TECHNICAL MANUAL

OPERATOR'S AND ORGANIZATIONAL

MAINTENANCE MANUAL

FOR

ANALYTICAL PHOTOGRAMMETRIC POSITIONING SYSTEM (APPS) AN/UYK-48 (NSN 1260-01-061-7081)

HEADQUARTERS, DEPARTMENT OF THE ARMY
17 DECEMBER 1986

WARNING

HIGH VOLTAGE is used in the operation of this equipment. SERIOUS INJURY may result if personnel fail to observe safety precautions. Do not be misled by the term "low voltage". Potentials as low as 50 volts may cause death under adverse conditions. Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technician is aided by operators, he must warn them about dangerous areas. Be careful not to contact 115 Vac input connections when installing or operating this equipment. Remove ac input power from the system when replacing lamps or fuses. Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.

Avoid skin contact with tape head and mirror cleaners. Use only where adequate ventilation is provided. Keep away from open flame. Do not take internally.

For artificial respiration and first aid data, refer to FM 21-11.

Mirror cleaner and tape head cleaner are toxic. Use only in ventilated area. Avoid contact with skin and eyes. Do not take internally. Do not use near fire or flame.

All operator and organizational maintenance procedures involving removal and replacement of components are to be performed with all power switches off. See table 2-4 for equipment turn-off instructions.

TECHNICAL MANUAL

NO. 5-1260-206-12

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 17 December 1986

Operator's and Organizational Maintenance Manual For ANALYTICAL PHOTOGRAMMETRIC POSITIONING SYSTEMS (APPS) AN/UYK-48 NSN 1260-01-061-7081

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

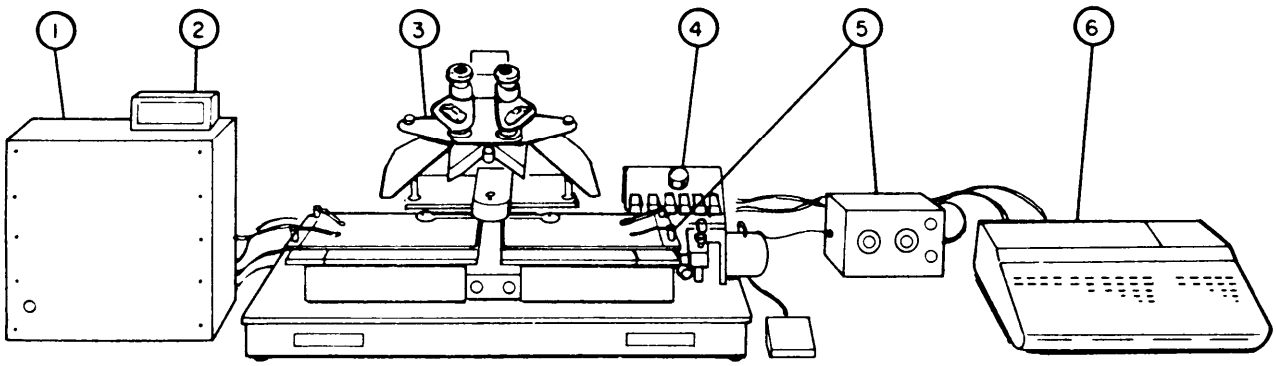
You can help improve this manual, If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms).or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Troop Support Command, AttN: AMSTR-MCTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

TABLE OF CONTENTS

Table of Contents (cont)

LIST OF ILLUSTRATIONS

LIST OF TABLES



1. Digital Controller
2. Digital Display
3. Optical-Mechanical Scanner
4. Data Input Control
5. Transillumination Device
6. Calculator

Figure 1-1. Analytical Photogrammetric Positioning System (APPS) AN/UYK-48

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE - This manual provides operator's and organizational maintenance procedures for the Analytical Photogrammetric Positioning System (APPS) AN/UYK-48.

1-2. MAINTENANCE FORMS AND RECORDS. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750. The Army Maintenance Management System (TAMMS).

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR'S) - If your APPS needs improvement let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Troop Support Command. ATTN: AMSTR-QX, 4300 Goodfellow Boulevard, St. Louis, MO. 63120-1798. We'll send you a reply.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE - Destruction of Army materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-5. WARRANTY INFORMATION - None of the system components are covered by a manufacturer's warranty. In case of an equipment malfunction, instructions in this manual enable the operator to isolate the problem to a major system component. Additional maintenance and troubleshooting information for direct support (DS) and general support (GS) personnel is provided in TM 5-1260-206-34, Direct Support and General Support Maintenance Manual for Analytical Photogrammetric Positioning System AN/UYK-48.

1-6. REFERENCE INFORMATION - This information includes a nomenclature cross-reference list and an explanation of terms (glossary) used in this manual.

a. Nomenclature Cross-Reference List

Common Name	Equipment Nomenclature
APPS	Analytical Photogrammetric Positioning System AN/UYK-48
Calculator	Calculator, Programmable CP-1387/U
DAC	Controller, Digital C-10805/UYK-48
DIC	Control, Data Input C-10134/UYK-31
Digital Display	Display, Digital ID-2239/UYK-48
OMS	Optical-Mechanical Scanner SU-119/UYK-48
TID	Transillumination Device SU-120/UYK-48

b. Glossary

Term	Definition
Analytical	Mathematical approach or simulation of a physical situation.
Data Base	The entire body of information that has to do with a subject.
Feature	A distinctive terrain detail or prominent man-made object.
Parallax	The apparent separation between images. This applies to reference marks or photo images being viewed.
Photogrammetric	Pertaining to measurements of photography, such as the determination of the coordinates of a point by measuring its images on two overlapping photographs.

Term	Definition
Point Positioning Data Base (PPDB)	Consists of a data-base index, area index, geodetically-controlled photographic coverage (in stereo) of a data base area and associated data-base cartridges. The PPDB enables trained operators to determine accurate positional data for any identifiable feature on the photography. The PPDBs are produced by the Defense Mapping Agency.
Photography	Photographs, cronapaques, film positives, grids, or other material mounted on the OMS for viewing.

1-7. HAND RECEIPT - Hand receipts for Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL) items are published in a Hand Receipt manual, TM 5-1260-206-12-HR. This manual is published to aid in property accountability and is available through: The U.S. Army Adjutant General Publication Center, 2800 Eastern Blvd., Baltimore, MD. 21220-2896.

Section II. EQUIPMENT DESCRIPTION

1-8. EQUIPMENT PURPOSE, CAPABILITIES, AND APPLICATION -

a. Purpose of Equipment. The APPS allows the operator to accurately measure photographic features. It then computes the position and elevation or other data of the features selected.

b. Capabilities.

- Measures coordinates of points on PPDB.
- Coordinates can be measured quickly and accurately.
- Computes latitude and longitude or Universal Transverse Mercator (UTM) grid coordinates.
- Records results on paper tape and/or magnetic tape cartridge.
- Is transportable.
- Diagnostic Programs provide self-test capability.

c. Application Concept (figure 1-2). The APPS equipment is the hardware used with a PPDB to compute point-positioning data for geographical features. The APPS operator uses PPDB indexes to locate the pair of stereo photographs containing the desired feature. The operator inserts these photographs and the companion data tape into the APPS equipment. The system then computes the elevation and X- and Y-coordinates of the feature. This information is printed on paper tape and/or magnetic tape cartridge.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Identification information for the APPS system and its components is given on figures 1-3 thru 1-9.

1-10. DIFFERENCES BETWEEN MODELS - All APPS Systems are functionally identical. However, Programmable Calculator CP-1387/U (HP9825 series) may vary because of manufacturer model changes.

1-11. EQUIPMENT DATA - Specifications for the APPS system and its components are given in table 1-1.

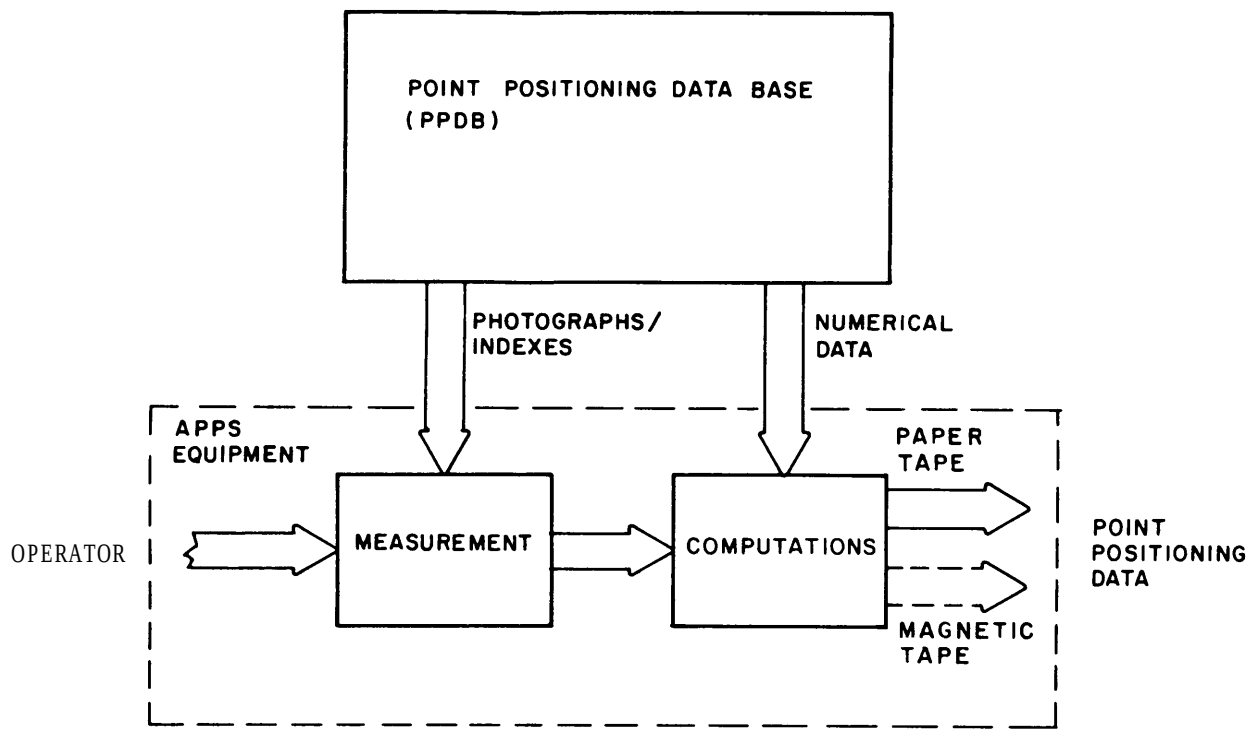
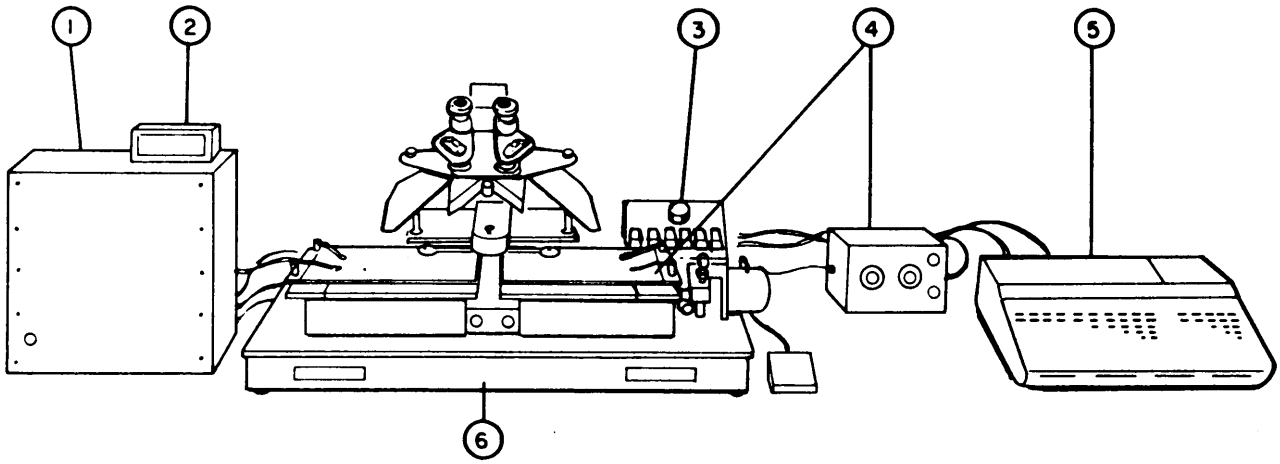
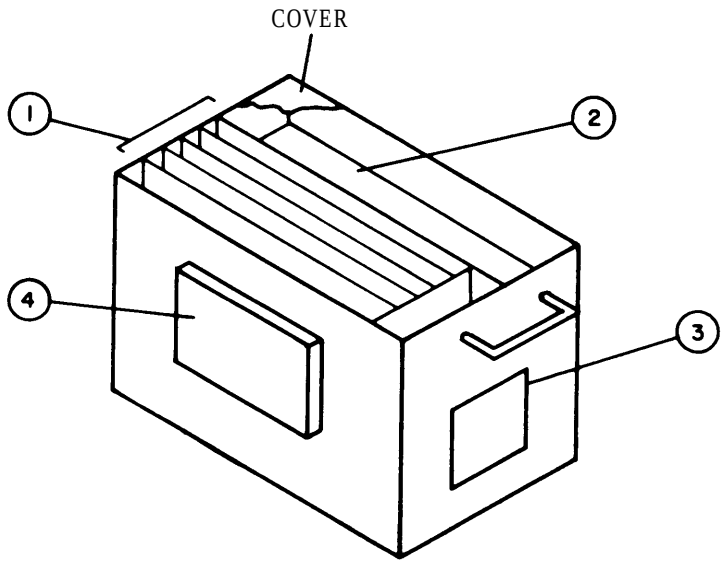


Figure 1-2. APPS Concept



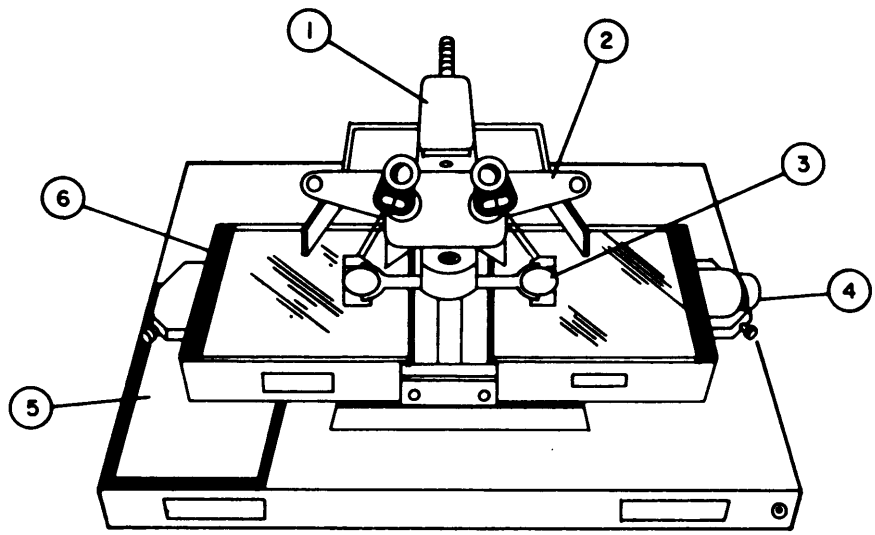
ITEM NO.	COMPONENT	DESCRIPTION
1	DAC	Provides power to all other components in APPS system. Processes measurement data from OMS before it is sent to Calculator.
2	Digital Display	Provides readout of X-axis and Y-axis coordinates of point under measure mark in thousandths of inches.
3	DIC	Provides operator control of APPS system,
4	TID	Back-lights plexiglas photo plates. Holds photo material in place.
5	Calculator	Operator-controlled, programmable computation equipment.
6	OMS	Allows the operator to position PPDB photographs or photo positives to view desired features. Detects and sends X-axis, Y-axis, and ΔX-movement to DAC.

Figure 1-3. APPS System Components Identification



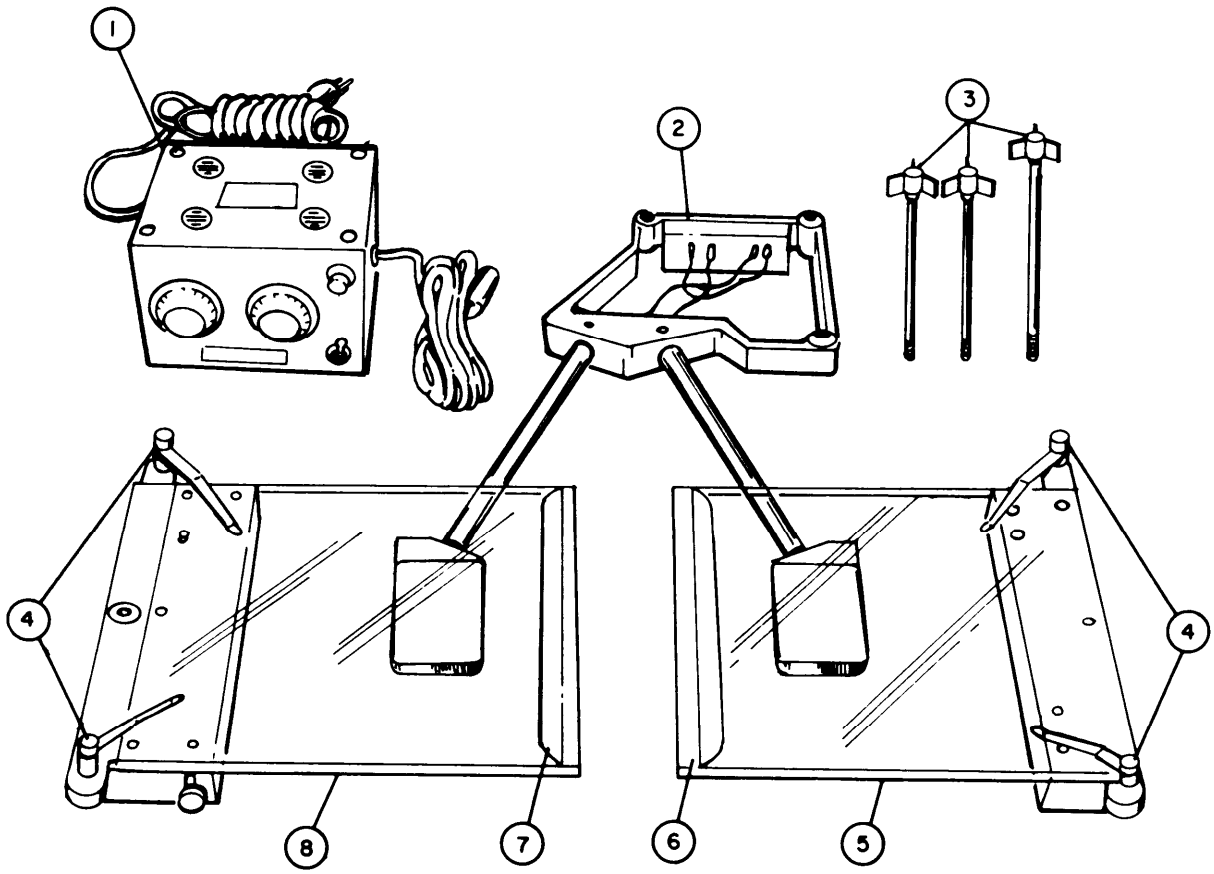
ITEM NO.	COMPONENT	DESCRIPTION
1	Control Unit	Processes measurement data from OMS.
2	Power Supply	Provides dc voltages to control unit.
3	Fan	Provides cooling for power supply and control unit.
4	Power Distribution Assembly	Provides ac power to all other APPS components.

Figure 1-4. DAC Components Identification



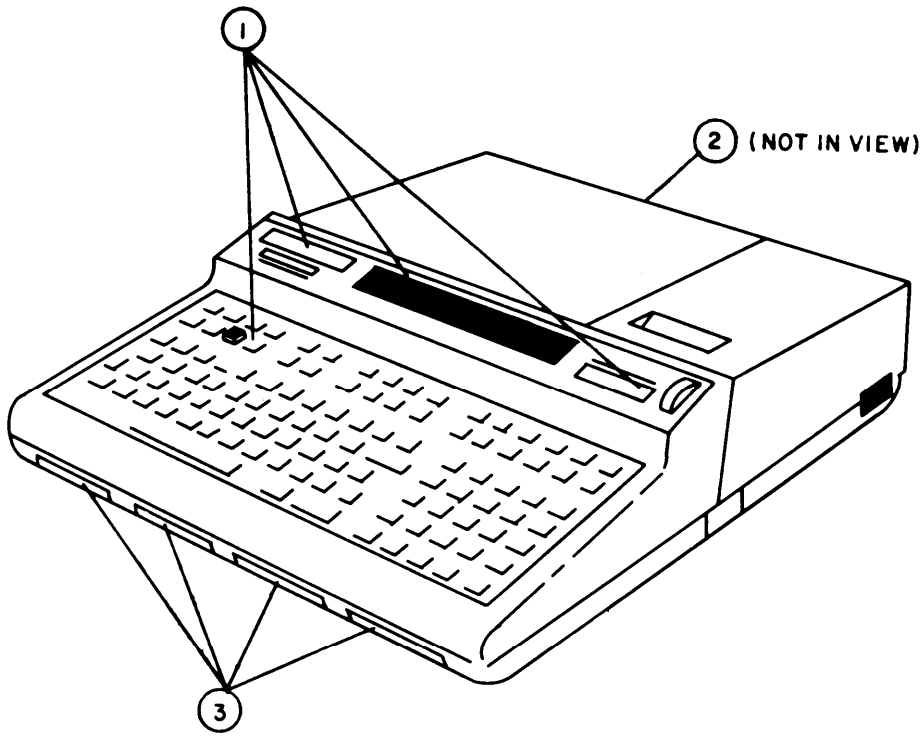
ITEM NO.	COMPONENT	DESCRIPTION
1	Lamp Assembly	Provides illumination.
2	Stereoscope Assembly	Consists of lenses and mirrors used to view photographs or photo positives.
3	Measuring Mark Assembly	Provides reference marks to locate and measure desired features.
4	X-Axis Encoder	Converts right photo holder movement (AX) into electronic pulses used by Calculator to compute elevation of feature.
5	Baseplate Assembly	Mounting plate for OMS. Contains electromagnetic datagrid to sense X-axis and Y-axis movement of photo-carriage.
6	Photo-Carriage Assembly	Moveable assembly allows operator to position features under measuring mark.

Figure 1-5. OMS Components Identification



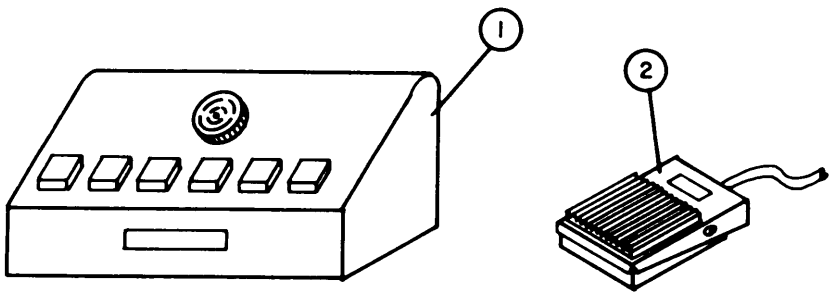
ITEM NO.	COMPONENT	DESCRIPTION
1	Lamp Control Assembly	Controls intensity of back-lights.
2	Illuminator Assembly	Provides back-lighting of photo plates.
3	TID Capstan Bolts (3 each)	Secure illuminator assembly to OMS.
4	Photo Clips (4 each)	Secure photography to photo plates.
5	Right Photo Plate	Moveable assembly to mount photography.
6	Right Photo Holder	Secures photograph to right photo plate.
7	Left Photo Holder	Secures photography to left photo plate.
8	Left Photo Plate	Stationary assembly to mount photography.

Figure 1-6. TID Components Identification



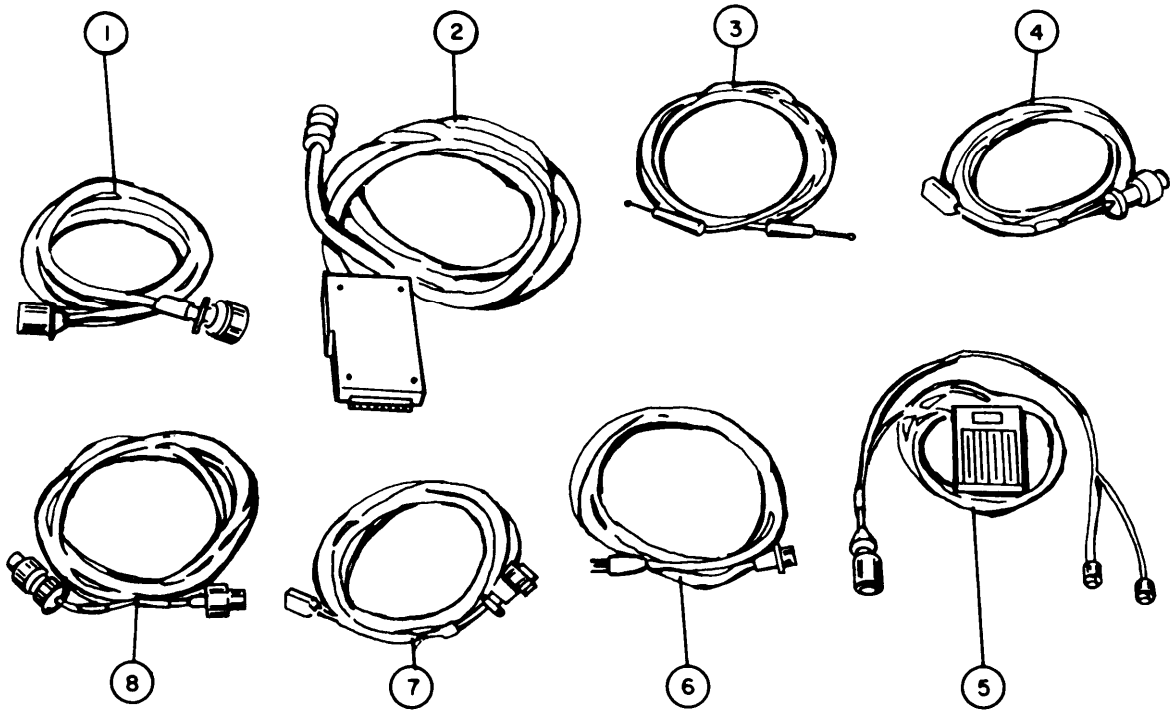
ITEM NO.	COMPONENT	DESCRIPTION
1	Input/Output Devices	Enable operator and Calculator to communicate.
2	Fan	Provides cooling for Calculator.
3	Plug-In-Memory	Read only memory (ROM) cartridges.

Figure 1-7. Calculator Components Identification



ITEM NO.	COMPONENT	DESCRIPTION
1	DIC	Operator control panel that contains switches for system operation.
2	Foot switch	Operator control pedal that provides alternate means of controlling system operation.

Figure 1-8. DIC Components Identification



ITEM NO.	COMPONENT	DESCRIPTION
1	Cable Assembly W101	Connects signals between OMS and DAC.
2	Cable Assembly W102	Connects signals between Calculator and DAC.
3	Cable Assembly W103	Connects output data from DAC to teletype equipment.
4	Cable Assembly W104	Connects power from power distribution assembly to DAC.
5	Cable Assembly W105	Connects baseplate to photo-carriage and footswitch.
6	Cable Assembly W106	Connects power from ac source to power distribution assembly.
7	Cable Assembly W107	Connects power from power distribution assembly to OMS.
8	Cable Assembly W108	Connects power from power distribution assembly to Calculator.

Figure 1-9. System Cables Identification

Table 1-1. APPS System Equipment Data

CHARACTERISTIC	SPECIFICATION
APPS	
Shipping Weight	
Case 1	226.0 lbs. (102.6 kg)
Case 2	113.0 lbs. (51.3 kg)
Case 3	140.0 lbs. (63.6 kg)
Operating Temperature	55 to 85°F (12 to 29°C)
Operating Humidity	10 to 90 percent, noncondensing
Power Requirements	105 - 125 Vac, 9 amperes, 55-65 Hz
Resolution	0.001 inches (25.4 microns)
Accuracy	0.0012 inches (30.0 microns) rms
DAC	
Size	12.5 inches (31.75 cm) high 15.75 inches (40.0 cm) wide 11.0 inches (27.9 cm) deep
Weight	32.5 lbs (14.8 kg)
Power: Input	105 - 125 Vac, 3 amperes, 55-65 Hz
output	105 - 125 Vac, 55-65 Hz, +5 V
Fuse	3 ampere, 1 each
Digital Display	
Size	2.25 inches (5.7 cm) high 5.0 inches (12.7 cm) wide 2.25 inches (5.7 cm) deep
Weight	1.0 lb (0.45 kg)
Power Requirements	+5 V, 0.5 ampere
Display Capability	Four digit; 0.000 to 9.999 for X and Y

Table 1-1. APPS System Equipment Data - Continued

CHARACTERISTIC		SPECIFICATION
TID (lamp control assembly)		
Size		3.9 inches (9.9 cm) high 5.9 inches (15.0 cm) wide 5.0 inches (12.7 cm) deep
Weight		5.0 lbs (2.25 kg)
Power:	Input	105 - 125 Vac, 1.5 ampere, 55-65 Hz
	output	0 to 750 Vac, variable
	Fuse	1.5 ampere, 1 each
DIC		
Size		4.25 inches (10.8 cm) high 7.0 inches (17.8 cm) wide 4.25 inches (10.8 cm) deep
Weight		1.0 lb. (0.45 kg)
Power Requirements		+5 V, 0.2 ampere
CALCULATOR		
Size		4.75 inches (12.1 cm) high 14.75 inches (37.5 cm) wide 19.75 inches (50.2 cm) deep
Weight		26.75 lbs. (12.1 kg)
Power:	Input	105 - 125 Vac, 3 amperes, 48-66 Hz
	Fuse	3 ampere, 1 each
OMS		
Size		16.5 inches (41.9 cm) high 30.0 inches (76.2 cm) wide 25.0 inches (63.5 cm) deep
Weight		101.25 lbs. (46.0 kg)
Power:	Input	105 - 125 Vac, 1.5 amperes, 55-65 Hz
	Fuse	1.6 ampere, 1 each

Section III. PRINCIPLES OF OPERATION

1-12. FUNCTIONAL DESCRIPTION - Figure 1-10 is a functional block diagram of the APPS. The operator mounts the photography on the OMS photo plates and inserts the associated PPDB cartridge into the Calculator. The TID provides back-light for the photography. The operator moves the photo-carriage to locate the desired feature in the stereo optics. This movement provides X- and Y-position data to the DAC, as indicated by the Digital Display read-out. To measure the height of the feature, the operator adjusts the right photo plate to produce a 3-dimensional image. This movement provides ΔX elevation data to the DAC.

When the operator has measured the feature, he transfers this data from the DAC to the Calculator. This is done by pressing the DIC pushbutton or footpedal switches. The sonalert sounds to indicate that the transfer command has been received. The Calculator performs as programmed by the data base. The computed point-position data is then printed out on paper tape or recorded on a tape cartridge.

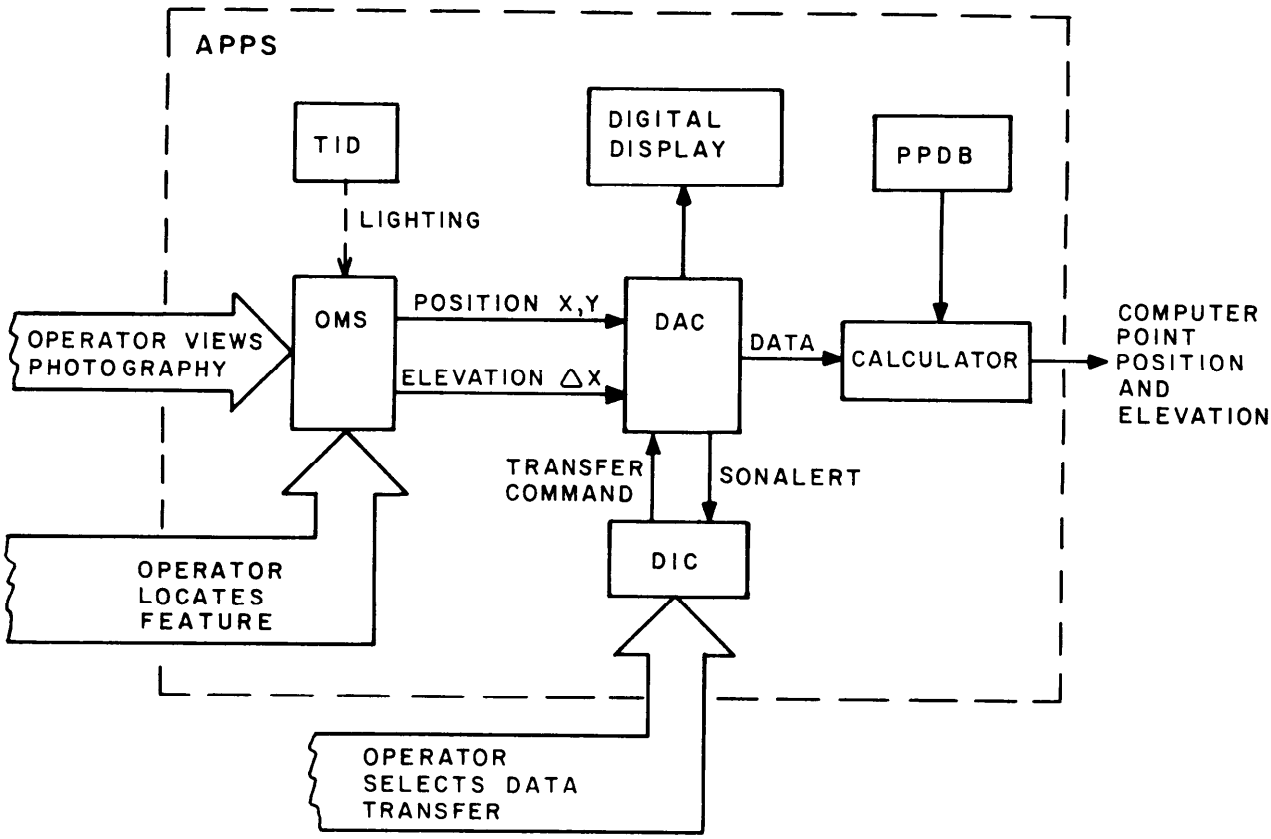


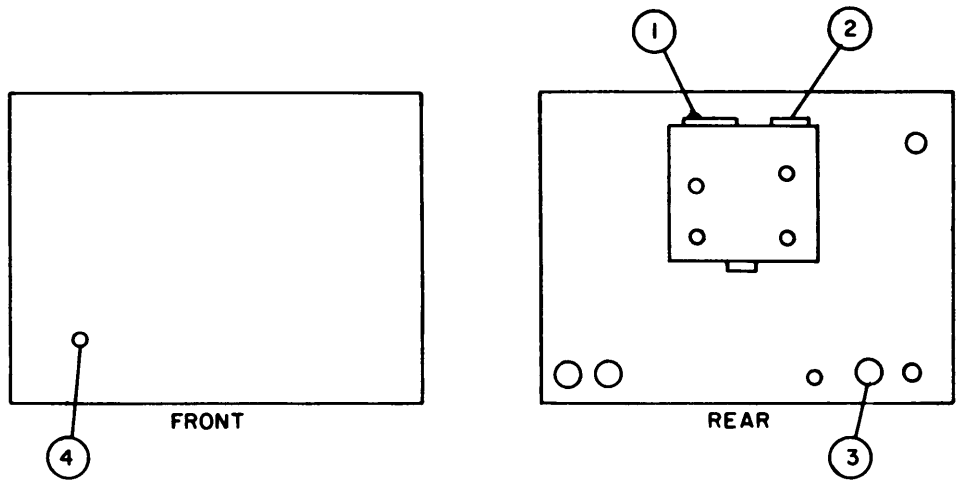
Figure 1-10. APPS Functional Block Diagram

CHAPTER 2

OPERATING INSTRUCTIONS

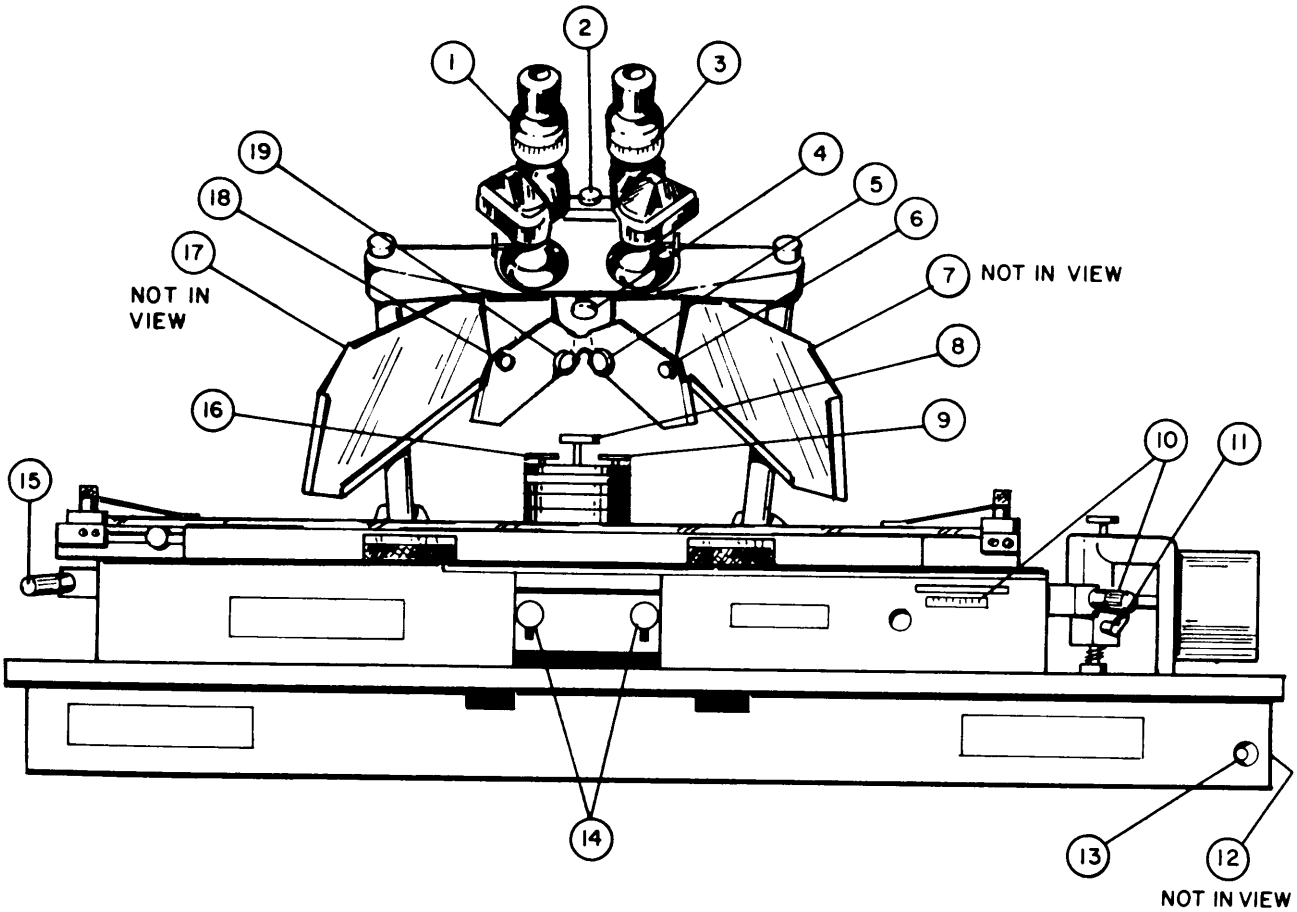
SECTION I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. CONTROLS AND INDICATORS - Controls and indicators for the APPS components are given on figures 2-1 through 2-6.



ITEM No.	CONTROL/INDICATOR	DESCRIPTION
1	A.C. POWER S1 (switch/indicator)	Turns APPS power on and off. Indicator lights when ON.
2	ELAPSED TIME M1 (meter)	Records total number of hours and tenths of hours that power distribution assembly is energized.
3	F1, 3 AMP (fuse)	Provides current overload protection for DAC circuits.
4	Power (indicator)	Lights when DAC is turned on.

Figure 2-1. DAC Controls and Indicators

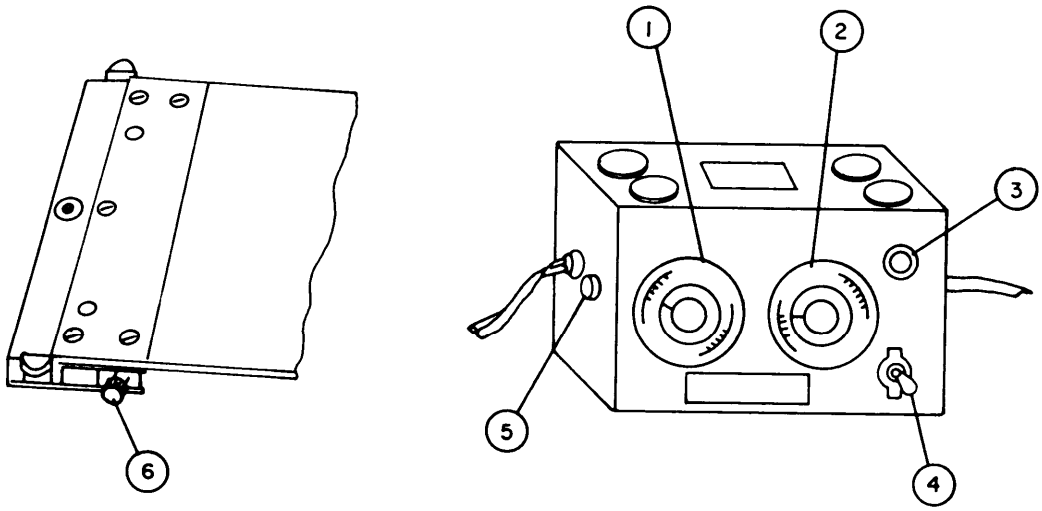


ITEM NO.	CONTROL/INDICATOR	DESCRIPTION
1	Left Monocular Focus (ring control)	Adjusts focus on left monocular.
2	Stereoscope Adjust (knurled screw)	Simultaneously moves both measuring mark dots in the Y-axis direction.
3	Right Monocular Focus (ring control)	Adjusts focus of right monocular.
4	Monocular Eyebase Adjust (knurled screw)	Adjusts distance between monocular eyepieces for operator comfort.
5	Right Small Mirror Adjust (knurled screw)	Moves right measuring mark dot in the Y-axis direction
6	Right Image Rotation Adjust (knurled screw)	Rotates right image to reduce parallax.

Figure 2-2. OMS Controls and Indicators (Sheet 1 of 2)

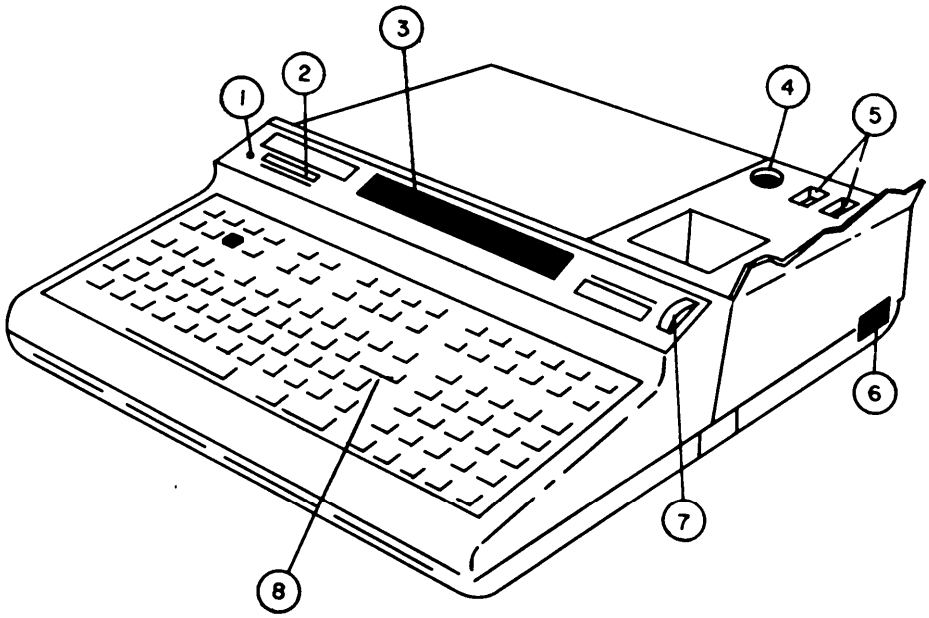
ITEM No.	CONTROL/INDICATOR	DESCRIPTION
7	Right Large Mirror Lock (knurled screw)	When loosened, permits adjustment of right measuring mark dot in X-axis direction.
8	Measuring Mark Bridge Height Adjust (knurled screw)	Adjusts height of measuring mark bridge above photo-carriage.
9	Right Tilt Adjust (knurled screw)	Adjusts tilt of measuring mark bridge.
10	X-Axis Parallax Adjust/Indicator (knurled screw/scale)	Individually moves right photo plate in the X-axis direction. Scale indicates amount of movement.
11	Photo-Carriage Lock (lever)	When down, blocks photo-carriage movement.
12	F1 (fuse)	Provides current overload protection for OMS.
13	S1 Lamp Power Switch (pushbutton switch)	Turns OMS lamp on and off.
14	Cursor Coil Lock (knurled screws)	When loosened, permit vertical adjustment of cursor coil.
15	Y-Axis Parallax Adjust (knurled knob)	Moves right photo plate in Y-axis direction.
16	Left Tilt Adjust (knurled screw)	Adjusts tilt of measuring mark bridge.
17	Left Large Mirror Lock (knurled screw)	When loosened, permits adjustment of left measuring mark dot in X-axis direction.
18	Left Image Rotation Adjust (knurled screw)	Rotates left image to reduce parallax.
19	Left Small Mirror Adjust (knurled screw)	Moves left measuring mark dot in the Y-axis direction.

Figure 2-2. OMS Controls and Indicators (Sheet 2 of 2)



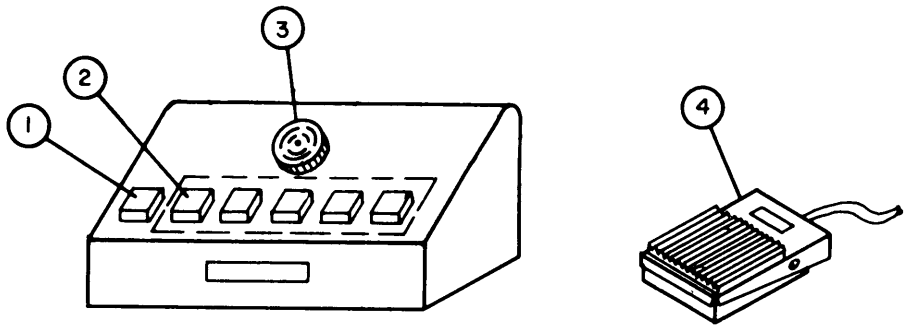
ITEM NO.	CONTROL/INDICATOR	DESCRIPTION
1	Left Lamp Dimmer (switch/potentiometer)	Fully counterclockwise is off. Clockwise rotation increases intensity of left TID illuminator lamp.
2	Right Lamp Dimmer (switch/potentiometer)	Fully counterclockwise is off. Clockwise rotation increases intensity of right TID illuminator lamp.
3	Power (indicator)	Lights when power is applied to TID.
4	ON/OFF Power (switch)	Turns TID unit on and off.
5	F1, 1.5A (fuse)	Provides current overload protection for TID.
6	Skew Adjust (knurled knob)	Rotates left photo plate.

Figure 2-3. TID Controls and Indicators



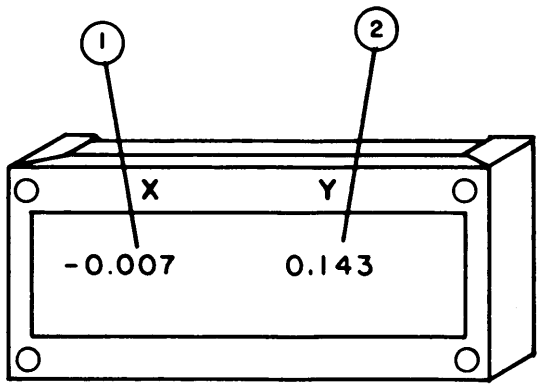
ITEM NO.	CONTROL/INDICATOR	DESCRIPTION
1	Tape Running Light (light-emitting diode)	Lights when cartridge tape is in motion.
2	Eject Bar (spring-loaded mechanical linkage)	Ejects tape cartridge when pressed.
3	Display (light-emitting diodes)	Thirty-two character display presents messages for APPS operator.
4	Fuse	Provides current overload protection for calculator.
5	Line Voltage Selector (slide switches)	Selects 120 Vac input line source.
6	~0/1 Power Switch	Turns calculator on (1) and off (0).
7	Paper Tape Advance (thumbwheel)	Advances paper tape.
8	Keyboard (momentary-contact switches)	Used by the operator to input data and commands to the calculator.

Figure 2-4. Calculator Controls and Indicators



ITEM NO.	CONTROL/INDICATOR	DESCRIPTION
1	ZERO (Momentary-contact pushbutton/ indicator)	When pressed, establishes zero reference point for system. Indicator is always lit.
2	Record Control Panel (Momentary-contact pushbuttons/ indicators)	When pressed, input position data to calculator along with button codes for programmed options as shown. Indicators are always lit.
	INDEX	Button code 2
	MEAS CONT	Button code 1
	REJECT	Button code 2
	TERM	Button code 3
	TTY	Button code 4
3	Sonalert (audio alarm)	Sounds each time DIC pushbuttons or footswitch are pressed. Sounds repeatedly when error condition exists.
4	Footswitch (Momentary-contact switch)	Functions identical to MEAS CONT pushbutton.

Figure 2-5. DIC Controls and Indicators



ITEM NO.	CONTROL/INDICATOR	DESCRIPTION
1	x (light-emitting diode display)	Indicates the X-axis coordinates of the feature under the measuring mark.
2	Y (light-emitting diode display)	Indicates the Y-axis coordinates of the feature under the measuring mark.

Figure 2-6. Digital Display Indicators

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2. GENERAL - Preventive maintenance checks and services must be performed by the operator in order to keep the system at an optimum performance level.

a. Before You Operate. Always keep in mind the CAUTIONS and WARNINGS. Perform the before (B) PMCS.

b. While You Operate. Always keep in mind the CAUTIONS and WARNINGS. Perform your during (D) PMCS.

c. If Your Equipment Fails To Operate. Troubleshoot with proper equipment according to the maintenance instructions listed in Chapter 3, Section III. Report any deficiencies that you cannot correct using the proper forms, see DA Pam 738-750.

2-3. PMCS PROCEDURES - Table 2-1 is a listing of preventive maintenance checks and services for the APPS. During the performance of these procedures, first check the condition of the item to be inspected. Then, if service is needed, perform the indicated procedure. The following Interval Column definitions are used:

B = Before
W = Weekly
M = Monthly

Table 2-1. Preventive Maintenance Checks and Services

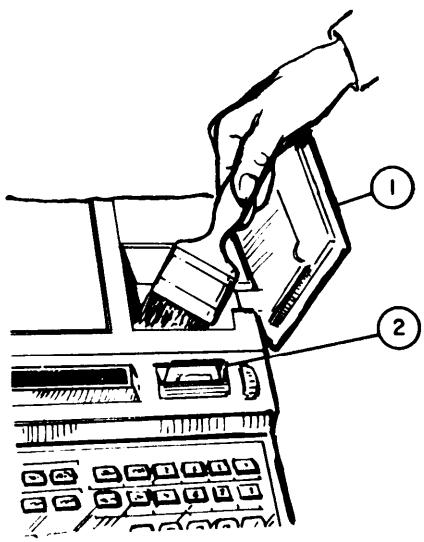
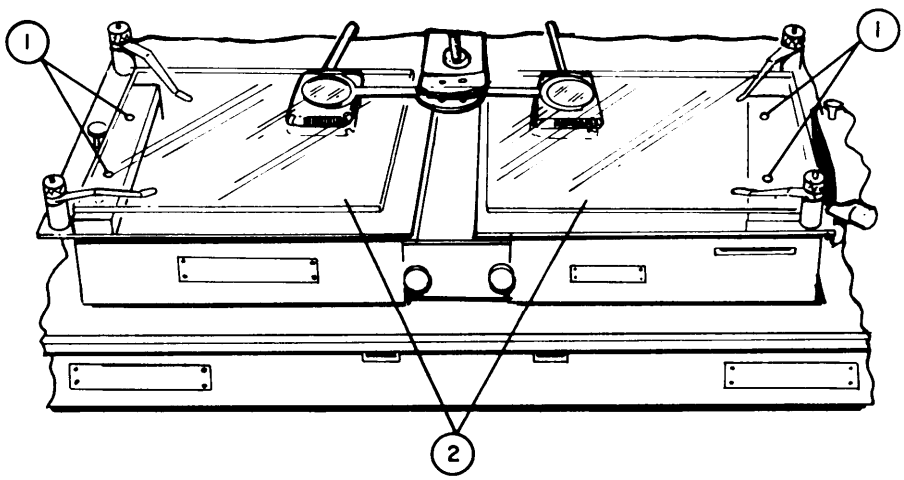
ITEM NO.	INTERVAL B	8	A	W	M	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF
						APPS SYSTEM	
1	*			*		All Equipment Surfaces Except Optical Components  a. With a stiff bristle brush (item 3, App E), clean dust and loose dirt from calculator, base plate, datagrid, DAC, DIC, and TID surfaces. b. Open calculator printer door (1) and brush away any paper fiber residue. c. Close door and brush away paper residue from plastic tear guide and thumbwheel area (2).	
2					*	All painted surfaces **CAUTION** Do not clean glass or plexiglas surfaces with chamois cleaning cloth. Scratching or other damage may result. a. Moister (item 8, App E) b. Using m ll painted surface c. Rinse c d wring out. d. Repeat sary. e. When cl chamois into or o dry.	

Table 2-1. Preventive Maintenance Checks and Services - Continued

ITEM NO.	INTERVAL B	8	A	W	N	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF
						TID	
3	*			*		Photo Plates and Illuminators	



a. Using a screwdriver, loosen recessed screws (1) on left and right photo plates (2). Remove photo plates.

b. Clean upper and lower surfaces of photo plates with anti-static cloth (item 7, App E).

c. Clean illuminator surfaces with anti-static cloth.

d. Replace photo plates.

Table 2-1. Preventive Maintenance Checks and Services - Continued

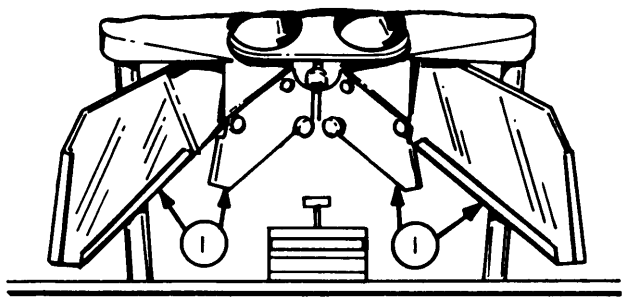
ITEM NO.	INTERVAL B	8	A	W	M	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF
						OMS 	
4	*			*		Mirrors **CAUTION** Do not touch mirror with fingers. a. Check mirrors (1) for dust or lint. b. Clean mirrors with very light strokes, using a camels hair blower brush (item 2, App E	
5	*					Mirrors a. Check mirrors for smudges or blemishes that cannot be removed using blower brush. If necessary to clean mirrors proceed to step b. b. If a container and clean water are available do the following; otherwise proceed to step c. (1) In container, prepare a solution of warm soapy water (use mild soap only) (2) Remove smudged mirror. (See table 3-5). (3) Saturate cotton ball (item 1, App E with soap solution.	Mirrors are cracked or broken or zontain smudges or blemishes that interfere with operator vision of image area.

Table 2-1. Preventive Maintenance Checks and Services - Continued

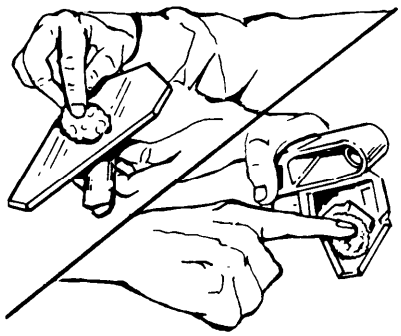
ITEM NO.	INTERVAL B	8	A	W	M	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF
5 Cont	*					OMS - Continued  (4) Swab mirror using very light strokes from top to bottom. Overlap strokes but do not swab same path twice. (5) Rinse mirror using cotton ball saturated with clean water. (6) Dry mirror using lens cleaning tissue (item 12, App E). (7) Repeat as necessary until mirror is clean. (8) Replace mirror. (See table 3-5.) (9) Repeat steps (1) thru (8) for remaining smudged mirrors. C. When a container and clean water are not available, clean smudged mirrors with mirror cleaning fluid (item 5, App E) doing the following: **WARNING** Mirror cleaner is toxic. Use only in ventilated area. Avoid contact with skin and eyes. Do not take internally. Do not use near fire or flame. (1) Remove smudged mirror. (See table 3-5.) (2) Put on cleaning glove (item 13, App E). (3) Saturate cotton ball with mirror cleaner.	

Table 2-1. Preventive Maintenance Checks and Services - Continued

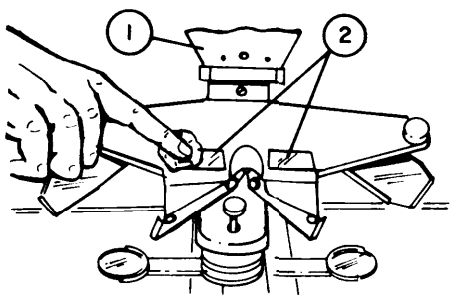
ITEM NO.	INTERVAL					ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF
	B	8	A	W	M		
						OMS - Continued	
5 Cont	*					(4) Swab mirror using very light strokes from top to bottom. Overlap strokes but do not swab same path twice. (5) Repeat as necessary until mirror is clean. (6) Replace mirror. (See table 3-5.) (7) Repeat steps (1) thru (6) for remaining smudged mirrors. (8) Reseal all cleaning supplies. (9) Discard used cotton balls away from personnel.	
6	*			*		Prisms 	
						a. Raise monocular holder (1). b. Check prisms (2) for dust or smudges. c. If prisms contain dust or lint, clean with light strokes using camels hair blower brush. d. If cleaning is needed perform the following: (1) Remove prism assembly. (See table 3-5.) (2) Place one drop of lens cleaning fluid (item 4, App E) prism.	Prisms are cracked or broken or contain scratches which interfere with operator vision of image area.

Table 2-1. Preventive Maintenance Checks and Services - Continued

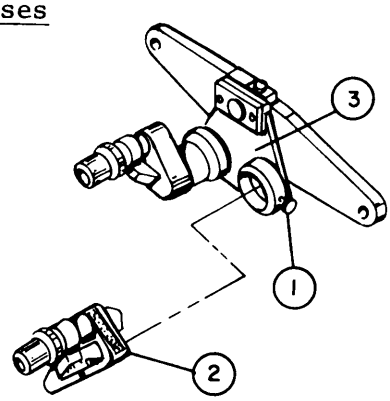
ITEM NO.	INTERVAL B	8	A	W	M	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF
						OMS - Continued	
6 Cont	*			*		(3) Wipe dry with lens cleaning tissue (item 12, App E).	
						(4) Replace prism assembly. (See table 3-5.)	
7	*			*		Monocular Lenses 	
						a. Loosen right knurled locking screw (1).	Lenses are cracked or broken or contain smudges which interfere with operator vision of image area.
						b. Remove right monocular (2) from holder (3).	
						c. Check lenses for dust or smudges.	
						d. If lens contains dust or lint, clean with light strokes using camels hair blower brush (item 2, App E).	
						e. If lens is smudged, do the following:	
						(1) Place one drop of lens cleaning fluid (item 4, App E) on lens.	
						(2) Wipe dry with lens cleaning tissue (item 12, App E).	
						f. Insert monocular in holder until firmly seated. Do not twist.	
						g. Tighten locking screw.	
						h. Repeat steps a. thru g. for left monocular.	

Table 2-1. Preventive Maintenance Checks and Services - Continued

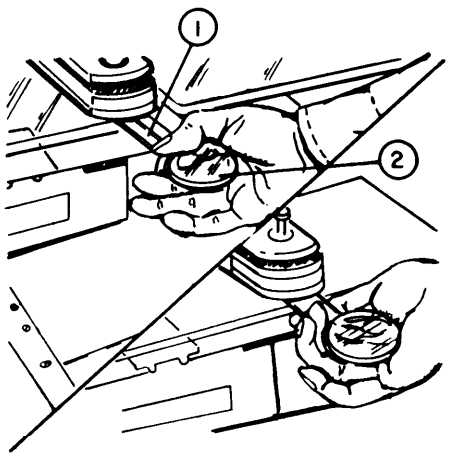
ITEM NO.	INTERVAL B	8	A	W	M	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF
						OMS - Continued	
8	*					Measuring Marks a. Inspect measuring marks for dust, lint, or smudges. b. If marks contain dust or lint, clean with light strokes using camels hair blower brush (item 2, App E). c. If marks are smudged do the following:  (1) Rotate measuring mark bridge (1). Remove mark (2) from bridge. (2) Place one drop of lens cleaner (item 4, App E) on each side of mark. (3) Wipe dry with lens cleaning tissue (item 12, App E). (4) Replace mark in bridge, ensuring that etched side is facing down.	Marks are cracked or broken or contains smudges that interfere with operator vision.
						CALCULATOR	
9				*		Tape Head **WARNING** Tape head cleaner is toxic. Use only in ventilated area. Avoid contact with skin and eyes. Do not take internally. Do not use near fire or flame.	

Table 2-1. Preventive Maintenance Checks and Services - Continued

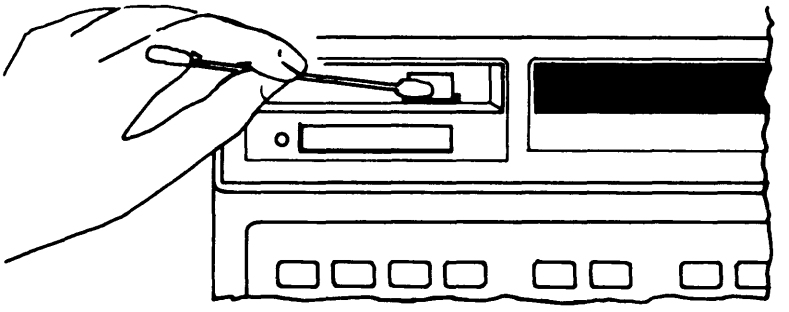
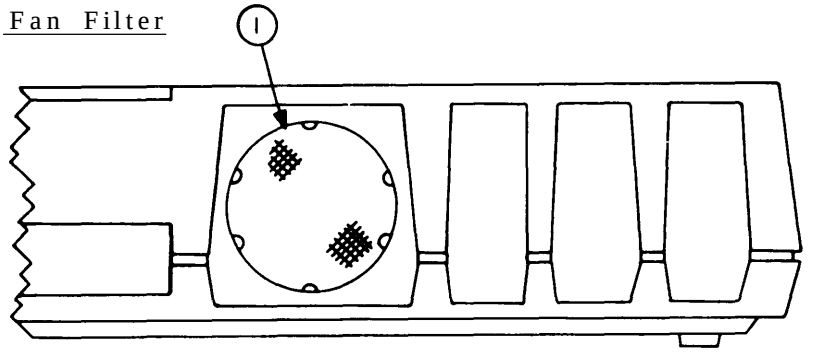
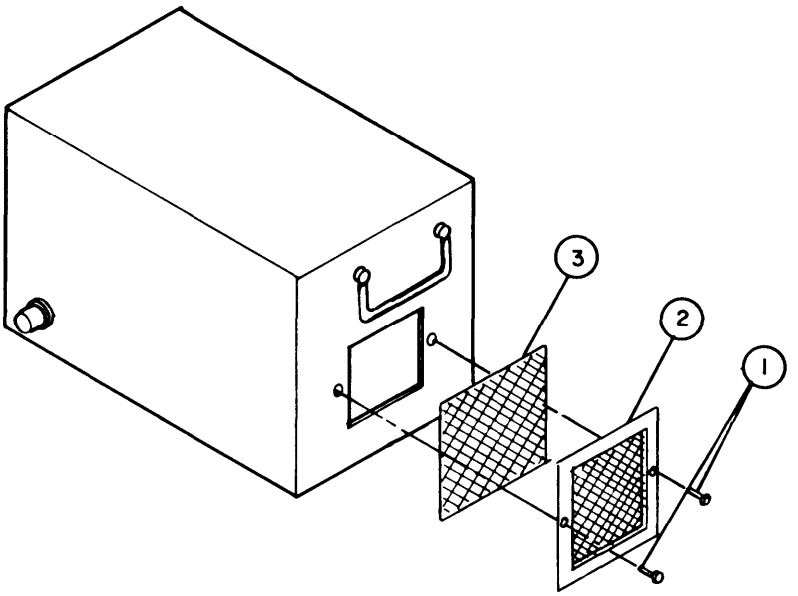
ITEM NO.	INTERVAL B	8	A	W	M	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF
						CALCULATOR - Continued	
9 Cont				*			
						a. Push open tape access door.	
						b. Using a cotton swab (item 10, App E) moistened with tape head cleaner (item 6, App E), wipe tape head and surrounding area.	
						c. Discard used swab away from personnel.	
10					*	Fan Filter 	
						a. Prepare solution of warm soapy water.	
						b. Pinch in filter (1) at opposite edges and remove.	
						c. Wash filter in solution until clean.	
						d. Rinse filter in clean water and allow to dry.	
						e. Replace filter.	

Table 2-1. Preventive Maintenance Checks and Services - Continued

ITEM NO.	INTERVAL B	8	A	W	M	ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF
						DAC	
11				*		Air Filter  a. Prepare solution of warm soapy water in container. b. Remove two knurled screws (1). c. Lift off filter screen holder (2) and remove filter (3). d. Wash filter in solution until clean. e. Rinse filter in clean water and allow to dry. f. Replace filter and screen holder. g. Tighten two knurled screws.	

Section III. OPERATION UNDER USUAL CONDITIONS

2-4. SERVICE UPON RECEIPT -

a. Site and Shelter Requirements. The following requirements should be observed when installing the APPS:

Site should be free from strong vibrations.

Shelter should: provide AC power
be relatively dust free
have a constant temperature

Equipment table should: be approximately 8 feet X 4 feet
support 170 pounds
be level within ±5°

Other requirements are given in table 1-1. Figure 2-7 shows a typical APPS installation.

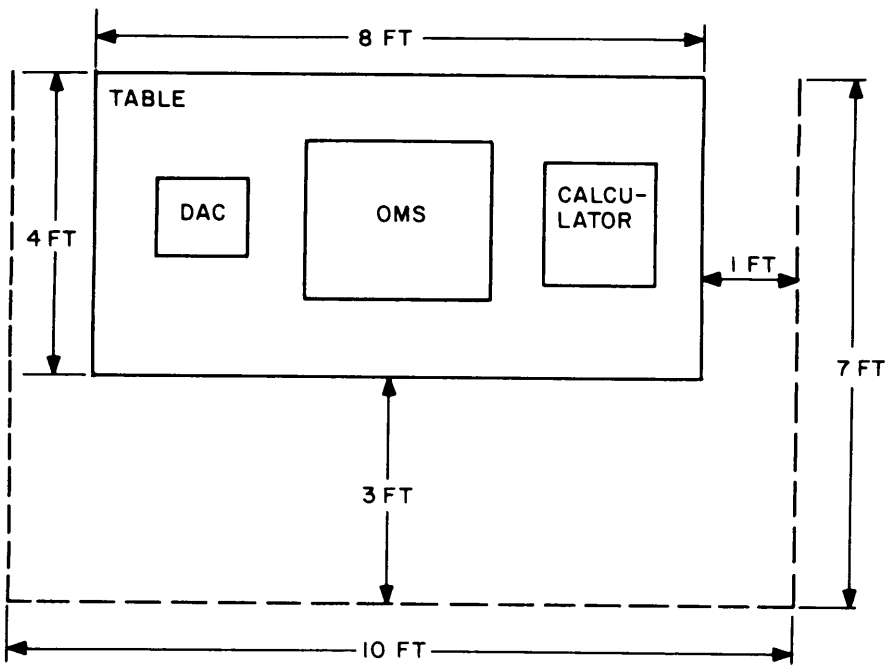
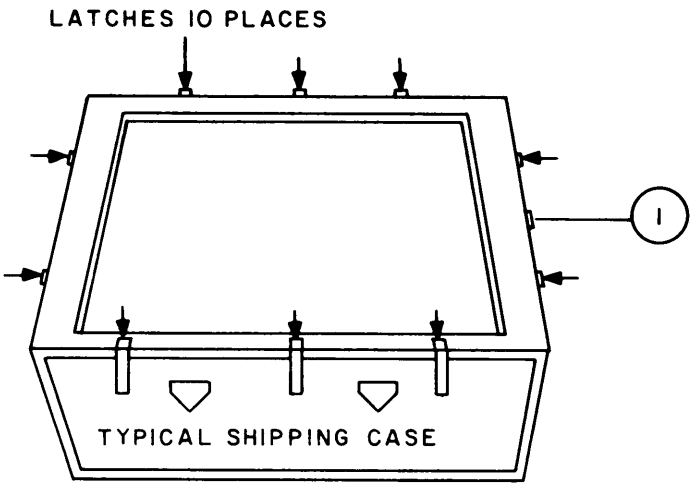


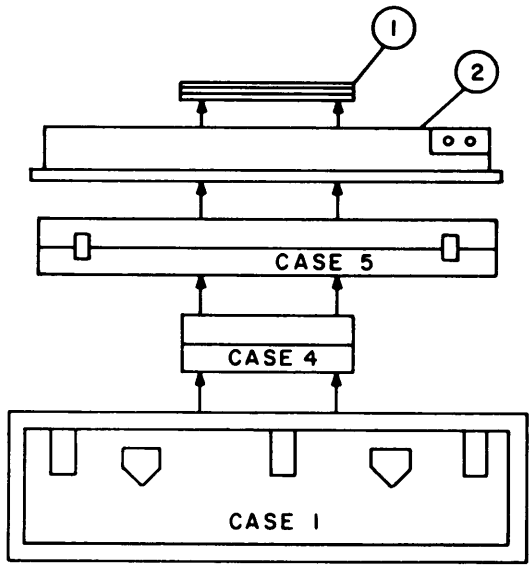
Figure 2-7. Typical APPS Installation

b. Service Upon Receipt of Material. The APPS system is shipped/stored in three shipping cases. These cases should be opened and their contents checked before installation.

CAUTION

The base plate assembly should always be placed topside up on a level surface. Never lean on edge or subject to rough handling.



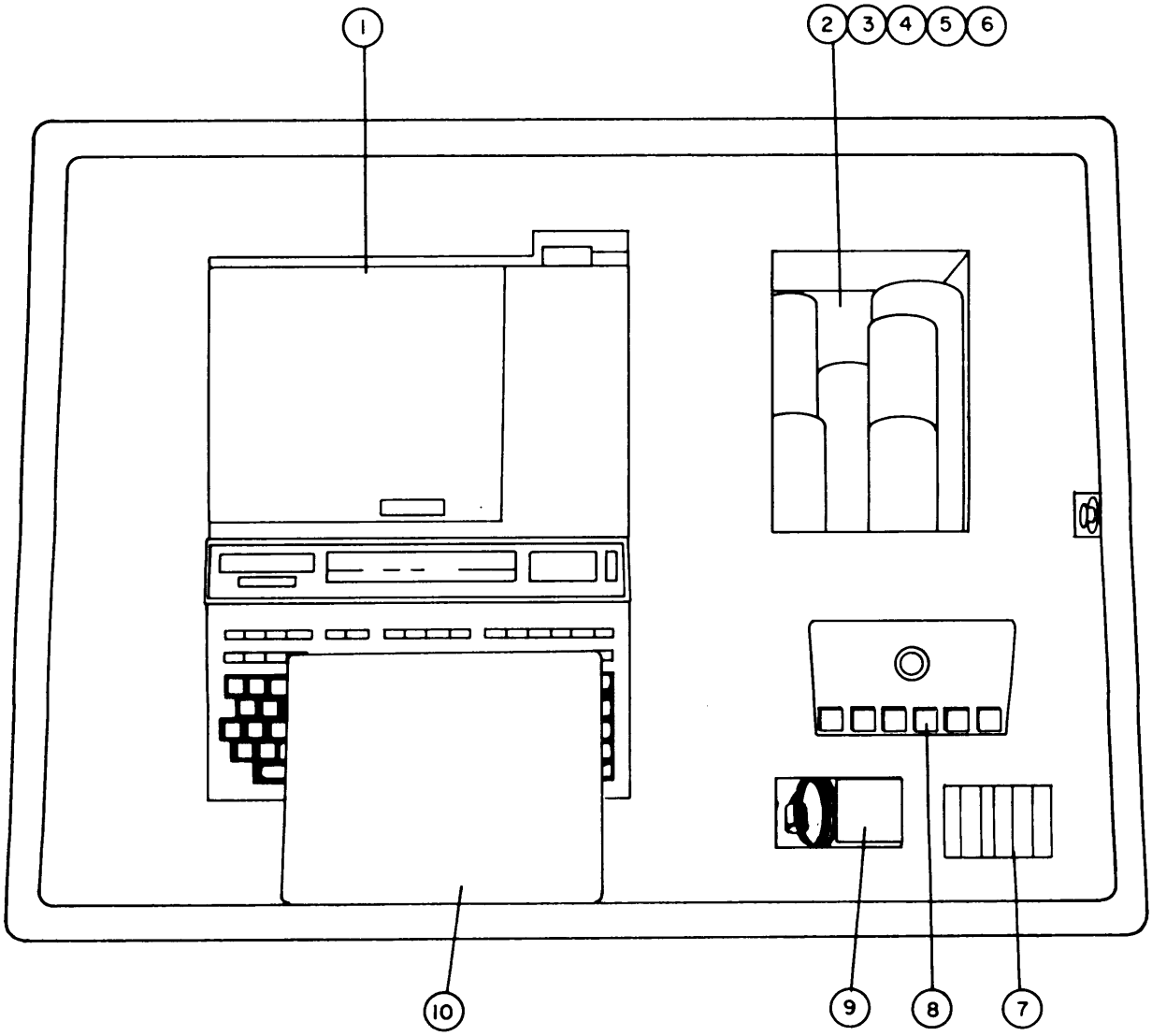


(1) Press pressure valve (1) to equalize pressure. Open ten latches on each case. Remove case tops and lay aside.

(2) Remove dust cover (1) and base plate assembly (2) from case 1. Remove carrying cases 5 and 4 and open catches.

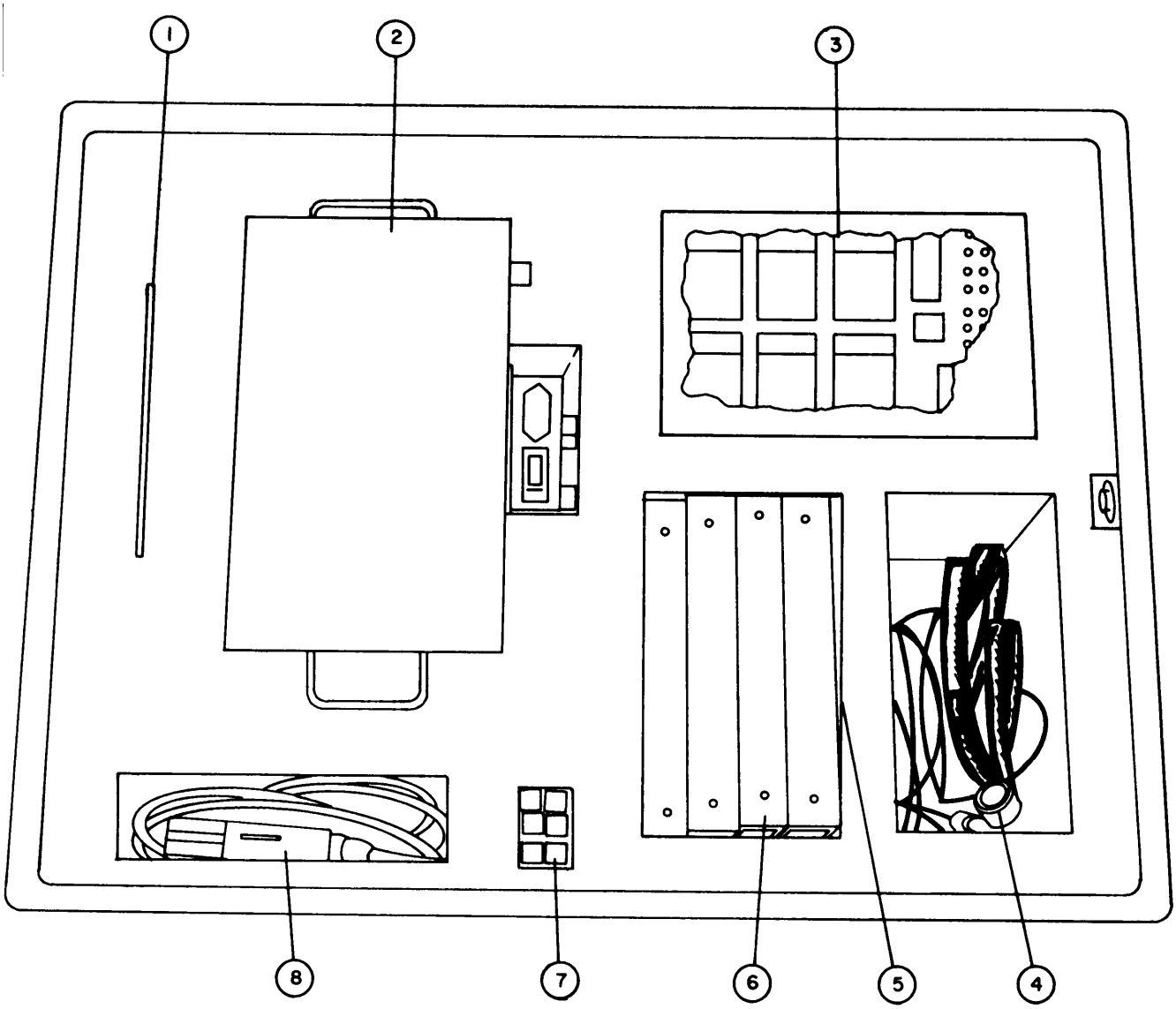
(3) Check equipment against TM 5-1260-206-12HR and figures 2-8 through 2-11. Report all discrepancies in accordance with DA Pam 738-750.

(4) Inspect equipment for damage. Report any damage on DD Form 6, Packaging Improvement Report.



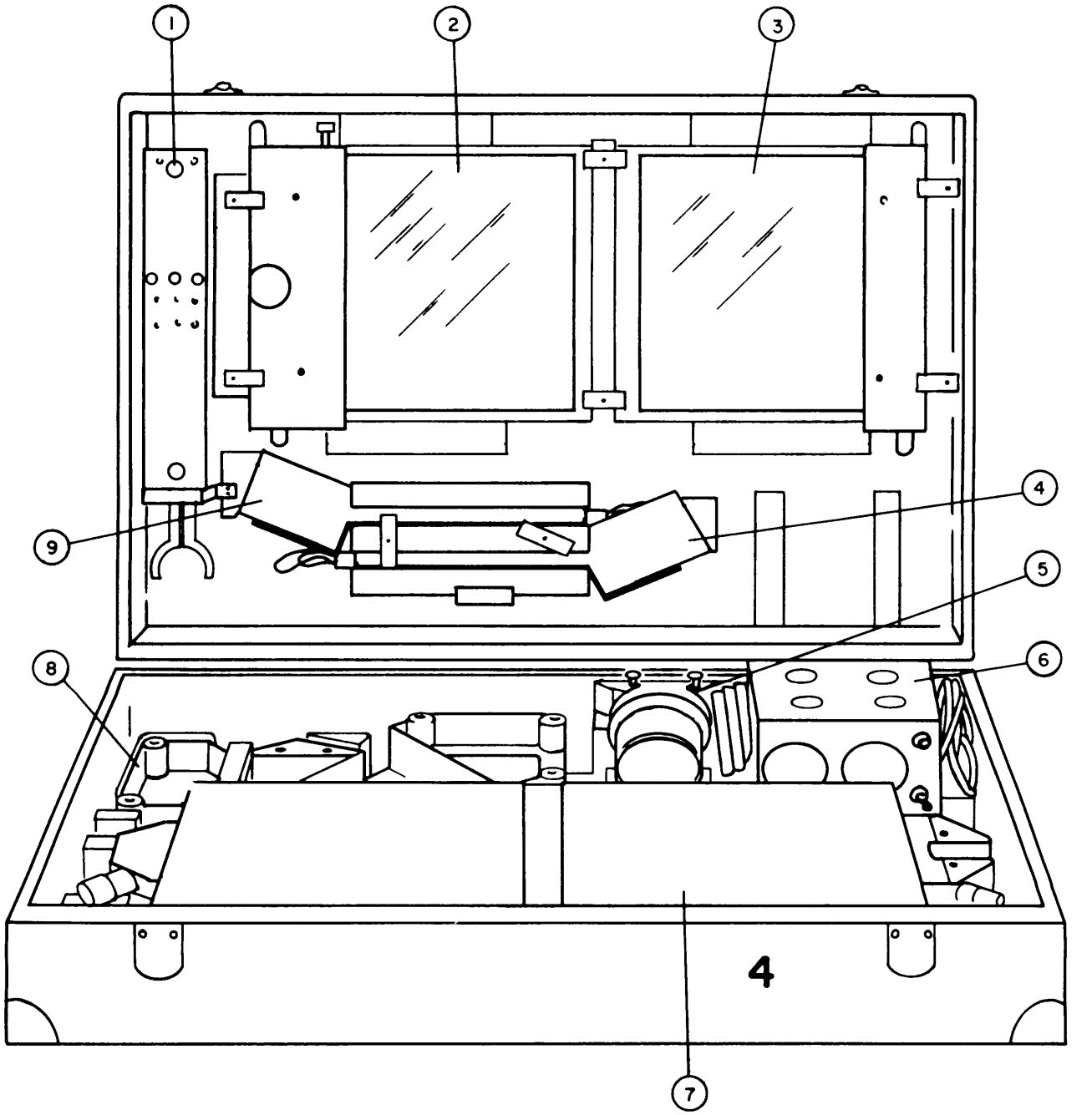
ITEM NO.	NAME	ITEM NO.	NAME
1	Calculator	6	Mirror Cleaning Kit (field)
2	Lens Cleaning Kit	7	Data Cartridges
3	Cleaning Kit	8	DIC
4	Tape Head Cleaner Kit	9	Digital Display
5	Mirror Cleaning Kit	10	Calculator Dust Cover

Figure 2-8. Case 2 Unpacking Diagram



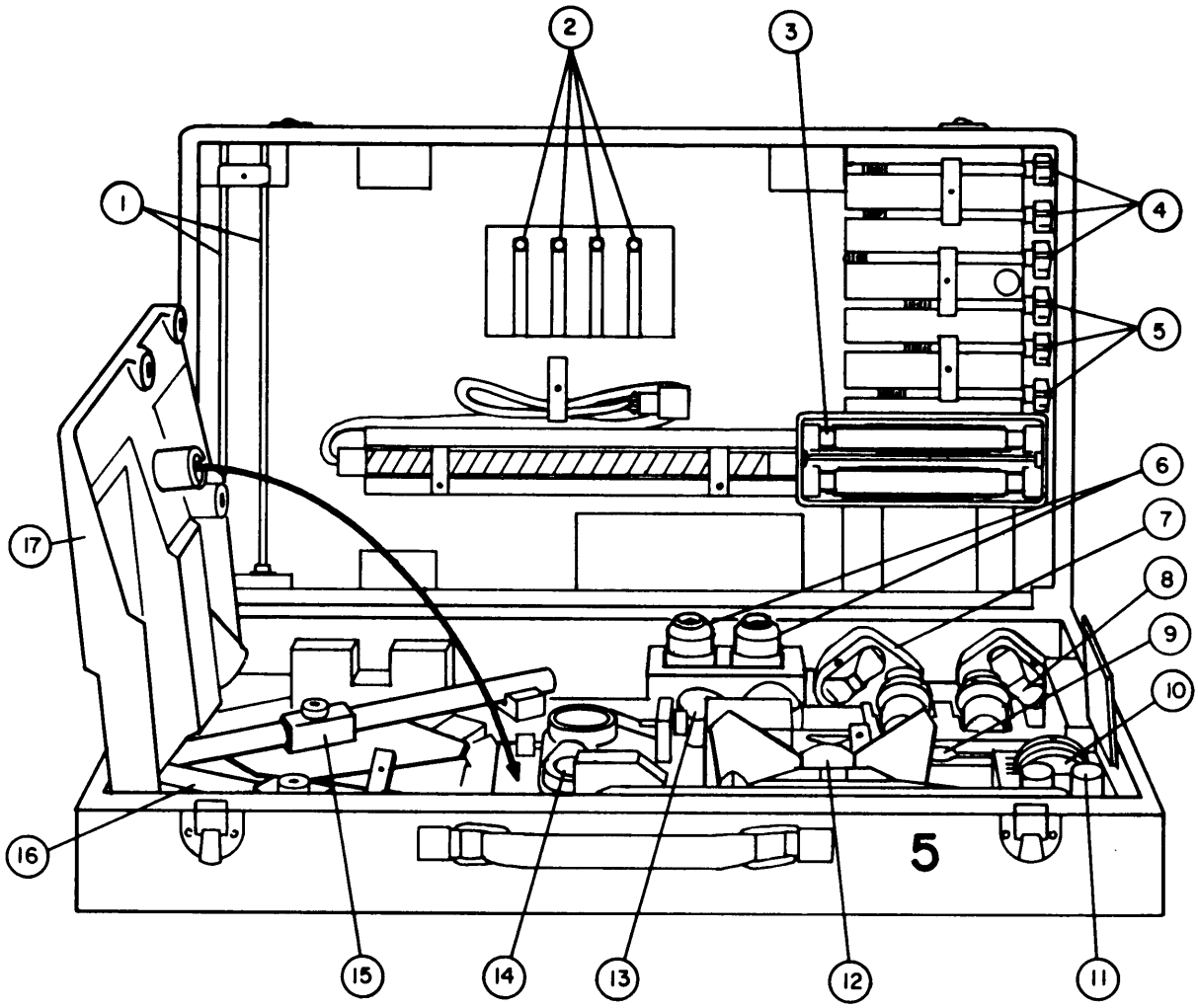
ITEM NO.	NAME	ITEM NO.	NAME
1	Spare Photoholders	5	Envelope
2	DAC	6	Manuals
3	Spares Box	7	Spare Fluorescent Lamps
4	Cables W101 and W103 thru W108	8	Cable W102

Figure 2-9. Case 3 Unpacking Diagram



ITEM NO.	NAME	ITEM NO.	NAME
1	Measuring Mark Bridge	6	Lamp Control Assembly
2	Left Photo Plate	7	Photo-Carriage
3	Right Photo Plate	8	Spacer
4	Right Illuminator	9	Left Illuminator
5	X-Axis Encoder		

Figure 2–10. Case 4 Unpacking Diagram



ITEM NO.	NAME	ITEM NO.	NAME
1	Through Bolts	10	Measuring Marks
2	Photo Clips	11	Magnets
3	Lamp Assembly	12	Prism Holder
4	TID Capstan Bolts	13	Large and Small Eyeguards
5	Capstan Bolts	14	Mounting Plate Assembly
6	Zoom Eyepieces	15	Right Large Mirror Assembly
7	Left Monocular with Fixed Eyepiece	16	Left Large Mirror Assembly
8	Right Monocular with Fixed Eyepiece	17	Stereoscope Base Plate
9	Screwdriver		

Figure 2–11. Case 5 Unpacking Diagram

2-5. INSTALLATION INSTRUCTIONS - To install the APPS, the OMS and TID components, position all other units, and connect the cables.

a. Tools, Test Equipment, and Materials Required for Installation. Assembly and installation of the APPS requires the use of the screwdriver found in case 5.

b. Assembly of Equipment. To assemble the APPS, do the procedures given in table 2-2.

c. Interconnections. Figure 1-9 illustrates and identifies each cable used in the APPS. Inspect all cables for frayed insulation or other visible defects.

CAUTION

Do not connect power cable W106 to the site AC power source until all other interconnections have been made. Check that A.C. POWER S1 switch on DAC is set at OFF before making this connection.

To connect the APPS, remove cables (8 each) from case 3 and perform interconnections as shown on figure 2-12.

NOTE

Be sure to align key-ways before tightening connectors.

2-6. INITIAL ADJUSTMENTS AND DAILY CHECKS - Table 2-3 is a listing of initial adjustments and daily checks. Perform these procedures after installation, at the start of a duty shift, and whenever power is restored to the APPS after an operational shutdown. Report all discrepancies to your supervisor.

NOTE

All knurled screws are to be tightened only finger tight.

Table 2-2. APPS Assembly Procedures

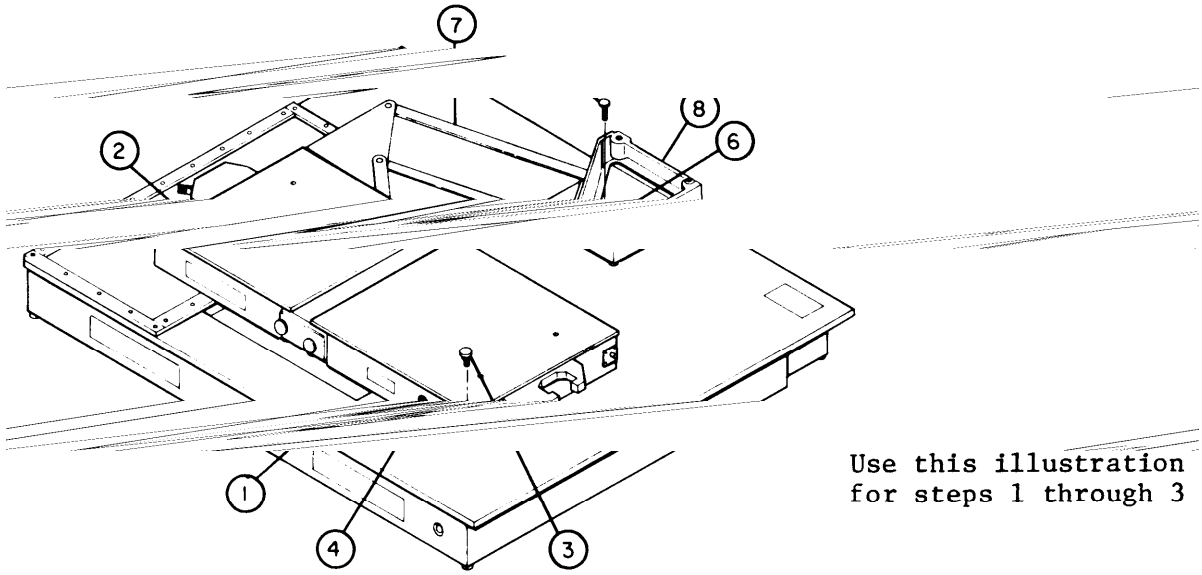
STEP NO.	ITEM PROCEDURE
	 Use this illustration for steps 1 through 3
1	Base plate (1) - Remove from case 1. Photo-carriage (2) - Remove from case 4. a. Set base plate on suitable table. b. Center photo-carriage on top of base plate.
2	Photo-carriage red holddown screw (3) a. Remove red screw from front right corner of photo-carriage. b. Store screw in red hole (4) on front right side of photo-carriage.
3	Parallelogram locking screw (5) **CAUTION** Do not exert pressure on parallelogram. a. Remove locking screw from transport hole. b. Place screw in red storage hole (6). c. Open parallelogram (7) to position anchor block (8) on baseplate

Table 2-2. APPS Assembly Procedures - Continued

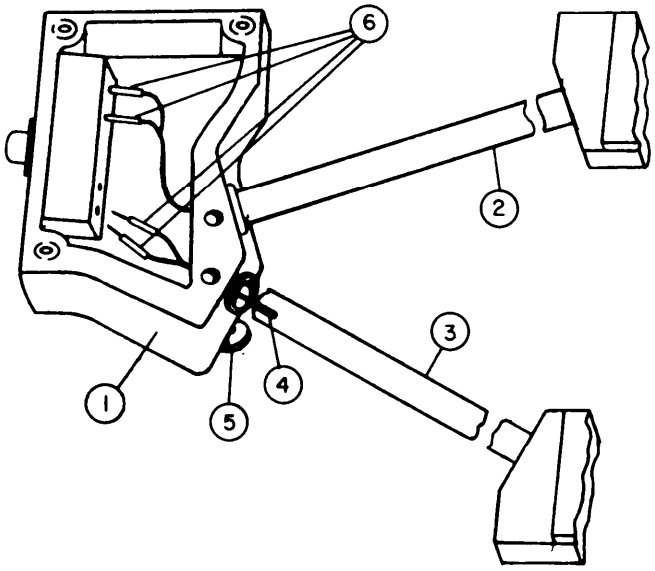
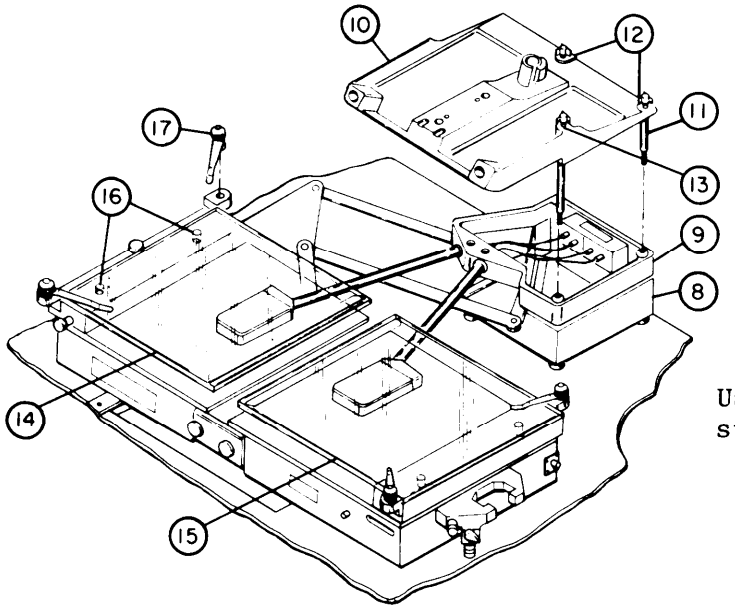
STEP NO.	ITEM PROCEDURE
4	Spacer (1) - Remove from case 4. Right TID illuminator (2) - Remove from case 4. Left TID illuminator (3) - Remove from case 4.  Insert left and right illuminators into spacer. Be sure slot (4) aligns with pin in spacer. Tighten knurled screws (5). Plug lamp jacks (6) into sockets in block (red to red, black to black).  Use this illustration for steps 5 through 8
5	TID assembly (9) a. Set assembly on top of photo-carriage anchor block (8). b. Align three holes.

Table 2-2. APPS Assembly Procedures - Continued

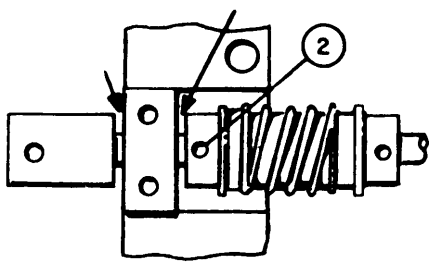
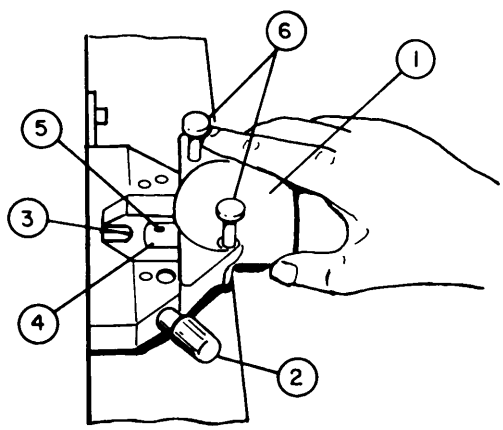
STEP NO.	ITEM PROCEDURE
6	Stereoscope base plate (10) - Remove from case 5. TID capstan bolts (3 each) (11) - Remove from case 5. Set base plate on top of TID assembly. Align three holes. a. Insert two short capstan bolts in rear holes (12) of base plate. c. Insert long capstan bolt in hole on right side of base plate (13). d. Tighten bolts.
7	Left photo plate (14) - Remove from case 4. Right photo plate (15) - Remove from case 4. a. Set left photo plate on left side of photo-carriage. b. Align two recessed screws (16) with holes in photo-carriage. c. Using a screwdriver, tighten screws. d. Repeat for right photo plate.
8	Photo clips (4 each) (17) - Remove from case 5. Install one clip at each outside corner of both photo plates.
9	X-axis encoder (1) - Remove from case 4.  a. Rotate X-axis parallax adjust (2) until flat side of shaft (3) is facing upwards. b. Rotate flexible coupling (4) until set screw (5) is facing upwards. c. Push X-axis encoder onto shaft.  d. Ensure that there is clearance between shaft and support blocks, e. Tighten two knurled knobs (6). f. Check that flat side of shaft and set screw line up. g. Rotate X-axis parallax adjust to ensure free movement of shaft.

Table 2-2. APPS Assembly Procedures - Continued

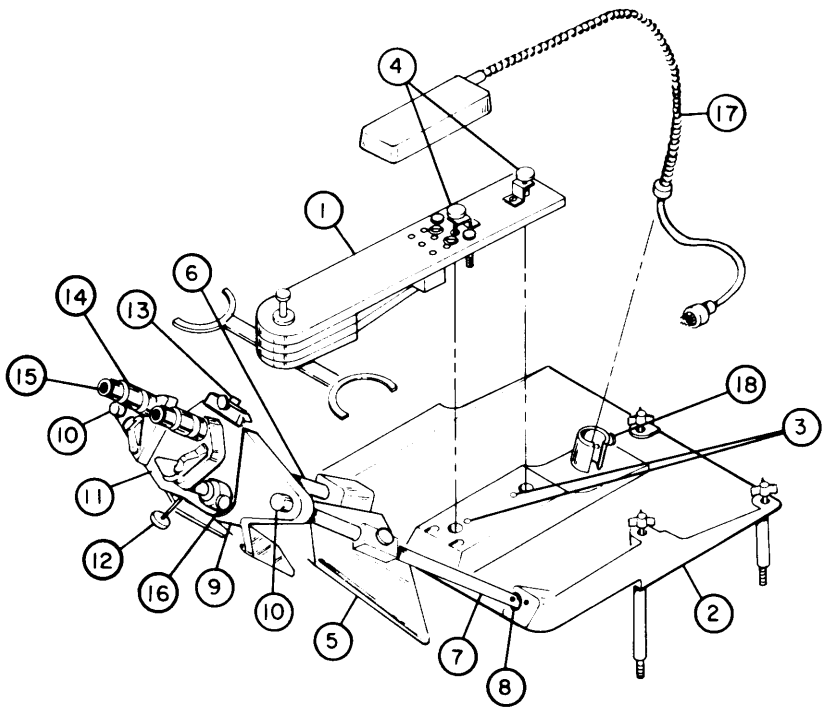
STEP NO.	ITEM PROCEDURE
	 Use this illustration for steps 10 through 16
10	Measuring mark bridge (1) - Remove from case 4. a. Set measuring mark bridge on top of base plate (2). b. Align locator pins with holes in base plate (3). c. Tighten two knurled screws (4).
1	Right large mirror assembly (5) - Remove from case 5. Left large mirror assembly (6) - Remove from case 5. **CAUTION** Do not touch mirrors, lenses, or prisms with fingers. Do not place any of these components face down on any surface. a. Insert right mirror tube (with 1 red dot on end) (7) into hole on right side of base plate (8). Align dots and push to seat tube. b. Insert and seat remaining mirror tube into hole on left side of base plate. Align two red dots and push to seat.

Table 2-2. APPS Assembly Procedures - Continued

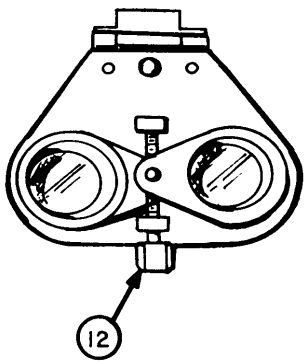
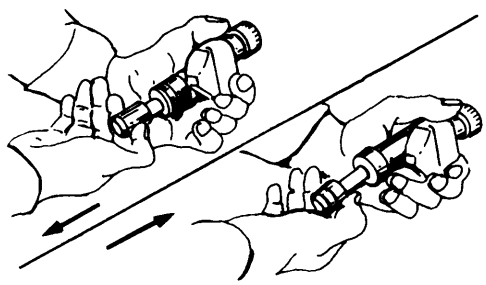
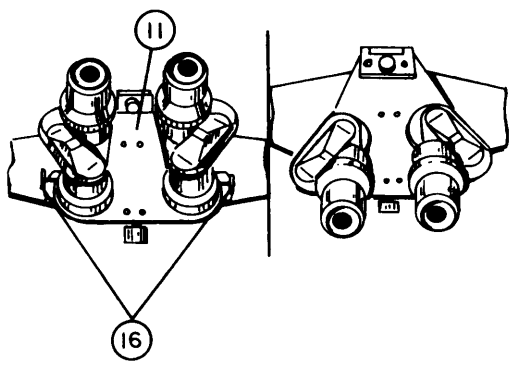
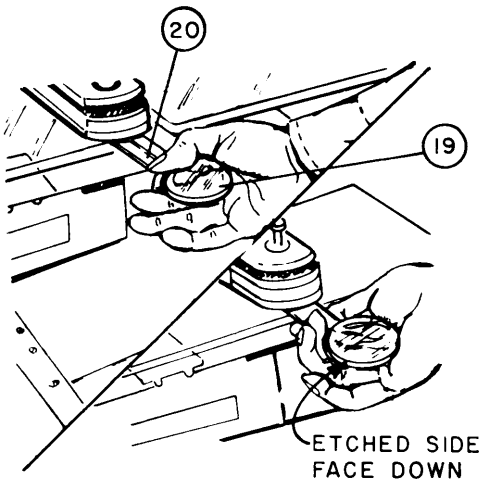
STEP NO.	ITEM PROCEDURE
12	Prism holder (9) - Remove from case 5. Through bolts (2 each) (10) - Remove from case 5. a. Mount prism holder on mirror tubes. b. Insert one through bolt into each hole in prism holder. c. Tighten both bolts at same time to prevent binding.
13	Mounting plate assembly (11) - Remove from case 5.  a. Turn eyebase adjust (12) to mid range. b. Position plate assembly on top of prism holder and tighten screw (13).
14	Monocular (fixed eyepieces installed) (2 each) (14) - Remove from case 5. Zoom eyepieces (2 each) (15) - Remove from case 5 (if desired).  a. If zoom eyepieces are desired, install in monocular.  b. Without rotating monocular, insert them into mounting plate assembly (11) until firmly seated. c. Tighten two knurled screws (16).

TABLE 2-2. APPS Assembly Procedures - Continued

STEP NO.	ITEM PROCEDURE
15	Measuring marks (19) - Remove from case 5. 40u with zoom eyepieces (2 each). 100u with fixed eyepieces (2 each).  a. Push photo-carriage to rear of OMS. b. Rotate measuring mark holder (20). c. Using steady pressure, insert measuring mark in holder. d. Rotate holder half turn. e. Insert other measuring mark. f. Rotate holder until detent seats
16	Lamp assembly (17) - Remove from case 5. a. Place light cord in slotted hole on base plate (2). b. Insert lamp assembly base in hole. c. Tighten screw (18).
17	DIC - Remove from case 2.
18	DAC - Remove from case 3.
19	Calculator - Remove from case 2.
20	Digital Display - Remove from case 2.
21	TID lamp control assembly - Remove from case 4. **CAUTION** Lamp control assembly must be placed at least 4 inches from all other APPS components.

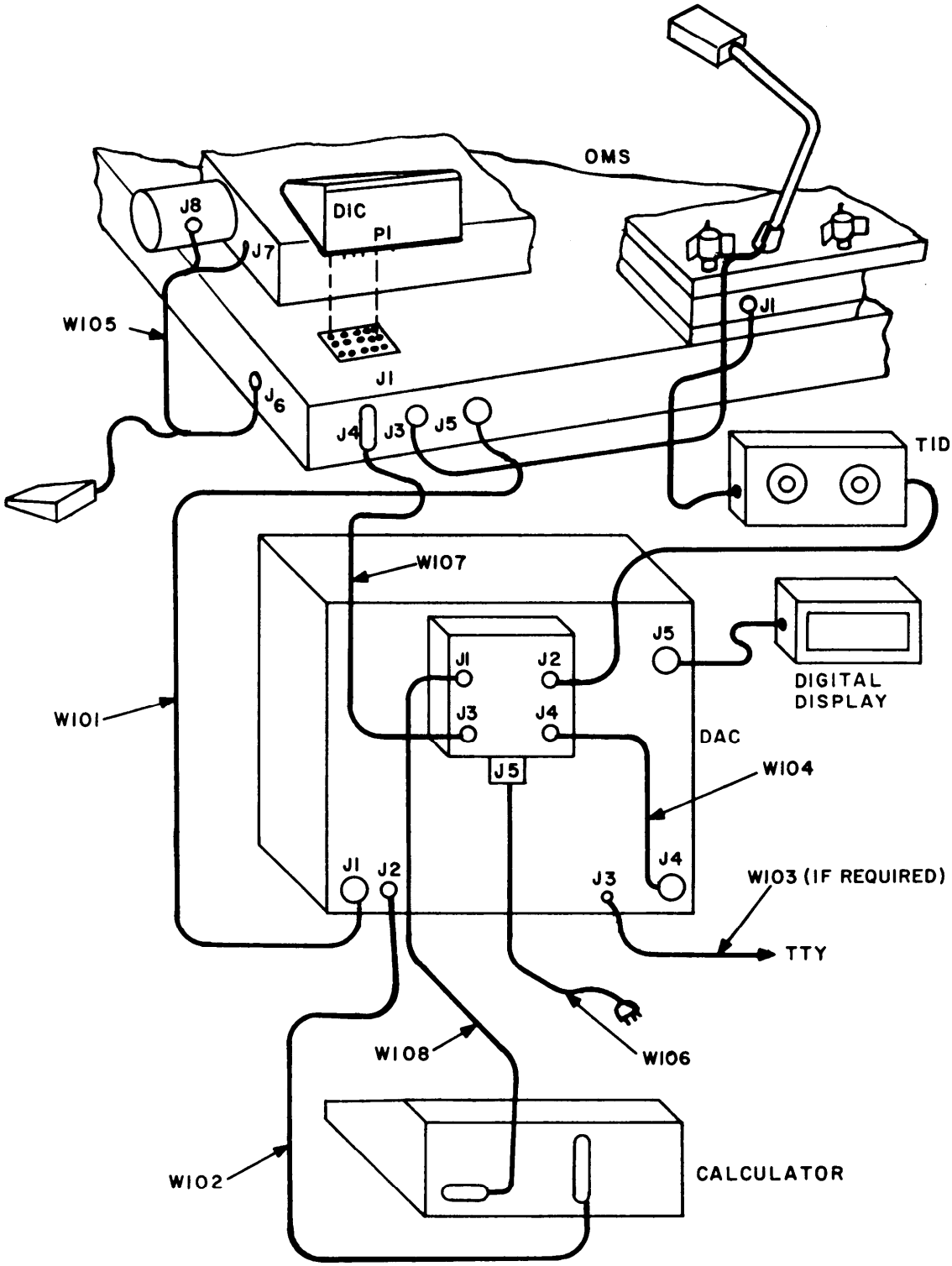


Figure 2-12. APPS Interconnecting Diagram

Table 2-3. Initial Adjustment and daily Checks

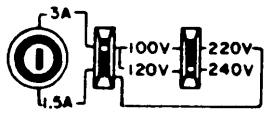
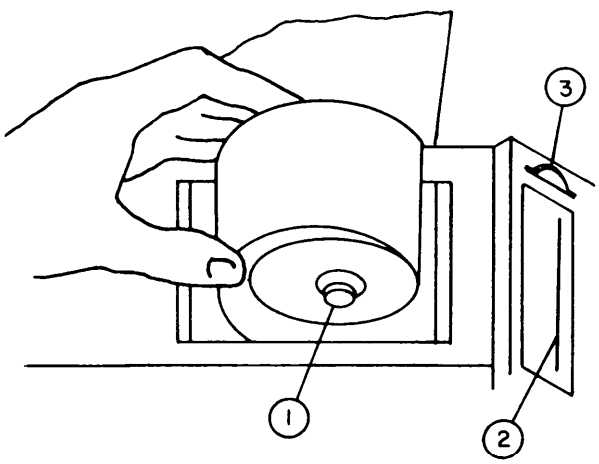
STEP NO.	ITEM PROCEDURE
	INTERCONNECTING CABLES
1	Check that all cable connection are made securely.
2	Check all cables for frayed insulation or other visible defects.
	CALCULATOR
1	Calculator power off. DAC power off.
2	Open printer access door. Ensure that line voltage selector switches are set for 120 volts. If adjustment is needed:  Switches shown in 120 v position a. Insert tip of small crewdriver into slot on switch. b.Slide switch so that slot is in position shown.
3	Check printer paper tape supply. If depleted :  Remove spindle (1) and discard paper core. Insert spindle through center hole of new paper roll (item 9, App E). Replace the spindle. Thread paper through paper slot (2). Rotate thumbwheel (3) to advance paper.
4	Closer printer access door.

Table 2-3. Initial Adjustments and Daily Checks - Continued

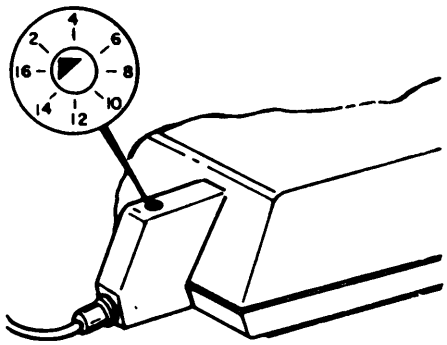
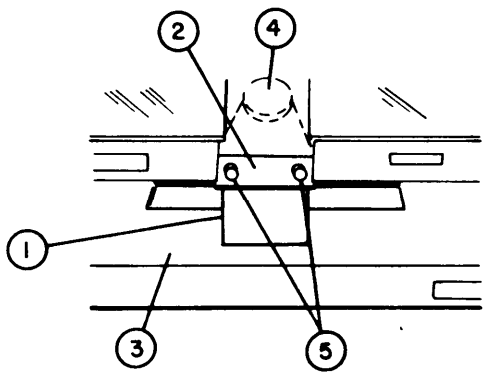
STEP NO.	"ITEM PROCEDURE
5	Check that selector on I/O connector of cable W102 is set at 2. If adjustment is needed:  a. Insert tip of screwdriver into slot on selector. b. Rotate selector so that arrow points at 2.
	CURSOR COIL
1	All power off.
2	Insert a piece of calculator paper (1) face down between cursor coil mounting bracket (2) and base plate (3). Check that cursor coil (4) just clears print. If paper cannot be inserted or if adjustment is needed:  a. Loosen two locking screws (5). b. Move mounting bracket for correct clearance. c. Tighten locking screws. d. Check that coil moves freely over datagrid. e. Repeat if necessary.
3	Remove paper.

Table 2-3. Initial Adjustments and Daily Checks - Continued

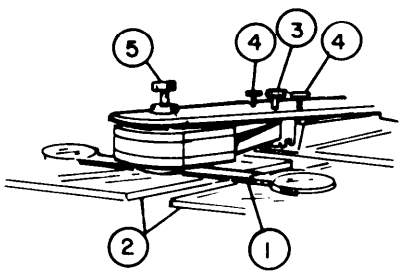
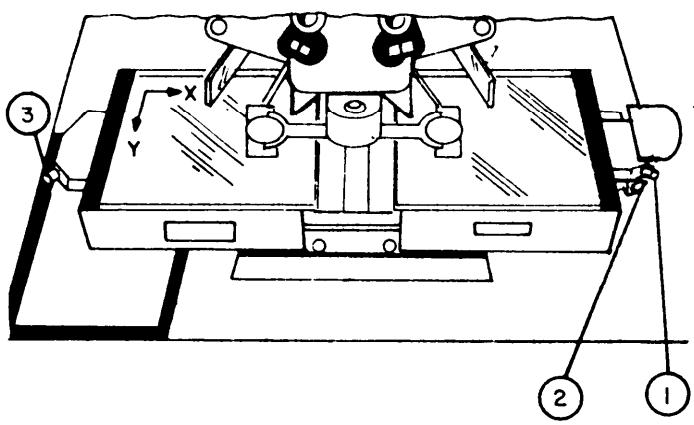
STEP NO.	ITEM PROCEDURE
1	MEASURING MARK
	All power off.
2	Check that measuring mark holder (1) is not tilted and is slightly above photo plates (2). If adjustment is needed:
	 a. Loosen front holddown screw (3). b. Rotate left and right tilt screws (4) until measuring mark assembly is parallel to photo plates (2). c. Tighten holddown screw. d. Rotate height adjust screw (5) until measuring mark holder just clears photo plates.
	PHOTO-CARRIAGE
1	DAC power off.
2	Check for free movement of photo-carriage by doing the following:
	 a. Place photo-carriage lock lever (1) up. b. Move photo-carriage across base plate in X and Y directions. No binding or friction should be felt.
3	Check for free movement of the X-axis parallax adjust (2) by rotating it back and forth.
4	Check for free movement of the Y-axis parallax adjust (3) by rotating it back and forth.

Table 2-3. Initial Adjustments and Daily Checks - Continued

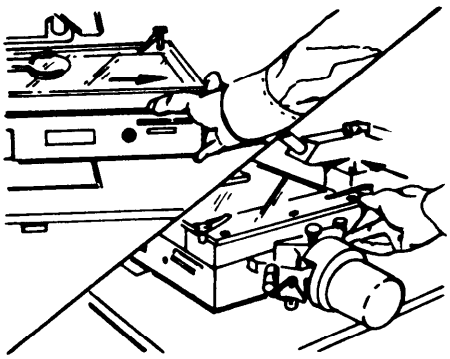
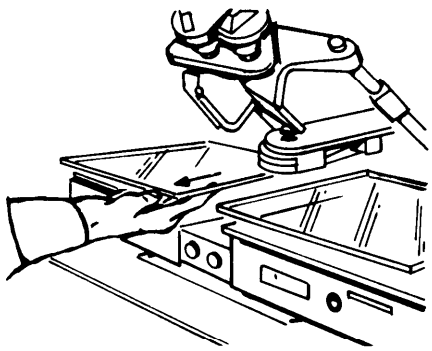
STEP NO.	ITEM PROCEDURE
5	Check spring movements of right photo plate by doing the following:  a. Push lightly at front right corner. b. Push lightly at rear right corner. c. Photo plate should return to its original position.
6	Check for play of left photo plate by doing the following:  a. Push up very lightly on right front corner of photo plate. b. Try to move photo plate back and forth. c. Very little play should be felt.
	DIGITAL DISPLAY
1	DAC power on. TID power on, lamp dimmers fully clockwise.
2	Move photo-carriage to front left corner of baseplate. Press: [ZERO]. Check that display shows all zeros.
3	Move photo-carriage slowly across datagrid. Check that display counts in X- and Y-axis directions.
4	Check display modules for signs of damage.
	DAC
1	Check all connectors for damaged, loose, or broken pins.
2	Remove DAC top and bottom cover plates. Check power supply, printed circuit cards, and connector pins for damage. Ensure all cards are firmly seated. Replace cover plates.

Table 2-3. Initial Adjustments and Daily Checks - Continued

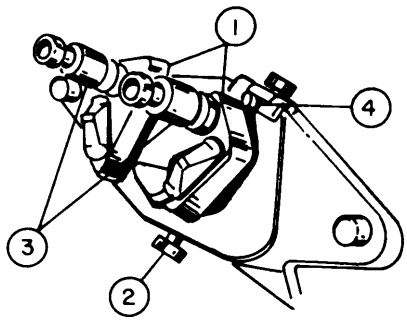
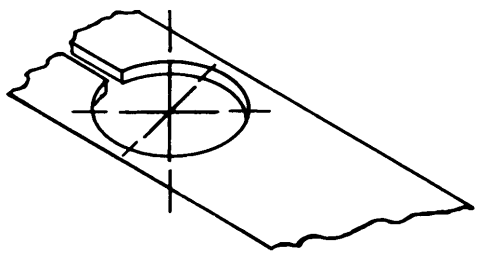
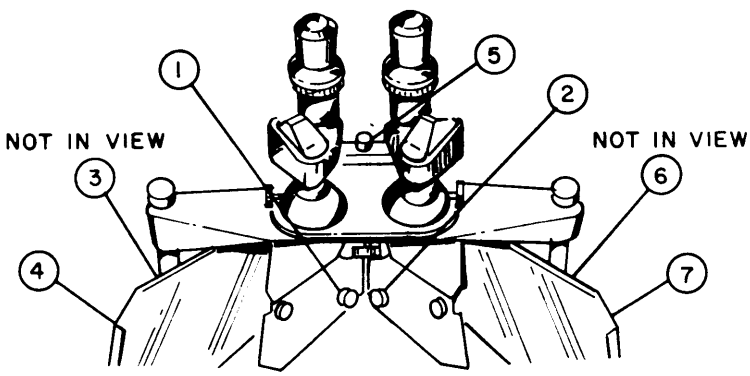
STEP NO,	ITEM PROCEDURE
	STEREOSCOPE
1	DAC power on. TID power on, lamp dimmers fully clockwise.
2	 Use this illustration for steps 2 through 4 Look through both monocular (1). Rotate eyebase adjust (2) for comfortable viewing position. **NOTE** These adjustments should be repeated as needed during this procedure.
3	Check that measuring mark dots are visible in left and right image areas. Focus as required, using focus rings (3). If No: do step 4 If Yes: do step 8 **NOTE** Placing a piece of paper with a centering guide under each measuring mark helps to locate the dots. 
4	Look through one monocular. Rotate stereoscope adjust (4) until measuring mark dot is visible in center of image area.
5	Look through both monocular. Check that measuring mark dots are visible in left and right image areas. If No: do step 6 If Yes: do step 8  Use this illustration for steps 6 and 7.

Table 2-3. Initial Adjustments and Daily Checks - Continued

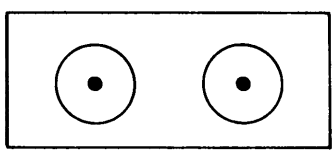
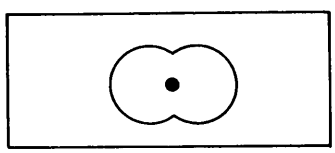
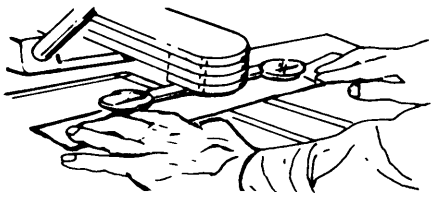
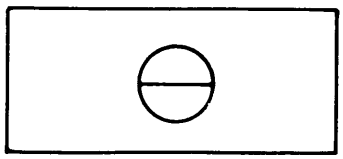
STEP NO.	ITEM PROCEDURE
6	Tighten small mirror adjust screws (1) and (2) until stops are reached.
7	Locate measuring mark dots in left and right image areas by doing the following:
	a. Draw a centering guide on a piece of calculator paper. Place guide under center of left measuring mark.
	b. Rotate stereoscope adjust (5) until centering guide is centered in image area. Focus on measuring mark dot.
	c. Loosen left large mirror locking screw (3).
	d. Rotate left large mirror (4) until centering guide is near center of left image area.
	e. Tighten left mirror locking screw.
	f. Place centering guide under center of right measuring mark.
	g. Loosen right large mirror locking screw (6).
	h. Rotate right large mirror (7) until centering mark is near center of right image area.
	i. Tighten right mirror locking screw.
	j. Unscrew right small mirror adjust until centering guide is centered in image area.
	 Check that measuring mark dots are centered in left and right image areas. If adjustment is needed, rotate large mirrors or small mirror adjust screws as required to center dots.
	 Look through both monocular. Check that measuring mark dots appear to merge in center of image area. If adjustment is needed, rotate large mirrors or small mirror adjust screws as required to merge dots.

Table 2-3. Initial Adjustments and Daily Checks - Continued

STEP NO.	ITEM PROCEDURE
10	(Optional) Check for parallax by doing the following:



a. Connect two measuring mark dots with edge of a piece of calculator paper.



b. Look through both monocular. Check that paper edge appears as one continuous line.

c. If one continuous line is not seen, select and perform the required adjustments as shown.

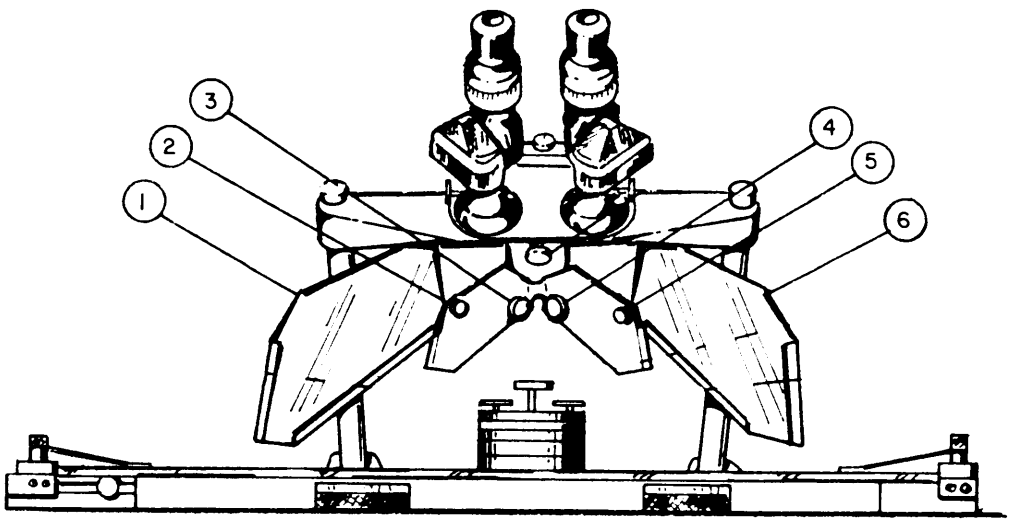
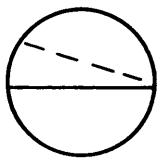
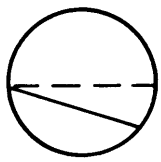
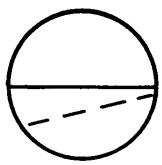
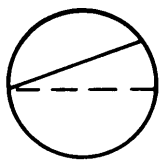
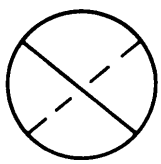
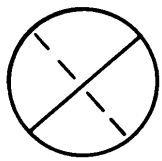
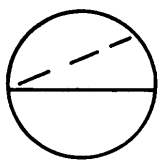
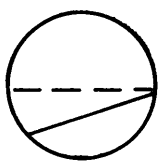
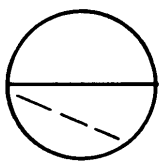
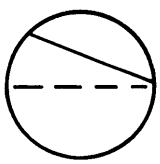
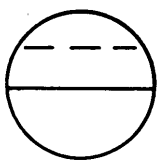
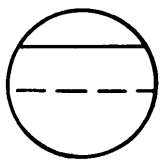
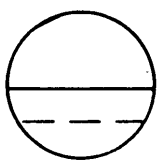
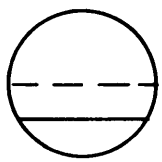


Table 2-3. Initial Adjustments and Daily Checks - Continued

STEP NO.	ITEM / PROCEDURE

IF THIS IS SEEN	THEN ADJUST	IF THIS IS SEEN	THEN ADJUST
	4CCW		3CW
	4CW		3CCW
	ICCW 6CCW		1 CW 6CW
	5CCW		2CW
	5CW		2 Cw
	4CCW 5CCW		2CCW 3CCW
	4CW 5CW		2CW 3CW

———— = LEFT EYE
= RIGHT EYE

2-7. OPERATING PROCEDURE - Table 2-4 provides procedures for equipment turn-on and turn-off. Refer to the specific operator's program description provided with each PPDB for instructions peculiar to a particular PPDB.

CAUTION

- If a malfunction occurs, set all power switches at OFF. Refer to paragraph 3-5, troubleshooting procedures.
- If power should go OFF during operation, set all power switches at OFF to prevent equipment damage.
- Do not allow any object to strike or mar datagrid surface. Do not allow food, drink, smoking ashes, or other similar materials to come in contact with datagrid surface. Damage to the datagrid may result.
- Do not touch mirrors, lenses, or prisms with fingers. Do not place any of these components face down on any surface. Smudging or scratching of these optical components may result.
- Do not lean on measuring unit during or between measurements. Leaning on measuring unit can result in inaccurate computations by the calculator and damage to OMS.
- Do not place any tape cartridge near TID control assembly or any magnetic field. Erasure of data stored on tape may result.
- Do not switch lamp or power switches on or off during equipment operation. Check that TID lamp control assembly is at least 4 inches from all other APPS components. Erasure of calculator memory may result.
- Do not remove plastic protection cover from calculator RECORD key.

Table 2-4. APPS Operating Procedures

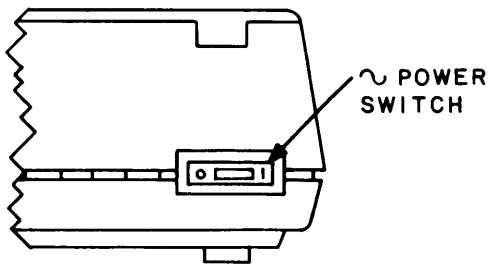
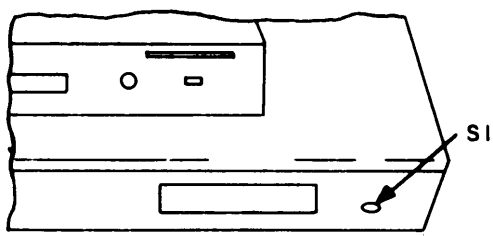
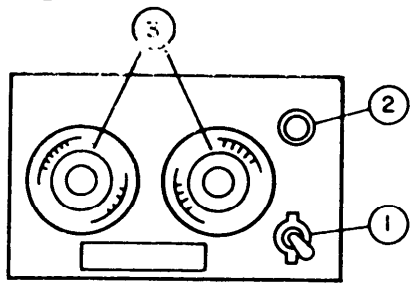
STEP NO,	ITEM PROCEDURE	
	EQUIPMENT TURN-ON	
1	DAC	Set A.C. POWER S1 switch (1) at ON. Check that ELAPSED TIME M1 meter (2) operates, power indicators (3) and (4) light, and blower operates. **NOTE** If sonalert sounds press [ZERO].
2	Calculator 	Set power switch at 1. Check that calculator displays [⊢] and blower operates. **NOTE** If sonalert sounds press [RESET].
3	OMS 	Press S1 power switch. Check that overhead lamp lights.
4	TID 	Set power switch (1) at ON. Check that indicator (2) lights. Rotate left and right lamp dimmers (3) fully clockwise. Check that left and right illuminators light.

Table 2-4. APPS Operating Procedures - Continued

STEP NO.	ITEM PROCEDURE
5	Check that desired eyepieces, fixed or zoom, are installed. If not, replace eyepieces and measuring marks. (See table 2-2, steps 14 and 15.)
6	If monocular eye guards are desired, do the following: a. Remove eye guards from case 5 (large eye guards for zoom eyepieces, small eye guards for fixed eyepieces). b. Install eye guards on eyepieces.
7	Perform daily checks. (See tables 2-1 and 2-3.)
	EQUIPMENT TURN-OFF
1	TID Set power switch at OFF.
2	OMS Press S1 power switch.
3	Calculator Set ∿ power switch at 0.
4	DAC Set A.C. POWER S1 switch at OFF.

2-8. PREPARATION FOR MOVEMENT - Preparing the APPS for movement consists of disassembling the system and packing the system components in the carrying and transit cases. Refer to figures 2-8 thru 2-11 to ensure that the cases are packed correctly. To disassemble and pack the APPS do the procedures given in table 2-5.

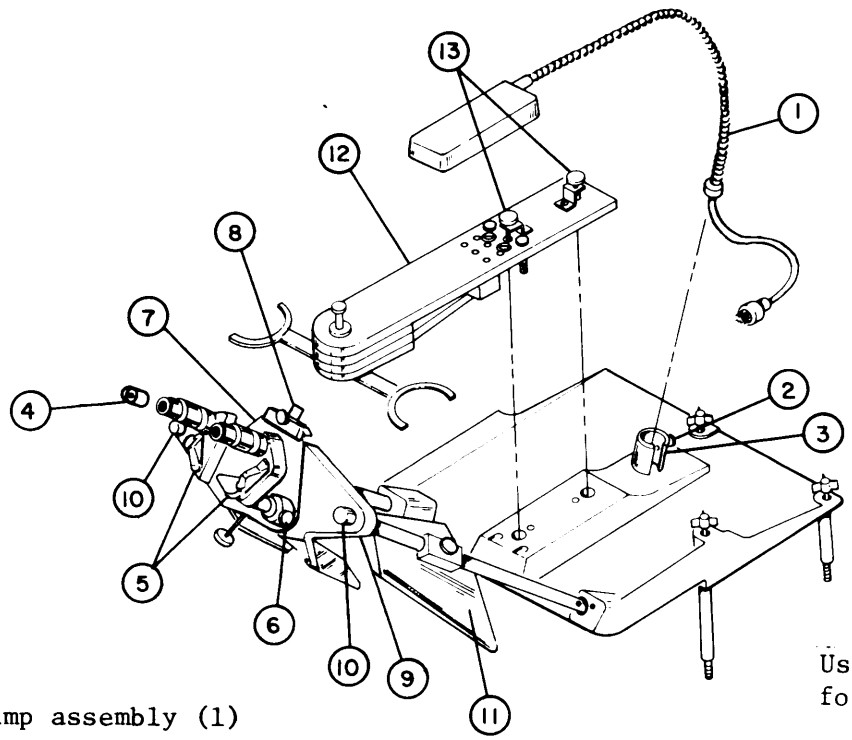
2-9. OPERATING INSTRUCTIONS ON INSTRUCTION PLATES -Figure 2-13 illustrates the locations of the instruction plates on the APPS. The operator must be aware of these instructions during equipment operation.

SECTION IV. OPERATION UNDER UNUSUAL CONDITIONS

2-10. OPERATION IN UNUSUAL WEATHER - Accuracy of the APPS is degraded when the system is operated in unusual weather. All possible attempts should therefore be made to keep the system in a climate-controlled environment. In locations where this is not possible, take whatever measures possible to keep the APPS free from dust, sand, moisture, and at a temperature of 55 to 85°F (12 to 29°C).

Table 2-5. APPS Disassembly Procedures

STEP NO.	ITEM PROCEDURE
1	Turn off APPS equipment. (See table 2-4.)
2	Disconnect all cable connections.
3	Interconnecting cables (8 each) - Pack in case 2.
4	TID lamp control assembly - Pack in case 4.
5	Digital Display - Pack in case 2.
6	Calculator - Pack in case 2.
7	DAC - Pack in case 3.
8	DIC - Disconnect from OMS and pack in case 2.
9	Lamp assembly (1) a. Loosen screw (2). b. Remove lamp assembly from hole in base plate (3). c. Pack in case 5. Fold cable and store beneath locking device.
10	Eye guards (4) (if installed) - Remove from monocular and pack in case 5.



Use this illustration for steps 9 through 15

Table 2-5. APPS Disassembly Procedures - Continued

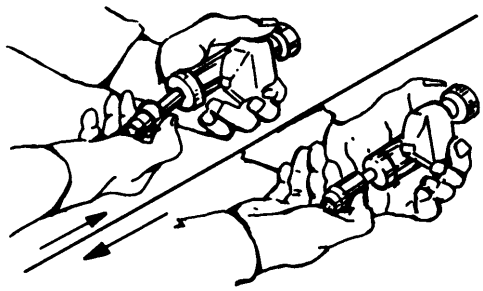
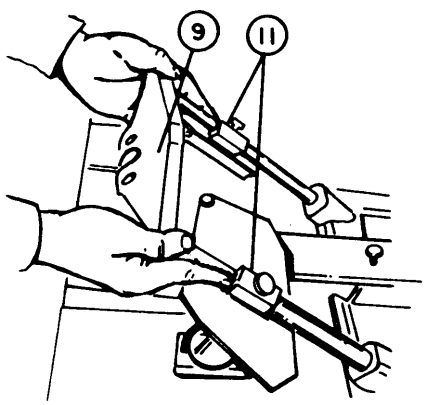
STEP NO.	ITEM PROCEDURE
11	Monocular with eyepieces (5) a. Loosen two knurled screws (6). b. Pull monocular straight out from mounting plate assembly.  c. If zoom eyepieces are installed, remove and replace with fixed eyepieces from case 5. d. Pack zoom eyepieces in case 5. e. Pack monocular in case 5.
12	Mounting plate assembly (7) a. Loosen screw (8). b. Remove plate assembly and pack in case 5.
13	Prism holder (9) Through bolts (2 each) (10) a. Loosen both through bolts. b. Remove bolts and pack in case 5.  c. Carefully lift prism off large mirror assemblies (11). d. Pack prism holder in case 5.
14	Large mirror assemblies (2 each) - Remove both mirror assemblies and pack in case 5.
15	Measuring mark bridge (12). Measuring marks (2 each) a. Loosen two knurled screws (13) and remove measuring mark bridge. b. Remove both measuring marks by pulling them straight out from bridge.

Table 2-5. APPS Disassembly Procedures - Continued

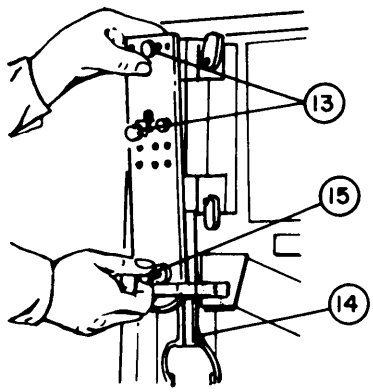
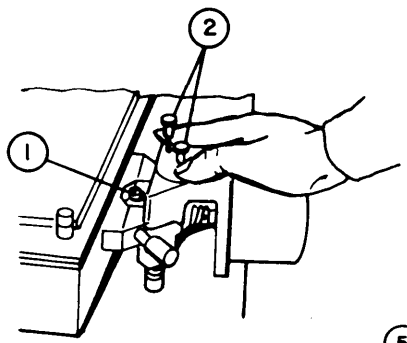
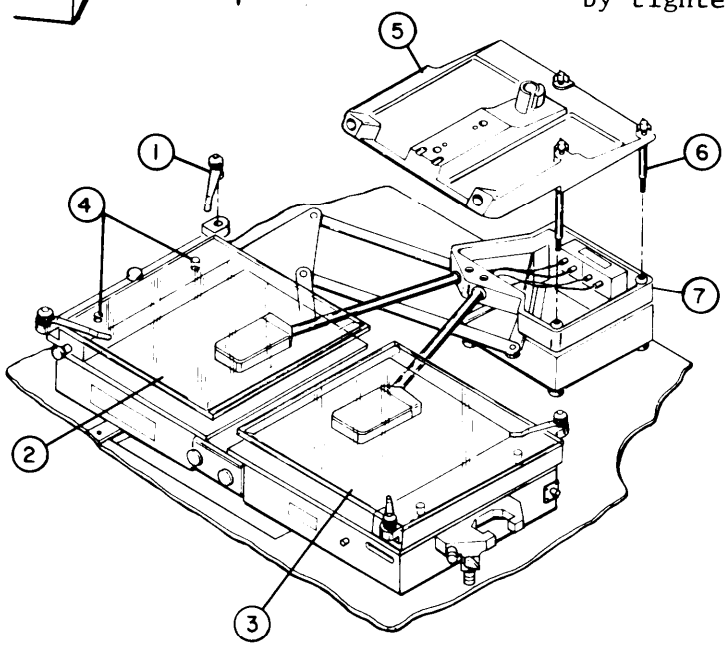
STEP NO.	ITEM PROCEDURE
	c. Pack measuring marks in case 5.  d. Rotate holder (14) in line with bridge. e. Back off height adjust (15). f. Pack bridge in case 4. g. Tighten two knurled screws (13).
16	X-axis encoder (4).  a. Using a screwdriver, loosen set screw (1). b. Loosen two knurled screws (2). c. Lift up on knurled screws and pull encoder to the right to remove. d. Pack encoder in case 4 and secure by tightening two knurled screws.  Use this illustration for steps 17 through 19

Table 2-5. APPS Disassembly Procedures - Continued

STEP NO.	ITEM PROCEDURE
17	Photo clips (4 each) (1). a. Unscrew one clip at each outside corner of both photo plates. b. Pack clips in case 5 by screwing each one in place.
18	Left photo plate (2). Right photo plate (3). a. Using a screwdriver, unscrew two recessed screws (4) in left photo plate. b. Pack photo plate in case 4. c. Repeat for right photo plate.
19	Stereoscope base plate (5). TID capstan bolts (3 each) (6). a. Loosen three capstan bolts. b. Remove bolts and pack in case 5. c. Lift base plate off TID assembly (7) and pack in case 5. d. Lift off TID assembly.
20	Spacer (8). Right TID illuminator (9). Left TID illuminator (10). a. Unplug lamp jacks (11). b. Loosen two knurled screws (12). c. Remove left and right illuminators and pack in case 4. d. Pack spacer in case 4.

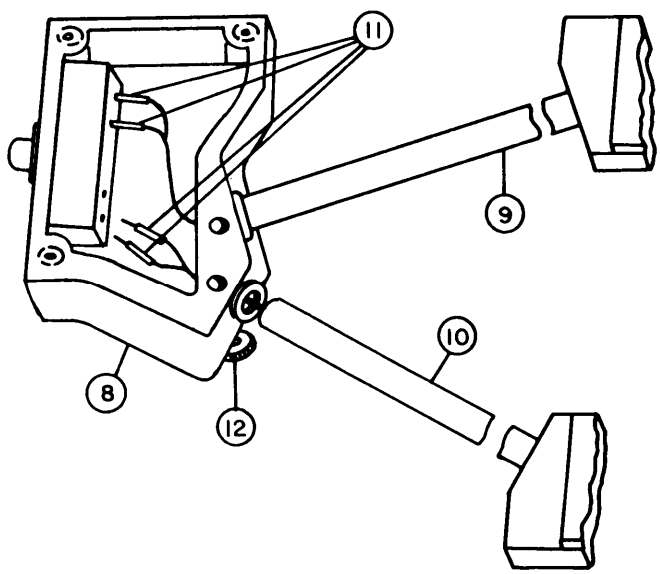
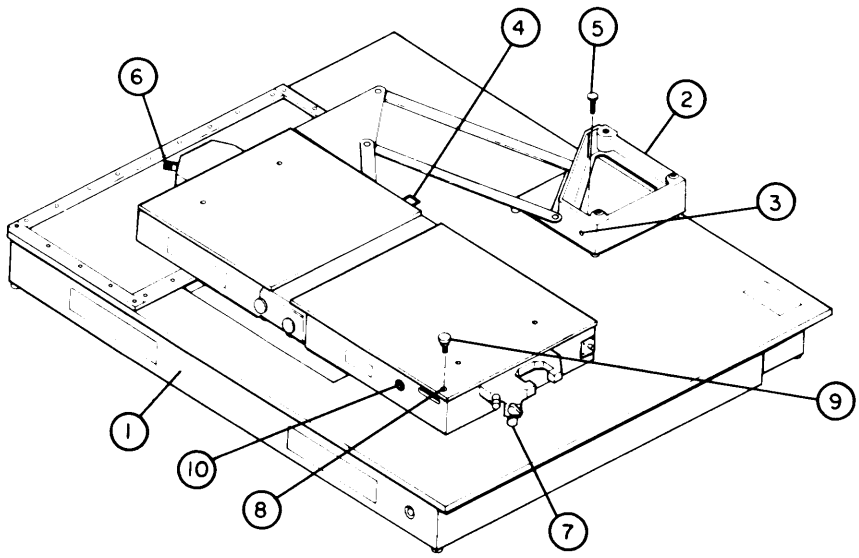


Table 2-5. APPS Disassembly Procedures - Continued

STEP NO.	ITEM PROCEDURE
21	Photo-carriage (1)



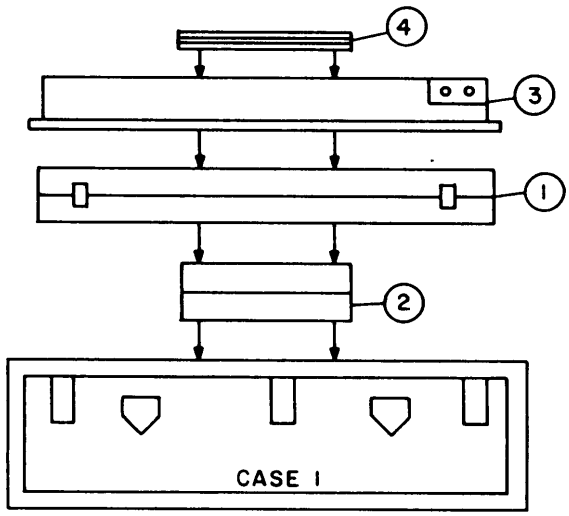
CAUTION

Do not exert pressure on parallelogram.

a. Slide anchor block (2) towards photo-carriage.
b. Align hole (3) at front of anchor block with standoff (4) at rear of photo-carriage.
c. Remove red locking screw (5) from storage hole. Insert in red transport hole (3).
d. Tighten locking screw.
e. Rotate parallax adjust screws (6) and (7) until transport hole (8) in right photo plate aligns with hole in photo-carriage.
f. Remove red screw (9) from red storage hole (10) at front of photo-carriage and insert in transport hole.
g. Tighten screw.
h. Pack photo-carriage in case 4

Table 2-5. APPS Disassembly Procedures - Continued

STEP NO.	ITEM PROCEDURE
22	Case 4 (1) Case 5 (2) Base Plate (3) Dust Cover (4)



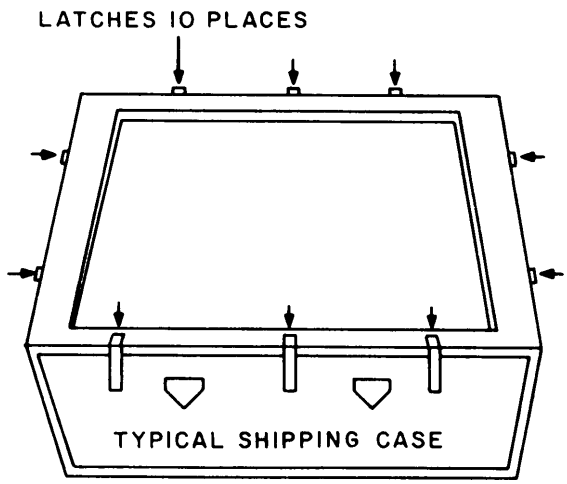
a. Check that all holddown screws are tight and all components are packed as shown in figures 2-8 thru 2-11.

b. Close and lock carrying cases 4 and 5.

c. Pack cases 4 and 5 inside shipping case

CAUTION

To avoid damaging base plate/data grid use caution during packing.



d. Turn base plate upside down. Pack base plate and dust cover in case 1.

e. Pack expendable materials and other supplies in case 3.

f. Close three shipping cases and secure ten latches.

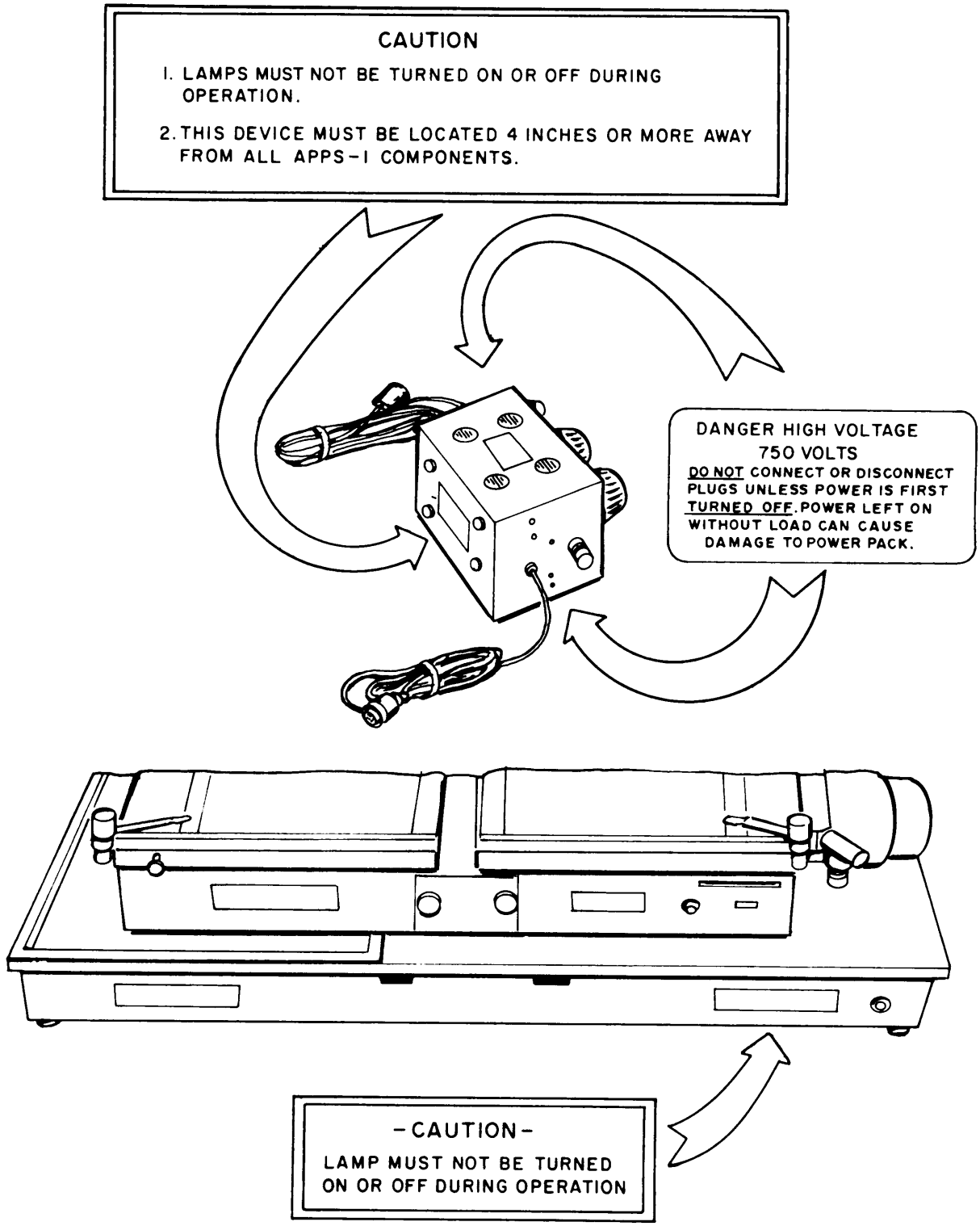


Figure 2-13. APPS Instruction Plate Locations

CHAPTER 3

MAINTENANcE INSTRUCTIONS

SECTION I. LUBRICATION INSTRUCTIONS

3-1. LUBRICATION - None required.

SECTION II. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

3-2. COMMON TOOLS AND EQUIPMENT - For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

3-3. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT - No special tools, Test, Maintenance, and Diagnostic Equipment (TMDE), and support equipment are required for organizational maintenance.

3-4. REPAIR PARTS - Repair parts for this equipment are listed in the Repair Parts and Special Tools List, TM 5-1260-206-24P covering organizational maintenance.

SECTION III. TROUBLESHOOTING PROCEDURES

3-5. SCOPE -

a. Table 3-1 lists the common malfunctions which you may find during operation or maintenance of the APPS or its components. You should perform the test/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

3-6. TROUBLESHOOTING TABLE - Table 3-2 lists troubleshooting procedures for the APPS. Before doing these procedures:

- Check that system is properly assembled
- Check that all cable connections are secure
- Check that all switches are in the proper positions
- Perform initial adjustments and daily checks given in table 2-3.

Table 3-1. APPS Symptom Index

SYMPTOM	TABLE 3-2 MALFUNCTION
Obtained readings out of tolerance	1
System degradation suspected	2
One DIC pushbutton indicator not lit	3
All DIC pushbutton indicators not lit	4
DAC power indicator not lit	5
OMS overhead lamps do not light	6
Impaired image of photography	7
TID illuminators do not light	8
⊢ does not appear on calculator display	9
Calculator printer does not print point positioning data	10
Digital display read-out not lit	11

3-7. CALCULATOR ERROR MESSAGES - When an error occurs during system operation, an error message will appear in the calculator display. Table 3-3 provides a listing of the more common error messages and explains their meanings. Most error messages that are not listed are caused by incorrect operating procedures. Correct this by doing the procedure over again. If the same error persists, repeat the procedure again using a new tape cartridge. If this does not solve the problem, refer the APPS to DS/GS maintenance personnel.

3-8. DIAGNOSTIC PROCEDURES - Three diagnostic programs are provided for fault isolation:

- Hewlett Packard System Test . . . . . table 3-4
- IDP 03 Grid Measure In Thousandths of Inch. . . table 3-5
- IDP 01 Grid Comparator . . . . . table 3-6

Table 3-2. Troubleshooting Procedures

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
APPS
1. Obtained Readings Out of Tolerance
Step 1. Perform IDP 03 diagnostic. (See table 3-5.) If performed successfully, do step 2. If not performed successfully, refer system to DS/GS maintenance personnel.
Step 2. Perform IDP 01 diagnostic. (See table 3-6.) If performed successfully, no equipment fault exists. Refer to PPDB operator's manual to verify procedures. If not performed successfully, refer OMS to DS/GS maintenance personnel.
2. System Degradation Suspected
Step 1. Perform IDP 03 diagnostic. (See table 3-5.) If performed successfully, do step 2. If not performed successfully, refer equipment to DS/GS maintenance personnel.
Step 2. Perform IDP 01 diagnostic. (See table 3-6.) If performed successfully, no degradation exists. If not performed successfully, refer OMS to DS/Gs maintenance personnel.
DIC
3. One Pushbutton Indicator Not Lit
Check that other pushbutton indicators are lit. If lit, replace faulty lamp. (See table 3-7.) If out, see item 4.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

DIC - Continued

4. All Pushbutton Indicators Not Lit

Step 1. Check that DIC unit is securely seated on OMS.

Seat DIC unit firmly into connector.

Step 2. Check that DAC power indicator is lit.

If lit, OMS wiring, DIC unit, or DAC power supply is defective. Refer to DS/GS maintenance personnel.

If out, see item 5.

DAC

5. DAC Power Indicator Not Lit

Step 1. Check that DIC pushbutton indicators are lit.

If lit, replace lamp.

If out, replace fuse. (See figure 2-1, item no. 3.)

Step 2. Check that malfunction is corrected.

If not, refer faulty DAC unit to DS/GS maintenance personnel.

OMS

6. Lamps In Overhead Lamp Assembly Do Not Light

Step 1. Check that OMS fuse F1 is good by replacing with known good fuse. (See figure 2-2, item no. 12.)

If good, replace faulty overhead lamps.

If bad, replace fuse.

Step 2. Check that malfunction is corrected.

If not, refer faulty OMS to DS/GS maintenance personnel.

Table 3-2. Troubleshooting Procedures - Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
OMS - Continued
7. Impaired Image of Photography Do PMCS item no. 3 thru 8. (See table 2-1.) If malfunction is not corrected, refer faulty OMS to DS/GS maintenance personnel.
TID
8. Illuminators Do Not Light Step 1. Check whether both illuminators do not light. If both, do step 2. If one, replace illuminator. (See table 3-7.) Step 2. Check that power indicator on lamp control assembly is lit. (See figure 2-3, item no. 3.) If lit, replace illuminator. (See table 3-7.) If out, do step 3. Step 3. Check that fuse F1 on lamp control assembly is good by replacing with known good fuse. (See figure 2-3, item no. 5.) If good, refer faulty TID to DS/GS maintenance personnel. If bad, replace fuse. Step 4. Check that malfunction is corrected. If not, refer faulty TID to DS/GS maintenance personnel.
CALCULATOR
9. ⊢ Does Not Appear On Display Check that calculator fuse is good by replacing with known good fuse. (See figure 2-4, item no. 4.) If good, refer faulty calculator to DS/GS maintenance personnel. If bad, replace fuse.

Table 3-2. Troubleshooting Procedures - Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
CALCULATOR - Continued
10. Printer Does Not Print Point Positioning Data
Step 1. Perform calculator System Test Cartridge diagnostic. (See table 3-3.) If performed successfully, do step 2. If not performed successfully, refer faulty calculator to DS/GS maintenance personnel.
Step 2. Perform IDP 03 diagnostic. (See table 3-4.) If performed successfully, no equipment fault exists. Refer to PPDB operator's manual to verify procedures. If not performed successfully, refer faulty calculator interface to DS/GS maintenance personnel.
DIGITAL DISPLAY
11. No Display
Perform IDP 03 diagnostic. (See table 3-4.) If performed successfully, refer faulty digital display to DS/GS maintenance personnel. If not performed successfully, refer APPS system to DS/GS maintenance personnel.

Table 3-3. Calculator Error Message Explanation

ERROR MESSAGE	EXPLANATION
G4, G8	Hardware or peripheral problem. Check that all cables and ROM's are plugged in and seated properly. ,
G9	Indicates that the I/O selecter code is wrong. See table 2-3, step 5.
15	Printer out of paper or printer failure. See table 2-3, step 3.
20, 29	Missing or malfunctioning ROM. Check that the ROM's located on the lower front of the calculator are firmly seated.
41	No cartridge in tape transport. Check that cartridge is firmly seated.
42	Tape cartridge is write protected and calculator cannot execute RECORD statement. Slide RECORD tab on tape cartridge to opposite (record) position.
43	Unexpected beginning-of-tape or end-of-tape marker encountered. Try a new tape. If tape transport fails, call DS/GS maintenance.
46	Read error of tape file body. Clean tape head as explained in table 2-1.
47	Read error of file head. Clean tape head as explained in table 2-1.
60	The tape being loaded into calculator memory does not have any data recorded on it.
65	Indicated tape file cannot be found. The tape has probably been altered. Obtain another tape.

Table 3-4. Calculator System Diagnostic Procedures

ITEM NO.	ACTION	CALCULATOR INDICATION DISPLAY PRINTER
1	Apply power to Calculator.	⊢
2	Insert system test cartridge into Calculator.	
3	**Press:** [REWIND]	
4	When tape-running light (1) goes out, press: [RESET] [ERASE] [A] [EXECUTE] [L] [D] [B] [EXECUTE]	WHICH TEST(S)?
5	Press:	R/W MEMORY TEST
	NOTE If the wrong key is pressed while entering the test number, press: [STOP] [CONTINUE] and then repeat the step.	R/W MEMORY TEST 60K BOARD PASSED 70K BOARD PASSED 50K BOARD PASSED R/W MEMORY TEST COMPLETE
		WHICH TEST(S)?

Table 3-4. Calculator System Diagnostic Procedures - Continued

ITEM NO.	ACTION	CALCULATOR INDICATION DISPLAY PRINTER
6	ress: [2] [CONTINUE]	ROM TEST ROM TEST ROMS ON SYSTEM: MAINFRAME 32 K 34 K 36 K 40 K 42 K 44 K 46 K ROMS IN ERROR: NONE ROM TEST COMPLETE WHICH TEST(S)?
7	Press: [3] [CONTINUE]	PROCESSOR TEST PROCESSOR PASSED WHICH TEST(S)?
8	Press: [4] [CONTINUE]	CARTRIDGE TEST CARTRIDGE TEST COMPLETE INSERT SCRATCH CARTRIDGE
9	Push eject bar and remove system test cartridge.	

Table 3-4. Calculator System Diagnostic Procedures - Continued

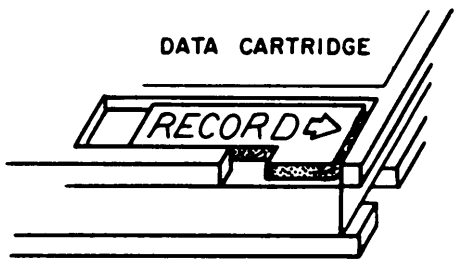
ITEM NO.	ACTION	CALCULATOR INDICATION DISPLAY PRINTER
10	 Take blank cartridge IDP 04 and move RECORD switch to right. Insert cartridge into Calculator	
11	Press: CONTINUE	CARTRIDGE TEST COMPLETE REPLACE TEST CARTRIDGE
12	Remove blank cartridge from Calculator. Reinsert system test cartridge.	
13	Press: CONTINUE	WHICH TEST(S)?
14	Press: 5 CONTINUE	PRINTER TEST PRINTER TEST ========== ========== ==========

Table 3-4. Calculator System Diagnostic Procedures - Continued

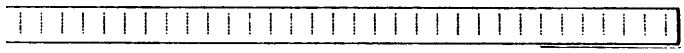
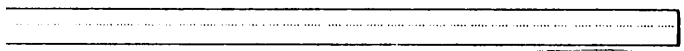
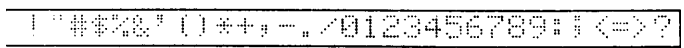
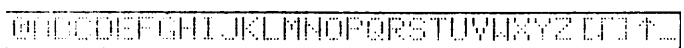
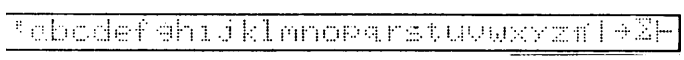
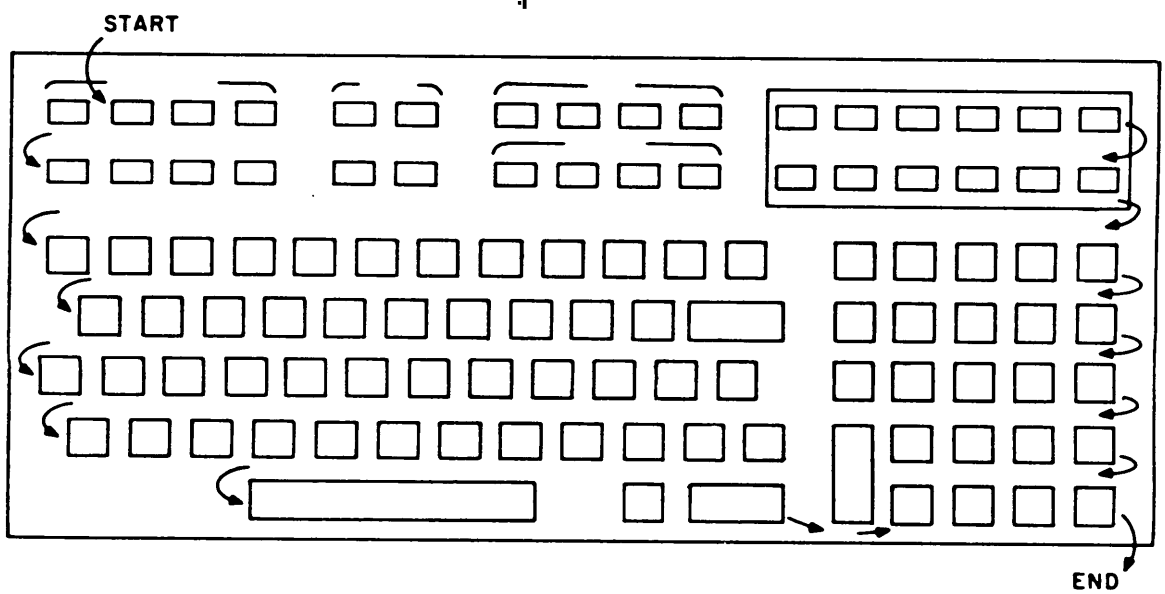
ITEM NO.	ACTION	CALCULATOR INDICATION DISPLAY PRINTER
15	Press: [6] [CONTINUE] **NOTE** If you need more time to check any of the displays, press: [CONTINUE]. Press: [CONTINUE] again to resume the test.	 PRINTER TEST COMPLETE WHICH TEST(S)? DISPLAY TEST DISPLAY TEST  5 SECONDS, THIS DISPLAY MAY FLICKER  3 SECONDS  3 SECONDS  20 SECONDS  20 SECONDS  20 SECONDS  20 SECONDS DISPLAY TEST COMPLETE WHICH TEST(S)?

Table 3-4. Calculator System Diagnostic Procedures - Continued

ITEM NO.	ACTION	CALCULATOR INDICATION DISPLAY PRINTER
16	Press: [7] [CONTINUE]	KEYBOARD TEST
17	Press: [PRT ALL]	Subsequent keys are called.
18	Press each key as it is called:	



NOTE

Use pencil to press

[RECORD].

Remember to press:

[SHIFT LOCK]

before pressing: [A]

and [SHIFT] before

pressing: [Z].

KEYBOARD TEST COMPLETE

Table 3-4. Calculator System Diagnostic Procedures - Continued

ITEM NO.	ACTION	CALCULATOR INDICATION DISPLAY / PRINTER
19	**Press:** [,] [0] [CONTINUE] **to end system test.**	F
20	**Press:** [REWIND]	
21	**When tape running light goes out press eject bar and remove tape cartridge.**	

Table 3-5. IDP 03 Grid Measure in Thousandths of Inch Diagnostic Procedures

ITEM NO.	ACTION	INDICATION	
		DIGITAL DISPLAY	CALCULATOR PRINTER
1	Apply power to system.		
2	Secure 10-mm grid on right TID photo plate.		
3	Insert ITC-001 diagnostic cartridge into Calculator.		
4	Press: [REWIND]		
5	When tape-running light (1) goes out, press: [RESET] [ERASE] [A] [EXECUTE] [T] [R] [K] [O] [EXECUTE] [LOAD] [2] [EXECUTE]		
6	When tape-running light goes out, press: [RUN]		
7	Move photo-carriage to approximate center of datagrid. Push photo-carriage lock lever down.		

Table 3-5. IDP 03 Grid Measure in Thousandths of Inch Diagnostic Procedures - Continued

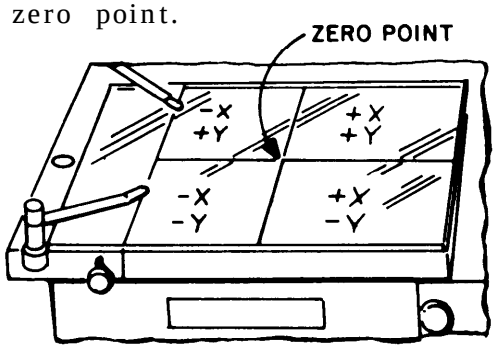
ITEM NO.	ACTION	INDICATION	
		DIGITAL DISPLAY	CALCULATOR PRINTER
8	Press [ZERO] Sonalert sounds	X=0.000 Y=0.000	BUTTON CODE SAE ZERO 50000.1 Y 0.0 X 0.0 50000.2 0.0 0.0 50000.2 0.0 0.0 50000.3 0.0 0.0 50000.4 0.0 0.0 50000.1 0.0 0.0
	[MEAS CONT] Sonalert sounds		
	[INDEX] Sonalert sounds		
	[REJECT] Sonalert sounds		
	[TERM] Sonalert sounds		
	[TTY] Sonalert sounds		
9	Press footswitch.		
10	Push photo-carriage lock level up. Move photo-carriage such that measuring mark is over the zero point. 		
11	Press: [ZERO] [MEAS CONT]	X=0.000 Y=0.000	50000.1 0.0 0.0
12	Move photo-carriage such that measuring mark is over the +X, +Y quadrant. Push photo-carriage lock lever down.	X counts Y counts	50000.1 0.0 0.0

Table 3-5. IDP 03 Grid Measure in Thousandths of Inch Diagnostic Procedures - Continued

ITEM NO.	ACTION	INDICATION	
		DIGITAL DISPLAY	CALCULATOR PRINTER
13	Press: [MEAS CONT] or footswitch.	Digital Display read-out identical to Calculator print-out for X and Y.	
14	Repeat 12 and 13 for: +X, -Y quadrant -X, -Y quadrant -X, +Y quadrant		
15	Move photo-carriage to lower left corner.		
16	Press: [ZERO]	X=0.000 Y=0.000	
17	Move photo-carriage very slowly to the right (+X-axis direction;	X displays all numbers 0.001 thru 0.009 0.010 thru 0.090 0.100 thru 0.900 1.000 until stop	
18	If a number is skipped over do the following: a. Move photo-carriage to suspect position b. Press: [MEAS CONT]	Digital Display read-out identical to Calculator print-out for X and Y.	
19	Return photo-carriage to lower left corner.		
20	Move photo-carriage very slowly to the rear (+Y-axis direction).	Y displays all numbers 0.001 thru 0.009 0.010 thru 0.090 0.100 thru 0.900 1.000 until stop	

Table 3-5. IDP 03 Grid Measure in Thousandths of Inch Diagnostic Procedures - Continued

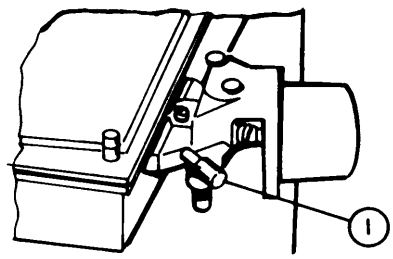
ITEM NO.	ACTION	INDICATION	
		DIGITAL DISPLAY	CALCULATOR PRINTER
21	If a number is skipped over, do step 18. 		
22	Push photo-carriage lock lever down.		
23	Press: ZERO		
24	Rotate X-axis parallax adjust (1) clockwise one revolution.		
25	Press: MEAS CONT		approx. 51000.1 0.0 0.0
26	Press: ZERO	X=0.000 Y=0.000	
27	Rotate X–axis parallax adjust counterclockwise one revolution.		
28	Press: MEAS CONT	X=0.000 Y=0.000	approx. 49000.1 1.0 0.0
29	Rotate X-axis parallax adjust counterclockwise until stop is reached.		
30	Look through right monocular. Rotate X-axis parallax adjust clockwise until 10-mm grid line is directly under measuring mark dot.		
31	Press: ZERO	X=0.000 Y=0.000	

Table 3-5. IDP 03 Grid Measure in Thousandths of Inch Diagnostic Procedures – Continued

ITEM NO.	ACTION	INDICATION	
		DIGITAL DISPLAY	CALCULATOR PRINTER
32	Without moving photo–carriage, rotate X–axis parallax adjust clockwise until next 10–mm grid line is directly under measuring mark dot.		50000.1 0.0 0.0
33	Press: MEAS CONT or footswitch.	X=0.000 Y=0.000	55000.1 (±10. 0.0 0.0
34	Repeat steps 31 thru 33.		
35	Repeat steps 31 thru 33 again.		
36	Press: ZERO	X=0.000 Y=0.000	50000.1 0.0 0.0
37	Without moving photo-carriage, rotate X-axis parallax adjust counterclockwise until next 10-mn grid line is directly under measuring mark dot.		
38	Press: MEAS CONT or footswitch.	X=0.000 Y=0.000	45000.1 (±10. 1.0 -1.0
39	Repeat steps 36 thru 38.		
40	Repeat steps 36 thru 38 again.		
	NOTE Always approach grid lines from direction indicated. If a grid line is overshot, back up past the line and continue.		

Table 3-6. IDP 01 Grid Comparator Diagnostic Procedures

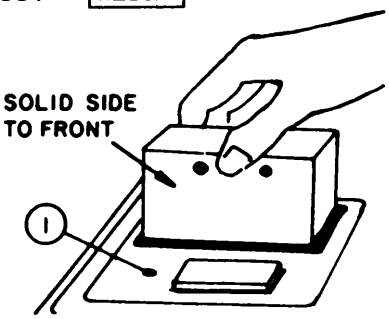
ITEM NO.	ACTION	CALCULATOR INDICATION DISPLAY PRINTER
1	Apply power to system.	
2	Secure 10-mm grid on left TID photo plate.	
3	Press: [RESET]	
4	 Insert ITC-001 diagnostic cartridge into Calculator.	
5	Press: [REWIND]	
6	When tape-running light (1) goes out, press: [RESET] [ERASE] [A] [EXECUTE] [T] [R] [K] [O] [EXECUTE] [LOAD] [0] [EXECUTE]	

Table 3-6. IDP 01 Grid Comparator Diagnostic Procedures – Continued

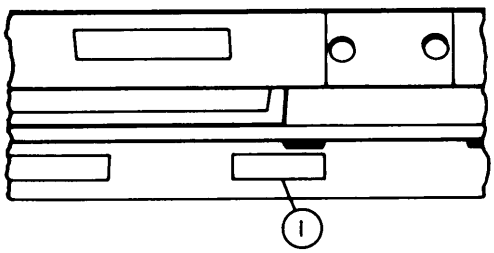
ITEM NO.	ACTION	CALCULATOR INDICATION DISPLAY PRINTER
7	When tape-running light goes out, press: RUN	K? IF SYSTEM NEEDS DATA GRID CORRECTIONS PRESS: 1 CONTINUE IF NO CORRECTION NEEDED PRESS: CONTINUE
8	 A red sticker (1) on OMS indicates need for correction coefficients. If sticker is present, do the following: a. Press: 1 CONTINUE b. Press eject bar and remove diagnostic cartridge. c. Insert correction cartridge into Calculator. d. Using numeric keyboard, enter OMS serial number into Calculator. e. Press: CONTINUE	I? MOUNT CORRECTION COEFFICIENT TAPE ENTER SERIAL NUMBER PRESS: CONTINUE

Table 3-6. IDP 01 Grid Comparator Diagnostic Procedures - Continued

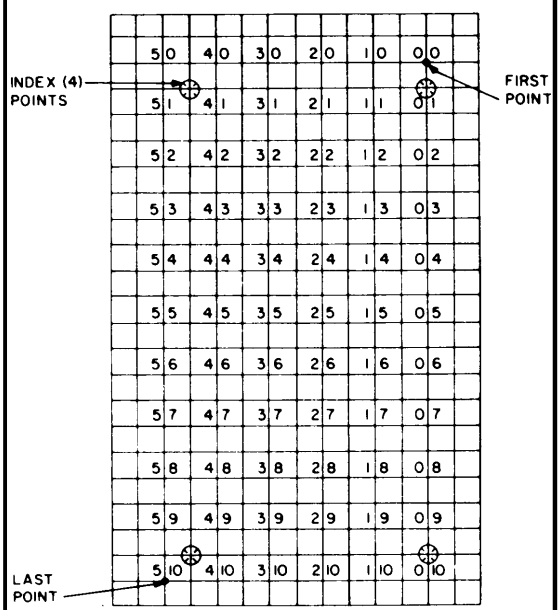
ITEM NO.	ACTION	CALCULATOR INDICATION DISPLAY PRINTER
9	If no red sticker is present, press: [0] [CONTINUE]	ZERO APPS IN LOWER LEFT CORNER measure index point
10	Move photo-carriage to front left corner of base plate.	
11	Press: [ZERO]  	
12	Look through left monocular. Move photo-carriage to position an index point under measuring mark dot.	
13	Press: [MEAS CONT] or footswitch	point # _____

Table 3-6. IDP 01 Grid Comparator Diagnostic Procedures – Continued

ITEM NO.	ACTION	CALCULATOR INDICATION DISPLAY PRINTER
14	Proceeding in a counterclockwise direction, repeat steps 12 and 13 for remaining three index points.	point # _____ _____ _____
15	If any of the four points were measured incorrectly or if residuals are greater than 0.030, do the following: a. Press: [1] [CONTINUE] b. Remeasure all four index points.	point # _____ _____ _____ point # _____ _____ _____ residual= pt ____ x= _____ y= _____ residuals pt ____ x= _____ y= _____ residuals pt ____ x= _____ y= _____ residuals pt ____ x= _____ y= _____
16	Press: [0] [CONTINUE]	measure test point, or reject
17	Look through left monocular. Move photo-carriage to position first point (00) under measuring mark dot.	
18	Press: [MEAS CONT] or footswitch.	x= _____ xres= _____ y= _____ yres= _____

Table 3-6. IDP 01 Grid Comparator Diagnostic Procedures - Continued

ITEM NO.	ACTION	CALCULATOR INDICATION DISPLAY PRINTER
19	If point was measured incorrectly, do the following: a. Press: REJECT b. Remeasure point	
20	Repeat steps 16 and 17 for remaining 65 points in right-to-left, top-to-bottom sequence	
21	Press: TERM	rms x= (less than 30) rms y= (less than 30) **NOTE** System performance is acceptable when rms x and rms y are both less than 30.

SECTION IV. MAINTENANCE PROCEDURES

3-9 INTRODUCTION - Operator and organizational maintenance of the APPS consists of accessing and cleaning lenses, prisms, mirrors, and measuring marks; servicing air filters; and replacement of failed lamps and fuses. Instructions for replacing common lamps and fuses are not included.

3-10. MAINTENANCE TABLE - Table 3-7 provides maintenance procedures for the APPS.

WARNING

All operator and organizational maintenance procedures involving removal and replacement of components are to be performed with all power switches off. See table 2-4 for equipment turn-off instructions.

Table 3-7. Maintenance Procedures

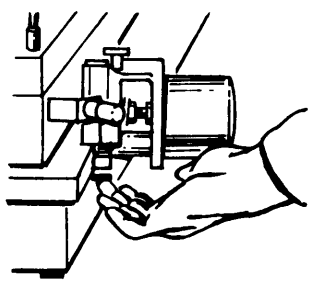
ITEM TO BE SERVICED	ACTION	
OMS		
1. Large Mirrors	Removal	See table 2-5, steps 10 thru 14.
2. Large Mirrors	Cleaning	See table 2-1, items 4 and 5.
3. Large Mirrors	Replacement	See table 2-2, items 11 thru 14.
4. Measuring Marks	Removal, Servicing, and Replacement	See table 2-1, item 8.
5. Monocular Lenses	Servicing	See table 2-1, item 7.
6. Prisms	Removal	See table 2-5, steps 10 thru 13.
7. Prisms	Cleaning	See table 2-1, item 6.
8. Prisms	Replacement	See table 2-2, steps 12 thru 14.
9. Small Mirrors	Removal	See table 2-5, steps 10 thru 13.
10. Small Mirrors	Cleaning	See table 2-1, items 4 and 5.
11. Small Mirrors	Replacement	See table 2-2. steps 11 thru 14.
12. Photo-carriage Brake Foot	Replacement	Check that old brake foot has been completely removed.  2. Remove new foot from adhesive backing and press into place.
DAC		
Filter	Servicing	See table 2-1, item 11.

Table 3-7. Maintenance Procedures - Continued

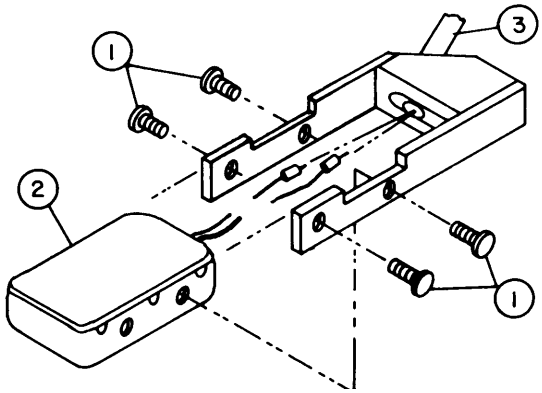
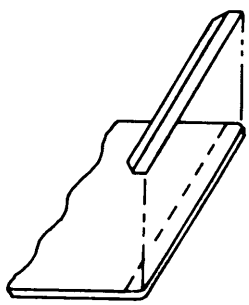
ITEM TO BE SERVICED	ACTION	PROCEDURE
TID		
1. Illuminators	Removal	1. See table 2-5, steps 9 thru 21.  2. Remove four screws (1). 3. Remove illuminator (2). Pull cord and plugs through tube (3).
2. Illuminators	Replacement	1. Thread cord and plugs through tube. 2. Position illuminator. Secure with four screws. 3. See table 2-2, steps 1 thru 16.
3. Illuminators	Cleaning	See table 2-1, item 3.
4. Photo Holders	Replacement	1. Check that old photo holders have been completely removed and photo plate surfaces are clean.  2. Remove wide photo holder from adhesive backing and press onto right photo plate. 3. Remove narrow photo holder from adhesive backing and press onto left photo plate.

Table 3-7. Maintenance Procedures - Continued

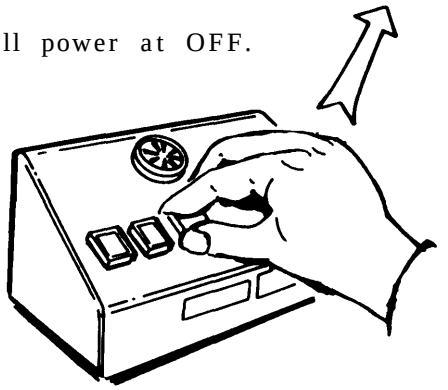
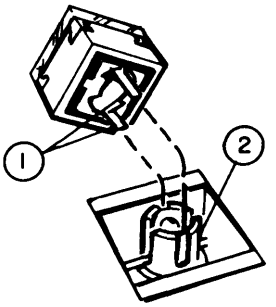
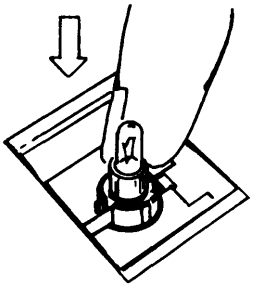
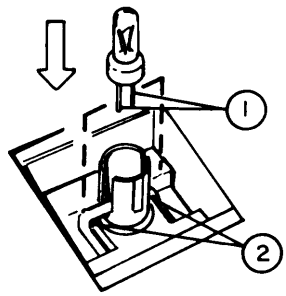
ITEM TO BE SERVICED	ACTION	PROCEDURE
CALCULATOR		
Filter	Servicing	See table 2-1, item 10.
Tape Head	Cleaning	See table 2-1, item 9.
DIC		
1. Switch Cap	Removal	1. Set all power at OFF.  2. Remove Switch Cap.
2. Switch Cap	Replacement	 Align switch cap pins (1) with lamp collar (2) and press into place.
3. Lamp	Removal	1. Remove switch cap.  2. Press down on lamp collar and remove lamp, by grasping between thumb and finger. Pull firmly.

Table 3-7. Maintenance Procedures - Continued

ITEM TO BE SERVICED	ACTION	PROCEDURE
DIC - Continued		
4. Lamp	Replacement	 1. Align lamp pins (1) with contacts (2) and insert lamp. 2. Replace switch cap.

APPENDIX A

REFERENCES

A-1. SCOPE.

This appendix lists all forms, technical manuals, and other publications referenced in this manual.

A-2. FORMS.

Recommended Changes to DA Publications ..... DA Form 2028

Recommended Changes to Equipment Technical Manuals . . . . . DA Form 2028-2

Equipment Inspection and Maintenance Worksheet . . . . . DA Form 2404

Maintenance Request ..... DA Form 2407

Packaging Improvement Report ..... DD Form 6

Quality Deficiency Report . . . . . SF 368

A-3. TECHNICAL MANUALS AND OTHER PUBLICATIONS.

Classification, Reclassification, Maintenance, Issuance, and Reporting of Maintenance Training Aircraft ..... AR 700-42

Operator's Manual for Analytical Photogrammetric Positioning System (HP 9825A Model) ..... DMATM 80-001

Depot Maintenance Work Requirement for Analytical Photogrammetric Positioning System (APPS) AN/UYK-48 NSN 1260-01-061-7081 . . . . . DMWR 5-1260-206

First Aid for Soldiers . . . . . FM 21-11

Hand Receipt Covering Content of Component of End Item (COEI), Basic Issure Items (BII), and Additional Authorization List (AAL) for APPS, AN/UYK-48 (NSN 1260-01-061-7081) . . . . . TM 5-1260-206-12-HR

Direct Support and General Support Maintenance Manual for Analytical Photogrammetric Positioning System (APPS) AN/UYK-48 ..... TM 5-1260-206-34

Organizational, Direct Support, and General Support Maintenance Manual for HP9825A Calculator, CP-1387/U ..... TM 11-6660-263-24-2

Destruction of US Army Electronics Command Technical Equipment to Prevent Enemy Use ..... TM 750-244-2

The Army Maintenance Management System (TAMMS) ..... DA PAM 738-750

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL.

a. This section provides a general explanation of all maintenance functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS.

Maintenance functions will be limited to and defined as follows:

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

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

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

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

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

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

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

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

i. Repair. The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (services/actions) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army Equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipments/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

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

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

c. Column 3 - Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see para. B-2.)

d. Column 4 - Maintenance Category. Column 4 specifies, by the listing of a “work time” figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform the maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance

function vary at different maintenance categories, appropriate "work time" figures will be shown for each category. The number of man-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

C ..... Operator or crew.
O ..... Organization maintenance.
F ..... Direct support maintenance.
H ..... General support maintenance.
D ..... Depot maintenance.

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

f. Column 6 - Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

a. Column 1 - Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. Column 2 - Maintenance Category. The lowest level of maintenance authorized to use the tool or test equipment.

c. Column 3 - Nomenclature. Name or identification of the tool or test equipment.

d. Column 4 - National Stock Number. The National stock number of the tool or TMDE.

e. Column 5 - Tool Number. The manufacturer's part number.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

a. Reference Code. The code recorded in column 6, section II.

b. Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, section II.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIP	(6) REMARKS
01	ANALYTICAL PHOTOG RAMMETRIC POSITIONING SYSTEM	Inspect	1.5		3.2				
		Test	.3		.5				
		Service	1.4						
		Adjust	.6		10.0				
		Align			2.0				
		Install	1.5		8.8				
		Replace		.7	7.4				
		Repair		.9	15.7		*		A
		Overhaul					*		A
0101	W104 CABLE	Inspect	.1						
		Replace			.1			1	
		Repair			.3		*	1	A
0102	W103 CABLE	Inspect	.1						
		Replace			.1			1	
		Repair			.3		*	1	A
0103	W106 CABLE	Inspect	.1						
		Replace			.1			1	
		Repair			.3		*	1	A
0104	W101 CABLE	Inspect	.1						
		Replace			.1			1	
		Repair			.5		*	1	A
0105	W107 CABLE	Inspect	.1						
		Replace			.1			1	
		Repair			.3		*	1	A
0106	W102 CABLE	Inspect	.1						
		Adjust	.1					7	
		Replace			.1			1	
		Repair			1.0		*	1	A
0107	W108 CABLE	Inspect	.1						
		Replace			.1			1	
		Repair			13		*	1	A
0110	DATA INPUT CONTROL	Inspect	.1		.1				
		Service	.1						C
		Install	.1						
		Replace			.2			1	
		Repair			.2		*	1 thru 7	A
		overhaul					*		A

SECTION II. MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIP	(6) REMARKS
011014A	PC BOARD ASSEMBLY	Install			.2				C
		Replace			.2			1	
		Repair					*	1 thru 7	A
0111	TRANSILLUMINATION DEVICE	Inspect	.1		.1				
		Service	.1						
		Install	.2		.4			7	
		Replace		.4	.3				
		Repair		.2	.3		*	1, 4	A
011133	ILLUMINATOR	Install			.2				
		Replace		.2					
		Repair					*	1	A
011156	ILLUMINATOR	Install			.2				
		Replace		.2					
		Repair					*	1	A
011160A	LAMP CONTROL ASSEMBLY	Install	.1						
		Repair		.1	.2		*	1	A
0112	W105 CABLE	Inspect	.2						
		Replace			.2			1	
		Repair			1.0		*	1	A
0112A	FOOTSWITCH ASSEMBLY	Inspect	.1						
		Replace			.1			1	
		Repair			.5		*	1	A
0113	OPTICAL MECHANICAL SCANNER	Inspect	.1						
		Test	.1		.5				
		Service	.9						C
		Adjust	.5		3.0				
		Install	.9		3.7			7	
		Replace		.3	1.6				
		Repair		.4	2.9		*	1, 3, 4	A
		Overhaul					*		A
011301	MEASURING MARK ASSEMBLY	Inspect	.1	.1					
		Service	.1						C
		Install	.1						
		Repair		.1				1	A

SECTION II. MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIP	(6) REMARKS
011302	LAMP ASSEMBLY	Inspect	.1	.1	.1				
		Service	.1						C
		Install	.1						
		Replace		.1					
		Repair		.1	.3		*	1, 4	A
011303	STEREOSCOPE ASSEMBLY	Inspect	.1		.1				
		Service	.1						C
		Ad just	.3						
		Install	.2						
		Repair			.2		*		A
011304	PARALLELOGRAM ASSEMBLY	Inspect			.1				
		Install			.5				
		Replace			1.0				
		Repair					*		A
		Overhaul					*		A
011305	BASE PLATE ASSEMBLY	Inspect	.1		.1				
		Service	.2						
		Adjust			2.0				
		Install	.1		2.5				
		Repair			1.9		*	1, 4	A
01130525	DATA GRID	Service	.1						C
		Install			2.5			1, 2	
		Repair					*		A
011306	PHOTO-CARRIAGE	Inspect	.1		.1				
		Service	.1						
		Adjust	.2		1.0				
		Install	.1		.3			7	
		Replace			.5				
		Repair			.5		*	1, 4	A
		Overhaul					*		A
01130658A	BALL TRANSFER ASSEMBLY	Inspect					*		
		Repair					*		
		Overhaul					*		A
01130670A	CURSOR ASSEMBLY	Inspect	.1		.1				
		Install			.2			1	
		Adjust	.2						
		Repair			.2		*		A

SECTION II. MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIP	(6) REMARKS
011306102A	BEARING BLOCK ASSEMBLY	Inspect					*		
		Repair					*		
		Overhaul					*		A
011306126A	SHAFT ANGLE ENCODER	Inspect	.1		.1				
		Install			.1				
		Replace			.2				
		Repair			.3		*		A
011307	MONOCULAR ASSEMBLY	Inspect	.1	.1					
		Service	.3						C
		Install	.3						
		Replace		.2					
		Repair		.2			*	1	A
31130705	PRISMATIC LENS ASSEMBLY	Inspect	.1	.1					
		Service	.1						C
		Install	.1						
		Replace		.1					
		Repair		.1			*		A
01130715A	MOUNTING PLATE ASSEMBLY	Inspect	.1	.1					
		Install	.1					1	A
		Repair					*	1	
01130737	PRISMATIC LENS ASSEMBLY	Inspect	.1	.1					
		Service	.1						C
		Install	.1						
		Replace		.1					
		Repair		.1			*		A
0121	HP 9825A CALCULATOR	Inspect	.1						
		Test	.1					6	B
		Service	.1						C
		Install	.1						
		Replace							

SECTION II. MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIP	(6) REMARKS
0122	DIGITAL CONTROLLER	Inspect	.1						
		Test	.1					5	
		Service	.1						C
		Adjust			.2				
		Install	.1		3.1				
		Replace		.1	3.3				
		Repair			1.0		*	1 thru 7	A
		Overhaul					*		A
012207	EXTENDER BOARD (X CARD)	Install			.5			1, 2, 7	
		Replace			.5				
		Repair					*	1 thru 7	A
012208	ANALOG BOARD (A CARD)	Install			.5			1, 2, 7	
		Replace			.5				
		Repair					*	1 thru 7	A
01229	AXIS BOARD (B AND C CARDS)	Install			.5			1, 2, 7	
		Replace			.5				
		Repair					*	1 thru 7	A
012210	DIGITIZER BOARD (D CARD)	Install			.5			1, 2, 7	
		Replace			.5				
		Repair					*	1 thru 7	A
012211	MULTIPLEXER STR BOARD (F CARD)	Install			.5			1, 2, 7	
		Replace			.5				
		Repair					*	1 thru 7	A
012212	CONTROL BOARD (G CARD)	Install			.5			1, 2, 7	
		Replace			.5				
		Repair					*	1 thru 7	A
012213	POWER SUPPLY ASSEMBLY	Inspect			.1				
		Install			.1			7	
		Adjust			.2				
		Replace			.2				
		Repair					*	1, 2, 7	A
012236	POWER DISTRIBUTION ASSEMBLY	Inspect			.1				
		Install			1.0			7	
		Replace			1.0				
		Repair			1.0		*	1,3,4,7	

SECTION II. MAINTENANCE ALLOCATION CHART - Continued

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIP	(6) REMARKS
0123	DIGITAL DISPLAY ASSEMBLY	Inspect	.1		.1				
		Service	.1						
		Install	.1		1.0				
		Replace			1.0				
		Repair			.4		*	1 thru 7	A
012303A	X-Y DISPLAY BOARD	Install			.5			1	
		Replace			.5				
		Repair					*	1 thru 7	A
012317A	X-Y DISPLAY CABLE	Install			.5			1	
		Replace			.5				
		Repair			.4		*	1 thru 7	A
0124	CASE 1	Inspect			.5				
		Repair			.5			1	
		Overhaul					*		A
0125	CASE 2	Inspect			.5				
		Repair			.5			1	
		Overhaul					*		A
0126	CASE 3	Inspect			.5				
		Repair			.5			1	
		Overhaul					*		A
0127	ALIGNMENT KIT	Inspect			.5				
		Repair			1.7				
		Overhaul					*		A
012717	PRECISION ALIGNMENT ASSEMBLY	Inspect			.1				
		Repair			1.0				
		Overhaul					*		A
012718	BAR ASSEMBLY	Inspect			.1				
		Repair			.2				
		Overhaul					*		A
012720	BLOCK ASSEMBLY	Inspect			.1				
		Repair			.2				
		Overhaul					*		A

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR AN/UYK-48

(1) TOOL OR TEST EQUIPMENT REF CODE	(2) MAINTENANCE CATEGORY	(3) NOMENCLATURE	(4) NATIONAL/NATO STOCK NUMBER	(5) TOOL NUMBER
1	0	TOOL KIT, ELECTRONIC EQUIPMENT	5180-00-610-8177	TK-105/G
2	F	MAINTENANCE KIT, APPS	-	Z85272
3	F	OSCILLOSCOPE, AN/USM-281C	6625-00-106-962	
4	F	MULTIMETER, TS-352 B/U	6625-00-553-0124	
5	0	SYSTEM TEST CARTRIDGE	-	09825-90035
6	0	DIAGNOSTIC TAPE CARTRIDGE	-	ITC 001
7	0	SCREWDRIVER, FLAT BLADE	-	R 5324

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	Depot maintenance will be defined in DMWR.
B	For information only. The HP 9825A calculator is covered by a separate TM.
C	Use materials called for in procedure.

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

Section I. INTRODUCTION

C-1. SCOPE.

This appendix lists components of end item and basic issue items for the APPS to help you inventory items required for safe and efficient operation.

C-2. GENERAL.

The Components of End Item and Basic Issue items are divided into the following sections:

a. Section II. Components of End Item. Not applicable.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the APPS in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the APPS during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization to the end items.

C-3. EXPLANATION OF COLUMNS.

The following provides an explanation of columns found in the tabular listings:

a. Column 1 - Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column 2 - National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Column 3 - Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

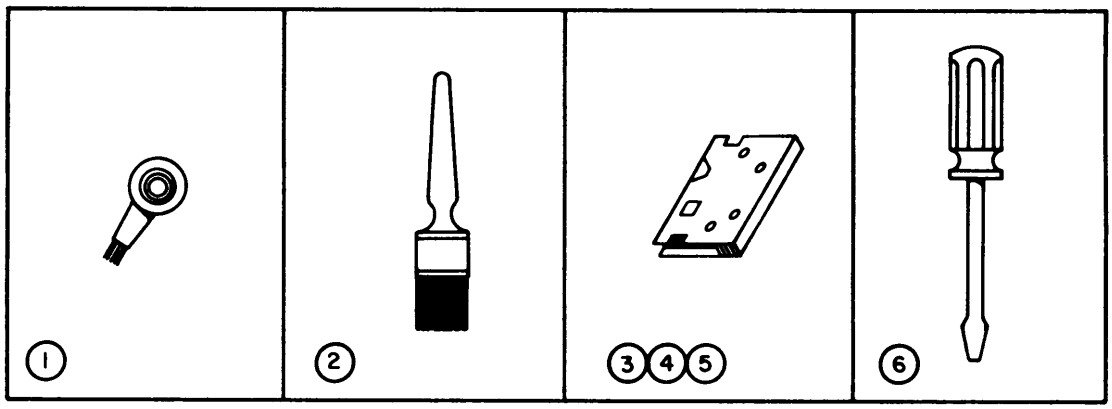
d. Column 4 - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g. ea, in, pr).

e. Column 5 - Quantity required (Qty rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	Usable On Code	(4) U/M	(5) Qty rqr
		NOT APPLICABLE			

Section III. BASIC ISSUE ITEMS



(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	Usable On Code	(4) U/M	(5) Qty rqr
1	7920-00-205-0565	BRUSH, CAMELS HAIR (81349)		EA	1
2	8020-00-559-0389	BRUSH, STIFF BRISTLE 2" X 8" (81349)		EA	1
3		CARTRIDGE, TAPE, MAGNETIC, BLANK (52326) 2017		EA	1
4		CARTRIDGE, TAPE, MAGNETIC, CALCULATOR SYSTEM TEST (52326) 2099		EA	1
5		CARTRIDGE, TAPE, MAGNETIC, DIAGNOSTIC TEST PROGRAMS (52326) 2014		EA	1
6		SCREWDRIVER, FLAT BLADE (81349) R5324		EA	1

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

D-1. SCOPE.

This appendix lists additional items you are authorized for the support of the APPS.

D-2. GENERAL.

This list identifies items that do not have to accompany the APPS and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

D-3. EXPLANATION OF LISTING.

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type of document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM & PART NUMBER USABLE ON CODE	(3) U/M	(4) QTY AUTH
	CALCULATOR COVER (28480) 9222-0495	EA	1
	CALCULATOR DUST FILTER (28480) 4208-0110	EA	1
	DAC DUST FILTER (52326) 1024	EA	1
5920-00-050-4953	FUSE, 1-1/2 AMP, 250 VOLT (81349) F02A250V1-1/2A	EA	3
5920-00-681-0918	FUSE, 3 AMP, 125 VOLT (81349) F02B125V3A	EA	1
	LAMP (92966) 120MB	EA	1
	LAMP, FLUORESCENT (95217) F4T5	EA	1

APPENDIX E

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain the APPS. This listing is for information purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except Medical, Class V, Repair Parts and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

E-2. EXPLANATION OF COLUMNS.

a. Column 1 - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. F").

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

0 -- Organizational Maintenance

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

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

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

Section II: EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	C		Balls, Cotton, J-J HRI-8137-006101	ea
2	C	7920-00-205-0565	Brush, Camels Hair	ea
3	C	8020-00-559-0389	Brush, Stiff Bristle 2" x 8"	ea
4	C	6850-00-392-9751	Cleaner, Lens	oz
5	C	6850-00-935-1082	Cleaner, Mirror	oz
6	C	6850-00-935-1082	Cleaner, Tape Head	oz
7	C		Cloth, Anti-Static, ALPEX 24-120	ea
8	C	8305-00-170-5062	Cloth, Chamois	ea
9	C		Printer Tape, HP 9821-0401	pk
10	C	6515-00-303-8250	Swabs, Cotton	ea
11	C		Tape Cartridge, Blank, IDEAS 2017	ea
12	C	6760-00-408-5175	Tissue, Lens	pk
13	C		Viny1 Gloves, TRU TOUCH 34-650	pr

APPENDIX F

PACKING LIST
ANALYTICAL PHOTOGMMMETRIC POSITIONING SYSTEM
AN/UYK-48

Shipping Case No. 1 Contents:

1 Base Plate Assy
1 Cover, Dust (System)
1 Carrying Case No. 4 Contents:

1 Photo carriage Assy
1 X-Axis Encoder
1 Measuring Mark Bridge
1 Photoplate, Left
1 Photoplate, Right
1 Illuminator, Left
1 Illuminator, Right
1 Spacer
1 Lamp Control Assy

1 Carrying Case No. 5 Contents:

1 Screwdriver, 7 in.
2 Measuring Mark, 100u Red
2 Measuring Mark, 40u Red
1 Base Plate, Stereoscope
1 Large Mirror Assy, Left
1 Large Mirror Assy, Right
1 Monocular, Left
1 Monocular, Right
2 Eyepieces, Fixed
2 Eyepieces, Zoom
1 Mounting Plate Assy
1 Prism Holder
4 Magnets, Cylindrical
1 Lamp Assy
2 Eye Guards, Large
2 Eye Guards, Small
2 Through Bolts, 12 in.
2 Capstan Bolts, 4 in.
1 Capstan Bolt, 4.5 in.
2 Capstan Bolts, 7 in.
1 Capstan Bolt, 7.5 in.
4 Photo Clips

Shipping Case No. 2 Contents:

1	Calculator, HP9825A	CP-1387/U
1	ROM String Adv. Prog.	P/N 98210A
1	ROM Matrix	P/N 98211A
1	ROM Gen. I/O - Ext. I/O	P/N 98213A
1	Control, Data Input	C-10134/UYK-31
1	Display, Digital	ID-2239/UYK-48
2	Data Cartridges, ITC-001	P/N 2014
2	Data Cartridges, ITC-004	P/N 2017
2	Data Cartridges, 9825A Test	P/N 2099
1	Cover, Dust (Calculator)	
1	Kit, Tape Head Cleaner	P/N 3001
1	Kit, Lens Cleaning	P/N 3002
1	Kit, Cleaning	P/N 3003
1	Kit, Mirror Cleaning	P/N 3004
2	Kits, Mirror Cleaning (Field)	P/N 3005

Shipping Case No. 3 Contents:

1	Controller, Digital	C-10805/UYK-48
1	Power Distribution Assy	
1	Cable Assy W101	
1	Cable Assy W102	
1	Cable Assy W103	
1	Cable Assy W104	
1	Cable Assy W105	
1	Cable Assy W106	
1	Cable Assy W107	
1	Cable Assy W108	
2	Manuals (TM 5-1260-206-12)	
2	Manuals (TM 5-1260-206-34)	
6	Lamps, Fluorescent	P/N F4T5
2	Photo Holders	P/N 2088-1
2	Photo Holders	P/N 2088-2
1	Envelope Contents:	
	1 Grid	
	1 Scale	
1	Spares Box, Contents:	
	6 Printer Paper, Thermal	P/N 9270-0479
	1 Cloth, Antistatic	P/N 8956
	1 Filter, Air	P/N 4208-0110
	1 Filter, Air	P/N 1024
	2 Lamps, Incand.	P/N 120MB
	2 Lamps, Incand.	P/N SW10569
	4 Fuses, 0.1A 250V	P/N 312.100
	8 Fuses, 1.5A 250V	P/N AGC-1 1/2
	8 Fuses, 3A 125V	P/N F02B125V3A
	2 Foot	P/N 1196
	1 Illumimtor	P/N 1397-1
	1 Illuminator	P/N 1397-2

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United State Army
The Adjutant General

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U.S. GOVERNMENT PRINTING OFFICE: 1987 - 754-030/60293.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
PFC JOHN DOE
COA, 3d ENGINEER BN
FT. LEONARDWOOD, MO 63108

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 5-1260-206-12	17 Dec 86	ANALYTICAL PHOTOGRAMMETRIC POSITIONING SYSTEM (APPS)

BE EXACT. . . PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
6	2-1 a		
B1		4-3	
125	line 20		

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 Cylenders. The engine on my set only has 4 Cylenders. Change the manual to show 4 Cylenders.

Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please Correct one or the Other.

I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is Wrong. Please give me a good NSN

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
JOHN DOE, PFC (268) 317-7111

SIGN HERE John Doe
JOHN DOE

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DRSTS-M Overprint 1, 1 Nov 80

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C