

ARMY TECHNICAL MANUAL
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AIR FORCE TECHNICAL ORDER

TM 5-6350-264-14&P-10
NAVELEX EE 181-AA-
OMI-110/E121 C-9412
T.O.31S9-2FSS9-1-10

TECHNICAL MANUAL

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

**CONTROL UNIT, ALARM SET
C-9412/FSS-9(V)
NSN 6350-00-228-2735**

**DEPARTMENTS OF THE ARMY, THE NAVY, AND THE AIR
FORCE
8 OCTOBER 1982**

CHANGE

NO. 2

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

CONTROL UNIT, ALARM SET
C-9412/FSS-9(V)
NSN 6350-00-228-2735

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CHANGE }
No. 1

HEADQUARTERS
DEPARTMENTS OF THE ARMY, NAVY AND AIR FORCE
WASHINGTON, D. C., 14 April 1986

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Direct Support and General Support
Maintenance Manual
(Including Repair Parts and Special Tools List)

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i and ii
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To be distributed in accordance with DA Form 12-25A, Operator's, Organizational, Direct Support and General Support Maintenance requirements for Detection System, Joint Service, Interior Intrusion (JSIIDS).

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.

WARNING

RADIATION HAZARD

The Data Transmitter contains trace amounts of radioactive isotope, Promethium 147. The minute amount of ionizing radiation from Pm 147 is no health hazard when the equipment is installed or in storage; however, if it is necessary to dispose of a Data Transmitter, the procedures specified in AR755-15 must be observed.

WARNING

HIGH VOLTAGE

High voltage is used in the operation of this equipment. Death on contact may result if personnel fail to observe safety precautions. A 115-volt ac potential may cause death under certain conditions; therefore, precautions should be taken at all times. Be careful not to contact connections for 115-volt ac input when installing or repairing this equipment. Never work on electronic equipment unless there is another person nearby who is familiar with the hazards of the equipment and who is competent in administering first aid.

WARNING

HYDROGEN GAS

The Control Unit contains a rechargeable battery which may generate ignitable amounts of hydrogen gas if certain failures occur. This is a potential safety hazard. Do not smoke when opening the door. After opening, allow the unit to ventilate with the door open for 2 minutes before turning off the Power Switch or performing any other maintenance action. If excessive heat or fumes of any nature are being emitted from the Monitor Cabinet, immediately open the-enclosure door and ventilate for 2 minutes before performing any maintenance action.

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DEPARTMENTS OF THE ARMY, NAVY, AND AIR FORCE
WASHINGTON, D.C., 8 October 1982

Operator's, Organizational, Direct Support and General Support
Maintenance Manual
(Including Repair Parts and Special Tools List)
CONTROL UNIT, ALARM SET
C-9412/FSS-9(V)
NSN 6350-00-228-2735

Current as of 4 September 1985

REPORTING OF ERRORS

You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. ARMY: Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), should be mailed directly to Commander, U.S. Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., 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 form should be mailed to: Naval Electronics Systems Command Training and Publications Management Office, ATTN: ELEX. Code 8122, Washington, D.C. 20360.

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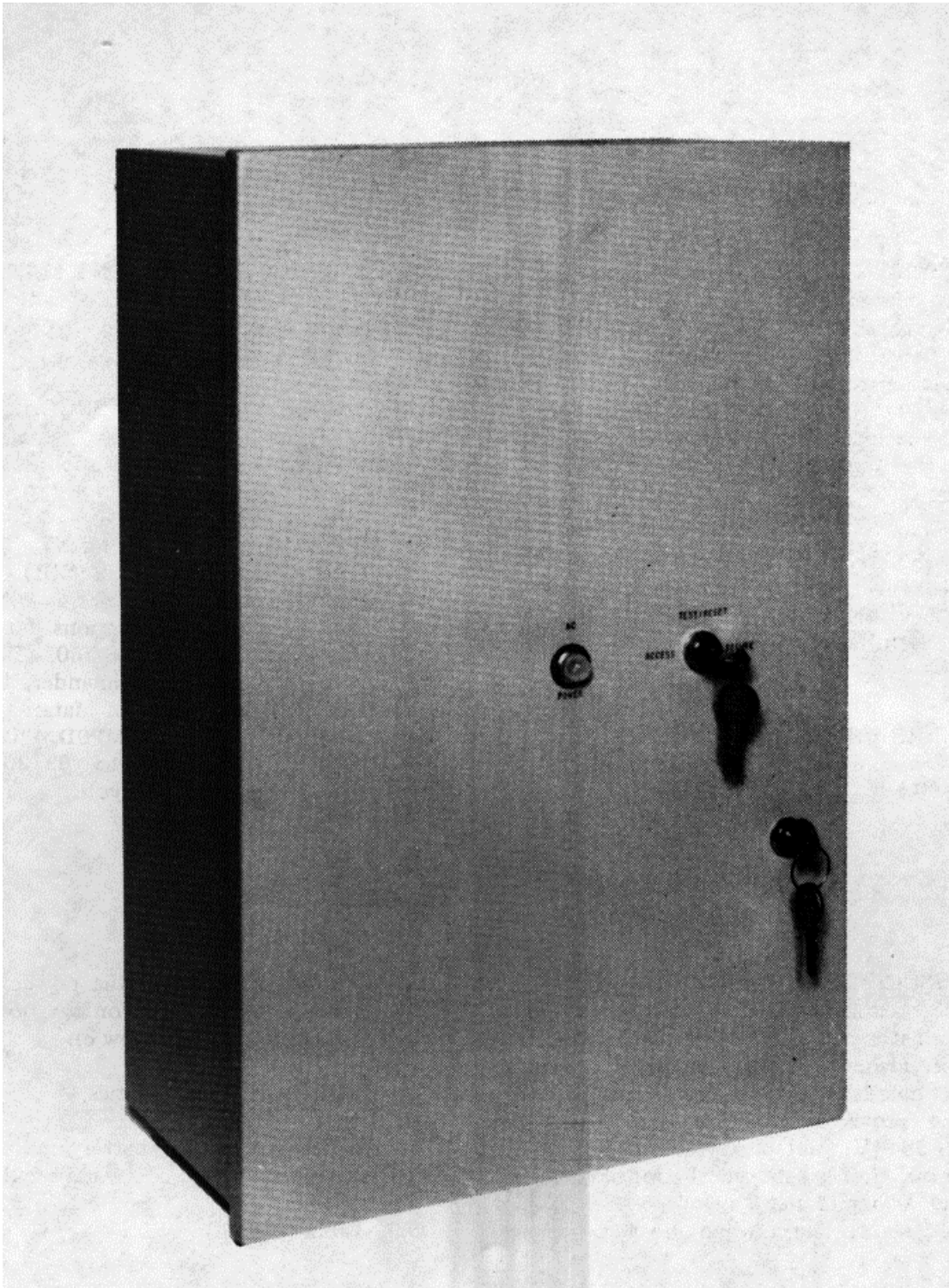


Figure 1-1. Control Unit (Access Door Closed)

CHAPTER 1 INTRODUCTION

Section I. GENERAL

1-1. SCOPE. This manual is for your use in operating and maintaining the Alarm Set, Control Unit Model C-9412/FSS-9(V), under normal operating conditions. The Control Unit (CU) is an integral part of the Joint-Services Interior Intrusion Detection System (J-SIIDS). For information on other major assemblies of J-SIIDS, refer to the applicable manual listed in appendix A..

1-2. MAINTENANCE FORMS AND RECORDS. Equipment maintenance forms and procedures for their use are contained in DA PAM 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 MATERIEL TO PREVENT ENEMY USE. Instructions for the destruction of Army materiel to prevent enemy use are contained in TM 750-244-3.

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

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). EIR's will be prepared on standard Form 368, Quality Deficiency Report. Instructions for preparing EIR's are provided in DA PAM 738-750. EIR's should be mailed directly to Commander, U. S. Army Troop Support Comamnd, ATTN: AMSTR-QX, 4300 Goodfellow Blvd. , St. Louis, Missouri 63120-1798. A reply will be furnished directly to you.

Section II. DESCRIPTION AND DATA

1-7. DESCRIPTION. The Control Unit (fig. 1-1 and 1-2) consists of a steel enclosure, a power supply, a battery for emergency operation, a status processor, associated controls, and input/output terminal boards. The enclosure also contains mounting provisions for the Data Transmitter T-1257/FSS-9(V) (not part of the Control Unit). The Control Unit is the central control element of J-SIIDS. A tamper alarm switch (TAS) automatically initiates an alarm when the access door is opened.

1-8. TABULATED DATA.

a. Identification Data. There are three identification plates on the Control Unit as follows: One located inside the access door (fig. 1-3, view a); one located on

top of the power supply (fig. 1-3, view b); one located on the bottom of the status processor (fig. 1-3, view c).

b. Equipment Characteristics.

Weight (Control Unit less battery and
Data Transmitter 38 pounds (17.24 kg)

Dimensions (overall)

Height..... 22.500 inches (57.5 cm)

Width..... 8.250 inches (21.0 cm)

Depth 14.625 inches (37.0 cm)

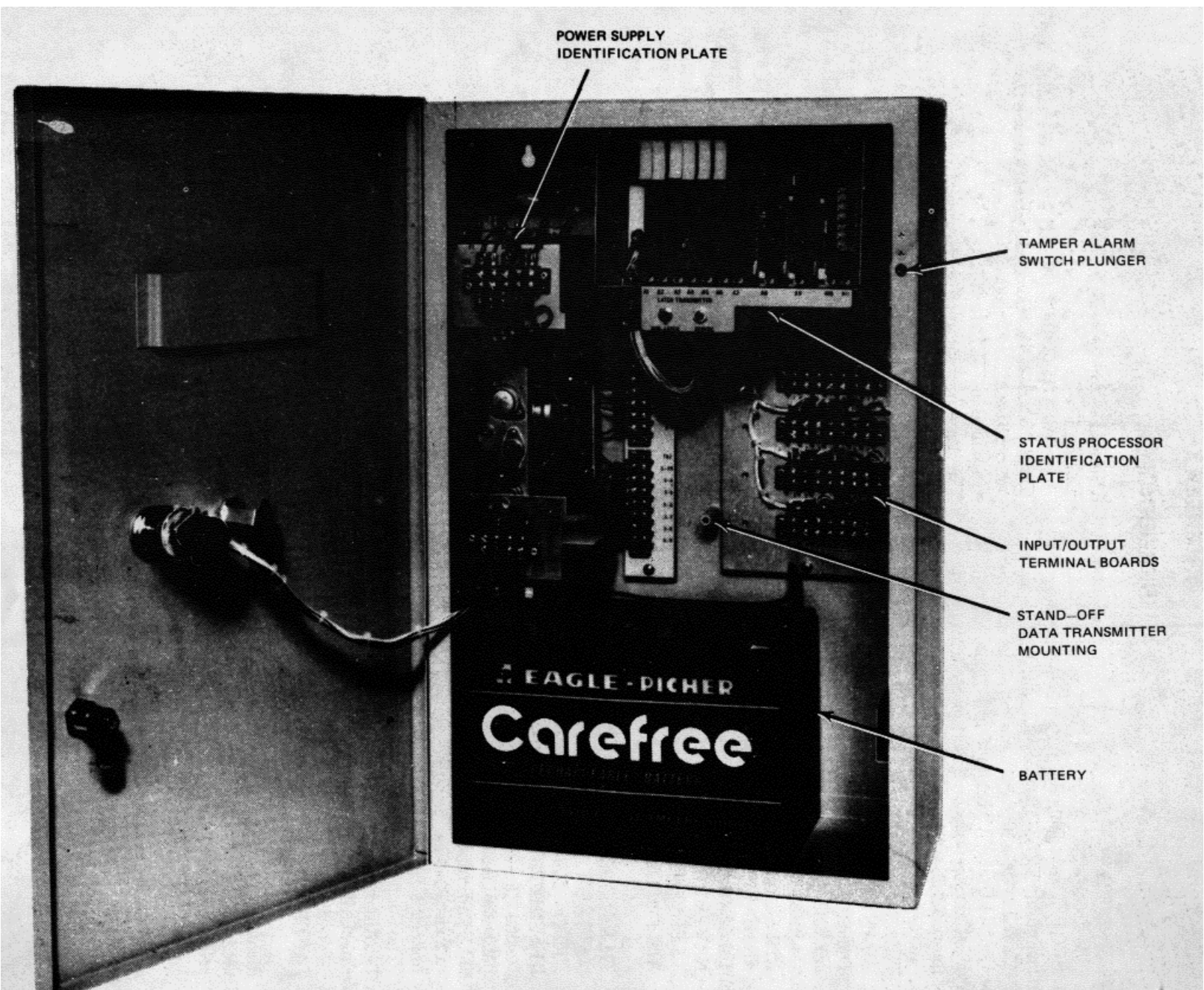


Figure 1-2. Control Unit (Access Door Open)

CONTROL UNIT, ALARM SET	
C 9412 FSS 9(V) NSN6350 00 225 2735	
CONTRACT NO	
S N	DATE OF MFG
P N 97403 13220E4200	
MOD	

A. CONTROL UNIT

POWER SUPPLY CONTROL UNIT	
CONTRACT NO	
S N	DATE OF MFG
P N 97403 13220E4202	
MOD	

B. POWER SUPPLY

STATUS PROCESSOR	
CONTRACT NO	
S N	DATE OF MFG
P N 97403 13220E4201	
MOD	

C. STATUS PROCESSOR

Figure 1-3. Identification Plates, Control Unit

Color

Housing..... Gray per federal Standard 595,
color chip 326440 MIL-C-22751

Environmental (operational)

Temperature range-20° to +150°F (-29DG to
+63°C)
Relative humidity..... Up to 95%

Environmental (nonoperational and storage)

Temperature range -30° to +165° F (-34° to
+74°C)
Relative humidity..... Up to 95%

Shock 20 g for ms and bench handling
(without battery)

Power requirements

Primary..... 110 to 125 vac, 48 to 62 HZ.
Emergency..... 24 vdc; supplied by internal
battery.

Battery

Type..... Sealed, rechargeable
Weight 36 pounds (16.33 kg)
Height 6.45 inches (16.383 cm)
Width 6.45 inches (16.383 cm)
Depth 9.75 inches (24.829 cm)
Voltage capacity 34 vdc, 18 ampere hours

Number of inputs..... 6 (status signals from sensors)

Alarm Over 100,000 ohms
No alarm Less than 2,000 ohms

Number of outputs 4

Instantaneous alarm Alarm - over 100,000
ohms; no alarm - less than 2,000 ohms

Latched alarm.....Alarm - over 100,000 ohms;
no alarm - less than 2,000 ohms

Secure/accessSecure - over 100,000 ohms;
access - less than 2,000 ohms

AC power..... Power fail - over 100,000 ohms;
power on - less than 2,000 ohms

CHAPTER 2 OPERATING INSTRUCTIONS

Section I. OPERATING PROCEDURES

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

2-2. NORMAL OPERATING PROCEDURES.

- a. Under normal conditions, the operating mode switch (key operated) on the CU door is turned to the ACCESS or SE-CURE position. The switch is turned to ACCESS to allow entry into the secure area, and is turned to SECURE to allow

protection of the secure area. The LATCH/NON-LATCH switch is normally placed in the LATCH position. When it is in the LATCH position, the mode switch is turned to TEST/RESET and then to either SECURE or ACCESS to clear an alarm condition. When the LATCH/NON-LATCH switch is in the NON-LATCH position, the alarm condition may be cleared at the Monitor Cabinet. This switch is not accessible to the operator and is set to one position or the other at the time of installation.

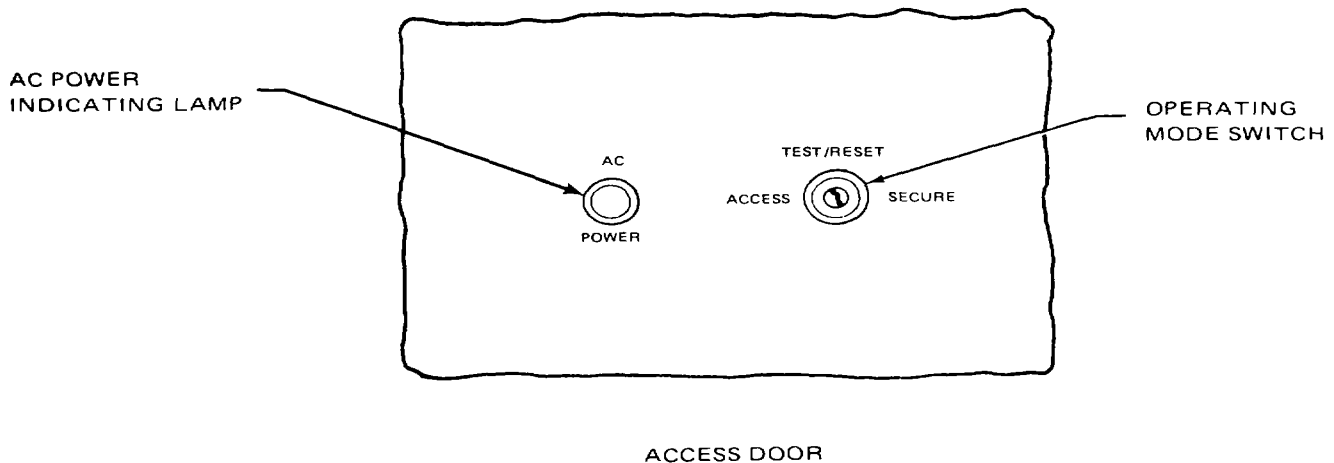


Figure 2-1. Control Unit Controls and Indicators

Table 2-1. Operator Controls and Indicators

Control or indicators	Function
Operating mode switch (key-operated, 3-position rotary)	Selects the Control Unit operating mode (ACCESS, TEST/RESET, SECURE).
AC POWER (indication lamp)	Illuminated when ac power is applied to unit.
Audible signal device	Sounds when the operating mode switch is at TEST/RESET and a duress, intrusion, or tamper alarm is received at the Control Unit.

- b. There is an adjustable alarm delay to allow access if the CU is within the secure area. Enter the area and insert key in mode switch lock. Turn switch to TEST/RESET and then to ACCESS before the end of the alarm delay or an alarm will be initiated. To leave the secure area, turn mode switch to TEST/ RESET or ACCESS and then to SE-CURE. Remove key and leave area be-fore the end of the alarm delay or an alarm will be initiated.
- c. After responding to an alarm, reset the CU, to a no-alarm condition. To reset

CU, turn mode switch to TEST/RESET, and then to SECURE. Remove key and leave area before the end of the alarm delay or an alarm will be initiated.

2-3. EMERGENCY OPERATION. Operation with incomplete surveillance coverage or faulty tamper circuit should be held to a minimum. Extended periods of operation on battery (stand-by) power should be avoided.

2-4. UNUSUAL OPERATING CONDITIONS. Loss of synchronization between Data Transmitter and Data Receiver may occur while operating during heavy thunderstorms.

Section II. THEORY OF OPERATION

2-5. FUNCTIONAL DESCRIPTION. The Control Unit is the central element of J-SIIDS. Its primary function is to monitor continuously the status of the secure area. It does this by processing signals from a duress alarm and five, or fewer, intrusion detection sensors located in the secure area. This status information is processed and transmitted to peripheral monitoring equipment. The Control

Unit also provides primary and emergency standby power to its associated sensors; provides Secure, Access, and Test/Reset modes of system operation within the secure area; and maintains secure area subsystem security by monitoring sensor and audible alarm signal lines and antitamper control of its own enclosure. See figure 2-2 for a simplified functional block diagram of the Control Unit

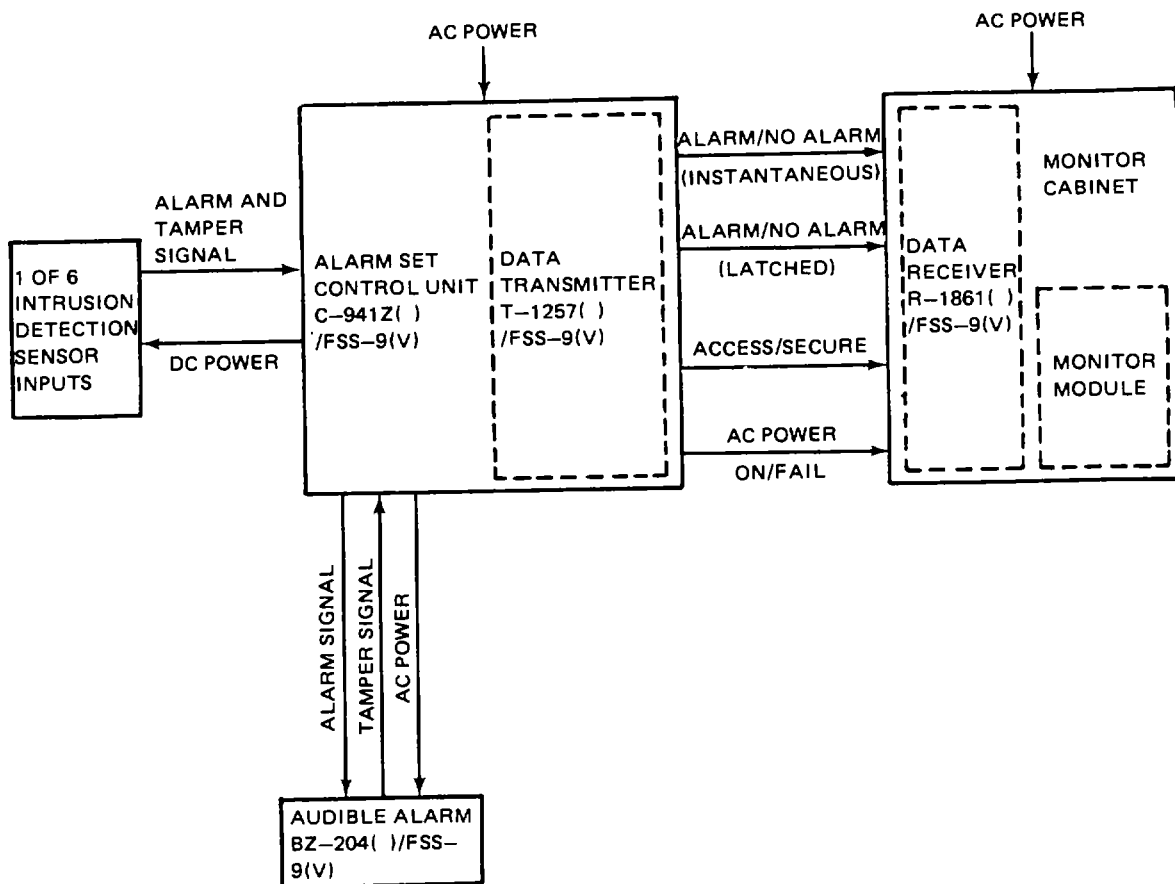


Figure 2-2. Control Unit Simplified Functional Block Diagram

2-3/(2-4 blank)

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION

This section is not applicable.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

3-1. CLEANING. Clean exterior surfaces with a cloth dampened in water and a mild detergent.

Rinse with a cloth dampened in cold water. Dry with a lint-free cloth.

Section III. TROUBLESHOOTING

This section is not applicable.

Section IV. MAINTENANCE

This section is not applicable.

3-1/(3-2 blank)

CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

This chapter is not applicable to this equipment.

4-1/(4-2 blank)

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 Control Unit, Alarm Set.

5-2. REPAIR PARTS. Repair parts are listed and illustrated in the repair parts and special tools list covering direct and general support maintenance for this equipment in appendix C of this manual.

Section II. TROUBLESHOOTING

5-3. GENERAL.

- a. This section contains troubleshooting information for locating and correcting most Of the operating troubles which may develop in the Control Unit. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine corrective actions to take. You should perform the test/inspections in the corrective actions column in the order listed.
- b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

NOTE

Before you use table 5-2, be sure you have performed all applicable operating checks.

- c. The table lists the common malfunctions which you may find during the operation or maintenance of the Control Unit or its components. You should perform the test/inspections in the corrective actions column in the order listed.

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

NOTE

Touchup paint is recommended instead of refinishing whenever practical.

- (6) Inspect all metal surfaces intended to be painted for condition of finish and legibility of panel lettering.

- (7) Inspect varistors for evidence of physical damage or overheating. Check varistors by disconnecting one lead of each varistor from TB1. Set multimeter to ohms and connect meter leads to varistor. Meter should indicate over 100,000 ohms.

f. Refer to figures 5-1, 5-2, 5-3, 5-4, and FO-1 and table 5-1 for maintenance controls, parts locations and identification, and wiring diagram and test points referred to in table 5-2 troubleshooting procedures.

NOTE

Before you use table 5-2, be sure you have performed all applicable operating checks.

WARNING

The Audible Alarm presents a noise hazard to personnel in the area. It must be disabled before any troubleshooting procedures are attempted.

g. Disable the Audible Alarm. To Disable The Audible Alarm (AA) for maintenance or troubleshooting, notify proper authorities per installation/site security procedures. Enter the Control Unit area and turn the operating mode switch (key operated) to TEST/RESET position. If the Control Unit audible signal device sounds, ignore it for the moment. Inspect the Control Unit door to ensure it is flat, straight, and completely closed. Open the door, pull the TAS plunger all the way out, and ensure there is no debris between the door and enclosure. There are six LED's on PC board A12 in the upper right corner of the Control Unit. Note any of these LED's that are on. To locate the source of an alarm, turn the mode switch to TEST/RESET, unlock and open the door. Look at the LED's in the upper right corner of the

CU. Each detector is connected to one LED. The first alarm signal received at the CU will light the LED connected to the detector that originated the alarm.

- (1) If the AA is silenced, don ear protection and open the AA door. Pull the TAS plunger all the way out, remove screws that secure the faceplate, and remove the faceplate. The power switch is in the upper left corner of the AA; turn it off.
- (2) If the AA continues to sound, tag, remove, and isolate the green wire (from status processor) from TB4-1 in the Control Unit. Install a jumper between TB4-4 and 1. AA should be off. Don ear protection and open the AA door. Pull the TAS plunger all the way out, remove screws that secure the faceplate, and remove the faceplate. The power switch is in the upper left corner of the AA; turn it off.
- (3) In the Control Unit, remove interconnecting wire from AA from TB4-3, and connect a jumper wire between TB44 and 3. The AA is now disabled; however, for safety it should be treated as if it were on. Remove jumper from TB4-4 and 1.

5-4. TROUBLESHOOTING PROCEDURES.

WARNING

HIGH VOLTAGE is used in the operation of this equipment. DEATH ON CONTACT may result if personnel fail to observe safety precautions. Learn the areas containing high voltage in each piece of equipment. Be careful not to contact high-Voltage connections when installing or operating this equipment. Never work on electronic equipment unless there is another person nearby who is familiar with the hazards of the equipment and competent in administering first aid.

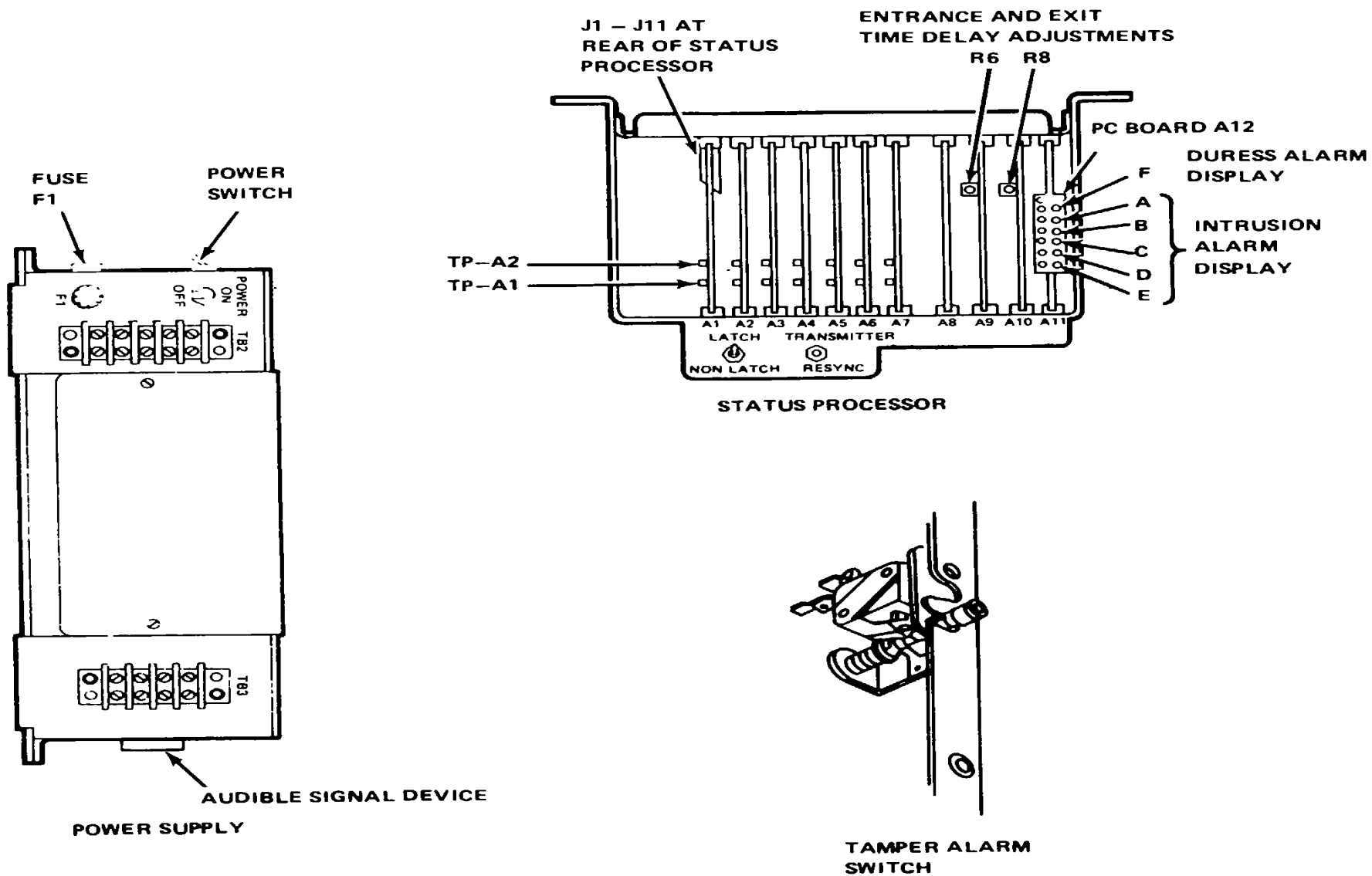


Figure 5-1. Maintenance Controls and Indicators

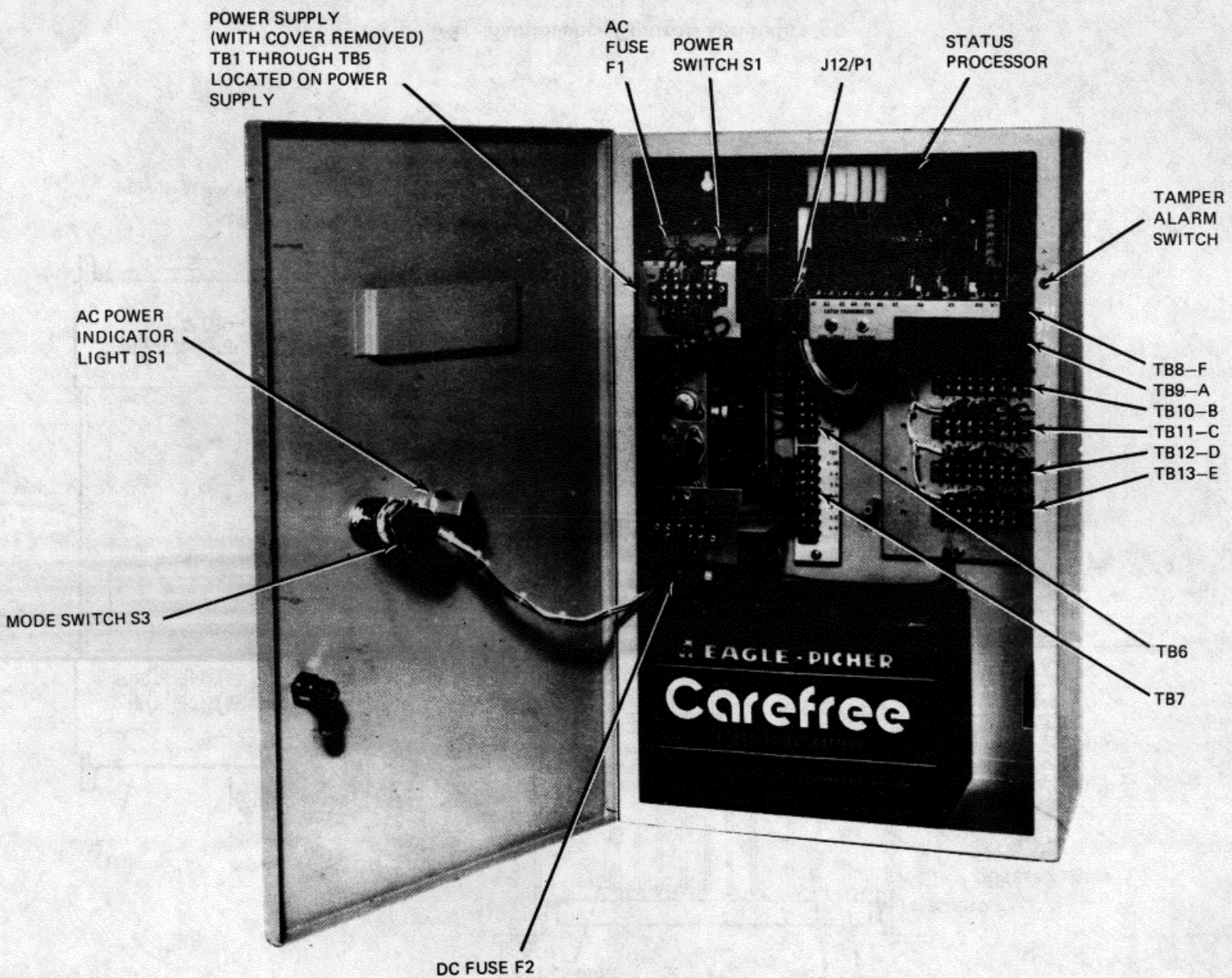
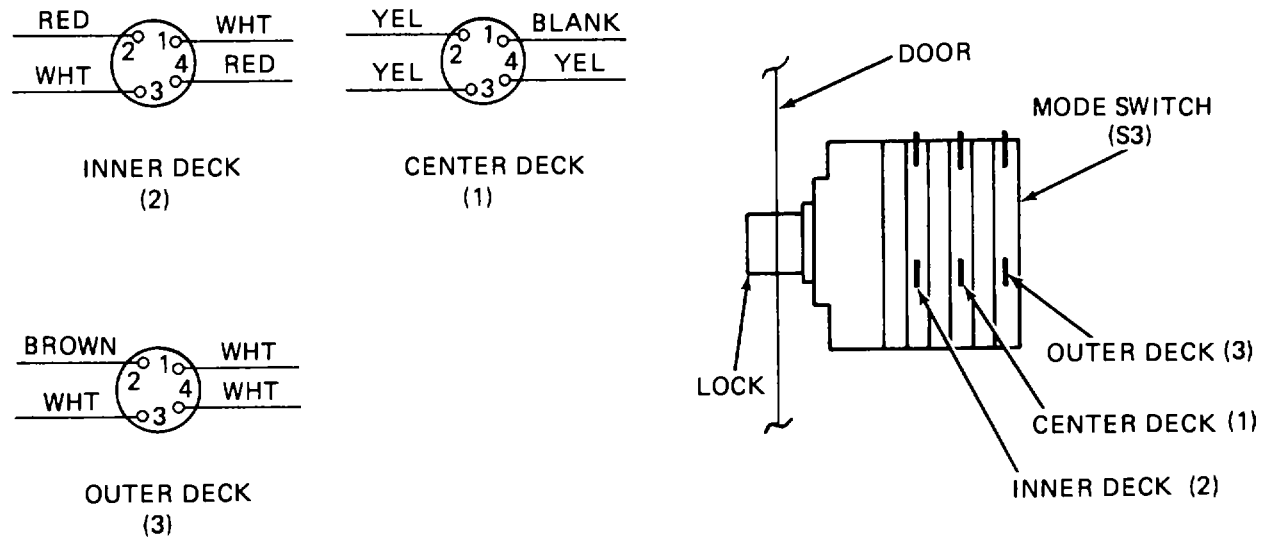


Figure 5-2. Control; Unit troubleshooting Test Points

CONTROL UNIT SWITCH IDENTIFICATION

MODE SWITCH (S3) TERMINAL LOCATION



LATCH/NON-LATCH SWITCH (S5) TERMINAL LOCATION

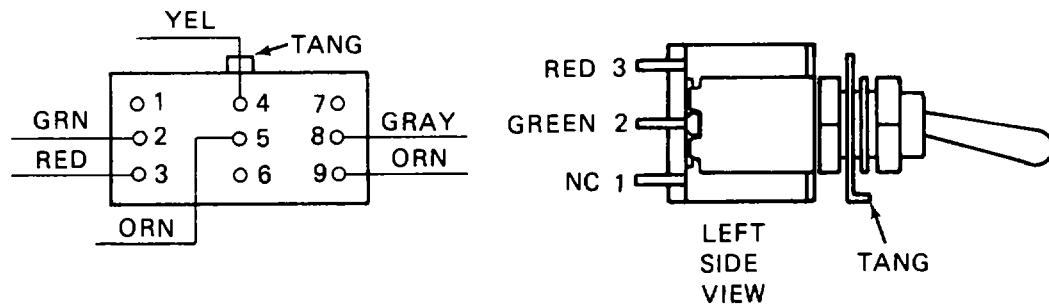
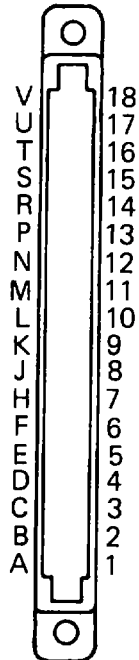


Figure 5-3. Control Unit Switch Identification



TERMINAL NUMBERS FOR CARD
 EDGE RECEPTACLES, J1–J11
 AT REAR OF STATUS PROCESSOR.
 PC BOARDS A1 THROUGH A11
 PLUG INTO RECEPTACLES J1
 THROUGH J11 IN REAR OF
 STATUS PROCESSOR.

PIN NUMBERS FOR J12, PIN SIDE

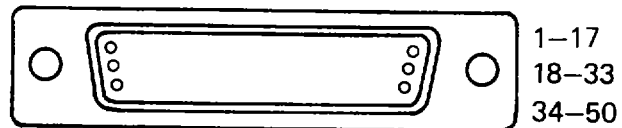


Figure 5-4. Status Processor Connector Identification

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.

WARNING

While performing maintenance or troubleshooting on the Control Unit, ensure that test points and terminals are never grounded or shorted to each other or to chassis. This will cause serious damage to the internal components.

CAUTION

When taking measurements with a multimeter, ensure that the meter is set to the

proper scale and range before inserting probes into the circuit.

NOTE

If the Audible Alarm is installed, it must be disabled BEFORE any troubleshooting procedures are attempted. Disabling the alarm requires setting the key-operated switch on Control Unit to TEST/ RESET position, opening Audible Alarm, removing faceplate, and turning off power switch. After troubleshooting, the Audible Alarm must be reactivated. Activating the Alarm requires setting the key operated switch on Control Unit to TEST/RESET position, turning Alarm power switch on, replacing faceplate, closing and locking Audible Alarm door.

Table 5-1. Maintenance Controls and Indicators

Controls/indicators	Function														
Duress/intrusion alarm display	<p>Light-emitting diodes (LED) illuminate to indicate the first duress or intrusion alarm input.</p> <p style="text-align: center;">Terminal Board A12</p> <table> <tr> <td>Diode</td><td>(Alarm input)</td></tr> <tr> <td>F</td><td>F (duress)</td></tr> <tr> <td>A</td><td>A (intrusion)</td></tr> <tr> <td>B</td><td>B (intrusion)</td></tr> <tr> <td>C</td><td>C (intrusion)</td></tr> <tr> <td>D</td><td>D (intrusion)</td></tr> <tr> <td>E</td><td>E (intrusion)</td></tr> </table> <p style="text-align: center;">NOTE</p> <p>Display is reset by moving operating mode switch to ACCESS OR TEST/RESET, then back to SECURE.</p>	Diode	(Alarm input)	F	F (duress)	A	A (intrusion)	B	B (intrusion)	C	C (intrusion)	D	D (intrusion)	E	E (intrusion)
Diode	(Alarm input)														
F	F (duress)														
A	A (intrusion)														
B	B (intrusion)														
C	C (intrusion)														
D	D (intrusion)														
E	E (intrusion)														
LATCH/NON-LATCH (2-position toggle switch)	<p>Controls mode of operation for the delayed alarm output at terminal S1-D as follows:</p> <p>LATCH position - normal operating position. This permits latched alarm conditions to remain until reset by positioning operating mode switch to TEST/RESET.</p> <p>NON-LATCH position - limits latched alarm output at terminal S1-D to 10+2 seconds after alarm disappears.</p>														
Transmitter RESYNC (push-button switch) 12 & P.	<p>When pressed, resynchronizes operation of Data Transmitter and Data Receiver. Refer to TM 5-6350-264-14/</p>														
Power (2-position toggle switch)	<p>Connects ac power and emergency battery power to Control Unit power supply.</p>														
Tamper switch	<p>Initiates alarm signal when CU door is opened. Pulling switch plunger all the way out disables the switch.</p>														

NOTE

Troubleshooting procedures listed in table 5-2 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 5-2. Troubleshooting Procedures

Trouble	Probable cause	Corrective action
1. Constant alarm	a. Bad intrusion or tamper circuits.	<p>a. Open CU door and pull TAS plunger all the way out. Note which light emitting diode (LED) is lighted. If the only LED lighted is for sensor monitoring entrance, secure entrance. Turn mode switch to SECURE and then to TEST/RESET.</p> <p style="text-align: center;">NOTE</p> <p>If motion sensors are used near CU, remain motionless to avoid setting off false alarms.</p> <p>The audible signal device will normally stop sounding 10+ 2 seconds after CU has been reset. If the audible signal device continues to sound and there are no LED's lighted, this indicates a tamper alarm. If an LED is lighted, it will indicate which sensor or group of sensors has been activated. LED's A through E indicate intrusion alarms, and LED F indicates a duress alarm (Latching Alarm Switch).</p> <p>b. Turn mode switch to SECURE and then to TEST/RESET. Set multi-meter to dc volts. Connect positive meter lead to TP1 (brown), and negative lead to chassis (ground). Note meter indication. Connect positive meter lead to TP2 (red), and negative lead to chassis (ground). Note meter indication. Repeat these steps</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	a. (Cont)	<p>for PC boards A1, A2, A3, A4, A5, and A6. A meter indication of 18.5 to 21 vdc on any TP1 indicates an intrusion alarm condition for the sensor or group of sensors connected to that PC board. A meter indication of 18.5 to 21 vdc on any TP2 indicates a tamper alarm condition for the sensor or group of sensors connected to that PC board. Less than 5 vdc means no alarm.</p> <div style="border: 1px solid black; padding: 2px; text-align: center;">CAUTION</div> <p>On terminal boards TB8-F through TB13-E, ensure that correct terminals are used for testing or damage will result.</p> <p style="text-align: center;">NOTE</p> <p>If Data Transmitter is installed, it must be removed to reach TB8-F through TB13-E. Remove screws that secure Transmitter and carefully move it aside.</p> <p>c. Ensure that there is a real alarm condition. For duress or intrusion alarm, connect a jumper wire from terminal number 2 to number 1 on TB8-F through TB13-E. For a tamper alarm, connect jumper wire from terminal number 2 to number 3 of TB8-F through TB13-F. PC boards are connected to terminal boards as follows:</p> <p style="margin-left: 40px;">PC board A1 to TB8-F PC board A2 to TB9-A PC board A3 to TB10-B PC board A4 to TB11-C PC board A5 to TB12-D PC board A6 to TB13-E</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	a. (Cont)	<p>If an intrusion alarm is indicated on PC board A2, TP1, for example, connect jumper to terminal numbers 1 and 2 on TB9-A. With jumper installed, meter should indicate less than 0.5 vdc. With jumper removed, meter should indicate 18.5 to 21 vdc. If these voltages are correct, there is a genuine alarm condition.</p> <p>d. If voltage indications at TP1 and TP2 are correct, troubleshoot interconnecting wiring and associated sensor per steps in TM5-6350-264-14/1, System Manual.</p> <p>e. If voltage indications at TP1 and TP2 are not correct, replace faulty PC board in status processor.</p> <p>(1) To remove PC boards A1 through A6, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p style="text-align: center;">NOTE</p> <p>PC boards A1 through A6 are identical and may be installed in any slot, 1 through 6.</p> <p>(2) To install new PC boards A1 through A6, turn PC board so that plastic board ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle. Turn on switch S1 on top of power supply. Depress TRANSMITTER RESYNC switch . S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, set multimeter for dc</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action																																			
1. (Cont)	a. (Cont)	<p>volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate $5 + 0.25$ vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to SECURE and then TEST/RESET.</p> <p>f. Turn off switch S1 on top of power supply. Remove PC boards A1 through A6. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>g. Inspect wires for loose or broken connections at TB8-F through TB13-E, TB2-4, and P1/J12.</p> <p>h. Set multimeter to ohms and check for continuity (0 ohms) by connecting meter leads to the following points:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>J1-4 to TB8-F-1</td><td rowspan="3">}</td><td rowspan="3">via P1/J12-3</td></tr> <tr> <td>J1-4 to TB8-F-2</td></tr> <tr> <td>J1-4 to TB8-F-3</td></tr> <tr> <td>J1-12 to TB8-F-1</td><td rowspan="3">}</td><td rowspan="3">via P1/J12-4</td></tr> <tr> <td>J1-12 to TB8-F-2</td></tr> <tr> <td>J1-12 to TB8-F-3</td></tr> <tr> <td>J2-4 to TB9-A-1</td><td rowspan="3">}</td><td rowspan="3">via P1/J12-5</td></tr> <tr> <td>J2-4 to TB9-A-2</td></tr> <tr> <td>J2-4 to TB9-A-3</td></tr> <tr> <td>J2-12 to TB9-A-1</td><td rowspan="3">}</td><td rowspan="3">via P1/J12-7</td></tr> <tr> <td>J2-12 to TB9-A-2</td></tr> <tr> <td>J2-12 to TB9-A-3</td></tr> <tr> <td>J3-4 to TB10-B-1</td><td rowspan="3">}</td><td rowspan="3">via P1/J12-8</td></tr> <tr> <td>J3-4 to TB10-B-2</td></tr> <tr> <td>J3-4 to TB10-B-3</td></tr> <tr> <td>J3-12 to TB10-B-1</td><td rowspan="3">}</td><td rowspan="3">via P1/J12-9</td></tr> <tr> <td>J3-12 to TB10-B-2</td></tr> <tr> <td>J3-12 to TB10-B-3</td></tr> <tr> <td>J4-4 to TB11-C-1</td><td rowspan="3">}</td><td rowspan="3">via P1/J12-10</td></tr> <tr> <td>J4-4 to TB11-C-2</td></tr> <tr> <td>J4-4 to TB11-C-3</td></tr> </table>	J1-4 to TB8-F-1	}	via P1/J12-3	J1-4 to TB8-F-2	J1-4 to TB8-F-3	J1-12 to TB8-F-1	}	via P1/J12-4	J1-12 to TB8-F-2	J1-12 to TB8-F-3	J2-4 to TB9-A-1	}	via P1/J12-5	J2-4 to TB9-A-2	J2-4 to TB9-A-3	J2-12 to TB9-A-1	}	via P1/J12-7	J2-12 to TB9-A-2	J2-12 to TB9-A-3	J3-4 to TB10-B-1	}	via P1/J12-8	J3-4 to TB10-B-2	J3-4 to TB10-B-3	J3-12 to TB10-B-1	}	via P1/J12-9	J3-12 to TB10-B-2	J3-12 to TB10-B-3	J4-4 to TB11-C-1	}	via P1/J12-10	J4-4 to TB11-C-2	J4-4 to TB11-C-3
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J1-4 to TB8-F-2																																					
J1-4 to TB8-F-3																																					
J1-12 to TB8-F-1	}	via P1/J12-4																																			
J1-12 to TB8-F-2																																					
J1-12 to TB8-F-3																																					
J2-4 to TB9-A-1	}	via P1/J12-5																																			
J2-4 to TB9-A-2																																					
J2-4 to TB9-A-3																																					
J2-12 to TB9-A-1	}	via P1/J12-7																																			
J2-12 to TB9-A-2																																					
J2-12 to TB9-A-3																																					
J3-4 to TB10-B-1	}	via P1/J12-8																																			
J3-4 to TB10-B-2																																					
J3-4 to TB10-B-3																																					
J3-12 to TB10-B-1	}	via P1/J12-9																																			
J3-12 to TB10-B-2																																					
J3-12 to TB10-B-3																																					
J4-4 to TB11-C-1	}	via P1/J12-10																																			
J4-4 to TB11-C-2																																					
J4-4 to TB11-C-3																																					

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	a. (Cont)	<p> J4-12 to TB11-C-1 } J4-12 to TB11-C-2 } via P1/J12-11 J4-12 to TB11-C-3 } J5-4 to TB12-D-1. } J5-4 to TB12-D-2 } via P1/J12-12 J5-4 to TB12-B-3 } J5-12 to TB12-D-1 } J5-12 to TB12-D-2 } via P1/J12-13 J5-12 to TB12-D-3 } J6-4 to TB12-E. } J6-4 to TB12-E. } via P1/J12-14 J6-4 to TB12-E. } J6-12 to TB12-E. } J6-12 to TB12-E. } via P1/J12-15 J6-12 to TB12-E. } </p> <p>i. If meter indicates more than 0 ohms, disconnect P1 from bottom of status processor. Check for continuity by connecting meter leads to the following points:</p> <p> P1-3 to TB8-F-1 P1-3 to TB8-F-2 P1-3 to TB8-F-3 P1-4 to TB8-F-1 P1-4 to TB8-F-2 P1-4 to TB8-F-3 P1-5 to TB9-A-1 P1-5 to TB9-A-2 P1-5 to TB9-A-3 P1-7 to TB9-A-1 P1-7 to TB9-A-2 P1-7 to TB9-A-3 P1-8 to TB10-B-1 P1-8 to TB10-B-2 P1-8 to TB10-B-3 P1-9 to TB10-B-1 P1-9 to TB10-B-2 P1-9 to TB10-B-3 P1-10 to TB11-C-1 P1-10 to TB11-C-2 P1-10 to TB11-C-3 P1-11 to TB11-C-1 P1-11 to TB11-C-2 P1-11 to TB11-C-3 </p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	a. (Cont)	<p>P1-12 to TB12-D-1 P1-12 to TB12-D-2 P1-12 to TB12-D-3 P1-13 to TB12-D-1 P1-13 to TB12-D-2 P1-13 to TB12-D-3 P1-14 to TB13-E-1 P1-14 to TB13-E-2 P1-14 to TB13-E-3 P1-15 to TB13-E-1 P1-15 to TB13-E-2 P1-15 to TB13-E-3</p> <p>j. If meter indicates more than 0 ohms, inspect wiring from P1 to TB8 & TB2. If wiring is bad, repair or replace. If wiring is good replace P1.</p> <p>(1) To remove P1, remove screws and locking devices from ends of connector. Remove screws that secure junction shell to cable, and slide shell along cable to expose pins on back of P1. Tag wires. Slide heat-shrink tubing on each wire away from connector pin. Use a soldering iron of 50 watts maximum and carefully unsolder wires from pins.</p> <p>(2) To install new P1, check heat-shrink tubing on each wire in cable and replace if necessary. Work from the center outward with a soldering iron of 50 watts maximum. Carefully solder wires to pins on back of connector. Slide heat-shrink tubing down over each pin after soldering. Slide junction shell along cable to cover connector P1. Slip locking devices over ends of shell/connector. Insert and tighten screws that secure shell to cable. Align P1 with J12 on status processor and press P1 into J12. Insert screws and tighten to secure. Turn on switch S1 on top of power supply.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	a. (Cont)	<p>k. If meter indicates 0 ohms in step i. above, remove PC boards A1 through A6.</p> <p>(1) To remove PC boards A1 through A6, place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) Check for continuity by connecting meter leads to the following points:</p> <p style="padding-left: 40px;">J12-3 to J1-4 J12-4 to J1-12 J12-5 to J2-4 J12-7 to J2-12 J12-8 to J3-4 J12-9 to J3-12 J12-10 to J4-4 J12-11 to J4-12 J12-12 to J5-4 J12-13 to J5-12 J12-14 to J6-4 J12-15 to J6-12</p> <p>(3) To reinstall PC boards A1 through A6, note that these boards are identical and may be installed in any slot, 1 through 6. Turn PC board so that plastic board ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>l. If meter indicates more than 0 ohms replace Status Processor Interconnecting Wiring Subassembly (SPWS).</p> <p>(1) To remove status processor, turn off switch S1 on power supply. Tag and disconnect Data Transmitter wires from TB6 and TB7. Remove screws that secure Transmitter to standoffs</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	a. (Cont)	<p>in CU. Be careful not to drop Transmitter inside CU. Remove Data Transmitter. Loosen screws that secure plug P1 to bottom of status processor. Pull plug P1 straight down to disconnect it. Remove screws that secure status processor to top of CU enclosure and it will drop straight down.</p> <p>(2) Remove PC boards A1 through A12 from status processor by placing thumb or finger under board ejector and lifting until board pops out of receptacle.</p> <p>(3) Install PC boards A1 through A12 in new status processor interconnecting wiring subassembly. Ensure that pins on all PC boards are not bent or otherwise damaged. Turn PC boards so plastic ejectors are toward top. Align boards with guides at top and bottom of status processor. Slide boards straight in until they contact receptacles at back of processor. Then press firmly on boards until they seat completely in receptacle.</p> <p>(4) To install new status processor, position it under standoffs in top of CU. Insert screws and tighten to secure status processor. Insert plug P1 into connector on bottom of status processor and push up. Tighten screws to secure plug P1. Position Data Transmitter over standoffs in CU and insert screws. Tighten screws to secure transmitter. Connect wires to TB6 and TB7 in CU.</p> <p>m. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	<p>a. (Cont)</p> <p>b. Bad tamper alarm circuitry or TAS.</p>	<p>period, check power supply. Set multi-meter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>a. Set multimeter to dc volts and connect positive meter lead to PC board A7, TP1 (brown), and negative lead to chassis (ground). Push TAS plunger all the way in, and then pull plunger all the way out. Meter should indicate less than 0.5 vdc for both switch positions. Depress TAS plunger and then release. Meter should indicate 18.5 to 21 vdc.</p> <p>b. If these meter indications are not correct, turn off switch S1 on top of power supply. Use board ejector to remove PC board A7. Set multimeter to ohms and connect meter leads to TAS terminals which have wires attached. Push TAS plunger all the way in, and then pull plunger all the way out. Meter should indicate 0 ohms for both switch positions. Depress TAS plunger and then release. Meter should indicate over 100,000 ohms.</p> <p>c. If these meter indications are not correct, replace TAS.</p> <p>(1) To remove TAS, remove two screws that secure TAS to edge of CU housing. Loosen screws that secure crimp lugs to switch.</p> <p>(2) To install new TAS, slip crimp lugs under screw heads marked COM and NO on switch, and tighten screws. Insert switch through hole in edge of housing from the</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	b. (Cont)	<p>back, and insert screws from the front. Tighten screws to secure switch.</p> <p>d. If meter indications are correct, pull TAS plunger all the way out. Connect meter leads to J7-4 and J7-7. Meter should indicate 0 ohms.</p> <p>e. If meter indicates over 100,000 ohms, inspect J12/P1, pins 18 and 19 for broken or loose wires. Resolder any bad connections on P1.</p> <p>f. If meter indicates 0 ohms at J7-4 and J7-7, connect a jumper wire on power supply from TB4-3 to TB4-2. Connect meter leads to J7-1 and 14. Meter should indicate 0 ohms.</p> <p>g. If meter indicates 0 ohms, replace PC board A7.</p> <p>To install new PC board A7, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>h. If meter indicates over 100,000 ohms at J7-1 and 14, connect meter leads to J7-14 and TB4-3 on power supply. Meter should indicate 0 ohms.</p> <p>i. If meter indicates over 100,000 ohms, inspect J12/P1, pin 17 for broken or loose connections. Resolder any bad connections on P1.</p> <p>j. Connect meter leads to J7-1 and TB4-2 in power supply. Meter should indicate 0 ohms.</p> <p>k. If meter indicates over 100,000 ohms, inspect J12/P1, pin 34 for broken or loose connections. Resolder any bad connections at P1, pin 34.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	<p>b. (Cont)</p> <p>c. Bad tamper circuitry (telephone dialer).</p>	<p>I. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect positive lead to TB2-2. Meter should indicate 20 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>a. Set multimeter to dc volts and connect positive meter lead to PC board A7, TP2 (red), and negative lead to chassis (ground).</p> <p>b. If meter indicates 18.5 to 21 vdc, ensure that there is a jumper between TB7-S-8, TB7, S-8 and S-9. Set multimeter to ohms and connect leads to TB7, S-8 and TB7, S-9.</p> <p>c. If meter indicates 0 ohms, turn off switch S1 on power supply. Use board ejector remove PC board A7. Connect meter leads to J7-1 and 7.</p> <p>d. If meter indicates more than 100,000 ohms, inspect J12/P1, pins 19 and 34 for broken or loose wires. Resolder any bad connections on P1.</p> <p>e. If meter indicates 0 ohms at J4 and 7, replace PC board A7.</p> <p>To install new PC board, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	<p>c. (Cont)</p> <p>d. Incorrect supply voltage or bad tamper circuitry.</p>	<p>f. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch 82. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect positive lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>a. Set multimeter to dc volts and connect positive meter lead to PC board A10, TP1 (brown), and negative lead to chassis (ground). Turn mode switch to SECURE and ensure that no alarms are activated. Meter should indicate 18.5 to 21 vdc.</p> <p>b. If meter indicates less than 1 vdc, turn mode switch to ACCESS. Connect positive meter lead to power supply TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive meter lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect positive meter lead to TB2-2. Meter should indicate 28 ± 2 vdc.</p> <p>c. If any of these indications are not correct, turn off switch S1 on power supply. Check wiring for poor or loose connections, broken wires, or frayed insulation. Repair or replace any bad wiring.</p> <p>d. If wiring is good, replace power supply.</p> <p>(1) To remove power supply, pull main circuit breaker to remove 120 vac from CU. Disconnect wires from battery. As battery is heavy, lift and turn it to remove from bottom of CU enclosure. Tag and disconnect wires from TB2</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	d. (Cont)	<p>and TB4. Remove screws that secure cover, and remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop it inside CU. Note cable clamp under screw near TB4 (bottom front). Support power supply and turn it so wires can be tagged and disconnected from TB3 on bottom of power supply.</p> <p>(2) To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply, and connect wires to TB3. Turn power supply upright and position it over standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first; turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>e. Set multimeter to dc volts and connect positive meter lead to PC board A10, TP1 (brown), and negative lead to chassis (ground). Turn mode switch to SECURE and ensure that no alarms are activated. Meter should indicate 18.5 to 21 vdc.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	d. (Cont)	<p>f. If meter still indicates less than 1 vdc, turn off switch S1 on power supply. Remove PC board A8. Lift board ejector until PC board pops out of receptacle, then grasp board and pull straight out.</p> <p>g. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>h. Set multimeter to dc volts and connect positive meter lead to J8-11, and negative lead to chassis (ground). Ensure that no alarms are activated.</p> <p>i. If meter indicates more than 10 vdc, replace PC board A7.</p> <p>(1) To Remove PC board A7, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A7, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	d. (Cont)	<p>j. If meter indicates less than 1 vdc at J8-11, remove PC board A10 and install PC board A8.</p> <p>(1) To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install PC board A8, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>k. Connect positive meter lead to J10-7, and negative lead to chassis (ground).</p> <p>l. If meter indicates more than 10 vdc, replace PC board A8.</p> <p>(1) To remove PC board A8, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A8, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	d. (Cont)	<p>it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>m. If meter indicates less than 1 vdc at J10-7, replace PC board A10.</p> <p>(1) To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A10, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>n. Set mode switch to ACCESS. Set multi-meter to dc volts and connect positive lead to PC board A10, TP1 (brown), and negative lead to chassis (ground).</p> <p>o. If meter indicates less than 1 vdc, connect positive meter lead to mode switch</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	d. (Cont)	<p>(S3), terminal 2-1, and negative lead to chassis (ground). Meter should indicate 20 1 vdc.</p> <p>p. If meter indicates less than 0.5 vdc, replace mode switch.</p> <p>(1) To remove mode switch, turn off switch S1 on top of power supply. Remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.</p> <p>(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door; slip spacer over lock. Slip switch arm over switch shaft. Ensure that arm is aligned with tang on switch stop. Place large hex nut inside switch mounting bracket; slip bracket over lock. Engage switch shaft in lock. Tighten nut to secure switch.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	d. (Cont)	<p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>q. If meter indicates 20 ± 1 vdc at S3, terminal 2-1, replace PC board A10.</p> <p>(1) To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A10, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p>
	e. Bad alarm identification circuitry.	<p>a. Tag, remove, and isolate any wires or jumpers from TB6, terminals S1-I, S1-IR, S1-D, and S1-DR to Data Transmitter or Monitor Cabinet. Ensure that no LED's are lighted. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to TP1 (brown), and then to TP2 (red), on each PC board, A1, A2, A3, A4, A5, A6, and A7. A meter indication of 18.5 to 21 vdc on either test point on any of these PC boards indicates an alarm condition. Less than 0.5 vdc indicates a non-alarm condition.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	e. (Cont)	<p>b. If there are no alarms indicated at any test point, turn mode switch to SECURE. Set multimeter to ohms and connect leads to TB6, terminals S1-I and S1-IR. Meter should indicate less than 2,000 ohms.</p> <p>c. If meter indicates more than 100,000 ohms, remove PC board A10. To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>d. Turn on switch S1 on top of power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE. Connect meter leads to J10-13 and 14. If meter indicates less than 2,000 ohms, replace PC board A10. If meter indicates more than 100,000 ohms, replace PC board A9.</p> <p>(1) To remove PC board A9, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC boards A9 and A10, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor, then press firmly on board until it seats completely in receptacle.</p> <p>e. Turn on switch S1 on top of power supply. Connect meter leads to TB6, terminals S1-D and S1-DR. Meter should indicate less than 2,000 ohms.</p>

Table 5-1. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	e. (Cont)	<p>f. If meter indicates more than 100,000 ohms, remove PC board A9.</p> <p>To remove PC board A9, turn off switch S1 on top of power supply, place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>g. Turn on switch S1 on top of power supply. Connect meter leads to J9-15 and J9-B, then to J9-18 and J9-N, then to J9-4 and TB6, terminal S1-D, and then to J9-B and TB6, terminal S1-DR.</p> <p>h. If meter indicates less than 2,000 ohms at all of these points, replace PC board A9.</p> <p>i. If meter indicates more than 100,000 ohms at J9-4 and TB6, terminal S1-D, or J9-B and TB6, terminal S1-DR, inspect J12/P1 pins 29 and 44 for loose or broken wires. Resolder any bad connections on P1.</p> <p>j. If meter indicates more than 100,000 ohms at J9-15 and J9-B, or J9-18 and J9-N, replace PC board A10.</p> <p>(1) To remove PC board A9 or A10, turn off switch S1 on top of power supply, place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A9 or A10, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in</p>

Table 5-1. Troubleshooting Procedures - Continued

	Trouble Probable cause	Corrective action
1. (Cont)	e. (Cont)	<p>until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>k. Turn on switch S1 on top of power supply. Connect meter leads to J9-18 and J9-N. If meter still indicates over 100,000 ohms, remove PC board A10.</p> <p>(1) To remove PC board A10, turn off switch S1 on top of power supply, place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>l. Set multimeter to dc volts. Connect positive meter lead to J10-17 and negative meter lead to chassis (ground). Meter should indicate 18.5 to 21 vdc.</p> <p>m. If this indication is not correct, inspect wires from power supply TB2-3 to J12/P1, pin 36, and from J12/P1, pin 36 to J10-17 for loose or broken connections.</p> <p>n. Resolder any bad connections at TB2-3, or P1, pin 36.</p> <p>o. Inspect fuse F2 at power supply. Replace if necessary.</p> <p>p. Reconnect wires and jumpers to TB6, S1-I, S1-IR, S1-D, and S1-DR. Replace PC boards A9 and A10.</p> <p>(1) To install PC boards A9 and A10, turn off switch S1 on top of power</p>

Table 5-1. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	<p>e. (Cont)</p> <p>f. Bad Audible Alarm (AA) circuit.</p>	<p>supply. Turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(2) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>NOTE</p> <p>Ensure there is no jumper from TB4-1 to TB4-4. Remove AA wire from TB4-3. Remove green wire from TB4-1. Connect jumper wire from TB4-3 to TB4-4</p> <p>a. Turn mode switch to TEST/RESET. Set multimeter to dc volts. Connect positive meter lead to TB4-1 and negative meter lead to TB4-2.</p> <p>b. If meter indicates less than 1 vdc, connect positive meter lead to mode switch S3, terminal 3-2, and negative lead to chassis.</p> <p>c. If meter indicates less than 1 vdc, inspect wiring from mode switch S3, terminal 3-2 to power supply TB2-5 for loose or broken connections. Resoled any bad connections.</p> <p>d. If meter indicates 5 +0.25 vdc, connect positive meter lead to S3, terminal 3-4.</p> <p>e. If meter indicates less than 1 vdc, replace mode switch S3.</p> <p>(1) To remove mode switch, turn off switch S1 on top of power supply. Remove large hex nut that secures</p> <p>5-29</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1.(Cont)	f. (Cont)	<p>switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.</p> <p>(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door; slip spacer over lock. Slip switch arm over switch shaft. Ensure that arm is aligned with tang on switch stop. Place large hex nut inside switch mounting bracket; slip bracket over lock. Engage switch shaft in lock. Tighten nut to secure switch.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	f. (Cont)	<p>supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect positive leads to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>f. If meter indicates $5 +0.25$ vdc at S3, terminal 3-2, remove leads and set multimeter to ohms. Remove PC board A10.</p> <p>To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>g. Connect meter leads to S3, terminal 3-4, and J10-11.</p> <p>h. If meter indicates more than 100,000 ohms, inspect wires from S3, terminal 3-4 to J12/P1, pin 32, and from J12/P1, pin 32 to J10-11 for loose or broken connections. Resolder any bad connections on P1.</p> <p>i. If meter indicates 0 ohms, connect leads to J10-R and power supply TB4-1.</p> <p>j. If meter indicates more than 100,000 ohms, inspect wires from J10-R to J12/P1, pin 30, and from J12/P1, pin 30 to TB4-1 for loose or broken connections. Resolder any bad connections on P1.</p> <p>k. If meter indicates 0 ohms, connect leads to S3, terminal 3-4 and J10-4. Turn mode switch S3 to SECURE and then to ACCESS.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	f. (Cont)	<p>l. If meter indicates less than 2, 000 ohms in SECURE and more than 100, 000 ohms in ACCESS, and if there is a jumper wire from S3, terminal 3-1 to terminal 3-3, replace mode switch S3.</p> <p>m. If meter indicates more than 100, 000 ohms with mode switch in SECURE, connect meter leads to S3, terminals 3-4 and 3-3, and then terminals 3-4 and 3-1.</p> <p>n. If meter indicates more than 100, 000 ohms, replace mode switch S3.</p> <p>(1) To remove mode switch, remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.</p> <p>(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door; slip spacer over</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	f. (Cont)	<p>lock. Slip switch arm over switch shaft. Ensure that arm is aligned with tang on switch stop. Place large hex nut inside switch mounting bracket; slip bracket over lock. Engage switch shaft in lock. Tighten nut to secure switch.</p> <p>o. If meter indicates 0 ohms, inspect wires from S3, terminal 3-3 and terminal 3-1 to J12/P1, pin 33, and from J12/P1, pin 33 to J10-4 for loose or broken connections. Resolder any bad connections on P1.</p> <p>p. If meter indicates 0 ohms from S3, terminal 3-4 to J10-4, connect meter leads to J10-5 and power supply TB2-5.</p> <p>q. If meter indicates 0 ohms, replace PC board A10.</p> <p>To install new PC board A10, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>r. If meter indicates more than 100, 000 ohms, inspect wires from S3, terminal 3-4 to J12/P1, pin 28, and from J12/P1, pin 28 to J10-5. Resolder any bad connections on P1.</p> <p>s. Turn on Switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>a. Turn mode switch to TEST/RESET. Set multimeter to dc volts. Connect positive lead to mode switch S3, terminal 2-2, and</p>
	g. Bad mode switch S3.	

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	g. (Cont)	<p>negative lead to chassis. Meter should indicate 20 ± 1 vdc.</p> <p>b. Connect positive lead to S3, terminal 3-2. Meter should indicate $5 + 0.25$ vdc.</p> <p>c. Turn mode switch to SECURE. Connect positive meter lead to S3, terminal 1-2. Generate a valid intrusion alarm by activating a sensor. Meter should indicate 18.5 to 21 vdc.</p> <p>d. If any of these indications are not correct, inspect wiring for broken or loose connections. Resolder any bad connections.</p> <p>e. If wiring is good, replace mode switch S3.</p> <p>(1) To remove mode switch, turn off switch S1 on top of power supply. Remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.</p> <p>(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in mounting bracket.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
1. (Cont)	g. (Cont)	<p>Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door; slip spacer over lock. Slip switch arm over switch shaft. Ensure that arm is aligned with tang on switch stop. Place large hex nut inside switch mounting bracket; Engage switch shaft in lock. Tighten nut to secure switch.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p>
2. Nuisance alarms.	a. Bad tamper switch.	<p>a. Close CU door. Ensure that there is no debris of any sort between door and enclosure. Ensure that door and enclosure are not warped or bent. Ensure that door closes tightly.</p> <p>b. Open CU door. Set multimeter to dc volts and connect positive meter lead to PC board A7, TP1 (brown), and negative lead to chassis (ground). Push TAS plunger all the way in, and then pull plunger all the way out. Meter should indicate less than 0.5 vdc for both switch positions. Depress TAS plunger and then release. Meter should indicate 18.5 to 21 vdc.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	a. (Cont)	<p>c. If these meter indications are not correct, turn off switch S1 on top of power supply. Use board ejector to remove PC board A7. Set multimeter to ohms and connect meter leads to TAS terminals which have wires attached. Push TAS plunger all the way in, and then pull plunger all the way out. Meter should indicate 0 ohms for both switch positions. Depress TAS plunger and then release. Meter should indicate over 100, 000 ohms.</p> <p>d. If these meter indications are not correct, replace TAS.</p> <p>(1) To remove TAS, remove screws that secure TAS to edge of CU housing. Loosen screws that secure crimp lugs to switch.</p> <p>(2) To install new TAS, slip crimp lugs under screw heads marked COM and NO on switch, and tighten screws. Insert switch through hole in edge of housing from the back, and insert screws from the front. Tighten screws to secure switch.</p> <p>e. If meter indications are correct, pull TAS plunger all the way out. Connect meter leads to J7-4 and J7-7. Meter should indicate 0 ohms.</p> <p>f. If meter indicates over 100, 000 ohms, inspect J12/P1, pins 18 and 19, for broken or loose wires. Resolder any bad connections on P1.</p> <p>g. If meter indicates 0 ohms at J7-4 and J7-4, connect a jumper wire in power supply from TB4-3 to TB4-2. Connect meter leads to J7-1 and J7-14. Meter should indicate 0 ohms.</p> <p>h. If meter indicates 0 ohms, install PC board A7.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	a. (Cont)	<p>To install PC board A7, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>i. If meter indicates over 100, 000 ohms at J7-1 and J7-14, connect meter leads to J7-14 and TB4-3 in power supply. Meter should indicate 0 ohms.</p> <p>j. If meter indicates over 100, 000 ohms, inspect J12/P1, pin 17, for broken or loose connections. Resolder any bad connections on P1.</p> <p>k. Connect meter leads to J7-1 and TB4-2 in power supply. Meter should indicate 0 ohms.</p> <p>l. If meter indicates over 100, 000 ohms, inspect J12/P1, pin 34, for broken or loose connections. Resolder any bad connections on P1.</p> <p>m. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p>
	b. Loose or broken wire connections.	<p>a. Turn off switch S1 on top of power supply. Inspect all wiring for tight, clean connections. Repair any bad connections.</p> <p style="text-align: center;">NOTE</p> <p>If data transmitter is installed, it must be removed to reach TB8-F through TB13-E. Remove screws that secure Transmitter and carefully move it aside.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	c. (Cont)	<p>d. If wiring is good, replace power supply</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px 0;">WARNING</div> <p>High voltage is used in the operation of this equipment. Death on contact may result if personnel fail to observe safety precautions. A 115-volt ac potential may cause death under certain conditions; therefore, precautions should be taken at all times. Be careful not to contact connections for 115-volt ac input when installing or repairing this equipment.</p> <p>Never work on electronic equipment unless there is another person nearby who is familiar with the hazards of the equipment and who is competent in administering first aid.</p> <p>e. If alarms occur immediately after a voltage change, set meter to ac volts and CAREFULLY connect leads to power supply TB1-1 and TB1-2. Meter should indicate 110 to 125 vac.</p> <p>f. If ac voltage is stable, replace power supply.</p> <p>(1) To remove power supply, pull main circuit breaker to remove 120 vac from CU. Disconnect wires from battery. As battery is heavy, lift and turn it to remove from bottom of CU enclosure. Tag and disconnect wires from TB2 and TB4. Remove screws that secure cover, and remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop it inside CU. Note cable clamp under screw near</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	c. (Cont)	<p>TB4 (bottom front). Support power supply and turn it so wires can be tagged and disconnected from TB3 on bottom of power supply.</p> <p>(2) To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply, and connect wires to TB3. Turn power supply upright and position it over standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first; turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>g. If voltage changes above 125 vac or below 110 vac, notify facility personnel.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	d. Bad PC board A8, or mode switch S3.	<p>a. Turn mode switch to ACCESS. Set multi-meter to dc volts and connect positive lead to terminals 7 and negative lead to 6 on TB9-A, and TB10-B, and TB11-C, and TB12-D, and TB13-E in turn. Meter should indicate 28 +2 vdc on each terminal board.</p> <p>b. If meter indications are not correct on some terminal boards, turn off switch S1 on power supply. Remove PC board A8. Lift board ejector until board pops out of receptacle and then pull board straight out. Set multimeter to ohms and connect leads to chassis and terminal 6 on terminal boards where voltage was incorrect. Meter should indicate 0 ohms. Connect meter leads to J8-17 and terminal 7 of terminal board where voltage was incorrect. Meter should indicate 0 ohms.</p> <p>(1) If meter does not indicate 0 ohms when connected to terminal 6, inspect jumper wires from terminal 6 to 5, from terminal 5 to 2, and wires that go to ground for broken or loose connections.</p> <p>(2) If meter does not indicate 0 ohms when connected to terminal 7, inspect wires from terminal 7 to J12/P1, pin 24, and from J12/P1, pin 24 to J8-17 for broken or loose connections. Resolder any bad connections on P1.</p> <p>c. If meter indications are incorrect on all terminal boards, turn off switch S1 on power supply. Remove PC board A8. Lift board ejector until board pops out of receptacle and then pull board straight out.</p> <p>d. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	d. (Cont)	<p>S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5 vdc. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc.</p>
	e.	<p>Set multimeter to dc volts and connect positive lead to J8-18 and negative lead to chassis. Meter should indicate 28 ± 2 vdc.</p> <p>(1) If meter indication is not correct at J8-18, connect positive meter lead to power supply TB2-2 and negative lead to chassis. Meter should indicate 28 ± 2 vdc.</p> <p>(2) If meter does not indicate 28 ± 2 vdc at TB2-2, replace power supply.</p> <p>(3) To remove power supply, pull main circuit breaker to remove 120 vac from CU. Disconnect wires from battery. As battery is heavy, lift and turn it to remove from bottom of CU enclosure. Tag and disconnect wires from TB2 and TB4. Remove screws that secure cover, and remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop it inside CU. Note cable clamp under screw near TB4 (bottom front). Support power supply and turn it so wires can be tagged and disconnected from TB3 on bottom of power supply.</p> <p>(4) To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply,</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	d. (Cont)	<p>and connect wires to TB3. Turn power supply upright and position it over standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first; turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker.</p> <p>(5) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>(6) If meter indication is correct, at J8-18 turn off switch S1 on power supply. Set meter to ohms and connect leads to TB2-2 and J8-18. Meter should indicate 0 ohms.</p> <p>(7) If meter does not indicate 0 ohms, inspect wires from TB2-2 to J12/P1 pin 26 to J8-18 for broken or loose connections. Resolder any bad connections.</p> <p>f. If meter indicates 28 ± 2 vdc, at J8-18 connect positive meter lead to J8-16. Meter should indicate 18.5 to 21 vdc.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	d. (Cont)	<p>(1) If meter indication is correct, install new PC board A8.</p> <p>(2) To install new PC board A8, turn off switch S1 on top of power supply, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>g. If meter does not indicate 18.5 to 21 vdc at J8-16, connect positive meter lead to mode switch S3, terminal 2-1, and negative meter lead to chassis. Meter should indicate 20 ± 1 vdc.</p> <p>h. If meter indicates 0 v, connect positive lead to S3, terminal 2-4, but not at 2-1.</p> <p>i. If meter indicates $20 +1$ vdc, replace mode switch S3.</p> <p>(1) To remove mode switch, turn off switch S1 on top of power supply. Remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	d. (Cont)	<p>and switch stop. Note that mode switch is a three deck switch. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.</p> <p>(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in the mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door; Slip switch arm over switch shaft. Ensure that arm is aligned with tang on switch stop. Place large hex nut inside switch mounting bracket; slip bracket over lock. Engage switch shaft in lock. Tighten nut to secure switch.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>j. If meter indicates 0 v at switch S3, terminal 2-4, connect positive meter lead to power supply TB2-3.</p> <p>k. If meter indicates 0 v, check fuse F2.</p> <p>l. If F2 is good, replace power supply. (1) To remove power supply, pull main circuit breaker to remove 120 vac from CU. Disconnect wires from battery. As battery is heavy, lift and turn it to remove from bottom of CU enclosure. Tag and disconnect</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	d. (Cont)	<p>wires from TB2 and TB4. Remove screws that secure cover, and remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop it inside CU. Note cable clamp under screw near TB4 (bottom front). Support power supply and turn it so wires can be tagged and disconnected from TB3 on bottom of power supply.</p> <p>(2) To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply, and connect wires to TB3. Turn power supply upright and position it over standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first; turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	d. (Cont)	<p>m. If meter indicates 20 +1 vdc at TB2-3, turn off switch S1 on power supply. Set multimeter to ohms and connect leads to TB2-3 and S3, terminal 2-4. Meter should indicate 0 ohms.</p> <p>n. If meter does not indicate 0 ohms, inspect wires from TB2-3 to S3, terminal 2-4 for broken or loose connections. Re-solder any bad connections.</p> <p>o. To reinstall PC board A8, turn off switch S1 on top of power supply, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>p. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p>
	e. Bad Pc board A10.	<p>a. Remove PC board A10.</p> <p style="padding-left: 40px;">To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>b. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 i1 vdc. Connect positive lead to TB2-5. Meter should</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	e. (Cont)	<p>indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>c. Set meter to dc volts and connect positive meter lead to J10-P and negative meter lead to chassis.</p> <p>d. If meter indicates 28 ± 2 vdc, replace A10.</p> <p>e. If meter indicates 0 v at J10-P, turn off switch S1 on power supply. Remove PC board A8.</p> <p>To remove PC board A8, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>f. Set multimeter to ohms and connect leads to J8-17 and J10-P.</p> <p>g. If meter indicates 0 ohms, replace A8.</p> <p>h. If meter indicates more than 100, 000 ohms, replace status processor interconnecting wiring subassembly.</p> <p>(1) To remove status processor, turn off switch S1 on power supply. Tag and disconnect Data Transmitter wires from TB6 and TB7. Remove screws that secure Transmitter to standoffs in CU. Be careful not to drop Transmitter inside CU. Remove Data Transmitter. Loosen screws that secure plug P1 to bottom of status processor. Pull plug P1 straight down to disconnect it. Remove screws that secure status processor to top of CU enclosure and it will drop straight down.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	e. (Cont)	<p>(2) Remove PC boards A1 through A12 from status processor by placing thumb or finger under board ejector and lift up until board pops out of receptacle.</p> <p>(3) Install PC boards A1 through A12 in new status processor interconnecting wiring subassembly. Ensure that pins on all PC boards are not bent or otherwise damaged. Turn PC boards so plastic ejectors are toward top. Align boards with guides at top and bottom of status processor. Slide boards straight in until they contact receptacles at back of processor. Then press firmly on boards until they seat completely in receptacle.</p> <p>(4) To install new status processor, position it under standoffs in top of CU. Insert screws and tighten to secure status processor. Insert plug P1 into connector on bottom of processor, and push up. Tighten screws to secure plug P1. Position Data Transmitter over standoffs in CU and insert screws. Tighten screws to secure Transmitter. Connect wires to TB6 and TB7 in CU.</p> <p>i. Above steps verify time delay circuits. If time delay period has been properly adjusted and nuisance alarms still occur, determine if they are tamper, duress, or intrusion alarms.</p> <p>j. If intrusion alarms occur during entry, replace PC board A10. If intrusion alarms occur during exit, replace PC board A9.</p> <p>(1) To remove PC boards A9 or A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	e. (Cont)	<p>board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC boards A9 or A10, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>k. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p>
	f. Bad TRANSMITTER RESYNC switch.	<p>a. Tag, remove, and isolate Data Transmitter wire from TB7, terminal S-7. Set multimeter to ohms and connect leads to TB7, terminals S-6 and S-7. Meter should indicate over 100, 000 ohms.</p> <p>b. Depress TRANSMITTER RESYNC switch. Meter should indicate 0 ohms.</p> <p>c. If meter indicates more than 100, 000 ohms with switch depressed, connect leads to terminals with red and black wires attached on back of TRANSMITTER RESYNC switch.</p> <p>d. With switch depressed, meter should indicate 0 ohms. With switch released, meter should indicate over 100, 000 ohms.</p> <p>e. If these indications are not correct, replace switch.</p> <p>(1) To remove TRANSMITTER RESYNC switch, turn off switch S1 on power supply. Remove hex nut and push switch through hole in panel. Use</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
2. (Cont)	f.(Cont)	<p>a soldering iron of 50 watts maximum to remove wires from switch terminals.</p> <p>(2) To install new TRANSMITTER RESYNC switch, use a soldering iron of 50 watts maximum to solder wires to switch terminals. Insert switch through hole in panel from rear. Place hex nut over threaded portion of switch and tighten to secure.</p> <p>f. If meter indicates 0 ohms with switch depressed, connect leads to TB7, terminal S-7 and to switch terminal with red wire attached. Meter should indicate 0 ohms.</p> <p>g. If meter indicates more than 100, 000 ohms, inspect wires from TB7, terminal S-7 to J12/P1, pin 23, and from J12/P1, pin 23 to switch (red wire) for broken or loose connections. Resolder any bad connections on P1.</p> <p>h. If meter indicates 0 ohms, connect leads to other switch terminal (black wire) and power supply TB2-4. Meter should indicate 0 ohms.</p> <p>i. If meter indicates more than 100, 000 ohms, inspect wires from switch to J12/P1, pin 34, and from J12/P1, pin 34 to power supply TB2-4 for broken or loose connections. Resolder any loose connections on P1.</p> <p>j. Reconnect Data Transmitter wire to TB7, terminal S-7.</p> <p>k. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
3. Alarm sounds during entry/exit time delay	Improper adjustment of entry/exit time delay	<p>If alarm sounds after entry and before mode switch can be turned to ACCESS, or if alarm sounds after mode switch is turned to SECURE and before exit from secure area, refer to TM5-6350-264-14/1, System Manual, for adjustment of entry or exit time delay.</p> <p style="text-align: center;">NOTE</p> <p>If Data Transmitter is installed, it must be removed to reach TB8-F through TB13-E. Remove screws that secure transmitter and carefully move it aside. Reinstall transmitter after tests.</p>
4. No alarms	a. Bad duress intrusion or tamper switch circuitry.	<p>a. Set multimeter to dc volts and connect negative lead to chassis. Connect positive lead to TP1 (brown) on PC board A1. Disconnect and then reconnect wire on TB8-F-1. Repeat these steps for PC board A2 and TB9-A-1 through PC board A6 and TB13-E-1. Meter should indicate 0 volts with wire connected and 18.5 to 21 vdc with wire disconnected.</p> <p>b. If meter indications are incorrect for any steps, replace the PC board(s) being tested.</p> <p>c. Connect positive meter lead to TP2 (red) on PC board A1. Disconnect and then reconnect wire on TB8-F-3. Repeat these steps for PC board A2 and TB9-A-3 through PC board A6 and TB13-E-3. Meter should indicate 0 volts with wire connected and 18.5 to 21 vdc with wire disconnected.</p> <p>d. If meter indications are incorrect for any steps, replace the PC board(s) being tested.</p> <p>(1) To remove PC board, turn off switch S1 on top of power supply. Place thumb or finger under board</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	a. (Cont)	<p>ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate $20 + 1$ vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p>
4. (Cont)	b. Bad tamper alarm or voltage monitor circuitry.	<p>a. Tag, remove, and isolate Data Transmitter or Monitor Cabinet wires from TB6, terminals S1-D and S1-DR.</p> <p>b. Set multimeter to dc volts and connect positive meter lead to PC board A7-TP1 (brown), and negative lead to chassis (ground). Push TAS plunger all the way in, and then pull plunger all the way out. Meter should indicate less than 0.6 vdc for both switch positions. Depress TAS plunger and then release. Meter should indicate 18.5 to 21 vdc.</p> <p>c. If these meter indications are not correct, turn off switch S1 on top of power supply. Use board ejector to remove</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	b. (Cont)	<p>PC board A7. Set multimeter to ohms and connect meter leads to TAS terminals which have wires attached. Push TAS plunger all the way in, and then pull plunger all the way out. Meter should indicate 0 ohms for both switch positions. Depress TAS plunger and then release. Meter should indicate over 100,000 ohms.</p> <p>d. If these meter indications are not correct, replace TAS.</p> <p>(1) To remove TAS, remove screws that secure TAS to edge of CU housing. Loosen screws that secure crimp lugs to switch.</p> <p>(2) To install new TAS, slip crimp lugs under screw heads marked COM and NO on switch, and tighten screws. Insert switch through hole in edge of housing from the back, and insert screws from the front. Tighten screws to secure switch.</p> <p>e. If meter indications are correct, pull TAS plunger all the way out. Connect meter leads to J7-4 and J7-7. Meter should indicate 0 ohms.</p> <p>f. If meter indicates over 100, 000 ohms, inspect J12/P1, pins 18 and 19 for broken or loose wires. Resolder any bad connections at P1, pins 18 and 19.</p> <p>g. If meter indicates 0 ohms at J7-4 and J7-7, connect a jumper wire in power supply from TB4-3 to TB4-2. Connect meter leads to J7-1 and J7-14. Meter should indicate 0 ohms.</p> <p>h. If meter indicates 0 ohms, replace PC board A7.</p> <p>To install new PC board, turn board so plastic ejector is toward top. Align board with guides at top</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	b. (Cont)	<p>and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>i. If meter indicates over 100, 000 ohms at J7-1 and J7-14, connect meter eads to J7-14 and TB4-3 in power supply. Meter should indicate 0 ohms.</p> <p>j. If meter indicates over 100,000 ohms, inspect J12/P1, pin 17 for broken or loose connections. Resolder any bad connections at P1, pin 17.</p> <p>k. Connect meter leads to J7-1 and TB4-2 in power supply. Meter should indicate 0 ohms.</p> <p>l. If meter indicates over 100, 000 ohms, inspect J12/P1, pin 34 for broken or loose connections. Resolder any bad connections at P1, pin 34.</p> <p>m. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>n. Reconnect Data Transmitter or Monitor Cabinet wires to TB6 S1-D and S1-DR.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	c. Bad tamper circuitry (telephone dialer).	<p>a. Set multimeter to dc volts and connect positive meter lead to PC board A7-TP2 (red), and negative lead to chassis (ground).</p> <p>b. If meter indicates 18.5 to 21 vdc, ensure that there is a jumper between TB7, S-8 and S-9. Set multimeter to ohms and connect leads to TB7, S- and S-9. If meter indicates more than 0 ohms, replace jumper.</p> <p>c. If meter indicates 0 ohms, turn off switch S1 on power supply. Use board ejector to remove PC board A7. Connect meter leads to J7-1 and J7-7.</p> <p>d. If meter indicates more than 100, 000 ohms, inspect J12/P1, pins 19 and 34 for broken or loose wires. Resolder any bad connections at P1, pins 19 and 34.</p> <p>e. If meter indicates 0 ohms at J7-1 and J7-7, replace PC board A7.</p> <p style="padding-left: 40px;">To install new PC board, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>f. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 +1 vdc. Connect positive lead to TB2-S. Meter should indicate</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	<p>c. (Cont)</p> <p>d. Incorrect supply voltage or bad tamper circuitry.</p>	<p>28 +2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>a. Set multimeter to dc volts and connect positive meter lead to PC board A1-TP1 (brown), and negative lead to chassis (ground). Turn mode switch to SECURE and ensure that no alarms are activated. Meter should indicate 18.5 to 21 vdc.</p> <p>b. If meter indicates less than 1 vdc, turn mode switch to ACCESS. Connect positive meter lead to power supply TB2-3. Meter should indicate 20 + 1 vdc. Connect meter lead to TB2-5. Meter should indicate 5 +0.25 vdc. Connect meter lead to TB2-2. Meter should indicate 28 +2 vdc.</p> <p>c. If any of these indications are not correct, turn off switch S1 on power supply. Check wiring for poor or loose connections, broken wires, or frayed insulation. Repair or replace any bad wiring.</p> <p>d. If wiring is good, replace power supply.</p> <p>(1) To remove power supply, pull main, circuit breaker to remove 120 vac from CU. Disconnect wires from battery. As battery is heavy, lift and turn to remove it from bottom of CU enclosure. Tag and disconnect wires from TB2 and TB4. Remove screws that secure cover, and remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop it inside CU. Note cable clamp under screw near TB4 (bottom front). Support power supply and turn it so wires can be tagged and disconnected from TB3 on bottom of power supply.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	d. (Cont)	<p>(2) To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply, and connect wires to TB3. Turn power supply upright and position it over standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first; turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply. TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>e. Set multimeter to dc volts and connect positive meter lead to PC board A1-TP1 (brown), and negative lead to chassis (ground). Turn mode switch to secure and ensure that no alarms are activated. Meter should indicate 18.5 to 21 vdc.</p> <p>f. If meter still indicates less than 1 vdc, turn off switch S1 on power supply. Remove PC board A8. Lift board ejector</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	d. (Cont)	<p>until PC board pops out of receptacle, then grasp board and pull straight out.</p> <p>g. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to TEST/RESET and then to SECURE.</p> <p>h. Set multimeter to dc volts and connect positive meter lead to J8-11, and negative lead to chassis (ground). Ensure that no alarms are activated.</p> <p>i. If meter indicates more than 10 vdc, replace PC board A7.</p> <p>(1) To remove PC board A7, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A7, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>j. If meter indicates less than 1 vdc at J8-11, remove PC board A10 and install PC board A10 and install PC board A8.</p> <p>(1) To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	d. (Cont)	<p>ejector and loft up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To reinstall PC board A8, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>k. Connect positive meter lead to J10-7, and negative lead to chassis (ground).</p> <p>l. If meter indicates more than 10 vdc, replace PC board A8.</p> <p>(1) To remove PC board A8, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A8, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	d. (Cont)	<p>for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>m. If meter indicates less than 1 vdc at J10-7, replace PC board A10.</p> <p>(1) To install new PC board A10, turn off switch S1 on top of power supply, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(2) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>n. Set mode switch to ACCESS. Set multi-meter to dc volts and connect positive lead to PC board A1-TP1 (brown), and negative lead to chassis (ground).</p> <p>o. If meter indicates less than 1 vdc, connect positive meter lead to mode switch (S3), terminal 2-1. Meter should indicate 20 ± 1 vdc.</p> <p>p. If meter indicates less than 0.5 vdc, replace mode switch.</p> <p>(1) To remove mode switch, turn off switch S1 on top of power supply. Remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	d. (Cont)	<p>from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.</p> <p>(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door; slip spacer over lock. Slip switch arm over switch shaft. Ensure that arm is aligned with tang on switch stop. Place large hex nut inside switch mounting bracket; slip bracket over lock. Engage switch shaft in lock. Tighten nut to secure switch.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>q. If meter indicates 20 ± 1 vdc at S3, terminal 2-1, replace PC board A10.</p> <p>(1) To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	d. (Cont)	<p>(2) To install new PC board A10, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>r. Set multimeter to dc volts and connect positive lead to A10, TP1 (brown) and negative lead to chassis. Turn mode switch to SECURE. Ensure that no intrusion or tamper alarms are activated. At power supply, remove fuse F2. Meter should indicate 1 vdc or less. Reinstall F2. Meter should indicate 18.5 to 21 vdc.</p> <p>s. If these indications are not correct, replace PC board A7.</p> <p>(1) To remove PC board A7, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A7, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	d. (Cont)	<p>t. Set multimeter to ohms and connect leads to TB6, terminals S1-D and S1-DR. Press and release TAS.</p> <p>u. If meter indicates less than 2,000 ohms, remove PC board A8.</p> <p>To remove PC board A8, place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>v. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>w. Set meter to dc volts and connect positive leads to J8-11 and negative lead to chassis.</p> <p>x. If meter indicates 1 vdc or less, replace PC board A7.</p> <p>(1) To remove PC board A7, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A7, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	d. (Cont)	<p>for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>y. Connect positive meter lead to J8-11 and negative meter lead to chassis. If meter indicates more than 10 vdc, reinstall PC board A8 and remove A10.</p> <p>(1) To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To reinstall PC board A8, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE'</p> <p>z. Connect positive meter lead to J10-7 and negative meter lead to chassis. Meter should indicate 5 ± 2 vdc.</p> <p>aa. If meter indicates less than 1 or more than 10 vdc, replace PC board A8.</p> <p>(1) To remove PC board A8, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	<p>d. (Cont)</p> <p>e. Bad instantaneous alarm circuitry or bad mode switch.</p>	<p>out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A8, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>a. Turn mode switch S3 to SECURE and ensure that no alarms are activated. Set multimeter to ohms and connect leads to TB6, terminals S1-I and S1-IR. Meter should indicate less than 2,000 ohms.</p> <p>b. Disconnect and then reconnect wire on TB8-F-1. Meter should indicate more than 100,000 ohms and then return to less than 2,000 ohms 10 ±2 seconds after wire is reconnected.</p> <p>c. If meter does not indicate more than 100,000 ohms with wire disconnected from TB8-F-1, replace PC board A9.</p> <p>(1) To remove PC board A9, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A9, turn board so plastic ejector is toward top.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	e. (Cont)	<p>Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>d. Connect meter leads to TB6, terminals S1-I and S1-IR. Meter should indicate less than 2,000 ohms.</p> <p>e. Disconnect and then reconnect wire on TB8-F-1. Meter should indicate more than 100,000 ohms and then return to less than 2,000 ohms 10 ± 2 seconds after wire is reconnected.</p> <p>f. If meter does not indicate more than 100,000 ohms with wire disconnected from TB8-F-1, disconnect and then reconnect wire on TB9-A-1.</p> <p>g. If meter does not indicate more than 100,000 ohms with wire disconnected from TB9-A-1, set meter to dc volts and connect negative lead to chassis. Connect positive lead to mode switch S3, terminal 1-3, and then 1-4. Meter should indicate 18.5 to 21 vdc on both switch terminals.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	e. (Cont)	<p data-bbox="784 344 1312 432">h. If meter indicates 18.5 to 21 vdc on one switch terminal, but not the other, replace mode switch.</p> <p data-bbox="833 468 1304 1035">(1) To remove mode switch, turn off switch S1 on top of power supply. Remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. Tag wires and use soldering iron of 50 watts maximum to remove them from switch terminals.</p> <p data-bbox="833 1071 1336 1671">(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door, and slip spacer over lock. Slip switch arm over switch shaft. Ensure that arm is aligned with tang on switch stop. Place large hex nut inside switch mounting bracket; slip bracket over lock. Engage switch shaft in lock. Tighten nut to secure switch.</p> <p data-bbox="784 1707 1320 1795">i. If both meter indications in step g are correct, turn off switch S1 on top of power supply and remove PC boards</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	<p>e. (Cont)</p> <p>f. Bad LATCH/ NON-LATCH switch or circuitry.</p>	<p>A1 through A6 and A9 and A10. Set multimeter to ohms and connect leads to following points:</p> <p>J9-9 to J12/P1 pin 27, J12/P1 pin 27 to S3 terminal 1-4, S3 terminals 1-2 and 1-3 to J12/P1 pin 6, J12/P1 pin 6 to J2 through J6 pin 8, J9-8 to J1-8, J10-6 to J1-8, J1 through J6 pin 10 to J12/P1 pin 36, J12/P1 pin 36 to power supply TB2-3.</p> <p>Meter should indicate 0 ohms.</p> <p>j. If meter does not indicate 0 ohms at any point, inspect for broken or loose connections. Resolder any bad connections.</p> <p>k. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>a. Turn mode switch S3 to SECURE and ensure that no alarms are activated. Set LATCH/NON-LATCH switch to NON-LATCH. Set multimeter to ohms and connect leads to TB6, terminals S1-D and S1-DR. Meter should indicate less than 2,000 ohms.</p> <p>b. Disconnect and then reconnect wire on TB8-F-1. Meter should indicate more than 100,000 ohms and then return to less than 2,000 ohms 10 +2 seconds after wire is reconnected.</p> <p>c. If meter does not indicate more than 100,000 ohms with wire disconnected from TB8-F-1, set meter to dc volts, connect positive lead to LATCH/NON-LATCH switch S5, terminal 8 (gray wire), and negative lead to chassis.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	f. (Cont)	<p>d. If meter indicates 0 volts, replace PC board A10.</p> <p>(1) To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A10, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>e. If meter indicates 19 ± 2 vdc at S5, terminal 8, connect positive meter lead to S5, terminal 2 (green wire) and then terminal 9 (orange wire).</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	f. (Cont)	<p data-bbox="784 344 1325 432">f. If meter indicates 0 volts at either terminal 2 or 9, replace LATCH/NON-LATCH switch, S5.</p> <p data-bbox="834 468 1300 764">(1) To remove LATCH/NON-LATCH switch, turn off switch S1 on power supply. Remove hex nut and lock washer from switch. Push switch through hole in panel. Catch keyed washer when it drops out. Cut cable ties if necessary to pull switch out. Tag wires and use a soldering iron of 50 watts maximum to remove wires from switch terminals.</p> <p data-bbox="834 800 1300 1220">(2) To install new LATCH/NON-LATCH switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Replace any cable ties that were cut for switch removal. Place keyed washer over switch. Ensure that tang on washer projects forward so it will engage hole in panel under switch hole. Insert switch through hole in panel from the rear. Place lock washer and hex nut over threaded portion of switch, and tighten hex nut to secure switch.</p> <p data-bbox="834 1255 1292 1430">(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p data-bbox="784 1465 1341 1671">g. Turn mode switch S3 to SECURE and ensure that no alarms are activated. Set LATCH/NON-LATCH switch to NON-LATCH. Set multimeter to ohms and connect leads to TB6, terminals S1-D and S1-DR. Meter should indicate less than 2,000 ohms.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	f. (Cont)	<p data-bbox="786 344 1325 491">h. Disconnect and then reconnect wire on TB8-F-1. Meter should indicate more than 100,000 ohms and then return to less than 2,000 ohms 10 '2 seconds after wire is reconnected.</p> <p data-bbox="786 527 1325 642">i. If meter does not indicate more than 100,000 ohms with wire disconnected from TB8-F-1, replace PC boards A8 and A9.</p> <p data-bbox="834 678 1325 915">(1) To remove PC boards A8 and A9, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p data-bbox="834 951 1325 1220">(2) To install new PC boards A8 and A9, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p data-bbox="834 1255 1325 1430">(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p data-bbox="786 1465 1325 1640">j. Turn mode switch to SECURE. Set LATCH/NON-LATCH switch S5 to LATCH. Set multimeter to ohms and connect leads to TB6, terminals S1-D and S1-DR. Meter should indicate less than 2,000 ohms.</p> <p data-bbox="786 1675 1325 1791">k. Remove and then reconnect wire on TB8-F-1. Meter should indicate more than 100,000 ohms until mode switch is turned to RESET.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	f. (Cont)	<p data-bbox="784 344 1321 527">l. If meter does not indicate more than 100,000 ohms with wire removed from TB8-F-1, set multimeter to dc volts and connect positive lead to S5, terminal 4 (yellow wire), and negative lead to chassis.</p> <p data-bbox="784 558 1321 646">m. If meter indicates 0 volts, replace status processor interconnecting wiring sub-assembly (SPIWS).</p> <p data-bbox="833 678 1321 1161">(1) To remove status processor interconnecting wiring subassembly (SPIWS) turn off switch S1 on power supply. Tag and disconnect Data Transmitter wires from TB6 and TB7. Remove screws that secure Transmitter to standoffs in CU. Be careful not to drop Transmitter inside CU. Remove Data Transmitter. Loosen screws that secure plug P1 to bottom of status processor. Pull plug P1 straight down to disconnect it. Remove screws that secure status processor to top of CU enclosure and it will drop straight down.</p> <p data-bbox="833 1192 1321 1581">(2) To install new status processor interconnecting wiring subassembly (SPIWS), position it under standoffs in top of CU. Insert screws and tighten to secure status processor. Insert plug P1 into connector on bottom of processor and push up. Tighten screws to secure plug P1. Position Data Transmitter over standoffs in CU and insert screws. Tighten screws to secure Transmitter. Connect wires to TB6 and TB7 in CU.</p> <p data-bbox="784 1612 1321 1701">n. If meter indicates 19 ± 2 vdc, connect positive lead to S5 orange wire, center terminal, terminal 5.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	f. (Cont)	<p data-bbox="786 344 1325 401">o. If meter indicates 0 volts, replace LATCH/ NON-LATCH switch, S5.</p> <p data-bbox="834 436 1299 764">(1) To remove LATCH/NON-LATCH switch, turn off switch S1 on power supply. Remove hex nut and lock washer from switch. Push switch through hole in panel. Catch keyed washer when it drops out. Cut cable ties if necessary to pull switch out. Tag wires and use a soldering iron of 50 watts maxi- mum to remove wires from switch terminals.</p> <p data-bbox="834 800 1292 1220">(2) To install new LATCH/NON-LATCH switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Replace any cable ties that were cut for switch removal. Place keyed washer over switch. Ensure that tang on washer projects forward so it will engage hole in panel under switch hole. Insert switch through hole in panel from the rear. Place lock washer and hex nut over threaded portion of switch; tighten hex nut to secure switch.</p> <p data-bbox="834 1255 1292 1430">(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p data-bbox="786 1465 1349 1640">p. Turn mode switch to SECURE. Set LATCH/ NON-LATCH switch, S5, to LATCH. Set multimeter to ohms and connect leads to TB6, terminals S1-D and S1-DR. Meter should indicate less than 2,000 ohms.</p> <p data-bbox="786 1675 1317 1793">q. Remove and then reconnect wire on TB8-F-1. Meter should indicate more than 100,000 ohms until mode switch is turned to RESET.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	f. (Cont)	<p>r. If meter does not indicate more than 100,000 ohms with wire removed from TB8-F-1, replace PC board A10.</p> <p>(1) To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A10, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>s. Turn off switch S1 on top of power supply. Remove PC boards A8, A9, and A10. Set multimeter to ohms and connect leads to following points:</p> <p>J10-18 to S5 terminal 8 (gray wire), S5 terminal 9 (orange wire) to J8-5, J8-6 to J9-C, J10-L to S5 terminal J9-D to S5 terminal 5 (orange wire, center terminal), 2 (green wire).</p> <p>Meter should indicate 0 ohms.</p> <p>t. If meter does not indicate 0 ohms at any point, inspect for broken or loose connections. Resolder any bad connections.</p> <p>u. Turn on switch S1 on top of power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	g. Bad Audible Alarm Circuitry	<p style="text-align: center;">NOTE</p> <p>Ensure that there is no jumper from TB4-1 to TB4-4. Disconnect AA wire from TB4-3. Disconnect green wire from TB4-1. Connect jumper from TB4-3 to TB4-4.</p> <ol style="list-style-type: none"> a. Turn mode switch to TEST/RESET. Set multimeter to dc volts and connect positive lead to power supply TB4-1 and negative lead to TB4-2. b. If meter indicates less than 1 vdc, connect positive meter lead to mode switch S3, terminal 3-2, and negative lead to chassis. c. If meter indicates less than 1 vdc, inspect wiring from mode switch S3, terminal 3-2 to power supply TB2-5 for loose or broken connections. Resolder any bad connections. d. If meter indicates 5 +0.25 vdc, connect positive meter lead to S3, terminal 3-4. e. If meter indicates less than 1 vdc, replace mode switch, S3. <p>(1) To remove mode switch, turn off switch S1 on top of power supply. Remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	g. (Cont)	<p>(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door, slip spacer over lock. Slip switch arm over switch shaft. Ensure that arm is aligned with tang on switch stop. Place large hex nut inside switch mounting bracket, and slip bracket over lock. Engage switch shaft in lock. Tighten nut to secure switch.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RE-SYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	g. (Cont)	<p data-bbox="784 344 1317 464">f. If meter indicates 5 ± 0.25 vdc at S3, terminal 3-2, remove leads and set multimeter to ohms. Remove PC board A10.</p> <p data-bbox="833 495 1208 768">To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p data-bbox="784 800 1308 856">g. Connect meter leads to S3, terminal 3-4, and J10-11.</p> <p data-bbox="784 888 1317 1066">h. If meter indicates more than 100,000 ohms, inspect wires from S3, terminal 3-4 to J12/P1 pin 32 to J10-11 for loose or broken connections. Resolder any bad connections on P1.</p> <p data-bbox="784 1098 1308 1155">i. If meter indicates 0 ohms, connect leads to J10-R and power supply TB4-1.</p> <p data-bbox="784 1186 1284 1339">j. If meter indicates more than 100,000 ohms, inspect wires from J10-R to J12/P1 pin 30 to TB4-1 for loose or broken connections. Resolder any bad connections on P1.</p> <p data-bbox="784 1371 1308 1491">k. If meter indicates 0 ohms, connect leads to S3, terminal 3-4 and J10-4. Turn mode switch S3 to SECURE and then to ACCESS.</p> <p data-bbox="784 1522 1308 1701">l. If meter indicates less than 2,000 ohms in SECURE and more than 100,000 ohms in ACCESS, and if there is a jumper wire from S3, terminal 3-1 to terminal 3-3, replace mode switch S3.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	g. (Cont)	<p>m. If meter indicates more than 100,000 ohms, with mode switch in SE-CURE, connect meter leads to S3, terminals 3-4 and 3-3, and then terminals 3-4 and 3-1.</p> <p>n. If meter indicates more than 100,000 ohms, replace mode switch S3.</p> <p>(1) To remove mode switch, remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.</p> <p>(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door; slip spacer over lock. Slip switch arm over switch shaft. Ensure that arm is aligned with tang</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	g. (Cont)	<p>on switch stop. Place large hex nut inside switch mounting bracket; slip bracket over lock. Engage switch shaft in lock. Tighten nut to secure switch.</p> <p>o. If meter indicates 0 ohms, inspect wires from S-3, terminal 3-3 and 3-1 to J12/P1 pin 33 to J10-4 for loose or broken connections. Resolder any bad connections on P1.</p> <p>p. If meter indicates 0 ohms from S-3, terminal 3-4 to J10-4, connect meter leads to J10-5 and power supply TB2-5.</p> <p>q. If meter indicates 0 ohms, replace PC board A10.</p> <p>To install new PC board A10, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>r. If meter indicates meter indicates more than 100,000 ohms, inspect wires from S3, terminal 3-4 to J12/P1, pin 28 to J10-5. Resolder any bad connections.</p> <p>s. Reconnect jumper wire between power supply TB4-1 and 4. Reconnect interconnecting wire from AA to TB4-3. Remove jumper wire from TB4-3 and 4.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	g. (Cont)	<p>t. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>u. Set multimeter to dc volts. Connect positive lead to A10, TP1 (brown), and negative lead to chassis (ground).</p> <p>v. If meter indicates 18.5 to 21 vdc, remove PC board A8.</p> <p>(1) To remove PC board A8, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn Mode switch to TEST/RESET and then to SECURE.</p> <p>w. Connect positive meter lead to J8-11 and negative meter lead to chassis. If meter indicates less than 1 vdc, replace PC board A7.</p> <p>(1) To remove PC board A7, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	g. (Cont)	<p>(2) To install new PC board A7, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>x. If meter indicates more than 10 vdc at J8-11, remove PC board A10 and reinstall A8.</p> <p>(1) To remove PC board A10, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To reinstall PC board A8, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
4. (Cont)	g. (Cont)	<p>y. Connect positive meter lead to J10-7 and negative meter lead to chassis. If meter indicates less than 1 vdc, replace PC board A8. If meter indicates more than 10 vdc, replace PC board A10.</p> <p>(1) To remove PC board A8, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A8 or A10, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p>
5. Improper operation of SECURE/ACCESS mode.	a. Improper adjustment of entry/exit time delay.	<p>If alarm sounds after entry and before mode switch can be turned to ACCESS, or if alarm sounds after mode switch is turned to SECURE and before exit from secure area, refer to TM 5-6350-264-14/1, System Manual, for adjustment of entry or exit time delay.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
5. (Cont)	b. Bad SECURE/ACCESS identification circuitry.	<p>a. Tag, remove, and isolate Data Transmitter or Monitor Cabinet wires from TB6, terminals S-2 and S-2R. Turn mode switch S3 to SECURE. Set multi-meter to ohms and connect leads to TB6, terminals S-2 and S-2R.</p> <p>b. If meter indicates less than 2,000 ohms, replace PC board A8.</p> <p>c. Turn mode switch to TEST/RESET and back to SECURE. Meter should indicate less than 2,000 ohms for 4.5 to 6 seconds.</p> <p>d. If meter indicates less than 2,000 ohms for less than 4.5 or more than 6 seconds. Replace PC board A8.</p> <p>(1) To remove PC board A8, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A8, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
5. (Cont)	b. (Cont)	<p>to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>e. If meter does not indicate less than 2,000 ohms, set multimeter to dc volts and connect positive meter lead to mode switch S3, terminal 2-2 and negative meter lead chassis. Turn mode switch to ACCESS.</p> <p>f. If meter indicates 0 volts, replace mode switch.</p> <p>g. Connect positive meter lead to S3, terminal 2-1 and negative meter lead to chassis. Turn mode switch to TEST/RESET.</p> <p>h. If meter indicates 0 volts, replace mode switch.</p> <p>(1) To remove mode switch, turn off switch S1 on top of power supply. Remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
5. (Cont)	b. (Cont)	<p>(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door; slip spacer over lock. Slip switch arm over switch shaft. Ensure that arm is aligned with the tang on switch stop. Place large hex nut inside switch mounting bracket; slip bracket over lock. Engage switch shaft in lock. Tighten nut to secure switch.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>i. If meter indicates 20 ± 1 vdc on both terminals 2-2 and 2-1 on S3, replace PC board A8.</p> <p>(1) To remove PC board A8, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
5. (Cont)	b. (Cont)	<p>(2) To install new PC board A8, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>j. Set multimeter to ohms and connect leads to TB6 S-2 and S-2R. Turn mode switch to SECURE. Meter should indicate more than 100,000 ohms. Turn mode switch to TEST/RESET and then to SECURE. Meter should indicate less than 2,000 ohms for 4.5 to 6 seconds, and then indicate over 100,000 ohms.</p> <p>k. If any of these indications are not correct, turn off switch S1 on power supply. Remove PC boards A8, A9, and A10. Set multimeter to ohms and connect leads to following points:</p> <p style="padding-left: 40px;">TB6 S-2 to J12/P1 pin 22 J12/P1 pin 22 to J8-3 TB6 S-2R to J12/P1 pin 41 J12/P1 pin 41 to J8-2 J8-15 to J12/P1 pin 21 J12/P1 pin 21 to S3 terminal 2-2 J10-H to J12/P1 pin 16 J12/P1 pin 16 to S3 terminal 2-3</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
5. (Cont)	b. (Cont)	<p>J9-3 to J12/P1 pin 21 J12/P1 pin 21 to S3 terminal 2-2 J9-13 to J12/P1 pin 16 J12/P1 pin 16 to S3 terminal 2-3</p> <p>Meter should indicate 0 ohms.</p> <p>l. If meter does not indicate 0 ohms at any point, inspect for broken or loose connections. Resolder any bad connections.</p> <p>m. Reconnect Data Transmitter or Monitor Cabinet wires to TB6, terminals S-2 and S-2R.</p>
6. Improper operation of TEST/RESET mode.	Improper operation of audible signal device.	<p>a. Turn mode switch to TEST/RESET. Press and release CU TAS. Audible signal device should sound. Turn mode switch to ACCESS and then to TEST/RESET. Audible signal device should continue to sound for 10 ±2 seconds and then stop.</p> <p>b. If audible signal device sounds for less than 8 or more than 12 seconds, replace PC board A9.</p> <p>(1) To remove PC board A9, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A9, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
6. (Cont)	Improper operation of audible signal device. (Cont)	<p>c. If audible signal device does not sound, set multimeter to dc volts and connect positive meter lead to power supply TB3-3 and negative meter lead to TB34.</p> <p>d. If meter indicates 18.5 to 21 vdc, replace power supply.</p> <p>(1) To remove power supply, pull main circuit breaker to remove 120 vac from CU. Disconnect wires from battery. As battery is heavy, lift and turn to remove it from bottom of CU enclosure. Tag and disconnect wires from TB2 and TB4. Remove screws that secure cover, and remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop it inside CU. Note cable clamp under screw near TB4 (bottom front). Support power supply and turn it so wires can be tagged and disconnected from TB3 on bottom of power supply.</p> <p>(2) To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply, and connect wires to TB3. Turn power supply upright and position it over standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first; turn and lower it into</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
6. (Cont)	Improper operation of audible signal device. (Cont)	<p data-bbox="930 344 1289 432">bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker.</p> <p data-bbox="836 464 1300 1005">(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p data-bbox="789 1037 1268 1094">e. If meter indicates 0 volts, remove PC board A8.</p> <p data-bbox="836 1125 1317 1367">(1) To remove PC board A8, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p data-bbox="836 1398 1300 1761">(2) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
6. (Cont)	Improper operation of audible signal device. (Cont)	<p>lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>f. Connect positive meter lead to J8-14 and negative meter lead to chassis. If meter indicates 5 ± 0.25 vdc, replace PC board A8.</p> <p>To install new PC board A8, turn off switch S1 on power supply. Turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight out until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>g. If meter indicates less than 1 vdc at J8-14, replace PC board A9.</p> <p>(1) To remove PC board A9, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A9, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
6. (Cont)	Improper operation of audible signal device. (Cont)	<p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>h. Turn mode switch to TEST/RESET. Press and release CU TAS. Audible signal device should sound. Turn mode switch to ACCESS and then to TEST/RESET. Audible signal device should continue to sound for 10 ±2 seconds, and then stop.</p> <p>i. If audible signal device still does not perform properly, turn off switch S1 on power supply. Remove PC boards A8 and-A9. Set multimeter to ohms and connect leads to the following points:</p> <p style="padding-left: 40px;">TB3-3 to audible signal device positive terminal; TB3-4 to audible signal device negative terminal; TB3-3 to mode switch, terminal 2-2; TB3-4 to J12/P1 pin 38; J12/P1 pin 38 to J8-13; J8-14 to J9-R.</p> <p style="padding-left: 40px;">Meter should indicate 0 ohms.</p> <p>j. If meter does not indicate 0 ohms at any point, inspect wires for broken or loose connections. Resolder any bad connections.</p> <p style="text-align: center;">NOTE</p> <p>If Data Transmitter is installed, it must be removed to reach TB8-F through TB13-E. Remove screws that secure transmitter and carefully move it aside. Reinstall transmitter after tests.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
7. Improper operation of ACCESS mode.	Bad PC board A8, or mode switch S3.	<p>a. Turn mode switch to ACCESS. Set multimeter to dc volts and connect positive lead to terminals 7 and negative lead to terminal 6 on TB9-A, and TB10-B, and TB11-C, and TB12-D, and TB13-E in turn. Meter should indicate 28 ± 2 vdc on each terminal board.</p> <p>b. If meter indications are not correct on some terminal boards, turn off switch S1 on power supply. Remove PC board A8. Lift board ejector until board pops out of receptacle and then pull board straight out. Set multimeter to ohms and connect leads to chassis and terminal 6 on terminal boards where voltage was incorrect. Meter should indicate 0 ohms. Connect meter leads to J8-17 and terminal 7 of terminal board where voltage was incorrect. Meter should indicate 0 ohms.</p> <p>(1) If meter does not indicate 0 ohms when connected to terminal 6, inspect jumper wires from terminal 6 to 5 to 2 and wires to ground for broken or loose connections.</p> <p>(2) If meter does not indicate 0 ohms when connected to terminal 7, inspect wires from terminal 7 to J12/P1 pin 24 to J8-17 for broken or loose connections. Resolder any bad connections on P1.</p> <p>c. If meter indications are correct on all terminal boards, turn off switch S1 on power supply. Remove PC board A8. Lift board ejector until board pops out of receptacle and then pull board straight out.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
7. (Cont)	Bad PC board A8, or mode switch S3. (Cont)	<p>d. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>e. Set multimeter to dc volts and connect positive lead to J8-18 and negative lead to chassis. Meter should indicate 28 ± 2 vdc.</p> <p>(1) If meter indication is not correct at J8-18, connect positive meter lead to power supply TB2-2. Meter should indicate 28 ± 2 vdc.</p> <p>(2) If meter does not indicate 28 ± 2 vdc at TB2-2, replace power supply.</p> <p>(3) To remove power supply, pull main circuit breaker to remove 120 vac from CU. Disconnect wires from battery. As battery is heavy, lift and turn it to remove from bottom of CU enclosure. Tag and disconnect wires from TB2 and TB4. Remove screws that secure cover; remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop it inside CU. Note cable clamp under screw near TB4 (bottom front). Support power supply and turn it</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
7. (Cont)	Bad PC board A8, or mode switch S3. (Cont)	<p>so wires can be tagged and disconnected from TB3 on bottom of power supply.</p> <p>(4) To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply and connect wires to TB3. Turn power supply upright and position it over standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first; turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker.</p> <p>(5) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
7. (Cont)	Bad PC board A8, or mode switch S3. (Cont)	<p>(6) If meter indication is correct, turn off switch S1 on power supply. Set meter to ohms and connect leads to TB2-2 and J8-18. Meter should indicate 0 ohms.</p> <p>(7) If meter does not indicate 0 ohms, inspect wires from TB2-2 to J12/P1 pin 26 to J8-18 for broken, loose, or bad connections on P1.</p> <p>f. If meter indicates 28 ± 2 vdc at J8-18, connect positive meter lead to J8-16 and negative lead to chassis. Meter should indicate 18.5 to 21 vdc.</p> <p>(1) If meter indication is correct, replace PC board A8.</p> <p>(2) To install new PC board A8, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>g. If meter does not indicate 18.5 to 21 vdc at J8-16, connect positive meter lead to mode switch S3, terminal 2-1 and negative meter lead to chassis. Meter should indicate 20 ± 2 vdc.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
7. (Cont)	Bad PC board A8, or mode switch S3. (Cont)	<p data-bbox="786 344 1284 401">h. If meter indicates 0 v, connect positive lead to S3, terminal 2-4.</p> <p data-bbox="786 436 1260 493">i. If meter indicates 20 ± 2 vdc, replace mode switch S3.</p> <p data-bbox="834 529 1300 1157">(1) To remove mode switch, turn off switch S1 on top of power supply. Remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.</p> <p data-bbox="834 1192 1300 1766">(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door; slip spacer over lock. Slip switch arm over switch shaft. Ensure that arm is aligned with tang on switch stop. Place large hex nut inside switch mounting</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
7. (Cont)	Bad PC board A8, or mode switch S3. (Cont)	<p data-bbox="927 344 1284 436"> bracket; slip bracket over lock. Engage switch shaft in lock. Tighten nut to secure switch. </p> <p data-bbox="834 464 1279 674"> (3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE. </p> <p data-bbox="786 709 1284 802"> j. If meter indicates 0 v at switch S3, terminal 2-4, connect positive meter lead to power supply TB2-3. </p> <p data-bbox="786 829 1263 856"> k. If meter indicates 0 v, check fuse F2. </p> <p data-bbox="786 888 1252 915"> l. If F2 is good, replace power supply. </p> <p data-bbox="834 951 1317 1556"> (1) To remove power supply, pull main circuit breaker to remove 120 vac from CU. Disconnect wires from battery. As battery is heavy, lift and turn it to remove from bottom of CU enclosure. Tag and disconnect wires from TB2 and TB4. Remove screws that secure cover, and remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop it inside CU. Note cable clamp under screw near TB4 (bottom front). Support power supply and turn it so wires can be tagged and disconnected from TB3 on bottom of power supply. </p> <p data-bbox="834 1585 1292 1766"> (2) To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply, and connect wires to TB3. Turn power supply upright and position it over </p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
7. (Cont)	Bad PC board A8, or mode switch S3. (Cont)	<p>standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first; turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>m. If meter indicates 20 ± 1 vdc at TB2-3, turn off switch S1 on power supply. Set multimeter to ohms and connect leads to TB2-3 and S3, terminal 2-4. Meter should indicate 0 ohms.</p> <p>n. If meter does not indicate 0 ohms, inspect wires from TB2-3 to S3, terminal 2-4, for broken or loose connections. Resolder any bad connections.</p> <p>5-99</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
7. (Cont)	Bad PC board A8, or mode switch S3. (Cont)	<p>o. To reinstall PC board A8, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>p. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p>
8. Improper intrusion alarm identification.	Bad alarm identification circuitry.	<p>a. Open CU door and pull TAS plunger all the way out. Note which light emitting diode (LED) is lighted. If the only LED lighted is for sensor monitoring entrance, secure entrance. Turn mode switch to SECURE and then to TEST/RESET.</p> <p style="text-align: center;">NOTE</p> <p>If motion sensors are used near CU, remain motionless to avoid setting off false alarms.</p> <p>The audible signal device will normally stop sounding 10 ±2 seconds after CU has been reset. If the audible signal device continues to sound and there are no LEDs lighted, this indicates a tamper alarm. If a LED is lighted, it will indicate which sensor or group of sensors has been activated. LEDs A through E indicate intrusion alarms and LED F indicates a duress alarm (Latching Alarm Switch).</p> <p style="text-align: right;">5-100</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p>b. Turn mode switch to SECURE and then to TEST/RESET. Set multimeter to dc volts. Connect positive meter lead to A1-TP1 (brown) and negative lead to chassis (ground). Note meter indication. Connect positive meter lead to A1-TP2, red, and negative lead to chassis (ground). Note meter indication. Repeat these steps for PC boards A2, A3, A4, A5, and A6. A meter indication of 18.5 to 21 vdc on any TP1 indicates an intrusion alarm condition for the sensor or group of sensors connected to that PC board. A meter indication of 18.5 to 21 vdc on any TP2 indicates a tamper alarm condition for the sensor or group of sensors connected to that PC board. A meter indication of less than 0.5 vdc means no alarm.</p> <p>c. Set multimeter to dc volts and connect positive meter lead to PC board A7-TP1 (brown), and negative lead to chassis (ground). Push TAS plunger all the way in, and then pull plunger all the way out. Meter should indicate less than 0.5 vdc for both switch positions. Depress TAS plunger and then release. Meter should indicate 18.5 to 21 vdc.</p> <p>d. Set meter to dc volts and connect negative lead to chassis. Connect positive lead to TP1 (brown), on PC board A1 through A6, in turn. If an intrusion alarm is indicated by 18.5 to 21 vdc on any TP1, inspect LEDs. If wrong LED is lighted, or if no LEDs are lighted, connect positive meter lead to each of seven gold pins on PC board A12. If meter indicates 20 vdc on bottom pin, and 0 volts on other six pins, replace PC board A12.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p>(1) To remove PC board A12, turn off switch S1 on top of power supply. Place thumb or finger under board ejector on A11 and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out. Carefully pull A11 and A12 apart.</p> <p>(2) To install new PC board A12, align sockets on A12 with pins on A11. Carefully press board together until pins are fully engaged in sockets. Ensure that pins on A11 are not bent or otherwise damaged. Turn PC board A11 so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle on P1.</p> <p>e. If meter indicates 0 volts on bottom pin, remove PC board A11 and connect positive meter lead to J11-17.</p> <p>(1) If meter indicates 0 volts, turn off switch S1 on power supply. Set meter to ohms and connect leads to power supply TB2-3 and J12/P1 pin 36, and then to J12/P1 pin 36 and J11-17. Meter should indicate 0 ohms.</p> <p>(2) If meter does not indicate 0 ohms, inspect wires for broken or loose connections. Resolder any bad connections on P1.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p data-bbox="786 344 1260 432">f. If meter indicates 20 vdc at J11-17, replace faulty PC boards A11 or A12.</p> <p data-bbox="834 466 1325 768">(1) To remove PC boards A11 and A12, turn off switch S1 on top of power supply. Place thumb or finger under board ejector on A11 and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out. Carefully pull A11 and A12 apart.</p> <p data-bbox="834 798 1292 1281">(2) To install new PC board A11 and A12, align sockets on A12 with pins on A11. Carefully press boards together until pins are fully engaged in sockets. Ensure that pins on A11 are not bent or otherwise damaged. Turn PC board A11 so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p data-bbox="834 1310 1292 1764">(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action						
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p>should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>g. Connect negative meter lead to chassis and positive meter lead to TP1 on each PC board, A1 through A6. If voltage at TP1 on any PC board is 18.5 to 21 vdc, then the same voltage should be present on associated A12 pin. Terminals on J11 are associated with PC boards as follows:</p> <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td></td><td style="text-align: center;">J11</td><td style="text-align: center;">A12</td></tr> <tr> <td style="text-align: center;">CARD NO.</td><td style="text-align: center;">PIN NO.</td><td style="text-align: center;">PIN NO.</td></tr> </table> <p>A1-TP1 to J1-6 to J11-16 to A12-F A2-TP1 to J2-6 to J11-18 to A12-A A3-TP1 to J3-6 to J11-14 to A12-B A4-TP1 to J4-6 to J11-12 to A12-C A5-TP1 to J5-6 to J11-4 to A12-D A6-TP1 to J6-6 to J11-2 to A12-E</p> <p>If voltage is not present on A12, turn off switch S1 on power supply. Remove PC board A11.</p> <p>(1) To remove PC board A11, turn off switch S1 on top of power supply. Place thumb or finger under board ejector on A11 and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p>		J11	A12	CARD NO.	PIN NO.	PIN NO.
	J11	A12						
CARD NO.	PIN NO.	PIN NO.						

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p data-bbox="836 344 1300 615">(3) Connect negative meter lead to chassis and positive meter lead to J11 terminal associated with PC board which had voltage on TP1. If voltage is not present on J11, turn off switch S1 on top of power supply and remove PC board which had voltage on TP1.</p> <p data-bbox="883 646 1300 888">(a) To remove PC boards A1 through A6, as applicable, place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p data-bbox="883 919 1300 1098">(b) Set multimeter to ohms and connect leads to applicable terminal 6 of PC board receptacle and J11 terminal. Meter should indicate 0 ohms.</p> <p data-bbox="787 1129 1279 1220">h. If meter indicates 0 ohms, install new PC board A1 through A6 as applicable.</p> <p data-bbox="883 1251 1292 1766">To install new PC boards A1 through A6 as applicable, note that these boards are identical and may be installed in any slot, 1 through 6. Turn PC board so that plastic board ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle. Turn on switch S1 on top of power supply. Depress TRANSMITTER RESYNC switch S2. Wait</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p>about 5 minutes for system to stabilize. Turn mode switch to SECURE and then TEST/RESET.</p> <p>i. If meter does not indicate 0 ohms, replace status processor interconnecting wiring subassembly.</p> <p>(1) To remove status processor, turn off switch S1 on power supply. Tag and disconnect Data Transmitter wires from TB6 and TB7. Remove screws that secure Transmitter to stand-offs in CU. Be careful not to drop Transmitter inside CU. Remove Data Transmitter. Loosen screws that secure plug P1 to bottom of status processor. Pull plug P1 straight down to disconnect it. Remove screws that secure status processor to top of CU enclosure and it will drop straight down.</p> <p>(2) Remove PC boards A1 through A12 from status processor by placing thumb or finger under board ejector and lift up until board pops out of receptacle.</p> <p>(3) Install PC boards A1 through A12 in new status processor interconnecting wiring subassembly. Ensure that pins on all PC boards are not bent or otherwise damaged. Turn PC boards so plastic ejectors are toward top. Align boards with guides at top and bottom of status processor. Slide boards straight in until they contact receptacles at back of processor. Then press firmly on boards until they seat completely in receptacle.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p>(4) To install new status processor, position it under standoffs in top of CU. Insert screws and tighten to secure status processor. Insert plug P1 into connector on bottom of processor, and push up. Tighten screws to secure plug P1. Position Data Transmitter over standoffs in CU and insert screws. Tighten screws to secure Transmitter. Connect wires to TB6 and TB7 in CU.</p> <p>(5) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>j. Remove PC board A12. Set multimeter to ohms. Connect negative lead to chassis. Connect positive lead to whichever gold pin on board A11 is associated with PC board where 18.5 to 21 vdc was present on TP1. Meter should indicate 1,500 to 3,000 ohms after alarm ceases. Turn mode switch to TEST/RESET and then SECURE. After expiration of time delay period, meter should indicate more than 100,000 ohms. If indications are correct, replace A12. If indications are not correct, replace A11.</p> <p>(1) To remove PC boards A11 and A12, turn off switch S1 on top of power supply. Place thumb or finger under board ejector on A11 and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out. Carefully pull A11 and A12 apart.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p>(2) To install new PC board A11 and A12, align sockets on A12 with pins on A11. Carefully press boards together until pins are fully engaged in sockets. Ensure that pins on A11 are not bent or otherwise damaged. Turn PC board A11 so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>k. Remove PC boards A11 and A12. Set multimeter to dc volts and connect leads to J11-8 (+) and chassis (-). After expiration of time delay, if meter indicates 0 volts, replace PC board A9.</p> <p>(1) To remove PC board A9, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p>until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC board A9, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.</p> <p>l. Turn mode switch to SECURE. Connect positive meter lead to J11-10. Meter should indicate 20 ± 1 vdc. Turn mode switch to TEST/RESET, and then to ACCESS. Meter should indicate 0 volts.</p> <p>m. If meter indicates 20 ± 1 vdc with switch in TEST/RESET position, turn mode switch to ACCESS. Connect positive meter lead to mode switch S3, terminal 2-3. If meter indicates 20 ± 1 vdc, turn off switch S1 on power supply. Use a soldering iron of 50 watts maximum to disconnect wire from S3, terminal 2-3. Isolate wire and turn on switch S1.</p> <p>n. Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>5-109</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p data-bbox="787 344 1304 436">o. Turn mode switch to ACCESS. If meter indicates 20 ± 1 vdc at S3, terminal 2-3, replace mode switch S3.</p> <p data-bbox="834 495 1312 1129">(1) To remove mode switch, turn off switch S1 on top of power supply. Remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose switch arm because it is not secured to switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.</p> <p data-bbox="834 1161 1307 1822">(2) To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that the tang on switch stop engages notch in mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door; slip spacer over lock. Slip switch arm over switch shaft. Ensure that arm is aligned with tang on switch stop. Place large hex nut inside switch mounting bracket; slip bracket over lock. Engage switch shaft in lock. Tighten unit to secure switch.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch 2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>p. Turn mode switch to ACCESS. If meter indicates 0 volts at S3, terminal 2-3, connect positive meter lead to wire removed from terminal 2-3. If meter indicates 20 ± 1 vdc on wire, replace status processor.</p> <p>(1) To remove status processor, turn off switch S1 on power supply. Tag and disconnect Data Transmitter wires from TB6 and TB7. Remove screws that secure Transmitter to standoffs in CU. Be careful not to drop Transmitter inside CU. Remove Data Transmitter. Loosen screws that secure plug P1 to bottom of status processor. Pull plug P1 straight down to disconnect it. Remove screws that secure status processor to top of CU enclosure and it will drop straight down.</p> <p>(2) To install new status processor, position it under standoffs in top of CU. Insert four screws and tighten to secure status processor. Insert plug P1 into connector on bottom of processor, and push up. Tighten screws to secure plug P1. Position Data Transmitter over standoffs in CU and insert screws. Tighten screws to secure Transmitter. Connect wires to TB6 and TB7 in CU.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	<p>q. Use a soldering iron of 50 watts maximum to reconnect wire to S3, terminal 2-2.</p> <p>r. Turn on switch S1 on power supply. Depress TRANSMITTER RE-SYNC switch S2. Wait about 5 minutes for system to stabilize. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>s. Inspect LEDs on PC board A12. If more than one LED is lighted, ensure that sensors are not in an alarm condition. Turn mode switch to TEST/RESET and then to SECURE. One at a time, disconnect and then reconnect wires on terminal 1 on terminal strips TB8-F through TB13-E. When wire is disconnected from TB8-F, LED F on top of PC board A12 should light immediately. If a time delay period is used, other LEDs will not light immediately after wire is disconnected from associated terminal strip. After each wire is disconnected, only LED associated with that terminal strip should light. If wrong LED, or if more than one LED lights, replace PC boards A9 and A11.</p> <p>(1) To remove PC boards A9 and A11, turn off switch S1 on top of power supply. Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out.</p> <p>(2) To install new PC boards A9 and A11, turn board so plastic ejector is toward top. Align board with guides at top and bottom of status processor.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
8. (Cont)	Bad alarm identification circuitry. (Cont)	Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle.
9. Improper AC indications.	a. Bad AC Power indicator lamp, DS1.	<p>a. Ensure switch S1 on CU power supply is on.</p> <p>b. Set multimeter to ac volts and connect leads to terminals on back of AC POWER indicator lamp. Meter should indicate 6.3 ± 1 vac.</p> <p>c. If voltage indication is correct, replace AC POWER indicator lamp, DS1.</p> <p>(1) To remove AC POWER indicator lamp, unscrew plastic lens from front side of door. Grasp lamp, press in, rotate counter-clockwise, and pull out.</p> <p>(2) To install new AC POWER indicator lamp, insert it in socket, press in, and rotate clockwise until it locks in place. Put plastic lens over lamp, and screw in place.</p>
	b. Bad ac line fuse, power supply, or no ac power	<p>a. Carefully remove power supply cover. Set multimeter to ac volts and connect leads to power supply TB5-1 and 2.</p> <p>b. If meter indicates 0 volts, connect meter leads to TB1-1 and 2. If meter indicates 115 vac, replace ac line fuse F1.</p> <p>(1) To remove fuse F1, turn off switch S1 on top of power supply. Grasp knob on top of fuse holder and unscrew about 1/4 turn. Pull knob straight out; fuse will come with it. Pull fuse out of knob.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
9. (Cont)	b. (Cont)	<p>(2) To install new fuse F1, insert end of fuse into knob from fuse holder. Insert other end of fuse into holder, push down on knob, and screw in about 1/4 turn to lock.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>c. If meter indicates less than 110 volts on TB1, inspect main circuit breaker. If circuit breaker is tripped, ensure that there is no voltage on wires and inspect for faulty wiring from circuit breaker to CU power supply TB1-1 and 2. Repair faulty wiring.</p> <p>d. Turn on main circuit breaker. Connect meter leads to TB1-1 and 2 in power supply. If meter indicates less than 110 volts, notify facility personnel. Ensure that system is operating properly on battery power.</p> <p>5-114</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
9. (Cont)	b. (Cont)	<p>e. If meter indicates 0 v on TB2, replace power supply.</p> <p>(1) To remove power supply, pull main circuit breaker to remove 120 vac from CU. Disconnect wires from battery. As battery is heavy, lift and turn it to remove from bottom of CU enclosure. Tag and disconnect wires from TB2 and TB4. Remove screws that secure cover, and remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop it inside CU. Note cable clamp under screw near TB4 (bottom front). Support power supply and turn it so wires can be tagged and disconnected from TB3 on bottom of power supply.</p> <p>(2) To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply, and connect wires to TB3. Turn power supply upright and position it over standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first; turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
9. (Cont)	<p>b. (Cont)</p> <p>c. Bad ac presence circuitry.</p>	<p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>a. Tag, remove, and isolate Data Transmitter or Monitor Cabinet wires from TB6 and TB7. Set multimeter to ohms and connect leads to TB6, terminal S-3 and TB7, terminal S-3R. If AC POWER indicator light DS1 is on, meter should indicate less than 2,000 ohms. If indicator light DS1 is off, meter should indicate more than 100,000 ohms.</p> <p>b. If meter indications are not correct, turn off switch S1 on power supply. Connect meter leads to TB3-1 and TB6, terminal S-3, and then to TB3-2 and TB7, terminal S-3R.</p> <p>c. If meter indicates more than 100,000 ohms, inspect wires for broken or loose connections. Resolder any bad connections.</p> <p>5-116</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
9. (Cont)	c. (Cont)	<p>d. If meter indicates 0 ohms, replace power supply.</p> <p>(1) To remove power supply, pull main circuit breaker to remove 120 vac from CU. Disconnect wires from battery. As battery is heavy, lift and turn it to remove from bottom of CU enclosure. Tag and disconnect wires from TB2 and TB4. Remove screws that secure cover, and remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop it inside CU. Note cable clamp under screw near TB4 (bottom front). Support power supply and turn it so wires can be tagged and disconnected from TB3 on bottom of power supply.</p> <p>(2) To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply, and connect wires to TB3. Turn power supply upright and position it over standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first; turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
9. (Cont)	c. (Cont)	<p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RESYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p> <p>e. Reconnect Data Transmitter or Monitor Cabinet wires to TB6 and TB7.</p>
10. Improper battery operation.	a. Battery bad or discharged.	<p>If facility ac power is off for 12 to 24 hours, set multimeter to dc volts. Connect leads to battery terminals, positive to red and negative to black. If meter indicates less than 21 vdc, replace battery.</p> <p>(1) To remove battery, turn off switch S1 on power supply. Disconnect wires from battery terminals. As battery is heavy, carefully lift and turn to remove it from bottom of enclosure.</p> <p>(2) To install new battery, position it outside CU enclosure. Carefully insert battery, end first, turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Turn on switch S1 on power supply. Connect meter leads to battery terminals. Meter should indicate 28 ± 2 vdc. Depress TRANSMITTER RESYNC</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
10. (Cont)	a. (Cont)	<p>switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p>
	b. Bad battery charger circuit.	<p>a. Set multimeter to dc volts and connect leads to battery terminals, positive to red and negative to black. Meter should indicate 28 ± 2 vdc.</p> <p>b. If meter does not indicate 28 ± 2 vdc, disconnect wires from battery. Ensure that they do not touch anything. Connect meter leads to these wires, positive to red and negative to black. Meter should indicate 28 ± 2 vdc.</p> <p>c. If this indication is not correct, replace power supply.</p> <p>(1) To remove power supply, pull main circuit breaker to remove 120 vac from CU. Disconnect wires from battery. As battery is heavy, lift and turn it to remove from bottom of CU enclosure. Tag and disconnect wires from TB2 and TB4. Remove screws that secure cover, and remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop it inside CU. Note cable clamp under screw</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
10. (Cont)	b. (Cont)	<p>near TB4 (bottom front). Support power supply and turn it so wires can be tagged and disconnected from TB3 on bottom of power supply.</p> <p>(2) To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply, and connect wires to TB3. Turn power supply upright and position it over standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first; turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker.</p> <p>(3) Turn on switch S1 on power supply. Depress TRANSMITTER RE-SYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive TB2-5. Meter should 5 ± 0.25 vdc. Connect TB2-2. Meter should 28 ± 2 vdc. Turn mode TEST/RESET and SECURE.</p>

Table 5-2. Troubleshooting Procedures - Continued

Trouble	Probable cause	Corrective action
10. (Cont)	b. (Cont)	<p>d. If meter indicates 28 ± 2 vdc, replace battery.</p> <p>(1) To remove battery, turn off switch S1 on power supply. Disconnect wires from battery terminals. As battery is heavy, carefully lift and turn to remove it from bottom of enclosure.</p> <p>(2) To install new battery, position it outside CU enclosure. Carefully insert battery end first; turn and lower it into bottom of CU enclosure. Connect wires to battery terminals. Turn on switch S1 on power supply. Connect meter leads to battery terminals. Meter should indicate 28 ± 2 vdc. Depress TRANSMITTER RE-SYNC switch S2. Wait about 5 minutes for system to stabilize. During 5-minute stabilization period, check power supply. Set multimeter to dc volts and connect negative lead to chassis (ground). Connect positive lead to power supply, TB2-3. Meter should indicate 20 ± 1 vdc. Connect positive lead to TB2-5. Meter should indicate 5 ± 0.25 vdc. Connect lead to TB2-2. Meter should indicate 28 ± 2 vdc. Turn mode switch to TEST/RESET and then to SECURE.</p>

Section III. GENERAL MAINTENANCE

5-5. MAINTENANCE ACTION. The extent of direction and general support maintenance is governed by the Maintenance Allocation Chart (MAC), Appendix B. The MAC authorizes on-site test and replacement of the AC POWER indicator lamp, battery, power supply, fuse F1, status processor, PC boards in status processor, LATCH/ NON-LATCH toggle switch,

RESYNC pushbutton switch, connector receptacle, and tamper alarm switch (TAS). The MAC also authorizes on-site inspection and replacement of the mode switch, battery, interconnecting wiring assembly in the status processor, and the terminal board assembly. Periodic testing of the Control Unit is not scheduled because the J-SIIDS is maintained in continuous operation.

Section IV. REMOVAL AND REPLACEMENT OF MAJOR COMPONENTS AND ASSEMBLIES

5-6. REMOVAL AND INSTALLATION PROCEDURES.

- a. To remove AC POWER indicator lamp, unscrew the plastic lens from the front side of the door. Grasp the lamp, press in, rotate to the left, and pull out.
- b. To install new AC POWER indicator lamp, insert it in socket, press in, and rotate to the right until it locks into place. Put plastic lens over lamp and screw in place.
- c. To remove battery, turn off switch S1 on power supply. Disconnect and insulate wires from battery terminals. As battery is heavy, carefully lift and turn it to remove from bottom of CU enclosure.
- d. To install a new battery, position it outside CU enclosure. Carefully insert battery, end first, turn and lower into bottom of CU enclosure. Connect wires to battery terminals. Turn on switch S1 on power supply.
- e. To remove power supply, turn off switch S1 on top of power supply. Pull main circuit breaker to remove 120 vac from CU. Disconnect wires from battery.

Carefully (battery is heavy) lift and turn battery to remove it from bottom of CU enclosure. Tag and disconnect wires from TB2 and TB4. Remove screws that secure cover, and remove cover. Tag and disconnect wires from TB1. Carefully remove screws that secure power supply to side of CU enclosure. Be careful not to drop power supply inside CU. Note cable clamp under screw near TB4 (bottom front). Support power supply and turn it so wires can be tagged and disconnected from TB3 on the bottom of power supply. Remove power supply.

- f. To install new power supply, remove cover, and turn unit so TB3 is accessible. Support power supply and connect wires to TB3. Turn power supply upright and position it over standoffs on side of CU enclosure. Note that cable clamp goes under screw on bottom front of power supply. Insert screws and tighten to secure power supply. Connect wires to TB1. Replace cover and secure with screws. Connect wires to TB2 and TB4. Position battery outside CU enclosure. Carefully insert battery end first, turn, and lower it into bottom of CU enclosure. Connect wires to battery terminals. Switch on main circuit breaker. Turn on switch S1 on top of power supply.

- g. To remove fuse F1I, turn off switch S1 on top of power supply. Grasp knob on top of fuse holder and unscrew about 1/4-turn. Pull knob straight out; fuse will come with it. Pull fuse out of knob.
- h. To install new fuse, insert end of fuse into knob of fuse holder. Insert other end of fuse into holder, push down on knob, and screw in about 1/4-turn to lock. Turn on switch S1 on top of power supply.
- i. To remove status processor, turn off switch S1 on top of power supply. Tag and disconnect Data Transmitter wires from TB6 and TB7. Remove screws that secure Transmitter to standoffs in CU. Be careful not to drop Transmitter inside CU. Remove Data Transmitter. Loosen two screws that secure plug P1 to bottom of status processor. Pull plug P1 straight down to disconnect it. Remove screws that secure status processor to top of CU enclosure and it will drop straight down.
- j. To install new status processor, position it under standoffs in top of CU. Insert screws and tighten to secure status processor. Insert plug P1 into connector on bottom of processor, and push up. Tighten screws to secure plug P1. Position Data Transmitter over standoffs in CU and insert screws. Tighten screws to secure Transmitter. Connect wires to TB6 and TB7 in CU. Turn on switch S1 on top of power supply.
- k. To remove PC boards from status processor, turn off switch S1 on top of power supply. To remove board A1 through A11, place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out. To remove board A12, CAREFULLY pull straight out to unplug it from PC board A11. Ensure that pins on A11 are not bent or otherwise damaged.
- l. To install new PC boards A1 through A11, note that boards A1 through A6 are identical and may be installed in any slot, one through six. Each of these boards are marked A1, 2, 3, 4, 5, 6. PC boards A7 through A11 are all different and each board is keyed to fit only in the correct slot. These boards are marked A7, or A8, or A9, or A10, or A11. Turn all PC boards so that plastic board ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle. To install a new A12 PC board, remove board A11. Align sockets on board with pins on PC board A11. CAREFULLY press A12 until pins are fully engaged in sockets. Ensure that pins on A11 are not bent or otherwise damaged. Install PC board A11. Turn on switch S1 on top of power supply.
- m. To remove LATCH/NON-LATCH switch turn off switch S1 on top of power supply. Remove hex nut and lock washer from switch. Push switch through hole in panel. Catch keyed washer when it drops out. It may be necessary to cut one or two cable ties in order to pull switch out far enough to disconnect wires. Tag wires and use a soldering iron of 50 watts maximum to remove wires from switch terminals.
- n. To install new LATCH/NON-LATCH switch, see figure 5-3 for switch terminal and wire identification. Use a soldering iron of 50 watts maximum to connect wires to switch terminals. Replace any cable ties that were removed for switch removal. Place keyed washer over switch. Ensure that tang on washer projects forward so it will engage hole in panel under switch hole. Insert switch through hole in panel from the rear. Place lock washer and hex nut over threaded portion of switch, and tighten hex nut to secure switch. Turn on switch S1 on top of power supply.

- o. To remove TRANSMITTER RESYNC switch, turn off switch S1 on top of power supply. Remove hex nut and push switch through hole in panel. Use a soldering iron of 50 watts maximum to remove wires from switch terminals.
- p. To install new TRANSMITTER RESYNC switch, solder wires to switch terminals with a soldering iron of 50 watts maximum. Insert switch through hole in panel from the rear. Place hex nut over threaded portion of switch, and tighten to secure. Turn on switch S1 on top of power supply.
- q. To remove tamper alarm switch (TAS) assembly, remove screws that secure TAS to edge of housing. To disconnect wires from switch, loosen screws that secure crimp lugs to switch.
- r. To install new TAS, slip crimp lugs under screw heads on switch, and tighten screws. Insert switch from the back through hole in edge of housing, and insert screws from the front. Tighten screws to secure switch.
- s. To remove connector receptacle J12, turn off switch S1 on top of power supply. Remove screws that secure connector to bottom of status processor and unplug connector by pulling straight down. Remove locking devices from ends of connector. Remove two screws that secure junction shell to cable, and slide shell along cable to expose pins on back of J12. Tag wires. Slide shrink tubing on each wire away from connector pin. Use a soldering iron of 50 watts maximum and carefully unsolder wires from pins.
- t. To install new connector receptacle J12, check heat-shrink tubing on each wire in cable, and replace if necessary. Work from the center outward with a soldering iron of 50 watts maximum. Carefully solder wires to pins on back of connector. Slide heat-shrink tubing down over each pin after soldering. Slide junction shell along cable to cover connector J12. Slip locking devices over ends of shell/connector to secure shell to connector. Insert and tighten screws that secure shell to cable. Align connector receptacle J12 with plug P1 on bottom of status processor and press J12 into P1. Insert screws that hold J12, and tighten to secure. Turn on switch S1 on top of power supply.
- u. To remove mode switch, turn off switch S1 on top of power supply. Remove large hex nut that secures switch mounting bracket to inside of CU door. Remove switch and mounting bracket together. Be careful not to lose the switch arm which is not secured to the switch shaft. Remove spacer and lock from door so no items will be lost. Remove small hex nut and lock washer that secures mounting bracket and switch stop to the switch shaft. Remove mounting bracket and switch stop. Note that mode switch is a three deck switch. See figure 5-3 for switch terminal and wire identification. Tag wires and use a soldering iron of 50 watts maximum to remove them from switch terminals.
- v. To install new mode switch, use a soldering iron of 50 watts maximum to connect wires to switch terminals. Slip mounting bracket and switch stop over switch shaft. Ensure that notch in mounting bracket fits over tab on switch body, and that tang on switch stop engages notch in mounting bracket. Secure bracket and stop to switch with lock washer and small hex nut. Insert lock through hole in CU door, and slip spacer over lock. Slip switch arm over switch shaft. Ensure that arm is aligned with tang on switch stop. Place large hex nut inside switch mounting bracket, and slip bracket over lock. Engage switch shaft in lock. Tighten nut to secure switch. Turn on switch S1 on top of power supply.
- w. To remove the interconnecting wiring assembly from the status processor, turn off switch S1 on top of power supply. Remove PC boards A1 through A11.

- Place thumb or finger under board ejector and lift up until board pops out of receptacle at back of status processor. Then grasp PC board and pull straight out. Tag and disconnect Data Transmitter wires from TB6 and TB7. Remove screws that secure Data Transmitter to standoffs inside CU. Be careful not to drop Transmitter inside CU. Remove Transmitter. Loosen captive screws that secure connector receptacle J12 to bottom of status processor and disconnect J12. Remove screws that secure status processor to top of CU and gently lower it straight down to remove. Remove screws that secure cover and case to the receptacle brackets. Identify switch terminals and use a soldering iron of 50 watts maximum to remove wires from LATCH/NON-LATCH and TRANSMITTER RESYNC switches. Remove nuts that secure plug P1 to bottom of status processor. Remove screws that secure card receptacles to receptacle brackets. Remove interconnecting wiring assembly (PC board, card receptacles, plug P1, cable) as a unit.
- x. To install a new interconnecting wiring assembly, insert screws that secure card receptacles to receptacle brackets, and tighten screws to secure. Insert plug P1 into slot in bottom of status processor and secure with nuts. Use a soldering iron of 50 watts maximum to solder wires to LATCH/NON-LATCH and TRANSMITTER RESYNC switches. Put case and cover in place and insert screws that secure them to receptacle brackets. Tighten screws to secure. Place status processor in position against top of CU and insert screws to secure it in place. Align connector receptacle J12 with plug P1 on bottom of status processor and press it into place. Tighten screws to secure connector to plug. Position Data Transmitter over standoffs in CU. Insert screws and tighten to secure Transmitter. Connect Data Transmitter wires to TB6 and TB7. Note that PC boards A1 through A6 are identical and may be installed in any slot, one through six. Each of these boards are marked A1, 2, 3, 4, 5, 6. PC boards A7 through A11 are different and each board is keyed to fit only in the correct slot. These boards are marked A7, or A8, or A9, or A10, or A11. Turn all PC boards so that plastic board ejector is toward top. Align board with guides at top and bottom of status processor. Slide board straight in until it contacts receptacle at back of processor. Then press firmly on board until it seats completely in receptacle. Install A12 board before installing All board. Align sockets on A12 with pins on All board. CAREFULLY press PC board A12 until pins are fully engaged in sockets. Ensure that pins on A11 are not bent or otherwise damaged. Install PC board A11. Turn on switch S1 on power supply.
- y. To remove terminal board assembly, tag and disconnect wires from terminal boards TB8-F, TB9-A, TB10-B, TB11-C, TB12-D, and TB13-E. Remove screws that secure assembly to CU and remove assembly.
- z. To install new terminal board assembly, position assembly over standoffs in CU. Insert screws and tighten to secure terminal board assembly. Connect wires to terminal boards TB8-F, TB9-A, TB10-B, TB11C, TB12-D and TB13-E.
- aa. After replacement of major components or assemblies, test the CU for proper operation as follows:
- (1) Turn mode switch on CU to ACCESS, open CU door, and pull Tamper Alarm Switch (TAS) plunger all the way out. Turn mode switch to TEST/RESET and then to SECURE. Monitor Cabinet should indicate a secure condition.
 - (2) If an Ultrasonic Motion Sensor (UMS) is installed near the CU, ensure that it does not cause an alarm to be activated when a secure condition is desired. Create an alarm

condition (by activating a nearby sensor). After expiration of the time delay period, the Monitor Cabinet should indicate an alarm condition.

- (3) Remove cause of alarm, turn mode switch to TEST/RESET and then to SECURE. At the Monitor Cabinet, go to the Status Monitor Module with alarm lights flashing and move reset switch to ACK and then to RESET. Monitor Cabinet should indicate a secure condition.
- (4) Turn mode switch to ACCESS. Monitor Cabinet should indicate an access condition.
- (5) Remove ac power fuse F1 from CU power supply. AC POWER indicator

lights on Monitor Cabinet should change from on-steady to flashing, and the audible signal device should sound.

- (6) Move reset switch on Status Monitor Module to ACK. Indicator lights should go out and audible signal device should be silenced.
- (7) Reinstall ac power fuse F1 in CU power supply. AC POWER indicator lights should flash and the audible signal device should sound.
- (8) Move reset switch on Status Monitor Module to ACK. AC POWER indicator lights should change from flashing to on-steady and the audible signal device should be silenced.

CHAPTER 6

REPAIR OF THE CONTROL UNIT

This chapter is not applicable to this equipment.

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
TB 5-4200-200-10 | Hand Portable Fire Extinguishers Approved for
Army Users |
| 3. | MAINTENANCE
DA PAM 738-750 | 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/E 121
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 Processor,
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/E 121
DT546 M9442
AIR FORCE T.O. 31S9-2FSS9-1-4 | Detector, Vibration Signal and Processor, Vibration
Signal |
| | TM 5-6350-264-14&P-5
NAVELEX EE181-AA-OMI-060/E121
SA-1955
AIR FORCE T.O. 31S9-2FSS9-1-5 | Switch, Balanced Magnetic |
| | TM 5-6350-264-14&P-6
NAVELEX EE181-AA-OMI-070/E121
DT-545
AIR FORCE T.O. 31S9-2FSS9-1-6 | Sensor, Grid Wire |
| | TM 5-6350-264-14&P-7
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/E 121
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/E 121
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/E 121
DT-547
AIR FORCE T.O. 31S9-2FSS9-1-13

Sensor, Magnetic Weapons (DT-547)

TB 5-6350-264
NAVELEX EE181-AB-OMI-010/E121
J-SIIDS
AIR FORCE T.O. 31S9-4-1-111

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 |

A-3/(A-4 blank)

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. GENERAL.

- a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.
- b. Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.
- c. Section III lists the special tools and test equipment required for each maintenance function as referenced from Section II.
- d. Section IV contains supplemental instructions or explanatory notes for a particular maintenance function. (Not Applicable)

B-2. MAINTENANCE FUNCTIONS. Maintenance functions are defined as follows:

- a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.
- b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.
- c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean, to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

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

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

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

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

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

i. Repair. The application of maintenance services (inspect, test service, adjust, align, calibrate, or replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, 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 prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

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

B-3. Column Entries.

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

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

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

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

complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate "work time" figures will be shown for each level. The number of man-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. 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 CONTROL UNIT (C-9412)

[illegible]

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

for

Control Unit (C-9412)

(1)	(2)	(3)	(4)	(5)
REFERENCE CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL/ STOCK NUMBER(NSN)	TOOL NUMBER
1. 2.	F D	Multimeter Oscilloscope	6625-00-019-0815 6625-00-127-0079	Vom 475

B-5/(B-6 blank)

**ORGANIZATIONAL, DIRECT SUPPORT, AND
GENERAL SUPPORT MAINTENANCE
REPAIR PARTS AND SPECIAL TOOLS LIST**

Section I. INTRODUCTION

1. **SCOPE.** This RPSTL lists and authorizes spares and 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 Alarm Set, Control Unit Model C-9412/FSS-9 (V). 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.** In addition to this section, Introduction, 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 item name sequence. Repair parts kits are listed separately in their own functional group within Section II. Repair parts for repairable special tools are also listed in this section. Items listed are shown on the associated illustration(s)/figure(s).

b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE column) for the performance of maintenance.

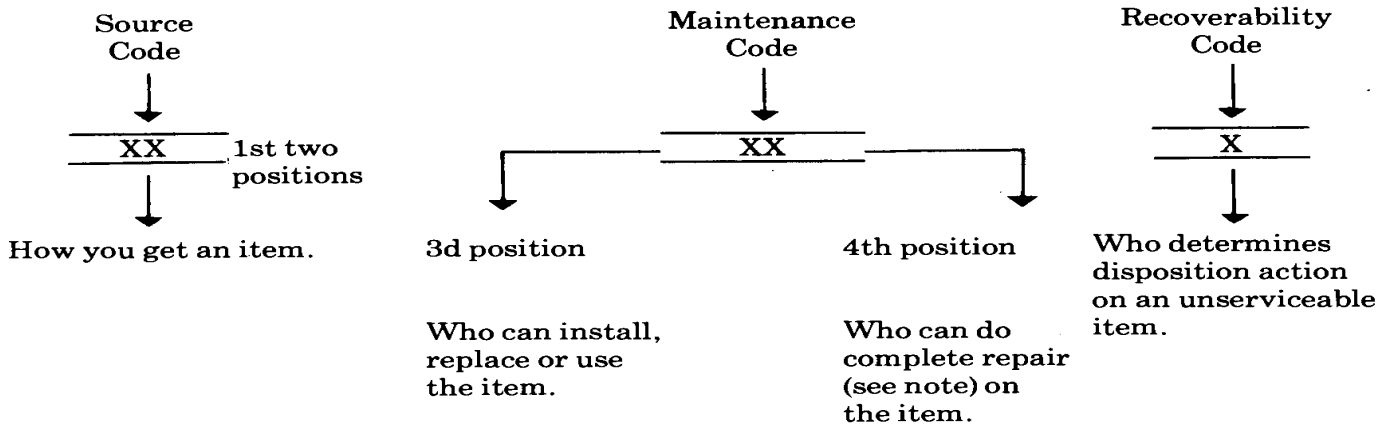
c. Section IV. National Stock Number and Part Number Index. A list, in National item identification number (NIIN) sequence, of all National stock numbered items appearing in the listing, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers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

3. **EXPLANATION OF COLUMNS (SECTIONS II AND III).**

a. ITEM NO. (Column (1)). 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 instruction, as shown in the following breakout:

Change 1 C-1



*Complete Repair: Maintenance capacity, capability, and authority to perform all 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 to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follows:

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. **NOTE: Items coded PC are subject to deterioration.
KD KF KE	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.

Code	Explanation
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 the part number in the DESCRIPTION and USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in the RPSTL. 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 level, order the item from the higher level 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 level 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 items are assembled at a higher level, order the item from the higher level of maintenance.

Code	Explanation
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 tells you the level(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 level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following levels 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 level can remove, replace, and use the item.
H	-General support level can remove, replace, and use the item.
L	-Specialized repair activity can remove, replace, and use the item.
D	-Depot level can remove, replace, and use the item.

- (b)** The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level 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 level 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 level that can do complete repair of the item.
F	-Direct support or aviation intermediate is the lowest level that can do complete repair of the item.

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

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

Recoverability Codes	Application/Explanation
Z	-Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3d position of SMR Code.
O	-Reparable item. When uneconomically reparable, condemn and dispose of the item at organizational or aviation unit level.
F	-Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or aviation intermediate level.
H	-Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D	-Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
L	-Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A	-Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. FSCM (Column (3)). 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.

d. PARTNUMBER (Column (4)). 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 a NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. DESCRIPTION AND USABLE ON CODE (UOC) (Column (5)). 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, e.g., Phy Sec C1 - 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) Part numbers for bulk materials are referenced in this column in the line item entry for the item to be manufactured/fabricated.
- (6) When the item is not used with all serial numbers of the same model, the effective serial numbers are shown on the last line(s) of the description (before UOC).
- (7) The usable on code, when applicable (see paragraph 5, 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.
- (9) The statement "END OF FIGURE" appears just below the last item description in Column 5 for a given figure in both Section II and Section III.

f. QTY (Column (6)). The QTY (quantity per figure column) 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 the quantity is variable and may vary from application to application.

4. EXPLANATION OF COLUMNS (SECTION IV).

a. NATIONAL STOCK NUMBER (NSN) INDEX.

- (1) **STOCK NUMBER column.** This column lists the NSN by National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN, i.e.

NSN
(5305-01-574-1467).
NIIN

When using this column to locate an item, ignore the first 4 digits of the NSN. However, the complete NSN should be used when ordering items by stock number.
- (2) **FIG. column.** This column lists the number of the figure where the item is identified/located. The figures are in numerical order in Section II and Section III.
- (3) **ITEM column.** The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. PARTNUMBER INDEX. Part numbers in this index are listed by part number in ascending alphanumeric sequence (i.e., vertical arrangement of letter and number combination which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

- (1) **FSCM column.** The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.
- (2) **PART NUMBER column.** Indicates the primary number used by the manufacturer (individual, 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.
- (3) **STOCK NUMBER column.** This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and FSCM columns to the left.
- (4) **FIG. column.** This column lists the number of the figure where the item is identified/located in Sections II and III.
- (5) **ITEM column.** The item number is that number assigned to the item as it appears in the figure referenced in adjacent figure number column.

5. **SPECIAL INFORMATION.** The usable on code appears in the lower left corner of the Description column heading. Usable on codes are shown as "UOC: " in the Description Column (justified left) on the first line applicable item description/nomenclature. Uncoded items are applicable to all models.

6. **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 assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.
- (2) **Second.** Find the figure covering the assembly group or subassembly group to which the item belongs.
- (3) **Third.** Identify the item on the figure and note the item number.
- (4) **Fourth.** Refer to the Repair Parts List for the figure to find the part number for the item number noted on the figure.
- (5) **Fifth.** Refer to the Part Number Index to find the NSN, if assigned.

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 (see 4a(1)). The part numbers in the Part Number index are listed in ascending alphanumeric sequence (see paragraph 4b). Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.
- (2) **Second.** After finding the figure and item number, verify that the item is the one you are looking for, then locate the item number in the repair parts list for the figure.

7. **ABBREVIATIONS.** Abbreviations used in this manual are listed in MIL-STD-12.

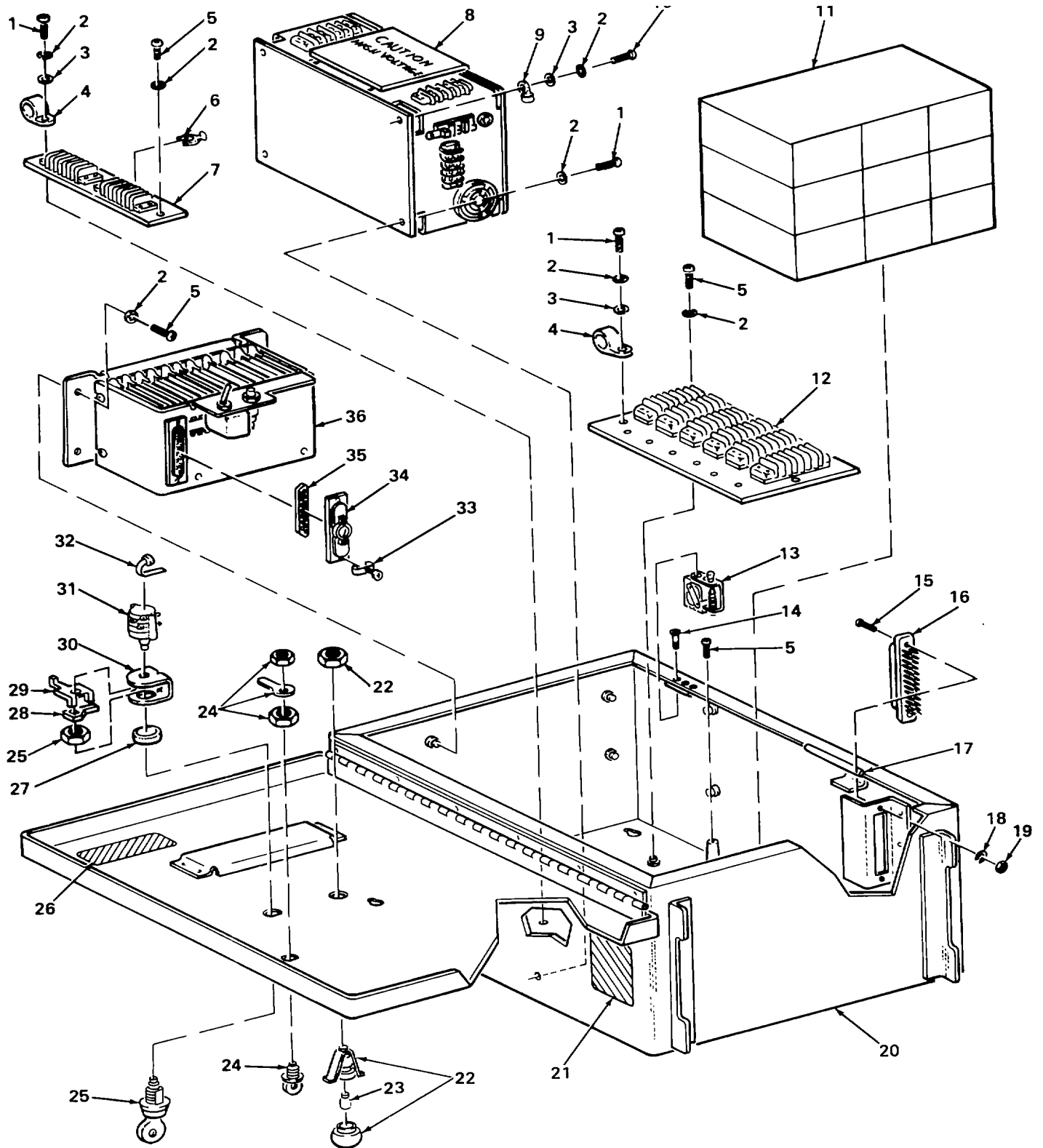


Figure C-1. Control Unit, Alarm Set C-9412/FSS-9 (V) (Sheet 1 of 4)

Change 1 C-7

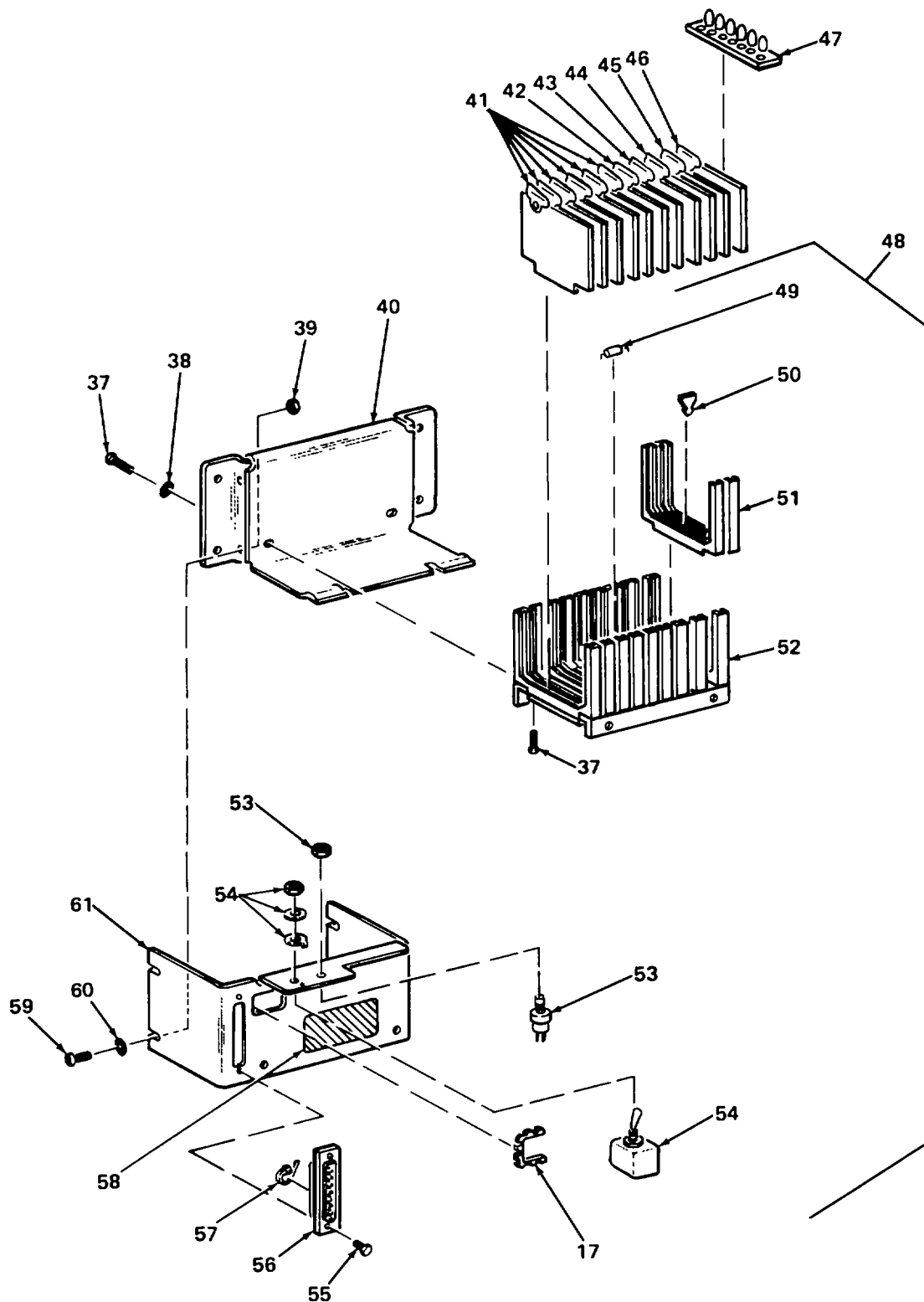


Figure C-1. Control Unit, Alarm Set C-9412/FSS-9 (V) (Sheet 2 of 4)

Change 1 C-8

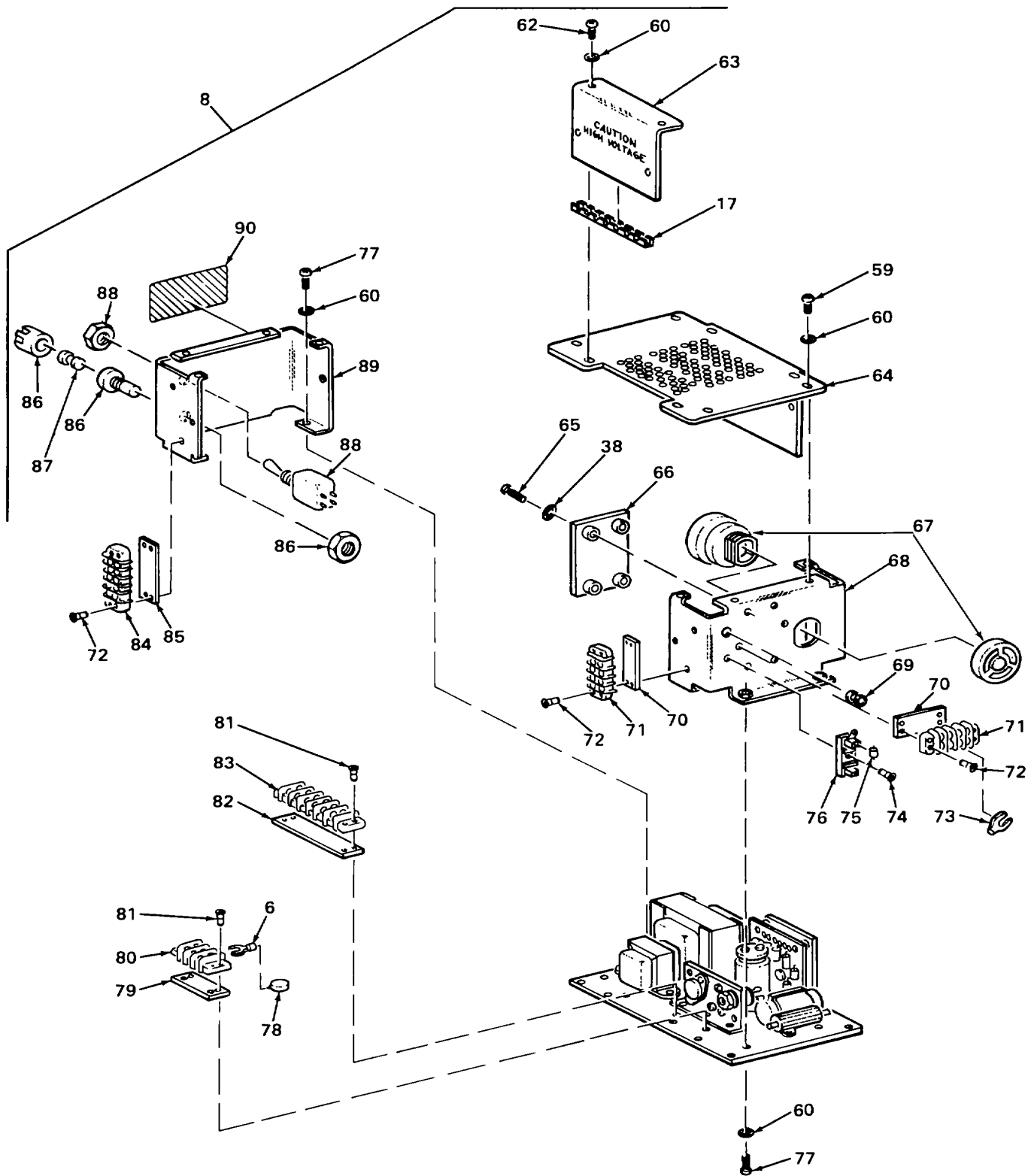


Figure C-1. Control Unit, Alarm Set C-9412/FSS-9 (V) (Sheet 3 of 4)

Change 1 C-9

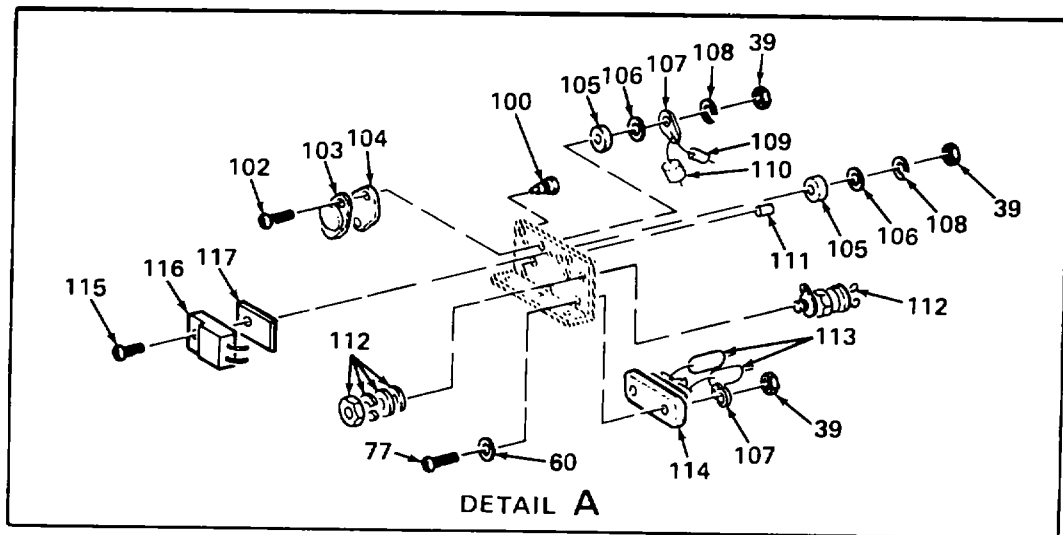
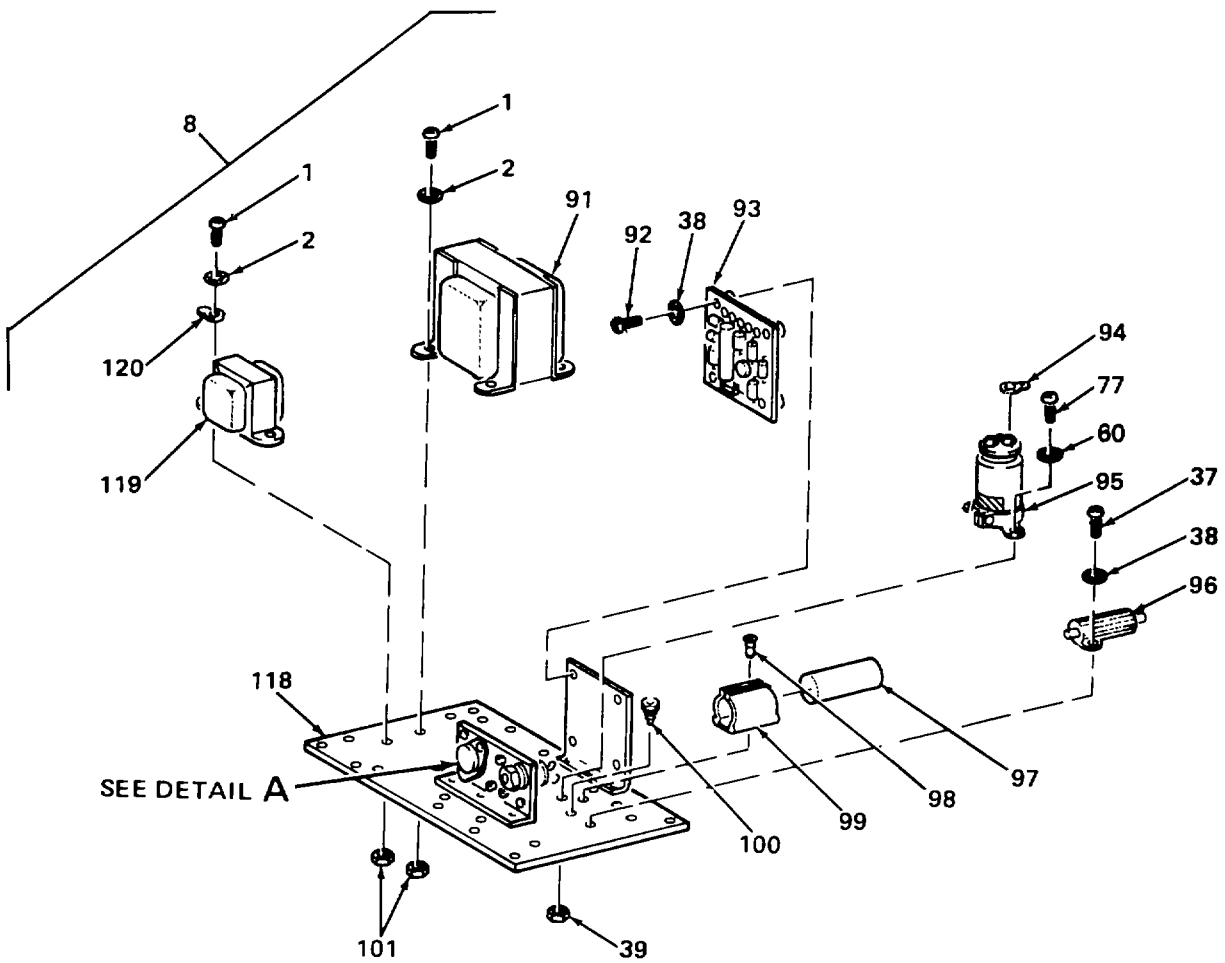


Figure C-1. Control Unit, Alarm Set C-9412/FSS-9 (V) (Sheet 4 of 4)

Change 1 C-10

Section II.

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
				GROUP 01 CONTROL UNIT	
				FIG. C-1 CONTROL UNIT, ALARM SET C-9412/ FSS-9(V)	
1	PAFZZ	96906	MS35206-245	SCREW,MACHINE,PAN	5
2	PAFZZ	96906	MS35333-38	WASHER,LOCK	6
3	PAFZZ	96906	MS27183-7	WASHER,FLAT	3
4	XBFZZ	97403	13220E3621-3	CLAMP,CABLE	2
5	PAFZZ	96906	MS35206-243	SCREW,MACHINE,PANHEAD	11
6	XDFZZ	97403	13220E3829-1	TERMINAL,RED	61
7	PAFZZ	97403	13220E4203	BARRIER STRIPS A-F	1
8	PAFFF	97403	13220E4202	CONTROL UNIT,POWER REPLACED BY NSN 6350-01-189-5345,PN 13226E1152,FSCM 97403	1
9	XBFZZ	97403	13220E3621-2	CLAMP,CABLE	1
10	PAFZZ	96906	MS35206-246	SCREW,MACHINE,PNH	1
11	PCFZZ	97403	13220E4208	BATTERY,STORAGE	1
12	XBFZZ	97403	13220E4204	BARRIER SUBASSY,BARRIER STRIP	1
13	PAFZZ	96906	MS16106-1	SWITCH ASSY	1
14	PAFZZ	96906	MS35190-234	SCREW,MACHINE,FLAT	2
15	PAFZZ	96906	MS35206-217	SCREW,MACHINE,PNH	2
16	PAFZZ	97403	13220E4162	CONNECTOR,RECEPTACLE	1
17	XBFZZ	96906	MS21266-IN	GROMMET,PLASTIC EDGING	1
18	PAFZZ	96906	MS35338-40	WASHER,LOCK SPRING	2
19	PAFZZ	96906	MS35649-242	NUT,HEX,PLAIN	2
20	XBFZZ	97403	13220E4212	HOUSING,CONTROL UNIT	1
21	XDFZZ	97403	13220E4048-2	LABEL,WEIGHT AND LIFT POINT	2
22	PAFZZ	97403	13220E4211	LAMP HOUSING	1
23	PAFZZ	96906	MS15571-8	LAMP,INCANDESCENT	1
24	PAFZZ	24153	60-4055-104-1012	LOCK,SECURITY CAM	1
25	PAFZZ	24153	60-1053	LOCK,SECURITY	1
26	XBFZZ	97403	13220E4231	PLATE,IDENTIFICATION	1
27	XBFZZ	97403	13220E4161	SPACER	1
28	XDFZZ	97403	13220E4191	ARM,SWITCH	1
29	XDFZZ	97403	13220E4192	STOP,SWITCH	1
30	XBFZZ	97403	13220E4226	BRACKET,SWITCH	1
31	PAFZZ	97403	13220E4207	SWITCH,ROTARY	1
32	XBFZZ	96906	MS3367-5-9	STRAP,TIEDOWN	1
33	PAFZZ	97403	13220E4228	SCREW LOCK ASSEMBLY	2
34	PAFZZ	97403	13220E3732-1	CONNECTOR,RECEPTACLE	1
35	PAFZZ	97403	13220E4227	CLAMP,CABLE,ELECTRICAL	1
36	XDFFF	97403	13220E4201	CONTROL UNIT,STATUS ASSY	1
37	PAFZZ	96906	MS35206-213	.SCREW,MACHINE HEAD	26
38	PAFZZ	96906	MS35333-36	.WASHER,LOCK,INTERNAL TOOTH	8
39	PAFZZ	96906	MS35649-262	.NUT,PLAIN,HEXAGON	4
40	XBFZZ	97403	13220E4209	.COVER,STATUS PROCESSOR	1
41	PAFZZ	97403	13220E4213	.PRINTED WIRING BOARD ASSY,TAMPER ALARM....	6
Change 1 C-11					

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
42	PAFZZ	97403	13220E4214	.PRINTED WIRING BOARD ASSY,VOLTAGE MONITOR	1
43	PAFZZ	97403	13220E4215	PRINTED WIRING BOARD ASSY,AUDIBLE ALARM ...	1
44	PAFZZ	97403	13220E4216	..PRINTED WIRING BOARD ASSY,INSTANTANEOUS ALARM	1
45	PAFZZ	97403	13220E4217	.PRINTED WIRING BOARD ASSY,LATCHED ALARM .	1
46	PAFZZ	97403	13220E4218	.PRINTED WIRING BOARD ASSY,ALARM ID	1
47	PAFZZ	97403	13220E4219	.PRINTED WIRING BOARD ASSY,LED	1
48	PAFFF	97403	13220E4225	.STATUS PROCESSOR,INTERCONNECTING SUBASSY	1
49	PAFZZ	81349	JANIN4148	..SEMICONDUCTOR DEVICE	2
50	PAFZZ	97403	13220E4238	..KEY,POLARIZATION	11
51	PAFZZ	97403	13220E4237-2	..CONNECTOR,RECEPTACLE	2
52	PAFZZ	97403	13220E4237-1	..CONNECTOR,RECEPTACLE	9
53	PAFZZ	97403	13220E4230	..SWITCH,SPST	1
54	XDFZZ	97403	13220E4229	..SWITCH,TOGGLE	1
55	PAFZZ	97403	13220E3751	..SCREWLOCK ASSEMBLY	2
56	PAFZZ	97403	13220E3724-1	..CONNECTOR,RECEPTACLE	1
57	XBFZZ	96906	MS3367-4-9	.STRAP,TIEDOWN	V
58	XBFZZ	97403	13220E4247	.PLATE,IDENTIFICATION	1
59	PAFZZ	96906	MS35206-227	.SCREW,MACHINE HEAD	8
60	PAFZZ	96906	MS35333-37	.WASHER,LOCK INTERNAL TOOTH	24
61	XBFZZ	97403	13220E4171	..CASE,STATUS PROCESSOR	1
62	PAFZZ	96906	MS35206-228	.SCREW,MACHINE HEAD	4
63	XBFZZ	97403	13220E4185	.COVER,POWER SUPPLY	1
64	XBFZZ	97403	13220E4232	.COVER,POWER SUPPLY	1
65	PAFZZ	96906	MS35206-216	.SCREW,MACHINE,PNH	4
66	XAFZZ	97403	13220E4241	.PRINTED WIRING BOARD	1
67	PAFZZ	97403	13220E3981	.BUZZER	1
68	XBFZZ	97403	13220E4246	.SUPPORT,RIGHT SIDE	1
69	XBFZZ	96906	MS35489-4	.GROMMET,NONMETALLIC	1
70	XDFZZ	97403	13220E4093-2	.INSULATOR	2
71	XBFZZ	97403	13220E3823-4	.BARRIER STRIP,TB4	2
72	XBFZZ	97403	13220E2998-6	.RIVET,BLIND	6
73	XDFZZ	97403	13220E3829-2	.TERMINAL,BLUE	25
74	XBFZZ	96906	MS20604AD4T4	.RIVET,BLIND	1
75	PAFZZ	81349	F02A250V3/4A	.FUSE,CARTRIDGE	1
76	PAFZZ	97403	13220E4182	.HOLDER,FUSE	1
77	PAFZZ	96906	MS35206-229	.SCREW,MACHINE,PNH	12
78	PAFZZ	97403	13220E3967	.VARISTOR	2
79	XDFZZ	97403	13220E4093-9	.INSULATOR	1
80	XBFZZ	97403	13220E4026-3	.BARRIER STRIP,TB5	1
81	XBFZZ	07707	AD410ABS	.RIVET,BLIND	4
82	XDFZZ	97403	13220E4093-11	.INSULATOR	1
83	XBFZZ	97403	13220E4026-6	.BARRIER STRIP,TB1	1
84	XBFZZ	97403	13220E3823-5	.BARRIER STRIP,TB2	1

Change 1 C-12

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
85	XDFZZ	97403	13220E4093-3	.INSULATOR.....	1
86	PAFZZ	81349	FNH20G	.FUSEHOLDER.....	1
87	PAFZZ	81349	F02B250V2A	.FUSE	1
88	PAFZZ	96906	MS35059-22	.SWITCH, TOGGLE	1
89	XBFZZ	97403	13220E4245	.SUPPORT, LEFT SIDE.....	1
90	XBFZZ	97403	13220E4239	.PLATE, IDENTIFICATION	1
91	PAFZZ	97403	13226E1177	.TRANSFORMER	1
92	PAFZZ	96906	MS35206-219	.SCREW, MACHINE, PNH.....	4
93	XAFZZ	97403	13220E4190	.PRINTED WIRING BOARD	1
94	XDFZZ	96906	MS35431-7	.TERMINAL, LUG.....	5
95	PAFZZ	97403	13220E3715-1	.CAPACITOR, ELECTROLYTIC	1
96	PAFZZ	97403	13220E4021-2	.RESISTOR, FIXED	1
97	PAFZZ	81349	M39018/03-1247M	.CAPACITOR, FIXED, ELECTROLYTIC.....	1
98	XDFZZ	07707	AD44ABS	.RIVET, BLIND	1
99	PAFZZ	81349	M24066/2-311	.CLIP, SPRING TENSION	1
100	XDFZZ	81349	SE09XE03	.TERMINAL, STUD, INSULATED	4
101	PAFZZ	96906	MS35649-282	.NUT, PLAIN, HEXAGON.....	6
102	PAFZZ	96906	MS35206-231	.SCREW, MACHINE HEAD	2
103	PAFZZ	97403	13220E4096-1	.MICROCIRCUIT, LINEAR.....	1
104	PAFZZ	97403	13220E3929-2	.INSULATOR, PLATE	1
105	XDFZZ	97403	13220E3928-1	.INSULATOR BUSHING	3
106	PAFZZ	96906	MS27183-6	.WASHER, FLAT	3
107	XDFZZ	96906	MS35431-3	.TERMINAL, LUG.....	3
108	PAFZZ	96906	MS35338-41	.WASHER, LOCK	3
109	PAFZZ	81349	RNR60C2670FS	.RESISTOR, FIXED, FILM.....	1
110	PAFZZ	97403	13220E4033-1	.SEMICONDUCTOR, DIODE.....	1
111	XBFZZ	97403	13220E3928-1	.INSERT, FEED THRU	2
112	PAFZZ	97403	13220E4196	.SEMICONDUCTOR DEVICE.....	1
113	PAFZZ	97403	13220E3971-2	.RESISTOR.....	2
114	XDFZZ	97403	13220E4022	.DIODE, RECTIFIER.....	1
115	PAFZZ	96906	MS35206-327	.SCREW, MACHINE HEAD	1
116	XDFZZ	97403	13220E2974	.MICROCIRCUIT, LINEAR.....	1
117	PAFZZ	97403	13220E3929-1	.INSULATOR, PLATE	1
118	XBFZZ	97403	13220E4244	.PLATE, BASE	1
119	PAFZZ	97403	13220E4153	.INDUCTOR	1
120	XDFZZ	96906	MS35431-5	.TERMINAL, LUG.....	1
END OF FIGURE					
Change 2 C-13					

Section III. SPECIAL TOOLS LIST

(Not Applicable)

Change 1

C-14

Section IV.

NATIONAL STOCK NUMBER AND PART NUMBER INDEX					
NATIONAL STOCK NUMBER INDEX					
STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310-00-045-4007	C-1	108	5305-00-984-4989	C-1	77
5935-00-073-8885	C-1	33	5305-00-984-6191	C-1	5
5310-00-082-1404	C-1	106	5305-00-984-6193	C-1	1
6140-00-111-0500	C-1	11	5305-00-984-6194	C-1	10
5905-00-139-1989	C-1	96	5340-00-989-4255	C-1	99
5920-00-142-7439	C-1	76	5305-00-993-5767	C-1	115
6240-00-155-7859	C-1	23	6210-01-007-9758	C-1	22
5310-00-193-7577	C-1	38	5910-01-011-1740	C-1	95
5920-00-228-7882	C-1	87	5930-01-014-5572	C-1	31
5905-00-254-2157	C-1	109	5961-01-034-6542	C-1	49
5920-00-296-0446	C-1	75	5905-01-049-1525	C-1	113
6350-00-036-7544	C-1	41	6350-01-062-0695	C-1	24
6350-00-360-7552	C-1	43	5935-01-076-9477	C-1	52
6350-00-360-7585	C-1	44	5935-01-077-8687	C-1	51
6350-00-360-7598	C-1	45	5950-01-081-4774	C-1	119
6350-00-360-7599	C-1	46	5961-01-083-0555	C-1	112
6350-00-366-7688	C-1	7	5935-01-085-0586	C-1	56
6350-00-366-7753	C-1	8	5935-01-085-6511	C-1	34
6350-00-366-7758	C-1	48	6350-01-094-9738	C-1	25
6350-00-366-7760	C-1	47	5910-01-142-4476	C-1	97
5961-00-383-1149	C-1	110	5950-01-299-8444	C-1	91
6350-00-397-3074	C-1	42			
5935-00-417-7350	C-1	16			
5970-00-426-1054	C-1	117			
5905-00-487-1614	C-1	78			
6740-00-490-3022	C-1	50			
5930-00-519-8144	C-1	13			
5310-00-543-2410	C-1	18			
5920-00-556-0144	C-1	86			
5310-00-559-0070	C-1	2			
5310-00-579-0079	C-1	60			
5930-00-655-1575	C-1	88			
5310-00-809-8544	C-1	3			
5930-00-839-4331	C-1	53			
5970-00-840-5109	C-1	104			
5305-00-889-2998	C-1	65			
5305-00-889-2999	C-1	15			
5305-00-889-3001	C-1	102			
5305-00-889-3116	C-1	37			
5935-00-898-0494	C-1	55			
5310-00-934-9739	C-1	19			
5310-00-934-9747	C-1	39			
5310-00-934-9757	C-1	101			
5935-00-944-3871	C-1	35			
5305-00-957-6265	C-1	14			
5305-00-984-4976	C-1	92			
5305-00-984-4984	C-1	59			
5305-00-984-4988	C-1	62			

Change 2 C-15

SECTION IV

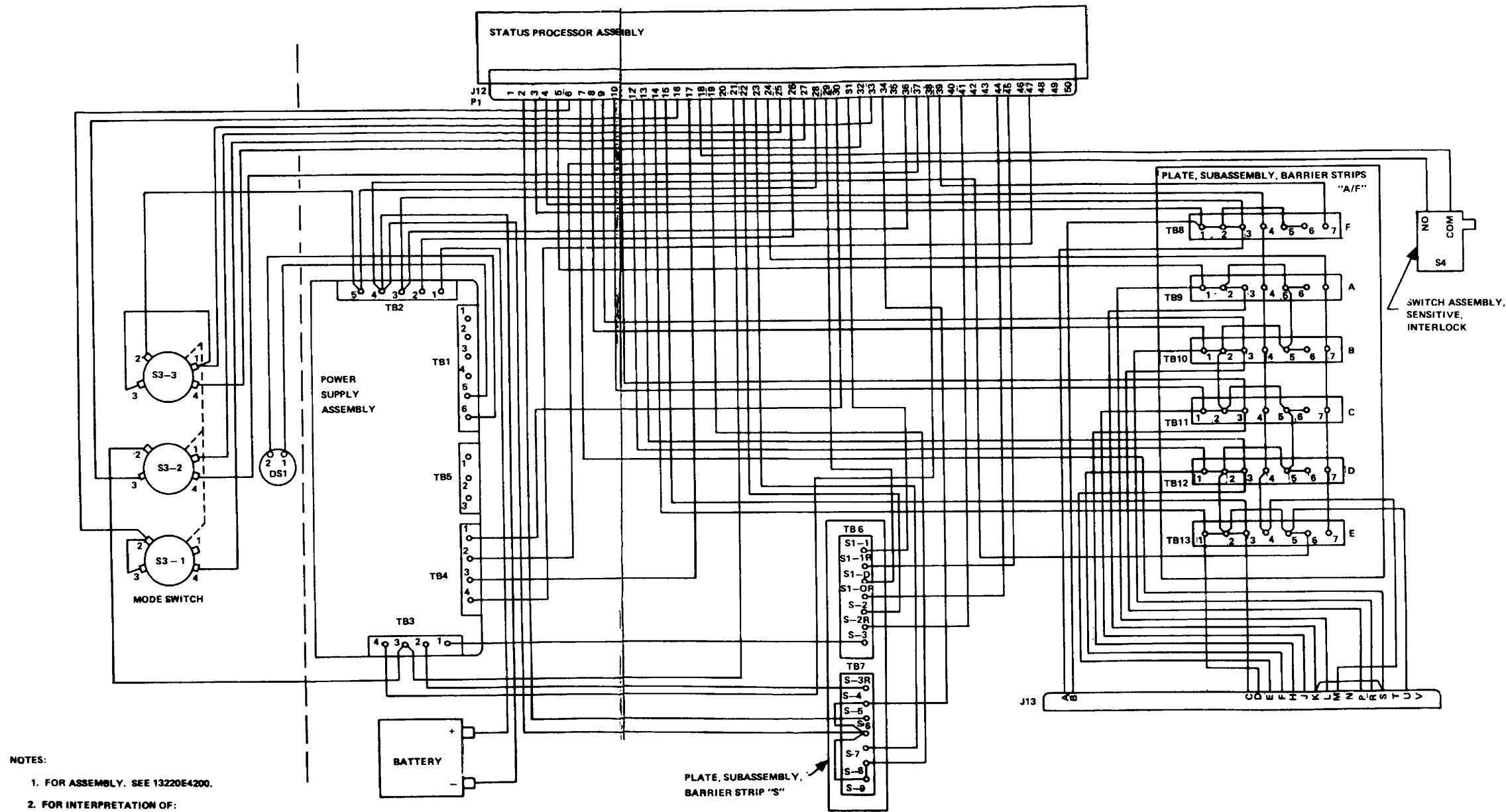
NATIONAL STOCK NUMBER AND PART NUMBER INDEX PART NUMBER INDEX				
FSCM	PART NUMBER	STOCK NUMBER	FIG.	ITEM
07707	AD41 OABS		C-1	81
07707	AD44ABS		C-1	98
81349	FNH20G	5920-00-556-0144	C-1	86
81349	F02A250V3/4A	5920-00-296-0446	C-1	75
81349	F02B250V2A	5920-00-228-7882	C-1	87
81349	JAN IN4148	5961-01-034-6542	C-1	49
96906	MS15571-8	6240-00-155-7859	C-1	23
96906	MS16106-1	5930-00-519-8144	C-1	13
96906	MS20604AD4T4		C-1	74
96906	MS21266-IN		C-1	17
96906	MS27183-6	5310-00-082-1404	C-1	106
96906	MS27183-7	5310-00-809-8544	C-1	3
96906	MS3367-4-9		C-1	57
96906	MS3367-5-9		C-1	32
96906	MS35059-22	5930-00-655-1575	C-1	88
96906	MS35190-234	5305-00-957-6265	C-1	14
96906	MS35206-213	5305-00-889-3116	C-1	37
96906	MS35206-216	5305-00-889-2998	C-1	65
96906	MS35206-217	5305-00-889-2999	C-1	15
96906	MS35206-219	5305-00-984-4976	C-1	92
96906	MS35206-227	5305-00-984-4984	C-1	59
96906	MS35206-228	5305-00-984-4988	C-1	62
96906	MS35206-229	5305-00-984-4989	C-1	77
96906	MS35206-231	5305-00-889-3001	C-1	102
96906	MS35206-243	5305-00-984-6191	C-1	5
96906	MS35206-245	5305-00-984-6193	C-1	1
96906	MS35206-246	5305-00-984-6194	C-1	10
96906	MS35206-327	5305-00-993-5767	C-1	115
96906	MS35333-36	5310-00-193-7577	C-1	38
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81349	M39018/03-1247M	5910-01-142-4476	C-1	97
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NOTES:

1. FOR ASSEMBLY. SEE 13220E4200.
2. FOR INTERPRETATION OF:
REFERENCE DESIGNATIONS FOR ELECTRICAL AND
ELECTRONICS PARTS AND EQUIPMENTS

FO-1. Control Unit Wiring Diagram
FO-1

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The Metric System and Equivalents

Linear Measure

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

Weights

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

Liquid Measure

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

Square Measure

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

Cubic Measure

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

Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

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