TECHNICAL MANUAL

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

ALARM SET, ANTI-INTRUSION RESTRICTED AREA, MINISID III, AN/GSQ-154 (V) NSN 6350-00-182-7653, AND AN/GSQ-154A (V) NSN 6350-00-160-0293

HEADQUARTERS, DEPARTMENT OF THE ARMY

JULY 1975

Technical Manual

No. 5-6350-255-13

HEADQUARTERS
DEPARTMENT OF THE ARMY
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CURRENT AS OF 9 JUNE 1975

'This manual supersedes TM 5-8350-255-13, 23 June 1970, including all changes.

LIST OF ILLUSTRATIONS

LIST OF TABLES

WARNING

Do not short out battery terminals. Shorted mercury battery may explode causing injury to personnel, or damage to equipment.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

This manual is for your use in operating and maintaining the Alarm Set, Anti-Intrusion Restricted Area, MINISID III, Models AN/GSQ-154 (V) and AN/GSQ-154A (V).

In this manual the Alarm Set, Anti-Intrusion Restricted Area is referred to as MINISID III.

NOTE

All dimensions and tolerances are given in U.S. measurements and Metric measurements. All Metric units are enclosed in parentheses.

1-2. Maintenance Forms and Records Maintenance forms and records that you are required to use, but not limited to are: DA Form 2400;, DA Form 2402; DA Form 2404; and DA Form 2407. For detailed instructions, refer to TM 38750.

1-3. Reporting of Errors

You can help to improve this manual by calling attention to errors and by recommending improvements. Your letter, DA Form 2028 (Recommended Changes to Publications), or DA Form 2028-2 (Recommended Changes to Equipment Technical Manuals), may be used. Copies of DA Form 2028-2 are attached in the back of the manual for your use. Please mail your recommended changes directly to Commander, U. S. Army Troop Support Command, ATTN: AMSTS-MPP, 4300 Goodfellow Boulevard, St. Louis, MO 63120. A reply will be furnished directly to you.

1-4. Equipment Serviceability Criteria This equipment is not covered by an ESC.

1-5. Destruction of Army Material to Prevent Enemy Use When ordered by proper authority, proceed with the destruction of the MINISID III as follows:

a. Mechanical Destruction. Using an axe, pick, sledge or other heavy implement, damage all vital elements such as controls, cable and battery, modules, case.

b. Use of Natural Surroundings. Submergence of the equipment and repair parts underwater (lakes, ponds, swamps).

c. Gun Fire. Fire on equipment with the heaviest weapon required aiming at the housings or controls.

Although one well-placed direct hit may render the equipment inoperative, several hits may be required for complete destruction of all components.

1-6. Administrative Storage When storing the MINISID III for a prolonged period of time, always remove the battery. Dry batteries, being a perishable item will deteriorate during storage or shipment if the temperature exceeds +750F. (23.89°C.) for any length of time. When storing the mercury cell battery from the MINISID III, the same consideration should be given as perishable foodstuffs. For detailed instructions, refer to TM 740-90-1.

Section II. DESCRIPTION AND DATA

1-7. Purpose and Use

a. The Alarm Set, Anti-Intrusion, Restricted Area, Models AN/GSQ-154 (V), and AN/GSQ-154A (called MINISID III) is a hand carried, field implanted, battery-powered seismic detector unit. The unit is contained in a binocular shaped aluminum housing. Three rotary switches are placed along t he top of the unit to control the electronics. These switches are protected from dirt by a protective cover. A seismic geophone, capable of being embedded in the ground and attached signal cable is wound around and snapped into a holding fixture on one end of the unit . A removable cap is located on the same end to provide access into the housing for battery replacement. An interface connector is also provided on the same end for attachment of add-on units, including an external battery which can double the operating life of MINISID III. An antenna and transmitter cap assembly is located on the opposite end. This assembly allows the manual attachment and removal of the whip antenna. When not in use, the wire antenna is stored in a storage pouch on the carrying cover (fig. 1-1).

b. An identification tag (fig. 1-2) attached to the unit provides code information for the proper setting of the SECURITY switches when the unit is recovered. Rings are placed on each side of the case for attachment of the carrying strap provided with the unit. The antenna is secured to one of the rings by a lanyard.

1-8. Overall Functional Description

a. The MINISID III electronics uses unique modules designed expressly for this application, and modules from the family of multi-purpose units

called "common" modules.

b. The major functional blocks of MINISID III are the disable/control logic, battery, geophone seismic amplifier, encoder, code plug, transmitter and add-on unit interface logic (fig. 1-3). The encoder and transmitter are the "common" modules utilized.

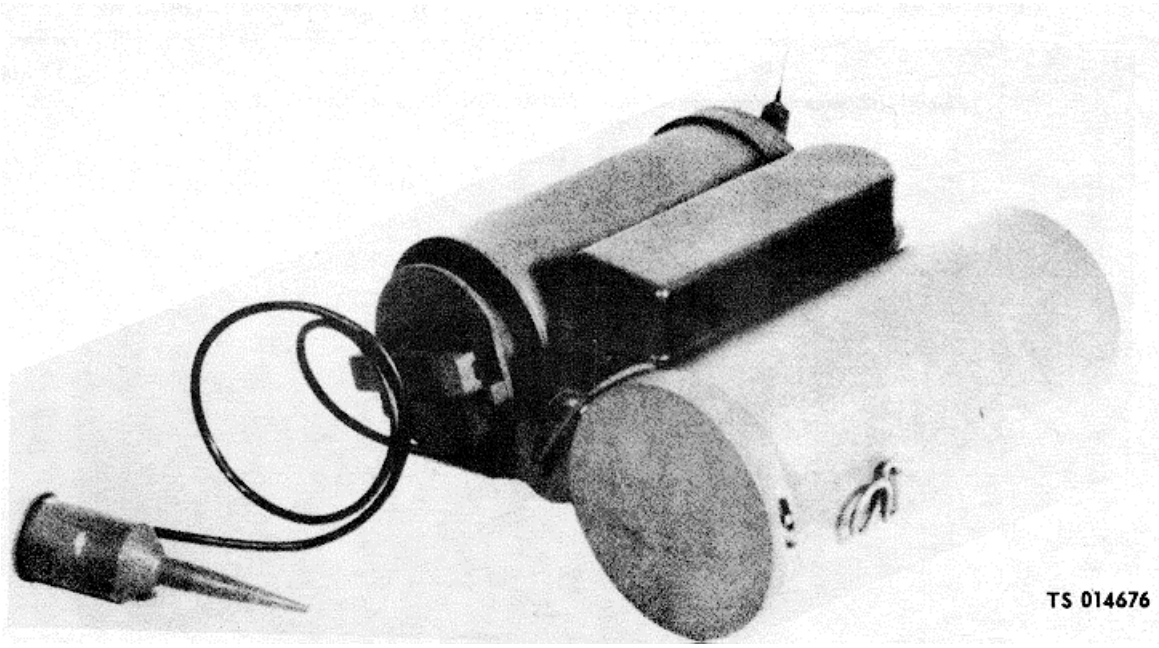


Figure 1-1. MINISID III (Models AN/GSQ-154 (V) and AN/GSQ-154A (V)

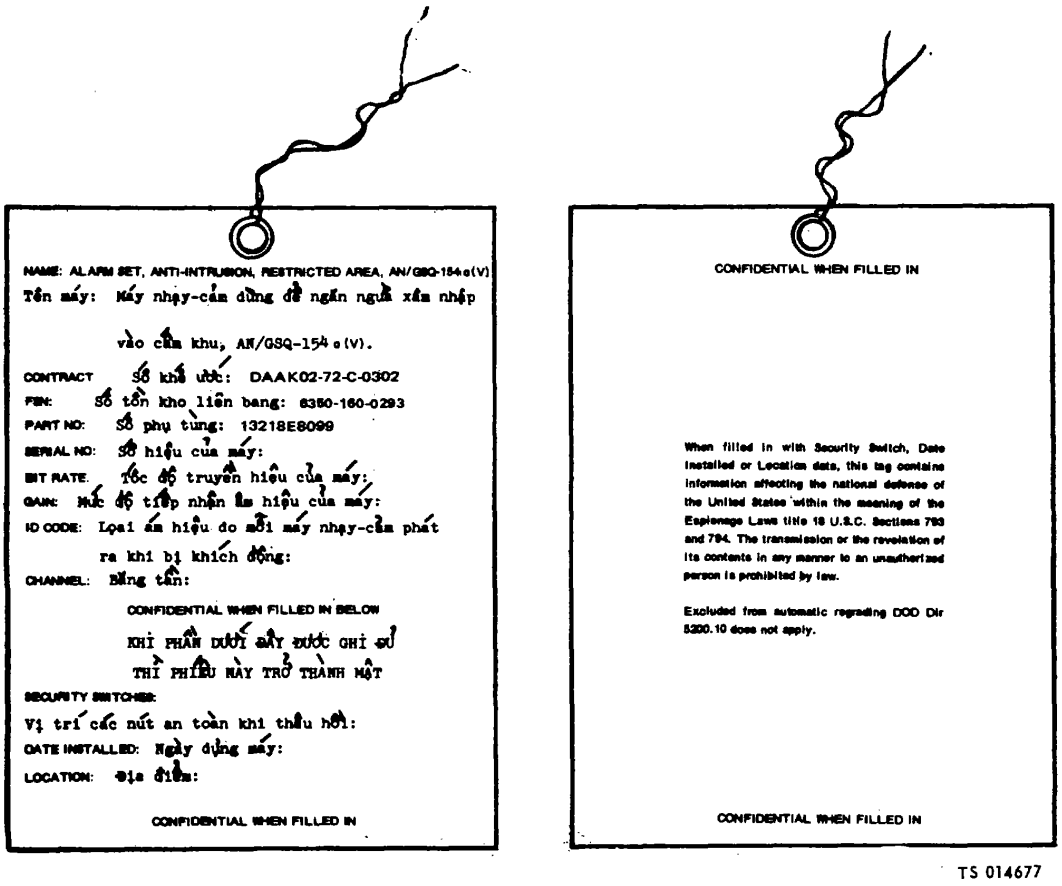


Figure 1-2. Identification Wag (Models ANCSQ-154 (V) and ANICSQ-154A (V)).

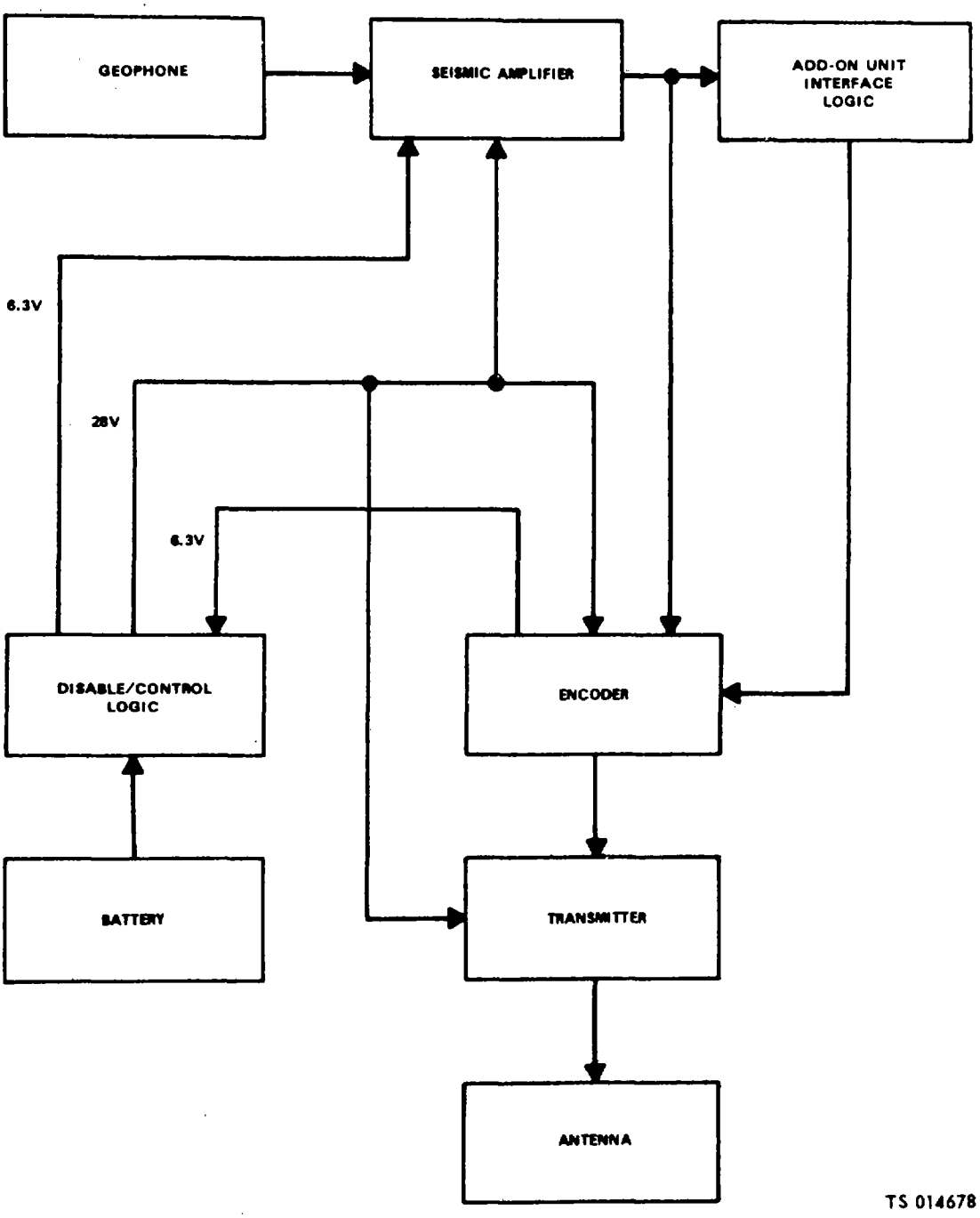


Figure 1-3. Functional block diagram (Models AN/GSQ-154 (V) and AN/GSQ-154A (V).

c. When the unit is implanted the geophone senses ground movements and sends the signals to the seismic amplifier. The seismic amplifier amplifies and processes these signals to characterize them and to determine when a proper signal is found. The seismic amplifier module then sends an alarm signal to the encoder module which controls the application of power from the battery to the transmitter module.

The encoder module also generates an 18-bit code which frequency modulates the transmitter. The 18 bit code sequence contains 9 bits of synchronizing data, 2 bits of data to identify the mode (MINISID III or add-on), 6 bits of address identification for the particular MINISID III unit, and a parity bit. The transmitter delivers a minimum of 2 watts of rf output power to the antenna. The total sequence can occur once every 10 seconds with the data message transmitting time being approximately 70 milliseconds long.

d. The code plug provides the inputs to the encoder

which determine the address of the particular unit.

e. The code plug settings are achieved by selection of pin placements on the code plug module. These settings include the 6 bits of address; 1 bit of parity; 1 pin for fast or slow rate; 1 pin for high, medium, or low gain; and 1 pin for the complementary form of the identification.

f. The power supply is a 28-volt mercury cell battery, providing an expected life of greater than 30 days for the MINISID III unit.

g. The add-on unit interface logic provides an appropriate set of signals for external control of the MINISID III unit by any add-on unit.

h. Disable Functions. In addition to the normal operating functions, there are functions which cause the disabling of the transmitter module.

i. An attempt to turn the unit from ARM to test or off without placing the security switches to their properly coded positions.

j. An attempt to remove the end caps.

k. Lowering of the battery voltages to approximately 19 volts.

I. When the caps are removed while the unit is in the armed condition, a small magnet releases a reed relay causing the disable pulse. A threshhold circuit monitors the nominal 28-volt battery and when the voltage is reduced to approximately 19 volts, the circuit initiates a disable pulse.

1-9. Recovery and Reuse Circuits are contained in the MINISID III that allow for safe recovery of the armed unit. By proper use of controls on the unit, the MINISID III is prevented from disabling the transmitter. After recovery, MINISID III may reused.

1-10. Seismic Module The seismic module is a self-contained assembly that receives the low level signals generated by the geophone. The seismic module produces a six volt, 15 millisecond pulse when the signal received from the geophone exceeds approximately 35 microvolts and is between 10 and 45 Hertz. With continued seismic activity, a pulse will be produced every 10 seconds. The 15 millisecond pulse is sent to the encoder module where the 18-bit code is generated. The input level detection and filtering are made to distinguish between seismic disturbances caused by men and equipment, and those caused by false alarm sources such as rain, tree root movement from wind and other natural ground vibration.

1-11. Differences Between Models

The major differences between Model AN/GSQ-154 (V), and model AN/GSQ-1M4A (V), are the CID (complementary identification) which is set into 0 for normal identification coding or 1 position for the complementary identification code, when required for ancillary equipment identification. Refer to Table 52 for ID to CID conversion on Model AN/GSQ-154A (V).

1-12. Tabulated Data

Physical Characteristics:

Size ..... 7.3" lg. by 7.4" wide by 3.0" high (19.0420 cm lg. by 19.0960 cm wide by 7.6200 cm high)

Volume ..... 162 cu. inches (2655.2000 cm)

Weight ..... 8 lbs. (3.60 kg) (assembled)

Operational Characteristics:

Transmitting power ..... 2w (minimum)

Transmitting frequen-.162 to 174 Mhz (on cy range channels assigned channels) Transmission characteristics ..... Digital fsk

Power ..... Battery, 28 volt, Mercury

Provisions are built in for add-on devices.

Built in self disable and tamper-proof circuitry (except for units stenciled TEST and TRAINING)

Resettable code plug

30-day minimum life on internal battery power

Field replaceable battery

Recoverable for reuse

Transmitter module

Encoder module

Battery

Seismic module

Interrupt/control assembly

CHAPTER 2
OPERATING INSTRUCTIONS

WARNING

If equipment fails to operate, refer trouble to organizational maintenance personnel

Section I. 0PERATING PROCEDURES

2-1. Operation of Security Switches

CAUTION

With the power switch (fig. 2-1) in the ARM Position, the sensor disable system is activated. Any movement or tilting of the sensor case will permanently damage the transmitter.

a. The security switches (fig. 2-1) when in safe position, allows recovery of the armed unit without disabling the transmitter. The switches must be positioned to a letter-number code unique to the particular unit. The code is printed inside the battery compartment and/or the wiring side of the code plug. The code must be recorded on the identification tag (fig. 1-2).

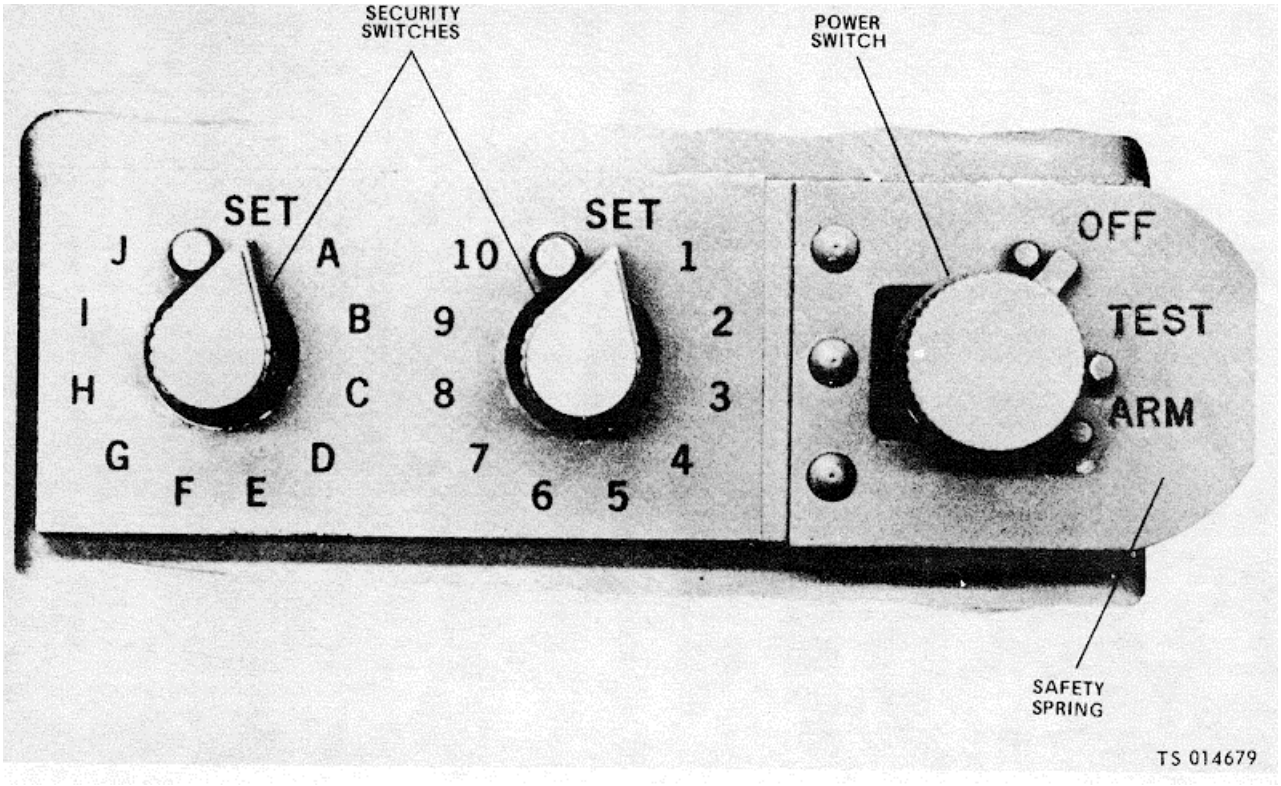


Figure 2-1. MINISID III, controls (Models AN/GSQ-154 (V) and AN/GSQ-154A (V).

b.poor visibility conditions, the above mentioned settings can be accomplished by feel in the following manner:

(1) Orient yourself with respect to the MINISID III location.

(2) Feel the outlines of MINISID III and take a position where MINISID III is in front of you with the antenna protruding to the right side.

(3) Locate, by touch, the knob located at the leftmost position.Verify that the knob is in the full counterclockwise position. Begin rotating this knob slowly clockwise. Listen for each click as you rotate the knob clockwise. First click is the letter "A", second click is "B", etc., through "J". Stop on the required security code letter position.

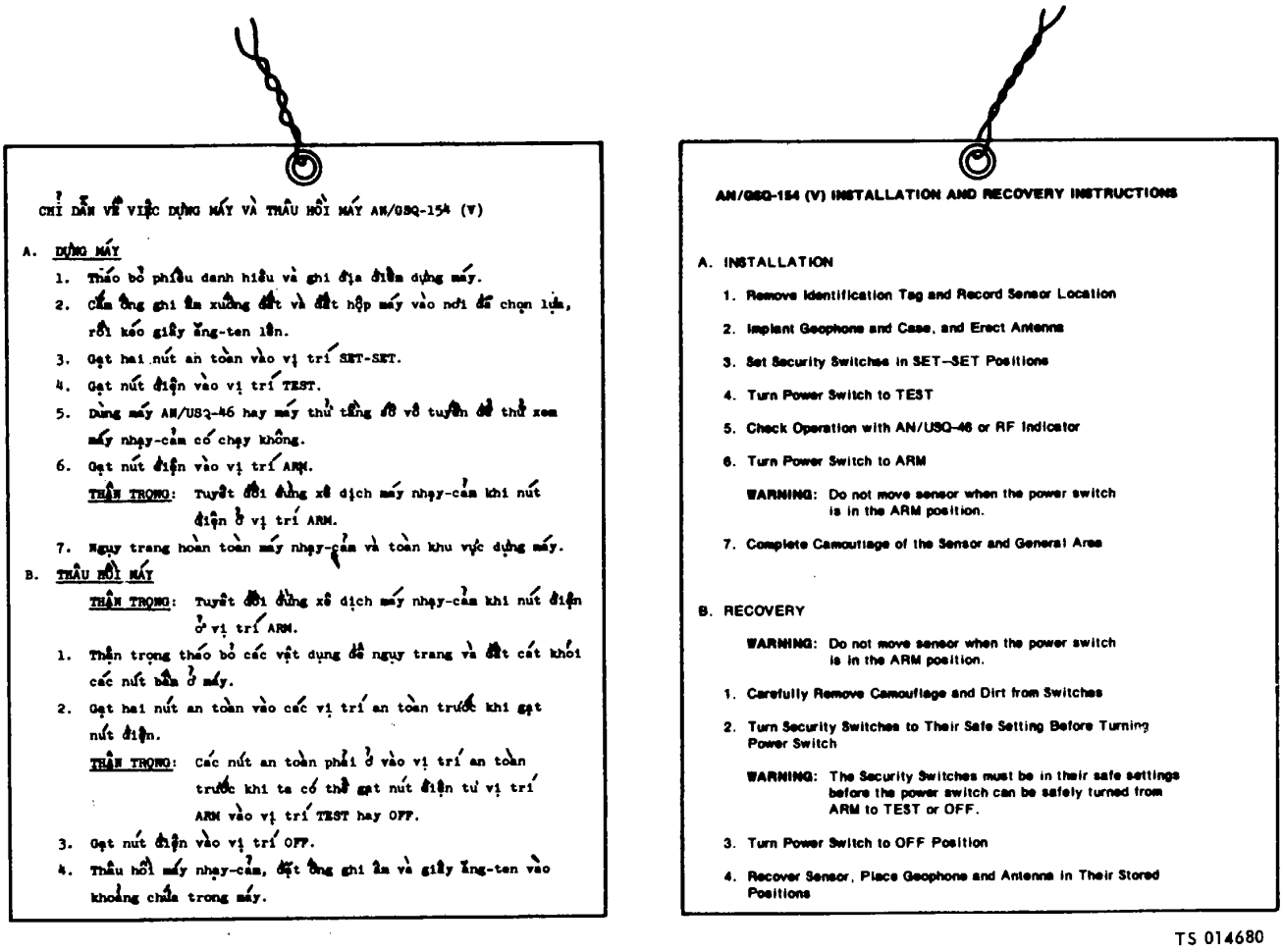
(4) Locate, by touch, the knob located at the center position. Verify that knob is in the full counterclockwise position. Listen for clicks. First click is "1", second click is "2", etc., through "10". Stop at the correct security code number setting.

(5) Locate, by touch, the knob override latch spring on the right stop side of the case assembly. Depress the spring and while it is held in the depressed position, rotate the knob slowly counterclockwise, until a firm stop is felt. The MINISID III now is turned off.

2-2. Operator's Instruction Tag Simplified bilingual installation and recovery instructions are contained on the operator's instruction tag.

NOTE

For operator's instruction tag on Model AN/GSQ-154 (V), refer to figure 2-2. For operator's instruction tag on Model AN/GSQ.154A (V), refer to figure 2-3



CHỈ DẪN VỀ VIỆC DỰNG MÁY VÀ THÂU HỒI MÁY AN/GSQ-154 (V)

A. DỰNG MÁY

1. Tháo bỏ phiếu danh hiệu và ghi địa điểm dựng máy.
2. Cắm ống ghi âm xuống đất và đặt hộp máy vào nơi đã chọn lựa, rồi kéo giây ăng-ten lên.
3. Gạt hai nút an toàn vào vị trí SET-SET.
4. Gạt nút điện vào vị trí TEST.
5. Dùng máy AN/USQ-46 hay máy thử tầng để vô tuyến để thử xem máy nhạy-cảm có chạy không.
6. Gạt nút điện vào vị trí ARM.

   THẬN TRỌNG: Tuyệt đối đừng xê dịch máy nhạy-cảm khi nút điện ở vị trí ARM.
7. Ngụy trang hoàn toàn máy nhạy-cảm và toàn khu vực dựng máy.

B. THÂU HỒI MÁY

   THẬN TRỌNG: Tuyệt đối đừng xê dịch máy nhạy-cảm khi nút điện ở vị trí ARM.
1. Thận trọng tháo bỏ các vật dụng để ngụy trang và đất cát khỏi các nút bấm ở máy.
2. Gạt hai nút an toàn vào các vị trí an toàn trước khi gạt nút điện.

   THẬN TRỌNG: Các nút an toàn phải ở vào vị trí an toàn trước khi ta có thể gạt nút điện từ vị trí ARM vào vị trí TEST hay OFF.
3. Gạt nút điện vào vị trí OFF.
4. Thâu hồi máy nhạy-cảm, đặt ống ghi âm và giây ăng-ten vào khoảng chứa trong máy.

AN/GSQ-154 (V) INSTALLATION AND RECOVERY INSTRUCTIONS

A. INSTALLATION

1. Remove Identification Tag and Record Sensor Location
2. Implant Geophone and Case, and Erect Antenna
3. Set Security Switches in SET–SET Positions
4. Turn Power Switch to TEST
5. Check Operation with AN/USQ-46 or RF Indicator
6. Turn Power Switch to ARM

   WARNING: Do not move sensor when the power switch is in the ARM position.
7. Complete Camouflage of the Sensor and General Area

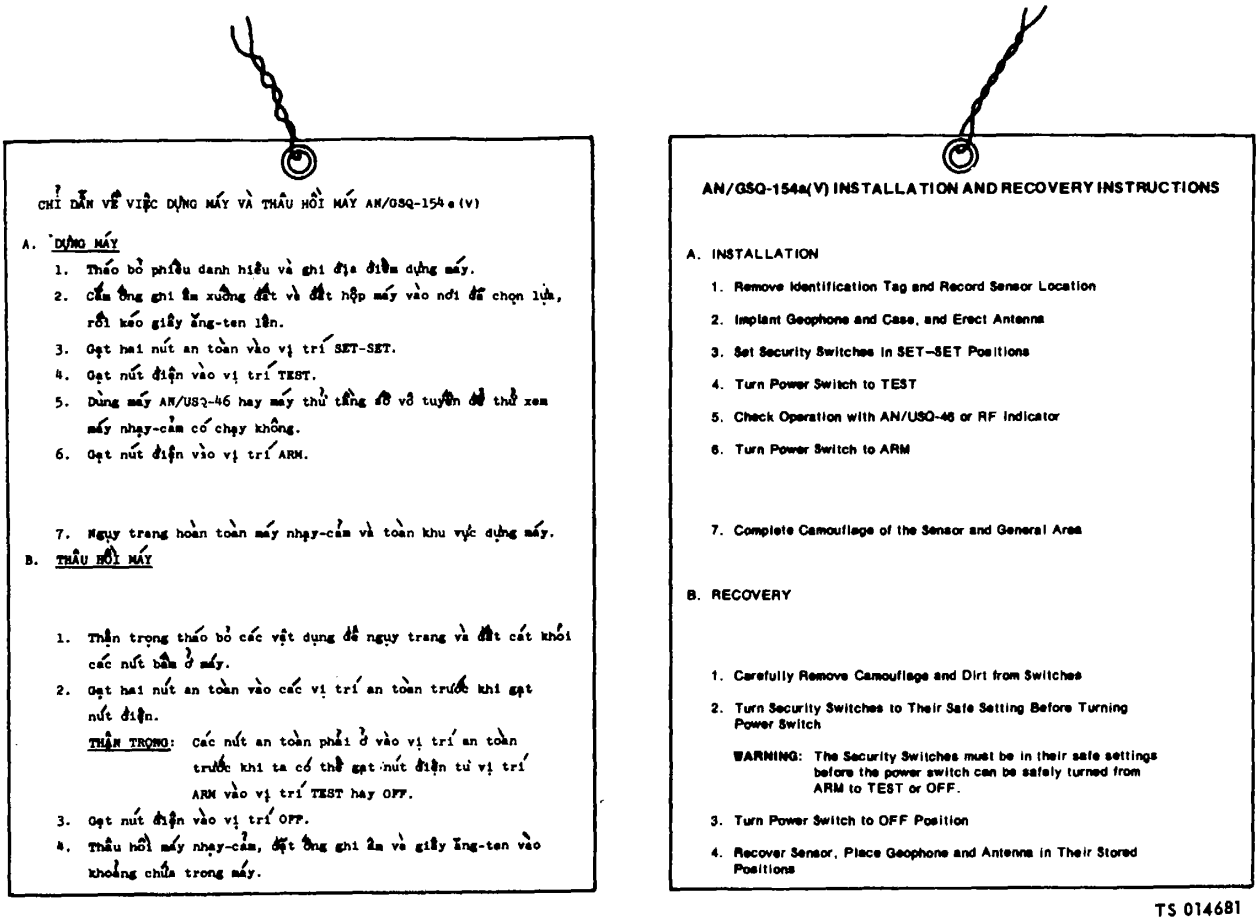
B. RECOVERY

   WARNING: Do not move sensor when the power switch is in the ARM position.
1. Carefully Remove Camouflage and Dirt from Switches
2. Turn Security Switches to Their Safe Setting Before Turning Power Switch

   WARNING: The Security Switches must be in their safe settings before the power switch can be safely turned from ARM to TEST or OFF.
3. Turn Power Switch to OFF Position
4. Recover Sensor, Place Geophone and Antenna in Their Stored Positions

TS 014680

Figure 2-2. Operator's instruction tag (Model AN/GSQ-154 (V))



CHỈ DẪN VỀ VIỆC DỰNG MÁY VÀ THÂU HỒI MÁY AN/GSQ-154a(V)

A. DỰNG MÁY

1. Tháo bỏ phiếu danh hiệu và ghi địa điểm dựng máy.
2. Cắm ống ghi âm xuống đất và đặt hộp máy vào nơi đã chọn lựa, rồi kéo giây ăng-ten lên.
3. Gạt hai nút an toàn vào vị trí SET-SET.
4. Gạt nút điện vào vị trí TEST.
5. Dùng máy AN/USQ-46 hay máy thử tầng số vô tuyến để thử xem máy nhạy-cảm có chạy không.
6. Gạt nút điện vào vị trí ARM.
7. Ngụy trang hoàn toàn máy nhạy-cảm và toàn khu vực dựng máy.

B. THÂU HỒI MÁY

1. Thận trọng tháo bỏ các vật dụng để ngụy trang và đất cát khỏi các nút bấm ở máy.
2. Gạt hai nút an toàn vào các vị trí an toàn trước khi gạt nút điện.

   THẬN TRỌNG: Các nút an toàn phải ở vào vị trí an toàn trước khi ta có thể gạt nút điện từ vị trí ARM vào vị trí TEST hay OFF.
3. Gạt nút điện vào vị trí OFF.
4. Thâu hồi máy nhạy-cảm, đặt ống ghi âm và giây ăng-ten vào khoảng chứa trong máy.

AN/GSQ-154a(V) INSTALLATION AND RECOVERY INSTRUCTIONS

A. INSTALLATION

1. Remove Identification Tag and Record Sensor Location
2. Implant Geophone and Case, and Erect Antenna
3. Set Security Switches in SET–SET Positions
4. Turn Power Switch to TEST
5. Check Operation with AN/USQ-46 or RF Indicator
6. Turn Power Switch to ARM
7. Complete Camouflage of the Sensor and General Area

B. RECOVERY

1. Carefully Remove Camouflage and Dirt from Switches
2. Turn Security Switches to Their Safe Setting Before Turning Power Switch

   WARNING: The Security Switches must be in their safe settings before the power switch can be safely turned from ARM to TEST or OFF.
3. Turn Power Switch to OFF Position
4. Recover Sensor, Place Geophone and Antenna in Their Stored Positions

TS 014681

Figure 2-3. Operator's instruction tag (Model AN/GSQ-154A (V)).

Section II. OPERATION OF AUXILIARY EQUIPMENT

2-3. General

There is no auxiliary equipment for the MINISID III that is required by the Operator/Crew to operate.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

2-4. Unusual Operating Conditions

There are no unusual operating conditions that will effect the operation of the MINISID III. Any unusual operating conditions are corrected by built-in devices of the MINISID III.

CHAPTER 3
OPERATOR/CREW MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

3-1. General

There are no lubrication instructions required to service the MINISID III.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

3-2. General

To ensure that the MINISID III is always ready for operation, it must be inspected periodically so that defects may be discovered and corrected before they result in failure. The necessary inspections to be performed are made by the organizational and direct support maintenance personnel, in accordance with the Maintenance Allocation Chart (MAC).

Section III. TROUBLESHOOTING

3-3. General

There is no troubleshooting information allocated by the Maintenance Allocation Chart (MAC) to the operator/crew personnel on the MINISID III. All troubleshooting information is directed to Organizational and Direct Support Maintenance personnel (Tables 4-1 and 5-1).

CHAPTER 4
ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

4-1. Inspecting the Equipment

a. Inspect the MINISID III for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6 (Packaging Improvement Report) as prescribed by AR 700-58.

b. Check the equipment received against the packing slip to see if the shipment is complete. Report all discrepancies on DD Form 6.

c. Check to see if the equipment has been modified. (Equipment that has been modified will have the MWO number in a conspicuous place.

Section II. INSTALLATION

4-2. Installation of MINISID III

CAUTION

Insure that both end caps and interface connector dust cover are secure.

NOTE

The following instructions apply to Models ANIGSQ154 (V), and AN/GSQ-154A (V).

a. Dig hole for geophone and cable (and for the sensor case if burial is required for camouflage)

b. Remove identification tag and record sensor location. Keep tag for use during recovery of sensor.

c. Press geophone spike firmly into the ground. Make sure the geophone is in a vertical position.

Cover geophone and cable with at least six inches (15.cm) of soil.

d.Screw wire antenna into antenna and transmitter cap assembly.

e. Lift protective cover, and turn security switches (fig. 2-1)to their SET-SET positions.

fDepress the safety spring (fig. 2-1) and turn power switch to ARM.

CAUTION

At this point, the MINISID III is fully operational.

g. Place protective cover over switches.

h. Cover the sensor with soil to a depth of about 1 inch (2.54 cm) above the top of the switches.

i. Check camouflage of general area.

4-3. Recovery

The following procedures are used when recovering the MINISID III, Models AN/GSQ-154 (V), and AN/GSQ-154A (V).

WARNING

With the power switch (fig. 2-1) in the ARM position the sensor disable system is activated.

a. Carefully remove soil or camouflage material from top of protective cover. Lift protective cover so as to expose sensor switches.

b. Turn security switches (fig. 2-1) to the safe settings found on the sensor identification card. Make sure that the serial number of the sensor and the card are the same.

c. Depress the safety spring (fig. 2-1) and turn the power switch to the OFF position.

d. Remove sensor from ground by removing soil from top of case and geophone.

CAUTION

Grasp geophone when removing. Do not remove by pulling cable.

e. Place geophone and antenna in their stored positions.

Section III. REPAIR PARTS, SPECIAL TOOLS AND TEST EQUIPMENT

4-4. Tools and Equipment

There are no special tools issued to organizational maintenance personnel to maintain the MINISID III.

4-5. Special Test Equipment

There is no special test equipment issued to organizational maintenance personnel to maintain the MINISID III.

4-6. Maintenance Repair Parts

Repair parts and equipment are listed and illustrated in Appendix C, and figure C-1.

Section IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4-7. General

This section contains information for organizational maintenance personnel in keeping the MINISID III

in a constant state of readiness. This is accomplished by maintenance checks and services monthly, or every 250 hours of operation, whichever occurs first.

4-8. Preventive Maintenance Checks and Services

Table 4-1 contains a list of preventive maintenance checks and services which must be performed by organizational maintenance personnel as allocated by the Maintenance Allocation Chart (MAC).

Table 4-1. Organizational Preventive Maintenance Checks and Services

M - Monthly
Total man-hours required: 0.5

Sequence Number	ITEM TO BE INSPECTED WORK PROCEDURE	TIME (M/H)
1	BATTERY CAP ASSEMBLY Inspect battery cap for cracks, dents, proper fit, bent bayonet lock. If general condition of battery cap assembly is found to be defective, replace battery cap assembly.	0.2
2	BATTERY Inspect battery for fungus corrosion. The life expectancy of the battery is 30 days. Replace when necessary.	0.3
3	CLEANING **CAUTION** Do not use Trichloroethane or any other hydrocarbon cleaning agents. Use only soap and water for cleaning purposes. Remove fungus and ground in dirt from case, using a cloth dampened (not wet) with soap and water.	

Section V. TROUBLESHOOTING

4-9. Scope

a. This section contains troubleshooting or malfunction information and tests for locating and correcting most of the troubles which may develop in the MINISID III. Each malfunction or trouble symptom for an individual component, unit, or system is followed by a list of tests, inspections necessary for you to determine probable causes and suggested corrective actions for you to remedy the malfunction.

b. This manual cannot list all possible malfunctions that may occur or all tests or inspections and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious), or is not corrected by listed corrective actions, you should notify higher level maintenance.

c. Table 4-2 lists the common malfunctions that you may find during the operation or maintenance of the MINISID III or its components. You should perform the tests/inspections and corrective actions in the order listed.

NOTE

Before you use this table, be sure you have performed all normal operational checks. If you have a malfunction which is not listed in this table, notify the next higher level of maintenance.

Table 4-2. TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. POWER SWITCH FAILS TO ACTIVATE MINISID III WHEN TURNED TO ARM OR TEST POSITION
Step I. Battery connector no snapped onto mating receptacles of battery. **CAUTION** Depress safety spring (fig. 4-1) and set power switch to OFF position.

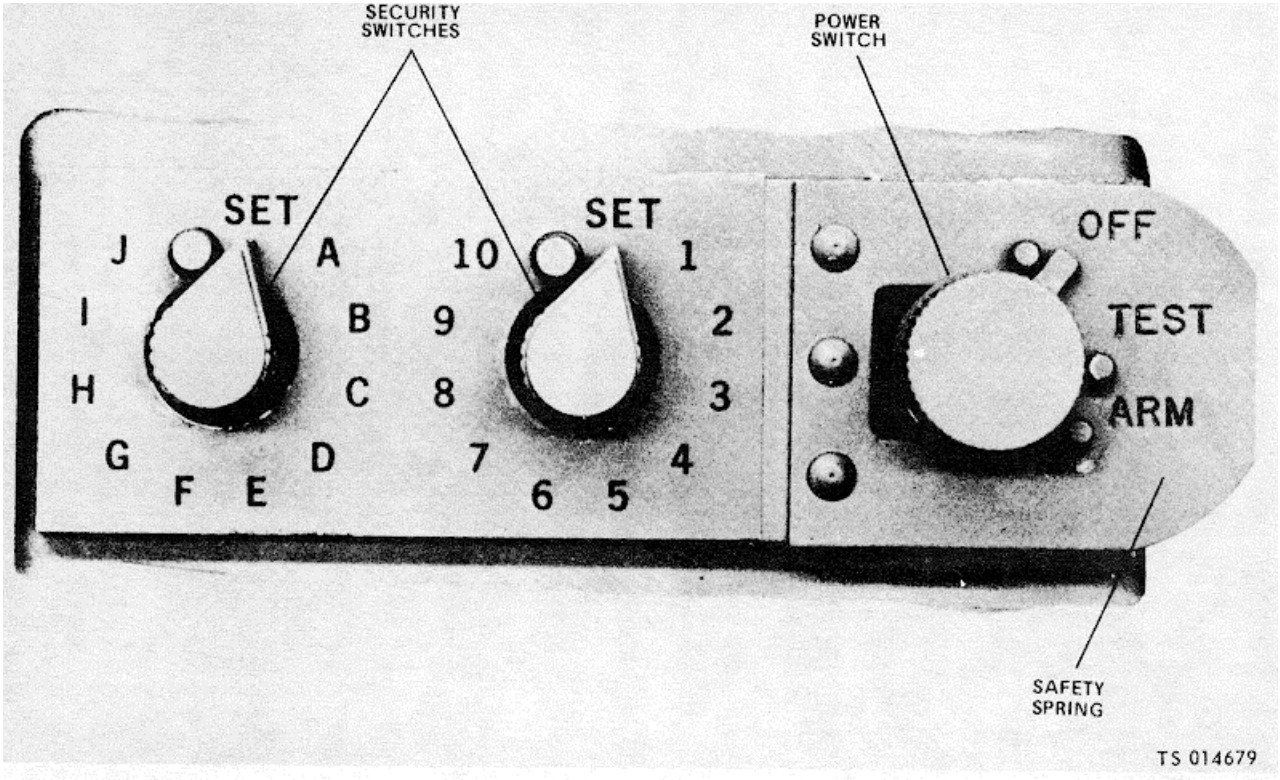


Figure 4-1. MINISID III controls (Models AN/GSQ-154 (V) and AN/GSQ-154A (V).

Table 4-2. TROUBLESHOOTING -Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. POWER SWITCH FAILS TO ACTIVATE MINISID I1I WHEN TURNED TO ARM OR TEST POSITION (Cont'd)
a Turn battery cap assembly counterclockwise, remove and set aside. b. Grasp the battery connector and push mating receptacles on battery. c. Install battery cap assembly with · clockwise movement until a click is heard or felt. d. Set power switch to ARM or TEST position. Check operation of the MINISID Ill.
Step 2. Battery voltage low or dead. a Replace a defective battery as follows: (1) Depress safety springg and set power switch to OFF (fig 4-1). (2) Remove battery cap assembly (fig. 4-2) by a counterclockwise movement to disengage the bayonet lock. Unsnap the battery connector from the battery. (3}) With the open end of the long tube facing out slide battery lightly forward (fig. 4-3).

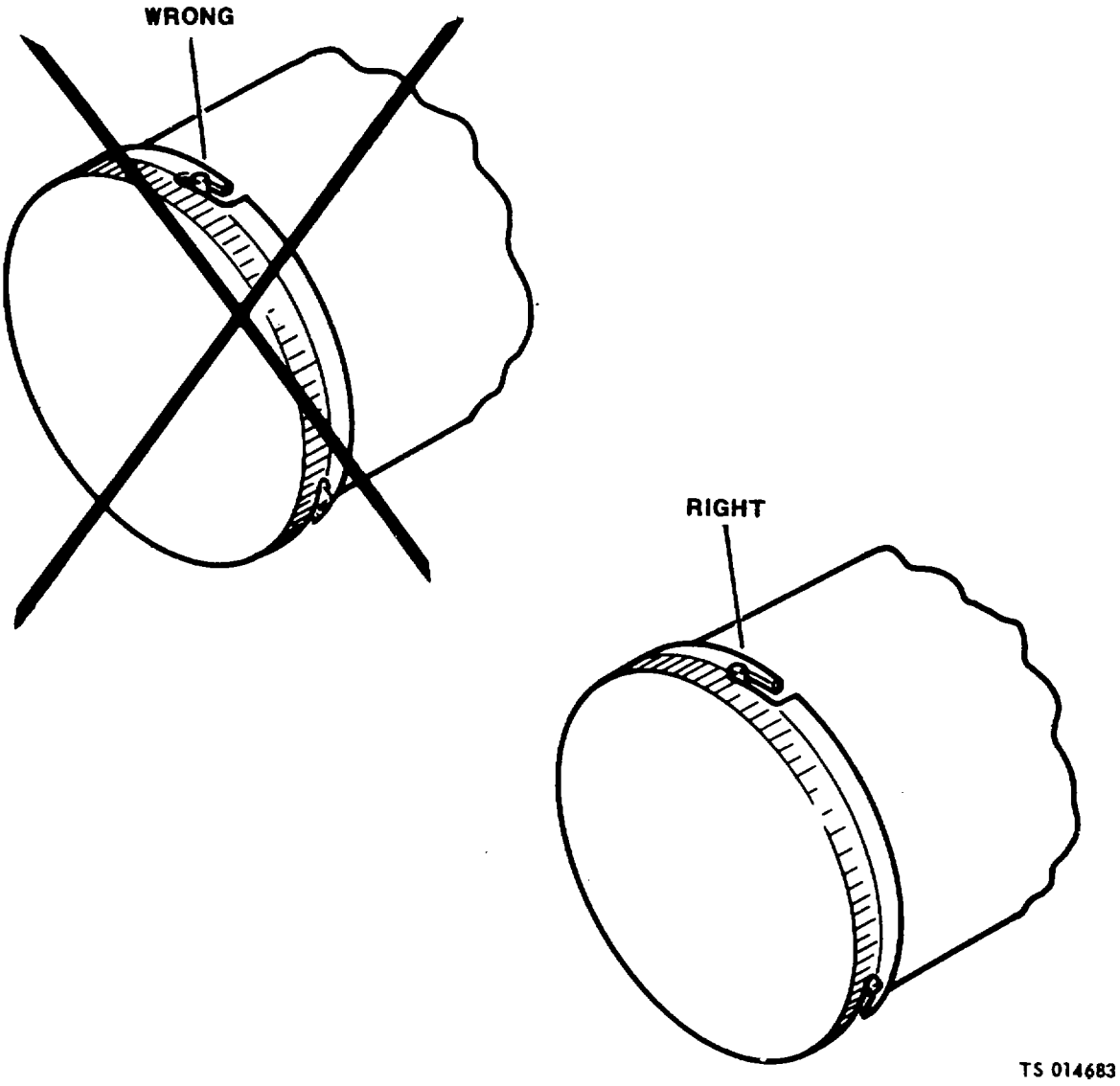


Figure 4-2. Installation of battery cap (Models AN/GSQ-154 (v), AND an/GSQ154a (V).

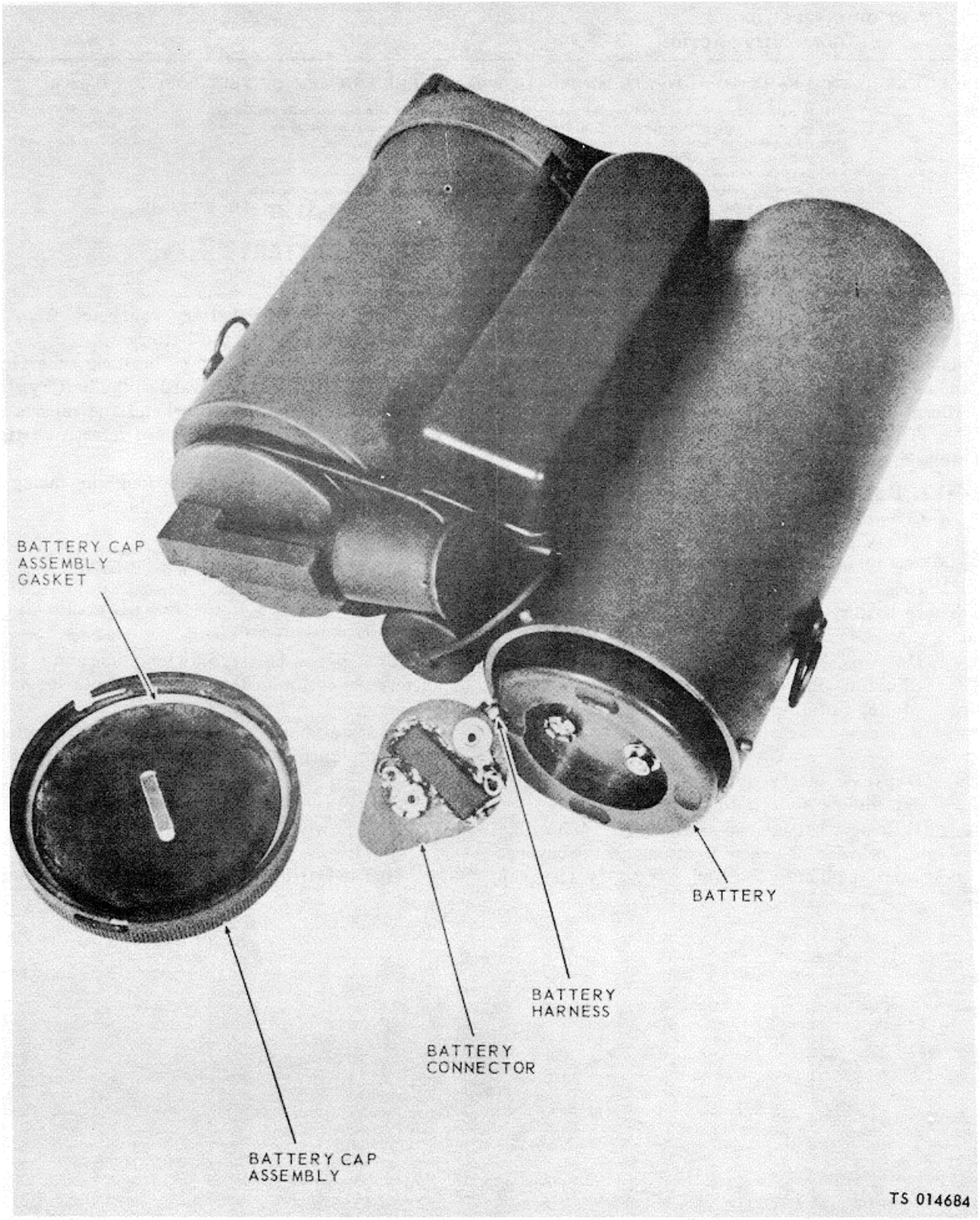


Figure 4-3. Battery installation (Models ANICSQ-154 (V), and ANIGSQ-154A (V)).

Table 4-. TROUBLESHOOTING - Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. POWER SWITCH FAILS TO ACTIVATE MINISID III WHEN TURNED TO ARM OR TEST POSITION (Cont'd) (4) Grasp battery with bad and remove battery completely from ease and discard defective battery. (5) Insert new battery into opening of the long tube which the battery receptacles facing out (6) Insure that the battery connector is pulled out from the long tube. (7) Slide the battery inside long tube until it bottoms. (8) Snap the battery connector on the battery. (9) Install the battery cap assembly with a clockwise movement until a click is heard or felt (10) Depress safety spring and oat power switch to ARM or TEST position. Check operation of the MINISID 111.

Section VI. MAINTENANCE OF BATTERY

4-10. General

a. This section includes instructions to organizational maintenance personnel to aid them in maintaining that portion of the MINISID III that is their responsibility as assigned on the Maintenance Allocation Chart (MAC), Appendix B.

b. This portion of the MINISID III covers the replacement of the 28 volt mercury cell battery.

4-11. Battery

a. General. The battery is located directly behind the battery cap assembly and battery connector in the long tube (fig. 4-3).

b Removal. to figures 4-1, 4-2 and 4-3 and remove battery as follows:

WARNING

Do not short out battery terminals. Shorted mercury battery may explode, causing injury to personnel or damage to equipment.

CAUTION

Depress safety spring (fig. 2-1) and set power switch to OFF position.

(1) Remove battery cap assembly (fig. 4-2) with a counterclockwise movement to disengage the bayonet lock from the long tube and remove battery cap assembly.

(2) Unsnap the battery connector from the mating receptacles on the battery.

(3) With the open end of the long tube facing toward you, tilt case downward so the battery slides outward. Grasp battery with hand and remove battery completely from case. Discard defective battery.

b.Installation.

(1) With the open end of the long tube facing out, hold battery connector outside the tube.

NOTE

The flat surface, located in the center bottom portion of the battery case assembly, provides clearance for the battery connector harness, therefore, the harness should lay flat on the bottom of the case to allow the battery to seat properly.

(2) Slide new battery into long tube and snap the battery connector to the mating receptacles on the battery.

(3) Install battery cap assembly with a clockwise movement until a click is heard or felt (fig. 4-2).

CAUTION

Depress safety spring (fig. 4-1) and set power switch to ARM or TEST position.

(4) MINISID III is now ready for operation.

CHAPTER 5
DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS AND SPECIAL TEST EQUIPMENT

5-1. Special Test Equipment
The special test equipment is listed in Appendix B, Section III, of the Maintenance Allocation Chart

5-2. Maintenance Repair Parts
Repair parts are listed and illustrated in Appendix C of this manual.

Section II. TROUBLESHOOTING

5-3. Scope

a. This section contains troubleshooting or malfunction information and tests for locating and correcting most of the troubles which may develop in the MINISID III. Each malfunction or trouble symptom for an individual component, unit, or system is followed by a list of tests or inspections necessary for you to determine probable causes and suggested corrective actions for you to remedy the malfunction.

b. This manual cannot list all possible malfunctions that may occur or all tests or inspections, and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious), or is not corrected by listed corrective actions, you should notify higher level maintenance.

c. Table 5-1 lists the common malfunctions that you may find during the operation or maintenance of the MINISID III or its components. You should perform the tests Inspections and corrective actions in the order listed.

NOTE

Before you use this table, be sure you have performed all normal operational checks. If you have a malfunction which is not listed in this table, notify the next

Table 5-1. TROUBLESHOOTING

MALIFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 1. The checkout procedures of the MINISID III which isolates a malfunction to a replaceable assembly are as follow a. Screw wire antenna into antenna and transmitter cap assembly (fig 5-1).

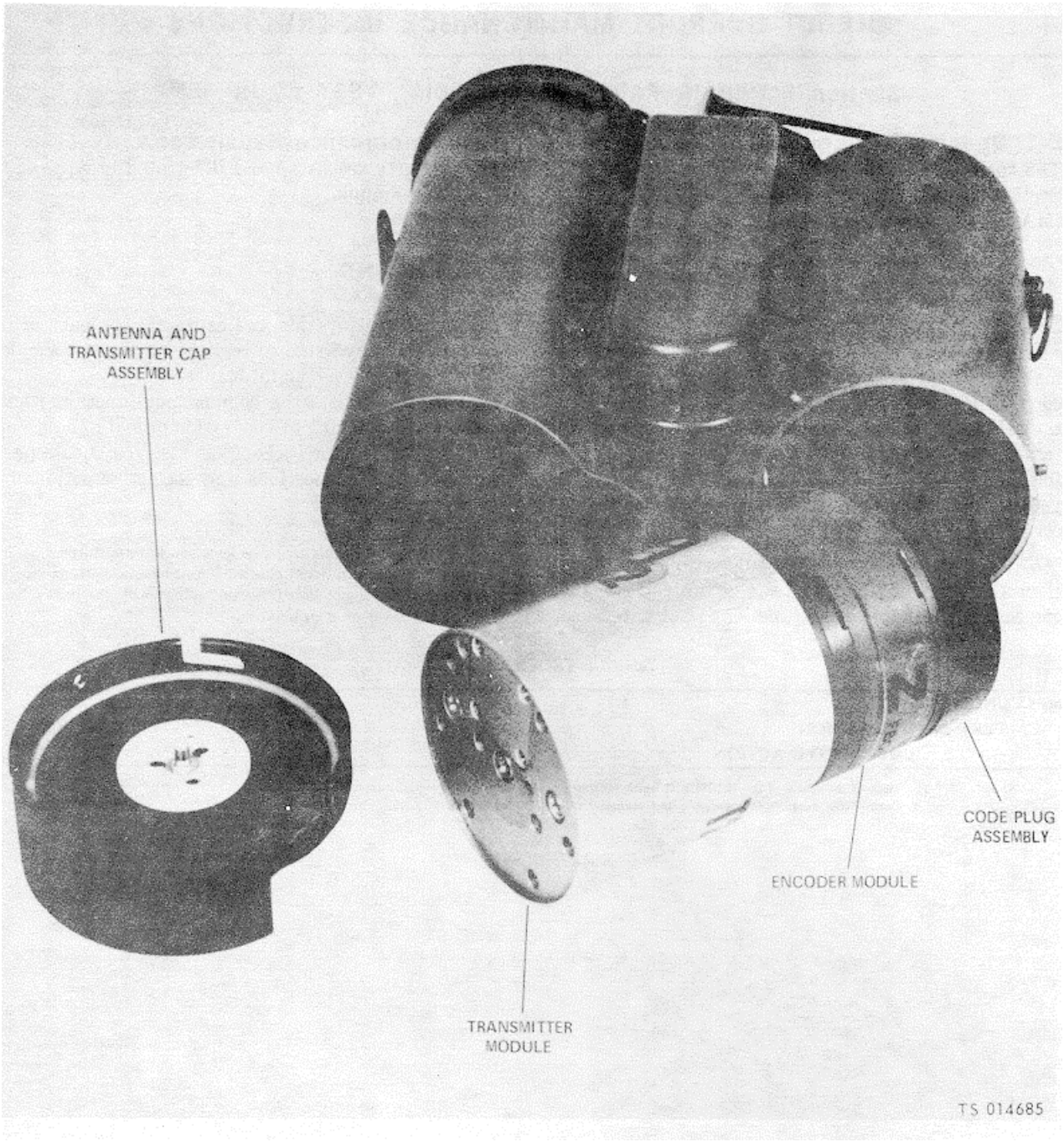


Figure 5-1. Transmitter and encoder installation (Models AN-GSQ-154 (V) and AN/GSQ-154A (V)).

Table 5-1. TROUBLESHOOTING - Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
b.. Turn power switch to TEST position (fig. 5-2).

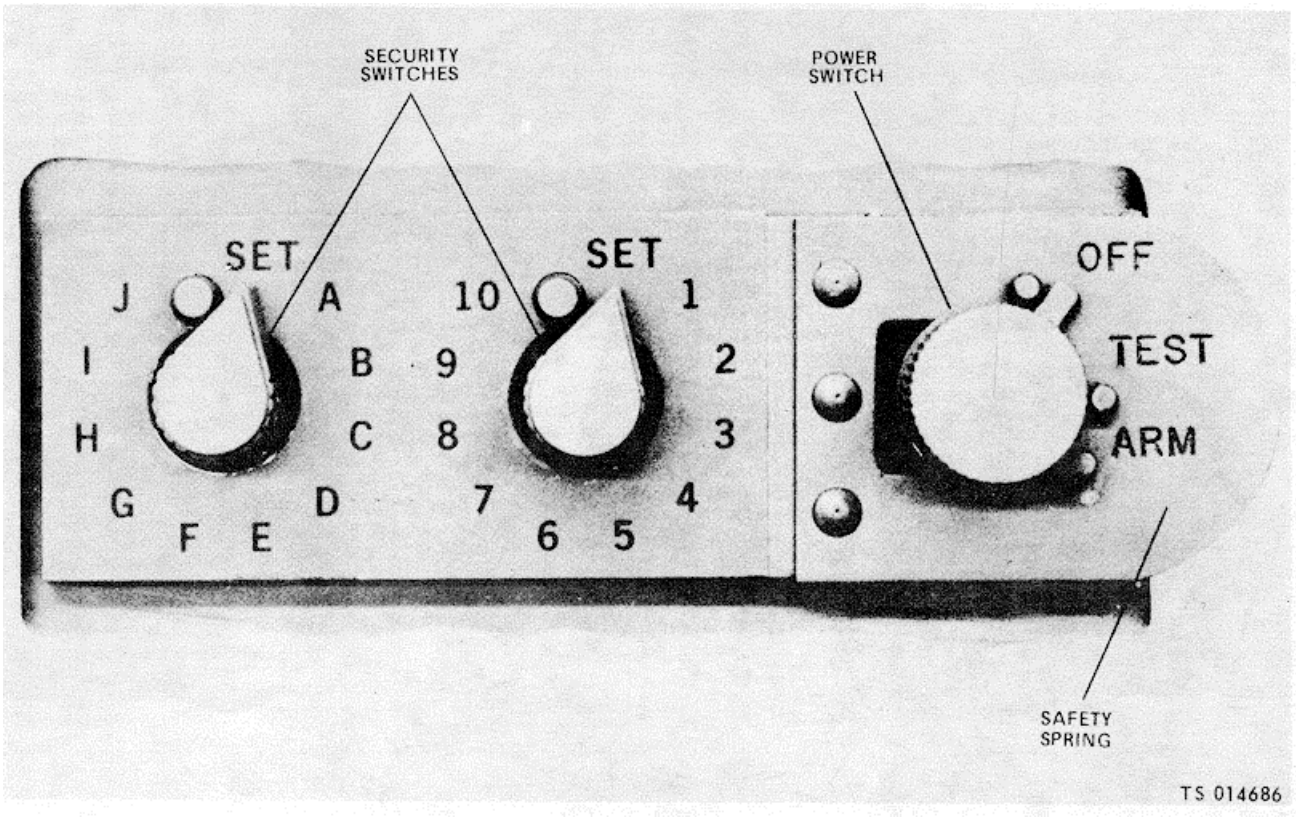


Figure 5-2. MINISID III controls (Models AN/GSQ-154 (V) and ANIGSQ-154A (V)).

Table 5-1. TROUBLESHOOTING - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
	c. Using a· portatle receiver, check the ID code of the MINISID III by tapping the geophone spike lightly downward on any surface. The ID code is set in the code plug (fig. 5-3).	

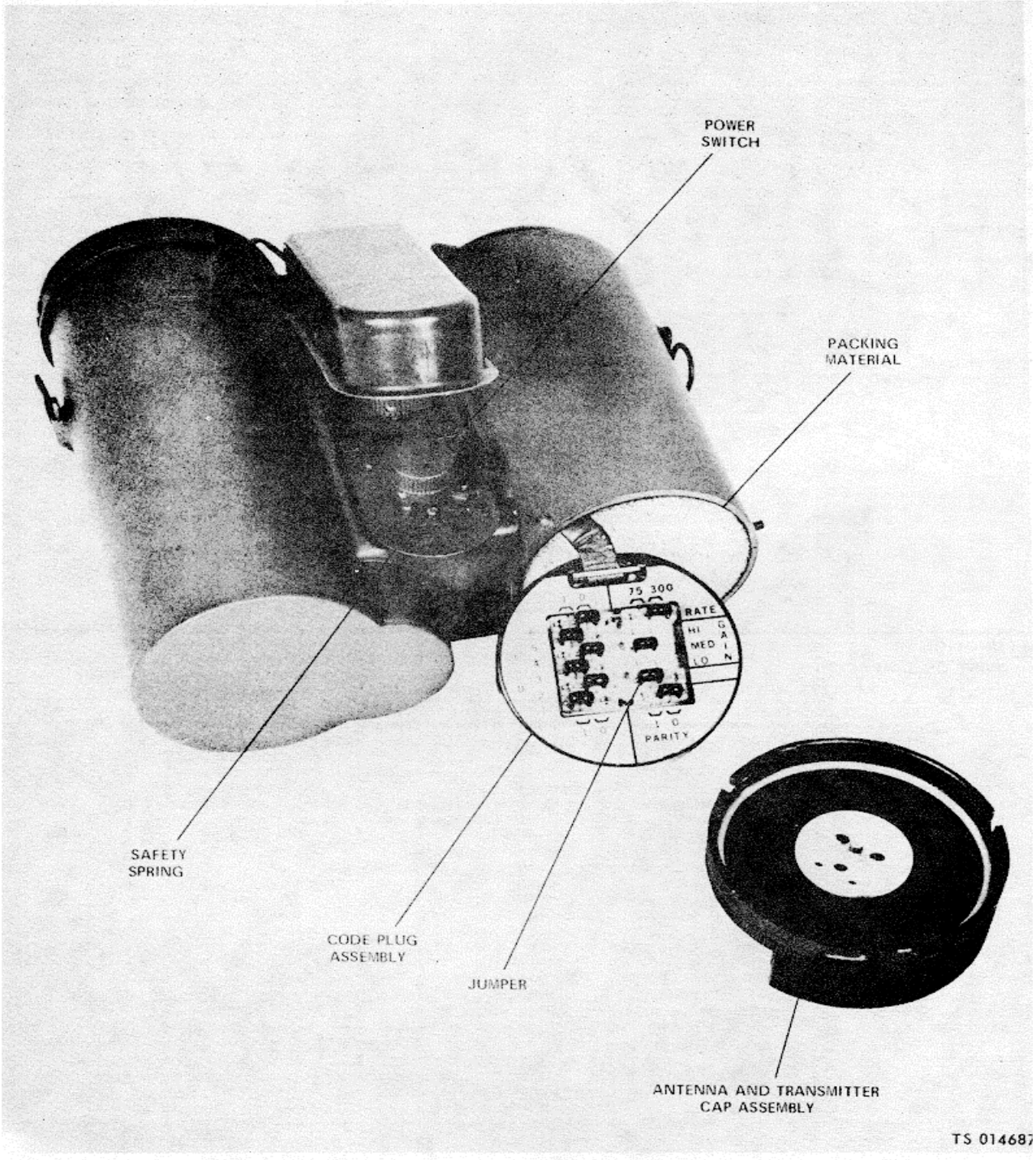


Figure 5-3. Code plug assembly extraction (Models ANIGSQ-154 (V) ad ANIGSQ-I154A (V)).

Table 5-1. TROUBLESHOOTING - Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

d If paraph c fails, check code plug setting for proper parity (Table 5-2) and receiver for correct bit rate setting and repeat pargraph c

e If paragraph d. fails., test the battery using the GCeneral Automaticl Test Equipment (GATE) as follow. Check the battery voltage for +28 +/-3 volts acros pins G (+) and B (-) of the interface connector. When the voltage is out of tolerance, replace the battery and repeat paragraph c

f. Replace defective battery as follows.

WARNING

Do not short out battery terminals. Shorted mercury battery may explode, causing injury to personnel, and damage to equipment.

(1) Depress safety spring and met power switch to OFF position (fig. 5-2)

(2) Remove battery cap asembly (fig. 5-4) with a counterclockwie movement to disengage the bayonet lock.

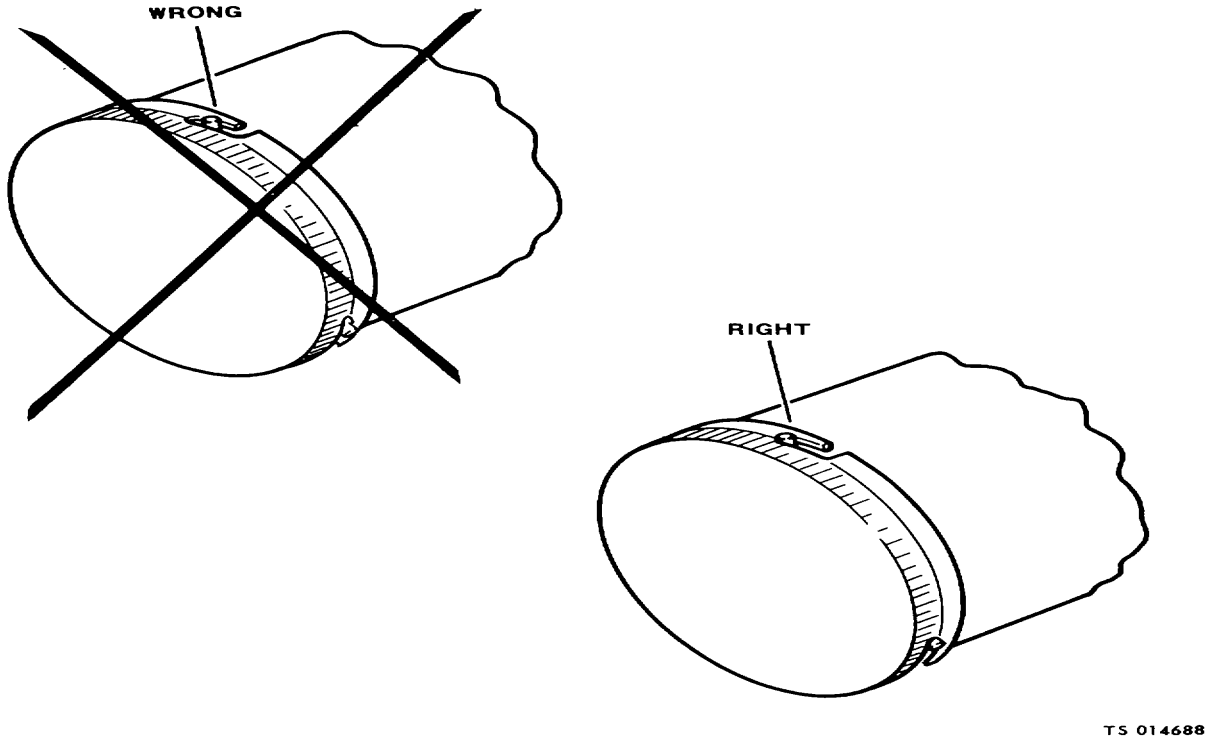


Figure 5-4. Installation of battery cap (Models AN/GSQ-154 (V) and AN/GSQ-154A (V)).

Table 5-1. TROUBLESHOOTING----Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

(3) Unsnap the battery connector from its mating receptacle (fig. 5-5)

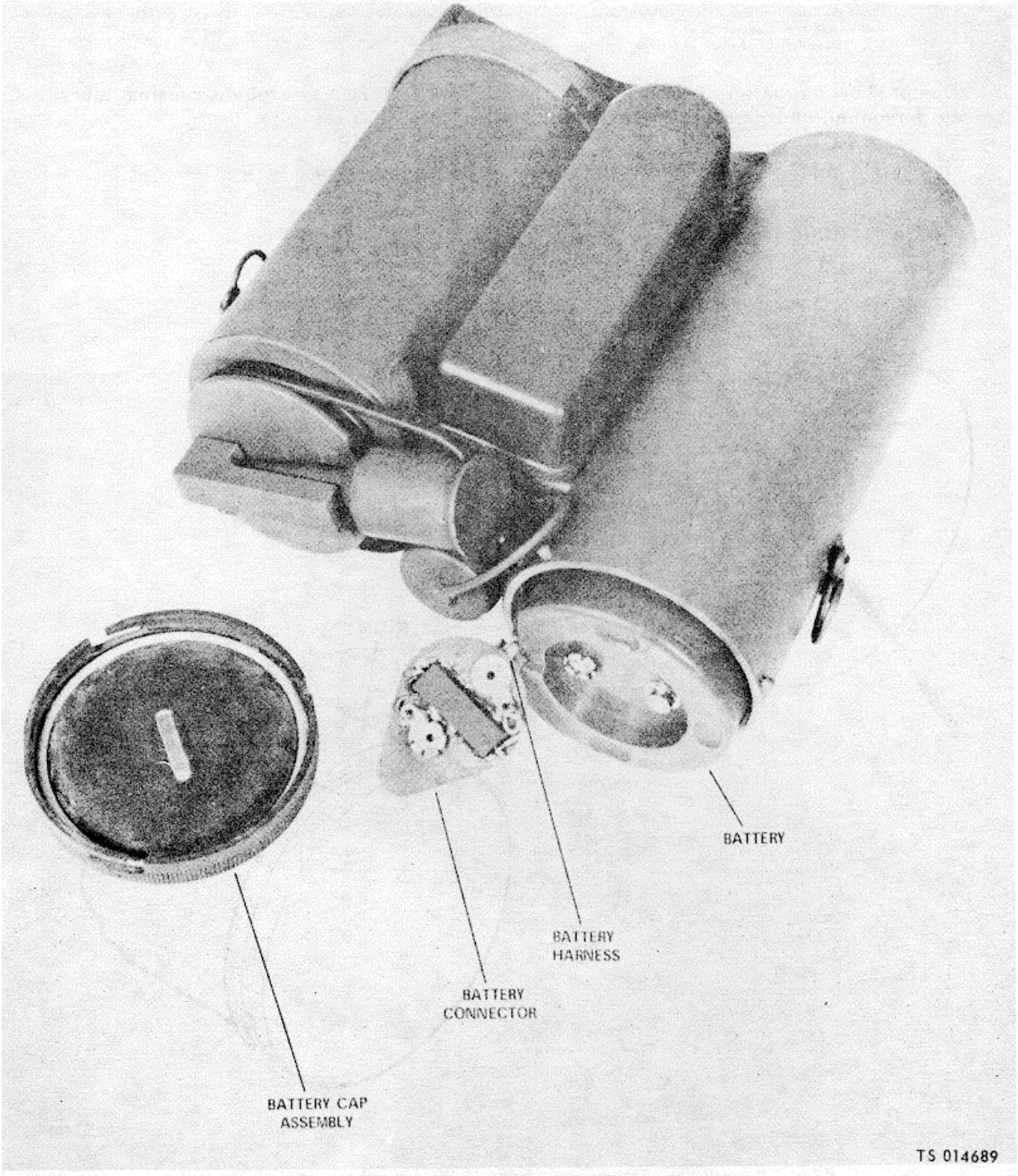


Figure 5-5. Battery installation (Models AN/GSQ-154 (V) and AN.GSQ-154A (V))

Table 5-1. TROUBLESHOOTING - Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

(4) With the open end of the long tube facing out, tilt and elide battery slightly outward.
(5) Grasp the battery with hand, and remove completely from the long tube, then discard defective battery.
(6) When Installing a new battery, position the long tube facing outward and hold battery connector outside the long tube.

NOTE

The flat surface, located in the center bottom portion of the battery case assembly, provides clearance for the battery harness, therefore, the harness should lay flat on the bottom of center portion of the case to allow the battery to seat properly.

(7) Slide new battery into the long tube, then snap the battery connector to the mating receptacles on the battery.
(8) Install battery cap assembly with a clockwise movement until a click is heard or felt fig. 5-4).
(9) Depress the safety spring (fig. 5-2) and set power switch to ARM or T7ST position.

g. If paragraph c. still fails, check the rf connector on the transmitter module and end cap. Replace module or end cap if its rf connector is damaged and repeat paragraph c.

h. If the rf connectors are good, replace transmitter and encoder stack (fig. 5-1), then repeat paragraph c

i. If paragraph c still fails, remove antenna and transmitter cap assembly (fig. 5-1). Check for continuity, using the General Automatic Test Equipment (GATE) between the end of the coaxial connector on the inside of the antenna and transmitter cap assembly (fig. 5-6). When there is no continuity, replace the assembly and repeat paragraph c.

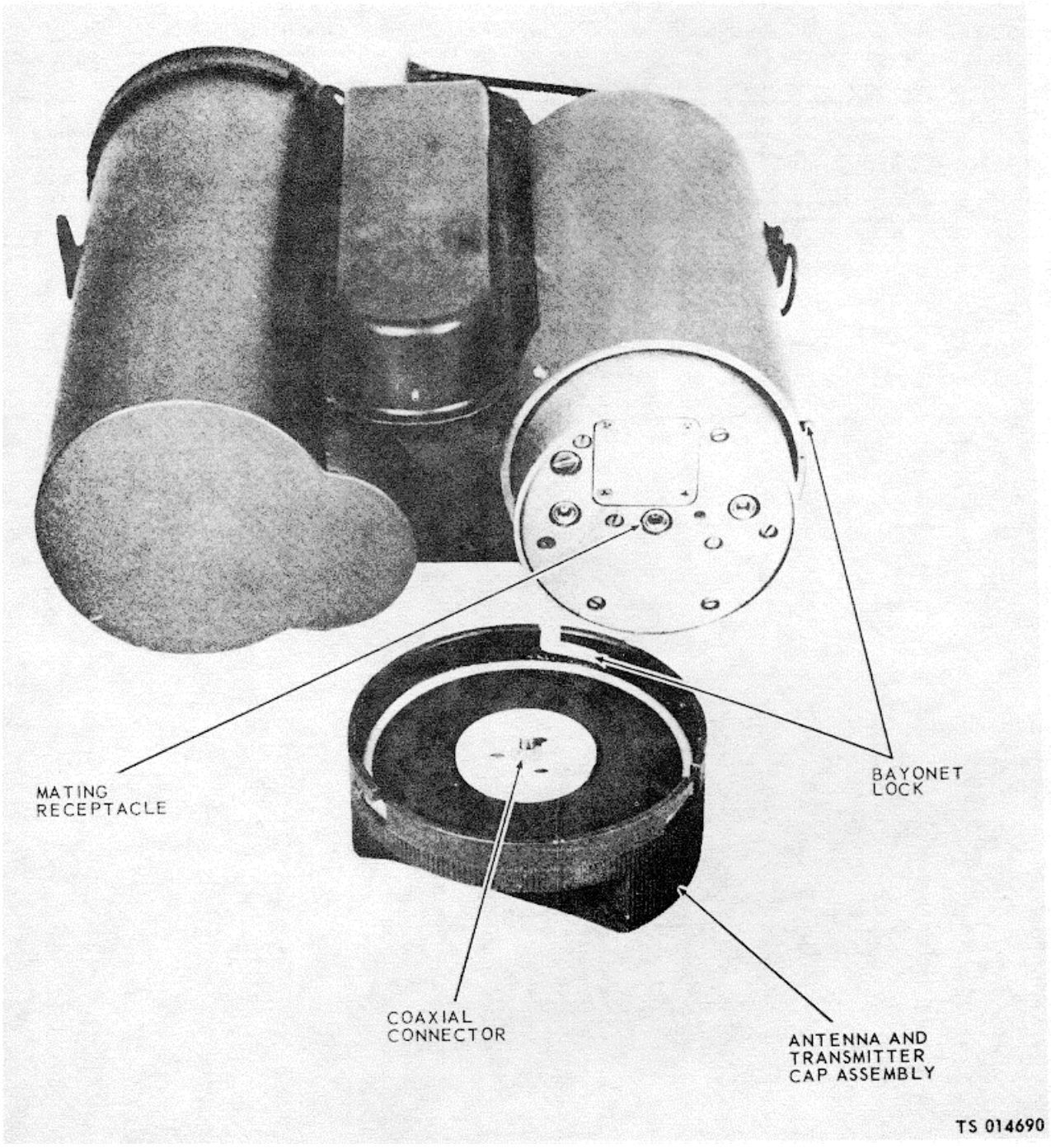


Figure 5-6. Transmitter coaxial connection (Models AN/CSQ-154 (V) and AN/CSQ.I54A (V)).

Table 5.1. TROUBLESHOOTING -- Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
.j If peragraph ·c saII falls, check for a + 6. volt 15 millisecond pulse at pin D on the Interface connector with an oeclIloscope whom tappleg the geophone spike. k If the +6 volt. 15 millisecond pulse is observed in paragraph J, disconnect the transmitter from the encoder. Check pin 36 of the encoder for the +6 volt 15 millisecond pulse. If the pulse is not there, very carefully check the wiring into the code plug for an open. If the wiring checks our properly, replace the interrupt/control assembly. l. If the pulse checked in paragraph i is missing, replace the seismic module and repeat paragraph c. m. If paragraph c stil fails, temporarily replace the geophone and cable assemebly by disconnecting the small connector on the seismic module and reconnecting a new geophone and cable assembly. Repeat paragraph c. If paragraph c is successful, replace the geophone and cable assembly permanently.

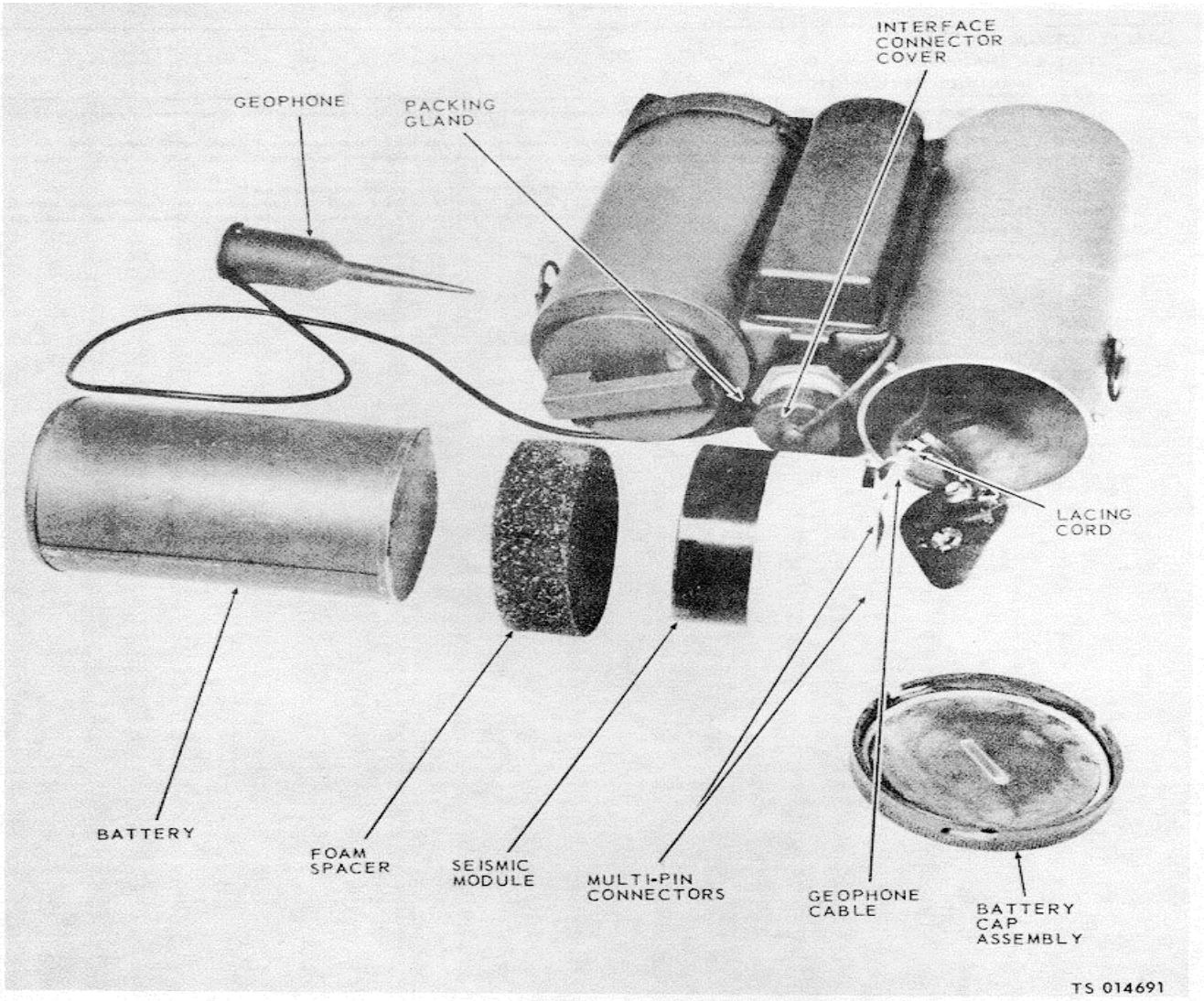


Figure 5-7. Replacement of seismic module.

Table 5-2. BINARY TO IDENTIFICATION NUMBER CONYVERSION TABLE AND PARITY TABLE

ID. No	Bits						Parity	ID. No	Bits						Parity
	I	2	3	4	5	6			1	2	3	4	5	6	
1	0 0	I	0	1	0	1	0	23	1	1	0	1	1	1	
2	0 1	1	0	1	1	0	0	24	1	1	1	0	0	1	
3	0	1	0	1	1	1	1	25	1	1	1	0	1	0	

Table 5-2. BINARY TO IDENTIFICATION NUMBER CONVERSION TABLE AND PARITY TABLE (Cont'd)

	Bits								Bits						
ID No.	1	2	3	4	5	6	Parity	ID No	1	2	3	4	5	6	Parity
4	0	1	1	0	0	1	0	26	1	1	1	0	1	1	0
5	0	1	1	0	1	0	0	7	1	1	1	1	0	1	0
6	0	1	1	0	1	1	1	28	I	1	1	1	1	0	0
7	0	1	1	1	0	1	1	29	1	1	1	1	1	1	1
8	0	1	1	1	1	0	1	31	0	0	0	1	0	1	1
9	0	1	1	1	1	1	0	32	0	0	0	1	1	0	1
11	1	0	0	1	0	1	0	33	0	0	0	1	1	1	0
12	1	0	0	1	1	0	0	34	0	0	1	0	0	1	1
13	1	0	0	1	1	1	1	35	0	0	1	0	1	0	1
14	1	0	1	0	0	1	0	36	0	0	1	0	1	1	0
15	1	0	1	0	1	0	0	37	0	0	1	1	0	1	0
16	0	1	0	1	1	1	1	38	0	0	1	1	1	0	0
17	1	0	1	1	0	1	1	39	0	0	1	1	1	1	1
18	1	0	1	1	1	0	1	41	0	1	0	0	0	1	1
19	1	0	1	1	1	1	0	42	0	1	0	0	1	0	1
21	1	1	0	1	0	1	1	43	0	1	0	0	1	1	0
22	1	1	0	1	1	0	1	44	1	0	0	0	0	1	1
45	1	0	0	0	1	0	1	58	1	1	1	0	0	0	0
46	1	0	0	0	1	1	0	59	1	1	1	1	0	0	1
47	1	1	0	0	0	1	0	61	0	0	0	0	0	1	0
48	1	1	0	0	1	0	0	62	0	0	0	0	1	0	0
49	1	1	0	0	1	1	1	63	0	0	0	0	1	1	1
51	0	1	0	1	0	0	1	64	0	0	0	1	0	0	0
52	0	1	1	0	0	0	1	65	0	0	1	0	0	0	0
53	0	1	1	1	0	0	0	66	0	0	1	1	0	0	1
54	1	0	0	1	0	0	1	67	0	1	0	0	0	0	0
55	1	0	1	0	0	0	1	68	1	0	0	0	0	0	0
56	1	0	I	1	0	0	0	69	1	1	0	0	0	0	1
57	1	1	0	1	0	0	0	71	0	0	0	0	0	0	1

Section III. ASSEMBLY AND CHECKOUT

5-4. Installation of MINISID III Modules

a. Remove MINISID III SCUE (Sensor Case Unique Electronics or MINISID III without common modules) from its packing container.

CAUTION

Depress safety spring (fig. 5-2) and set power switch to OFF position.

b. The antenna and transmitter cap assembly is equipped with a setscrew that locks this cap to the case assembly to prevent unnecessary field opening of the case. This setscrew must be loosened before removing the cap assembly. The two caps must be removed from the case assembly by a counterclockwise movement to disengage the bayonet lock. Remove antenna and transmitter cap assembly (fig. 5-3) from the end of the short tube.

5-5. Code Plug

a. Removal. With the open end of the short tube facing you, tilt the case downward causing the code plug assembly to slide forward. Remove and discard packing material (fig. 5-3). Do not remove doughnut shaped foam spacer at bottom of tube. Fold out code plug from the case as far as the flat cable assembly will permit with the multicolored surface up.

5-6. Code Plug Unique Setable Assembly

a. The following parameters are set on the code plug, ID for AN/GSQ-154 (V) (fig. 5-9) (or CID when used with ancillary equipment, for Model AN/GSQ154A (V)); Code Parity, Bit Rate, and Gain. Code plug setting is accomplished by installing a horseshoe shaped jumper (fig. 5-8) into an appropriate location within the code plug assembly.

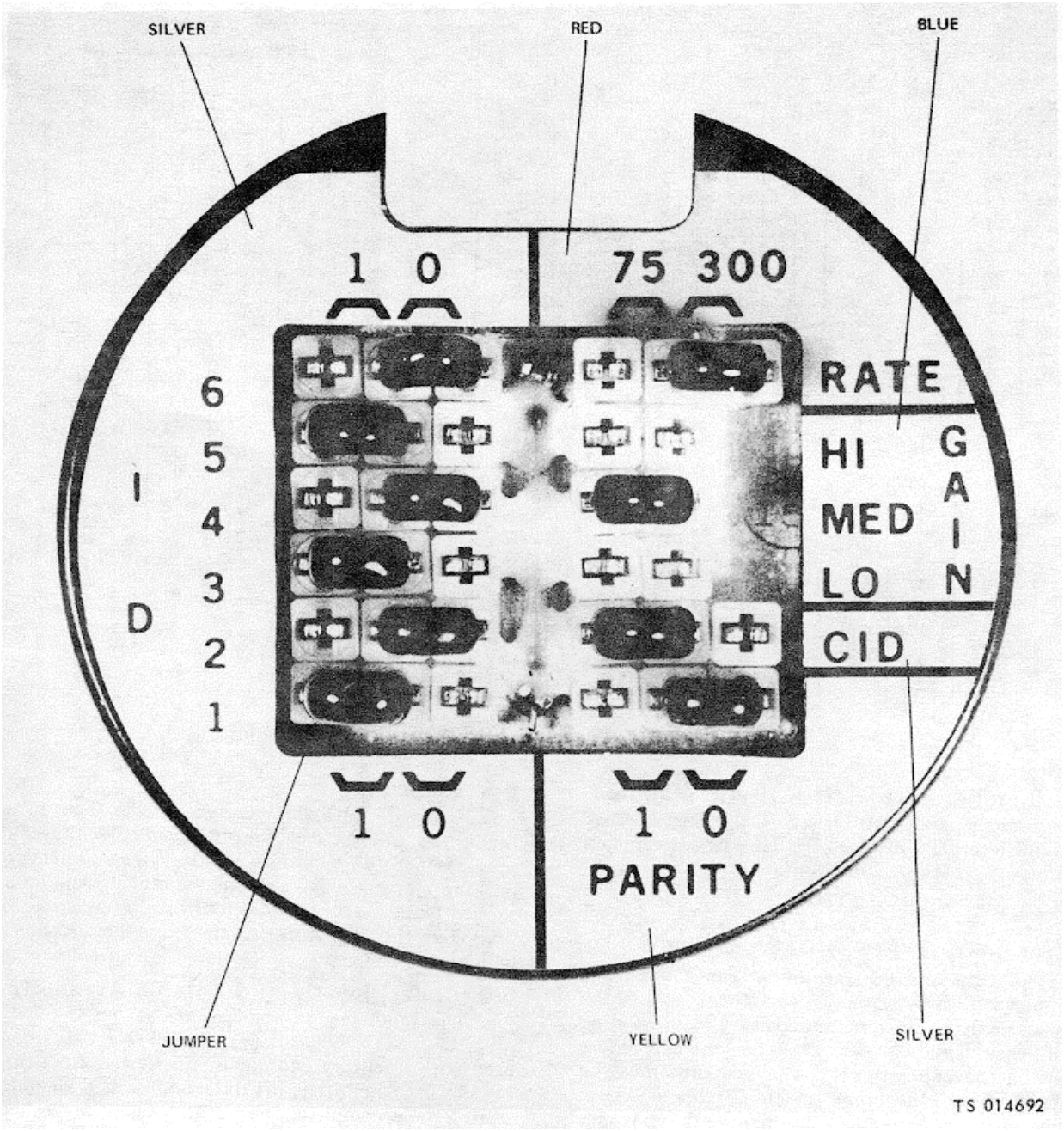


Figure 5-8. Code plug assembly (Model ANGSQ-154A (V)).

b. The code for each of the identification numbers is set into a "1" or "0" position: See table 5-2 for decimal to binary conversion.

c. The parity is set into a " 1" or "O" position for an odd number of ones in the ID (table 5-2).

d. The CID (complementary identification for Model ANIGSQ-154A (V)) is set into "0" for normal identification coding or "1" position for the complementary identification code when required for ancillary equipment identification. See table 5-3 for ID to CID conversion.

e. The seismic range of the MINISID III is determined by the sensitivity (GAIN) setting of the seismic module. The highest GAIN will give the

maximum range but it will also result in the greatest number of false alarms due to wind, rain, aircraft, and other sources of undersired seismic disturbances.
Because of this, the GAIN should be set on the lowest setting that will give an acceptable seismic range.
The best GAIN setting will be different for different locations. It is recommended that the medium gain setting be used when MINISID III is first installed in an area with unknown seismic characteristics. The gain is set by installing a single jumper in either the HI (high), MED (medium), or LO (low) positions in the GAIN section of the code plug (fig. 5-8). The address identification code is changed to the com

plementary form by installing a single jumper in CID 1. The complementary form can only be generated when required by ancillary equipment, regardless of the jumper position.

f: The specific code plug setting shown in figure 5-9 is Ident. Code 101010, Parity 0, Bit Rate 300, Gain Medium, and CID Complementary.

CAUTION

When a code plug setting is made, make sure to fill out the appropriate portion of the identification tag (fig. 1-2).

Table 5-3. IDENTIFICATION TO COMPLEMENTARY IDENTIFICATION NUMBERS CROSS REFERENCE TABLE (ANGSQSO154A (V))

ID No	CID No	ID No	CID No	ID No	CID No	ID No	CID No
1	15	18	41	36	57	54	6
2	14	19	67	37	48	55	3
3	55	21	35	38	47	56	43
4	12	22	34	39	69	57	36
5	11	23	65	41	18	58	33
6	54	24	32	42	17	59	63
7	45	25	31	43	56	61	28
8	44	26	64	44	8	62	27
9	68	27	62	45	7	63	59
11	5	28	61	46	53	64	26
12	4	29	71	47	38	65	23
13	52	31	25	48	37	66	49
14	2	32	24	49	66	67	19
15	1	33	58	51	16	68	9
16	51	34	22	52	13	69	39
17	42	35	21	53	46	71	29

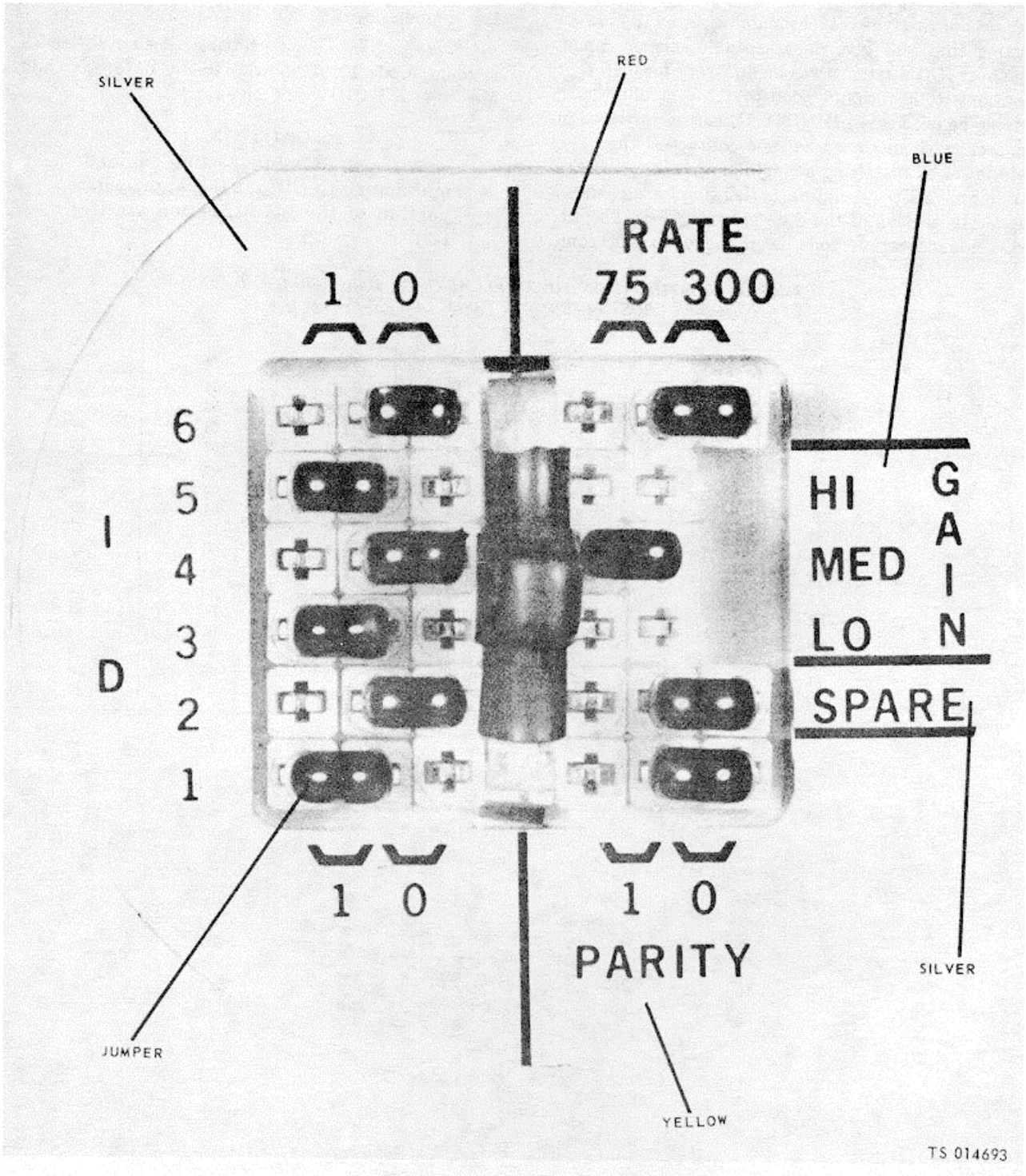


Figure 5-9. Code plug assembly (Model AN/;2Q-154 (V)).

5-7. Transmitter and Encoder

a. **Installation**. Remove plastic protective cap from encoder. Plug a stack of "common modules" (encoder and transmitter) into the code plug receptacle (fig. 5-5).

CAUTION

Align cable, and black mark on code plug with black mark on inside of tube, being careful not to rotate stack and slide the entire stack into the short tube.

NOTE

An elastic spacer installed in the case assembly will cause the transmitter and encoder stack to stick out from the case assembly] approximately 1/2 inch (1.27 cm).

CAUTION

RF connectors can be easily damaged unless properly mated.

b. Mate the coaxial connector located inside the antenna and transmitter cap assembly (fig. 5-6) into the mating receptacle on the transmitter face.

CAUTION

Check and verify that complete and full engagement has been made between the two halves of the coaxial connectors by looking through one of the bayonet slots in the antenna and transmitter cap assembly.

c. Align the antenna and transmitter cap assembly bayonet lock, and push the entire stack assembly. Rotate the cap clockwise until it engages the three mating pins and a click is heard or felt, indicating full engagement of the bayonet lock (fig. 5-4). Install and tighten the set screw on the antenna and transmitter cap assembly.

5-8. Battery

WARNING

Do not short out battery terminals. Shorted mercury battery may explode causing injury to personnel or damage to the equipment.

a. Remove battery cap assembly (fig. 5-5) from the end of the long tube. Remove packing material from the long tube. After removal of battery cap, verify recovery code as printed inside compartment, or wiring side of code plug, and that printed on the identification tag. If different, assume code inside MINISID III is correct. Change identification tag accordingly. With the open end of the long tube facing you, tilt the case downward, causing the battery harness to slide forward toward the opening (fig. 5-5). Grasp the battery connector and hold with one hand outside of tube. Insert battery into the long tube with two contacts facing toward the opening of the tube. Replace battery cap with a clockwise movement until a click is heard or felt. Depress safety spring (fig. 5-2) and turn MINISID III to TEST or ARM position.

Section IV. VERIFICATIONOF MINISID III OPERATION

5-9. Operation Check Using a Receiver Radio Frequency Monitor or Stack Tester

The MINISID III operation can be checked with a Receiver Radio Frequency Monitor AN/USQ-46 (Portatle), or Stack Tester PT1585. The following steps should be taken.

CAUTION

Remove Portatle antenna prior to test, to protect input of Portatle.

a. Screw wire antenna into antenna and transmitter cap assembly.

b. Turn the MINISID III power switch to TEST position.

c Tap the geophone and observe that a transmission of proper ID code is received.

d. Turn OFF MINISID III.

e. Unscrew antenna and store pouch on the carrying strap.

Section V. MODULE REPLACEMENT

5-10. Replacement of Modules

The following procedures are for the replacement of the battery, seismic module, transmitter and encoder, geophone and cable assembly, security and power switches, and interrupt/control.

CAUTION

Depress safety spring (fig. 5-2) and set power switch to OFF position.

5-11. Replacement of Battery

a. Removal.

WARNING

Do not short out battery terminals. Shorted mercury battery may explode, causing injury to personnel and damage to the equipment.

(1) Remove battery cap assembly (fig. 5-4) with a counterclockwise movement to disengage the bayonet lock. Unsnap the battery connector from the battery. With the open end of the long tube facing out, tilt and slide battery slightly outward. Grasp battery

with hand and remove battery completely from case. Discard defective battery.

b. Installation.

(1) With the open end of the long tube facing out, hold battery connector outside the long tube.

NOTE

The flat surface, located in the center bottom portion of the battery case assembly provides clearance for the battery connector harness, therefore, the harness should lay flat on the bottom of the case to allow the battery to seat properly.

(2) Slide new battery into the long tube and snap the battery connector to the mating receptacles on the battery.

(3) Install battery cap assembly with a clockwise movement until a click is heard or felt (fig. 5-4).

CAUTION

Depress safety spring (fig. 5-2) and set power switch to ARM or TEST position.

(4) The MINISID III is now operational.

5-12. Seismic Module Replacement

a. Removal.

WARNING

Do not short out battery terminals. Shorted mercury battery may explode, causing injury to personnel and damage to the equipment.

CAUTION

Depress safety spring (fig. 5-2) and set power switch to OFF position.

(1) Remove battery cap assembly (fig. 5-4) with a counterclockwise movement to disengage the bayonet lock. Unsnap the battery connector from the battery (fig. 5-5). With the open end of the long tube facing out, tilt and slide battery slightly outward. Grasp battery with hand and remove battery from the long tube and set aside.

(2) Remove the doughnut shaped foam spacer (fig. 5-7). Tuck the battery connector and its cable into the space inside the sensor between the Interrupt/Control Assembly board and the sensor case.

CAUTION

The battery cable can be damaged when removing the seismic module, unless the battery connector and cable are tucked inside the sensor case.

(3) With the open end of the long tube facing you, tilt case downward causing the seismic module (fig. 5-7) to slide forward. Grasp seismic module with hand and remove from case. Carefully cut lacing cord holding cable to seismic module. Disconnect two multi-pin connector (fig. 5-7) from seismic module.

b. Installation.

CAUTION

When installing seismic module into case, align white mark on bottom of seismic module with black mark on inside of case. Use screwdriver with slot in center of seismic module to align and seat the seismic module properly.

(1) Install cable with two multi-pin connector to the seismic module (fig. 5-7).

(2) Replace new lacing cord holding cable to seismic module.

CAUTION

The battery can be damaged when installing the seismic module unless the battery connector and cable are tucked inside the sensor case.

(3) Pull out the battery connector and its cable that was previously tucked into the space inside the sensor between the Interrupt/Control Assembly board and the sensor case.

(4) Replace the battery as follows

(a) With the open end of the long tube facing out, hold battery connector outside the tube (fig. 5-5).

NOTE

The flat surface, located in the center bottom portion of the battery case assembly provides clearance for the battery connector harness, therefore, the harness should be flat on the bottom of the case to allow the battery to seat properly.

(b) Slide new battery into the long tube and snap the battery connector to the mating receptacles on the battery.

(c) Install battery cap assembly with a clockwise movement until a click is heard or felt (fig. 5-4).

CAUTION

Depress safety spring (fig. 5-2) and set power switch to ARM or TEST position.

(d) The MINISID III is now ready for operation.

5-13. Transmitter and Encoder Replacement

a. Removal.

CAUTION

Depress safety spring (fig. 5-2) and set power switch to OFF position.

The antenna and transmitter cap assembly is equipped with a set screw that locks the cap to the case assembly to prevent unnecessary field opening of the case. This set screw must be loosened before taking off the cap assembly. Remove antenna and transmitter cap assembly (fig. 5-1). With open end of the short tube facing you, tilt the case downward causing the transmitter and encoder modules to come slightly

forward. Grasp transmitter and encoder module stack with hand and remove from case. Disconnect transmitter and encoder stack from code plug assembly (fig. 5-6).

b. **Installation.**

(1) Remove plastic protective caps from new encoder. Plug a stack of "common modules" (encoder and transmitter) into the code plug receptacle (fig. 5-1).

CAUTION

Align cable, and black mark on code plug with black mark on inside of tube, being careful not to rotate stack.

(2) Slide the entire stack into the short tube.

NOTE

An elastic spacer Installed in the case assembly will cause the transmitter and encoder stack to stick out from case assembly approximately 1/2 inch (12.7000 mm).

CAUTION

RF connectors can be easily damaged unless properly mated.

(3) Mate the coaxial connector located inside the antenna and transmitter cap assembly (fig. 5-6) into the mating receptacle on the transmitter face.

CAUTION

Check and verify that complete and full engagement has been made between the two halves of the coaxial connectors by looking through one of the bayonet slots in the antenna and transmitter cap assembly.

(4) Align the antenna and transmitter cap assembly bayonet lock, and push the entire stack assembly into the case. Rotate the cap clockwise until it engages the three mating pins and a click is heard or felt, indicating full engagement of the bayonet lock. Install and tighten the set screw on the antenna and transmitter cap assembly.

(5) Depress spring (fig. 5-2) and turn power switch from OFF to ARM or TEST position. The MINISID III is ready for operation.

5-14. Geophone and Cable Assembly Replacement

a. Removal.

CAUTION

Depress safety spring (fig. 5-2) and set power switch to OFF position.

(1) Remove battery cap, battery, seismic module, and transmitter and encoder from the case assembly.

(2) Grasp the shielded geophone cable end protruding from the opening of the long tube (fig. 5-7); cut off the small connector.

(3) Unscrew cable clamp packing gland (fig. 5-7) using 3/8 inch (9.5250 mm) open-end wrench or equivalent. Pull the geophone cable out of its case assembly and discard geophone and cable.

CAUTION

Remove O-ring located inside the case assembly packing gland opening (fig. 5-7).

b. Installation.

(1) Obtain a replacement geophone and cable assembly from stock. Push the wire end of this assembly through the packing gland and through the appropriate opening of the case assembly, until the shrink fit tubing on the shielded cable bottoms in the packing gland opening. Push cable into the case assembly and tighten packing gland.

(2) Grasp the cable end through the open end of the short tube of the case assembly. Feed the wire end through the center section of the case assembly into the long tube. Grasp the wire end through the opening of the long tube and pull it out to protrude about 2 inches (5.08 cm) from the case assembly.

(3) Remove the protective sleeving at cable end. This sleeving protects the already installed connector contacts that are attached to the cable assembly. Install the contacts into connector in the following manner; red wire into pins 3 and 4; black wire into pins 5 and 6; and shield into pins 2 and 7. Installation can be achieved by pushing pins into the connector shell. Pin 1 is the guide pin.

CAUTION

Exercise reasonable care in pushing a contact into the connector since the 26 gauge wires in the cable assembly are fragile.

(4) Reinstall all removed modules.

(5) Depress safety spring (fig. 5-2) and turn power switch to ARM or TEST position. The MINISID III is ready for operation.

5-15. Power Switch and Security Switches Replacement

a. Removal.

CAUTION

Depress safety spring (fig. 5-2) and turn power switch to OFF position.

(1) Remove all modules from case assembly. While using an Allen wrench, loosen both set screws on power switch (8A, fig. B-1), remove power switch knob, and set aside.

(2) Using a screwdriver, pry up underneath of both security switches, remove and set aside.

(3) With an open end wrench or equivalent, loosen and remove nut holding switch to case assembly. Reach into case assembly through opening at end of either long or short tube and remove switch.

(4) Remove switch plate and set aside.

CAUTION

Before unsoldering wires, make a sketch of the location of each wire by color and terminal number, tag wires if necessary.

(5) Unsolder wire from switch terminals noting the location of each wire and discard defective switch.

b. **Installation**.

(1) Insert new switch into case assembly through either long or short tube and into the holes provided in the center of the case assembly (fig. C-1). Install nut that secures switch to the case assembly, and tighten nut using an open end wrench or equivalent.

(2) Turn the switches to full counterclockwise position.

(3) Install switch plate (fig. C-1) on switch shafts.

Tighten Allen screws with flat portion of shaft facing C-3, or ARM as applicable.

(4) Install the knobs for the security switches so that they point to SET position, and the power switch knob should point to the OFF position.

(5) Replace the code plug assembly, transmitter and encoder modules, and seismic module.

(6) Replace end cap with a clockwise movement until a click is felt or heard.

5-16. End Cap Assembly Gaskets

CAUTION

Depress safety spring (fig. 5-2) and turn power switch to OFF position.

a. ***Removal***. To remove, turn end cap assembly with a counterclockwise movement, and remove end cap assembly.

NOTE

When the end cap assembly gaskets have been cut, broken, cracked, or mutilated, they must be replaced.

b *Cleaning*. Remove gasket and all material left in space occupied by gasket. Clean space thoroughly. Wipe off using soap and water (not wet). Dry thoroughly using a clean dry cloth.

c. *Installation*. Apply adhesive sparingly to new gaskets, and insert into end cap assembly. Remove all excess adhesive. Replace end cap assembly (fig. 5-4) with a clockwise movement until a click is heard or felt. Turn power switch (fig. 5-2) to ARM or TEST position. The MINISID III is ready for operation.

5-17. Battery Connector Replacement CAUTION

Depress safety spring (fig. 5-2) and turn power switch to OFF position.

a. *Removal*.

(1) Turn end cap assembly counterclockwise and remove end cap.

(2) Unsnap the mating receptacles from the battery (fig. 5-5).

CAUTION

Before unsoldering wires, make a sketch of the location of each wire by color. Tag wires if necessary.

(3) Unsolder wires from terminals noting location of each wire from the defective battery connector, and discard connector.

(4) Using the sketch or tags of the wire location resolder leads from the terminal to the new battery connector.

(5) Snap the battery connector to its mating receptacles, and replace battery cap with a clockwise movement until a click is felt or heard. Set power switch to ARM or TEST position, whichever is applicable.

5-18. Interrupt/Control Assembly Replacement

NOTE

The following procedures apply to Model AN/GSQ-154 (V) and ANIGSQ-154A (V).

a. Removal. Remove the battery, seismic module, transmitter, and encoder from the case assembly. Cut lacing cord which binds geophone and Interrupt/Control cable connectors together (fig. 5-7).

Remove the switches from the case assembly (para 5-15). Do not unsolder. Work the switches clear of the interrupt/control assembly and into the short tube of the case assembly. Remove nut, switch cover, nut, lanyard washer, and cap from the interface connector (fig. C-l). Remove the two flat head screws securing the interrupt/control assembly from the bottom of the case assembly. Remove the interrupt/control assembly, interface connector and cables by working it into the short tube.

CAUTION

Depress safety spring (fig. 5-2) and turn power switch to OFF position.

b. Installation.

NOTE

When installing an interrupt/control assembly, make sure switch plate is installed correctly before installing power switch attaching hardware. Replace two ring seals on the flat head securing screws.

(1) Pull out the interface connector (fig. C-1) from the short tube, and position it through hole in center of housing assembly. Secure with nut.

NOTE

Do not install switch cover, washer nut, lanyard washer, and cap until switch plate and knobs are secured.

(2) Install new interrupt/control to bottom of case assembly, using two new ring seals, and two flat head screws.

(3) Install switch assembly and secure to case assembly with nut and tighten using an open end wrench or equivalent.

NOTE

While installing new switch, rotate shaft to its maximum counterclockwise position, using seals and hardware provided with switch. Tighten securing nut with flat portion of shaft facing C, 3, or ARM, as applicable.

(4) Install the knobs for the security switches so they point to SET, and the knob for the power switch should point to OFF. Using an Allen wrench or equivalent, tighten the power switch knob with two set screws to the power switch shaft.

(5) Install switch cover, washer, nut, lanyard washer and cap to the interface connector, and replace all previously removed modules.

(6) Turn power switch (fig. 5-2) to TEST or ARM and check operation of the MINISID III.

APPENDIX A.
REFERENCES

A-1. Maintenance

TM 38-750	The Army Maintenance Management System (TAMMS)

A-2. Shipment and Storage

TM 740-90-1	Administrative Storage of Equipment
DD Form 6	Packaging Improvement Report
SB 11-30	Transportation, Storage, Testing, Shelf Life, and Quantity Unit Pack Requisitioning of Dry Batteries

A-3. Demolition

TM.740-2443	Destruction of Equipment to Prevent Enemy Use

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 and the work measurement time required to perform the functions by the designated maintenance level. 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 tools and test equipment required for each maintenance function as referenced from Section II.

B-2. Explanation of Columns in Section II

a. *Column (1), Group Number*. Column 1 lists group numbers to identify related components, assemblies, subassemblies, and modules with their next higher assembly. The applicable groups are listed in the MAC in disassembly sequence beginning with the first group removed.

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

c. Column (3), Maintenance Functions. This column lists the functions to be performed on the item listed in Column 2. The maintenance functions are defined as follows:

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

(2) **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.

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

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

(5) **Align**. To adjust specified variable elements of an item to bring about optimum or desired performance.

(6) **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparison 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.

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

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

(9) **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 (component or assembly), end item, or system.

(10)Overhaul. That maintenance effort (service/action) 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 a like new condition.

(11) 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 equipment/components.

d. Column (4), Maintenance Category. This column is made up of subcolumns for each category of maintenance. Work time figures are listed in these subcolumns for the lowest level of maintenance authorized to perform the function listed in Column 3. These figures indicate the average active time required to perform the maintenance function at the indicated category of maintenance under typical field operating conditions. e. Column (5), Tools and Equipment. This column

is provided for referencing by code, the common tool sets (not individual tools) special tools, test and support equipment required to perform the designated function.

B-3. Explanation of Columns in Section III

a. Column (1), Reference Code. This column consists of an arabic number listed in sequence from Column 5 of Section II. The number references the common tool sets, special tools and test equipment requirements.

b. Column (2), Maintenance Category. This column shows the lowest category of maintenance authorized to use the special tools or test equipment.

c. *Column (3), Nomenclature*. This column lists the name or identification of the common tool sets, special tools or test equipment.

d. *Column (4), National/Nato Stock No. (NSN).* This column is provided for the NSN of common tool sets, special tools and test equipment listed in the nomenclature column.

e. *Column (5), Tool Number*. This column lists the manufacturer's code and part number of tools and

Section II. - MAINTENANCE ALLOCATION CHART
Alarm Set, Anti-Intrusion, Restricted Area, Minisid III

(1)	(2)	(3)			(4)			(5)
Group number	**Component/assembly**	**Maint. function**	**C**	**O**	**Maint.category F**	**H**	**D**	**Tool/ equip ment**
01	ALARM SET, ANTI-INTRUSION	Test			0.5			1-3 & 4
		Inspect		0.2				
	RESTRICTED AREA, MINISID III	Install		0.8				
0102	Battery	Test			0.4			1
		Replace		0.5				
0103	Seismic Module	Test			0.5			1
		Replace			0.5			
0104	Transmitter	Test			0.5			1 & 4
		Replace			0.5			
0105	Encoder	Test			0.5			1 & 4
		Replace			0.5			
0106	Geophone. and Cable	Test			0.5			
		Replace			0.5			1
0107	Battery Connector	Test		1	0.5			
		Replace			0.5			
0108	Interrupt/Control	Test			0.5			1
		Replace			1.5			

* SUBCOLUMNS ARE AS FOLLOWS: COPERATOCREW; O--OGANIZATIONAL;
F--DIRECT SUPPORT; H--IERAL SUPPORT; D-DEPOT
*' INDICATES WT/MH RMQUIRED

Section III. - TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Reference Code	(2) Maintenance Category	(3) Nomenclature	(4) National Stock Number (NSN)	(5) Tool Number
I	F	Test Set, Gate	6350-O0-133-7595	AN/GSMY 2
2	F	RF Indicator	6S50-169-15	
3	F	Radio Frequency, Monitor (ECOM)		ANfUSQ.46
4	F	Stack Tester (ECOM)		

APPENDIX C.
REPAIR PARTS

Section I. INTRODUCTION

C-1. Scope

a. This section lists repair parts, required for the performance of organizational and direct support maintenance of the MINISID III.

b. Repair parts listed represent those authorized for use at indicated maintenance levels and will be requisitioned on an "as required" basis until stockage is justified by demand in accordance with AR 710-2.

C-2. General

This Repair Parts list is divided into the following sections:

a. Prescribed Load Allowance List, Section II (Not applicable).

b. Repair Parts List, Section II. A list of repair parts authorized at the organizational and direct support level for performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of assembly groups in ascending numerical sequence, with the parts in each group listed in figure and item number sequence.

C-3. Explanation of Columns

The following provides an explanation of columns found in the tabulated listings in Section III.

a. Source, Maintenance, and Recoverability Codes (SMR). The SMR code is a five letter code composed of three parts consisting of a two (2) position source code, a two (2) position maintenance code, and a one (1) position recoverability code. Support items listed in the RPSTL assigned maintenance and recoverability codes and no source code can be requisitioned, with justification, through normal supply channels by use of the manufacturer's code and part number. Such support items are NOT normally stocked.

(1)Source Code. Indicates the manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions as follows:

Code	Definition
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purposes because essentiality dictates that a minimum quantity be available in the supply system.
PC	Item procured and stocked and which otherwise would be coded PA except that it is deteriorative in nature.
PD	Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional initial issues or outfittings. NOT subject to automatic replenishment.
PE	Support equipment procured and stocked for initial issue or outfittings to specified maintenance repair activities.
PF	Support equipment which will not be stocked but which will be centrally procured on demand.
PG	Item procured and stocked to provide for sustained support for life of the equipment It is applied to an item peculiar to the equipment which, because of probable discontinuance or shutdown of production facilities, would prove uneconomical to reproduce at a later date.
KD	An item of depot overhaul/repair kit and not purchased separately.
KF	An item of a maintenance kit and not purchased separately.
KB	Item included in both a depot overhaul/repair kit and a maintenance kit.
MO	Item to be manufactured or fabricated at organizational level.
MF	Item to be manufactured or fabricated at direct support maintenance level.
MH	Item to be manufactured or fabricated at general support maintenance level.
MD	Item to be manufactured or fabricated at depot maintenance level.
AO	Item to be assembled at organizational level.
AF	Item to be assembled at direct support maintenance level.
AH	Item to be assembled at general support maintenance level.
AD	Item to be assembled at depot maintenance level.
XA	Item is NOT procuredor stocked because the requirements for the item will result in replacement of the next higher assembly.
XB	Item NOT procured or stocked If available through salvage requisition.
XC	Installation drawing, diagram, instruction sheet, or field service drawing that is identified by manufacturer's part number.
XD	A low mortality item that is not stocked When required, items will be requested and provided through normal supply channels.

NOTE

Cannibalization or salvage may be used as a source of supply for any items coded above except those coded XA or XD.

(2) Maintenance Code. Maintenance are assigned to indicate the levels of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance:

Code	Application/Explanation
C	Crew or operator maintenance performed within organizational maintenance.
0	Support item is removed, replaced, used at the organizational level.
I	Support item is removed, replaced, used by the direct support element of integrated direct support maintenance.
F	Support item is removed, replaced, used at the direct support level.
H	Support item is removed, replaced, used at the general support level.
D	Support items that are removed, replaced, used at depot, mobile depot, specialized repair activity only.

NOTE

Codes "I" and "F" will be considered the same by direct support units.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes:

Code	Application/Explanation
O	The lowest maintenance level capable of complete repair of the support item is the organizational level.
F	The lowest maintenance level capable of complete repair of the support item is the direct support level.
H	The lowest maintenance level capable of complete repair of the support item is the general support level.
D	The lowest maintenance level capable of complete repair of the support item is the depot level.
L	Repair restricted to designated specialized repair ac- tivity.
Z	Nonreparable. No repair is authorized.
B	No repair is authorized The item may be reconditioned by adjusting, lubricating, etc., at the user level No parts or special tools are procured for the maintenance of this item.

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

Code	Definition
Z	Nonreparable item When unserviceable, condemn and dispose at the level indicated in position 3.
0	Reparable item When uneconomically reparable, condemn and dispose at organizational level.
F	Reparable item When uneconomically reparable, condemn and dispose at the direct support level.
H	Reparable item When uneconomically reparable, condemn and dispose at the general support level.
D	Reparable item When beyond lower level repair capability, return to depot Condemnation and disposal not authorized below depot level.
L	Reparable item Repair, condemnation, and disposal not authorized below depot/specialized repair activity level.
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**. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

d. **Part Number**.' Indicates the primary number used by the manufacturer 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 a stock numbered item is requisitioned, the repair part received may have a different part number than the part being replaced.

e. Federal Supply Code for Manufacturer (FSCM).

The FSCM is a 5-digit numeric code listed in 511 (0842 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. Description. Indicates the Federal Item name, and, if required, a minimum description to identify the item. Items that are included in kits and sets are listed below the name of the kit or set with the quantity of each item in the kit or set indicated in the quantity incorporated in unit column. 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.

g. Unit of Measure (UIM). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. Quantity Incorporated 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, etc.).

C-4. Special Information

a. Detailed assembly instructions for items source coded to be assembled are found in Appendix C.

Assembly components are listed immediately following the item to be assembled.

b. Repair parts kits and gasket sets appear as the last entries in the repair parts listing for the figure in which its parts are listed as repair parts or are listed at the end of the repair parts listing for the last figure containing parts of the kit.

C-5. How to Locate Repair Parts

a. When National Stock Number or Part Number is Unknown: (1) First. Using the Index of National Stock Numbers and Part Numbers, find the pertinent National

stock number or part. number. This index is in ascending NSN sequence followed by a list of part numbers in ascending alpha-numeric sequence, cross-referenced to the illustration figure number and item number.

(2) Second. After finding the figure and item number, locate the figure and item number in the repair parts list.

C-6. Abbreviations

Abreviations	Defintion
ea	each

C-7. Federal Supply Codes for Manufacturers

Code	Manufacturer
065371	RCA Corp., Electromagnetic and Aviation Systems Division
80068	U. S. Army Electronics Command
97403	U. S. Army Research and Development Laboratories

Section III. REPAIR PARTS
Group 01

(1) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-1	1	PAFZZ	6350-182-7655	13218E8110	97403	Cap assembly, battery	ea	1
C-1	2	PAFZZ	635-00-182-7656	13218E8111	97403	Gasket, End cap: battery aide	ea	1
C-1	3	PAOZZ	6350-00-182-7926	BA1546( )/U	80063	Battery	ea	1
C-1	4	PAFZZ	6350-00-182-7667	13218E813	97403	Pad, Pressure:. .battery side	ea	1
C-1	5	PAFZZ	6350-00-182-7660	13218E8130	97403	Module. Seismic	ea	1
C-1	6	PAFZZ	6350-00-182-7658	13218E8120	97403	Geophone and cable assembly	ea	1
C-1	7	PAFZZ	6350-00-182-7665	13218E8147	97403	Knob, recovery Switch	ea	2
C-1	8	PAFZZ	6350-0-182-7664	13218E8146	97403	knob, Power Switch	ea	1
C-1	9	PAFZZ	6350-00-169-1575	13218E8099	97403	Cap Assemblv , Antenna and Transmitter	ea	1
C-1	10	PAFZZ	6350-00-182-7923	13218E9597	97403	Antenna, Whip	ea	1
C-1	11	PAFZZ	6350-00-182-7656	13218E8111	97403	Gasket, End Cap:. .Transmitter	ea	1
C-1	12	PAFZZ	----------	TC 434	80063	Module.Transmitter	ea	1
C-1	13	PAFZZ	----------	TC 431	80063	Module, Encoder	ea	1
C-1	14	XBFZZ	----------	2121325-501	05371	Code Plug for AN/GSQ-154 (V)	ea	1
C-1	14	XBFZZ	----------	2121325-503	05371	Code Plug for AN/ICSQ-154A (V)	ea	1
C-1	15	PAFZZ	63530--182-7657	13211E8113	97403	Jumper, Code plug	ea	10
C1	16	PAFZZ	----------	212135-503	05371	Interrupt/control assembly for MAI/C-S-154 (V)	ea	1
C-1	16	PAFZZ	635-00-160-1319	2121358-504	05371	Interrupt/control assembly for AN/rS-154A (V)	ea	1
		PAFZZ	6350-00-182-7662	13219E8144	97403	Kit,Power Switch Consists of: (1) Switch (1) O-ring (1) Nut (2),Screw, self sealing	ea	1
		PAFZZ	6350-00-182-7663	13218E8145	97403	Kit,recovery Switch Consists of: (1).Switch (1).O-ring (1).Lockwasher (1).Nut (2).Screw, self sealing	ea	2
		PAFZZ	6350-00-182-7666		97403	Kit, Modification	ea	1
		PAFZZ	6350-0160-0773		97603	Kit, Modification	ea	1

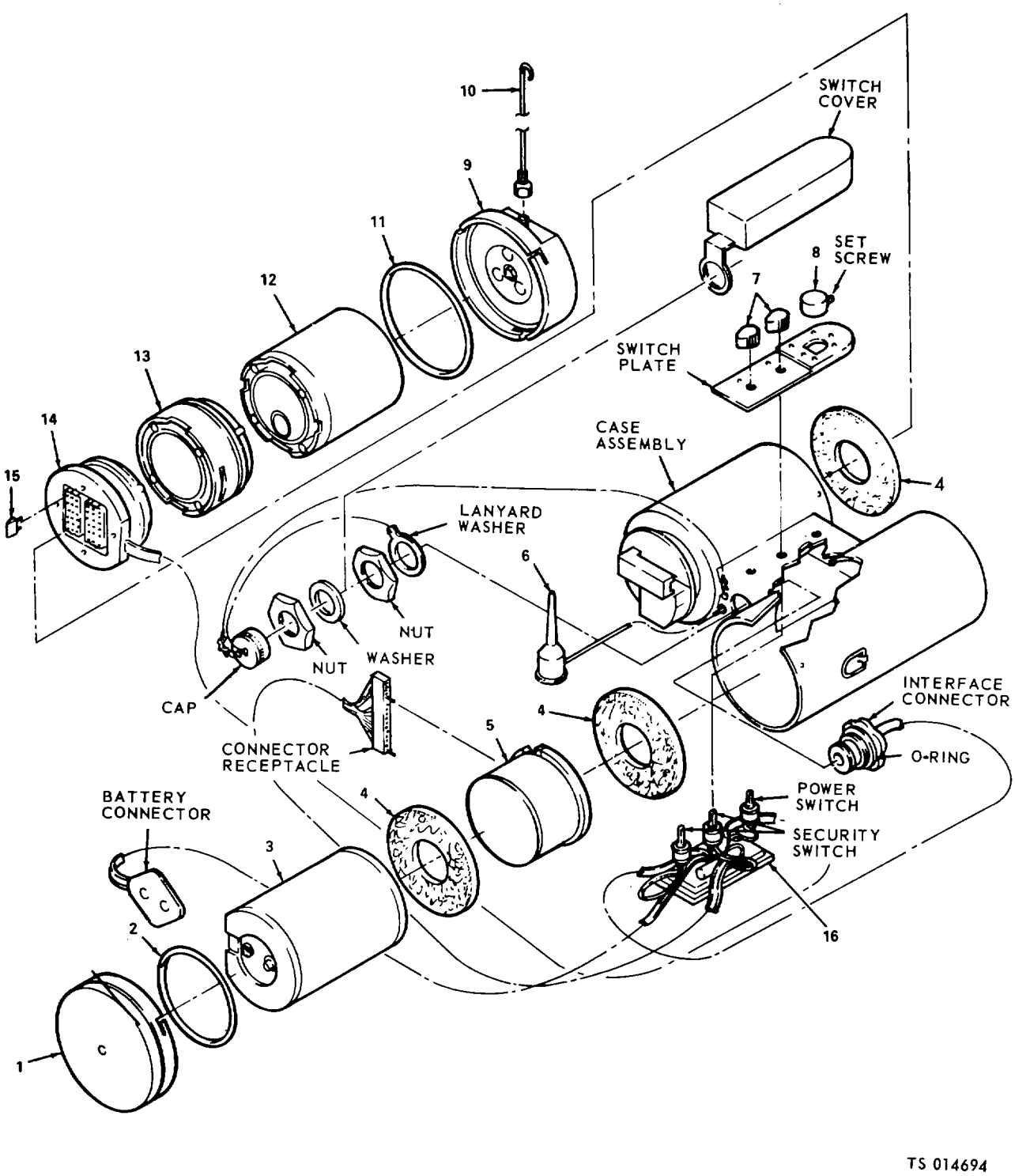


Figure C-1. Minisid 111, exploded view.

Section IV. INDEX-NATIONAL STOCK NUMBER AND REFERENCE NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER

Stock No.	Figure No	Item No.	Reference No.	Mfg. Code
6350-00-160-1319	C-1	16	2121358404	05371
6350-00-182-7655	C-1	1	13218E8110	97403
6350-00-182-7656	C-1	2, 11	13218E111	97403
6350-00-182-7657	C-1	15	13218E113	97403
6350-00-182-7658	C-1	6	13218E8120	97403
6350-00-1827660	C-1	5	13218E8130	97403
6350-00-169-1575	C-1	9	13218E8099	97403
6350-00-182-7662	Not illustrated		13218E8144	97403
6350-00-182-7663	Not illustrated		13218E8145	97403
6350-00-182-7664	C-1	8	13218E8146	97403
6350-00-182-7665	C-1	7	13218E8147	97403
6350-00-182-7667	C-1	4	13218E8153	97403
6350-00-182-7923	C-1	10	13218E9597	97403
6350-00-182-7926	C-1	3	BA1546( )/U	80063
	C-1	12	TC434	80063
	C-1	13	TC431	80063
6350-00-182-7666	Not illustrated	97403		
635040-160-0773	Not illustrated	97403		

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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.

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