

ARMY TECHNICAL MANUAL
NAVY PUBLICATION

AIR FORCE TECHNICAL ORDER

TM 5-6350-264-14&P-8
NAVELEX EE181-AA-OMI-
090/E121 SA-1954
T.O. 31S9-2FSS9-1-8

TECHNICAL MANUAL

**OPERATOR'S, ORGANIZATIONAL,
DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)**

**SWITCH, ALARM, LATCHING
SA- 1954/ FSS-9(V)
NSN 6350-00-228-2510**

**HEADQUARTERS, DEPARTMENTS OF THE ARMY, THE NAVY AND THE AIR FORCE
27 AUGUST 1982**

CHANGE

HEADQUARTERS
DEPARTMENTS OF THE ARMY, NAVY and AIR FORCE
WASHINGTON, D.C., 20 May 1986

No. 1

Operator's, Organizational, Direct Support, and General Support
Maintenance Manual
(Including Repair Parts and Special Tools List)

SWITCH, ALARM, LATCHING SA-1954/FSS-9(V)
NSN 6350-00-228-2510

TM 5-6350-264-14&P-8/NAVELEX EE 181-AA-OMI-O90/E121 SA-1954/T.O.31S9-2FSS9-1-8, 27 August 1982, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

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i and ii
1-1 and 1-2
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C-1 through C-5/C-6

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WARNING

NOISE HAZARD

The Audible Alarm presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Authorized protective equipment must be worn by all personnel in the work area. If the Audible Alarm is installed, it must be disabled BEFORE any trouble-shooting procedures are attempted. Disable the alarm by setting the key-operated switch on Control Unit to TEST/RESET position, opening Audible Alarm, removing faceplate, and turning off power switch. After trouble-shooting the Audible Alarm must be reactivated. Activate the Alarm by setting the key-operated switch on Control Unit to TEST/RESET position, turn Alarm power switch on, replace faceplate, close and lock Audible Alarm door. Turn key-operated switch on Control Unit to SECURE or ACCESS.

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 WASHINGTON, D.C. 27 August 1982

Operator's, Organizational, Direct Support, and General Support
 Maintenance Manual
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SWITCH, ALARM, LATCHING SA-1954FSS-9(V)
 NSN 6350-00-228-2510

Current as of 17 April 1984

REPORTING OF ERRORS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures. please let us know. ARMY: Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), should be mailed to: Commander, U.S. Army Troop Support Command. ATTN: AMSTR-MCTS. 4300 Goodfellow Boulevard. St. Louis. IO 63120-1798. AIR FORCE: Completed AFTO Form 22 (Technical Order Publication Improvement Report and Reply) should be forwarded to: HQ, SA-ALC/MMEDT, Kelly AFB. TX 78241. NAVY: Completed DA Form 2028 (Recommended Changes to Publications and Blank Forms). User Activity Technical Manual Comment Sheet. Feedback Report. or other suitable reporting forms should be mailed to:
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Figure 1-1. Latching Alarm Switch

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. SCOPE. This manual is for your use in operating and maintaining the Latch Alarm Switch (LAS) Model SA-1954/FSS-9 (under normal operating conditions). The LAS is an integral part of the Joint-Services Interior Intrusion Detection System (J-SIIDS). For information on other major assemblies of J-SIIDS, refer to the applicable manual listed in appendix A.

1-2. MAINTENANCE FORMS AND RECORDS. Equipment maintenance forms and procedures for their use are contained in DA pamphlet 738-750, the Army Maintenance Management System (TAMMS).

1-3. ADMINISTRATIVE STORAGE. Instructions for administration storage are contained in TM 740-90-1.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE. Instructions for the

destruction of Army materiel to prevent enemy use are contained in TM 750-244-3.

1-5. QUALITY ASSURANCE/QUALITY CONTROL. There are no Quality Assurance/Quality Control technical manuals applicable to this equipment.

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). EIR's will be prepared on Standard Form 368. Quality Deficiency Report. Instructions for preparing EIR's are provided in DA pamphlet 738-750. EIR's should be mailed directly to Commander U.S. Army Troop Support Command. ATTN: AMSTR-QX. 4300 Goodfellow Blvd., St., Louis Missouri 63120-1779. A reply will be furnished directly to you.

1-7. EQUIPMENT SERVICEABILITY CRITERIA (ESC). This equipment is not covered by ESC.

Section II. DESCRIPTION

1-8. DESCRIPTION. The LAS (fig. 1-1) consists of a metal chassis, three push-button switches, a magnetic latching relay, light emitting diode (LED), and associated mounting and wiring hardware. The switch is used to initiate manually, by hand or by foot, an alarm whenever an intruder threatens the area under guard. A tamper alarm is automatically initiated when the switch cover is removed.

1-9. TABULATED DATA.

a. Identification Data. An identification plate (fig 1-2) is mounted inside the enclosure.

b. Equipment Characteristics

Weight 3 pounds (1.36 kg)

Dimensions (overall)

Height 3.8125 inches (9.9.85 cm)

Width 8.0625 inches (20.3 cm)

Length 8.0625 inches (20.3 cm)

Color

Housing.....Gray per Federal
Standard 595, color chip
36440 MIL-c-22751

Lettering Black per TT-I-558

Environmental (operational)

Temperature range -20° to +150 F
(-290 to +650 C)

Relative humidity Up to 95%

Environmental (nonoperational and storage)

Temperature range 30 to +165° F
(-34° to +74° C),

Relative humidity Up to 95%

Shock 11 g for 11 ms
and bench handling

Vibration Withstands transportation
.....conditions

Power requirements. 20 +2 vdc; supplied
by J-SIIDS Control Unit

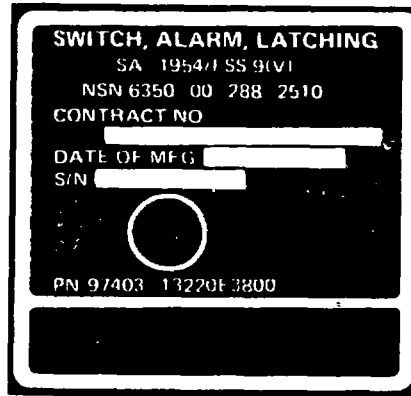


Figure 1-2. Latching Alarm Switch Identification Plate

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. OPERATING PROCEDURES

2-1. CONTROLS AND INDICATORS. The LAS operator controls and indicators are shown in figure 2-1 and described in table 2-1.

2-2. NORMAL OPERATING PROCEDURES. The LAS is operational after it has been installed,

tested, and connected to the J-SIIDS Control Unit. Since the startup and shutdown of the LAS are dependent on the presence or absence of power from the control unit, no operating procedures other than those listed in table 2-1 are required.

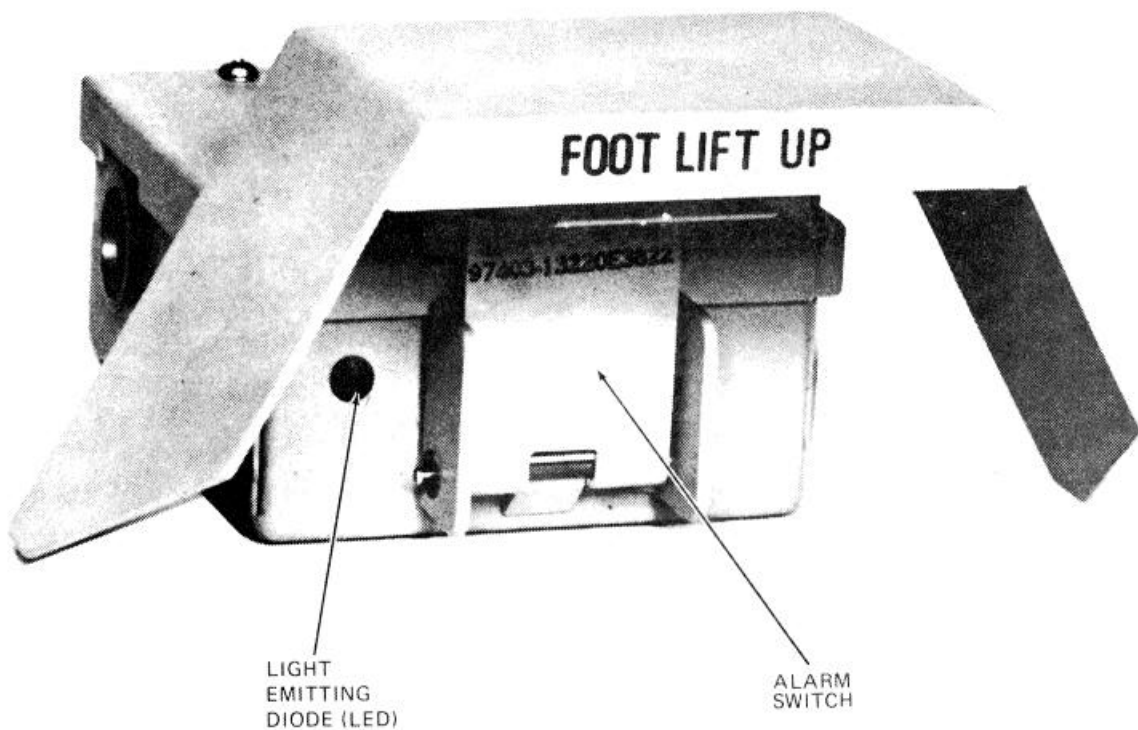


Figure 2-1. LAS Controls and Indicators

Table 2-1. Operator Controls and Indicators

Controls and indicators	Function
Alarm switch	<p>Provides an alarm signal output when actuated.</p> <p style="text-align: center;">NOTE</p> <p>After an alarm has been responded to, notify appropriate direct support maintenance personnel to reset the LAS to a no-alarm condition.</p>
Alarm indicator	<p>LED comes on when alarm is actuated; goes off when alarm switch is reset.</p>

Section II. THEORY OF OPERATION

2-3. FUNCTIONAL DESCRIPTION.

- a. The LAS permits authorized personnel to manually activate an alarm signal to the J-SIIDS Control Unit when the security of an area is threatened. The LAS chassis cover contains a tamper switch that also activates an alarm signal when the cover is removed from the housing by ¼ inch (0.635 cm) or more. See figure 2-2 for a simplified functional block diagram of the LAS.
- b. The LAS has four operational modes as follows: duress alarm, duress alarm reset, tam-per alarm, and no alarm.

(1) Duress alarm. When an operator actuates the duress alarm switch, the low impedance across TB1-1 and TB1-2 is changed to a high impedance which is used as the duress alarm signal output. When the duress alarm switch contacts open, volt-

age is applied to one side of the latching relay. With the latching relay operating and latched, the closed latching relay contacts provide a continuous signal path and return path through an LED. The indicator light (LED), on the front of the LAS comes on red and remains on as long as the duress alarm signal is present. The indicator light goes out when the reset switch is pressed and the LAS returns to the no-alarm state.

(2) Duress alarm reset. When the duress alarm switch is actuated, the alarm signal and the alarm indicator light will remain on until the reset switch is pressed. When the reset switch is pressed, voltage is applied to the other side of the latching relay which restores the relay contacts to the no-alarm condition.

(3) Tamper alarm. When the cover is moved from the chassis by 1/4 inch (0.635 cm) or more, a tamper alarm switch on the inside of the cover activates a tamper alarm signal. When the cover

is moved, the normally low resistance across the tamper switch terminals is changed to high resistance which is used as the tamper alarm signal. When the cover is installed, the tamper alarm switch is restored to the no-alarm state.

(4) No alarm. The LAS is in the no-alarm state when a circuit impedance of 2000 ohms or less is present across TB1-1 and TB1-2 and TB1-5 and TB1-6.

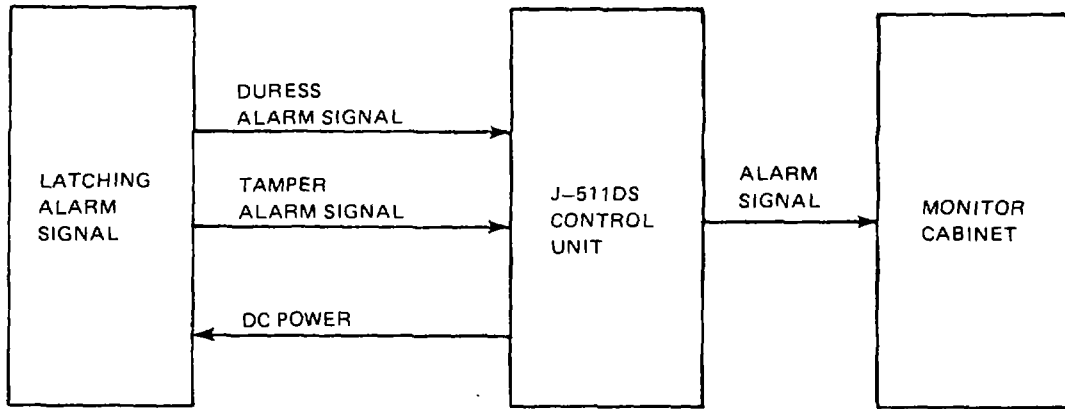


Figure 2-2. LAS Simplified Functional Block Diagram

2-3/(2-4 blank)

CHAPTER 3

OPERATING MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

This section is not applicable

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

CAUTION

Do not use TRICHLORETHANE or other hydrocarbon cleaning compounds.

3-1. PMCS PROCEDURES. Operator PMCS is limited to cleaning the exterior of the LAS. Clean exterior surfaces using a cloth dampened in a solution of mild detergent and water. Rinse with a cloth dampened in cold water and dry thoroughly.

Section III TROUBLESHOOTING

This section is not applicable.

Section IV. MAINTENANCE PROCEDURES

This section is not applicable.

3-1/(3-2 blank)

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

This chapter is not applicable to this equipment.

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CHAPTER 5

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

5-1. SPECIAL TOOLS. No special tools are required for the Latching Alarm Switch.

list covering direct and general support maintenance for this equipment in appendix C of this manual.

5-2. REPAIR PARTS. Repair parts are listed and illustrated in the repair parts and special tools

Section II. TROUBLESHOOTING

5-3. TROUBLESHOOTING PROCEDURES.

NOTE

WARNING

The Audible Alarm presents a noise hazard to personnel in the area. The noise level exceeds the allowable limits for unprotected personnel. Authorized protective equipment must be worn by all personnel in the work area.

NOTE

If the Audible Alarm is installed, it must be disabled BEFORE any troubleshooting procedures are attempted. Disable the Alarm by setting the key-operated switch on Control Unit to TEST/RESET position. Open Audible Alarm, remove faceplate, and turn off power switch. After troubleshooting, the Audible Alarm must be reactivated.

Activate the Alarm by setting the key-operated switch on Control Unit to TEST/RESET position. Turn Alarm power switch on, replace faceplate, close and lock Audible Alarm door. Turn key-operated switch on Control Unit to SECURE or AC-CESS.

Before you use table 5-1, be sure you have performed all applicable operating checks.

- a. This section contains troubleshooting information for locating and correcting most of the operating troubles which may develop in the Latching Alarm Switch. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine corrective actions to take. You should perform the test/inspections in the corrective actions column 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.
- c. The table lists the common malfunctions which you may find during the operation or maintenance of the Latching Alarm Switch or its components. You should perform the test/inspections in the corrective actions column in the order listed.

- d. Check all available information on the equipment for aid in diagnosing problems.
- e. Make a visual inspection of the equipment.
 - (1) Inspect the equipment for evidence of physical damage.
 - (2) Inspect the terminal strips for clean and secure connections.
 - (3) Inspect all wiring and cabling for worn or frayed insulation and broken wires.
 - (4) Inspect all resistors for discoloration due to overheating.
 - (5) Inspect the complete subsystem for the presence of dirt, corrosion, moisture,

and bits of wire or solder inside the housings.

NOTE

Touchup paint is recommended instead of refinishing whenever practical.

- (6) Inspect all metal surfaces intended to be painted for condition of finish and legibility of panel lettering.
- f. Refer to figure 5-1 for all test points referred to in table 5-1. Step-by-step troubleshooting procedures, including Trouble, Probable Cause, and Corrective Action, are listed in table 5-1.

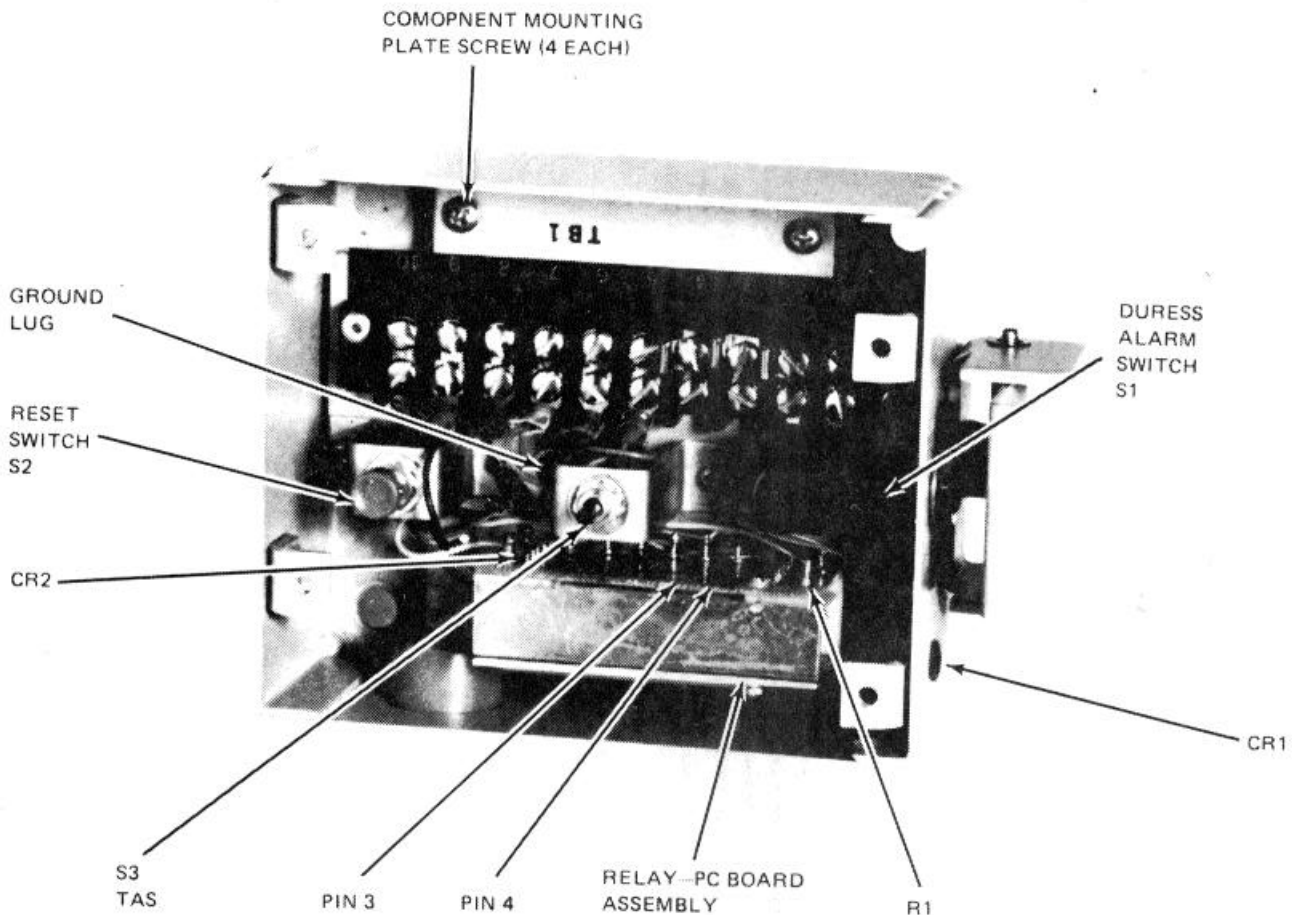


Figure 5-1. Latching Alarm Switch with Callouts for Troubleshooting Test Points

Section III. GENERAL MAINTENANCE

5-4. MAINTENANCE ACTION. The extent of direct and general support maintenance is governed by the Maintenance Allocation Chart (MAC), Appendix B. The MAC provides for on-site test and replacement of the switch assemblies, light-

emitting diode, and PC board. On-site inspection and replacement are provided for the cover and cover gasket. Periodic testing of the Latching Alarm Switch is not scheduled because the J-SIIDS is maintained in continuous operation.

Section IV. REMOVAL AND REPLACEMENT OF MAJOR COMPONENTS AND ASSEMBLIES

5-5. REMOVAL AND INSTALLATION PROCEDURES.

- a. To remove LED, tag and carefully unsolder wires from PC board. Use a soldering iron of 50 watts maximum.
- b. To replace LED, turn flat spot on side of LED toward 2 on PC board. Carefully solder wires to PC board, using soldering iron of 50 watts maximum.
- c. Remove the PC board and relay. Remove screws that secure the PC board to the relay bracket. Tag the wires, and use a soldering iron of 50 watts maximum to remove them from the PC board terminals.
- d. To install new PC board, use soldering iron of 50 watts maximum and solder wires to the terminals; secure relay bracket to the PC board.
- e. To remove cover, remove screws that secure it to chassis, and lift it off the chassis.
- f. To install new cover, orient it so that the guard at one end is over the duress alarm switch and the screw holes in the cover are aligned with the screw holes in the chassis. Insert the screws and tighten them to secure cover.
- g. To remove gasket, remove screws that secure cover to chassis, and lift cover off chassis.

Remove gasket from cover. Scrape off any bits of gasket that adhere to cover.

- h. To install a new gasket, orient it so the holes in the gasket are aligned with the holes in the cover. Apply adhesive and press the gasket into place. Orient the cover so that the guard at one end of cover is over the duress alarm switch and the screw holes in the cover are aligned with the screw holes in the chassis. Insert the screws and tighten them to secure cover.
- i. After replacement of major components or assemblies during troubleshooting, test the LAS for proper operation. Ensure that the key-operated switch on the Control Unit is in the access position. Remove the chassis cover, and disconnect wire from TB1-2. Set multimeter to ohms and connect leads to TB1-1 and TB1-2. Meter should indicate 2000 ohms or less. Operate duress alarm switch (S1). Meter indication should change to over 100,000 ohms, and the alarm indicator light should come on. Depress the reset switch (S2). The meter indication should change to less than 2000 ohms, and the indicator light should go out. Connect meter leads to TB1-5 and TB1-6, and depress TAS (S3). Meter should indicate less than 2000 ohms. Slowly release TAS plunger. When the switch plunger moves $\frac{1}{4}$ inch (0.635 cm) or less, the meter indication should change to over 100,000 ohms. Disconnect the meter leads from TB1-5 and TB1-6, connect the wire to TB1-2, and install the cover.

NOTE

Troubleshooting procedures listed in table 5-1 may require more than one person to perform corrective action.

Covers should be removed as necessary to perform troubleshooting procedures.

Never disconnect a wire without first marking that wire to assure proper reconnection.

Table 5-1. Troubleshooting Procedures

Trouble	Probable cause	Corrective action
1. Constant alarm.	a. Bad duress alarm switch	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;">CAUTION</div> <p>When power is on, do not short test points to chassis or other test points, or damage may result.</p> <p style="text-align: center;">NOTE</p> <p>Before troubleshooting the LAS, remove all components from chassis as follows: Tag and disconnect wires TB1-1, TB1- and TB1-7. Remove the nut and lock washer from switch S1, and push the switch into the chassis. Remove component mounting plate screws. Remove plate and all components from chassis. Connect patch cable between wire removed from TB1-7 and terminal TB1-7. Connect patch cable between wire removed from TB1-8 and terminal TB1-8. Remove screws securing PC board assembly. Remove screws securing reset switch (S2). Move these two parts aside to provide working space.</p> <p>a. Set multimeter to ohms and connect leads to TB1-1 and TB1-2. Meter should indicate 0 ohms. Operate duress alarm switch (S1). Meter should indicate infinity or open circuit.</p>

Table 5-1. Troubleshooting Procedures-Continued

Trouble	Probable cause	Corrective action
1. (cont)	<p>a. (cont)</p> <p>b. Bad PC board</p>	<p>b. If these indications are not correct, connect meter leads to TB1-2 and pin 4 on PC board. With switch S1 in no-alarm position, meter should indicate 0 ohms.</p> <p>c. If these indications are not correct, replace switch S1.</p> <p>(1) To remove S1, tag the wires; and using a soldering iron of 50 watts maximum, unsolder and remove the wires from the pins on the PC board. Disconnect red wire from TB1-2.</p> <p>(2) To replace S1, connect wires to pins on the PC board, using a soldering iron of 50 watts maximum. Install a crimp lug on red wire and connect it to TB1-2.</p> <p>a. If switch S1 is good, set multimeter to ohms and check between TB1-1 and pin 4 on PC board. With switch S1 in the normal position (no-alarm), meter should indicate 0 ohms. Operate S1, and meter indication should change to infinity.</p> <p>b. If these indications are not correct, replace the PC board.</p> <p>(1) To remove PC board, remove screws that secure the PC board to the relay bracket. Tag the wires, and use a soldering iron of 50 watts maximum to remove them from the PC board terminals.</p> <p>(2) To replace PC board, use a soldering iron of 50 watts maximum to solder wires to PC board terminals. Secure PC board to relay bracket with screws.</p>

Table 5-1. Troubleshooting Procedures-Continued

Trouble	Probable cause	Corrective action
1. (cont)	c. Bad tamper alarm switch.	<p>a. Inspect the cover to ensure that it is flat, straight, and completely closed. Open the cover and ensure that there is no debris between cover and chassis. Set multimeter to ohms and connect leads to TB1-5 and TB1-6. Meter should indicate infinity. Depress the tamper alarm switch (TAS). The meter indication should change to 0 ohms.</p> <p>b. If these indications are not correct, replace the TAS.</p> <p>(1) To remove TAS, disconnect switch wires from TB1-5 and TB1-6. Remove screws that secure switch mounting bracket to component mounting plate, and remove mounting bracket. Remove nut and lock washer from switch. Remove switch from mounting bracket. Use a soldering iron of 50 watts maximum to remove wires from switch.</p> <p>(2) To replace TAS, set meter to ohms and check switch terminals. Meter should indicate 0 ohms with switch depressed and infinity with switch released. Use a soldering iron of 50 watts maximum to solder wires to switch terminals. Insert switch through hole in mounting bracket. nut on switch and tighten nut to secure switch. Use screws to secure switch mounting bracket and ground lug to component mounting plate. Connect switch wires to TB1-5 and TB1-6.</p>
2. Nuisance alarms.	a. Bad duress alarm switch .	<div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: fit-content;">CAUTION</div> <p>When power is on, do NOT short test points to chassis or other test points, or damage may result.</p>

Table 5-1. Troubleshooting Procedures-Continued

Trouble	Probable cause	Corrective action
2. (cont)	a. (cont)	<p style="text-align: center;">NOTE</p> <p>Before troubleshooting the LAS, remove all components from chassis as follows: Tag and disconnect from TB1. Insulate wires removed from TBI-1, TB1-6, and TB1-7. Remove the nut and lock washer from switch S1, and push the switch into the chassis. Push the LED into the chassis. Remove component mounting plate screws. Remove plate and all components from chassis. Connect patch cable between wire removed from TB1-7 and terminal TB1-7. Connect patch cable between wire removed from TB1-8 and terminal TB1-8. Remove screws securing PC board assembly. Remove screws securing reset switch (S2). Move these two parts aside to provide working space.</p> <p>a. Disconnect wire from TB1-7. Set multi-meter to ohms, and check between TB1-2 (red wire) and pin 4 (yellow wire) on PC board. With the duress alarm in the normal position, the meter should indicate 0 ohms. Operate the duress alarm switch (S1). The meter indication should change to infinity.</p> <p>b. If the indications are not correct, replace switch S1.</p> <p>(1) To remove S1, tag the wires; and using a soldering iron of 50 watts maximum, unsolder and remove the wires from the pins on the PC board. Disconnect red wire from TB1-2.</p>

Table 5-1. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (cont)	<p>a. (cont)</p> <p>b. Bad tamper alarm switch.</p> <p>c. Loose interconnecting wiring.</p>	<p>(2) To replace S1, connect wires to pins on the PC board, using a soldering iron of 50 watts maximum. Install a crimp lug on red wire and connect to TB1-2.</p> <p>a. Inspect the cover to ensure that it is flat, straight, and completely closed. Open the cover and ensure that there is no debris between cover and chassis. Set multimeter to ohms and connect leads to TB1-5 and TB1-6. Meter should indicate infinity. Depress the tamper alarm switch (TAS). The meter indication should change to 0 ohms.</p> <p>b. If these indications are not correct, replace the TAS.</p> <p>(1) To remove TAS, disconnect switch wires from TB1-5 and TB1-6. Remove screws that secure switch mounting bracket to component mounting plate, and remove mounting bracket. Remove nut and lock washer from switch. Remove switch from mounting bracket. Use a soldering iron of 50 watts maximum to remove wires from switch.</p> <p>(2) To replace TAS, set meter to ohms and check switch terminals. Meter should indicate 0 ohms with switch depressed and infinity with switch released. Use a soldering iron of 50 watts maximum to solder wires to switch terminals. Insert switch through hole in mounting bracket. Put lock washer and nut on switch and tighten nut to secure switch. Use screws to secure switch mounting bracket and ground lug to component mounting plate. Connect switch wires to TB1-5 and TB1-6.</p> <p>Ensure that all wire and conduit connections are clean and tight.</p>

Table 5-1. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
3. No latch or reset.	a. Low voltage to the LAS.	<div style="border: 1px solid black; padding: 5px; text-align: center; margin-bottom: 10px;">CAUTION</div> <p>When power is on, do NOT short test points to chassis or other test points, or damage may result.</p> <p style="text-align: center;">NOTE</p> <p>Before troubleshooting the LAS, remove all components from chassis as follows: Tag and disconnect wires from TB1. Insulate wires removed from TB1-1, 6, and 7. Remove the nut and lock washer from switch S1, and push the switch into the chassis. Push the LED into the chassis. Remove component mounting plate screws. Remove plate and all components from chassis. Connect patch cable between wire removed from TB1-7 and terminal TB1-7. Connect patch cable between wire removed from TB1-8 and terminal TB1-8. Remove screws securing PC board assembly. Remove screws securing reset switch (S2). Move these two parts aside to provide working space.</p> <p>a. Set multimeter to dc volts. Connect positive meter lead to TB1-7 and negative lead to TB1-8. Check for 20 +2 vdc.</p> <p>b. If voltage is below 18 volts (20 ±2 vdc), disconnect wires from TB1-7 and TB1-8 and check voltage on these wires.</p> <p>c. If voltage on wires is low, refer to TM 5-6350-264-14/10 & P on J-SIIDS Control Unit.</p>

Trouble	Probable cause	Corrective action
3. (cont)	<p style="text-align: center;">a. (cont)</p> <p style="text-align: center;">b. Bad system ground.</p> <p style="text-align: center;">c. Bad PC board.</p>	<p>d. If voltage to Control Unit is good, check wires for open circuits and shorts-to-ground in accordance with steps in TM 5-6350-264-14/1.</p> <p>e. If voltage on wires is normal, replace PC board.</p> <p>(1) To remove PC board, remove screws that secure the PC board to the relay bracket. Tag the wires, and use a soldering iron of 50 watts maximum to remove them from the PC board terminals.</p> <p>(2) To replace PC board, use a soldering iron of 50 watts maximum to solder wires to PC board terminals. Secure PC board to relay bracket with screws.</p> <p>a. Set multimeter to ohms and check from TB1-9 to chassis and conduit. Meter should indicate 0 ohms.</p> <p>b. If meter does not indicate 0 ohms, check ground and conduit connections to ensure that they are clean and tight.</p> <p>c. Set multimeter to ohms and check between TB1-8 and pin 3 on PC board. Meter should indicate 0 ohms.</p> <p>d. If meter does not indicate 0 ohms, check TB1-8 and pin 3 on PC board to ensure that connections are clean and tight.</p> <p>a. If switch S1 is good, set multimeter to ohms and check between TB1-1 and pin 4 on PC board. With switch S1 in the normal position (no alarm), meter should indicate 0 ohms. Operate S1, and meter indication should change to infinity.</p>

Table 5-1. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
3. (cont)	<p>c. (cont)</p> <p>d. Bad duress alarm switch (S1).</p> <p>e. Bad reset switch (S2).</p>	<p>b. If these indications are not correct, replace the PC board.</p> <p>(1) To remove PC board, remove screws that secure the PC board to the relay bracket. Tag the wires, and use a soldering iron of 50 watts maximum to remove them from the PC board terminals.</p> <p>(2) To replace PC board, use a soldering iron of 50 watts maximum to solder wires to PC board terminals. Secure PC board to relay bracket with screws.</p> <p>a. Disconnect wire from TB1-7. Set multi-meter to ohms, and check between PC board pin 5 (blue wire) and reset switch (S2, orange wire).</p> <p>b. Operate duress alarm switch (S1). Meter should indicate 0 ohms. Release S1. Meter should indicate infinity.</p> <p>c. If these indications are incorrect, replace S1.</p> <p>(1) To remove S1, tag the wires; and using a soldering iron of 50 watts maximum, unsolder and remove the wires from the pins on the PC board. Disconnect red wire from TB1-2.</p> <p>(2) To replace S1, connect wires to pins on the PC board, using a soldering iron of 50 watts maximum. Install a crimp lug on red wire and connect it to TB1-2.</p> <p>a. Disconnect wire from TB1-7. Set multi-meter to ohms and check between S2 (red wire) and S2 (orange wire). With S2 depressed, meter should indicate infinity. With S2 released, meter should indicate 0 ohms.</p>

Table 5-1. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
3. (cont)	e. (cont)	<p>b. Check between S2 (red wire) and S2 (yellow wire). With S2 depressed, meter should indicate 0 ohms. With S2 released, meter should indicate infinity.</p> <p>c. If these indications are not correct, replace S2.</p> <p>(1) To remove S2, snap plastic cap off of switch plunger. Remove nut and lock washer; remove screws that secure switch mounting bracket to component mounting plate. Remove switch mounting bracket. Tag wires, and use a soldering iron of 50 watts maximum to disconnect them from the switch terminals.</p> <p>(2) To replace S2, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Insert switch into switch mounting bracket, and use screws to secure mounting bracket to component mounting plate. Put lock washer and nut on switch, and tighten nut to secure switch.</p> <div style="border: 1px solid black; padding: 2px; text-align: center; width: fit-content; margin: 10px auto;">CAUTION</div> <p>When power is on, do NOT short test points to chassis or other test points, or damage may result.</p> <p style="text-align: center;">NOTE</p> <p>Before troubleshooting the LAS, remove all components from chassis as follows: Tag and disconnect wires from TB1. Insulate wires removed from TBI-1, 6, and 7. Remove the nut and lock washer from switch S1, and push the switch into the chassis. Push the LED into the chassis. Remove component mounting plate screws.</p>
4. No alarms.	a. Bad duress alarm switch (S1).	

Table 5-1. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (cont)	<p>b. (cont)</p> <p>c. Bad tamper alarm switch (TAS).</p>	<p>b. If these indications are not correct, replace the PC board.</p> <p>(1) To remove PC board, remove screws that secure the PC board to the relay bracket. Tag the wires, and use a soldering iron of 50 watts maximum to remove them from the PC board terminals.</p> <p>(2) To replace PC board, use a soldering iron of 50 watts maximum to solder wires to PC board terminals. Secure PC board to relay bracket with screws.</p> <p>a. Set multimeter to ohms and connect leads to TB1-5 and TB1-6. Meter should indicate infinity. Depress TAS. The meter indication should change to 0 ohms.</p> <p>b. If these indications are not correct, replace the TAS.</p> <p>(1) To remove TAS, disconnect switch wires from TB1-5 and TB1-6. Remove screws that secure switch mounting bracket to component mounting plate, and remove mounting bracket. Remove nut and lock washer from switch. Remove switch from mounting bracket. Use a soldering iron of 50 watts maximum to remove wires from switch.</p> <p>(2) To replace TAS, set meter to ohms and check switch terminals. Meter should indicate 0 ohms with switch depressed and infinity with switch released. Use a soldering iron of 50 watts maximum to solder wires to switch terminals. Insert switch through hole in mounting bracket.</p>

Table 5-1 Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (cont)	c. (cont)	<p>Put lock washer and nut on switch and tighten nut to secure switch. Use screws to secure switch mounting bracket and ground lug to component mounting plate. Connect switch wires to TB1-5 and TB1-6.</p>
5. No visual indication of alarm.	<p>d. Loose interconnecting wiring.</p> <p>Bad LED or PC board.</p>	<p>Ensure that all wire and conduit connections are clean and tight.</p> <div style="border: 1px solid black; padding: 2px; text-align: center; width: fit-content; margin: 10px auto;">CAUTION</div> <p>When power is on, do NOT short test points to chassis or other test points, or damage may result.</p> <p style="text-align: center;">NOTE</p> <p>Before troubleshooting the LAS, remove all components from chassis as follows: Tag and disconnect wires from TB1. Insulate wires removed from TB1-1, TB1-6 and TB1-7. Remove the nut and lock washer from switch S1, and push the switch into the chassis. Push the LED into the chassis. Remove component mounting plate screws. Remove plate and all components from chassis. Connect patch cable between wire removed from TB1-7 and terminal TB1-7. Connect patch cable between wire removed from TB1-8 and terminal TB1-8. Remove screws securing PC board assembly. Remove screws securing reset switch (S2). Move these two parts aside to provide working space.</p> <p>a. Operate duress switch (S1), and then reset switch (S2). The LED should go on when S1 is operated and go off when S2 is operated.</p>

Table 5-1. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
5. (cont)	(cont)	<p>b. If LED does not operate properly, set multimeter to dc volts; connect positive meter lead to top end of R1 (end of R1 opposite pin 6) and negative meter lead to TB1-8. With S1 in normal position, meter should indicate 20 vdc. When S1 has been operated (duress alarm), meter should indicate 0 V.</p> <p>c. If these indications are correct, replace LED. If trouble remains or indications are incorrect, replace PC board.</p> <p>(1) To remove LED, tag and carefully unsolder wires from PC board. Use a soldering iron of 50 watts maximum.</p> <p>(2) To replace LED, turn flat spot on side of LED toward 2 on PC board. Carefully solder wires to PC board, using a soldering iron of 50 watts maximum.</p> <p>(3) To remove PC board, remove screws that secure the PC board to the relay bracket. Tag the wires, and use a soldering iron of 50 watts maximum to remove them from the PC board terminals.</p> <p>(4) To replace PC board, use a soldering iron of 50 watts maximum to solder wires to PC board terminals. Secure PC board to relay bracket with screws.</p>

CHAPTER 6

REPAIR OF THE LATCHING ALARM SWITCH

This chapter is not applicable to this equipment

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APPENDIX A

REFERENCES

- | | |
|--|--|
| 1. DEMOLITION
TM 750-244-3 | Procedures for Destruction of Equipment
to Prevent Enemy Use |
| 2. FIRE PROTECTION
TB5-4200-200-10 | Hand Portable Fire Extinguishers
Approved for Army Users |
| 3. MAINTENANCE
DA Pamphlet 738750 | The Army Maintenance
Management System |
| 4. TRI-SERVICE MANUALS | |
| DMWR 5-6350-264
NAVELEX EE181-AA-MMD-010/E121
J-SIIDS MWR
AIR FORCE T.O. 31S9-4-1-213 | Depot Maintenance Work Requirement |
| TM 5-6350-264-14-1
NAVELEX EE181-AA-INM-020/E121
J-SIIDS INS
AIR FORCE T.O. 31S9-4-1-201 | Installation, Operation and Checkout
Procedures |
| TM 5-6350-264-14&P-2
NAVELEX EE181-AA-OMI-030/E121
RT1161 M9443
AIR FORCE T.O. 31S9-2FSS9-1-2 | Transceiver, Ultrasonic Signal and Pro-
cessor, Ultrasonic Motion Signal |
| TM 5-6350-264-14&P-3
NAVELEX EE181-AA-OMI-040/E121
R1860 M9443
AIR FORCE T.O. 31S9-2FSS9-1-3 | Receiver Passive Signal, Ultrasonic and
Processor, Passive Signal, Ultrasonic |
| TM 5-6350-264-14&P-4
NAVELEX EE181-AA-OMI-050/E121
DT546 M9442
AIR FORCE T.O. 31S9-2FSS9-1-4 | Detector, Vibration Signal and Processor,
Vibration Signal |
| TM 5-6350-264-14&P-5
NAVELEX EE181-AA-OMI-060/E121
SA-1955
AIR FORCE T.O. 31S9-2FSS9-1-5 | Switch, Balanced Magnetic |
| TM 5-6350-264-14&P-6
NAVELEX EE181-AA-OMI-070/E121
DT-545
AIR FORCE T.O. 31S9-2Fss9-1-6 | Sensor, Grid Wire |
| TM 5-6350-264-14&P-7
NAEE181-AA-OMI-080/E121
DT-548
AIR FORCE T.O. 31S9-2FSS9-1-7 | Sensor, Capacity Proximity |

TM 5-6350-264-14&P-8 NAVELEX EE181-AA-OMI-090/E121 SA-1954 AIR FORCE T.O. 31S9-2FSS9-1-8	Switch, Alarm Latching
TM 5-6350-264-14&P-9 NAVELEX EE181-AA-OMI-100/E121 DZ-204 AIR FORCE T.O. 31S9-2FSS9-1-9	Alarm, Audible
TM 5-6350-264-14&P-10 NAVELEX EE181-AA-OMI-110/E121 C-9412 AIR FORCE T.O. 31S9-2FSS9-1-10	Control Unit, Alarm Set
TM 5-6350-264-14&P-11 NAVELEX EE181-AA-OMI-120/E121 C-7359-60-1 AIR FORCE T.O. 31S9-2FSS9-1-11	Cabinet, Monitor, Type A, Type B, Type C and Monitor Module, Status, Monitor Module, Alarm
TM 5-6350-264-14&P-12 NAVELEX EE181-AA-OMI-130/E121 R1861-TL257 AIR FORCE T.O. 31S9-2FSS9-1-12	Receiver, Data and Transmitter, Data
TM 5-6350-264-14&P-13 NAVELEX EE181-AA-OMI-140/EI21 DT-547 AIR FORCE T.O. 31S9-2FSS9-1-13	Sensor, Magnetic Weapons (DT-547)
TB --635(1-264 NAVELEX EEIS1-AB-()MI-()I/EI21 J-SIIDS AIR FORCE T.(). :1IS9-4-1- 11	Selection and Application of Joint Services Interior Intrusion Detection System
5. PAINTING SB 11-573 TM 43-0139	Painting and Preservation Supplies Available for Field Use for Electronic Equipment Painting Instructions for Field Use
6. RADIOACTIVE MATERIAL TB 43-0141	Instructions for Safe Handling, Mainte- nance, Storage, and Disposal of Radio- active Commodities
7. SHIPMENT AND STORAGE TM 740-90-1	Administrative Storage of Equipment

5. PAINTING
SB 11-573

Painting and Preservation Supplies
Available for Field Use for Electronic
Equipment

TM 43-0139

Painting Instructions for Field Use

6. RADIOACTIVE MATERIAL
TB 43-0141

Instructions for Safe Handling, Maintenance,
Storage, and Disposal of Radioactive
Commodities

7. SHIPMENT AND STORAGE
TM 740-90-1

Administrative Storage of Equipment

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APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL.

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

b. 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 or explanatory notes for a particular maintenance function. (Not Applicable)

B-2. MAINTENANCE FUNCTIONS. Maintenance functions are 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, 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 for 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 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 for an unserviceable counterpart.

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

j. Overhaul. That maintenance effort (service/ 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. COLUMN ENTRIES.

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

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

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in column 2.

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

maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate "work time" figures will be shown for each level. 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. They symbol designations for the various maintenance levels 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, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

Section II. MAINTENANCE ALLOCATION CHART
 for
Latching Alarm Switch (SA-1954)

(1) Group number	(2) Component/assembly	(3) Maint. function	(4) Maint. category					(5) Tool/ equipment	(6) Remarks
			C	O	F	H	D		
			01	Latching Alarm Switch Cover	Inspect Replace				
	Gasket	Inspect Replace			0.1 0.1				
	Tamper Switch	Test Replace			0.5 0.5		1.		
	Diode, Light-Emitting	Test Replace			0.5 0.5		1.		
	Printed Wiring Board Assy	Test Replace Repair			0.5 1.0		1.		
	Latching Switch	Test Replace			0.5 0.7		1. 1.		
	Reset Switch	Test Replace			0.5 0.5		1.		

Section II. MAINTENANCE ALLOCATION CHART
for
Latching Alarm Switch (SA-1954)

(1)	(2)	(3)	(4)	(5)
REFERENCE CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL* NUMBER
1.	F	Multimeter	6625-00-019-0815	Vom

Section IV. REMARKS

Maintenance Allocation Chart

Reference code	Remarks

APPENDIX C
ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL
SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS

Section I. INTRODUCTION

1. Scope.

This manual lists and authorizes repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of organizational, direct support, and general support maintenance of the Latching Alarm Switch. It authorizes the requisitioning, issue and disposition of spares, repair parts and special tools as indicated by the Source, Maintenance and Recoverability (SMR) codes.

2. General.

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

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed in NSN sequence.

b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL for the performance of maintenance.

c. Section IV. National Stock Number and Part Number Index. A list, in National item identification number (NIIN) sequence, of all National stock numbers (NSN) appearing in the listings, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

3. Explanation of Columns.

a. Illustration (Column (1)). This column is divided as follows:

(1) ((a) FIG NO.) Figure Number. Indicates the figure number illustrating an exploded view of a functional group.

(2) ((b) ITEM NO.). Indicates the number used to identify items called out in the illustration.

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Code	Explanation
AO - (Assembled by org/ AVUM Category) AF - (Assembled by DS/ AVIM Category) AH - (Assembled by GS Category) AD - (Assembled by Depot)	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the category of maintenance indicated by the source code. If the 3d position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher category, order the item from the higher category of maintenance.

XA - Do not requisition an "XA"--coded item. Order its next higher assembly. (Also, refer to the NOTE below.)

XB - If an "XB" item is not available from salvage, order it using the FSCM and part number given.

XC - Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.

XD- Item is not stocked. Order an "XD"-coded item through normal supply channels using the FSCM and part number given, if no NSN is available.

NOTE: Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes. except for those source coded "XA" or those aircraft support items restricted by requirements of AR 700-42.

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

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

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

(b) The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance category with the capability to do complete repair (i.e., perform all authorized repair functions). (NOTE: Some limited repair may be done on the item at a lower category of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.) This position will contain one of the following maintenance codes.

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

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

Recoverability Codes	Definition
Z	- Nonreparable item. When unserviceable, condemn and dispose of the item at the category of maintenance shown in 3d position of SMR Code.
O	- Reparable item. When uneconomically reparable, condemn and dispose of the item at organizational or aviation unit category.
F	- Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or aviation intermediate category.
H	- Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support category.

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Recoverability Codes	Definition
D	- Reparable item. When beyond lower category repair capability, return to depot. Condemnation and disposal of item not authorized below depot category.
L	- Reparable item. Condemnation and disposal not authorized below specialized repair activity.
A	- Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material, or hazardous material.) Refer to appropriate manuals/directives for specific instructions.

c. National Stock Number (Column (3)). Lists the National stock number (NSN) assigned to the item. Use the NSN for requests/requisitions.

d. FSCM (Column (4)). The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

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

NOTE: When you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered, but go ahead and use or furnish it as the replacement part.

f. Description (Column (6)). This column includes the following information:

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

(2) The physical security classification of the item is indicated by the parenthetical entry (insert applicable physical security classification abbreviation, e.g., Phy Sec CI (C) - Confidential, Phy Sec CI (S) - Secret, Phy Sec CI (T) - Top Secret).

(3) Items that are included in kits and sets are listed below the name of the kit or set.

4) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

(5) NSN's for bulk materials are referenced in the description column in the line item entry for the item to be manufactured/fabricated.

(6) When the part to be used differs between serial numbers of the same model, the effective serial numbers are shown as the last line of the description.

(7) The USABLE ON CODE, when applicable (see paragraph 4, Special Information).

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(8) In the Special Tools List section, the basis of issue (BOI) appears as the last line(s) in the entry for each special tool, special TMDE, and other special support equipment. When density of equipments supported exceeds density spread indicated in the basis of issue, the total authorization is increased proportionately.

g. U/M (Column (7)). The Unit of Measure (U/M) indicates the measure (e.g., foot, gallon, pound) or count (e.g., each, dozen, gross) of a listed item. A two-character alpha code (e.g., FT, GL, LB, EA, DZ, GR) appears in this column to indicate the measure or count. If the U/M code appearing in this column differs from the Unit of Issue (U/I) code listed in the Army Master Data File (AMDF), request the lowest U/I that will satisfy your needs.

h. QTY INC IN UNIT (Column (8)). The Quantity Incorporated in 'Unit (QTY INC IN UNIT) indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable (e.g., shims, spacers).

4. Special Information. (Not applicable).

5. How to Locate Repair Parts.

a. When National Stock Number or Part Number is Not Known:

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

(2) Second. Find the figure covering the functional group or subfunctional group to which the item belongs.

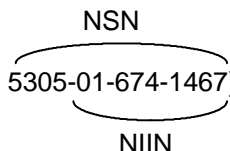
(3) Third. Identify the item on the figure and note the item number of the item.

(4) Fourth. Refer to the Repair Parts List for the figure to find the line item entry for the item number noted on the figure.

b. When National Stock Number or Part Number is Known:

(1) First. Using the Index of National Stock Numbers and Part Numbers, find the pertinent National stock number or part number. The NSN index is in National Item Identification Number (NIIN)* sequence. The part numbers in the Part Number index are listed in ascending alphanumeric sequence. Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

*The NIIN consists of the last 9 digits of the NSN (i.e., 5305-01-674-1467).



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

6. Abbreviations.

Abbreviations

Explanation

cd-or	Cadmium-ore
zn-pltd	zinc-plated
MOD	Model
opng	opening
NIIN	National Item Identification Number (consists of the last 9 digits of the NSN)
RPSTL	Repair Parts and Special Tools List

Change 1 C-7

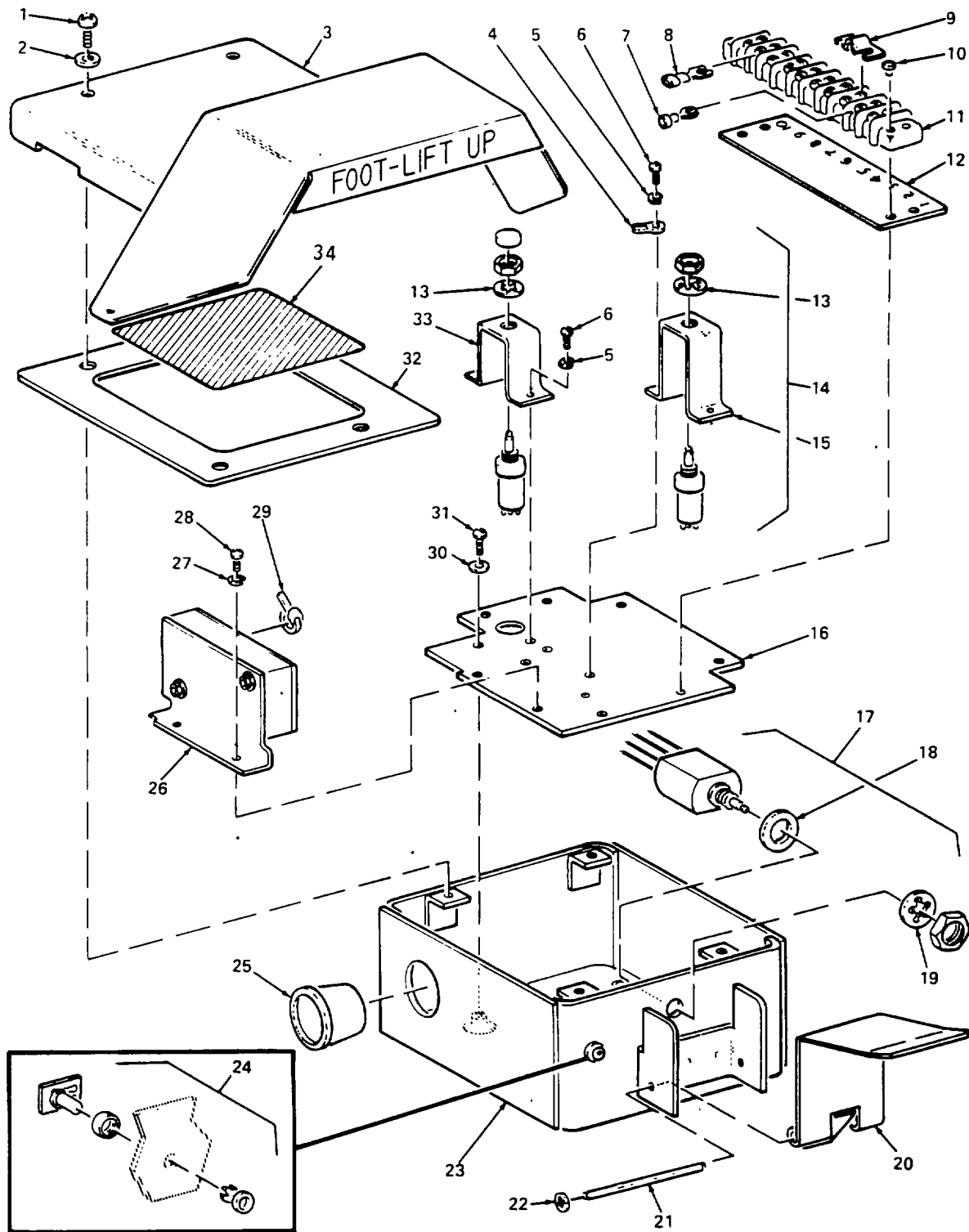


Figure C-1. Latching Alarm Switch SA-1954-/FSS-9(V)

Section II. REPAIR PARTS LIST

SECTION II

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO.	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
GROUP 01		ALARM	LATCHING SWITCH AY					
C-1	1	PAFZZ	5305-00-9846191	MS35206-243	96906	SCEW.AACHINE PAN	EA	4
C-1	2	PAFZZ	5310-00-045-3299	MS35338-42	96906	WASHER.LOCK-SPRING.....	EA	4
C-1	3	XBFZZ		13220E3802	97403	COVER	EA	1
C-1	4	XDFZZ		1322OE2996	97403	TERMINAL LUG	EA	1
C-1	5	PAFZZ	5310-00-543-2410	MS35338-40	96906	WASHER,LOCK-SPRING.....	EA	3
C-1	6	PAFZZ	5305-00-889-3116	MS35206-2L3	96906	SCREW MACHINE-PAN.....	EA	4
C-1	7	XDFZZ		RAV2217	59730	TERMINAL	EA	6
C-1	8	XFDZZ		13220E3804	97403	TERMINAL SLOTTED RG	EA	1
C-1	9	XBFZZ		13220E2987	91433	LINK,TERMINAL.....	EA	3
C-1	10	XBFZZ	5320-00-903-8778	13220E2998-6	97403	RIVET, BLIND	EA	2
C-1	11	XBFZZ		13220E3823-10	97403	BARRIER STRIP	EA	1
C-1	12	PAFZZ		13220E3840-10	97403	STRIP, MARKER	EA	1
C-1	13	PAFZZ	5310-00-550-1130	MS35333-40	96906	WASHER, LOCK	EA	2
C-1	14	XBFZZ	5930-01-015-3866	13220E3435	97403	SWITCH:SPOT.....	EA	2
C-1	15	XBFZZ		13220E3801-1	97403	BRACKET, SWITCH.....	EA	1
C-1	16	XBFZZ		13220E3821	97403	PLATE, MOUNTING	EA	1
C-1	17	PAFZZ	5930-01-015-0021	13220E3811	97403	SWITCH, DPDT.....	EA	1
C-1	18	PAFZZ	5330-01-076-3208	13220E3803	97403	GASKEET	EA	1
C-1	19	PAFZZ	5310-00-595-7237	MS35333-42	99606	WASHER,LOCK	EA	1
C-1	20	XBFZZ		13220E3822	97403	PLATE, SWITCH	EA	1
C-1	21	XBFZZ		13220E3819	97403	PIN,KEEPER	EA	1
C-1	22	PAFZZ	5310-01-023-8239	5105-12-S-MD	79316	PUSH ON NUT	EA	1
C-1	23	XBFZZ		13220E3820	97403	CHASSIS.....	EA	1
C-1	24	PAFZZ		13220E3813	97403	PRINTED WIRING BOAR ASSEMBLY	EA	1
C-1	25	XBFZZ		13220E3836	97403	PLUG, TAPERED	EA	1
C-1	26	PAFZZ	6350-01-190-754	13220E3030	97403	PRINTED WIRING BOAR D ASSEMBLY	EA	1
C-1	27	PAFZZ	5310-00-543-5060	MS35338-39	96906	WASHER, LOCK	EA	2
C-1	28	PAFZZ	5305-00-989-0682	MS35206-205	96906	SCREW, MACHINE PAN	EA	2
C-1	29	PAFZZ	5375-00-727-5153	MS3367-4-9	96906	STRAP, TIEDOWN, ELECTRIC	EA	2
C-1	30	PAFZZ	5310-00-045-4007	MS35338-41	96906	WASHER, LOCK	EA	4
C-1	31	PAFZZ	5305-00-984-4983	MS35206-226	96906	SCREW, MACHINE PAN	EA	4
C-1	32	XBFZZ		13220E3806	97403	GASKET	EA	1
C-1	33	XBFZZ		13220E3801-2	97403	BRACKET, SWITCH.....	EA	1
C-1	34	XBFZZ		13220E3826	97403	PLATE	EA	1

Section III. SPECIAL TOOLS LIST

This section is not applicable.

Section IV. NATIONAL STOCK NUMBER AND PART NUMBER INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.	STOCK NUMBER	FIGURE NO.	ITEM NO.
5310-00-045-3299	C-1	2	5305-00-889-3116	C-1	6
5310-00-045-4007	C-1	30	5305-00-889-3118	C-1	28
6350-00-360-7754	C-1	26	5320-00-903-8778	C-1	10
6350-00-368-8219	C-1	24	5305-00-984-4983	C-1	31
5310-00-543-2410	C-1	5	5305-00-984-6191	C-1	1
5310-00-543-5060	C-1	27	5930-01-015-0021	C-1	17
5310-00-550-1130	C-1	13	5930-01-015-3866	C-1	14
5310-00-595-7237	C-1	19	5310-01-023-8239	C-1	22
5975-00-727-5153	C-1	29	5330-01-076-3208	C-1	18

FSCM	PART NUMBER	FIGURE NO.	ITEM NO.	FSCM	PART NUMBER	FIGURE NO.	ITEM NO.
96906	M53367-4-9	C-1	29	97403	1322013802	C-1	3
96906	M535206-203	C-1	28	97403	1322013803	C-1	18
9b906	NS3520- Z13	C-1	6	97403	1322013804	C-1	8
96906	M 35206-226	C-1	31	97403	132Z203806	C-1	32
96906	M53206-243	C-1	1	97403	132203811	C-1	17
96906	MS35333-40	C-1	13	97403	13220E3812	C-1	26
96906	MS35333-42	C-1	19	97403	13220E3813	C-1	24
96906	NS35338-39	C-1	27	97403	13220E3819	C-1	21
96906	NS35338-40	C-1	5	97403	132ZOI320	C-1	23
96906	MS3533-41	C-1	30	97403	13220E3821	C-1	16
96904	MS35338-42	C-1	2	97403	13220E3822	C-1	20
59730	RAV2217	C-1	7	97403	132203823-10	C-1	11
97403	13220E2987	C-1	9	97403	13220E3826	C-1	34
9T403	13220E2996	C-1	4	97403	1322013836	C-1	25
97403	13220E2991-6	C-1	10	97403	13ZZOE384010	C-1	12
97403	13220E3435	C-1	14	79136	5105-12-S-NMO	C-1	22
97403	13220E3801-1	C-1	15				
97403	13220E3801-2	C-1	33				

U.S. GOVERNMENT PRINTING OFFICE: 1986 - 612-032/40104

PIN: 051 404-001

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TABLE NO.

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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 decigrams = .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
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