

**TM 11-6625-3081-23-5**

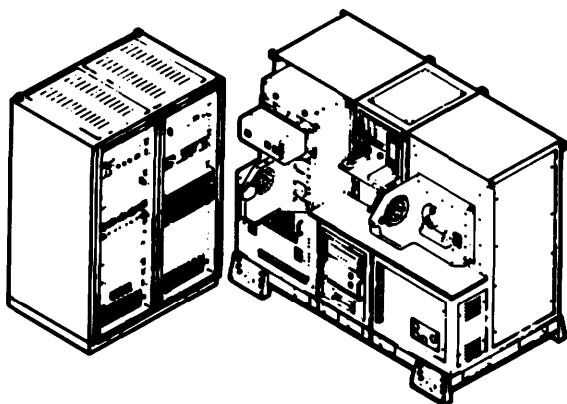
**TECHNICAL MANUAL**

**ORGANIZATIONAL AND DIRECT SUPPORT  
MAINTENANCE MANUAL  
FOR**

**ELECTRONIC EQUIPMENT TEST FACILITY  
TADS/PNVS AUGMENTATION EQUIPMENT**

**13082808-39, 13231600, 13231650 AND 13231800**

**TROUBLESHOOTING AND ALINEMENT**



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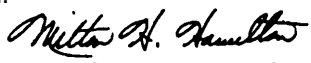
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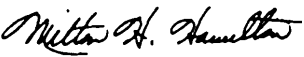
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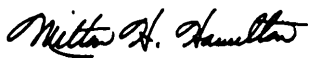
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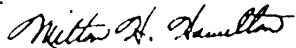
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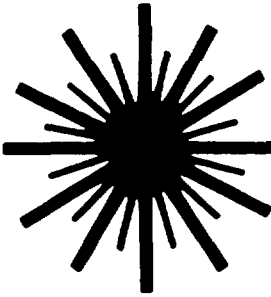






# DANGER

**INVISIBLE LASER RADIATION  
AVOID EYE EXPOSURE TO DIRECT RADIATION**



**ACTIVE LASERS ARE USED IN CERTAIN TESTS. OBSERVE ALL SAFETY  
PRECAUTIONS. ENSURE THAT USER PROTECTION COVER IS CLOSED.  
NEVER LOOK AT OR ALONG THE AXIS OF A LASER BEAM.**

**PROCEDURES IN THIS MANUAL DO NOT REQUIRE ANY FIRING OF THE LASER INTO OPEN SPACE.  
TESTING IS ACCOMPLISHED IN A PROTECTIVE ENCLOSURE WHICH PREVENTS EXPOSURE TO  
THE POTENTIALLY DANGEROUS LASER RADIATION.**

**YOUR SUPERVISOR WILL HAVE LASER SAFETY GOGGLES AVAILABLE IF ANY PROBLEM PRESENTS  
A POSSIBLE EXPOSURE TO THE LASER RADIATION. A STANDARD LASER SAFETY GOGGLE, NSN  
4240-00-258-2054, WILL PROVIDE ADEQUATE PROTECTION IF REQUIRED. OTHER LASER SAFETY  
GOGGLES CAN BE USED, BUT SHOULD BE SPECIFIC FOR AND LABELLED WITH THE 1064 NANOME-  
TER WAVELENGTH.**



## **WARNING**

### **HIGH VOLTAGE**

is used in the operation of this equipment

### **DEATH ON CONTACT**

May result if personnel fail to observe safety precautions. Learn the areas containing high voltage in each piece of equipment. Be careful not to contact high-voltage connections when installing or operating this equipment. Before working inside the equipment, turn power off and ground points of high potential before touching them.

For Artificial Respiration, refer to FM 21-11

## **WARNING**

### **HAZARDOUS SOLVENTS**

When you use solvents, be sure that the place you work in is well ventilated. **WEAR GLOVES AND EYE PROTECTION.** If you don't have good ventilation, read TB MED 223 and use the recommended respiratory (breathing) protection.

**DON'T USE FLAMMABLE SOLVENTS AROUND HEAT, OPEN FLAME, OR SPARKS.**

IF YOU GET SOLVENT IN YOUR EYES OR ON YOUR SKIN, FLUSH THE SOLVENT AWAY WITH WATER FOR 15 MINUTES: THEN GET MEDICAL HELP.

Freon reacts with highly active free metals such as sodium, barium, or potassium, and may produce toxic byproducts, fires, or explosions. Do not use Freon near highly active free metals.

### **TOXIC AND FLAMMABLE CHEMICALS**

Use the same care for toxic and flammable chemicals as you would for hazardous solvents.

### **CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL CONTAMINATION**

Notify your supervisor if you think you have been exposed to chemical, biological, or radiological contamination. TM 9-1300-275/2 gives procedures for decontamination.

### **PNEUMATIC SYSTEMS**

PNEUMATIC PRESSURE SHOULD BE TURNED OFF AND SYSTEM BLED DOWN TO PREVENT INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.

### **HEAVY OBJECTS**

HEAVY OBJECTS LIFTED OR CARRIED MAY REQUIRE MORE THAN ONE PERSON TO PREVENT INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.

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**CHAPTER 7**  
**TROUBLESHOOTING**

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**OVERVIEW**

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This chapter provides instructions for organizational level troubleshooting of the Electronic Equipment Test Facility (EETF) TADS/PNVS Augmentation Equipment. Section I contains an introduction and troubleshooting methodology. Sections II thru VI contain troubleshooting information.

## Section I. INTRODUCTION

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**7-1. INTRODUCTION****7-1****a. SCOPE**

This section provides an introduction of material contained in this chapter and a description of methodology used to troubleshoot (isolate) faults within the TADS/PNVS augmentation equipment.

**b. CHAPTER LAYOUT**

Chapter 7 consists of 6 sections. Section I contains introductory information. Sections II thru VI contain troubleshooting information for the Electronic Station, Dayside Test Bench, Test Console Test Bench, Nightside Test Bench and Common Modules, respectively. Each section contains peculiar data for the equipment it supports. All sections contain troubleshooting procedures. Each troubleshooting procedure or paragraph contains the following information:

- Description - describes the self-test module (program) and what is being tested.
- Replacement Procedure Reference - provides a cross-reference from reference designation and part number to procedural paragraph number for removal and installation.
- Segments or Faults - duplicates fault message information which is used to identify each fault segment. This display is also shown on the Video Display Terminal (VDT).
- Corrective Action - provides sequential steps to isolate malfunctions by removal and installation of assemblies, manually troubleshoot cables, and provides additional tests which can be performed. If a fault cannot be isolated, the problem is deferred to higher level maintenance.

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## 7-2. TROUBLESHOOTING METHODOLOGY

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7-2

### a. GENERAL

Troubleshooting is the process by which a problem is detected (identify that a problem exists), isolated (eliminate from a suspect group the cause of the problem), and repaired (restore system to proper operation). Troubleshooting methodology is the method or how a problem is detected, isolated, and repaired.

TADS/PNVS augmentation equipment uses a combination of built-in-test equipment (BITE) and operator interface/interaction to detect, isolate, and repair system in the shortest time possible. TADS/PNVS augmentation equipment fall into the following categories:

- Electronics
- Cabinets, Slides, Base
- Blowers, Lamps, Etc.
- Cables, Harnesses
- Glass, Mechanical

These categories are discussed in later paragraphs.

#### (1) Detection.

Faults can be detected by visual inspection, symptoms, functional inference, and automatic diagnostic testing using BITE and software programs. Troubleshooting of TADS/PNVS augmentation equipment is done in this manner.

Testing and troubleshooting of various electronic, electrical, electro-mechanical, and optical assemblies are done using BITE and a self-test program. This program contains 37 stand-alone self-test modules. Each module tests a particular function or system operation (refer to chapter 2 for an explanation of self-test program and procedures). If no faults are detected, a pass message is displayed on the VDT. If a fault is detected, a failure message is displayed on the VDT.

#### (2) Isolation.

Each self-test module will isolate a fault to a single function operation. This operation is dependent on a group of parts performing properly. To isolate the parts, each part is replaced beginning with the part most likely to fail. This continues until the part least likely to have failed is replaced. This will eliminate each member of that group until the failed part is found. Replacement order is displayed on VDT screen.

#### (3) Repair.

When a malfunctioning part is identified, it is repaired and restored to its proper operation. Often, isolation and repair happen at the same time. During isolation, a part is replaced and self-test performed to verify system performance. If system does not function properly, then the next item is replaced. If system does function properly, then last item replaced is bad. This item is either repaired, sent to depot for repair, or discarded as applicable.

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**7-2. TROUBLESHOOTING METHODOLOGY (cont)**

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**7-2****b. ELECTRONICS TROUBLESHOOTING**

Self-test module VSGST is used as an example to describe electronics troubleshooting methodology. VSGST is the input code for Video Signal Generator (VSG) assembly 2A2A7A1 self-test (ST).

To locate the paragraph containing troubleshooting information for this module, you would:

(1) By reference designation the VSG (2A2A7A1) is physically located in Test Console Test Bench 2A2, electronics drawer A7.

(2) Refer to Chapter 7 table of contents and determine the section number containing troubleshooting information for the Test Console Test Bench 2A2. You will find that this information is located in Section IV.

(3) Refer to Section IV table of contents and determine the paragraph number for Video Signal Generator (VSG) Case Assembly 2A2A7A1 Input Code: VSGST.

(4) This paragraph will contain a description, replacement procedure reference, repair messages (fault segments), and corrective actions.

A flow chart showing the troubleshooting process, and a description of each block is provided in this paragraph. Description of the flow chart is keyed by numbers in the "symbol" column. These numbers correspond to the circled numbers located near the blocks on the flow chart.



## 7-2. TROUBLESHOOTING METHODOLOGY (cont)

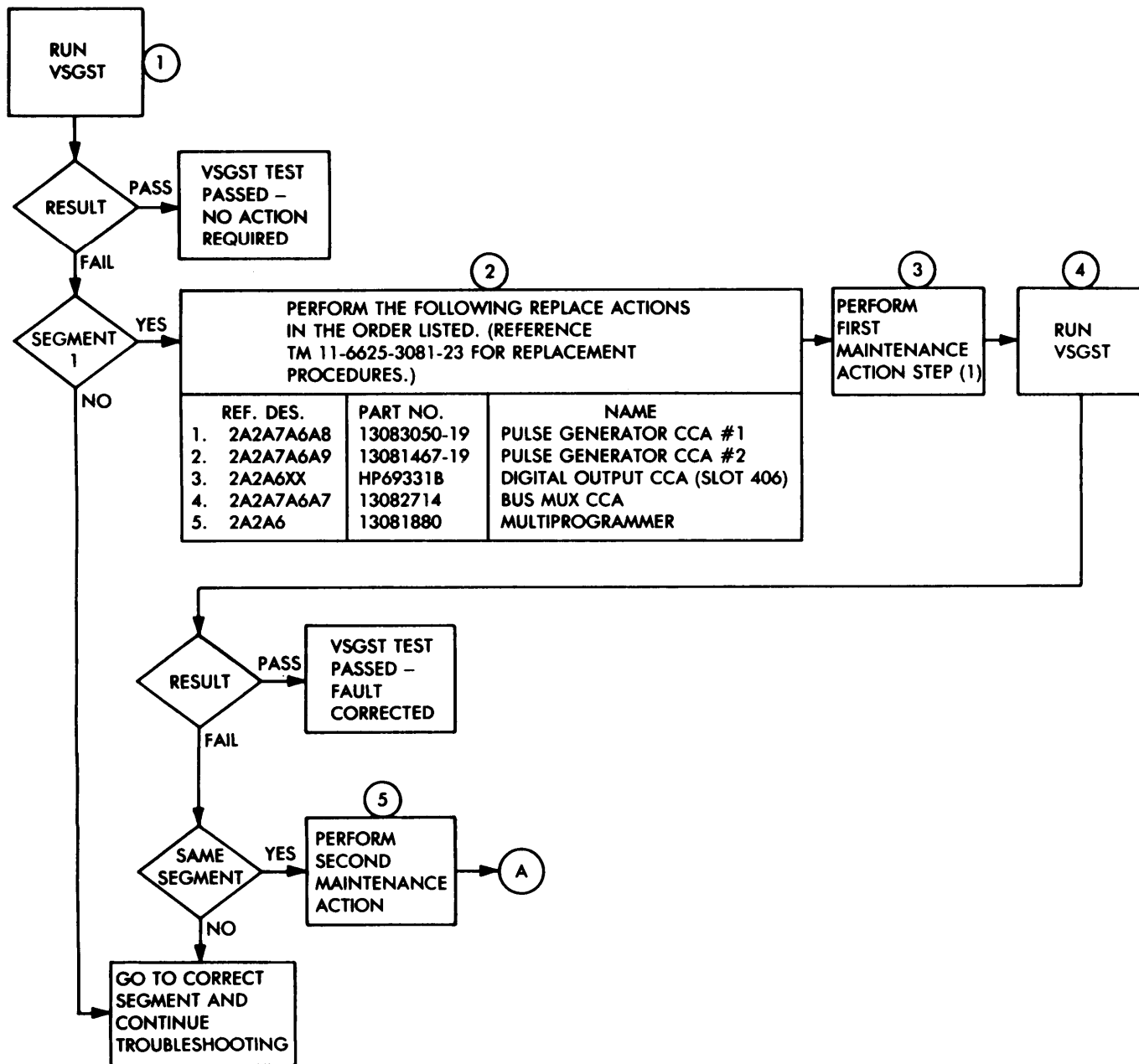
7-2

## ELECTRONICS TROUBLESHOOTING FLOW CHART DESCRIPTION

Symbol	Action
1	<p>RUN VSGST - refer to chapter 2 for self-test instructions.</p> <p>If VSGST test passes, no further action required.</p> <p>If VSGST test fails, then the correct fault segment must be determined.</p> <p>If segment 1 is not displayed, then the operator must find the correct segment before continuing.</p> <p>For this example, segment 1 is displayed.</p>
2	<p>This is the VDT display of the repair message for segment 1.</p> <p style="text-align: center;"><b>NOTE</b></p> <p style="text-align: center;">Prior to performing replace actions, check test tools for faults (connector seating, continuity, physical damage, etc.) and rerun test module.</p>
3	<p>PERFORM FIRST MAINTENANCE ACTION - refer to REPLACEMENT PROCEDURE REFERENCE paragraph. Under heading "Item (Ref Des/Part No.)" find 2A2A7A6A8/13083050-19. On this line under the heading "Reference (Para No.)" is paragraph number 2-51. Refer to chapter 2, paragraph 2-51 and replace Pulse Generator CCA #1 2A2A7A6A8.</p>
4	<p>RUN VSGST - rerun test.</p> <p>If VSGST test passes, then Pulse Generator CCA 2A2A7A6A8 was bad. No further action required.</p> <p>If VSGST test fails and its a different fault segment, then Pulse Generator CCA 2A2A7A6A8 was faulty but another fault exists. Operator must then find correct fault segment and continue troubleshooting.</p> <p>If VSGST test fails and its the same fault segment, then Pulse Generator CCA 2A2A7A6A8 was not faulty and troubleshooting in this leg continues.</p>
5	<p>PERFORM SECOND MAINTENANCE ACTION - Refer to REPLACEMENT PROCEDURE REFERENCE paragraph and determine procedural paragraph number to replace 2A2A7A6A9/13081467-19. Replace Pulse Generator CCA #2 2A2A7A6A9.</p>

## 7-2. TROUBLESHOOTING METHODOLOGY (cont)

7-2



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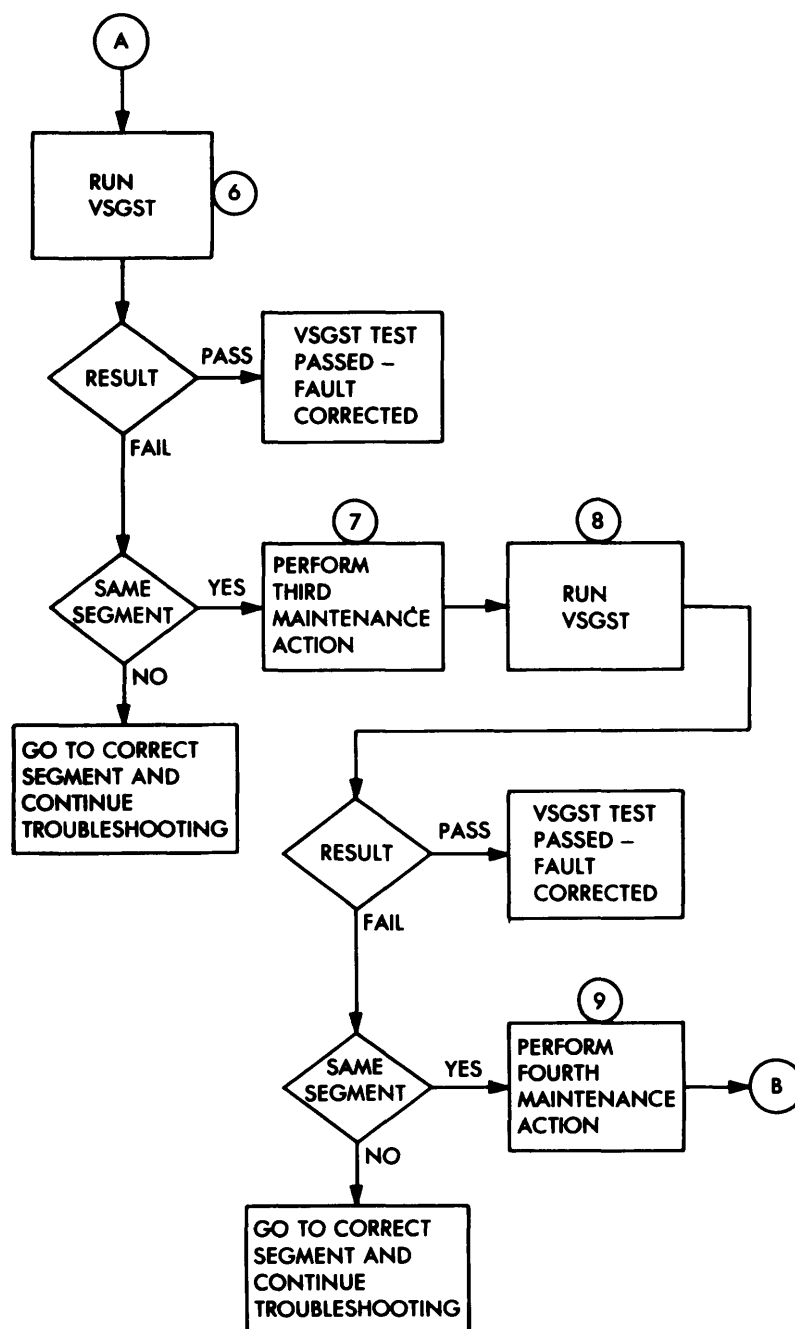
**7-2. TROUBLESHOOTING METHODOLOGY (cont)****7-2**

## ELECTRONICS TROUBLESHOOTING FLOW CHART DESCRIPTION (cont)

Symbol	Action
6	<p>RUN VSGST - rerun test</p> <p>If VSGST test passes, then Pulse Generator CCA 2A2A7A6A9 was bad. No further action required.</p> <p>If VSGST test fails and its a different fault segment, then Pulse Generator CCA 2A2A7A6A9 was faulty but another fault exists. Operator must then find correct fault segment and continue troubleshooting.</p> <p>If VSGST test fails and its the same fault segment, then Pulse Generator CCA 2A2A7A6A9 was not faulty and troubleshooting in this leg continues.</p>
7	<p>PERFORM THIRD MAINTENANCE ACTION - Refer to REPLACEMENT PROCEDURE REFERENCE paragraph and determine procedural paragraph number to replace 2A2A6XX/HP69331B. Replace Digital Output CCA (Slot 406) 2A2A6XX.</p>
8	<p>RUN VSGST - rerun test.</p> <p>If VSGST test passes, then Digital Output CCA 2A2A6XX was bad. No further action required.</p> <p>If VSGST test fails and its a different fault segment, then Digital output CCA 2A2A6XX was faulty but another fault exists. Operator must then find correct fault segment and continue troubleshooting.</p> <p>If VSGST test fails and its the same fault segment, then Digital Output CCA 2A2A6XX was not faulty and troubleshooting in this leg continues.</p>
9	<p>PERFORM FOURTH MAINTENANCE ACTION - Refer to REPLACEMENT PROCEDURE REFERENCE paragraph and determine procedural paragraph number to replace 2A2A7A6A7/13082714. Replace Bus Multiplexer CCA 2A2A7A6A7.</p>
10	<p>Run VSGST - rerun test.</p> <p>If VSGST test passes, then Bus Multiplexer CCA 2A2A7A6A7 was bad. No further action required,</p> <p>If VSGST test fails and its a different fault segment, then Bus Multiplexer CCA 2A2A7A6A7 was faulty but another fault exists. Operator must then find correct fault segment and continue troubleshooting.</p> <p>If VSGST test fails and its the same fault segment, then Bus Multiplexer CCA 2A2A7A6A7 was not faulty and troubleshooting in this leg continues.</p>

## 7-2. TROUBLESHOOTING METHODOLOGY (cont)

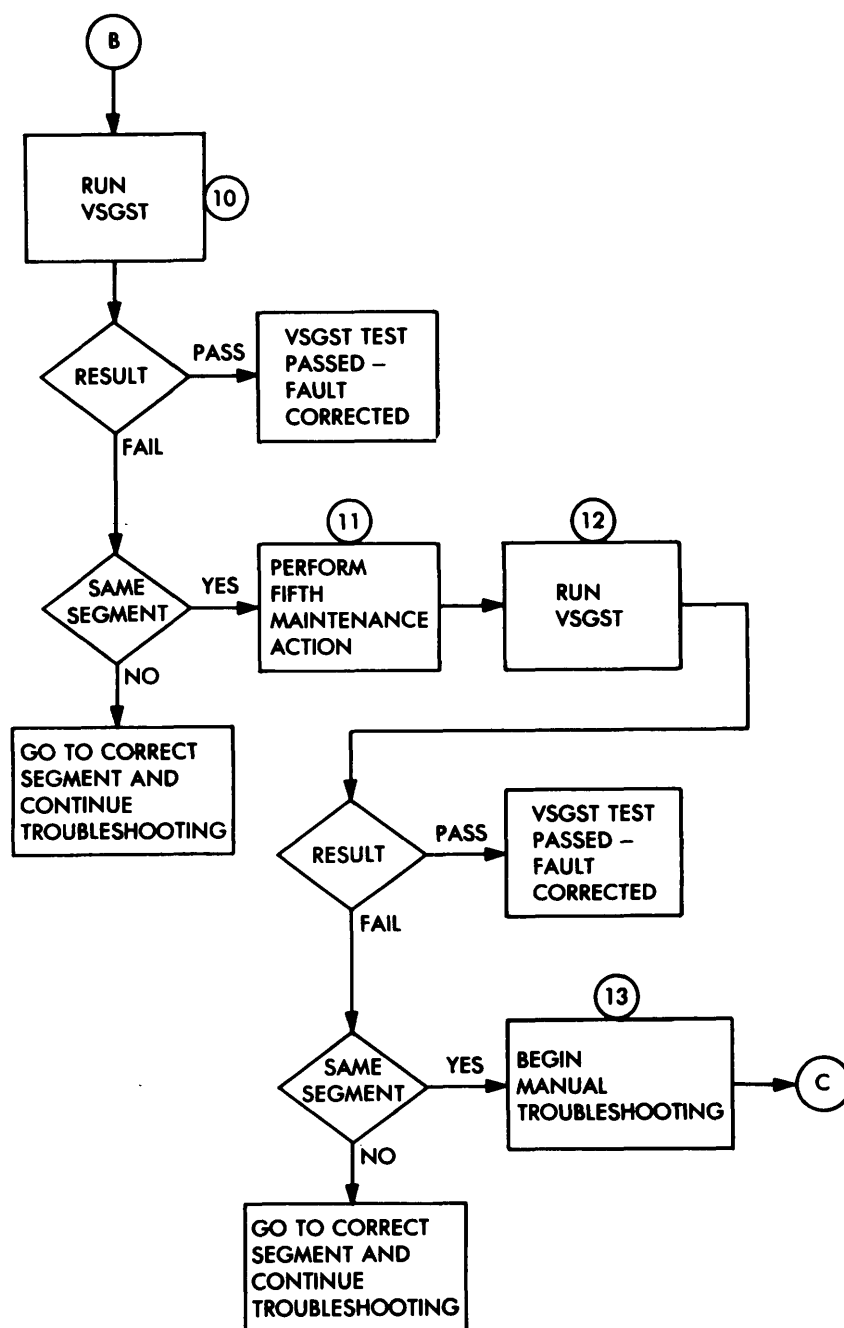
7-2



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## 7-2. TROUBLESHOOTING METHODOLOGY (cont)

7-2



EL9Q-1100-103-3

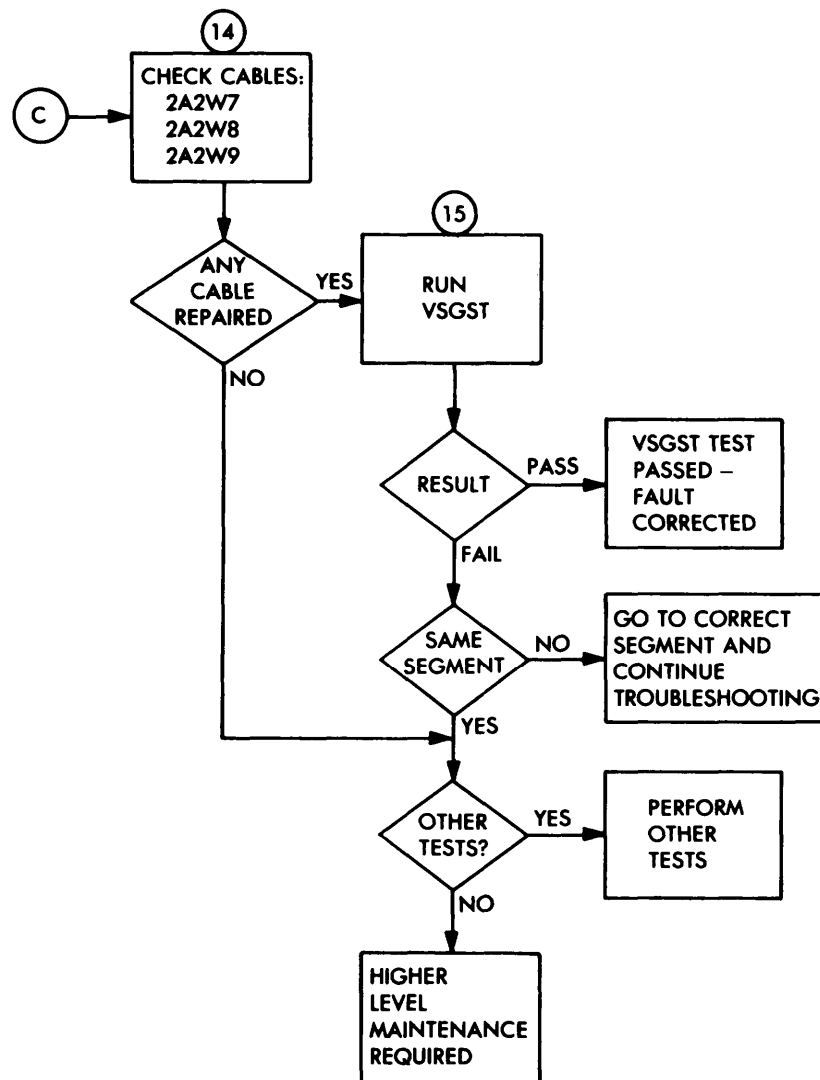
**7-2. TROUBLESHOOTING METHODOLOGY (cont)****7-2**

## ELECTRONICS TROUBLESHOOTING FLOW CHART DESCRIPTION (cont)

Symbol	Action
11	PERFORM FIFTH MAINTENANCE ACTION - Refer to REPLACEMENT PROCEDURE REFERENCE paragraph and determine procedural paragraph number to replace 2A2A6/13081880. Replace Multi programmer 2A2A6.
12	<p>RUN VSGST - rerun test</p> <p>If VSGST test passes, then Multi programmer 2A2A6 was bad. No further action required.</p> <p>If VSGST test fails and its a different fault segment, then Multi programmer 2A2A6 was faulty but another fault exists. Operator must then find correct fault segment and continue troubleshooting.</p> <p>If VSGST test fails and its the same fault segment, then Multi programmer 2A2A6 was not faulty and troubleshooting in this leg continues.</p>
13	BEGIN MANUAL TROUBLESHOOTING - Refer to chapter 3 of this manual for interconnection diagrams and wire lists. Table of contents for chapter 3 shows wiring data for Test Console Test Bench is located in section IV.
14	<p>CHECK CABLES 2A2W7, 2A2W8, and 2A2W9 - Disconnect cables and check connectors for damage. Using wiring data in chapter 3, check continuity. Repair or replace cables as required using standard maintenance procedures.</p> <p>If no cable repairs required and other tests are available to perform; perform other tests.</p> <p>If no cable repairs required and other tests have been performed; next higher level of maintenance is required.</p> <p>If cable repairs were made, then proceed to block 15.</p>
15	<p>Run VSGST - rerun test.</p> <p>If VSGST test passes, then cable(s) were bad. No further action required.</p> <p>If VSGST test fails and its a different fault segment, then cable(s) were faulty but another fault exists. Operator must then find correct fault segment and continue troubleshooting.</p> <p>If VSGST test fails and its the same segment and other tests are available to perform; perform other tests.</p> <p>If VSGST test fails and other test have been performed; next higher level of maintenance required.</p>

## 7-2. TROUBLESHOOTING METHODOLOGY (cont)

7-2



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**7-2. TROUBLESHOOTING METHODOLOGY (cont)****7-2****c. CABINETS, SLIDES, AND BASE TROUBLESHOOTING**

Cabinets, slides, and base troubleshooting is accomplished by visual inspection. The "Cabinets, Slides, Base Troubleshooting Flow Chart", showing the troubleshooting process, and a description of each block, are provided in this paragraph. The description of the flow chart is keyed by circled numbers in the "Symbol" column. These numbers correspond to the circled numbers located near the blocks on the flow chart.

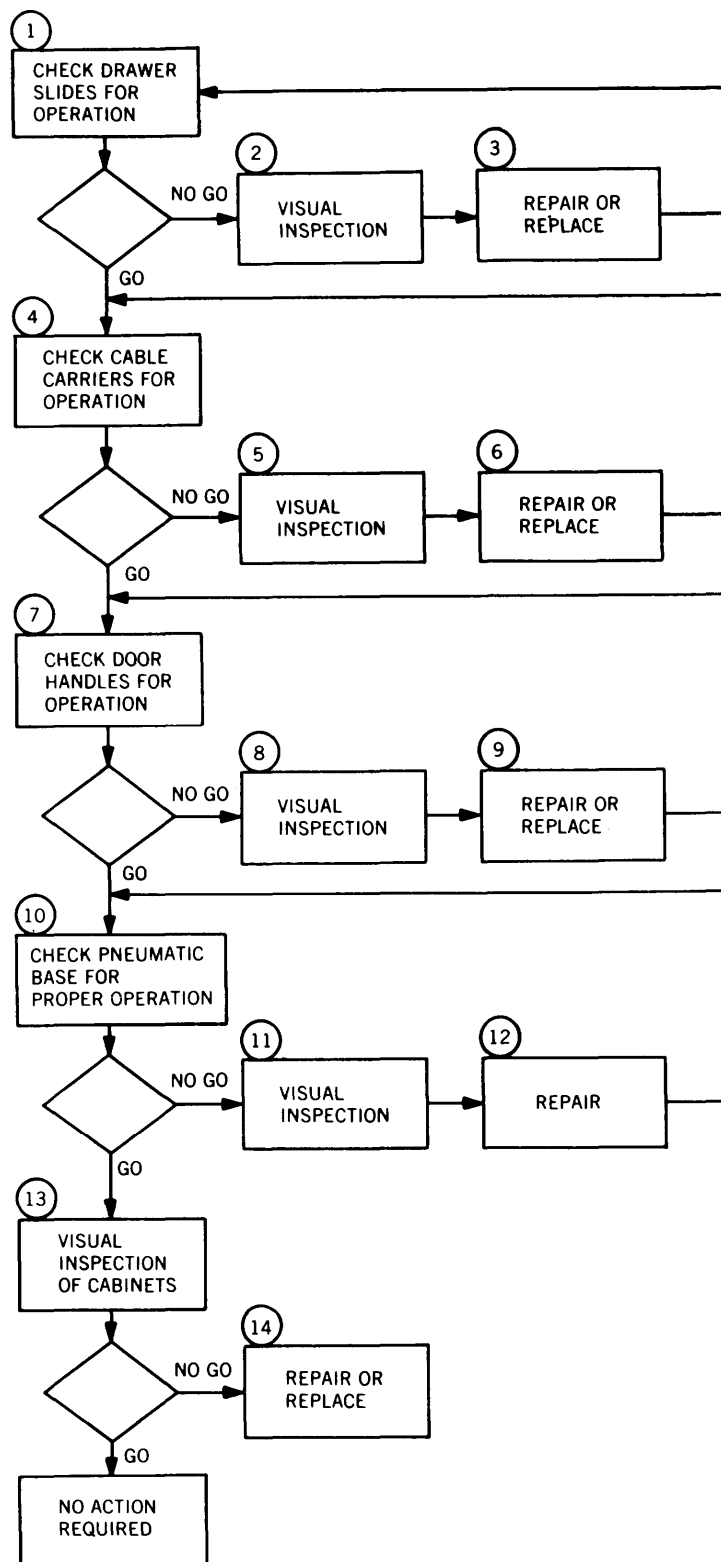
**CABINETS, SLIDES, AND BASE TROUBLESHOOTING FLOW CHART DESCRIPTION**

Symbol	Action
1	CHECK DRAWER SLIDES FOR OPERATION - pull drawers out of cabinets and check for slide operation.
2	VISUAL INSPECTION - look for bent or otherwise damaged slides, or obstructions that prevent proper operation.
3	REPAIR OR REPLACE - use standard maintenance procedures to repair. Refer to paragraph 2-25, 5-10, and 5-31 for procedures to replace slides.
4	CHECK CABLE CARRIERS FOR OPERATION - pull drawers out of cabinets and check for cable carrier operation.
5	VISUAL INSPECTION - look for cables not extending freely or any obstruction to cables.
6	REPAIR OR REPLACE - use standard maintenance procedures to repair. Refer to paragraphs 2-25, 5-10, and 5-31 for procedures to replace cable carriers
7	CHECK DOOR HANDLES FOR OPERATION - Open and close cabinet doors and check for proper operation.
8	VISUAL INSPECTION - look for damaged skirt, isolators, damaged tubing, etc.
9	REPAIR OR REPLACE - use standard maintenance procedures to repair. Refer to paragraph 2-25 for replacement procedures.
10	CHECK PNEUMATIC BASE FOR PROPER OPERATION - refer to TM 11-6625-3085-12 for operation procedures.
11	VISUAL INSPECTION - look for damaged skirt, isolators, damaged tubing, etc.
12	REPAIR - refer to paragraph 5-6 for procedures to repair base assembly.
13	VISUAL INSPECTION OF CABINETS - look for damage panels, chipped paint, etc.
14	REPAIR OR REPLACE - refer to paragraphs 2-25, 2-42, 2-64, and 5-10 for procedures to repair or replace cabinets.



## 7-2. TROUBLESHOOTING METHODOLOGY (cont)

7-2



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**7-2. TROUBLESHOOTING METHODOLOGY (cont)**

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**7-2****d. BLOWERS AND LAMPS, ETC. TROUBLESHOOTING**

Blowers and lamps, etc., troubleshooting is accomplished by deduction of symptoms. If no airflow can be felt at top of cabinet or no blower noise can be heard, you can determine from these symptoms that the blower has malfunctioned. If a lamp is not lit when it should be, you can determine that the lamp is burned out, etc.

**e. CABLES AND HARNESES TROUBLESHOOTING**

The cables and harnesses troubleshooting is accomplished by elimination and is described in the Electronics Troubleshooting Flow Chart in this paragraph.

**f. GLASS AND MECHANICAL TROUBLESHOOTING**

Glass and mechanical troubleshooting is accomplished by functional inference. For example, if the light source in the OSG is operating, but the light beam is not received at the outlet port, the functional inference is that one or more of the fixed mirrors is not reflecting the light beam.

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## Section II. ELECTRONIC STATION 1

Subject	Para	Page
Digital Computer Assembly 1A11 Input Code: CALCST . . . . .	7-3	7-16
DC Power Supply Assembly 1A4 Input Code: FPSST . . . . .	7-4	7-22
Programmable Power Supply Assembly 1A3 Input Code: PPSST . . . . .	7-5	7-26

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### OVERVIEW

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This section contains troubleshooting information for Electronic Station 1.

### 7-3. DIGITAL COMPUTER ASSEMBLY 1A11 INPUT CODE: CALCST

7-3

#### a. DESCRIPTION

This module gives the operator instructions to check extender assemblies 1A9A1, 1A9A2, 2A2A8, and the extender assembly in the AN/USM-410(V)2 for status of front panel lights. Then, the module exercises the calculate commands. If a time out error does not occur before the first calculate command test is completed, the IEEE 488 Bus, extender assemblies, and digital computer assembly 1A11 are functioning normally. Since a time out error "locks out" the self-test program, the error message is displayed at the start of the first calculate command test.

A calculate error will cause a prompt to be displayed upon completion of the test.

#### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
1A9A1/37203A	2-38
1A9A2/37203A	2-38
1A11/13231746	2-39.1
1A11A1/HP12205A	2-40
1A11A2/HP12201A	2-40
1A11A3/HP12202A	2-40
1A11A4/HP12203A	2-40
1A11A5/HP12204A	2-40
1A11A6/HP12221A	2-40
1A11A7/HP12009A	2-40
1A11A8/HP12005B/002	2-40
1A11A9/13081742	2-40
1A11A10/HP12012A	2-40
1A11A11/HP12009A	2-40
1A11A12/13081431	2-40
1A11A13/13081483	2-40
1A11XX/12305A	2-40
2A2A8/37203A	2-52

## 7-3. DIGITAL COMPUTER ASSEMBLY 1A11

### INPUT CODE: CALCST (cont)

7-3

#### c. SEGMENT 1

##### 1. VDT DISPLAY

IEEE 488 BUS EXTENDER IS SUSPECT. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES. )

<u>REF. DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1. EQUATE	HP37203A	HP-IB EXTENDER
2. 1A9A1	HP37203A	HP-IB EXTENDER
3. 1A9A2	HP37203A	HP-IB EXTENDER
4. 2A2A8	HP37203A	HP-IB EXTENDER

##### 2. CORRECTIVE ACTION - SEGMENT 1

- (a) Remove EQUATE HP-IB Extender. Check contacts of mating connectors and repair if required. Install replacement extender and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Extender 1A9A1. Check contacts of mating connectors and repair if required. Install replacement 1A9A1 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Extender 1A9A2. Check contacts of mating connectors and repair if required. Install replacement 1A9A2 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Extender 2A2A8. Check contacts of mating connectors and repair if required. Install replacement 2A2A8 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

### 7-3. DIGITAL COMPUTER ASSEMBLY 1A11 INPUT CODE: CALCST (cont)

7-3

#### 2. CORRECTIVE ACTION - SEGMENT 1 (cont)

(e) Check the following cable assemblies and repair as required:

HP10833B (2 Places)  
HP10833C  
HP12009-60014  
W9  
W13  
1W9  
1W13  
1W25  
2A2W6

If any cable was repaired, perform CALCST test. If CALCST test passes, no further action required. If this segment fails, repair is beyond this level of maintenance. Next higher level of maintenance required. If another segment displayed, proceed to that segment and continue troubleshooting.

If no cables were repaired, next higher level of maintenance required.

#### d. SEGMENT 2

##### 1. VDT DISPLAY

COMPUTER MEMORY TEST FAILED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT procedures. )

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A11A9	13081742	IEEE INTERFACE
2.	1A11A11	HP12009A	HPIB CCA
3.	1A11A12	13081431	PARALLEL INTERFACE
4.	1A11A1	HP12205A	CONTROL STORE CCA
5.	1A11A2	HP12201A	SEQUENCER CCA
6.	1A11A5	HP12204A	MEMORY CONTROLLER CCA
7.	1A11A6	HP12221A	MEMORY CCA
8.	1A11A3	HP12202A	DATA PATH CCA
9.	1A11A4	HP12203A	CACHE
10.	1A11A7	HP12009A	HPIB CCA
11.	1A11A13	13081483	BUFFER CCA
12.	1A11A10	HP12012A	PRIORITY JUMPER
13.	1A11A8	HP12005B/002	ASIC
14.	1A11AXX	12305A	POWER MODULE
15.	1A11	13231746	DIGITAL COMPUTER
16.	1A9A1	HP37203A	HP-IB EXTENDER
17.	EQUATE	HP37203A	HP-IB EXTENDER
18.	EQUATE	238879	IEEE I/O CARD

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**7-3. DIGITAL COMPUTER ASSEMBLY 1A11**  
**INPUT CODE: CALCST (cont)**

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**7-3****2. CORRECTIVE ACTION - SEGMENT 2**

- (a) Remove IEEE Interface CCA 1A11A9. Check contacts of mating connectors and repair if required. Install replacement 1A11A9 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove HPIB CCA 1A11A11. Check contacts of mating connectors and repair if required. Install replacement 1A11A11 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Parallel Interface 1A11A12. Check contacts of mating connectors and repair if required. Install replacement 1A11A12 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Control Store CCA 1A11A1. Check contacts of mating connectors and repair if required. Install replacement 1A11A1 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Sequencer CCA 1A11A2. Check contacts of mating connectors and repair if required. Install replacement 1A11A2 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove Memory Controller CCA 1A11A5. Check contacts of mating connectors and repair if required. Install replacement 1A11A5 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.
- (g) Remove Memory CCA 1A11A6. Check contacts of mating connectors and repair if required. Install replacement 1A11A6 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (h). If another segment displayed, proceed to that segment and continue troubleshooting.
- (h) Remove Data Path CCA 1A11A3. Check contacts of mating connectors and repair if required. Install replacement 1A11A3 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (i). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-3. DIGITAL COMPUTER ASSEMBLY 1A11**  
**INPUT CODE: CALCST (cont)**

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**7-3****2. CORRECTIVE ACTION - SEGMENT 2 (cont)**

- (i) Remove Cache CCA 1A11A4. Check contacts of mating connectors and repair if required. Install replacement 1A11A4 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (j). If another segment displayed, proceed to that segment and continue troubleshooting.
- (j) Remove HPIB CCA 1A11A7. Check contacts of mating connectors and repair if required. Install replacement 1A11A7 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (k). If another segment displayed, proceed to that segment and continue troubleshooting.
- (k) Remove Buffer CCA 1A11A13. Check contacts of mating connectors and repair if required. Install replacement 1A11A13 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (l). If another segment displayed, proceed to that segment and continue troubleshooting.
- (l) Remove Priority Jumper CCA 1A11A10. Check contacts of mating connectors and repair if required. Install replacement 1A11A10 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (m). If another segment displayed, proceed to that segment and continue troubleshooting.
- (m) Remove ASIC 1A11A8. Check contacts of mating connectors and repair if required. Install replacement 1A11A8 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (n). If another segment displayed, proceed to that segment and continue troubleshooting.
- (n) Remove Power Module 1A11AXX. Check contacts of mating connectors and repair if required. Install replacement 1A11AXX and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (o). If another segment displayed, proceed to that segment and continue troubleshooting.
- (o) Remove Digital Computer Assembly 1A11. Check contacts of mating connectors and repair if required. Install replacement 1A11 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (p). If another segment displayed, proceed to that segment and continue troubleshooting.
- (p) Remove HP-IB Extender 1A9A1. Check contacts of mating connectors and repair if required. Install replacement 1A9A1 and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (q). If another segment displayed, proceed to that segment and continue troubleshooting.



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**7-3. DIGITAL COMPUTER ASSEMBLY 1A11**  
**INPUT CODE: CALCST (cont)**

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**7-3****2. CORRECTIVE ACTION - SEGMENT 2 (cont)**

- (q) Remove EQUATE HP-IB Extender. Check contacts of mating connectors and repair if required. Install replacement Extender and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (r). If another segment displayed, proceed to that segment and continue troubleshooting.
- (r) Remove EQUATE IEEE I/O card. Check contacts of mating connectors and repair if required. Install replacement IEEE I/O card and perform CALCST test. If CALCST test passes, no further action required. If this segment displayed again, proceed to (s). If another segment displayed, proceed to that segment and continue troubleshooting.
- (s) Check the following cable assemblies and repair as required:

HP10833B  
HP10833C  
HP12009-60014  
W7  
W13  
W14  
1W7  
1W9  
1W13  
1W17  
1W25

If any cable was repaired, perform CALCST test. If CALCST test passes, no further action required. If this segment fails, repair is beyond this level of maintenance. Next higher level of maintenance required. If another segment displayed, proceed to that segment and continue troubleshooting.

If no cables were repaired, next higher level of maintenance required.

## 7-4. DC POWER SUPPLY ASSEMBLY 1A4 INPUT CODE: FPSST

7-4

### a. DESCRIPTION

This module tests fixed power supplies 1A4PS1, 1A4PS2, 1A4PS3, and 1A4PS4. The 1A4PS1 28 vdc output is measured by using channel 226 of A/D converter assembly 2A2A13 and scaling accordingly.

A prompt is displayed if voltage is not +26.0 to +30.0 vdc.

The 1A4PS2 +15 vdc output is measured using channel 227 of A/D converter assembly 2A2A13 and scaling accordingly.

A prompt is displayed if voltage is not +14.0 to +16.0 vdc.

The 1A4PS3 -15 vdc output is measured using channel 228 of A/D converter assembly 2A2A13 and scaling accordingly.

A prompt is displayed if voltage is not -14.0 to -16.0 vdc.

The 1A4PS4 +5 vdc output is measured using channel 229 of A/D converter assembly 2A2A13, and scaling accordingly.

A prompt is displayed if voltage is not +4.5 to +5.5 vdc.

### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
1A4PS1/BKF-28-4	2-33
1A4PS2/BKF-15-6	2-33
1A4PS3/BKF-15-6	2-33
1A4PS4/BKF-5-11	2-33
2A2A13XX (SL0T J8)/AC4720	2-61
2A2A7A6A4/13082738	2-51

## 7-4. DC POWER SUPPLY ASSEMBLY 1A4

### INPUT CODE: FPSST (cont)

7-4

#### c. SEGMENT 1

##### 1. VDT DISPLAY

+28 VOLT POWER SUPPLY FAILED ACCEPTABLE LIMITS. PERFORM THE FOLLOWING REPLACE ACTION IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A4PS1	BFK28-4	+28 VDC SUPPLY
2.	2A2A13XX	AC4720	DIFF. INPUT CCA (J8)
3.	2A2A7A6A4	13082738	TEMP. MONITOR CCA

NOTE: ATTEMPT ADJUSTMENT OF THE SUPPLY PRIOR TO REPLACEMENT.

##### 2. CORRECTIVE ACTION - SEGMENT 1

#### NOTE

Corrective actions for FPSST fault segments are identical except for power supplies. Refer to the VDT display for each fault segment for the correct power supply to be replaced.

(a) Remove applicable power supply:

1A4PS1	+28 vdc	Power Supply
1A4PS2	+15 vdc	Power Supply
1A4PS3	-15 vdc	Power Supply
1A4PS4	+5 vdc	Power Supply

Check contacts of mating connectors and repair if required. Install replacement power supply and perform FPSST test. If FPSST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

(b) Remove Differential Input CCA 2A2A13XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform FPSST test. If FPSST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.

(c) Remove Temperature Monitor CCA 2A2A7A6A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A4 and perform FPSST test. If FPSST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-4. DC POWER SUPPLY ASSEMBLY 1A4

### INPUT CODE: FPSST (cont)

7-4

## 2. CORRECTIVE ACTION - SEGMENT 1 (cont)

(d) Check the following cable assemblies and repair as required:

W3  
1W5  
2A2W1  
2A2W3  
2A2W7  
2A2W17

If any cable was repaired, perform FPSST test. If FPSST test passes, no further action required. If FPSST test fails and CALCST, PLLBUS, MTRXSW, ADST, and DIGITST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, and DIGITST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

## d. SEGMENT 2

### 1. VDT DISPLAY

+15 VOLT POWER SUPPLY FAILED ACCEPTABLE LIMITS PERFORM THE FOLLOWING REPLACE ACTIONS IN ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A4PS2	BKF 15-6	+15 VDC SUPPLY
2.	2A2A13XX	AC4720	DIFF. INPUT CCA (J8)
3.	2A2A7A6A4	13082738	TEMP. MONITOR CCA

NOTE: ATTEMPT ADJUSTMENT OF THE SUPPLY PRIOR TO REPLACEMENT.

### 2. CORRECTIVE ACTION - SEGMENT 2

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

## 7-4. DC POWER SUPPLY ASSEMBLY 1A4 INPUT CODE: FPSST (cont)

7-4

### e. SEGMENT 3

#### 1. VDT DISPLAY

+5 VOLT POWER SUPPLY FAILED ACCEPTABLE LIMITS. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A4PS4	BKF5-11	+5 VDC SUPPLY
2.	2A2A13XX	AC4720	DIFF. INPUT CCA (J8)
3.	2A2A7A6A4	13082738	TEMP. MONITOR CCA

#### 2. CORRECTIVE ACTION - SEGMENT 3

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

### f. SEGMENT 4

#### 1. VDT DISPLAY

-15 VOLT POWER SUPPLY FAILED ACCEPTABLE LIMITS. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A4PS3	BKF 15-6	-15 VDC SUPPLY
2.	2A2A13XX	AC4720	DIFF. INPUT CCA (J8)
3.	2A2A7A6A4	13082738	TEMP. MONITOR CCA

#### 2. CORRECTIVE ACTION - SEGMENT 4

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

## 7-5. PROGRAMMABLE POWER SUPPLY ASSEMBLY 1A3 INPUT CODE: PPSST

7-5

### a. DESCRIPTION

This module tests programmable power supplies 1A3PS1, 1A3PS2, 1A3PS3, and 1A3PS4. Each of the programmable power supplies is programmed and checked at three different dc voltages and currents. The output voltage, load resistance, and noise (ac ripple) are measured and compared to upper and lower limits. The output current is calculated from the measured voltage and load resistance, and compared to upper and lower limits.

A prompt is displayed at the completion of the test if an error is detected.

### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/part No.)	Reference (Para No.)
1A2/13082835 (SN488-8)	2-28
1A2A1/SN488B	2-29
1A2A2/SN488B	2-29
1A2A3/SN488B	2-29
1A2A4/SN488B	2-29
1A3PS1/ATE 36-3M	2-31
1A3PS2/ATE 36-3M	2-31
1A3PS3/ATE 75-1.5M	2-31
1A3PS4/ATE 75-1.5M	2-31
2A2A11XX (SL0T 409)/HP69433A	2-57
2A2A4A1/13083063	2-33

## 7-5. PROGRAMMABLE POWER SUPPLY ASSEMBLY 1A3

### INPUT CODE: PPSST (cont)

7-5

#### c. SEGMENT 1

##### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A2	13082835	POWER SUPPLY CONTROLLER

##### 2. CORRECTIVE ACTION - SEGMENT 1

(a) Remove Power Supply Controller 1A2. Check contacts of mating connectors and repair if required. Install replacement 1A2 and perform PPSST test. If PPSST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting,

(b) Check the following cable assemblies and repair as required:

HP10833B (2 Places)  
 HP10833C  
 HP12009-6002  
 W2  
 1W2  
 2A2W1

If any cable was repaired, perform PPSST test. If PPSST test passes, no further action required. If PPSST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, and FPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, and FPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-5. PROGRAMMABLE POWER SUPPLY ASSEMBLY 1A3

### INPUT CODE: PPSST (cont)

7-5

#### d. SEGMENT 2

##### 1. VDT DISPLAY

POWER SUPPLY # FAILED PROGRAMMED VOLTAGE DRIVE TEST. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DS.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A2A#	SN488-8	CONTROLLER CCA
2.	1A3PS#	ATE36-3 (or ATE75-1.5)	PROGRAMMABLE POWER SUPPLY
3.	1A2	13082835	POWER SUPPLY CONTROLLER
4.	2A2A11XX	HP69433	RELAY READ BACK CCA (SLOT 409)
5.	2A2A4A1	13083063	RELAY ASSEMBLY

#### NOTE

The VDT display will complete the reference designation where the symbol # is shown above.

#### 2. CORRECTIVE ACTION - SEGMENT 2

#### NOTE

In (a) and (b), a # symbol is used in the reference designation. The VDT display will indicate the proper reference designation of the components to be replaced.

- (a) Remove Controller CCA 1A2A#. Check contacts of mating connectors and repair if required. Install replacement 1A2A# and perform PPSST test. If PPSST test passes, no further action required. If this segment displayed again, proceed to (b). If this segment is displayed again with a different set of reference designators, return to (a). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Programmable Power Supply 1A3PS#. Check contacts of mating connectors and repair if required. Install replacement 1A3PS# and perform PPSST test. If PPSST test passes, no further action required. If this segment displayed again, proceed to (c). If this segment is displayed again with a different set of reference designators, return to (a). If another segment displayed, proceed to that segment and continue troubleshooting.



## 7-5. PROGRAMMABLE POWER SUPPLY ASSEMBLY 1A3

### INPUT CODE: PPSST (cont)

7-5

#### 2. CORRECTIVE ACTION - SEGMENT 2 (cont)

- (c) Remove Power Supply Controller 1A2. Check contacts of mating connectors and repair if required. Install replacement 1A2 and perform PPSST test. If PPSST test passes, no further action required. If this segment displayed again, proceed to (d). If this segment is displayed again with a different set of reference designators, return to (a). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Relay Readback CCA 2A2A11XX in slot 409. Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform PPSST test. If PPSST test passes, no further action required. If this segment displayed again, proceed to (e). If this segment is displayed again with a different set of reference designators, return to (a). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Relay Assembly 2A2A4A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A4A1 and perform PPSST test. If PPSST test passes, no further action required. If this segment displayed again, proceed to (f). If this segment is displayed again with a different set of reference designators, return to (a). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Check the following cable assemblies and repair as required:

Test Cable 13082730  
 HP10833B  
 HP10833C  
 W2  
 W3  
 1W2  
 1W6  
 2A2W1  
 2A2W4  
 2A2W11

If any cable was repaired, perform PPSST test. If PPSST test passes, no further action required. If PPSST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, and FPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, and FPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

If this segment is displayed again with a different set of reference designators, return to (a).

## 7-5. PROGRAMMABLE POWER SUPPLY ASSEMBLY 1A3

### INPUT CODE: PPSST (cont)

7-5

#### e. SEGMENT 3

##### 1. VDT DISPLAY

POWER SUPPLY # FAILED AC NOISE TEST. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A2A#	SN488-8	CONTROLLER CCA
2.	1A3PS#	ATE36-3 (or ATE75-1.5)	PROGRAMMABLE POWER SUPPLY
3.	1A2	13082835	POWER SUPPLY CONTROLLER
4.	2A2A11XX	HP69433	RELAY READBACK CCA (SLOT 409)
5.	2A2A4A 1	13083063	RELAY ASSEMBLY

#### NOTE

The VDT display will complete the reference designation where the symbol # is shown above.

##### 2. CORRECTIVE ACTION - SEGMENT 3

Corrective action same as segment 2. Refer to segment 2 for troubleshooting.

#### f. SEGMENT 4

##### 1. VDT DISPLAY

POWER SUPPLY # FAILED PROGRAMMABLE CURRENT DRIVE TEST. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PAT NO.</u>	<u>NAME</u>
1.	1A2A#	SN488-8	CONTROLLER CCA
2.	1A3PS#	ATE36-3 (or ATE75-1.5)	PROGRAMMABLE POWER SUPPLY
3.	1A2	13082835	POWER SUPPLY CONTROLLER
4.	2A2A11XX	HP69433	RELAY READBACK CCA (SLOT 409)
5.	2A2A4A 1	13083063	RELAY ASSEMBLY

#### NOTE

The VDT display will complete the reference designation where the symbol # is shown above.

##### 2. CORRECTIVE ACTION - SEGMENT 4

Corrective action same as segment 2. Refer to segment 2 for troubleshooting.

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### Section III. DAYSIDE TEST BENCH 2A1

Subject	Para	Page
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Automatic Focus Control Assembly 2A1A2A12 Input Code: DCFOCUS	7-7	7-35
B Mirror Input Code: DCBMIR	7-8	7-42
Cable Assembly (Target Lamp) 2A1A2A11W19 Input Code: DCDCTL	7-9	7-45
Camera Test Special Purpose Cable (External Source) Input Code: DCEXSO	7-10	7-48
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OSA Cables 13083702 and 13083701 Self-Test Input Code: OSACABLE	7-25	7-121

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#### OVERVIEW

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This section contains troubleshooting information for Dayside Test Bench 2A1.

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**7-6. A MIRROR**  
**INPUT CODE: DCAMIR**

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**7-6****a. DESCRIPTION**

This module tests the ability of the A mirror to respond to commands for both positions 1 and 2. The A mirror is programmed to position 1 and the motor status checked.

A prompt is displayed at the completion of the test if motor status is in error.

The A mirror is then programmed to position 2 and motor status checked.

A prompt is displayed at the completion of the test if the motor status is in error.

The A mirror is then programmed from position 2 to position 1 and the motor status checked.

A prompt is displayed if the motor status is in error.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

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Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A2A6XX (SL0T 401)/13083412	2-49
2A2A6XX (SL0T 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51

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## 7-6. A MIRROR INPUT CODE: DCAMIR (cont)

7-6

### c. A MIRROR SELF TEST FAILURE

#### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA No. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA No. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA No. 3
6.	2A1	13082800-39	DAYSIDE TEST BENCH

#### 2. CORRECTIVE ACTION - DCAMIR

- (a) Remove Digital Output CCA 2A2A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCAMIR test. If DCAMIR test passes, no further action required. If DCAMIR test fails, proceed to (b).
- (b) Remove Digital Input CCA 2A2A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCAMIR test. If DCAMIR test passes, no further action required. If DCAMIR test fails, proceed to (c).
- (c) Remove Stepper Motor CCA No. 1 2A2A7A6A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A1 and perform DCAMIR test. If DCAMIR test passes, no further action required. If DCAMIR test fails, proceed to (d).
- (d) Remove Stepper Motor CCA NO. 2 2A2A7A6A2. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A2 and perform DCAMIR test. If DCAMIR test passes, no further action required. If DCAMIR test fails, proceed to (e).

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**7-6. A MIRROR**  
**INPUT CODE : DCAMIR (cont)**

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**7-6****2. CORRECTIVE ACTION - DCAMIR (cont)**

(e) Remove Stepper Motor CCA No. 3 2A2A7A6A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A3 and perform DCAMIR test. If DCAMIR test passes, no further action required. If DCAMIR test fails, proceed to (f).

(f) Check the following cable assemblies and repair as required:

W27  
W28  
W29  
2A1A2W1  
2A1A2W40  
2A1W26  
2A1W32  
2A2W8  
2A2W9  
2A2W17

If any cable was repaired, perform DCAMIR test. If DCAMIR test passes, no further action required. If DCAMIR test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

## 7-7. AUTOMATIC FOCUS CONTROL ASSEMBLY 2A1A2A12

### INPUT CODE: DCFOCUS

7-7

#### a. DESCRIPTION

This module tests the ability of automatic focus control assembly 2A1A2A12 to respond to position commands. The automatic focus control assembly is programmed to the home position and motor status checked.

If the motor status is in error, a prompt is displayed at completion of the test.

The automatic focus control assembly is then programmed off of home position and the motor status checked.

If the motor status is in error, a prompt is displayed at the completion of the test.

The automatic focus control assembly is then programmed back to the home position and motor status checked.

If the motor status is in error, a prompt is displayed.

#### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A1A2XX/13081588-49	5-23
2A2A6XX (SL0T 401)/13083412	2-49
2A2A6XX (SL0T 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51
2A2A7A6A4/13082738	2-51
2A2A13/13081746	2-60
2A2A13XX (SL0T J4)/AC4720	2-61

## 7-7. AUTOMATIC FOCUS CONTROL ASSEMBLY 2A1A2A12

### INPUT CODE: DCFOCUS (cont)

7-7

#### c. SEGMENT 1

##### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA No. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA No. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA No. 3
6.	2A1	13082800-59	DAYSIDE TEST BENCH

##### 2. CORRECTIVE ACTION - SEGMENT 1

- (a) Remove Digital Output CCA 2A2A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCFOCUS test. If DCFOCUS test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Digital Input CCA 2A2A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCFOCUS test. If DCFOCUS test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Stepper Motor CCA No. 1 2A2A7A6A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A1 and perform DCFOCUS test. If DCFOCUS test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Stepper Motor CCA No. 2 2A2A7A6A2. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A2 and perform DCFOCUS test. If DCFOCUS test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.



## 7-7. AUTOMATIC FOCUS CONTROL ASSEMBLY 2A1A2A12

### INPUT CODE: DCFOCUS (cont)

7-7

#### 2. CORRECTIVE ACTION - SEGMENT 1 (cont)

(e) Remove Stepper Motor CCA No. 3 2A2A7A6A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A3 and perform DCFOCUS test. If DCFOCUS test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.

(f) Check the following cable assemblies and repair as required:

W27  
W28  
2A2W1  
2A2W7  
2A2A7W3

If any cable was repaired, perform DCFOCUS test. If DCFOCUS test passes, no further action required. If DCFOCUS test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

#### d. SEGMENT 2

##### 1. VDT DISPLAY

TIME OUT ERROR ON 3000 STEPS. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA No. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA No. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA No. 3
6.	2A1	13082800-59	DAYS IDE TEST BENCH

##### 2. CORRECTIVE ACTION - SEGMENT 2

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

## 7-7. AUTOMATIC FOCUS CONTROL ASSEMBLY 2A1A2A12

### INPUT CODE: DCFOCUS (cont)

7-7

#### e. SEGMENT 3

##### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A7A6A4	13082738	TEMP. MONITOR CCA
2.	2A2A13XX	AC4720	DIFF. INPUT CCA (J4)
3.	2A2A13	13081746	A/D CONVERTER
4.	2A1A2XX	13081588-49	CIRCUIT & HEATSINK (W55 SENSOR)
5.	2A1	13082800-59	DAYSIDE TEST BENCH

##### 2. CORRECTIVE ACTION - SEGMENT 3

- (a) Remove Temperature Monitor CCA 2A2A7A6A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A4 and perform DCFOCUS test. If DCFOCUS test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Differential Input CCA 2A2A13XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform DCFOCUS test. If DCFOCUS test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform DCFOCUS test. If DCFOCUS test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Circuit & Heatsink (W55 Sensor) 2A1A2XX. Check contacts of mating connectors and repair if required. Install replacement 2A1A2XX and perform DCFOCUS test. If DCFOCUS test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-7. AUTOMATIC FOCUS CONTROL ASSEMBLY 2A1A2A12

### INPUT CODE: DCFOCUS (cont)

7-7

#### 2. CORRECTIVE ACTION - SEGMENT 3 (cont)

(e) Check the following cable assemblies and repair as required:

W27  
W28  
2A2W1  
2A2W7  
2A2A7W3

If any cable was repaired, perform DCFOCUS test. If DCFOCUS passes, no further action required. If DCFOCUS test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

#### f. SEGMENT 4

##### 1. VDT DISPLAY

SPECT = 1 FAILED 'A'

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA No. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA No. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA No. 3
6.	2A1	13082800-59	DAYSIDE TEST BENCH

##### 2. CORRECTIVE ACTION - SEGMENT 4

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

## 7-7. AUTOMATIC FOCUS CONTROL ASSEMBLY 2A1A2A12

### INPUT CODE: DCFOCUS (cont)

7-7

#### g. SEGMENT 5

##### 1. VDT DISPLAY

SPECT = 2 FAILED 'A'

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA No. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA No. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA No. 3
6.	2A1	13082800-59	DAYSIDE TEST BENCH

##### 2. CORRECTIVE ACTION - SEGMENT 5

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

#### h. SEGMENT 6

##### 1. VDT DISPLAY

SPECT = 3 FAILED 'A'

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT procedures. )

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA No. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA No. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA No. 3
6.	2A1	13082800-59	DAYSIDE TEST BENCH

##### 2. CORRECTIVE ACTION - SEGMENT 6

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

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**7-7. AUTOMATIC FOCUS CONTROL ASSEMBLY 2A1A2A12**  
**INPUT CODE: DCFOCUS (cont)**


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**7-7****i. SEGMENT 7****1. VDT DISPLAY**

SPECT = 4 FAILED 'A'

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE  
 TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA No. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA No. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA No. 3
6.	2A1	13082800-59	DAYSIDE TEST BENCH

**2. CORRECTIVE ACTION - SEGMENT 7**

Corrective action same as segment 1. Refer to segment 1 for  
 troubleshooting.

## 7-8. B MIRROR INPUT CODE: DCBMIR

7-8

### a. DESCRIPTION

This module tests the ability of the B mirror to respond to commands for both positions 1 thru 3. The B mirror is programmed to position 1 and the motor status checked.

A prompt is displayed at the completion of the test if the motor position is in error.

The B mirror is then programmed from position 1 to position 2 and motor status checked.

A prompt is displayed at the completion of the test if the motor status is in error.

The B mirror is then programmed from position 2 to position 3 and motor status checked.

A prompt is displayed if the motor status is in error.

### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A1A2A1W48/13082263-69	5-20
2A1A2A1W49/13082263-79	5-20
2A1A2A1W50/13082263-89	5-20
2A2A6XX (SL0T 401)/13083412	2-49
2A2A6XX (SL0T 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51

## 7-8. B MIRROR INPUT CODE: DCBMIR (cont)

7-8

### c. B MIRROR SELF TEST FAILURE

#### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA No. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA No. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA No. 3
6.	2A1A2A1W48	13082263-69	CABLE ASSY, W48 (SENSOR POS 1)
7.	2A1A2A1W49	13082263-79	CABLE ASSY, W49 (SENSOR POS 2)
8.	2A1A2A1W50	13082263-89	CABLE ASSY, W50 (SENSOR POS 3)
9.	2A1	13082800-59	DAYSIDE TEST BENCH

#### 2. CORRECTIVE ACTION - DCBMIR

- (a) Remove Digital Output CCA 2A2A6XX (slot 407). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCBMIR test. If DCBMIR test passes, no further action required. If DCBMIR test fails, proceed to (b).
- (b) Remove Digital Input CCA 2A2A6XX (slot 401). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCBMIR test. If DCBMIR test passes, no further action required. If DCBMIR test fails, proceed to (c).
- (c) Remove Stepper Motor CCA No. 1 2A2A7A6A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A1 and perform DCBMIR test. If DCBMIR test passes, no further action required. If DCBMIR test fails, proceed to (d).
- (d) Remove Stepper Motor CCA No. 2 2A2A7A6A2. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A2 and perform DCBMIR test. If DCBMIR test passes, no further action required. If DCBMIR test fails, proceed to (e).
- (e) Remove Stepper Motor CCA No. 3 2A2A7A6A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A3 and perform DCBMIR test. If DCBMIR test passes, no further action required. If DCBMIR test fails, proceed to (f).

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**7-8. B MIRROR**  
**INPUT CODE: DCBMIR (cont)**

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**7-8****2. CORRECTIVE ACTION - DCBMIR (cont)**

- (f) Remove Cable Assembly 2A1A2A1W48. Check contacts of mating connectors and repair if required. Install replacement 2A1A2A1W48 and perform DCBMIR test. If DCBMIR test passes, no further action required. If DCBMIR test fails, proceed to (g).
- (g) Remove Cable Assembly 2A1A2A1W49. Check contacts of mating connectors and repair if required. Install replacement 2A1A2A1W49 and perform DCBMIR test. If DCBMIR test passes, no further action required. If DCBMIR test fails, proceed to (h).
- (h) Remove Cable Assembly 2A1A2A1W50. Check contacts of mating connectors and repair if required. Install replacement 2A1A2A1W50 and perform DCBMIR test. If DCBMIR test passes, no further action required. If DCBMIR test fails, proceed to (i).
- (i) Check the following cable assemblies and repair as required:

W27  
W28  
W29  
2A1W26  
2A1W32  
2A1A2W40  
2A2W8  
2A2W9  
2A2W17

If any cable was repaired, perform DCAMIR test. If DCAMIR test passes, no further action required. If DCAMIR test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.



## 7-9. CABLE ASSEMBLY (TARGET LAMP) 2A1A2A11W19 INPUT CODE: DCDCTL

7-9

### a. DESCRIPTION

This module tests the ability of cable assembly (target lamp) 2A1A2A11W19 to respond to on and off commands. The target lamp is programmed on and shutter assembly 2A1A2A2 opens. The operator observes the lamp by looking through the open shutter and if lamp is on, presses [YES] or if lamp is off, presses [NO] on the AN/USM-410 VDT.

If NO is pressed, a prompt is displayed at the completion of the test.

The target lamp is then programmed off. The operator observes the lamp through the open shutter and if lamp is on, presses [YES] or if lamp is off, presses [NO] on the AN/USM-410 VDT.

If YES is pressed, a prompt is displayed.

### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A2A4A1K9/13083063	5-33
2A1A2A11W19/13082266 (LAMP)	5-21
2A2A6XX (SL0T 409)/69331B	2-49
2A2A7A4K5/13081572	2-34

## 7.9. CABLE ASSEMBLY (TARGET LAMP) 2A1A2A11W19

### INPUT CODE: DCDCTL (cont)

7-9

#### c. DAY COLLIMATOR TARGET LAMP FAILURE

##### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 409)
2.	2A2A7A4	13081572	RELAY ASSY.
3.	2A2A4A1	13083063	RELAY ASSY.
4.	2A1A2A11W19	13082266	CABLE ASSY. W19 (LAMP)
5.	2A1	13082800-59	DAYSIDE TEST BENCH

##### 2. CORRECTIVE ACTION - DCDCTL

- (a) Remove Digital Output CCA 2A2A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCDCTL test. If DCDCTL test passes, no further action required. If DCDCTL test fails, proceed to (b).
- (b) Remove Relay Assembly 2A2A7A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A4 and perform DCDCTL test. If DCDCTL test passes, no further action required. If DCDCTL test fails, proceed to (c).
- (c) Remove Relay Assembly 2A2A4A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A4A1 and perform DCDCTL test. If DCDCTL test passes, no further action required. If DCDCTL test fails, proceed to (d).
- (d) Remove Cable Assembly 2A1A2A11W19. Check contacts of mating connectors and repair if required. Install replacement 2A1A2A11W19 and perform DCDCTL test. If DCDCTL test passes, no further action required. If DCDCTL test fails, proceed to (e).

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**7-9. CABLE ASSEMBLY (TARGET LAMP) 2A1A2A11W19**  
**INPUT CODE: DCDCTL (cont)**

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**7-9****2. CORRECTIVE ACTION - DCDCTL (cont)**

(e) Check the following cable assemblies and repair as required:

W2  
W27  
W28  
W29  
2A2W9  
2A2W11  
2A2A7W3

If any cable was repaired, perform DCDCTL test. If DCDCTL test passes, no further action required. If DCDCTL test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

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**7-10 CAMERA TEST SPECIAL PURPOSE CABLE (EXTERNAL SOURCE)**  
**INPUT CODE: DCEXSO**

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**7-10****a. DESCRIPTION**

This module tests the ability of camera test special purpose cable (external source), part number 13081836, to respond to on and off commands. The external source lamp is programmed to on, and AN/USM-410 power supply DC2B ramped to 6 vdc. The operator observes the lamp and if lamp is on, presses [YES] or if lamp is off, presses [NO] on the AN/USM-410 VDT.

If NO is pressed, a prompt is displayed at the completion of the test.

The lamp is then programmed to off with AN/USM-410 power supply DC2B still at 6 vdc. The operator observes the lamp and if lamp is on, presses [YES] or if lamp is off, presses [NO] on the AN/USM-410 VDT.

If YES is pressed, a prompt is displayed.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A4A1K8/13083063	5-33
2A2A6XX (SL0T 408)/69331B	2-49
2A2A7A4K3/13081572	5-34
W64/13081836	3-32

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**7-10. CAMERA TEST SPECIAL PURPOSE CABLE (EXTERNAL SOURCE)**  
**INPUT CODE: DCEXSO (cont)**


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**7-10****c. DAY COLLIMATOR TARGET LAMP FAILURE****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	XXXX	13081836	CAMERA TEST S. P. CABLE
2.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 408)
3.	2A2A7A4	13081572	RELAY ASSY.
4.	2A2A4A1	13083063	RELAY ASSY.

**2. CORRECTIVE ACTION - DCEXSO**

- (a) Remove Camera Test Special Purpose Cable W64. Check contacts of mating connectors and repair if required. Install replacement cable and perform DCEXSO test. If DCEXSO test passes, no further action required. If DCEXSO test fails, proceed to (b).
- (b) Remove Digital Output CCA 2A2A6XX (slot 408). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCEXSO test. If DCEXSO test passes, no further action required. If DCEXSO test fails, proceed to (c).
- (c) Remove Relay Assembly 2A2A7A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A4 and perform DCEXSO test. If DCEXSO test passes, no further action required. If DCEXSO test fails, proceed to (d).
- (d) Remove Relay Assembly 2A2A4A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A4A1 and perform DCEXSO test. If DCEXSO test passes, no further action required. If DCEXSO test fails, proceed to (e).

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**7-10. CAMERA TEST SPECIAL PURPOSE CABLE (EXTERNAL SOURCE)**  
**INPUT CODE: DCEXSO (cont)**

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**7-10**

**2. CORRECTIVE ACTION - SEGMENT 1 (cont)**

(e) Check the following cable assemblies and repair as required:

2A2W9  
 2A2W11  
 2A2W15  
 2A2A7W3

If any cable was repaired, perform DCEXSO test. If DCEXSO test passes, no further action required. If DCEXSO test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

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7-11. DELETED

7-11

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**7-12. CID VIDEO CAMERA (INTERNAL CAMERA) 2A1A2A1A1A15**  
**INPUT CODE: DCINTCAM**


---

**7-12****a. DESCRIPTION**

This module tests the ability of CID video camera (internal camera) 2A1A2A1A1A15 to respond to commands to detect and measure energy from the target lamp.

The B mirror is moved to position 3 and the target lamp programmed off. The average pixel value of the camera is read.

If the average pixel value is not 221 to 225, a prompt is displayed at the completion of the test.

The target lamp is programmed on and AN/USM-410 power supply DC2B ramped to 12 vdc. The average pixel value of the camera is read.

If the average pixel value is not 0 to 220 a prompt is displayed.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No. )
1A11A9/13081742	2-40
2A1/13082800-59	5-9
2A1A2A11W19/13082266 (LAMP)	5-21
2A2A7A3/13083700-I	2-51
2A2A7A6A5/13082717	2-51
2A2A7A6A7/13082714	2-51

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**7-12. CID VIDEO CAMERA (INTERNAL CAMERA) 2A1A2A1A1A15**  
**INPUT CODE: DCINTCAM (cont)**


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**7-12****c. SEGMENT 1****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTION IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A7A6A5	13082717	FIFO CCA
2.	2A2A7A6A7	13082714	BUS MUX CCA
3.	1A11A9	13081742	INTERFACE CCA
4.	2A2A7A3	13083700-2	CAMERA CONTROLLER
5.	2A1A2A11W19	13082266	CABLE ASSY. W19 (LAMP DSI)
6.	2A1	13082800-59	DAYSIDE TEST BENCH

**2. CORRECTIVE ACTION - SEGMENT 1**

- (a) Remove FIFO CCA 2A2A7A6A5. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A5 and perform DCINTCAM test. If DCINTCAM test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove BUS MUX CCA 2A2A7A6A7. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A7 and perform DCINTCAM test. If DCINTCAM test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Interface CCA 1A11A9. Check contacts of mating connectors and repair if required. Install replacement 1A11A9 and perform DCINTCAM test. If DCINTCAM test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Camera Controller 2A2A7A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A3 and perform DCINTCAM test. If DCINTCAM test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-12. CID VIDEO CAMERA (INTERNAL CAMERA) 2A12A1A1A15

### INPUT CODE: DCINTCAM (cont)

7-12

#### 2. CORRECTIVE ACTION - SEGMENT 1 (cont)

(e) Remove Cable Assembly 2A1A2A11W19. Check contacts of mating connectors and repair if required. Install replacement 2A1A2A11W19 and perform DCINTCAM test. If DCINTCAM test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.

(f) Check the following cable assemblies and repair as required:

W2  
W7  
W14  
W30  
1W2  
1W7  
1W9  
2A1W25  
2A1A2W30  
2A2W24  
2A2A7W3  
2W2W5

If any cable was repaired, perform DCINTCAM test. If DCINTCAM test passes, no further action required. If DCINTCAM test fails and CALCST, PLLBUS, MTRXSW, ADST DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

#### d. SEGMENT 2

##### 1. VDT DISPLAY

DC INTERNAL CAMERA DARK READING ERROR. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A7A6A5	13082717	FIFO CCA
2.	2A2A7A6A7	13082714	BUS MUX CCA
3.	1A11A9	13081742	INTERFACE CCA
4.	2A2A7A3	13083700-2	CAMERA CONTROLLER
5.	2A1A2A11W19	13082266	CABLE ASSY. W19 (LAMP DSI)
6.	2A1	13082800-59	DAYSIDE TEST BENCH

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**7-12. CID VIDEO CAMERA (INTERNAL CAMERA) 2A12A1A1A15**  
**INPUT CODE: DCINTCM (cont)**


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**7-12****2. CORRECTIVE ACTION - SEGMENT 2**

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

**e. SEGMENT 3****1. VDT DISPLAY**

DC INTERNAL CAMERA LIGHT READING ERROR. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A7A6A5	13082717	FIFO CCA
2.	2A2A7A6A7	13082714	BUS MUX CCA
3.	1A11A9	13081742	INTERFACE CCA
4.	2A2A7A3	13083700-2	CAMERA CONTROLLER
5.	2A1A2A11W19	13082266	CABLE ASSY. W19 (LAMP DSI)
6.	2A1	13082800-59	DAYSIDE TEST BENCH

**2. CORRECTIVE ACTION - SEGMENT 3**

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

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**7-13. FILTER WHEEL/MOTOR ASSEMBLY (VARIABLE FILTER) 2A1A2A10**  
**INPUT CODE: DCVARF**

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**7-13****a. DESCRIPTION**

This module tests the ability of filter wheel/motor assembly (variable filter) 2A1A2A10 to respond to position commands. The variable filter is programmed to the home position and motor status checked.

If the motor status is in error, a prompt is displayed at the completion of the test.

The variable filter is then programmed off the home position and motor status checked.

If the motor status is in error, a prompt is displayed at the completion of the test.

The variable filter is then programmed back to the home position and motor status checked.

If the motor status is in error, a prompt is displayed.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A1A2W53/13082263-49	3-19
2A2A6XX (SL0T 401)/13083412	2-49
2A2A6XX (SL0T 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51

---

**7-13. FILTER WHEEL/MOTOR ASSEMBLY (VARIABLE FILTER) 2A1A2A10**  
**INPUT CODE: DCVARF (cont)**


---

**7-13****c. SEGMENT 1****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTION IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA No. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA No. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA No. 3
6.	2A1A2A10A2W53	13082263-49	CABLE ASSY. W53 (OPTICAL SENSOR)
7.	2A1	13082800-59	DAYSIDE TEST BENCH

**2. CORRECTIVE ACTION - SEGMENT 1**

- (a) Remove Digital Output 2A2A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCVARF test. If DCVARF test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Digital Input 2A2A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCVARF test. If DCVARF test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Stepper Motor CCA No. 1 2A2A7A6A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A1 and perform DCVARF test. If DCVARF test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Stepper Motor CCA No. 2 2A2A7A6A2. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A2 and perform DCVARF test. If DCVARF test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-13. FILTER WHEEL/MOTOR ASSEMBLY (VARIABLE FILTER) 2A1A2A10**  
**INPUT CODE: DCVARF (cont)**

---

**7-13****2. CORRECTIVE ACTION - SEGMENT 1 (cont)**

- (e) Remove Stepper Motor No. 3 2A2A7A6A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A3 and perform DCVARF test. If DCVARF test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove Cable Assembly 2A1A2A10A2W53. Check contacts of mating connectors and repair if required. Install replacement 2A1A2A10A2W53 and perform DCVARF test. If DCVARF test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.
- (g) Check the following cable assemblies and repair as required:

W28  
W29  
2A1W23  
2A1A2W40  
2A1A2A10W46  
2A2W8  
2A2W9

If any cable was repaired, perform DCVARF test. If DCVARF test passes, no further action required. If DCVARF test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.



---

**7-13. FILTER WHEEL/MOTOR ASSEMBLY (VARIABLE FILTER) 2A1A2A10**  
**INPUT CODE: DCVARF (cont)**


---

**7-13****d. SEGMENT 2****1. VDT DISPLAY**

TIME OUT ERROR ON ND = 0.58. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA No. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA No. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA No. 3
6.	2A1A2A10A2W53	13082263-49	CABLE ASSY. W53 (OPTICAL SENSOR)
7.	2A1	13082800-59	DAYSIDE TEST BENCH

**2. CORRECTIVE ACTION - SEGMENT 2**

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

---

**7-14. INDIRECT VIEW DISPLAY (IVD) 2A1A3 WITHOUT OSA  
INPUT CODE: IVD**

---

**7-14****a. DESCRIPTION**

This module tests the ability of the indirect view display (IVD) 2A1A3 to produce correct outputs in response to function commands.

An error detected during any of the checks will display a prompt at the completion of the test.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A3/13078701	5-25

---

**7-14. INDIRECT VIEW DISPLAY (IVD) 2A1A3 WITHOUT OSA**  
**INPUT CODE: IVD (cont)**


---

**7-14****c. SEGMENTS 1 THRU 44 - ERROR MESSAGES**

There are 44 error messages (segments) that can be displayed on the VDT display during IVD testing. Each of these error messages requires replacement of IVD 2A1A3. Error messages are:

1. INT IVD POWER LINE TEST FAILED
2. INT IVD +35V OUTPUT TEST FAILED
3. INT IVD +25V POWER TEST FAILED
4. INT IVD CONTINUITY TEST FAILED
5. INT IVD +15V POWER TEST FAILED
6. INT IVD -15V POWER TEST FAILED
7. INT IVD +28V POWER TEST FAILED
8. INT IVD 6.9 VAC POWER TEST FAILED
9. INT IVD VIDEO SIG TEST FAILED
10. INT IVD FOCUS VOLTAGE TEST FAILED
11. INT IVD +100V TEST FAILED
12. INT IVD VERTICAL DRIVE SIGNAL TEST FAILED
13. INT IVD HORIZONTAL YOKE SIGNAL TEST FAILED
14. INT IVD COMPOSITE BLANKING SIGNAL TEST FAILED
15. GREYSCALE HORIZONTAL BLANKING PULSE WIDTH FAILURE
16. GREYSCALE HORIZONTAL PERIOD PULSE WIDTH FAILURE
17. GREYSCALE HORIZONTAL STEP WIDTH PULSE FAILURE
18. GREYSCALE HORIZ PLSE STEP WIDTH CENTERING FAILURE
19. GREYSCALE STEP 1 VOLTAGE FAILURE
20. GREYSCALE STEP 2 VOLTAGE FAILURE
21. GREYSCALE STEP 3 VOLTAGE FAILURE
22. GREYSCALE STEP 4 VOLTAGE FAILURE
23. GREYSCALE STEP 5 VOLTAGE FAILURE
24. GREYSCALE STEP 6 VOLTAGE FAILURE
25. GREYSCALE STEP 7 VOLTAGE FAILURE
26. GREYSCALE STEP 8 VOLTAGE FAILURE
27. GREYSCALE STEP 9 VOLTAGE FAILURE
28. GREYSCALE STEP 10 VOLTAGE FAILURE
29. GREYSCALE HORIZONTAL REFERENCE VOLTAGE FAILURE
30. MISSING HORIZONTAL SFP SIGNAL
31. MISSING HORIZONTAL BLANKING PULSE
32. HORIZONTAL BLANKING PULSE FAILURE
33. HORIZONTAL LINEAR REGRESSION TEST FAILURE
34. HORIZONTAL AMPLITUDE TEST FAILURE
35. HORIZONTAL LEFT LINEARITY TEST FAILURE
36. HORIZONTAL RIGHT LINEARITY TEST FAILURE
37. VERTICAL DRIVE AMPLITUDE TEST FAILURE
38. VERTICAL DIVE LINEAR REGRESSION TEST FAILURE
39. VERTICAL TOP LINEARITY TEST FAILURE
40. VERTICAL BOTTOM LINEARITY TEST FAILURE
41. MISSING VERTICAL BLANKING SIGNAL
42. G# MISSING VERTICAL DRIVE SIGNAL
43. VERTICAL DRIVE SYNC TEST FAILURE
44. VERTICAL DRIVE DELAY TEST FAILURE

---

**7-14. INDIRECT VIEW DISPLAY (IVD) 2A1A3 WITHOUT OSA**  
**INPUT CODE: IVD (cont)**

---

**7-14****d. INDIRECT VIEW DISPLAY SELF TEST FAILURE****1. VDT DISPLAY - SEGMENTS 1 THRU 44****NOTE**

An error message from the preceding list will be displayed where the symbol # is used.

# PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF. DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1. 2A1A3	13078701	IVD

**2. CORRECTIVE ACTION - SEGMENTS 1 THRU 44**

- (a) Remove IVD 2A1A3. Check contacts of mating connectors and repair if required. Install replacement 2A1A3 and perform IVD test. If IVD test passes, no further action required. If IVD test fails, proceed to (b).

- (b) Check the following cable assemblies and repair as required:

2A1W34  
2A1W36  
2A1W37  
2A1W77  
2A1W78

If any cable was repaired, perform IVD test. If IVD test continues to fail and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, next higher level of maintenance required.

---

**7-15. INDIRECT VIEW DISPLAY (IVD) 2A1A3 WITH OSA**  
**INPUT CODE: IVDST**


---

**7-15****a. DESCRIPTION**

This module tests the ability of the indirect view display (IVD) 2A1A3 to produce correct outputs in response to function commands.

An error detected during any of the following checks will display a prompt at the completion of the test.

The optical signal analyzer (OSA) chassis to shield continuity is checked for 10 ohms or less. The OSA shutter interlock operation is verified by checking the shutter status with the OSA door open (shutter closed).

The operator closes the OSA door, the shutter is programmed open, and shutter status checked. The internal and external relays 1 through 4, phase A, B, and C contacts are checked for a closed condition. The operator opens the OSA door and the OSA shutter is checked for a closed status. The internal and external relays 1 through 4, phase A, B, and C contacts are checked for an open status.

The operator applies pressure to OSA door interlock switch S1 while OSA door interlock switch S2 is checked for a shorted condition. The operator then releases S1 and applies pressure to S2 while S1 is checked for a shorted condition. The operator then releases S2 and closes the OSA door. The OSA door status is checked. The IVD is then programmed to produce a vertical output pulse and a horizontal output pulse, which are checked for period and amplitude.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A3/13078701	5-25

---

**7-15. INDIRECT VIEW DISPLAY (IVD) 2A1A3 WITH OSA**  
**INPUT CODE: IVDST (cont)**


---

7-15

**C. SEGMENTS 1 THRU 46 - ERROR MESSAGES**

There are 46 error messages (segments) that can be displayed on the VDT display during IVDST testing. Each of these error messages requires replacement of IVD 2A1A3. Error messages are:

1. INT IVD POWER LINE TEST FAILED
2. 16KVDC VOLTAGE DIVIDER TEST FAILED
3. INT IVD +35V OUTPUT TEST FAILED
4. INT IVD +25V POWER TEST FAILED
5. INT IVD CONTINUITY TEST FAILED
6. INT IVD +15V POWER TEST FAILED
7. INT IVD -15V POWER TEST FAILED
8. INT IVD +28V POWER TEST FAILED
9. INT IVD 6.9 VAC POWER TEST FAILED
10. INT IVD VIDEO SIG TEST FAILED
11. INT IVD FOCUS VOLTAGE TEST FAILED
12. INT IVD +100V TEST FAILED
13. INT IVD 16 KV TEST FAILED
14. INT IVD VERTICAL DRIVE SIGNAL TEST FAILED
15. INT IVD HORIZONTAL YOKE SIGNAL TEST FAILED
16. INT IVD COMPOSITE BLANKING SIGNAL TEST FAILED
17. GREYSCALE HORIZONTAL BLANKING PULSE WIDTH FAILURE
18. GREYSCALE HORIZONTAL PERIOD PULSE WIDTH FAILURE
19. GREYSCALE HORIZONTAL STEP WIDTH PULSE FAILURE
20. GREYSCALE HORIZ PLSE STEP WIDTH CENTERING FAILURE
21. GREYSCALE STEP 1 VOLTAGE FAILURE
22. GREYSCALE STEP 2 VOLTAGE FAILURE
23. GREYSCALE STEP 3 VOLTAGE FAILURE
24. GREYSCALE STEP 4 VOLTAGE FAILURE
25. GREYSCALE STEP 5 VOLTAGE FAILURE
26. GREYSCALE STEP 6 VOLTAGE FAILURE
27. GREYSCALE STEP 7 VOLTAGE FAILURE
28. GREYSCALE STEP 8 VOLTAGE FAILURE
29. GREYSCALE STEP 9 VOLTAGE FAILURE
30. GREYSCALE STEP 10 VOLTAGE FAILURE
31. GREYSCALE HORIZONTAL REFERENCE VOLTAGE FAILURE
32. MISSING HORIZONTAL SFP SIGNAL
33. MISSING HORIZONTAL BLANKING PULSE
34. HORIZONTAL BLANKING PULSE FAILURE
35. HORIZONTAL LINEAR REGRESSION TEST FAILURE
36. HORIZONTAL AMPLITUDE TEST FAILURE
37. HORIZONTAL LEFT LINEARITY TEST FAILURE
38. HORIZONTAL RIGHT LINEARITY TEST FAILURE
39. VERTICAL DRIVE AMPLITUDE TEST FAILURE
40. VERTICAL DIVE LINEAR REGRESSION TEST FAILURE
41. VERTICAL TOP LINEARITY TEST FAILURE
42. VERTICAL BOTTOM LINEARITY TEST FAILURE
43. MISSING VERTICAL BLANKING SIGNAL
44. G# MISSING VERTICAL DRIVE SIGNAL
45. VERTICAL DRIVE SYNC TEST FAILURE
46. VERTICAL DRIVE DELAY TEST FAILURE

---

**7-15. INDIRECT VIEW DISPLAY (IVD) 2A1A3 WITH OSA**  
**CODE : IVDST (cont)**


---

**7-15****d. INDIRECT VIEW DISPLAY SELF TEST FAILURE****1. VDT DISPLAY - SEGMENTS 1 THRU 46****NOTE**

An error message from the preceding list will be displayed where the symbol # is used.

# PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A3	13078701	IVD

**2. CORRECTIVE ACTION - SEGMENTS 1 THRU 46**

(a) Remove IVD 2A1A3. Check contacts of mating connectors and repair if required. Install replacement 2A1A3 and perform IVDST test. If IVDST test passes, no further action required. If IVDST test fails, proceed to (b).

(b) Check the following cable assemblies and repair as required:

2A1W34  
 2A1W36  
 2A1W37  
 2A1W77  
 2A1W78

If any cable was repaired, perform IVDST test. If IVDST test continues to fail and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, next higher level of maintenance required.

---

**7-16. LASER POWER METER (INTERNAL RADIOMETER) 2A1A7**  
**INPUT CODE: INTRAD**

---

**7-16****a. DESCRIPTION**

This module tests the ability of laser power meter (internal radiometer) 2A1A7 to detect light energy from the flash lamp. The flash lamp is programmed off, and the internal radiometer output digitized and recorded. The flash lamp is then programmed on, and the internal radiometer output digitized and compared with the recorded lamp off output.

If the off output is not +0.0125 to +0.080 vdc higher than the on output, a prompt is displayed at the completion of the test.

The lamp is then programmed off, and the internal radiometer output digitized and compared to the previously recorded off output.

A prompt is displayed if the difference is greater than +0.002 vdc.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A2A4A1/13083063	5-33
2A2A6XX (SL0T 409)/69331B	2-49
2A2A7A4/13081572	5-34



---

**7-16. LASER POWER METER (INTERNAL RADIOMETER) 2A1A7**  
**CODE: INTRAD (cont)**


---

**7-16****c. INTERNAL RADIOMETER FAILURE****1. VDT DISPLAY**

INTERNAL RADIOMETER FAILURE THE ZERO INPUT READING = ###.##, DC FLASH READING = ####.####. PERFORM THE FOLLOWING REPLACE ACTION IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES. )

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 409)
2.	2A2A7A4	13081572	RELAY ASSY
3.	2A2A4A1	13083063	RELAY ASSY
4.	2A1	13082800-59	DAYSIDE TEST BENCH

**2. CORRECTIVE ACTION - INTRAD**

- (a) Remove Digital Output CCA 2A2A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform INTRAD test. If INTRAD test passes, no further action required. If INTRAD test fails, proceed to (b).
- (b) Remove Relay Assembly 2A2A7A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A4 and perform INTRAD test. If INTRAD test passes, no further action required. If INTRAD test fails, proceed to (c).
- (c) Remove Relay Assembly 2A2A4A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A4A1 and perform INTRAD test. If INTRAD test passes, no further action required. If INTRAD test fails, proceed to (d).

---

**7-16. LASER POWER METER (INTERNAL RADIOMETER) 2A1A7**  
**INPUT CODE: INTRAD (cont)**

---

**7-16****2. CORRECTIVE ACTION - INTRAD (cont)**

(d) Check the following cable assemblies and repair as required:

W24  
W28  
W29  
2A2W9  
2A2W11  
2A2W15  
2A2A7W3

If any cable was repaired, perform INTRAD test. If INTRAD test passes, no further action required. If INTRAD test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

---

**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST**


---

**7-17****a. DESCRIPTION**

This module checks laser cover assembly 2A1A2A19 and laser power supply assembly 2A1A6.

An error detected during any of the following checks will display a prompt at the completion of the test.

The operator opens the laser enclosure, and turns the laser off switch to OFF. The laser shield interlock, laser cover assembly switches, and laser fire switch are checked. The operator then closes and locks the laser enclosure, and the above checks are repeated. The program then applies logic signals and voltages (115 vac, -15 vdc and +28 vdc) to check relays and interlocks. The operator checks for both LASER ARMED lights on. The programmable pulse generator is programmed for sync signals. The operator holds the laser fire switch in the on position and the interlocks and high voltage sample are checked. The operator then releases the laser fire switch.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A1A2A19/13083360-39	5-22
2A1A6A1/13081519	5-29
2A1A6/13081582	5-29
2A1A6XX/13079420	5-29
2A1A6XX/13079722	5-29

7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19  
INPUT CODE: LASERST (cont)

7-17

c. SEGMENT 1

1. VDT DISPLAY

DISCONTINUITY EXISTS IN THE CABLE P/N 13081837 OR IN SHORTING PLUG BETWEEN PINS 3 AND 5 OR PINS 4 AND 1. RESISTANCE READING IS #.# OHMS. PERFORM THE FOLLOWING REPLACE ACTION IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY.
2.	2A1A6A1	13081519	RELAY ASSY.

2. CORRECTIVE ACTION - SEGMENT 1

- (a) Remove Laser Cover Assembly 2A1A2A19. Check contacts of mating connectors and repair if required. Install replacement 2A1A2A19 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Relay Assembly 2A1A6A1. Check contacts of mating connectors and repair if required. Install replacement 2A1A6A1 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Check the following cable assemblies and repair as required:

W27  
W28  
W29  
2A1W26  
2A1W32  
2A1W45  
2A1A2W40

If any cable was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


---

**7-17****d. SEGMENT 2****1. VDT DISPLAY**

SHUTTER SWITCH IS SHORTED WHILE THE SHUTTER IS OPENED. RESISTANCE READING IS #.# OHMS. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1	13082800-59	DAYSIDE TEST BENCH

**2. CORRECTIVE ACTION - SEGMENT 2**

Check the following cable assemblies and repair as required:

W27  
W28  
W29

If any cable was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**e. SEGMENT 3****1. VDT DISPLAY**

SHORT EXISTS IN THE LASER ENCLOSURE #1 COVER SWITCH. RESISTANCE READS #.# OHMS. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S1)

---

**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


---

**7-17****2. CORRECTIVE ACTION - SEGMENT 3**

- (a) Remove Switch 2A1A2A19S1. Install replacement 2A1A2A19S1 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

- (b) Check the following cable assemblies and repair as required:

2A1W26  
 2A1W32  
 2A1A2W40

If any cable was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**f. SEGMENT 4****1. VDT DISPLAY**

SHORT EXISTS IN THE LASER ENCLOSURE #2 COVER SWITCH. RESISTANCE READS #.# OHMS. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S2)

**2. CORRECTIVE ACTION - SEGMENT 2**

- (a) Remove Switch 2A1A2A19S2. Install replacement 2A1A2A19S2 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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**7-17****2. CORRECTIVE ACTION - SEGMENT 4 (cont)**

(b) Check the following cable assemblies and repair as required:

2A1W26  
 2A1W32  
 2A1A2W40

If any cable was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**g. SEGMENT 5****1. VDT DISPLAY**

SHORT EXISTS IN THE LASER ENCLOSURE KEY SWITCH. RESISTANCE READS #.# OHMS. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S4)

**2. CORRECTIVE ACTION - SEGMENT 5**

(a) Remove Switch 2A1A2A19S4. Install replacement 2A1A2A19S4 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19  
INPUT CODE: LASERST (cont)

7-17

2. CORRECTIVE ACTION - SEGMENT 5 (cont)

(b) Check the following cable assemblies and repair as required:

- 2A1W26
- 2A1W32
- 2A1A2W40

If any cable was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

h. SEGMENT 6

1. VDT DISPLAY

SHORT EXISTS IN THE LASER MOMENTARY FIRE SWITCH. RESISTANCE READS #.# OHMS. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S3)

2. CORRECTIVE ACTION - SEGMENT 6

(a) Remove Switch 2A1A2A19S3. Install replacement 2A1A2A19S3 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.



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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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**7-17****2. CORRECTIVE ACTION - SEGMENT 6 (cont)**

(b) Check the following cable assemblies and repair as required:

2A1W26  
 2A1W32  
 2A1A2W40

If any cable was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**i. SEGMENT 7****1. VDT DISPLAY**

THE +28V IS NOT PRESENT AT THE A7 CARD OR IS SHORTED OUT. VOLTAGE READING IS ## VDC. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY.

**2. CORRECTIVE ACTION - SEGMENT 7**

(a) Remove Laser Cover Assembly 2A1A2A19. Check contacts of mating connectors and repair if required. Install replacement 2A1A2A19 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19

INPUT CODE: LASERST (cont)

7-17

2. CORRECTIVE ACTION - SEGMENT 7 (cont)

(b) Check the following cable assemblies and repair as required:

- 2A1W26
- 2A1W32
- 2A1A2W40

If any cable was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

j. SEGMENT 8

1. VDT DISPLAY

THE SHUTTER SHIELD IS OPEN AND THE TP IS READING #.# VDC. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

REF.	DES.	PART NO.	NAME
1.	2A1	13082800-59	DAYSIDE TEST BENCH

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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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**7-17****2. CORRECTIVE ACTION - SEGMENT 8**

Check the following cable assemblies and repair as required:

W27  
W28  
W29

If any cable was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**k. SEGMENT 9****1. VDT DISPLAY**

SHUTTER SHIELD CLOSED, BUT TP WHEN CLOSED READS #.# VDC. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1	13082800-59	DAYSIDE TEST BENCH

**2. CORRECTIVE ACTION - SEGMENT 9**

Corrective actions same as segment 8. Refer to segment 8 for troubleshooting.

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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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7-17

**1. SEGMENT 10****1. VDT DISPLAY**

COVER 1 TP READS #.# VDC WHEN COVER IS OPEN. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S1)

**2. CORRECTIVE ACTION - SEGMENT 10**

Corrective actions same as segment 3. Refer to segment 3 for troubleshooting.

**m. SEGMENT 11****1. VDT DISPLAY**

COVER 2 TP READS #.# VDC WHEN COVER IS OPEN. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S2)

**2. CORRECTIVE ACTION - SEGMENT 11**

Corrective actions same as segment 4. Refer to segment 4 for troubleshooting.

**n. SEGMENT 12****1. VDT DISPLAY**

COVER 1 TP READS #.# VDC WHEN COVER IS CLOSED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S1)

**2. CORRECTIVE ACTION - SEGMENT 12**

Corrective actions same as segment 3. Refer to segment 3 for troubleshooting.

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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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**7-17****o. SEGMENT 13****1. VDT DISPLAY**

COVER 2 TP READS #.# VDC WHEN COVER IS CLOSED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S2)

**2. CORRECTIVE ACTION - SEGMENT 13**

Corrective actions same as segment 4. Refer to segment 4 for troubleshooting.

**p. SEGMENT 14****1. VDT DISPLAY**

KEY SWITCH TP READS ##.## VDC WITH KEY SWITCH OPEN. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S4)

**2. CORRECTIVE ACTION - SEGMENT 14**

Corrective actions same as segment 5. Refer to segment 5 for troubleshooting.

**q. SEGMENT 15****1. VDT DISPLAY**

KEY SWITCH TP READS ##.## VDC WITH KEY SWITCH CLOSED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S4)

**2. CORRECTIVE ACTION - SEGMENT 15**

Corrective actions same as segment 5. Refer to segment 5 for troubleshooting.

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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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**7-17****r. SEGMENT 16****1. VDT DISPLAY**

LASER FIRE SWITCH OPEN, VOLTAGE READS ##.## VDC. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S3)

**2. CORRECTIVE ACTION - SEGMENT 16**

Corrective actions same as segment 6. Refer to segment 6 for troubleshooting.

**s. SEGMENT 17****1. VDT DISPLAY**

READY ARMED FAILED TEST. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S4)
2.	2A1A2A19	13083360	LASER COVER ASSY. (DS1)
3.	2A1A2A19	13083360	LASER COVER ASSY. (DS2)

**2. CORRECTIVE ACTION - SEGMENT 17**

- (a) Remove Switch 2A1A2A19S4. Install replacement 2A1A2A19S4 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Light 2A1A2A19DS1. Install replacement 2A1A2A19DS1 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19  
INPUT CODE: LASERST (cont)**


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**7-17****2. CORRECTIVE ACTION - SEGMENT 17 (cont)**

(c) Remove Switch 2A1A2A19DS2. Install replacement 2A1A2A19DS2 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.

(d) Check the following cable assemblies and repair as required:

2A1W26  
2A1W32  
2A1A2W40

If any cable was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**t. SEGMENT 18****1. VDT DISPLAY**

PHASE 1 INTERLOCK VOLTAGE READS ##.## VAC WHEN ON. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A6A1	13081519	RELAY ASSY.
2.	2A1A2A19	13083360	LASER COVER ASSY. (S3)

**2. CORRECTIVE ACTION - SEGMENT 18**

(a) Remove Relay Assembly 2A1A6A1. Check contacts of mating connectors and repair if required. Install replacement 2A1A6A1 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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**7-17****2. CORRECTIVE ACTION - SEGMENT 18 (cont)**

(b) Remove Switch 2A1A2A19S3. Install replacement 2A1A2A19S3 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.

(c) Check the following cable assemblies and repair as required:

2A1W26  
 2A1W32  
 2A1W45  
 2A1A2W40

If any cable was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**u. SEGMENT 19****1. VDT DISPLAY**

-15 VDC INTERLOCK VOLTAGE READS ##.## VDC WHEN ON. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A6A1	13081519	RELAY ASSY.

**2. CORRECTIVE ACTION - SEGMENT 19**

(a) Remove Relay Assembly 2A1A6A1. Check contacts of mating connectors and repair if required. Install replacement 2A1A6A1 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.



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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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**7-17****2. CORRECTIVE ACTION - SEGMENT 19 (cont)**

(b) Check cable assembly 2A1W45 and repair as required.

If 2A1W45 was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If 2A1W45 does not require repair and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**v. SEGMENT 20****1. VDT DISPLAY**

HV SAMPLE TEST POINT READS ##.## WITH ENABLE 'OFF'. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A6XX	13079722	HIGH VOLTAGE CCA
2.	2A1A6XX	13079420	POWER SUPPLY

**2. CORRECTIVE ACTION - SEGMENT 20**

(a) Remove High Voltage CCA 2A1A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A1A6XX and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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**7-17****2. CORRECTIVE ACTION - SEGMENT 20 (cont)**

- (b) Remove Power Supply 2A1A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A1A6XX and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.

- (c) Check cable assembly 2A1W45 and repair 2A1W45 as required.

If 2A1W45 was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If 2A1W45 does not require repair and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**w. SEGMENT 21****1. VDT DISPLAY**

FIRE SWITCH TP READS ##.## WHEN SWITCH IS CLOSED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A2A19	13083360	LASER COVER ASSY. (S3)

**2. CORRECTIVE ACTION - SEGMENT 21**

Corrective actions same as segment 6. Refer to segment 6 for troubleshooting.

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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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**7-17****x. SEGMENT 22****1. VDT DISPLAY**

+28V INTERLOCK TP READS ##.## VDC DURING 'FIRE'. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A6A1	13081519	RELAY ASSY.
2.	2A1A2A19	13083360	LASER COVER ASSY. (S3)

**2. CORRECTIVE ACTION - SEGMENT 22**

Corrective actions same as segment 18. Refer to segment 18 for troubleshooting.

**y. SEGMENT 23****1. VDT DISPLAY**

HV SAMPLE READS ##.## VDC DURING 'FIRE' (OV CONTROL). PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A6TB1	13081582	HIGH V. TERMINAL BOARD ASSY.
2.	2A1A6XX	13079722	HIGH VOLTAGE CCA
3.	2A1A6XX	13079420	POWER SUPPLY

**2. CORRECTIVE ACTION - SEGMENT 23**

- (a) Remove Terminal Board Assembly 2A1A6TB1. Check wire leads and repair if required. Install replacement 2A1A6TB1 and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove High Voltage CCA 2A1A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A1A6XX and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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**7-17****2. CORRECTIVE ACTION - SEGMENT 23 (cont)**

(c) Remove Power Supply 2A1A6XX. Check contacts of mating connectors and repair if required. Install replacement 2A1A6XX and perform LASERST test. If LASERST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.

(d) Check cable assembly 2A1W45 and repair 2A1W45 as required.

If 2A1W45 was repaired, perform LASERST test. If LASERST test passes, no further action required. If LASERST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If 2A1W45 does not require repair and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**2. SEGMENT 24****1. VDT DISPLAY**

HV SAMPLE READS ##.## VDC DURING 'FIRE' (5V CONTROL). PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A6TB1	13081582	HIGH V. TERMINAL BOARD ASSY.
2.	2A1A6XX	13079722	HIGH VOLTAGE CCA
3.	2A1A6XX	13079420	POWER SUPPLY

**2. CORRECTIVE ACTION - SEGMENT 24**

Corrective actions same as segment 23. Refer to segment 23 for troubleshooting.

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**7-17. LASER POWER SUPPLY ASSEMBLY 2A1A6 AND LASER COVER ASSEMBLY 2A1A2A19**  
**INPUT CODE: LASERST (cont)**


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**7-17****aa. SEGMENT 25****1. VDT DISPLAY**

HV SAMPLE READS ##.## VDC DURING 'FIRE' (10V CONTROL). PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A6TB1	13081582	HIGH V. TERMINAL BOARD ASSY.
2.	2A1A6XX	13079722	HIGH VOLTAGE CCA
3.	2A1A6XX	13079420	POWER SUPPLY

**2. CORRECTIVE ACTION - SEGMENT 25**

Corrective actions same as segment 23. Refer to segment 23 for troubleshooting.

**ab. SEGMENT 26****1. VDT DISPLAY**

\*\*\* RELAY ASSEMBLY FAILURE. #FAILURE(S) \*\*\*. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A1A6A1	13081519	RELAY ASSY.

**2. CORRECTIVE ACTION - SEGMENT 26**

Corrective actions same as segment 19. Refer to segment 19 for troubleshooting.

7-18. FILTER AND DETECTOR ASSEMBLY 2A1A1A14  
INPUT CODE: OAFOCUS

7-18

a. DESCRIPTION

This module tests the ability of filter and detector assembly 2A1A1A14 to respond to focus commands. The optical signal analyzer (OSA) focus mechanism is programmed to the home position and motor status checked.

If motor status is in error, a prompt is displayed at the completion of the test.

The focus mechanism is then programmed to move off the home position and motor status is checked.

If the motor status is in error, a prompt is displayed at the completion of the test.

The focus mechanism is programmed to the home position, and the motor status checked.

If the motor status is in error, a prompt is displayed.

b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A1/13082799-29	5-11
2A1A1A14A1/13083919-19	5-14
2A2A6XX (SL0T 401)/13083412	2-49
2A2A6XX (SL0T 407)/693316	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51

## 7-18. FILTER AND DETECTOR ASSEMBLY 2A1A1A14 INPUT CODE: OAFOCUS (cont)

7-18

### c. OPTICAL SIGNAL ANALYZER FOCUS FAILURE

#### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA No. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA No. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA No. 3
6.	2A1A1A14A1	13083919-19	FILTER BRACKET (SENSOR A)
7.	2A1A1	13082799-29	O. S. A.

#### 2. CORRECTIVE ACTION - OAFOCUS

- (a) Remove Digital Output CCA 2A2A6XX (slot 407). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform OAFOCUS test. If OAFOCUS test passes, no further action required. If OAFOCUS test fails, proceed to (b).
- (b) Remove Digital Input CCA 2A2A6XX (slot 401). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform OAFOCUS test. If OAFOCUS test passes, no further action required. If OAFOCUS test fails, proceed to (c).
- (c) Remove Stepper Motor CCA NO. 1 2A2A7A6A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A1 and perform OAFOCUS test. If OAFOCUS test passes, no further action required. If OAFOCUS test fails, proceed to (d).
- (d) Remove Stepper Motor CCA NO. 2 2A2A7A6A2. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A2 and perform OAFOCUS test. If OAFOCUS test passes, no further action required. If OAFOCUS test fails, proceed to (e).

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**7-18. FILTER AND DETECTOR ASSEMBLY 2A1A1A14**  
**INPUT CODE: OAFOCUS (cont)**

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**7-18****2. CORRECTIVE ACTION - OAFOCUS (cont)**

- (e) Remove Stepper Motor No. 3 2A2A7A6A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A3 and perform OAFOCUS test. If OAFOCUS test passes, no further action required. If OAFOCUS test fails, proceed to (f).
- (f) Remove Filter Bracket 2A1A1A14A1. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A14A1 and perform OAFOCUS test. If OAFOCUS test passes, no further action required. If OAFOCUS test fails, proceed to (g).
- (g) Remove Optical Signal Analyzer 2A1A1. Check contacts of mating connectors and repair if required. Install replacement 2A1A1 and perform OAFOCUS test. If OAFOCUS test passes, no further action required. If OAFOCUS test fails, proceed to (h).
- (h) Check the following cable assemblies and repair as required:

W6  
W28  
W29  
2A1W31  
2A1W32  
2A2W8  
2A2W9

If any cable was repaired, perform OAFOCUS test. If OAFOCUS test passes, no further action required. If OAFOCUS test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.



## 7-19. FILTER BRACKET ASSEMBLY 2A1A1A14

### INPUT CODE: OSADAF

7-19

#### a. DESCRIPTION

This module tests the ability of filter bracket assembly 2A1A1A14 to position the filter in response to commands. The OSA is cleared and the filter checked for position 1 (in).

If the filter is in position 2 (out), a prompt is displayed at the completion of the test.

The filter is programmed to position 2 and position status checked.

If the filter is in position 1, a prompt is displayed at the completion of the test.

The filter is moved back to position 1 and position status checked.

If the filter is in position 1, a prompt is displayed at the completion of the test.

#### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A1/13082799-29	5-11
2A1A1A14XX/13083919-19	5-14
2A2A6/13081880	2-48
2A2A6XX/06940-60026	2-49
2A2A6XX (SL0T 403)/13083412	2-49
2A2A6XX (SL0T 409)/69331B	2-49
2A2A7A4/13081572	5-34

## 7-19. FILTER BRACKET ASSEMBLY 2A1A1A14

### INPUT CODE: OSADAF (cont)

7-19

#### c. SEGMENT 1

##### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 409)
2.	2A2A6XX	06940-00625	CCA (SLOT 200)
3.	2A2A6	13081880	MULTI PROGRAMMER

##### 2. CORRECTIVE ACTION - SEGMENT 1

- (a) Remove Digital Output CCA 2A2A6XX (slot 409). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform OSADAF test. If OSADAF test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove CCA 2A2A6XX (slot 200). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform OSADAF test. If OSADAF test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Multiprogrammer 2A2A6. Check contacts of mating connectors and repair if required. Install replacement 2A2A6 and perform OSADAF test. If OSADAF test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Check the following cable assemblies and repair as required:

2A2W7  
2A2W8  
2A2W9  
2A2W25

If any cable was repaired, perform OSADAF test. If OSADAF test passes, no further action required. If OSADAF test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-19. FILTER BRACKET ASSEMBLY 2A1A1A14 INPUT CODE: OSADAF (cont)

7-19

### d. SEGMENT 2

#### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 403)
2.	2A2A6	13081880	MULTI PROGRAMMER

#### 2. CORRECTIVE ACTION - SEGMENT 2

- (a) Remove Digital Input CCA 2A2A6XX (slot 403). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform OSADAF test. If OSADAF test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Multi programmer 2A2A6. Check contacts of mating connectors and repair if required. Install replacement 2A2A6 and perform OSADAF test. If OSADAF test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Check the following cable assemblies and repair as required:

2A2W7  
2A2W8  
2A2W9  
2A2W25

If any cable was repaired, perform OSADAF test. If OSADAF test passes, no further action required. If OSADAF test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-19. FILTER BRACKET ASSEMBLY 2A1A1A14**  
**INPUT CODE: OSADAF (cont)**


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**7-19****e. SEGMENT 3****1. VDT DISPLAY**

FILTER NOT AT OUT POSITION AT STARTUP. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 409)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 403)
3.	2A2A7A4	13081572	RELAY ASSY.
4.	2A1A1A14XX	13083919-19	FILTER BRACKET (A1, A3, S1, S2)
5.	2A1A1	13082799-29	O. S. A.

**2. CORRECTIVE ACTION - SEGMENT 3**

- (a) Remove Digital Output CCA 2A2A6XX (slot 409). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform OSADAF test. If OSADAF test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Digital Input CCA 2A2A6XX (slot 403). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform OSADAF test. If OSADAF test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Relay Assembly 2A2A7A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A4 and perform OSADAF test. If OSADAF test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Filter Bracket 2A1A1A14XX. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A14XX and perform OSADAF test. If OSADAF test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-19. FILTER BRACKET ASSEMBLY 2A1A1A14**  
**INPUT CODE: OSADAF (cont)**

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**7-19****2. CORRECTIVE ACTION - SEGMENT 3 (cont)**

(e) Remove Optical Signal Analyzer 2A1A1. Check contacts of mating connectors and repair if required. Install replacement 2A1A1 and perform OSADAF test. If OSADAF test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.

(f) Check the following cable assemblies and repair as required:

W6  
W28  
W30  
2A1W31  
2A1W32  
2A1W34  
2A1W35  
2A1W36  
2A2W8  
2A2W9  
2A2A7W3

If any cable was repaired, perform OSADAF test. If OSADAF test passes, no further action required. If OSADAF test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

7-20. OSA 2A1A1 - SHUTTER  
INPUT CODE: OSADAS

7-20

a. DESCRIPTION

This module tests the ability of photomultiplier bracket assembly 2A1A1A7 shutter to respond to open and close commands. The OSA is cleared, which programs the shutter closed. The operator opens the OSA door. The door interlock is tested by programming the shutter to open.

The interlock should prevent the shutter from opening; if it does not, a prompt is displayed at the completion of the test.

The operator closes the OSA door and the shutter is programmed to open. The shutter status is checked.

If the shutter remains closed, a prompt is displayed.

b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A1A7XX/1-176-257	5-15
2A1A1A2XX/13083921	5-14
2A1A1A11/13081425-19	5-12
2A2A6XX (SL0T 403)/13083412	2-49
2A2A6XX (SL0T 408)/69331B	2-49
2A2A7A4/13081572	5-34

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**7-20. OSA 2A1A1 - SHUTTER**  
**INPUT CODE: OSADAS (cont)**


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**7-20****c. OPTICAL SIGNAL ANALYZER SHUTTER FAILURE****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 409)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 403)
3.	2A2A7A4	13081572	RELAY ASSY.
4.	2A1A1A7XX	1-176-257	SHUTTER ASSY.
5.	2A1A1A11	13081425-19	SWITCH ASSY.
6.	2A1A1A2XX	13083921	FILTER BRACKET (A1, A2)

**2. CORRECTIVE ACTION - OSADAS**

- (a) Remove Digital Output CCA 2A2A6XX (slot 409). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform OSADAS test. If OSADAS test passes, no further action required. If OSADAS test fails, proceed to (b).
- (b) Remove Digital Input CCA 2A2A6XX (slot 403). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform OSADAS test. If OSADAS test passes, no further action required. If OSADAS test fails, proceed to (c).
- (c) Remove Relay Assembly 2A2A7A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A4 and perform OSADAS test. If OSADAS test passes, no further action required. If OSADAS test fails, proceed to (d).
- (d) Remove Shutter Assembly 2A1A1A7XX. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A7XX and perform OSADAS test. If OSADAS test passes, no further action required. If OSADAS test fails, proceed to (e).

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**7-20. OSA 2A1A1 - SHUTTER**  
**INPUT CODE: OSADAS (cont)**

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**7-20****2. CORRECTIVE ACTION - OSADAS (cont)**

- (e) Remove Switch Assembly 2A1A1A11. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A11 and perform OSADAS test. If OSADAS test passes, no further action required. If OSADAS test fails, proceed to (f).
- (f) Remove Filter Bracket 2A1A1A2XX. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A2XX and perform OSADAS test. If OSADAS test passes, no further action required. If OSADAS test fails, proceed to (g).
- (g) Check the following cable assemblies and repair as required:

W6  
W28  
W29  
2A1W31  
2A1W32  
2A2W8  
2A2W9

If any cable was repaired, perform OSADAS test. If OSADAS test passes, no further action required. If OSADAS test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.



## 7-21. PHOTOMULTIPLIER BRACKET ASSEMBLY 2A1A1A7 AND PHOTOMULTIPLIER TUBE (PMT/LED SOURCE) INPUT CODE: PMTLED

7-21

### a. DESCRIPTION

This module tests photomultiplier bracket assembly 2A1A1A7 photomultiplier tube (PMT) temperature, and ability to detect light energy.

If an error is detected during any of the following checks, a prompt is displayed at the completion of the tests.

The PMT cooler is checked by reading the OSA temperature sensors for 5.0 to 15.0°C. The OSA PMT is turned on and after a 15-second delay, the PMT high voltage test point is checked for -3.0 to -5.5 vdc. The operator is then prompted to connect the I-250 illuminator to the adapter on the OSA assembly door 2A1A1 and adjust the illuminator for a voltage of 7.80 to 8.20 volts. The PMT level is then checked for each of 6 loads. PMT test 3 is selected and PMT output checked for 7.80 to 8.20 vdc. PMT test 3 with filter is selected and PMT output is checked for 0.72 to 0.88 vdc. PMT test 4 with filter is selected and PMT output is checked for 7.00 to 9.00 vdc. PMT test 2 is selected and PMT output is checked for 0.72 to 0.88 vdc. PMT test 1 is selected and PMT output is checked for 0.04 to 0.12 vdc. PMT test 5 is selected and PMT output checked for 0.04 to 0.12 vdc. PMT test 6 is selected and PMT output is checked for 0.72 to 0.88 vdc. PMT test 6 with low impedance is selected and PMT output is checked for -0.04 to 0.04 vdc.

### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
1A7/MODEL 33-2124	2-35
2A1A1A7/13083875	5-15
2A1A1A7XX/1-176-257	5-15
2A1A1A8/13082137	5-17
2A1A1A11/13081425-19	5-12
2A1A1A6/13081943-19	5-16
2A2A6XX (SL0T 408)/69331B	2-49
2A2A6XX (SL0T 409)/69331B	2-49
2A2A7A4/13081572	5-34
2A2A7A6A4/13082738	2-51
2A2A13/13081746	2-60
2A2A13XX (SL0T J4)/AC4720	2-61

## 7-21. PHOTOMULTIPLIER BRACKET ASSEMBLY 2A1A1A7 AND PHOTOMULTIPLIER TUBE (PMT/LED SOURCE) INPUT CODE: PMTLED (cont)

7-21

### c. SEGMENT 1

#### 1. VDT DISPLAY

PMT TEMPERATURE ERROR. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A7	MODEL 33-2124	PMT CONTROLLER
2.	2A2A7A6A4	13082738	TEMP. MONITOR CCA
3.	2A2A13XX	AC4720	DIFF. INPUT CCA (J4)
4.	2A2A13	13081746	A/D CONVERTER
5.	2A1A1A1A7	13083875	PMT BRACKET (SENSOR Q1)
6.	2A1A1A1A7	13083875	PMT BRACKET (PMT)

#### 2. CORRECTIVE ACTION - SEGMENT 1

- (a) Remove Photomultiplier Tube (PMT) Controller 1A7. Check contacts of mating connectors and repair if required. Install replacement 1A7 and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Temperature Monitor CCA 2A2A7A6A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A4 and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Differential Input CCA 2A2A13XX (slot J4). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-21. PHOTOMULTIPLIER BRACKET ASSEMBLY 2A1A1A7 AND PHOTOMULTIPLIER TUBE  
(PMT/LED SOURCE)  
INPUT CODE: PMTLED (cont)**

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**7-21****2. CORRECTIVE ACTION - SEGMENT 1 (cont)**

- (e) Remove Sensor 2A1A1A1A7Q1. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A1A7Q1 and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove PMT on PMT Bracket 2A1A1A1A7. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A1A7 and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.
- (g) Check the following cable assemblies and repair as required:

W6  
 W27  
 W28  
 1W8  
 2A1W26  
 2A1W31  
 2A1W32  
 2A1A1W9  
 2A1A1W11  
 2A1A1W14  
 2A2W1  
 2A2W19

If any cable was repaired, perform PMTLED test. If PMTLED test passes, no further action required. If PMTLED test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-21. PHOTOMULTIPLIER BRACKET ASSEMBLY 2A1A1A7 AND PHOTOMULTIPLIER TUBE  
(PMT/LED SOURCE)  
INPUT CODE: PMTLED (cont)**


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**7-21****d. SEGMENT 2****1. VDT DISPLAY**

PMT HIGH VOLTAGE TEST POINT READING IN ERROR. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A13XX	AC4720	DIFF. INPUT CCA (J7)
2.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 409)
3.	2A2A7A4	13081572	RELAY ASSY.
4.	2A2A13	13081746	A/D CONVERTER
5.	2A1A1A6	13081943-19	POWER SUPPLY ASSY.
6.	2A1A1A2A11	13081425-19	SWITCH ASSY.

**2. CORRECTIVE ACTION - SEGMENT 2**

- (a) Remove Differential Input CCA 2A2A13XX (slot J7). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Digital Output CCA 2A2A6XX (slot 409). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Relay Assembly 2A2A7A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A4 and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-21. PHOTOMULTIPLIER BRACKET ASSEMBLY 2A1A1A7 AND PHOTOMULTIPLIER TUBE  
(PMT/LED SOURCE)  
INPUT CODE: PMTLED (cont)**

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7-21

**2. CORRECTIVE ACTION - SEGMENT 2 (cont)**

- (e) Remove Power Supply Assembly 2A1A1A6. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A6 and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove Switch Assembly 2A1A1A2A11. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A2A11 and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.
- (g) Check the following cable assemblies and repair as required:

W27  
W28  
2A1W26  
2A1W32  
2A1A1W9  
2A1A1W11  
2A1A1W16  
2A2W1  
2A2W3

If any cable was repaired, perform PMTLED test. If PMTLED test passes, no further action required. If PMTLED test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-21. PHOTOMULTIPLIER BRACKET ASSEMBLY 2A1A1A7 AND PHOTOMULTIPLIER TUBE  
(PMT/LED SOURCE)  
INPUT CODE: PMTLED (cont)**


---

**7-21****e. SEGMENT 3****1. VDT DISPLAY**

FILTER NOT AT OUT POSITION AT STARTUP. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF. DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1. 2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 408)
2. 2A1A1A1A8	13082137	ELECTRICAL FILTER ASSY.
3. 2A1A1A1A7XX	1-176-257	PMT SHUTTER ASSY.

**2. CORRECTIVE ACTION - SEGMENT 3**

- (a) Remove Digital Output CCA 2A2A6XX (slot 408). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Electrical Filter Assembly 2A1A1A1A8. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A1A8 and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove PMT Shutter Assembly 2A1A1A1A7XX. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A1A7XX and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-21. PHOTOMULTIPLIER BRACKET ASSEMBLY 2A1A1A7 AND PHOTOMULTIPLIER TUBE  
(PMT/LED SOURCE)  
INPUT CODE: PMTLED (cont)**


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**7-21****2. CORRECTIVE ACTION - SEGMENT 3 (cont)**

(d) Check the following cable assemblies and repair as required:

W27  
W28  
2A1W26  
2A1W32  
2A1A1W9  
2A1A1W11  
2A2W3  
2A2W9

If any cable was repaired, perform PMTLED test. If PMTLED test passes, no further action required. If PMTLED test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**f. SEGMENT 4****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 408)
2.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 409)
3.	2A1A1A1A8	13082137	ELECT. FILTER INTERFACE
4.	2A1A1A1A7XX	1-176-257	PMT SHUTTER ASSY.

## 7-21. PHOTOMULTIPLIER BRACKET ASSEMBLY 2A1A1A7 AND PHOTOMULTIPLIER TUBE (PMT/LED SOURCE) INPUT CODE: PMTLED (cont)

7-21

### 2. CORRECTIVE ACTION - SEGMENT 4

- (a) Remove Digital Output CCA 2A2A6XX (slot 408). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Digital Output CCA 2A2A6XX (slot 409). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Electrical Filter Interface 2A1A1A1A8. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A1A8 and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove PMT Shutter Assembly 2A1A1A1A7XX. Check contacts of mating connectors and repair if required. Install replacement 2A1A1A1A7XX and perform PMTLED test. If PMTLED test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Check the following cable assemblies and repair as required:

W27

W28

2A1W26

2A1W32

2A1A1W9

2A1A1W11

If any cable was repaired, perform PMTLED test. If PMTLED test passes, no further action required. If PMTLED test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.



---

**7-22. RADIOMETER HEAD 2A1A8 (EXTERNAL RADIOMETER)**  
**INPUT CODE: EXTRAD**


---

**7-22****a. DESCRIPTION**

This module test the ability of radiometer head (external radiometer) 2A1A8 to detect light energy. The A mirror is programmed to position 1 (out), the B mirror is programmed to position 1, the dayside shutter is programmed open, and the target lamp programmed off. The operator mounts the external radiometer to the shutter port of the dayside test bench, and sets the external radiometer head to position 3.

The operator then turns the external radiometer controller on, and sets range to 10-5. The operator then zeros the external radiometer, and pulls the laser shield out. The external radiometer output is digitized, and the samples averaged and recorded. The target lamp is turned on, and AN/USM-410 power supply DC2B ramped to 12 vdc.

The external radiometer output is digitized, and the average of the samples compared to the recorded output average with the target lamp off.

If the lamp on average is not +0.125 to +0.800 vdc higher than the lamp off average, a prompt is displayed at the completion of the test.

The target lamp is then turned off, the external radiometer output digitized, and the average of the samples compared to the previously recorded lamp off output.

If the difference is not within 0.02 vdc, a prompt is displayed.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A8/460-2	None (External Radiometer)

---

**7-22. RADIOMETER HEAD 2A1A8 (EXTERNAL RADIOMETER)  
INPUT CODE: EXTRAD (cont)**

---

**7-22****c. EXTERNAL RADIOMETER FAILURE****1. VDT DISPLAY**

EXTERNAL RADIOMETER FAILURE. THE ZERO INPUT READING = ###.###. T LAMP READING = ####.####. PERFORM THE FOLLOWING REPLACE ACTION IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF. DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1. 2A1A8	460	EXTERNAL RADIOMETER

**2. CORRECTIVE ACTION - EXTRAD**

Remove External Radiometer 2A1A8. Check contacts of mating connectors and repair if required. Install replacement 2A1A8 and perform EXTRAD test. If EXTRAD test passes, no further action required. If EXTRAD test continues to fail, repair is beyond this level of maintenance. Next higher level of maintenance required.

---

**7-23. SHUTTER ASSEMBLY 2A1A2A2**  
**INPUT CODE : DCDCS**


---

**7-23****a. DESCRIPTION**

This module tests the ability of shutter assembly 2A1A2A2 to respond to open and close commands. The dayside test bench is cleared and the shutter assembly sensors checked for position 2 (closed).

If the sensors indicate position 1 (open), a prompt is displayed at the completion of the test.

The shutter assembly is then programmed to open, and the shutter assembly sensors checked for position 1.

If the sensors indicate position 2, a prompt is displayed at the completion of the test.

The shutter assembly is then programmed to close, and the shutter assembly sensors checked for position 2.

If the sensors indicate position 1, a prompt is displayed.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A2A6XX (SL0T 402)/13083412	2-49
2A2A6XX (SL0T 409)/69331B	2-49
2A2A7A4/13081572	5-34

---

**7-23. SHUTTER ASSEMBLY 2A1A2A2**  
**INPUT CODE: DCDCS (cont)**

---

**7-23****c. DAY COLLIMATOR SHUTTER FAILURE****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 402)
2.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 409)
3.	2A2A7A4	13081572	RELAY ASSY.
3.	2A1	13082800-59	DAYSIDE TEST BENCH

**2. CORRECTIVE ACTION - DCDCS**

- (a) Remove Digital Input CCA 2A2A6XX (slot 402). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCDCS test. If DCDCS test passes, no further action required. If DCDCS test fails, proceed to (b).
- (b) Remove Digital Output CCA 2A2A6XX (slot 409). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform DCDCS test. If DCDCS test passes, no further action required. If DCDCS test fails, proceed to (c).
- (c) Remove Relay Assembly 2A2A7A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A4 and perform DCDCS test. If DCDCS test passes, no further action required. If DCDCS test fails, proceed to (d).

---

**7-23. SHUTTER ASSEMBLY 2A1A2A2**  
**INPUT CODE: DCDCS (cont)**

---

**7-23****2. CORRECTIVE ACTION - DCDCS (cont)**

(d) Check the following cable assemblies and repair as required:

W6  
W24  
W27  
W28  
W29  
W30  
2A2W8  
2A2W9  
2A2W14  
2A2A7W3

If any cable was repaired, perform DCDCS test. If DCDCS test passes, no further action required. If DCDCS test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

---

**7-24. OPTICAL - HOD AND IVD ALIGNMENT ASSEMBLY**  
**INPUT CODE: FIXTST**

---

**7-24****a. DESCRIPTION**

This module tests the optical alignment assembly through various voltage and resistance measurements.

The values are compared to upper and lower limits and if an error is detected, a prompt is displayed at the end of the test.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
H20	6-10
13081937	6-10
13083124	6-10
13083123	6-10
BZ-2R01	6-10
13083126	6-10

---

**7-24. OPTICAL - HOD AND IVD ALIGNMENT ASSEMBLY**  
**INPUT CODE: FIXTST (cont)**


---

**7-24****c. SEGMENT 1****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTION IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.		13083124	BRACKET AND CIRCUIT CARD ASSY.

**2. CORRECTIVE ACTION - SEGMENT 1**

- (a) Remove Bracket and Circuit Card Assembly. Check contacts of mating connectors and repair if required. Install replacement Bracket and Circuit Card Assembly and perform FIXTST test. If FIXTST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

- (b) Check the following test cables and test connectors and repair as required:

Test cables - 13081706, 13082730, 13083702

Test connectors - 13083962-419, 13083962-429, 13083962-439, and 13083962-449

If any cable or connector was repaired, perform FIXTST test. If FIXTST test passes, no further action required. If FIXTST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables or connectors were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-24. OPTICAL - HOD AND IVD ALIGNMENT ASSEMBLY

### INPUT CODE: FIXTST (cont)

7-24

#### d. SEGMENT 2

##### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT procedures.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.		BZ-2RQ1	SWITCH, S1
2.		BZ-2RQ1	SWITCH, S2

#### 20 CORRECTIVE ACTION - SEGMENT 2

- (a) Remove Switch S1. Install replacement S1 and perform FIXTST test. If FIXTST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Switch S2. Install replacement switch and perform FIXTST test. If FIXTST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Check the following test cables and test connectors and repair as required:

Test cables - 13081706, 13082730, 13083702

Test connectors - 13083962-419, 13083962-429, 13083962-439, and 13083962-449

If any cable or connector was repaired, perform FIXTST test. If FIXTST test passes, no further action required. If FIXTST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables or connectors were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.



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**7-24. OPTICAL - HOD AND IVD ALIGNMENT ASSEMBLY**  
**INPUT CODE: FIXTST (cont)**


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**7-24****e. SEGMENT 3****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTION IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.		13083123	COIL ASSY, YOKE LOAD

**2. CORRECTIVE ACTION - SEGMENT 3**

- (a) Remove Yoke Load Coil Assembly. Check contacts of mating connectors and repair if required. Install replacement Yoke Load Coil Assembly and perform FIXTST test. If FIXTST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

- (b) Check the following test cables and test connectors and repair as required:

Test cables - 13081706, 13082730, 13083702

Test connectors - 13083962-419, 13083962-429, 13083962-439, and 13083962-449

If any cable or connector was repaired, perform FIXTST test. If FIXTST test passes, no further action required. If FIXTST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables or connectors were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-24. OPTICAL - HOD AND IVD ALIGNMENT ASSEMBLY**  
**INPUT CODE: FIXTST (cont)**

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**7-24****f. SEGMENT 4****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.		H-20	HIGH VOLTAGE C.R.T. POWER SUPPLY, PS-1
2.		13081937	LEAD, ELECTRICAL, S.P., W8
3.		13083124	BRACKET AND CIRCUIT CARD ASSY.

**2. CORRECTIVE ACTION - SEGMENT 4**

- (a) Remove High Voltage C.R.T. Power Supply PS-1. Check contacts of mating connectors and repair if required. Install replacement PS-1 and perform FIXTST test. If FIXTST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Electrical Lead W8. Check contacts of mating connectors and repair if required. Install replacement W8 and perform FIXTST test. If FIXTST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Bracket and Circuit Card Assembly. Check contacts of mating connectors and repair if required. Install replacement Bracket and Circuit Card Assembly and perform FIXTST test. If FIXTST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.

7-24. OPTICAL - HOD AND IVD ALIGNMENT ASSEMBLY  
INPUT CODE: FIXTST (cont)

7-24

2. CORRECTIVE ACTION - SEGMENT 4 (cont)

(d) Check the following test cables and test connectors and repair as required:

Test cables - 13081706, 13082730, 13083702  
Test connectors - 13083962-419, 13083962-429, 13083962-439, and 13083962-449

If any cable or connector was repaired, perform FIXTST test. If FIXTST test passes, no further action required. If FIXTST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables or connectors were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

g. SEGMENT 5

1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTION IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.		13083126	CONTROL PANEL ASSY.

2. CORRECTIVE ACTION - SEGMENT 5

(a) Remove Control Panel Assembly. Check contacts of mating connectors and repair if required. Install replacement Control Panel Assembly and perform FIXTST test. If FIXTST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-24. OPTICAL - HOD AND IVD ALIGNMENT ASSEMBLY**  
**INPUT CODE: FIXTST (cont)**

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**7-24****2. CORRECTIVE ACTION - SEGMENT 5 (cont)**

- (b) Check the following test cables and test connectors and repair as required:

Test cables - 13081706, 13082730, 13083702

Test connectors - 13083962-419, 13083962-429, 13083962-439, and 13083962-449

If any cable or connector was repaired, perform FIXTST test. If FIXTST test passes, no further action required. If FIXTST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables or connectors were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-25. OSA CABLES 13083702 AND 13083701 SELF-TEST**  
**INPUT CODE: OSACABLE**

---

**7-25****a. DESCRIPTION**

This module tests OSA self-test cables 13083701 and 13083702 by measuring pin-to-pin continuity and insulation resistance.

If a continuity or insulation check fails, a prompt is displayed and the operator directed to repair or replace the defective cable.

**b. REPLACEMENT PROCEDURE REFERENCE**

Replacement procedures for OSA cables are maintenance insignificant (detailed procedures not required) and are not provided in this manual.

**c. CORRECTIVE ACTION - OSACABLE**

Corrective actions are displayed on the VDT screen. Follow procedures on VDT screen to troubleshoot this module.

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**Section IV. TEST CONSOLE TEST BENCH 2A2**

Subject	Para	Page
Analog-to-Digital (A/D) Converter 2A2A13 Input Code: ADST . . . . .	7-26	7-123
Matrix Switch Assembly 2A2A10 Input Code: MTRXSW . . . . .	7-27	7-138
Optical Signal Generator (OSG) 2A2A3 Input Code: OSGST . . . . .	7-28	7-143
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Programmable Pulse Generator (PPG) Input Code: PPGTST . . . . .	7-30	7-156
Video Signal Generator (VSG) Case Assembly 2A2A7A1 Input Code: VSGST. . . . .	7-31	7-159

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**OVERVIEW**

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This section contains troubleshooting information for Test Console Test Bench 2A2.

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**7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13**  
**INPUT CODE: ADST**

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**7-26****a. DESCRIPTION**

This module tests various channels of analog-to-digital (A/D) converter 2A2A13 for noise and gain. The tests are made on four channels of the simultaneous sample and hold card (SSH), differential input card, and two single-ended input cards.

If an error is detected, a prompt is displayed at the completion of the test.

The A/D converter channels are checked as follows:

- The SSH input is programmed for 0.000 vdc. The noise is measured and recorded. An output of +7.5 vdc is applied to SSH input and voltage measured. The recorded noise at 0.000 vdc input is subtracted from the measured voltage at +7.5 vdc input then compared to an upper limit of +7.51 vdc and lower limit of +7.49 vdc.
- The differential input card input is programmed for 0.000 vdc and the noise measured and recorded. Then +7.5 vdc is applied to the differential input card input, and the output voltage measured. The recorded noise at 0.000 vdc is subtracted from the measured voltage +7.5 vdc input, and compared with an upper limit of +7.51 vdc and a lower limit of +7.49 vdc.
- The single-ended input card is then programmed for 0.000 vdc input and the noise measured and recorded.
- The single-ended input card is programmed for +7.5 vdc input and the output voltage measured. The recorded noise at 0.000 vdc input is subtracted from the measured voltage at +7.5 vdc input, then compared to an upper limit of +7.51 vdc and a lower limit of +7.49 vdc.

## 7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13 INPUT CODE: ADST (cont)

7-26

### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A6/13081880	2-48
2A2A6XX (SL0T 300)/5060-2689	2-49
2A2A6XX (SL0T 200)/06940-60025	2-49
2A2A6XX (SL0T 500)/06940-60026	2-49
2A2A7A6A7/13082714	2-51
2A2A10/13081925-19	2-54
2A2A11/13081879	2-56
2A2A11XX (SL0T 100)/06941-60026	2-57
2A2A11XX (SL0T 200)/06941-60025	2-57
2A2A11XX (SL0T 300)/5060-2689	2-57
2A2A11XX (SL0T 400)/HP69433A	2-57
2A2A13/13081746	2-60
2A2A13XX (SL0T J1)/AC280	2-61
2A2A13XX (SL0T J4)/AC4720	2-61
2A2A13XX (SL0T J5)/AC4060	2-61
2A2A13XX (SL0T J6)/AC4060	2-61
2A2A13XX (SL0T J7)/AC4720	2-61
2A2A13XX (SL0T J8)/AC4720	2-61
2A2A13XX (SL0T J17)/AC333	2-61
2A2A13XX (SL0T J18)/AC333	2-61
2A2A13XX (SL0T J73)/AC262	2-61
2A2A13XX (SL0T J74)/AC8016-2D	2-61
2A2A13XX (SL0T J75)/13082276-2	2-61
2A2A13XX (SL0T J76)/13082276-3	2-61
2A2A13XX (SL0T J77)/AC471-1B	2-61



## 7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13

### INPUT CODE: ADST (cont)

7-26

#### c. SEGMENT 1

##### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A7A6A7	13082714	BUS MUX CCA
2.	2A2A6XX	06940-60025	REMOTE/LOCAL CCA (SLOT 200)
3.	2A2A6XX	06940-60026	UNIT SELECT CCA (SLOT 500)
4.	2A2A6XX	5060-2689	LOGIC & TIMING CCA (SLOT 300)
5.	2A2A6	13081880	MULTI PROGRAMMER
6.	2A2A11	13081879	MULTI PROGRAMMER EXTENDER

##### 2. CORRECTIVE ACTION - SEGMENT 1

- (a) Remove Bus Mux CCA 2A2A7A6A7. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A7 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Remote/Local CCA 2A2A6XX (slot 200). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Unit Select CCA 2A2A6XX (slot 500). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Logic & Timing CCA 2A2A6XX (slot 300). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Multiprogrammer 2A2A6. Check contacts of mating connectors and repair if required. Install replacement 2A2A6 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13

### INPUT CODE: ADST (cont)

7-26

#### 2. CORRECTIVE ACTION - SEGMENT 1 (cont)

(f) Remove Multiprogrammer Extender 2A2A11. Check contacts of mating connectors and repair if required. Install replacement 2A2A11 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

(g) Check the following cable assemblies and repair as required:

Test Cable 13082730

2A2W1

2A2W7

2A2W8

2A2W11

2A2W19

2A2W25

If any cable was repaired, perform ADST test. If ADST test passes, no further action required. If ADST test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

#### d. SEGMENT 2

##### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A7A6A7	13082714	BUS MUX CCA
2.	2A2A13XX	13082276-2	CCA (J75)
3.	2A2A13XX	13082276-3	CCA (J76)
4.	2A2A13XX	AC471-1B	INTERFACE CCA (J77)
5.	2A2A13	13081746	A/D CONVERTER

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**7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13**  
**INPUT CODE: ADST (cont)**

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**7-26****2. CORRECTIVE ACTION - SEGMENT 2**

- (a) Remove Bus Mux CCA 2A2A7A6A7. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A7 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove CCA 2A2A13XX (J75). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove CCA 2A2A13XX (J76). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Interface CCA 2A2A13XX (J77). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13

### INPUT CODE: ADST (cont)

7-26

#### 2. CORRECTIVE ACTION - SEGMENT 2 (cont)

(f) Check the following cable assemblies and repair as required:

Test Cable 13082730  
2A2W1  
2A2W7  
2A2W11

If any cable was repaired, perform ADST test. If ADST test passes, no further action required. If ADST test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

#### e. SEGMENT 3

##### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A11XX	HP69433A	RELAY READBACK CCA (SLOT 400)
2.	2A2A11XX	06941-60026	EXTENDER INPUT CCA (SLOT 100)
3.	2A2A11XX	06941-60025	I/O TRANSFER CCA (SLOT 200)
4.	2A2A11XX	5060-2689	LOGIC & TIMING CCA (SLOT 300)
5.	2A2A11	13081879	MULTI PROGRAMMER EXTENDER
6.	2A2A6	13081880	MULTI PROGRAMMER

#### 2. CORRECTIVE ACTION - SEGMENT 3

(a) Remove Relay Readback CCA 2A2A11XX (slot 400). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13**  
**INPUT CODE: ADST (cont)**

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**7-26****2. CORRECTIVE ACTION - SEGMENT 3**

- (b) Remove Extender Input CCA 2A2A11XX (slot 100). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove I/O Transfer CCA 2A2A11XX (slot 200), Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Logic & Timing CCA 2A2A11XX (slot 300). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Multi programmer Extender 2A2A11. Check contacts of mating connectors and repair if required. Install replacement 2A2A11 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove Multi programmer 2A2A6. Check contacts of mating connectors and repair if required. Install replacement 2A2A6 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.

7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13  
INPUT CODE: ADST (cont)

7-26

2. CORRECTIVE ACTION - SEGMENT 3 (cont)

(g) Check the following cable assemblies and repair as required:

Test cable 13082730  
2A2W8  
2A2W9  
2A2W11  
2A2W25  
2A2W27

If any cable was repaired, perform ADST test. If ADST test passes, no further action required. If ADST test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

f. SEGMENT 4

1. VDT DISPLAY

A/D CONVERTER SAMPLE & HOLD FAILED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

REF.	DES.	PART NO.	NAME
1.	2A2A13XX	AC280	SAMPLE & HOLD CCA (J1)
2.	2A2A10	13081925-19	MATRIX SWITCH
3.	2A2A13XX	AC80162D	16-BIT A/D CCA (J74)
4.	2A2A13XX	AC262	SIGNAL PROCESSOR CCA (J73)
5.	2A2A13XX	13082276-2	CCA (J75)
6.	2A2A13XX	13082276-3	CCA (J76)
7.	2A2A13XX	AC471-1B	CCA (J77)
8.	2A2A13XX	AC4060	CCA (J5)
9.	2A2A13XX	AC4060	CCA (J6)
10.	2A2A13XX	AC333-1 & 2	CCA's (J17 & J18)
11.	2A2A13	13081746	A/D CONVERTER

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**7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13**  
**INPUT CODE: ADST (cont)**

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**7-26****2. CORRECTIVE ACTION - SEGMENT 4**

- (a) Remove Sample and Hold CCA 2A2A13XX (J1). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Matrix Switch 2A2A10. Check contacts of mating connectors and repair if required. Install replacement 2A2A10 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove 16-Bit A/D CCA 2A2A13XX (J74). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Signal Processor CCA 2A2A13XX (J73). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove CCA 2A2A13XX (J75). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove CCA 2A2A13XX (J76). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13**  
**INPUT CODE: ADST (cont)**

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**7-26****2. CORRECTIVE ACTION - SEGMENT 4 (cont)**

- (g) Remove CCA 2A2A13XX (J77). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (h). If another segment displayed, proceed to that segment and continue troubleshooting.
- (h) Remove CCA 2A2A13XX (J5). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (i). If another segment displayed, proceed to that segment and continue troubleshooting.
- (i) Remove CCA 2A2A13XX (J6). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (j). If another segment displayed, proceed to that segment and continue troubleshooting.
- (j) Remove CCA's 2A2A13XX (J17 and J18). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (k). If another segment displayed, proceed to that segment and continue troubleshooting.
- (k) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (l). If another segment displayed, proceed to that segment and continue troubleshooting.



## 7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13 INPUT CODE: ADST (cont)

7-26

### 2. CORRECTIVE ACTION - SEGMENT 4 (cont)

(1) Check the following cable assemblies and repair as required:

Test cable 13082730  
2A2W1  
2A2W7  
2A2W19

If any cable was repaired, perform ADST test. If ADST test passes, no further action required. If ADST test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

### g. SEGMENT 5

#### 1. VDT DISPLAY

DIFFERENTIAL INPUT CARD SLOT J4 FAILED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A13XX	AC4720	DIFF. INPUT CCA (J4)
2.	2A2A11XX	HP69433A	RELAY READBACK CCA (SLOT 400)
3.	2A2A13	13081746	A/D CONVERTER
4.	2A2A10	13081925-19	MATRIX SWITCH

### 2. CORRECTIVE ACTION - SEGMENT5

(a) Remove Differential Input CCA 2A2A13XX (J4). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13**  
**INPUT CODE: ADST (cont)**

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**7-26****2. CORRECTIVE ACTION - SEGMENT 5 (cont)**

- (b) Remove Relay Readback CCA 2A2A11XX (slot 400). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Matrix Switch 2A2A10. Check contacts of mating connectors and repair if required. Install replacement 2A2A10 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Check the following cable assemblies and repair as required:

Test cable 13082730  
2A2W1  
2A2W7  
2A2W11  
2A2W19  
HP09412-61603  
HP09412-61604

If any cable was repaired, perform ADST test. If ADST test passes, no further action required. If ADST test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13 INPUT CODE: ADST (cont)

7-26

### h. SEGMENT 6

#### 1. VDT DISPLAY

SINGLE ENDED INPUT CARD SLOT J7 FAILED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A13XX	AC4720	DIFF. INPUT CCA (J7)
2.	2A2A11XX	HP69433A	RELAY READBACK CCA (SLOT 400)
3.	2A2A13	13081746	A/D CONVERTER
4.	2A2A10	13081925-19	MATRIX SWITCH

#### 2. CORRECTIVE ACTION - SEGMENT 6

- (a) Remove Differential Input CCA 2A2A13XX (J7). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Relay Readback CCA 2A2A11XX (slot 400). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Matrix Switch 2A2A10. Check contacts of mating connectors and repair if required. Install replacement 2A2A10 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13  
INPUT CODE: ADST (cont)

7-26

2. CORRECTIVE ACTION - SEGMENT 6 (cont)

(e) Check the following cable assemblies and repair as required:

- Test cable 13082730
- 2A2W1
- 2A2W7
- 2A2W11
- 2A2W19
- HP09412-61603
- HP09412-61604

If any cable was repaired, perform ADST test. If ADST test passes, no further action required. If ADST test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

i. SEGMENT 7

1. VDT DISPLAY

SINGLE ENDED INPUT CARD SLOT J8 FAILED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A13XX	AC4720	DIFF. INPUT CCA (J8)
2.	2A2A11XX	HP69433A	RELAY READBACK CCA (SLOT 400)
3.	2A2A13	13081746	A/D CONVERTER
4.	2A2A10	13081925-19	MATRIX SWITCH

2. CORRECTIVE ACTION - SEGMENT 7

(a) Remove Differential Input CCA 2A2A13XX (J8). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13**  
**INPUT CODE: ADST (cont)**

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**7-26****2. CORRECTIVE ACTION - SEGMENT 7**

- (b) Remove Relay Readback CCA 2A2A11xx (slot 400). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Matrix Switch 2A2A10. Check contacts of mating connectors and repair if required. Install replacement 2A2A10 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Check the following cable assemblies and repair as required:

Test cable 13082730  
2A2W1  
2A2W7  
2A2W11  
2A2W19  
HP09412-61603  
HP09412-61604

If any cable was repaired, perform ADST test. If ADST test passes, no further action required. If ADST test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13  
INPUT CODE: ADST (cont)

7-26

j. SEGMENT 8

1. VDT DISPLAY

PEAK DETECTOR FAILED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A13XX	AC4720	DIFF. INPUT CCA (J8)
2.	2A2A11XX	HP69433A	RELAY READBACK CCA (SLOT 400)
3.	2A2A13	13081746	A/D CONVERTER
4.	2A2A10	13081925-19	MATRIX SWITCH

2. CORRECTIVE ACTION - SEGMENT 8

- (a) Remove Differential Input CCA 2A2A13XX (J8). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Relay Readback CCA 2A2A11XX (slot 400). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Matrix Switch 2A2A10. Check contacts of mating connectors and repair if required. Install replacement 2A2A10 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13 INPUT CODE : ADST (cont)

7-26

### 2. CORRECTIVE ACTION - SEGMENT 8 (cont)

(e) Check the following cable assemblies and repair as required:

Test cable 13082730  
2A2W1  
2A2W7  
2A2W11  
2A2W19  
HP09412-61603  
HP09412-61604

If any cable was repaired, perform ADST test. If ADST test passes, no further action required. If ADST test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

## k. SEGMENT 9

### 1. VDT DISPLAY

EXTERNAL TRIGGER FAILED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A13XX	AC4720	DIFF. INPUT CCA (J8)
2.	2A2A11XX	HP69433A	RELAY READBACK CCA (SLOT 400)
3.	2A2A13	13081746	A/D CONVERTER
4.	2A2A10	13081925-19	MATRIX SWITCH

### 2. CORRECTIVE ACTION - SEGMENT 9

- (a) Remove Differential Input CCA 2A2A13XX (J8). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Relay Readback CCA 2A2A11XX (slot 400). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-26. ANALOG-TO-DIGITAL (A/D) CONVERTER 2A2A13**  
**INPUT CODE: ADST (cont)**

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**7-26****2. CORRECTIVE ACTION - SEGMENT 9 (cont)**

- (c) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Matrix Switch 2A2A10. Check contacts of mating connectors and repair if required. Install replacement 2A2A10 and perform ADST test. If ADST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Check the following cable assemblies and repair as required:

Test cable 13082730  
2A2W1  
2A2W7  
2A2W11  
2A2W19  
HP09412-61603  
HP09412-61604

If any cable was repaired, perform ADST test. If ADST test passes, no further action required. If ADST test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.



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**7-27. MATRIX SWITCH ASSEMBLY 2A2A10**  
**INPUT CODE: MTRXSW**


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**7-27****a. DESCRIPTION**

This module tests matrix switch assembly 2A2A10 120 x 16 relays for both open and closed positions. The matrix switch assembly built-in self-test is performed on quadrants 1, 2, 3, and 4.

If an error is detected, a prompt is displayed at the completion of test.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
1A9A2/37203A	2-37
1A11A11/12009A	2-40
2A2A8/13082763 (37203A)	2-53
2A2A10XX (Any of 64 identified by QUAD and SLOT) /HP94140A	2-55
2A2A10XX/HP94140B	2-55
2A2A12/13081427-19	2-58
2A2A12XX/09411-66502	2-59



## 7-27. MATRIX SWITCH ASSEMBLY 2A2A10

### INPUT CODE: MTRXSW (cont)

7-27

#### c. SEGMENT 1

##### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A9A2	HP37203A	HP-IB BUS EXTENDER
2.	2A2A8	HP37203A	HP-IB BUS EXTENDER
3.	1A11A11	HP12009A	INTERFACE BUS CCA
4.	2A2A12XX	13081427-19	CCA
5.	2A2A12XX	09411-66502	CCA
6.	2A2A12	13081427	SWITCH CONTROLLER

##### 2. CORRECTIVE ACTION - SEGMENT 1

- (a) Remove Bus Extender 1A9A2. Check contacts of mating connectors and repair if required. Install replacement 1A9A2 and perform MTRXSW test. If MTRXSW test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Bus Extender 2A2A8. Check contacts of mating connectors and repair if required. Install replacement 2A2A8 and perform MTRXSW test. If MTRXSW test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Interface Bus CCA 1A11A11. Check contacts of mating connectors and repair if required. Install replacement 1A11A11 and perform MTRXSW test. If MTRXSW test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove CCA 2A2A12XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A12XX and perform MTRXSW test. If MTRXSW test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-27. MATRIX SWITCH ASSEMBLY 2A2A10**  
**INPUT CODE: MTRXSW (cont)**

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**7-27****2. CORRECTIVE ACTION - SEGMENT 1 (cont)**

- (e) Remove CCA 2A2A12XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A12XX and perform MTRXSW test. If MTRXSW test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove Switch Controller 2A2A12. Check contacts of mating connectors and repair if required. Install replacement 2A2A12 and perform MTRXSW test. If MTRXSW test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.
- (g) Check the following cable assemblies and repair as required:

HP09412-61603  
HP09412-61604  
HP10833B (3 Places)  
HP10833C (2 Places)  
HP12009-60002  
W13  
1W9  
1W13  
2A2W6

If any cable was repaired, perform MTRXSW test. If MTRXSW test passes, no further action required. If MTRXSW test fails and CALCST and PLLBUS tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST and PLLBUS tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-27. MATRIX SWITCH ASSEMBLY 2A2A10**  
**INPUT CODE: MTRXSW (cont)**


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**7-27****d. SEGMENT 2****1. VDT DISPLAY**

MATRIX SWITCH FAILED SELF-TEST. SEE PRINTOUT FOR BAD SWITCHES OF OTHER ERRORS. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A10AXX	HP94140A	RELAY SWITCH CCA
2.	2A2A10AXX	HP94140B	QUAD CONTROL CCA
3.	2A2A12XX	13081427	SWITCH CONTROLLER
4.	2A2A12XX	09411-66502	CCA

**2. CORRECTIVE ACTION - SEGMENT 2**

- (a) Remove Relay Switch CCA 2A2A10AXX. Check contacts of mating connectors and repair if required. Install replacement 2A2A10AXX and perform MTRXSW test. If MTRXSW test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Quad Control CCA 2A2A10AXX. Check contacts of mating connectors and repair if required. Install replacement 2A2A10AXX and perform MTRXSW test. If MTRXSW test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Switch Controller 2A2A12XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A12XX and perform MTRXSW test. If MTRXSW test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove CCA 2A2A12XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A12XX and perform MTRXSW test. If MTRXSW test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-27. MATRIX SWITCH ASSEMBLY 2A2A10**  
**INPUT CODE: MTRXSW (cont)**

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**7-27****2. CORRECTIVE ACTION - SEGMENT 2 (cont)**

(e) Check the following cable assemblies and repair as required:

HP09412-61603

HP09412-61604

2A2W11

If any cable was repaired, perform MTRXSW test. If MTRXSW test passes, no further action required. If MTRXSW test fails and CALCST and PLLBUS tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST and PLLBUS tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-28. OPTICAL SIGNAL GENERATOR (OSG) 2A2A3 INPUT CODE: OSGST

7-28

### a. DESCRIPTION

This module tests the ability of the optical signal generator (OSG) assembly 2A2A3 lamps to respond to on and off commands.

Lamp detector A2 is checked through the A/D converter lamp detector channel. Voltage is applied and output compared to an upper limit of 0.50 vdc and a lower limit of -1.00 vdc.

The CTF lamp is then checked with an application of 10.2 vdc. After a 2 second delay output is compared to an upper limit of 4.00 vdc and lower limit of 0.80 vdc.

The sphere lamp is then checked with an application of 25.4 vdc. After a 2 second delay output is compared to an upper limit of 4.00 vdc and lower limit of 0.80 vdc. Lamp detector A3 is checked for same parameters as detector A2.

The CTF lamp is then checked with an application of 23 vdc. After a 2 second delay output is compared to an upper limit of 8.00 vdc and lower limit of 2.00 vdc. If an error is detected a prompt is displayed at the completion of each test.

### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A3/13231679	2-46
2A2A3A1/13231678	5-32
2A2A3A2DS1/13231773	5-32
2A2A3A4/13231677	5-32
2A2A3A5DS1-DS3/LMS-343-0	5-32
2A2A7A4/13081572	5-34
2A2A6XX (SL0T 408)/69331B	2-49
2A2A4A1/13083063	5-33
2A2A13XX (SL0T J7)/AC4720	2-61

## 7-28. OPTICAL SIGNAL GENERATOR (OSG) 2A2A3 INPUT CODE: OSGST (cont)

7-28

### c. SEGMENT 1

#### 1. VDT DISPLAY

OSG LAMP DETECTOR A1 ERROR. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A3A2XX	13081976	OPTICAL SENSOR
2.	2A2A13X	AC4720	A/D CCA (SLOT J7)
3.	2A2A7A	13081572	RELAY ASSY.
4.	2A2A4A1	13083063	RELAY ASSY.
5.	2A2A3	13231679	O. S. G.

#### 2. CORRECTIVE ACTION - SEGMENT 1

- (a) Remove Optical Sensor 2A2A3A2XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A3A2XX and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove A/D CCA 2A2A13XX (J7). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Relay Assembly 2A2A7A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A4 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Relay Assembly 2A2A4A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A4A1 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Optical Signal Generator (OSG) 2A2A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A3 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.



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**7-28. OPTICAL SIGNAL GENERATOR (OSG) 2A2A3**  
**INPUT CODE: OSGST (cont)**


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**7-28****2. CORRECTIVE ACTION - SEGMENT 1 (cont)**

(f) Check the following cable assemblies and repair as required:

W2  
 2A2W13  
 2A2W17  
 2A2W21  
 2A2W22

If any cable was repaired, perform OSGST test. If OSGST test passes, no further action required. If OSGST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**d. SEGMENT 2****1. VDT DISPLAY**

OSG COLLIMATOR LAMP ERROR. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A3A2DS1	13231773	TARGET/COLLIMATOR LAMP
2.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 408)
3.	2A2A3A1	13231678	RELAY BRACKET ASSY
4.	2A2A3A4	13231677	AMPLIFIER-DETECTOR CCA
5.	2A2A3	13231679	O. S. G.

## 7-28. OPTICAL SIGNAL GENERATOR (OSG) 2A2A3 INPUT CODE: OSGST (cont)

7-28

### 20 CORRECTIVE ACTION - SEGMENT 2

- (a) Remove Lamp 2A2A3A2DS1. Check contacts of mating connectors and repair if required. Install replacement 2A2A3A2DS1 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Digital Output CCA 2A2A6XX (slot 408). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Relay Bracket Assembly 2A2A3A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A3A1 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Amplifier-Detector CCA 2A2A3A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A3A4 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Optical Signal Generator (OSG) 2A2A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A3 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Check the following cable assemblies and repair as required:

W2  
2A2W13  
2A2W17  
2A2W21  
2A2W22

If any cable was repaired, perform OSGST test. If OSGST test passes, no further action required. If OSGST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-28. OPTICAL SIGNAL GENERATOR (OSG) 2A2A3 INPUT CODE: OSGST (cont)

7-28

### e. SEGMENT 3

#### 1. VDT DISPLAY

OSG LAMP DETECTOR A2 ERROR. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A3A3	13231574	INTEGRATING SENSOR ASSY
2.	2A2A13XX	AC4720	A/D CCA (SLOT J7)
3.	2A2A7A4	13081572	RELAY ASSY.
4.	2A2A4A1	13083063	RELAY ASSY.
5.	2A2A3	13231679	O. S. G.

#### 2. CORRECTIVE ACTION - SEGMENT 3

- (a) Remove Integrating Sensor Assembly 2A2A3A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A3A3 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove A/D CCA 2A2A13XX (J7). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Relay Assembly 2A2A7A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A4 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Relay Assembly 2A2A4A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A4A1 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Optical Signal Generator (OSG) 2A2A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A3 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-28. OPTICAL SIGNAL GENERATOR (OSG) 2A2A3 INPUT CODE: OSGST (cont)

7-28

(f) Check the following cable assemblies and repair as required:

W2  
2A2W13  
2A2W17  
2A2W21  
2A2W22

If any cable was repaired, perform OSGST test. If OSGST test passes, no further action required. If OSGST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

### f. SEGMENT 4

#### 1. VDT DISPLAY

**OSG UNIFORMITY LAMP ERROR. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)**

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A3A5DS1-DS3	LMS-343-D	UNIFORMITY LAMPS
2.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 408)
3.	2A2A3A1	13231678	RELAY BRACKET ASSY
4.	2A2A3A4	13231677	AMPLIFIER-DETECTOR CCA
5.	2A2A3	13231679	O. S. G.

#### 2. CORRECTIVE ACTION - SEGMENT 4

- (a) Remove Lamps 2A2A3A5DS1 thru DS3. Check contacts of mating connector and repair if required. Install replacement 2A2A3A5DS1 thru DS3 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-28. OPTICAL SIGNAL GENERATOR (OSG) 2A2A3**  
**INPUT CODE: OSGST (cont)**

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**7-28****2. CORRECTIVE ACTION - SEGMENT 4 (cont)**

- (b) Remove Digital Output CCA 2A2A6XX (slot 408). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Relay Bracket Assembly 2A2A3A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A3A1 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Amplifier-Detector CCA 2A2A3A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A3A4 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Optical Signal Generator (OSG) 2A2A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A3 and perform OSGST test. If OSGST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Check the following cable assemblies and repair as required:

W2  
2A2W13  
2A2W17  
2A2W21  
2A2W22

If any cable was repaired, perform OSGST test. If OSGST test passes, no further action required. If OSGST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-28. OPTICAL SIGNAL GENERATOR (OSG) 2A2A3**  
**INPUT CODE: OSGST (cont)**


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**7-28****g. SEGMENT 5****1. VDT DISPLAY**

OSG LAMP DETECTOR A3 ERROR. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF. DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1. 2A2A3A2XX	13082472-19	OPTICAL SENSOR
2. 2A2A13XX	AC4720	A/D CCA (SLOT J7)
3. 2A2A7A4	13081572	RELAY ASSY.
4. 2A2A4A1	13083063	RELAY ASSY.
5. 2A2A3	13231679	O. S. G.

**2. CORRECTIVE ACTION - SEGMENT 5**

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

**h. SEGMENT 6****1. VDT DISPLAY**

OSG IMAGE LAMP ERROR. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF. DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1. 2A2A3A2DS1	13231773	TARGET/COLLIMATOR LAMP
2. 2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 408)
3. 2A2A3AI	13231678	RELAY BRACKET ASSY
4. 2A2A3A4	13231677	AMPLIFIER-DETECTOR CCA
5. 2A2A3	13231679	O. S. G.

**2. CORRECTIVE ACTION - SEGMENT 6**

Corrective action same as segment 2. Refer to segment 2 for troubleshooting.

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**7-29. PROGRAMMABLE DIGITIZER 2A2A1**  
**INPUT CODE: DIGITST**

---

**7-29****a. DESCRIPTION**

This module tests the ability of programmable digitizer assembly 2A2A1 to accept stimulus inputs and convert them to digital equivalents.

If an error is detected in the following checks, a prompt is displayed at the completion of the test.

The programmable amplifier channel A is programmed to 1 V/D, POS -4 and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 0 to 15.

Channel A is programmed to 1 V/D, POS -2 and coupling to ground.

The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 52 to 76.

Channel A is programmed to 1 V/D, POS 0, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 118 to 128.

Channel A is programmed to 1 V/D, POS +2, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 180 to 204.

Channel A is programmed to 1 V/D, POS +4, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 240 to 255.

The programmable amplifier channel B is programmed for 1 V/D, POS -4, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 0 to 15.

Channel B is programmed for 1 V/D, POS -2, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 52 to 76.

Channel B is programmed for 1 V/D, POS 0, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 118 to 128.

Channel B is programmed to 1 V/D, POS +2, and coupling to ground. The data is sampled, moved to a matrix and averaged. The averaged sampled data is checked for 180 to 204.

## 7-29. PROGRAMMABLE DIGITIZER 2A2A1 INPUT CODE: DIGITST (cont)

7-29

Channel B is programmed to 1 V/D, POS +4, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 240 to 255. A 5v p-p, 10 kHz sine wave is applied to channel A input B. The sample rate is programmed to 0.1 microseconds per sample. The period of the sampled signal is checked for 99.0 to 101.0 microseconds. The signal measured by the programmable digitizer assembly is checked for 4.75 to 5.25v p-p. A 5v p-p, 10 kHz sine wave is applied to channel B, input B. The sample rate is programmed to 0.1 microseconds per sample. The period of the sampled signal is checked for 99.0 to 101.0 microseconds. The signal measured by the programmable digitizer assembly is checked for 4.75 to 5.25v p-p.

### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A1/7612D	2-43
2A2A1XX (Channel A) 7A16P	2-43
2A2A1XX (Channel B) 7A16P	2-43

### c. SEGMENT 1

#### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF. DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1. 2A2A1	7612D	DIGITIZER

#### 2. CORRECTIVE ACTION - SEGMENT 1

- (a) Remove Digitizer 2A2A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A1 and perform DIGITST test. If DIGITST test passes, no further action required. If DIGITST test fails, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.



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**7-29. PROGRAMMABLE DIGITIZER 2A2A1**  
**INPUT CODE: DIGITST (cont)**


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**7-29****2. CORRECTIVE ACTION - SEGMENT 1 (cont)**

(b) Check the following cable assemblies and repair as required:

Shorting Plug 13081435-19  
 HP10833C  
 W2  
 W62  
 2A2W10  
 2A2W17  
 2A2W20  
 2A2W21  
 2A2W22  
 2A2W27  
 2A2W28

If any cable or shorting plug was repaired, perform DIGITST test. If DIGITST test passes, no further action required. If DIGITST test fails and CALCST, PLLBUS, MTRXSW, and ADST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables or shorting plug were repaired and CALCST, PLLBUS, MTRXSW, and ADST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

**d. SEGMENT 2****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A1XX	7A16P	PLUG-IN (CHAN A)
2.	2A2A1	7612D	DIGITIZER

**2. CORRECTIVE ACTION - SEGMENT 2****NOTE**

Removal and replacement of plug-in amplifiers are not authorized due to calibration requirements. Digitizer must be replaced as a single unit.

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

## 7-29. PROGRAMMABLE DIGITIZER 2A2A1 INPUT CODE: DIGITST (cont)

7-29

### e. SEGMENT 3

#### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A1XX	7A16P	PLUG-IN (CHAN A)
2.	2A2A1	7612D	DIGITIZER

#### 2. CORRECTIVE ACTION - SEGMENT 3

##### NOTE

Removal and replacement of plug-in amplifiers are not authorized due to calibration requirements. Digitizer must be replaced as a single unit.

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

### f. SEGMENT 4

#### 1. VDT DISPLAY

ERROR IN DIGITIZER - A CHAN. PULSE TST REPLACE. PERIOD = #, AMPLITUDE = #.  
PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A1XX	7A16P	PLUG-IN (CHAN A)
2.	2A2A1	7612D	DIGITIZER

#### 2. CORRECTIVE ACTION - SEGMENT 4

##### NOTE

Removal and replacement of plug-in amplifiers are not authorized due to calibration requirements. Digitizer must be replaced as a single unit.

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

7-29. PROGRAMMABLE DIGITIZER 2A2A1  
INPUT CODE: DIGITST (cont)

7-29

g. SEGMENT 5

1. VDT DISPLAY

ERROR IN DIGITIZER - B CHAN. PULSE TST REPLACE. PERIOD = #, AMPLITUDE = #.  
PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE  
TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A1XX	7A16P	PLUG-IN (CHAN B)
2.	2A2A1	7612D	DIGITIZER

2. CORRECTIVE ACTION - SEGMENT 5

NOTE

Removal and replacement of plug-in amplifiers are not authorized due to calibration requirements. Digitizer must be replaced as a single unit.

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

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**7-30. PROGRAMMABLE PULSE GENERATOR (PPG)**  
**INPUT CODE: PPGTST**

---

**7-30****a. DESCRIPTION**

This module tests the ability of the programmable pulse generator (PPG) 2A2A7A6A8 to produce correct output pulses in response to input function commands. Each of the four output channels is programmed for a test pulse which is checked using the programmable digitizer assembly 2A2A1.

PPG output 1 is programmed for a 1.0 microsecond positive pulse. The PPG gating feature is programmed to switch off every other pulse resulting in a period of 10 microseconds. The measured pulse is checked for a pulse width of 0.95 to 1.05 microseconds with a period of 9.95 to 10.05 microseconds, a low state of -0.5 to +0.8 vdc, and a high state of +2.5 to +5.5 vdc.

An error in the pulse measurements will display a prompt at the completion of the test.

PPG output 2 is programmed for a 2.0 microsecond positive pulse. The PPG gating feature is programmed to switch off every other pulse resulting in a period of 10 microseconds. The measured pulse is checked for a pulse width of 1.95 to 2.05 microseconds with a period of 9.95 to 10.05 microseconds, a low state of -0.5 to +0.8 vdc, and a high state of +2.5 to +5.5 vdc.

An error in the pulse measurements will display a prompt at the completion of the test.

PPG output 3 is programmed for a 3.0 microsecond positive pulse. The PPG gating feature is programmed to switch off every other pulse resulting in a period of 10 microseconds. The measured pulse is checked for a pulse width of 2.95 to 3.05 microseconds with a period of 9.95 to 10.05 microseconds, a low state of -0.5 to +0.8 vdc, and a high state of +2.5 to +5.5 vdc.

An error in the pulse measurements will display a prompt at the completion of the test.

PPG output 4 is programmed for a 4.0 microsecond positive pulse. The PPG gating feature is programmed to switch off every other pulse resulting in a period of 10 microseconds. The measured pulse is checked for a pulse width of 3.95 to 4.05 microseconds with a period of 9.95 to 10.05 microseconds, a low state of -0.5 to +0.8 vdc, and a high state of +2.5 to +5.5 vdc.

An error in the pulse measurements will display a prompt at the completion of the test.

## 7-30. PROGRAMMABLE PULSE GENERATOR (PPG) INPUT CODE: PPGTST (cont)

7-30

### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A6XX (SL0T 406)/69331B	2-46
2A2A7A6A8/13083050-19	2-51
2A2A7A6A9/13081467-19	2-51
2A2A11XX (SL0T 400)/69433A	2-57

### c. PROGRAMMABLE PULSE GENERATOR FAILURE

#### 1. VDT DISPLAY

PROGRAMMABLE PULSE GENERATOR FAILED TEST. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF. DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1. 2A2A7A6A8	13083050-19	PULSE GENERATOR CCA #1
2. 2A2A7A6A9	13081467-19	PULSE GENERATOR CCA #2
3. 2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SL0T 406)
4. 2A2A11XX	HP69433A	RELAY READBACK CCA (SL0T 400)

#### 20 CORRECTIVE ACTION - PPGTST

- (a) Remove Pulse Generator CCA #1 2A2A7A6A8. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A8 and perform PPGTST test. If PPGTST test passes, no further action required. If PPGTST test fails, proceed to (b).

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**7-30. PROGRAMMABLE PULSE GENERATOR (PPG)**  
**INPUT CODE: PPGTST (cont)**

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**7-30****2. CORRECTIVE ACTION - PPGTST (cont)**

- (b) Remove Pulse Generator CCA #2 2A2A7A6A9. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A9 and perform PPGTST test. If PPGTST test passes, no further action required. If PPGTST test fails, proceed to (c).
- (c) Remove Digital Output CCA 2A2A6XX (slot 406). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform PPGTST test. If PPGTST test passes, no further action required. If PPGTST test fails, proceed to (d).
- (d) Remove Relay Readback CCA 2A2A11XX (slot 400). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform PPGTST test. If PPGTST test passes, no further action required. If PPGTST fails, proceed to (e).
- (e) Check the following cable assemblies and repair as required:

Test Cable 13083093  
2A2W9  
2A2W11

If any cable was repaired, perform PPGTST test. If PPGTST test passes, no further action required. If PPGTST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

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**7-31. VIDEO SIGNAL GENERATOR (VSG) CASE ASSEMBLY 2A2A7A1**  
**INPUT CODE: VSGST**

---

**7-31****a. DESCRIPTION**

This module tests the ability of video signal generator (VSG) case assembly 2A2A7A1 to produce video output signals in response to input function commands.

If an error is detected during any of the following checks, a prompt is displayed at the completion of the test.

The VSG is programmed for a 525 line rate and the blanking level to 0.3 volts. The displayed video output is measured by the programmable digitizer assembly, which is triggered by the VSG and the following checks made:

- The horizontal sync width for 4.0 to 6.0 microseconds.
- The horizontal sync period for 60.0 to 68.0 microseconds.
- The porch level of display output signal for -0.075 to +0.75 vdc.
- The difference between the porch level and sync level for 0.1 to 0.4 vdc.
- The time from the start of the last horizontal sync of the even field to the beginning of the odd vertical field for 60.0 to 68.0 microseconds.
- The time from the start of the odd field vertical sync to the start of the first pulse for 25.0 to 30.0 microseconds.
- The time from the start of the odd field vertical sync to the start of the sixth pulse for 188.0 to 196.0 microseconds.
- The time of the start of the sixth pulse of the odd field vertical sync to the next positive transition for 6.0 to 14.0 microseconds.
- The time from the first positive transition after the odd field vertical sync to the start of the next horizontal sync for 55.0 to 63.0 microseconds.
- The time from the start of the last horizontal sync of the odd field to the beginning of the even field vertical sync for 25.0 to 35.0 microseconds.

---

**7-31. VIDEO SIGNAL GENERATOR (VSG) CASE ASSEMBLY 2A2A7A1**  
**INPUT CODE: VSGST (cont)**

---

**7-31****a. DESCRIPTION (cont)**

The VSG is then programmed for an 875 line rate and the blanking level for 0.3 volts. The displayed video output is measured by the programmable digitizer, which is triggered by the VSG and the following checks made:

- The horizontal sync width for 2.0 to 3.5 microseconds.
- The horizontal sync period for 35.0 to 40.0 microseconds.
- The porch level of the display output signal for -0.075 to +0.75 vdc.
- The difference between the porch level and the sync level for +0.1 to +0.4 vdc.
- The time from the start of the last horizontal sync of the even field to the beginning of the odd vertical sync for 36.0 to 40.0 microseconds.
- The time from the start of the odd field vertical sync to the start of the first pulse for 15.0 to 19.0 microseconds.
- The time from the start of the odd field vertical sync to the start of the sixth pulse for 112.0 to 116.0 microseconds.
- The time from the start of the sixth pulse of the odd field vertical sync to the next positive transition for 3.0 to 6.0 microseconds.
- The time from the first positive transition after the odd field vertical sync to the start of the next horizontal sync for 34.0. to 36.0 microseconds.
- The time from the start of the last horizontal sync of the odd field to the beginning of the even field vertical sync for 15.0 to 22.0 microseconds.

To check composite video without sine wave, a 20 microsecond window is placed 11 microseconds after the start of horizontal sync. The brightness level is programmed to +1.0 vdc and the programmable digitizer assembly is triggered 10 microseconds after the start of horizontal sync and the following checks made:

- The window to start 0.6 to 1.4 microseconds after the trigger.
- The width of the window to 19.6 to 20.4 microseconds.
- The amplitude of the window for +0.25 to +0.75 vdc.



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**7-31. VIDEO SIGNAL GENERATOR (VSG) CASE ASSEMBLY 2A2A7A1**  
**INPUT CODE: VSGST (cont)**


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**7-31****a. DESCRIPTION (cont)**

To check the composite video with sine wave, the window in the previous check is reprogrammed to a brightness level of +0.5 vdc and modulated with a 10 mHz sine wave programmed for 0.5v p-p. The difference between the maximum and minimum samples during the window is checked for 0.25 to 0.30v p-p. the camera sync signals are checked with the VSG programmed for an 875 line rate. The programmable digitizer assembly is triggered 10 microseconds into line 18, and samples the camera sync (encoded sync) signals. The following checks are made:

- The second pulse of the inverted sync signal for 3.7 to 3.9 microseconds.
- The third pulse of the inverted sync signal for 3.7 to 3.9 microseconds.
- The time interval between the first and second pulses of the inverted sync signal for 37.6 to 38.6 microseconds.
- The time interval between the end of the second pulse and the start of the third pulse of the inverted sync signal for 0.9 to 1.1 microseconds.
- The start of the first pulse of the inverted sync signal to occur at 27.7 to 28.1 microseconds in relation to the programmable digitizer trigger.
- The first pulse of the noninverted sync signal for 3.7 to 3.9 microseconds.
- The second pulse of the noninverted sync signal for 3.7 to 3.9 microseconds.
- The third pulse of the noninverted sync signal for 3.7 to 3.9 microseconds.
- The time interval between the first and second pulses of noninverted sync signal for 37.6 to 38.6 microseconds.
- The time interval between the end of the second pulse and start of the third pulse of the noninverted sync signal for 0.9 to 1.1 microseconds.
- The start of the first pulse of the noninverted sync signal to occur at 27.7 to 28.1 microseconds in relation to the programmable digitizer trigger.

## 7-31. VIDEO SIGNAL GENERATOR (VSG) CASE ASSEMBLY 2A2A7A1

### INPUT CODE: VSGST (cont)

7-31

#### a. DESCRIPTION (cont)

To check the camera video signal, the camera video output is programmed for windows of +2.00 vdc with a duration of 15 microseconds occurring on lines 100 and 101 at 15 microseconds after the start of the horizontal sync. The programmable digitizer assembly is triggered 10 microseconds into line 99, and the following checks are made:

- The width of the first window for 14.8 to 15.2 microseconds.
- The width of the second window for 14.8 to 15.2 microseconds.
- The first window to occur 42.4 to 43.5 microseconds after the programmable digitizer trigger.
- The second window to occur 80.5 to 81.6 microseconds after the programmable digitizer trigger. Line 102 for no camera window.
- The camera video amplitude for +1.4 to +1.9 vdc.

#### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A1A1/13083325	2-45
2A2A6/13081880	2-48
2A2A6XX (SL0T 406)/HP69331B	2-49
2A2A7A1/13082244	5-34
2A2A7A6A7/13082714	2-51
2A2A7A6A8/13083050-19	2-51
2A2A7A6A9/13081467-19	2-51
2A2A7A6A10/13081471-19	2-51
2A2A11/13081879	2-56
2A2A11XX (SL0T 100)/06941-60026	2-57
2A2A11XX (SL0T 200)/06941-60025	2-57
2A2A11XX (SL0T 300)/5060-2689	2-57
2A2A11XX (SL0T 401)/69433A	2-57

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**7-31 VIDEO SIGNAL GENERATOR (VSG) CASE ASSEMBLY 2A2A7A1**  
**INPUT CODE: VSGST (cont)**


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**7-31****c. SEGMENT 1****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A7A6A8	13083050-19	PULSE GENERATOR CCA #1
2.	2A2A7A6A9	13081467-19	PULSE GENERATOR CCA #2
3.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 406)
4.	2A2A7A6A7	13082714	BUS MUX CCA
5.	2A2A6	13081880	MULTI PROGRAMMER

**2. CORRECTIVE ACTION - SEGMENT 1**

- (a) Remove Pulse Generator CCA #1 2A2A7A6A8. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A8 and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Pulse Generator CCA #2 2A2A7A6A9. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A9 and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Digital Output CCA 2A2A6XX (slot 406). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove BUS MUX CCA 2A2A7A6A7. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A7 and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

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**7-31. VIDEO SIGNAL GENERATOR (VSG) CASE ASSEMBLY 2A2A7A1**  
**INPUT CODE: VSGST (cont)**


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**7-31****2. CORRECTIVE ACTION - SEGMENT 1 (cont)**

(e) Remove Multiprogrammer 2A2A6. Check contacts of mating connectors and repair if required. Install replacement 2A2A6 and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.

(f) Check the following cable assemblies and repair as required:

2A2W7  
2A2W8  
2A2W9

If any cable was repaired, perform VSGST test. If VSGST test passes, no further action required. If VSGST test fails and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**d. SEGMENT 2****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A11XX	HP69433A	RELAY READBACK CCA (SLOT 401)
2.	2A2A11XX	06941-60026	EXTENDER INPUT CCA (SLOT 100)
3.	2A2A11XX	06941-60025	I/O TRANSFER CCA (SLOT 200)
4.	2A2A11XX	5060-2689	LOGIC & TIMING CCA (SLOT 300)
5.	2A2A11	13081879	MULTI PROGRAMMER EXTENDER
6.	2A2A6	13081880	MULTI PROGRAMMER

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**7-31. VIDEO SIGNAL GENERATOR (VSG) CASE ASSEMBLY 2A2A7A1**  
**INPUT CODE: VSGST (cont)**

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**7-31****2. CORRECTIVE ACTION - SEGMENT 2**

- (a) Remove Relay Readback CCA 2A2A11XX (slot 401). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Extender Input CCA 2A2A11XX (slot 100). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove IO Transfer CCA 2A2A11XX (slot 200). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Logic and Timing CCA 2A2A11XX (slot 300). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Multiprogrammer Extender 2A2A11. Check contacts of mating connectors and repair if required. Install replacement 2A2A11 and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove Multiprogrammer 2A2A6. Check contacts of mating connectors and repair if required. Install replacement 2A2A6 and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.

7-31. VIDEO SIGNAL GENERATOR (VSG) CASE ASSEMBLY 2A2A7A1  
INPUT CODE: VSGST (cont)

7-31

2. CORRECTIVE ACTION - SEGMENT 2 (cont)

(g) Check the following cable assemblies and repair as required:

- 2A2W8
- 2A2W9
- 2A2W11
- 2A2W25

If any cable was repaired, perform VSGST test. If VSGST test passes, no further action required. If VSGST test fails and CALCST, PLLBUS, MTRXSW, ADST DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

e. SEGMENT 3

1. VDT DISPLAY

VIDEO SIGNAL GENERATOR FAILED # TEST(S). PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A7A6A8	13083050-19	PULSE GENERATOR CCA #1
2.	2A2A7A6A9	13081467-19	PULSE GENERATOR CCA #2
3.	2A2A7A6A10	13081471-19	PULSE GENERATOR CCA #3
4.	2A2A11XX	HP69433A	RELAY READBACK CCA (SLOT 401)
5.	2A2A7A1	13082244	VIDEO SIGNAL GEN. ASSY.
6.	2A2A1A1	13083325	CLOCK INTERFACE ASSY.

---

**7-31. VIDEO SIGNAL GENERATOR (VSG) CASE ASSEMBLY 2A2A7A1**  
**INPUT CODE: VSGST (cont)**

---

**7-31****2. CORRECTIVE ACTION - SEGMENT 3**

- (a) Remove Pulse Generator CCA #1 2A2A7A6A8. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A8 and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Pulse Generator CCA #2 2A2A7A6A9. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A9 and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Pulse Generator CCA #3 2A2A7A6A10. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A10 and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove Relay Readback CCA 2A2A11XX (slot 401). Check contacts of mating connectors and repair if required. Install replacement 2A2A11XX and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Video Signal Generator Assembly 2A2A7A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A1 and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove Clock Interface Assembly 2A2A1A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A1A1 and perform VSGST test. If VSGST test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-31. VIDEO SIGNAL GENERATOR (VSG) CASE ASSEMBLY 2A2A7A1**  
**INPUT CODE : VSGST (cont)**

---

**7-31****2. CORRECTIVE ACTION - SEGMENT 3 (cont)**

(g) Check the following cable assemblies and repair as required:

2A2W10  
2A2W11  
2A2W16  
2A2W30  
2A2A7W3

If any cable was repaired, perform VSGST test. If VSGST test passes, no further action required. If VSGST test fails and CALCST, PLLBUS, MTRXSW, ADST DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.



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Section V. NIGHTSIDE TEST BENCH 2A3

Subject	Para	Page
Heat Source Target Assembly 2A3A1A1 - Aperture		
Input Code: FIRCAST . . . . .	7-32	7-170
Heat Source Target Assembly 2A3A1A1 - Target		
Input Code: FIRCTGST . . . . .	7-33	7-173
Shutter Assembly 2A3A1A2 Input Code: FIRCSST . . . . .	7-34	7-176

---

OVERVIEW

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This section contains troubleshooting information for Nightside Test Bench 2A3.

## 7-32. HEAT SOURCE TARGET ASSEMBLY 2A3A1A1 - APERTURE INPUT CODE: FIRCAST

7-32

### a. DESCRIPTION

This module tests the ability of heat source target assembly 2A3A1A1 aperture wheel positioner to position the proper aperture, in response to input commands. Aperture number 1 is selected and the sensor checked.

If the sensor does not indicate status 22, a prompt is displayed at the completion of the test.

Aperture number 2 is selected and the sensor checked.

If the sensor does not indicate status 26, a prompt is displayed at the completion of the test.

Aperture number 3 is selected and the sensor checked.

If the sensor does not indicate status 28, a prompt is displayed at the completion of the test.

Aperture number 4 is selected and the sensor checked.

If the sensor does not indicate status 30, a prompt is displayed.

### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A6XX (SL0T 401)/13083412	2-49
2A2A6XX (SL0T 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51
2A3/13082782-49	5-36
2A3A1A1W20/13082263-129	5-38
2A3A1A1W16/13082264-29	5-38
2A3A1A1XX/FS176	5-38
2A3A1A1W17/13081524	5-38

---

**7-32. HEAT SOURCE TARGET ASSEMBLY 2A3A1A1 - APERTURE**  
**INPUT CODE: FIRCAST (cont)**


---

**7-32****c. FIR COLLIMATOR APERTURE FAILURE****1. VDT DISPLAY**

POSITION = ## STATUS = ##. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA NO. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA NO. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA NO. 3
6.	2A3A1A1W20	13082263-129	CABLE ASSY. W13 (SENSOR)
7.	2A3A1A1W17	13081524	CABLE ASSY. W17 (CLUTCH)
8.	2A3A1A1W16	13082264-29	CABLE ASSY. W16 (MOTOR)
9.	2A3A1A1XX	FS176	TIMING BELT
10•	2A3	13082782-49	NIGHTSIDE TEST BENCH

**2. CORRECTIVE ACTION - FIRCAST**

- (a) Remove Digital Output CCA 2A2A6XX (slot 407). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform FIRCAST test. If FIRCAST test passes, no further action required. If FIRCAST test fails, proceed to (b).
- (b) Remove Digital Input CCA 2A2A6XX (slot 401). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform FIRCAST test. If FIRCAST test passes, no further action required. If FIRCAST test fails, proceed to (c).
- (c) Remove Stepper Motor CCA NO. 1 2A2A7A6A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A1 and perform FIRCAST test. If FIRCAST test passes, no further action required. If FIRCAST test fails, proceed to (d).
- (d) Remove Stepper Motor CCA NO. 2 2A2A7A6A2. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A2 and perform FIRCAST test. If FIRCAST test passes, no further action required. If FIRCAST test fails, proceed to (e).
- (e) Remove Stepper Motor CCA NO. 3 2A2A7A6A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A3 and perform FIRCAST test. If FIRCAST test passes, no further action required. If FIRCAST test fails, proceed to (f).

---

**7-32. HEAT SOURCE TARGET ASSEMBLY 2A3A1A1 - APERTURE**  
**INPUT CODE: FIRCAST (cont)**

---

**7-32****2. CORRECTIVE ACTION - FIRCAST (cont)**

- (f) Remove Cable Assembly 2A3A1A1W20. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1W20 and perform FIRCAST test. If FIRCAST test passes, no further action required. If FIRCAST test fails, proceed to (g).
- (g) Remove Cable Assembly 2A3A1A1W17. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1W17 and perform FIRCAST test. If FIRCAST test passes, no further action required. If FIRCAST test fails, proceed to (h).
- (h) Remove Cable Assembly 2A3A1A1W16. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1W16 and perform FIRCAST test. If FIRCAST test passes, no further action required. If FIRCAST test fails, proceed to (i).
- (i) Remove Timing Belt 2A3A1A1XX. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1XX and perform FIRCAST test. If FIRCAST test passes, no further action required. If FIRCAST test fails, proceed to (j).
- (j) Check the following cable assemblies and repair as required:

W8  
W12  
2A2W8  
2A2W10  
2A2W13  
2A2W17  
2A2A7W3  
2A3W3  
2A3W4  
2A3W6

If any cable was repaired, perform FIRCAST test. If FIRCAST test passes, no further action required. If FIRCAST test fails and CALCST, PLLBUS, MTRXSW, ADST DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

### 7-33. HEAT SOURCE TARGET ASSEMBLY 2A3A1A1 - TARGET INPUT CODE: FIRCTGST

7-33

#### a. DESCRIPTION

This module tests the ability of heat source target assembly 2A3A1A1 target wheel positioner to correctly position targets in response to input commands. There are 10 selectable target wheel positions (position 2 thru 11). Each position is checked by this module.

If an error is detected during any of the following checks, a prompt is displayed at the completion of the test.

Target number 2 is selected and the target wheel sensor status checked for 2. Target number 3 is selected and the target wheel sensor status checked for 3. Target number 4 is selected and the target wheel sensor status checked for 4. Target wheel 5 is selected and the target wheel sensor status checked for 5. Target number 6 is selected and the target wheel sensor status checked for 6. Target number 7 is selected and the target wheel sensor status checked for 7. Target number 8 is selected and the target wheel sensor status checked for 8. Target number 9 is selected and the target wheel sensor status checked for 9. Target number 10 is selected and the target wheel sensor status checked for 10. Target number 11 is selected and the target wheel status checked for 11. The target wheel is then moved from target 11 to target 5 and the target wheel sensor status checked for 5.

#### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A6XX (SL0T 401)/13083412	2-49
2A2A6XX (SL0T 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51
2A3/13082782-49	5-36
2A3A1A1W13/13082262	5-38
2A3A1A1W16/13082264-29	5-38
2A3A1A1XX/FS189	5-38
2A3A1A1A3A4/13082809	5-38
2A3A1A1W17/13081524-29	5-38

## 7-33. HEAT SOURCE TARGET ASSEMBLY 2A3A1A1 - TARGET INPUT CODE: FIRCTGST (cont)

7-33

### c. FIR COLLIMATOR TARGET FAILURE

#### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTION IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 407)
2.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 401)
3.	2A2A7A6A1	13082741	STEPPER MOTOR CCA NO. 1
4.	2A2A7A6A2	13082735	STEPPER MOTOR CCA NO. 2
5.	2A2A7A6A3	13082732	STEPPER MOTOR CCA NO. 3
6.	2A3A1A1W13	13082262	CABLE ASSY. W13 (SOLENOID)
7.	2A3A1A1W17	13081524-29	CABLE ASSY. W17 (CLUTCH)
8.	2A3A1A1W16	13082264-19	CABLE ASSY. W16 (MOTOR)
9.	2A3A1A1XX	FS189	BELT
10.	2A3A1A1XX	13082809	CLUTCH DRIVE PULLY ASSY.
11.	2A3	13082782-49	NIGHTSIDE TEST BENCH

#### 2. CORRECTIVE ACTION - FIRCTGST

- (a) Remove Digital Output CCA 2A2A6XX (slot 407). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform FIRCTGST test. If FIRCTGST test passes, no further action required. If FIRCTGST test fails, proceed to (b).
- (b) Remove Digital Input CCA 2A2A6XX (slot 401). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform FIRCTGST test. If FIRCTGST test passes, no further action required. If FIRCTGST test fails, proceed to (c).
- (c) Remove Stepper Motor CCA NO. 1 2A2A7A6A1. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A1 and perform FIRCTGST test. If FIRCTGST test passes, no further action required. If FIRCTGST test fails, proceed to (d).
- (d) Remove Stepper Motor CCA No. 2 2A2A7A6A2. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A2 and perform FIRCTGST test. If FIRCTGST test passes, no further action required. If FIRCTGST test fails, proceed to (e).
- (e) Remove Stepper Motor CCA NO. 3 2A2A7A6A3. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A3 and perform FIRCTGST test. If FIRCTGST test passes, no further action required. If FIRCTGST test fails, proceed to (f).

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**7-33. HEAT SOURCE TARGET ASSEMBLY 2A3A1A1 - TARGET  
INPUT CODE: FIRCTGST (cont)**

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**7-33****2. CORRECTIVE ACTION - FIRCTGST (cont)**

- (f) Remove Cable Assembly 2A3A1A1W13. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1W13 and perform FIRCTGST test. If FIRCTGST test passes, no further action required. If FIRCTGST test fails, proceed to (g).
- (g) Remove Cable Assembly 2A3A1A1W17. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1W17 and perform FIRCTGST test. If FIRCTGST test passes, no further action required. If FIRCTGST test fails, proceed to (h).
- (h) Remove Cable Assembly 2A3A1A1W16. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1W16 and perform FIRCTGST test. If FIRCTGST test passes, no further action required. If FIRCTGST test fails, proceed to (i).
- (i) Remove Belt 2A3A1A1XX. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1XX and perform FIRCTGST test. If FIRCTGST test passes, no further action required. If FIRCTGST test fails, proceed to (j).
- (j) Remove Clutch Drive Pulley Assembly 2A3A1A1XX. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1XX and perform FIRCTGST test. If FIRCTGST test passes, no further action required. If FIRCTGST test fails, proceed to (k).
- (k) Check the following cable assemblies and repair as required:

W8  
W12  
2A2W8  
2A2W9  
2A2W13  
2A2W17

If any cable was repaired, perform FIRCTGST test. If FIRCTGST test passes, no further action required. If FIRCTGST test fails and CALCST, PLLBUS, MTRXSW, ADST DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

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**7-34. SHUTTER ASSEMBLY 2A3A1A2**  
**INPUT CODE: FIRCSST**

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**7-34****a. DESCRIPTION**

This module tests the ability of shutter assembly 2A3A1A2 to respond to position input commands. The night side test bench is cleared and the shutter assembly sensors checked for position 2 (closed).

If the sensors indicate position 1 (open), a prompt is displayed at the completion of the test.

The shutter assembly is then programmed to open and the sensor checked for position 1.

If the sensors indicate position 2, a prompt is displayed at the completion of the test.

The shutter assembly is then programmed to close and the sensors checked for position 2.

If the sensors indicate position 1, a prompt is displayed at the completion of the test.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A6XX (SL0T 403)/13083412	2-49
2A2A6XX (SL0T 408)/69331B	2-49
2A2A6XX (SL0T 410)/69331B	2-49
2A2A7A4/13081572	5-34
2A3/13082782-49	5-36



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**7-34. SHUTTER ASSEMBLY 2A3A1A2**  
**INPUT CODE: FIRCSST (cont)**


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**7-34****c. FIR COLLIMATOR SHUTTER FAILURE****1. VDT DISPLAY**

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 408)
2.	2A2A6XX	HP69331B	DIGITAL OUTPUT CCA (SLOT 410)
3.	2A2A6XX	13083412	DIGITAL OUTPUT CCA (SLOT 403)
4.	2A2A7A4	13081572	RELAY ASSY.
5.	2A3A1A2W7	13082241-19	CABLE ASSY. W7 (SENSOR A1, A2)
6.	2A3A1A2W8	13082243-19	CABLE ASSY. W8 (SOLENOID A3)
7.	2A3A1A2	13082817	SHUTTER ASSY.

**NOTE**

Items 5, 6, and 7 are depot level repair only. Removal and installation of these items are not authorized at AVIM.

**2. CORRECTIVE ACTION - FIRCSST**

- (a) Remove Digital Output CCA 2A2A6XX (slot 408). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform FIRCSST test. If FIRCSST test passes, no further action required. If FIRCSST test fails, proceed to (b).
- (b) Remove Digital Output CCA 2A2A6XX (slot 410). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform FIRCSST test. If FIRCSST test passes, no further action required. If FIRCSST test fails, proceed to (c).
- (c) Remove Digital Input CCA 2A2A6XX (slot 403). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform FIRCSST test. If FIRCSST test passes, no further action required. If FIRCSST test fails, proceed to (d).
- (d) Remove Relay Assembly 2A2A7A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A4 and perform FIRCSST test. If FIRCSST test passes, no further action required. If FIRCSST test fails, proceed to (e).

---

**7-34. SHUTTER ASSEMBLY 2A3A1A2**  
**INPUT CODE: FIRCSST (cont)**

---

**7-34****2. CORRECTIVE ACTION - FIRCSST (cont)****NOTE**

Cable assemblies 2A3A1A2W7 and 2A3A1A2W8, and shutter assembly 2A3A1A2 are depot level repair only. Removal and installation of these items are not authorized at AVIM.

(e) Check the following cable assemblies and repair as required:

W8  
W12  
2A2W8  
2A2W9  
2A2W13  
2A3W3  
2A3W4

If any cable was repaired, perform FIRCSST test. If FIRCSST test passes, no further action required. If FIRCSST test fails and CALCST, PLLBUS, MTRXSW, ADST DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST, PLLBUS, MTRXSW, ADST, DIGITST, FPSST, and PPSST tests have been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

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## Section VI. COMMON MODULES

Subject	Para	Page
Interlocks Input Code: BITCHECK . . . . .	7-35	7-180
Parallel Bus Input Code: PLLBUS . . . . .	7-36	7-184
Temperature Sensors Input Code: AUGTEM . . . . .	7-37	7-187
Portable Video Monitor Input Code: VIDEOST . . . . .	7-38	7-205

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### OVERVIEW

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This section contains troubleshooting information for Common Modules of the Electronic Equipment Test Facility (EETF) TADS/PNVS Augmentation Equipment.

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**7-35. INTERLOCKS**  
**INPUT CODE: BITCHECK**

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**7-35****a. DESCRIPTION**

This module tests interlocks in dayside test bench 2A1 and nightside test bench 2A3. The program displays operator instructions to position controls, located on the dayside test bench and nightside test bench, which engage or disengage interlocks. The interlock sensors are checked for proper position status.

If an error is detected, a prompt is displayed.

Interlocks that are checked on the dayside test bench are laser interface carriage, laser interlock handle, and sensor mount handle. The interlock checked on the nightside test bench is the sensor mount handle.

**b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A2A6XX (SL0T 404)/13083412	2-49
2A2A6XX (SL0T 405)/13083412	2-49
2A3/13082782-49	5-36

## 7-35. INTERLOCKS

### INPUT CODE: BITCHECK (cont)

7-35

#### C. SEGMENTS 1 THRU 4 AND 6 THRU 9

##### 1. ERROR MESSAGES - SEGMENTS 1 THRU 4 AND 6 THRU 9

- (a) SENSOR 1 2A1A2A4W5-A1 FAIL
- (b) SENSOR 1 2A1A2A4W5-A2 FAIL
- (c) SENSOR 1 2A1A2A4W75-A1 FAIL
- (d) SENSOR 1 2A1A2A4A10W14-A1 FAIL
- (e) SENSOR 2 2A1A2A4W43-A1 FAIL
- (f) SENSOR 2 2A1A2A4W5-A3 FAIL
- (g) SENSOR 2 2A1A2A4W44-A1 FAIL
- (h) SENSOR 2 2A1A2A4A10W14-A2 FAIL

##### 2. VDT DISPLAY - SEGMENTS 1 THRU 4 AND 6 THRU 9

###### NOTE

An error message from the preceding list will be displayed where the # symbol is used.

#. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 405)
2.	2A1	13082800-59	DAYSIDE TEST BENCH

##### 3. CORRECTIVE ACTION - SEGMENTS 1 THRU 4 AND 6 THRU 9

- (a) Remove Digital Input CCA 2A2A6XX ( slot 405). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform BITCHECK test. If BITCHECK test passes, no further action required. If segments 1 thru 4 or 6 thru 9 fail, proceed to (b). If segments 5 or 10 fail, proceed to that segment and continue troubleshooting.

## 7-35. INTERLOCKS

### INPUT CODE: BITCHECK (cont)

7-35

### 3. CORRECTIVE ACTION - SEGMENTS 1 THRU 4 AND 6 THRU 9 (cont)

(b) Check the following cable assemblies and repair as required:

W27  
W28  
2A2W8  
2A2W14

If any cable was repaired, perform BITCHECK test. If BITCHECK test passes, no further action required. If BITCHECK test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If segments 5 or 10 fail, proceed to that segment and continue troubleshooting.

### d. SEGMENTS 5 AND 10

#### 1. ERROR MESSAGES - SEGMENTS 5 AND 10

- (a) SENSOR 1 2A3A1A3W10-A2 FAIL
- (b) SENSOR 2 2A3A1A3W10-A1 FAIL

#### 2. VDT DISPLAY - SEGMENTS 5 AND 10

#### NOTE

An error message from the preceding list will be displayed where the # symbol is used.

#. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A6XX	13083412	DIGITAL INPUT CCA (SLOT 404)
2.	2A3	13082782-49	NIGHTSIDE TEST BENCH

---

**7-35. INTERLOCKS**  
**INPUT CODE: BITCHECK (cont)**

---

**7-35****3. CORRECTIVE ACTION - SEGMENTS 5 AND 10**

(a) Remove Digital Input CCA 2A2A6XX (slot 404). Check contacts of mating connectors and repair if required. Install replacement 2A2A6XX and perform BITCHECK test. If BITCHECK test passes, no further action required. If segments 5 or 10 fails, proceed to (b).

(b) Check the following cable assemblies and repair as required:

W8  
2A2W8  
2A2W13

If any cable was repaired, perform BITCHECK test. If BITCHECK test passes, no further action required. If BITCHECK test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If segments 1 thru 4 or 6 thru 9 fail, proceed to that segment and continue troubleshooting.

## 7-36. PARALLEL BUS INPUT CODE: PLLBUS

7-36

### a. DESCRIPTION

This module tests the ability of the parallel bus to transfer 16 bits of information in parallel. The built-in, self-test feature of the parallel bus is used to check out the data and handshake lines of the interface.

If an error is detected during the following checks, a prompt is displayed at the completion of the test.

The following numbers are output to the parallel bus self-test address and the input value from the parallel bus self-test address to the AN/USM-410 is checked for the same value.

Output -1 (all ones), 0 (all zeros), 1 (bit 0), 2 (bit 1), 4 (bit 2), 8 (bit 3), 16 (bit 4), 32 (bit 5), 64 (bit 6), 128 (bit 7), 256 (bit 8), 512 (bit 9), 1024 (bit 10), 2048 (bit 11), 4096 (bit 12), 8192 (bit 13), 16384 (bit 14), -32768 (bit 15), 21845 (even bits), and -21846 (odd bits).

### b. REPLACEMENT PROCEDURE REFERENCE

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
1A4PS4/BKF-5-11	2-33
1A11/13231746	2-39.1
1A11A9/13081742	2-40
1A11A12/13081431	2-40
1A11A13/13081483	2-40
2A2A7A6A5/13082717	2-51
2A2A7A6A7/13082714	2-51



## 7-36. PARALLEL BUS INPUT CODE: PLLBUS (cont)

7-36

### c. PARALLEL BUS FAILURE

#### 1. VDT DISPLAY

PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A11A12	13081431	PARALLEL I/O CCA
2.	1A11A9	13081742	INTERFACE CCA
3.	1A11A13	13081483	BUFFER CCA
4.	2A2A7A6A7	13082714	BUS MUX CCA
5.	2A2A7A6A5	13082717	FIFO CCA
6.	1A4PS4	BKF-5-11	5-VOLT PS
7.	1A11	13231746	DIGITAL COMPUTER ASSY.

#### 2. CORRECTIVE ACTION - PLLBUS

- (a) Remove Parallel I/O CCA 1A11A12. Check contacts of mating connectors and repair if required. Install replacement 1A11A12 and perform PLLBUS test. If PLLBUS test passes, no further action required. If PLLBUS fails, proceed to (b).
- (b) Remove Interface CCA 1A11A9. Check contacts of mating connectors and repair if required. Install replacement 1A11A9 and perform PLLBUS test. If PLLBUS test passes, no further action required. If PLLBUS fails, proceed to (c).
- (c) Remove Buffer CCA 1A11A13. Check contacts of mating connectors and repair if required. Install replacement 1A11A13 and perform PLLBUS test. If PLLBUS test passes, no further action required. If PLLBUS fails, proceed to (d).
- (d) Remove BUS MUX CCA 2A2A7A6A7. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A7 and perform PLLBUS test. If PLLBUS test passes, no further action required. If PLLBUS fails, proceed to (e).
- (e) Remove FIFO CCA 2A2A7A6A5. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A5 and perform PLLBUS test. If PLLBUS test passes, no further action required. If PLLBUS fails, proceed to (f).

---

**7-36. PARALLEL BUS**  
**INPUT CODE: PLLBUS (cont)**

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**7-36****2. CORRECTIVE ACTION - PLLBUS (cont)**

- (f) Remove 5-volt Power Supply 1A4PS4. Check contacts of mating connectors and repair if required. Install replacement 1A4PS4 and perform PLLBUS test. If PLLBUS test passes, no further action required. If PLLBUS fails, proceed to (g).
- (g) Remove Digital Computer Assembly 1A11. Check contacts of mating connectors and repair if required. Install replacement 1A11 and perform PLLBUS test. If PLLBUS test passes, no further action required. If PLLBUS fails, proceed to (h).
- (h) Check the following cable assemblies and repair as required:

W7  
W14  
1W2  
1W7  
1W9  
2A2W5

If any cable was repaired, perform PLLBUS test. If PLLBUS test passes, no further action required. If PLLBUS test fails and CALCST test has been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired and CALCST test has been performed, repair is beyond this level of maintenance. Next higher level of maintenance required.

---

**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AUGTEM**

---

**7-37****a. DESCRIPTION**

This module tests the ability of hand-held temperature probe, dayside test bench temperature sensors, and nightside test bench temperature sensors to detect ambient temperature to within acceptable limits. The hand-held temperature probe may also be tested at 32°F and 212°F.

The operator holds the probe near the equipment and presses [YES] on the AN/USM-410 VDT (if the operator desires to skip the test, [NO] is pressed) and the temperature indication is displayed in degrees C or degrees F.

If the indication is reasonable, the operator presses [YES] on the AN/USM-410 VDT and the probe passes test. If the indication is not reasonable, the operator presses [NO], the probe fails the test, and a prompt is displayed.

If the operator has boiling water available, and desires to test the probe at high temperature, [YES] is pressed on the AN/USM-410 VDT. If boiling water is not available, or the operator wishes to skip the test, [NO] is pressed.

The operator puts the probe into the boiling water and the indication is displayed with an option to perform another test. The indication is compared to upper limit 105 and lower limit 95.

If not within the limits, a prompt is displayed.

If ice water is available, and the operator desires to test the probe at low temperatures, [YES] is pressed on the AN/USM-410 VDT. If ice water is not available, or the operator wishes to skip the test, [NO] is pressed.

The operator puts the probe into the ice water and the indication is displayed with the option to perform another test. The indication is compared with upper limit +5 and lower limit -5.

If the indication is not within the limits, a prompt is displayed.

The dayside test bench temperature sensors 1 and 3 are checked for 17.0° to 29.0°C and recorded. The two indications are compared for a difference of -2.5° to +2.5°C. The indications are displayed.

If the indications are not within limits, a prompt is displayed.

The optical signal analyzer (OSA) PMT temperature sensor is checked for upper limit 15.0°C and lower limit 5.0°C.

If the indication is not within limits, a prompt is displayed.

---

**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AUGTEM (cont)**

---

**7-37****a. DESCRIPTION (cont)**

The nightside test bench thermal source controller ambient temperature sensor is checked for a 17.0° to 29.0°C indication. The indication is recorded and used as a base for other nightside test bench sensor tests.

If the indication is not within limits, a prompt is displayed, and a 22°C ambient temperature assumed in all other tests.

The A source is programmed to ambient and the A auxiliary-temperature sensor checked for an indication from -5.0° to +10.0°C of the recorded ambient temperature indication.

If the indication is not within limits, a prompt is displayed.

The B source is programmed to ambient and the B auxiliary temperature sensor is checked for an indication from -5.0 to +10.0°C of the recorded ambient indication.

If the indication is not within limits, a prompt is displayed.

The C source is programmed to ambient, and the C auxiliary temperature sensor checked for an indication from -5.0° to +10.0°C of the recorded ambient temperature.

If the indication is not within the limits, a prompt is displayed.

The A source is programed to ambient and the A controller temperature sensor checked for an indication from -5.0° to +10.0°C of the recorded ambient temperature.

If the indication is not within limits, a prompt is displayed.

The B source is programmed to ambient, and the B controller temperature sensor checked for an indication from -5.0° to +10.0°C of the recorded ambient temperature.

If the indication is not within limits, a prompt is displayed.

The C source is programmed for ambient and the C controller temperature sensor checked for an indication from -5.0° to +10.0°C of the recorded ambient temperature.

If the indication is not within limits, a prompt is displayed.

The A source is programmed to 30°C. The A controller sensor is checked, after a 200-second delay, for an indication of 29.0° to 31.0°C.

If the indication is not within limits, a prompt is displayed.

---

**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AUGTEM (cont)**

---

**7-37****a. DESCRIPTION (cont)**

The A source is programmed to 30°C and the A auxiliary temperature sensor checked after a 200-second delay, for an indication of 27.5° to 32.5°C.

If the indication is not within limits, a prompt is displayed.

The B source is programmed for 35°C. The B controller temperature sensor is checked after a 200-second delay, for an indication of 34.0° to 36.0°C.

If the indication is not within limits, a prompt is displayed.

The B source is programmed to 35°C. The B auxiliary temperature is checked, after a 200-second delay, for an indication of 32.5° to 37.5°C.

If the indication is not within the limits, a prompt is displayed.

The C source is programmed to 35°C and the C controller temperature sensor checked, after a 200-second delay, for an indication of 34.0° to 36.0°C.

If the indication is not within limits, a prompt is displayed.

The C source is programmed to 35°C. The C auxiliary temperature sensor checked, after a 200-second delay, for an indication of 32.5° to 37.5°C.

If the indication is not within limits, a prompt is displayed.

---

**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AUGTEM (cont)**


---

**7-37****b. REPLACEMENT PROCEDURE REFERENCE**

The following list provides a cross reference of replacement items to replacement procedures. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the procedural paragraph used to perform the replacement action. The VDT screen will display the proper sequence of repair/replace actions.

Item (Ref Des/Part No.)	Reference (Para No.)
1A1/13082765	2-26
2A1/3082800-59	5-9
2A1A2W54/13081588-39	5-23
2A2A7A6A4/13082738	2-51
2A2A13/13081746	2-60
2A2A13XX (SL0T J4)/AC4720	2-61
W26/13081531	None (External Probe)
2A3/13082782-49	5-36
2A3A1A1A1/13082971	5-38
2A3A1A1W24/13081588-19	5-38
2A3A1A1A2/13082972	5-38
2A3A1W6/13081969-19	3-27
2A3A1A1/13082974-29	5-39
2A3A1A17W23/13081588	5-39

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## 7-37. TEMPERATURE SENSORS INPUT CODE: AUGTEM (cont)

7-37

### c. SEGMENT 1

#### 1. VDT DISPLAY

PROBE DOES NOT GIVE REASONABLE READING. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2W26	13081531	TEMP. PROBE ASSY.
2.	2A2A7A6A4	13082738	TEMP. MONITOR CCA
3.	2A2A13XX	AC4720	DIFF. INPUT CCA (J4)
4.	2A2A13	13081746	A/D CONVERTER

#### 2. CORRECTIVE ACTION - SEGMENT 1

- (a) Remove Temperature Probe Assembly 2A2W26. Check contacts of mating connectors and repair if required. Install replacement 2A2W26 and perform AUGTEM test. If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Temperature Monitor CCA 2A2A7A6A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A4 and perform AUGTEM test. If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Differential Input CCA 2A2A13XX. Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform AUGTEM test. If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform AUGTEM test. If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.

7-37. TEMPERATURE SENSORS

INPUT CODE: AUGTEM (cont)

7-37

2. CORRECTIVE ACTION - SEGMENT 1 (cont)

(e) Check the following cable assemblies and repair as required:

- 2A2W1
- 2A2W7
- 2A2W19
- 2A2A7W3

If any cable was repaired, perform AUGTEM test. If AUGTEM test passes, no further action required. If AUGTEM test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

d. SEGMENT 2

1. VDT DISPLAY

ERROR IN HAND HELD TEMPERATURE PROBE HIGH READING. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2W26	13081531	TEMP. PROBE ASSY.
2.	2A2A7A6A4	13082738	TEMP. MONITOR CCA
3.	2A2A13XX	AC4720	DIFF. INPUT CCA (J4)
4.	2A2A13	13081746	A/D CONVERTER

2. CORRECTIVE ACTION - SEGMENT 2

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.



## 7-37. TEMPERATURE SENSORS INPUT CODE: AUGTEM (cont)

7-37

### e. SEGMENT 3

#### 1. VDT DISPLAY

ERROR IN HAND HELD TEMPERATURE PROBE LOW READING. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2W26	13081531	TEMP. PROBE ASSY.
2.	2A2A7A6A4	13082738	TEMP. MONITOR CCA
3.	2A2A13XX	AC4720	DIFF. INPUT CCA (J4)
4.	2A2A13	13081746	A/D CONVERTER

#### 2. CORRECTIVE ACTION - SEGMENT 3

Corrective action same as segment 1. Refer to segment 1 for troubleshooting.

### f. SEGMENT 4

#### 1. VDT DISPLAY

TEMP CONTROLLER AMBIENT SENSOR FAILED. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A1	13082765	CONTROL UNIT ASSY.
2.	2A3A1W6	13081969-19	CABLE ASSY. W6 (TEMP SENSOR)
3.	2A3	13082782-49	NIGHTSIDE TEST BENCH

#### 2. CORRECTIVE ACTION - SEGMENT 4

- (a) Remove Control Unit Assembly 1A1. Check contacts of mating connectors and repair if required. Install replacement 1A1 and perform AUGTEM test. If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Temperature Sensor Cable Assembly 2A3A1W6. Check contacts of mating connectors and repair if required. Install replacement 2A3A1W6 and perform AUGTEM test. If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AUGTEM (cont)**


---

**7-37****2. CORRECTIVE ACTION - SEGMENT 4 (cont)**

(c) Check the following cable assemblies and repair as required:

W1  
 1W4  
 2A3W1  
 2A3A1W16

If any cable was repaired, perform AUGTEM test. If AUGTEM test passes, no further action required. If AUGTEM test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**g. SEGMENT 5****1. VDT DISPLAY**

ERROR ON DC SENSOR TEMPERATURE # TEMPERATURE READS #.##. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	2A2A7A6A4	13082738	TEMP. MONITOR CCA
2.	2A2A13XX	AC 4720	DIFF. INPUT CCA (J4)
3.	2A2A13	13081746	A/D CONVERTER
4.	2A1A2W54	13081588-49	W54 SENSOR << OR >>
	[2A1	13082800-59	DAYSIDE TEST BENCH].

**2. CORRECTIVE ACTION - SEGMENT 5**

(a) Remove Temperature Monitor CCA 2A2A7A6A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A4 and perform AUGTEM test. If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

(b) Remove Differential Input CCA 2A2A13XX (J4). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform AUGTEM test. If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-370 TEMPERATURE SENSORS INPUT CODE: AUGTEM (cont)

7-37

### 2. CORRECTIVE ACTION - SEGMENT 5 (cont)

- (c) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform AUGTEM test. If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove W54 Sensor. Check contacts of mating connectors and repair if required. Install replacement W54 sensor and perform AUGTEM test. If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Check the following cable assemblies and repair as required

W8  
W28  
2A1A2W40  
2A1W32  
2A2W1  
2A2W13

If any cable was repaired, perform AUGTEM test. If AUGTEM test passes, no further action required. If AUGTEM test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

## h. SEGMENT 6

### 1. VDT DISPLAY

FC SENSOR 2 IS IN ERROR - READS #.##. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A1	13082765	CONTROL UNIT ASSY.
2.	2A2A7A6A4	13082738	TEMP. MONITOR CCA
3.	2A2A13XX	AC4720	DIFF. INPUT CCA (J4)
4.	2A2A13	13081746	A/D CONVERTER
5.	2A3A1A1A1XX	13081588-19	U CIRCUIT + HEATSINK (W24 SENSORS)
6.	2A3A1A1A1	13082971	SOURCE 'A'

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**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AUGTEM (cont)**

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**7-37****2. CORRECTIVE ACTION - SEGMENT 6**

- (a) Remove Control Unit Assembly 1A1. Check contacts of mating connectors and repair if required. Install replacement 1A1 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Temperature Monitor CCA 2A2A7A6A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A4 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Differential Input CCA 2A2A13XX (J4). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Circuit and Heatsink 2A3A1A1A1XX (W24 SENSOR). Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1A1XX and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove Source A 2A3A1A1A1. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1A1 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.

## 7-37. TEMPERATURE SENSORS

### INPUT CODE: AUGTEM (cont)

7-37

(g) Check the following cable assemblies and repair as required:

W1  
W8  
1W4  
2A2W13  
2A3W1  
2A3W4  
2A3A1W6

If any cable was repaired, perform AUGTEM test. If AUGTEM test passes, no further action required. If AUGTEM test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

## i. SEGMENT 7

### 1. VDT DISPLAY

FC SENSOR 3 IS IN ERROR - READS ###.#. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A1	13082765	CONTROL UNIT ASSY.
2.	2A2A7A6A4	13082738	TEMP. MONITOR CCA
3.	2A2A13XX	AC4720	DIFF. INPUT CCA (J4)
4.	2A2A13	13081746	A/D CONVERTER
5.	2A3A1A1A2XX	13081588-19	U CIRCUIT & HEATSINK (W25 SENSOR)
6.	2A3A1A1A2	13082972	SOURCE 'B'

### 2. CORRECTIVE ACTION - SEGMENT 7

- (a) Remove Control Unit Assembly 1A1. Check contacts of mating connectors and repair if required. Install replacement 1A1 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AUGTEM (cont)**

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**7-37****2. CORRECTIVE ACTION - SEGMENT 7 (cont)**

- (b) Remove Temperature Monitor CCA 2A2A7A6A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A4 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Differential Input CCA 2A2A13XX (J4). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.
- (d) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Circuit and Heatsink 2A3A1A1A1XX (W25 SENSOR). Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1A1XX and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove Source B 2A3A1A1A2. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1A2 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.
- (g) Check the following cable assemblies and repair as required:

W8  
W10  
1W15  
2A2W13  
2A3W2  
2A3W4  
2A3A1W6

## 7-37. TEMPERATURE SENSORS

### INPUT CODE: AUGTEM (cont)

7-37

If any cable was repaired, perform AUGTEM test. If AUGTEM test passes, no further action required. If AUGTEM test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

## j. SEGMENT 8

### 1. VDT DISPLAY

FC SENSOR 4 IS IN ERROR - READS #.##. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A1	13082765	CONTROL UNIT ASSY.
2.	2A2A7A6A4	13082738	TEMP. MONITOR CCA
3.	2A2A13XX	AC4720	DIFF. INPUT CCA (J4)
4.	2A2A13	13081746	A/D CONVERTER
5.	2A3A1A17XX	13081588	U CIRCUIT & HEATSINK (W23 SENSOR)
6.	2A3A1A17	13082972	SOURCE 'C'

### 2. CORRECTIVE ACTION - SEGMENT 8

- (a) Remove Control Unit Assembly 1A1. Check contacts of mating connectors and repair if required. Install replacement 1A1 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Temperature Monitor CCA 2A2A7A6A4. Check contacts of mating connectors and repair if required. Install replacement 2A2A7A6A4 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Differential Input CCA 2A2A13XX (J4). Check contacts of mating connectors and repair if required. Install replacement 2A2A13XX and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AUGTEM (cont)**

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**7-37****2. CORRECTIVE ACTION - SEGMENT 8 (cont)**

- (d) Remove A/D Converter 2A2A13. Check contacts of mating connectors and repair if required. Install replacement 2A2A13 and perform AUGTEM test. (It is not mandatory to perform hand held temperature portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (e). If another segment displayed, proceed to that segment and continue troubleshooting.
- (e) Remove Circuit and Heatsink 2A3A1A17XX (W23 SENSOR). Check contacts of mating connectors and repair if required. Install replacement 2A3A1A17XX and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (f). If another segment displayed, proceed to that segment and continue troubleshooting.
- (f) Remove Source C 2A3A1A17. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A17 and perform AUGTEM test. (It is not mandatory to perform hand held temperature portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (g). If another segment displayed, proceed to that segment and continue troubleshooting.
- (g) Check the following cable assemblies and repair as required:

W8  
W11  
1W16  
2A3W3  
2A3W4  
2A3A1W5

If any cable was repaired, perform AUGTEM test. If AUGTEM test passes, no further action required. If AUGTEM test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.



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**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AU6TEM (cont)**


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**7-37****k. SEGMENT 9****1. VDT DISPLAY**

TEMP CONTROLLER SOURCE A IN ERROR TEMPERATURE READS #.## AND SHOULD READ 30.00. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A1	13082765	CONTROL UNIT ASSY.
2.	2A3A1A1A2	13082971	SOURCE 'A'

**2. CORRECTIVE ACTION - SEGMENT 9**

- (a) Remove Control Unit Assembly 1A1. Check contacts of mating connectors and repair if required. Install replacement 1A1 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Source A 2A3A1A1A2. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1A2 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.

- (c) Check the following cable assemblies and repair as required:

W1  
1W4  
2A3A1W6

If any cable was repaired, perform AUGTEM test. If AUGTEM test passes, no further action required. If AUGTEM test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AUGTEM (cont)**


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**7-37****1. SEGMENT 10****1. VDT DISPLAY**

TEMP CONTROLLER SOURCE C IN ERROR TEMPERATURE READS #.## AND SHOULD READ 35.00. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A1	13082765	CONTROL UNIT ASSY.
2.	2A3A1A17	13082974-29	SOURCE 'C'
3.	2A3A1A17	13082165-19	SEC. HEAT SOURCE ASSY.

**2. CORRECTIVE ACTION - SEGMENT 10**

- (a) Remove Control Unit Assembly 1A1. Check contacts of mating connectors and repair if required. Install replacement 1A1 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Source C 2A3A1A17. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A17 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.
- (c) Remove Secondary Heat Source 2A3A1A17. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A17 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (d). If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AUGTEM (cont)**


---

**7-37****2. CORRECTIVE ACTION - SEGMENT 10 (cont)**

(d) Check the following cable assemblies and repair as required:

W11  
 1W16  
 2A3W3  
 2A3A1W5

If any cable was repaired, perform AUGTEM test. If AUGTEM test passes, no further action required. If AUGTEM test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

**m. SEGMENT 11****1. VDT DISPLAY**

TEMP CONTROLLER SOURCE B IN ERROR TEMPERATURE READS #.## AND SHOULD READ 35.00. PERFORM THE FOLLOWING REPLACE ACTIONS IN THE ORDER LISTED. (REFERENCE TM 11-6625-3081-23 FOR REPLACEMENT PROCEDURES.)

<u>REF.</u>	<u>DES.</u>	<u>PART NO.</u>	<u>NAME</u>
1.	1A1	13082765	CONTROL UNIT ASSY.
2.	2A3A1A1A2	13082972	SOURCE 'B'

**20 CORRECTIVE ACTION - SEGMENT 11**

- (a) Remove Control Unit Assembly 1A1. Check contacts of mating connectors and repair if required. Install replacement 1A1 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (b). If another segment displayed, proceed to that segment and continue troubleshooting.
- (b) Remove Source B 2A3A1A1A2. Check contacts of mating connectors and repair if required. Install replacement 2A3A1A1A2 and perform AUGTEM test. (It is not mandatory to perform hand held temperature probe portion of test.) If AUGTEM test passes, no further action required. If this segment displayed again, proceed to (c). If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-37. TEMPERATURE SENSORS**  
**INPUT CODE: AUGTEM (cont)**

---

**7-37**

**2. CORRECTIVE ACTION - SEGMENT 11 (cont)**

(c) Check the following cable assemblies and repair as required:

W10  
1W15  
2A3W2  
2A3A1W6

If any cable was repaired, perform AUGTEM test. If AUGTEM test passes, no further action required. If AUGTEM test fails, repair is beyond this level of maintenance. Next higher level of maintenance required.

If no cables were repaired, repair is beyond this level of maintenance. Next higher level of maintenance required.

If another segment displayed, proceed to that segment and continue troubleshooting.

---

**7-38. PORTABLE VIDEO MONITOR**  
**INPUT CODE: VIDEOST**

---

**7-38****a. DESCRIPTION**

This module tests the portable video monitor. The portable monitor is first checked for uniform brightness. The operator is prompted to observe the portable monitor for uniform brightness over the entire screen, and to press yes if the brightness is acceptable and no if it is unacceptable. If unacceptable, the operator is prompted to replace portable monitor.

The operator is prompted to place the FULL UNDER switch to the UNDER position and adjust the HEIGHT control until the vertical and horizontal borders are about the same on all four sides. The operator is prompted to press yes if acceptable and no otherwise. If no, the operator is prompted to replace the portable monitor.

The operator is next prompted to place the FULL UNDER switch to the FULL position and verify that the display is now completely illuminated and the border has been completely removed. The operator presses yes if the display is completely illuminated, no otherwise. If no, the operator is prompted to replace the portable monitor.

The operator is next prompted to observe that a fine vertical bar pattern is visible on the monitor and to press yes if the image is acceptable and no if the image is unacceptable. If no, the operator is prompted to replace the portable monitor.

**b. REPLACEMENT PROCEDURE REFERENCE**

Replacement procedures for portable monitor are not provided in this manual.

**c. ERROR MESSAGES**

The following is a list of error messages associated with portable video monitor test.

1. VIDEO-MONITOR GREYSCALE TEST FAILED.
2. VIDEO-MONITOR FLAT-FIELD PATTERN TEST FAILED.
3. MONITOR UNDER SIZE PATTERN TEST FAILED.
4. MONITOR FULL SIZE PATTERN TEST FAILED.
5. 10 MHz BAR PATTERN TEST FAILED.

**d. CORRECTIVE ACTION - VIDEOST**

Remove portable video monitor. Check cables and connectors and repair as required. Install replacement portable video monitor and perform VIDEOST test. If VIDEOST test passes, no further action required. If VIDEOST continues to fail, next higher level of maintenance required.



**CHAPTER 8****ALIGNMENT**

	Para	Page
General . . . . .	8-1	8-1
Indirect View Display Electronics Assembly 2A1A3 . . . . .	8-2	8-2
Analog to Digital Converter Assembly 2A2A13 . . . . .	8-3	8-3
BUS Multiplexer CCA 2A2A7A6A7 . . . . .	8-4	8-18
Programmable Digitizer 2A2A1 . . . . .	8-5	8-22

**8-1. GENERAL**

8-1

This chapter contains procedures to be performed when alignment of certain equipment is required. Perform appropriate procedures when directed by PMCS procedures in chapter 2 or when equipment is suspected to be in need of alignment. If equipment cannot be aligned properly, refer to next higher echelon of maintenance for repair.

8-2. INDIRECT VIEW DISPLAY ELECTRONICS ASSEMBLY 2A1A3

8-2

INITIAL SETUP

References

Materials/Parts (appendix C)

TM 9-6625-476-30

Acetone (Item 1)  
Lens paper (Item 36)  
Sealing compound (Item 14.1)

Equipment Status

Rear panel removed (para 2-41)  
IVD removed (para 5-25)

Personnel Required

396 ATE Repairer  
One Assistant

NOTE

Perform the following procedures  
at 8 month intervals.

ALIGNMENT

1. Run self-test program EOBS (para 2-12).
- 1.1 When MAIN MENU is displayed, select:  
2) E/O BENCH ALIGNMENT MODE.
- 1.2 When ALIGNMENT MENU is displayed,  
select: 3) IVD ASSEMBLY.
- 1.3 Follow prompts on VDT.

EQUIPMENT DISPOSITION

2. If ALL TESTS GO prompt is received  
at end of test, install IVD in day-  
side test bench (para 5-25).
3. If IVD is defective, tag and return  
for repair. Install replacement IVD  
in dayside test bench (para 5-25).
4. Install rear panel (para 2-41).



**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13****8-3****INITIAL SETUP**Personnel Required

39B ATE Repairer  
One Assistant

Test Equipment Required

Oscilloscope (TEK 475 or  
equivalent)  
Digital Voltmeter

Equipment Required

EO Calibration Kit 13231056:  
Self-Test Connector 13231049  
RF Cable Assembly 13231052  
Electronic Test Extender card  
13231055  
Extender Card AC70  
Coaxial Shorting Plug  
Coaxial Cable 13081706-69  
BNC to Banana Plug Adapter (2)  
Digital Voltmeter HP3456A or  
Equivalent

Equipment Status

A/D converter removed (para 2-60)

**NOTE**

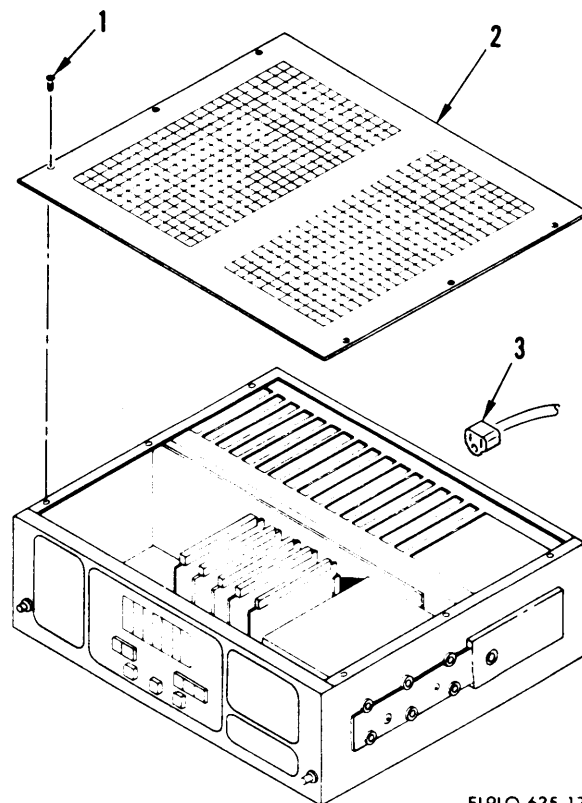
Perform the following procedures  
at 12 months intervals.

**PREPARATION FOR ALINEMENT**

1. Place A/D converter on workbench.
2. Disengage six fasteners (1) and remove top cover (2). Connect ac power cable (3) to ac input connector on rear of chassis. Connect ac power cable to a convenient 115 vac power source. Ensure that straps to PWR RTN, SIG RTN, and CHS RTN are in place on rear of A/D converter.
3. Press front panel POWER switch. Allow minimum of 10 minutes warmup time before proceeding.

**POWER SUPPLY OUTPUT ADJUSTMENT****CAUTION**

The A/D converter contains parts and assemblies sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCAS.



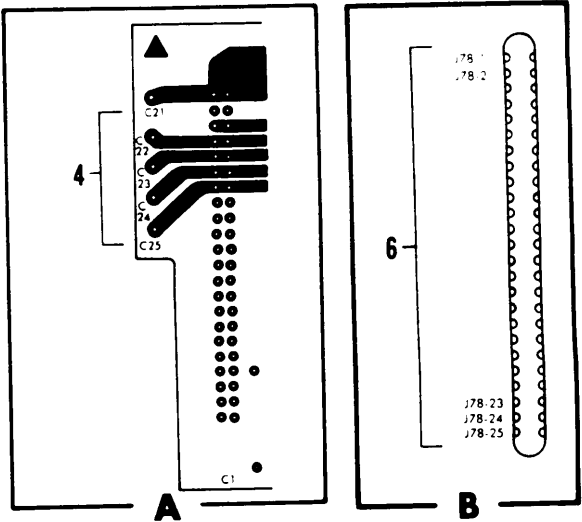
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8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)

8-3

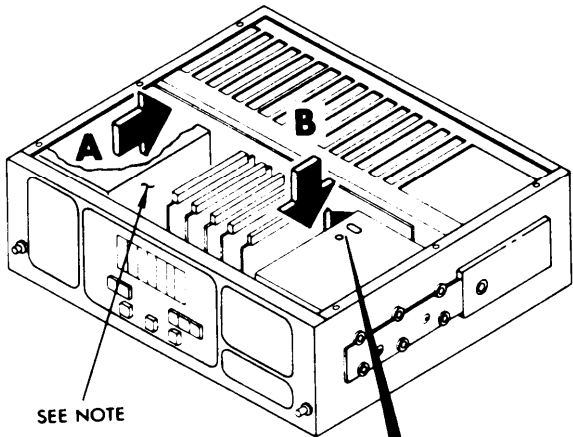
4. If A/D converter has only one power supply, measure power supply voltage outputs at test points (4) according to the following table, and adjust potentiometers (5) as necessary:

Test Point	Output Voltage	Lower Tol. (vdc)	Upper Tol. (vdc)	Potentiometer
C21	15v RTN	--	--	--
C22	-15 vdc	-14.55	-15.45	R14
C23	+15 vdc	+14.55	+15.45	R11
C24	+5 vdc	+4.85	+5.15	R26
C25	5v RTN	--	--	--



5. If A/D converter has two power supplies, measure power supply voltage outputs at test points (6) according to the following table, and adjust potentiometers (5) as necessary:

Test Point	Output Voltage	Lower Tol. (vdc)	Upper Tol. (vdc)	Potentiometer
J78-1	5v RTN	--	--	--
J78-2	+5 vdc	+4.85	+5.15	R26
J78-23	-15 vdc	-14.55	-15.45	R14
J78-24	+15 vdc	+14.55	+15.45	R11
J78-25	15v RTN	--	--	--

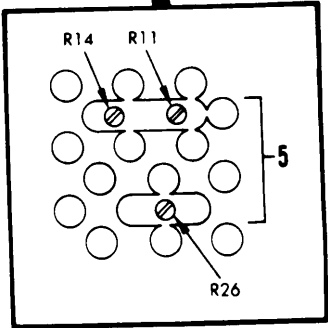


A/D CONVERTER OFFSET ADJUSTMENT

6. Press front panel POWER switch to remove power.

**CAUTION**

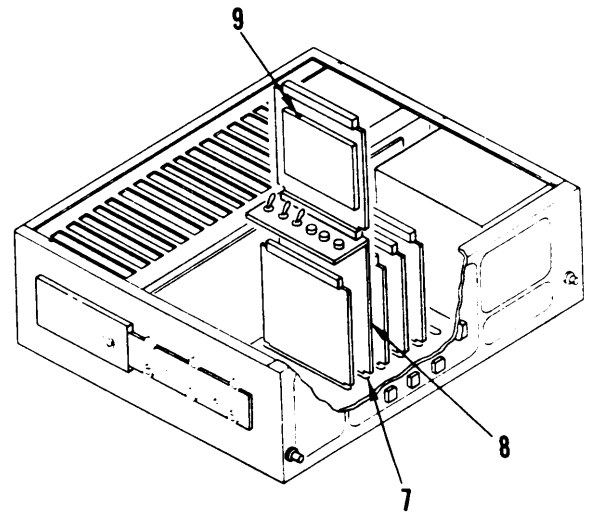
The A/D converter contains parts and assemblies sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCAS.



NOTE: THIS POWER SUPPLY IS NOT PRESENT ON A ONE POWER SUPPLY UNIT.

**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)****8-3**

7. Remove A/D converter CCA (9) from slot J74 (7). Install extender card (8) in slot J74. Install CCA (9) in extender card.
8. Set extender card switches S1, S2, and S3 to position 1.
9. Press front panel POWER switch to apply power. Press LOCAL/REMOTE switch for local control.
10. Set extender card switch S1 to position 3.
11. Press ANALOG switch on front panel. Verify that ANALOG LED is on.
12. If necessary, adjust A/D converter CCA OFFSET control (9) until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
13. Press front panel POWER switch to remove power.



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**CAUTION**

The A/D converter contains parts and assemblies sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCAS.

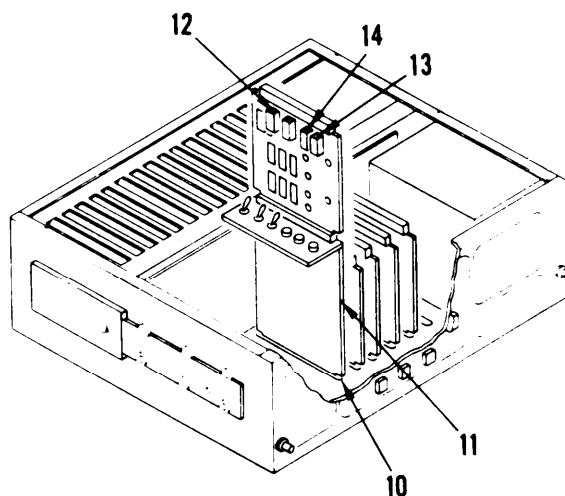
14. Remove CCA from extender card. Remove extender card from slot J74. Install CCA in slot J74.

**SIGNAL PROCESSOR TIMING ADJUSTMENT****CAUTION**

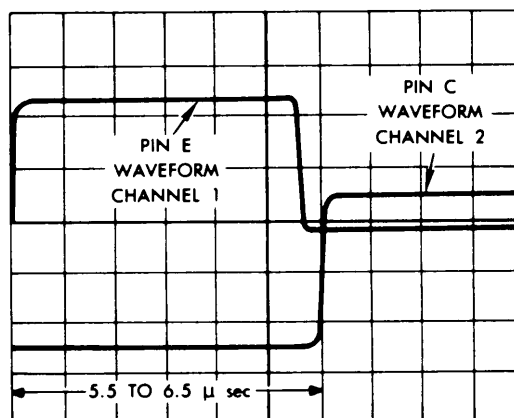
The A/D converter contains parts and assemblies sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCAS.

**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)****8-3**

15. Remove signal processor AC262 CCA from slot J73 (10). Install extender card (11) in slot J73. Install CCA in extender card.
16. Set extender card switches S1, S2, and S3 to position 1.
17. Press front panel POWER switch to apply power. Press LOCAL/REMOTE switch for local control.
18. Set extender card switch S2 to position 2.
19. Press front panel ANALOG switch. Verify that ANALOG LED is on.
20. Set front panel digi switches to 000000.
21. Connect channel 1 vertical input of oscilloscope to pin E on extender card.
22. Connect channel 2 vertical input of oscilloscope to pin C on extender card.
23. Set up oscilloscope as follows:  
 Channel 1 vertical input: 2v/division  
 Channel 2 vertical input: 2v/division  
 Horizontal timebase: 50 microseconds  
 Triggering: + slope  
 Trigger source: channel 1
24. Adjust channel 1 trigger to place leading edge of displayed pulse on leftmost vertical graticule.
25. Display channel 2. Change horizontal timebase to 1 microsecond.
26. If necessary, adjust R15 (12) on CCA until time between rising edge of signal on channel 1 and rising edge of signal on channel 2 is between 5.5 and 6.5 microseconds.
27. Disconnect oscilloscope probes from CCA.



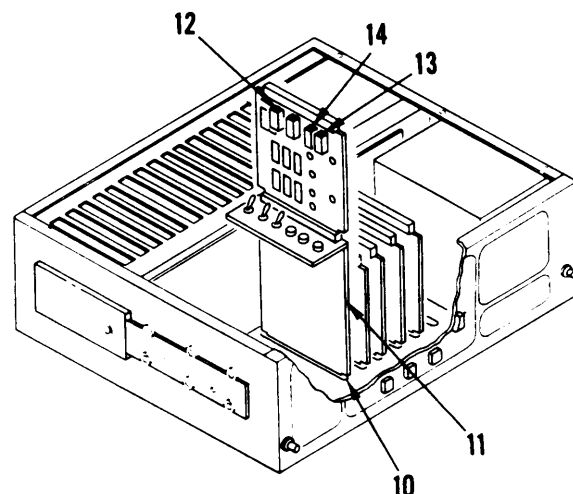
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EL9LQ-635-28

**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)****8-3****SIGNAL PROCESSOR OFFSET ADJUSTMENT**

28. Set front panel digiswitches to 100000. Press ANALOG switch.
29. If necessary, adjust R14 (13) and R16 (14) on CCA until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)



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**A/D GAIN ADJUSTMENT**

30. On USM-410 DC Station A2 DC standard (programmable constant current constant voltage calibrator) A9, connect the SENSE and OUTPUT positive (+) terminals together and the SENSE and OUTPUT negative (-) terminals together. Set POWER switch to OPR. Press CROWBAR OFF switch. Set MODE switches to 10 VOLTS. Set decade dials for output of 7.500000 volts. Temporarily connect a digital voltmeter to A2A9 output terminals and verify output voltage is correct.

**CAUTION**

When connecting cable between DC standard A2A9 and extender card, ensure that L0 (black) output terminal on DC standard is connected to GND side of both BNC to banana plug adapters. Also ensure that GND side of BNC to banana plug adapter is connected to - jack on extender card.

31. Using a BNC to banana plug adapter, connect a 13081706-69 coaxial cable to DC standard A2A9 output. Using a second BNC to banana plug adapter, connect opposite end of cable to extender card + and - jacks.
32. Set extender card switch S3 to position 2. Press front panel ANALOG switch.

**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)****8-3**

33. Locate CCA 8016-2D in slot J74 (15). Using a nonshorting adjusting tool, adjust range adjust potentiometer (16) until front panel DATA DISPLAY indicates between 57774 and 60004 (nominal: 60000).
34. Disconnect cable 13081706-69 from extender card. Leave other end of cable connected to DC standard A2A9.
35. Press front panel POWER switch to remove power.

**CAUTION**

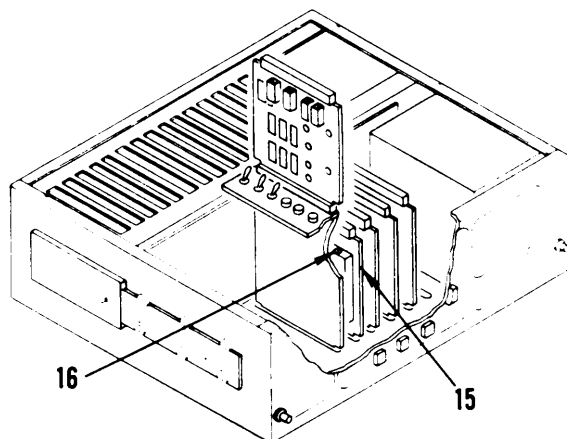
The A/D converter contains parts and assemblies sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCAS.

36. Remove extender card from slot J73. Remove CCA from extender card. Install CCA in slot J73.

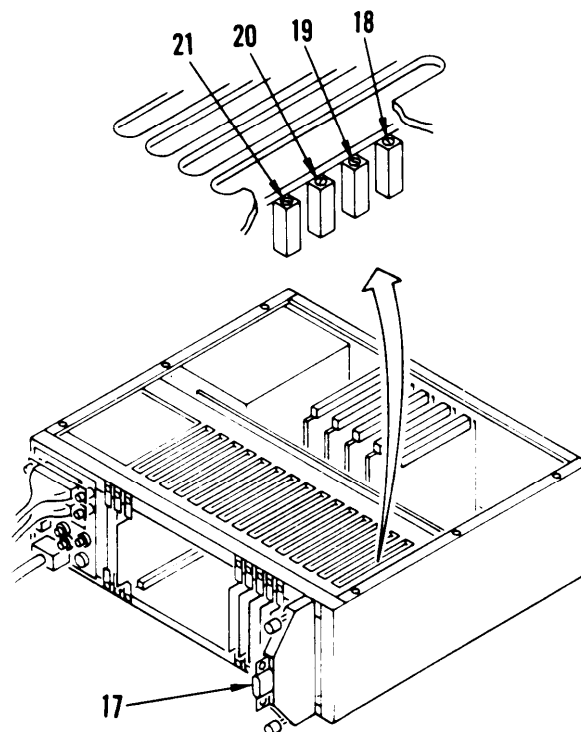
**SSH AC280 OFFSET ADJUSTMENT****CAUTION**

The A/D converter contains parts and assemblies sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCAS.

37. Install self-test connector (17) on CCA in slot J1. Orient self-test connector so that TOP marking is up.
38. Press front panel POWER switch to apply power. Press LOCAL/REMOTE switch for local control.
39. Set front panel digi switches to 004000. Press DIGITAL switch. Press OUT switch. Press IN switch.



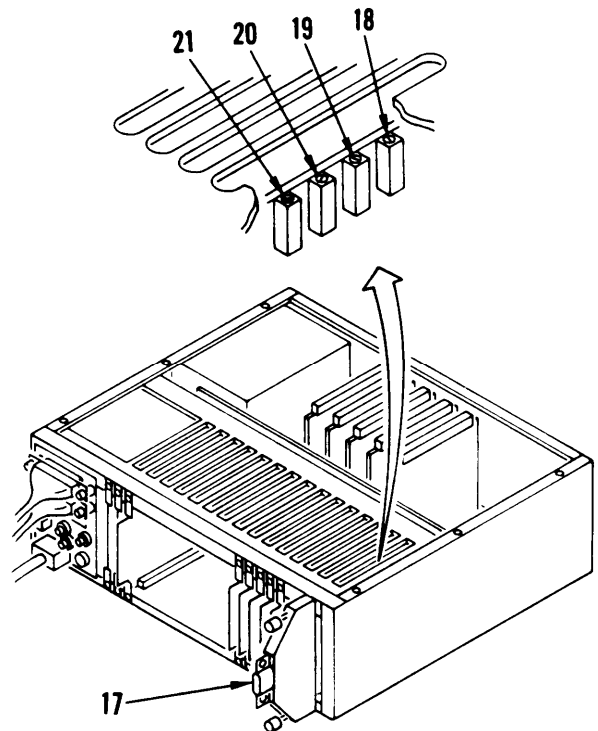
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EL9LQ-635-22

**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)****8-3**

40. Set front panel digi switches to 100000. Press ANALOG switch.
41. If necessary, adjust channel 0 potentiometer (18) on CCA in slot J1 until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
42. Set front panel digi switches to 100010. Press front panel ANALOG switch.
43. If necessary, adjust channel 1 potentiometer (19) on CCA in slot J1 until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
44. Set front panel digi switches to 100020. Press front panel ANALOG switch.
45. If necessary, adjust channel 2 potentiometer (20) on CCA in slot J1 until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
46. Set front panel digi switches to 100030. Press front panel ANALOG switch.
47. If necessary, adjust channel 3 potentiometer (21) on CCA in slot J1 until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
48. Press front panel POWER switch to remove power.
49. Remove self-test connector from CCA in slot J1.



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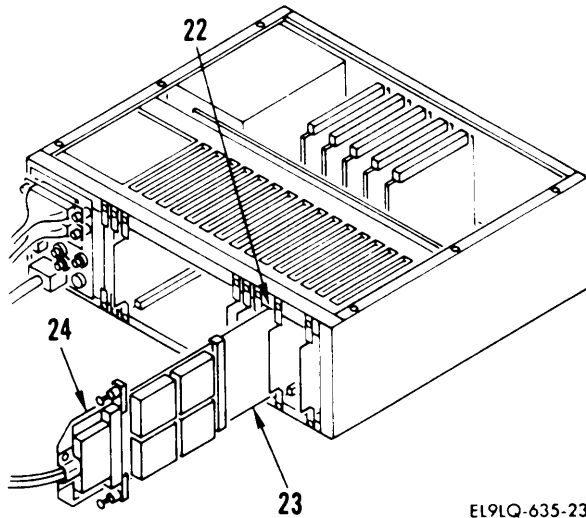
## 8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)

8-3

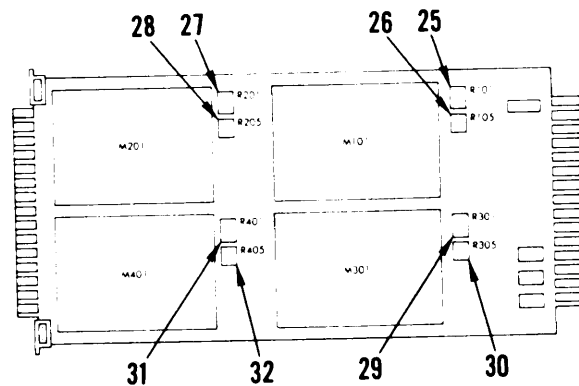
ISOPLEXER OFFSET AND GAIN ADJUSTMENTS  
(SLOT J5)**CAUTION**

The A/D converter contains parts and assemblies sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCAs.

50. Remove isoplexer CCA from slot J5 (22). Install extender (23) in slot J5. Install CCA in CCA extender.
51. Install radio frequency (rf) cable assembly (24) on CCA in slot J5.
52. Press front panel POWER switch to apply power. Press LOCAL/REMOTE switch for local control.
53. Set front panel digi switches to 100200. Install shorting plug on P1 of rf cable assembly.
54. Press front panel ANALOG switch.
55. If necessary, adjust R101 (25) until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
56. Remove shorting plug from P1 of rf cable assembly. Set A2A9 calibrator to +7.5 VDC. Connect P1 of rf cable assembly to unconnected connector of 13081706-69 cable.
57. If necessary, adjust R105 (26) until front panel DATA DISPLAY indicates as close to 60000 as possible. (Upper limit is 60004 and lower limit is 57774.)
58. Disconnect P1 of rf cable assembly from 13081706-69 cable.
59. Set front panel digi switches to 100210. Install shorting plug on P2 of rf cable assembly.
60. Press front panel ANALOG switch.



EL9LQ-635-23



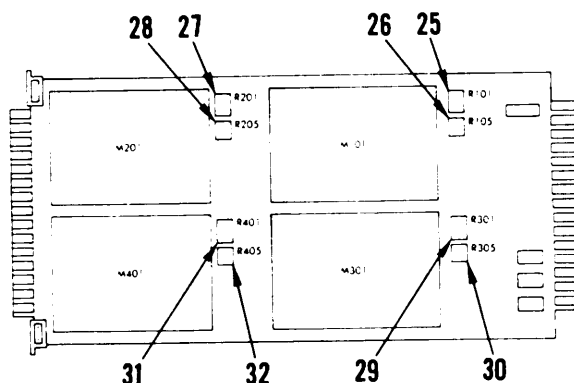
NOTE: POTENTIOMETER LOCATIONS MAY NOT BE AS SHOWN. VERIFY LOCATIONS BY OBSERVING STENCILING ON CCA.

EL9LQ-635-25



**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)****8-3**

61. If necessary, adjust R201 (27) until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
62. Remove shorting plug from P2 of rf cable assembly. Connect P2 of rf cable assembly to unconnected connector of 13081706-69 cable.
63. If necessary, adjust R205 (28) until front panel DATA DISPLAY indicates as close to 60000 as possible. (Upper limit is 60004 and lower limit is 57774.)
64. Disconnect P2 of rf cable assembly from 13081706-69 cable.
65. Set front panel digiswitches to 100220. Install shorting plug on P3 of rf cable assembly.
66. Press front panel ANALOG switch.
67. If necessary, adjust R301 (29) until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
68. Remove shorting plug from P3 of rf cable assembly. Connect P3 of rf cable assembly to unconnected connector of 13081706-69 cable.
69. If necessary, adjust R305 (30) until front panel DATA DISPLAY indicates as close to 60000 as possible. (Upper limit is 60004 and lower limit is 57774.)
70. Disconnect P3 of rf cable assembly from 13081706-69 cable.
71. Set front panel digiswitches to 100230. Install shorting plug on P4 of rf cable assembly.
72. Press front panel ANALOG switch.



NOTE: POTENTIOMETER LOCATIONS MAY NOT BE AS SHOWN. VERIFY LOCATIONS BY OBSERVING STENCILING ON CCA.

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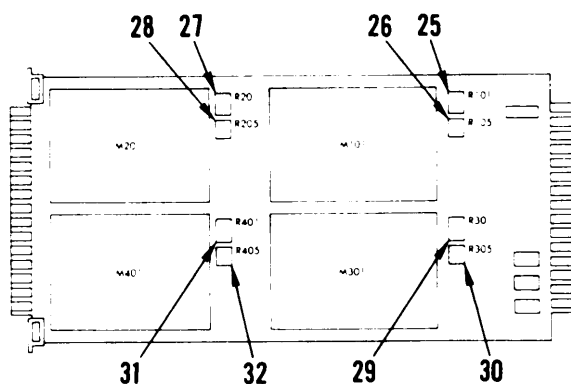
**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)****8-3**

73. If necessary, adjust R401 (31) until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
74. Remove shorting plug from P4 of rf cable assembly. Connect P4 of rf cable assembly to unconnected connector of 13081706-69 cable.
75. If necessary, adjust R405 (32) until front panel DATA DISPLAY indicates as close to 60000 as possible. (Upper limit is 60004 and lower limit is 57774.)
76. Disconnect P4 of rf cable assembly from 13081706-69 cable.
77. Press front panel POWER switch to remove power.

**CAUTION**

The A/D converter contains parts and assemblies sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCAs.

78. Remove rf cable assembly from CCA. Remove CCA extender from slot J5. Remove CCA from CCA extender. Install CCA in slot J5.



NOTE: POTENTIOMETER LOCATIONS MAY NOT BE AS SHOWN. VERIFY LOCATIONS BY OBSERVING STENCILING ON CCA.

EL9LQ-635-25

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8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)

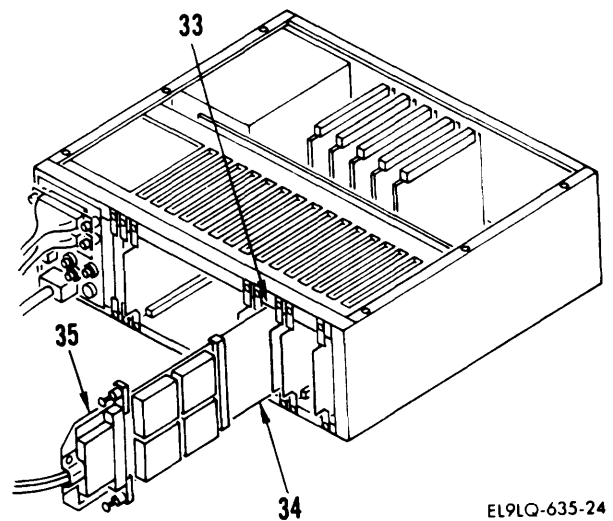
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8-3

**ISOPLEXER OFFSET AND GAIN ADJUSTMENT  
(SLOT J6)****CAUTION**

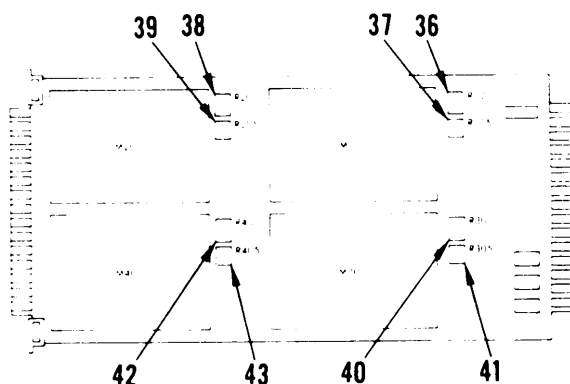
The A/D converter contains parts and assemblies sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCAs.

79. Remove isoplexer CCA from slot J6 (33). Install CCA extender AC70 (34) in slot J6. Install CCA in CCA extender.
80. Install rf cable assembly (35) on CCA in slot J6.
81. Press front panel POWER switch to apply power. Press LOCAL/REMOTE switch for local control.
82. Set front panel digi switches to 100240.
83. Install shorting plug on P1 of rf cable assembly.
84. Press front panel ANALOG switch.



**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)****8-3**

85. If necessary, adjust R101 (36) until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
86. Remove shorting plug from P1 of rf cable assembly. Connect P1 of rf cable assembly to unconnected connector of 13081706-69 cable.
87. If necessary, adjust R105 (37) until front panel DATA DISPLAY indicates as close to 60000 as possible. (Upper limit is 60004 and lower limit is 57774.)
88. Remove P1 of rf cable assembly from 13081706-69 cable.
89. Set front panel digi switches to 100250.
90. Install shorting plug on P2 of rf cable assembly.
91. Press front panel ANALOG switch.
92. If necessary, adjust R201 (38) until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
93. Remove shorting plug from P2 of rf cable assembly. Connect P2 of rf cable assembly to unconnected connector of 13081706-69 cable.
94. If necessary, adjust R205 (39) until front panel DATA DISPLAY indicates as close to 60000 as possible. (Upper limit is 60004 and lower limit is 57774.)
95. Remove P2 of rf cable assembly from 13081706-69 cable.
96. Set front panel digi switches to 100260.

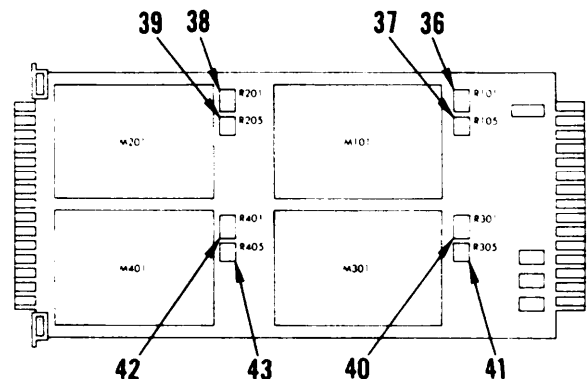


NOTE: POTENTIOMETER LOCATIONS MAY NOT BE AS SHOWN. VERIFY LOCATIONS BY OBSERVING STENCILING ON CCA.

EL9LQ-635-26

**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)****8-3**

97. Install shorting plug on P3 of rf cable assembly.
98. Press front panel ANALOG switch.
99. If necessary, adjust R301 (40) until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
100. Remove shorting plug from P3 of rf cable assembly. Connect P3 of rf cable assembly to unconnected connector of 13081706-69 cable.
101. If necessary, adjust R305 (41) until front panel DATA DISPLAY indicates as close to 60000 as possible. (Upper limit is 60004 and lower limit is 57774.)
102. Remove P3 of rf cable assembly from 13081706-69 cable.
103. Set front panel digi switches to 100270.
104. Install shorting plug on P4 of rf cable assembly.
105. Press front panel ANALOG switch.
106. If necessary, adjust R401 (42) until front panel DATA DISPLAY indicates as close to 0 as possible. (Upper limit is 4 and lower limit is 177774.)
107. Remove shorting plug from P4 of rf cable assembly. Connect P4 of rf cable assembly to unconnected connector of 13081706-69 cable.
108. If necessary, adjust R405 (43) until front panel DATA DISPLAY indicates as close to 60000 as possible. (Upper limit is 60004 and lower limit is 57774.)



NOTE: POTENTIOMETER LOCATIONS MAY NOT BE AS SHOWN. VERIFY LOCATIONS BY OBSERVING STENCILING ON CCA.

E19LQ-635-26

---

**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)**

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**8-3**

109. Remove P4 of rf cable assembly from 13081706-69 cable.
110. Press front panel POWER switch to remove power.

**CAUTION**

The A/D converter contains parts and assemblies sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCAs.

111. Remove rf cable assembly from CCA. Remove CCA extender from slot J6. Remove CCA from CCA extender. Install CCA in slot J6.
112. Remove straps from DC standard A2A9 SENSE and voltage output connectors. Return DC standard A2A9 to previous settings.

**REASSEMBLY**

113. Remove ac power cable from ac input connector on rear of chassis.
114. Replace top cover in the reverse order of removal.
115. Replace A/D converter in test console test bench (para 2-60).

**ALIGNMENT VERIFICATION**

116. To verify alignment, run A/D converter software self-test program ADST on AN/USM-410 automatic test equipment as follows:
  - a. Run self-test program EOBST (para 2-12).
  - b. When MAIN MENU is displayed, select: 1) EO BENCH SELF-TEST MODE.

---

**8-3. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)**

---

**8-3**

- c. When SELF-TEST MENU is displayed, select: 2) SINGLE TEST MODE.
- d. When SINGLE SELF-TEST MENU is displayed, select: 4) ADST.
- e. When SINGLE SELF-TEST MENU is displayed, select: 99) RETURN.
- f. When SELF-TEST MENU is displayed, select: 99) RETURN TO MAIN MENU.
- g. When MAIN MENU is displayed, select: 99) EXIT PROGRAM.

**EQUIPMENT DISPOSITION**

117. If A/D converter fails self-test program ADST, repeat alignment procedure. If A/D converter fails ADST a second time, remove from test console test bench (para 2-60) and return for repair. Install replacement A/D converter in test console test bench (para 2-60).

END OF TASK

**8-4. BUS MULTIPLEXER CCA 2A2A7A6A7****8-4****INITIAL SETUP**Personnel Required

39B ATE Repairer

Tools & Equipment Required

Hewlett-Packard Timer/Counter  
 HP5315A (or equivalent)  
 AVIM Calibration Kit 13231167  
 (Extender Board 13231171)

**NOTE**

Perform the following procedures  
 at 8 month intervals.

**PRELIMINARY SETUP**

1. Remove eight screws (1), lockwashers (2), and flat washers (3).
2. Pull electronics drawer assembly (4) out to full extension.

**CAUTION**

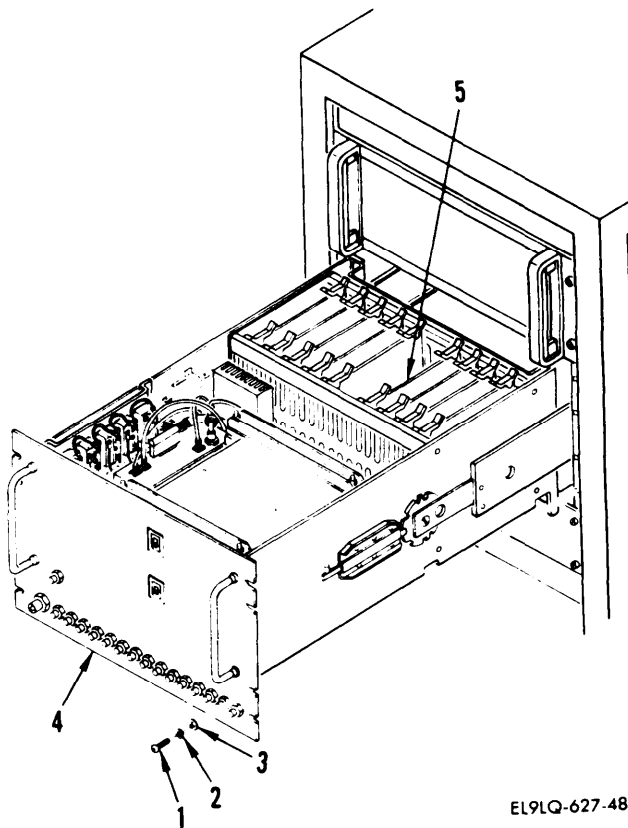
When removing power from the EO bench, de-energize CB3 before deenergizing CB1.

3. De-energize CB3 and CB1 on AC Control Panel 1A5.

**CAUTION**

The bus multiplexer CCA contains parts sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCA.

4. Lift BUS Multiplexer CCA (5) out of electronics drawer (4).

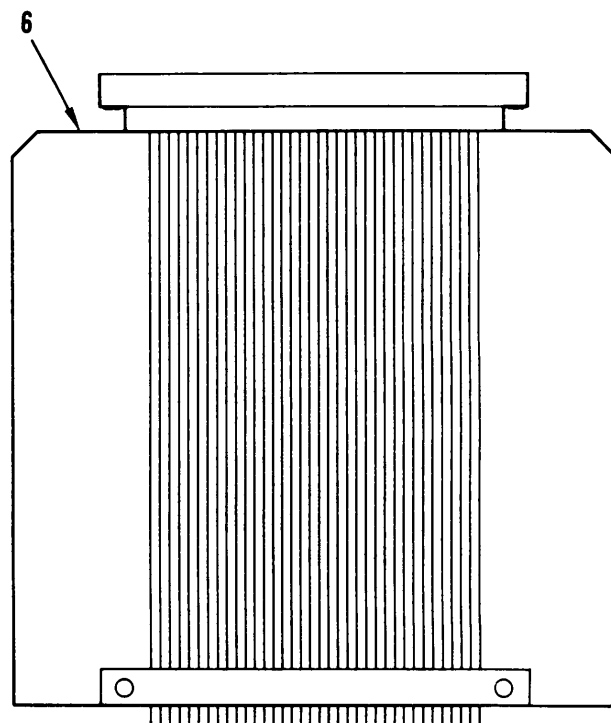


EL9LQ-627-48



**8-4. BUS MULTIPLEXER CCA 2A2A7A6A7 (cont)****8-4**

5. Install extender board (6) in BUS multiplexer position.
6. Connect BUS multiplexer CCA to extender board.
7. Connect Hewlett-Packard Model HP5315A counter (or equivalent) to 115 vac 60 Hz power source not controlled by CBs on AC control panel.
8. Turn power switch to standby.
9. Set HP counter switches as follows:
  - a. Power: ON
  - b. Function: FREQ A
  - c. Blue function sw: out position
  - d. GATE TIME: mid-range



EL9LQ-627-59

**8-4. BUS MULTIPLEXER CCA 2A2A7A6A7 (cont)****8-4****CAUTION**

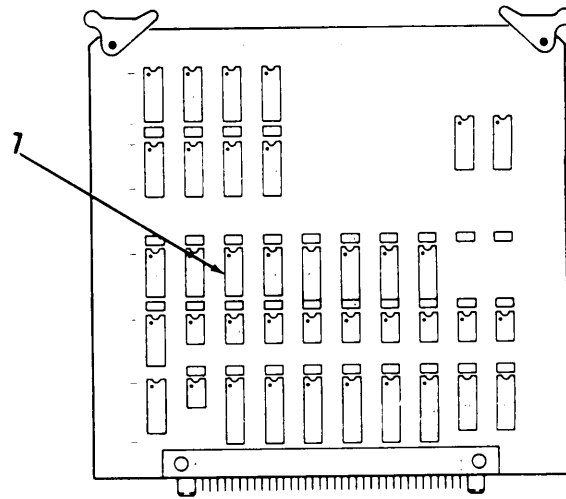
Visually inspect connections to insure no visible shorts exist prior to applying power.

10. Connect frequency counter input clip lead to U25-10 (7) (location 26R on back) on BUS multiplexer CCA.
11. Connect ground clip lead to CCA ground labeled G on back of CCA.
12. Energize CB1 on AC Control Panel 1A5. Wait 10 seconds, then energize CB3. Allow 10 minutes warmup time before proceeding.
13. Observe counter for a displayed frequency between 6.719988 and 6.720012 MHz.

**NOTE**

Allow 30 minutes for reading to stabilize.

14. If counter indicates frequency is within limits, no adjustments are required. If frequency is not within limits, continue with step 15.



EL9LQ-627-50

## 8-4. BUS MULTIPLEXER CCA 2A2A7A6A7 (cont)

8-4

**NOTE**

Make adjustments in small increments to allow readings to stabilize.

15. If counter indicates frequency deviation exceeds limits, but is between 6.71988 and 6.72012 MHz, adjust U42 (8) as required to obtain stable, nominal frequency.

**NOTE**

After adjustments are complete, allow 30 minutes for possible drift.

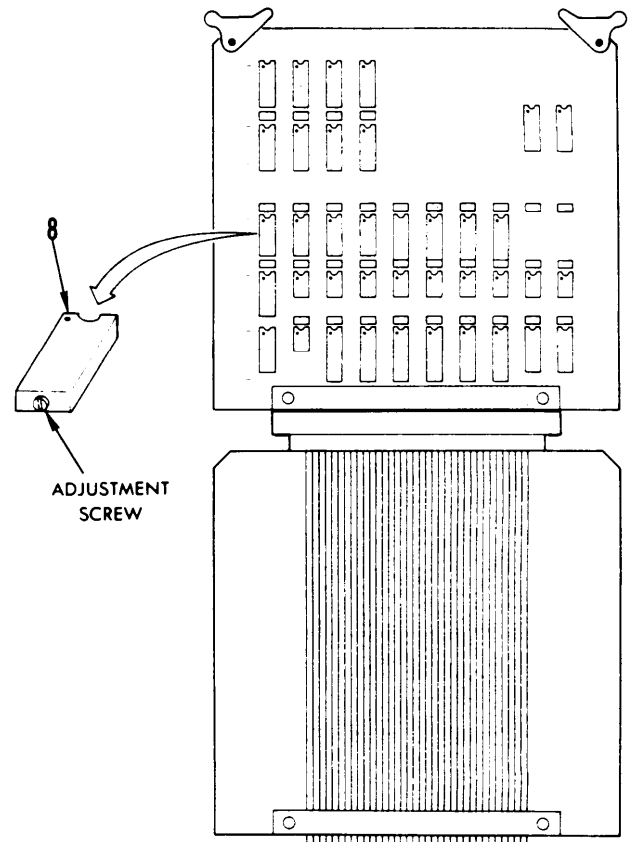
16. Turn off CB3 on AC control panel.
17. Turn off CB1 on AC control panel.

**CAUTION**

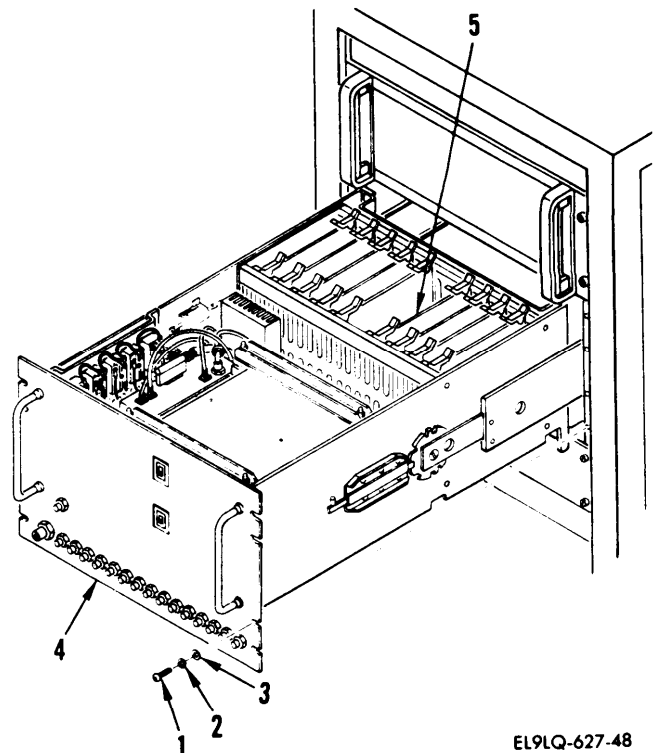
The bus multiplexer CCA contains parts sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures (para 2-21) when touching, removing, or inserting CCA.

18. Remove BUS multiplexer CCA/extender board from electronics drawer backplane.
19. Disconnect CCA from extender board and reinstall CCA in backplane.
20. Slide electronics drawer fully into cabinet.
21. Reinstall, securing screws (1), lockwashers (2), and flat washers (3).
22. If system is to be operated after adjustment, energize CB1. Wait 10 seconds, then energize CB3.

END OF TASK



EL9LQ-627-49



EL9LQ-627-48

---

**8-5. PROGRAMMABLE DIGITIZER 2A2A1**

---

**8-5****INITIAL SETUP**Personnel Required39B ATE Repairer

---

**NOTE**

Perform the following procedures at 12 month intervals.

**ALIGNMENT**

Alignment consists of running alignment module DIGALIGN and self-test modules DIGTST, PPGTST, and VSGST on AN/USM-410 automatic test equipment, as follows:

1. Run self-test program EOBST (para 2-12).
2. When MAIN MENU is displayed, select: 2) EO BENCH ALIGNMENT MODE.
3. When ALIGNMENT MENU is displayed, select: 1) DIGITIZER. If adjustments to preamplifiers are required, remove seals from preamplifiers and follow directions on VDT.
4. When MAIN MENU is displayed, select: 1) EO BENCH SELF-TEST MODE.
5. When SELF-TEST MENU is displayed, select: 2) SINGLE TEST MODE.
6. When SINGLE SELF-TEST MENU is displayed, select: 5) DIGTST.
7. When SINGLE SELF-TEST MENU is displayed, select: 8) PPGTST.
8. When SINGLE SELF-TEST MENU is displayed, select: 9) VSGST.

---

**8-5. PROGRAMMABLE DIGITIZER 2A2A1 (cont)**

---

**8-5**

9. When SINGLE SELF-TEST MENU is displayed, select: 99) RETURN.
10. When SELF-TEST MENU is displayed, select: 99) RETURN TO MAIN MENU.
11. When MAIN MENU is displayed, select: 99) EXIT PROGRAM.

**EQUIPMENT DISPOSITION**

12. If digitizer fails any test, remove from test console test bench (para 2-43) and return for repair. Install replacement digitizer in test console test bench (para 2-43).

END OF TASK



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TM 9-1430-550-34-1

PUBLICATION DATE  
7 Sep 72 .

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AN/MPQ-50 Tested at the HFC

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9-19		9-5	
21-2	step 1C	21-2	

SAMPLE

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AND WHAT SHOULD BE DONE ABOUT IT:

"B" Ready Relay K11 is shown with two #9 contacts. That contact which is wired to pin 8 of relay K16 should be changed to contact #10.

Reads: Multimeter B indicates 600 K ohms to 9000 K ohms.

Change to read: Multimeter B indicates 600 K ohms minimum.

Reason: Circuit being checked could measure infinity. Multimeter can read above 9000 K ohms and still be correct.

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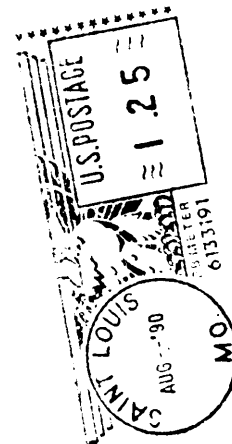
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