

TM 11-6625-489-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

TEST SET, ACTUATOR AND
ARMING SWITCH AN / USM-155



HEADQUARTERS, DEPARTMENT OF THE ARMY

DECEMBER 1962

WARNING

Be careful when operating Test Set, Actuator and Arming Switch AN/USM-155. Accidental release of the carriage could cause serious injury to personnel. When the carriage is latched, keep hands out of guide tube and away from carriage. Always use the safety block when installing or removing an air safety switch, dummy load, or ballast weights.

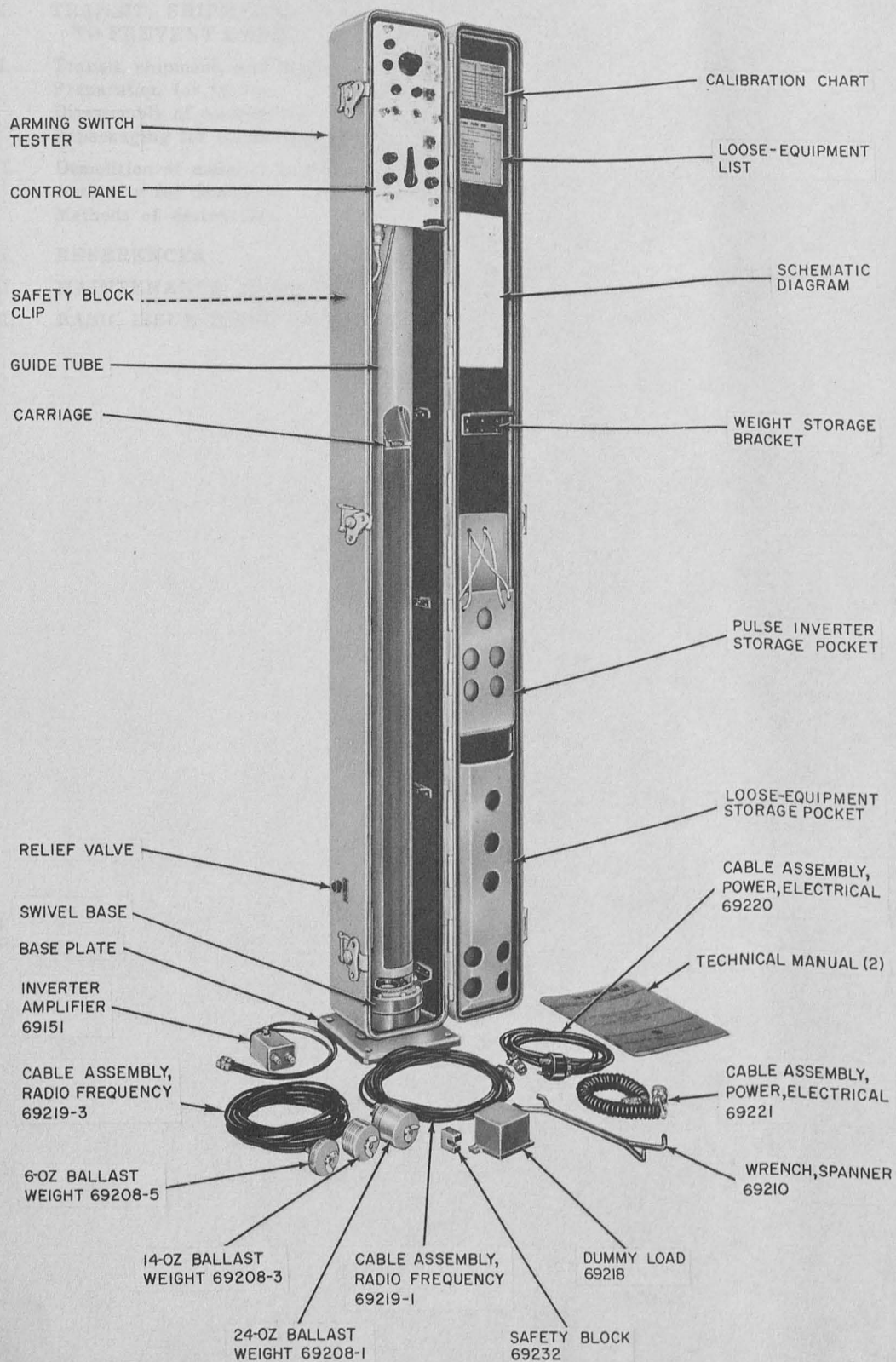
TECHNICAL MANUAL }
 No. 11-6625-489-12 }

HEADQUARTERS,
 DEPARTMENT OF THE ARMY
 WASHINGTON 25, D.C., 16 November 1962

Operator and Organizational Maintenance Manual
TEST SET, ACTUATOR AND ARMING SWITCH AN/USM-155

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Figure 1. Test set, actuator and arming switch AN/USM-155.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

This manual describes Test Set, Actuator and Arming Switch AN/USM-155 and covers its installation, operation, and operational and organizational maintenance. It includes operating, cleaning, and installation, adjustment, and parts replacement procedures applicable to first and second echelon maintenance.

2. Forms and Records

a. Report of Unsatisfactory Equipment. Fill out DA Form 2407 (Maintenance Request) in accordance with instructions in TM 38-750 and forward it to—Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS-PIE, Fort Monmouth, N.J. The form should be filled out and forwarded to report—

- (1) Receipt of defective equipment. (Use DD Form 6 (b below) if defect is due to damaged or improper shipment.)
- (2) Equipment deficiencies (deadlined equipments).
- (3) Equipment shortcomings (operable,

but at less than rated capability or efficiency).

- (4) Equipment improvement suggestions and recommendations.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment), as prescribed in AR 700-58 (Army), NAVSANDA Publications 378 (Navy), and AFR 71-4 (Air Force).

c. Comments on Manual. Forward all other comments on this publication direct to—Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS-MP, Fort Monmouth, N.J. (DA Form 1598 (Record of Comments on Publications), DA Form 2028 (Recommended Changes to DA Technical Manual Parts List or Supply Manual 7, 8, or 9), DD Form 96 (Disposition Form), or letter may be used.)

3. Index of Equipment Publications

Refer to DA Pam 310-4 to determine what changes to or revisions of this publication are current.

Section II. DESCRIPTION AND DATA

4. Purpose and Use

a. Purpose. Test Set, Actuator and Arming Switch AN/USM-155 provides a carriage for testing the operation of flare arming switch 101137 (air safety switch) used in Surveillance Drone OA-2343/USD-1.

b. Use. Test Set, Actuator and Arming Switch AN/USM-155 is used in conjunction with Frequency Meter AN/TSM-16 to determine if an air safety switch actuates at the proper acceleration of force and if it will deactuate in the correct time period.

5. Technical Characteristics

Motor type Acceleration, constant-force spring.

Acceleration force 3 to 6 G, 100-millisecond minimum duration.

Direction of acceleration .. Upward

Operating position Vertical, $\pm 5^\circ$.

Inverter amplifier 69151 output. Negative start-and-stop pulses to Frequency Meter AN/TSM-16.

Power Requirements:

Input voltage 28 volts dc ± 2.8 .

Power consumption .. 25 watts (approximately).

6. Table of Components

The components of Test Set, Actuator and Arming Switch AN/USM-155 are listed in the basic issue items lists (app. III) and are illustrated in figure 1.

7. Nomenclature and Common Names

Nomenclature	Common name
Test Set, Actuator and Arming AN/USM-155.	Arming switch tester unit
Test Set, Actuator and Arming AN/USM-155 (less minor components).	Arming switch tester
Inverter amplifier 69151...	Pulse inverter
Wrench, spanner 69210 ...	Spanner wrench
Cable assembly, power, electrical 69220.	Power cable
Cable assembly, power, electrical 69221.	Arming cable
Cable assembly, radio frequency 69219-1	Rf cable (69219-1)
Cable assembly, radio frequency 69219-3.	Rf cable (69219-3)
Safety block 69232	Safety block
Dummy load 69218	Dummy load
Ballast weight 69208-1, 69208-3, and 69208-5.	Ballast weight
Frequency Meter AN/TSM-16.	Counter

8. Description of Test Set, Actuator and Arming Switch AN/USM-155

(fig. 1)

a. The arming switch tester unit consists of the arming switch tester and associated minor components (par. 9). The arming switch tester is housed in a rectangular metal cabinet which is mounted on a base plate used to secure the bottom of the cabinet. The cabinet contains a guide tube that is mounted on a swivel base at the bottom of the cabinet. The swivel base allows the arming switch tester to be adjusted to a vertical position, and the guide tube positions the carriage and guides the carriage direction of movement during operation of the equipment. The carriage is used to mount the ballast weights and the flare arming switch to be tested.

b. A control panel at the top of the cabinet

contains the operating controls and the connectors necessary for the interconnections of equipment required for operation of the tester. A door is hinged to the left side of the cabinet and is secured to the other side of the cabinet with three clamp-type fasteners. The joint between the cabinet and the door is made airtight and watertight by a rubber gasket. The cabinet is fitted with a screw-type relief valve which can be opened to equalize the pressure between the inside of the cabinet and the atmosphere.

c. A safety-block clip is secured to the left side of the cabinet for storage of the safety block when it is not in use. The cabinet door contains a calibration chart, a loose-equipment list, schematic diagram, weight storage bracket, and two storage pockets. Two ballast weights are stored on the weight storage bracket, and the third ballast weight is stored on the carriage along with the dummy load. The cable assemblies and the spanner wrenches are stored in the loose-equipment storage pocket, and the pulse inverter is stored in the pulse inverter storage pocket. One spanner wrench is chained to the arming switch tester.

9. Description of Minor Components

(fig. 1)

a. *Ballast Weights.* A total of 36 calibrated weights are provided with the arming switch tester unit. Three different sizes of weights are provided to allow adjustment of the ballast weight required to cover the complete acceleration range of the arming switch tester unit.

- (1) Each of the weights is fabricated from cold rolled steel, contains a 0.348 inch-diameter center mounting hole, and has a manufacturer's part number and weight stamped on it. The manufacturer's part number of the various sizes of weights and the dimensions of the weights are given below.

Manufacturer's part No.	Quantity	Diameter (in.)	Height (in.)	Weight (oz.)
69209-1	32	1.87	0.078	1
69209-3	3	1.56	0.063	0.5
69209-5	1	1.87	0.984	12

- (2) The weights are shipped in three groups, each group held together with a wingbolt and nut. The weights are grouped together to form 6-, 15-, and 24-ounce ballast weights. The weights that make up each ballast weight are given below.

Ballast weight (oz.)	Manufacturer's part No. and weight of weights		
	69209-1 1 oz.	69209-3 0.5 oz.	69209-5 12 oz.
6	6	1	
14	14	1	
24	12	1	1

- (3) Each ballast weight contains a 0.5-ounce weight in addition to the weights required to make up the ballast weight. The 0.5-ounce weight is a trim weight used to adjust the actual weight as required for each different arming switch tester.

b. Safety Block 69232. The safety block is a slotted phenolic block which prevents the carriage from retracting during the installation of an air safety switch, a ballast weight, or the dummy load.

c. Cable Assembly, Power, Electrical 69220. The power cable is a 54-inch, two-conductor cable which is used to connect the arming switch tester to a +28-volt direct-current (dc) power source.

d. Cable Assembly, Power, Electrical 69221. The arming cable is a 5-foot telephone-type, retractable cable. It is used to connect the arming switch tester to an air safety switch when the time delay of an air safety switch is tested.

e. Inverter Amplifier 69151. The pulse inverter consists of a rectangular metal box with a sensitivity adjustment control mounted on the top of the box. Attached to the box are two coaxial cables which are connected to the counter during operation of the arming switch tester unit. Two coaxial connectors are also provided for connection of the pulse inverter to the arming switch tester.

f. Dummy Load 69218. The dummy load is an aluminum block which is inserted into the carriage of the arming switch tester to stimulate an air safety switch (weighing 0.85 pound) during adjustment and maintenance of the arming switch tester unit.

g. Wrench Spanner 69210. This special tool is a two-pronged wrench constructed of steel rods (1/4-inch diameter). The spanner wrench is used to level the arming switch tester.

h. Cable Assembly, Radio Frequency 69219-1 and 69219-3. The radiofrequency (rf) cables are 218-inch coaxial cables which provide interconnection between the pulse inverter and the arming switch tester.

10. Additional Equipment Required

The following items of equipment are not furnished as part of the arming switch tester but are required for normal operation.

a. Frequency Meter AN/TSM-16. The counter is required to check the accuracy of the carriage acceleration for each acceleration setting of the arming switch tester. The counter is used to make time-interval measurements which are compared with standard time periods for a given acceleration.

b. Power Source. A +28-volt dc power source capable of supplying 25 watts of power at +28 volts dc ± 10 percent is required for operating the arming switch tester unit.

CHAPTER 2 INSTALLATION

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

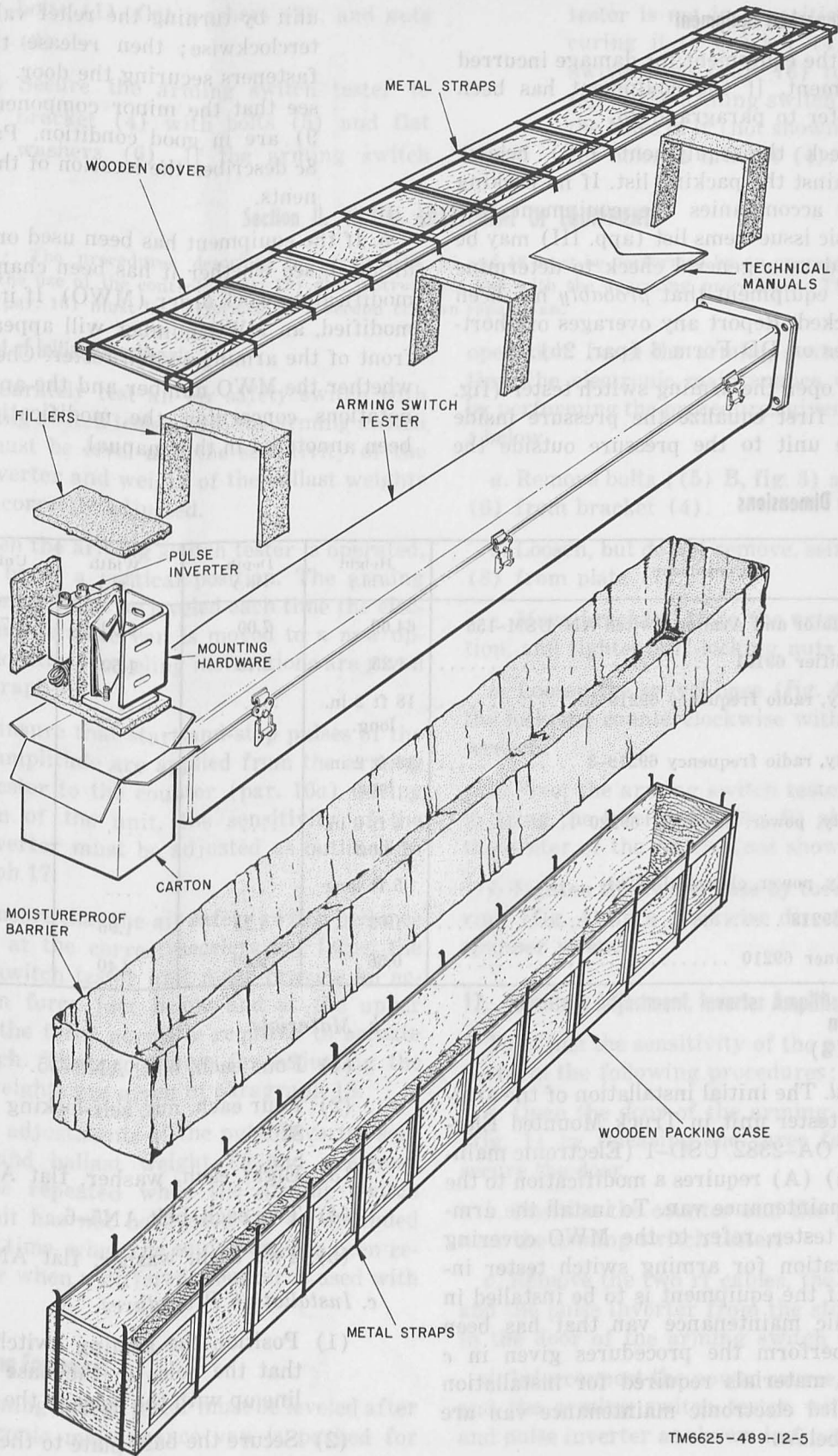
11. Unpacking

(fig. 2)

a. *Packaging Data.* The arming switch tester unit is packed for shipment in a wooden packing case. The unit is protected from damage by a moistureproof barrier and fillers. The pulse inverter and mounting hardware are further protected by fillers and are packed in a corrugated cardboard carton before being placed in the wooden packing case. The wooden packing case is 72 inches high, 10 inches wide, 10 inches deep. The volume of the wooden packing case is approximately 4 1/6 cubic feet.

b. *Removing Contents.* Remove the arming switch tester, the pulse inverter, and the mounting hardware from the wooden packing case as follows:

- (1) Cut the metal straps just below the wooden cover; fold back the metal straps.
- (2) Remove the nails (not shown) from the wooden cover with a nailpuller and lift the wooden cover off the wooden packing case.
- (3) Remove the technical manuals and the three fillers.
- (4) Open the moistureproof barrier and remove the carton containing the pulse inverter and the mounting hardware.
- (5) Open the carton and remove the fillers, the pulse inverter, and mounting hardware.
- (6) Remove the arming switch tester from the wooden packing case.



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Figure 2. Packaging diagram.

12. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, refer to paragraph 2b.

- (1) Check the equipment ((2) below) against the packing list. If no packing list accompanies the equipment, the basic issue items list (app. III) may be used as a general check to determine the equipment that *probably* has been packed. Report any overages or shortages on DD Form 6 (par. 2b).
- (2) To open the arming switch tester (fig. 1), first equalize the pressure inside the unit to the pressure outside the

unit by turning the relief valve counterclockwise; then release the three fasteners securing the door. Check to see that the minor components (par. 9) are in good condition. Paragraph 8c describes the location of the components.

b. If the equipment has been used or reconditioned, see whether it has been changed by a modification work order (MWO). If it has been modified, an MWO number will appear on the front of the arming switch tester. Check to see whether the MWO number and the appropriate notations concerning the modifications have been annotated in this manual.

13. Component Dimensions

Component	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb.)
Test Set, Actuator and Arming Switch AN/USM-155 ..	64.00	7.00	6.00	75.00
Inverter amplifier 69151	1.25	2.75	1.50	0.72
Cable assembly, radio frequency 69219-1	18 ft 2 in. long.	....	....	0.50
Cable assembly, radio frequency 69219-3	18 ft 2 in. long.	....	....	0.50
Cable assembly, power, electrical 69220	4 ft 6 in. long.	....	....	0.38
Cable assembly, power, electrical 69221	5 ft long	....	....	0.27
Dummy load 69218	1.63	3.25	1.96	0.85
Wrench, spanner 69210	0.56	9.00	2.40	0.25

14. Installation

(fig. 3)

a. *General.* The initial installation of the arming switch tester unit in Truck Mounted Electronic Shop OA-2382/USD-1 (Electronic maintenance van) (A) requires a modification to the electronic maintenance van. To install the arming switch tester, refer to the MWO covering the modification for arming switch tester installation. If the equipment is to be installed in an electronic maintenance van that has been modified, perform the procedures given in c below. The materials required for installation in a modified electronic maintenance van are listed in b below.

b. *Materials.*

- (1) Four each, bolt, AN8-35.
- (2) Four each, nut, self-locking MS20365-820.
- (3) Eight each, washer, flat AN960-816.
- (4) Two each, bolt AN5-6.
- (5) Two each, washer, flat AN970-4.

c. *Installation Procedures.*

- (1) Position the arming switch tester so that the holes in the base plate (B) line up with the holes in the floor.
- (2) Secure the base plate to the floor with

bolts (1), flat washers (2), and nuts (3).

- (3) Secure the arming switch tester to bracket (4) with bolts (5) and flat washers (6). If the arming switch

tester is not in a position to allow securing it to bracket (4), adjust the swivel base (par. 16) to position the top of the arming switch tester so that the holes in it (not shown) line up with the holes in bracket (4).

Section II. INITIAL ADJUSTMENT OF EQUIPMENT

Note: The procedures described in paragraphs 17 and 18 must be performed by an operator who is familiar with the use of the controls (par. 19) and instruments and with the operating procedures. The leveling procedures (par. 16) must be performed by a second echelon repairman.

15. Extent of Initial Adjustments

To accurately test an air safety switch with the arming switch tester unit, the arming switch tester must be level and the sensitivity of the pulse inverter and weight of the ballast weights must be correctly adjusted.

a. When the arming switch tester is operated, it must be in a vertical position. The arming switch tester must be leveled each time the electronic maintenance van is moved to a new operating location. Leveling instructions are given in paragraph 16.

b. To insure that start-and-stop pulses of the correct amplitude are applied from the arming switch tester to the counter (par. 10*a*) during operation of the unit, the sensitivity of the pulse inverter must be adjusted as outlined in paragraph 17.

c. To insure that the air safety switch becomes actuated at the correct acceleration force, the arming switch tester unit must provide an acceleration force just below and at the upper limit of the force normally required to actuate the switch. The procedures for adjusting the ballast weights are given in paragraph 18.

d. The adjustments of the pulse inverter sensitivity and ballast weight (*b* and *c* above) should be repeated when the arming switch tester unit has not been used for an extended period of time, when the equipment has been repaired, or when a different counter is used with the unit.

16. Leveling Equipment

The arming switch tester must be leveled after the electronic maintenance van is parked for

operation. Level the arming switch tester each time the electronic maintenance van is moved by performing the procedures given in *a* through *f* below.

a. Remove bolts ((5) B, fig. 3) and flat washer (6) from bracket (4).

b. Loosen, but do not remove, self-locking nuts (8) from plate (7).

c. Move bracket (4) to the extreme top position, and tighten self-locking nuts (8).

d. Loosen the swivel base (fig. 4) by turning the lockring counterclockwise with the spanner wrench.

e. Pivot the arming switch tester as required to bring the level gage (fig. 9) air bubble into the center of the reticle (not shown).

f. Tighten the swivel base by turning the lockring (fig. 4) in a clockwise direction with the spanner wrench.

17. Sensitivity Adjustment, Inverter Amplifier 69151

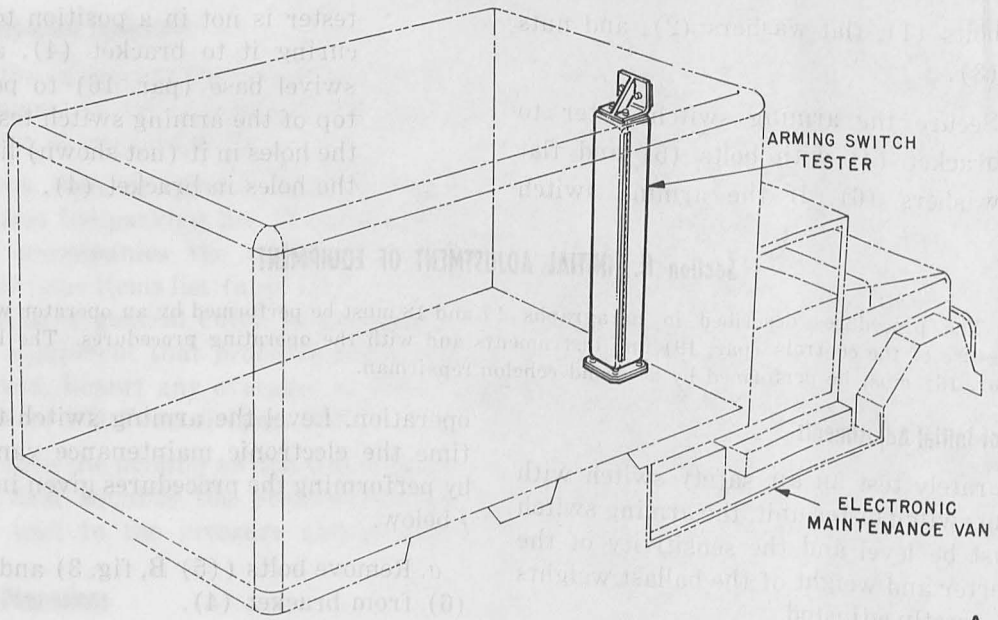
To adjust the sensitivity of the pulse inverter, perform the following procedures:

a. Open the door of the arming switch tester (fig. 1) by releasing the three fasteners that secure the door.

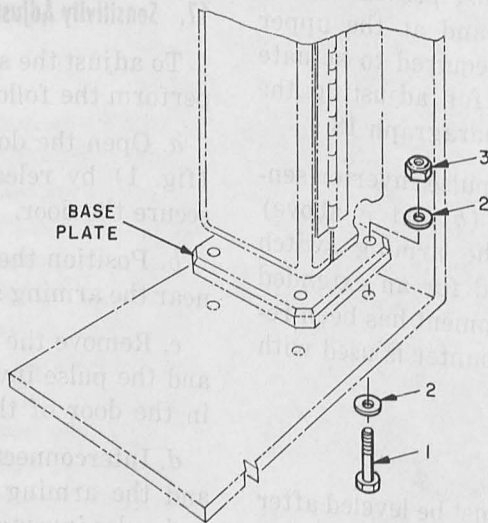
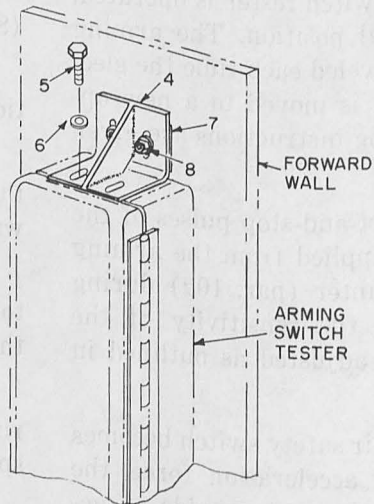
b. Position the counter and the power source near the arming switch tester.

c. Remove the two rf cables, the power cable, and the pulse inverter from the storage pockets in the door of the arming switch tester.

d. Interconnect the power source, the counter, and the arming switch tester with the cables and pulse inverter as shown in figure 5. Con-



A



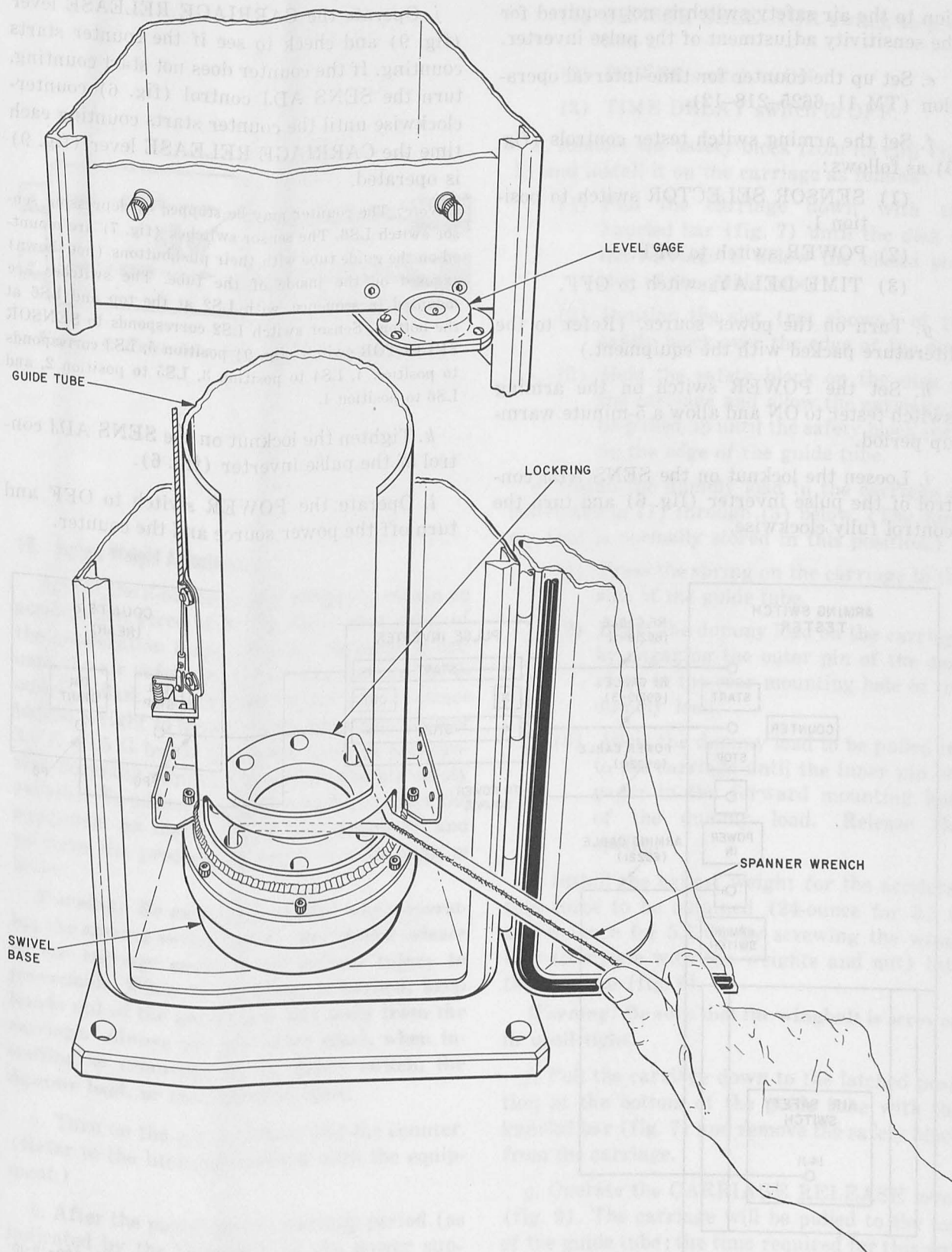
B

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- 1 Bolt, AN8-35
- 2 Flat washer, AN960-816
- 3 Self-locking nut, MS20365-820
- 4 Bracket, 69229

- 5 Bolt, AN8-35
- 6 Flat washer, AN960-516
- 7 Plate, 69230
- 8 Self-locking nut, MS20365-428

Figure 3. Installation data.



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Figure 4. Use of spanner wrench.

tion to the air safety switch is not required for the sensitivity adjustment of the pulse inverter.

e. Set up the counter for time-interval operation (TM 11-6625-218-12).

f. Set the arming switch tester controls (fig. 9) as follows:

- (1) SENSOR SELECTOR switch to position 1.
- (2) POWER switch to OFF.
- (3) TIME DELAY switch to OFF.

g. Turn on the power source. (Refer to the literature packed with the equipment.)

h. Set the POWER switch on the arming switch tester to ON and allow a 5-minute warm-up period.

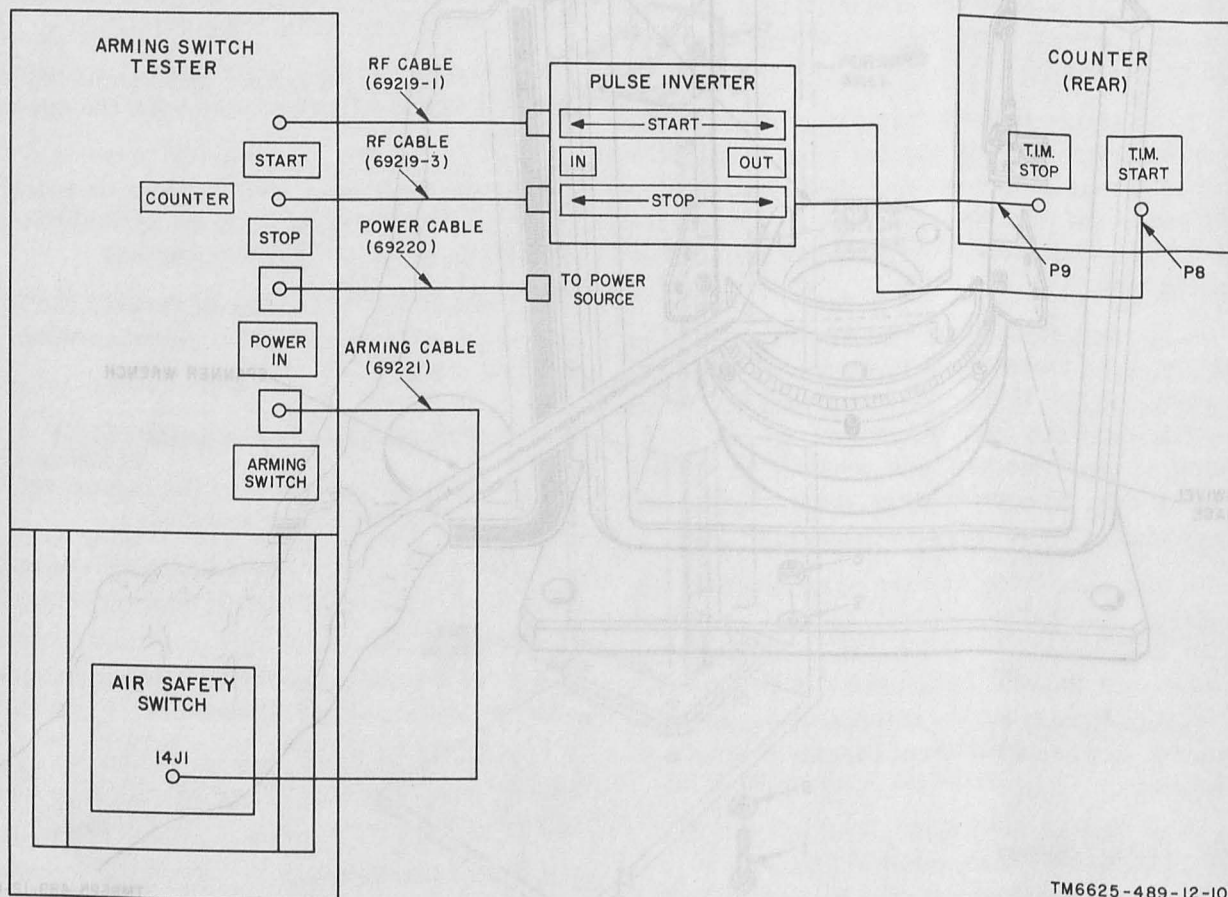
i. Loosen the locknut on the SENS ADJ control of the pulse inverter (fig. 6) and turn the control fully clockwise.

j. Operate the CARRIAGE RELEASE lever (fig. 9) and check to see if the counter starts counting. If the counter does not start counting, turn the SENS ADJ control (fig. 6) counter-clockwise until the counter starts counting each time the CARRIAGE RELEASE lever (fig. 9) is operated.

Note: The counter may be stopped by depressing sensor switch LS6. The sensor switches (fig. 7) are mounted on the guide tube with their pushbuttons (not shown) exposed on the inside of the tube. The switches are mounted in sequence, with LS2 at the top and LS6 at the bottom. Sensor switch LS2 corresponds to SENSOR SELECTOR switch (fig. 9) position 5, LS3 corresponds to position 4, LS4 to position 3, LS5 to position 2, and LS6 to position 1.

k. Tighten the locknut on the SENS ADJ control of the pulse inverter (fig. 6).

l. Operate the POWER switch to OFF and turn off the power source and the counter.



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Figure 5. Interconnecting cable diagram.

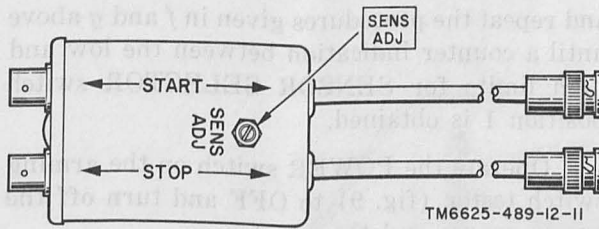


Figure 6. Pulse inverter, sensitivity adjustment.

18. Ballast Weight Adjustment

Adjust the 6-ounce ballast weight to obtain an acceleration force of 5.5 G (the upper limit of the acceleration force normally required to actuate the air safety switch); then remove the 6-ounce ballast weight and adjust the 24-ounce ballast weight to obtain an acceleration force of 3.5 G (0.5 G below the lower limit of acceleration normally required to actuate the air safety switch). To adjust a ballast weight, connect the equipment as instructed in paragraph 17 and perform the procedures given in *a* through *m* below.

Warning: Be extremely careful when operating the arming switch tester. Accidental release of the carriage could cause serious injury to personnel. When the carriage is latched, keep hands out of the guide tube and away from the carriage. Always use the safety block when installing or removing an air safety switch, the dummy load, or the ballast weights.

a. Turn on the power source and the counter. (Refer to the literature packed with the equipment.)

b. After the power source warmup period (as indicated by the literature on the power supply), set the arming switch tester controls (fig. 9) as follows:

- (1) SENSOR SELECTOR switch to position 1.
- (2) POWER switch to ON.
- (3) TIME DELAY switch to OFF.

c. Remove the safety block from its clip (fig. 1) and install it on the carriage as follows:

- (1) Pull the carriage down with the knurled bar (fig. 7) until the disk of the carriage is below the closed portion of the guide tube.
- (2) Position the slot (not shown) of the safety block over the edge of the disk.
- (3) Hold the safety block on the disk of the carriage and allow the carriage to be pulled up until the safety block rests on the edge of the guide tube.

d. Install the dummy load in the carriage as instructed in (1) through (3) below. (The dummy load is normally stored in this position.)

- (1) Press the spring on the carriage to the side of the guide tube.
- (2) Insert the dummy load on the carriage by engaging the outer pin of the carriage in the rear mounting hole of the dummy load.
- (3) Allow the dummy load to be pulled into the carriage until the inner pin engages in the forward mounting hole of the dummy load. Release the spring.

e. Install the ballast weight for the acceleration force to be obtained (24-ounce for 3.5 G and 6-ounce for 5.5 G) by screwing the wingbolt (complete with the weights and nut) into the carriage (fig. 8).

Warning: Be sure that the wingbolt is screwed in until tight.

f. Pull the carriage down to the latched position at the bottom of the guide tube with the knurled bar (fig. 7) and remove the safety block from the carriage.

g. Operate the CARRIAGE RELEASE lever (fig. 9). The carriage will be pulled to the top of the guide tube; the time required for this will be indicated on the counter. Note the time interval indicated on the counter and refer to the

acceleration time chart (par. 28d) for the normal time interval for the acceleration force being used with the SENSOR SELECTOR switch in position 1.

Note: If the NO TEST indicator lights, depress the RESET button and repeat the procedures given in *f* and *g* above. If the NO TEST indicator lights again, refer the arming switch tester to higher echelon for repair.

h. If a counter indication between the low and high limit is obtained, the ballast weight is correct. If a counter indication above the high limit is obtained, one or more weights must be removed from the wingbolt. If the indication is below the low limit, additional weights must be installed on the wingbolt. Adjust the ballast weight as follows:

- (1) Install the safety block (*c* above).
- (2) Remove the ballast weight by unscrewing the wingbolt (fig. 8) from the carriage.
- (3) Unscrew the nut that secures the weights, and add or remove the weights as required. If the counter indication was not too far above or below the high or low limit, add or remove only the trim weight.

(4) Secure the weights on the wingbolt with the nut, and screw the wingbolt (complete with weights and nut) into the carriage.

i. Reset the counter (TM 11-6625-218-12) and repeat the procedures given in *f* and *g* above until a counter indication between the low and high limits for SENSOR SELECTOR switch position 1 is obtained.

j. Operate the POWER switch on the arming switch tester (fig. 9) to OFF and turn off the power source and the counter.

k. Install the safety block (*c* above) and remove the dummy load from the carriage by pressing the spring (fig. 7) to the side of the guide tube and rotating the dummy load until the inner and outer pins become disengaged from the mounting holes in the dummy load. Lift the dummy load out of the carriage and release the spring.

l. Pull the knurled bar down to release the pressure on the safety block, and remove the safety block; then allow the carriage to be pulled into the enclosed portion of the guide tube.

m. Store the safety block in its clip (fig. 1).

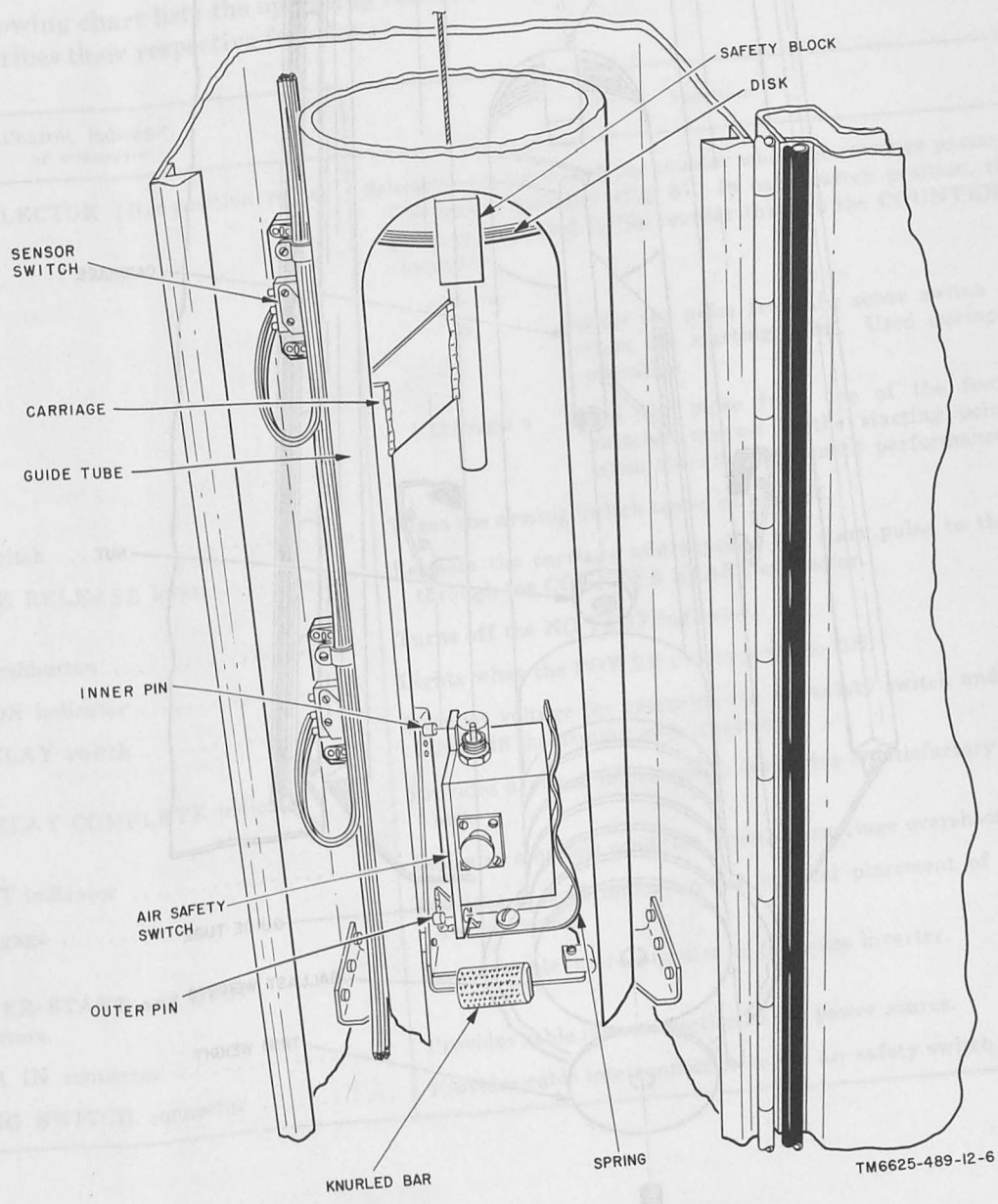
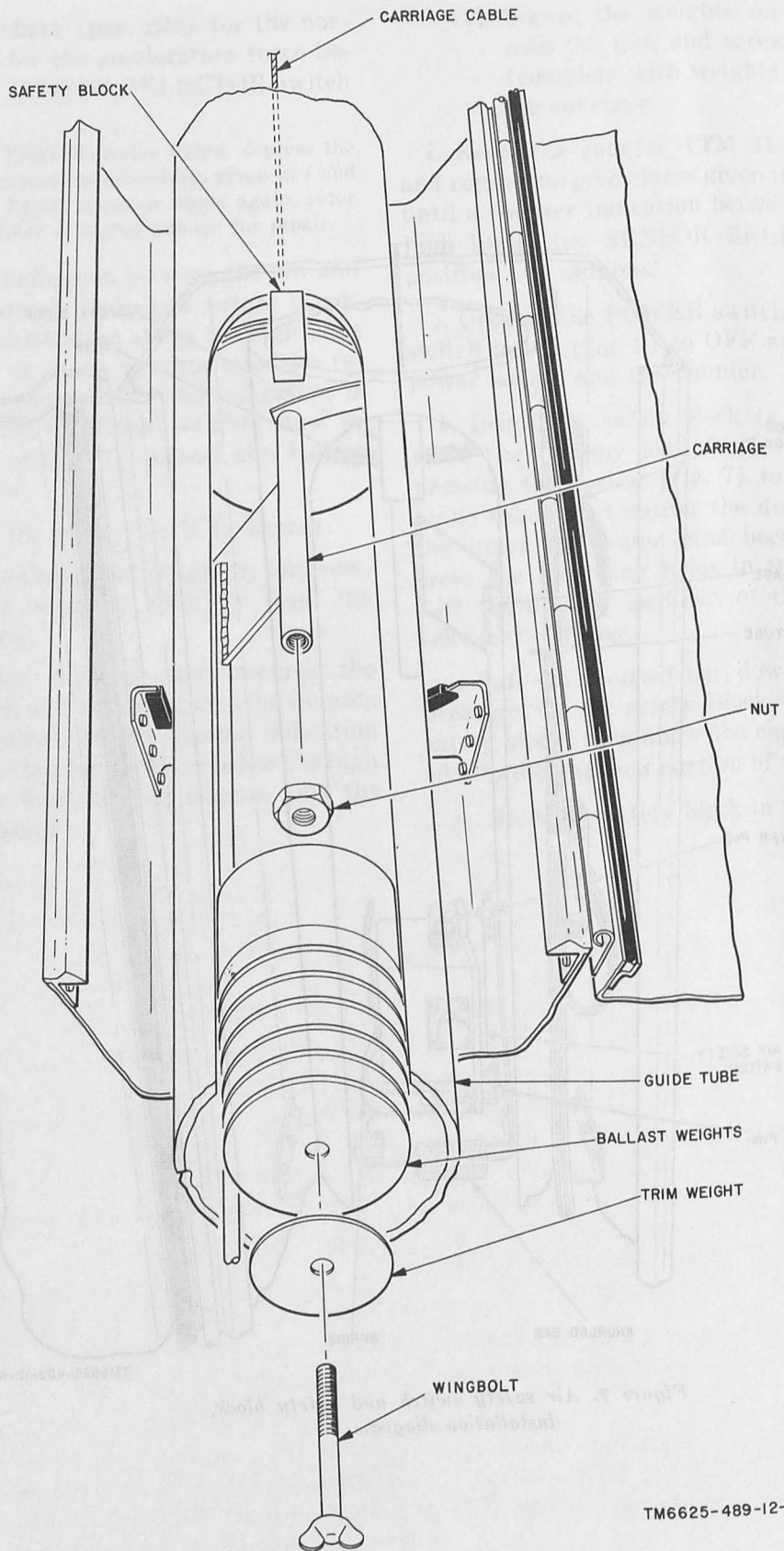


Figure 7. Air safety switch and safety block, installation diagram.



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Figure 8. Ballast weight installation.

CHAPTER 3
OPERATING INSTRUCTIONS

19. Operating Controls, Indicators, and Connectors
(fig. 9)

The following chart lists the operating controls, indicators and connectors used by the operator, and describes their respective functions:

Control, indicator, or connector	Function						
SENSOR SELECTOR (five-position rotary switch).	<p>Selects the pulse to stop the counter when the carriage passes one of five sensor switches (fig. 8). In each switch position, the stop pulse is connected to the counter through the COUNTER STOP connector.</p> <table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: center; width: 20%;">Position</th> <th style="text-align: center;">Action</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">5</td> <td>Selects the pulse from the sensor switch farthest from the starting point. Used during normal operation.</td> </tr> <tr> <td style="text-align: center;">1 through 4</td> <td>Select the pulse from one of the four sensor switches nearest to the starting point. Used when checking equipment performance.</td> </tr> </tbody> </table>	Position	Action	5	Selects the pulse from the sensor switch farthest from the starting point. Used during normal operation.	1 through 4	Select the pulse from one of the four sensor switches nearest to the starting point. Used when checking equipment performance.
Position	Action						
5	Selects the pulse from the sensor switch farthest from the starting point. Used during normal operation.						
1 through 4	Select the pulse from one of the four sensor switches nearest to the starting point. Used when checking equipment performance.						
POWER switch	Turns the arming switch tester on and off.						
CARRIAGE RELEASE lever	Releases the carriage and supplies the start pulse to the counter through the COUNTER START connector.						
RESET bushbutton	Turns off the NO TEST indicator.						
POWER ON indicator	Lights when the POWER switch is set to ON.						
TIME DELAY switch	Supplies voltage for operating the air safety switch and starts the timer in the arming switch tester.						
TIME DELAY COMPLETE indicator	Provides a visual indication to determine a satisfactory time delay test.						
NO TEST indicator	Indicates a no-test condition when the carriage overshoots.						
LEVEL gage	Provides a level indication for vertical placement of the arming switch tester.						
COUNTER START and STOP connectors.	Provide cable interconnection to the pulse inverter.						
POWER IN connector	Provides cable interconnection to the power source.						
ARMING SWITCH connector	Provides cable interconnection to the air safety switch.						

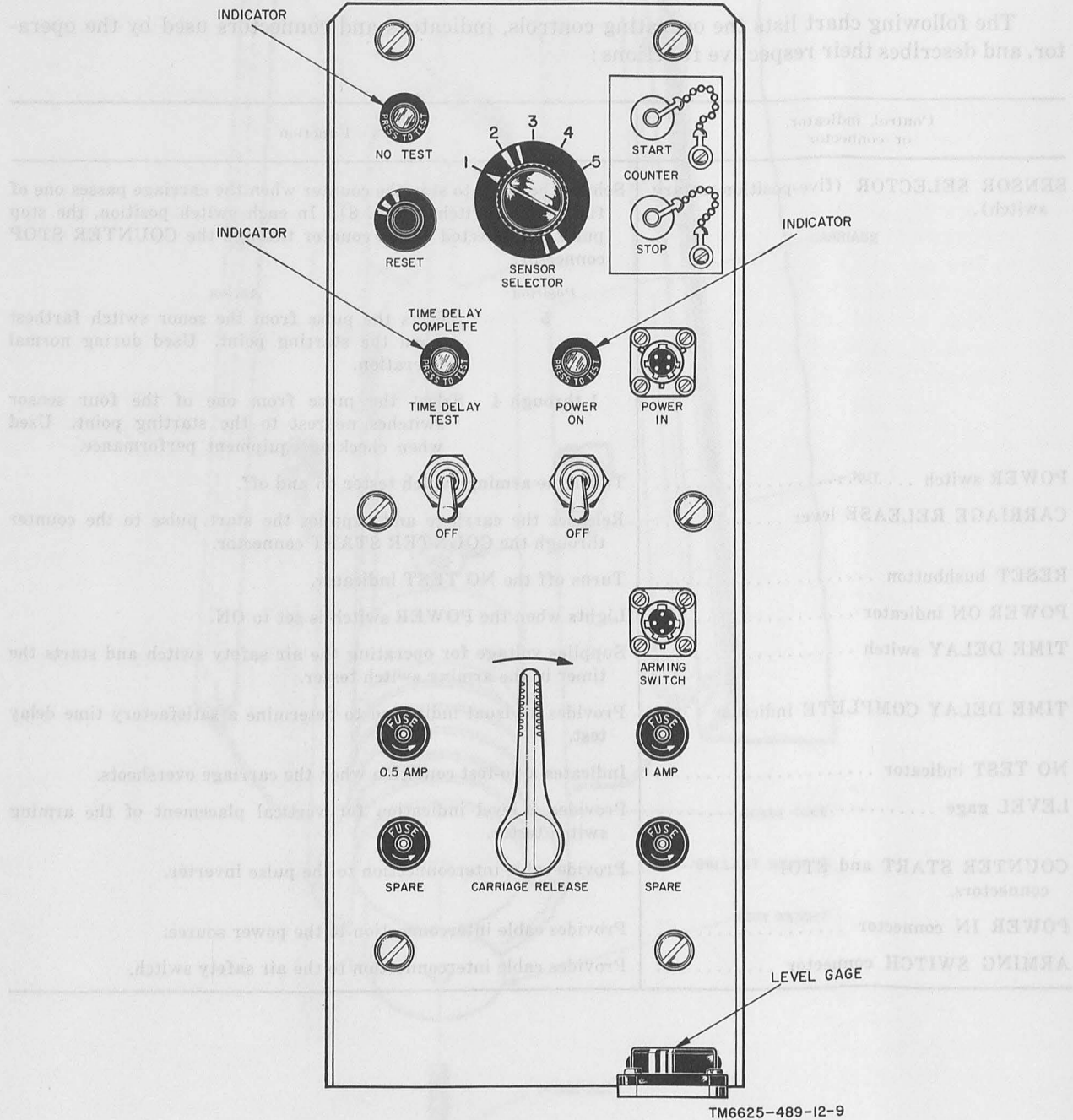


Figure 9. Operating controls, indicators, and connectors.

20. Preliminary Starting Procedure

Perform the preliminary operations listed below starting the equipment as described in paragraph 21. Be sure that the equipment has been properly adjusted and leveled (pars. 16-18).

a. Open the door of the arming switch tester (fig. 1) by turning the relief valve counter-clockwise to equalize the pressure inside the unit to the pressure outside the unit, and releasing the three fasteners that secure the door.

b. Set the TIME DELAY and POWER switches (fig. 9) to OFF.

c. Remove the safety block from its clip (fig. 1) and install it as follows:

- (1) Pull the carriage down with the knurled bar (fig. 7) until the disk of the carriage is below the closed portion of the guide tube.
- (2) Position the slot of the safety block (not shown) over the edge of the disk.
- (3) Hold the safety block on the disk of the carriage and allow the carriage to be pulled up until the safety block rests on the edge of the guide tube.

Warning: Always use the safety block when installing or removing the air safety switch, the dummy load, or the ballast weights. Always remove the safety block when the carriage is placed in the latched position.

d. Install the adjusted 24-ounce ballast weight (par. 18).

e. Install the air safety switch to be tested as follows:

- (1) Press the spring on the carriage (fig. 7) to the side of the guide tube.
- (2) Insert the air safety switch on the carriage by engaging the outer pin of the carriage in the rear mounting hole of the air safety switch.
- (3) Allow the air safety switch to be pulled into the carriage until the inner pin engages in the forward mounting hole of the air safety switch. Release the spring.

f. Position the counter and the power supply near the arming switch tester.

g. Remove the rf cables, the power cable, and the pulse inverter from the storage pockets in the door of the arming switch tester (fig. 1).

h. Interconnect the power source, the counter, and the arming switch tester with the cables and the pulse inverter as shown in figure 5.

i. Set the counter up for time-interval operation (TM 11-6625-218-12).

21. Starting Procedure

To start the equipment, first make sure that it is correctly connected and that the controls are set as required by the preliminary starting procedure (par. 20); then perform the steps described in a through f below.

Warning: Be extremely careful when operating the arming switch tester. Accidental release of the carriage could cause serious injury to personnel. When the carriage is latched, keep hands out of the guide tube and away from the carriage. Always use the safety block when installing or removing the air safety switch, the dummy load, or the ballast weights. Always remove the safety block when the carriage is placed in the latched position.

a. Turn on the power source. (Refer to the literature packed with the equipment.)

b. Set the POWER switch on the arming switch tester (fig. 9) to ON.

c. Set the SENSOR SELECTOR switch to position 5.

d. Turn on the counter (TM 11-6625-218-12) and allow a 15-minute warmup period.

e. Pull the carriage down to the latched position at the bottom of the guide tube with the knurled bar (fig. 7) and remove the safety block from the carriage.

f. Check the position of the air safety switch plunger. If the plunger is not in an extended position, the air safety switch is actuated and must be reset as follows:

- (1) Set the TIME DELAY switch (fig. 8) to TEST. After a short period of time, the plunger will be extended.

- (2) After the plunger has been extended, set the TIME DELAY TEST switch to OFF.

22. Operating Procedure

Before performing the operating procedure outlined below, perform the starting procedure (par. 21). Satisfactory completion of the operating procedure will insure the proper operation of the air safety switch.

Note. If any abnormal indication is observed during the operating procedure, refer to the operational checklist (par. 28) for the corrective measures.

a. Nonactuation Test.

- (1) Release the carriage by operating the CARRIAGE RELEASE lever (fig. 9).
- (2) After the carriage has been released, note the following:
 - (a) The NO TEST indicator light should not be lighted. If it is lighted, depress the RESET pushbutton to extinguish the light. Reset the counter (TM 11-6625-218-12) and pull the carriage down to the latched position at the bottom of the guide tube with the knurled bar (fig. 7). Repeat the procedure given in (1) above. If the NO TEST light lights the second time, refer the equipment to higher echelon maintenance.
 - (b) The time interval indicated on the counter should be between 195 and 239 milliseconds. If the time interval is not between 195 and 239 milliseconds, check the ballast weight (par. 18) and adjust the weight as required.
 - (c) The plunger on the air safety switch should be in the extended position. If the plunger has moved from the extended position, the air safety switch has become actuated by an acceleration force of less than that normally required to actuate it. The switch is defective and no further testing is required.
- (3) Reset the counter (TM 11-6625-218-12).

- (4) Pull the carriage down to the latched position at the bottom of the guide tube with the knurled bar (fig. 7).
- (5) Repeat the procedures given in (1) through (4) above several times to insure that the air safety switch does not become actuated ((2) (c) above).
- (6) Operate the POWER switch (fig. 9) to OFF.

b. Actuation Test.

- (1) Remove the 24-ounce ballast weight used in the nonactuation test (a above) and install the 6-ounce ballast weight (par. 18).
- (2) Operate the POWER switch to ON and the SENSOR SELECTOR switch to position 5.
- (3) Pull the carriage down to the latched position at the bottom of the guide tube with the knurled bar (fig. 7) and remove the safety block.
- (4) Reset the counter (TM 11-6625-218-12).
- (5) Release the carriage by operating the CARRIAGE RELEASE lever (fig. 9).
- (6) After the carriage has been released, note the following:
 - (a) The NO TEST indicator light should not be lighted. If it is lighted, depress the RESET pushbutton to extinguish the light. Deactuate the air safety switch by performing the procedures given in (c below) and then repeat the procedures given in (3) through (5) above. If the NO TEST light lights the second time, refer the equipment to higher echelon maintenance.
 - (b) The time interval indicated on the counter should be between 151 and 169 milliseconds. If the time interval is not between 151 and 169 milliseconds, check the ballast weight (par. 18) and adjust the weight as required.
 - (c) The plunger on the air safety switch should not be in the extended posi-

tion. If the plunger has not moved from the extended position, the air safety switch has not become actuated by an acceleration force of the upper limit normally required to actuate it. The switch is defective and no further testing is required.

c. Time Delay Test. The time delay test is performed with the air safety switch actuated. If the air safety switch is not actuated, perform the procedures given in *b* above to actuate it.

- (1) Install the safety block (par. 20c) and connect the air safety switch to the control panel of the arming switch tester with the arming cable (fig. 5).
- (2) Set the TIME DELAY switch to TEST. After approximately eight seconds, the TIME DELAY COMPLETE indicator on the arming switch tester (fig. 9) should light and the plunger on the air safety switch should be pushed to the extended position.
- (3) Actuate the air safety switch by performing the procedures given in *b* above and repeat the procedure in (2) above to insure that the air safety switch deactuates correctly.

23. Stopping Procedure

Turn off the equipment and remove the air safety switch tested by performing the procedures in *a* below. If the unit is not to be used again for some time, perform the procedures in *a* below and then shut down the unit as instructed in *b* below. If the electronic maintenance van is to be moved, shut down the unit and refer it to second echelon repair personnel to prepare it for transit.

a. Equipment Turnoff. Turn off the equipment and remove the air safety switch as follows:

- (1) Set the POWER switch (fig. 9) to OFF.
- (2) Turn off the counter and the power source. (Refer to the equipment literature.)

- (3) Remove the air safety switch from the carriage by pressing the spring (fig. 7) to the side of the guide tube and rotating the air safety switch until the inner and outer pins become disengaged from its mounting holes. Lift the air safety switch out of the carriage and release the spring.

- (4) Pull the knurled bar down to release the pressure on the safety block and remove the safety block; then allow the carriage to be pulled up into the enclosed portion of the guide tube.

- (5) Store the safety block in its clip (fig. 1).

b. Unit Shutdown. After the equipment has been turned off (*a* above), shut down the arming switch tester unit and store the minor components as follows:

- (1) Disconnect the pulse inverter and the interconnecting cables (fig. 5).

- (2) Place the cables and the spanner wrench in the loose equipment storage pocket in the door of the arming switch tester (fig. 1).

- (3) Place the pulse inverter in the pulse inverter pocket in the door of the arming switch tester.

- (4) With one ballast weight installed in the carriage after the last test performed (par. 22), place all the other weights on the two remaining wingbolts (weights that may have been removed during ballast adjustments (par. 18)) and screw the wingbolts (with the weights secured on them with nuts (fig. 8)) into the weight storage bracket (fig. 1).

- (5) Install the dummy load on the carriage (par. 18c and d).

- (6) Remove the safety block (*a*(4) and (5) above).

- (7) Close the door (fig. 1) and secure it with the three fasteners.

- (8) Close the relief valve by turning it clockwise until it is tight.

CHAPTER 4

OPERATOR'S MAINTENANCE

24. Scope of Operator's Maintenance

Maintenance of the arming switch tester unit at the operator's level (first echelon) consists of the following:

- a. Preventive maintenance (par. 26).
- b. Visual inspection (par. 27).
- c. Operational check (par. 28).
- d. Replacement of lamps and fuses (par. 29).

25. Material Required for Operator's Maintenance

The only materials required for operator's maintenance are a clean lint-free cloth and Cleaning Compound (Federal stock No. 7930-395-9542).

26. Operator's Preventive Maintenance

Preventive maintenance at the operator's level consists of the daily and weekly maintenance checks listed below:

Warning: Before inspecting or cleaning the arming switch tester, make certain that the carriage is unlatched and at the top of the guide tube (fig. 1). Accidental release of the carriage in the latched position could cause serious injury to personnel.

Caution: Disconnect the power before performing preventive maintenance.

a. Daily Maintenance Checks.

- (1) Use a clean cloth to remove dust, dirt, moisture, and grease from the cabinet, the guide tube (fig. 1), the control panel, and the cable connectors. If necessary, wet the cloth with cleaning compound and then dry with a clean dry cloth.

Warning: Cleaning compound is flammable and its fumes are toxic. Do not use near a flame; provide adequate ventilation.

- (2) Check the controls, indicators, connectors, and fuse holders for secure mounting to the control panel (fig. 9).

- (3) Check the SENSOR SELECTOR switch, the TIME DELAY switch, and the POWER switch for smooth operation. Make sure that the switches are tight and operate without binding.

- (4) During operation of the arming switch tester, be alert for any unusual performance or condition.

b. Maintenance Weekly Checks.

- (1) Check the cables (fig. 1) for evidence of damage, broken insulation, and corroded connectors.

- (2) Make sure that the cabinet fasteners securely fasten the door to the cabinet.

- (3) Check the cabinet and guide tube for external signs of damage, wear, corrosion, or deterioration.

27. Visual Inspection

a. When the equipment fails to perform properly, check it for the following:

- (1) Incorrect settings of switches and controls (par. 19).

- (2) Disconnected or poorly connected control panel connectors and interconnecting cables (fig. 5).

- (3) Wrong ballast weight for the test being performed (par. 18).

- (4) Burned-out control panel fuses and indicator lamps. (Check the lamps by depressing the indicators.)

- (5) Equipment not level. The air bubble must be in the center of the level gage (fig. 9).

b. If the visual inspection does not locate the trouble, refer to the operational checklist (par. 28).

28. Operational Checklist

a. *General.* The operational checklist will help the operator to locate trouble quickly. The corrective measures are used to repair this trouble.

If the measures suggested do not restore normal equipment performance, troubleshooting is required by higher echelon. Note on the repair tag what corrective measures were taken and how the equipment performed at the time of the failure.

unit for sensitivity adjustment of the pulse inverter (par. 17a-h). After the equipment has had time to warm up, perform the procedures given in *c* below, in the order given. Observe the equipment operation and perform any corrective measures necessary.

b. Procedure. Set up the arming switch tester

c. Checklist.

Action	Normal indication	Corrective measure
POWER switch set to ON (par. 17h).	POWER ON indicator lamp lights.	Check power source for 28-vdc output. Replace or repair defective power source. Check POWER ON indicator lamp (fig. 9) by depressing indicator. Replace lamp if it does not light (par. 29b). Check 1 AMP fuse by substitution (par. 29a). Replace power cable (69220) (fig. 5).
Operate CARRIAGE RELEASE lever (fig. 9).	Counter starts counting	Adjust sensitivity of pulse inverter (par. 17i-k). Replace rf cable (69219-1) connected to START connector. Replace pulse inverter.
Stop counter by depressing sensor switch LS6. Refer to note in paragraph 17j for location of LS6.	Counter stops counting	Replace rf cable (69219-3) connected to COUNTER STOP connector (fig. 5). Replace pulse inverter.
Set SENSOR SELECTOR switch to positions 2 through 5 and operate CARRIAGE RELEASE lever at each position. Stop counter at each position by depressing sensor switch associated with SENSOR SELECTOR switch. Refer to note in paragraph 17j for sensor switch locations.	Counter starts counting each time CARRIAGE RELEASE lever is operated, and stops counting each time sensor switch is depressed.	Adjust sensitivity of pulse inverter (para. 17i-k) with SENSOR SELECTOR switch in position in which it had been when counter did not start counting.
Install dummy load and 24-ounce ballast weight adjusted for 3.5 G (par. 18).	Carriage automatically latches when positioned at bottom of guide tube. Indication on counter is between 87 and 107 milliseconds. NO TEST indicator lamp does not light.	Operate CARRIAGE RELEASE lever (fig. 9) several times to clear latch.
Resetting counter (TM 11-6625-218-12): Each time, set SENSOR SELECTOR switch to positions 2, 3, 4, and 5, pull carriage down to latch position at bottom of guide tube with the knurled bar (fig. 8), and operate CARRIAGE RELEASE lever (fig. 9).	Indication on counter is between low and high limit on acceleration time chart (<i>d</i> below) for the position in which SENSOR SELECTOR switch is at an acceleration force of 3.5 G. NO TEST indicator lamp does not light.	

Action	Normal indication	Corrective measure
Remove the 24-ounce ballast weight and install the 6-ounce ballast weight adjusted for 5.5 G (par. 18).	Indication on counter is between 68 and 76 milliseconds. NO TEST indicator lamp does not light.	
Resetting counter (TM 11-6625-218-12): each time, set SENSOR SELECTOR switch to positions 2, 3, 4, and 5, pull carriage down to latch position at bottom of guide tube with the knurled bar (fig. 8), and operate CARRIAGE RELEASE lever (fig. 9).	Indication on counter is between low and high limit on acceleration time chart (<i>d</i> below) for the position in which SENSOR SELECTOR switch is at an acceleration force of 5.5 G. NO TEST indicator lamp does not light.	
Install and actuate known good air safety switch (pars. 20, 21 and 22 <i>b</i>). Connect air safety switch to arming switch tester with arming cable (69221) (fig. 5); then set TIME DELAY switch (fig. 9) to TEST.	After delay period of approximately eight seconds, TIME DELAY COMPLETE indicator lamp will light, and air safety switch will be deactivated.	Check 0.5 AMP fuse by substitution (par. 29 <i>a</i>). Check TIME DELAY COMPLETE indicator lamp by depressing indicator. Replace lamp if it does not light (par. 29 <i>b</i>). Replace arming cable (69221) (fig. 5).
Turn off or shut down equipment (para. 23).		

d. Acceleration Time Chart.

Acceleration force in G	SENSOR SELECTOR switch position	Counter indication (milliseconds)	
		Low limit	High limit
3.5	1	87	107
	2	123	150
	3	151	185
	4	174	232
	5	195	239
5.5	1	68	76
	2	96	107
	3	117	131
	4	135	151
	5	151	169

29. Replacement of Lamps and Fuses
(fig. 9)

a. Replacement of Fuses. Replace the control panel fuses as follows:

- (1) Turn the fusecap in the direction indicated by the arrow, and pull the cap and fuse out of the fuseholder.
- (2) Remove the spare fuse in the same manner ((1) above).

- (3) Insert the spare fuse and cap in the fuseholder, and turn the cap in the opposite direction to that indicated by the arrow on the cap.
- (4) Remove the defective fuse from the fusecap and replace it with a new one.
- (5) Insert the new fuse and cap into the spare fuseholder, and turn the cap in the opposite direction to that indicated by the arrow on the cap.

b. *Replacement of Indicator Lamps.* Replace the indicator lamps as follows:

- (1) Turn the lampholder cap in a counter-clockwise direction until it is free from the lampholder.
- (2) Remove the defective indicator lamp

from the lampholder cap and replace it with a new one.

- (3) Insert the indicator lamp and lampholder cap into the lampholder, and turn the lampholder cap in a clockwise direction until it is handtight.

SECOND ECHELON MAINTENANCE

30. Scope of Second Echelon Maintenance

Except for additional preventive maintenance (par. 31), second echelon maintenance is the same as first echelon maintenance (par. 24). In addition to the materials given for first echelon (par. 25), second echelon requires the use of the spanner wrench (fig. 1) for leveling the arming switch tester, and Multimeter AN/URM-105 for checking cables.

31. Second Echelon Preventive Maintenance

Preventive maintenance at second echelon level is performed monthly. Proceed with the maintenance checks as follows:

a. Perform the daily and weekly checks listed for first echelon maintenance of the arming switch tester (par. 26).

b. Clean rust and corrosion from the metal surfaces (fig. 1) by lightly sanding the surfaces with a fine sandpaper. Brush two thin coats of paint on the bare metal to protect it from further corrosion. Refer to the applicable cleaning

and refinishing practices specified in TM 9-2851.

c. Inspect the seating of readily accessible items of a pluckout nature, such as the panel-mounted fuses (fig. 9) and the control panel indicator lamps. Do not remove, rock, or twist the items during inspection. Use only a direct pressure to insure that the item is fully seated.

d. Make sure that the control panel mounting screws are tight.

e. Check to see that the connector pins on the control panel are not bent or broken.

f. Inspect the gasket around the edge of the arming switch tester door (fig. 1) to see if it is loose, cracked, or damaged.

g. Repair any cuts in cable insulation by covering the cuts with rubber tape and then with friction tape. Replace or repair all broken cables.

h. Clean and tighten the switches and knobs; clean the interior of the guide tube and cabinet.

TRANSIT, SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. TRANSIT, SHIPMENT, AND LIMITED STORAGE

32. Preparation for Transit

To prepare the arming switch tester unit for transit when it is installed in a vehicle, shut down the equipment (par. 26) and perform the following procedures:

a. Secure the bracket ((4) B, fig. 3) to plate (7) by tightening self-locking nuts (8).

b. Secure the top of the arming switch tester to bracket (4) with bolts (5) and flat washers (6).

c. If the arming switch tester is not in a position to allow for installing the bolts (*b* above), secure the top of it as follows:

(1) Open the relief valve on the side of the arming switch tester (fig. 1).

(2) Open the arming switch tester door by releasing the three fasteners that secure the door.

(3) Remove the spanner wrench from the loose-equipment storage pocket, and loosen the swivel base by turning the lockring (fig. 4) counterclockwise with the spanner wrench.

(4) Pivot the arming switch tester until the bolts ((5) B, fig. 3) can be screwed into the holes in the top of the arming switch tester (through the holes in bracket (4)).

(5) Secure the arming switch tester to bracket (4) with bolts (5) and flat washers (6). Before tightening bolts (5), position the top of the arming switch tester as close to the forward wall as possible.

(6) Tighten the swivel base by turning the lockring (fig. 4) clockwise with the spanner wrench.

(7) Store the spanner wrench in the loose-

equipment storage pocket (fig. 1) and close the arming switch tester door. Secure the door with the three fasteners.

(8) Close the relief valve by turning it clockwise until it is tight.

33. Disassembly of Equipment

To disassemble the arming switch tester unit for shipment or limited storage, shut down the equipment as instructed in paragraph 23. Do not put the pulse inverter in its pocket (par. 23*b* (3)) since it is to be packed outside of the arming switch tester (par. 34). After shutting down the equipment, perform the procedures given in *a* through *c* below.

a. Disconnect the base plate (B, fig. 3) from the floor by removing bolts (1), flat washers (2) and self-locking nuts (3).

b. If the bracket (4) is not attached to the arming switch tester, lay the tester down on the floor or on a bench and secure bracket (4) to plate (7) by tightening self-locking nuts (8).

c. If bracket (4) is attached to the arming switch tester, remove bracket (4) from it by removing bolts (5) and flat washers (6).

34. Repackaging for Shipment or Limited Storage

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever circumstances permit. The information concerning the original packaging (par. 11) will also be helpful.

a. *Material Requirements.* The following materials are required for packaging Test Set, Actuator and Arming Switch AN/USM-155. For stock numbers of materials, consult SB 38-100.

Material	Quantity
Waterproof paper	60 sq ft
Waterproof tape	30 ft
Corrugated cardboard	40 sq ft
Gummed tape	40 ft
Filler material	12 sq ft
Wooden packing case (<i>b</i> below)	1 ea

b. Wooden Packing Case. A wooden packing case is required for shipping the arming switch tester unit. The inside dimensions of the case are 70 by 9 by 9 inches.

c. Packaging.

- (1) Wrap the arming switch tester with waterproof paper and seal it with waterproof tape. Cushion all surfaces with filler material. Wrap the cushion unit in corrugated cardboard. Secure

the corrugated cardboard with gummed tape.

- (2) Wrap the pulse inverter with waterproof paper and seal it with waterproof tape. Cushion all surfaces with filler material. Wrap the pulse inverter in corrugated cardboard. Secure the corrugated cardboard with gummed tape.
- (3) Wrap the technical manuals with waterproof paper and seal them with waterproof tape.

d. Packing.

- (1) Cover the bottom of the wooden packing case with filler material.
- (2) Place the packages in the wooden packing case and fill all voids with filler material.
- (3) Place a wooden cover on the wooden packing case and nail it closed.

Section II. DEMOLITION OF MATERIAL TO PREVENT ENEMY USE

35. Authority for Demolition

The demolition procedures given in paragraph 36 will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

36. Methods of Destruction

Any or all of the methods of destruction given below may be used. The time available and the tactical situation will determine the method to be used when destruction of equipment is ordered. It is preferable to demolish completely some critical portion of the equipment rather than to partially destroy all the equipment.

a. Smash. Smash the interior of the arming switch tester; use sledges, axes, hammers, crowbars, and any other heavy tools available.

- (1) Open the door of the cabinet. Smash the control panel, carriage, and guide tube with a heavy hammer or crowbar.

- (2) Smash the cabinet; use the heaviest tool on hand.

b. Cut. Cut cabling, cording, and wiring; use axes, handaxes, machetes, or similar tools. Cut the power cable; use a heavy axe or machete. Cut all cords and cables in a number of places.

c. Burn. Burn the technical manuals first. Burn as much of the equipment as is flammable; use gasoline, oil, flamethrowers, and similar tools. Pour gasoline on the cut cables and internal wiring and ignite it. Use a flamethrower to burn auxiliary equipment, or pour gasoline on it and ignite it. Use incendiary grenades to complete destruction of unit interiors.

Warning: Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.

d. Explode. Use explosives to complete demolition or to cause maximum damage when time does not permit complete demolition by other means. Powder charges, fragmentation grenades, or incendiary grenades may be used. In

incendiary grenades are most effective if destruction of small parts and wiring is desired.

(1) Use an incendiary grenade to destroy the carriage and guide tube. Be sure that the cabinet door is secured after the grenade is placed.

(2) Smash the control panel and insert a

small explosive charge to destroy the interior.

c. *Dispose.* Bury or scatter the destroyed parts, or throw them into nearby waterways. This is particularly important if a number of parts have not been completely destroyed.

APPENDIX I
REFERENCES

The following is a list of applicable references available to the operator and unit repairman of Test Set, Actuator and Arming Switch AN USM-155.

- DA Pamphlet 310-4 Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Work Orders.
- SB 38-100 Preservation, Packaging, and Packing Materials, Supplies, and Equipment used by the Army.
- TM 9-2851 Painting Instructions for Field Use.
- TM 55-1550-200-12 Operator's and Organizational Maintenance Manual: Surveillance Drone OA-2343 USD-1.
- TM 11-5895-246-12 Operator's and Organizational Maintenance: Airborne Drone Surveillance System AN USD-1A.
- TM 11-6625-203-12 Operation and Organizational Maintenance: Multimeter AN URM-105 including Multimeter ME-77 U.
- TM 11-6625-218-12 Operation and Organizational Maintenance: Frequency Meter AN TSM-16.
- TM 38-750 The Army Equipment Record System and Procedures.

APPENDIX II MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. This appendix assigns maintenance functions to be performed on components, assemblies, and subassemblies by the lowest appropriate maintenance echelon.

b. Columns in the maintenance allocation chart are as follows:

(1) *Component*. This column shows only the nomenclature or standard item name. Additional descriptive data is included only where clarification is necessary to identify the component. Components, assemblies, and subassemblies are listed in top-down order. That is, the assemblies which are part of a component are listed immediately below that component, and the subassemblies which are part of an assembly are listed immediately below that assembly. Each generation breakdown (components, assemblies, or subassemblies) is listed in disassembly order or alphabetical order.

(2) *Maintenance function*. This column indicates the various maintenance functions allocated to the echelons.

- (a) *Service*. To clean, to preserve, and to replenish lubricants.
- (b) *Adjust*. To regulate periodically to prevent malfunction.
- (c) *Inspect*. To verify serviceability and to detect incipient electrical or mechanical failure, by scrutiny.
- (d) *Test*. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment, such as gages and meters.
- (e) *Replace*. To substitute serviceable components, assemblies, or subassemblies for unserviceable components, assemblies, or subassemblies.
- (f) *Repair*. To restore an item to service-

able condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

(g) *Align*. To adjust two or more components of an electrical system so that their functions are properly synchronized.

(h) *Calibrate*. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(i) *Overhaul*. To restore an item to completely serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(j) *Rebuild*. To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and or specifications and subsequent reassembly of the item.

(3) *1st, 2d, 3d, 4th, 5th echelons*. The symbol X placed in columns 3 through

7 indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding column.

c. Columns in the allocation of tools for maintenance functions are as follows:

- (1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.
- (2) *1st, 2d, 3d, 4th, 5th echelon.* The dagger (†) symbol in these columns indicates the echelons normally allocated the facility.
- (3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to theater headquarters or communications zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

SECTION II MAINTENANCE ALLOCATION CHART

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
TEST SET, ACTUATOR AND ARMING SWITCH AN/USM-155	service adjust inspect test replace repair align calibrate overhaul		X		X	X X X X X X X	8 6,8 1,2,3,4,6,7,8 5,8 6,8 1,2,3,4,6,7,8 1,2,3,4,6,7,8 1,2,3,4,6,7,8,9	Visual
CABLE ASSEMBLIES	replace repair	X		X				
INVERTER-AMPLIFIER	replace repair	X		X				

SECTION III ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	1ST ECH	2ND ECH	3RD ECH	4TH ECH	5TH ECH	TOOL CODE	REMARKS
AN/USM-155 (continued)							
ACCELEROMETER, STATHAM AS-15-350					+	1	
ARMING SWITCH-FLARE ARMING GEORGE HARMON CO NO. EL1092					+	2	
CAMERA; OSCILLOSCOPE RECORDING BEATTIE COLEMAN K-LLP					+	3	
FREQUENCY METER AN/TSM-16					+	4	
MULTIMETER AN/URM-105		+				5	
MULTIMETER TS-352 U				+	+	6	
OSCILLOSCOPE AN/USM-81					+	7	
PRE AMPLIFIER AM-3148/USM					+	8	
TOOLS NORMALLY AVAILABLE TO THE REPAIRMAN				+	+	9	
THERMISTOR							
THERMISTOR							
THERMISTOR							
THERMISTOR							
THERMISTOR							
THERMISTOR							
THERMISTOR							
THERMISTOR							
THERMISTOR							

APPENDIX III

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. General

This appendix lists items supplied for initial operation and for running spares. The list includes tools, parts, and material issued as part of the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

2. Columns

a. *Source, Maintenance, and Recoverability Code.* Not used.

b. *Federal Stock Number.* This column lists the 11-digit Federal stock number.

c. *Designation by Model.* Not used.

d. *Description.* Nomenclature or the standard item name and brief identifying data for each

item are listed in this column. When requisitioning, enter the nomenclature and description.

e. *Unit of Issue.* The unit of issue is each unless otherwise indicated and is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

f. *Expendability.* Nonexpendable items are indicated by NX. Expendable items are not annotated.

g. *Quantity Authorized.* Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spare Items" the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

h. *Illustrations.* Not used.

SECTION II FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS	
							FIGURE NO	ITEM NO.
	6625-877-2894		TEST SET, ACTUATOR AND ARMING SWITCH AN/USM-155: 28v dc, range 3 to 6 "G", 150 to 750 milliseconds, output 28v dc time pulse; performance characteristics; acceleration test to calibrate arming switch		NX			
			ITEMS COMPRISING AN OPERABLE EQUIPMENT					
	Ord thru AGC		TECHNICAL MANUAL TM 11-6625-489-12:			2		
			CABLE ASSEMBLY, SOLENOID SUPPRESSOR: Northrop Ventura No. 69188 (+L2Ab3-1)			1		
			CABLE ASSEMBLY, RADIO FREQUENCY: Northrop Ventura No. 69219-1 (+L2Ab3-2)			1		
			CABLE ASSEMBLY, RADIO FREQUENCY: Northrop Ventura No. 69219-3 (+L2Ab3-3)			1		
			CABLE ASSEMBLY, POWER, ELECTRICAL: Northrop Ventura No. 69220 (+L2Ab3-4)			1		
			CABLE ASSEMBLY, POWER, ELECTRICAL: Northrop Ventura No. 69221 (+L2Ab3-5)			1		
			INVERTER, AMPLIFIER: Northrop Ventura No. 69151 (+L2Ab3-6)			1		
			DUMMY LOAD: Northrop Ventura No. 69218 (+L2Ab3-7)			1		
			WRENCH, SPANNER: Northrop Ventura No. 69210 (+L2Ab3-8)			1		
			RUNNING SPARE ITEMS					
	5920-280-8344		FUSE, CARTRIDGE: MIL type 90078-7			5		
	5920-280-8342		FUSE, CARTRIDGE: MIL type MS90078-9			5		
	6240-155-7836		LAMP, INCANDESCENT: MIL type MS25237-327			1		

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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USA Engr CD Agcy (1)	USA Elet Mat Agcy, MRO (1)
USA CBR CD Agcy (1)	WRAMC (1)
USA Comm Elet CD Agcy (1)	AFIP (1)
USA Med Svc CD Agcy (1)	AMS (1)
USA Ord CD Agcy (1)	USA Trans Tml Comd (1)
USA QM CD Agcy (1)	Army Tml (1)
USA Trans CD Agcy (1)	OSA (1)
USA AD CD Agcy (2)	POE (1)
USA Armor CD Agcy (2)	Army Pictorial Cen (2)
USA Arty CD Agcy (1)	EMC (1)
USA Avn CD Agcy (1)	Yuma Test Sta (2)
USA Inf CD Agcy (1)	USA Carib Sig Agcy (1)
USA Intel CD Agcy (1)	USA Sig Msl Spt Agcy (13)
USA SPWAR CD Agcy (1)	Sig Fld Maint Shops (3)
USAATBD (1)	Def Log Svc Cen (1)
USCONARC (5)	USA Strat Comm Comd (4)
ARADCOM (2)	USA Corps (3)
ARADCOM Rgn (2)	JBUSMC (2)
OS Maj Comd (3)	Units org under fol TOE: (2 copies
OS Base Comd (2)	each except as indicated)
LOGCOMD (2)	11-7
MDW (1)	11-16
Armies (2)	11-57
Corps (2)	11-97
Instl (2) except	11-98
Ft Monmouth (63)	11-117
USATC AD (2)	11-155
USATC Engr (2)	11-157
USATC Inf (2)	11-500 (AA-AE) (4)
USATC Armor (2)	11-557
Svc Colleges (2)	11-587
Br Svc Sch (2)	11-592
GENDEP (OS) (2)	11-597

NG: None.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

TM 11-6625-489-12 TEST SET, ACTUATOR AND ARMING SWITCH AN/USM-155-1962