

ARMY TECHNICAL MANUAL
NAVY PUBLICATION

TM 5-6350-264-14&P-6
NAVELEX EE 181-AA-OMI-
1/E121 DT-545
T.O. 31S9-2FSS9-1-6

AIR FORCE TECHNICAL ORDER

TECHNICAL MANUAL

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

**SENSOR, GRID WIRE
DT-545/FSS-9(V)
NSN 6350-00-228-2504**

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

CHANGE }
No. 1 }

HEADQUARTERS, DEPARTMENTS OF
THE ARMY, AIR FORCE AND NAVY
WASHINGTON, D.C., 8 July 1986

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

SENSOR, GRID WIRE DT-545/FSS-9(V)
NSN 6350-00-228-2504

TM 5-6350-264-14&P-6/NAVELEX EE 181-AA-OMI-07A/E121 DT-545/T.O. 31S9-2FSS9-1-6, 30 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.

Remove pages

i and ii
1-1 and 1-2
2-1/2-2
A-1 and A-2
A-3/A-4
C-1 through C-6

Insert pages

i and ii
1-1 and 1-2
2-1/2-2
A-1 and A-2

C-1 through C-12

2. Retain this sheet in front of manual for reference purposes.

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DISTRIBUTION:

To be distributed in accordance with DA Form 12-25A, Operator Maintenance requirements for Detection System, Joint Service, Interior Intrusion (JSIIDS)
(TM 5-6350-264 Series)

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

SENSOR, GRID WIRE DT-545/FSS-9(V)
 NSN 6350-00-228-2504

Current as of 8 May 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, MO 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: Naval Electronics Systems Command Training and Publications Management Office, ATTN: ELEX. Code 8122, Washington, DC 20360.

TABLE OF CONTENTS

		Paragraph	Page
CHAPTER 1.	INTRODUCTION		
Section I.	General	1-1	1-1
II.	Description and data	1-8	1-1
CHAPTER 2.	OPERATING INSTRUCTIONS		
Section I.	Operating procedures	2-1	2-1
II.	Theory of operation	2-4	2-1
CHAPTER 3.	OPERATOR'S MAINTENANCE INSTRUCTIONS (Not Applicable)		
CHAPTER 4.	ORGANIZATIONAL MAINTENANCE INSTRUCTIONS (As Applicable)		
Section I.	Service upon receipt of material (Not Applicable)		
II.	Movement to a new worksite (Not Applicable)		
III.	Repair parts, special tools and equipment.....	4-1	4-1
IV.	Lubrication instructions (Not Applicable)		
V.	Preventive maintenance checks and services (PMCS) (Not Applicable)		4-1
VI.	Troubleshooting (Not Applicable)		
VII.	Radio interference suppression (Not Applicable)		
VIII.	Maintenance (Not Applicable)		

TABLE OF CONTENTS (Continued)

		Paragraph	Page
CHAPTER 5.	DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS		
Section I.	Repair parts, special tools and equipment.....	5-1	5-1
II.	Troubleshooting	5-3	5-1
III.	General maintenance.....	5-4	5-3
IV.	Removal and replacement of major components and assemblies	5-5	5-3
CHAPTER 6.	REPAIR OF GRID WIRE	6-1	6-1
APPENDIX A.	REFERENCES.....		A-1
APPENDIX B.	MAINTENANCE ALLOCATION CHART.....		B-1
APPENDIX C.	REPAIR PARTS AND SPECIAL TOOLS LIST		C-1
Section I.	Introduction		C-1
II.	Repair parts list		C-9
Group 01.	Junction box assembly.....		C-9
Group 02.	Grid wire tool assembly.....		C-10
Section III.	Special Tools List (Not Applicable)		
IV.	National stock number and part number index		C-12

LIST OF ILLUSTRATIONS

Figure	Title	Page
1-1	Grid Wire Sensor	1-0
1-2	Grid Wire Identification Plate	1-2
2-1	Grid Wire Sensor Simplified Block Diagram.....	2-1
5-1	Grid Wire Sensor, Exploded View	5-2
C-1	Grid Wire Sensor DT-545/FSS-9(V).....	C-8
C-2	Grid Wire Sensor DT-545/FSS-9(V).....	C-9

LIST OF TABLES

Table	Title	Page
5-1	Troubleshooting Procedures	5-4

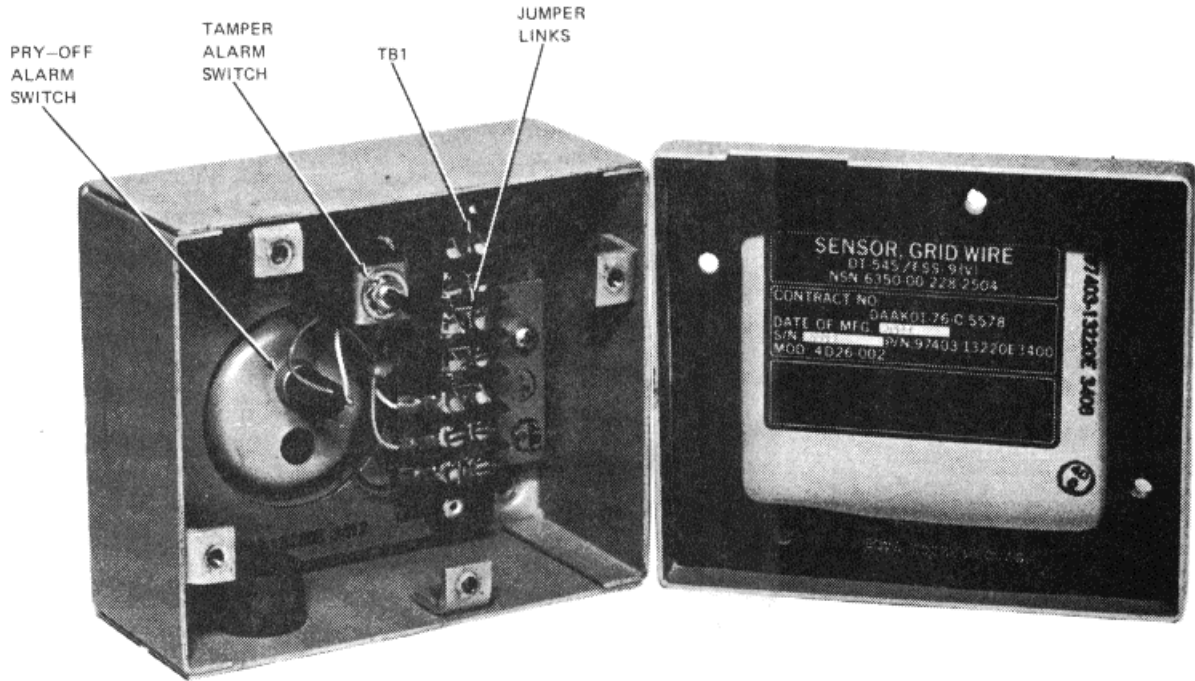


Figure 1-1. Grid Wire Sensor

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. SCOPE. This manual is for your use in operating and maintaining the Grid Wire Sensor (GWS) Model DT-545/FSS-9(V) in its operational environment. The GWS is an integral part of the Joint Services Interior Intrusion Detection System (J-SIIDS). For information on the 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 administrative storage are contained in TM 740-90-1.

1-4. DESTRUCTION OF ARMY MATERIAL 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 63120-1798. A reply will be furnished directly to you.

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

Section II. DESCRIPTION AND DATA

1-8. DESCRIPTION. The GWS consists of a wire grid in four inch squares and a steel chassis (fig. 1-1) containing a component mounting plate, a terminal strip, a pry-off alarm switch, and a cover tamper alarm switch (TAS). The chassis has a removable cover and an access hole where interconnecting wiring is brought in through conduit. The wire grid is made of continuous horizontal and vertical wires and can cover up to 160 square feet in any shape. Depending on the barrier material, the grid wire is stapled directly to the barrier or to a foundation board that is secured to the barrier. Fire-resistant panels are then installed over the grid wire for protection against daily abuse and visual detection.

1-9. TABULATED DATA.

a. Identification Data. An identification plate (Fig. 1-2) is located on the inside front cover.

b. Equipment Characteristics.

(1) GWS Assembly

Weight 6.7 pounds (3.1 kg)

Dimensions (overall)

Height 2.68 inches (6.8 cm)

Width 4.30 inches (11 cm)

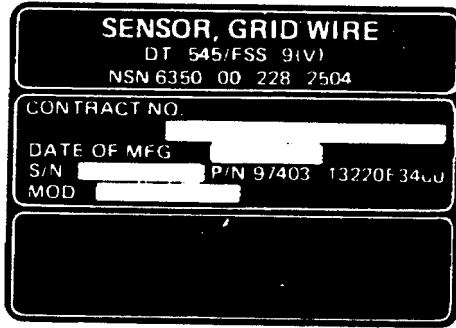


Figure 1-2. Grid Wire Sensor Identification Plate

Length..... 5.00 inches (12.6 cm)	Shock 20 g, 11 ms duration plus bench handling shock
Color (housing) Gray per Federal Standard 595, color chip 36440, MIL-C-227 51	Vibration Withstands trans- portation conditions
Environmental (operational)	(2) Grid Wire
Temperature range..... -20° to +150° F (-29° to +65° C)	Type No. 26 AWG, enamel-coated, solid copper wire
Relative humidity Up to 95%	Alarm circuit
Environmental (nonoperational and storage)	No alarm..... Less than 2000-ohm resistance
Temperature range..... -30° to +165° F (-34° to +740C)	No alarm..... More than 100, 000-ohm resistance
Relative humidity Up to 95%	

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. OPERATING PROCEDURES

2-1. CONTROLS AND INDICATORS. There are no operator controls or indicators on the GWS.

installed, tested, and connected to the J-SIIDS Control Unit.

2-2. NORMAL OPERATING PROCEDURES. The GWS is operationally ready after it has been

2-3. EMERGENCY OPERATION. Operation with incomplete surveillance coverage or faulty tamper circuit should be held to a minimum.

Section II. THEORY OF OPERATION

2-4. FUNCTIONAL DESCRIPTION. The GWS provides an intrusion alarm signal output when a break occurs in the wire grid. A tamper alarm is activated when the cover is lifted or the chassis is pulled away from its mounting surface. These two signals are normally wired in series into the sensor tamper input in the Control Unit, refer to TM5-6350-264-14&P-10. Refer to

figure 2-1 for a simplified block diagram. When a break in the wire grid occurs or when one of the tamper switches is activated, the normally low resistance present across the output terminals changes to a high resistance (100, 000 ohms or more). This high resistance output to the J-SIIDS Control Unit activates an alarm.

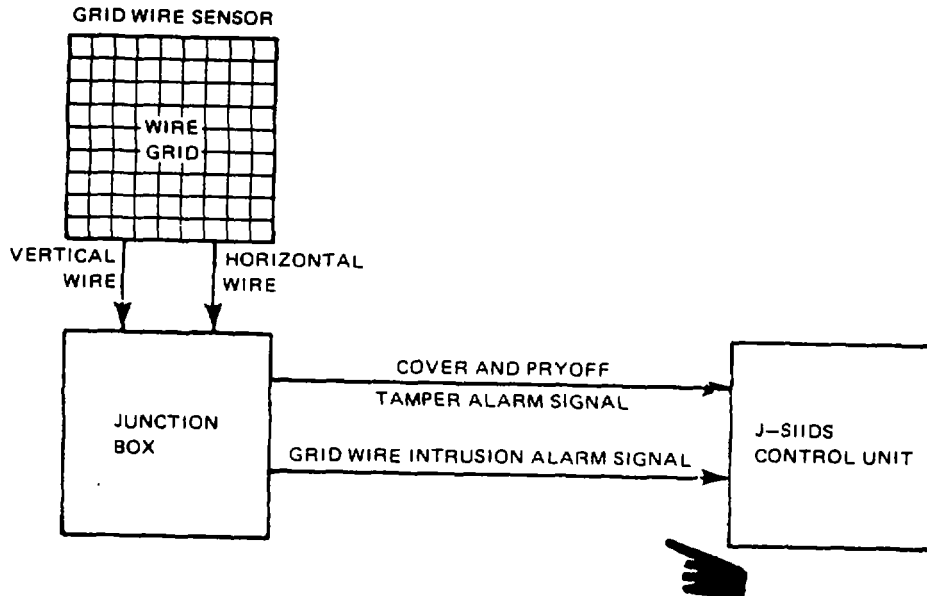


Figure 2-1. Grid Wire Sensor Simplified Block Diagram 2-1

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

This chapter is not applicable to this equipment.

3-1/(3-2 blank)

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIAL

This section is not applicable.

Section II. MOVEMENT TO A NEW WORKSITE

This section is not applicable.

Section III. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

4-1. SPECIAL TOOLS AND EQUIPMENT. No special tools and equipment is required for this equipment.

4-2. REPAIR PARTS. No repair parts are authorized at the organizational level.

4-3. FABRICATED TOOLS AND EQUIPMENT. No fabricated tools or equipment is required.

Section IV. LUBRICATION INSTRUCTIONS

This section is not applicable.

Section V. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

This section is not applicable.

Section VI. TROUBLESHOOTING

This section is not applicable.

Section VII. RADIO INTERFERENCE SUPPRESSION

This section is not applicable.

Section VIII. MAINTENANCE

This section is not applicable.

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 Grid Wire Sensor.

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 ACCESS.

Before you use this table, 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 Grid Wire Sensor. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspection which will help you to determine corrective actions to take. You should perform the tests/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 malfunction which you may find during the operation maintenance of the Grid Wire Sensor or components. You should perform the test/inspections in the corrective actions column in the order listed.

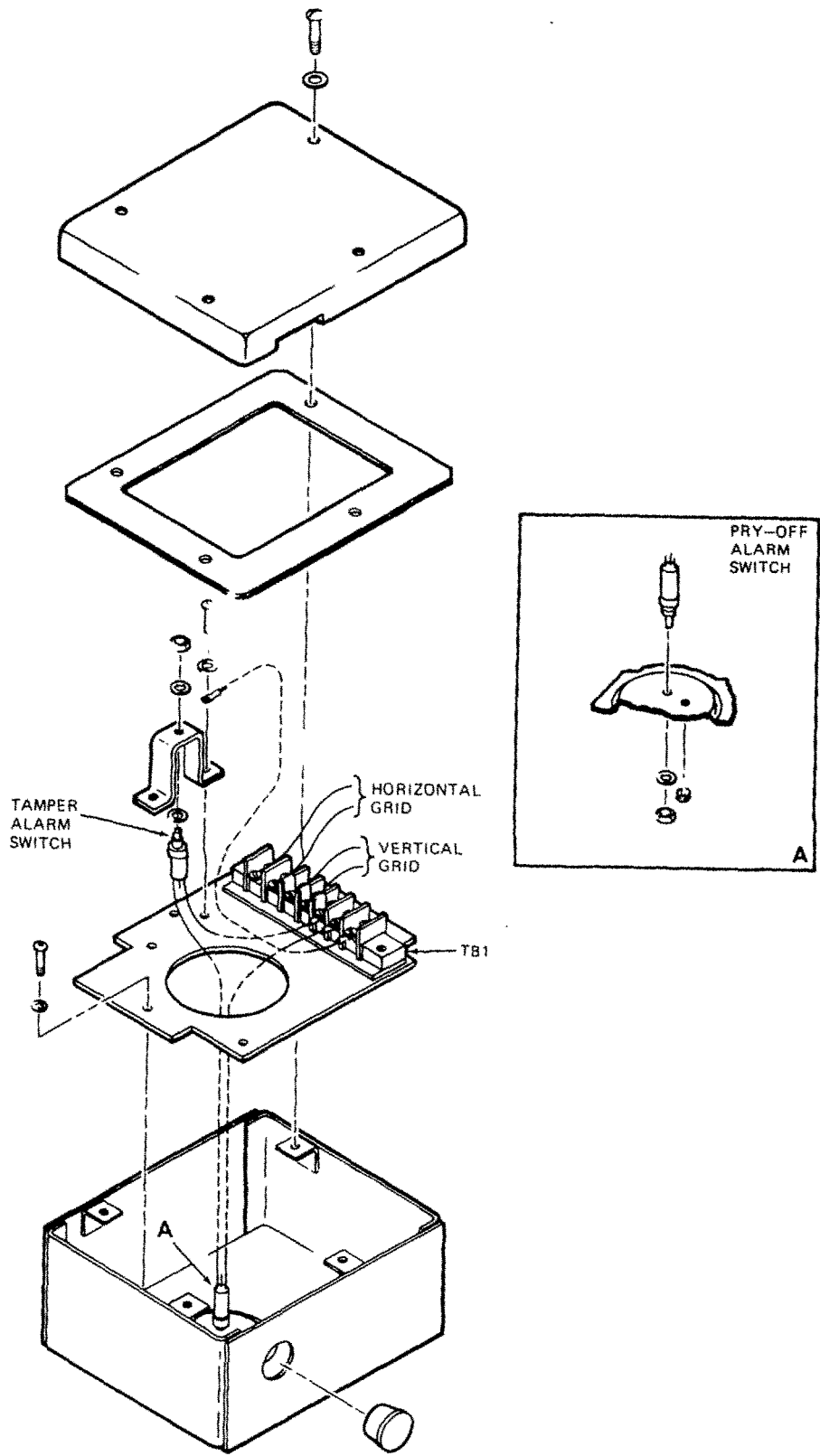


Figure 5-1. Grid Wire Sensor, Exploded View

d. Check all available information on the equipment for aid in diagnosing problems.

of wire or solder inside the housings.

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 the complete subsystem for the presence of dirt, corrosion, moisture, and bits

NOTE

Touchup paint is recommended over refinishing whenever practical.

- (5) 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 found in the troubleshooting table 5-1. Step-by-Step troubleshooting procedures, including Trouble, Probable Cause, and Corrective Action, are listed in table 5-1.

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 tamper alarm and pry-off

alarm switches. The MAC provides for inspection and replacement of the cover gasket and chassis. Periodic testing of the Grid Wire Sensor 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 cover gasket, remove screws that secure cover. Remove cover. Remove gasket from cover. Scrape out any parts of old gasket that adhere to cover.
- b. To replace cover gasket, apply adhesive to new gasket; orient gasket so that screw holes in gasket are aligned with holes in cover. Press gasket down inside cover. Replace cover.
- c. To remove TAS, remove nut and lock washer from switch and push switch down through

mounting bracket (fig. 5-1). Depress the TAS plunger, if necessary, to clear the bracket. Use a soldering iron of 50 watts maximum to remove wires from switch terminals. Remove switch from chassis.

- d. 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. Depress switch plunger, if necessary, to clear bracket. Place lock washer and nut on switch, and tighten nut to secure switch in place.

- e. To remove pry-off alarm switch (fig. 5-1), use soldering iron of 50 watts maximum to remove wires from switch terminals. Remove screws that secure chassis to mounting surface. Pull housing away from mounting surface. Remove switch retaining nut and lock washer from rear side of housing. (Refer to fig. 5-1.) Remove switch.
- f. To replace pry-off alarm switch, 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 rear panel and secure lock washer and nut from rear of panel. Secure chassis to mounting surface with screws.
- g. To remove chassis, remove screws that secure cover. Remove cover. Tag and disconnect wires from TB1. Remove screws that secure chassis to mounting surface. Remove nut from end of conduit inside housing. Remove chassis.
- h. To replace chassis, align new chassis with conduit and screw holes in mounting surface. Insert conduit through hole in side of chassis, and secure retaining nut. Secure chassis to

mounting surface with mounting screws. Connect wires to TB1. Secure cover to chassis with screws.

- i. After replacement of major components or assemblies during troubleshooting, test the GWS for proper operation. Ensure that the key-operated switch on the Control Unit is in the access position. Remove the chassis cover. Disconnect the wire between TBI-1 and the conduit from TBI-1. Set multimeter to ohms and connect meter leads to TBI-1 and 6. Meter should indicate over 100, 000 ohms. Depress TAS. Meter indication should change to 2 ohms or less. Hold TAS plunger down with a piece of tape. Loosen chassis mounting screws and move chassis away from mounting surface. Meter indication should change to over 100, 000 ohms. Tighten screws to secure chassis to mounting surface, and meter indication should change to 2 ohms or less. Disconnect wire from TB1-2. Meter indication should change to over 100, 000 ohms. Connect wire to TB1-2. Meter indication should return to 2 ohms or less. Disconnect wire from TB1-3. Meter indication should change to over 100, 000 ohms. Connect wire to TB1-3, disconnect meter leads, and connect wire to TBI-1. Install 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. Broken grid wire	a. Tag and disconnect grid wire from TBI-1 and TB1-2. Set multimeter to ohms, and connect leads to wires removed from TBI-1 and TB1-2. Meter should indicate less than 2 ohms. Tag and disconnect grid wires from TB1-3 and TB1-4. Connect meter leads to wires removed from TB1-3 and TB1-4. Meter should indicate less than 2 ohms.

Table 5-1. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (cont)	<p>a. (cont)</p> <p>b. Terminal jumper links installed incorrectly or missing.</p> <p>c. Bad tamper alarm switch (TAS).</p>	<p>b. If meter indicates more than 2 ohms on either pair of wires, locate and repair broken wire.</p> <p>c. To repair broken grid wire, remove covering as necessary to locate break. Clean coating 1/2 inch (1.27 cm) from ends of broken wire and piece of wire to be used as patch. Use crimp lugs to splice new piece of wire to grid wire. Install covering as necessary.</p> <p>Visually inspect jumper links. Ensure that there are jumper links from TB1-2 to TB1-3 and from TB1-4 to TB1-5.</p> <p>a. Disconnect wire between TB1-6 and conduit entrance hole from TB1-6. Set multimeter to ohms and connect leads to TB1-5 and 6. Use a straightedge across chassis to depress TAS plunger. Meter should indicate less than 2 ohms resistance. Slowly raise the straightedge. After the plunger moves 1/4 inch (0.635 cm) or less, the meter should indicate over 100, 000 ohms.</p> <p>b. If the TAS checks bad, replace it.</p> <p>(1) To remove TAS, remove nut and lock washer. Push TAS down through mounting bracket. Depress the TAS plunger, if necessary, to clear the mounting bracket. Use a soldering iron of 50 watts maximum to remove wires from switch terminals.</p> <p>(2) To install new TAS, set multimeter 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 new switch. Insert switch through hole in mounting bracket. Depress switch plunger, if necessary. Secure switch in place with lock washer and nut.</p>

Table 5-1. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (cont)	d. Bad pry-off alarm switch.	<p>a. Loosen screws that secure chassis to mounting surface. Hold TAS plunger down with a piece of tape. Disconnect wire between TB1-6 and conduit entrance hole from TB1-6. Set multimeter to ohms and connect leads to TB1-5 and 6. Meter should indicate less than 2 ohms. Slowly move chassis away from mounting surface. After a movement of less than 1/4 inch (0.635 cm), meter should indicate over 100, 000 ohms.</p> <p>b. If the pry-off alarm switch checks bad, replace it.</p> <p>(1) To remove pry-off alarm switch, use soldering iron of 50 watts maximum to remove wires from switch terminals. Remove screws that secure chassis to mounting surface. Remove switch retaining nut and lock washer from rear side of chassis. Remove switch.</p> <p>(2) To install new pry-off alarm switch, set multimeter 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 new switch. Insert new switch through hole in rear panel, and secure switch with lock washer and nut from rear of panel.</p>
2. No alarm.	<p>a. Terminal jumper links installed incorrectly.</p> <p>b. Bad tamper alarm switch (TAS).</p>	<p>Visually inspect jumper links. Ensure that there are jumper links from TB1-2 to TB1-3 and from TB1-4 to TB1-5.</p> <p>a. Disconnect wire between TB1-6 and conduit entrance hole from TB1-6. Set multimeter to ohms and connect leads to TB1-5 and 6. Use a straightedge across chassis to depress TAS plunger. Meter should indicate less than 2 ohms resistance. Slowly raise the straightedge. After the plunger moves 1/4 inch (0.635 cm) or less, the meter should indicate over 100, 000 ohms.</p>

Table 5-1. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (cont)	c. (cont)	(2) To install new pry-off alarm switch, set multimeter 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 new switch. Insert new switch through hole in rear panel, and secure switch with lock washer and nut from rear of panel.

CHAPTER 6

REPAIR OF GRID WIRE SENSOR

6-1. REPAIR OF GRID WIRE. Repair of the grid wire is restricted to reconnecting/patching a broken wire.

- a. Remove covering as necessary to locate broken wire.
- b. Clean coating (1/2 inch, 1.27 cm) from ends of broken wire and piece of wire to be used as patch.
- c. Using a crimp connection method, attach patch wire to broken wire ends of installed grid wire.
- d. Install previously removed covering (if applicable).

6-2. CHECKOUT PROCEDURE. After repair, test GWS for proper operation.

- a. Tag and disconnect grid wires from TBI-1 and TB1-2. Set multimeter to ohms and connect leads to wires removed from TBI-1 and TB1-2. Meter should indicate less than 2 ohms.
- b. Tag and disconnect grid wires from TB1-3 and TB1-4. Connect meter leads to wires removed from TB1-3 and TB1-4. Meter should indicate less than 2 ohms.
- c. Remove meter leads from TB1-3 and TB1-4. Reconnect wires to TB1.

6-1/(6-2 blank)

**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
Sensor, Grid Wire
NAVELEX EE181-AA-OMI-070/E121
DT-545
AIR FORCE T.O. 31S9-2FSS9-1-6 | |
| TM 5-6350-264-14&P-7
NAVELEX EE181-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-T1257 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/E121 DT-547 AIR FORCE T.O. 31S9-2FSS9-1-13	Sensor, Magnetic Weapons (DT-547)
	TB 5-6350-264 NAVELEX EE181-AB-MI-010/E121 J-SIIDS AIR FORCE T.O. 31S94-1-I 11	Selection and Application of Joint Services Interior Intrusion Detection System
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

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)

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 equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, 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, remachining, 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

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.

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/com-ponents.

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 of 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 time, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance 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

Grid Wire Sensor (DT--545)

(1) Group number	(2) Component/assembly	(3) Maint. function	(4) Maint. category					(5) Tool/ equipment	(6) Remarks
			C	O	F	H	D		
01	Grid Wire Sensor Gasket	Inspect			1.0			1.	
		Replace			0.2				
	Switches	Test			0.3				
		Replace			0.6				
	Enclosure	Inspect			0.1				
	Replace				1.5				
02	Grid wire	Test			0.2			1.	
		Repair			2.0				

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

for

Grid Wire Sensor (DT-545)

(1)	(2)	(3)	(4)	(5)
Reference code	Maintenance category	Nomenclature	National stock number (NSN)	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 LIST

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 Grid Wire Sensor. 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.

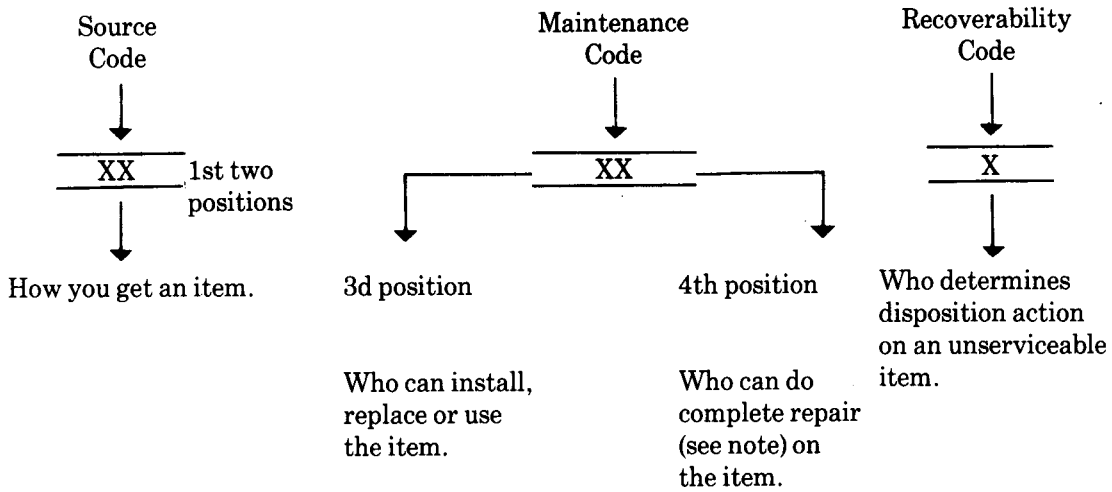
3. Explanation of Columns.

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.

b. SMR CODE (Column (2)). The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instructions, as shown in the following breakout:



*Complete Repair: Maintenance capacity, capability, and authority to perform all the corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item

(1) Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Source codes are always the first two positions of the SMR code. Explanations of source codes follow:

Code	Explanation
PA PB PC PD PE PF PG	Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3d position of the SMR code.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3d position of the SMR code. The complete kit must be requisitioned and applied.
MO--Made at org/ AVUM category MF--Made at DS/ AVUM category MH--Made at GS category ML--Made at Specialized Repair Activity (SRA) MD--Made at Depot	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by NSN in the Description column and listed in the Bulk Material group in the repair parts list in this manual. If the item is authorized to you by the 3d position code of the SMR code, but the source code indicates it is made at a higher category, order the item from the higher category of maintenance.

Code

Explanation

AO - Assembled by org/AVUM category
AF - Assembled by DS/AVUM category
AH - Assembled by GS category
AL - Assembled by SRA
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
O	-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 items) 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 repairable, condemn and dispose of the item at organizational or aviation unit category.
F	-Reparable item. When uneconomically repairable, condemn and dispose of the item at the direct support or aviation intermediate category.
H	-Reparable item. When uneconomically repairable, condemn and dispose of the item at the general support category.

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 C1 (C) - Confidential, Phy Sec C1 (S) - Secret, Phy Sec C1 (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).

(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 (eg., each, dozen, gross) of a listed item. A two-character alpha code (e.g., F'T, 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 listings 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.

NSN
*The NIIN consists of the last 9 digits of the NSN (i.e., 530541-674-1467).
NIIN

(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

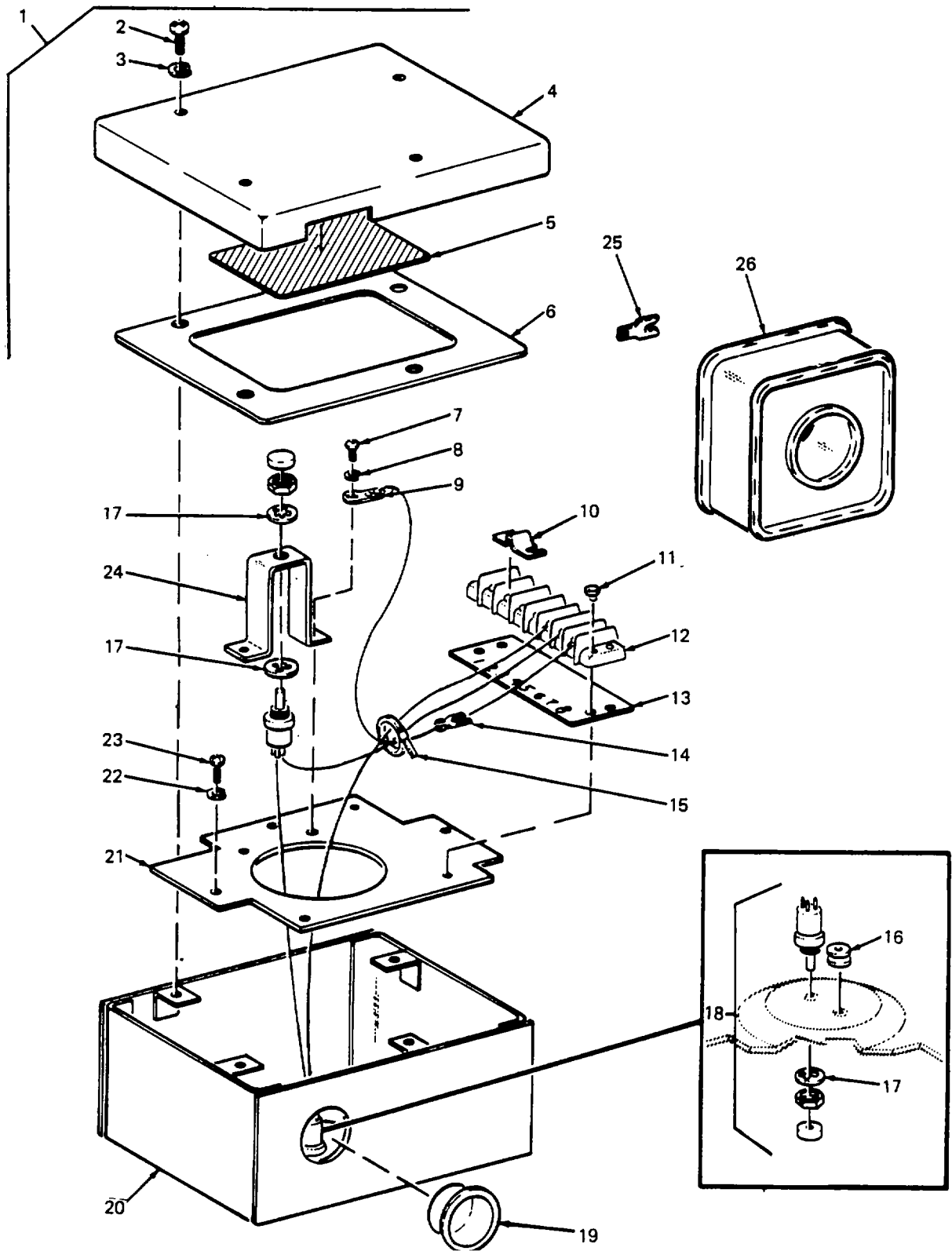


Figure C-1. Grid Wire Sensor DT-545/FSS-9(V)

Change 1 C-8

Section II. REPAIR PARTS LIST

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO.	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
GROUP 01 JUNCTION BOX AY								
C-1	1	PAFFF	6350-00-368-8210	97403	13220E3402	ASSEMBLY, JCT BOX.....	EA	1
C-1	2	PAFZZ	5305-00-984-6191	96906	MS35206-243	•SCREW, MACHINE.....	EA	4
C-1	3	PAFZZ	5310-00-045-329	96906	MS35338-42	•WASHER, LOCK.....	EA	4
C-1	4	XBFZZ		97403	13220E3408	•COVER.....	EA	1
C-1	5	XDFZZ		97403	13220E3433	•PLATE.....	EA	1
C-1	6	XBFZZ	5330-01-012-3061	97403	13220E3409	•GASKET.....	EA	1
C-1	7	PAFZZ	53C5-00-889-3116	96906	MS35206-213	•SCREW, MACHINE.....	EA	2
C-1	8	PAFZZ	5310-00-543-2410	96906	MS35338-40	•WASHER, LOCK.....	EA	2
C-1	9	XDFZZ		97403	13220E2996	•TERMINAL LUG.....	EA	1
C-1	10	XBFZZ		97403	13220E2987	•LINK, TERMINAL.....	EA	3
C-1	11	XDFZZ	5320-00-903-8778	07707	AD46AB5	•RIVET, BLIND.....	EA	2
C-1	12	XBFZZ		97403	13220E3823-7	•BARRIER STRIP.....	EA	1
C-1	13	XBFZZ		97403	13220E3840-7	•STRIP, MARKER.....	EA	1
C-1	14	XDFZZ		97403	13220E3829-1	•TERMINAL.....	EA	3
C-1	15	PAFZZ	5975-00-727-5153	96906	MS3367-4-9	•STRAP, TIEDOWN.....	EA	1
C-1	16	PAFZZ	5325-00-286-6047	96906	MS35489-1	•GROMMET, NONMETALLIC.....	EA	1
C-1	17	PAFZZ	5310-00-550-1130	96906	MS35333-40	•WASHER, LOCK.....	EA	3
C-1	18	PAFZZ	5930-01-015-3866	97403	13220E3435	•SWITCH, SPOT.....	EA	2
C-1	19	XBFZZ		97403	13220E3836	•PLUG, TAPERED.....	EA	1
C-1	20	XAFZZ		97403	13220E3411	•CHASSIS, GRIDWIRE.....	EA	1
C-1	21	XAFZZ		97403	13220E3412	•MOUNTING PLATE.....	EA	1
C-1	22	XBFZZ	5310-00-045-4007	96906	MS35338-41	•WASHER, SPLIT, LOCK.....	EA	4
C-1	23	PAFZZ	5305-00-984-4983	96906	MS35206-226	•SCREW, MACHINE.....	EA	4
C-1	24	XBFZZ		97403	13220E3801-1	•BRACKET, SWITCH.....	EA	1
C-1	25	PAFZZ	5940-01-012-0738	97403	13220E3405	•TERMINAL, LUG.....	EA	4
C-1	26	PAFZZ	6350-00-360-7760	97403	13220E3406	•WIRE, GRID, COPPER, SP.....	EA	1

Change 1 C-9

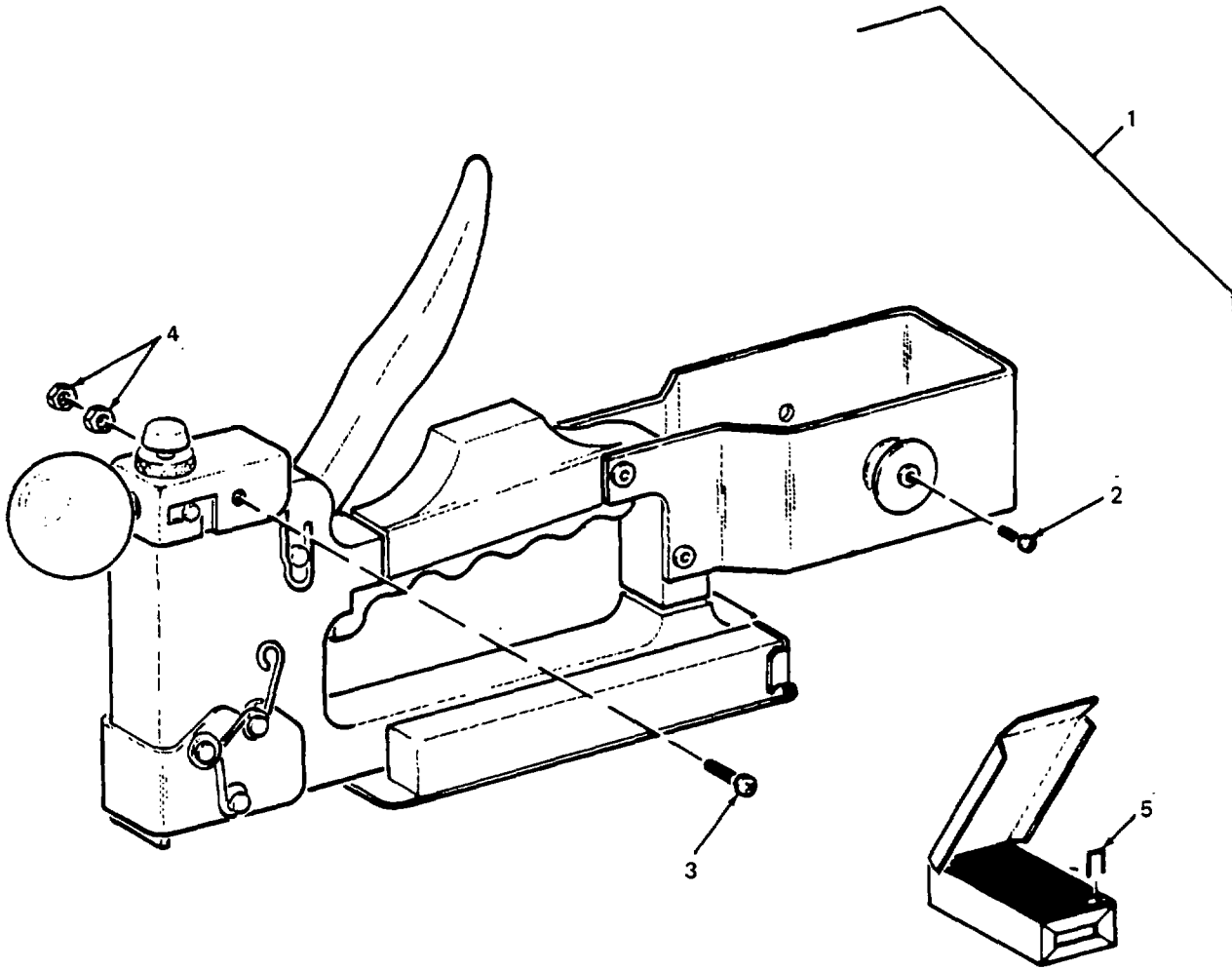


Figure C-2. Grid Wire Sensor DT-545/FSS-9(V)

Change 1 C-10

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG NO.	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	FSCM	PART NUMBER	DESCRIPTION USABLE ON CODE	U/M	QTY INC IN UNIT
						GROUP 02 GRID WIRE TOOL AY		
C-2	1	PBFZZ	6350-00-360-7759	97403	13220E3401	TOOL ASSEMBLY, GRIDW.....	EA	1
C-2	2	PAFZZ	5305-00-052-8880	96906	MS24630-12	SCREW, TAPPING, THREA.....	EA	1
C-2	3	PAFZZ	5305-00-984-6198	96906	MS35206-250	SCREW, PAN HEAD	EA	1
C-2	4	PAFZZ	5310-00-934-9757	96906	MS35649-282	NUT.....	EA	2
C 2	5	PAFZZ	5315-01-020-0389	97403	13220E3407	STAPLE ONE BOX CONTAINING 5000 STAPLES	EA	1
Change 1 C-11								

Section III. SPECIAL TOOLS LIST

This section is not applicable.

Section IV. NATIONAL STOCK NUMBER AND PART NUMBER INDEX

STOCK NUMBER	FIG. NO.	ITEM NO.	STOCK NUMBER	FIG. NO.	ITEM NO.
5310-00-045-3299	C-1	3	5305-00-889-3116	C-1	7
5310-00-045-4007	C-1	22	5320-00-903-8778	C-1	11
5305-00-052-8880	C-2	2	5310-00-934-9757	C-2	4
5325-00-286-6047	C-1	16	5305-00-984-4983	C-1	2
6350-00-360-7759	C-2	1	5305-00-984-6191	C-1	2
6350-00-360-7760	C-1	26	5305-00-984-6198	C-2	3
6350-00-368-8210	C-1	1	5940-01-012-0738	C-1	25
5310-00-543-2410	C-1	8	5330-01-012-3061	C-1	6
5310-00-550-1130	C-1	17	5315-01-020-0389	C-2	5
5975-00-727-5153	C-1	15	5930-01-015-3866	C-1	18

FSCM	PART NUMBER	FIGURE NO.	ITEM NO.	FSCM	PART NUMBER	FIGURE NO.	ITEM NO.
07707	AD46ABS	C-1	11	97403	13220E3402	C-1	1
96906	MS24630-12	C-2	2	97403	13220E3405	C-1	25
96906	MS3367-4-9	C-1	15	97403	13220E3406	C-1	26
96906	MS35206-213	C-1	7	97403	13220E3407	C-2	5
96906	MS35206-226	C-1	23	97403	13220E3408	C-1	4
96906	MS35206-243	C-1	2	97403	13220E3409	C-1	6
96906	MS35206-250	C-2	3	91403	13220E3411	C-1	20
96906	MS35333-40	C-1	17	97403	13220E3412	C-1	21
96906	MS35338-40	C-1	8	97403	13220E3433	C-1	5
96906	MS35338-41	C-1	22	97403	13220E3435	C-1	18
96906	MS35338-42	C-1	3	97403	13220E3801-1	C-1	24
96906	MS35489-1	C-1	16	91403	13Z20E3823-7	C-1	12
96906	MS35649-282	C-2	4	97403	13220E3829-1	C-1	14
97403	13220E2987	C-1	10	97403	13220E3836	C-1	19
97403	13220E2996	C-1	9	97403	13220E3840-7	C-1	13
97403	13220E3401	C-2	1				

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PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.
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TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

DA FORM 2028-2 JUL 79

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.—IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter	10 Millimeters	0 01 Meters	0 3937 Inches
1 Meter	100 Centimeters	1000 Millimeters	39 37 Inches
1 Kilometer	1000 Meters	0 621 Miles	

SQUARE MEASURE

1 Sq Centimeter	100 Sq Millimeters	0 155 Sq Inches
1 Sq Meter	10,000 Sq Centimeters	10 76 Sq Feet
1 Sq Kilometer	1,000,000 Sq Meters	0 386 Sq Miles

WEIGHTS

1 Gram	0 001 Kilograms	1000 Milligrams	0 035 Ounces
1 Kilogram	1000 Grams	2 2 Lb	
1 Metric Ton	1000 Kilograms	1 Megagram	1 1 Short Tons

CUBIC MEASURE

1 Cu Centimeter	1000 Cu Millimeters	0 06 Cu Inches
1 Cu Meter	1,000,000 Cu Centimeters	35 31 Cu Feet

LIQUID MEASURE

1 Milliliter	0 001 Liters	0 0338 Fluid Ounces
1 Liter	1000 Milliliters	33 82 Fluid Ounces

TEMPERATURE

5/9 (F - 32)	C
212 Fahrenheit	is equivalent to 100 Celsius
90 Fahrenheit	is equivalent to 32 2 Celsius
32 Fahrenheit	is equivalent to 0 Celsius
9/5 C + 32	F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2 540
Feet	Meters	0 305
Yards	Meters	0 914
Miles	Kilometers	1 609
Square Inches	Square Centimeters	6 451
Square Feet	Square Meters	0 093
Square Yards	Square Meters	0 836
Square Miles	Square Kilometers	2 590
Acres	Square Hectometers	0 405
Cubic Feet	Cubic Meters	0 028
Cubic Yards	Cubic Meters	0 765
Fluid Ounces	Milliliters	29 573
Pints	Liters	0 473
Quarts	Liters	0 946
Gallons	Liters	3 785
Ounces	Grams	28 349
Pounds	Kilograms	0 454
Short Tons	Metric Tons	0 907
Pound-Feet	Newton-Meters	1 356
Pounds per Square Inch	Kilopascals	6 895
Miles per Gallon	Kilometers per Liter	0 425
Miles per Hour	Kilometers per Hour	1 609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0 394
Meters	Feet	3 280
Meters	Yards	1 094
Kilometers	Miles	0 621
Square Centimeters	Square Inches	0 155
Square Meters	Square Feet	10 764
Square Meters	Square Yards	1 196
Square Kilometers	Square Miles	0 386
Square Hectometers	Acres	2 471
Cubic Meters	Cubit Feet	35 315
Cubic Meters	Cubic Yards	1 308
Milliliters	Fluid Ounces	0 034
Liters	Pints	2 113
Liters	Quarts	1 057
Liters	Gallons	0 264
Grams	Ounces	0 035
Kilograms	Pounds	2 205
Metric Tons	Short Tons	1 102
Newton-Meters	Pound-Feet	0 738
Kilopascals	Pounds per Square Inch	0 145
Kilometers per Liter	Miles per Gallon	2 354
Kilometers per Hour	Miles per Hour	0 621

