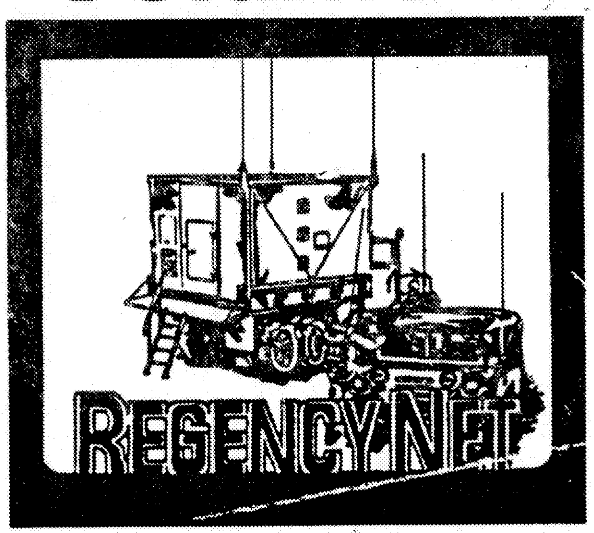
ARMY TB 11-5895-1218-12-2
NAVY EE150-LQ-OMI-020/AN-TRC179V1
AIR FORCE TO 31R2-2TRC179-21-2

TECHNICAL BULLETIN

Operating and Troubleshooting Guide for Regency Net (U)

Communications Terminal AN/TRC-179(V)1
Communications Terminal AN/TRC-179(V)3
Radio Set AN/GRC-215

Volume 2



DEPARTMENTS OF THE ARMY, THE NAVY, AND THE AIR FORCE

ARMY TB 11-5895-1218-12-2
NAVY EE150-LQ-OMI-020/AN-TRC179V1
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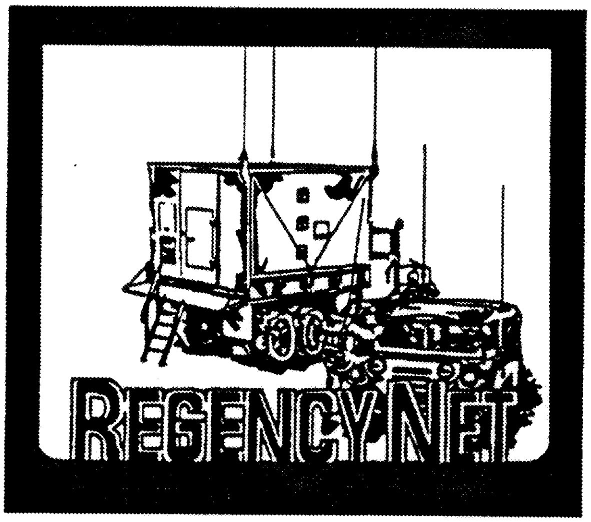


DEPARTMENTS OF THE ARMY, THE NAVY, AND THE AIR FORCE

WARNING

CARBON MONOXIDE

Carbon monoxide is without color or smell, but can kill. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of fuel-burning generators and internal combustion engines. Carbon monoxide can become dangerously concentrated under conditions of no air movement. Precautions which must be followed to ensure crew safety when the generator, main, or auxiliary engine of the vehicle is operating and the shelter is occupied:

1. DO NOT operate generator or engine in a closed area unless the area has a lot of moving air.

2. DO NOT idle engine for long periods without ventilator blower operating. If tactical situation permits, open hatches.

3. DO NOT drive any vehicle with inspection plates, cover plates, or engine compartment doors removed unless necessary for maintenance purpose.

4. BE ALERT at all times during vehicle operation and generator operation for exhaust odors and exposure symptoms. If either is present, immediately ventilate personnel compartments. If symptoms persist, remove affected crew to fresh air; keep warm; and do not permit physical exercise. If necessary, give artificial respiration.

   FOR ARTIFICIAL RESPIRATION, REFER TO FM21-11.

5. BE AWARE: The field protective mask for chemical-biological-radiological (CBR) protection will not protect you from carbon monoxide poisoning.

WARNING

RF RADIATION HAZARD

Dangerous RF power levels exist on and around the antenna during operation. Do not stand closer than 40 inches (1.0 meters) to the antenna when the transmitter is operating. Failure to heed this warning may result in death or serious injury.

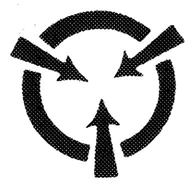
Do not allow bare flesh to touch exposed equipment during periods of extreme cold or heat. Bare flesh can freeze and stick to the metal as a result of extreme cold, or be severely burned as a result of metal exposed to solar heating. Use of gloves is recommended.

Operator and maintenance personnel should be familiar with the requirements of TB 43-1029 before attempting installation or operation of the antenna. Failure to observe the requirements of TB 43-0129 could result in injury or death.

Before painting equipment, personnel should be familiar with SB 11-573. Painting and Preservation of Supplies and TB 43-0118, Field Instructions for Painting and Camouflage.

Isopropyl Alcohol is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well ventilated areas. Keep away from open flames or other sources of ignition.

CAUTION



This equipment contains certain static-sensitive solid state devices which are subject to damage from electrostatic discharge. Effective control of electrostatic discharge is maintained only through continuous strict observance of the following maintenance procedures:

- Any maintenance requiring disassembly of the equipment must be performed at an approved work station. The work station must include a grounded surface and grounded wrist strap in accordance with DOD-HDBK-263.
- All maintenance personnel must have completed training in the handling of static-sensitive devices before working on this equipment. Maintenance personnel must wear the grounded wrist strap and be at an approved work station when performing maintenance.
- The static-sensitive subassemblies or circuit cards must be stored in approved electrostatic free material when not installed in the equipment.

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1. DO NOT TRY TO PULL OR GRAB THE INIDIVIDUAL

2. IF POSSIBLE, TURN OFF THE ELECTRICAL POWER

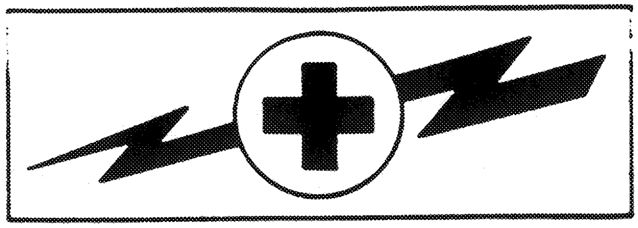
3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL

4. SEND FOR HELP AS SOON AS POSSIBLE

5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

NOTE: DON'T WAIT UNTIL AN ACCIDENT HAPPENS! READ ABOUT ARTIFICIAL RESPIRATION IN FM21-11. AIR FORCE PERSONNEL REFER TO AFOSH 127-50 AND AFOSH 127-66, CHAPTER 10.

WARNING



HIGH VOLTAGE

is used in the operation of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hadzards of the equipment and who is competent in administering first aid. When the technicians are aided by operators, they must be warned about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before begining work on the equipment. Take particular care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections or 120 volt ac input connections when installing or operating this equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through the body.

WARNING: DO NOT BE MISLED BY THE TERM "LOW VOLTAGE". POTENTIALS AS LOW AS 50 VOLTS MAY CAUSE DEATH UNDER ADVERSE CONDITIONS.

For Artificial Respiration, refer to FM 21-11. Air Force personnel refer to AFOSH 127-50 and AFOSH 127-66, Chapter 10.

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CHAPTER 6 (U) TROUBLESHOOTING GUIDE

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CHAPTER 1

INTRODUCTION

CHAPTER 1 TABLE OF CONTENTS

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CHAPTER 1
INTRODUCTION

1.1 SCOPE

This manual (Technical Bulletin, Operating and Troubleshooting Guide) describes the Regency Net (RN) equipment and provides operating and maintenance information not included in the technical manuals. This document is not intended to replace the technical manuals. Instead it serves to supplement the manuals by providing a concise overview and a source of practical guidance to help operate and maintain the RN equipment. Chapters 2, 3, and 4 detail the operational procedures for the RN Force Terminal (FT), the Split Site (SS) and Team Terminal (TT). Chapter 5 presents the message communication procedures among RN members. Chapter 6 contains an expanded troubleshooting guide.

The names and nomenclatures of the RN equipment covered by this technical bulletin are:

- Communications Terminal AN/TRC-179(V)1
- Communications Terminal AN/TRC-179(V)3
- Radio Set AN/GRC-215

Communications Terminal AN/TRC-179(V)1 (Figure 1-1), commonly called the Force Terminal (FT), provides high frequency (HF) command and control communication (secure/non-secure data, radio-teletype, or voice) among the Regency Network members.

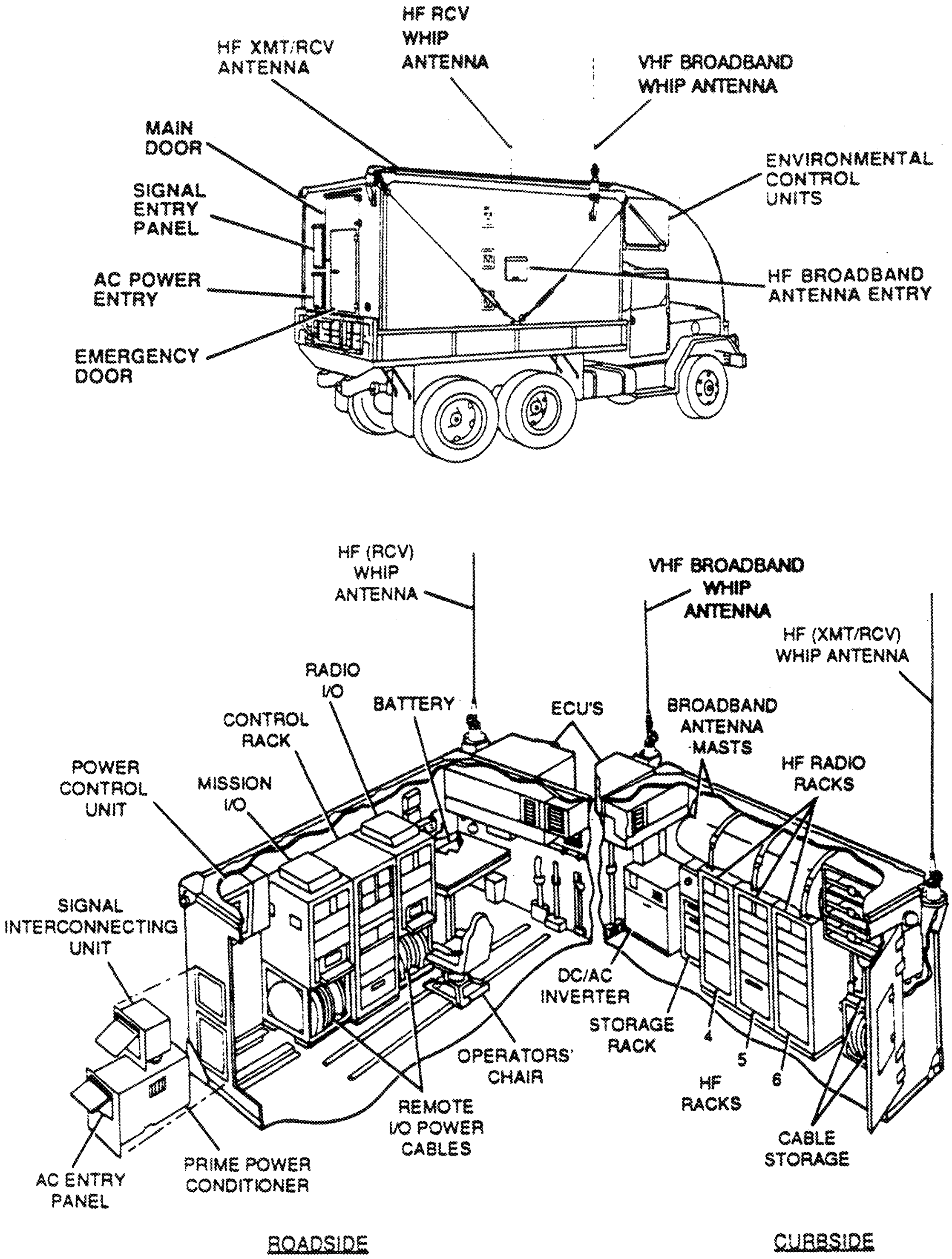

Figure 1-1. Communications Terminal AN/TRC-179(V)1
(Force Terminal)

Communications Terminal AN/TRC-179(V)3 (Figure 1-2), commonly called the Split-Site (SS), is made up of two major equipment groups: the Receiving Group, Radio OR-304/TRC-179(V)3 (receive station) and the Communications Terminal AN/TRC-179(V)1 (transmit station). The Split-Site provides command and control communications within network at sites which require that the transmit and receive equipment be separated.

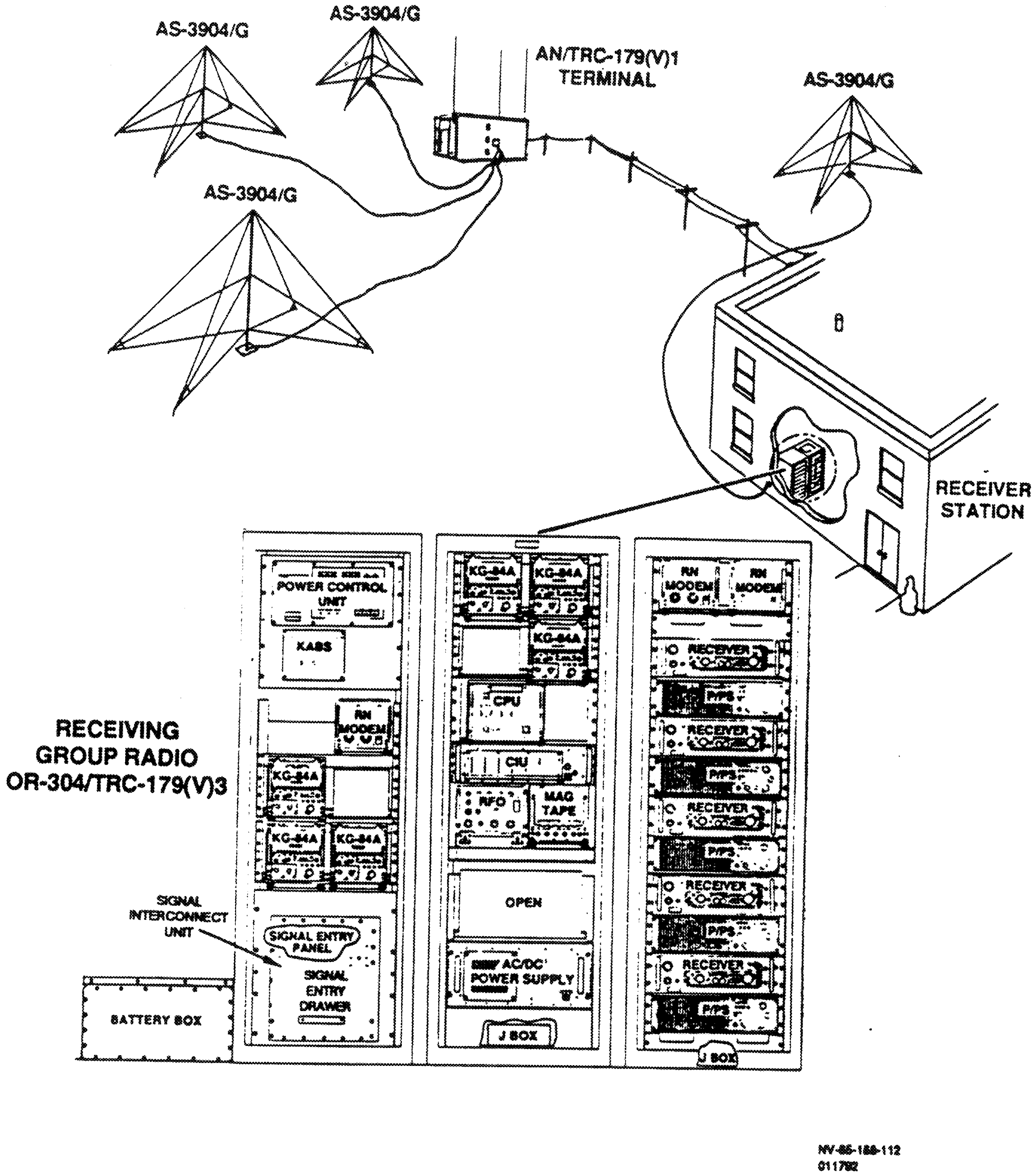

Figure 1-2. Communications Terminal AN/TRC-179(V)3
(Split-Site)

Radio Set AN/GRC-215 (Figure 1-3), commonly called the Team Terminal (TT), provides a single HF communication (secure/non-secure data or voice) link with a RN Force Terminal.

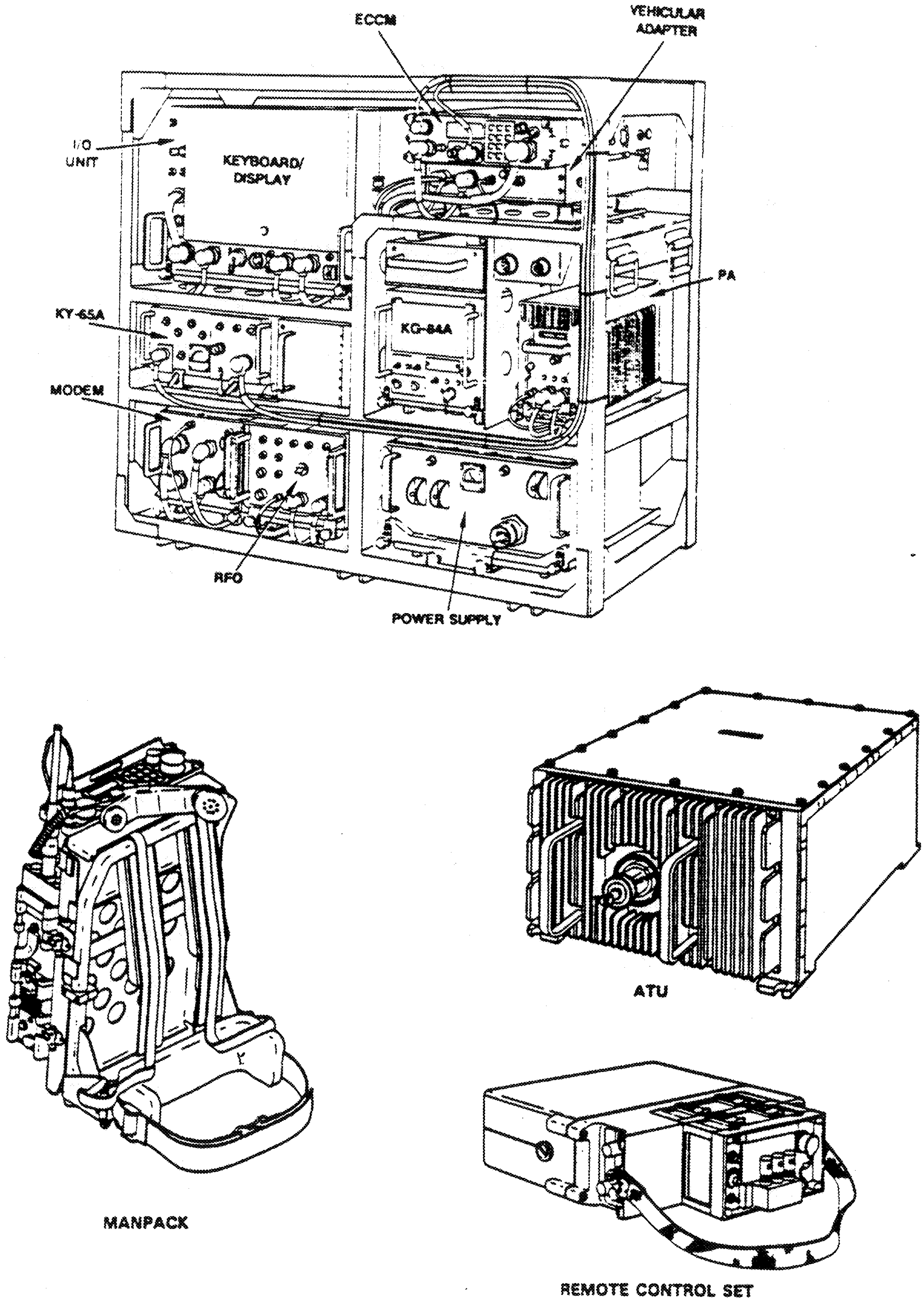

Figure 1-3. Radio Set AN/GRC-215
(Team Terminal)

1.2 CONSOLIDATED INDEX OF ARMY PUBLICATIONS

Refer to the latest issue of DA Pam 25-30 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1.3 MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance are those prescribed by DA Pam 738-750, as contained in Maintenance Management Update. Air Force personnel should use AFR 66-1 for maintenance reporting and TO-00-35D54 for unsatisfactory equipment reporting. Navy personnel should report maintenance performed using the Maintenance Data Collection Subsystem (MDCS) IAW OPNAVINST 4790.2, Vol 3 and unsatisfactory material/conditions (UR submissions) IAW OPNAVINST 4790.2, Vol 2, chapter 17.

b. Reporting of Item and Packaging Discrepancies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/SECNAVINST 4355.18/AFR 400-54/MCO 4430.3J.

c. Transportation Discrepancy Report (TDR) (SF 361). Fill out and forward Transportation Discrepancy Report (TDR) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1.4 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs)

a. Army. If your Regency Net equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ED-PH, Fort Monmouth, New Jersey 07703-5000. We'll send you a reply.

b. Air Force. Air Force personnel are encouraged to submit EIRs in accordance with AFR 900-4.

c. Navy. Navy personnel are encouraged to submit EIRs through their local Beneficial Suggestion Program.

1.5 ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with PMCS charts before storing. When removing the equipment from administrative storage the PMCS should be performed to assure operational readiness. Disassembly and repacking for shipment or limited storage are covered in other paragraphs.

1.6 DESTRUCTION OF MATERIAL TO PREVENT ENEMY USE

Destruction of Army electronics material to prevent enemy use shall be in accordance with TM 750-244-2.

1.7 NOMENCLATURE CROSS-REFERENCE INDEX

Table 1-1 is a cross-reference list of common names and official nomenclature for the RN equipment addressed in this manual.

1.8 TECHNICAL MANUAL REFERENCES

RN technical manuals referenced in this technical bulletin are identified in the text by an abbreviated technical manual number to save space. The cross reference of the RN technical manuals and their abbreviated numbers are listed in Table 1-2. Additional manuals required are identified in Appendix A in each of the manuals.

1.9 DESTRUCTION NOTICE

Destroy by any method that will prevent disclosure of contents or reconstruction of the document.

Table 1-1. Nomenclature Cross-Reference List (Sheet 1 of 3)

COMMON NAME	OFFICIAL NOMENCLATURE
AC/DC Power Supply	Power Supply PP-8095/G
Antenna Tuning Unit (100W ATU)	Coupler, Antenna CU-2351/GRC-215
Antenna Tuning Unit (400W ATU)	Tuner, Radio Frequency TN-611/G
Battery Charging System	Power Supply, Uninterrupted PP-8143/G
Broadband Antenna	Antenna, Broadband AS-3791/G
Central Processor Unit (CPU)	Computer, Digital AN/UYK-42(V)4
Control Interface Unit	Interface Unit, Control J-4406/G
DC/AC Inverter	Power Supply, Inverter PP-8105/G
ECCM Module C-11670/G	Controller, Receiver-Transmitter
FAN Terminal AN/MSC-64(V)2	Satellite Communications Terminal
Field Wire	Telephone Cable WF-16/W
Force Terminal (FT) AN/TRC-179(V)1	Communications Terminal
Force Terminal Receiver-Transmitter (FT-RT)	Receiver-Transmitter RT-1512/G
Handset	Handset H-251/U
Handset	Handset H-356/G
I/O Unit	Input-Output Unit MX-10819/GRC-215
Keyboard Display Unit (KDU)	Display Unit, Keyboard ID-2390/G
KG-84A	Communications Security Equipment TSEC/KG-84A
KY-65A	Speech Security Equipment TSEC/KY-65A
KY-75A	Cryptographic Speech Equipment TSEC/KY-75A

Table 1-1. Nomenclature Cross-Reference List (Sheet 2 of 3)

COMMON NAME	OFFICIAL NOMENCLATURE
KY-75A RCU	Remote Control Unit, I-Z-AKR/TSEC/KY-75A
Magnetic Tape Unit (MTU)	Memory Unit, Magnetic Tape MU-859/G
Manpack Whip Antenna	Antenna AS-3805/GRC-215
Mission or Radio Input/Output Unit	Input-Output Unit MX-10778/G
Near Vertical Incident Skywave (NVIS) Antenna	Antenna Assembly AS-2259/GR
NVIS Antenna Base	Antenna Adapter MX-9313/GR
Power Amplifier (100W PA)	Amplifier, Power AM-7301/GRC-215
Power Amplifier (400W PA)	Amplifier, Power AM-7296/G
Power Amplifier Power Supply (PA PS)	Power Supply PP-8097/G
Power Control Unit (PCU)	Panel, Power Distribution, Monitor SB-4283/TRC-179(V)1
Pre/Post Selector (P/PS)	Tuning Unit, Pre/Post Selector TN-612/G
Prime Power Conditioner	Power Supply, AC Conditioner PP-8104/G
Receiver	Receiver, Radio R-2322/G
Remote Control Set	Converter CV-3968/GRC-215
RN Modem	Modem. Digital Data MD-1204/G
Shelter Assembly, Non-Expandable	Shelter, Non-Expandable S-711/TRC-179(V)1
Signal Interconnecting Unit (SIU) or Signal Entry Panel (SEP)	Interconnecting Unit, Signal J-4414/G
Split-Site	Communications Terminal AN/TRC-179(V)3

Table 1-1. Nomenclature Cross-Reference List (Sheet 3 of 3)

COMMON NAME	OFFICIAL NOMENCLATURE
Split-Site Receive Station (SS RG)	Receiving Group, Radio OR-304/TRC-179(V)3
Team Terminal (TT)	Radio Set AN/GRC-215
Team Terminal Power Supply (TT PS)	Power Supply PP-8170/GRC-215
Team Terminal Receiver-Transmitter (TT-RT)	Receiver-Transmitter RT-1511/GRC-215
Telephone Modem	Modem, Telephone MD-1201/G
Time of Day Transfer Cable (TOD Cable)	Cable Assembly and Reel CG-3883/G
Time Standard Reference Frequency Oscillator (RFO)	Oscillator, Frequency Reference O-1836/G
Vehicular Adapter (VA)	Mounting Base, Electrical Equipment MT-6452/GRC-215
Very High Frequency Receiver-Transmitter (VHF RT) (RT-524)	Receiver-Transmitter RT-524/VRC

Table 1-2. TECHNICAL MANUAL CROSS REFERENCE (Sheet 1 of 4)

REFERENCE NUMBER	TECHNICAL MANUAL
FORCE TERMINAL TECHNICAL MANUALS:	
1. 400W ATU TM-24	Tuner, Radio Frequency TN-611/G TM 11-5985-377-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
2. 400W PA TM-24	Amplifier, Radio AM-7296/G TM 11-5895-1304-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
3. AC/DC PS TM-24	Power Supply PP-8095/G TM 11-5895-1323-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
4. Antenna TM-14	Broadband Antenna, Fixed AS-3904/G TM 11-5985-385-14&P Operator,Unit, Intermediate Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools List) **NOTE:** Broadband Antenna, Fixed AS-3904/G is for Fixed Site locations only.
5. CIU TM-24	Interface Unit, Control J-4406/G TM 11-5895-1313-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
6. CPU TM-24	Computer, Digital AN/UYK-42(V)4 TM 11-5895-1308-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
7. ECCM TM-24	Controller, Receiver-Transmitter C-11670/G TM 11-5895-1315-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
8. FT TM-12	Communications Terminal AN/TRC-179(V)1 and Communications Terminal AN/TRC-179(V)3 TM 11-5895-1218-12 Operator's and Unit Maintenance Manual

Table 1-2. TECHNICAL MANUAL CROSS REFERENCE (Sheet 2 of 4)

REFERENCE NUMBER	TECHNICAL MANUAL
9. FT TM-34	Communication Terminal AN/TRC-179(V)1 TM 11-5895-1218-34 Intermediate Direct Support and General Support Maintenance Manual
10. I/O TM-10	Input-Output Unit MX-10778/G TM 11-5895-1324-10 Operator's Manual
11. KDU TM-24	Display Unit, Keyboard ID-2390/G TM 11-5895-1306-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
12. MTU TM-24	Memory Unit, Magnetic Tape MU-859/G TM 11-5895-1335-24&P Unit, Intermediate Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools List)
13. PA PS TM-24	Power Supply PP-8097/G TM 11-5895-1311-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
14. PPS TM-24	Tuning Unit, Pre/Post Selector TN-612/G TM 11-5895-1305-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
15. Printer TM-24	Printer, Thermal RP-342/G TM 11-3610-264-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
16. Receiver TM-24	Receiver, Radio R-2322/G TM 11-5895-1310-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
17. RFO TM-24	Oscillator, Frequency Reference O-1836/G TM 11-5895-1312-24 Unit, Intermediate Direct Support and General Support Maintenance Manual

Table 1-2. TECHNICAL MANUAL CROSS REFERENCE (Sheet 3 of 4)

REFERENCE NUMBER	TECHNICAL MANUAL
18. RN Modem TM-24	Modem, Digital Data MD-1204/G TM 11-5895-1307-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
19. RT-1512 TM-24	Receiver-Transmitter RT-1512/G TM 11-5895-1303-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
20. Tel. Modem TM-24	Modem, Telephone MD-1201/G TM 11-5805-752-24 Unit, Intermediate Direct Support and General Support Maintenance Manual

SPLIT-SITE TECHNICAL MANUALS:

NOTE:

The Split-Site requires the same technical manuals as listed for the Force Terminal.

TEAM TERMINAL TECHNICAL MANUALS:

REFERENCE NUMBER	TECHNICAL MANUAL
21. 100W ATU TM-24	Coupler, Antenna CU-2351/GRC-215 TM 11-5985-378-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
22. CPU TM-24	Computer, Digital AN/UYK-42(V)4 TM 11-5895-1308-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
23. ECCM TM-24	Controller, Receiver-Transmitter C-11670/G TM 11-5895-1315-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
24. I/O TM-24	Input-Output Unit MX-10819/GRC-215 TM 11-5895-1322-24 Unit, Intermediate Direct Support and General Support Maintenance Manual

Table 1-2. TECHNICAL MANUAL CROSS REFERENCE (Sheet 4 of 4)

REFERENCE NUMBER	TECHNICAL MANUAL
25. 100W PA TM-24	Amplifier, Radio AM-7301/GRC-215 TM 11-5895-1319-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
26. RCS TM-24	Converter CV-3968/GRC-215 TM 11-5895-1309-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
27. RFO TM-24	Oscillator, Reference Frequency O-1836/G TM 11-5895-1312-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
28. RN Modem TM-24	Modem, Digital Data MD-1204/G TM 11-5895-1307-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
29. RT-1511 TM-24	Receiver-Transmitter RT-1511/G TM 11-5895-1318-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
30. TT TM-12	Radio Set AN/GRC-215 TM 11-5895-1220-12 Operator's and Unit Maintenance Manual
31. TT PS TM-24	Power Supply PP-8170/GRC-215 TM 11-5895-1320-24 Unit, Intermediate Direct Support and General Support Maintenance Manual
32. VA TM-24	Mounting Base, Electrical Equipment MT-6452/GRC-215 TM 11-5895-1321-24 Unit, Intermediate Direct Support and General Support Maintenance Manual

1.10 RN EQUIPMENT DESCRIPTION

1.10.1 Communications Terminal AN/TRC-179(V)1

The Communications Terminal AN/TRC-179(V)1 (FT) consists of power distribution, control/interface, and communication equipment housed in an S-711/TRC-179(V) shelter. It is mounted on the bed of a vehicle for mobile communications or dismounted at fixed sites. Figure 1-4 shows a vehicular mounted FT with views of the internal shelter roadside and curbside equipment location. Major units of the FT are discussed below. Information on other units of the FT may be found in the TM 11-5895-1218-12.

1.10.1.1 Power Equipment

a. Power Control Unit (PCU). The PCU contains the circuitry to monitor and control the input power to the terminal. It also contains the circuit breakers for control of AC power to the various power supplies within the terminal. The PCU also contains the circuit breakers for control of the DC power from these supplies for distribution to units within the terminal.

b. Prime Power Conditioner (PPC). The PPC converts Wye and Delta input source voltages (seven wire connection, from 47 to 63 Hz, 3-phase) to 115 VAC (113.5-126.5)/230 VAC (207-253) single and 3-phase output for shelter operation. When any overvoltage is sensed, primary power is removed from the power transformers by the main circuit breaker. If an improper input voltage is applied, sense circuitry does not allow the main circuit breaker to be engaged.

c. Battery Charging System (BCS). The BCS consists of the battery storage assembly and two separate emergency DC power charging systems. These two systems are the emergency lighting battery system (ELBS) and the keep-alive battery system (KABS) charger.

(1) Battery Storage Assembly. The battery storage assembly consists of three rechargeable battery packs of 12 VDC each. Two battery packs (24 VDC) provide emergency 28 VDC power for the RFO and 5.2 VDC for the CPU memory. The third battery pack (12 VDC) supplies emergency DC power for the lighting system.

(2) Emergency Lighting Battery System (ELBS). During a power failure in a mobile or stationary operating scenario, a portion of the ELBS maintains partial lighting inside the terminal. An operator action is required to enable the ELBS when power is lost. Blackout protection is maintained.

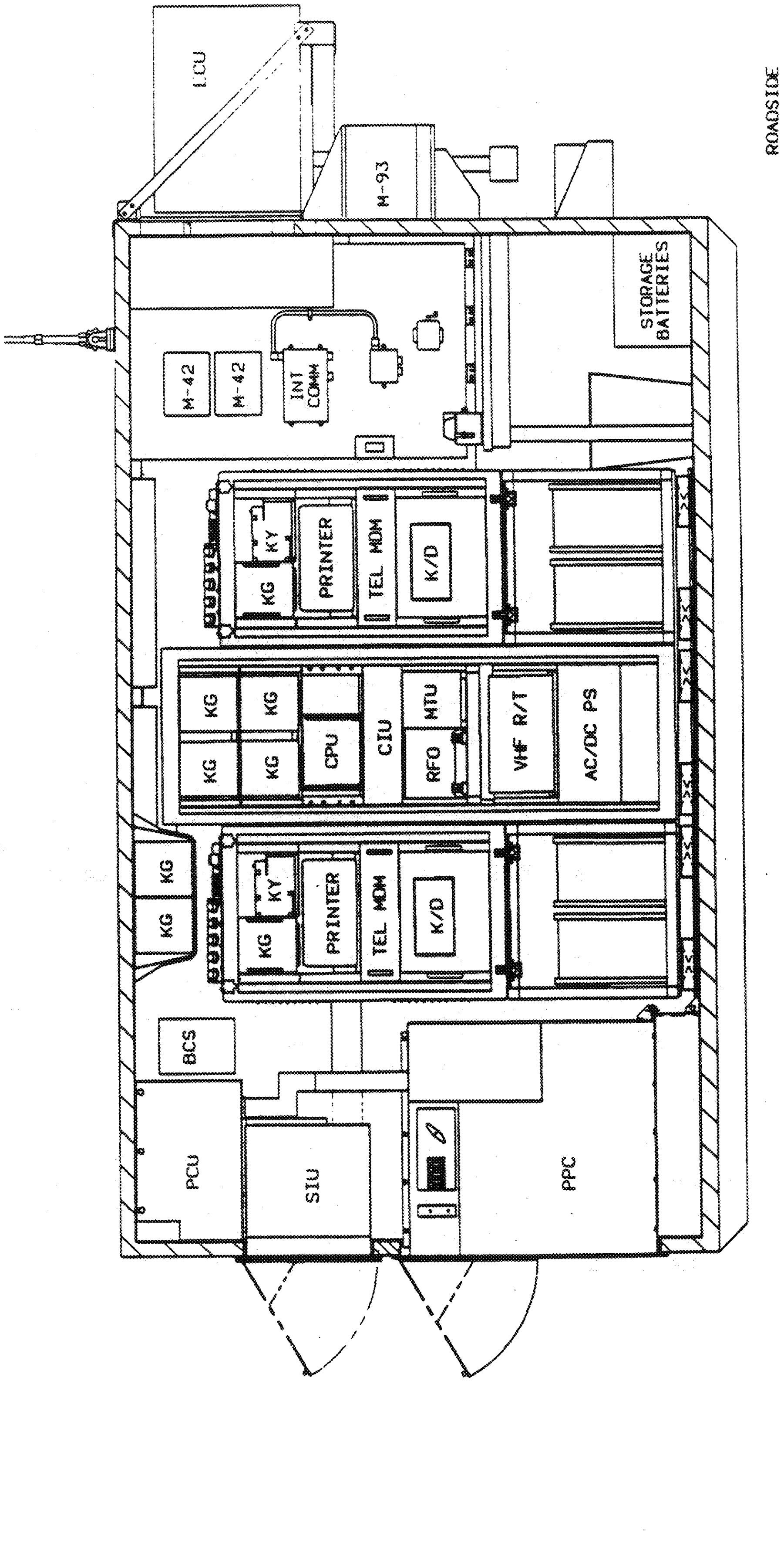

Figure 1-4. (U) Force Terminal Equipment Location (Sheet 1 of 2)

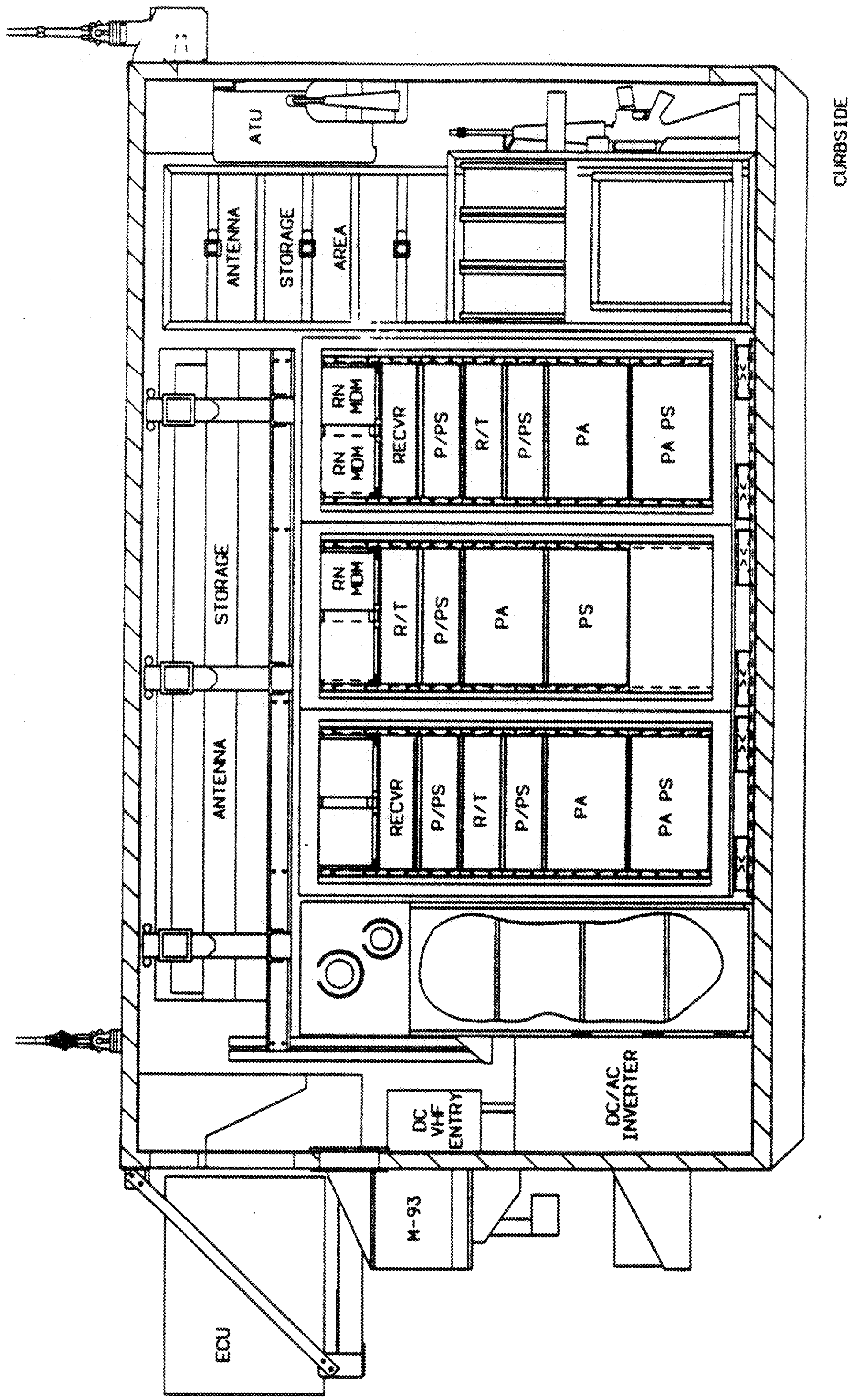

Figure 1-4. (U) Force Terminal Equipment Location (Sheet 2 of 2)

(3) Keep-Alive Battery System (KABS). The KABS is used during power failures in mobile or stationary operations. The KABS maintains the internal memory of the CPU and the time reference signals for the RFO keep-alive subsystems inside the terminal.

d. AC/DC PS. The AC/DC PS converts a 115/230 VAC, single-phase, 47 to 63 Hz input source to a +28 VDC output for +28 VDC operated equipment.

e. DC/AC Inverter. The DC/AC Inverter converts a +28 VDC power source to 115/230 VAC single phase, 60 Hz. The DC/AC Inverter provides AC power to the required equipment for on-the-move (mobile) operation.

1.10.1.2 Control/Inferface Equipment

a. Signal Interconnecting Unit (SIU). The signal entry drawer (SED) and the signal entry panel (SEP) make up the SIU.

(1) SED. The SED allows the connection of any mission or radio I/O device to any of the R/Ts or receivers within the Force Terminal.

(2) SEP. The SEP is located on the exterior of the Force Terminal. It provides remote interfaces for the audio/data signals transferred over remote links to/from up to six remoted I/O devices. It also provides interface between the terminal operator and the vehicle cab.

b. KG-84A. Seven KG-84As are required in a Force Terminal with additional wiring provided for five more. The KG-84As provide COMSEC for data communications.

c. KY-75A. A KY-75A is located behind a KY-75A RCU in each I/O rack of the Force Terminal. The KY-75A provides COMSEC for secure voice communications.

d. KY-75A RCU. The KY-75A RCU provides remote control of the KY-75A.

e. Telephone Modem. There are two telephone modems, one in the mission I/O rack and one in the radio I/O rack. They support voice and data communication across two or four-wire telephone lines between the Force Terminal and the I/Os. Voice and data may be transmitted concurrently.

f. Keyboard/Display Unit (KDU). Two KDUs are used in the Force Terminal: one performs mission I/O functions and the other performs radio I/O functions. Software in the KDU supports both functions. The KDU provides the ability to create messages from predefined screen menus, edit and delete messages, and pass messages to the CPU for transmission by the RF equipment. Messages are also received from the CPU.

g. Central Processing Unit (CPU). All automated functions of the Force Terminal are controlled by the CPU. The CPU provides control information to the radios, modems, and other HF equipment.

h. Control Interface Unit (CIU). The CIU provides interface between the CPU and the various HF equipment (RN modems, receivers, RTs, SIU, and RFO). The CIU is responsible for initiating system BIT and acquiring LRU BIT status for each piece of equipment.

i. Radio Frequency Oscillator (RFO). The RFO provides a reliable, real-time clock for the system. When the Time Of Day (TOD) has been correctly transferred into the RFO, it will maintain stable time for the system. It also provides a highly stable 10-MHz standard for the system. The RFO contains a rechargeable battery to maintain operation through short term power interruptions (30 minutes). If in continuous operation, the RFO requires TOD update at least every 90 days (30 day updates are recommended). Calibration is required every two years.

j. Magnetic Tape Unit (MTU). The MTU is a cassette magnetic tape unit which provides permanent storage of key operating parameters. It also is used to down load proper system programs and parameters to the CPU.

k. VHF Radio. The VHF radio is used as a link between the Force Terminal and an associated AN/MSC-64(V)2 FAN Terminal. This link is used when the terminals are physically separated beyond available cabling distance. The VHF radio is used for secure and non-secure voice or secure data communications. The VHF radio is not used in mobile operations.

l. RN Modem. Three RN modems are used in the Force Terminal. The RN modem is a microprocessor-controlled frequency shift keying (FSK) modulator/demodulator. It operates half duplex on both the transmit and receive portions of the RN radio link. The transmit portion of the RN modem converts data from the KG-84A or teletype into FSK tones and sends it to the radio for broadcast into the network. The receive portion of the RN modem converts tones from the radio into message data and sends it to the KG-84A or teletype. In addition, the modem provides signals required for link synchronization and timing for the ECCM function.

m. Printer. The printer is a non-impacting thermal printer and provides a hard copy record of data traffic. It prints 80 characters per line at the rate of 240 lines per minute. Print operations are normally initiated by the operator at the I/O keyboard. Paper is fed out the top front of the unit onto a paper take-up storage device.

1.10.1.3 Communications Equipment

a. Receiver. Two receivers are used in the Force Terminal. The receiver is a single side band (SSB) radio receiver which operates in the 2.0000 to 29.9999 MHz frequency range. Incoming RF signals are received, amplified, filtered, and converted to baseband signals. The receiver is controlled by the plug-in ECCM Module which is an integral part of the receiver. The ECCM Module controls all radio functions including operating frequency and sideband selection. They are selected by means of a keyboard on the front panel or by remote control from the CPU. The receiver interfaces are identical to those of the FT RT except that the receiver has no transmit capability.

b. Pre/Post Selector (P/PS). Five P/PSs are used in the Force Terminal. The P/PS is composed of tunable filters and provides filtering of the received or transmitted HF RF signal to reduce noise and interference. It serves as an RF pre-amplifier for the 400W PA. It amplifies the output from the RT from 0.1 to 1 Watt. During ECCM operation, the P/PS filter circuit is bypassed.

c. FT Receiver/Transmitter (RT). Three RTs are used in the Force Terminal. The RT is a single side band (SSB) radio receiving and transmitting unit. The RT operates in the 2.0000 to 29.9999 MHz frequency range. Refer to RT-1512 TM 11-5895-1303-24 for additional description of the FT RT.

d. Power Amplifier (PA). Three 400W PAs are used in the Force Terminal. The PA amplifies the transmit RF signal from the P/PS to a selectable output of 25, 100, or 400 Watts.

e. PA Power Supply (PS). Three PA PSs are used in the Force Terminal. The PA PS converts AC input power into the appropriate DC voltages for use in the 400W PA. Each of the three 400W PAs has a dedicated PA PS.

f. 400W Antenna Tuning Unit (ATU). The 400W ATU provides impedance matching between the transmit whip antenna and the 400W PA output.

1.10.2 Communications Terminal AN/TRC-179(V)3

The Split-Site (SS) consists of a Force Terminal specifically configured to function as a Transmit Station (TXS) and a Receiving Group (RG), Radio OR-304/TRC-179(V)3 that functions as a Receive Station (RXS). Communication interconnects for the SS TXS and RXS are provided over military or commercial paths. The paths can be microwave, landline, tropospheric scatter, or satellite circuits. The interconnect circuit path must meet Defense Communication Agency (DCA) S3 (secure voice grade) circuit requirements. The interconnects consist of six four-wire circuits. Three of the circuits are remote audio interconnects. The connection between the SS RXS and SS TXS is through the SIU at each end. Figure 1-2 shows the SS equipment. Major units of the SS are briefly discussed below; further information on the SS equipment may be found in TM 11-5895-1218-12, Appendix H.

1.10.2.1 Receive Site Equipment

Location of the receive station equipment within the Split-Site is shown in Figure 1-5.

a. Battery Box. The battery box provides storage and interface point for the SS RG keep-alive batteries.

b. Power Control Unit. The Power Control Unit contains the circuit breakers for the distribution of power throughout the SS RG.

c. Keep-Alive Battery System (KABS). The KABS supplies charging voltage to batteries in the battery box. It also controls switching of the +5.2 VDC for keep-alive for the CPU memory and +28 VDC for keep-alive of the RFO.

d. RN Modem. Three RN modems are used in the SS RG. The RN modem provides analog to digital conversion for RN data and RTTY communications.

e. KG-84A. The KG-84As provide remote interconnect COMSEC between SS RXS and SS TXS and decryption COMSEC for RN receive data at the SS RG.

f. Signal Entry Panel (SEP). The SEP provides the terminal board for signal interconnection to the TXS.

g. Signal Interconnect Unit (SIU). The SIU provides the SS RXS with internal and external signal interconnection.

h. Central Processing Unit (CPU). All automated functions of the SS RG and Force Terminal are controlled by the CPU. The CPU provides control information to the radios, modems, and other HF equipment. It provides for operator message interface through the I/Os. The programs and system parameters are downloaded from the MTU cassette. Data enters or leaves the CPU by any one of 12 serial data ports. The data is worked on by the processor program. The TXS CPU has control over the RXS CPU. All commands originate in the TXS CPU and are passed to the RXS CPU via remote interconnects. The RXS CPU returns status and traffic back to the TXS CPU for processing.

i. Control Interface Unit (CIU). The CIU provides interface between the CPU and the various RG HF equipment. The CIU also provides BIT status display for SS RG equipment.

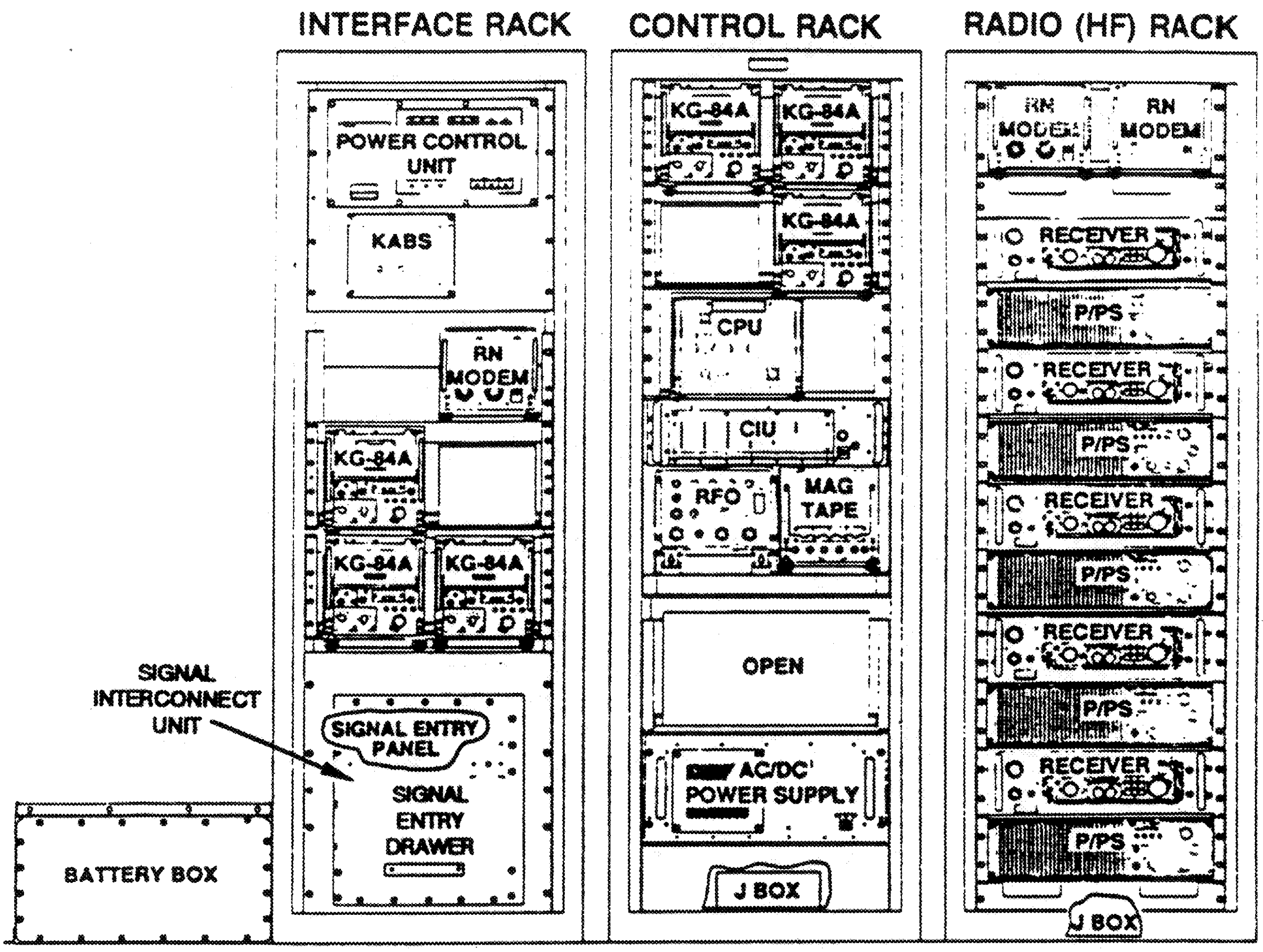

Figure 1-5. Split-Site Receive Station Equipment Location

j. Radio Frequency Oscillator (RFO). The RFO provides a reliable, real-time clock for the system. When the TOD has been correctly transferred into the RFO, it will maintain stable time for the system. It also provides a highly stable 10-MHz standard for the system. The RFO contains a rechargeable battery to maintain operation through short term power interruptions (30 minutes). If in continuous operation, the RFO requires TOD update at least every 90 days (30-day updates are recommended). Calibration is required every two years.

k. Magnetic Tape Unit (MTU). The MTU is a cassette magnetic tape unit which provides permanent storage of key operating parameters. It also is used to down load appropriate system programs and parameter to the CPU.

l. AC/DC PS. The AC/DC PS converts a 115/230 VAC, single-phase, 47 to 63 Hz input source to a +28 VDC output for +28 VDC operated equipment in the SS RG.

m. Receiver. Five receivers are used in the SS RG. The receiver is a single side band (SSB) radio receiver which operates in the 2.0000 to 29.9999 MHz frequency range. Incoming RF signals are received, amplified, filtered, and converted to baseband signals. The receiver is controlled by the plug-in ECCM Module which is an integral part of the receiver. The ECCM Module controls all radio functions including operating frequency and sideband selection. They are selected by a keyboard on the front panel or by remote control from the CPU.

n. Pre/Post Selector (P/PS). Five P/PSs are used in the SS RG. The P/PS is composed of tunable filters and provides filtering of the received or transmitted HF RF signal to reduce noise and interference. It serves as a RF pre-amplifier for the 100W PA. It amplifies the output from the RT from 0.1 to 1 Watt. During ECCM operation, the P/PS filter circuit is bypassed.

1.10.2.2 Transmit Site Equipment

The transmit station configuration requires the mission I/O rack be remoted from the Force Terminal. A KG-84A storage rack is installed in the area previously occupied by the mission I/O rack. A dummy load is installed on J4 (RX) on each of the five P/PSs in the Force Terminal. Three interface cables are supplied to connect the CPU and remote KG-84A in the TXS to provide a secure link with the RXS. Other equipment remains the same as in standard Force Terminal.

1.10.3 Radio Set AN/GRC-215

The Team Terminal (TT) is an element of the Regency Net communications system assigned for communication links with an individual Force Terminal. Secure or non-secure voice and data communication is established using a single HF radio set and a whip antenna via ground wave propagation. During poor HF propagation conditions the NVIS antenna is used to provide short-range skywave propagation for distances between 0 and 300 miles. Radio and voice encryption equipment may be removed from the rack assembly to provide Manpack communications. Figure 1-3 shows the Team Terminal equipment. Major units of the Team Terminal are briefly discussed below. Additional information on the Team Terminal equipment may be found in TM 11-5895-1220-12.

1.10.3.1 Power Equipment

a. TT Power Supply (PS). The TT PS converts the power of 115/230 VAC, single phase, 50/60 Hz or the +12/+24 VDC to a regulated +28 VDC at 24 Amperes and +8.5 VDC at 3 Amperes.

b. Battery Case/Charger. The Battery Case/Charger provides DC power for the TT RT when in Manpack configuration. The Battery Case/Charger mounts behind the RT.

1.10.3.2 Control/Interface Equipment

a. I/O Unit. The I/O unit provides the capability to transmit to and receive Regency Net messages from a Force Terminal. It manages, maintains, and controls the operating modes of the Team Terminal. The I/O unit consists of a removable display/keypad assembly and a controller assembly. A 20-foot remote cable allows the display/keypad to be operated at a remote location convenient to the operator. The display/keypad assembly provides the operator interface to the controller assembly. It displays menus in response to operational sequences and is used to compose and view messages. It performs network communication and is used for initiating BIT.

b. KY-65A. The KY-65A encrypts and decrypts voice traffic. AC/DC Power Supply (Z-AKE) powers the TSEC/KY-65A when in vehicular configuration. Battery pack assembly (Z-AKG) powers the TSEC/KY-65A when in Manpack operation.

c. RN Modem. The RN modem is a microprocessor-controlled frequency shift keying (FSK) modulator/demodulator. It operates half duplex on both the transmit and receive portions of the RN radio link. The transmit portion of the RN modem converts data from the KG-84A into FSK tones and sends it to the radio for broadcast into the network. The receive portion of the RN modem converts tones from the radio into message data and sends it to the KG-84A. In addition, the modem provides signals required for link synchronization and timing for the ECCM function.

d. Radio Frequency Oscillator (RFO). The RFO provides a reliable, real-time clock for the system. When the TOD has been correctly transferred into the RFO, it will maintain stable time for the system. It also provides a highly stable 10-MHz standard for the system. The RFO contains a rechargeable battery to maintain operation through short term power interruptions (30 minutes). If in continuous operation, the RFO requires TOD update every 90 days. Calibration is required every two years.

e. Vehicular Adapter (VA). The VA routes signals to/from the high speed synthesizer, TT RT, 100W ATU, and 100W PA. It also provides the mounting for the TT RT and the battery case/charger. The VA provides a cable for charging the remote control set batteries, and powering of the Battery Case/Charger.

f. KG-84A. The KG-84As provide COMSEC for data communications.

1.10.3.3 Communications Equipment

a. TT Receiver/Transmitter (RT). The TT RT is a single-sideband (SSB) receiving and transmitting unit. It comprises the receiver/exciter (R/E) and the ECCM Module. The R/E is controlled by the ECCM Module, which plugs into the R/E and becomes an integral part of the RT. All radio functions, including operating frequency and power level, are selected through the I/O display/keypad assembly or the keypad on the ECCM Module front panel (depending upon the configuration). The ECCM Module provides data and voice ECCM capabilities. It is the operator interface for Manpack operations. It controls the frequency synthesizer contained in the vehicular adapter, the PA, and the 100W ATU. The ECCM also contains self-test features.

b. 100W Power Amplifier (PA). The 100W PA amplifies the 10-Watt transmit signal from the TT RT. The PA amplifies, filters, and routes the signal to the 100W ATU. The PA sends BIT status signals back to the TT RT for transfer to the I/O unit. The power output of the PA is selectable for 5, 25, or 100 Watts via the I/O unit or the ECCM Module. Also, the received signals are filtered.

c. 100W Antenna Tuning Unit (ATU). The ATU couples the output of the 100W PA to the antenna. It compensates for antenna reactive impedance by matching the antenna impedance with the PA output impedance. The 100W ATU is mounted within the Team Terminal vehicle but is not in the TT rack.

1.11 RN STRUCTURE

1.11.1 Network Architecture

a. Figure 1-6 illustrates the five tier hierarchy structure of a RN communication network. At the top of this structure are the Net Control Station (NCS), its alternates, and the Injection Terminals (IT). Each terminal resides within one of the tiers and is linked to other terminals through subnets. Each subnet functions under the direction of a subnet controller terminal. The controller establishes the subnet channel and grants access to the members through a Time Division Multiple Access (TDMA) protocol.

b. A set of tier one terminals control a set of tier two terminals which in turn control a set of tier three terminals, etc. This structure is the backbone network which accommodates the flow of mission message traffic down the hierarchy as well as supporting overall network control. Overlaid on this structure are indigenous nets which provide delivery of traffic which is known to stay within an organic unit.

1.11.2 Node Descriptions

a. Each Force Terminal may actively participate in two subnets, one backbone and one indigenous, and monitor (receive only) a third. Subnets in which a terminal participates actively are termed primary links. Up to 15 members, known to the controller, including run silent or transmit capable, can participate in a primary link. Any number of members may monitor a subnet provided they have the required material. Message reception will not be acknowledged or retransmitted to a terminal over a monitor link.

b. The channel for RN data operations is divided into time slots. Slots are the time interval for a single packet transmission. A collection of slots form frames. Frames are the time span covered by the controllers channel allocation. The controller uses half the slots in a frame to broadcast to the members. The other half of the slots are allocated among the members for transmit to the controller. The member with the highest priority traffic is assigned the first transmit opportunity. Notice that members do not receive directly from other members.

c. The subnet member terminal automatically acknowledges any packet received from its controller. Acknowledgement of end-to-end message delivery is not automated. Message traffic used to direct network operation or convey command information should be acknowledged by the operator via a message transmission.

Network Hierachy

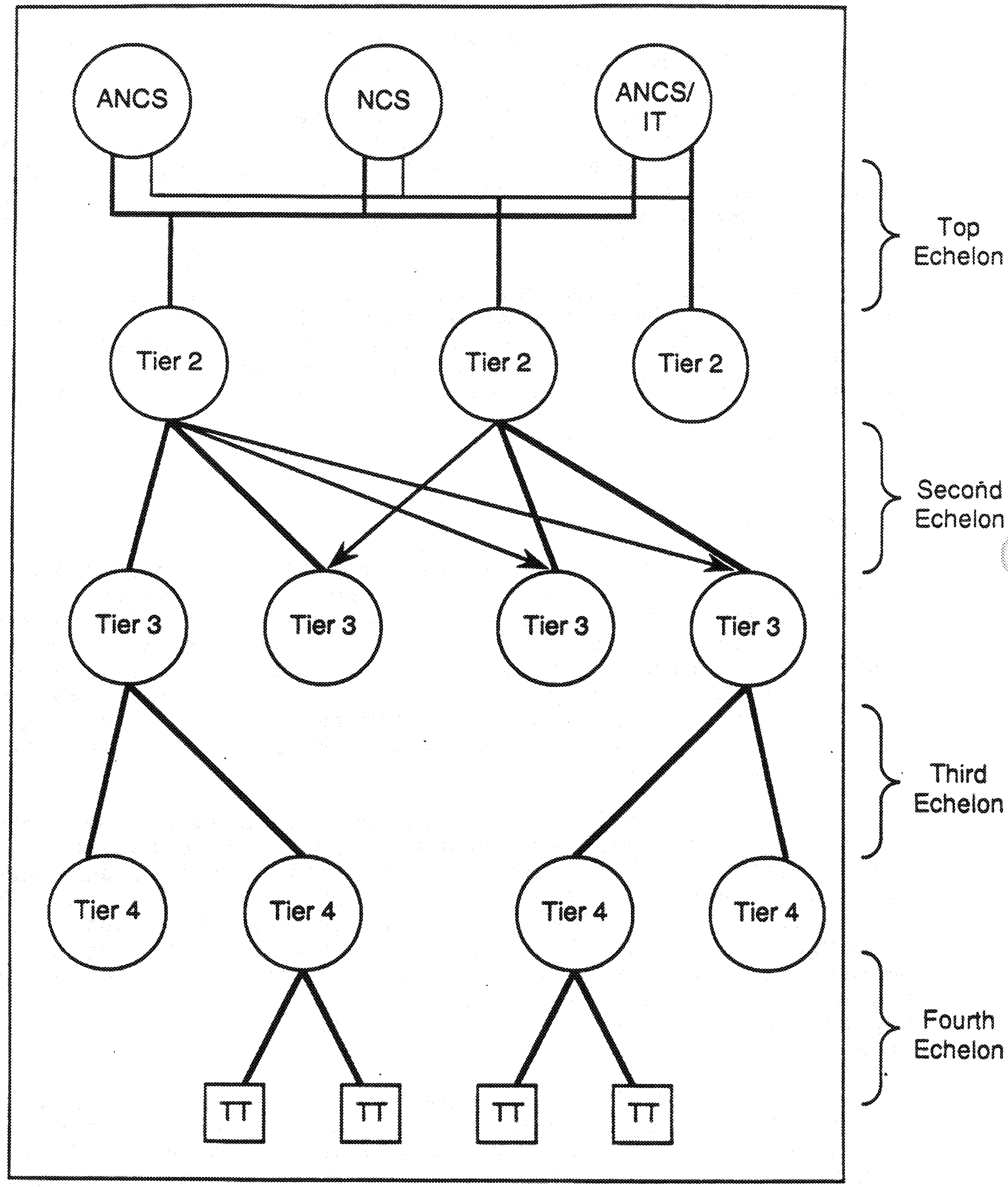

Figure 1-6. RN Network Hierarchy

1.11.3 Echelon Descriptions

a. Communication between tiers 1 and 2 is defined as the top echelon, between 2 and 3 the second echelon, between 3 and 4 the third echelon, and between 4 and 5 the bottom echelon.

b. Two separate subnets comprise the top echelon. All tier 1 terminals are members of both subnets while tier 2 terminals are members of just one of the subnets.

c. The second echelon provides communication between the Super Cluster Controllers (SCC) on tier 2 and the Cluster Controller (CC) on tier 3. The third echelon consists of CCs on tier 3 which control Force Terminals on tier 4. The fourth, or bottom echelon are subnets of Team Terminals on tier 5 which are controlled by a Force Terminal on tier 4. The controller is always one tier above the subnet members.

1.12 FUNCTIONAL DESCRIPTION OF NCS, ANCS, AND IT ROLES

a. Unique CPU program load magnetic tapes allow a Force Terminal to be initialized as an NCS, ANCS, or Injection Terminal. The primary function of an NCS is to establish the network operating modes and exercise control over the frequency channel resources.

b. The ANCS serves as a backup controller if the NCS exits the net. An Injection Terminal is one that is software capable of injecting mission traffic into the net. Any terminal on tier 1 can be an IT or ANCS/IT if the proper load tapes are used and if the rest of the net has recognized its privilege. Any one of the ANCSs can assume the role of NCS under the proper circumstances.

c. The operator of an NCS or an ANCS may add or remove ANCSs or ITs from a net, and print subnet status, frequency usage, and terminal location reports. In addition to these functions, the operator of the active NCS can specify a net operating mode change, modify the Address Identifier Group (AIG) and frequency hop set lists, specify ECCM authorization within the net, and transfer net control to an ANCS.

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CHAPTER 2

FORCE TERMINAL OPERATIONS

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CHAPTER 2
FORCE TERMINAL OPERATIONS

2.1 GENERAL

a. Communications Terminal AN/TRC-179(V)1, also called the Force Terminal (FT), is a radio communications terminal housed within an S-711/TRC-179(V) shelter. As described in Chapter 1 of this volume, the FT consists of HF and VHF radio equipment, and the supporting hardware and software.

b. The FT may be mounted on a vehicle, or installed at a fixed site. At a fixed site, the FT operates on facility power. The terminal can operate on Host Nation power with 3-phase input voltage between 190 and 240 VAC ±10%, and 50/60 Hz. A vehicle-mounted FT may be operated in stationary or mobile mode.

c. In the stationary mode of operation, the FT generally uses 3-phase 110/208 or 240/416 VAC power. An acceptable power source is a PU-794/G trailer-mounted generator which provides 20 kW of power. The FT is capable of operating on Host Nation commercial power when the power is any 30 kW 190-240 VAC ±10%, 50/60 Hz source. In the stationary mode, FT communications equipment is capable of operation in any mode (Voice, Data, RTTY or SCAN) available for selection at the I/O. The FT has five radio stacks available during stationary operation: three capable of transmit and receive, and two capable of receive only.

d. In mobile operation, the FT operates on +24 VDC power provided by the vehicle. This limitation of available input power places restrictions on the amount of equipment available for use during mobile operations. In the mobile mode, the FT is limited to operation of two radio stacks: one (stack 1) capable of transmit and receive, and one (stack 4) capable of receive only. Both stacks operate on the same TX/RX whip antenna. Maximum transmit output power of stack one is 100 Watts, compared to a maximum of 400 Watts while configured for stationary operations. Stacks one and four are capable of Data, Voice, or RTTY operation while mobile.

e. If desired, the mobile FT may also be powered by a towed generator set. Communications are restricted to stacks one and four due to available input power and the connection of the TX/RX whip to these two stacks. Power sources are summarized below:

STATIONARY	MOBILE
Host Nation Power	DC (Vehicle Power)
PU-794/G Gen Set	PU-794/G Gen Set

2.2 FORCE TERMINAL OPERATIONAL CAPABILITIES

a. The Force Terminal has the following communications capabilities:

- HF Radio Communications
  - Five receive channels and three transmit channels
  - Frequency range: 2.0000 to 29.9999 MHz
  - Power output (selectable): 25, 100, or 400 Watts
  - Data and voice (secure/non-secure), and radio-teletype (RTTY) modes
  - Electronic counter-countermeasures (ECCM) capabilities.
- VHF Radio Communications
  - Frequency range: 30 MHz to 76 MHz
  - Power output: 35 Watts
  - Data and voice (secure/non-secure) modes
- One Field Telephone Circuit
- Local Voice Circuit (Intercom) Between the Terminal Operator and the Vehicle Operator
- Remote Communications
  - Force Terminal radio and up to 5 mission I/Os can be remoted
  - Hardwire or VHF interconnect capabilities to Satellite Communications Terminal AN/MSC-64(V)2 Flaming Arrow Net (FAN) terminals.

b. These capabilities are summarized below:

STATIONARY	MOBILE
Communications Stacks:	
3 Transmit/Receive (1, 2 & 3) (400 W. per stack)	1 Transmit/Receive (1) (100 W. maximum)
2 Receive only (4,5)	1 Receive only (1)
Communications Modes: (Stacks)	
DATA (1, 2, 3 & 4)	DATA (1 & 4)
Voice (1, 2, 3, 4 & 5)	Voice (1 & 4)
RTTY (1, 2, 3 & 4)	RTTY (1 & 4)
SCAN (5)	SCAN (not available)
Antennas: (Stacks)	
3 Broadband (1 & 4, 2, 3)	1 Tx/Rx Whip (1 & 4)
1 VHF	
1 Receive Whip (5)	
1 NVIS (1 & 4)	

c. The following chart indicates which equipment is located in radio stacks one through five. The equipment is listed from top to bottom as mounted in the rack.

Table 2-2.

	STACK 1	STACK 2	STACK 3	STACK 4	STACK 5
RACK 4					
RN MODEM (optional)			X		
RECEIVER					X
R/T			X		
P/PS (2)			X		X
PA			X		
PA PS			X		
RACK 5					
RN MODEM		X			
R/T		X			
P/PS		X			
PA		X			
PA PS		X			
RF BITE					
RACK 6					
RN MODEM (2)	X			X	
RECEIVER				X	
R/T	X				
P/PS (2)	X			X	
PA	X				
PA PS	X				
CONTROL RACK (RACK 2)					
KG-84A #1	X				
KG-84A #2		X			
KG-84A #3 (optional)			X		
KG-84A #4				X	

2.2.1 Communications Modes (Data, RTTY, Scan, Voice)

a. Data Communications - The FT is capable of both transmitting and receiving Regency Net data communications in a network architecture in Non-ECCM, Training-ECCM, and ECCM modes. All stacks except stack 5 can be configured for Data operation.

b. RTTY Communications - The FT is capable of both transmitting and receiving RTTY communications in Non-ECCM mode only. This can be done from one FT to another or to an existing HF SSB RTTY terminal. Four modes of RTTY are available in both ASCII and BAUDOT: 85Hz, 85V, 85D, and 850Hz.

c. Voice Communications - The FT is capable of both transmitting and receiving voice communications in Secure or Non-Secure, Non-ECCM OR ECCM modes. Voice can be routed from any I/O via the SEP to another I/O or to any radio stack. Any stack can be set up for Voice operation.

d. SCAN Communications - The FT is capable of operating one radio stack (stack 5) in the Scan (voice) mode of operation. It can scan up to five frequencies with an operator-selected dwell time from 15 seconds to 300 seconds. SCAN mode operates in Non-ECCM mode only.

2.2.2 Force Terminal Antennas

a. Antennas provided with the Force Terminal include:

- Three Broadband Antennas - AS-3791/G
- One VHF antenna - AS-4252/G
- One HF receive whip - AS-4253/TRC-179(V)
- One HF transmit/receive whip - AS-4254/TRC-179(V)
- One NVIS antenna - AS-2259/GR.

b. During mobile operations, the 32' transmit/receive whip (AS-4254/TRC-179(V)) is used. (TM 11-5895-1218-12 provides detailed information on the use and deployment of these antennas.)

2.2.3 Transitioning Between Stationary and Mobile Operations

Operational conditions may call for rapid transition from your current mode of operation to either stationary or mobile. Upon receipt of directions to transition from one mode to another, you must determine the role of your terminal upon completion of the transition. If you are going from stationary to mobile operation, you may be expected to either remain configured for mobile, or to configure for stationary operations upon reaching your destination. Proper transition will only require a warm restart of the system CPU and allow you to be back on the air relatively quickly.

2.2.4 Alternate Takeovers

If you are directed to move to a new location and are presently a Subnet controller you will probably be directed to "handoff" your controller function to another Force terminal. This other terminal would be designated as the "Alternate Controller." This Alternate Controller Takeover allows you to move to a new location and get set up while providing your members with a controller while you move (or you may be the Alternate Controller). This is known as leap-frogging. Another scenario may be that your terminal is being assigned a new mission and this procedure allows for a smooth transition of controllers.

2.2.5 Power Sources/Options

a. AC Power. As mentioned previously, stationary operation of the Force Terminal requires an input voltage of 190-240 VAC ±10%, at 50-60 Hz. When operating in stationary mode, the FT normally receives power from a PU-794/G generator. This generator provides sufficient power (20 kW) for normal operation of all FT equipment. The Force Terminal is also capable of operating on Host Nation power with a minimum of 40 Amps/phase service. Input power for the FT is routed through the externally-mounted AC Power Entry Panel. (Refer to TM 11-5895-1218-12, paragraph 2-2, for Power Entry Panel controls and indicators.

b. DC Power. Mobile operations require an input voltage of +24 VDC. During mobile operation, power is provided by the vehicle batteries.

c. Battery System. The Force Terminal is equipped with back-up batteries for critical systems. The battery system includes a battery storage assembly and two separate emergency DC power charging systems. The two emergency systems are the Emergency Lighting Battery System (ELBS) and the Keep-Alive Battery System (KABS) charger. The battery storage assembly consists of three rechargeable battery packs of 12 volts each. Two of the three battery packs (24 Volts) provide emergency DC power for the KABS which powers the RFO and the CPU memory. The third battery pack (12 Volts) supplies emergency DC power for the ELBS.

d. Emergency Lighting Battery System (ELBS). If a power failure occurs during mobile or stationary operation, the ELBS (Figure 2-1) maintains partial lighting inside the Force Terminal. No operator action is required to enable the ELBS when primary power is lost. Blackout protection is also maintained.

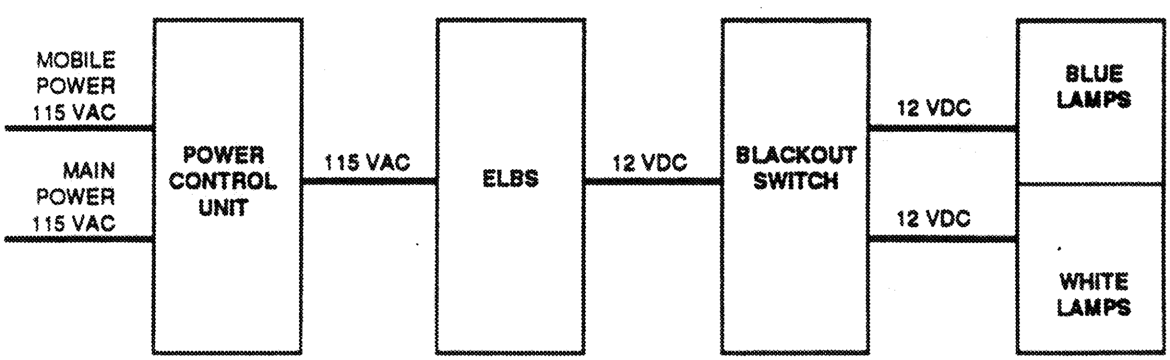


Figure 2-1. Emergency Lighting Battery System (ELBS)

e. Keep-Alive Battery System (KABS). The KABS charger (Figure 2-2) is used during power failures in mobile or stationary mode. The KABS maintains CPU internal memory, as well as time reference signals for the RFO keep-alive subsystems in the terminal for up to three hours.

(1) During normal operation, the KABS is maintained by power from the terminal DC power supply. During this time, the KABS also charges the two battery packs. When a power failure occurs, the KABS maintains the 5.2 VDC power to the selected CPU memory circuits, and the 28 VDC power to the RFO to maintain time-of-day (TOD). This reduces the time needed to return to operation after a short-term power loss or changeover between stationary and mobile operations.

2.2.6 Modular Chemical Protection Equipment (MCPE)

a. The MCPE allows the terminal to be operated in a chemically or biologically contaminated zone. The equipment that comprises the MCPE includes two NBC detectors, two NBC alarms, and a 100 CFM General Purpose Fan Unit (GPFU) M-93. The GPFU consists of a control module and a fan/filter unit.

b. The MCPE has an alarm which is activated when the presence of NBC agents is detected. The system provides filtered air under positive pressure. The positive pressure prevents harmful quantities of NBC agents from entering the shelter. An A/V alarm on the GPFU control module will activate when loss of positive pressure is detected.

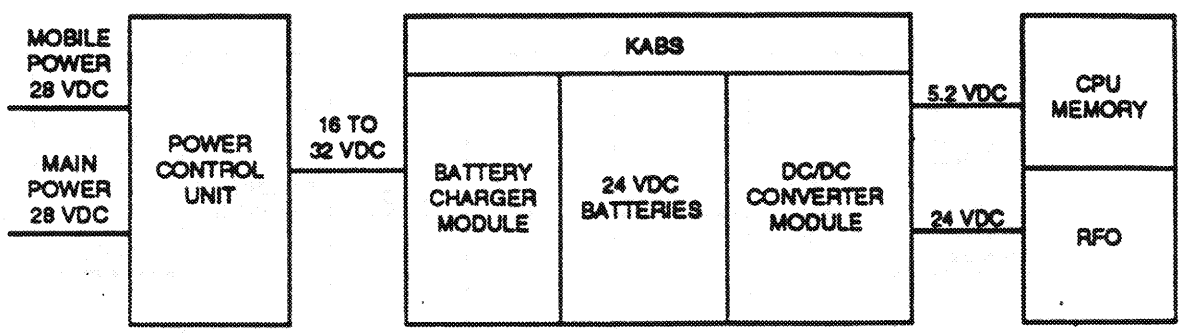


Figure 2-2. Keep-Alive Battery System

2.3 THEORY OF OPERATION

a. The Force Terminal provides radio communications with the remainder of the RN elements. It also links AN/MSC-64 FAN Terminals, and remoted I/O Units (Figure 2-3).

b. The Force Terminal's five receive and three transmit channels provide half-duplex HF communications. The terminal can provide up to three transmit/receive (TX/RX) channels for data or voice. Two monitor channels (receive-only) are also provided, one for data/voice, and one for voice only. The FT can operate all five channels in voice mode. The FT CPU can only support 3 RN data stacks.

c. The terminal is equipped with two I/Os, a radio I/O and a mission I/O. Both may be remoted. In addition, four more I/Os can be remoted from the Force Terminal for mission operation.

d. All automated functions of the Force Terminal are CPU controlled. The CPU sends control signals via the CIU to the radios, RFO, SIU, and modems. The CPU also provides the operator message interface through the I/Os. The Magnetic Tape Unit (MTU) loads the operating program, AIG, Frequency Dictionary, and Operational Parameters tapes into the CPU. The CPU also uses the MTU to store the latest operational configuration on the Operational Parameters tape.

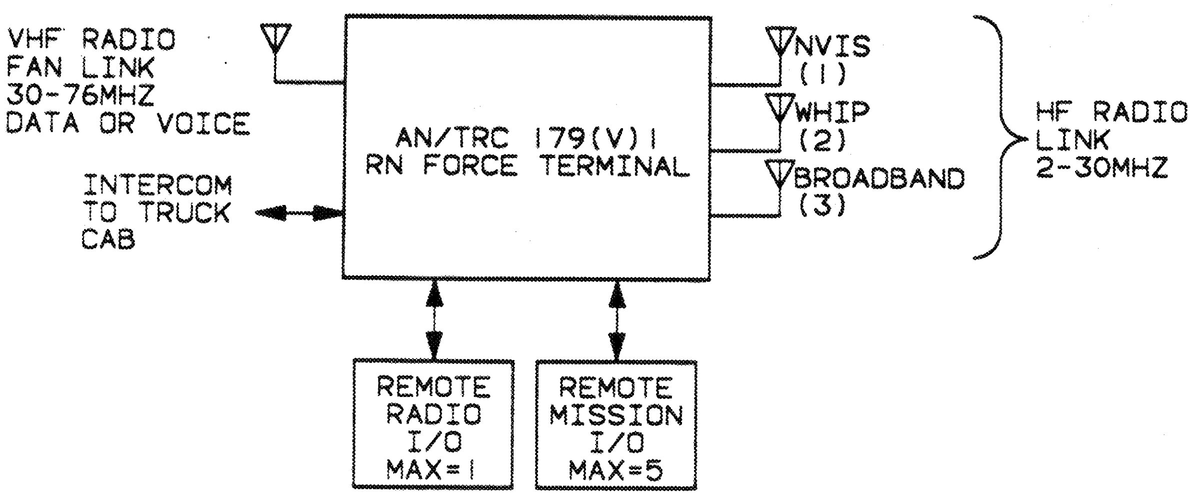


Figure 2-3. Force Terminal Regency Net Interconnects

2.3.1 Voice Signal Flow

a. Figure 2-4 shows the Voice Signal Flow Diagram. The HF voice signals are received on the HF antenna, filtered by the pre-post selector, and applied to the receiver (or receiver/exciter). The receiver demodulates the encrypted voice signal and routes the signal to the FT signal entry, where the encrypted voice is routed to the selected I/O device. As shown in the diagram, this can be an internal or remoted I/O. The VHF transmitter may be used when an RN mission I/O has been remoted into the FAN Terminal and a wireline interconnection between the Force and FAN Terminals is not used. Once the signal reaches the I/O, the encrypted voice signal is sent to the Telephone Modem. Here it is routed to the KY-75A for decryption. The KY-75A sends the clear voice signal back to the Telephone Modem where it is routed to the handset and/or speaker.

b. The remoted I/O case uses the same signal flow except the FT signal entry amplifies and conditions the signal before transfer to the Telephone Modem over the remote interconnect.

c. Voice transmissions originate at the handset where the push-to-talk (PTT) switch is activated. This key signal is sent to the Telephone Modem, where it is routed through the FT signal entry to the appropriate ECCM module within the receiver/exciter. The ECCM sends back a PTT key signal synchronized to its voice hop clock for ECCM operation. In non-ECCM operation, the signal is returned without synchronization. The synchronized PTT is routed through the FT signal entry back to the Telephone Modem. This signal is used to key the KY-75A. The KY-75A then encrypts the voice signals from the handset. The encrypted signal is then routed to the Telephone Modem, to the FT signal entry, and finally to the selected receiver/exciter. The receiver/exciter modulates the RF with the encrypted voice signal. The RF signal is amplified by the Power Amplifier and applied to the antenna.

c. The encrypted voice signal in the FT signal entry can also be routed to the VHF transmitter for modulation of the VHF carrier.

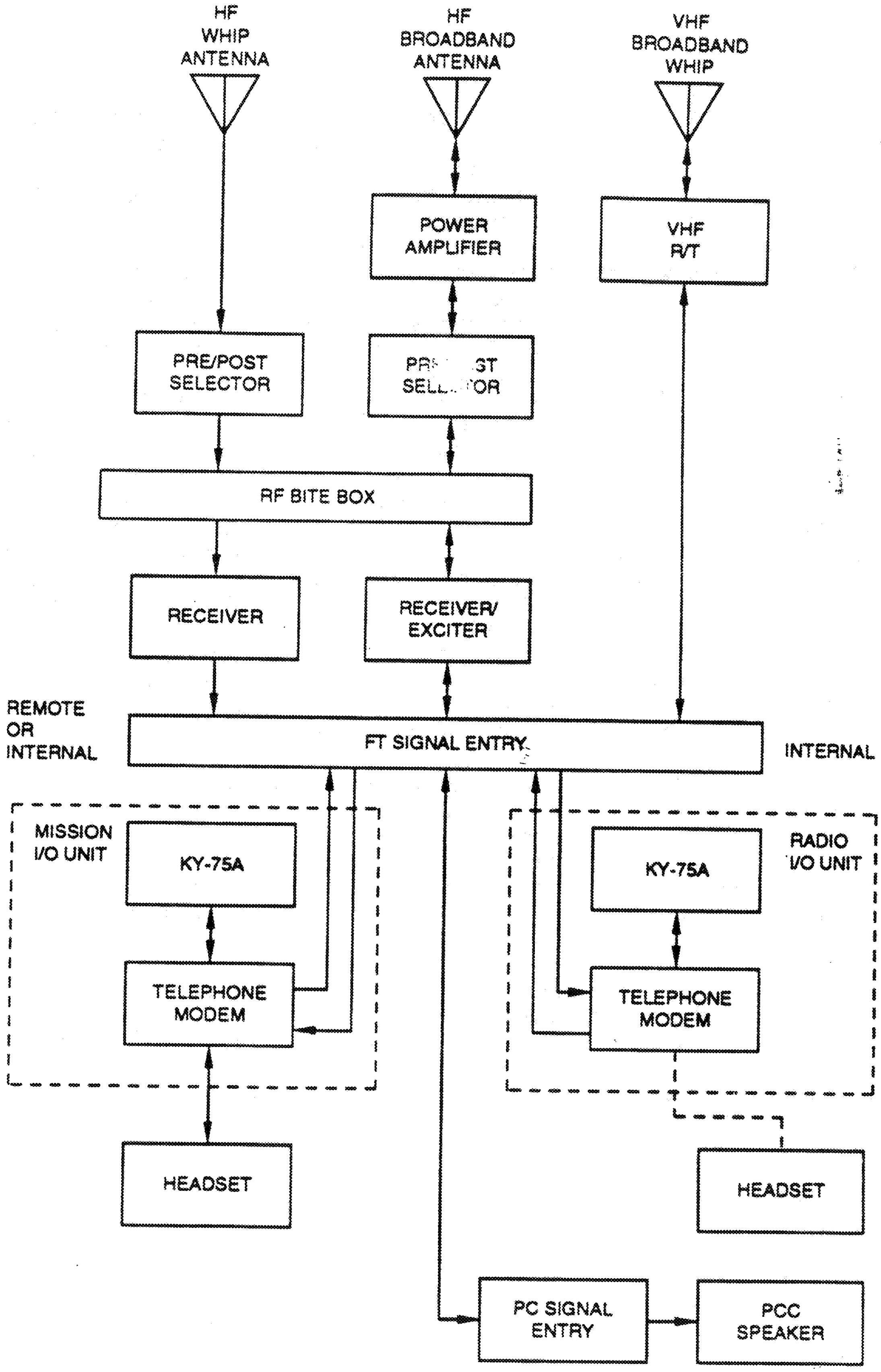


Figure 2-4. Voice Signal Flow Diagram

2.3.2 Data Flow

a. Figure 2-5 shows the Data Signal Flow Diagram. HF encrypted data signals are received by the antenna, filtered by the pre-post selector, and applied to the receiver (or receiver/exciter) where the signal is converted to baseband. During data ECCM operation, the pre-post selector (PPS) filter sections and control circuits are bypassed to allow the required frequency agility. The encrypted baseband signal is applied to the RN Modem where it is demodulated. The encrypted data is then applied to the KG-84A for decryption and to the CPU, where data is verified. The CPU extracts address information and routes the data to the appropriate I/O. If that I/O is located in the FAN Terminal and FAN/RN communication interconnect is VHF, then data is encrypted by a KG-84A and applied to the VHF RT for modulation and transmission. If the CPU determines the data is addressed to an I/O within the Force Terminal, the clear data is routed to the I/O element and directly to the keyboard/display. At the operator's discretion, the message can also be printed. (Type 1 messages are always printed.) If the address is for a remoted I/O, then the data is encrypted by a KG-84A and routed to the FT signal entry. Here the encrypted data is converted to frequency tones for the remoted I/O and routed to the Telephone Modem. The encrypted data is received at the remoted I/O and routed to the Telephone Modem. The encrypted data is converted from frequency tones to a binary data stream. From the Telephone Modem the signal is sent to the KG-84A for decryption. The output of the KG-84A is sent to the keyboard/display.

b. Upon receipt of any message at the keyboard display, the K/D audible alarm will sound. For Type 1 messages, the alarm will sound for 0.5 second on, 0.5 second off. This will be continuous until manually reset by the operator. For all other types of messages, the alarm will be activated for 2 seconds, then automatically shut off. There is no repeating function for a non-Type 1 message alarm.

c. Data transmissions are initiated from the keyboard/display by the operator, either recalling pre-formatted messages from CPU memory or composing messages. Each message is routed from the keyboard/display directly to the CPU via the Telephone Modem. The CPU can send the data out via HF, VHF, or wireline to another remoted I/O. The CPU applies this clear data to a KG-84A for encryption. In the case of HF communication, the encrypted data is sent to the RN Modem where it is converted to baseband tones. These tones are used by the receiver/exciter to modulate RF carrier. The signal is then filtered, amplified and applied to the antenna. For VHF transmission, the encrypted data is transferred to the FT signal entry and then used to modulate the VHF transmitter. The wireline connection has the encrypted data sent to the FT signal entry for conversion to FSK tones to be sent over the wireline.

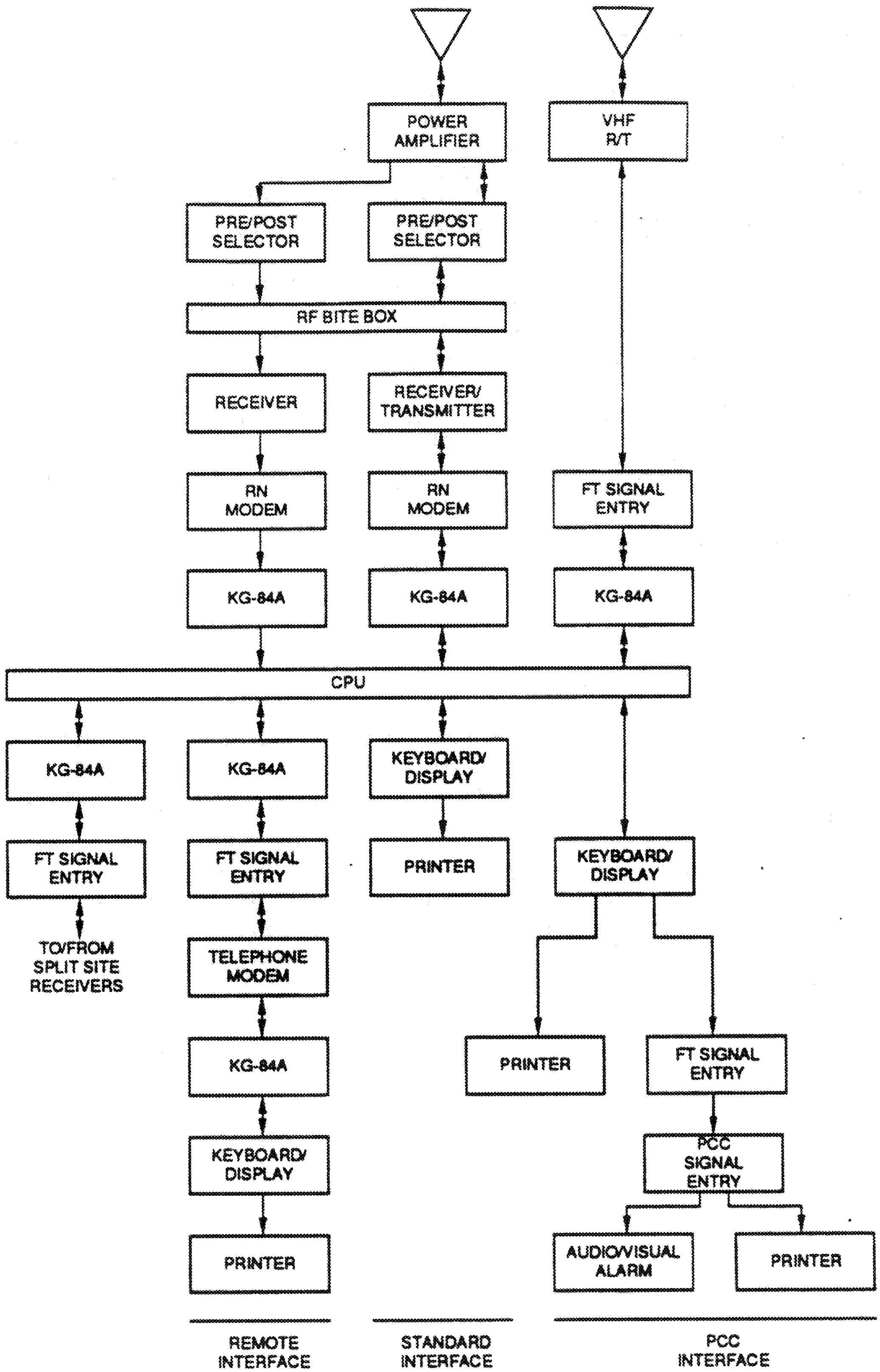


Figure 2-5. Data Signal Flow Diagram

2.3.3 Control Flow

a. Figure 2-6 shows the Control Signal Flow Diagram. All control signals originate at the CPU. The operator has control of terminal operation through the Radio I/O's Keyboard/Display. The CPU sends control commands to the Control Interface Unit. Here the commands are validated and converted to radio, modem, and RFO commands and sent over the control bus.

b. Via the control bus structure the Control Interface Unit commands the receiver to tune to new frequencies, load new frequency tables, start/end ECCM modes, etc. The radio, modem, and RFO communicate back to the Control Interface Unit via the status bus. Key variable selection within the KG-84A is controlled via the Control Interface Unit commands to the Modem. After command validation, the modem instructs the KG-84A to select a different operating variable. The control interface between radios, modems, and RFO is an asynchronous data format. Each data character is an 11-bit data stream consisting of 1 start bit, 8 data bits, 1 odd parity bit, and 1 stop bit. The radio to modem control is transmitted in response to the rising edge of the hop clock and modem to radio control data messages.

2.3.4 Force Terminal Interfaces

The principle RN equipment elements with which the Force Terminal interfaces are HF RF, VHF RF, remote I/O, and the intercom. These interfaces are described in detail in the following paragraphs:

a. HF RF Interface. The HF RF interface accommodates both data and voice communications, in secure or non-secure modes, in RTTY or RN data operations. COMSEC for data mode is provided by a KG-84A. COMSEC for voice mode is provided by a KY-75A. Normally, the terminal is operated in the secure (encrypted) mode.

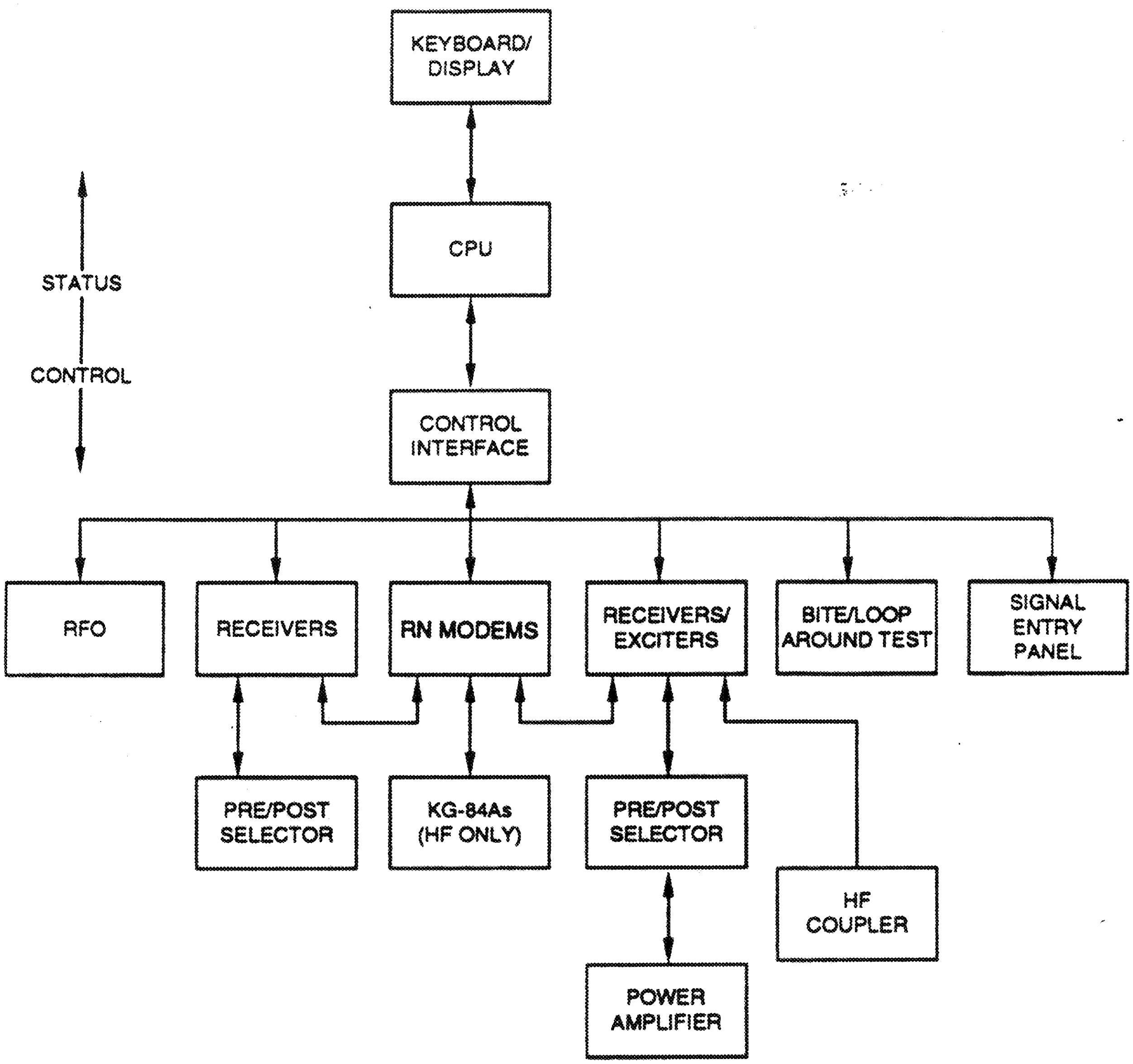


Figure 2-6. Control Signal Flow Diagram

b. VHF RF Interface. The VHF interface (Figure 2-7) is used to provide communications between the Force Terminal and an AN/MSC-64 FAN (Flaming Arrow Network) terminal. In this scenario, an RN Mission I/O Rack has been remoted and is collocated with the FAN I/O Rack. The voice link may be secure or non-secure. Data and voice may not be used simultaneously, but is selectable under the Signal Entry Panel set-up menu at the Force Terminal Radio I/O.

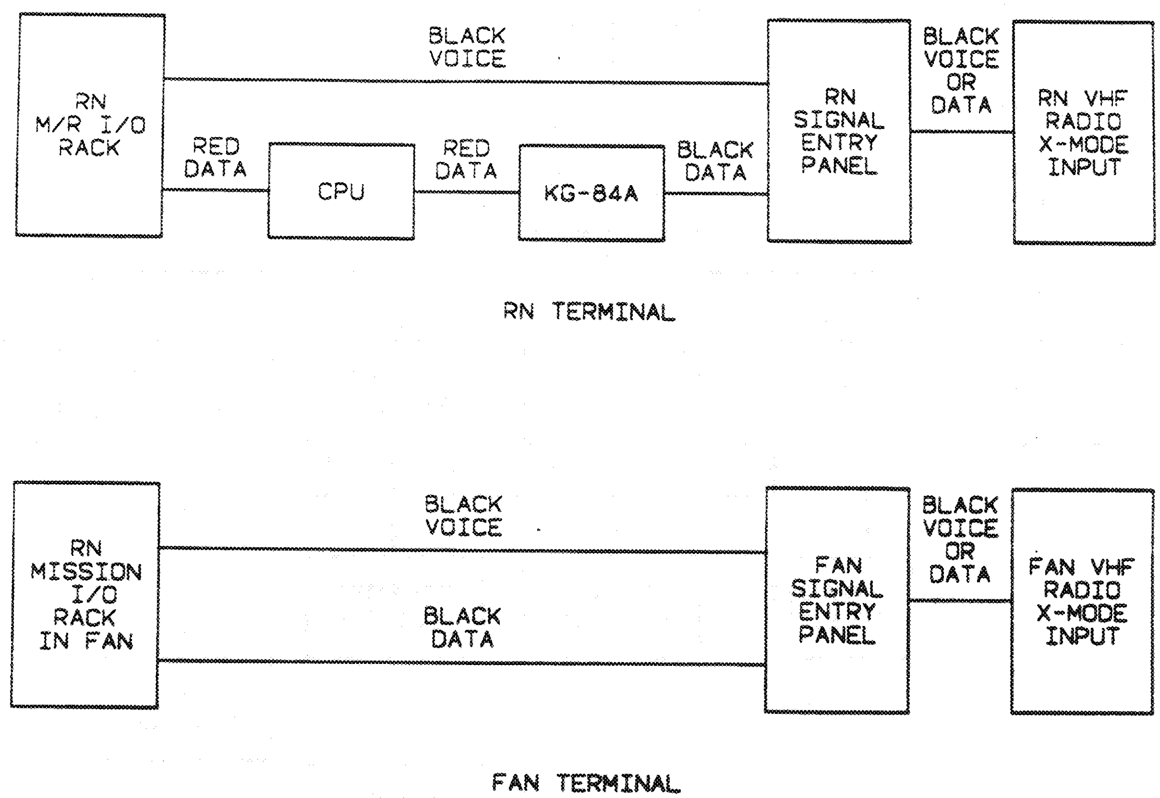


Figure 2-7. VHF Interface

c. Figure 2-7 shows how the VHF radio system in the Force Terminal and the FAN Terminal are linked:

1. The TX voice channel is a narrowband signal, output from the SEP into the X-mode connector located on the radio. A narrowband filter in the SEP determines the bandwidth of the voice signal. The RX voice signal also comes from the X-mode connector on the radio, and is passed through a narrowband filter in the SEP.

2. The data channel is wideband, and uses the baseband bandwidth required for the KG-84A data.

d. Remote I/O Interface. This interface gives a secure (BLACK) communications link between the Force Terminal and remote I/O Units. Data signals flowing over this link are encrypted by KG-84As. Voice traffic is encrypted by the KY-75A. The cables for this link are two WF-16 field wire pairs. Separate pairs are required for voice and data. Digital data is converted to FSK tones before it is sent over the cable. The content of the transmission is the same as when the I/O is located in the Force Terminal.

e. Intercom Interface. This interface provides non-secure voice communications between the Force Terminal operator and the vehicle cab during mobile operation.

2.3.5 Force Terminal Network Functions

Within Regency Net, the Force Terminal may function as a Network Control Station (NCS), Alternate Network Control Station (ANCS), subnet controller, or a subnet member. The Network control functions are separate from the subnet roles. That is you may be an NCS and a subnet controller or member. The same is true for the ANCS position. But you may not be an NCS and ANCS simultaneously. You can be a subnet controller and member at the same time. Net operation is described in the following paragraphs:

a. RN TDMA Processes. RN is a set of subnetworks which operate in time-division-multiple-access (TDMA). Time is divided into slots, and one terminal in the subnet is assigned to transmit in a slot at a time. All terminals in the system operate synchronously from a time-of-day clock.

b. Network Management. A portion of RN communications is devoted to network management. The NCS monitors overall network status (Figure 2-8). The NCS provides control of certain critical network parameters. The functions performed by the NCS at this level include:

- Frequency management
- ECCM mode selection
- Subnet status control
- ANCS/IT control

c. Subnet Control. Subnet controller terminals are located at each level of RN communications. Subnet controller functions include:

- Enter/change subnet membership list
- Constitute subnet
- Print subnet status report
- Print NCS-directed frequency report
- Enter location for a terminal
- (Data) Code rate selection

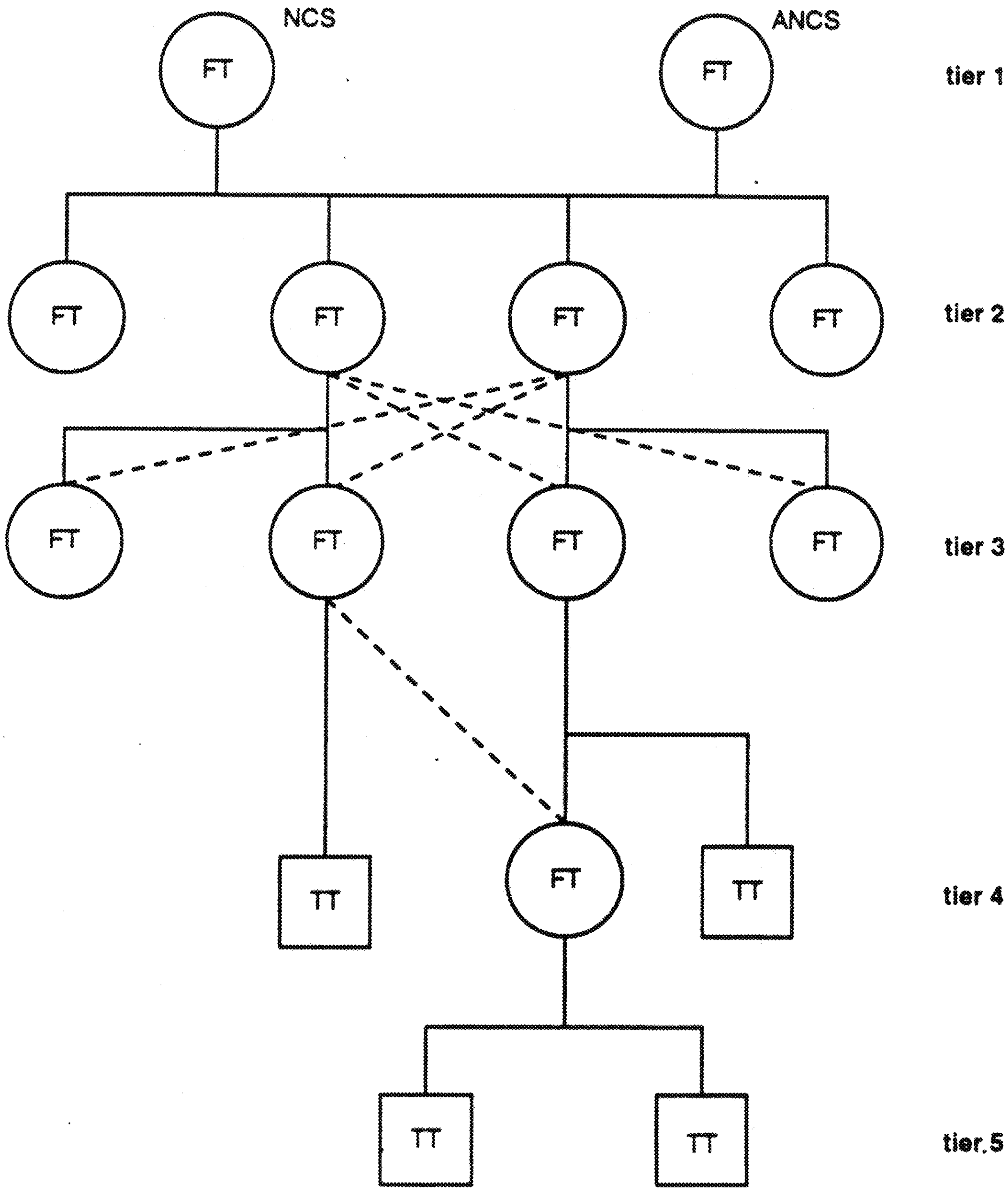
d. The dashed lines in Figure 2-8 illustrate the redundancy of Regency Net (monitor links), which enables message traffic to be passed successfully even during periods of difficult propagation or interference.

2.3.6 Self-Test Capabilities

a. The Built-In Tests (BITs) provide a method by which you may check the operating condition and reliability of the individual components of the I/O and terminal. They are run automatically when the equipment is powered up and may also be requested in the course of operations.

b. The Built-In Tests are an important tool for troubleshooting operational problems in your terminal. Fault messages appear on the status line when BIT finds a problem. See Appendix A for explanations and suggested actions for these fault messages.

c. The Built-In Tests may be run any time after initialization has been completed. They are accessible through the use of the [BIT] key. Pressing [BIT] will bring you to one of the BIT menus, where you will be able to specify which Built-In Test you wish to perform.



NCS = Net Control Station

ANCS = Alternate Net Control Station

Figure 2-8. RN Network Structure

d. Through these screens you may run BIT on any piece of equipment: any or all of the stacks; the MTU; the CIU; the CPU; the Signal Entry Panel (RN only); the RFO; or the Radio I/O Unit. In addition you may check the I/O Linkages (RN only) perform Loop-Around tests; or check the whole terminal. If the Whole Terminal option is chosen, BIT will run on the Display/Keyboard, Random Access Memory (RAM) and Read-Only Memory (ROM) processors, and linkages, as well as the other terminal components (stacks, RFO, CIU, etc.).

e. Upon completion of the selected Built-In Test, the display will show any faults detected by that test. Appendix A contains explanations and suggested actions for the fault messages. When the selected BIT is complete, the BIT menu will again be displayed, so that you can perform other tests as necessary.

f. The Force Terminal has both on-line and off-line Built-in Test (BIT) and fault detection capabilities. With operator intervention, BIT can isolate an equipment failure to the line-replaceable unit (LRU).

1. Off-Line BIT. Only a small amount of operator interaction is required to use off-line BIT. Most BIT functions are self-prompted, with audible/visual alarms and indicators. CPU errors are reported to the I/O Units. In turn, I/O BIT errors are reported by the I/O to the CPU. If an I/O BIT error occurs, the CPU may shut off communication with the faulty I/O. The following is a summary of BIT features:

   - If a fault occurs in the terminal, the CPU activates visual and audible alarms.

   - Off-line BIT is initiated by the Radio I/O operator. If an equipment fault is detected the CPU shuts down the failed stack.

   - The RN Modem reports any faults directly to the CPU during off-line BIT. The CPU terminates communications through any channel with a faulty RN Modem.

   - The KG-84A status of units used for secure HF data communications is monitored by the CPU. If a fault occurs, the CPU disables the channel.

   - BIT isolates faults to individual LRUs. The CIU also gives local indication of BIT status for each LRU.

2. Radio Loop Tests. A radio loop (off-line BIT) test is available to the Radio I/O operator. The test is activated through the CPU. A 100 mW RF signal from any of the three R/Ts can be looped back to any of the five HF R/Ts or receivers. This feature provides test verification through the audio baseband. At the radio I/O, select Item #14 "Loop Around Tests" from the BIT Menu. Select the transmit and receive stacks. After ["NEXT MENU"] is pressed on the radio I/O, the selected radios will tune to 17.1234MHz, LSB. Connect a handset to each J1 connector of each radio. Adjust the volume control fully clockwise on each radio to be tested. Key the handset and transmit a short count "123454321" while listening for the short count at the receiver. To leave the "Loop Around Tests" menu, press the ["ABORT"] key on the radio I/O K/D. NOTE: If desired the "Loop Around Tests" can be performed from the I/O racks if the SIU is configured properly.

3. On-Line Bit. On-line BIT is continuously being run by the CPU via the CIU control bus. This consists of "polling" of the On-line equipment by the CPU. When a piece of equipment is polled it responds with its present status. If that status report indicates a fault, that fault is reported to the operator via the CPU to K/D link at the Radio I/O. The RFO is polled once every minute. The radios and their associated RF equipment are polled once a minute as long as that stack is considered operational. The RN Modems are only polled during RN data operation, or whenever a command is sent to the Modem. On-line BIT of the CIU, MTU, and I/Os is performed via a "time-out" condition. This means the CPU expects to receive data from these units on a semi-regular basis. After a given amount of time without communication, the CPU considers them faulted and reports it. These units regularly report to the CPU in the event that there are no regular communications to pass.

2.4 STATIONARY SETUP

2.4.1 Deployment of the Force Terminal

Preparation for operation of the Force Terminal is discussed in detail in TM 11-5895-1218-12. The procedures covered include:

- Installation of COMSEC equipment, the RT-524, NBC detectors and NBC remote alarms
- Shelter grounding
- Power connections
- Power-up checks
- Broadband Antenna installation
- Remoting I/O racks
- Ventilation requirements.

2.4.1.1 Site Requirements

Selection of the proper site for installation of Broadband Antennas will greatly improve the ability to establish and maintain good radio communications.

a. When selecting a site to install antennas, the following must be taken into consideration:

- Up to three Broadband Antennas may be installed for each FT.
- Each antenna requires a 55 foot by 55 foot area.
- Each antenna must be within reach of the 150 foot terminal-to-antenna RF coaxial cable.
- Antenna separation should be maximized within the physical limitations of the site.

b. In addition, the site should have the following characteristics:

- The site should be free of overhead obstructions, such as power lines or bridges.
- The site should be away from man-made obstructions, such as buildings, bridges, fences, roadways, and antenna towers.
- The ground should be fairly level, and free of rocks or ground cover which could interfere with proper assembly of the antenna.

2.4.1.2 Grounding the Shelter

Step 1. Remove the ground rod, ground strap, and sledge hammer from their mountings in the shelter.

Step 2. At grounding site, dig a hole 6 inches deep and 6 to 8 inches across.

Step 3. Screw the driving stud onto the top of the ground rod.

Step 4. Using the sledge hammer, drive the ground rod into the ground at a 30 degree angle. Leave 6 inches of the rod exposed in the hole. It will be used to connect the rod to the shelter with the ground strap.

NOTE:
If using a PU-794/G generator set, it is acceptable to use the sledge hammer, mounted on the generator set, to drive the ground rod straight into the ground.

Step 5. Connect one end of the ground strap to the GROUND wingnut in the AC Power Entry Panel and tighten the wingnut securely. Insert the other end of the ground strap into clamp on the exposed end of the ground rod and secure by tightening the clamp bolt.

2.4.1.3 Power Requirements - Stationary Operation

a. Stationary operations require an input voltage range of 190 to 240 VAC ±10%, at 50 to 60 Hz. When operating in the stationary mode, the FT may use available Host Nation power or it may use a PU-794/G trailer-mounted generator. The PU-794/G provides sufficient power (20 kW) for normal operation of all FT equipment. Input power for the FT is routed through the externally mounted AC Power Entry Panel. For connections to available line power there is a data plate mounted on this panel or refer to TM 11-5895-1218-12, paragraph 2-8c. Proper hook up and proper strapping of the generator is essential.

b. Check type of power source to be used. Line voltage should have 40 Amps/phase available. If the PU-794/G Generator set is to be used it needs to be strapped for 240/416V operation. Ensure source is properly grounded.

2.4.1.4 Antenna Configuration

a. The normal antenna configuration while operating in the stationary mode is to deploy the three Broadband Antennas for both transmit and receive functions of stacks 1 through 4. (Assembly instructions can be found in TM 11-5895-1218-12, paragraph 2-8d.) The receive-only whip is used for stack 5 operations. The VHF transmit-receive antenna is needed when operating the RT-524 VHF radio. Both the VHF and the HF receive antenna must be raised from their stowed position for stationary operations.

b. The 32 foot HF transmit-receive antenna is not normally used when the terminal is operating in the stationary mode. This antenna should be stowed when not in use.

2.4.2 Power-Up Procedures

2.4.2.1 Connect Power to Shelter

Connect AC power to the shelter (refer to TM 11-5895-1218-12 TM, paragraph 2-8c) using the following steps:

Step 1. Ensure all Prime Power Conditioner (PPC), Power Control Unit (PCU) circuit breakers, and individual equipment power switches are in the off position.

Step 2. Remove the AC power cable assembly from the FT.

Step 3. Set the MAIN-MOBILE switch on the PCU to MAIN.

Step 4. Remove covers from the AC POWER INPUT receptacle on the AC Power Entry Panel and from the AC power cable.

Step 5. Connect the AC power cable to the AC POWER INPUT receptacle on the AC Power Entry Panel.

Step 6. Check type of power source to be used. Line voltage should have 100 Amps available. If the PU-794/G Generator set is to be used it needs to be strapped for 240/416V operation. Ensure source is properly grounded.

Step 7. Ensure power source circuit breaker is off.

Step 8. Connect AC power cable to selected power source (refer to TM 11-5895-1218-12, paragraph 2-8c, for appropriate hook-up charts).

NOTE:

If using the PU-794/G generator set, refer to TM 5-6115-634-14&P for PMCS and starting procedures.

Step 9. Turn on the power source circuit breaker.

Step 10. On PCU, check selected line input voltage. Set the LINE-LOAD-MOB SELECTOR switch (S2) to monitor each of the three line input positions.

Step 11. Set INPUT VOLTAGE SELECTOR switch (S1) to the first position lower than the voltage monitored in Step 10.

Step 12. Set CB1, CB2, and CB3 on the PPC to the ON position.

- The LINE 1, 2, 3 indicator lamps on PCU should light.

- PHASE SEQUENCE METER should indicate "ABC" in order.

- If using line power and PHASE SEQUENCE METER indicates "BAC", the power phases are connected incorrectly. Shut the power off; troubleshooting is required.

NOTE:
If CB1 will not set, hold it half way until you get an indication on the meter, if the indication is "OOO" then you have an open phase indication. Check the power connections. If these are valid then refer this to a higher maintenance organization.

CAUTION

If TRANSFORMER OVERTEMP indicator on power control unit lights, set INPUT POWER CIRCUIT BREAKER (CB1) on the PPC to OFF and contact Intermediate Maintenance.

Step 13. Set the LINE-LOAD-MOB test switch to LINE 1, LINE 2, and LINE 3. (AC VOLTS and AC AMPERES meters read the input voltage and current, less than 2 Amps.) Verify all voltages from your source.

Step 14. Set the LINE-LOAD-MOB test switch to LOAD 1, LOAD 2, and LOAD 3 and for each position:

- Set METER FUNCTION switch to 115 VAC. Meter should indicate between 103 and 127 VAC, and current less than 1 Amp.

- Set METER FUNCTION switch to 230 VAC. Meter should indicate between 207 and 253 VAC, and current less than 1 Amp.

- If the readings are not in the specified tolerance, recheck the setting of the INPUT VOLTAGE SELECTOR SWITCH on the PCU.

2.4.2.2 System Power-Up

Power-up the shelter using the following steps:

Step 1. Ensure all circuit breakers on PCU and ON/OFF power switches on Line Replaceable Unit (LRU) equipment are in the OFF position.

Step 2. On the PCU, set the following AUXILIARY EQUIPMENT circuit breakers to the ON position:

- MAIN LTS
- ECU 1
- ECU 2
- CONVENIENCE OUTLETS
- CB FILTER (optional depending on mission needs).

Step 3. Set the following Control Rack LRU power switches to the ON position:

- AC/DC Power Supply
- KG-84As
- RFO
- CIU
- MTU.

Step 4. Set the following circuit breakers to the ON position in the order listed:

On the PCU:

- RACK 2, center AC circuit breaker (CB9) (verify that AC/DC Power Supply came on)
- RFO DC circuit breaker (CB23)
- CPU DC circuit breaker (CB24)
- BAT CHG DC circuit breaker (CB25) (verify that RFO has powered on).

On the ELBS/KABS Unit:

- ELBS TEST/ARM CHARGE control switch to ARM CHARGE
- BATTERY DISCONNECT switch (under upper red cover) to the ON LINE position
- BATTERY CHARGER switch (under lower red cover).

On the PCU:

- RACK 1 AC circuit breaker (CB17)
- RACK 3 AC circuit breaker (CB11).

On Rack 3:

- Radio I/O rack top-hat circuit breaker (located on the Radio I/O rack) (CB1).

On Rack 1:

- Mission I/O rack top-hat circuit breaker (located on the Mission I/O rack) (CB1).

On the PCU:

- RACK 2 left AC circuit breaker (CB8)
- RACK 4 AC circuit breaker (CB12)
- RACK 5 AC circuit breaker (CB13)
- RACK 6 AC circuit breaker (CB14)
- SIG ENT panel AC circuit breaker (CB15)
- REMOTE I/O AC circuit breaker (CB16) (If required)
- REMOTE KG AC circuit breaker (CB17) (If required)
- RACK 2 DC circuit breaker (CB18)
- RACK 4 DC circuit breaker (CB19)
- RACK 5 DC circuit breaker (CB20)
- RACK 6 DC circuit breaker (CB21)
- ATU DC circuit breaker (CB22).

NOTE:
The ATU DC circuit breaker must always be set to ON for either MOBILE or STATIONARY operation.

Step 5. Set Signal Entry Drawer (SED) and all other LRU power switches in Racks 1, 3, 4, 5, and 6 to the ON position. (Most of these switches are also circuit breakers and should be set to ON carefully.)

Step 6. On the PCU, set the RACK 2 right AC circuit breaker to the ON position.

NOTE:
The CIU front panel LEDs will light sequentially while BIT is performed on the CIU. Next, the LOAD PGM TAPE LED will light. This indicates the CPU is ready to be booted.

2.4.3 Initialization

a. Initialization of the Force Terminal encompasses all of the activities required to bring the terminal from a cold start state to the point where it can establish or sign into a net. Initialization includes:

1. Loading the RN program tapes
2. Loading the AIG, Frequency Dictionary, and Operational Parameters tapes into the CPU
3. Loading Time-Of-Day (TOD)
4. Loading TRANSEC/COMSEC variables
5. Setting up the operational configuration for your mission.

b. These procedures are provided in detail in TM 11-5895-1218-12, for both stationary and mobile operation.

2.4.3.1 Loading RN Program Tapes (System Boot)

a. Insert the first program (PGM) tape into the MTU. It is not necessary to rewind the tape cartridge before loading it into the MTU. Tape will rewind automatically. Next the MTU BUSY lamp will flash, indicating the tape is running. The CPU will read the first 13 records off the tape then will pause for about 3 minutes running internal diagnostics. (If a fault is detected the CPU will flash the CIU "LOAD PGM TAPE" at an appropriate rate. See TM 11-5895-1218-12, paragraph 4-16d, for the correct action.) The CPU boot of the first tape will take approximately 20 minutes. Then, when the "LOAD PGM TAPE" light comes back on, the second tape will need to be loaded. This tape takes about 5 minutes to read. The first three records on this tape are the tape I.D. If the CPU rejects the I.D., it will flash the "LOAD PGM TAPE" light on the CIU at 2 second intervals and troubleshooting is required.

b. While waiting for the first tape to load you can set your shelter ventilation (see paragraph 2.4.4), load Time of Day, and load the COMSEC and TRANSEC variables.

2.4.3.2 Load Time of Day

Time Of Day (TOD) can be loaded from another RFO in a Force or Team terminal. It can also be accepted from an R-2171 satellite receiver or from a [mobile TOD unit]. TOD should not be loaded before the RFO COLD OSCILLATOR light is off. Refer to paragraph 2.8 for the exact procedures and sources of proper TOD.

2.4.3.3 Load TRANSEC/COMSEC Variables

Great care should be taken to insure that the proper key list is being used and that these variables are loaded correctly. The ECCM must have both positions one and two filled (for the present and future variables). The KG-84A and KY-75A may have several positions loaded depending on mission requirements. The correct variables must be in each position for proper operation. Detailed procedures are found in paragraph 2.9.

2.4.3.4 System Configuration

a. At the end of booting the program tapes the CPU will "RESTART." It starts this by initializing the CIU. You can recognize this by seeing the CIU individually turning on the fault lights one at a time in sequence. Also you will notice that the MTU BUSY light is no longer flashing. This means it is completed booting and the system is ready for configuring.

- Linking the I/O: The Radio I/O must be linked with the CPU, as described in the TM 11-5895-1218-12, Section 2-10, paragraph b.1, Steps 1-10. When the Radio I/O is linked, the CPU VERIFICATION menu should appear. If this does not appear, troubleshooting is required.

- Verifying the CPU load: If "seed variables" are provided, the operator may choose to verify the program in CPU memory. This is optional for normal operation.

- Load Tapes Menu: The next screen that appears after CPU VERIFICATION is the LOAD TAPES menu. Follow the directions on the screen to load the AIG, FREQUENCY DICTIONARY, and OPERATIONAL PARAMETER cassette tapes. Loading the AIG tape is not essential for terminal operation; however, if the network uses AIGs, the tape must be loaded before an AIG address can be used for transmitting, receiving, and routing group messages.

- Terminal Configuration: After loading the tapes, the Radio I/O will display the TERMINAL CONFIGURATION set-up menu. Enter the date, mode of operation (MOBILE or STATIONARY), terminal location, active Mission I/Os (if any), and transmit capability selection.

- Stack Configuration: After TERMINAL CONFIGURATION is entered, the Radio I/O will display the STACK CONFIGURATION set-up menu. Stack functions will be dictated by mission requirements, terminal configuration, and equipment availability. Enter the stack function (Voice, Data, RTTY, Scan function, Injector, CTF, or Off) as required. Additional details are provided in paragraph 2.10.

- Voice Mode: If voice is selected, you will need to know the operational mode (ECCM or NON-ECCM), transmit power level and frequency/hopset. Later in the initialization process you will be required to fill in the SEP CONFIGURATION. On that menu you will provide the information of how you want all the voice traffic to be routed. The procedures for filling out the SEP CONFIGURATION can be found in the TM 11-5895-1218-12 manual, Section 2-10, step 22.

- Data Mode: If Data mode is selected, you will also need to know your subnet number and role, and all your NON-ECCM and ECCM frequency codes. These codes are entered on two menus following the STACK Configuration menu. Also you will have to tell the system which KG-84A variable to use (depending on where you loaded it in the KG-84A. Finally, when working in the RN architecture, as you will be if in DATA mode, you must fill in the terminal address number for the NCS, ANCS and Injector terminals in the network.

- RTTY MODE: When RTTY is selected you must be ready to provide the system with the mode of operation. They are 85Hz, 85V, 85D, or 850Hz. Also you have BAUDOT or ASCII formats to choose from in NON-INVERTED or INVERTED senses. And you have to identify which I/O is to receive the RTTY messages. You will also have to know whether you are operating in a RN-only network, or an integrated RN and RATT terminal net. Further details are provided in paragraph 2.10.2.

- SCAN MODE: If you select stack 5 for SCAN operation you will have to provide the frequencies or frequency codes. Also you will be asked how long you wish to remain on each frequency. This is the DWELL TIME.

b. All the above mentioned information is required for successful operation of the terminal. More specific details may be found in TM 11-5895-1218-12, section 2-10.

2.4.4 Ventilation

After selecting a site for operations, and connecting input power to the FT, proper ventilation and temperature control for the shelter must be established.

a. The FT is equipped with two ECUs which control the shelter's internal environment. Each of these units is independently controlled by separate control units mounted on the inside forward wall. Refer to TM 11-5895-1218-12, paragraph 2-3, ECU CONTROL PANEL, for a description of the ECU controls. The following steps must be performed before turning on the ECUs.

Step 1. Roll up and secure the ECU protective cover (located on the front exterior of the ECU).

Step 2. Open the ECU output airducts to ensure adequate air flow into the shelter. These ducts are located on the inside front wall of the shelter (refer to TM 11-5895-1218-12, paragraph 1-12).

Step 3. Set the appropriate ECU CB on the PCU on.

b. The FT is also equipped with fresh air (filtered and unfiltered) inlets. Use of the fresh air system is optional except during operations in an NBC environment. These are located on the inside front wall of the shelter. When operating in a normal environment, the unfiltered fresh air inlet should be used. While operating in an NBC environment, the filtered air inlet must be used.

To operate the fresh air inlet:

Step 1. Open the outside protective cover. This cover is opened using the hand crank control located next to the vent on the inside front wall.

Step 2. Set the MCPE/FAN switch to the FAN position. This switch is located on the DC POWER ENTRY control box located in the right front corner of the shelter.

Step 3. On the PCU set the MCPE/FAN circuit breaker on.

To operate the filtered air system (MCPE):

Step 1. Set the MCPE/FAN switch to the MCPE position. This switch is located on the DC POWER ENTRY control box located in the right front corner of the shelter.

Step 2. Close the fresh air outside protective cover. This cover is closed using the hand crank control located next to the vent on the inside front wall.

Step 3. Close and secure the emergency door vent cover.

Step 4. On the GPFU FAN CONTROL MODULE (located next to the vent on the inside front wall) set the ON/OFF switch to the ON (up) position.

Step 5. On the PCU set the MCPE/FAN circuit breaker on.

2.4.5 Remoting the I/O

a. As previously stated an I/O can be remoted from the Force terminal by either wire line or by VHF. Up to five Mission I/Os can be remoted and the Radio I/O can also be remoted. Only Mission I/O #2 can be remoted via VHF to support a FAN Terminal. The I/Os to be remoted must be made active on the TERMINAL CONFIGURATION setup menu. If I/O #2 is remoted the operator will be asked if the VHF Radio is to be used for: (1) Voice; (2) Data; or (3) Not at all. Option (3) implies that the Mission #2 I/O is to be supported by a wireline-type interface.

b. In preparation for remoting the I/O the operator should set up the KG-84As to be used for the desired I/O port. One KG-84A is connected inside the terminal and the other is located in the remoted rack. Set the appropriate KG-84A switches in accordance with TM 11-5895-1218-12, paragraph 2-8, step 4.

2.4.5.1 Wireline

a. Remoting via wire line is done with either two or four wires for the data traffic. Another set of wire lines is required for remote voice operation. Detailed procedures for remoting of the I/O are in TM 11-5895-1218-12, Paragraph 2-8, STEP 4.

b. After locating the I/O to the desired location (within 1500 feet of the terminal) the wire lines and power must be connected. Two 750-foot power cords are provided for this purpose. Also a one-mile roll of WF-16 wireline is located in the shelter. Connect power to the I/O then to the external connections on the FT Power Entry panel. Next connect the wireline at the I/O Rack and at the Force Terminal Signal Entry Panel. If two wire mode is selected connect to the red binding posts. If four wire mode is desired then connect each colored wire pair to one pair of the binding posts. Then connect the same colors to the I/O. The same color convention must be used at each end. That is, if a pair of wires are attached to black binding posts at the I/O Rack, the same pair has to be connected to the black binding posts at the FT SEP. Then set the REMOTE I/O circuit breakers at the PCU to on. Turn the circuit breaker at the top of the I/O Rack to on.

c. Power on the I/O and all the equipment as normal. Fill the KG-84A in the I/O and the "remote" KG-84A in the Force Terminal. The mode switch remains in the OPERATE position, and not in the RMT position.

d. Next the I/O must be initialized, or "linked" to the CPU in the force terminal. Set the appropriate switches on the Telephone Modem for the desired 2/4 wire mode. (FT TM 11-5895-1218-12, paragraph 2-18). If this is an initial setup the Modem must be in 2-wire operation. This is due to the fact that the SIU defaults to the 2-wire mode whenever it is initialized by the CPU following a restart. 4-wire mode can be requested on the I/O even though the Modem is in 2-wire. The CPU will prompt the remote I/O Rack operator when to change the DATA switch on the Telephone Modem to 4-wire.

e. When the I/O is trying to link with the CPU (Following the sending of the "TYPE OF I/O" AND "I/O CONFIGURATION" menus.) communications between them is indicated by the flashing of the ALARM and PARITY lights on the KG-84As, and a "WORKING" prompt on the I/O display. The I/O starts the initialization with an information ("I think") packet which contains the required I/O circuit parameters. If the Force Terminal receives the request for the link and the CPU recognizes the "I think" packet as coming from an authorized I/O Rack, it will acknowledge the receipt of the packet. The CPU will then send confirmation of the system parameters, and assign an I/O number. After the remoted I/O acknowledges receipt of this packet, I/O initialization is complete.

f. Once the I/O is linked to the CPU, operation is the same as if it were inside the Force terminal.

2.4.5.2 VHF

a. Remoting via VHF requires that you use Mission I/O #2. When VHF is selected the SIU will patch the KG-84A to the RT-524 through the X-MODE connector. Ensure the RT-524 is tuned to the proper frequency and power level, and that the X-MODE is enabled.

b. At the FAN Terminal the operator requests VHF REMOTE on their I/O configuration menu. The SIU DATA mode should be set to VHF TO LOCAL if the I/O is inside the FAN Terminal. If the FAN operator elects to Wireline remote the I/O off his terminal then the setting should be VHF TO REMOTE. This establishes the communication path between the CPU and the Remoted I/O.

c. Power on the I/O and all the equipment as normal. Fill the KG-84A in the I/O and the "remote" KG-84A in the force terminal. Make sure the mode switch remains in the OPERATE position, and not in the RMT position.

d. When the I/O is located inside the FAN Terminal the Telephone Modem must be set to 2-wire DATA mode.

e. When the I/O is trying to link with the CPU (Following the sending of the "TYPE OF I/O" AND "I/O CONFIGURATION" menus.) communications between them is indicated by the flashing of the ALARM and PARITY lights on the KG-84As, and a "WORKING" prompt on the I/O display. When the alarm and parity lights flash on the KG-84A, the RT-5245 Fan will energize indicating that the radio is transmitting the initialization packet. The I/O starts the initialization with an information ("I think") packet which contains the required I/O circuit parameters. If the Force Terminal receives the request for the link and the CPU recognizes the "I think" packet as coming from an authorized I/O Rack, it will acknowledge the receipt of the packet. The CPU will then send confirmation of the system parameters, and assign an I/O number. After the remoted I/O acknowledges receipt of this packet, I/O initialization is complete.

2.5 MOBILE SETUP

2.5.1 General

2.5.1.1 Power Requirements - Mobile Operation

a. Mobile operations require an input voltage of +24 VDC as provided by the vehicle batteries. This voltage is fed through the DC ENTRY PANEL to the PCU (+24 VDC), and to the DC/AC Inverter. The INVERTER uses the +24 VDC to provide 110 VAC and 220 VAC to the PCU for use by the terminal. MOBILE power is selected via the MAIN/MOBILE selector switch on the PCU.

b. DC/AC Inverter is located on the forward curbside wall of the shelter. Refer to TM 11-5895-1218-12, paragraph 2-2, for DC/AC Inverter controls and indicators.

2.5.1.2 Antenna Configuration

During MOBILE operation the only antenna used is the transmit/receive (TX/RX) whip antenna mounted on the back of the shelter. It is also required to remove the RX and the VHF whips for actual MOBILE (on the move) operation. You are reminded that only stack 1 and 4 are available and that they share a common antenna. (This is true in both stationary and MOBILE operation.)

2.5.2 Power-Up Procedures

NOTE:
These procedures assume that you are presently in a powered down condition. If presently stationary, please refer to Section 2.6.1 for Stationary to Mobile Transition Procedures.

2.5.2.1 Connect Power to Shelter

a. Before powering up the shelter, the vehicle needs to be started and warmed to a normal operating temperature. The only connection to the terminal for mobile power is the DC power cable. This is connected directly to the vehicle batteries.

b. Power up the MOBILE terminal using the following steps:

Step 1. Ensure all Prime Power Conditioner (PPC), Power Control Unit (PCU) circuit breakers and individual equipment power switches are in the off position.

Step 2. Remove covers from the DC POWER INPUT receptacle on the DC ENTRY panel and from the DC power cable.

Step 3. Connect the DC power cable to the DC POWER INPUT receptacle on the DC ENTRY panel.

Step 4. Set MAIN-MOBILE switch on PCU to MOBILE.

Step 5. On DC ENTRY panel inside terminal set the DC CB1 to ON.

Step 6. On DC/AC Inverter, set input DC circuit breaker (CB1) and output AC circuit breaker (CB2) to ON.

Step 7. On PCU set LINE/LOAD switch to MOB.

- Set METER FUNCTION switch to 115 VAC. It should indicate between 103 and 127 VAC.

- Set METER FUNCTION switch to 230 VAC. It should indicate between 207 and 253 VAC.

2.5.2.2 System Power Up

a. On the PCU set the following circuit breakers to ON:

- MAIN LTS
- CB FILTER.

NOTE:
If the fresh air inlet is to be used, crank open the filter cover before setting the CB FILTER circuit breaker (CB3) to ON. If MCPE is to be used, leave the filter cover closed.

b. Set the following Control Rack LRU power switches to the ON position:

- KG-84As (Stack 1 and 4)
- RFO
- CIU
- MTU.

c. Set the following circuit breakers to the ON position in the order listed:

1. On the PCU:

   - RFO DC circuit breaker (CB23)
   - CPU DC circuit breaker (CB24)
   - BAT CHG DC circuit breaker (CB25).

2. On the ELBS/KABS Unit:

   - ELBS TEST/ARM CHARGE control switch to ARM CHARGE
   - BATTERY DISCONNECT switch (under upper red cover) to the ON LINE position
   - BATTERY CHARGER switch (under lower red cover).

3. On the PCU:

   - RACK 3 AC circuit breaker (CB11).

4. On Rack 3:

   - Radio I/O rack top-hat circuit breaker (located on the Radio I/O rack) (CB1).

5. On the PCU:

- RACK 6 AC circuit breaker (CB14)
- SIG ENT panel AC circuit breaker (CB15)
- RACK 6 DC circuit breaker (CB21)
- ATU DC circuit breaker (CB22)

d. Set LRU power switches for all equipment in rack 6, rack 3, and SIGNAL ENTRY UNIT, to the ON position.

e. On the PCU, set the RACK 2 right AC circuit breaker to the ON position.

NOTE:
The CIU front panel LEDs will light sequentially while BIT is performed on the CIU. Next, the LOAD PGM TAPE LED will light. This indicates the CPU is ready to be booted.

2.5.3 Initialization

Initialization in MOBILE mode is performed the same as it is in STATIONARY mode. Refer to paragraph 2.4.3 for procedures.

2.5.4 Ventilation

During mobile operations the ECUs are non-operational. The FT is ventilated by either the filtered or unfiltered fresh air system. When operating in a normal environment, the unfiltered fresh air inlet should be used. While operating in an NBC environment, the filtered air inlet must be used.

WARNING

Use of one of these systems is required during mobile operations. Death may occur due to asphyxiation unless adequate ventilation is maintained.

2.5.4.1 Fresh Air Inlet

To operate the fresh air inlet:

Step 1. Open the fresh air outside protective cover. This cover is opened using the hand crank control located next to the vent on the inside front wall.

Step 2. Open the emergency door vent cover.

Step 3. Set the MCPE/FAN switch to the FAN position. This switch is located on the DC POWER ENTRY control box located in the right front corner of the shelter.

Step 4. On PCU set CB filter circuit breaker to ON.

2.5.4.2 Filtered Air Inlet (MCPE)

To operate the filtered air system (MCPE):

Step 1. Set the MCPE/FAN switch to the MCPE position. This switch is located on the DC POWER ENTRY control box located in the right front corner of the shelter.

Step 2. Close the fresh air outside protective cover. This cover is closed using the hand crank control located next to the vent on the inside front wall.

Step 3. Close and secure the emergency door vent cover.

Step 4. On the GPFU FAN CONTROL MODULE (located next to the to the vent on the inside front wall) set the ON/OFF switch to the ON (up) position.

Step 5. On PCU set CB filter circuit breaker to ON.

2.6 TRANSITIONING BETWEEN STATIONARY - MOBILE OPERATIONS

a. When you have to change operational modes it is desirable to do so as quickly as possible to reduce subnet outages to a minimum. The best way to do this is to be able to "WARM RESTART" the system after changing power sources. The following procedures will enable you to safely transfer from MAIN power to MOBILE power with a minimum of subnet outage. This will allow the terminal to stay in communication with its controller while moving to a new area of operation (AO).

b. If the terminal is presently controlling a subnet it may be required to transfer control of that subnet to another terminal while it's moving. This is due to the restriction of only stacks 1 and 4 being available in MOBILE operation. See Alternate Takeover procedures in paragraph 2.11.4.

c. Prior to going MOBILE you should know exactly which subnets you will be required to maintain while MOBILE and if possible what your configuration will be at your new site. If your stack 1 and 4 configuration stays the same it will be even quicker to get back on the air after changing power sources. This is because the parameters are saved on the Operational Parameters tape.

2.6.1 Stationary to Mobile Transition

WARNING

Before proceeding, ensure the respective stack's PA PS is turned off.

a. Upon notification of the requirement to relocate begin by taking down any unused Broadband Antennas. Then perform the following steps to go to MOBILE operation:

1. Start vehicle and warm to a normal operating temperature.
2. Set DC ENTRY CB1 to ON.
3. On DC/AC Inverter set INPUT DC POWER to ON.
4. On DC/AC Inverter set OUTPUT AC POWER to ON.
5. On PCU check LINE-LOAD positions for proper AC voltages and current.
   - Set METER FUNCTION switch to 115 VAC. Meter should indicate between 103 and 127 VAC, and current less than 1 Amp.
   - Set METER FUNCTION switch to 230 VAC. Meter should indicate between 207 and 253 VAC, and current less than 1 Amp.
6. On DC/AC Inverter set OUTPUT AC POWER to OFF.
7. Perform an ALL STACKS BIT to pause all subnets.
8. Turn OFF ECUs and LRUs in racks 1,3,4,5,6 only.
9. Stow the VHF and RX Only whip antennas and secure the TX/RX whip antenna.
10. Turn OFF all circuit breakers on PCU except RFO, CPU, BAT CHG.
11. Turn OFF CB1 on PPC.
12. Turn off the Circuit Breaker on stationary power source.
13. On PCU set MAIN/MOBILE switch to MOBILE position.
14. On DC/AC Inverter, set AC OUTPUT POWER to ON.
15. Turn on the following circuit breakers on the PCU: CB FILTER, MAIN LIGHTS, RACK 3, RACK 6 (AC), SIG ENT, RACK 6 (DC), ATU, RACK 2 (right hand) (AC).

NOTE:

During a forced warm restart, the system should cycle through the CIU fault lights twice and the radio I/O should link with the CPU. During mobile operation, the only main lights that come on are the lights used during emergency operation.

16. Power ON LRUs in rack 3 and 6.

17. Link I/O and follow directions to load AIG, Frequency Dictionary, Operational Parameters tapes, and COMSEC/TRANSEC variables.
18. Complete terminal initialization and sign-in/monitor of subnets.

b. At this point you can take down the rest of the Broadband Antennas, pull the ground rods, disconnect power cable from power source.

c. Secure all components in their racks, mountings, etc. Secure the operator's chair to the track. Place loose items in the storage compartments. Close and secure the exterior panel covers.

d. The Force Terminal can participate as a RN subnet member, within the geographic constraints imposed by HF transmit/receive operation. As mentioned previously, the terminal operates on reduced power and uses the whip antennas.

2.6.2 Mobile to Stationary

Upon arrival at the new site prepare the generator or line power connections, ground the shelter, and install the required Broadband Antennas. Perform the following procedures to transition back to stationary operations:

1. Power OFF the LRUs in rack 3 and 6.
2. Reconfigure RX only and VHF whip antennas.
3. Turn OFF all PCU circuit breakers except RFO, CPU and BAT CHG.
4. Turn OFF both switches on the DC/AC Inverter.
5. Turn OFF CB1 on the DC ENTRY panel.
6. On PCU set MAIN/MOBILE switch to MAIN.
7. Apply power from your stationary source.
8. Verify input LINE voltages and set PPC selector switch appropriately.
9. Turn ON CB1 on PPC.
10. Set the appropriate circuit breakers on the PCU to ON.
11. Power on the appropriate LRU.
12. Link the I/O and follow directions to load AIG, Frequency Dictionary, Operational Parameters tapes, and COMSEC/TRANSEC variables.
13. Complete terminal initialization and start sign-in/monitor of subnets.

2.7 SYSTEM MAGNETIC TAPES

a. With each Force terminal there can be up to five magnetic tapes. Two tapes for the RN Program, an Address Identifier Group (AIG) tape, Frequency Dictionary tape, and an Operational Parameters tape.

b. The RN Program tapes contain all the information required by a Force terminal. There are several versions of these tapes. The various versions dictate whether the terminal will be capable of NCS, ANCS, or IT functions, or some combination of these functions, or none of these functions.

c. The AIG tape contains pre-programmed groups of terminal addresses. This enables an operator to send a message to a group of terminals by entering only one AIG number

d. The Frequency Dictionary contains the complete list of alphanumeric frequency/hopset codes. Also included is the information needed to set the radios to these frequencies and hopsets.

e. The Operational Parameters tape contains the latest System configuration. Whenever a change is made to any SETUP menu the CPU rewrites the entire system configuration to the Operational Parameters tape.

2.8 TIME OF DAY LOADING PROCEDURES

a. Time Of Day (TOD) is critical to RN DATA operation. It must be accurate. Therefore there are really only two acceptable sources of TOD. One is directly from an R-2171/TSC satellite receiver. The other source is from another RFO that is known to have accurate TOD. Whether this second RFO is in another FT or Team terminal or in an MMCTs Mobile TOD unit does not matter, as long as it is accurate.

b. Time Of Day should not be loaded if the COLD OSC light is illuminated.

c. Once TOD is loaded the RFO reset switch may not be set to OFF. Power may be disconnected without fear of losing time but for no longer than 30 minutes.

d. If the TOD source is R-2171/TSC, then the internal DATA RATE switch must be set to position 15. Connect the proper Time Transfer cable to the R-2171/TSC. The proper cable should have a 25 pin sub-d type connector on one end and the proper connector on the other end to mate with the R-2171 connector on the receiving RFO. This cable connects to the UTG Interface on the R-2171/TSC and to the R-2171 connector on the RFO or the exterior of the SEP. (Ensure cabling to RFO inside terminal is connected.) Press the RCV TOD button on the RFO (or SEP exterior). The SET CLOCK light will illuminate and several seconds later it should extinguish. If it fails to receive TOD the Receiving RFO will FAULT. Wait several seconds and the FAULT light will go out and it can be retried.

e. If the TOD source is another RFO, connect the Time Transfer cable to the Time Transfer connector on both RFOs. It can also be connected to the SEP exterior connector as long as the cabling to the RFO inside the terminal is connected. First, on the receiving RFO, press RCV TOD, the SET CLOCK will light. Within 7 seconds press the SEND TOD on the transmitting RFO. The SET CLOCK light should go out.

2.9 COMSEC/TRANSEC LOADING PROCEDURES AND KG-84A SETTINGS

The following procedures cover how to load the ECCM, KG-84A and KY-75A.

a. Load TRANSEC variables into ECCMs using the following procedures: (Repeat process for all ECCMs to be loaded.)

1. On the R/T (or Receiver), set the LOCAL-REMOTE switch to LOCAL

2. Connect the transfer cable of the fill device (KYK-13 or KOI-18) to the FILL connector on the ECCM.

NOTE:
If KYK-13 is used, turn it on and select the variable to be loaded (1 through 6).

3. The display shows: FILL

4. Initiate load mode. On the ECCM keypad, press the 2nd key and then press the 1/LOD key. The display shows LOD and the VAR indicator flashes.

5. Using the keypad, input 1 or 2 and then press the ENT key. (1 = first used variable and 2 = second used variable or "future" variable. The first position must be filled first.)

6. If KYK-13 is used for loading, the fill process is automatic. If KOI-18 is used for loading, slide paper tape into device and pull through. Paper tape loading must be completed within thirty (30) seconds.

7. If load is accepted, the display shows FILLED and the VAR indicator will go off.

8. If load is not accepted, the FAIL indicator lights and the display shows.

9. Repeat 4-8 above for position 2.

10. Turn off the KYK-13 (if used) and disconnect the fill device from the ECCM.

11. Set the R/T (or receiver) LOCAL-REMOTE switch to the REMOTE position.

b. Verify KG-84A setting using the following chart.

SWITCH	POSITION			
	CONTROL RACK		I/O AND REMOTE KG-84A	AN/GRC-142
	DATA	RTTY	DATA	RTTY
CLOCK	1	1	1	1
DATA MODE	2	2	2	2
DATA RATE:				
RX	4	4	8	2
TX	[illegible]	4	8	2
A-B (both)	B	B	A	A
STEP PULSE INTERVAL	1	1	1	1
+8 / +0	+0	+0	+0	+0
INTFC	1	1	1	2
SYNC MODE	4	1	4	1
TTY MODE	5	5	5	4
DATA LENGTH	SYNC	BAUDOT=8 ASCII=10	10	BAUDOT=8 ASCII=10
COMM MODE	2	2	2	5
FRONT PANEL SWITCHES:				
X VAR	1	1	1	1
MODE	RMT	RMT	OPR	OPR
POWER	ON	ON	ON	ON

c. Load COMSEC variables into KG-84As using the following procedures: (Repeat process for all KG-84As to be loaded.)

1. Pull out and set the ENABLE-ZEROIZE switch to the ZEROIZE position and then back to the ENABLE position.

2. Connect the KOI-18, or KYK-13, to the KG-84A FILL connector.

NOTE:
If KYK-13 is used, turn it on and select the variable to be loaded (1 through 6).

3. Set the MODE switch to LDU.

4. Set the INITIATE-IND TEST switch to INITIATE and then release the switch to return to its static position. (The red PARITY indicator light flashes.) (If KYK-13 is used, the red light on the fill device will flash at this point.)

5. Set the MODE switch to LDX. (The red PARITY indicator light will flash once.)

NOTE:
The MODE switch will remain in the LDX position until all X registers to be filled have been filled.

6. Set the X-VAR switch to the desired position.

7. On the KG-84A, set INITIATE-IND TEST switch to INITIATE and release. (The red ALARM and PARITY indicators light.) (If KYK-13 is used, the red light on the fill device will flash at this point.)

8. Load variable tape into KOI-18. With a smooth steady pull, gently pull the tape through the fill device. (The red PARITY indicator flashes while the code is loading.)

9. Repeat the above steps for positions 2, 3, and 4 as required.

10. On the KG-84A, set the MODE switch to the OPR position. (If the load is successful, the FULL OPR indicator light will illuminate and the ALARM and PARITY indicator lights will extinguish.)

11. After loading all variables, set the MODE switch to RMT.

12. Turn off the KYK-13 (if used) and disconnect the fill device from the KG-84A.

d. Load COMSEC variables into KY-75As using the following procedures: (Repeat this step for all KY-75As to be loaded.)

1. On the Telephone Modem, set the VOLUME control to mid range.

2. On the KY-75A, pull and turn the PWR/FILL switch to the OFF/ZEROIZE position.

3. Pull and turn the PWR/FILL switch to position 1. (Positions 2 and 3 are used to load a second and third variable if required.)

4. Set the CIPHER-PLAIN switch to the CIPHER position. (KY-75A RCU ALARM indicator lights; a 1000 Hz tone is heard from the Telephone Modem speaker.

5. Connect the KOI-18 to the KY-75A RCU FILL connector.

6. On the KY-75A RCU, turn the RMT-LOCAL-SIG CLR switch to the SIG CLR position and release. (Switch automatically returns to LOCAL when released.)

NOTE:
If KYK-13 is used, the light on it will flash at this point and the variable will be loaded.

7. Load variable tape into KOI-18 and with a smooth steady pull, gently pull the tape through the fill device. The KY-75A RCU ALARM indicator lamp extinguishes; Telephone Modem 1000 Hz tone stops. Turn the RCU rotary switch to POS 2 before disconnecting the fill device.

8. Turn off the KYK-13 (if used) and disconnect the fill device from the KY-75A. Then turn the RCU rotary switch back to POS 1.

2.10 TERMINAL CONFIGURATION OPTIONS

2.10.1 RN Data

RN Data is the prime operation of the Force terminal. In this mode the terminal is one element of an entire TDMA network architecture for the purpose of passing error-free data communication messages.

2.10.1.1 Stack Configuration

a. There are two stack modes available: Data or Injector.

b. Injector mode is actually a receive-only mode. This mode is used only on Stack 4 and only one operator input is required (I) to make this mode functional.

c. The Subnet # is stack specific. Each stack must operate in a different subnet.

d. Data mode implies that the stack is to be operating in the RN Network. When the Data Mode is selected for a stack in the Stack Configuration Menu, a specific role must be entered. This four character, alphanumeric entry will be what your specific role and tier level is within the net. The first two characters indicate tier level (T*--) where T means tier and * is the tier level (i.e., 1,2,3,4). The next two characters represent your role in the subnet. On a given tier the stack may act as either a Subnet Controller (T-SC), Subnet Member (T-SM), or a subnet Monitor (T-M*). Several stacks may be set up in different roles but the tier levels must all be the same.

e. There are three different operating modes; Non-ECCM (Fixed Frequency), Training ECCM, and ECCM (Frequency Hopping). One of these modes must be entered in the stack configuration menu.

f. After entering the operational mode you are required to make an entry pertaining to transmit power. The entries can be either H (High, 400W), M (Medium, 100W), or L (Low, 25W).

2.10.1.2 Non-ECCM Frequency Selection

In data mode the Non-ECCM frequencies (alphanumeric code) are entered on the next menu. Up to 12 frequencies may be entered, but at least one must be entered.

2.10.1.3 ECCM Hopset Selection

Training and ECCM are two types of frequency hopping communications. Following the Non-ECCM frequency list is the ECCM frequency list. Up to 12 hopsets may be entered, but at least one must be entered.

2.10.1.4 KG-84A Set-up

a. On the KG-84A set-up menu the operator tells the stack which variable position has the operational variable. Also the operator states which position is to be used for CTF. These two positions must be different. The CTF entry may be left blank. The operational variable must be stated.

b. The KG-84A also has switch settings that must be set for proper RN DATA operation. These settings can be found in TM 11-5895-1218-12, paragraph 2-8, step 4.

2.10.2 RTTY

Radio Teletype (RTTY) is a proven form of data communication presently in use by numerous RATT terminals. The Force Terminal is compatible with these terminals or may use RTTY to talk just to another FT. Extensive prior coordination must be done before an RN FT can enter an established RTTY NET that has AN/GRC-142 terminals.

2.10.2.1 Stack Configuration

a. Regardless of who is in the RTTY net, how to set the stack configuration of the FT remains the same. When a stack is dedicated to RTTY, the system parameters must be set and be the same for all terminals in the RTTY net. RTTY operates only in Non-ECCM mode. Following the STACK configuration menu the RTTY menu is displayed. As previously mentioned, you have three sets of configurations to set.

- 85Hz, 850Hz, 85D, or 85V. These four modes set the modulation that the RN Modem will use:

- ASCII or BAUDOT. These two formats dictate how the data is handled. They also affect the bit length of each word.

- INVERTED or NON-INVERTED. These dictate the voltage "sense" of the data.

b. Additionally it is on this screen that you decide which of your I/Os will receive the RTTY messages. Only one I/O can be listed here.

2.10.2.2 FT-to-FT-Only Operations

a. The simplest RTTY operation is when the terminal is operated in an FT only net. The aforementioned stack configurations need to be coordinated by all terminals and set up. No other special setups are required. The KG-84A switch settings are left the same as in normal RN data mode.

b. Sending a message in this type of operation is the same as in normal data operations except at the Message Destination menu. The operator selects the stack that is set for the RTTY net where the message is to go. Unlike RN DATA where the message was sent to a specific terminal, this message is sent to all terminals configured for that RTTY net. Message addressing is handled per normal RATT procedures.

2.10.2.3 FT and RATT Operations

When the RTTY net includes RATT terminals, several special considerations need to be made:

a. KG-84A Setup

Paragraph 2.9b lists the KG-84A switch settings required for proper RTTY FT/RATT operation.

b. RATT Terminal AN/UGC-74 Setup

The following table shows the switch settings for the RATT terminals AN/UGC-74 for the two available formats:

SWITCH	BAUDOT	ASCII
SWITCH STATE	ICT	ICT
MODE	BAUDOT	ASCII
BAUD RATE	75	75
STOP BITS	2	1
BELL OPTION	J	J
CLOCK	INT	INT
+/-	(-)	(-)
PARITY	INHIB	INHIB
SIGNAL	NRZ	NRZ
REC MODE	48	48
TRANS MODE	70	70

c. Message Preparation

1. The FT operator must begin his message with the RATT operators programmed RECEIVE ENVELOPE option. The AN/UGC-74's default is "VZCZC."

2. The RATT operator must start his message with the FT's preamble. For BAUDOT this is "LALALA." For ASCII this is "9#9#9#."

3. The messages must be started EXACTLY as stated above.

2.10.3 Voice

Voice mode enables an operator to talk to any other RN terminal in any mode or any other HF SSB radio in the Non-ECCM mode.

2.10.3.1 Stack Configuration

When voice mode is selected, the operator has only three choices to make on the Stack Configuration menu. The operator can select between Non-ECCM or ECCM (Training-ECCM not available) mode, transmit power (25W, 100W, or 400W), and the desired frequency or hopset. The Non-ECCM frequency may be entered as an alphanumeric code or the actual frequency in MHz. If the frequency is entered, the operator must also state whether to use Upper Sideband (USB) or Lower Sideband (LSB).

2.10.3.2 SEP Configuration

a. After setting up a stack for Voice operation, the Operator must set up the SEP configuration. This menu is basically an electronic patch panel. The operator matches the source with the desired destination and places an "X" at the point where the two cross. Two patches must be set for two-way voice communication: one patch for the receive path and a second patch for the transmit path.

b. If any voice is routed to remoted I/Os, the remote voice link parameters are set up on this menu. There are two parameters, 2/4-wire operation, and high (wire line lengths of 5 miles or more) or low power interface.

c. Detailed procedures to set up this menu is found in TM 11-5895-1218-12, paragraph 2-10b, step 22.

2.10.3.3 KY-75A Setup

After loading the KY-75A (paragraph 2.9) you may operate in clear voice (PLAIN), or encrypted voice (CIPHER).

2.10.4 Scan

Stack 5 is the only stack where this option is valid. SCAN allows the operator to listen to up to 5 frequencies, and to set the length of time to stay on each frequency (DWELL). This is strictly Non-ECCM only.

2.10.4.1 Stack Configuration

After setting stack 5 to Scan mode, the operator must fill in the SCAN MODE SETUP menu. On this menu the operator lists up to 5 different frequencies in alphanumeric code or a frequency and sideband. Also the operator will set the DWELL time in 15 second intervals as desired. Prompts will be given for each frequency as it is being scanned. To stop scanning, turn the stack OFF on the STACK CONFIGURATION menu.

2.11 SUBNET OPERATIONS

After the terminal has been fully configured the operator will perform various operations. Subnet operations include:

- Message Handling
- Controller Functions
- Member Functions.

2.11.1 Message Handling

Message handling is performed the same in both controller and member roles. The stack does not have to be successfully in net before inputing messages. The CPU will store the messages for 24 hours awaiting transmission. This is covered in detail in TM 11-5895-1218-12, paragraph 2-10(c) and Chapter 5 of this manual.

2.11.2 Controller Functions

a. To establish control of a subnet, an operator must first enter a membership list. This is initiated through the OPTIONS menu by selecting the PERFORM SUBNET FUNCTIONS OPTION and entering the subnet number that the terminal is controlling. At the SUBNET CONTROLLER FUNCTIONS menu, the operator enters the subnet membership list. This is where all the terminals that are to be in the subnet are listed. The terminals must be identified as Transmit Capable or Run Silent. After the previous entry, the operator will receive prompts on the I/O stating that the terminals are "SIGNED INTO NET." This means that the CPU will store any received messages for these terminals.

b. The operator now selects the "Constitute Subnet" option at the controller functions menu. The Operator will be prompted that the terminal is "WAITING TO BEGIN FREQUENCY CYCLE, SUBNET aaa." The terminal is now calculating the number of frequencies and the present time of day, to set up the time to start the Constitution so it is the same as the member terminals. When Constitution starts the Controller transmits an interrogation. If the members interrogated receive the message, they will respond. Providing the controller receives this the operator will be prompted that these members are now "ACTIVE." This continues through the rest of the frequencies/hopsets in the list. When the list is completed and the controller has a terminal active, the operator will be prompted with "CONSTITUTION OF SUBNET aaa SUCCESSFULL." Shortly after this the rest of the terminals in the list (as long as they are transmit capable) will transmit, in turn, and become ACTIVE. Run silent terminals are always carried as ACTIVE. If no member responds to the controller, the prompt "CONSTITUTION OF SUBNET aaa STILL IN PROGRESS" is displayed.

c. As long as one terminal is active in the subnet the net will stay constituted. When all members go inactive the System will automatically restart constitution without any operator intervention.

d. The Controller role has several more Subnet control options available. These are all listed on the SUBNET CONTROLLER FUNCTIONS menu and are self-explanatory.

2.11.3 Member Functions

The same as for the controller the member should first attempt to get into the subnet. The member starts by requesting sign-in through the OPTIONS menu. After selecting the subnet which is set up in a member role the SUBNET MEMBER FUNCTIONS menu appears. These functions are limited to entering, or exiting a net, either as a member or a monitor terminal. When entering a Subnet the operator gets a prompt that the stack is "WAITING TO BEGIN FREQUENCY CYCLE, SUBNET aaa." When SIGN-IN starts the member starts listening on each frequency for the Subnet Controller's interrogation. If received the member will transmit back a response.(This is one way to tell if you are receiving the controller because when the stack transmits the PA fan will come on.) If the controller responds and is received then the SIGN-IN will be successful at the end of the cycle. If no controller response is received then the SIGN-IN will stay "SIGN-IN TO SUBNET aaa STILL IN PROGRESS."

2.11.4 Alternate Takeover Procedures/Considerations

a. An Alternate controller is a terminal that has a controller stack set up to include the subnet membership list. This terminal does not constitute the subnet until directed. This terminal is designated as a backup to the present subnet controller. Both terminals are on the same operational tier, and members of the same subnet. The alternate, due to the membership being listed, will receive and store messages for the terminals in the list. That way when it does constitute the net (by direction), no loss of message traffic will occur.

b. To transfer control of the subnet to another terminal, or to receive control follow the following guidelines:

- Upon direction to transfer control the controller contacts the Alternate and they agree on a time to transfer control.
- At the given time the controller runs BIT on his Subnet controller stack. This pauses the subnet at his terminal.
- At the time agreed, the alternate starts constitution of the subnet.

2.12 NCS/ANCS FUNCTIONS

2.12.1 Add/Remove ANCS From NET

To add or remove an ANCS from the NET, the receiving terminals must receive two messages from different NCS/ANCSs that name the same ANCS for addition or removal from the NET. This addition or removal message must be from different valid NCS/ANCSs in order for this action to take place.

2.12.2 Add/Remove IT From NET

To add or remove an IT from the NET, the receiving terminals must receive two messages from different NCS/ANCSs that name the same IT for addition or removal from the NET. This addition or removal message must be from different valid NCS/ANCSs in order for this action to take place.

2.12.3 NCS-ANCS Reports

The status collection and maintenance process is used to provide information to the NCS/ANCS database and to define the location and status of the terminals which are currently participating in the net. This information is available upon request to NCS/ANCS terminals in the following reports.

2.12.3.1 Subnet Status Report

The Subnet Status Report contains information on the status of each subnet. This information is sent by each subnet controller to the NCS/ANCS terminals at a fixed time every day. In addition, status information is sent each time a subnet is constituted, when a controller signs into a higher controller, when a new terminal signs into tier 1 or 2, when an alternate replaces a controller, and when membership of an indigenous subnet changes.

2.12.3.2 Frequency Usage Report

The Subnet Frequency Usage Report contains a list of frequencies being used in each subnet. This report is compiled by frequency usage information sent once per day by each subnet controller to the NCS/ANCS terminals.

2.12.3.3 Terminal Location Report

The Terminal Location Report contains information on the location of each terminal in each subnet. This information is sent to the NCS/ANCS terminals each time a terminal's Radio I/O operator changes the terminal's grid coordinate location as well as during sign-in.

2.12.4 NCS Directives

RN executes net control functions between terminals with a set of net control messages. NCS directives is defined as net control messages that originate at the NCS. These directives include: Transfer Net Control to ANCS, Operating Mode Change, ECCM Authorization, New Frequencies/Hopsets for Subnet, and AIG Change. Each terminal in the network which can receive and act upon NCS directives maintains a database which allows it to verify the authority of the sending terminal. All NCS directives are sent in the normal traffic flow.

2.13 IT FUNCTIONS

2.13.1 Specify Injector I/O Units

In order for a terminal's I/O Unit to transmit injection messages, it must be authorized. This is normally done during initialization with the proper selection of I/O parameters and the proper CPU load tapes.

2.14 CPU RESTARTS

a. A warm restart results in the loss of messages in temporary storage. These are messages that are waiting to be viewed at the I/O and messages that are waiting to be transmitted (including messages to be relayed). Messages saved at the I/O are in permanent storage and will not be lost.

b. All directives received at this terminal that have been processed will be written to the operational parameters tape. This information will be read into memory as soon as the terminal is reinitialized. This does not include AIG information which will be lost due to a warm restart and will have to be recreated manually by the operator during initialization.

c. A cold restart will result in the loss of messages in temporary and permanent storage.

2.14.1 Cold Restarts

a. A cold system restart is when the CPU has completely lost the RN PROGRAM information and the operator has to "restart" by booting the CPU. This can happen either intentionally or by fault.

b. If the CPU detects an error in the RN Program in its memory it may perform a cold restart without notice. The operator would only notice the "LOAD PGM TAPE" light on the CIU. System boot would have to be performed at this point.

c. The operator may request a cold restart from the SETUP menu by selecting "RELOAD CPU PROGRAM." The operator may also choose to cold restart the CPU by powering down the control rack, KABS, and associated circuit breakers on the PCU. When powered back up, the system will need to be booted.

2.14.2 Warm Restarts

a. A warm system restart is when the CPU still contains the correct RN Program in memory and all saved messages (i.e., permanent storage) are still intact. However, all operating parameters need to be verified or re-entered by the operators. Like a cold restart, a warm restart can happen either intentionally or by fault. After a warm restart, the RN Program is restarted from the beginning.

b. If the CPU detects an unexpected circumstance, it may warm restart itself. This will be evident to the operator in a couple of ways. The operator may see the CIU fault lights cycling, or he may notice that fault lights that were on are no longer on. In fact there would be no lights on the CIU. Either way the Radio I/O would automatically re-link with the CPU and the "CPU LOAD VERIFICATION" menu would appear. It is possible that the Radio I/O will just lose link with the CPU and all communication with the CPU would stop. This may indicate that a warm restart is about to happen, or the operator may need to "force" a warm restart.

c. If the operator wants to warm restart the CPU, there are two ways to do this. The operator may go to the SETUP menu and request "RESTART SYSTEM." If communication with the CPU is discontinued, as stated in the previous paragraph, and the operator wanted to warm restart, the operator would have to "force" the restart. This is done by turning off rack 2, right, circuit breaker on the PCU. Wait a minimum of 10 seconds and then turn it back on.

2.15 RADIO-WIRE INTEGRATION (RWI)

2.15.1 General

a. The FT provides the capability to support the integration of a telephone circuit with an HF voice link via a manual I/O Unit interface. Normally this interface is supported by the Radio I/O Unit. Upon telephonic or radio request, the I/O Unit operator contacts the called party via the desired medium. The Radio I/O operator then follows the RWI procedures detailed in paragraph 2.15.2.

b. Using units shall provide guidelines or instructions concerning use of RWI within the RN framework. These procedures should address the following, as a minimum:

(1) Authorized radio stations
(2) Authorized telephone users
(3) Directories to support this capability
(4) Operator instructions.

These instructions should require the operator to advise all parties that this service is for unclassified information only, even if Parkhill encryption is used on the radio link. Serviced users shall follow doctrinal radio telephone procedures.

2.15.2 Radio Telephone Patch Operation

NOTE:
Telephone communication over RN is only available in non-secure mode.

To configure an I/O Unit to perform telephone patch functions, follow the procedure below:

NOTE:
If it is desired to remote the I/O, perform the procedures in Section 2.4.5 of this document.

a. Telephone communication requires at least two phones at the I/O site. One phone is for use by the I/O operator, and is connected to the top of the I/O rack binding posts (E1/E2) via fieldwire. The second (remoted) phone is connected via fieldwire in parallel with the other phone. This mode of operation also requires use of the footswitch provided with the I/O rack. The footswitch is connected to J10 of the Telephone Modem.

b. The VOICE MODE switch on the Telephone Modem must be in the TELEPHONE position.

c. The Radio I/O operator must configure the Signal Entry Panel to allow for operation of the I/O to send and receive HF voice radio traffic.

d. To operate, the operator at the remoted phone must contact the operator of the I/O via phone. The I/O operator monitors the radio/telephone conversation (using a telephone) and presses the footswitch whenever the remote phone operator talks. This action causes the speech from the remote phone to be routed to the appropriate radio in the Force Terminal.

e. When the footswitch is released, audio from the radio is routed via the I/O rack to the remoted field phone.

2.16 LOSS OF COMMUNICATIONS

a. When communications are lost or interrupted, the operator's first priority is to the terminal operational again, as quickly as possible. Thus, the operator/unit-level maintainer must be able to diagnose the cause of the problem, and determine whether or not communications can be re-established before or while the repairs are made.

b. Failures usually fall into three categories:

1. Non-equipment related - dropping out of the net, propagation loss, etc.
2. Equipment failure
3. Power/electrical - power failures, switches off, etc.

c. To determine which category a problem falls into, determine what the symptoms are, then refer to Chapter Six of this manual, Section 2.16.1 of this manual, or to the technical manuals for further guidance (TM 11-5895-1218-12 and TM 11-5895-1218-34).

d. If the failure does not appear to be equipment-related, attempt to restore the terminal to operation. Examples of non-equipement-related failures include:

- The terminal dropping out of the net
- The terminal re-constituting the net
- Loss of communications link/TOD/COMSEC variable load
- Interference/jamming
- Propagation loss.

2.16.1 Reasons For Lost Communications

2.16.1.1 Non-Equipment Causes

a. Loss of communications for reasons not related to equipment or power failure falls into two general categories: a) natural phenomena affecting propagation, and b) human error or misjudgment of a situation.

b. As a general rule, a terminal operator should always be aware and up to date regarding his terminals' status in a subnet. That is, the operator should know what the latest LQAs and active/inactive status are on both member and controller subnets.

c. Then, for example, if a link has had good LQAs, and a terminal (at the other end) is reported "Inactive", one could reasonably assume it was out due to some equipment or power failure, or overt action, and not due to propagation. If the LQAs are seen to gradually deteriorate, and then a terminal becomes "Inactive", perhaps sporadically, it would be reasonable to assume the outage is due to propagation problems, or rapid changes, which can be quite common during the sunrise and sunset time periods. No operator action is necessary in these circumstances since the system is designed to automatically adjust and work-through these situations.

d. Factors which should be kept in mind when evaluating an out-of-subnet condition (loss of communications) for potential problems (causes) may include, but are not limited to the following (some of these factors may require confirmation via an alternate method of communication):

1. Single or multi-member subnet?
   - Are other members out?
   - Is only (this) one terminal out?
   - Are all members out? (Problem may be at controller)
2. Has mode changed recently? (N,T,E)
3. Was terminal out during mode change?
4. Was terminal out during frequency table change?
5. Was TOD (Time of Day) recently changed (updated)?
6. Have cryptovariables been updated recently?
7. Have cryptovariables been changed recently?

- A given subnet must use the same COMSEC and TRANSEC variables.

8. May be trying to sign-in or constitute in ECCM, but ECCM has been de-authorized by NCS.
9. On-site/co-site interference.
   - Interferes with reception, but not with transmission.
10. Has any hardware been replaced recently?
    - Possible firmware update discrepancies.
11. Subnet member can be inadvertently signed-out of net by its controller.
    - Evidenced by audit trail message "OWN TRM SIGNED-OUT OF SUBNET aaa BY CONTROLLER"
12. Review all Terminal, I/O, Frequency, etc setups and configuration menus.
13. Has terminal changed subnets?
    - Are frequency tables correct?
    - Are cryptovariables correct?
14. Is terminal, or member mobile?

2.16.1.2 Equipment Failures

a. While some equipment failures will shut down the whole terminal, as does a power failure, most will result in the loss of only one stack, and therefore, at most, one data subnet. In many cases, loss of a data subnet (stack 1 or 2) due to equipment failure need only be temporary until the failed LRU is identified and replaced.

b. LRUs which the terminal cannot operate without are the PPC, AC/DC Power Supply (unless in Mobile mode), CPU, CIU, RFO, MTU, and KABS.

c. Note that once the CPU is booted and the AIG and Frequency Dictionary tape are loaded, the terminal can continue operating without the MTU, until such time as a restart is needed.

d. Additional LRUs critical to operation only in Mobile mode are the ATU and DC/AC Inverter. The SIU is critical for data operations only in the case of remoted I/Os, and for all cases of voice communications.

e. Equipment in the HF rack of the terminal is present in duplicate and triplicate, and therefore provides some redundancy. Although Stack 3 is identified as a voice stack, any of its LRUs may be used in Stack 1 or 2, and likewise, Stack 5 LRUs may be used to replace those in Stack 4. Pre/Post Selectors are interchangeable between all stacks.

f. Redundancy also exists for the Radio I/O in that the Mission I/O can replace it. This is easily accomplished by removing cable W3302 from J6 on the Radio I/O and connecting it to J6 on the Mission I/O, which will then perform all the functions of a Radio I/O.

2.16.1.3 Power Failure or Interruption

a. Communications will be lost in the case of a prime power failure (outage), and may or may not be lost in the case of a momentary interruption, or glitch.

b. If connected to a commercial or other fixed source of power that is out for more than a few minutes, and the reason for the outage is unknown or beyond the operators control, consideration should be given (depending on the history of the area) to connecting to an alternate power source, if available. This can be generator or vehicular power, although vehicular power will result in the limited capabilities of mobile operation.

c. If running on generator power and a failure occurs with no replacement available, operation could be resumed by switching to commercial or vehicular power. Similarly, if a problem arises with vehicular power, a source of generator or commercial power could be used.

d. When power is lost, turn off ECUs; LRUs in Racks 1,3,4,5, and 6; and PCU circuit breakers in anticipation of bringing the system back up when power is restored, or after switching to another power source. However, to maintain the CPU backup (Keep-Alive) system, the following switches must remain ON;

KABS Battery Charger ON/OFF switch
RFO ON/OFF switch
RFO DC circuit breaker
CPU DC circuit breaker
BAT CHG DC circuit breaker.

NOTE:

When power is restored, reinitialize and bring terminal back to the condition prior to power failure.

e. If batteries in the KABS (Keep-Alive Battery System) are fully charged, they should support the terminal for at least three hours. This backup maintains the CPU operating system in memory, and TOD (Time of Day) in the RFO. Therefore, the terminal will only need a Warm Restart and cryptovariable update to become operational.

f. In the case of a momentary power interruption, or power glitch of sufficient magnitude and duration, there is a possibility of a warm restart being required, even though the terminal remains powered up. In this situation, the restart is the only action which is necessary to resume operations.

2.16.2 Restoral Actions

2.16.2.1 Priorities

a. When equipment failures or communication disruptions occur, the first priority is to maintain, or re-establish operation of the uplink Stack (usually Stack 1) and Stack 4. Following this, the downlink subnet, if applicable, should be reconstituted. This sequence will maximize the number of messages sent from the upper tiers which will be received and held for retransmission, as applicable, to the lower tiers.

b. Following any equipment repair or replacement (by exchanging LRUs within the shelter if necessary) or CPU restart, the uplink subnet, if not already operating, should be signed into. Following this, any downlink equipment problems should be addressed.

c. If the present uplink stack will be out for a significant period, the downlink stack should be re-established as the uplink. Alternatively, an available RN Modem could be installed in Stack 3 for use as the uplink stack. At the same time, however, Stack 4 should be kept intact.

2.16.2.2 Warm and Cold Restarts

a. Warm or cold restarts will be necessary at times due to power interruptions or outages, or in some cases during troubleshooting.

b. A warm restart minimizes terminal down-time (compared to a cold start); however, it does result in loss of messages in temporary storage; both those seen at the I/O and those "passing through" the terminal. Also, no new messages will be received until the terminal becomes active in subnets following the restart. Messages "saved" at the I/O are in permanent storage and will not be lost. Following a Warm Restart, subnets will need to be "reconstituted" and "re-signed" into as applicable.

c. A cold restart is essentially the same as initializing a terminal, except most LRUs will already be turned on. All messages in temporary and permanent storage will be lost.

2.16.2.3 Reconstitution/Sign-in - Set-up Checks

Anytime a terminal is reconstituting or signing into a subnet, the operator should carefully check all the terminal and equipment configuration and setup menus, including frequency and hopset tables. This is especially important if an equipment failure has resulted in changing the subnet role of an R/T stack. However, it is equally important in the case of a power interruption or non-equipment related problem since the cause of the problem may be found in an incorrect or blank menu entry. Current subnet parameters should be confirmed with the controller via alternate means.

2.17 SPECIAL SECURITY PROCEDURES

2.17.1 Run Silent Operations

If mission requirements dictate that a Force Terminal is to operate in the Run-Silent mode, the following setup is required.

a. The operator in the Run-Silent terminal has to recall the TERMINAL CONFIGURATION screen via the Radio I/O set-up function, and select "RUN SILENT" (as opposed to "TRANSMIT-CAPABLE"). No changes need to be made to the stack configurations, except that the terminal will not function as a subnet controller.

b. For any subnet which the Run-Silent terminal is a member of, the Radio I/O operator at the subnet controller terminal will need to update the subnet membership list, making that particular subnet member a Run-Silent terminal.

c. In a Run-Silent mode, the terminal will never transmit, but it will receive all messages addressed to it. The Run-Silent terminal will also follow any subnet frequency changes or data mode changes which occur within the subnet.

2.18 SECURE TERMINAL SHUTDOWN/EMERGENCY ZEROIZATION

a. The zeroize function is used to return the Force Terminal to a cold start state and thoroughly erases the RN Program in memory. This inhibits unfriendly forces from retrieving any portion of the program. Additionally, this function will zeroize COMSEC variables in the control rack KG-84As and the TRANSEC variables in the ECCMs. Zeroization should be performed only in the event of an emergency, when the terminal is being secured, or upon direction from a higher authority. Once the zeroize command has been sent to the CPU, both the CPU and the I/O begin to zeroize their memories. When the zeroize function has been enabled, it cannot be aborted. Zeroization takes approximately two to two-and-a-half hours.

b. The following procedure is used to zeroize and secure the Force Terminal:

1. To zeroize the CPU from the K/D:

   a) Press the ZEROIZE key.

   b) The K/D display shows a warning and instructions.

   c) If you are sure you want to zeroize the terminal, enter Y for yes. Pressing ENTER then initiates the zeroization process. The display shows the message "ZEROIZE IN PROGRESS." When the terminal has been zeroized, the display shows the message: "ZEROIZATION COMPLETE."

2. To secure the terminal:

   a) Zeroize the remote KG-84As
   b) Zeroize the KY-75As
   c) Power off the terminal.

CHAPTER 3

SPLIT SITE OPERATIONS

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CHAPTER 3
SPLIT SITE OPERATIONS

3.1 INTRODUCTION

a. The RN Split Site configuration provides HF communications capabilities at sites where transmit and receive equipment must be separated. The Split Site consists of a Force Terminal modified to operate as a Transmit Station (TXS), and a Receiving Group which operates as the Receiver Station (RXS).

b. The Force Terminal is reconfigured as follows (see Figure 3-1):

- The Mission I/O rack is remoted with the remote KG-84As, either #5 or #6.
- A KG-84A storage rack is installed in place of the Mission I/O rack, and up to four KG-84As are installed in this rack.
- An additional KG-84A is installed in the Force Terminal's remote storage rack (located above the KG-84A storage rack)
- Signal and cable connections are made.
- KG-84A internal switches are set.
- An RF dummy load is connected to each Pre-Post Selector J-4 connector.

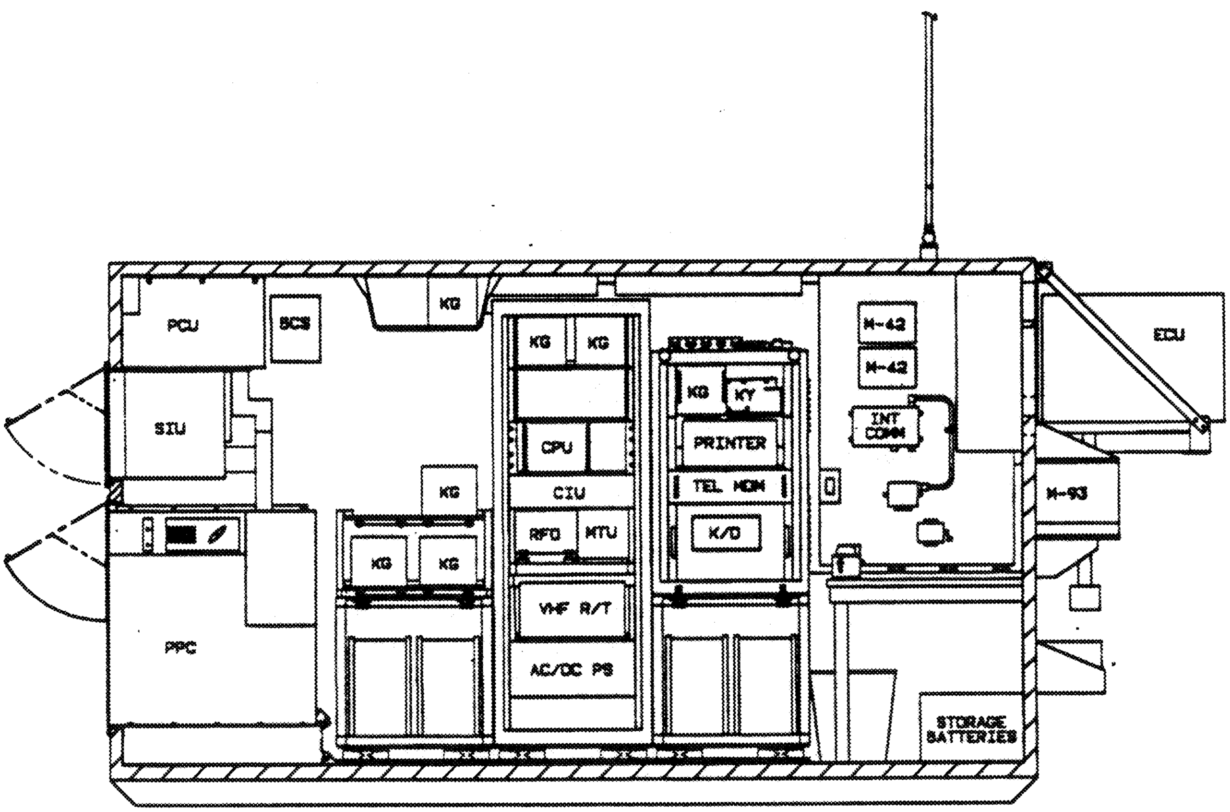

Figure 3-1. Split Site Transmit Station

c. The Receive Station (RXS) consists of the following equipment racks (see Figure 3-2):

- Interface rack
- Control rack
- Radio (HF) rack
- Battery box

3.1.1 Equipment Characteristics, Capabilities and Features

a. Receive Station (RXS) operation is similar to the operation of the receive portions of a Force Terminal, with the following exception.

(1) The RXS CPU is directly controlled from the TXS CPU.
(2) The RXS has a separate CIU.
(3) The RXS has five separate receive channels.
(4) There is a separate RN Operational System (RNOS) program tape for Split Site operation.

b. The RXS is remotely controlled from the TXS and the connection may be by landlines, microwave channels, or other military or commercial circuitry. The RXS uses an AS-3791/G antenna.

c. Three of the RXS stacks (1, 2, and 4) receive RTTY, RN data, or voice. Stacks 3 and 5 receive voice only.

3.1.1.1 Transmit Station

The Transmit Station (TXS) provides control of the RXS by using the Radio I/O installed in or remoted from the TXS. Remote capabilities include the following:

(1) Receiver selection
(2) Receiver mode selection
(3) Receiver tuning
(4) Activating the ECCM
(5) RXS equipment status.

3.1.1.2 Overview of Operation

a. The Split Site configuration requires the use of two CPUs, one to control TXS equipment, and one to control RXS equipment. For the Split Site to function properly, the two CPUs must be synchronized. One acts as the "master" and the other acts as the "slave." In this case, the TXS CPU controls the RXS CPU.

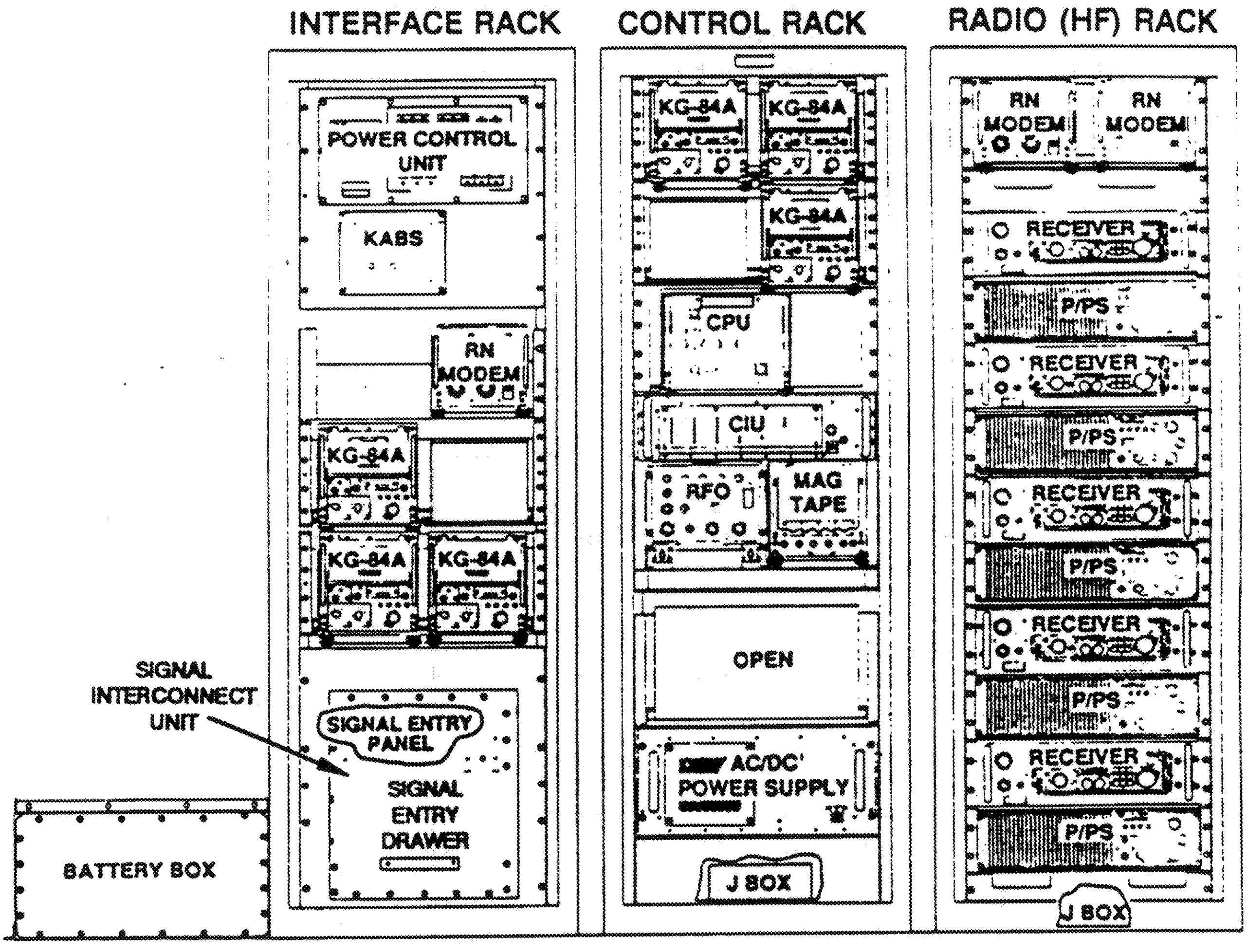

Figure 3-2. Split Site Receive Station

b. Commands originate at the TXS CPU and are passed to the RXS CPU. The RXS CPU sends back status information and traffic for processing. The CPU-CPU interconnections are high-quality, specially conditioned circuitry.

c. Communications connections between the TXS and the RXS may be provided over military or commercial paths; including microwave, land line, tropospheric scatter, and satellite circuits. Whatever type of interconnect is used must meet DCS S3 circuit requirements.

d. The TXS-RXS interconnects consist of six four-wire circuits (see Figure 3-3). Three of the circuits are remote data/control interconnects, and three are remote audio interconnects. The connection between the TXS and the RXS is made at the SIU.

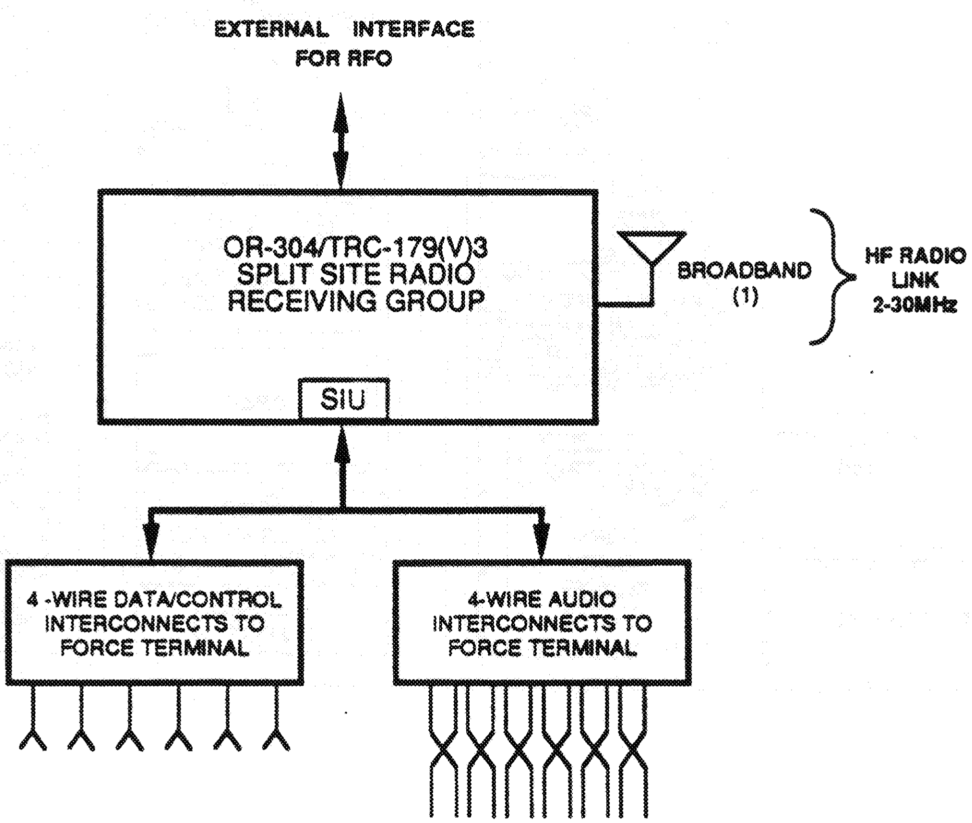

Figure 3-3. Receiver Group Communication Interconnects

3.1.1.3 Voice Signal Flow

a. Voice signal flow for the Split Site (both secure and non-secure) is similar to that of the Force Terminal. The major difference is that the HF receive for the TXS comes from the receiver in the RXS.

b. The HF signal is received by the antenna (see Figure 3-4). The antenna passes the signal to the 5:1 splitter, which takes one input and provides five outputs (one for each receiver). Each of the five outputs from the splitter is passed to a Pre/Post-Selector (P/PS). The P/PS provides filtering and passes the HF signal to the receiver. The receiver then passes the baseband audio signal to the RXS SIU. The RXS SIU passes the audio to the TXS over one of the remote audio interconnect circuits to the appropriate I/O Unit.

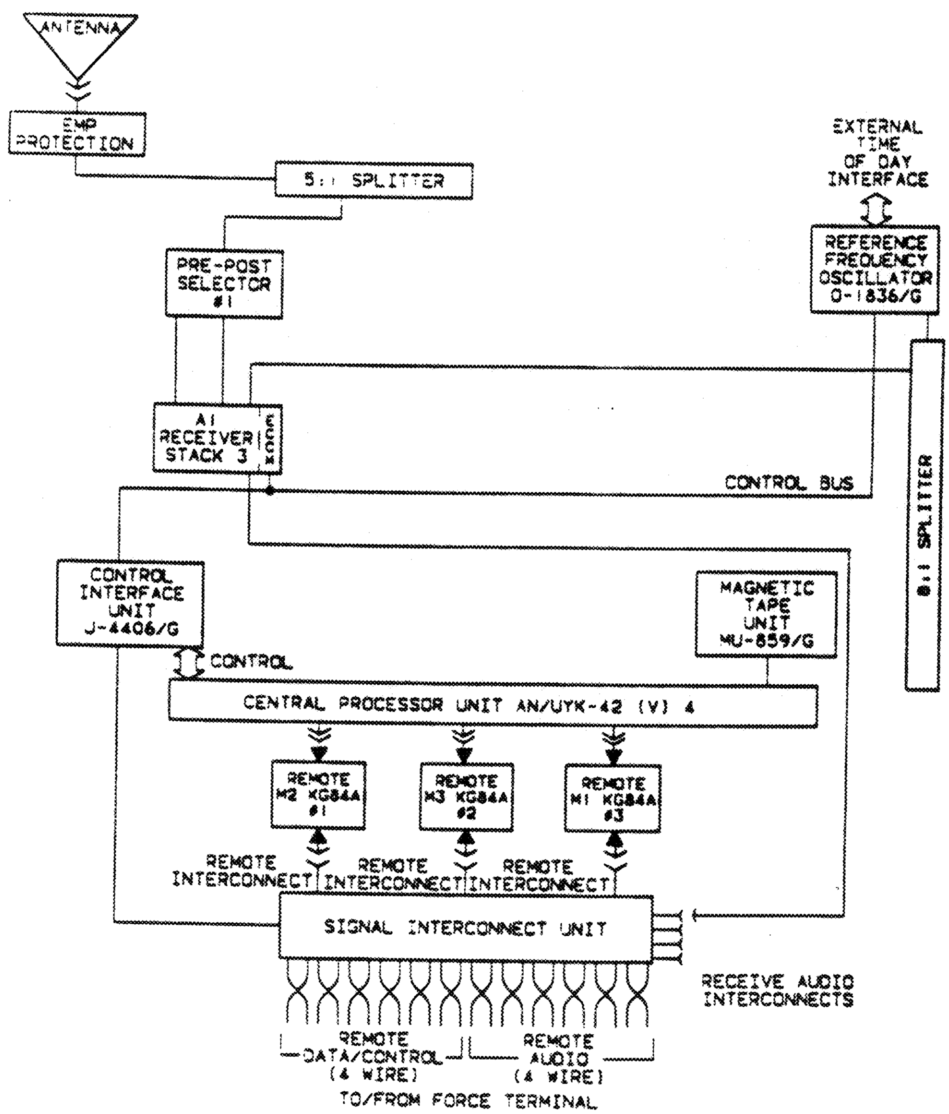

Figure 3-4. Split Site Voice Signal Flow

c. The RXS equipment, including the remote interconnect KG-84As, is controlled by the CPU in the TXS. The remote KG-84As provide communications security to the links that are passing control and status information between the two CPUs.

3.1.1.4 Data Signal Flow

a. Data flow for the Split Site is also similar to the Force Terminal. The primary difference is that the HF receive for the TXS comes from the receivers in the Split Site receiver group. The receivers are interfaced through the SIU in the receiver group, then are passed over the communications interconnect circuits to the TXS, through the TXS SEP.

b. The HF signal is received by the antenna (see Figure 3-5). The antenna passes the signal to the 5:1 splitter, which takes one input and provides five outputs, one for each receiver. Each output from the splitter is passed to a P/PS. The P/PS provides filtering, and passes the HF signal to the receiver. The receiver then passes the baseband audio signal to the RN modem. The modem converts the receive audio signal into digital data. The digital data is then routed to a KG-84A. The KG-84A decrypts the digital data and passes it to the RXS CPU. The RXS CPU routes the decrypted digital data to a remote interconnect KG-84A. The KG-84A encrypts the data and passes it to the RXS SIU. The SIU has built-in send and receive modems, and it uses these modems to convert the digital encrypted data into an audio signal. The audio signal passes over the 4-wire remote data/control interconnect circuits, to the TXS SEP. The SEP internal modems then convert the audio signal back into digital encrypted data, and pass it to the TXS remote interconnect KG-84As. The KG-84As decrypt the digital data and output the clear text data to the CPU. The CPU processes the digital clear text data in the TXS as if it were a data signal within a normal Force Terminal receiver.

c. The remote interconnect KG-84As between the TXS and the RXS provide communication security to the links that are passing information between the CPUs.

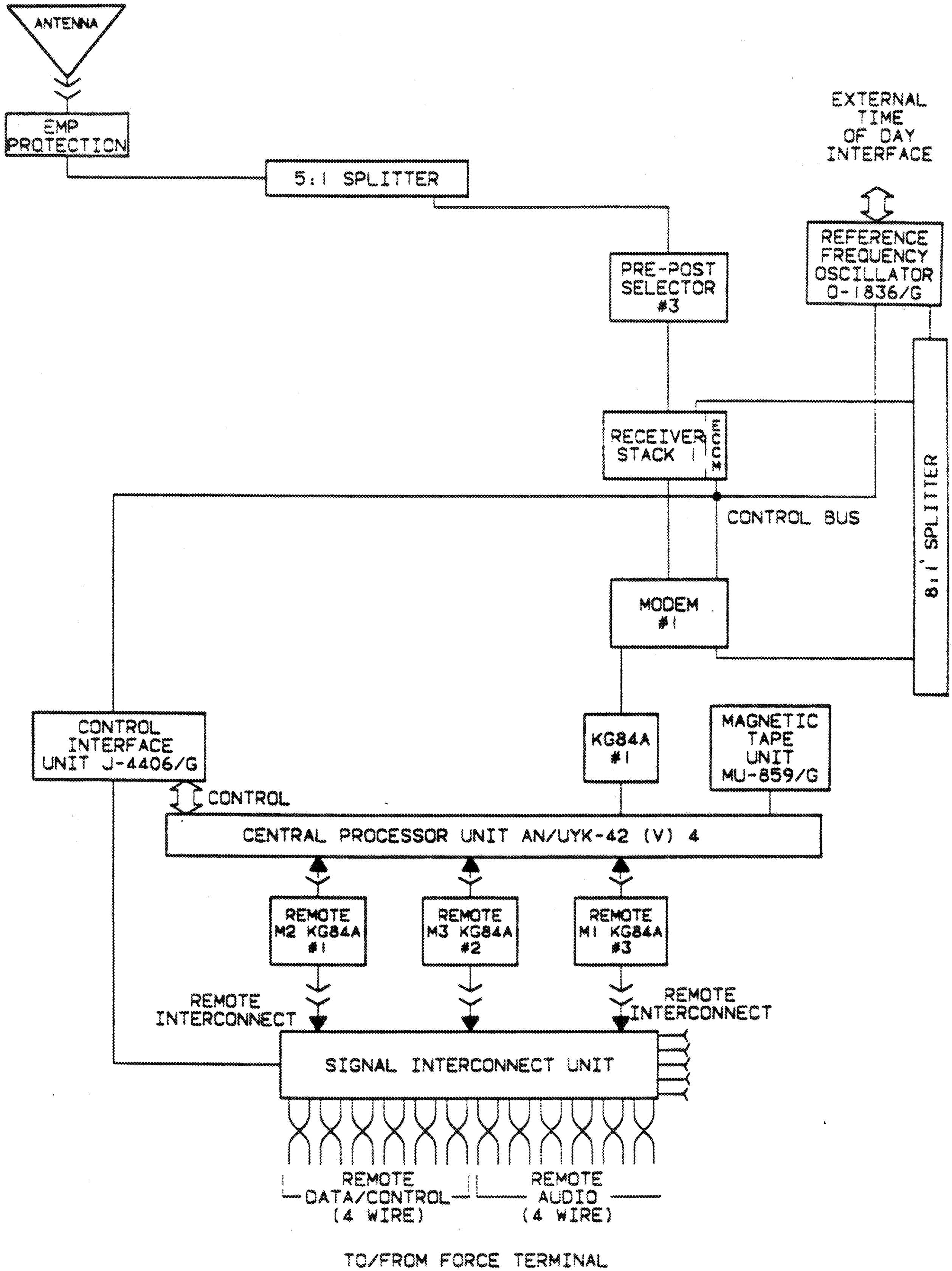

Figure 3-5. Data Signal Flow Diagram

3.1.1.5 Interconnect Signal Flow and SIU Setup

To set up the RXS SIU, each audio circuit between the TXS and the RXS is dedicated from a terminal strip post in the RXS SIU to an I/O binding post group at the TXS SEP (see Figure 3-6). A breakout of the audio connections is provided in TM 11-5895-1218-12, Appendix H.

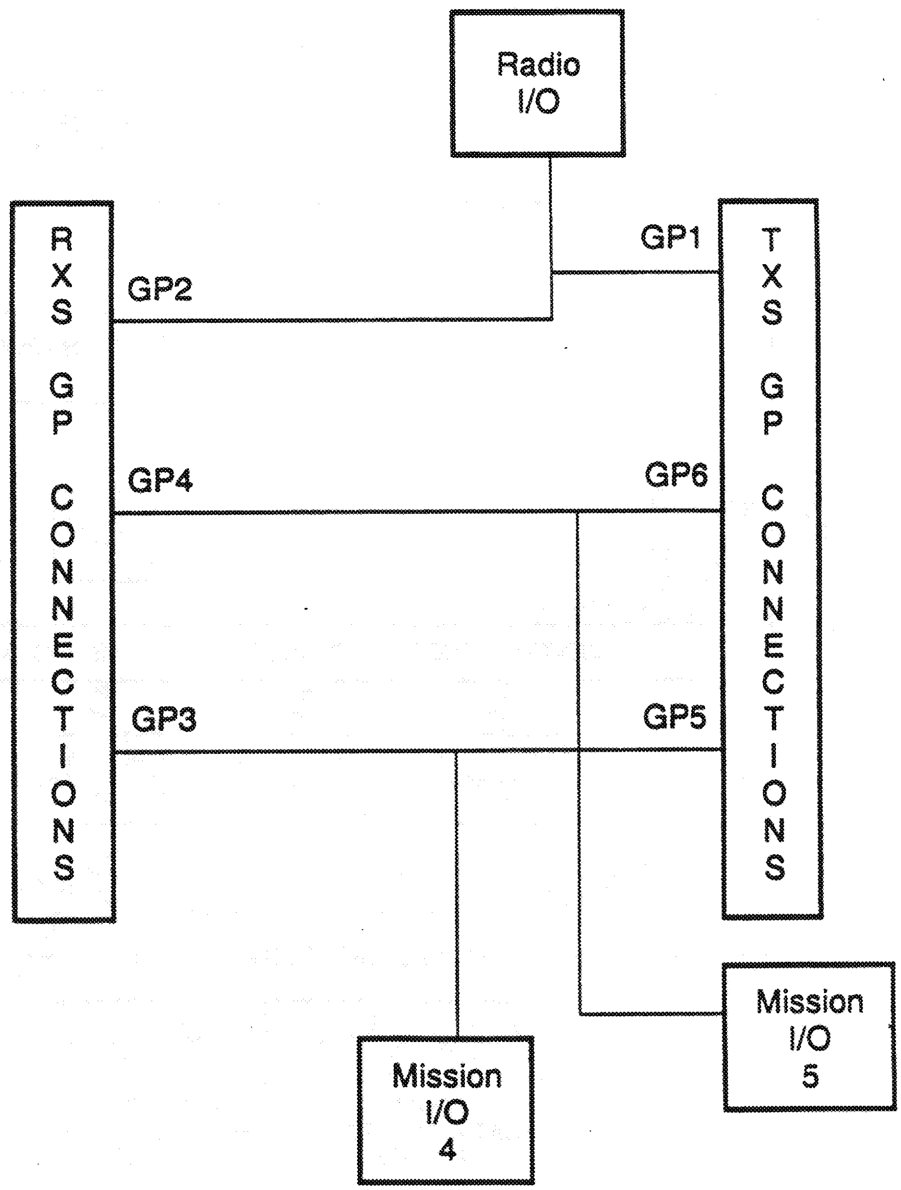

Figure 3-6. SEP-SIU Audio Interconnect Diagram

3.1.2 Self-Test Capabilities

a. The RXS and TXS both have the capability for system on-line (background) BIT, system off-line BIT, and individual LRU BIT and fault detection.

b. System on-line BIT, or background BIT, is transparent to the operator. When the Split Site is active in a net, LRUs are polled at specific intervals to verify that they are operating properly. The TXS CIU reports faults only from the TXS. The RXS CIU reports faults only from the RXS. The TXS radio I/O reports both TXS and RXS faults.

c. System off-line BIT is the same as for the Force Terminal. The following cautions apply:

- The loop-around tests are available at the TXS only
- Off-line BIT can cause the system to lose mission-ready status.

3.2 INITIALIZATION

Initialization of the Split Site encompasses all of the activities required to bring the equipment from a cold start state to the point of signing into or establishing a net.

3.2.1 Assembly and Preparation for Use

a. Before the Split Site equipment is ready for initialization the following activities must be completed:

- Site preparation
- RXS installation
- Force Terminal modification for Split Site operation
- RXS to TXS interconnection
- EMP filter installation to the receive RF cable, if it is not previously filtered.

b. Power-up and initialization procedures for the TXS and RXS are provided in TM 11-5895-1218-12, Appendix H, paragraph H-12.

3.2.2 Tape Loading

Tape loading procedures for the TXS are the same as for other Force Terminals (refer to TM 11-5895-1218-12, paragraph 2-15). The procedure for loading tapes into the RXS is also provided in TM 11-5895-1218-12, paragraph 2-15.

3.2.3 Operating Modes

After the TXS and RXS have been initialized, they may be operated in the following modes:

a. Voice mode - operation is the same as for the Force Terminal (refer to TM 11-5895-1218-12, paragraph 2-11)
b. Data mode - operation is the same as for the Force Terminal (refer to TM 11-5895-1218-12, paragraph 2-10c)
c. RTTY mode - operation is the same as for the Force Terminal (refer to TM 11-5895-1218-12, paragraph 2-12)
d. Scan mode - operation is the same as for the Force Terminal (refer to TM 11-5895-1218-12, paragraph 2-13)

3.3 CONTINUING OPERATIONS

3.3.1 I/O Initialization Sequence

a. I/O initialization, after completion of BIT, begins at the TYPE OF I/O menu, where the operator specifies how the Split Site will be used:

1 - RN only
2 - RN and FAN
3 - FAN only
4 - GLCM
5 - GLCM and FAN.

b. Selections 4 and 5 from the TYPE OF I/O menu are not valid for Force Terminals.

c. If option 1 is selected, the operator proceeds to set up for RN operation (refer to TM 11-5895-1218-12, paragraph 2-10b).

d. If option 2 is selected, the operator sets up for RN operation and continues into FAN setup by specifying TDM-3 mode parameters, destination headers and header storage. These procedures are also provided in TM 11-5895-1218-12, paragraph 2-10b.

e. If option 3 is selected, the operator proceeds directly from the TYPE OF I/O to the TDM-3 MODE PARAMETERS menu to begin FAN setup. Refer to TM 11-5895-1218-12, paragraph 2-10b.

f. Several menus require special consideration for Split-Site operation:

g. When "RN Only" or "RN and FAN" is selected from the TYPE OF I/O menu, the next menu to be displayed is the RN I/O CONFIGURATION menu. At this menu, the operator specifies I/O configuration parameters.

h. Once configuration parameters have been entered, the SPLIT SITE LOAD VERIFICATION menu is displayed. This menu allows the operator to verify the integrity of the tape load for the RXS CPU. The SPLIT SITE LOAD VERIFICATION menu is used like the CPU LOAD VERIFICATION menu, except that when Split Site load verification is completed, initialization is not restarted.

3.3.2 Terminal Setup

a. Terminal setup commences with the RN TERMINAL CONFIGURATION menu, and encompasses the following series of menus:

- STACK CONFIGURATION
- RTTY CONFIGURATION
- SCAN MODE SET-UP
- DATA MODE NON-ECCM FREQUENCY SELECTION
- ECCM HOPSET SELECTION
- KG-84A SET-UP
- CTF SET-UP
- SEP AUDIO CONFIGURATION
- NCS/ANCS/IT TERMINAL IDENTIFICATION
- INJECTOR I/O UnitS
- TDM-3 MODE PARAMETERS
- TDM-3 DESTINATION HEADERS
- SAVE DESTINATIONS

b. For the operating procedures associated with these menus, refer to TM 11-5895-1218-12, paragraph 2-10b.

c. For Split Site, the following considerations apply:

- Terminal configuration
- Stack configuration
- NCS/ANCS/IT identification.

3.3.3 RTTY

Split Site RTTY operations are identical to the FT RTTY operations.

3.3.4 Radio-Wire Integration (RWI)

a. RWI operation in the SS is identical to the RWI operation in the FT. The FT provides the capability to support the integration of a telephone circuit with an HF voice link via a manual I/O Unit interface. Normally this interface is supported by the Radio I/O Unit. Upon telephonic or radio request, the Radio I/O Unit operator contacts the called party via the desired medium. The Radio I/O operator then follows the RWI procedures detailed in paragraph 2.15.2 of this manual to service the call. Using units shall provide guidelines or instructions concerning use of RWI within the RN framework. These procedures should address the following, as a minimum:

(1) Authorized radio stations
(2) Authorized telephone users
(3) Directories to support this capability
(4) Operator instructions

b. These instructions should require the operator to advise all parties that this service is for unclassified information only, even if Parkhill encryption is used on the radio link.

c. Serviced users shall follow doctrinal radio telephone procedures.

3.3.5 Secure Terminal Shutdown

a. The zeroize function is used to return the Split Site to a cold start state. This function is the same in the FT. The zeroize function thoroughly erases the RN Program in memory. Zeroize will inhibit unfriendly forces from retrieving any portion of the program. Additionally, this function will zeroize COMSEC variables in the control rack KG-84As and the TRANSEC variables in the ECCMs. Zeroization should be performed only in the event of an emergency, when the terminal is being secured, or upon direction from a higher authority. Once the zeroize command has been sent to the CPU, both the CPU and the I/O begin to zeroize their memories. When the zeroize function has been enabled, it cannot be aborted. Zeroization takes approximately two to two-and-a-half hours.

b. The following procedures are used to zeroize and secure the Split Site:

1. To zeroize the CPU from the K/D:
   (a) Press the ZEROIZE key
   (b) The K/D display shows a warning and instructions
   (c) If you are sure you want to zeroize the terminal, enter Y for yes. Pressing ENTER then initiates the zeroization process. The display shows the message "ZEROIZE IN PROGRESS." When the terminal has been zeroized, the display shows the message "ZEROIZATION COMPLETE."

2. To secure the terminal:
   (a) Zeroize the remote KG-84As
   (b) Zeroize the KY-75As
   (c) Power off the terminal.

c. The personnel responsible for the Split Site should verify that the RXS has been zeroized and switch all power to the RXS off before securing the facility.

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CHAPTER 4

TEAM TERMINAL OPERATIONS

CHAPTER 4 TABLE OF CONTENTS

CHAPTER 4
TEAM TERMINAL OPERATIONS

4.1 GENERAL

The Team Terminal is the last elemental link in the Regency Net (RN) communications system. It is a single channel secure/non-secure data or voice system which communicates within a communications subnet as a member terminal with a Subnet Control Station. All Team Terminal data message traffic flows through a Subnet Control Station. Propagation coverage is 0 to 300 miles with the use of either the Whip (0-50 miles) or NVIS (0-300 miles) antennas. A subset of the radio equipment may be removed from the Team Terminal to create a Manpack configuration that supports secure/non-secure voice communications.

4.2 TEAM TERMINAL OPERATIONS

4.2.1 Communication Modes

The Team Terminal is capable of secure/non-secure data, voice, manpack, and remote control data or voice configurations. The terminal supports single frequency Non-ECCM as well as Training-ECCM and ECCM modes.

4.2.2 Power Requirements

Power requirements and options include vehicular power at +12 VDC or +24 VDC, 50-60 hertz commercial power at 115 VAC or 230 VAC ±10%, single phase 50-60 hertz all rated at a minimum of 1500 Watts.

4.2.3 Antenna Configurations

4.2.3.1 The 16' Whip Antenna

The 16' whip antenna is used in the horizontal, tied down, position for mobile operations and in the vertical, released, position for stationary operations. When changing the whip configuration, run BIT and shut the Receiver/Exciter (R/E) power off before touching the antenna. After changing the antenna configuration, power on the R/E, refill TRANSEC variables, and run BIT to resume network activities.

4.2.3.2 The NVIS Antenna

The NVIS antenna is used at ranges when the whip antenna has become inadequate. This antenna can only be used in a stationary configuration. When changing to this configuration, run BIT and shut the R/E power off before antenna installation. After antenna installation is complete, run BIT to resume network activities.

4.2.4 Operational Modes

The Team Terminal is capable of single channel communication in Non-ECCM, Training-ECCM, and ECCM data modes. It is capable of voice operations in Non-ECCM and ECCM mode. Remote Team Terminal data operation has the same capabilities as the non-remoted data mode. Remote voice operation is possible only in Non-ECCM mode. The Team Terminal can use either the whip or NVIS antenna to support its operational modes. The Manpack can use Non-ECCM or ECCM voice modes. All modes can be secure or non-secure, except remote voice which is non-secure only. Reference Figure 4-1 for a system functional overview.

4.2.4.1 Data Mode

4.2.4.1.1 Data Signal Flow

In data mode, the receive HF signal from the antenna passes through the Antenna Tuning Unit (ATU) to the Power Amplifier (PA), where it is filtered, and then to the R/E (Figure 4-1). The R/E demodulates the HF signal and turns it into audio baseband. This is sent to the RN modem which converts it to digital data. In secure data mode, the data is passed from the modem to the KG-84A for decryption and then passed to the I/O Unit for message processing. In non-secure data mode, the data is passed directly from the Modem to the I/O Unit. The I/O Unit is used by the operator to select operational modes, message transmission/reception sequences, and BIT operations. Messages are prepared for transmission by the operator using the display/keypad assembly (D/K). Transmission is the reverse of receive signal flow but with the R/E and PA amplifying and filtering the RF output signal.

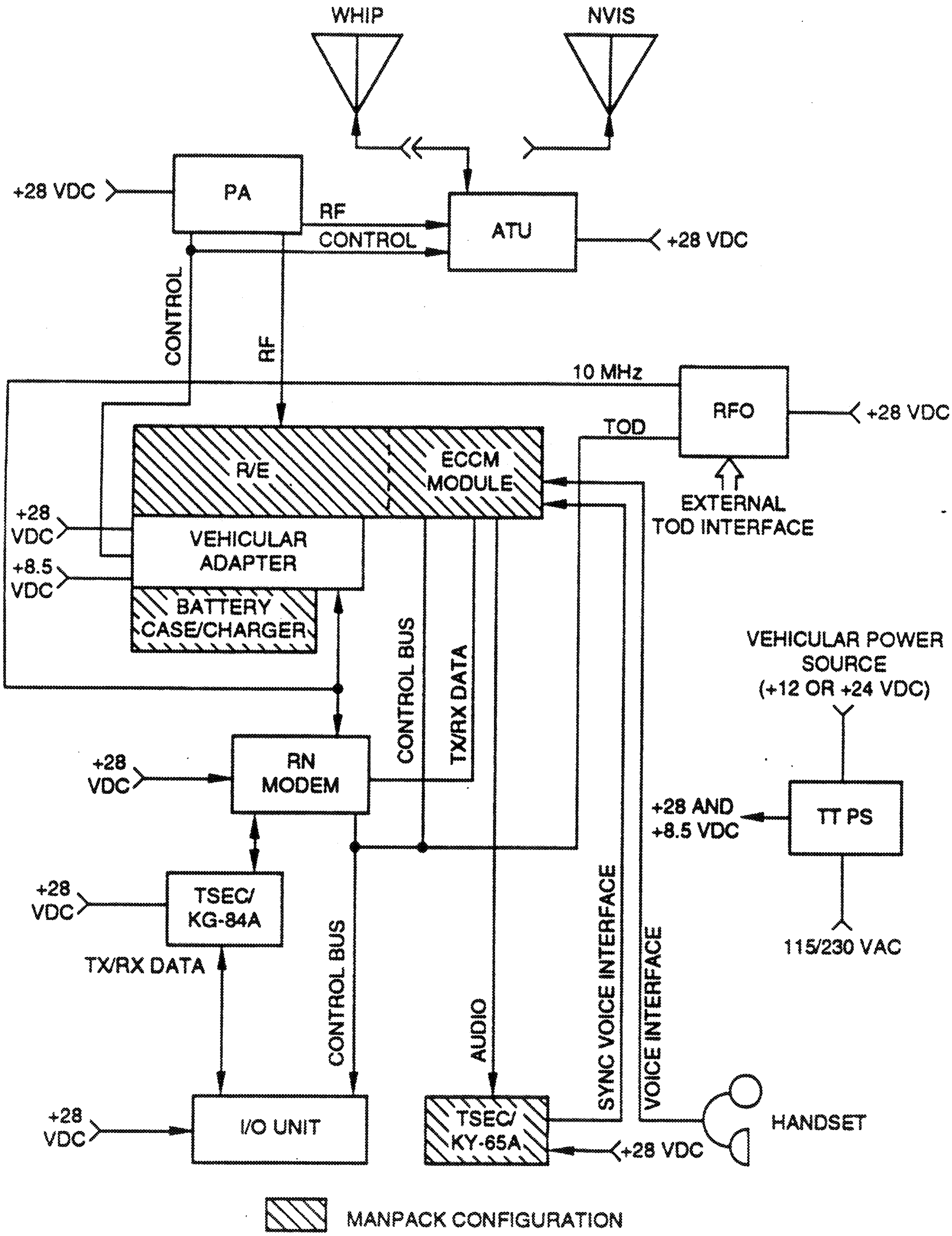

Figure 4-1. Team Terminal Functional Block Diagram

4.2.4.1.2 Remoted Data Signal Flow

When the D/K assembly is remoted from the controller assembly of the I/O, the D/K and the controller assembly interface through a remote cable (Figure 4-2). Data signal flow from the controller assembly to the antenna is the same as for normal vehicular configuration. The only difference is the remoted interface to the D/K through the remote cable.

4.2.4.2 Voice Mode

4.2.4.2.1 Voice Signal Flow

a. When a HF signal is received on the Team Terminal antenna, the signal passes through the ATU to the PA. The PA filters the HF signal, and applies it to the R/E (Figure 4-3). Within the R/E, the signal is filtered again and demodulated. The audio baseband output is routed through the ECCM to the KY-65A, which converts secure voice to non-secure voice. The resulting non-secure voice is routed back through the ECCM and applied to the handset. Secure voice transmission uses a signal flow that is the reverse of secure voice reception with the exception that the R/E and PA amplify and filter the RF output.

b. Non-secure voice signal reception/transmission follows the same signal flow, but the KY-65A is bypassed by placing the KY-65A mode switch in the PLAIN position.

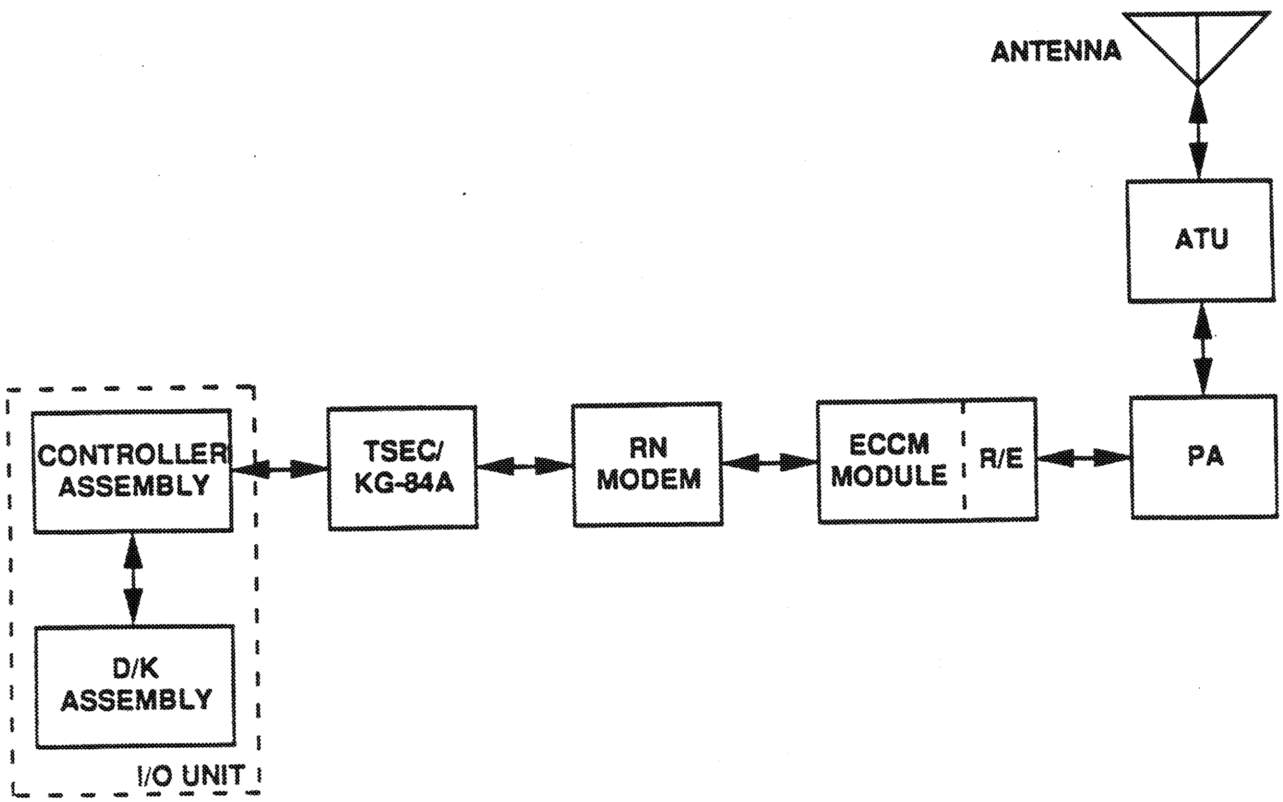

Figure 4-2. Data Signal Flow with the D/K Remoted

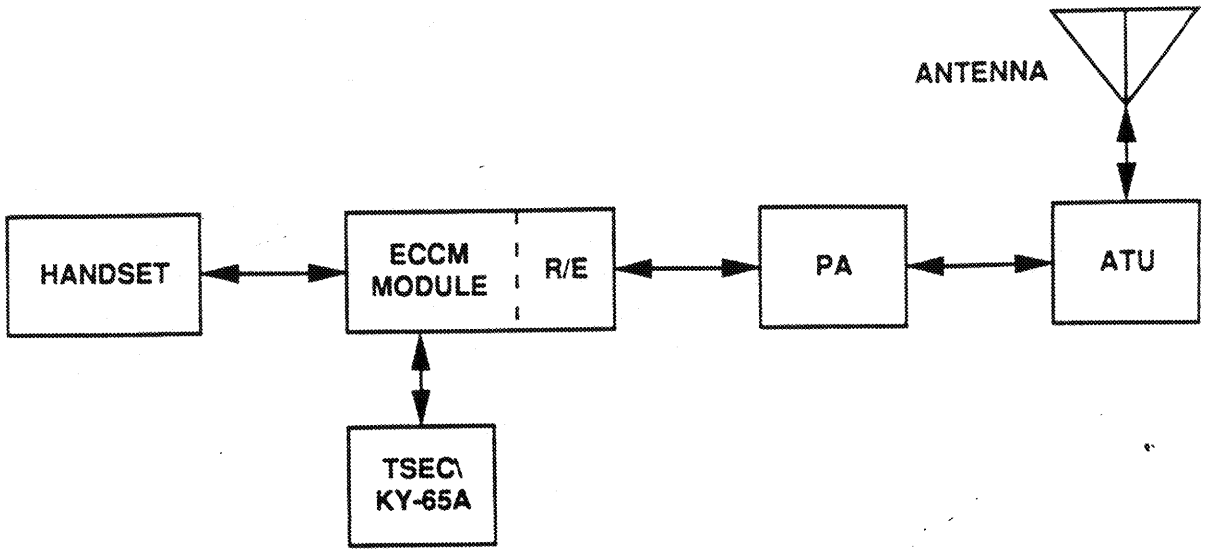

Figure 4-3. Voice Signal Flow

4.2.4.2.2 Remote Voice Signal Flow

For voice communications using the RCS, the ECCM is removed from the R/E and connected to the Remote Location (Figure 4-4). The R/E is mated to the Tone Converter and reconnected to the Vehicular Adapter (VA). The Fast Synthesizer cable must be removed from the VA to allow operation of the R/E internal synthesizer which is used in remote voice mode. The Tone Convertor and the Remote Location are then interconnected using field wire. Voice signal flow from the R/E to the antenna is the same as for normal vehicular configuration.

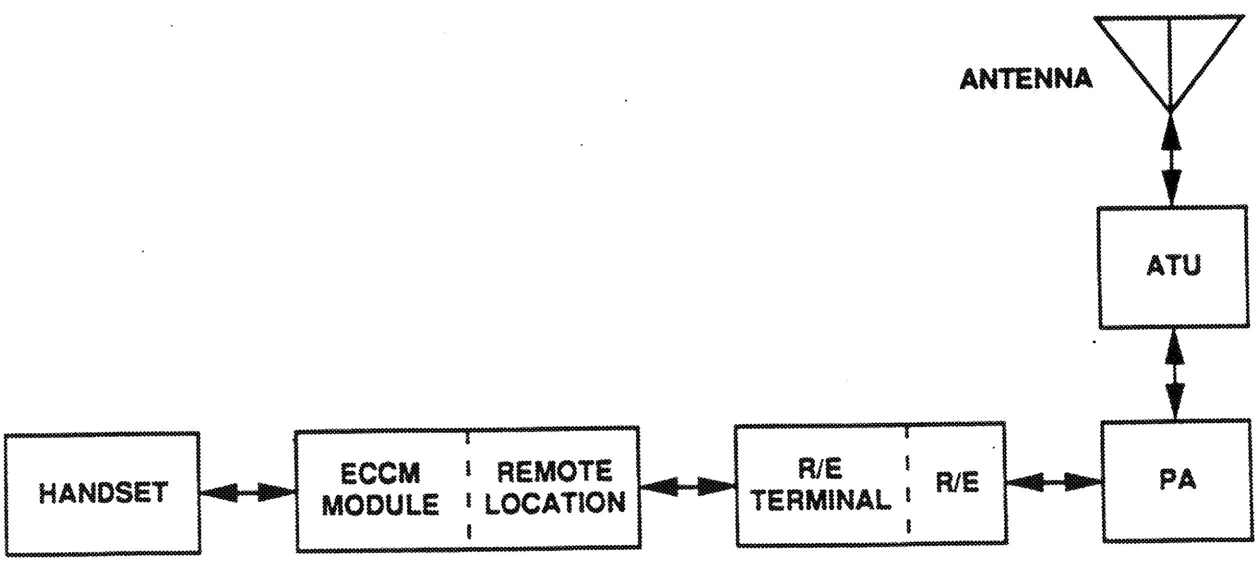

Figure 4-4. Voice Signal Flow with the RCS Remoted

4.2.4.2.3 Manpack Voice Signal Flow

The Manpack configuration is capable of secure or non-secure voice communications. The Manpack consists of the R/T (made up of the R/E and ECCM), and the Battery Case/Charger (Figure 4-5). For secure voice communications, the KY-65A is also removed from the Team Terminal rack and cabled to the R/T. During reception, the R/E filters and demodulates the HF signal from the Manpack Whip Antenna, and provides audio output. In secure voice mode, the audio output is applied through the ECCM to the KY-65A, which makes the secure voice non-secure. The non-secure voice output from the KY-65A is routed back through the ECCM to the handset. When transmitting, the operator's voice from the handset is applied through the ECCM to the KY-65A, to make the non-secure voice secure. The KY-65A secure voice output is sent through the ECCM to the R/E. The R/E then modulates the secure voice and converts it into a HF signal. In turn, the HF signal is amplified and applied to the Manpack Whip Antenna. Non-secure voice communications are achieved by placing the KY-65A in the PLAIN mode, or by disconnecting the KY-65A from the R/T, then connecting the handset directly to the ECCM Module audio connector.

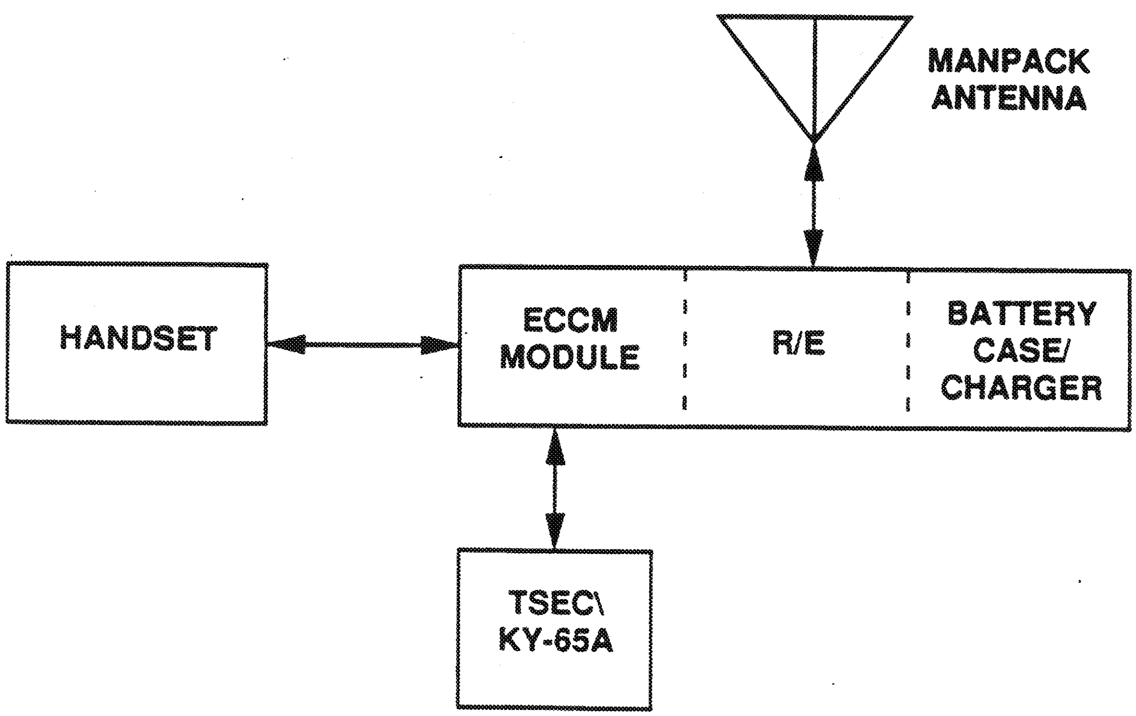

Figure 4-5. Manpack Voice Signal Flow

4.2.5 Self-Test Capability

a. The Team Terminal has the capability for several Built-In Tests (BITs). When the terminal is powered up in any configuration, local on-line LRU BIT is automatically initiated at the TT Power Supply (TT PS), RFO, modem, ECCM, and I/O. Local BIT checks the terminal for proper LRU operations. The ECCM also monitors BIT reports from the R/E, VA, PA, and the ATU. At the completion of system initialization all BIT results will be reported not only at the LRU but at the I/O as well.

b. When the Team Terminal I/O is powered up, a D/K BIT is available, and is selectable by the operator to check the integrity of the touch screen/display. D/K BIT may be bypassed, and the operator may proceed to off-line (whole-terminal) system BIT.

c. System BIT is activated when the last D/K BIT screen is completed, or when D/K BIT is bypassed. If any faults are detected they will be displayed either with a fault lamp or the word FAILED on the ECCM as well as being displayed on the I/O screen. The I/O will halt any further operations until the fault has been cleared.

d. When the Team Terminal is operational, LRUs are polled at intervals, which vary for each LRU, to verify the status of on-line BIT and insure that they are operating properly. When this background poll of on-line BIT detects a problem, a fault message is displayed on the I/O screen for the operator who must then take appropriate action. Reference section 6 for troubleshooting information.

4.3 MOBILE OPERATION

4.3.1 Deployment of Mobile Team Terminal

The selection of the proper site will enhance the ability to establish and maintain radio communications. When selecting a stationary site or when mobile the following considerations should be taken into account to optimize connectivity:

- The terminal should be free of overhead obstructions such as power lines, bridges, and contact with tree branches.

- The terminal should be clear of man-made obstructions such as buildings, metal fences, and commercial areas.

- If the local ambient noise floor is causing a loss of subnet, the terminal should be moved to a different location. This noise can be heard in the handset; however, the terminal should be moved only if there is a continuous loss of subnet and all other variables are confirmed as correct. The move required could be as little as 50 ft., or it might take locating to another site, depending on whether the loss of subnet is caused by the man-made noise floor or physical terrain.

4.3.2 Power Requirements for Mobile

Mobile operations can only be run on vehicle-supplied 24 VDC or 12 VDC. Power cable W100 is connected with P1 to TT PS J1 (all TT PS switches in the off position) and is connected to the vehicle terminal block with A (white wire) to positive and B (black wire) to negative.

4.3.3 Antenna Configurations for Mobile

Mobile operation requires that the 16' whip antenna, tied in the horizontal position, be used.

4.3.4 System Power Up Procedures for Mobile

a. Start the vehicle and wait for the motor to reach normal operating temperature. Then turn on the LRU power switches in the following order:

1. TT PS and RFO DC power switches (after proper connection of W100)
2. RFO
3. MODEM
4. KY-65A
5. KG-84A
6. R/E (PA, ATU, VA)
7. I/O

b. If any LRU does not power up properly, turn the power switch off and then on again. Some units that have been in storage are likely to need this power cycle before their D/K plasma displays will function.

4.3.5 TOD Loading Procedures for Mobile

Time Of Day (TOD) can be loaded from another RFO in a Force Terminal or Team Terminal. It can be loaded from a R-2171 satellite receiver or from a mobile TOD unit. TOD should not be loaded before the cold oscillator light on the RFO is extinguished. Refer to TM 11-5895-1220-12, paragraph 3-11, for the procedures and sources of proper TOD. Time should be transferred within 7 seconds once the RCV TOD switch has been pressed on the RFO.

4.3.6 COMSEC/TRANSEC Variable Loading for Mobile

Detailed instructions for loading variables may be found in 2.9. Briefly, instructions are as follows:

1. ECCM; connect the fill device, press 2nd-LOD-1 (for current day) or 2nd-LOD-2 (for future day), then ENT, and pull tape.
2. KG-84A; connect the fill device, set mode switch to LDU and initiate, set mode switch to LDX and initiate, set mode switch to operate and pull tape through the KOI-18.
3. KY-65A; connect the fill device, set switch to signal clear, and pull the tape through the KOI-18. The warning tone in cipher mode should be gone after a proper fill.

4.3.7 Initialization for Mobile

Initialization will require the following correct subnet and operational information; terminal ID, current date, operational mode, frequencies (both Non-ECCM and Hopset), power level, crypto variables, message destination, and subnet number. Detailed instructions for initialization are contained in TM 11-5895-1220-12, paragraph 2-8, b, steps 1 through 30. Follow the menu instructions as they are displayed. The first menu will take you through off-line BIT. Then enter the terminal ID (this is the only place to do so without a complete reset of the I/O). Next select voice or data mode. Either selection will take you through a series of menus requiring frequency, mode, power level, date (in data mode), and subnet information to be entered. Remember, correct information entered in these menus is critical to proper subnet operations.

4.3.8 Built-In Test

WARNING

The bezel key BIT controls off-line BIT. The BIT RESET button will initiate an I/O memory reset and lose all information currently in the I/O menus. BIT RESET acts the same as turning the I/O off.

a. When the Team Terminal is operational, LRUs are polled for on-line BIT status at intervals verifying that all components are operating properly. When this background poll of on-line BIT detects a problem, a fault message is displayed on the I/O screen. The operator should check for fault lamps and fault codes that may be displayed. The operator must then take the appropriate action which should begin with the verification of the reported fault by running a system BIT.

b. System BIT is activated when the last D/K BIT screen is completed, or when D/K BIT is bypassed. If any faults are detected they will be displayed either with a fault lamp or the word FAILED on the ECCM as well as being displayed on the I/O screen. The I/O will halt any further operations until the fault has been cleared. System BIT will begin off-line BIT and monitor local on-line LRU BIT and report on the TT PS, RFO, modem, ECCM, and I/O. The ECCM also monitors BIT reports from the R/E, VA, PA, and the ATU. At the completion of system BIT, troubleshoot the LRU at fault. Reference section 6 for troubleshooting information and as an aid to understanding the various BIT fault reports.

4.3.9 Remote Data

When the D/K assembly is remoted from the controller assembly of the I/O, the D/K and the controller assembly interface through a remote cable W313 (Figure 4-2). This interface requires that the I/O be turned off first. Disconnect W309 from the I/O. Remove the D/K by releasing the four hold down clips and pulling free the D/K. Connect cable W313 between the I/O and W309 at the D/K. Power on the I/O and complete initialization as explained in 4.3.7 under initialization procedures.

4.3.10 Transition to Stationary

WARNING

When changing the whip configuration, run BIT and shut the Receiver/Exciter (R/E) power off before touching the antenna. After changing the antenna configuration, power on the R/E, refill TRANSEC variables, and run BIT to resume network activities.

Transition to stationary requires that the Team Terminal be operational on 115 VAC, 230 VAC, or 24 VDC vehicle power. If the terminal is operated on DC, then only the proper antenna must be configured to meet the site requirements. If the terminal is operated on AC power, use the following steps:

1. Power off all LRUs except for the RFO.
2. Disconnect W100.
3. Connect W101 or W102 (reference 4.4.2).
4. Configure for proper antenna (reference 4.4.3).
5. Power on terminal (reference 4.4.4).
6. Initialize terminal (reference 4.4.6 and 4.4.7).

4.4 STATIONARY OPERATIONS

4.4.1 Deployment Of Stationary Team Terminal

The selection of the proper site will enhance the ability to establish and maintain radio communications. When selecting a stationary site or when mobile the following considerations should be taken into account to optimize connectivity:

- The terminal should be free of overhead obstructions such as power lines, bridges, and contact with tree branches.

- The terminal should be clear of man-made obstructions such as buildings, metal fences, and commercial areas.

- If the local ambient noise floor is causing a loss of subnet, the terminal should be moved to a different location. This noise can be heard in the handset; however, the terminal should be moved only if there is a continuous loss of subnet and all other variables are confirmed as correct. The move required could be as little as 50 ft., or it might take locating to another site, depending on whether the loss of subnet is caused by the man-made noise floor or physical terrain.

4.4.2 Power Requirements for Stationary

WARNING

All TT PS switches are to be in the off position before power cable connection. Personal injury or damage to equipment may result.

Stationary operations can be performed with vehicle supplied 24 VDC as well as 115 VAC and 230 VAC single phase. For 24 VDC power cable W100 (P1) is connected to TT PS (J1). The other end of the cable is connected to the vehicle terminal block with A (white wire) to positive and B (black wire) to negative. For 115 VAC operation connect W101 to J1. For 230 VAC single phase operation connect W102 to J1.

4.4.3 Antenna Configurations for Stationary

4.4.3.1 The Whip Antenna

Stationary operations can be performed with the 16' whip antenna used in the horizontal, tied down position or the vertical, released position. Ground wave reception can be improved with the antenna in the vertical position. Skywave reception is improved with the antenna in the horizontal position. When changing the whip configuration, run BIT and shut the R/E power off before touching the antenna. After changing the antenna configuration, power on the R/E, refill TRANSEC variables, and run BIT to resume network activities.

4.4.3.2 The NVIS Antenna

The NVIS antenna is used at ranges when the whip antenna has become inadequate. This antenna can only be used in a stationary configuration. This antenna can support communications from 0 to 300 miles. When changing the antenna configuration, run BIT and shut the R/E power off before touching the antenna. After antenna installation is complete, power on the R/E, refill TRANSEC variables, and run BIT to resume network activities.

4.4.4 System Power Up Procedures for Stationary

NOTE: For DC power applications, first start the vehicle and wait for the motor to reach normal operating temperature.

a. Turn on the LRU power switches in the following order:

1. TT PS: For 24 VDC operation, only switch on DC power
For 115/230 VAC operation, only switch on AC power
2. RFO
3. MODEM
4. KY-65A
5. KG-84A
6. R/E (PA, ATU, VA)
7. I/O

b. If any LRU does not power up properly, cycle the power switch off and then on again. Some I/O Units that have been in storage are likely to need this power cycle before their D/K plasma displays will function.

4.4.5 TOD Loading Procedures for Stationary

Time Of Day (TOD) can be loaded from another RFO in a Force Terminal or Team Terminal. It can be loaded from a R-2171 satellite receiver or from a mobile TOD unit. TOD should not be loaded before the cold oscillator light on the RFO is extinguished. Refer to TM 11-5895-1220-12, paragraph 3-11, for the procedures and sources of proper TOD. Time should be transferred within 7 seconds once the RCV TOD switch has been pressed on the RFO.

4.4.6 COMSEC/TRANSEC Variable Loading for Stationary

Detailed instructions for loading variables may be found in 2.9. Briefly, instructions are as follows:

1. ECCM; connect the fill device, press 2nd-LOD-1 (for current day) or 2nd-LOD-2 (for future day), then ENT, and pull tape.

2. KG-84A; connect the fill device, set mode switch to LDU and initiate, set mode switch to LDX and initiate, set mode switch to operate and pull tape through the KOI-18.

3. KY-65A; connect the fill device, set switch to signal clear, and pull the tape through the KOI-18. The warning tone in cipher mode should be gone after a proper fill.

4.4.7 Initialization for Stationary

Initialization will require the following correct subnet and operational information; terminal ID, current date, operational mode, frequencies (both Non-ECCM and Hopset), power level, crypto variables, message destination, and subnet number. Detailed instructions for initialization are contained in TM 11-5895-1220-12, paragraph 2-8, b, steps 1 through 30. Follow the menu instructions as they are displayed. The first menu will take you through off-line BIT. Then enter the terminal ID (this is the only place to do so without a complete reset of the I/O). Next select voice or data mode. Either selection will take you through a series of menus requiring frequency, mode, power level, date (in data mode), and subnet information to be entered. Remember, correct information entered in these menus is critical to proper subnet operations.

4.4.8 Built-In Test for Stationary

WARNING

The bezel key BIT controls off-line BIT. The BIT RESET button will initiate an I/O memory reset and lose all information currently in the I/O menus. BIT RESET acts the same as turning the I/O off.

a. When the Team Terminal is operational, LRUs are polled for on-line BIT status at intervals verifying that all components are operating properly. When this background poll of on-line BIT detects a problem, a fault message is displayed on the I/O screen. The operator should check for fault lamps and fault codes that may be displayed. The operator must then take the appropriate action which should begin with the verification of the reported fault by running a system BIT.

b. System BIT is activated when the last D/K BIT screen is completed, or when D/K BIT is bypassed. If any faults are detected they will be displayed either with a fault lamp or the word FAILED on the ECCM as well as being displayed on the I/O screen. The I/O will halt any further operations until the fault has been cleared. System BIT will begin off-line BIT and monitor local on-line LRU BIT and report on the TT PS, RFO, modem, ECCM, and I/O. The ECCM also monitors BIT reports from the R/E, VA, PA, and the ATU. At the completion of system BIT, troubleshoot the LRU at fault. Reference section 6 for troubleshooting information and as an aid to understanding the various BIT fault reports.

4.4.9 Stationary Operations-Options

4.4.9.1 Remote Data

When the D/K assembly is remoted from the controller assembly of the I/O, the D/K and the controller assembly interface through a remote cable W313 (Figure 4-2). This interface requires that the I/O be turned off first. Disconnect W309 from the I/O. Remove the D/K by releasing the four hold down clips and pulling free the D/K. Connect cable W313 between the I/O and W309 at the D/K. Power on the I/O and complete your initialization as explained in 4.4.7 under initialization procedures.

4.4.9.2 Remote VOICE RCS Operations

a. For voice communications using the RCS, the ECCM is removed from the R/E and connected to the Remote Location. The R/E is mated to the Tone Converter and reconnected to the VA. The Fast Synthesizer cable W304 must be removed from the VA to allow operation of the R/E internal synthesizer which is used in remote voice mode. The Tone Convertor and the Remote Location are then interconnected using field wire.

b. Initialization in RCS Voice mode requires the following steps:

1. Turn on the TT R/E and the RCS Remote Location within 5 seconds of each other.

2. The ECCM will start BIT and send data to the Tone Converter at the Team Terminal.

3. Team Terminal BIT will start and will key automatically.

4. The final tune at the end of BIT and all subsequent tunes will require the operator to key the mike for system tuning after the completion of the data transfer.

5. Frequency and sideband changes can be made from the ECCM keypad. Any change will result in retuning at the Team Terminal.

4.4.9.3 Manpack

Manpack configuration requires the removal of the R/T and the Battery Case/Charger from the Vehicular Adapter. Mate these two units to form the Manpack assembly. Attach the Manpack Whip Antenna to the R/T and follow the guidelines in 4.5 for initialization and usage.

4.4.10 Transition To Mobile

WARNING

When changing the whip configuration, run BIT and shut the Receiver/Exciter (R/E) power off before touching the antenna. After changing the antenna configuration, power on the R/E, refill TRANSEC variables, and run BIT to resume network activities.

Transition to mobile requires that the Team Terminal be operational on 24 VDC vehicle power. If the terminal is already operating on DC then you only need to configure the 16' whip to the horizontal tied down position. If you are operating on AC power then use the following steps:

1. Power off all LRUs except for the RFO.

Reference 4.3 for the following steps.

2. Disconnect W101 or 102.
3. Connect W100.
4. Configure for horizontal 16' whip antenna.
5. Power on terminal.
6. Initialize terminal.

4.5 MANPACK

4.5.1 Deployment of Manpack

The selection of the proper site will enhance the ability to establish and maintain radio communications. When selecting a stationary site or when mobile the following considerations should be taken into account to optimize connectivity:

- The manpack should be free of overhead obstructions such as power lines, bridges, and contact with tree branches.
- The manpack should be clear of man-made obstructions such as buildings, metal fences, and commercial areas.
- If the local ambient noise floor is causing a loss of communications, the manpack should be moved to a different location. This noise can be heard in the handset; however, the manpack should be moved only if there is a continuous loss of communications and all other variables are confirmed as correct. The move required could be as little as 50 ft., or it might take locating to another site, depending on whether the loss of communications is caused by the man-made noise floor or physical terrain.

4.5.2 Configuration

Manpack configuration requires the removal of the R/T and the Battery Case/Charger from the Vehicular Adapter. Mate these two units to form the Manpack assembly. Attach the Manpack Whip antenna to the R/T. Connect W312 to the ECCM J6 connector. Turn the R/E power switch on and allow the Manpack to complete BIT.

4.5.3 Power Requirements

WARNING

All TT PS switches are to be in the off position before power cable connection. Personal injury or damage to equipment may result.

The manpack operates on battery power; however, it must be initialized as part of a Team Terminal. Manpack initialization operations can be run with the Team Terminal on vehicle supplied 24 VDC as well as on 115 VAC and 230 VAC single phase. For 24 VDC power cable W100 is connected with P1 to TT PS J1 and is connected to the vehicle terminal block with A (white wire) to positive and B (black wire) to negative. For 115 VAC operation connect W101 to J1. For 230 VAC single phase operation connect W102.

4.5.4 Team Terminal System Power Up Procedures For Manpack Initialization

NOTE: For TT DC power applications, first start the vehicle and wait for the motor to idle smoothly.

a. Turn on the LRU power switches in the following order:

1. TT PS: For 24 VDC operation, only switch on DC power
   For 115/230 VAC operation, only switch on AC power
2. RFO
3. MODEM
4. KY-65A (if used)
5. I/O

b. If any LRU does not power up properly, cycle the power switch off and then on again. Some I/O Units that have been in storage are likely to need this power cycle before their D/K plasma displays will function.

4.5.5 TRANSEC Variable Loading Procedures

Detailed instructions for loading variables are contained in TM 11-5895-1220-12, paragraph 2-8, b, steps 3 through 5, page 2-78 (or reference 2.3.9) for further instructions. Briefly instructions are as follows:

1. ECCM; connect the fill device, press 2nd-LOD-1 (for current day) or 2nd-LOD-2 (for future day), then ENT, and pull tape through the KOI-18.

2. Secure Manpack Voice requires that the KY-65A be removed and connected to the Z-AKG battery pack as well as to the Manpack R/T.

3. KY-65A; connect the fill device, set switch to signal clear, and pull the tape through the KOI-18. The warning tone in cipher mode should be gone after a proper fill.

4.5.6 Initialization

Initialization will require the following correct operational information; terminal ID, operational mode, frequencies (both Non-ECCM and Hopset), power level, and crypto variables. Detailed instructions for initialization are contained in TM 11-5895-1220-12, paragraph 2-8, b, steps 6 through 30. Follow the menu instructions as they are displayed. The first menu takes you through off-line BIT. Then enter the terminal ID. Next select voice mode. This selection will take you through a series of menus requiring frequency, mode, and power level information to be entered. Remember, correct information entered in these menus is critical to proper voice net operations. Initialize the manpack for both non-ECCM and ECCM voice operations. Once initialization is complete, disconnect W312 from the ECCM J6 connector. Power off all TT LRUs. If the manpack is turned off or power is lost, it will be necessary to reinitialize before attempting ECCM voice communications.

4.5.7 Built-In Test for Manpack

a. When the Manpack is operational, on-line BIT monitors the status of the radio modules as well as the ECCM. When this background poll of on-line BIT detects a problem, a fault code is displayed on the ECCM display. The operator must then take the appropriate action which should begin with the verification of the reported fault by running Manpack BIT.

b. Manpack BIT requires the following steps:

- On the ECCM keypad,

  1. Press 2nd (2nd will appear)
  2. Press ENT (TEST/88.8888 will appear)
  3. Fault codes, if any, will appear after test is complete.

c. At the completion of Manpack BIT troubleshoot the LRU at fault. Reference section 6 for troubleshooting information and as an aid to understanding the various BIT fault reports.

4.5.8 Voice Mode Transition

a. Manpack voice mode transition from Non-ECCM to ECCM mode requires the following steps:

- On the ECCM keypad,

  1. Press 2nd (2nd will appear)
  2. Press ACT (blinking A will appear)
  3. Press ENT (steady A will appear)

b. The radio will now be in ECCM mode on the Hopset that you loaded during Manpack initialization. No other Hopset is available without reinitialization and reloading of a different Hopset from the Team Terminal.

c. Manpack voice mode transition from ECCM to Non-ECCM mode requires the following steps:

- On the ECCM keypad,

  1. Press 2nd (2nd will appear)
  2. Press ACT (blinking A will appear)
  3. Press ENT (the Non-ECCM frequency will appear)

d. The radio will now be in Non-ECCM mode on the frequency that you loaded during Manpack initialization. This frequency can be changed to any authorized Non-ECCM frequency, from the ECCM keypad.

4.5.9 Parameter Options

a. Power selection can be controlled with the following ECCM keypad entries:

1. Press 2nd (2nd will appear)
2. Press PWR (until desired power level is displayed)
3. Press ENT (power level LO or HI displayed)

b. Sideband selection can be controlled with the following ECCM keypad entries:

1. Press 2nd (2nd will appear)
2. Press SB (until upper or lower SB is displayed)
3. Press ENT (upper or lower SB displayed)

4.6 TERMINAL CONFIGURATION OPTIONS

4.6.1 Data

To initiate data while operating in voice mode press the data bezel key and follow the menu instructions.

4.6.1.1 Mode

Once in data, the mode can be changed by selecting the setup bezel key. Select the mode (Non-ECCM, TRAINING-ECCM, or ECCM) touch point. This will take you to the mode selection menu.

4.6.1.2 Frequency

Once in data, the frequency can be changed by selecting the setup bezel key. Select the frequency entry touch point. This will take you to the frequency selection menu.

4.6.1.3 Hopset

Once in data, the hopset can be changed by selecting the setup bezel key. Select the hopset entry touch point. This will take you to the hopset selection menu.

4.6.2 Voice

To initiate voice while operating in data mode press the voice bezel key and follow the menu instructions.

4.6.2.1 Mode

Once in voice, the mode can be changed by selecting the voice bezel key. At the next menu select the mode (Non-ECCM or ECCM) touch point.

4.6.2.2 Frequency

Once in voice, the frequency can be changed by selecting the voice bezel key. At the next menu select the mode (Non-ECCM or ECCM) touch point. Press next menu. You will then come to load new frequency code or load new frequency if Non-ECCM has been selected. If ECCM was selected follow through the menus until mode is enabled.

4.7 SUBNET OPERATIONS

Subnet operations require all of the correct parameters discussed under initialization.

4.8 LOSS OF SUBNET

Loss of subnet can be caused by many different circumstances. Unless the cause of the outage is obvious take no immediate corrective action. Allow the system to reestablish itself. Thirty minutes for groundwave and at least one hour for skywave is recommended.

4.8.1 Reasons for Loss of Subnet

4.8.1.1 Power Failure

The primary indication that a terminal has had power failure is when the I/O has been reset and has lost all setup parameters. Check for faulty connections.

4.8.1.2 Equipment Failure

When the Team Terminal is operational, LRUs are polled for on-line BIT status at different intervals, verifying that all components are operating properly. When this background poll of on-line BIT detects a problem, a fault message is displayed on the I/O screen. The operator should check for fault lamps and fault codes that may be displayed. The operator must then take the appropriate action which should begin with the verification of the reported fault by running a system BIT.

4.8.1.3 Non-Equipment Failure

a. Atmospherics can cause outages. Local noise floor conditions as well as day/night transitions can cause a temporary loss of subnet. The selection of the proper site will enhance the ability to establish and maintain radio communications. When selecting a stationary site or when mobile the following considerations should be taken into account to optimize connectivity:

1. The terminal should be free of overhead obstructions such as power lines, bridges, and contact with tree branches.

2. The terminal should be clear of man-made obstructions such as buildings, metal fences, and commercial areas.

3. If the local ambient noise floor is causing a loss of subnet, the terminal should be moved to a different location. This noise can be heard in the handset; however, the terminal should be moved only if there is a continuous loss of subnet and all other variables are confirmed as correct. The move required could be as little as 50 ft., or it might take locating to another site, depending on whether the loss of subnet is caused by the man-made noise floor or physical terrain.

b. Controller outage can cause loss of subnet. Local SOPs should specify appropriate measures for such an incident (i.e., sign-in to another subnet).

c. Missed mode change can appear as if the net is no longer operational. Local SOPs should specify appropriate measures for such an incident.

4.9 SECURE TERMINAL SHUTDOWN

Press the ZEROIZE bezel key on the I/O. Follow the menu instructions.

- On the ECCM press the ZERO pushbutton.
- On the KG-84A set the enable/zeroize switch to zeroize.
- On the KY-65A set the power switch to off/zeroize.

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CHAPTER 5

MESSAGES

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CHAPTER 5
MESSAGES

5.1 RN MESSAGES

a. RN messages consist of three groups. They are received messages, recalled messages, and created messages.

b. Received messages are messages received over the network and addressed to the terminal. These messages are held in the CPU's temporary storage area until the operator views them. The received messages are accessed by the SHOW MSG key. After viewing a received message, the message may be saved, printed, or deleted.

c. Recalled messages are messages that have been saved. These messages are each assigned a name and held in the CPU's permanent storage area. The message names appear in the MAIN MENU after the "--SAVED MESSAGE--" line. These messages are recalled from the MAIN MENU. Recalled messages may be saved, printed, deleted, edited, or transmitted.

d. Created messages are messages created by the operator using the RN Editor. These messages are held in the CPU's temporary storage during creation. These messages may be saved, printed, deleted, edited, or transmitted.

5.1.1 Types

a. Messages range from Type 1 to Type 4. Type 1 messages are used to alert Forces and to control time sensitive crisis management actions. Type 2 messages are used for acknowledgement of Type 1 messages. Type 3 messages are mission traffic oriented or indigenous communication traffic. Type 4 messages are for routine message traffic dealing with logistics, weather, security, administration, communications, and coordination. Table 5-1 "Types and Precedence of RN Traffic" provides guidelines for necessity/precedence of messages.

b. Team Terminals are limited to transmitting and receiving up to 200 character Type 3.1 and 3.2 messages. Longer receive messages will be truncated.

Table 5-1. Types and Precedence of RN Traffic

Type and Precedance	RN Traffic
1.1	Override (Modify) Previous EAM
1.2	EAM/Minimize
2	Respond to 1.1 (formatted)
2	Respond to 1.2 (formatted)
2	Respond to 1.1 narrative (not used to override low precedence traffic, report violations to the TSO)
2	Respond to 1.2 narrative (same as above)
3.1	High precedence theater mission traffic, NCS directives, CEOI authorized messages (CC message impending loss of connectivity) (highest Team Terminal message priority)
3.2	Reserved for normal theater mission traffic (normal Team Terminal traffic)
3.3	Highest Major Subordinate Command Mission Message (and severe weather warning)
3.4	Major Subordinate Command Normal Mission Message
4.1	Highest precedence for Non Major Command & Control Message
4.2	Highest precedence for normal Non Major Command & Control Message
4.3	Urgent Administrative/Logistic Indigenous
4.4	Normal Administrative/Logistic Indigenous

5.1.2 Main Menu

a. The MAIN MENU (Figure 5-1) is used to access or create messages, deal with Type 2 messages, and display AIG membership assignments. There are six available options:

1. PREV MESSAGE - Displays the current contents of the message edit buffers on the RECALLED MESSAGE screen (Figure 5-2). The message edit buffer contains the most recent edited or created message. The message is displayed with the option to save, print, delete, edit, or transmit the message. (Note the message edit buffers will be empty if the last recalled or created message was transmitted.)

2. NEW MESSAGE - Starts the creation of a new message using the full screen RN Editor. Once editing is complete, there is the option to save, print, delete, edit, or transmit the new message.

3. TYPE 2 DET - Starts the printing of a detailed report of Type 2 responses for a particular Type 1 message.

4. TYPE 2 SUM - Starts the printing of a summary report of Type 2 responses for a particular Type 1 message.

5. SEND TYPE 2 - Starts the transmission of a Type 2 message in response to a Type 1 message.

6. DISPLAY AIG - Displays the current Address Identifier Group (AIG) membership assignments used in addressing messages.

b. The MAIN MENU may present more options if there are messages saved. Saved messages are listed as options after the "-- SAVED MESSAGES --" line. Each saved message is identified by the option number and the message name. The saved messages start as option 7 and go up to 54. Save messages may be recalled by entering the option number. Saved messages that are recalled are displayed with the option to save, print, delete, edit, or transmit.

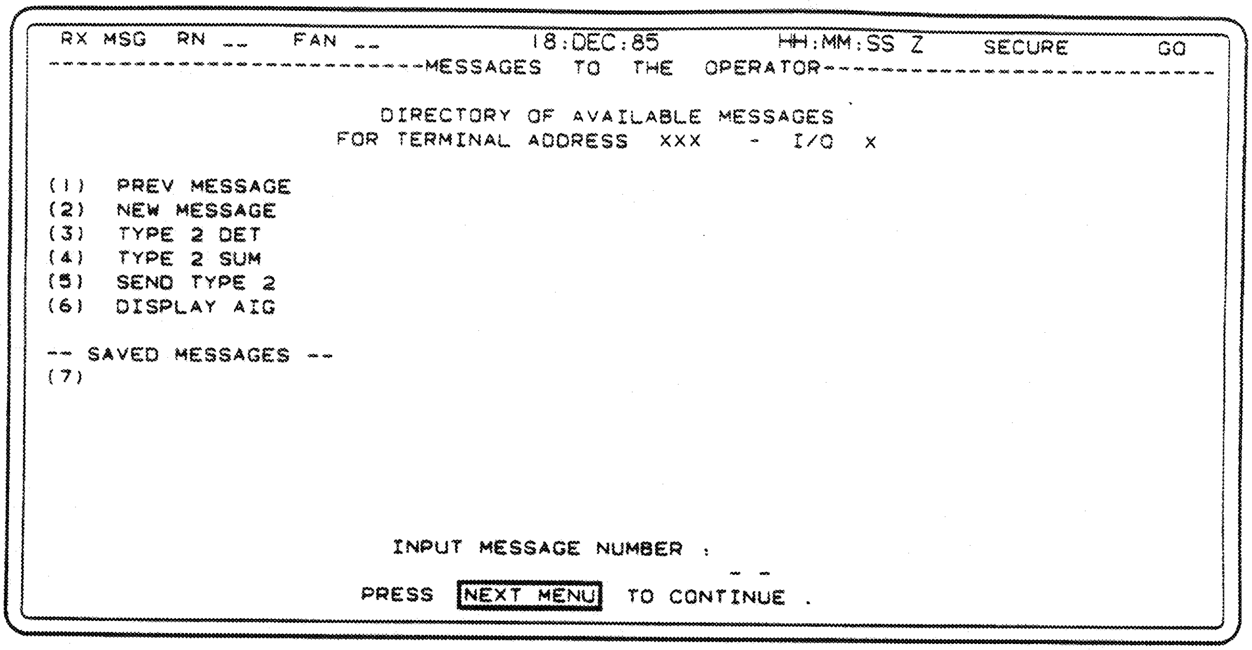

Figure 5-1. MAIN MENU

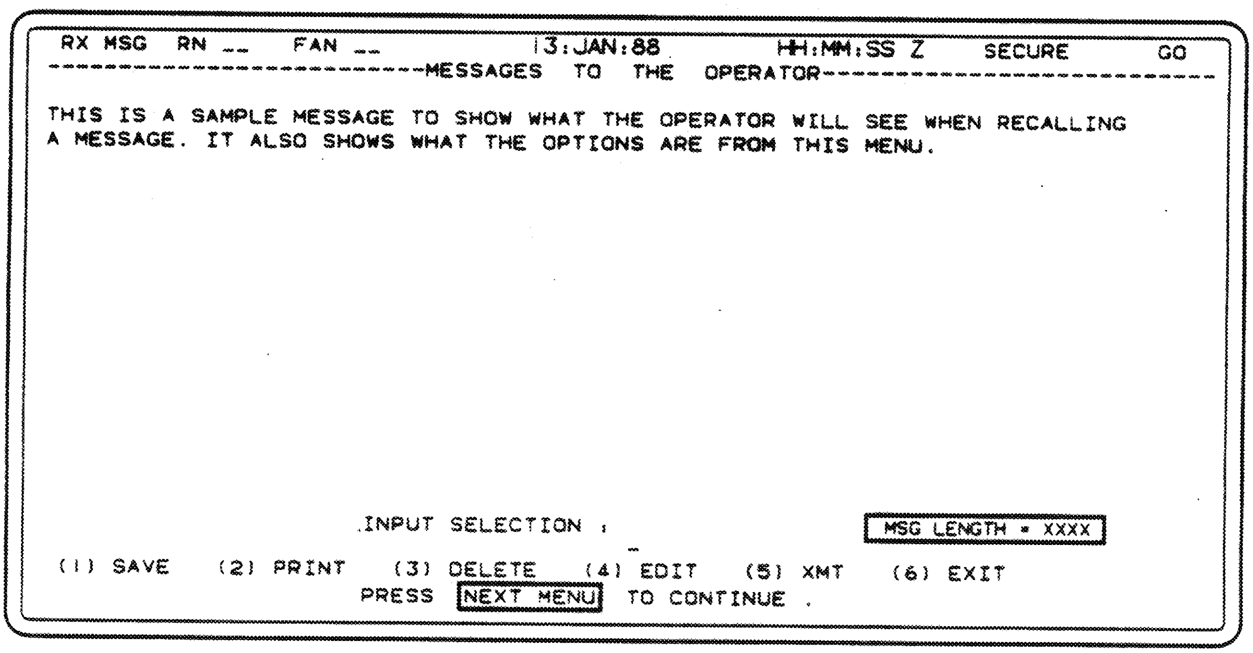

Figure 5-2. RECALLED MESSAGE Menu

5.1.3 Message Creation

Messages are created with the full screen RN Editor.

5.1.3.1 RN Editor

a. The RN Editor keeps a text message in a series of edit buffers. The RN Editor allows text to be inserted or deleted. A message remains in the edit buffers until the message is transmitted or another message is brought into the buffers. Once a message is transmitted, the edit buffers are cleared. The edit buffers will also be cleared when the CLR DATA key is pressed or when the NEW MESSAGE option (option 2 of the MAIN MENU) is selected.

b. There are two modes available on the RN Editor: Overstrike Mode and Insert Mode. Overstrike mode replaces the character at the current cursor position with the character typed. Insert mode inserts the character typed into the current cursor position. The text is shifted to the right. The default mode is Overstrike mode. Use Insert Mode only for editing purposes.

c. The RN Editor can be entered from the MAIN MENU in three ways:

1. Select NEW MESSAGE option to create a new message. The RN Editor appears without text.

2. Select PREV MESSAGE option to access the last edited message. The RN Editor appears with the text of the previous message displayed.

3. Select a saved message for recall from the CPU. The recalled message appears on the RECALLED MESSAGE menu with an option for editing. Select the EDIT option. The first page of the recalled message is displayed on the RN Editor screen (Figure 5-3).

d. The top of the Editor screen is ruled to show the 80 column width of the screen. The cursor appears at the top left corner of the Editor screen. The following bezel edit keys are enabled in the RN Editor:

1. INSERT - This key is a toggle between Overstrike mode and Insert mode. In Insert mode, the keyboard light above the INSERT key is lit.

2. DELETE - Use to delete the character from the current cursor position. All characters to the right of the cursor will move to the left.

3. ROLL UP, ROLL DOWN - Use to move the lines of text up or down the screen (four lines at a time).

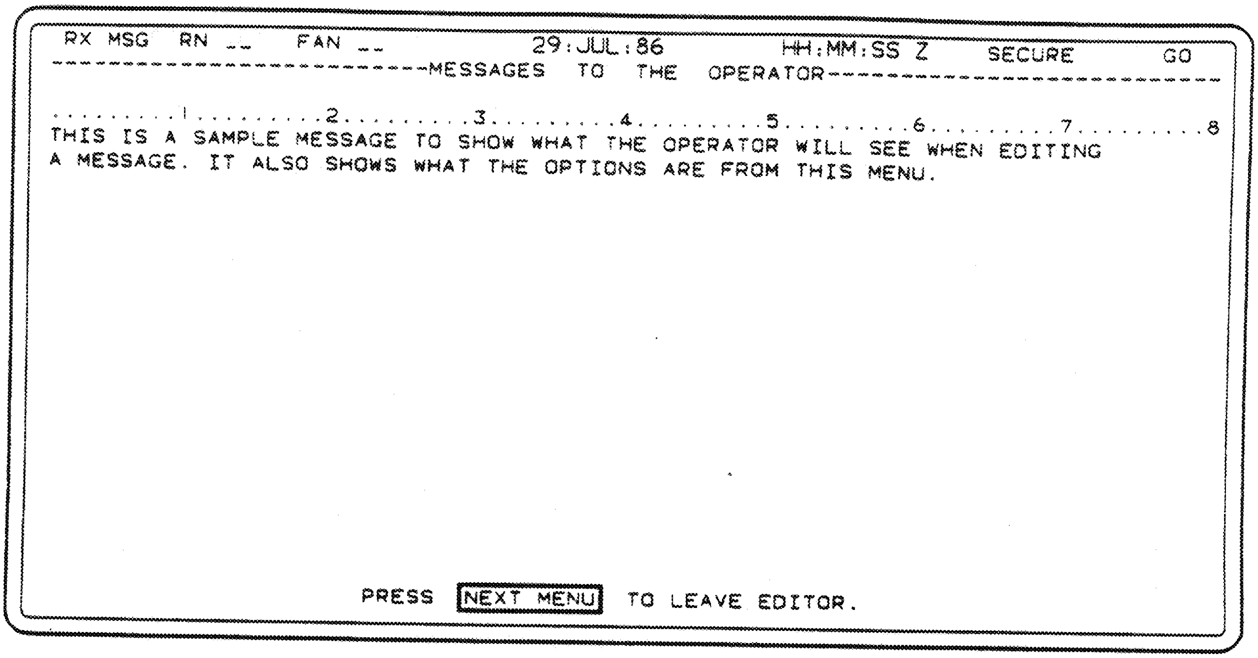

Figure 5-3. RN EDITOR Screen

4. **UP ARROW, DOWN ARROW** - Use to move the cursor up or down the screen one line at a time.

5. **LEFT ARROW, RIGHT ARROW** - Use to move the cursor left or right on the screen one character at a time.

6. **ENTER** - Moves the cursor to the beginning of the next line or creates a new line. In Overstrike mode, pressing ENTER moves the cursor to the beginning of the next line. In Insert mode, pressing ENTER creates a new line. The current line is split at the cursor position and a new line is created below the current line. Text which was to the right of the cursor becomes part of the new line.

e. Only one page of text may be edited at a time. A page of text is 19 lines in length and 80 characters in width. One page of text fills the entire screen. Text messages which are more than one page in length may be scrolled through using the ROLL UP and ROLL DOWN keys. Limits have been imposed because of space constraints. Text messages may only contain a maximum of 4800 characters. Text messages are also restricted to 199 lines. Any attempts to exceed these limits will result in "MAXIMUM MESSAGE LENGTH REACHED" or "MAX LINES REACHED, NO MORE LINES MAY BE ADDED."

f. Once editing of the message is complete, press the NEXT MENU key to proceed to the RECALLED MESSAGE menu. The message will be displayed with the option to save, print, delete, transmit, or edit. If a message is to be retained, save the message before transmitting. Transmitting a message clears the message from the buffer. Refer to TM 11-5895-1218-12, Chapter 2, Section 2-10c, for more details on the operating procedures of the RN Editor.

5.1.3.2 Saving Messages in CPU Permanent Storage

a. Messages can be saved into the CPU permanent storage by using the SAVE MESSAGE menu (Figure 5-4). The SAVE MESSAGE menu appears when the SAVE option is selected on the RECALLED MESSAGE menu or the RECEIVED RN MESSAGE menu (Figure 5-5).

b. The SAVE MESSAGE menu is used to supply a message name and security attributes to the message to be saved. The message name may be up to 12 alphanumeric characters in length. The security attributes consist of the message's Security (UNCLASSIFIED, CONFIDENTIAL, SECRET), Integrity (ORDINARY, IMPORTANT, CRITICAL), and Type/Precedence combination (a value in the range 1 to 11).

c. Once the data is filled in, save the message by pressing the NEXT MENU key. After the message is saved in permanent storage, the CPU returns an acknowledgement to the I/O Unit. The saved message is listed by number and name in the MAIN MENU. User saved messages start with number 7. Up to 48 messages can be saved in CPU permanent storage. The number of messages may be lower depending on available memory.

5.1.4 Routing Guidance

5.1.4.1 Addressing

a. Messages can be addressed in three ways. One is addressing the specific terminal ID and I/O ID to receive the message. The second is to address the message using the Address Identifier Groups (AIG). Each message can address either specific terminals or AIGs or both. Ten destination addresses are allowed for each message. The third way is to address the entire network. This is the use of an ALL CALL address.

b. Messages with individual addresses must specify the terminal ID and associated I/O ID. The destination terminal IDs that can be specified are 1 to 1023. The destination I/O IDs that can be specified are 0 to 5.

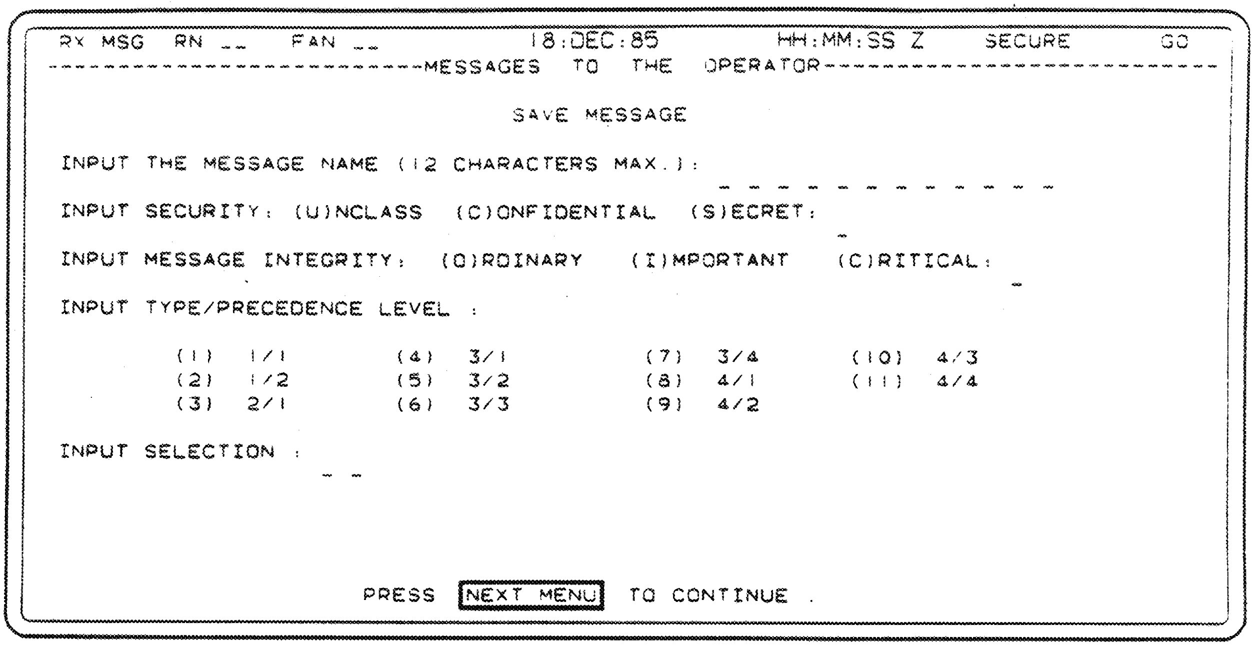

Figure 5-4. SAVE MESSAGE Menu

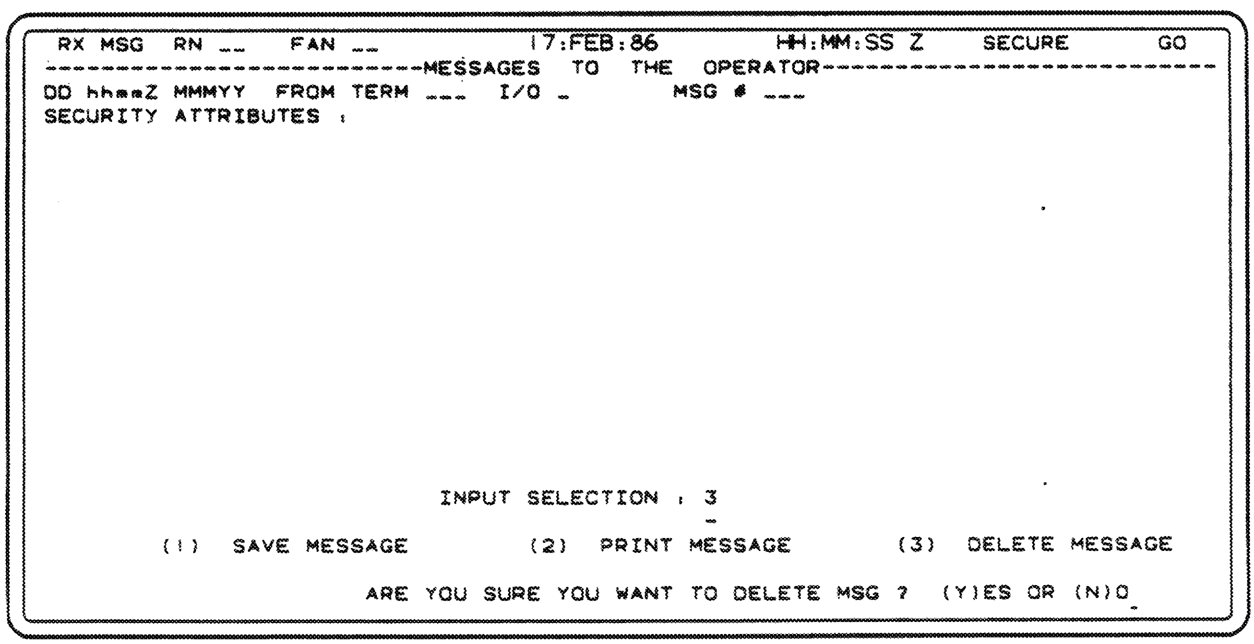

Figure 5-5. RECEIVED RN MESSAGE Menu

c. Address Identifier Groups (AIG) are lists of destination terminal IDs. Each AIG identifies terminals that could be addressed as a group. AIGs simplify addressing many terminals by allowing a group of terminals to be addressed with one three-digit number. The range of the AIGs is 1 to 253.

d. The membership list of an AIG is defined in the AIG MEMBERSHIP DISPLAY menu (Figure 5-6). This menu displays the list of terminal IDs and associated I/O ID numbers in a particular AIG. The AIG MEMBERSHIP DISPLAY menu appears when the DISPLAY AIG option (option 6) on the MAIN MENU is selected. Enter the three-digit number of an AIG. The terminal IDs and associated I/O Units that are members of that AIG are displayed.

e. The AIG Tape must be loaded to use AIGs in addressing messages. Otherwise the AIGs will not be interpreted correctly by the CPU. The AIG Tape must also be loaded before the AIG MEMBERSHIP DISPLAY menu will appear.

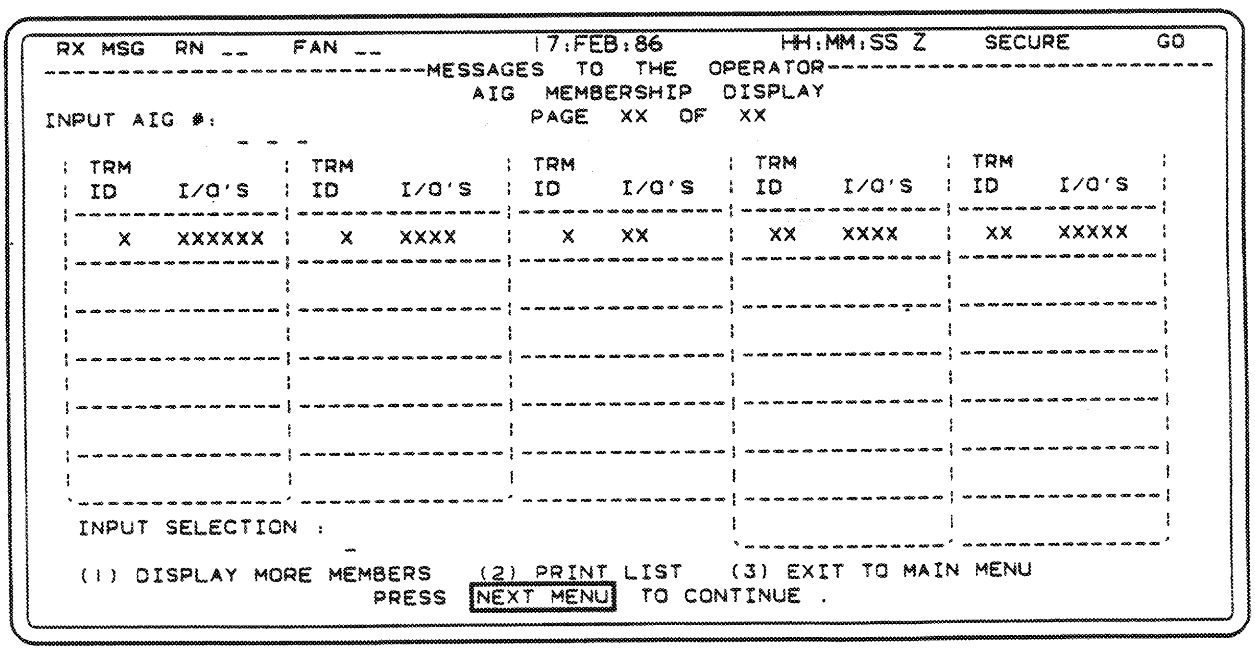

Figure 5-6. AIG MEMBERSHIP DISPLAY Menu

f. An ALL CALL address delivers a message to all terminals and their configured I/O Units that have signed into the net. To use an ALL CALL address, enter the word "ALL" in the 1st AIG field of the MESSAGE DESTINATION menu. An ALL CALL address is usually reserved for Type 1 messages.

5.1.5 Message Handling

5.1.5.1 Transmission

a. The message transmission process begins once the message has been recalled and the XMT option is chosen from the RECALLED MESSAGE menu. The transmit process identifies the security attributes and destination for the message. The message transmission sequence consists of the following screens:

1. TRANSMIT MESSAGE REVIEW Screen (Figure 5-7)

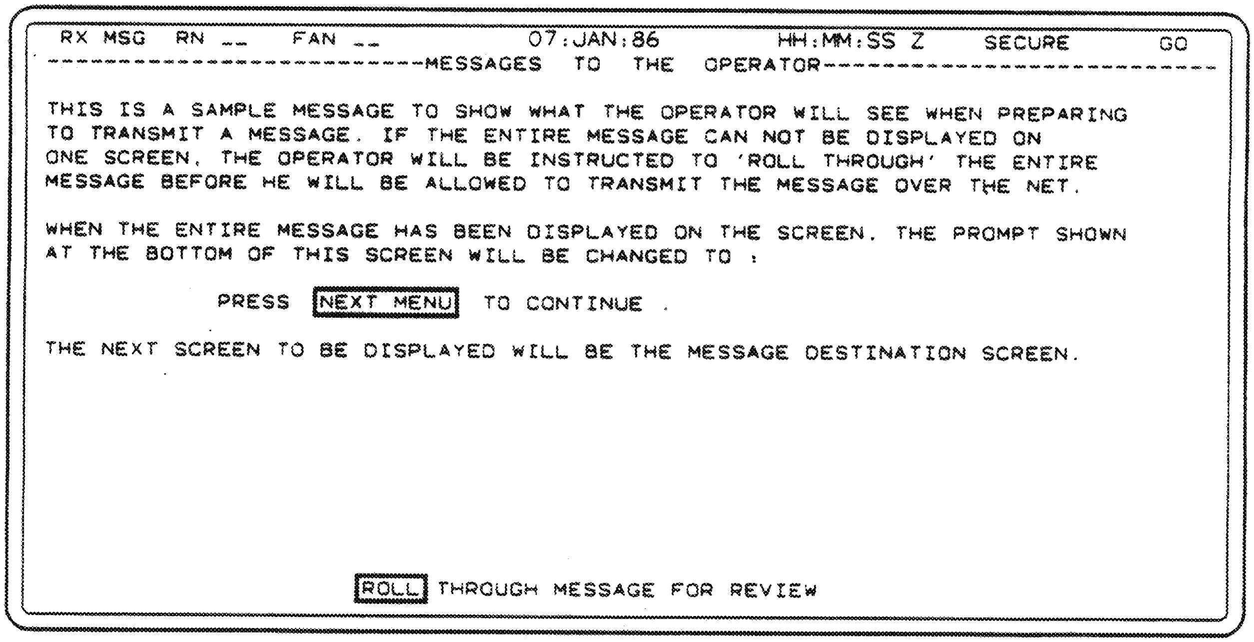

Figure 5-7. TRANSMIT MESSAGE REVIEW Screen

2. MESSAGE DESTINATION Menu (Figure 5-8)

3. TRANSMIT SECURITY PARAMETERS Menu (Figure 5-9)

4. INJECTION MODE Menu (Figure 5-10) (only when sending Type 1 messages).

b. All messages for transmission go through a guard sequence. This means the entire message must be displayed on the screen and reviewed before being released for transmission. The guard sequence is there to ensure the message is at the correct priority level and addressed properly. When passing through the guard sequence, check message security and addresses carefully. The data from the last transmitted message will be displayed. Do not assume the data is correct. This is important especially when relaying messages to Team Terminal members.

c. The TRANSMIT MESSAGE REVIEW screen appears after the XMT option has been selected. The screen displays the message to be transmitted. This screen is used to review the message before the message is transmitted over the network. Use the ROLL UP or ROLL DOWN bezel key to scroll through the message. After the entire message has been reviewed, press the NEXT MENU key. The MESSAGE DESTINATION menu will appear.

```
RX MSG   RN __    FAN __        17:FEB:86        HH:MM:SS Z      SECURE        GO
---------------------------MESSAGES  TO  THE  OPERATOR---------------------------

                              MESSAGE  DESTINATION

        (1)  RN                 (3)  RTTY  1              (5)  RTTY  3
        (2)  FAN                (4)  RTTY  2

                              INPUT SELECTION :
                                               _

  1.  AIG: _ _ _   OR   TERMINAL ID: _ _ _ _    I/O ID: _ _ _ _ _ _ _
  2.  AIG: _ _ _   OR   TERMINAL ID: _ _ _ _    I/O ID: _ _ _ _ _ _ _
  3.  AIG: _ _ _   OR   TERMINAL ID: _ _ _ _    I/O ID: _ _ _ _ _ _ _
  4.  AIG: _ _ _   OR   TERMINAL ID: _ _ _ _    I/O ID: _ _ _ _ _ _ _
  5.  AIG: _ _ _   OR   TERMINAL ID: _ _ _ _    I/O ID: _ _ _ _ _ _ _
  6.  AIG: _ _ _   OR   TERMINAL ID: _ _ _ _    I/O ID: _ _ _ _ _ _ _
  7.  AIG: _ _ _   OR   TERMINAL ID: _ _ _ _    I/O ID: _ _ _ _ _ _ _
  8.  AIG: _ _ _   OR   TERMINAL ID: _ _ _ _    I/O ID: _ _ _ _ _ _ _
  9.  AIG: _ _ _   OR   TERMINAL ID: _ _ _ _    I/O ID: _ _ _ _ _ _ _
 10.  AIG: _ _ _   OR   TERMINAL ID: _ _ _ _    I/O ID: _ _ _ _ _ _ _

              PRESS [NEXT MENU] TO GUARD [ABORT] TO EXIT .
```

Figure 5-8. MESSAGE DESTINATION Menu

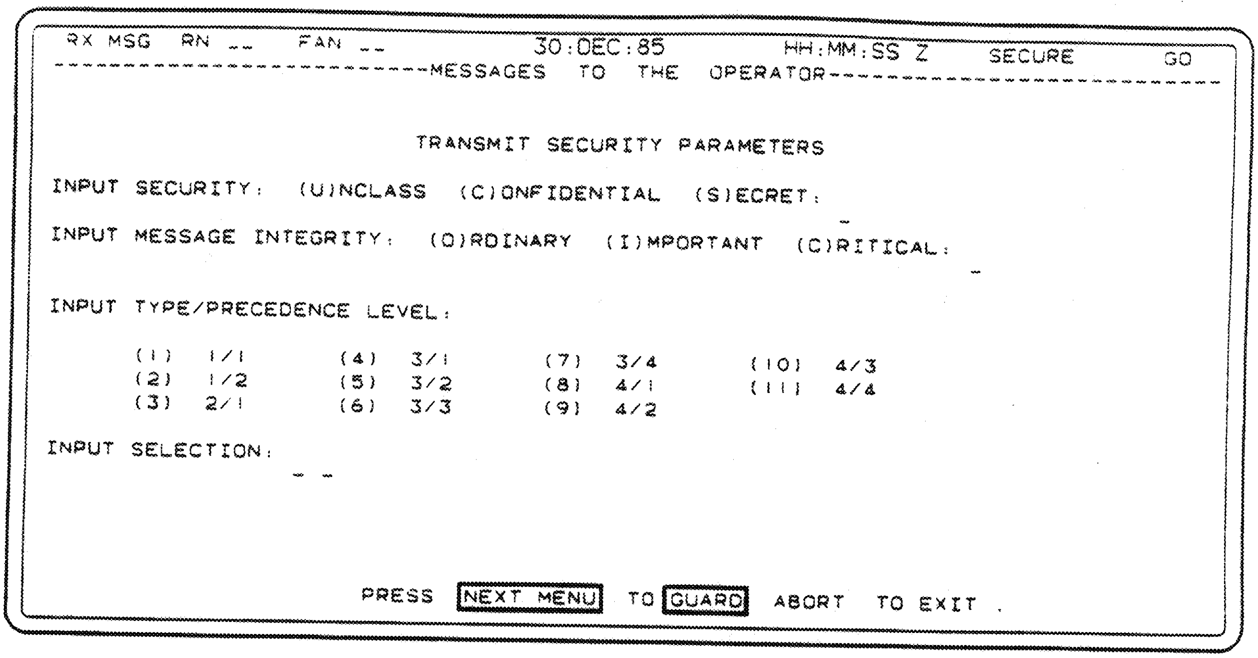

Figure 5-9. TRANSMIT SECURITY PARAMETERS Menu

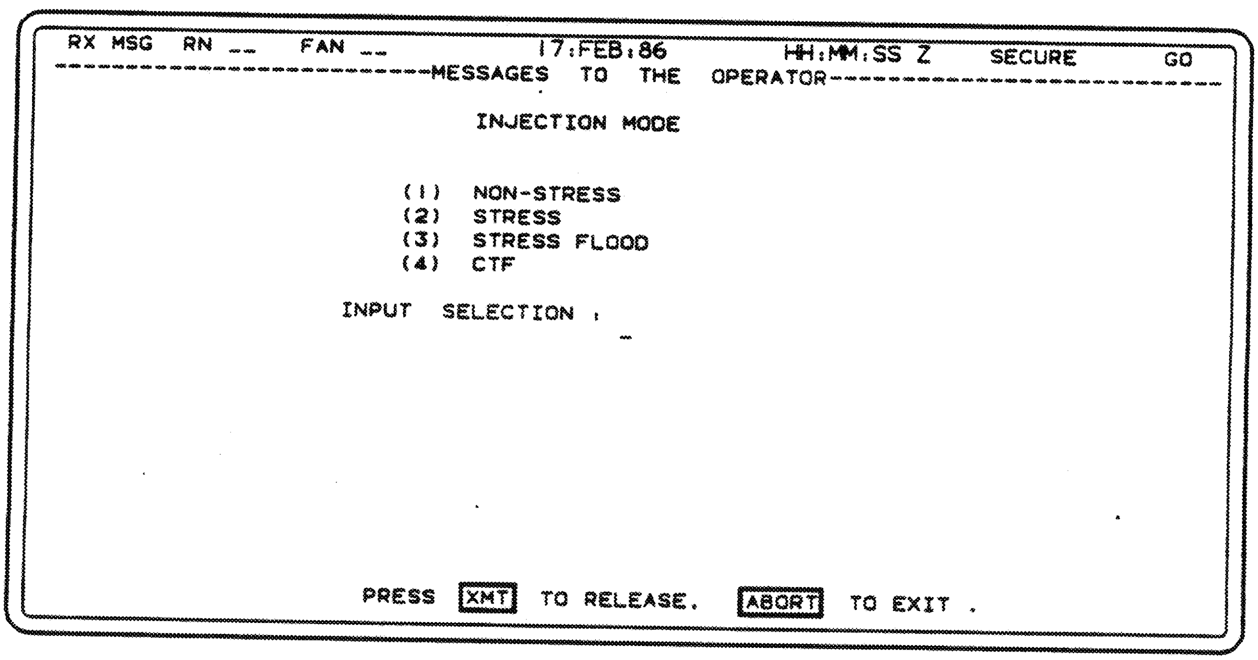

Figure 5-10. INJECTION MODE Menu

d. The MESSAGE DESTINATION menu is used to specify the destination information for the message to be transmitted. Pressing the ABORT key at any time on this menu will stop the transmission process. There are two message destinations available: network (RN or FAN) or a Radio Teletype device (RTTY). If the RTTY destination (options 3-5) is selected, the destination addresses are not entered on this menu. The RTTY destination addresses are entered during stack configuration. If option 2 (FAN) is selected, the FAN DESTINATION HEADER menu will appear. Refer to the I/O Unit Maintenance Manual TM 11-5895-1324-10, paragraph 2.8d, for more details on FAN.

e. If option 1 (RN) is selected, the cursor will be positioned in the Address Identifier Group (AIG) field. Entries for this menu are AIG numbers or terminal IDs and their associated I/O ID number. Refer to section 5.1.4 Routing Guidance for addressing the message.

f. If an AIG is entered on a line, the cursor proceeds to the AIG field on the next line. If the ENTER key is pressed while the cursor is in a blank AIG field, the cursor proceeds to the terminal ID field on the same line. Validation of entries on this menu has been designed to ensure that the terminal ID - I/O ID number combinations are always complete. Also that only one address is entered per line (either an AIG or terminal ID - I/O ID combination). If an AIG is entered on a line where a terminal and I/O combination exists, the terminal and I/O combination is automatically blanked out. The cursor will then proceed to the next AIG field. If a message has been transmitted previously, the data entered will be displayed. This data may be edited and used for the next message to be transmitted.

g. After one valid address has been entered, the following "guard" prompt will be displayed:

PRESS [NEXT MENU] TO GUARD, [ABORT] TO EXIT

h. Press the NEXT MENU key to guard the entries. The entries are cleared and then re-displayed for review. Press the NEXT MENU key again after the entries are verified to be correct. The TRANSMIT SECURITY PARAMETERS menu appears.

i. The TRANSMIT SECURITY PARAMETERS menu is used to define the security parameters for the message to be transmitted. Messages for transmission must specify the messages's Security (UNCLASSIFIED, CONFIDENTIAL, SECRET), Integrity (ORDINARY, IMPORTANT, CRITICAL), and Type/Precedence combination (a value in the range 1 to 11). If the destination is RTTY, the Integrity and Type/Precedence are defaulted. Only the security level may be entered. A classified RTTY message may only be transmitted over a RTTY stack with a KG-84A attached.

j. When all security parameters have been entered, the NEXT MENU prompt is displayed. Press the NEXT MENU key to continue. The entries are cleared and then re-displayed for review. Press the NEXT MENU key again after the entries are verified to be correct. If the message's Type/Precedence level is 1 or 2 (a Type 1 message) and the terminal is set up as an injector, the INJECTION MODE menu appears. If the message's Type/Precedence level ranges from 3 to 11, the following prompt is displayed:

PRESS [XMT] TO RELEASE, [ABORT] TO EXIT

k. Press the XMT key to release the message for transmission. An acknowledgment message is displayed by the CPU.

l. The INJECTION MODE menu is used to specify the injection mode for the message to be transmitted. The injection mode consists of NON-STRESS, STRESS, STRESS FLOOD, and CTF. Once the injection mode value is entered, the NEXT MENU prompt is displayed. Press the NEXT MENU key to continue. The entry is cleared and then re-displayed for review. Press the NEXT MENU key again after the entry is verified to be correct. The XMT prompt appears. Press the XMT key to release the message for transmission.

m. CTF messages are restricted to 200 characters. If the message exceeds 200 characters, an error will result. If an error results, choose a different mode or re-edit the message to 200 characters or less. The transmit sequence must start from the beginning again.

n. There are two important limitations to sending messages to the Team Terminals:

1. Team Terminals receive only 3.1 and 3.2 priority level messages.

2. Only the first two and a half lines of a message are displayed.

o. Refer to TM 11-5895-1218-12, Chapter 2, Section 2-10c, for more details on the message transmission operations.

5.1.5.2 Receipt

a. When a message is received for an I/O Unit, a status message and an audible alarm at the I/O notifies the operator. For Type 1 messages, the alarm sounds continuously (1/2 second on, 1/2 second off) until reset by the operator. Type 1 messages are always routed to the printer and printed whether the printer is enabled or disabled. Incoming messages are stored in the CPU temporary storage. The top line of the screen indicates the number of received messages currently in the CPU temporary storage.

b. The SHOW MSG key retrieves the first received highest priority message in the CPU temporary storage. The message is displayed with its origination time and source terminal ID on the RECEIVED RN MESSAGE menu. Once the message is displayed, there are three options available (SAVE, PRINT, DELETE). If the message is not saved in permanent storage or deleted, the message remains in temporary storage. The message will be retrieved again when the SHOW MSG key is pressed. The received message may remain in the temporary storage for only 24 hours.

c. Received messages should be reviewed promptly. The messages should be saved to permanent storage or deleted to avoid wasting temporary memory. Messages received for logged off I/Os waste temporary memory. There are audits that alert the Radio I/O operator of this condition. Deconfigure I/O Units which are not used.

d. Only one I/O receives RTTY messages. The operator can store the message and then transmit copies to other I/Os or other RN terminals as needed.

5.1.5.3 Acknowledgement/Response

a. Message traffic entered at a RN I/O Unit is acknowledged at the I/O Unit by an audit (MSG aaa ACCEPTED FOR TRANSMIT). In addition, the Radio I/O Unit receives an audit (BEGIN OWN TX, MSG aaa) when an attempt is made to transmit the first message packet. Also an audit (VALID MSG aaa SRC TRM bbbb TRANSMITTED) is received when the full message has been received at the next terminal.

b. On receipt of a Type 1 message, send a formatted Type 2 message from the SEND TYPE 2 menu (Figure 5-11). The SEND TYPE 2 menu appears when the Send Type 2 option (option 5) is selected from the MAIN MENU. This menu is used to start the transmission of a Type 2 message in response to a Type 1 message. The preformatted Type 2 message enables the I/O Unit operator to send 1 of 7 execution status responses. The formatted Type 2 requires the following:

1. Three-digit Type 1 message number to acknowledge

2. Three-digit ID of the terminal that sent the message

3. Execution status with values ranging from 1 to 7 per local SOP.

c. After pressing the NEXT MENU key, the SEND TYPE 2 (REVIEW) screen (Figure 5-12) appears. This screen is used to review message data entered and the default security attributes for the Type 2 message. If the displayed message information is correct, press the NEXT MENU key. Then press the XMT key to release the Type 2 message.

```
RX MSG  RN __   FAN __        31:JAN:86        HH:MM:SS Z     SECURE       GO
--------------------------MESSAGES  TO  THE  OPERATOR---------------------------

                              SEND  TYPE  2

        INPUT TYPE I MESSAGE NUMBER :
                                        - - -

        INPUT TYPE I SOURCE TERMINAL ID :
                                           - - -

        INPUT EXECUTION STATUS :
                                 -




                PRESS [NEXT MENU] TO GUARD. [ABORT] TO EXIT .
```

Figure 5-11. SEND TYPE 2 Menu

```
RX MSG  RN __   FAN __        31:JAN:86        HH:MM:SS Z     SECURE       GO
--------------------------MESSAGES  TO  THE  OPERATOR---------------------------
                              SEND  TYPE  2

        INPUT TYPE I MESSAGE NUMBER :
                                        - - -

        INPUT TYPE I SOURCE TERMINAL ID :
                                           - - -

        INPUT EXECUTION STATUS :
                                 -

        CLASSIFICATION :  SECRET

        INTEGRITY :  IMPORTANT

        TYPE/PRECEDENCE :  2/1

                PRESS [XMT] TO RELEASE . [ABORT] TO EXIT .
```

Figure 5-12. SEND TYPE 2 (REVIEW) Screen

d. These preformatted responses are accounted for in Type 2 ACK reports at the Injection Terminal. The TYPE 2 REPORT menu (Figure 5-13) appears when option 3 (TYPE 2 DET) or option 4 (TYPE 2 SUM) is selected on the MAIN MENU. This menu is used to generate a report of Type 2 responses to a particular Type 1 message. After the menu appears, enter the number of the Type 1 message. After the NEXT MENU key is pressed, a Detailed (option 3) or Summary (option 4) Type 2 report is printed.

5.2 TEAM TERMINAL MESSAGE HANDLING

a. Team Terminal messages consist of three groups. They are received messages, canned messages, and created messages.

b. Received messages are messages received over the network and addressed to the terminal. These messages are held in the Team Terminal's temporary storage area until they are viewed by the operator. These messages can be accessed by the SHOW MSG key. After viewing a received message, the message may be printed (if a printer is available) or deleted.

c. Canned messages are templates for messages to be sent out over the network. There are five canned messages that are permanently stored in the Team Terminal. These canned messages cannot be deleted nor changed permanently. Canned messages may be edited and then transmitted.

d. Created messages are messages created by the operator using the TT Editor. The last message edited is held in the Team Terminal's edit buffer. This message may be edited again or transmitted.

5.2.1 Types

The Team Terminal can only process Type 3 messages (both receive and transmit). Type 3 messages are mission traffic oriented or indigenous communication traffic. Team Terminal messages are limited to Type 3.1 and 3.2.

5.2.2 Main Menu

The MAIN MENU (Figure 5-14) is used to access or create messages. There are three available options:

1. RECALL CANNED MESSAGE DIRECTORY - Displays the list of canned messages available. One of the canned messages may be selected and then edited before transmitting.

```
RX MSG  RN __    FAN __          20:NOV:86         HH:MM:SS Z      SECURE        GO
---------------------------MESSAGES  TO  THE  OPERATOR---------------------------

                                TYPE  2  REPORT

        INPUT TYPE 1 MESSAGE NUMBER  :
                                         _ _ _

                   PRESS [NEXT MENU] TO CONTINUE .
```

Figure 5-13. TYPE 2 REPORT Menu

```
RX MSG WAITING __  TOTAL __    18:FEB:86    HH:MM:SS Z  ID=XXXX  SECURE    GO
--------------------------MESSAGES  TO  THE  OPERATOR-------------   IN    NET

                              MAIN MENU

               SELECT ONE :

             [   ]   RECALL CANNED MESSAGE DIRECTORY

             [   ]   RECALL LAST EDITED MESSAGE

             [   ]   CREATE NEW MESSAGE

                   PRESS [NEXT MENU] TO CONTINUE .
```

Figure 5-14. MAIN MENU

2. RECALLED LAST EDITED MESSAGE - Recalls the last edited message from the edit buffer. This message may then be edited or transmitted or both.

3. CREATE NEW MESSAGE - Starts the creation of a new message using the TT Editor. Once editing is complete, the message may be transmitted.

5.2.3 Message Creation

5.2.3.1 TT Editor

a. Messages are created by using the TT Editor. The TT Editor is entered from the MAIN MENU in three ways:

1. Select RECALL CANNED MESSAGE DIRECTORY option to recall the CANNED MESSAGE DIRECTORY menu (Figure 5-15). Then select one of the canned messages from the CANNED MESSAGE menu. The TT Editor appears with the canned message. The canned message may then be edited before transmitting.

2. Select RECALL LAST EDITED MESSAGE option to recall the last edited message in the edit buffer. The TT Editor appears with the last edited message on the CREATE MESSAGE menu (Figure 5-16). The message may then be edited before transmitting.

3. Select CREATE NEW MESSAGE option to create a new message. The TT Editor appears without text on the CREATE MESSAGE menu. A new message may now be created.

b. The TT Editor is accessed through the touch screen and the bezel edit keys. The message text is displayed above the keypad touchpoint area. The TT Editor allows text to be inserted and deleted. The following bezel edit keys are enabled:

1. INSERT - Use to insert a new character at the current cursor position.

2. DELETE - Use to delete the character from the current cursor position. All characters to the right of the cursor will move to the left.

3. ROLL UP, ROLL DOWN - Use to move the lines of text up or down the screen (four lines at a time).

4. UP ARROW, DOWN ARROW - Use to move the cursor up or down the screen one line at a time.

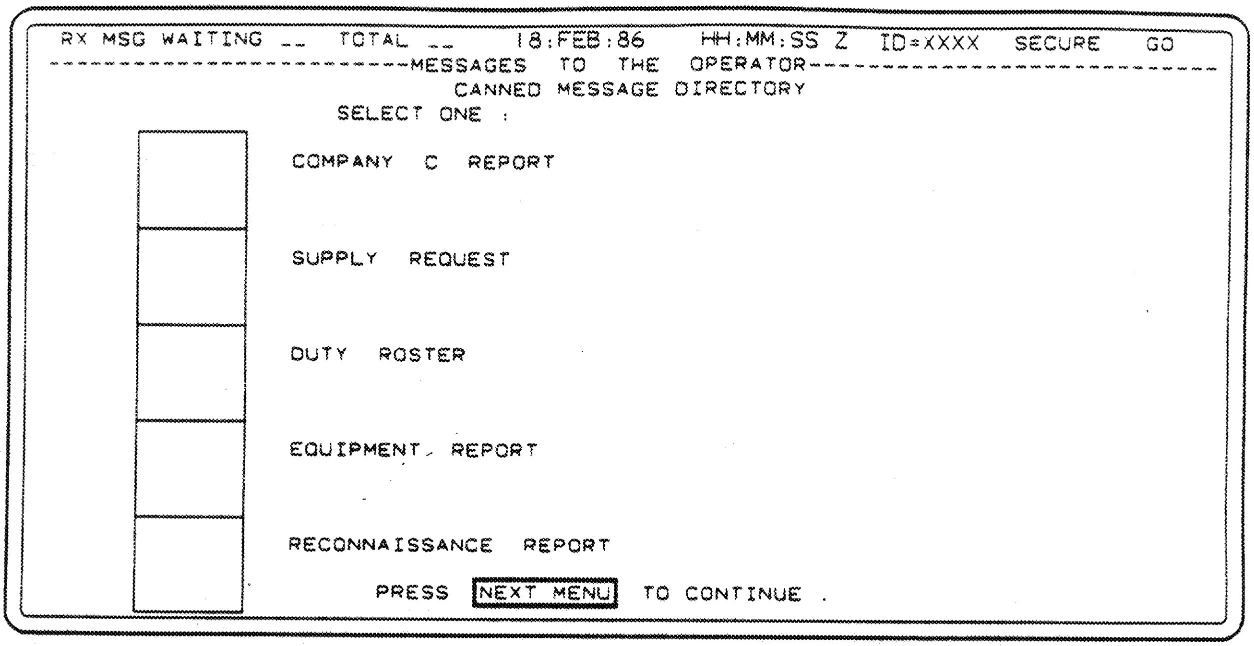

Figure 5-15. CANNED MESSAGE DIRECTORY Menu

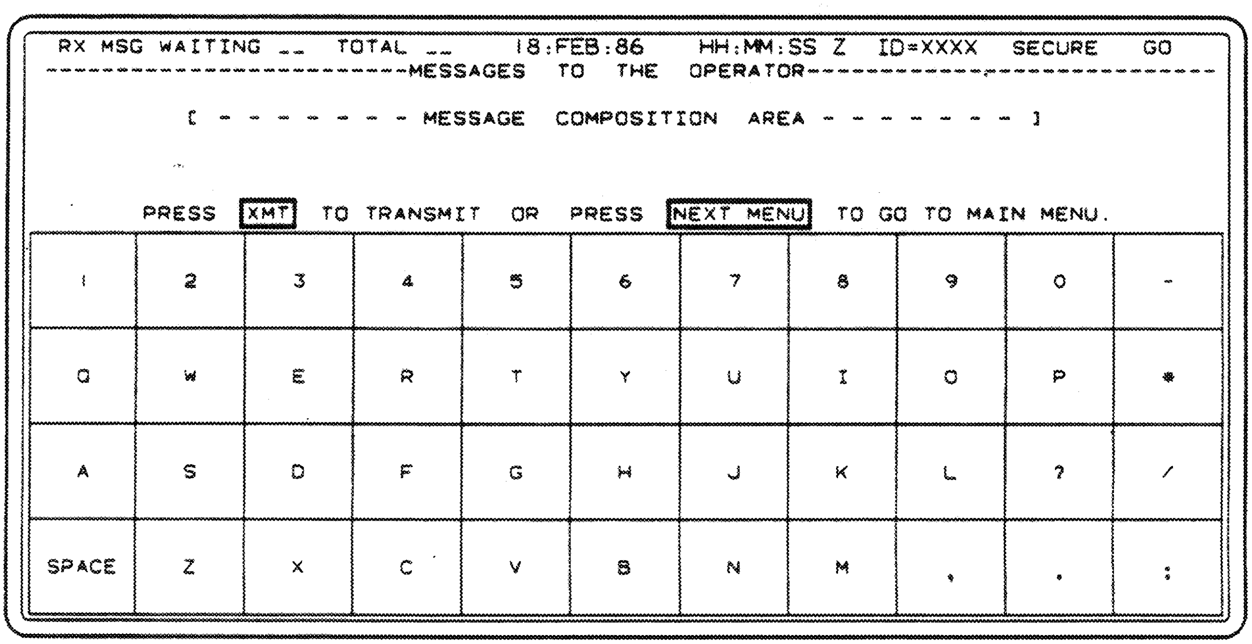

Figure 5-16. CREATE MESSAGE Menu

5. LEFT ARROW, RIGHT ARROW - Use to move the cursor left or right on the screen one character at a time.

6. ENTER - Moves the cursor to the next line or a new line.

c. The maximum length of transmit or receive messages is 200 characters. Refer to TM 11-5895-1220-12, Chapter 2, Section 2-8c, for more details of the operating procedures of the TT Editor.

d. To exit the TT Editor, press either the XMT bezel key or the NEXT MENU key. Use the XMT bezel key to transmit the message. Use the NEXT MENU key to return to the MAIN MENU. The message is stored in the edit buffer. The message can be recalled by selecting the RECALL LAST EDITED MESSAGE option from the MAIN MENU.

5.2.3.2 Saving Messages

The operator cannot save messages permanently on the Team Terminal. This includes received messages, edited canned messages, and operator created messages. The operator can keep the last edited message. The last edited message is stored in the edit buffer. Previously edited messages are not retained. Only the last edited message can be recalled from the edit buffer. TTs can be equipped with an optional printer to provide record copies of messages.

5.2.4 Routing Guidance

Refer to Paragraph 5.1.4, Routing Guidance, for details.

5.2.4.1 Individual Addresses

Each message must specify the destination terminal ID and the I/O ID. Team Terminal originated messages are automatically addressed to the destination terminal ID identified in the MESSAGE DESTINATION screen (Figure 5-17). The MESSAGE DESTINATION screen is completed during terminal setup. To address a message to another terminal ID, change the destination terminal ID on the MESSAGE DESTINATION screen. The destination terminal IDs that can be specified are 1 to 1023. The destination I/O IDs that can be specified are 0 to 5.

5.2.4.2 Address Identifier Groups

There is no AIG capability at the Team Terminal.

5.2.5 Message Handling

5.2.5.1 Transmission

a. The message transmission process begins once the XMT option is chosen from the CREATE MESSAGE menu. The transmit sequence can be canceled before the message is released. To cancel the transmit sequence, press the MAIN MENU bezel key or the ABORT bezel key to return to the MAIN MENU.

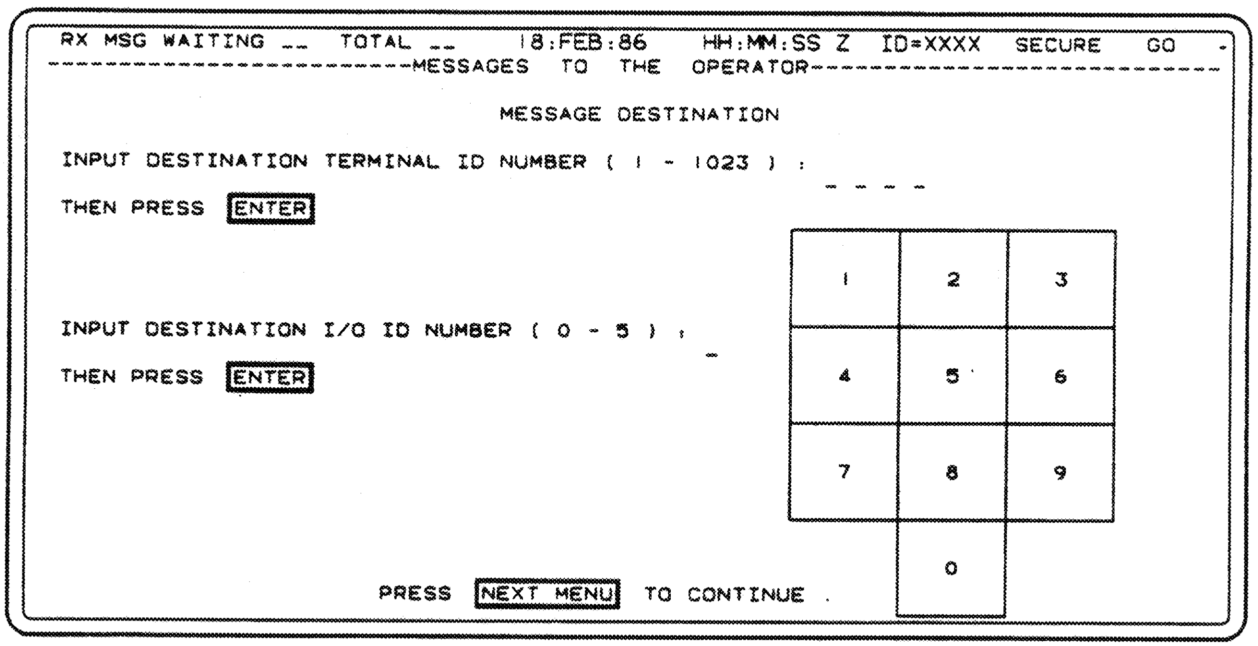

Figure 5-17. MESSAGE DESTINATION Menu

b. All message transmission is guarded. This means the entire message must be displayed on the screen and reviewed before being released for transmission. Once the XMT option is chosen, the message is displayed on the screen for review on the REVIEW MESSAGE screen (Figure 5-18). Use the ROLL UP bezel key to roll through message for review. If the message requires editing, press the PRIOR MENU bezel key to return to the TT Editor.

c. After the message has been reviewed, the transmit sequence enters the MESSAGE PRIORITY menu (Figure 5-19). Messages for transmission must specify the following on the MESSAGE PRIORITY menu:

1. message priority
   - HIGH
   - LOW

2. message classification
   - SECRET
   - CONFIDENTIAL
   - UNCLASSIFIED

d. After the message priority and classification has been entered, press the NEXT MENU key to guard the message. Press the XMT bezel key to release the message. The MSG # aaa QUEUED FOR TRANSMIT message is displayed. Up to 7 messages can be queued for transmission. If an 8th message is added for transmission, the lowest priority message in the queue is purged.

e. Refer to TM 11-5895-1220-12 Chapter 2 Section 2-8 for more details of the message transmission operations.

5.2.5.2 Receipt

a. Upon reception of a message, the audible alarm sounds and the MSG RECEIPT indicator lights. The audible alarm may be reset by pressing the ALARM RESET switch on the I/O Unit. The top line of the screen indicates the number of messages currently in the receive buffer. Up to 20 messages can be held in the receive buffer. Received messages should be reviewed promptly to avoid wasting memory.

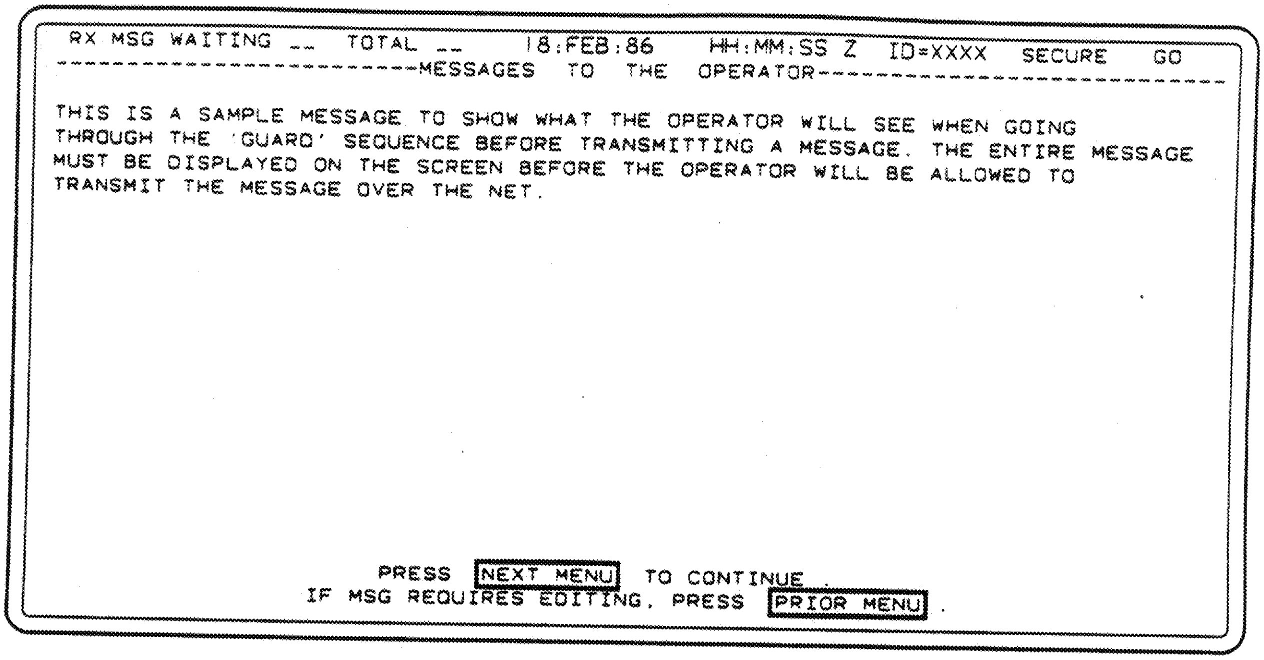

Figure 5-18. REVIEW MESSAGE Screen

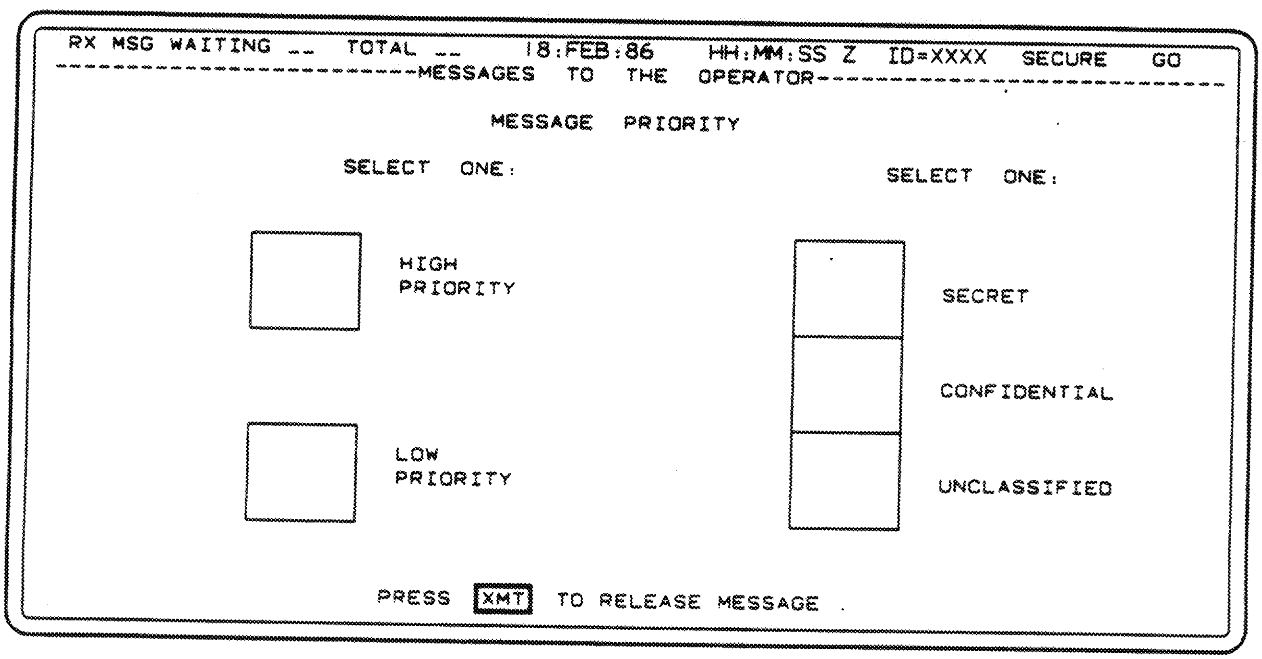

Figure 5-19. MESSAGE PRIORITY Menu

b. Use the SHOW MSG bezel key to show the message. The operator cannot select which received message to view first. The SHOW MSG key retrieves the last received highest priority message in the receive buffer that has not been viewed. The message is displayed on the SHOW MESSAGE menu (Figure 5-20). The user has the option to read the next message, delete the current message, or print the current message.

c. The operator can escape the show message function by pressing the MAIN MENU bezel key or the ABORT bezel key. The received message is not affected. The message remains in storage until deleted or overwritten.

d. Team Terminals cannot receive a message more than 200 characters in length. Team Terminals also cannot receive Type 1, Type 2, Type 3.3, Type 3.4, or Type 4 traffic.

5.2.5.3 Acknowledgement/Response

Except for the messages originated by the Force Terminal acting as the subnet controller for the Team Terminal, there is no automatic acknowledgement for the messages transmitted or received. Acknowledgement for these messages is the responsibility of the operator in accordance with command guidance.

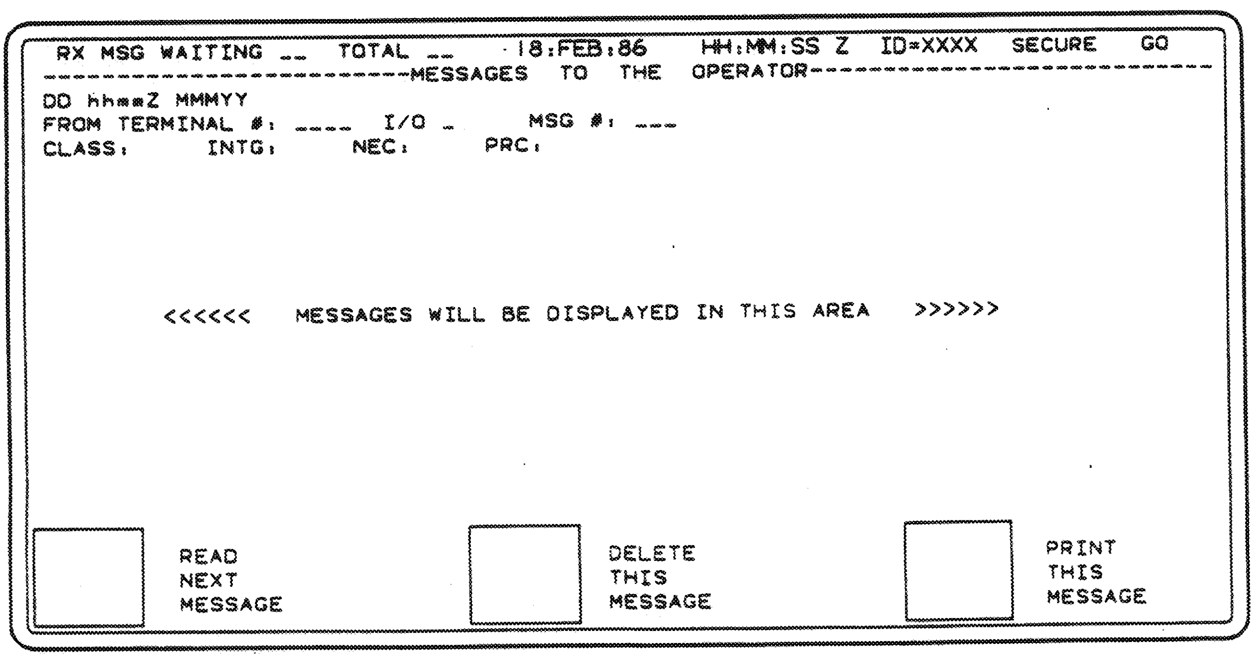

Figure 5-20. SHOW MESSAGE Menu

5.2.6 Status Messages

5.2.6.1 Message Creation and Handling Status Messages

The following are message creation and handling status messages that may appear on the Team Terminal screen:

1. THIS TRANSMIT MESSAGE WAS NOT QUEUED - An attempt was made to add a message to a full transmission queue. The priority of the message was lower or the same as the messages already in the queue.

2. MSG aaa OVERWRITTEN - A new message was added to the transmission queue when the queue was full. The new message had a higher priority than one of the other messages in the queue. The system deleted a lower priority message in the queue to make room for the higher priority message. There is no way to recover the lost message.

3. ABORT - INVAL KEY - Either a key that displayed another screen or the ABORT key was pressed while reviewing a message before transmission. Begin the transmission sequence again to transmit the message.

4. ABORT - INVAL MSG - The steps to transmit a message were not performed in the exact sequence specified on the screen. This has aborted the transmission sequence. Begin the transmission sequence again and follow the instructions closely.

5. ABORT - PRIOR MENU - The PRIOR MENU bezel key was pressed while reviewing a message before transmission. This indicated that the operator wished to change the message before transmission. This stops the transmission sequence. Begin the transmission sequence again to transmit the sequence.

6. ABORT - SEC PARAMS - Either the system did not accept the message security parameters or a component failure occurred. Press the ABORT bezel key to abort the transmission sequence. Begin the transmission sequence again. If the status message appears again, run BIT. This signs the terminal out of the subnet. Report the problem to unit maintenance.

7. Non-Secure MODE - SECRET MSG NOT QUEUE - The KG-84A is not connected or is inoperative. This causes secret message not to be queued for transmit. Inspect for proper installation of KG-84A and tighten all connections. If normal operations are not restored then report the problem to unit maintenance.

5.2.6.2 Show Message Status Messages

The following are show message status messages that may appear on the Team Terminal screen:

1. RECEIVE MESSAGE QUEUE NEARLY FULL - The total number of received messages (read and unread) in the receive message queue has reached about 75 percent of the queue's capacity. Press the SHOW MSG key to view the messages in the queue. Delete those messages that do not need to remain in the queue. If the operator does not delete messages in the queue, then the system will delete overflow messages. The system will delete the lowest precedence messages first. The system will then delete the oldest received messages.

2. ROLLED TO END - The ROLL UP bezel key has been pressed until the end of the message is displayed. This occurs on the REVIEW MESSAGE screen or the SHOW MESSAGE screen. Operation is not disrupted. Simply follow the instructions on the screen.

3. ROLLED TO TOP - The ROLL DOWN bezel key has been pressed until the top of the message is displayed. This occurs on the REVIEW MESSAGE screen or the SHOW MESSAGE menu. Operation is not disrupted. Simply press the ROLL UP bezel key to review the message or follow the instructions on the screen.

CHAPTER 6

TROUBLESHOOTING GUIDE

CHAPTER 6 TABLE OF CONTENTS

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CHAPTER 6
TROUBLESHOOTING GUIDE

6.1 INTRODUCTION

a. Built-In Test (BIT) provides a method of checking the operating condition of the individual components of the terminal. It is run automatically when the terminal is initialized and may also be requested in the course of operations. BIT is an important tool for troubleshooting operational problems in the terminal. Upon completion of the selected BIT, the display will show any faults detected by that test.

b. While following the troubleshooting tables, it may be necessary to cycle power on an LRU. Since most of the power switches are also circuit breakers, the best practice is to turn the switch off, wait approximately 10 seconds, and then turn the switch back on. Following this procedure will minimize the occurrences of a circuit breaker not fully resetting when quickly turned off and then on.

c. The troubleshooting tables often refer to running BIT at the LRU or from the LRU. Both of these references are indicating that BIT should be performed at the front panel of the LRU.

d. Before replacing any LRU, check pins, connections, power switches, circuit breakers, and any other obvious sources of problems.

NOTE:

Refer to the appropriate TM before replacing any LRU. Some equipment items contain multiple subassemblies and require additional troubleshooting to identify the appropriate LRU to be replaced.

e. The tables in this chapter provide an approach to isolating faults. The steps in the tables consist of inspection and action items. When the answer to an inspection question does not indicate proper operation of the component in question, follow that action item. If the procedures in the action item clear the fault, continue normal operations. If the procedures in the action item do not clear the fault, proceed with further inspections.

6.2 FORCE TERMINAL

6.2.1 Initialization/Operation Problems

For problems encountered during power-on, initialization, or for problems encountered during operation, refer to the following Tables:

TABLE	DESCRIPTION
6-1	Unable to Power-up Shelter
6-2	Shelter Light Faults
6-3	ECU Faults
6-4	Keep-Alive Battery System Problems
6-5	Unable to Power On I/O Rack
6-6	Unable to Load Program Tapes
6-7	Unable to Load COMSEC/TRANSEC Cryptovariables
6-8	Unable to Load Time-of-Day
6-9	CPU Fault Indications
6-10	Signal Entry Fault Indications
6-11	CIU Fault Indications
6-12	RFO Fault Indications
6-13	MTU Fault Indications
6-14	I/O Rack Fault Indications
6-15	AC/DC Power Supply Fault Indications
6-16	PPC Fault Indications
6-17	ICS Fault Indications
6-18	ATU Fault Indications
6-19	MODEM Fault Indications
6-20	Radio Fault Indications
6-21	Pre/Post Selector (PPS) Fault Indications
6-22	Power Amplifier (PA) Fault Indications
6-23	PA Power Supply (PA PS) Fault Indications

6.2.2 Voice Communication Problems

For problems encountered while trying to establish and maintain voice communication, refer to the following Tables:

TABLE	DESCRIPTION
6-24	Unable to Establish Voice Communications
6-25	Unable to Maintain Voice Communications

6.2.3 Data Communication Problems

6.2.3.1 Establishing Link

For problems encountered while trying to establish a RN data communications subnet, refer to the following Tables:

TABLE	DESCRIPTION
6-26	Unable to Establish Data Link (Constitution)
6-27	Unable to Establish Data Link (Sign-In/Monitor)

6.2.3.2 Maintaining Link

For problems encountered while trying to maintain a RN data communications subnet, refer to the following Tables:

TABLE	DESCRIPTION
6-28	Unable to Maintain Data Link (Controller)
6-29	Unable to Maintain Data Link (Member/Monitor)

6.2.4 I/O Unit Problems

6.2.4.1 Local I/O Unit

For problems encountered while trying to link a local I/O Unit, refer to the following Tables:

TABLE	DESCRIPTION
6-30	Unable to Link Local Radio I/O
6-31	Unable to Link Local Mission I/O

6.2.4.2 Remote I/O Unit

For problems encountered while trying to link a remoted I/O Unit by fieldwire or by VHF Radio, refer to the following Tables:

TABLE	DESCRIPTION
6-32	Unable to Link Fieldwire-Remoted I/O
6-33	Unable to Link VHF-Remoted I/O

6.2.5 Power Interruption

For problems related to power interruptions, refer to the following Tables:

TABLE	DESCRIPTION
6-34	Shelter Power Is Off
6-35	Shelter Power Was Briefly Interrupted

6.2.6 Other

The following Tables deal with other FT related problems that may occur:

TABLE	DESCRIPTION
6-36	Unable to Communicate in RTTY Mode
6-37	NCS/ANCS/IT Functional Problems
6-38	NCS/ANCS/IT Data Link Problems

6.3 SPLIT-SITE

6.3.1 Initialization/Operation Problems

For problems encountered during power-on, initialization, or for problems encountered during operation, refer to the following Tables:

TABLE	DESCRIPTION
6-6	Unable to Load Program Tapes
6-7	Unable to Load COMSEC/TRANSEC Cryptovariables
6-8	Unable to Load Time-Of-Day
6-9	CPU Fault Indications
6-10	Signal Entry Fault Indications
6-11	CIU Fault Indications
6-12	RFO Fault Indications
6-13	MTU Fault Indications
6-15	AC/DC Power Supply Fault Indications
6-19	MODEM Fault Indications
6-20	Radio Fault Indications
6-21	Pre/Post Selector (PPS) Fault Indications

6.3.2 TXS-RXS Interface Problems

For problems encountered while interfacing the TXS and RXS, refer to the following Tables:

TABLE	DESCRIPTION
6-39	TXS-RXS Interface Problems

6.3.3 Voice Communication Problems

For problems encountered while trying to establish and maintain voice communication, refer to the following Tables:

TABLE	DESCRIPTION
6-24	Unable to Establish Voice Communications
6-25	Unable to Maintain Voice Communications

6.3.4 Data Communication Problems

6.3.4.1 Establishing Link

For problems encountered while trying to establish a RN data communications subnet, refer to the following Tables:

TABLE	DESCRIPTION
6-26	Unable to Establish Data Link (Constitution)
6-27	Unable to Establish Data Link (Sign-In/Monitor)

6.3.4.2 Maintaining Link

For problems encountered while trying to maintain a RN data communications subnet, refer to the following Tables:

TABLE	DESCRIPTION
6-28	Unable to Maintain Data Link (Controller)
6-29	Unable to Maintain Data Link (Member/Monitor)

6.3.5 Power Interruption

For problems related to power interruptions, refer to the following Tables:

TABLE	DESCRIPTION
6-34	Shelter Power Is Off [TXS]
6-35	Shelter Power Was Briefly Interrupted [TXS]
6-40	RXS Power Is Off
6-41	RXS Power Was Briefly Interrupted

6.3.6 Other

The following Tables deal with other SS related problems that may occur:

TABLE	DESCRIPTION
6-36	Unable to Communicate in RTTY Mode
6-37	NCS/ANCS/IT Functional Problems
6-38	NCS/ANCS/IT Data Link Problems

6.4 TEAM TERMINAL

a. As an introduction to Team Terminal troubleshooting there are several interdependent actions and events which should be understood.

b. When the Team Terminal tunes the ATU, the operator will hear the ATU go to its home position. Homing means that the coil and capacitor assemblies inside the ATU will move to a known static reference position. The system will then transmit a continuous tone to tune the ATU. The RF from the R/T is amplified by the PA and is then applied to the ATU. Once the RF is applied to the ATU, the capacitor and coil assemblies inside the ATU move to 50 Ohm matching positions and stop. At this time the ATU is tuned and the system will stop transmitting. This sequence of events occurs each time the system changes frequency or hopset. The entire tune cycle should take approximately 10 seconds.

c. When BIT is initiated at the I/O, the R/T, or upon R/T power up, the tuning cycle will be performed three times. The first two tunes are part of BIT and the third is to the last known operational frequency (2 MHz upon power up).

d. If a fault does occur, close attention to the tuning cycle and displayed status lines can assist in troubleshooting the Team Terminal RF subsystem.

6.4.1 Initialization/Operation Problems

For problems encountered during power-on, initialization, or for problems encountered during operation, refer to the following Tables:

TABLE	DESCRIPTION
6-42	Team Terminal Does Not Power On
6-43	Unable to Load Time-Of-Day
6-44	Unable to Load COMSEC/TRANSEC Cryptovariables
6-45	TT I/O Fault Indications
6-46	Receiver/Transmitter Fault Indications
6-47	ATU Fault Indications
6-48	PA Fault Indications
6-49	RN Modem Fault Indications
6-50	RFO Fault Indications
6-51	Power Supply Fault Indications

6.4.2 Voice Communication Problems

For problems encountered while trying to establish and maintain voice communications, refer to the following Tables:

TABLE	DESCRIPTION
6-52	Unable to Establish Voice Communications
6-53	Unable to Maintain Voice Communications

6.4.3 Data Communication Problems

6.4.3.1 Establishing Link

For problems encountered while trying to establish a RN data communications subnet, refer to the following Tables:

TABLE	DESCRIPTION
6-54	Unable to Establish Data Link

6.4.3.2 Maintaining Link

For problems encountered while trying to maintain a RN data communications subnet, refer to the following Tables:

TABLE	DESCRIPTION
6-55	Unable to Maintain Data Link

6.4.4 Power Interruption

For problems related to power interruptions, refer to the following Tables:

TABLE	DESCRIPTION
6-56	TT Power Source Is Off
6-57	Power Was Briefly Interrupted

6.5 MANPACK

6.5.1 Initialization Problems

For problems encountered during power-on and initialization, refer to the following Tables:

TABLE	DESCRIPTION
6-7	Unable to Load COMSEC/TRANSEC Cryptovariables
6-58	Manpack Does Not Power On
6-59	Radio Fault Indications

6.5.2 Voice Communication Problems

For problems encountered while trying to establish and maintain voice communications, refer to the following Tables:

TABLE	DESCRIPTION
6-60	Unable to Establish Voice Communications
6-61	Unable to Maintain Voice Communications

Table 6-1. Unable to Power-Up Shelter

PROBLEM

On initial power-up of the shelter, there is no input power indications or improper indications at the shelter.

INSPECTION	ACTION
1. (Stationary) Does the Phase Sequence Meter on the PCU remain blank when CB1 on the PPC is turned on?	If so, ensure that the power cable to the shelter is properly connected and that the commercial power source is on or that the generator contactor is closed. If the source is good, refer to TM 11-5895-1218-34, paragraphs 2-47 and 2-48 for troubleshooting procedures for the PCU and PPC, respectively.
2. (Stationary) Does CB1 remain energized?	If not, ensure that the LINE-LOAD-MOB switch on the PCU is set to a LINE position and that the PPC is set accordingly to the input voltage reading on the PCU (refer to paragraph 2.4.2 for proper connections and settings).
3. (Stationary) Does the phase meter indicate an out of phase condition?	If so, shut off the power source and ensure that the proper connection are made between the Shelter and the power source. If the source is good, refer to TM 11-5895-1218-34, paragraphs 2-47 and 2-48 for troubleshooting procedures for the PCU and PPC, respectively.
4. (Stationary) Does the Phase Sequence Meter indicate an open phase?	If so, shut off the power source and ensure that the proper connections are made between the shelter and the power source. If the source is good, refer to TM 11-5895-1218-34, paragraphs 2-47 and 2-48 for troubleshooting procedures for the PCU and PPC, respectively.
5. (Mobile) Does the PCU voltmeter indicate the proper voltages?	If not, ensure that the vehicle is running and idling at the proper speed. Ensure that CB1 on the DC entry panel is on and that the DC/AC Inverter CB1 and CB2 are on.

Table 6-2. Shelter Light Faults

PROBLEM

Some or all of the shelter lights that should be on are not on.

INSPECTION	ACTION
1. Even though other shelter equipment is on, do any of the shelter lights come on?	If none of the lights are on, check the PCU circuit breaker for MAIN LIGHTS (top row). Also, check the wall switch on the raceway over the worktable next to the Radio I/O Rack. Check connection of cable W1126 at bottom right corner of KABS unit.
2. Are white lights on when the shelter door is open?	Make sure the blackout override switch on the wall between the PCU and the shelter door is in the desired position.
3. Are all four blue lights on when the shelter door is closed and the blackout override switch is in the blackout position?	If not, check the door switches that are directly over the shelter door. If the switches do not switch completely when the shelter door is closed, it will be necessary to adjust the metal actuation bracket on the shelter door.
4. Do the lights next to the shelter door turn on when the shelter door is closed? (Stationary operations only)	If not, check the door switch that is on the side of the doorway. If the switch does not switch completely when the shelter door is closed, it will be necessary to adjust the metal actuation bracket on the shelter door.
5. Do emergency lights come on when external power is shut off?	If not, check the wall switch on the raceway over the worktable next to the Radio I/O Rack. Also verify that the switches on the battery charger (ELBS) next to the Power Control Unit are set as follows: The Test/Off/Arm Charge switch should be set to Arm Charge. The Battery Disconnect switch should be set to On Line.
6. During normal operations (external power present), does only one lamp (of a pair) come on?	Replace the failed lamp in accordance with TM 11-5895-1218-34, paragraph 2-91.

Table 6-3. ECU Faults

PROBLEM

An Environmental Control Unit (ECU) is not working properly.

NOTES: 1) Ensure that the external transit flaps are properly rolled up and secured when operating the ECU.

2) Ensure that the ECU drain plug is properly removed when operating the ECU.

INSPECTION	ACTION
1. Are neither of the ECU circuit breakers on the Power Control Unit switching on?	Observe the reading on the PCU Phase Sequence meter. If the meter does not indicate ABC, re-check the ac power cable connection to the AC power source. Use the diagram on the Prime Power Conditioner as a reference. If the AC input power is correctly wired and the meter does not show ABC, consult TM 11-5895-1218-34, paragraph 2-47 for troubleshooting the PCU.
2. Is the ECU circuit breaker on the PCU turned on, but the ECU will not power up?	Check the circuit breaker and selector switch setting on the ECU's Remote Control Unit (RCU). If these are correct, check the toggle switch next to the input power connector on the ECU (behind the access panel). If the toggle switch goes off shortly after the ECU is turned on, consult the ECU operator's manual.
3. Is the ECU RCU set to COOL, but no cool air is coming out of the ECU?	Check the rotary knob on the ECU RCU. Try turning it clockwise (WARMER) all the way and then turn it counter-clockwise (COOLER). Within one minute, the compressor should turn on. If this does not work, put the RCU on VENT for ten minutes and then put the RCU back on COOL. If this does not work, consult the ECU operator's manual TM 5-4120-384-14 for the location of the reset switches.

Table 6-3. ECU Faults (continued)

INSPECTION	ACTION
4. Is shelter power interrupted shortly after the ECU is turned on or the compressor came on?	Measure the input AC voltage and compare it to the Prime Power Conditioner voltage switch setting. If the input voltage is too high or too low compared to the switch setting, the PPC voltage switch position will have to be changed accordingly. Refer to paragraph 2.4.2.1 for the proper procedures. **CAUTION:** Do not change the voltage selector switch while PPC CB1 is on!

Table 6-4. Keep-Alive Battery System Problems

PROBLEM

During initialization or operation, the low battery charge indicator lights on the KABS.

INSPECTION	ACTION
1. Is the LOW indicator on?	A low battery charge condition would occur if the shelter had lost main power and the KABS was used to maintain CPU memory and RFO time of day. The batteries will recharge during normal operations.
2. Does the BATT ON indicator come on when the BATTERY DISCONNECT switch is energized?	If not, check cable W1129 connection at the battery box under the worktable. Ensure that the AC/DC Power Supply is operational and the RFO power indicator is on. If the BATT on indicator is on and no other indicators light during lamp test, and the RFO has no power, the KABS is not receiving 28 VDC. Check output of 28 VDC from AC/DC PS.

Table 6-5. Unable To Power On I/O Rack

PROBLEM

The operator is unable to power on the I/O Rack or turn on CB1 on the top of the rack.

INSPECTION	ACTION
1. Is input power present?	Depending on the installation, input power will come either from the Force Terminal shelter cabling (W1102 or W1104), the remote I/O power cables, or local commercial power. For local (inside the FT shelter) I/O Racks, check the PCU circuit breaker for Rack #1 (Mission, stationary only) or Rack #3 (Radio). For I/O Racks remoted via the supplied 750' power cables (up to 1500'), check the Remote I/O circuit breaker on the PCU. For I/O Racks powered from a commercial source, check the commercial source.
2. Is the input power cable wired correctly?	For I/O Racks located within the FT shelter or powered via the supplied power cables, 230 VAC is provided. For I/O Racks powered by local commercial sources, the power cable must be checked for the correct voltage. On the power cable, the following pin assignment is used: PIN SIGNAL A 115 VAC (not used with pin C) B AC Return C 230 VAC (not used with pin A) D Safety Ground
3. Is input voltage within proper limits?	If input voltage is not within 10% of the expected (115 or 230) volts, the over/undervoltage relay in the top of the I/O Rack will prevent the circuit breaker (CB1) from energizing. If input voltage is correct, refer to TM 11-5895-1218-34, paragraph 2-45b for troubleshooting the I/O Rack.

Table 6-6. Unable To Load Program Tapes

PROBLEM

During initialization or reloading of cassette tapes, the tapes are not being read properly.

INSPECTION	ACTION
1. Are the power indicators on at the CPU, AC/DC PS, CIU, MTU, RFO, and the KABS?	If not, review the System Power-up procedure in paragraph 2.4.2.2 for Stationary operations or paragraph 2.5.2.2 for Mobile. Repeat the Power-up sequence, if necessary. If one of the LRUs listed does not show a power indication, check the associated cabling and circuit breakers. If the LRU still will not power on, replace it.
2. Has the MTU tape head been cleaned recently?	If not, follow the procedures for MTU tape head cleaning in TM 11-5895-1218-12, paragraph 3-12d.
3. Does the CIU "LOAD PGM TAPE" lamp come on after completion of the Power-up?	If not, perform the following sequence: Turn off the KABS Battery Charger switch, the Rack 2 right AC circuit breaker, the RFO DC circuit breaker, the CPU DC circuit breaker, and the BAT CHG DC circuit breaker. Leave off for approximately five minutes. Turn on the RFO DC circuit breaker, the CPU DC circuit breaker, the BAT CHG DC circuit breaker, the KABS Battery Charger switch, and the Rack 2 right AC circuit breaker. Observe that the CIU performs BIT and then if the "LOAD PGM TAPE" lamp does not come on, check CPU cables and pins. If the problem persists, replace the CPU. If the replacement CPU also exhibits the same problem, check KABS cables and pins. If the problem persists, replace the KABS.
4. Does the MTU show signs of rewinding when the tape is loaded?	If not, make sure the tape is loaded properly into the MTU and that the tape hubs can move freely. Also inspect for loose spindles.

Table 6-6. Unable To Load Program Tapes (continued)

INSPECTION	ACTION
5. Does the CIU "LOAD PGM TAPE" lamp start flashing during the reading of the first tape?	If so, verify that the proper tape is in the MTU. Consult TM 11-5895-1218-12, paragraph 4-16d for additional information concerning the flashing LOAD PROGRAM TAPE lamp. Repeat the switch sequence given in Action 3. If the problem persists, perform the following in the given order: 1) try a different set of boot tapes, 2) replace the MTU, and 3) replace the CPU.
6. Does the CIU "LOAD PGM TAPE" lamp start flashing soon after (approx. 30 sec.) the second tape has started?	If the "LOAD PGM TAPE" lamp starts flashing after a portion of the second tape is read, verify that the boot load tapes are a matched pair. If matched, replace the boot tapes.

Table 6-7. Unable To Load COMSEC/TRANSEC Crypto Variables

PROBLEM

While loading cryptovariables, the COMSEC/TRANSEC device responds incorrectly or a fault is reported.

INSPECTION	ACTION
1. Is the ECCM, KG-84A or KY-75A ready to receive crypto variables?	Check for power indications and setup conditions. Refer to paragraph 2.9b for proper loading procedures and KG-84A settings.
2. Is the crypto variable tape in good condition?	If the tape is damaged/worn-out/folded, replace it.
3. Does the ECCM respond when the fill device is attached?	If not, disconnect the fill device and run BIT on the radio from the I/O. If the ECCM still does not respond, cycle power on the radio. Attempt to load present and future variables. If the ECCM does not respond to the fill device after cycling power on the radio and the fill device has been used to fill another unit, replace the radio.
4. Is the cable securely attached between the fill device and the fill connection on the ECCM, KG-84A, or KY-75A?	If the connection is loose at either end, attempt to connect the cable properly. If the cable will not connect properly, either replace the cable or if possible, the operator can hold the cable in place.
5. Does the ECCM display a fault code '14' or '42' after attempting to load the variable?	If so, disconnect the fill device from the ECCM and try again. If the fault reoccurs, cycle power on the radio and try again.
6. Has this particular fill device and cable been used to successfully fill any other ECCM, KG-84A, or KY-75A?	If not, attempt to fill another unit, if possible, or replace the fill device battery, the cable, or the fill device.
7. Has the crypto fill device been loaded properly? (KYK-13)	Reload the fill device if possible. If uncertain, use a KOI-18.
8. Has the ECCM, KG-84A, or KY-75A been successfully loaded?	If not, replace the ECCM, KG-84A, or KY-75A.

Table 6-8. Unable To Load Time-Of-Day (TOD)

PROBLEM

Unable to successfully transfer TOD to the RFO during initial loading or updating of TOD.

NOTES: 1) TOD should not be loaded prior to the RFO COLD OSCILLATOR light extinguishing.
2) If power is cycled on the RFO, the Terminal will probably need to be re-booted.

INSPECTION	ACTION
1. Is the RFO external power indicator on?	If not, check the LAMPS switch on the RFO. If the LAMPS switch is properly positioned, review the System Power-up procedure in paragraph 2.4.2.2 for Stationary operations or paragraph 2.5.2.2 for Mobile operations. Repeat the Power-up sequence, if necessary. If the problem persists refer to Table 6-12 Inspection 2.
2. Are there cabling errors?	Make sure that all time transfer and R-2171 cables are attached between the Signal Interconnect Unit and the RFO. Also, make sure that the TOD source is connected properly.
3. Is the TOD source a R-2171/TSC?	If so, continue to Inspection 4. If the TOD source is a RFO go to Inspection 6.
4. Is the R-2171 setup and connected properly?	Refer to paragraph 2.8 for the proper setup, connections, and procedures for using the R-2171. If necessary, repeat the transfer procedure.
5. Has the R-2171 acquired TOD?	If not, it may be necessary to move the antenna or the satellite receiver in order to receive the signal from the appropriate satellite. If unable to acquire TOD refer to the R-2171 TM 11-5820-1708-14 & P for assistance or try a different R-2171.

Table 6-8. Unable To Load Time-Of-Day (continued)

INSPECTION	ACTION
6. Is the TOD source a RFO?	If so, refer to paragraph 2.8 for the proper connections and procedures for using the RFO as a TOD source. Ensure that the source RFO attempts to send TOD within 7 seconds of pressing RCV TOD on the SIU or receiving RFO.
7. Is the TOD source connected to the SIU?	If so, and if transfer problems persist, try connecting the TOD source directly to the receiving RFO front panel and attempt to transfer TOD again.
8. Has TOD been successfully transferred?	If not, perform the following in the order given: 1) try a different transfer cable, 2) try a different TOD source, and 3) replace the RFO.

Table 6-9. CPU Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate a CPU fault.

INSPECTION	ACTION
1. Is there a CPU fault indication at the CIU?	CPU and CIU fault indications at the CIU often occur when there is some interruption in the communication between these equipments. This may occur during Force Terminal initialization. Initialization must be completed to the point that the operator is able to run system BIT. Perform the following inspections.
2. Is the Radio I/O linked to the CPU?	If so, perform CPU BIT from the Radio I/O. If not, go to inspection 6.
3. Does CPU BIT from the Radio I/O clear the fault?	If BIT clears the fault, follow any prompts for that are displayed at the Radio I/O. If the fault persists, run Whole Terminal BIT from the Radio I/O.
4. Does Whole Terminal BIT from the Radio I/O clear the fault?	If BIT clears the fault, follow any prompts that are displayed at the Radio I/O. If the fault persists, run CIU BIT from the CIU and then run Whole Terminal BIT from the Radio I/O.
5. Does local CIU BIT and Whole Terminal BIT clear the fault?	If fault clears, follow any prompts that are displayed at the Radio I/O.
6. Is input power present at LRU?	The power lamp on the CPU should be on and the ETI should be clicking. If not, check the right ac circuit breaker for Rack 2 on the PCU. Also, check the KABS and the CPU circuit breaker on the PCU. If necessary, refer to TM 11-5895-1218-34, paragraphs 2-153 and 2-157 for the pinouts of power cables W1307 and W1311, respectively.

Table 6-9. CPU Fault Indications (continued)

INSPECTION	ACTION
7. Has the fault been cleared?	If not, perform a warm restart by turning off the Rack 2 right AC circuit breaker. Wait 10 seconds and then turn it back on. The CIU front panel LEDs should then light sequentially twice, the Radio I/O should link and display the CPU LOAD VERIFICATION menu.
8. Is the WARM restart successful?	If so, follow the prompts displayed on the Radio I/O. If not, perform a cold restart by: Turning off the KABS Battery Charger switch, the Rack 2 right AC circuit breaker, the RFO DC circuit breaker, the CPU DC circuit breaker, and the BAT CHG DC circuit breaker. Leave off for approximately five minutes. Turn on the RFO DC circuit breaker, the CPU DC circuit breaker, the BAT CHG DC circuit breaker, the KABS Battery Charger switch, and the Rack 2 right AC circuit breaker. Observe that the CIU front panel LEDs light sequentially and then the "LOAD PGM TAPE" lamp comes on.
9. Is the COLD restart successful?	If so, load the first boot tape into the MTU and boot the terminal. If not, replace the CPU. If the replacement CPU also exhibits the same problem, replace the KABS.

Table 6-10. Signal Entry Fault Indications

PROBLEM

During initialization or operation, the Radio I/O and/or CIU indicate a fault at the SIG ENT.

INSPECTION	ACTION
1. Is there a SIG ENT fault indication at the CIU?	Either a fault exists at the Signal Interconnect Unit (SIU) or some communication problem existed between the SIU and the CIU. A SIG ENT fault could occur if the proper power-on sequence was not followed completely. Run SEP BIT from the Radio I/O. If fault does not clear, go to inspection 2.
2. Is input power present at the Signal Interconnect Unit?	The power lamp on the SIU should be on. If not, check the power switch on the SIU and the corresponding circuit breaker on the PCU. If necessary, reference TM 11-5895-1218-34, paragraph 2-129 for pinouts of cable W1122.
3. Does SEP BIT from the Radio I/O clear the fault indication?	If the fault indication clears, it is probable that no permanent problem existed. Fault-detection circuitry monitors the signaling between the SEP and CIU for any errors. If not, cycle power on the SIU and then run SEP BIT from the Radio I/O.
4. Does cycling power at the Signal Interconnect Unit clear the fault indication?	If the fault indication clears, it is probable that some processor problem occurred that can only be cleared by cycling power. If not, refer to TM 11-5895-1218-12, paragraph 4-17 to perform local BIT on the SIU.
5. Does BIT (from the Signal Interconnect Unit) clear the fault at the Signal Interconnect Unit?	If BIT clears the fault indications, proceed. If not, refer to TM 11-5895-1218-12, paragraph 4-17 for further troubleshooting.
6. Is the fault reported as a CIU SEP USART error?	Verify terminal setup parameters, especially I/O voice matrix table. If an error is found correct the error. Run SEP BIT from the Radio I/O.

Table 6-11. Control Interface Unit (CIU) Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate a CIU fault.

INSPECTION	ACTION
1. Is there a CIU fault indication at the CIU or at the Radio I/O?	CPU and CIU fault indications at the CIU could occur when there is some interruption in the communication between these equipments. Run CIU BIT from the Radio I/O.
2. Is input power present at the CIU?	If the CIU power indicator is not on, check the CIU circuit breaker. If necessary, reference TM 11-5895-1218-34, paragraph 2-189 for pinouts of cable W1305.
3. Does CIU BIT from the Radio I/O clear the fault at the CIU?	If the fault indication is cleared, perform All Stacks BIT and proceed. If the fault indication persists, or the CIU does not respond to the BIT command, perform BIT at the CIU front panel.
4. Does BIT (from the CIU) clear the fault at the CIU?	If so, perform CIU BIT from the Radio I/O, then ALL STACKS BIT, and continue operations. If not, cycle power to the CIU.
5. Does cycling power at the CIU clear the fault indication?	If so, perform CIU BIT at the Radio I/O. If not, refer to TM 11-5895-1218-12, paragraph 4-16 for further troubleshooting.
6. Does the CIU pass BIT?	If so, perform All Stacks BIT and proceed. If not, perform Whole Terminal BIT at the Radio I/O.
7. Does Whole Terminal BIT clear the fault?	If not, refer to TM 11-5895-1218-12, paragraph 4-16 for further troubleshooting.

Table 6-12. RFO Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate an RFO fault.

NOTE: If Reset/Off switch on the RFO is set to off, TOD will be lost. If the CPU is booted when the RFO is turned back on, the CPU might need to be rebooted.

INSPECTION	ACTION
1. Is there a RFO fault indication at the CIU?	The RFO timekeeping functions may override all other communications with the CIU, and the CIU interprets this as a RFO fault. If this occurs, run RFO BIT at the Radio I/O.
2. Is input power present at the RFO?	If the EXT PWR lamp on the RFO is off, check the LAMPS switch setting, the KABS, and PCU circuit breaker for the RFO. If the KABS indicates output power, but the lamp is off, measure the input voltage to the RFO, using the pin-outs provided in TM 11-5895-1218-34, paragraph 2-155 for W1309.
3. Does RFO BIT from the Radio I/O clear the fault at the RFO?	If the fault is cleared, proceed. If the fault persists turn off the RFO circuit breaker on the PCU and then back on. Run RFO BIT from the Radio I/O.
4. Does cycling the RFO circuit breaker clear the fault?	If cycling RFO power and BIT do not clear the fault, replace the RFO.

Table 6-13. MTU Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate an MTU fault.

INSPECTION	ACTION
1. Is there a MTU fault indication at the CIU?	Run MTU BIT from the Radio I/O. If the fault does not clear, go to Inspection 2.
2. Is input power present at the MTU?	If both the Power and the Busy lamps are off, and the tape is not being rewound, check for AC input power on W1306 using the pinouts provided in TM 11-5895-1218-34, paragraph 2-152. If power is present, check the circuit breakers on the MTU front panel. If the MTU still does not show signs of operation, replace it.
3. Is the Run/Test switch in the Run position on the MTU?	If not, change it to Run and perform MTU BIT from the Radio I/O.
4. Does MTU BIT from the Radio I/O clear the MTU fault at the CIU?	If not, cycle power on the MTU and perform MTU bit from the Radio I/O.
5. Does cycling power at the MTU clear the fault indication?	If the MTU fails to pass BIT after cycling power, replace the MTU.

Table 6-14. I/O Rack Fault Indications

PROBLEM

During initialization/operation, a fault is indicated at an I/O Rack or the CIU indicates a fault at the Radio I/O Rack or any of the Mission I/O Racks.

INSPECTION	ACTION
1. Is there a Radio I/O or Mission I/O fault indication at the CIU?	If so, this is an indication that a fault was reported at the I/O Unit's Keyboard/Display (K/D). Run I/O BIT at the K/D for the faulty I/O Unit. If not, proceed to Inspection 3.
2. Does I/O BIT from the I/O Rack clear the fault indication at the CIU?	If not, reset the K/D and relink the I/O Rack.
3. Does the K/D indicate a fault?	If so, perform BIT on the K/D. If not, proceed to Inspection 6.
4. Does the K/D fault clear with BIT?	If not, reset the K/D.
5. Does the fault clear with the reset?	If not, cycle power on the K/D and re-initialize. If the fault persists, refer to TM 11-5895-1218-12, paragraph 4-14 for further troubleshooting.
6. Does the Telephone Modem indicate a fault?	If so, perform BIT at the Telephone Modem. If the fault persists, refer to TM 11-5895-1218-12, paragraph 4-18 for further troubleshooting. If not, proceed to Inspection 7.
7. Is power present at the printer?	If not, check CB under front cover and power cable connections (W1205).
8. Is the Paper Low indicator on the Thermal Printer on?	Open the front panel of the Thermal Printer. Install paper or if the paper is jammed, clear the jam.
9. Does the Thermal Printer indicate a fault?	Perform SELF TEST at the Thermal Printer.
10. Does PTR DSBL on screen go out when the PTR DSBL key is pressed on the K/D?	If not, check the data cable (W3201) connections at the printer and K/D.

Table 6-14. I/O Rack Fault Indications (continued)

INSPECTION	ACTION
11. Does SELF TEST clear the fault on the Thermal Printer?	If not, cycle power on the Thermal Printer. If the fault persists, replace the Thermal Printer.

Table 6-15. AC/DC Power Supply Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate an AC/DC Power Supply fault.

INSPECTION	ACTION
1. Is there a PS AC/DC fault indication at the CIU?	If so, cycle power on the AC/DC Power Supply.
2. Do other DC powered LRUs (Modems and RFO) indicate faults?	If so, there is no output from the AC/DC Power Supply. Verify that on the front panel of the AC/DC Power Supply, the circuit breaker, the fan, and the power indicator are on. Cycle power on the AC/DC Power Supply.
3. Is the terminal set up for stationary or mobile operations?	The AC/DC Power Supply will not have any input power when the Main/Mobile switch on the PCU is in the Mobile position.
4. Is input power present at the AC/DC Power Supply?	Check the middle AC circuit breaker for Rack #2 on the PCU and the voltmeter on the PCU for phase #2 LOAD 230 VAC. If necessary measure the voltage on cable W1308, using pinouts provided in TM 11-5895-1218-34, paragraph 2-154. If voltage is present, cycle power on the AC/DC Power Supply.
5. Does cycling power clear the fault?	If so, perform an All Stacks BIT from the Radio I/O to clear the induced faults. If not, replace the AC/DC Power Supply.
6. Is there free airflow through the front-panel screen?	If airflow is blocked, clean the filter. The AC/DC Power Supply is protected by thermal overload.

Table 6-16. PPC Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate a PPC fault.

INSPECTION	ACTION
1. Is there a PPC fault indication at the CIU?	Verify that CB2 and CB3 are on. Then inspect the AC input and output voltages using the voltmeter on the Power Control Unit. If any voltages differ from expected values by more than 10% (about 10V on the 115 VAC output readings, 20V on the input and 230 VAC output readings), refer to TM 11-5895-1218-34, paragraph 2-48 for PPC troubleshooting.
2. Is there free airflow through the outside panel screens?	Insufficient airflow can cause overheating inside the PPC. Follow procedures in TM 11-5895-1218-12, paragraph 3-12c for cleaning the air filters.

Table 6-17. ICS Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate an ICS fault.

INSPECTION	ACTION
1. Is there an ICS fault indication at CIU?	As the ICS is no longer part of the Force Terminal, a fault indication here indicates a CIU problem. Perform BIT on the CIU from the Radio I/O.
2. Does running CIU BIT from the Radio I/O clear the fault indication at the CIU?	If the fault indication is still present, cycle power on the CIU. If the fault persists, replace the CIU.

Table 6-18. ATU Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate an ATU fault.

INSPECTION	ACTION
1. Is there an ATU fault indication at the CIU?	ATU faults usually result from a tuning problem. Most often, they are accompanied by a RAD 1 fault indication at the CIU. Run BIT from the Radio I/O on Stack 1.
2. Is input power present at the LRU?	The ATU does not have a power indicator. If in doubt, turn the PCU circuit breaker for the ATU off, and then on. There should be an audible click from the ATU as relays are energized. Check for power to the Stack 1 Modem, and check the PCU Main/Mobile switch. During mobile operations, the ATU and Stack 1 Modem receive power from the truck via the DC Entry panel and the PCU. If necessary, refer to TM 11-5895-1218-34, paragraph 2-125 for the pinouts of cable W1118.
3. Is the terminal set-up (stationary vs. mobile) correct?	If the Terminal Configuration is set up for stationary, change configuration to mobile and run BIT on stack 1.
4. Are all of the Stack 1 LRUs turned on?	If not, turn on the appropriate LRUs and run Stack 1 BIT from the Radio I/O.
5. Does running Stack 1 BIT from the Radio I/O clear the fault at the ATU?	If not, run BIT at the Stack 1 Radio. If so, continue operations. If the ATU fault returns during operations continue troubleshooting at Inspection 10.
6. Does running BIT at the Stack 1 Radio clear the fault?	If so, run Stack 1 BIT from the Radio I/O and continue operations. If the ATU fault returns during operations continue troubleshooting at Inspection 10.

Table 6-18. ATU Fault Indications (continued)

INSPECTION	ACTION
7. Is the ATU attempting to tune during BIT but fails BIT?	If so, check the TX whip installation and the wire between the whip and the shelter. If no problem is found, check the wire between the ATU and the lightning/EMP protection. Check for stray wires from the RF shield assembly and reinstall the shield assembly. If this fails, replace the TX whip with the RX whip and run BIT. If this passes, replace the TX whip. If this fails, replace the ATU, and return the whip antennas to their proper positions. If not, observe forward power (FWD PWR) readings on the PA Test Meter during the tuning cycle.
8. Does the PA Test Meter indicate forward power during the tuning phase?	If so, the RF switching relay might be stuck. Go to the Terminal Configuration menu, set the terminal to Stationary and then set the terminal to Mobile. If the ATU still does not attempt to tune, the relay or the interconnecting cabling might be damaged and needs to be inspected. If the relay and cabling are good, replace the ATU.
9. Does the PA Test Meter indicate +5V TX and +26V TX voltages during the tuning cycle?	If not, cycle power on the Stack 1 Radio and observe the tuning cycle. If the voltages are still not present, replace the Radio. If so, a problem exists in the RF stack. Attempt to isolate by replacing the following LRUs in the given order; the Radio, the PPS, the PA, and the PA Power Supply. If the problem persists, check the RF cables.
10. Does the ATU pass BIT but fail during operations?	If so, attempt to isolate the frequency area in which the ATU fails.

Table 6-18. ATU Fault Indications (continued)

INSPECTION	ACTION
11. Is the range narrow (less than 500 kHz)?	If so, verify the TX whip installation and the wire between the whip and the shelter. If no problem is found, check the wire between the ATU and the lightning/EMP protection. Check for stray wires from the RF shield assembly and reinstall the shield assembly. If the problem persists, replace in the order given, the ATU, the PPS, the PA, and the Radio.
12. Is the range wide (greater than 500 kHz)?	If so, replace the following LRUs in the order given; the PPS, the PA, the Radio, and the ATU.

Table 6-19. Modem Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate a Modem fault.

INSPECTION	ACTION
1. Is there a Modem ("MDM x") fault indication at CIU?	If a Modem fault is reported at the CIU, run the appropriate Stack x BIT from the Radio I/O and perform the following checks.
2. Is the Modem present?	The standard configuration for a Force Terminal does not include a RN Modem for Stack 3. If a Modem is not present in any of the four data capable stacks (only Stacks 1 and 4 in Mobile), the CIU will report a fault at that position. If the Modem is present, ensure that the power switch is on.
3. Is the terminal set-up (stationary vs. mobile) correct?	If the PCU Main/Mobile switch is not in the correct position, Modems in Stacks 2 and 3 will not have input power present, and the CIU will report faults accordingly. If the Terminal Configuration is set up for Stationary operations while the Force Terminal is powered for Mobile operations, the CIU will report faults at Stacks 2 and 3, as no power is present at these Modems.
4. Is input power present at the Modem?	If power is not present, check the PCU circuit breakers and the Main/Mobile switch. If necessary, refer to TM 11-5895-1218-34, paragraph 2-182 for W1417 (Stack 1), 2-183 for W1418 (Stack 2), 2-181 for W1416 (Stack 3), or 2-184 for W1419 (Stack 4) for the appropriate power cable pinout. If power is present but the Modem does not power on, refer to TM 11-5895-1218-12, paragraph 4-15 for further troubleshooting.

Table 6-19. Modem Fault Indications (continued)

INSPECTION	ACTION
5. Does the Modem always fail when beginning to transmit in the data mode?	This type of fault is an indicator of a SMI lockup in the CPU. Perform Whole Terminal BIT from the Radio I/O.
6. Does the BIT lamp on the Modem flash approximately 8 times and then stay on?	If so, check for the presence of 10MHz at the Modem input. If all Modems show the same symptoms, check the RFO. If only the one Modem shows this symptom, refer to TM 11-5895-1218-12, paragraph 4-15 for further troubleshooting.
7. Does the appropriate Stack x BIT from the Radio I/O clear the fault at the Modem?	If Stack x BIT does not clear the fault indications, check the KG-84A settings and operational status.
8. Is the KG-84A loaded and setup properly?	If the KG-84A is not set properly, change the settings (refer to TM 11-5895-1218-12, paragraph 2-8d for proper settings) and repeat Stack x BIT. If the fault persists, run BIT at the Modem.
9. Does BIT from the Modem clear the fault at the Modem?	If not, cycle power on the Modem. If so, run Stack x BIT to clear the fault on the CIU.
10. Does cycling power clear the fault at the Modem?	If not, disconnect all cables (except power and 10MHz) from the Modem and run BIT at the Modem.
11. Does BIT from the Modem clear the fault with the cables removed?	If not, refer to TM 11-5895-1218-12, paragraph 4-15 for further troubleshooting. If so, connect the Control Bus cable to the Modem and run BIT at the Modem.

Table 6-19. Modem Fault Indications (continued)

INSPECTION	ACTION
12. Does BIT from the Modem pass with the Control Bus cable connected?	If not, run BIT at the CIU and then run BIT at the Modem. If the fault persists and this is the only Modem failing, refer to TM 11-5895-1218-12, paragraph 4-15 for further troubleshooting. If other Modems are failing replace the CIU. If the fault does not reoccur, connect the KG-84A cable to the Modem and run BIT at the Modem.
13. Does BIT from the Modem pass with the KG-84A cable connected?	If not, replace the KG-84A. If the fault persists, refer to TM 11-5895-1218-12, paragraph 4-15 for further troubleshooting. If so, connect the Radio cable to the Modem and run BIT at the Modem.
14. Does BIT from the Modem pass with the Radio cable connected?	If so, run Stack x BIT from the Radio I/O to clear the faults on the CIU. If not, cycle power on the Radio and run BIT at the Modem. If the fault persists, replace the Radio. If the fault reoccurs, refer to TM 11-5895-1218-12, paragraph 4-15 for further troubleshooting.

Table 6-20. Radio Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate a Radio fault.

INSPECTION	ACTION
1. Is there a Receiver or Receiver/Exciter ("RAD x") fault indication at the CIU?	If a Radio fault is reported at the CIU, run the appropriate Stack x BIT from the Radio I/O and perform the following checks.
2. Is the terminal set-up (stationary vs. mobile) correct?	If the PCU Main/Mobile switch is not in the correct position, Stacks 2, 3, and 5 radio equipment will not have input power present, and the CIU will report faults accordingly. If the Terminal Configuration is set up for Stationary operations while the Force Terminal is powered for Mobile operations, the CIU will report faults at Stacks 2, 3, and 5 as no power is present at these racks.
3. Is the power lamp on at the Radio?	If not, check the PCU circuit breakers and the Main/Mobile switch. If necessary, refer to TM 11-5895-1218-34, paragraph 2-177 for W1412 (Stack 1), 2-174 for W1409 (Stack 2), 2-178 for W1413 (Stack 3), 2-175 for W1410 (Stack 4), or 2-176 for W1411 (Stack 5) for the appropriate power cable pinout. If power is present but the equipment does not power on, replace the Receiver or R/E.
4. Does the appropriate Stack x BIT from the Radio I/O clear the fault at the Radio?	Run Stack x BIT from the Radio I/O. If a fault indication persists, run BIT from the Receiver or R/E.
5. Does BIT (from the Radio) clear the fault at the Radio?	If so, run Stack x BIT from the Radio I/O. If not, turn the radio's power switch off and on again.
6. Does cycling power at the Radio clear the fault at the Radio?	If so, refill the cryptovariables and run Stack x BIT from the Radio I/O. If the fault persists, replace the Radio.

Table 6-21. Pre/Post Selector (PPS) Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate a Pre/Post Selector fault.

INSPECTION	ACTION
1. Is there a Pre-Post Selector ("PPS x") fault indication at the CIU?	If a PPS fault is indicated, run the appropriate Stack x BIT from the Radio I/O and perform the following checks.
2. Is input power present at the PPS?	Check the power indicators on the PPS and the adjacent Radio (Receiver or R/E). If both are off, check the PCU circuit breakers, the Radio and PPS power switches, the PCU Main/Mobile switch, and the Terminal Configuration. If Radio has power and none of the PPS lamps are on, check the power cable pinout provided in TM 11-5895-1218-34, paragraph 2-170 for W1405 (Stack 1), 2-171 for W1406 (Stack 2), 2-173 for W1408 (Stack 3), 2-169 for W1404 (Stack 4), or 2-172 for W1407 (Stack 5). If power is present on the cable, replace the PPS.
3. Does the appropriate Stack x BIT from the Radio I/O clear the fault at the PPS?	If a fault indication persists, run BIT at the Radio.
4. Does BIT (from the Radio) clear the fault at the PPS?	If a fault indication persists or reappears while attempting to establish communication, check the stack cabling between the Radio and the PPS. Make sure the PCU Rack ATU DC circuit breaker is on, energizing the RF BITE Assembly. Look for any fault indications on the Power Amplifier (PA) or PA Power Supply (PA PS), stacks 1-3 only. If the PA or PA PS also indicate a fault, troubleshoot the PA or the PA PS. If not, turn the PPS power switch off and then turn it on.
5. Does cycling power at the PPS clear the fault at the PPS?	If not, replace the PPS. If so, run Stack x BIT from the Radio I/O and continue operations.

Table 6-22. Power Amplifier (PA) Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate a Power Amplifier fault.

INSPECTION	ACTION
1. Is there a Power Amplifier ("PA x") fault indication at the CIU?	If so, run the appropriate Stack x BIT from the Radio I/O and perform the following checks.
2. Is input power present at the PA?	If power is not present, check the PA Power Supply.
3. Are all the voltage and temperature readings on the PA panel meter within nominal limits?	If voltage readings are not within the middle green portion of the meter, troubleshoot the PA Power Supply. If temperature readings are not within the left-hand green portion of the meter, refer to TM 11-5895-1304-24.
4. (Stack 1 only) Is the terminal set-up (stationary vs. mobile) correct?	Check the Terminal Configuration menu and the PCU Main/Mobile switch for the correct set-up. Also check for the presence of the correct antenna (TX whip in mobile, Broadband Antenna attached to J1 in stationary).
5. Is an antenna attached via coaxial cable to the appropriate shelter port?	In mobile, the TX whip must be installed. In stationary, an antenna must be attached to the appropriate BB Entry Panel port (J11 for Stack 1, J12 for Stack 2, J13 for Stack 3). If the PA is keyed to transmit while an antenna is not attached, a fault indication will be induced at the PA along with a high VSWR indication on the meter.
6. Does the appropriate Stack x BIT from the Radio I/O clear the fault at the PA?	If the fault persists after running BIT from the Radio I/O, perform BIT at the Receiver/Exciter.

Table 6-22. Power Amplifier (PA) Fault Indications (continued)

INSPECTION	ACTION
7. Does BIT (from the Receiver/Exciter) clear the fault at the PA?	If the fault persists after running BIT at the Receiver/Exciter, cycle power to the PA Power Supply.
8. Does cycling power at the PA Power Supply clear the fault at the PA?	If not, replace the PA. If the fault persists, replace the PA Power Supply.
9. Does the fault reoccur when transmitting?	If so, perform BIT at the R/E (to place stack in Voice mode). Attach a handset to the Audio connector (J1) of the ECCM. Key the stack without speaking into the handset.
10. Does the PA fault?	If so, replace the PA. If not, unkey the stack. Configure the stack for high power CTN mode. Using the Test Meter on the PA, check for reflected power (PWR REFL) when the handset is keyed. Note: If high level of reflected power is present, the PA will quickly fault.
11. Does the meter indicate significant reflected power?	Check the connections of the RF cables at the front of the PA, the Broadband Entry Panel, and at the antenna. Inspect the condition of the RF cable connecting the antenna to the shelter, the condition of the antenna ground wires and elements, and the proper setup of the antenna. If possible, use a different antenna to isolate the problem.

Table 6-23. PA Power Supply (PA PS) Fault Indications

PROBLEM

During initialization/operation, the Radio I/O and/or CIU indicate a PA Power Supply fault.

INSPECTION	ACTION
1. Is there a PA PS ("PS x") fault indication at the CIU?	If a fault is reported at the CIU, run the appropriate Stack x BIT from the Radio I/O and perform the following inspections.
2. Is input power present at the PA PS?	If the PA PS power lamp is not on, check the PA PS power switch, the PCU circuit breakers, and the Terminal Configuration (only Stack #1 is available in mobile). If required, check the power cable pinout provided in TM 11-5895-1218-34, paragraph 2-166 for W1401 (Stack 1), 2-168 for W1403 (Stack 2), or 2-167 for W1402 (Stack 3).
3. Does the appropriate Stack x BIT from the Radio I/O clear the fault at the PA PS?	If the fault persists, check the voltage readings on the Test Meter on the PA. If any of the voltages measured on the front panel meter (other than +5VTX and +26VTX) are outside the middle green portion of the meter, cycle power on the PA PS.
4. Does cycling power on the PA PS clear the fault?	If not, turn off the PA PS and remove W3101 and W3902. After these cables are removed, turn the PA PS on.
5. Does cycling power at the PA PS with the cables removed clear the fault indication?	If so, replace the PA PS. If not, properly install the PA PS in a different stack and turn it on.
6. Does the PA PS fault in a different stack?	If so, replace the PA PS. If not, replace the PA in the original stack.

Table 6-24. Unable To Establish Voice Communications

PROBLEM

The operator is unable to establish voice communications.

INSPECTION	ACTION
1. Is the Signal Interconnect Unit set up correctly?	Review the Signal Entry Panel Audio Configuration menu. Carefully check selections for the transmit path and the receive path. Make sure the correct I/O is selected.
2. Is the Telephone Modem set up correctly?	Make sure the power indicator is on at the Telephone Modem, the volume is turned up, and the Self Test switch is in the Normal position. Make sure the Voice mode switch is in the handset position and the handset is connected to the HANDSET connection.
3. Is the I/O Rack local or remote?	If local, ensure that the audio cable is connected to J3 of the I/O Rack. If remote, ensure that fieldwire is connected to the correct binding posts at both the I/O Rack and at the Force Terminal. Also, ensure that the Telephone Modem 2-wire/4-wire and Local/Remote switches are set properly.
4. Is the KY-75A RCU loaded and set up correctly?	Make sure the RCU is set to the correct mode (plain or cipher), and that one of the variable settings is selected. If cipher, make sure the correct cryptovariable was loaded properly.
5. Is the correct handset being used?	Only H-356 handsets are wired correctly for transmission from RN equipment.
6. Are there any equipment fault indications?	If a fault indication is shown on the CIU or at the Radio I/O, perform the appropriate troubleshooting sequence(s).

Table 6-24. Unable To Establish Voice Communications (continued)

INSPECTION	ACTION
7. Is communication quality poor?	If the sound is garbled or noisy, check the RCU for receipt of encrypted audio. Make sure both communication terminals have the same cryptovariables. If excessive noise is present when neither terminal is transmitting, it may be necessary to select a different frequency (hopset) for communication.
8. Is the correct mode (N or E) selected?	Make sure both terminals are using the same operating mode.
9. Is the correct frequency or hopset loaded?	Make sure both terminals are using the same operating frequency (hopset) and sideband for voice communication.
10. Are the correct COMSEC/TRANSEC cryptovariables loaded?	If audio is garbled or intermittent, the cryptovariables should be checked. Re-load if necessary.
11. Is ECCM mode audio intermittent?	If the Time-of-Day (TOD) is not the same at both terminals, ECCM mode audio might be intermittent. If Non-ECCM mode voice communication is successful under these conditions, at least one terminal needs to have TOD reloaded. If data communications are successful at one terminal, and not the other it is probable that the other terminal requires TOD update.
12. Is the radio tuning to the correct frequency?	See if another stack is available for use of loop around BIT. If not, try tuning the radio to the frequency of a known nearby HF broadcast station. If the radio is unable to receive the broadcast signal, it might not be tuning to the correct frequency, or may have a high receive path attenuation, and the Receiver (or R/E) needs to be replaced. Also, the PPS and cabling may require replacing.

Table 6-24. Unable To Establish Voice Communications (continued)

INSPECTION	ACTION
13. Is there a problem with the I/O Rack equipment or the SIU?	Connect the handset directly to the audio connector (J1) of the radio. If voice communications (plain mode only) are then possible, troubleshoot the SIU, Telephone Modem, and KY-75A. If voice communications are still not possible, replace the Radio after checking Inspection 14.
14. Is there a problem with the terminal that the Force Terminal is trying to communicate with?	If voice communications is possible with other terminals, and the frequency/hopset, mode, cryptovariables, and TOD are correct, then the other terminal might be the cause of the communication problem.

Table 6-25. Unable To Maintain Voice Communications

PROBLEM

Voice communications are lost or interrupted.

INSPECTION	ACTION
1. Are there any equipment fault indications?	If a fault indication is shown on the CIU or at the Radio I/O, refer to the appropriate table.
2. Is communication quality poor?	If excessive noise is present when neither terminal is transmitting, it may be necessary to select a different frequency (hopset) for communication.
3. Are incorrect cryptovariables present after variable change?	If voice communication is not possible after variable change, load the correct cryptovariables into the ECCM and/or KY-75A.
4. Is the radio tuning to the correct frequency?	See if another stack is available for use of loop around BIT. If not, and if possible, try tuning the radio to the frequency of a known nearby HF broadcast station. If the radio is unable to receive the broadcast signal, it might not be tuning to the correct frequency, or may have a high receive path attenuation, and the Receiver (or R/E) needs to be replaced. Also, the PPS and cabling may require replacing.
5. Is there a problem with the I/O Rack equipment or the SIU?	Connect the handset directly to the audio connector (J1) of the radio. If voice communications (plain mode only) are then possible, troubleshoot the SIU, Telephone Modem, and KY-75A. If voice communications are still not possible, replace the Radio after checking Inspection 6.
6. Is there a problem with the terminal that the Force Terminal is trying to communicate with?	If voice communications is possible with other terminals, and the frequency/hopset, mode, cryptovariables, and TOD are correct, then the other terminal might be the cause of the communication problem.

Table 6-25. Unable to Maintain Voice Communications (continued)

INSPECTION	ACTION
7. Is the quality of communication degrading?	If so, it may be necessary to select a different frequency (hopset) for communication.
8. Has the alignment on the KY-75A been maintained?	If not, contact the proper organization to have the KY-75A replaced or aligned.

Table 6-26. Unable To Establish Data Link (Constitution)

PROBLEM

The operator is unable to establish data communications as a subnet controller.

INSPECTION	ACTION
1. Are there any equipment fault indications and are all equipment stacks powered on?	If any equipment faults are indicated at the Radio I/O or at the CIU, perform the necessary troubleshooting by referring to the appropriate table.
2. Are the stack set-up parameters, frequencies, and hopsets correct?	Confirm the stack configuration menu entries.
3. Are the subnet number and members entered correctly?	Confirm the subnet controller parameters.
4. Was the proper KG-84A variable selected?	Confirm the KG-84A variable selection in the KG-84A Setup menu.
5. Are any of the specified members attempting to Sign-In?	Contact the potential member terminals. Verify all subnet parameters and intent to Sign-In.
6. Was constitution started and allowed to continue for at least three frequency cycles?	Verify that "Constitution of Subnet aaa Started" and "Constitution of Subnet aaa Still in Progress", where aaa is the subnet number, status lines appeared on the I/O and the printer roll. If not, start constitution from the Options menu.
7. Is the date correct?	Confirm the date on the top row of the K/D display. If the date is not correct, enter the correct date in the Terminal Configuration menu.
8. Are the correct COMSEC/TRANSEC cryptovariables loaded?	If in doubt, reload COMSEC and TRANSEC cryptovariables in the KG-84A and the ECCM.
9. Are the COMSEC equipments set up correctly?	Confirm the KG-84A setup for the controller stack.

Table 6-26. Unable To Establish Data Link (Constitution) (continued)

INSPECTION	ACTION
10. Does terminal contain correct TOD?	If the displayed time is more than 5 minutes off of a known good time, reload TOD. TOD updates are required at least every 90 days from a known good source (R-2171/TSC). Reload TOD if update has not been done within 90 days or if update cannot be verified.
11. Does the stack operate in Voice mode?	Refer to Table 6-24. If voice operations are good, set the stack back up for Data mode operations.
12. Do the PA and PA PS fans come on when constitution is started?	The fans will come on if the stack is transmitting. If the fans come on, go to Inspection 27. If not, watch the KG-84A ALARM and PARITY lights.
13. Do the ALARM and PARITY lights flash at least once per minute?	If so, run BIT at the appropriate R/E, connect a handset to the Audio connector (J1) of the R/E, and continue to Inspection 23. If not, verify that the KG-84A FULL OPR light is on.
14. Is the KG-84A FULL OPR light on?	If so, perform Stack x BIT from the Radio I/O, restart constitution, and continue to Inspection 19. If not, cycle the KG-84A Mode switch to STBY (standby) and then back to RMT (remote). Verify that the KG-84A FULL OPR light comes on.
15. Does the KG-84A FULL OPR light come on?	If so, perform Stack x BIT from the Radio I/O. If not, reload the proper variable(s) in to the KG-84A and perform Stack x BIT from the Radio I/O.
16. Does the KG-84A FULL OPR indicator remain on?	If so, start constitution from the Options menu and continue to Inspection 6. If not, replace the KG-84A. Load the proper variable(s) and perform Stack x BIT from the Radio I/O.

Table 6-26. Unable To Establish Data Link (Constitution) (continued)

INSPECTION	ACTION
17. Does the KG-84A FULL OPR light remain on with the replacement KG-84A?	If so, start constitution from the Options menu and continue to Inspection 6. If not, replace the Modem and perform Stack x BIT from the Radio I/O.
18. Does the KG-84A FULL OPR light remain on with the replacement Modem?	If so, start constitution from the Option menu and continue to Inspection 6.
19. Do the KG-84A lights flash at least once per minute after Stack BIT was performed?	If so, continue to Inspection 22. If not, replace the KG-84A, load the proper variable(s), perform Stack x BIT from the Radio I/O, and start constitution from the Options menu.
20. Do the KG-84A lights flash at least once per minute with the replacement KG-84A?	If so, continue to Inspection 22. If not, perform Whole Terminal BIT from the Radio I/O and start constitution from the Options menu.
21. Do the KG-84A lights flash at least once per minute after Whole Terminal BIT was performed?	If so, continue to Inspection 22. If not, the problem is probably in the CPU or the interconnecting cables. In order to isolate, perform the following: use a different RF Stack, reboot the CPU, or replace the CPU.
22. Do the PA and PA PS fans come on when constitution is started?	If so, continue to Inspection 6. If not, run BIT at the appropriate R/E, connect a handset to the Audio connector (J1) of the R/E, and continue to Inspection 23.
23. Do the PA and PA PS fans come on when the handset is keyed?	If not, continue to Inspection 24. If so, the problem is probably in the Modem, R/E, or KG-84A. In order to isolate, replace each of the LRUs listed in the order given. After each replacement, perform Stack x BIT from the Radio I/O and start constitution.
24. Are the PPS and the PA PS turned on?	If not, perform Stack X BIT from the Radio I/O, power on the proper LRU(s), and start constitution.

Table 6-26. Unable To Establish Data Link (Constitution) (continued)

INSPECTION	ACTION
25. Are all the proper cables connected on the RF stack?	If not, perform Stack x BIT from the Radio I/O, connect the proper cable(s), and start constitution. If so, cycle power on the PA PS, PPS, and R/E.
26. Do the PA and PA PS fans come on when the handset is keyed after cycling power?	If so, fill the ECCM with the proper variables, perform Stack x BIT from the Radio I/O, and start constitution. If not, the problem is in the R/E, PPS, PA, PA PS, or interconnecting cables. In order to isolate, replace each of the LRUs in the order given. After each replacement key the handset and check for fan operation.
27. Does the Test Meter on the PA indicate the proper level of forward power (PWR FWD) when the PA is keyed (as indicated by the +26V TX)?	If the level is very low or zero, run BIT at the R/E, connect a handset to the Audio connector (J1), and proceed to Inspection 29. If the level is about half of the expected level, check the level of reflected power (PWR REFL) on the Test Meter. If the level is proper, continue to Inspection 30.
28. Does the meter indicate significant reflected power?	Check the connections of the RF cables at the front of the PA, the Broadband Entry Panel, and at the antenna. Inspect the condition of the RF cable connecting the antenna to the shelter, the condition of the antenna ground wires and elements, and the proper setup of the antenna. If possible, use a different antenna to isolate the problem.
29. Does the meter indicate the proper level of forward power when the R/E is keyed using CTN mode?	If so, perform Stack x BIT from the Radio I/O, start constitution, and continue to Inspection 30. If not, the problem is in the R/E, PPS, PA, PA PS, or interconnecting cables. In order to isolate, replace each of the LRUs in the order given. After each replacement key the handset and check for proper readings.

Table 6-26. Unable To Establish Data Link (Constitution) (continued)

INSPECTION	ACTION
30. Does the forward power indication on the PA Test Meter ever only last for approximately 3 seconds or less?	If so, perform Stack x BIT from the Radio I/O and start constitution. If the problem reoccurs, perform Whole Terminal BIT from the Radio I/O and start constitution.
31. Are the specified members attempting to Sign-In?	Contact potential members and verify all parameters. If possible, have an alternate controller attempt to establish the data link.

Table 6-27. Unable To Establish Data Link (Sign-In/Monitor)

PROBLEM

The operator is unable to monitor or sign into a data subnet.

INSPECTION	ACTION
1. Are there any equipment fault indications and are all equipment stacks powered on?	If any equipment faults are indicated at the Radio I/O or at the CIU, perform the necessary troubleshooting by referring to the appropriate table.
2. Are the stack set-up parameters, frequencies, and hopsets correct?	Confirm the stack configuration menu entries.
3. Was the proper KG-84A variable selected?	Confirm the KG-84A variable selection in the KG-84A Setup menu.
4. Is the controller attempting to constitute the subnet?	Contact the controller terminal. Verify all subnet parameters and intent to constitute.
5. Was sign-in started and allowed to continue for at least three frequency cycles?	Verify that "Sign-In to Subnet aaa Started" and "Sign-In to Subnet aaa Still in Progress", where aaa is the subnet number, status lines appeared on the I/O and the printer roll. If not, start sign-in from the Options menu.
6. Is the date correct?	Confirm the date on the top row of the K/D display. If the date is not correct, enter the correct date in the Terminal Configuration menu.
7. Are the correct COMSEC/TRANSEC cryptovariables loaded?	If in doubt, reload COMSEC and TRANSEC cryptovariables in the KG-84A and the ECCM.
8. Are the COMSEC equipments set up correctly?	Confirm the KG-84A setup for the controller stack.
9. Does terminal contain correct TOD?	If the displayed time is more than 5 minutes off of a known good time, reload TOD. TOD updates are required at least every 90 days from a known good source (R-2171/TSC). Reload TOD if update has not been done within 90 days or if update cannot be verified.

Table 6-27. Unable To Establish Data Link (Sign-In/Monitor) (continued)

INSPECTION	ACTION
10. Does the stack operate in Voice mode?	Refer to Table 6-24. If voice operations are good, set the stack back up for Data mode operations.
11. Do the PA and PA PS fans come on during frequency cycle?	The fans will come on if the stack is transmitting. If the fans come on, go to Inspection 20. If not, verify that the KG-84A FULL OPR light is on.
12. Is the KG-84A FULL OPR light on?	If so, continue to Inspection 17. If not, cycle the KG-84A Mode switch to STBY (standby) and then back to RMT (remote). Verify that the KG-84A FULL OPR light comes on.
13. Does the KG-84A FULL OPR light come on?	If so, perform Stack x BIT from the Radio I/O. If not, reload the proper variable(s) in to the KG-84A and perform Stack x BIT from the Radio I/O.
14. Does the KG-84A FULL OPR indicator remain on?	If so, start sign-in from the Options menu and continue to Inspection 5. If not, replace the KG-84A. Load the proper variable(s) and perform Stack x BIT from the Radio I/O.
15. Does the KG-84A FULL OPR light remain on with the replacement KG-84A?	If so, start sign-in from the Options menu and continue to Inspection 5. If not, replace the Modem and perform Stack x BIT from the Radio I/O.
16. Does the KG-84A FULL OPR light remain on with the replacement Modem?	If so, start sign-in from the Option menu and continue to Inspection 5.
17. Are the PPS and the PA PS turned on?	If not, perform Stack X BIT from the Radio I/O, power on the proper LRU(s), and start sign-in.

Table 6-27. Unable To Establish Data Link (Sign-In/Monitor) (continued)

INSPECTION	ACTION
18. Are all the proper cables connected on the RF stack?	If not, perform Stack x BIT from the Radio I/O, connect the proper cable(s), and start sign-in.
19. Is the radio tuning to the correct frequency?	Do a voice test by use of a loop around BIT. Then if possible, put the radio in voice mode and try tuning the radio to the frequency of a known nearby HF broadcast station. If the radio is unable to receive the broadcast signal, it might not be tuning to the correct frequency or may have a high attenuation in the receive path, and the Receiver (or R/E) needs to be replaced. Also, the PPS and cabling may require replacing.
20. Does the Test Meter on the PA indicate the proper level of forward power (PWR FWD) when the PA is keyed (as indicated by the +26V TX)?	If the level is very low or not at all, run BIT at the R/E, connect a handset to the Audio connector (J1), and proceed to Inspection 22. If the level is about half of the expected level, check the level of reflected power (PWR REFL) on the Test Meter. If the level is proper, continue to Inspection 23.
21. Does the meter indicate significant reflected power?	Check the connections of the RF cables at the front of the PA, the Broadband Entry Panel, and at the antenna. Inspect the condition of the RF cable connecting the antenna to the shelter, the condition of the antenna ground wires and elements, and the proper setup of the antenna. If possible, use a different antenna to isolate the problem.

Table 6-27. Unable To Establish Data Link (Sign-In/Monitor) (continued)

INSPECTION	ACTION
22. Does the meter indicate the proper level of forward power when the R/E is keyed using CTN mode?	If so, perform Stack x BIT from the Radio I/O, start sign-in, and continue to Inspection 23. If not, the problem is in the R/E, PPS, PA, PA PS, or interconnecting cables. In order to isolate, replace each of the LRUs in the order given. After each replacement key the handset and check for proper readings.
23. Does the forward power indication on the PA Test Meter ever only last for approximately 3 seconds?	If so, perform Stack x BIT from the Radio I/O and start sign-in. If the problem reoccurs, perform Whole Terminal BIT from the Radio I/O and start sign-in.
24. Is the controller attempting to constitute?	If in doubt, contact the controller and verify all parameters.
25. Does the terminal appear to be in subnet, but is listed as inactive at the controller?	If so, verify the correct power level selection for the stack and that the PA PS is turned on. If the situation continues, perform Stack x BIT from the Radio I/O and start sign-in. If this does not clear the situation, reload TOD, If the situation persists, request that the controlling terminal reload TOD.

Table 6-28. Unable To Maintain Data Link (Controller)

PROBLEM

Data communications are lost or interrupted at the subnet controller.

INSPECTION	ACTION
1. Are there any equipment fault indications and are all equipment stacks powered on?	If any equipment faults are indicated at the Radio I/O or at the CIU, perform the troubleshooting by referring to the appropriate table.
2. Was the subnet established before COMSEC or TRANSEC variables were updated or reloaded?	Verify that the proper variables were used. If in doubt, reload COMSEC and TRANSEC cryptovariables in the KG-84A and the ECCM.
3. Is the selection of frequencies/hopsets appropriate for the communication link?	Review the frequencies or hopsets available. During transition between night and day, usable skywave frequencies can change fast enough to cause a loss of connectivity, which might take up to 30 minutes to recover from. If a limited number of frequencies/hopsets are available, interference might prevent operation on these frequencies.
4. Did the link fail after crypto rollover (midnight)?	Confirm that the proper TRANSEC cryptovariable was used to load the future variable prior to rollover. If in doubt, load the proper variable.
5. Is there a problem at member terminal(s)?	If only one subnet member goes inactive and other members remain active, that member has the problem. If all members go inactive within ten minutes of each other, the problem exists in the controller terminal. Review the above items.
6. Did terminal have a power interruption?	Refer to Table 6-35.
7. Is the data link still interrupted?	Refer to Table 6-26.

Table 6-29. Unable To Maintain Data Link (Member/Monitor)

PROBLEM

Data communications are lost or interrupted.

INSPECTION	ACTION
1. Are there any equipment fault indications and are all equipment stacks powered on?	If any equipment faults are indicated at the Radio I/O or at the CIU, perform the necessary troubleshooting by referring to the appropriate table.
2. Was the link established before COMSEC/TRANSEC variables were updated or reloaded?	Verify that the proper variables were used. If in doubt, reload COMSEC and TRANSEC cryptovariables in the KG-84A and the ECCM.
3. Is the selection of frequencies/hopsets appropriate for the communication link?	During transition between night and day, usable skywave frequencies can change fast enough to cause a loss of connectivity, which might take up to 30 minutes to recover from. If a limited number of frequencies or hopsets are available, interference might prevent operation on these frequencies.
4. Did the link fail after crypto rollover (midnight)?	Confirm that the proper TRANSEC cryptovariable was used to load the future variable prior to rollover. If in doubt, load the proper variable.
5. Is there a problem at the controller member terminal?	Contact the controller terminal and verify status.
6. Did terminal have a power interruption?	Refer to Table 6-35.
7. Is the data link still interrupted?	Refer to Table 6-27.

Table 6-30. Unable To Link Local Radio I/O

PROBLEM

The operator is unable to link the Radio I/O to the CPU.

INSPECTION	ACTION
1. Is there a fault reported at the Keyboard/Display?	If a fault is indicated, reset the K/D. If the fault indication persists, see Table 6-14.
2. Is the K/D software version compatible with the CPU boot tape version?	Note the software versions listed on the display when the K/D is turned on (or reset). Software versions 10 and lower will only work with CPU version 20 boot tapes. Software versions 11 and higher will only work with CPU versions 22 and higher. If in doubt, the CPU boot tapes are marked with a four-digit sequence x2vv, where x=1 or 2 (of two tapes), and vv is the software version number.
3. Is the Local I/O Configuration selected?	When initializing the local Radio I/O, make sure option 1 (LOCAL) is selected at the I/O configuration menu.
4. Is W3302 attached to J6 of the I/O Rack?	W3302 must be attached to J6 of the I/O Rack. It is the only cable that will support Radio I/O operation.
5. Is the CPU active?	Make sure the CPU has been booted successfully.

Table 6-31. Unable To Link Local Mission I/O

PROBLEM

The operator is unable to link the Mission I/O with the CPU.

INSPECTION	ACTION
1. Is there a fault reported at the Keyboard/Display?	If a fault is indicated, reset the K/D. If the fault indication persists, see Table 6-14.
2. Is the K/D software version compatible with the CPU boot tape version?	Note the software versions listed on the display when the K/D is turned on (or reset). Software versions 10 and lower will only work with CPU version 20 boot tapes. Software versions 11 and higher will only work with CPU versions 22 and higher. If in doubt, the CPU boot tapes are marked with a four-digit sequence x2vv, where x=1 or 2 (of two tapes), and vv is the software version number.
3. Is the Radio I/O linked?	If the Radio I/O is not linked, it is possible that either the CPU needs to be reset (warm restart or re-boot), or that the terminal has not been initialized or configured yet. Establish the Radio I/O link first.
4. Does the terminal configuration set-up include Mission I/O #1?	If the Terminal Configuration does not include Mission I/O #1, the CPU will not support a link with the local Mission I/O.
5. Is the Local I/O configuration selected?	When initializing the local Mission I/O, make sure option 1 (LOCAL) is selected at the I/O configuration menu.
6. Is W3303 attached to J6 of the I/O Rack?	If W3303 is not attached to the J6, the local Mission I/O will not be able to link with the CPU.

Table 6-32. Unable To Link Fieldwire-Remoted I/O

PROBLEM

The operator is unable to link a remoted I/O Rack to the Force Terminal via fieldwire.

INSPECTION	ACTION
1. Is there a fault reported at the Keyboard/Display?	If a fault is indicated, reset the K/D. If the fault indication persists, see Table 6-14.
2. (Mission I/O only) Is the I/O listed in the terminal configuration set-up menu?	If the Terminal Configuration does not include the appropriate Mission I/O, the CPU will not support a link with the I/O. Note: Upon initialization, the Radio I/O must be active and the Terminal Configuration must be set up before the mission I/O will link.
3. Are the SIU, Telephone Modem, and FAN SEP (if applicable) set up correctly?	Review setup for the SIU, Telephone Modem, and FAN SEP as applicable in TM 11-5895-1218-12, paragraph 2-8.g.
4. Is the appropriate I/O configuration (2-wire or 4-wire) selected?	When initializing the I/O, make sure option 2 (2-wire) or option 3 (4-wire) is selected at the I/O configuration menu.
5. Are the KG-84As set up properly in the I/O Rack and at the Force Terminal?	Make sure a KG-84A is installed in the I/O Rack and in the Force Terminal to support the remote data link. Make sure the KG-84A settings are appropriate for the remote I/O link and that the same cryptovariable has been loaded at each KG-84A. If the I/O Rack KG-84A is set up properly, the indicator lamps on the KG-84A will flash every 15 to 30 seconds until the link is established. If the flashing does not occur, check the K/D, KG-84A, Telephone Modem, and rack cabling.
6. Does the fieldwire show any signs of damage?	Visually inspect the fieldwire for any signs of insulation damage, kinks, or breaks. Make sure both ends are securely attached to the correct binding posts.

Table 6-32. Unable To Link Fieldwire-Remoted I/O (continued)

INSPECTION	ACTION
7. Is the fieldwire connected properly?	The binding posts on the SIU and I/O Rack are color coded with a red and black pair for each voice and data channel. The red binding posts are used for communications in the 2-wire mode, while both pairs are used in the 4-wire mode. The red pair at the SIU must be connected to the red pair at the I/O Rack and the black pair at the SIU must be connected to the black pair at the I/O Rack.
8. Are any other I/O Racks associated with the Force Terminal active?	If no, make sure that the CPU has been booted successfully. If yes, use a known good port on the SIU and attempt to link the I/O.

Table 6-33. Unable To Link VHF-Remoted I/O

PROBLEM

The operator is unable to link a remoted I/O Rack to the RN Force Terminal via VHF Radio.

INSPECTION	ACTION
1. Is there a fault reported at the Keyboard/Display?	If a fault is indicated, reset the K/D. If the fault indication persists, see Table 6-14.
2. Is Mission I/O #2 listed in the terminal configuration set-up menu?	Mission I/O #2 is the only I/O that is supported for VHF-remoted operations by the Force Terminal.
3. Are the SIU, Telephone Modem, and FAN SEP set up correctly?	Review setup for the SIU, Telephone Modem, and FAN SEP as applicable. Note: All VHF modes of operation are 2-wire only.
4. Is the VHF I/O configuration selected?	When initializing the I/O, make sure option 4 (VHF) is selected at the I/O configuration menu.
5. Are the KG-84As set up properly in the I/O Rack and at the Force Terminal?	Make sure a KG-84A is installed in the I/O Rack and in the Force Terminal to support the remote data link and that the same cryptovariable has been loaded at each KG-84A. Make sure the KG-84A settings are appropriate for the remote I/O link. If the I/O Rack KG-84A is set up properly, the indicator lamps on the KG-84A will flash every 15-30 seconds until the link is established.
6. Is the VHF Radio set up properly in the FAN Terminal and transmitting?	When the KG-84A lights flash, the VHF Radio in the FAN Terminal should be transmitting. Listen for the sound of the fan on the VHF Radio. If the VHF Radio is not transmitting, check the FAN SEP switch settings, cabling, and ensure that the VHF radio has been set for X-mode operations. Ensure that the Squelch is set to New Squelch Off.

Table 6-33. Unable To Link VHF-Remoted I/O (continued)

INSPECTION	ACTION
7. Is the FAN SEP operational?	Perform BIT on the FAN SEP. If BIT fails, refer to TM 11-5895-1104-10-2.
8. Is the VHF Radio set up properly in the Force Terminal?	Ensure that the proper cabling is connected and that the VHF radio has been set for X-mode operations. Ensure that the Squelch is set to New Squelch Off.
9. Are both VHF Radios set to the same frequency?	Make sure both VHF Radios (RN FT and FAN Terminal) are set to the same frequency.
10. Is the VHF Radio frequency usable?	If interference or other traffic is present on the VHF Radio frequency, the data link will be affected. When possible, try to establish a voice link before attempting a data link.
11. Is unsquelched noise is heard in the handset or continual clicking in the SIU or in the FANSEP?	If so, the VHF squelch may need to be adjusted in the SIU or the FANSEP. Refer to TM 11-5895-1218-34, paragraph 2-50f for the proper procedures.
12. Are any other I/O Racks associated with the Force Terminal active?	If no other I/O Racks are active, make sure that the CPU has been booted successfully.
13. Is the I/O Rack remoted from the FAN Terminal but still connected to the RN FT via VHF?	If so, ensure that the FAN SEP Mode switch is set to Remote VHF. Also, the Telephone Modem should be set up for 2-wire and the red binding posts on the FAN SEP are connected to the red binding posts on the I/O Rack.

Table 6-34. Shelter Power Is Off

PROBLEM

No power is present at the Force Terminal.

INSPECTION	ACTION
1. Is input power present?	Check the power source (truck, generator, commercial power) for available power. NOTE: The PPC power switch will shut itself off if voltage drops too much, so the power source may still be active. Make sure power is present before attempting any more troubleshooting.
2. (Stationary) Is the PPC power switch on?	Check the input voltage available, using the PCU voltmeter. If all input voltages are within acceptable values, turn the PPC power switch on. If the PPC power switch does not stay on, turn off all PCU circuit breakers and try again.
3. (Stationary) Is the PPC voltage selector switch in the appropriate position?	Check the input voltages using the PCU voltmeter. The PPC voltage selector should be set closest to the input voltages measured. **CAUTION** Do not change the voltage selector switch while the PPC is on!
4. (Mobile) Is the truck running?	Continued mobile operation after truck engine stoppage will cause vehicle battery damage. If engine has stopped, operator should pause all stacks and turn off non-essential equipment. If truck cannot immediately be restarted, or there is a charging circuit failure; power down all radio stack equipment and apply generator power, if possible.

Table 6-34. Shelter Power Is Off (continued)

INSPECTION	ACTION
6. (Mobile) Are the DC Entry and DC/AC Inverter switches on?	Make sure the truck is running and make sure the DC Entry circuit breaker and the DC/AC Inverter circuit breakers are on.
7. (Mobile) Is the engine running at the proper RPM?	If the truck is not moving, set the engine RPM to the specifications outlined in the vehicle TM.

Table 6-35. Shelter Power Was Briefly Interrupted

PROBLEM

The power to the shelter was lost or interrupted briefly.

INSPECTION	ACTION
1. Was there an interruption of the input power?	If power was interrupted due to lightning, or brief commercial power/generator power fluctuations/outages, or truck engine stall/restart, verify that the CIU is on (if not cycle CIU power), verify radio stack equipment is powered on and initiate a warm restart. If power was interrupted for no apparent reason, check the input voltages and the PPC voltage selector switch (stationary) or the engine idle speed (mobile) before proceeding.
2. (Stationary) Is the PPC voltage selector switch in the appropriate position?	Check the input voltage using the PCU voltmeter. The PPC voltage selector should be set closest to the input voltages measured. **CAUTION** Do not change the voltage selector switch while the PPC is on!
3. Did any of the PCU circuit breakers trip?	If a PCU circuit breaker tripped (other than for ECUs 1 and 2), an LRU may have caused the trip. This LRU may have caused sufficient current surge to trip the terminal's input circuit breaker(s), causing power to be interrupted to the entire terminal. Whenever the proper 3-phase input power is interrupted, PCU breakers for ECUs 1 and 2 will automatically shut off. Reset circuit breakers.
4. Has CB1 on the PPC tripped?	When CB1 has tripped, refer to paragraph 2.16.1.3d.

Table 6-36. Unable To Communicate Via RTTY

PROBLEM

The operator is unable to communicate in RTTY mode.

INSPECTION	ACTION
1. Is there an active voice or RN data stack in the shelter?	Interference from voice or RN data communications could be preventing proper RTTY communication. Insure Broadband Antenna being used for RTTY is separated as far as possible from the other antennas.
2. Are the stack setup RTTY settings and KG-84A settings correct?	KG-84A settings differ for RTTY than for RN data operations. Refer to paragraph 2.10.2.3a for the correct settings.
3. Are the proper message headers being included as the first part and at the end of the message?	Refer to paragraph 2.10.2.3c for the proper headers.
4. Are the terminals using the same character formats?	Verify that both are using the same character format (BAUDOT or ASCII). Refer to paragraph 2.10.2.3b.
5. Are the terminals using the same sideband?	Verify sideband to be used.
6. Is the radio tuning to the correct frequency?	If possible, put the radio in voice mode and try tuning the radio to the frequency of a known nearby HF broadcast station. If the radio is unable to receive the broadcast signal, it might not be tuning to the correct frequency, and the Receiver (or R/E) needs to be replaced. Loop around BIT test can be used to verify proper tuning; replace R/E, PPS, or cables as necessary.
7. Was RTTY 1, RTTY 2, or RTTY 3 selected in the Message Destination?	RTTY1 sends the message from the CPU to Stack 1. If the RTTY message destination does not match the RTTY configured stack, the message will not be transmitted. Ensure that the proper destination is being entered.

Table 6-36. Unable To Communicate Via RTTY (continued)

PROBLEM

The operator is unable to communicate in RTTY mode.

INSPECTION	ACTION
8. Is there a problem at other terminal(s)?	If there is an idle data stack in the Force Terminal, it can be used as a RTTY-receive stack. Simply transmit a message from the RTTY stack to the RTTY-receive stack. If communication is successful, this means that the other terminal(s) have a problem, or are not set up with the same RTTY parameters.

Table 6-37. NCS/ANCS/IT Functional Problems

PROBLEM

Unable to perform NCS/ANCS/IT functions.

INSPECTION	ACTION
1. Is the shelter ANCS capable?	Upon initialization of the terminal the following audit trail should appear "Terminal is ANCS Capable". This audit trail appears at the Radio I/O after the CPU version number. If it does not appear, verify that the correct CPU load tapes were used to boot the terminal.
2. Is access allowed to the NCS/ANCS Functions Option menu?	If not, go to the Setup menu on the Radio I/O. Select "Specify NCS/ANCS/IT List". Verify that your terminal ID number is specified as a NCS or ANCS. If still unable to perform NCS options, verify that the correct version of CPU load tapes were used to boot the terminal.
3. Are any status lines or audit trails displayed indicating an invalid attempt to perform a NCS/ANCS/IT command or function?	If so, go to the Setup menu on the Radio I/O. Select "Specify NCS/ANCS/IT List". Verify that your terminal ID number is specified as a NCS or ANCS. If still unable to perform NCS options, verify that the correct version of CPU load tapes were used to boot the terminal.

Table 6-38. NCS/ANCS/IT Data Link Problems

PROBLEM

T1SC (TC0) unable to gain complete control of the subnet.

INSPECTION	ACTION
1. Has control been lost for more than 30 minutes?	If so, review Table 6-28.
2. Has complete control been re-established?	During normal operation of the upper echelon, the top tier is monitored by the TC1 on Tier 2. If the TC1 detects the absence of the TC0, the TC1 will direct another Tier 1 terminal to take over the role of TC0. At this time the new TC0 will receive an audit trail indicating "Acquired Control of Subnet aaa on Stack b". The new TC0's stack configuration will automatically be changed to T1SC. The previous TC0 will receive an audit trail indicating "Surrendered Control of Subnet aaa on Stack b". The previous TC0's stack configuration will automatically change to T1SM. Under poor propagating conditions, the existing TCD may not receive the TC1 directive. If this happens, the affected Tier 1 terminals will compete for control of the subnet. When a tier 1 terminal acquires or surrenders subnet control, that terminal shall notify the Network Manager. The Network Manager shall perform the following inspections and appropriate actions to resolve the competition.

Table 6-38. NCS/ANCS/IT Data Link Problems (continued)

INSPECTION	NETWORK MANAGER ACTION
1. Are any of the Tier 1 terminals currently configured to be a T1SC for the affected subnet?	If not, configure the desired Tier 1 terminal to be a T1SC for the affected subnet and ensure that subnet constitution is started. Pause the other T1 terminal until the subnet is constituted.
2. Is there more than 1 terminal currently configured to be a T1SC for the affected subnet?	If not, review Table 6-28.
3. Are more than 1 of the T1SC terminals indicating that they are in subnet?	If so, wait 10 minutes for the terminal(s) to surrender control. If the situation persists, pause all but the desired T1SC by performing the appropriate Stack x BIT for the affected subnet. Following BIT, wait 10 minutes and then start constitution. If the terminal(s) continues to lockstep, after two complete frequency cycles, use the Stack Configuration menu to turn the appropriate stack off, reconfigure the terminal(s) to be a T1SM, and start sign-in.
4. Is 1 of the T1SC terminals indicating that it is in subnet and the other T1SC terminal(s) is lockstepping?	If so, allow the lockstepping terminal(s) to perform two complete frequency cycles, then use the Stack Configuration menu to turn the appropriate stack off, reconfigure the terminal(s) to be a T1SM, and start sign-in.
5. Are all of the T1SC terminals lockstepping?	If so, pause all but the desired T1SC by performing the appropriate Stack x BIT for the affected subnet. Following BIT, wait 10 minutes and then start constitution. If the terminal(s) continues to lockstep, after two complete frequency cycles, use the Stack Configuration menu to turn the appropriate stack off, reconfigure the terminal(s) to be a T1SM, and start sign-in.

Table 6-39. TXS-RXS Interface Problems

PROBLEM

Unable to receive status information from the RXS.

INSPECTION	ACTION
1. Are there any equipment fault indications?	All of the equipment in the TXS and RXS are the same as in a standard Force Terminal. If a fault indication is given, refer to the appropriate troubleshooting table listed in paragraph 6.1.1.
2. Are the correct variables loaded in the COMSEC and TRANSEC devices?	ANY LRU that is duplicated at each site (i.e Stack 1 Radio at the TXS and Stack 1 Radio at the RXS) must have the same variable loaded in order to communicate. If in doubt, load the proper variable.
3. Is the correct Time of Day loaded in the TXS and the RXS?	If the TOD does not match, the Radio I/O will display the following audit trail "Time Difference Detected with RXS, Check RFO". Reload TOD at the TXS. If the time difference still exists, reload TOD at the RXS.
4. Are all three link KG-84As FULL OPR lights on?	If not, verify that the KG-84As have been properly loaded and setup.
5. Is the interface problem persisting?	If so, the problem may be with the communications connection between the TXS and the RXS. Have the communication media verified by the proper organization.

Table 6-40. RXS Power Is Off

PROBLEM

There is no power to any of the RXS equipment.

INSPECTION	ACTION
1. Is input power present?	Check the power source for available power. Make sure power is present before attempting any more troubleshooting.
2. Are any of the PCU circuit breakers tripped?	If a PCU circuit breaker tripped, an LRU may have caused the trip. This LRU may have caused sufficient current surge to trip the terminal's input circuit breaker, causing power to be interrupted to the entire terminal.

Table 6-41. RXS Power Was Briefly Interrupted

PROBLEM

Power to the RXS equipment was lost or interrupted briefly.

INSPECTION	ACTION
1. Was there an interruption of the input power?	If power was interrupted due to lightning or brief commercial power/generator power fluctuations/outages, or truck engine stall/restart, recycle CIU power, verify radio stack equipment is powered on and initiate a warm start. If power was interrupted for no apparent reason, check the input voltage before proceeding.
2. Did any of the PCU circuit breakers trip?	If a PCU circuit breaker tripped, an LRU was affected, causing the trip. This LRU may have caused sufficient current surge to trip the terminal's input circuit breaker, causing power to be interrupted to the entire terminal.

Table 6-42. Team Terminal Does Not Power On

PROBLEM

The Team Terminal equipment does not power up.

CAUTION

Ensure that all switches on the TT PS are in the OFF position prior to connecting or disconnecting the input power.

INSPECTION	ACTION
1. Is the polarity of input power cable connections correct?	The Team Terminal Power Supply (TT PS) is sensitive to DC input polarity. The TT PS is also sensitive to the wiring of the ac input, and the AC and neutral input lines must be wired correctly. Refer to paragraph 4.4.2 for the proper procedures.
2. Is the correct input (AC or DC) selected on the TT PS?	Check the position of the AC and DC power switches on the front panel of the TT PS. If in doubt about the type of power source (AC vs. DC), the DC power cable is W100, the 115V AC power cable is W101, and the 230V AC power cable is W102.
3. Is the power source turned on?	Verify that the power source for the Team Terminal is on and supplying the proper voltage.
4. (AC only) Is the correct power cable being used?	Check the power cable to make sure it is the correct cable for the input voltage (115 VAC or 230 VAC) available.
5. Is the fault light on the TT PS on?	If so, verify Inspections 1 through 4. If the fault persists, refer to Table 6-51.
6. Is the TT PS properly seated in the rack?	If the TT PS indicates output power but the other LRUs will not power on, ensure that the TT PS is making proper connection to the power distribution box located behind the TT PS. **CAUTION** Ensure that all power switches are off prior to disconnecting the TT PS.

Table 6-43. TT Unable To Load Time-Of-Day (TOD)

PROBLEM

Unable to successfully transfer TOD to the RFO during initial loading or updating of TOD.

NOTE: TOD should not be loaded prior to the RFO COLD OSCILLATOR light extinguishing.

INSPECTION	ACTION
1. Is the RFO external power indicator on?	Review the System Power Up procedure in paragraph 4.4.4. Repeat the Power Up sequence, if necessary. If the problem persists refer to Table 6-50 Inspection 3.
2. Are there cabling errors?	Make sure the TOD source is connected properly.
3. Is the TOD source a R-2171/TSC?	If so, continue to Inspection 4. If the TOD source is a RFO go to Inspection 6.
4. Is the R-2171 setup and connected properly?	Refer to paragraph 2.8 for the proper setup and procedures for using the R-2171. If necessary, repeat the transfer procedure.
5. Has the R-2171 acquired TOD?	It may be necessary to move the antenna on the satellite receiver in order to receive the signal from the appropriate satellite. If unable to acquire TOD refer to the R-2171 TM 11-5820-1708-14&P or try a different R-2171.
6. Is the TOD source a RFO?	If so, refer to paragraph 2.8 for the proper connections and procedures for using the RFO as a TOD source. Ensure that the source RFO attempts to send TOD within 7 seconds of pressing RCV TOD.

Table 6-43. TT Unable To Load Time-Of-Day (continued)

INSPECTION	ACTION
7. Is the TOD transfer being attempted from a RN FT by connecting to the SIU?	If so, connect the TOD transfer cable directly to the transmitting RFO front panel and attempt to transfer TOD again.
8. Has TOD been successfully transferred?	If not, perform the following in the order given: 1) try a different transfer cable, 2) try a different TOD source, and 3) replace the RFO.

Table 6-44. TT Unable To Load COMSEC/TRANSEC Crypto Variables

PROBLEM

While loading cryptovariables, the COMSEC/TRANSEC device responds incorrectly or a fault is reported.

INSPECTION	ACTION
1. Is the ECCM, KG-84A or KY-65A ready to receive crypto variables?	Check for power indications and setup conditions. Refer to paragraph 4.3.6 for the proper loading procedures.
2. Is the crypto variable tape in good condition?	If the tape is damaged/worn-out/folded, replace it.
3. Does the ECCM respond when the fill device is attached?	If not, disconnect the fill device and cycle power on the radio. Attempt to load present and future variables. If the ECCM does not respond to the fill device after cycling power on the radio and the fill device has been used to fill another unit, replace the ECCM.
4. Is the cable securely attached between the fill device and the fill connection on the ECCM, KG-84A, or KY-65A?	If the connection is loose at either end, attempt to connect the cable properly. If the cable will not connect properly, either replace the cable or if possible, the operator can hold the cable in place.
5. Does the ECCM display a fault code '14' or '42' after attempting to load the variable?	If so, disconnect the fill device from the ECCM and try again. If the fault reoccurs, cycle power on the radio and try again.
6. Has this particular fill device and cable been used to successfully fill any other ECCM, KG-84A, or KY-65A?	If not, attempt to fill another unit, if possible, or replace the fill device battery, the cable, or the fill device.

Table 6-44. TT Unable To Load COMSEC/TRANSEC Crypto Variables (continued)

INSPECTION	ACTION
7. Has the crypto fill device been loaded properly? (KYK-13)	Reload the fill device if possible. If uncertain, use a KOI-18.
8. Has the ECCM, KG-84A, or KY-65A been successfully loaded?	If not, replace the ECCM, KG-84A, or KY-65A.

Table 6-45. TT I/O Fault Indications

PROBLEM

The Team Terminal I/O indicates a fault on the display or on the I/O front panel.

INSPECTION	ACTION
1. Is there a fault indication at the I/O?	If a fault is indicated, run system BIT. If the D/K is indicated to be at fault, be sure to enter YES in response to the D/K BIT Menu.
2. Does BIT clear the fault at the I/O?	If BIT does not clear the fault indications, press the BIT/RESET button on the I/O.
3. Does resetting the I/O clear the fault?	If BIT/RESET does not clear the fault, cycle the power switch off and on at the I/O.
4. Does cycling power at the I/O clear the fault?	If the fault persists, replace the I/O.

Table 6-46. TT Receiver/Transmitter Fault Indications

PROBLEM

A fault is indicated on the I/O display or on the ECCM display.

NOTE: The Receiver/Transmitter (R/T) is composed of the ECCM Module and the Receiver/Exciter (R/E).

INSPECTION	ACTION
1. Is there a R/T, ECCM, or R/E fault indication at I/O?	If a fault is indicated, run system BIT at the I/O.
2. Is input power present at the R/T?	If the green (power) lamp on the PA is not lit, press the ENT key on the R/T. The ECCM display should light up. If it does not, check the R/T power switch and the power indicator on the Vehicular Adaptor. Make sure the R/T is securely attached to the VA. Make sure power is present at the Team Terminal.
3. Does BIT from the I/O clear the fault at the R/T?	If the R/T does not respond to BIT from the I/O, cycle R/T power and repeat system BIT. If a processor-related fault is indicated (RED/BLACK INTERFACE or similar), reset the I/O and run system BIT again. If BIT results in a R/T related fault, run BIT from the R/T.
4. Does BIT (from the R/T) clear the fault at the R/T?	If an ATU or other tuning fault is indicated at the R/T after running BIT, check the ATU and antenna installation and repeat BIT. If a fault persists, cycle power to the R/T.
5. Does cycling power at the R/T clear the fault?	If the R/T passes power-on BIT after cycling power, repeat BIT from the I/O. If the R/T fails, consult Appendix A for the ECCM fault code(s) displayed and take the appropriate action.

Table 6-47. TT ATU Fault Indications

PROBLEM

A fault is indicated on the I/O display or on the ECCM display.

INSPECTION	ACTION
1. Is there an ATU fault indication at the I/O?	If an ATU fault is indicated at the I/O, run system BIT.
2. Is input power present at the ATU?	If no tuning noise is heard, make sure the power and control cables are attached to the ATU and to the front of the TT rack.
3. Does BIT from the I/O clear the fault at the ATU?	If the fault persists, run BIT from the R/T.
4. Does BIT (from the R/T) clear the fault at the ATU?	If the fault persists, check the antenna installation, cabling, and grounding.
5. Is the antenna attached securely?	If the antenna is wired properly and attached securely, replace the ATU.

Table 6-48. TT Power Amplifier (PA) Fault Indications

PROBLEM

A fault is indicated on the I/O display, on the ECCM display, or on the PA front panel.

INSPECTION	ACTION
1. Is there a PA fault indication at the I/O?	If the I/O reports a PA fault, run system BIT.
2. Is input power present at the PA?	If the green (power) lamp on the PA is not lit, press the ENT key on the R/T. The ECCM display should light up. If it does not, check the R/T power switch and the power indicator on the Vehicular Adaptor. Make sure the R/T is securely attached to the VA. Make sure power is present at the Team Terminal.
3. Does BIT from the I/O clear the fault at the PA?	If a fault persists, run BIT from the R/T.
4. Does BIT (from the R/T) clear the fault at the PA?	If a fault persists, check the R/T, ATU, and antenna installation. Manually enter any frequency on the RT then run BIT. If the ATU is not tuning properly, refer to Table 6-47. If the fault persists, replace the PA.
5. Does system BIT (with test frequency) clear the fault at the PA?	If so, troubleshoot the ATU. If fault persists, replace the PA.

Table 6-49. TT RN Modem Fault Indications

PROBLEM

A fault is indicated on the I/O display and/or the Modem front panel.

INSPECTION	ACTION
1. Is there a Modem fault indication at the I/O?	If a Modem fault is indicated, run system BIT.
2. Is input power present at the Modem?	If power is not present, check the TT PS and the Modem power switches. If power is present but the Modem does not power on, replace the Modem.
3. Does the BIT lamp on the Modem continue flashing?	If the BIT lamp flashes for approximately eight times and then stays on, check for the presence of 10MHz at the Modem input.
4. Does running system level BIT clear the fault at the Modem?	If BIT does not clear the fault indications, check the KG-84A settings and operational status.
5. Is the KG-84A loaded and setup properly?	If the KG-84A is not set properly, change the settings (refer to TM 11-5895-1220-12, paragraph 2-5a(2) for proper settings) and repeat system level BIT. If the fault persists, run BIT at the Modem.
6. Does BIT from the Modem clear the fault at the Modem?	If not, cycle power on the Modem. If so, run system BIT to clear the system level fault.
7. Does cycling power clear the fault at the Modem?	If not, disconnect all cables (except power and 10MHz) from the Modem and run BIT at the Modem.
8. Does BIT from the Modem clear the fault with the cables removed?	If not, replace the Modem. If so, connect the Control Bus cable to the Modem and run BIT at the Modem.
9. Does BIT from the Modem pass with the Control Bus cable connected?	If not, reset the I/O and then run BIT at the Modem. If the fault persists, replace the Modem. If the fault does not reoccur, connect the KG-84A cable to the Modem and run BIT at the Modem.

Table 6-49. TT RN Modem Fault Indications (continued)

INSPECTION	ACTION
10. Does BIT from the Modem pass with the KG-84A cable connected?	If not, replace the KG-84A. If the fault persists, replace the Modem. If so, connect the Radio cable to the Modem and run BIT at the Modem.
11. Does BIT from the Modem pass with the Radio cable connected?	If so, run system BIT to clear the system level fault. If not, cycle power on the R/T and run BIT at the Modem. If the fault persists, replace the R/T. If the fault reoccurs, replace the Modem.

. Table 6-50. TT RFO Fault Indications

PROBLEM

A RFO Fault is reported at the I/O.

INSPECTION	ACTION
1. Is the I/O reporting a fatal fault and the audit "RFO HAS NEW TIME"?	Run system BIT. This is normal after TOD is updated.
2. Is there a RFO fault indication at the I/O?	Occasionally, the RFO timekeeping functions override all other communications with the I/O, and the I/O interprets this as a RFO fault. If this occurs, run terminal level BIT.
3. Is input power present at the RFO?	If the EXT PWR lamp on the RFO is off, check the lamp switch setting and the TT PS ac or DC power switch. If necessary, measure the voltage at the power cable. If correct voltage is present, replace the RFO.
4. Does BIT from the I/O clear the fault at the RFO?	If the fault is cleared, proceed. If the fault persists and the I/O is operational, cycle power to the RFO.
5. Does cycling the RFO power switch clear the fault at the RFO?	If BIT and cycling RFO power do not clear the fault, replace the RFO.

Table 6-51. Power Supply (TT PS) Fault Indications

PROBLEM

The I/O indicates a TT PS fault and/or the TT PS fault lamp is on.

NOTE: The TT PS has three front panel switches: AC, DC, and RFO. The RFO switch is only used in DC operation and it's only function is to allow the RFO to maintain TOD from the vehicle battery.

INSPECTION	ACTION
1. Is there a TT PS fault indication at the I/O?	If the I/O reports a TT PS fault, inspect the TT PS and check the other equipment for power.
2. Is any of the Team Terminal equipment receiving power from the TT PS?	If power is present at the equipment, proceed with initialization. Watch the TT PS voltmeter for proper voltage or fluctuations.
3. Is the proper output voltage present?	If the proper voltage is present (28 VDC on the meter), proceed. If the voltage is too high, replace the TT PS.
4. Is voltage fluctuating when the ATU is tuning?	If the voltmeter shows a voltage drop when the ATU tunes, and the TT equipment turns off momentarily, check the ATU and antenna installation. If the ATU and antenna are properly installed, the TT PS should be replaced.
5. Is the output voltage too low or fluctuating?	If so, turn all switches off and disconnect external power. Pull the TT PS forward in the rack, so it is disconnected from the Power Junction Assembly in the rack. Reapply power.
6. Is the output voltage correct with the TT PS pulled out?	If so, some of the Team Terminal equipment may be damaged or interfering with the TT PS operation. Turn the TT PS off and reinstall. Turn on one LRU at a time to isolate the faulty LRU and replace accordingly. If not, check the input voltage. If the input voltage is correct, replace the TT PS.

Table 6-52. TT Unable To Establish Voice Communications

PROBLEM

The operator is unable to establish voice communications.

INSPECTION	ACTION
1. Are there any equipment fault indications?	If any equipment faults are indicated at the I/O, perform the necessary troubleshooting.
2. Is the KY-65A loaded and set up correctly?	Make sure the KY-65A is set to the correct mode (plain or cipher). If cipher, make sure the correct cryptovariable was loaded properly.
3. Is the correct handset being used?	Only H-356 handsets are wired correctly for transmission from RN equipment.
4. Is communication quality poor?	If the sound is garbled or noisy, check the KY-65A for receipt of encrypted audio. Make sure both communication terminals have the same cryptovariables. If excessive noise is present when neither terminal is transmitting, it may be necessary to select a different frequency (hopset) for communication.
5. Is the correct mode (N or E) selected?	Make sure both terminals are using the same operating mode.
6. Is the correct sideband and frequency or hopset loaded?	Make sure both terminals are using the same operating sideband and frequency (hopset) for voice communication.
7. Are the correct COMSEC/TRANSEC cryptovariables loaded?	If audio is garbled or intermittent, the cryptovariables should be checked. Reload if necessary.
8. Is ECCM mode audio intermittent?	If the TOD (time of day) is not the same at both terminals, ECCM mode audio might be intermittent. If Non-ECCM mode voice communication is successful under these conditions, at least one terminal needs to have TOD reloaded. If data communications are successful at one terminal, and not at the other it is probable that the other terminal requires TOD update.

Table 6-52. TT Unable To Establish Voice Communications (continued)

INSPECTION	ACTION
9. Is the radio tuning to the correct frequency?	If possible, try tuning the radio to the frequency of a known nearby HF broadcast station. If the radio is unable to receive the broadcast signal, it might not be tuning to the correct frequency, and the Receiver/Transmitter or Vehicular Adapter needs to be replaced.
10. Is there a problem with the terminal that the Team Terminal is trying to communicate with?	If voice communications are possible with other terminals, and the frequency/hopset, mode, cryptovariables, and TOD are correct, then the other terminal might be the cause of the communication problem.

Table 6-53. TT Unable To Maintain Voice Communications

PROBLEM

Voice communications are lost or interrupted.

INSPECTION	ACTION
1. Are there any equipment fault indications?	If a fault indication is shown, refer to the appropriate table.
2. Is communication quality poor?	If excessive noise is present when neither terminal is transmitting, it may be necessary to select a different frequency (hopset) for communication.
3. Are incorrect cryptovariables present after variable change?	If voice communication is not possible after variable change, load the correct cryptovariables into the ECCM and KY-65A.
4. Is the radio tuning to the correct frequency?	Try tuning the radio to the frequency of a known nearby HF broadcast station. If the radio is unable to receive the broadcast signal, it might not be tuning to the correct frequency, or may have a high receive path attenuation, and the R/E needs to be replaced. Also, the PA, ATU, antenna, or cabling may require replacing.
6. Is there a problem with the terminal that the Team Terminal is trying to communicate with?	If voice communications are possible with other terminals, and the frequency/hopset, mode, cryptovariables, and TOD are correct, then the other terminal might be the cause of the communication problem.

Table 6-54. TT Unable To Establish Data Link

PROBLEM

The Team Terminal does not sign into a data subnet.

INSPECTION	ACTION
1. Are there any equipment fault indications?	If any equipment faults are indicated at the I/O, perform the necessary troubleshooting.
2. Are the set-up parameters, subnet number, mode, destination terminal, sideband, frequencies, and hopsets correct?	Confirm the set-up entries.
3. Is the date correct?	Confirm the date on the top row of the I/O display. If the date is incorrect, enter the proper date by selecting the DATE option on the SET UP menu.
4. Are the correct COMSEC/TRANSEC cryptovariables loaded?	If in doubt, reload COMSEC and TRANSEC cryptovariables.
5. Is the KG-84A set up correctly?	Confirm the KG-84A setup.
6. Does terminal contain correct TOD?	If the displayed time is more than 5 minutes off of a known good time, reload TOD. TOD updates are required at least every 90 days from a known good source (R-2171/TSC). Reload TOD if update has not been done within 90 days or if update cannot be verified.
7. Is the ATU tuning at the appropriate time?	The ATU should tune once every minute until a data link is established. When first initialized, the tune will begin at 53 seconds into the minute, as displayed on the I/O, and should complete by 3 seconds into the next minute. If the ATU is tuning at 7 seconds into the minute, it has heard and understood an even tier controller. If the ATU is not tuning properly following initialization, reinitialize the terminal.

Table 6-54. TT Unable To Establish Data Link (continued)

INSPECTION	ACTION
8. Is the radio tuning to the correct frequency?	If possible, put the radio in voice mode and try tuning the radio to the frequency of a known nearby HF broadcast station. If the radio is unable to receive the broadcast signal, it might not be tuning to the correct frequency, and the Receiver/ Transmitter or the Vehicular Adapter needs to be replaced.
9. Is the Team Terminal transmitting?	The terminal will only transmit after it has heard and understood a controlling terminal. To determine if the terminal is transmitting, watch for the lights on the KG-84A to flash and then listen to the handset (connected to J3 of the ECCM) to hear the transmit data. If the terminal does not transmit, the problem could be at the controlling terminal. If possible confirm the status of the controlling terminal.
10. Is the terminal transmitting but not signing in?	If so, it is probable that the controlling terminal is unable to hear or understand the terminal. This situation is an indication of poor propagation or interference. Some actions that can improve this situation are: move to a new location, change frequency list (only with proper authorization), or wait to see if the propagation will improve.
11. Is there a problem at the controller terminal?	If possible, contact the controller terminal. The fault may exist at that terminal.

Table 6-55. TT Unable To Maintain Data Link

PROBLEM

Data communications are lost or interrupted.

INSPECTION	ACTION
1. Are there any equipment fault indications?	If any equipment faults are indicated, perform the necessary troubleshooting by referring to the appropriate table.
2. Was the link established before COMSEC or TRANSEC variables were updated or reloaded?	Verify that the proper variables were used. If in doubt, reload COMSEC and TRANSEC cryptovariables in the KG-84A and the ECCM.
3. Did the link fail after crypto rollover (midnight)?	Confirm that the proper TRANSEC cryptovariable was used to load the future variable prior to rollover. If in doubt, load the proper variable.
4. Is there a problem at the controller member terminal?	Contact the controller terminal and verify status.
5. Did terminal have a power interruption?	Refer to Table 6-57.
6. Is the data link still interrupted?	Refer to Table 6-54.

Table 6-56. Team Terminal Power Source Is Off

PROBLEM

No input power is available for the Team Terminal.

INSPECTION	ACTION
1. Is the input (AC or DC) power present?	Make sure the power source is turned on. If the power source turns off when the TT is turned on, check the source for power output capability. Under normal conditions, the TT power consumption is less than 1.5kW (about 60 Amps maximum at 24 VDC, 15 Amps maximum at 115 VAC, 8 Amps maximum at 230 VAC). If excessive power is being drawn by the Team Terminal, check the TT PS for proper operation.

Table 6-57. TT Power Was Briefly Interrupted

PROBLEM

The power to the Team Terminal was lost or interrupted briefly.

INSPECTION	ACTION
1. Was input power interrupted?	Make sure the power source is turned on. If power continues to be interrupted, refer to Table 6-56.
2. Did any of the equipment power switches trip?	If a LRU power switch tripped, an LRU may have caused the trip. This LRU may have caused sufficient current surge to trip the TT PS's input circuit breaker, causing power to be interrupted to the entire terminal. Reinitialize the terminal.

Table 6-58. Manpack Does Not Power On

PROBLEM

The ManPack Radio does not power on.

INSPECTION	ACTION
1. Is the Battery Case attached properly to the Manpack Radio?	Inspect the connection between the Battery Case and the Manpack Radio. If in doubt, re-connect the two LRUs.
2. Are the batteries in the Battery Case fully charged?	Insufficient power can prevent operation. If necessary, re-install the Manpack equipment on the Team Terminal to recharge the Battery Case, or replace the Battery Case.

Table 6-59. Manpack Radio Fault Indications

PROBLEM

The ECCM display indicates a fault.

INSPECTION	ACTION
1. Does a fault appear on the ECCM display?	Perform BIT at the Manpack radio.
2. Does BIT clear the fault?	If a fault persists, refer to Appendix A for a list of ECCM faults and check the following.
3. Is the antenna attached securely?	If the antenna is not attached properly, a tuning fault may occur. Make sure the antenna is installed correctly and repeat BIT.
4. Does cycling power to the Manpack radio clear the fault?	If power-on BIT reveals no faults, proceed. If the Manpack fails BIT, refer to Appendix A for the ECCM fault code(s) displayed and take the appropriate action.
5. Are the batteries in the Battery Case fully charged?	Insufficient power can cause problems with tuning or Manpack operation. If necessary, reinstall the Manpack equipment on the Team Terminal to recharge the Battery Case, or replace the Battery Case.
6. Is the fault occurring when attempting to change to ECCM mode?	If so, ensure that the proper initialization procedures were followed and that the Manpack has not been turned off or lost power since initialization.

Table 6-60. Unable To Establish Manpack Voice Communications

PROBLEM

The operator is unable to establish voice communications.

INSPECTION	ACTION
1. Are there any equipment fault indications?	If any equipment faults are indicated, perform the necessary troubleshooting.
2. Is the KY-65A being used?	If so, make sure the KY-65A is set to the correct mode (plain or cipher). If cipher, make sure the correct cryptovariable was loaded properly.
3. Is the correct handset being used?	Only H-356 handsets are wired correctly for transmission from RN equipment.
4. Is communication quality poor?	If so, it may be necessary to select a different frequency (hopset) for communication.
5. Is the correct mode (N or E) selected?	Make sure both sites are using the same operating mode.
6. Is the correct sideband and frequency or hopset loaded?	Make sure both sites are using the same operating sideband and frequency (hopset) for voice communication.
7. Are the correct COMSEC/TRANSEC cryptovariables loaded?	If not, the cryptovariables should be reloaded.
8. Has power been lost or cycled on the Manpack?	If so, ECCM mode communications will not be possible. If ECCM mode is required, it will be necessary to reinitialize the Manpack.
9. Is ECCM mode audio intermittent?	If the TOD (time of day) is not the same at both terminals, ECCM mode audio might be intermittent. If Non-ECCM mode voice communication is successful under these conditions, at least one terminal needs to have TOD reloaded. Reloading Manpack TOD will require reconnecting to the TT J6 connector.

Table 6-60. Unable to Establish Manpack Voice Communications (continued)

INSPECTION	ACTION
10. Is the radio tuning to the correct frequency?	If possible, try tuning the radio to the frequency of a known nearby HF broadcast station. If the radio is unable to receive the broadcast signal, it might not be tuning to the correct frequency, and the Receiver/Transmitter needs to be replaced.
11. Is there a problem with the terminal that the Manpack is trying to communicate with?	If voice communications are possible with other terminals, and the frequency/hopset, mode, cryptovariables, and TOD are correct, then the other terminal might be the cause of the communication problem.

Table 6-61. Unable to Maintain Manpack Voice Communications

PROBLEM

The operator is unable to continue voice communications.

INSPECTION	ACTION
1. Are there any equipment fault indications?	Refer to Table 6-58.
2. Is communication quality poor?	If excessive noise is present when neither terminal is transmitting, it may be necessary to select a different frequency (hopset) for communication or move to a different location.
3. Are incorrect TRANSEC cryptovariables present after midnight?	If voice communication is not possible after midnight (UT) or rollover, load the correct TRANSEC cryptovariable into the ECCM.
4. Is the radio tuning to the correct frequency?	If possible, try tuning the radio to the frequency of a known nearby HF broadcast station. If the radio is unable to receive the broadcast signal, it might not be tuning to the correct frequency, and the Radio needs to be replaced.
5. Did the link fail after rollover (midnight)?	Confirm the TRANSEC cryptovariable. If the operator is unable to load the TRANSEC cryptovariable, run BIT on the Radio. If the Radio does not respond to BIT, there is probably a rollover-induced fault at the Radio that will require cycling power to the Radio and reloading.
6. Is there a problem at the other terminal(s)?	If the Manpack Radio is not communicating with another terminal, try to make contact with any other terminal or known HF broadcast station. If contact is made, then either the other terminal is not operational or the frequency (hopset) needs to be changed.

Table 6-61. Unable to Maintain Manpack Voice Communications (continued)

INSPECTION	ACTION
7. Are the batteries in the Battery Case fully charged?	Insufficient power can prevent operation. If necessary, reinstall the Manpack equipment on the Team Terminal to recharge the Battery Case, or replace the Battery Case.

APPENDIX A

STATUS LINE, AUDIT TRAIL, I/O STATUS LINE, FAN, ERROR TRAP MESSAGES, AND E-FAULT CODES

Section I. Introduction

NOTE:
Refer to the appropriate TM before replacing any LRU. Some equipment items contain multiple subassemblies and require additional troubleshooting to identify the appropriate LRU to be replaced.

A.1 GENERAL

Status Lines and Audit Trails are used to inform Radio I/O and Mission I/O operators of the actions that are being performed by the FT. Status Lines and Audit Trails are presented on line 2 of the I/O unit display. There are two general types of Status Lines that are presented to the operators; those that are generated by the I/O unit itself, and those that are generated by the CPU. All Audit Trails are generated by the CPU.

The CPU generated Status Lines are sent, on a case by case basis, to either the Radio I/O unit or to any one of the Mission I/O units. These Status Lines will be printed on the I/O printer if the printer is powered on and enabled via the [PRINT DSBL] key. Section II of this appendix provides a description of the Status Lines generated by the CPU.

The CPU generated Audit Trails are all sent to the Radio I/O unit. While the Radio I/O unit is off-line, however, the CPU will send Audit Trails to all of the Mission I/Os that are on-line. Audit trails are automatically printed on the I/O printer if the printer is powered on, regardless of whether it has been enabled via the [PRINT DSBL] key. As each Audit Trail is sent to the I/O, it is given a sequence number. The sequence numbers start at 1, go up through 999, and then start again at 1. Section III of this appendix provides a description of the Audit Trails generated by the CPU.

The I/O generated Status Lines usually indicate operator input errors. These Status Lines are displayed on line 2 of the I/O display, but are not usually printed. Section IV of this appendix provides a description of the Status Lines generated by the I/O.

A.2 MESSAGE CONTENT

A.2.1 Variables

Variables are operational parameters which may be included in a Status Line or Audit Trail message. These parameters appear in this appendix with designations such as "aaa", "bbbb", and "cc", with each variable in a message assigned a different variable designation. The following explanation applies to all Status Line and Audit Trail messages:

- Source Terminal ID - refers to the terminal that originated the message.
- Force Terminal IDs - have numbers from 1 through 499.
- Split Site Terminal IDs - have numbers from 500 through 512.
- Team Terminal IDs - have numbers from 513 through 1022.

A.2.2 Abbreviations

All Status Line and Audit Trail messages are limited to 48 characters. Because of this limitation, certain terms are abbreviated to stay within the maximum length. The abbreviations that are used are listed below:

- AC/DC - alternating current/direct current
- ACK - acknowledgement
- AIG - Address Identifier Group
- AMP - amplifier
- ANCS - Alternate Network Control Station
- BIT - Built-In Test
- CIU - Control Interface Unit
- CPU - Central Processing Unit
- CTF - Central Theater Flood
- DB - Data Base
- ECCM - Electronic Counter Countermeasures
- FREQ - frequency
- FRQ - frequency
- FRQS - frequencies
- FUNCT - function
- GLCM - Ground Launched Cruise Missile
- HS - Hopset
- I/O - Input/Output unit
- INVLD - invalid
- IT - Injection Terminal
- LQA - Link Quality Analysis
- LRU - Line Replaceable Unit
- MSG - message
- MSGS - messages
- MTU - Magnetic Tape Unit

- NCS - Network Control Station
- NET - network
- PA - Power Amplifier
- PERM - Permanent
- RF - Radio Frequency
- RFO - Reference Frequency Oscillator
- RPT - report
- RTTY - Radio Teletype
- RX - receive
- RX'D - received
- RXS - Split Site Receive Site
- SEP - Signal Entry Panel
- SN - Subnet Number
- SRC - source
- STK - stack
- SUBCMD - sub-command
- T1 - Type 1
- T2 - Type 2
- TEMP - Temporary
- TOD - Time-of-Day
- TRM - terminal
- TX - transmit
- TX'D - transmitted
- TXS - Split Site Transmit Site

A.2.3 Message Categories. There are two categories of Status Line and Audit Trail messages: Informational and Warning.

- Informational - Informs the operator that a requested action could or could not be executed by the system, or informs the operator that the system is automatically executing a specific function and the operator is not required to take further action.

- Warning - Informs the operator that a condition exists which requires action to avoid the loss or delay of information.

Section II. CPU STATUS LINE MESSAGES

The following status line messages are arranged alphabetically starting with the first letter of the messages.

AIG aaa FULL, UNABLE TO ADD TERMINAL bbb

Where: **aaa** = AIG number
bbb = terminal ID

Explanation: Informational. An attempt was made to add a terminal to a full AIG. This can result when an NCS AIG Change Directive is transmitted or received.

Action: Non-NCS operators have no action. The NCS operator may use the DISPLAY AIG option on the MAIN MENU to examine the AIG. If desired, use the NCS AIG MEMBERSHIP CHANGE Menu to remove an existing terminal from the AIG and add the new terminal.

AIG aaa IN MSG bbb ADDRESS HAS NO MEMBERS

Where: **aaa** = AIG number
bbb = message number

Explanation: Warning. A transmit message entered by the operator or a network message being relayed by the CPU contains an AIG for which there is no terminal membership, even though the AIG tape was loaded. If this status line is displayed at a Mission I/O it indicates that the message entered for transmission from the Mission I/O contains the AIG with no members. If this status line is displayed at the Radio I/O, either a transmit message or a relay message is in error. The Radio I/O operator may determine, by the message number, whether it is a transmit message or relay message. The CPU will route an I/O-entered transmit message with a non-member AIG to its subnet controller in the hope that the AIG can be resolved at the controller. The CPU will also route both transmit messages and relay messages to all other terminal addresses that it can resolve.

Action: 1. The Radio I/O operator may verify that the AIG tape is current. If the AIG tape that was loaded is not the current tape, obtain a copy of the current AIG tape and load it using the LOAD PARAMETER TAPES option on the RADIO I/O OPERATIONAL SETUP menu.

2. If the status line is received for a message you are transmitting, verify that the AIG identified in the status line is an AIG which you want to use as an address. If it is not, retransmit the message with the correct AIG.

3. The DISPLAY AIG option on the MAIN MENU can be used to examine the contents of any AIG if there is a question concerning its membership.

AIG'S IN MESSAGE aaa IGNORED, NO AIG TAPE LOADED

Where: **aaa** = message number

Explanation: Warning. The CPU cannot properly route the message identified because it contains an AIG address and the AIG tape has not been loaded. Any transmit message entered by the operator or network message relayed by the CPU that contains an AIG address will be improperly routed until the AIG tape is loaded. Under these conditions, the CPU will route an I/O-entered transmit message that contains an AIG address to its subnet controller in the hope that the AIG can be resolved at the controller. The CPU will also route both transmit messages and relay messages to all other terminal addresses it can resolve.

Action: The Radio I/O operator must load the AIG tape, using the LOAD PARAMETER TAPES option on the RADIO I/O OPERATIONAL SETUP menu. Any transmit message entered from an I/O that contained an AIG may be re-entered for transmission after the AIG tape is loaded to ensure that the message is properly routed.

APPROACHING LOW PERM STORAGE SPACE

Explanation: Informational. The memory space reserved in the CPU for saving messages (in permanent storage) from your I/O is almost used up. In fact, the permanent message storage space is 90% full with room for only 3200 additional characters.

Action: The I/O operator should delete unnecessary messages identified on the MAIN MENU by using the DELETE MESSAGE option on the RECALLED MESSAGE Screen.

APPROACHING PERM DIRECTORY ENTRY LIMITS

Explanation: Informational. Each I/O is allowed to save up to 48 messages in the CPU's permanent storage. The name of each message in permanent storage is displayed on the MAIN MENU. This status line is displayed when the 43rd through 48th messages are stored, indicating that the maximum number of entries is being reached.

Action: The operator should be aware that the maximum number of messages that can be saved is 48. If the limit is being reached, delete unnecessary messages by using the DELETE MESSAGE option on the RECALLED MESSAGE Screen.

BAD SUBNET ROLE, STK a, NET FUNCTION NOT APPLIED

Where: a = stack number

Explanation: Informational. An attempt was made to execute a subnet member function on a subnet controller stack, or vice versa.

Action: Abort the current function. Use the SET UP STACKS option on the RADIO I/O OPERATIONAL SET UP Screen to check the subnet role of the stack in question.

CIU DOWN, ALL STK/FRQ MODIFICATIONS IGNORED

Explanation: Warning. The STACK CONFIGURATION screen data has been received and discarded by the CPU. The data cannot be processed due to CIU equipment failure.

Action: Run BIT on the CIU in order to isolate the CIU failure. When a failure is reported by CIU BIT, correct the CIU failure using the normal maintenance procedures. When CIU BIT does not report a CIU failure, run ALL STACKS BIT from the RADIO I/O BIT screen and re-enter the STACK CONFIGURATION screen data.

CIU DOWN, RF DEVICE BIT COMMANDS VOIDED

Explanation: Warning. An attempt was made by the Radio I/O operator to run BIT on a radio stack device while the CIU was down. The RF device BIT command was discarded. The CIU must be operational in order to run BIT on any of the radio stack devices.

Action: Run BIT on the CIU in order to isolate the CIU failure. When a failure is reported by CIU BIT, correct the CIU failure using the normal maintenance procedures. When CIU BIT does not report a CIU failure, run ALL STACKS BIT from the RADIO I/O BIT screen.

CIU DOWN, SIGNAL PANEL CONFIGURATION NOT APPLIED

Explanation: Warning. An attempt was made by the Radio I/O operator to configure the Signal Entry Panel while the CIU was down. The Signal Panel Configuration command was discarded. The CIU must be operational in order for the Signal Entry Panel to be configured.

Action: Run BIT on the CIU in order to isolate the CIU failure. When a failure is reported by CIU BIT, correct the CIU failure using the normal maintenance procedures. When CIU BIT does not report a CIU failure, run ALL STACKS BIT from the RADIO I/O BIT screen and re-enter the SIGNAL ENTRY PANEL AUDIO CONFIGURATION screen data.

CIU DOWN, TRM CONFIGURATION NOT APPLIED

Explanation: Warning. An attempt was made by the Radio I/O operator to configure the terminal while the CIU was down. The CIU must be operational in order for the terminal to be configured.

Action: Run BIT on the CIU in order to isolate the CIU failure. When a failure is reported by CIU BIT, correct the CIU failure using the normal maintenance procedures. When CIU BIT does not report a CIU failure, run ALL STACKS BIT from the RADIO I/O BIT screen and re-enter the TERMINAL CONFIGURATION screen data.

CONSTITUTION OF SUBNET aaa STARTED

Where: **aaa** = subnet number

Explanation: Informational. The terminal has started the network operations required to constitute (build) a subnet as a controller. This status line will occur as a result of your request to start constitution or for a loss of communications with subnet member terminals.

Action: None. Informational only

CONSTITUTION OF SUBNET aaa STILL IN PROGRESS

Where: **aaa** = subnet number

Explanation: Informational. The terminal has finished a complete pass of the network operations required to constitute (build) a subnet. It is starting another pass because the subnet is not yet built. Note: Each constitution pass will require one minute for each frequency (or hopset, depending upon operational mode) assigned to the subnet. For example, a constitution pass will require six minutes for a subnet configured with six frequencies that is operating in the Non-ECCM mode.

Action:

1. The first time this status line is received, the Radio I/O operator should use the SET UP STACKS option on the RADIO I/O OPERATIONAL SET UP screen to verify that the operational parameters for the stack have been configured correctly. The SUBNET MEMBERSHIP LIST should also be checked to confirm that the terminals identified as subnet members have been entered correctly.

2. If all configuration and subnet membership list parameters are correct and this status line is received for a second time, the Radio I/O operator should ensure that the RFO Time of Day is loaded and that the ECCM and KG variables have been loaded. The operator may also run BIT on the stack and then restart constitution. Note: If it is known that the reason that constitution of the subnet has not yet been successful is because the subnet member terminals are not ready to participate or conditions for communication are poor, this action may be avoided, and the operator may allow the terminal to continue constituting without interruption. However, the terminal should not be allowed to continue constitution indefinitely while in the Mobile mode as this will reduce the life of the Antenna Tuning Unit.

CONSTITUTION OF SUBNET aaa SUCCESSFUL

Where: **aaa** = subnet number

Explanation: Informational. The terminal has successfully performed the network operations required to establish a subnet.

Action: None. Informational only.

CONTROLLER STACK a NOW IN STANDBY

Where: **a** = stack number

Explanation: Informational. Controller stack **a** is adequately configured with operational parameters and a subnet membership list. Subnet constitution may be requested at any time.

Action: The Radio I/O operator may constitute the subnet by selecting the CONSTITUTE SUBNET option on the SUBNET CONTROLLER FUNCTIONS screen.

CPU VERSION NUMBER IS aaaa

Where: **aaaa** = CPU software version number

Explanation: Informational. This status line identifies the software version number of the CPU that has been loaded into memory from tape. It is displayed after the CPU program has been successfully loaded from tape and whenever the CPU program load is verified by the Radio I/O operator using the CPU LOAD VERIFICATION screen.

Action: None. Informational only. However, if the CPU version number is not the one which was expected, reload the CPU with the desired set of program load tapes.

CTF OPERATIONS STARTED ON STACK a

Where: **a** = stack number

Explanation: Informational. Stack **a** is now in the CTF monitor or injection mode. If the stack identified is one which has been configured in the CTF mode, the stack is now monitoring the CTF frequency. If the stack identified is one which was previously in the DATA mode, a CTF injection is currently in progress. A DATA mode stack will automatically restart subnet constitution or sign-in after the CTF injection has completed.

Action: None. Informational only.

CURRENT MODE = a, CURRENT FRQ = bb, SUBNET = ccc

Where: **a** = operating mode (N = Non-ECCM, E = ECCM, T = Training)
bb = frequency index
ccc = subnet number

Explanation: Informational. This status line identifies the current operating mode and frequency that is being used for a particular subnet. This status line will initially appear after a terminal has successfully signed-into or constituted a subnet. It will then be regularly displayed every 15 minutes while the terminal is participating in the subnet. It will also appear whenever a new operational mode or frequency (or hopset) is selected for use in the subnet.

GARBLED RTTY MESSAGE aaa RECEIVED ON STACK b

Where: **aaa** = message number
b = stack number

Explanation: Informational. Your terminal received an RTTY message, but the CPU detects that 5% or more of the message is garbled.

Action: Be aware when viewing the message that it may be incorrect. You may wish to ask the originator to re-transmit.

ILLEGAL TYPE 2 INPUT

Explanation: Informational. CPU-I/O software communications are out of synch. The CPU has received a status value from the I/O which is invalid. The T2 has been discarded.

Action: Perform BIT on the I/O. When BIT does not report any failures, re-enter the T2. When a failure is reported, perform normal maintenance procedures on the I/O unit.

INVALID ANCS COMMAND

Explanation: Informational. CPU-I/O software communications are out of synch. The CPU received an ANCS command from the I/O but the terminal is not ANCS capable.

Action: Perform BIT on the I/O. When BIT does not report any failures, continue operation. When a failure is reported, perform normal maintenance procedures on the I/O unit.

INVALID COMMAND

Explanation: Informational. CPU-I/O software communications are out of synch. The CPU has received an unrecognized command code from the I/O, which it disregards.

Action: Perform BIT on the I/O. When BIT does not report any failures, continue operation. When a failure is reported, perform normal maintenance procedures on the I/O unit.

INVALID CTF HOPSET, CODE aa

Where: **aa** = 2 character hopset code

Explanation: Warning. The Radio I/O operator specified a CTF hopset that was not found on the frequency tape. The CPU will be unable to monitor for CTF injections until a valid hopset is entered.

Action:

1. Use the SET UP CTF option on the RADIO I/O OPERATIONAL SET UP screen to verify that the CTF hopset was entered correctly. If it was not, re-enter the correct CTF hopset.

2. If the CTF hopset was correct, verify that the Frequency tape is current. If the Frequency tape that was loaded is not the current tape, obtain a copy of the current Frequency tape and load it using the LOAD TAPES Menu.

INVALID FREQ ON STACK a, CODE: bb bb bb bb bb bb

Where: **a** = stack number
bb = frequency index (6 maximum)

Explanation: Warning. This status line is most likely to occur when the frequencies or hopsets identified in the status line were not found on the Frequency tape. In addition, a top echelon terminal (T1SC, T1SM, T2SM) could have identified hopsets that are not valid for use in a top echelon subnet. An error in the entry of one or more NON-ECCM codes causes all NON-ECCM codes to be ignored. An error in the entry of one or more HOPSET codes causes HOPSET codes to be ignored. Although up to twelve frequencies or hopsets could have been entered, only up to six bad frequencies or hopsets can be reported.

Action:

1. Use the SET UP STACKS option on the RADIO I/O OPERATIONAL SET UP screen to verify that the correct frequencies were entered. If they were not, re-enter the correct frequencies.

2. If the correct frequencies were entered, verify that the Frequency tape is current. If the Frequency tape that was loaded is not the current tape, obtain a copy of the current Frequency tape and load it using the LOAD PARAMETER TAPES option on the RADIO I/O OPERATIONAL SETUP menu.

3. If you are operating in a top echelon subnet, only "odd" hopset indexes are valid. "Even" hopset indexes are reserved for use by the CPU during stress mode injections. Refer to Section VII of this appendix for a list of which hopsets are "odd" and which are "even."

INVALID IT COMMAND

Explanation: Informational. An attempt was made to execute an Injector function when the terminal was not configured as an Injector. This will occur on requests for TYPE 2 REPORT or INJECTOR I/O UNITS screen functions.

Action: If the terminal should be an Injector, ensure that it is listed as such on the NCS/ANCS/IT SET-UP Screen.

INVALID NCS COMMAND

Explanation: Informational. An attempt was made to execute an NCS function when the terminal was not configured as the NCS. Note: Other network terminals must have you listed as the NCS before they will accept your NCS directive.

Action: If the terminal should be the NCS, ensure that it is listed as such on the NCS/ANCS/IT SET-UP Screen.

INVLD T2 FOR T1# aaa, SRC bbb, IOc NOT ADDRESSED

Where: **aaa** = message number
bbb = source terminal-ID
c = I/O unit number

Explanation: Warning. An attempt was made to send a Type 2 Acknowledgement from I/O c for a Type 1 message which was not addressed to I/O c. The CPU will not transmit the Type 2 Acknowledgement.

Action: A Type 2 Acknowledgement can only be sent from the I/O unit(s) that received the Type 1 message. Do not attempt to send a Type 2 Acknowledgement from an I/O other than the I/O that received the Type 1 message.

INVLD T2 FOR T1# aaa, SRC bbb, NO TYPE 1'S RX'ED

Where: **aaa** = message number
bbb = source terminal-ID

Explanation: Warning. An attempt was made to send a Type 2 Acknowledgement but the FT has not received the specified Type 1 message. The CPU will not transmit the Type 2 Acknowledgement.

Action:

1. A Type 2 Acknowledgement cannot be sent until a Type 1 message is received. Do not attempt to send a Type 2 Acknowledgement until after a Type 1 message is received.

2. Verify that the data to be entered for the Type 2 Acknowledgement is correct and then attempt to send the Type 2 Acknowledgement again.

3. If a warm or cold restart of the CPU has occurred after the receipt of a Type 1 message but before the entry of the Type 2 Acknowledgement, the CPU will no longer be aware of the Type 1 message and will not allow a Type 2 Acknowledgement to be sent. Under these circumstances, a text message explaining your Type 2 acknowledgement status may be entered for transmission using a type/precedence value of 2.1.

INVLD T2 FOR T1# aaa, SRC bbb, TYPE 1 NOT FOUND

Where: **aaa** = message number
bbb = source terminal-ID

Explanation: Warning. The CPU keeps a record of the last 32 T1's received. The Type 1 message number and/or source terminal ID entered on the SEND TYPE 2 Screen do not match up with any of the last 32 Type 1 messages received by the FT for your I/O. The CPU will not transmit the Type 2 Acknowledgement.

Action:

1. Check the Type 1 message number and source terminal ID entered on the SEND TYPE 2 Screen. If either or both are incorrect, re-enter the correct values and resend your Type 2 Acknowledgement.
2. If a warm or cold restart of the CPU has occurred after the receipt of a Type 1 message but before the entry of the Type 2 Acknowledgement, the CPU will no longer be aware of the Type 1 message and will not allow a Type 2 Acknowledgement to be sent. Under these circumstances, a text message explaining your Type 2 acknowledgement status may be entered for transmission using a type/ precedence value of 2.1.
3. If the T2 you are attempting to send is for a T1 received, but no longer being tracked, compose and send a text message with a type 2 response.

I/O DE-CONFIGURED BY RADIO I/O, CPU LINK HALTED

Explanation: Informational. Your Mission I/O unit has been de-configured by the Radio I/O operator, terminating your communication with the CPU. This results in the loss of all temporary messages. Any status lines or reports destined for the I/O will be discarded. There will be no further message delivery. All messages destined for the I/O from the network or another I/O at this terminal will be purged. All permanent messages, however, will be retained.

Action: If operation of your Mission I/O unit is required, contact the Radio I/O operator to configure your I/O. The Radio I/O operator can accomplish this by using the SET UP TERMINAL option on the RADIO I/O OPERATIONAL SET UP screen.

I/O a LOGGED OFF - ACCUMULATING TEMP MSGS

Where: **a** = I/O unit number

Explanation: Informational. This status line is sent to the Radio I/O when one of the Mission I/Os terminates communication with the CPU. The CPU will continue to save received messages for the logged off Mission I/O.

Action: If the operation of the logged off Mission I/O was temporary and is no longer required, the Radio I/O operator can de-configure the Mission I/O by deleting it from the Mission I/O list on the TERMINAL CONFIGURATION Screen. Be aware that de-configuring the Mission I/O will cause the CPU to delete all received and saved messages for that I/O. If, on the other hand, the operation of the Mission I/O is of a more permanent nature, no action is required, and the CPU will continue to save any messages received for the logged off Mission I/O. These messages will automatically be purged after 24 hours.

LQA TRMaaaa SNbbb c:dd • dd • dd • dd • dd •

Where:
- **aaaa** = terminal-ID to which LQA applies
- **bbb** = subnet number through which the terminal is connected
- **c** = operating mode of the subnet, indicating whether frequencies or hopsets are being reported (N = Non-ECCM, ECCM, T = Training)
- **dd** = index of a frequency/hopset for which LQA was measured
- **•** = quality of the frequency/hopset link to the terminal-ID (2 = 1/2 - best, 4 = 1/4 - good, 8 = 1/8 - acceptable, 6 = 1/16 - poor, U = unacceptable, Z = noise)

Explanation: Informational. This status line contains the Link Quality Analysis (LQA) status for the given subnet in which your terminal is participating as a controller or member. It is reported every 15 minutes (unless preempted by other actions) as a result of automatic measurements taken on the quality of the frequencies/hopsets assigned to the subnet. For controller-role subnets, one LQA status line is displayed for each active terminal (member) in the subnet. For member-role subnets, the LQA status line reports the quality of the link to the subnet controller terminal only. Up to five frequencies/hopsets assigned to the subnet can be reported in a single LQA status line. The first frequency/hopset in the list is always the one currently being used for subnet communication.

Action: None. Informational only.

MODE CHANGE TO aaaaaaaa IN PROGRESS, SUBNET bbb

Where: **aaaaaaaa** = new mode
bbb = subnet number

Explanation: Informational. A subnet operating mode change has been directed by the NCS operator or by the subnet controller Radio I/O operator. The terminal will change to the new operating mode of the subnet automatically.

Action: None. Informational only. However, if subnet communication is lost while a mode change was in progress, forcing the terminal to re-start the constitution or sign-in process, the Radio I/O operator should reconfigure the subnet for the new mode of operation. This may be done by using the STACK CONFIGURATION screen.

MSG aaa ACCEPTED FOR TRANSMIT

Where: **aaa** = message number

Explanation: Informational. The CPU has accepted the message you entered for transmission and has assigned the indicated number to the message for tracking purposes.

Action: None. Informational only. The CPU will automatically transmit the message on the network.

MSG DELETED FROM PERM STORAGE: aaaaaaaaaaaa

Where: **aaaaaaaaaaaa** = message name

Explanation: Informational. The CPU has deleted the specified message from permanent storage as you requested. The message name will no longer appear on the MAIN MENU. The permanent storage memory space that was used to hold the message is now available.

Action: None. Informational only.

MSG aaaaaaaaaaaa MOVED TO PERM, MSGS IN TEMP: bb

Where: **aaaaaaaaaaaa** = message name
bb = remaining number of temp messages

Explanation: Informational. You used the SAVE option on the RECEIVED MESSAGE Screen to move a received message from temporary to permanent storage and name it **aaaaaaaaaaaa**. This status line confirms the move and states the number of messages remaining in temporary storage **bb**. The saved message name will appear on the MAIN MENU to allow you to access the message.

Action: None. Informational only.

MSG aaa NOT ACCEPTED, STACK NOT CONFIGURED

Where: **aaa** = message number

Explanation: Warning. A message has been entered for transmission, but the Radio I/O operator has not yet configured any of the radio stacks. They are all currently "Off". The CPU cannot resolve any of the message destination addresses. Messages will not be accepted until at least one stack is configured.

Action:

1. The Radio I/O operator can configure one or more stacks by using the SET-UP STACKS option on the OPERATIONAL SET-UP Screen. When ready, the Constitute or Sign-in options (as appropriate) can be used to connect the terminal to the subnet.

2. Any message entered for transmission that was not previously accepted by the CPU may be re-entered after the Radio I/O operator has configured at least one stack. The terminal does not need to be active in a subnet in order for a transmit message to be accepted.

MSG NOT FOUND IN PERM STORAGE: aaaaaaaaaaaa

Where: **aaaaaaaaaaaa** = message name

Explanation: Informational. The CPU could not find the requested message in permanent storage. If this occurs, it may indicate that CPU-I/O software communications are out of synch.

Action; Check message name **aaaaaaaaaaaa** for correctness. When the message name is correct, reset the I/O to re-synchronize the CPU and I/O. The MAIN MENU will re-list all of the known messages in permanent storage.

MSG aaa PURGED, UNABLE TO ROUTE TO ANY ADDRESS

Where: **aaa** = message name

Explanation: If the system cannot find a place to route a message, that message will be purged.

Action: None. Informational only.

MSG RECEIVED, PRIORITY: a.a, MSGS IN TEMP: bb

Where: **a.a** = type/precedence
bb = number of temporary messages

Explanation: Informational. A message of the indicated type/precedence was received by the CPU and placed into temporary storage. A total number of **bb** messages are now being held by the CPU in temporary storage for your I/O.

Action: Recall the received message to the I/O using the [SHOW MSG] key. The message may be printed using the PRINT option and then either saved to permanent storage (using the SAVE option) or deleted (using the DELETE option). Note: When more than one message is being held by the CPU in temporary storage, the CPU always returns the highest priority message to the I/O. This may or may not be the last message received. In order to see all of the received messages being held, a SAVE or DELETE action must be performed on each message after it is recalled.

MSG aaa SRC bbbb DELETED, MSGS IN TEMP: cc

Where: **aaa** = message number
bbbb = source terminal-ID
cc = number of received messages

Explanation: Informational. The received message that you requested to be deleted has been deleted. There are now **cc** messages being held by the CPU for your I/O in temporary storage.

Action: None. Informational only.

MSG aaa SRC bbbb NOT FOUND IN TEMP STORAGE

Where: **aaa** = message number
bbbb = source terminal-ID

Explanation: Informational. The message being viewed on the SHOW MESSAGE screen (message **aaa**, source **bbbb**) was not found in temporary storage. The request to DELETE the message or SAVE the message into permanent storage cannot be completed. This may indicate that the CPU and I/O are out of synch.

Action: Reset the I/O. Retry the previous operation using the [SHOW MSG] key to recall messages from temporary storage.

MSG STORED IN PERM STORAGE: aaaaaaaaaaaa

Where: **aaaaaaaaaaaa** = message name

Explanation: Informational. The message that you requested to be saved has been saved in the CPU's permanent storage for your I/O. The message name **aaaaaaaaaaaa** will be displayed on the MAIN MENU to allow subsequent access to the message.

Action: None. Informational only.

MSGS PURGED FROM TEMP, MSGS NOW IN TEMP: aa

Where: **aa** = number of temporary messages

Explanation: Warning. The CPU is low on memory space, so it is purging messages that have been received and are residing in temporary storage in order to increase the memory space available. (The CPU purges the lowest type/precedence level of messages it can find in temporary storage. Type 1 and Type 2 messages are never purged as a result of being low on available memory space. They can only be purged as a result of being 24 hours old).

Action: Promptly review all remaining received messages. The messages may be recalled to the I/O unit by using the [SHOW MSG] key. After reviewing each message, delete it (using the DELETE option) or move it to permanent storage (using the SAVE option) in order to free memory space in the CPU.

NO AIG MEMBERSHIP AVAILABLE FOR AIG aaa

Where: **aaa** = AIG number

Explanation: Informational. The AIG number selected for display upon the DISPLAY AIG screen does not have any members.

Action: None. Informational only. However, if you have information indicating that the AIG should contain members, you may wish to display several other AIGs to determine if (1) the AIG tape has been loaded, or (2) if the loaded AIG tape is current.

NO DIRECTED FREQ/HS RPT AVAILABLE FOR SUBNET aaa

Where: **aaa** = subnet number

Explanation: Informational. The CPU does not have any directed frequency or hopset information from the NCS, so the requested NCS Directed Frequency report cannot be generated.

Action: An NCS Directed Frequency report can only be printed one time after the CPU has received a frequency change directive from the NCS. Receipt of a frequency change directive is denoted by the audit trail: NCS FREQ CHANGE SUBNET **aaa** RX'D, MSG **bbb** SRC **ccc**. If this audit trail has not been displayed, or if the NCS Directed Frequency report has already been printed, then the CPU does not have the information for the report.

NO FREQ USAGE REPORT AVAILABLE FOR SUBNET aaa

Where: **aaa** = subnet number

Explanation: Informational. Your NCS/ANCS terminal has not received any frequency usage data from the subnet identified in the status line. The CPU is unable to provide you with the NCS Frequency Usage report for the requested subnet.

Action:

1. If the subnet number you requested was incorrect, respecify the correct subnet number.

2. If the subnet number you requested was correct (and is known to be a configured subnet) request the Frequency Usage report again at a later time. Each subnet controller places its frequency usage information on its transmit

queue to the NCS/ANCS terminals once each day. The frequency usage information may not yet have arrived at your NCS/ANCS terminal.

NO FREQ'S FOR NEW MODE OF OPERATION ON STACK a

Where: **a** = stack number

Explanation: Warning. The mode of operation for the subnet on stack **a** has been changed but the CPU does not have any frequencies (if the change was to Non-ECCM mode) or any hopsets (if the change was to ECCM or Training mode). Subnet communication on the stack cannot be accomplished in the new mode of operation without the frequencies or hopsets.

Action: The Radio I/O operator should enter the missing frequencies (if the change was to Non-ECCM mode) or the missing hopsets (if the change was to ECCM or Training mode) by using the SET UP STACKS option on the RADIO I/O OPERATIONAL SET UP screen. After the frequencies or hopsets have been entered, the sign-in or constitution process (as appropriate to subnet role) may be started by selecting the PERFORM SUBNET FUNCTIONS item on the RADIO I/O OPTIONS screen.

Note: If an invalid frequency or hopset had been previously entered, the frequency or hopset list will remain as entered, but will not be used by the CPU. If the status line: "INVALID FREQ ON STACK a, CODE: **bb bb bb bb bb bb**" has been received for the same stack for which the "NO FREQ'S FOR NEW MODE OF OPERATION ON STACK **a**" status line was received, then an invalid frequency or hopset has been entered. See the description of the "INVALID FREQ..." status line.

NO FRQS STK a, NET FUNCT NOT APPLIED

Where: **a** = stack number

Explanation: Warning. A command from the Radio I/O operator to constitute, sign into, or begin monitoring a subnet cannot be performed because the frequencies or hopsets have not been provided for the indicated radio stack.

Action: The Radio I/O operator should enter the missing frequencies (if the stack is in Non-ECCM mode) or the missing hopsets (if the stack is in ECCM or Training mode) by using the SET UP STACKS option on the RADIO I/O OPERATIONAL SET UP screen. After the frequencies or hopsets have been entered, the constitution, sign-in, begin monitoring process (as appropriate to subnet role) may be started by selecting the PERFORM SUBNET FUNCTIONS item on the RADIO I/O OPTIONS screen.

NO MESSAGES CURRENTLY AVAILABLE

Explanation: Informational. The [SHOW MSG] key was selected to retrieve a received message from the CPU's temporary storage, however, there aren't any received messages currently available for your I/O.

Action: None. Informational only.

NO SUBNET STATUS REPORT AVAILABLE FOR SUBNET aaa

Where: **aaa** = subnet number

Explanation: Informational. Your NCS/ANCS terminal has not received any subnet status data from the subnet identified in the status line. The CPU is unable to provide you with the NCS Subnet Status report for the requested subnet.

Action:

1. If the subnet number you requested was incorrect, respecify the correct subnet number.

2. If the subnet number you requested was correct (and is known to be a configured subnet) request the Subnet Status report again at a later time. Each subnet controller places its subnet status information on its transmit queue to the NCS/ANCS terminals once each day. The subnet status information may not yet have arrived at your NCS/ANCS terminal.

NO TERMINAL LOCATION REPORT AVAILABLE

Explanation: Informational. Your NCS/ANCS terminal has not received terminal location information from any of the Force Terminals in the RN network. The CPU is unable to provide you with the NCS Terminal Location report.

Action: Each FT will place location information on its transmit queue to the NCS/ANCS terminals when the location information is entered by the FT Radio I/O operator. Request the report at a later time.

NO TYPE 2 RÊPORT AVAILABLE FOR MESSAGE aaa

Where: **aaa** = message number

Explanation: Informational. The CPU does not have any Type 2 responses for the Type 1 message **aaa** identified in the status line.

Action: You may request a Type 2 report at a later time if you are expecting to receive Type 2 responses. Also, note that the CPU will hold Type 2 information for up to 20 different Type 1 messages sent from your IT. If more than 20 Type 1 messages have been transmitted from your IT, the Type 2 responses for the oldest Type 1 message will be automatically deleted by the CPU. Therefore, this status line can also be an indication that the Type 2 responses that were previously being held in the CPU for the oldest Type 1 message have been deleted.

N-ECCM/HOPSET LIST MISMATCH WITH TRM aaa SN bbb

Where: **aaa** = terminal-ID
bbb = subnet number

Explanation: Warning. A frequency/hopset mismatch between terminal **aaa** and your terminal has been detected. This detection occurs after a subnet is constituted. When subnet **bbb** has a member role the output indicates that the controller has selected a frequency/hopset for use which is not in your frequency/hopset list. When subnet **bbb** has a controller role the output indicates that the member returned LQA information for a frequency/hopset that is not in your list.

Action: Check the NON-ECCM FREQUENCY SELECTION or ECCM HOPSET SELECTION and contact your controller/member to confirm correctness of the lists.

OUT OF PERM DIRECTORY SPACE

Explanation: Informational. You have used up all of the space available to your I/O for saving the permanent messages that are identified on the MAIN MENU. The CPU will not accept any more messages for permanent storage.

Action: If you wish to save additional permanent messages, you will have to delete enough of the messages you currently have saved in order to make room for any new messages. Delete all unnecessary messages by selecting them from the MAIN MENU and then using the DELETE MESSAGE option on the RECALLED MESSAGE Screen.

PA a THERMAL OVERLOAD, DECREASE POWER LEVEL

Where: **a** = stack number of power amplifier

Explanation: Warning. The power amplifier in stack **a** is overheating.

Action: Decrease the power level on the identified stack by using the STACK CONFIGURATION Screen.

RECEIVED TYPE 1 MSG aaa FROM TERMINAL bbb

Where: **aaa** = message number
bbb = source terminal-ID

Explanation: Informational. You have received a Type 1 message from the identified terminal. The I/O alarm will be sounding at 1/2 second intervals.

Action: Silence the I/O alarm. Retrieve the Type 1 message by using the [SHOW MSG] key.

RTTY MESSAGE aaa TOO LONG, TRUNCATED

Where: **aaa** = RTTY message number

Explanation: Warning. A message entered for RTTY transmission was longer than 1032 characters. Messages transmitted in RTTY mode are truncated after the first 1032 characters.

Action: If you wish to transmit a message in RTTY mode that is longer than 1032 characters divide the message into two or more message sections that are less than 1032 characters long, and then separately transmit each section of the message. You may wish to use the SAVE option on the RECALLED MESSAGE screen to divide the message into sections and save each section in permanent storage. Each section could then be recalled from the MAIN MENU and transmitted separately.

RXS VERIFICATION FAILED TO COMPLETE

Explanation: The TXS expected a response to the verification process within a specific period of time. The RXS did not respond in time.

Action: Retry operation. If failure persists, verify RXS-TXS link. Verify equipment condition.

SCAN MODE STOPPED

Explanation: Informational. Scanning of stack 5 has stopped, either because the Radio I/O operator has configured the SCAN stack to OFF.

Action: None. Informational only.

SCANNING ON FREQUENCY: aa.aaaa

Where: **aa.aaaa** = frequency (in Mhz)

Explanation: Informational. Identifies the current frequency that is being scanned on stack 5.

Action: None. Informational only.

SEARCH FOR MONITOR SUBNET aaa STARTED

Where: **aaa** = subnet number

Explanation: Informational. The terminal has started the network operations required to find the frequency or hopset upon which subnet **aaa** can be monitored. Subnet monitoring is a receive-only capability.

Action: None. Informational only.

SEARCH FOR MONITOR SUBNET aaa STILL IN PROGRESS

Where: **aaa** = subnet number

Explanation: Informational. The terminal has finished a complete pass of the network operations required to find the subnet to be monitored. It is starting another pass because the subnet has not been found. Note: Each pass will require one minute for each frequency (or hopset, depending upon operational mode) assigned to the subnet. For example, a pass will require six minutes for a subnet configured with six frequencies that is operating in the Non-ECCM mode.

Action: 1. The first time this status line is received, the Radio I/O operator should use the SET UP STACKS option on the RADIO I/O OPERATIONAL SET UP screen to verify that the operational parameters for the stack have been configured correctly.

2. If all operational parameters are correct and this status line is received for a second time, the Radio I/O operator should ensure that the RFO Time of Day is loaded and that the ECCM and KG variables have been loaded. The operator may also run BIT on the stack and then restart monitoring. Note: If it is known that the reason that monitoring of the subnet has not yet been successful is because the subnet is not in operation or conditions for communication are poor, this action may be avoided, and the operator may allow the terminal to continue searching without interruption.

SEP BIT COMPLETED

Explanation: Informational. The Built-In Test on the Signal Entry Panel (SEP) has completed.

Action: None. Informational only.

SEP BIT HAS STARTED

Explanation: Informational. The Built-In Test on the Signal Entry Panel (SEP) has begun.

Action: None. Informational only.

SHELTER DOOR IS CLOSED

Explanation: Switch S4 has detected a closing of the shelter door.

Action: None. Informational only.

SHELTER DOOR IS OPEN

Explanation: Switch S4 has detected an opening of the shelter door.

Action: Verify need for access of person entering shelter, or close the door.

SHELTER TEMPERATURE IS HIGH

Explanation: CPU exhaust air temperature has reached a temperature of at least 130 degrees Fahrenheit.

Action: Increase shelter cooling. If this does not decrease exhaust temperature to normal, notify your supervisor of possible defective CPU fan assembly located in Control rack.

SHELTER TEMPERATURE IS NORMAL

Explanation: CPU exhaust air temperature has decreased to a normal range of 115 degrees Fahrenheit.

Action: None. Informational only.

SIGN-IN TO SUBNET aaa STARTED

Where: **aaa** = subnet number

Explanation: Informational. The terminal has started the network operations required to sign-in to subnet **aaa**.

Action: None. Informational only.

SIGN-IN TO SUBNET aaa STILL IN PROGRESS

Where: **aaa** = subnet number

Explanation: Informational. The terminal has finished a complete pass of the network operations required to sign-in to a subnet. It is starting another pass because the subnet has not yet been found. Note: Each sign-in pass will require one minute for each frequency (or hopset, depending upon operational mode) assigned to the subnet. or example, a sign-in pass will require six minutes for a subnet configured with six frequencies that is operating in the Non-ECCM mode.

1. The time this status line is received, the Radio I/O operator should use the SET UP STACKS option on the RADIO I/O OPERATIONAL SET UP screen to verify that the operational parameters for the stack have been configured correctly.

2. If all operational parameters are correct and this status line is received for a second time, the Radio I/O operator should ensure that the RFO Time of Day is loaded and that the ECCM and KG variables have been loaded. The operator may also run BIT on the stack and then restart sign-in. Note: If it is known that the reason that sign-in to the subnet has not yet been successful is because the subnet is not in operation or conditions for communication are poor, this action may be avoided, and the operator may allow the terminal to continue sign-in without interruption. However, the terminal should not be allowed to continue sign-in operations indefinitely while in the mobile mode as this will reduce the life of the Antenna Tuning Unit.

SIGN-IN TO SUBNET aaa SUCCESSFUL

Where: **aaa** = subnet number

Explanation: Informational. The terminal has successfully performed the network operations required to sign-in to subnet **aaa**.

Action: None. Informational only.

SIGNAL PANEL DOWN, CONFIGURATION NOT APPLIED

Explanation: Warning. The Signal Entry Panel (SEP) has a fault. The CPU could not apply the SEP configuration provided by the Radio I/O operator because of the fault.

Action: Perform BIT on the SEP to identify the problem. After the problem has been corrected select the SET UP SIGNAL ENTRY PANEL option on the RADIO I/O OPERATIONAL SET UP screen to configure the SEP. When an SEP failure occurs, correct the SEP failure using normal maintenance procedures.

SPLIT SITE CONNECTED, RUN ALL STACKS BIT

Explanation: Informational. Confirms that the Receive Site (RXS) equipment of the Split Site terminal is connected to the Transmit Site (TXS).

Action: Run All Stacks BIT to continue initialization of the Split Site terminal.

SPLIT SITE LINK BIT COMPLETE, RUN ALL STACKS BIT

Explanation: Informational. The Built-In Test (BIT) of the Transmit Site (TXS) and Receive Site (RXS) links that connect the Split Site has completed.

Action: Run All Stacks BIT to continue initialization of the Split Site terminal.

SPLIT SITE LINK BIT STARTED, ALL STACKS DOWN

Explanation: Informational. The Built-In Test (BIT) of the Transmit Site (TXS) and Receive Site (RXS) links that connect the Split Site together has started.

Action: None. Informational only.

SPLIT SITE NOT CONNECTED, ALL STACKS DOWN

Explanation: Warning. The Receive Site (RXS) CPU is not connected with the Transmit Site (TXS) CPU. Split Site terminal operations cannot be performed. Communication has been disrupted on one or more of the three lines that connect the RXS to the TXS.

Action: Check to see the number of RXS S-3 LINK x TIMED OUT notifications output. Follow the steps laid out in the RXS S-3 LINK x TIMED OUT audit line Action.

STACK a HAS BEEN TURNED OFF BY OPERATOR

Where: **a** = stack number

Explanation: The system has completed the operator's command to turn off the stack.

Action: None. Informational only.

STACK a OFF - SIGNED OUT OF SUBNET BY CONTROLLER

Where: **a** = stack number

Explanation: Informational. The Radio I/O operator of the controller terminal of the subnet on stack **a** has removed your terminal from the subnet membership list. Your terminal is no longer a member of the subnet, so stack **a** has been turned off.

Action: Removal of your terminal from the subnet should have been coordinated with the subnet controller operator. If you wish to remain a member of the subnet, contact the controller operator to determine if there is space available on his subnet membership list. If space is available, you may regain entry into the subnet by selecting the SET UP STACKS option on the RADIO I/O OPERATIONAL SET UP screen, re-configuring stack **a** for DATA operation, and then selecting the SIGN INTO SUBNET option from the SUBNET MEMBER FUNCTIONS screen.

STACK a OFF - SIGNED OUT OF SUBNET BY OPERATOR

Where: **a** = stack number

Explanation: The system has completed the operator's command to sign out of subnet.

Action: None. Informational only.

STACK a UNAVAILABLE FOR GLCM OPERATIONS

Where: **a** = stack number

Explanation: Informational. This command indicates that stacks 4 and/or 5 were still configured when the operator changed the terminal configuration from FT to GLCM. Only stacks 1 through 3 can be used in the GLCM configuration.

Action: None. Informational only.

STK a IN USE, SIGN-IN OR MONITOR REQUEST IGNORED

Where: **a** = stack number

Explanation: Informational. Stack **a** is already being used for subnet member or subnet monitor operation. Your request to SIGN INTO SUBNET or BEGIN MONITORING SUBNET will be ignored by the CPU.

Action: None. Informational only.

STK a IS DOWN, REQUEST IGNORED, RUN BIT ON STACK

Where: **a** = stack number

Explanation: The request sent to the stack has been ignored because the stack is not in operation at the time.

Action: Run BIT on the stack.

STK a UNAVAILABLE FOR MOBILE OPERATIONS

Where: **a** = stack number

Explanation: Informational. An attempt was made to perform data operations on stack 2 or 3 while the terminal was configured for the Mobile mode. Only stacks 1 and 4 are operational when the terminal is configured for the Mobile mode.

Action: Only use stacks 1 and 4 while in the Mobile mode.

STK/FRQ CHANGES ACCEPTED FOR PAUSED STK a

Where: **a** = stack number

Explanation: Informational. The CPU has accepted the new stack configuration, frequencies, or hopsets that were assigned by the Radio I/O operator to stack **a** while the stack was in a paused condition (i.e., capable of operating, but not currently operating in subnet). The new configuration information will be used when subnet operations are restarted. The PERFORM SUBNET FUNCTIONS option on the RADIO I/O OPTIONS screen provides access to restarting the subnet operations of the stack.

Action: None. Informational only.

SUBNET aaa FUNCTION NOT APPLIED, NO MEMBERS

Where: **aaa** = subnet number

Explanation: Warning. The request to Constitute subnet **aaa** could not be performed because the Subnet Membership List for subnet **aaa** has not been entered or all members have signed out.

Action: Use the ENTER/CHANGE SUBNET MEMBERSHIP LIST option on the SUBNET CONTROLLER FUNCTIONS screen to assign member terminals to subnet **aaa**.

SUBNET NUMBER aaa IS UNKNOWN

Where: **aaa** = subnet number

Explanation: Informational. CPU-I/O software communications are out of synch. A request was made to start subnet operation for a subnet number that is not known.

Action: Perform BIT on the I/O. When BIT does not report any failures, continue operation. When a failure is reported, perform normal maintenance procedures on the I/O unit.

SUBNET aaa PAUSED, CONSTITUTE SUBNET

Where: **aaa** = subnet number

Explanation: Warning. The stack upon which subnet **aaa** is configured is operational. The stack has successfully passed Built-In Test and subnet operation is now in a paused condition.

Action: Use the CONSTITUTE SUBNET option on the SUBNET CONTROLLER FUNCTIONS screen to restart the operation of subnet **aaa**.

SUBNET aaa PAUSED, NO FREQUENCIES

Where: **aaa** = subnet number

Explanation: Warning. The stack upon which subnet **aaa** is configured is operational, but the CPU does not have a valid list of frequencies (or hopsets) to use for subnet operation. Therefore, operation of the subnet is now in a paused condition. This status line follows the NO FREQ'S FOR NEW MODE OF OPERATION ON STACK **a** status line.

Action: Use the SET UP STACKS option on the RADIO I/O SET UP screen to enter a valid set of frequencies (or hopsets, depending upon the operational mode of the subnet) for use in the subnet. Subnet operation may be restarted by selecting the PERFORM SUBNET FUNCTIONS option on the RADIO I/O OPTIONS screen.

SUBNET aaa PAUSED, NO MEMBERS

Where: **aaa** = subnet number

Explanation: Warning. All of the members of subnet **aaa** have been signed out. This has occurred because (1) the member terminals themselves have signed out of the subnet, or (2) the member terminals have been removed from the Subnet Membership List by the Radio I/O operator, or (3) a combination of (1) and (2) has occurred. Subnet **aaa** is now in a paused condition since the controller no longer has any member terminals to communicate with.

Action: If all members of subnet **aaa** were intentionally signed out, then no action is necessary and the subnet may be left in the paused condition. If subnet operation is desired, use the ENTER/CHANGE SUBNET MEMBERSHIP LIST option followed by the CONSTITUTE SUBNET option, which are both on the SUBNET CONTROLLER FUNCTIONS screen, to reconstitute the subnet.

SUBNET aaa PAUSED, REQUEST SIGN-IN

Where: **aaa** = subnet number

Explanation: Warning. The stack upon which subnet **aaa** is configured is operational. The stack has successfully passed Built-In Test. Operation of your terminal as a member in subnet **aaa** is now paused.

Action: Wait for all BIT operations to be completed and then use the SIGN INTO SUBNET option on the SUBNET MEMBER FUNCTIONS screen to restart the operation of your terminal as a member in subnet **aaa**.

SUBNET aaa PAUSED, RESTART MONITOR

Where: **aaa** = subnet number

Explanation: Warning. The stack upon which subnet **aaa** is configured is operational. The stack has successfully passed Built-In Test. Operation of your terminal in the monitoring of subnet **aaa** is now paused.

Action: Wait for all BIT operations to be completed and then use the BEGIN MONITORING SUBNET option on the SUBNET MEMBER FUNCTIONS screen to restart the operation of your terminal in the monitoring of subnet **aaa**.

SUCCESSFUL MONITORING OF SUBNET aaa BEGUN

Where: **aaa** = subnet number

Explanation: Informational. The terminal has successfully performed the network operations required to monitor subnet **aaa**.

Action: None. Informational only.

SWITCH DATA I/O MODEM TO a-WIRE REMOTE

Where: **a** = number of wires

Explanation: Informational. The CPU has completed the configuration of the Signal Entry Panel for either 2-wire or 4-wire remote I/O operation as you specified on the REGENCY NET I/O CONFIGURATION screen. The Data I/O Modem 2-wire/4-wire switch may now be placed in the position designated in the status line.

Action: Switch the Data I/O modem to 2-wire or 4-wire operation (as designated) to complete the configuration of the remoted I/O.

T2 RPT NOT ALLOWED, T1 aaa NOT SENT BY THIS I/O

Where: **aaa** = message number

Explanation: Informational. A Type 2 report was requested for a Type 1 message which did not originate from your I/O. Type 2 reports may only be requested from the I/O that sent the corresponding Type 1 message.

Action: Ensure that you requested a Type 2 report for the correct Type 1 message number. If your I/O was not the originator of the Type 1 message, you will not be allowed to obtain a Type 2 report.

TERMINAL aaaa HAS GONE INACTIVE IN SUBNET bbb

Where: **aaaa** = terminal-ID
bbb = subnet number

Explanation: Informational. Communication from terminal **aaaa** has not been received for the last 10 minutes. Your terminal now considers terminal **aaaa** to be inactive in subnet **bbb**. Messages will not be transmitted from your terminal to terminal **aaaa** on subnet **bbb** until communication is reestablished with terminal **aaaa**, that is, until terminal **aaaa** becomes active.

Action: Terminal **aaaa** may be experiencing equipment problems, may be reloading a cryptovariable, or may be unable to communicate with your terminal due to noise or other interference. If there is an alternative means for contacting the operator of terminal **aaaa**, you may wish to make such contact in order to determine what the problem may be and establish a corrective action. Note: When all members of subnet **bbb** have gone inactive, and you are the controller, your terminal will automatically attempt to constitute the subnet again. This may be indicative of the inability of your terminal to receive the communication signals of the subnet member terminals. When the last terminal in the subnet goes inactive you will see the notification CONSTITUTION OF SUBNET **aaa** STARTED.

TERMINAL aaaa IS NOW ACTIVE IN SUBNET bbb

Where: **aaaa** = terminal-ID
bbb = subnet number

Explanation: Informational. Communication with terminal **aaaa** has been reestablished on subnet **bbb**. The terminal is considered active.

Action: None. Informational only.

TERMINAL IS OPERATING IN NON-SECURE MODE

Explanation: Informational. This status line indicates that all stacks are operating in a non-secure mode, that is, they are no protected with KG-84A equipment.

Action: None. However, operator should exercise caution when transmitting in a non-secure mode.

TERMINAL IS OPERATING IN SECURE MODE

Explanation: Informational. This status line indicates that all stacks are operating in a secure mode, that is, they are protected with KG-84A equipment.

Action: None. Informational only.

TERMINAL IS OPERATING IN SECURE/NON-SECURE MODE

Explanation: Informational. This status line indicates that some DATA capable stacks are operating in a secure mode and some DATA capable stacks are operating in a non-secure mode.

Action: None. However, operator should exercise caution when transmitting in a secure/non-secure mode.

TERMINAL aaaa SIGNED INTO SUBNET bbb

Where: **aaaa** = terminal-ID
bbb = subnet number

Explanation: Informational. Terminal **aaaa** has been assigned as a member of subnet **bbb**. This occurs either as a result of terminal **aaaa** being entered into the Subnet Membership List by the subnet controller operator, or as a result of terminal **aaaa** being signed into the subnet by the terminal **aaaa** operator. In either case, the terminal is now identified on the Subnet Membership List of the controller terminal.

Action: None. Informational only.

TERMINAL aaaa SIGNED OUT OF SUBNET bbb

Where: **aaaa** = terminal-ID
bbb = subnet number

Explanation: Informational. Terminal **aaaa** has been deleted as a member of subnet **bbb**. This occurs either as a result of terminal **aaaa** being removed from the Subnet Membership List by the subnet controller operator, or as a result of terminal **aaaa** being signed out of the subnet by the terminal **aaaa** operator. In either case, the terminal is now removed from the Subnet Membership List of the controller terminal.

Action: None. Informational only.

TERMINAL aaaa UNABLE TO SIGN IN, SUBNET bbb FULL

Where: **aaaa** = terminal-ID
bbb = subnet number

Explanation: Informational. The Subnet Membership List of subnet **bbb** is full, so the operator of terminal **aaaa** is unable to sign into the subnet.

Action: The subnet controller operator may use the ENTER/CHANGE SUBNET MEMBERSHIP LIST option on the SUBNET CONTROLLER FUNCTIONS screen to adjust the membership of subnet **bbb**. In order to allow terminal **aaaa** to become a member of the subnet, one of the other member terminals on the list would have to be removed. Note: The CPU will require approximately 15 minutes to notify a member terminal that it has been removed from the Subnet Membership List. New terminals cannot be assigned to the list until this process is complete.

TOO MANY PERM DIRECTORY ENTRIES

Explanation: Warning. You have attempted to store more than the maximum number of messages (48) allowed in permanent message storage. No more new messages can be saved in permanent storage until some older messages are deleted.

Action: Recall from the MAIN MENU any old messages that can be deleted and delete them prior to attempting to save any new messages.

TRM IN INJECTION MODE-STK a FUNCTION NOT APPLIED

Where: **a** = stack number

Explanation: Informational. The SIGN INTO SUBNET, BEGIN MONITORING FUNCTION, or CONSTITUTE SUBNET command was not applied. The terminal is currently in Injection mode and is disallowing any changes.

Action: Command the function at a later time, after the terminal has ceased the Injection mode.

TXS CPU VERSION NUMBER IS aaaa

Where: **aaaa** = Transmit Site CPU software version number

Explanation: Informational. This status line identifies the software version number of the CPU that has been loaded into memory from tape. It is displayed after the CPU program has been successfully loaded from tape and whenever the CPU program load is verified by the Radio I/O operator using the CPU LOAD VERIFICATION screen.

Action: None. Informational only. However, if the CPU version number is not the one which was expected, reload the CPU software with the desired set of program load tapes.

TYPE 2 ACK FOR MSG aaa, ACCEPTED FOR TRANSMIT

Where: **aaa** = Type 1 message number

Explanation: Informational. The entered Type 2 Acknowledgement for the designated Type 1 message has been accepted by the CPU for transmission.

Action: None. Informational only.

TYPE 2 ACK RX'D FROM TERMINAL aaa FOR MSG bbb

Where: **aaa** = terminal identification number
bbb = Type 1 message number

Explanation: Informational. A Type 2 Acknowledgement was received from terminal **aaa** for Type 1 message **bbb**.

Action: You may wish to request the Type 2 Detailed Report to review what the response was from terminal **aaa**.

UNABLE TO ADDRESS NCS FREQ CHANGE TO SUBNET aaa

Where: **aaa** = subnet number

Explanation: Warning. As the NCS operator, you have tried to direct a frequency change to subnet **aaa** but your terminal does not know the identity of the subnet controller. This is because the NCS terminal has not received a subnet status from the controller terminal of subnet **aaa**. The NCS Frequency Change directive cannot be transmitted.

Action: If you are aware of the terminal identification of the controller of subnet **aaa**, you may wish to send your frequency change in a transmit message addressed to the controller terminal.

UNABLE TO ADDRESS NCS MODE CHANGE TO SUBNET aaa

Where: **aaa** = subnet number

Explanation: Warning. As the NCS operator, you have tried to direct a mode change to subnet **aaa** but your terminal does not know the identity of the subnet controller. This is because the NCS terminal has not received a subnet status from the controller terminal of subnet **aaa**. The NCS Mode Change Directive cannot be transmitted.

Action: If you are aware of the terminal identification of the controller of subnet **aaa**, you may wish to send your mode change in a transmit message addressed to the controller terminal.

UNABLE TO INJECT MSG aaa IN CTF MODE

Where: **aaa** = msg number

Explanation: Informational. Message **aaa** cannot be injected in the CTF mode because there are no stacks available for transmit. A downgraded version of the message will be queued for transmit over RN subnets.

Action: None. Informational only.

UNABLE TO TRANSMIT RTTY MESSAGE ON STACK a

Where: **a** = stack number

Explanation: Warning. Stack "a" is not configured for RTTY mode, is down, or has inadequate security protection (no KG-84A) for the classification of the RTTY message entered for transmission.

Action: The following steps may be taken:

1. Check the configuration of the stacks (select the SET UP STACKS option on the RADIO I/O OPERATIONAL SET UP screen to review the currently assigned parameters).

2. Run BIT on the stack (use the RADIO I/O BIT screen) to determine if there are any faults on the stack.

3. If you wish to transmit a classified RTTY message, attach a KG-84A unit to the stack and ensure that the cryptographic variable is loaded.

WAITING TO BEGIN FREQUENCY CYCLE, SUBNET aaa

Where: **aaa** = subnet number

Explanation: Informational. You have commanded that the start of subnet constitution, sign-in, or monitor operations are to begin. The CPU is now waiting for the correct timeframe to begin cycling through frequencies in order to establish or locate subnet **aaa**.

Action: None. Additional status lines will indicate when the subnet constitution, sign-in, or monitor search has been started.

Section III. AUDIT TRAIL MESSAGES

The following audit line messages are arranged alphabetically starting with the first letter of the messages.

AC/DC POWER SUPPLY FAULT

Explanation: Warning. CIU detected a fault in the AC/DC Power Supply.

Action: Correct the AC/DC Power Supply failure using normal maintenance procedures.

ACQUIRED CONTROL OF SUBNET aaa ON STACK b

Where **aaa** = subnet number
b = stack number

Explanation: Informational. Your tier 1 terminal became controller of subnet **aaa**, operating on stack **b**. This notification occurs as the result of the T2SM, who has been designated as the opposite tier controller for subnet **aaa** by the previous T1SC, automatically designating your terminal as the new controller. Your terminal's subnet role has been changed from a T1SM to a T1SC. The functions available on the SUBNET CONTROLLER FUNCTIONS screen are now available for use on subnet **aaa**. Note: This audit has no bearing on NCS/ANCS functionality.

Action: Perform controller functions, as required.

ADD ANCS, TRM bbb, ASSIGNED MSG aaa

Where: **aaa** = message number
bbb = terminal-ID

Explanation: Informational. Your add ANCS vote, for terminal **bbb** in the ADD/REMOVE ANCS FROM NET screen, has been processed. The CPU accepted your command and assigned it message number **aaa** (the command is converted to a message for network transmission).

Action: None. Informational only.

ADD IT, TRM bbb, DIRECTIVE ASSIGNED MSG aaa

Where: **aaa** = message number
bbb = terminal-ID

Explanation: Informational. Your add IT vote, for terminal **bbb** in the ADD/REMOVE INJECTOR FROM NET screen, has been processed. The CPU accepted your command and assigned it message number **aaa** (the command is converted to a message for network transmission).

Action: None. Informational only.

ANCS ADD TRM aaa VOTE RX'D, MSG bbb SRC ccc

Where: **aaa** = terminal-ID
bbb = message number
ccc = source terminal-ID

Explanation: Informational. A vote to add terminal **aaa** to the ANCS list has been received. Two votes must be received from two different ANCS terminals for the change to be made. An update to the list is noted by the CHANGE MADE TO ANCS LIST, TERMINAL **aaa** ADDED audit line.

Action: None. Informational only.

ANCS DIRECTIVE NOT FROM ANCS, MSG aaa SRC bbb

Where: **aaa** = message number
bbb = source terminal-ID

Explanation: Warning. You received an ANCS directive from a terminal not on your system's list of valid ANCSs. The directive is message **aaa** and it is from terminal **bbb**. The directive has been deleted.

Action: Verify whether terminal **bbb** should be on the list of valid ANCSs. If it should, add **bbb** to the ANCS list (using the NCS/ANCS/IT TERMINAL IDENTIFICATION Screen). Notify **bbb** that the ANCS directive given message number **aaa** was not received.

ANCS REMOVE TRM aaa VOTE RX'D, MSG bbb SRC ccc

Where: **aaa** = terminal-ID
bbb = message number
ccc = source terminal-ID

Explanation: Informational. A vote to remove terminal **aaa** from the ANCS list has been received. Two votes must be received from two different ANCS terminals for the change to be made. An update to the list is noted by the CHANGE MADE TO ANCS LIST, TERMINAL **aaa** REMOVED audit line.

Action: None. Informational only.

BAD DATA RECEIVED FROM RXS

Explanation: Warning. Data was received from the RXS, but did not pass the CRC check. The data cannot be used.

Action: No actions are required when this notification occurs as the result of FT TO SPLIT SITE LINK BIT. In addition, a single audit does not require action. When this audit occurs frequently the connections between the TXS and RXS should be checked.

BEGIN OWN TX, MSG aaa

Where: **aaa** = message number

Explanation: Informational. The message **aaa** is being transmitted. This notification is output for messages originated at this terminal. (The messages may be operator entered or automatically generated.) When a message is sent out on two DATA stacks the audit line appears twice.

Action: None. Informational only.

BEGIN OWN TX, TYPE 2 PACKET FOR MSG aaa

Where: **aaa** = message number

Explanation: Informational. A Type 2 response to message **aaa** is being transmitted.

Action: None. Informational only.

CHANGE IN NCS, NEW NCS IS TERMINAL aaa

Where: **aaa** = terminal-ID

Explanation: Informational. Terminal **aaa** has assumed the NCS role. Your terminal will only accept NCS commands that are originated by the new NCS terminal.

Action: None. Informational only.

CHANGE MADE TO ANCS LIST, TERMINAL aaa ADDED

Where: **aaa** = terminal-ID

Explanation: Informational. Terminal **aaa** has been designated as an ANCS. Votes for IT and ANCS terminals will be accepted by your terminal from the new ANCS terminal **aaa**.

Action: None. Informational only.

CHANGE MADE TO ANCS LIST, TERMINAL aaa REMOVED

Where: **aaa** = terminal-ID

Explanation: Informational. Terminal **aaa** is no longer an ANCS. Votes generated by terminal **aaa** will now be ignored by your terminal.

Action: None. Informational only.

CHANGE MADE TO IT LIST, TERMINAL aaa ADDED

Where: **aaa** = terminal-ID

Explanation: Informational. Terminal **aaa** has been designated as an Injector. Your terminal will now accept Type 1 messages sent by terminal **aaa**.

Action: None. Informational only.

CHANGE MADE TO IT LIST, TERMINAL aaa REMOVED

Where: **aaa** = terminal-ID

Explanation: Informational. Terminal **aaa** is no longer an Injector. Your terminal will no longer accept Type 1 messages that are sent by terminal **aaa**.

Action: None. Informational only.

CIU BIT COMPLETED, RUN ALL STACKS BIT

Explanation: Informational. BIT has completed successfully on the CIU. When the CIU faults or BIT is run on the CIU, all stacks are paused. BIT must be run on each stack to allow desired stack operations to resume.

Action: Use the following action when the CIU BIT COMPLETED, RUN ALL STACKS BIT is received after a CIU BIT request. Note: This audit also appears as part of Terminal Configuration Setup or Whole Terminal BIT. Use the ALL STACKS option on the

RADIO I/O BIT Screen to check the operational condition of the stacks.

CIU FATAL FAULT, ALL STACKS DOWN

Explanation: Warning. System error occurred; CIU stopped operating. System shut down all stacks.

Action: Recycle CIU power and run off-line BIT on the CIU. Use the RADIO I/O BIT screen and select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running front panel BIT on the CIU. When CIU BIT does not report a CIU failure, run ALL STACKS BIT from the RADIO I/O BIT screen.

CIU - SIGNAL ENTRY PANEL USART ERROR, S.E.P. BAD

Explanation: Warning. A signal entry panel USART error was detected in the CIU. All stacks are inoperative.

Action: Use the RADIO I/O BIT screen and select the SIGNAL ENTRY PANEL BIT option (SEP BIT). When a SEP failure is reported by SEP BIT, correct the SEP failure using normal maintenance procedures. When SEP BIT does not report a SEP failure, run ALL STACKS BIT from the RADIO I/O BIT screen.

CPU - CIU LINK CHECKSUM ERROR, ALL STACKS DOWN

Explanation: Warning. A CPU to CIU link checksum error was detected. Communication between the CPU and CIU has failed. All stacks are inoperative.

Action: Use the RADIO I/O BIT screen and select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running front panel BIT on the CIU. When CIU BIT does not report a CIU failure, run ALL STACKS BIT from the RADIO I/O BIT screen.

CPU - CIU LINK SEQUENCE ERROR, ALL STACKS DOWN

Explanation: Warning. A CPU to CIU link sequence error has been detected. Communication between the CPU and CIU has failed. All stacks are inoperative.

Action: Use the RADIO I/O BIT screen to select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running front panel BIT on the CIU. When CIU BIT does not report a CIU failure, run ALL STACKS BIT from the RADIO I/O BIT screen.

CPU - CIU LINK TIMEOUT, ALL STACKS DOWN

Explanation: Warning. A CPU to CIU link timeout has been detected. Communication between the CPU and CIU has failed. System shut down all stacks.

Action: Recycle CIU power and run off-line BIT on the CIU. Use the RADIO I/O BIT screen to select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running front panel BIT on the CIU. When CIU BIT does not report a CIU failure, continue normal operational procedures.

DELETING STORED MSG aaaaaaaaaaaa FOR I/O b

Where: **aaaaaaaaaaaa** = message name
b = I/O unit number

Explanation: Informational. Message **aaaaaaaaaaaa** is being deleted from permanent storage per operator request.

Action: None. Informational only.

E-CONFIG: a,bbb,cccc; a,bbb,cccc; a,bbb,cccc

Where: **a** = stack number
bbb = subnet number
cccc = subnet role

Explanation: Informational. The CPU is reporting the contents of a stack configuration command which has been received from the radio I/O.

Action: None. Informational only.

FAULT: aaaa

Where: **aaaa** = fault code

Explanation: Informational. This notification contains the actual fault code that was returned from a device that failed. An indication of which device has faulted is reported in an accompanying status or audit line. Refer to Section VIII for a detailed description of the equipment fault codes.

Action: None. Informational only.

ECCM AUTHORIZATION TRANSMITTED

Explanation: Informational. Your previously entered ECCM Authorization command is being transmitted. The command will be sent out over each subnet in which this terminal is a member/controller. This audit will appear each time the command is sent out on a different subnet.

Action: None. Informational only.

CM DE-AUTHORIZATION TRANSMITTED

Explanation: Informational. Your previously entered ECCM De-authorization command is being transmitted. The command will be sent out over each subnet in which this terminal is a member/controller. This audit will appear each time the command is sent out on a different subnet.

END OF TAPE ON MTU

Explanation: Warning. An unexpected END OF TAPE status has been returned from the MTU. This indicates that a read or write request to the Operational Parameters Tape can not be processed.

Action: Load a new Operational Parameters Tape.

ERROR TRAP CONDITION aa OCCURRED IN bbbbbb

Where: **aa** = trap number
bbbbbb = source module name

Explanation: Informational. The CPU software has detected a non-fatal error in the specified source module. A description of the faults that can be reported are found in Section IX.

Action: Note the source module name and trap condition, and report to Intermediate Maintenance.

FAULT ON ECCM VARIABLE TRANSFER, STACK a DOWN

Where: **a** = stack number

Explanation: Warning. An error occurred during the ECCM variable transfer in stack a.

Action: Cycle power on the Radio and refill the ECCM. Use the RADIO I/O BIT screen and select the Stack **a** BIT option.

HEALTHY STACKS DOWN, PERFORMING CIU BIT

Explanation: Informational. CIU BIT is being performed. The BIT request causes all operational stacks to be set to a down state.

Action: None. Informational only.

HEALTHY STACKS DOWN, PERFORMING RFO BIT

Explanation: Informational. The operator-requested RFO BIT is being performed. The RFO BIT request causes all operational stacks to be set to a down state.

Action: None. Informational only.

HEALTHY STACKS DOWN, TIME UPDATE STARTED

Explanation: Informational. The RFO is being reloaded with the Time-Of-Day. The reload of time causes all operational stacks to be shut down. All stacks are inoperable during the loading.

Action: None. Informational only.

HEALTHY STACKS DOWN, aaa TIME UPDATE STARTED

Where: **aaa** = RXS or TXS

Explanation: Informational. The Split Site RXS or TXS RFO is being reloaded with the Time-Of-Day. All stacks are inoperable during the loading.

Action: None. Informational only.

24 HOURS OLD, MSG aaa SRC bbb PURGED FROM TEMP

Where: **aaa** = message number
bbbb = source terminal-ID

Explanation: Warning. The CPU has deleted message **aaa**, received from terminal **bbbb**, because it was over 24 hours old and was still being held in temporary storage. Received messages are held by the CPU for up to 24 hours awaiting operator action.

Action: After a message has been recalled from temporary storage by using the [SHOW MSG] key, the SAVE or DELETE option should be used to permanently remove the message from temporary storage.

INJECTION MSG LIST FULL

Explanation: Informational. You have injected more than 20 Type 1 messages in a 24-hour period. The CPU list of Type 1 messages injected is now full. The CPU keeps the list of Type 1 messages injected so that you can collect and review Type 2 responses. Type 2 responses received for type 1's that are not in the injection message list will be provided to the operator in audit form.

Action: The type 2 responses not being collected will be displayed in the audit line T2 FROM **aaaa** FOR T1 **bbb**, I/O'S 0-5: **c**, **c**, **c**, **c**, **c**, **c**. Examine the terminal **aaaa** operator responses **c** to type 1 message **bbb**.

INVALID NCS REPLACEMENT RECEIVED, NOT APPLIED

Explanation: Warning. The request, from the TRANSFER NET CONTROL TO ANCS screen, to give your terminal NCS capability was ignored. Your terminal is already the NCS terminal.

Action: None. Informational only. The terminal ID to be entered on the TRANSFER NET CONTROL TO ANCS screen should be an ANCS terminal ID.

I/O a BACK ON-LINE

Where: **a** = I/O unit number

Explanation: Informational. The CPU is informing you that I/O **a** is reconnected. Communication between I/O **a** and the CPU has resumed.

Action: None. Informational only.

I/O BIT FAULTS: I/O a LRU bb

Where: **a** = I/O unit number
bb = LRU-ID

Explanation: Warning. This audit identifies an I/O unit that has detected a fault. The LRU number identifies the failed component. I/O **a** is now unable to receive messages, status lines, or audit trails.

Action: Correct the I/O failure using normal maintenance procedures.

I/O BIT FAULTS CLEARED: I/O a

Where: **a** = I/O unit number

Explanation: Informational. Faults have been corrected and the equipment is again operational.

Action: None. Informational only.

I/O a: INVALID ATTEMPT AT SENDING A TYPE 1 MSG

Where: **a** = I/O unit number

Explanation: Informational. The operator of I/O unit **a** tried to send a Type 1 message without having injector capability. This means that the I/O is either not configured as an injector or the terminal has not been loaded with injector software. The Type 1 message is deleted.

Action:

1. Are the proper CPU Program tapes loaded? Check the CPU program tape labels to determine whether the proper software is loaded. If the CPU is not loaded with the correct tapes the terminal must be cold started.

2. Has I/O **a** been setup as an injector I/O? Use the INJECTOR I/O UNITS screen and add I/O **a** as an injector.

3. Inform the operator that the terminal or I/O does not have injector capabilities. Report unauthorized attempts to enter Type 1 messages.

I/O a: INVALID ATTEMPT TO SEND INJECTION COMMAND

Where: a = I/O unit number

Explanation: Informational. CPU-I/O software communications are out of synch. The I/O permitted an injector-only command, but the CPU does not recognize the terminal or the I/O as capable of sending injection commands.

Action: Perform BIT on the I/O. When BIT does not report any failures, continue operation. When a failure is reported, perform normal maintenance procedures on the I/O unit.

I/O a: INVALID ATTEMPT TO SEND NCS/ANCS COMMAND

Where: a = I/O unit number

Explanation: Informational. CPU-I/O software communications are out of synch. The I/O sent a command reserved for NCS or ANCS terminals that is not in the CPU's list of valid commands.

Action: Perform BIT on the I/O. When BIT does not report any failures, continue operation. When a failure is reported, perform normal maintenance procedures on the I/O unit.

I/O a: INVALID ATTEMPT TO SEND RADIO COMMAND

Where: a = I/O unit number

Explanation: Informational. A Mission I/O unit tried to send a command reserved for a Radio I/O unit. The command was ignored.

Action: None. If the problem persists, contact I/O a operator.

I/O a: INVALID SECURITY LABEL

Where: a = I/O unit number

Explanation: Warning. The CPU detected that information that was to be sent to I/O a had invalid security labels. The information has been deleted.

Action: Continue normal operation. If this notification continues to appear, the CPU should be replaced using normal maintenance procedures.

I/O a LOW BUFFER POOL, MSG bbb SRC cccc PURGED

Where: **a** = I/O unit number
bbb = message number
cccc = source terminal-ID

Explanation: Warning. The CPU is low on memory space, so it is purging messages (MSG **bbb** SRC **cccc**) with the lowest necessity level from temporary storage. Messages will continue to be purged until there is enough memory to continue normal operations.

Action: To help the memory space problem use the [SHOW MSG] key to recall any messages that remain in temporary storage. Use the SAVE or DELETE option to remove the messages from temporary storage. Also, you may want to notify the message originator to re-transmit the purged messages.

I/O a NOT CONFIGURED, MSG bbb SRC cccc PURGED

Where: **a** = I/O unit number
bbb = message number
cccc = source terminal-ID

Explanation: Warning. The identified message was purged because it was received for an I/O unit that was not configured, or because the message was being held for a Mission I/O that has been deconfigured by the Radio I/O operator. If the message was addressed to the Radio I/O or to any configured Mission I/O, that I/O will receive the message.

Action: Notify source terminal **cccc** that message number **bbb** was not received. If the non-configured I/O should be active, go to the REGENCY NET TERMINAL CONFIGURATION screen and use the INPUT MISSION I/O'S ACTIVE option to configure I/O a.

I/O a NOT CONFIGURED OR LOGGED ON

Where: **a** = I/O unit number

Explanation: Informational. Mission I/O unit **a** is not configured or logged on. I/O **a** sent a command and the CPU does not recognize I/O **a** as being available.

Action: If the non-configured I/O unit should be active, go to the REGENCY NET TERMINAL CONFIGURATION screen and use the INPUT MISSION I/O'S ACTIVE option to configure I/O **a**. If I/O **a** is configured, reset I/O **a**.

I/O a OFF-LINE

Where: **a** = I/O unit number

Explanation: Informational. I/O **a** failed to communicate with the CPU for 5 minutes. The I/O could also be put off-line if a session stamp failure was detected. When the session stamp is invalid the message block is deleted.

Action: Check the following:

1. VHF options for Mission I/O #2 in the Signal Entry Panel AUDIO CONFIGURATION menu.
2. Wire line connections on the SIGNAL ENTRY Panel.
3. Wire connections between the CPU and the I/O unit. Reset the I/O and continue normal operations.

I/O a TIMED OUT

Where: **a** = I/O unit number

Explanation: Informational. The CPU expected an acknowledgement from the I/O unit and has not received a response in about 30 seconds.

Action: None, unless you do not receive the "I/O **a** BACK ON-LINE" within a short period of time. t that point you should check the connection between the CPU and the I/O unit. Reset I/O a.

IT ADD TRM aaa VOTE RX'D, MSG bbb SRC ccc

Where: **aaa** = terminal-ID
bbb = message number
ccc = source terminal-ID

Explanation: Informational. A vote to add terminal **aaa** to the IT list has been received. Two votes must be received from two different ANCS terminals for the change to be made. An update to the list is noted by the CHANGE MADE TO IT LIST, TERMINAL **aaa** ADDED audit line.

Action: None. Informational only.

IT REMOVE TRM aaa VOTE RX'D, MSG bbb SRC ccc

Where: **aaa** = terminal-ID
bbb = message number
ccc = source terminal-ID

Explanation: Informational. A vote to remove terminal **aaa** from the IT list has been received. Two votes must be received from two different ANCS terminals for the change to be made. An update to the list is noted by the CHANGE MADE TO IT LIST, TERMINAL **aaa** REMOVED audit line.

Action: None. Informational only.

LOW NET MSG BUFFER POOL, MSG aaa SRC bbbb PURGED

Where: **aaa** = message number
bbbb = source terminal-ID

Explanation: Warning. The CPU is low on memory space available to handle transmit and receive messages and is beginning to purge low priority messages. The CPU will purge low priority messages that are in the process of being received, or are ready for transmit in order to reclaim memory space. Expect to see groups of these notifications as whole levels of low priority messages are purged.

Action: Delay entry of low priority messages. Instruct all I/O operators at the terminal to review their received messages. Received messages need to be deleted or saved in permanent storage. Delete all unnecessary temporary messages.

M-ENT:aaa;bbbb;c.c;d;ee;ffff,ffff,ffff,ffff,ffff

Where: **aaa** = assigned message number
bbbb = time in minutes past midnight (Zulu)
c.c = message type (necessity.precedence)
d = TX type (Stress, Non-stress, Flood)
ee = number of packets to transmit
ffff = destination address(es), terminal ID/AIG

Explanation: Informational. The CPU has accepted a message with the above characteristics for transmission.

Action: None. Informational only.

MM AUDIT DB FULL, MSG aaa SRC bbbb NOT TRACKED

Where: **aaa** = message number
bbbb = source terminal-ID

Explanation: Informational. The data base used to track messages originated from this terminal is full. All messages entered while the data base is full will not be tracked with BEGIN OWN TX, MSG **aaa** or VALID MSG **aaa** SRC **bbbb** TRANSMITTED audit messages, but will still be accepted and transmitted. The data base contains entries for 140 messages. After a message has been transmitted successfully, the associated data base entry is cleared and additional messages will be tracked.

Action: None. Informational only.

MODEM a, ECCM INTERFACE FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. The modem detected a fault in the ECCM interface. The Stack is operational only in voice mode.

Action: Use the RADIO I/O BIT screen to select the STACK **a** BIT option. When a MODEM failure is reported by STACK BIT, correct the MODEM failure using normal maintenance procedures. When STACK BIT does not report a MODEM failure, continue normal operational procedures.

MODEM a FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. There is a fault with the modem. Stack is operational only in voice mode.

Action: Use the RADIO I/O BIT screen to select the STACK **a** BIT option. When a MODEM failure is reported by STACK BIT, correct the MODEM failure using normal maintenance procedures. When STACK BIT does not report a MODEM failure, continue normal operational procedures.

MODEM a, KG-84 ALARM FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. The modem detected a fault in the KG-84. Stack is operational only in voice mode.

Action: Make sure the KG-84 is set up properly; i.e., variables loaded and switches on proper settings. Use the RADIO I/O BIT screen to select the STACK **a** BIT option. When a MODEM/KG failure is reported by STACK BIT, correct the MODEM/KG failure using normal maintenance procedures. When STACK BIT does not report a MODEM/KG failure, continue normal operational procedures.

MODEM a, KG-84 OPERATIONAL FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. This is a status message relayed from Modem **a**. The modem detects that the attached KG-84 is not working properly. Stack is operational only in voice mode.

Action: Make sure the KG-84 is set up properly; i.e., variables loaded and switches on proper settings. Use the RADIO I/O BIT screen to select the STACK **a** BIT option. When a MODEM/KG failure is reported by STACK BIT, correct the MODEM/KG failure using normal maintenance procedures. When STACK BIT does not report a MODEM/KG failure, continue normal operational procedures.

M-RXD:aaa;bbbb;c.c;dd;ee;ffff,gggg

Where: **aaa** = message number
bbbb = TX time in minutes past midnight (Zulu)
c.c = message type (necessity.precedence)
d = TX type (Stress, Non-stress, Flood)
ee = number of packets received
ffff = destination address(es)
gggg = RX time in minutes past midnight (Zulu)

Explanation: Informational. The CPU has received a message with the above characteristics for your I/O.

Action: None. Informational only.

MSG aaa NOT ACCEPTED, STACK NOT CONFIGURED

Where: **aaa** = message number

Explanation: Warning. Message **aaa** was entered for transmission, but it was not accepted by the CPU and it has been purged. This notification has been output because the information needed by the CPU to accept message data was not entered into the STACK CONFIGURATION screen. At least one stack must be configured with a stack mode of DATA and a stack role of subnet member or controller before any messages will be accepted for transmission.

Action: Use the STACK CONFIGURATION screen to configure the desired stacks. Re-enter the message.

MSG aaa, SECURITY bb.b, RX'ED FOR TX FROM I/O c

Where: **aaa** = message number
bb.b = security labels
c = I/O unit number

Explanation: Informational. This audit notifies the Radio I/O operator that the CPU has received a message for transmission from I/O **c**. The message has been assigned number **aaa**.

Action: None. Informational only.

MSG aaa, SRC TRM bbbb ABORTED

Where: **aaa** = message number
bbbb = source terminal-ID

Explanation: Warning. The CPU could not transmit a message to the requested destination. The message has been deleted.

Action: Check message destination for accuracy. Re-enter the message.

MTU BIT STARTED

Explanation: Informational. This notification indicates that the MTU BIT request is being run.

Action: None. Informational only.

MTU BIT COMPLETED

Explanation: Informational. This notification indicates that the MTU BIT has completed successfully.

Action: None. Informational only.

MTU BUSY

Explanation: Informational. The MTU is busy executing a read/write function.

Action: None. Informational only.

MTU CHECKSUM ERROR ON A READ

Explanation: Warning. The CPU has detected that information it read from an AIG, Frequency, or Operational Parameters tape is in error. Either the MTU or the tape maybe faulty.

Action: Use the MTU maintenance procedure to clean the MTU Tape Transport and Head. Reload the tape. If the problem persists, the tape is faulty. Replace with another tape.

MTU HAS WRITE PROTECTED TAPE

Explanation: Informational. The CPU cannot write information on the tape loaded in the MTU. The tape is write protected.

Action: Verify that the correct tape is in the MTU. The AIG, Frequency, and Program load tapes are READ only (Write Protected). Operational Parameters tapes should be READ/WRITE capable, make sure it is not write protected.

MTU TIMEOUT

Explanation: Warning. The MTU has not responded to CPU commands. It may be defective.

Action: Use the Radio I/O screen to run BIT on the MTU. When a MTU failure is reported by MTU BIT, correct the MTU failure using normal maintenance procedures. When MTU BIT does not report a MTU failure, continue normal operational procedures.

MTU WRONG TAPE PRESENT OR NO TAPE PRESENT

Explanation: Informational. The MTU is trying to perform a Read/Write function but either the wrong tape has been inserted or the tape drive is empty.

Action: This error normally occurs when the operator is using the LOAD TAPES screen and has forgotten to load a tape or has loaded the wrong tape. When a tape is not present, insert the required tape. When a tape is present, replace the tape with the correct tape. The tape label indicates what data is stored on the tape.

NCS AIG ASSIGNMENT DIRECTIVE ASSIGNED MSG # aaa

Where: **aaa** = message number

Explanation: Informational. Your NCS AIG Assignment directive has been accepted for transmission by the CPU and has been assigned message number **aaa**.

Action: None. Informational only.

NCS AIG ASSIGNMENT RX'D, MSG aaa SRC bbb

Where: **aaa** = message number
bbb = source terminal-ID

Explanation: Informational. An AIG Assignment directive has been received from the NCS. Your terminal's AIG list is being automatically updated.

Action: None. Informational only.

NCS DIRECTIVE NOT FROM NCS, MSG aaa SRC bbbb

Where: **aaa** = message number
bbbb = source terminal-ID

Explanation: Warning. An NCS directive has been received from a terminal that is not identified as the NCS on your NCS/ANCS/IT list. The NCS directive has been ignored.

Action: Use the NCS/ANCS/IT TERMINAL IDENTIFICATION screen to see what terminal is specified as the NCS. Contact your subnet controller and request verification of the NCS identity.

NCS ECCM AUTHORIZATION ACCEPTED FOR TX

Explanation: Informational. As the NCS operator, the CPU has accepted your directive to enable ECCM authorization. The audit line ECCM AUTHORIZATION TRANSMITTED will appear when the directive is transmitted.

Action: None. Informational only.

NCS ECCM DE-AUTHORIZATION ACCEPTED FOR TX

Explanation: Informational. As the NCS operator, the CPU has accepted your directive to disable ECCM authorization. The audit line ECCM DE-AUTHORIZATION TRANSMITTED will appear when the directive is transmitted. Note: Any subnet that is in ECCM mode when this directive is received will automatically change the mode to training.

Action: None. Informational only.

NCS FREQ CHANGE, SUBNET aaa, ASSIGNED MSG bbb

Where: **aaa** = subnet number
bbb = message number

Explanation: Informational. As the NCS operator, your Frequency Change directive has been accepted for transmission by the CPU, and has been assigned message number **bbb**. Execution of the Frequency Change directive is the responsibility of the subnet **aaa** controller operator. The subnet **aaa** controller operator must coordinate the change with subnet members. Note: The changeover to the new frequencies does not occur automatically.

Action: None. Informational only.

NCS FREQ CHANGE SUBNET aaa RX'D, MSG bbb SRC ccc

Where: **aaa** = subnet number
bbb = message number
ccc = source terminal-ID

Explanation: Informational. A frequency change directive was received from the NCS.

Action: When your terminal is the controller of subnet **aaa**, go to the SUBNET CONTROLLER FUNCTIONS screen and select the PRINT NCS DIRECTED FREQUENCY REPORT option. Compose and send a message to all subnet members that contains the details of the frequency change. These details should include the new frequency list and the time the change is to take place.

NCS MODE CHG FOR ALL SUBNETS ACCEPTED FOR TX

Explanation: Informational. As the NCS operator, your NCS Mode Change directive has been accepted for transmission by the CPU. All subnets in the network will change to the new mode of operation selected on the OPERATING MODE CHANGE screen.

Action: None. Informational only.

NCS MODE CHG FOR SUBNET aaa ACCEPTED FOR TX

Where: **aaa** = subnet number

Explanation: Informational. As the NCS operator, your NCS Mode Change directive for subnet **aaa** has been accepted for transmission by the CPU. When the subnet controller terminal of subnet **aaa** receives the directive, it will automatically change the mode of subnet **aaa** to the mode that you specified on the OPERATING MODE CHANGE screen.

Action: None. Informational only.

NCS MODE CHG TO aaaaaaaa ENTERED

Where: **aaaaaaaa** = new mode

Explanation: Informational. A Mode Change directive was entered at the NCS. This audit verifies the mode selected on the OPERATING MODE CHANGE screen. The NCS MODE CHANGE TX'D ALL SUBNETS or NCS MODE CHANGE TX'D, SUBNET **aaa** will follow this notification.

Action: None. Informational only. If the mode selected was not the mode you intended to select, allow 1 hour to elapse prior to commanding another mode change.

NCS MODE CHANGE TX'D, ALL SUBNETS

Explanation: Informational. Your NCS directive to change the mode of all subnets was transmitted.

Action: None. Informational only.

NCS MODE CHANGE TX'D, SUBNET aaa

Where: **aaa** = subnet number

Explanation: Informational. Your NCS directive to change the mode of subnet **aaa** was transmitted.

Action: None. Informational only.

NCS REPLACE TRM aaa VOTE RX'D, MSG bbb SRC ccc

Where: **aaa** = terminal-ID
bbb = message number
ccc = source terminal-ID

Explanation: Informational. A vote has been received to replace the NCS with terminal **aaa**. Two votes must be received from two different ANCS terminals for the change to be made.

Action: None. Informational only

NCS REPLACEMENT, TRM bbb, ASSIGNED MSG aaa

Where: **aaa** = message number
bbb = terminal-ID

Explanation: Informational. As an NCS or ANCS operator, your command to TRANSFER NET CONTROL TO ANCS has been accepted by the CPU and assigned message number **aaa**. If you are the current NCS operator, your terminal will automatically change to an ANCS role. If you are currently an ANCS operator, your vote for a new NCS must be confirmed by a second NCS terminal before the new NCS will take effect.

Action: None. Informational only.

NCS VOTE FROM aaa BUT TRM bbb NOT ON ANCS LIST

Where: **aaa** = source terminal-ID
bbb = terminal-ID

Explanation: Warning. Your terminal received an ANCS vote from terminal **aaa** to replace the NCS with ANCS terminal **bbb**. Terminal **bbb** is not on your terminal's ANCS list. The vote has been discarded.

Action: Verify the correctness of the ANCS list. If terminal **bbb** should be on the ANCS list, use the NCS/ANCS/IT TERMINAL IDENTIFICATION screen to insert terminal **bbb** as an ANCS. Note: If there is a second vote for terminal **bbb**, then replace the current NCS with terminal **bbb**. In addition, add the previous NCS terminal ID to the ANCS list.

N-MODE aa;bbb;ccc;d

Where: **aa** = mode
bbb = terminal-ID
ccc = address
d = ECCM authorization

Explanation: Informational. An NCS role change/authorization command has been received.

Action: None. Informational only.

OWN TRM SIGNED-OUT OF SUBNET aaa BY CONTROLLER

Where: **aaa** = subnet number

Explanation: Informational. Your terminal was removed from subnet **aaa** by your controller. The stack role has been configured to OFF. The stack must be reconfigured before subnet operations can resume.

Action: When this is an unexpected event, contact your subnet controller.

PLAYBACK ATTEMPT, INVALID MSG BLK I/O a

Where: **a** = I/O unit number

Explanation: Warning. The CPU detected a violation of the message block protocol on its link with I/O **a**. The CPU no longer considers this link to be secure. This audit trail will not appear at I/O **a**.

Action: Reset I/O **a**. Proceed through the TYPE OF I/O and REGENCY NET I/O CONFIGURATION menus. Wait for the LINKED WITH CPU status to appear. When no other PLAYBACK ATTEMPT, INVALID MSG BLK I/O a audits are output, continue normal operations. When other PLAYBACK ATTEMPT, INVALID MSG BLK I/O a audits are output, use the established operational procedures to determine the integrity of the physical link between the CPU and I/O **a**. Once the physical link is secure, complete the TYPE OF I/O and the REGENCY NET I/O menus. Wait for the "LINKED WITH CPU" to appear on the screen.

PRIME POWER CONDITIONER FAULT

Explanation: Warning. The system detected a fault in the prime power conditioner.

Action: Use the RADIO I/O BIT screen to select the CIU BIT option. When a PPC failure is reported by CIU BIT, correct the PPC failure using normal maintenance procedures. When CIU BIT does not report a PPC failure, continue normal operational procedures.

PURGE OF CPU MEMORY BUFFER FAILED

Explanation: Informational. The CPU has detected a failed memory cell. The CPU was unable to initialize a buffer that contained the memory cell. The buffer has been removed from the list of available buffers.

Action: Continue operation. When the failure is reported frequently, follow normal CPU maintenance procedures.

RADIO 1, ANTENNA TUNING UNIT FAULT, STACK DOWN

Explanation: Warning. The ATU has a fault. Stack 1 is not operational.

Action: Use the RADIO I/O BIT screen to select the STACK 1 BIT option. When a failure is reported by STACK BIT, correct the ATU failure using normal maintenance procedures. When STACK BIT does not report an ATU failure, continue normal operational procedures.

RADIO a FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. A radio fault has been detected in stack **a**. Stack **a** is down.

Action: Use the RADIO I/O BIT screen to select the STACK **a** BIT option. When a RADIO failure is reported by STACK BIT, correct the RADIO failure using normal maintenance procedures. When STACK BIT does not report a RADIO failure, continue normal operational procedures.

RADIO a HAS NO VARIABLE, STACK DOWN

Where: **a** = stack number

Explanation: Warning. The ECCM for stack **a** does not have a loaded cryptovariable. Stack **a** is down.

Action: Load cryptovariable in the ECCM in stack a. se the RADIO I/O BIT screen to select the STACK a BIT option after the cryptovariable has been successfully loaded.

RADIO a, POWER AMP FAULT, STACK DOWN

Where: a = stack number

Explanation: Warning. A fault has been detected in Power Amplifier a. Stack a is down.

Action: Use the RADIO I/O BIT screen to select the STACK a BIT option. When a RADIO POWER AMP failure is reported by STACK BIT, correct the RADIO POWER AMP failure using normal maintenance procedures. When STACK BIT does not report a RADIO failure, continue normal operational procedures.

RADIO a, POWER SUPPLY FAULT, STACK DOWN

Where: a = stack number

Explanation: Warning. A fault has been detected in Power Supply a. Stack a is down.

Action: Use the RADIO I/O BIT screen to select the STACK a BIT option. When a RADIO POWER SUPPLY failure is reported by STACK BIT, correct the RADIO POWER SUPPLY failure using normal maintenance procedures. When STACK BIT does not report a RADIO failure, continue normal operational procedures.

RADIO a, PRE-POST SELECTOR FAULT, STACK DOWN

Where: a = stack number

Explanation: Warning. A fault has been detected in Pre-Post Selector a. Stack a is down.

Action: Use the RADIO I/O BIT screen to select the STACK a BIT option. When a RADIO PRE-POST SELECTOR failure is reported by STACK BIT, correct the RADIO PRE-POST SELECTOR failure using normal maintenance procedures. When STACK BIT does not report a RADIO failure, continue normal operational procedures.

RECALLING STORED MSG aaaaaaaaaaaa FOR I/O b

Where: **aaaaaaaaaaaa** = message name
b = I/O unit number

Explanation: Informational. This audit informs the Radio I/O operator that the identified message being recalled by the I/O **b** operator.

Action: None. Informational only.

MOVE ANCS, TRM bbb, DIRECTIVE ASSIGNED MSG aaa

Where: **aaa** = message number
bbb = terminal-ID

Explanation: Informational. As an NCS or ANCS operator, you entered a command to remove an ANCS from the net. The CPU accepted your command and assigned it message number **aaa** (The command is converted to a message for network transmission).

Action: None. Informational only.

REMOVE IT, TRM bbb, DIRECTIVE ASSIGNED MSG aaa

Where: **aaa** = message number
bbb = terminal-ID

Explanation: Informational. As an NCS or ANCS operator, you entered a command to remove an injector from the net. The CPU accepted your command and assigned it message number **aaa** (The command is converted to a message for network transmission).

Action: None. Informational only.

RFO BIT COMPLETED, RUN ALL STACKS BIT

Explanation: Informational. Your requested RFO BIT operation has completed successfully.

Action: Use the ALL STACKS option on the RADIO I/O BIT Screen to check the operational condition of all terminal stacks.

RFO FAULT, HEALTHY STACKS DOWN

Explanation: Warning. An RFO Fault has been detected; all stacks are down.

Action: Use the RADIO I/O BIT screen to select the RFO BIT option. When an RFO failure is reported by RFO BIT, correct the RFO failure using normal maintenance procedures. When RFO BIT does not report a RFO failure, continue normal operational procedures.

ROLE CHANGE FROM ANCS TO NCS

Explanation: Informational. Your terminal is now the Net Control Station (NCS) and is the only terminal capable of entering NCS directives. These directives are: SPECIFY NEW FREQS/HOPSETS FOR SUBNET, SPECIFY AIG CHANGE, SPECIFY OPERATING MODE CHANGE, and SPECIFY ECCM AUTHORIZATION. You are still able to perform all ANCS functions (All functions on the NCS/ANCS Functions screen).

Action: None. Informational only.

ROLE CHANGE FROM NCS TO ANCS

Explanation: Informational. Your terminal is no longer the NCS. It is now an ANCS. You are no longer capable of issuing NCS directives. These directives are: SPECIFY NEW FREQS/HOPSETS FOR SUBNET, SPECIFY AIG CHANGE, SPECIFY OPERATING MODE CHANGE, and SPECIFY ECCM AUTHORIZATION. An attempt to perform an NCS directive will cause an error message to be generated. You may still perform ANCS functions (Add/Remove ANCS/IT, Transfer Net Control, Print Reports) on the NCS/ANCS Functions screen.

Action: None. Informational only.

RTTY MESSAGE aaa RECEIVED ON STACK b

Where: **aaa** = message number
b = stack number

Explanation: Informational. Your terminal received RTTY message **aaa** on stack b.

Action: Use the [SHOW MSG] key to recall the new message. While in the RECALL MESSAGE screen either request to DELETE or SAVE the RTTY message.

RTTY MESSAGE aaa TRANSMITTED ON STACK b

Where: **aaa** = message number
b = stack number

Explanation: Informational. Your terminal transmitted RTTY message **aaa** on stack b.

Action: None. Informational only.

RX NET MSG DATA BASE FULL

Explanation: Warning. The CPU can not receive any more messages. There are currently 100 incomplete messages in the process of being received by your terminal. New messages will be purged until one of the incomplete messages is completed.

Action: None. The message traffic on the network is heavy and must clear. You may wish to note which message(s) are purged so that you may inform the originator(s) that they were not received.

RX NET MSG TIME OUT, MSG aaa SRC bbbb PURGED

Where: **aaa** = message number
bbbb = source terminal-ID

Explanation: Informational. The CPU allows a maximum of 24 hours to receive a complete message. If, after 24 hours the whole message is not received, the message is deleted.

Action: Investigate the excessive delay. Notify the originator of the message that the message was not received.

RXS AC/DC POWER SUPPLY FAULT

Explanation: Warning. The Split Site RXS CIU detected a fault in the AC/DC Power Supply.

Action: Correct the RXS AC/DC Power Supply failure using normal maintenance procedures.

RXS CIU FATAL FAULT, ALL STACKS DOWN

Explanation: Warning. A fatal fault was detected in the CIU. All stacks are inoperative.

Action: Use the SPLIT SITE BIT screen to select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running front panel BIT on the CIU at the RXS site. When CIU BIT does not report a CIU failure, continue normal operational procedures.

RXS CIU - SIGNAL ENTRY PANEL USART ERROR, SEP BAD

Explanation: Warning. A signal entry panel USART error was detected in the CIU at the RXS site. All stacks are inoperative.

Action: Use the SPLIT SITE BIT screen to select the FT TO SPLIT SITE LINK BIT option. This causes BIT to be run on both the RXS and TXS SEPs. A link checksum error could occur as a result of the LINK BIT. The BAD DATA RECEIVED FROM RXS notification can be ignored in this case. When a SEP failure is reported by SEP BIT, correct the SEP failure using normal maintenance procedures. When SEP BIT does not report a SEP failure, continue normal operational procedures.

RXS CPU RESTART COMPLETE, INITIALIZATION STARTED

Explanation: Warning. The RXS has restarted as a result of an operator initiated cold start, operator initiated warm start, power loss, or RXS equipment failure. The TXS has started sending initialization information to the RXS, but all stacks are down, terminal cannot perform normal operations.

Action: Use the SPLIT SITE BIT screen to select ALL STACKS BIT.

RXS CPU - CIU LINK CHECKSUM ERROR, ALL STACKS DOWN

Explanation: Warning. A CPU to CIU link checksum error was detected at the RXS site. Communication between the CPU and CIU has failed. All stacks are inoperative.

Action: Use the SPLIT SITE BIT screen to select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running front panel BIT on the CIU at the RXS site. When CIU BIT does not report a CIU failure, continue normal operational procedures.

RXS CPU - CIU LINK SEQUENCE ERROR, ALL STACKS DOWN

Explanation: Warning. A CPU to CIU link sequence error has been detected at the RXS site. Communication between the CPU and CIU has failed. All stacks are inoperative.

Action: Use the SPLIT SITE BIT screen to select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running front panel BIT on the CIU at the RXS site. When CIU BIT does not report a CIU failure, continue normal operational procedures.

RXS CPU - CIU LINK TIMEOUT, ALL STACKS DOWN

Explanation: Warning. A CPU to CIU link timeout has been detected at the RXS site. Communication between the CPU and CIU has failed. All stacks are inoperative.

Action: Use the SPLIT SITE BIT screen to select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running front panel BIT on the CIU at the RXS site. When CIU BIT does not report a CIU failure, continue normal operational procedures.

RXS FAILED TO COMPLETE BIT

Explanation: Warning. The RXS CPU did not respond to a BIT command.

Action: Use the SPLIT SITE BIT screen to retry the BIT request. Contact RXS site location if problem continues.

RXS MODEM a, ECCM INTERFACE FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. The modem detected a fault in the ECCM interface at the Receive Site. The Stack is operational only in voice mode.

Action: Use the SPLIT SITE BIT screen to select the STACK **a** BIT option. This request causes BIT to be run both the TXS and RXS Stack **a**. When a MODEM failure is reported by STACK BIT, correct the MODEM failure using normal maintenance procedures. This may require running off-line BIT on the MODEM at the RXS site. When STACK BIT does not report a MODEM failure, continue normal operational procedures.

RXS MODEM a FAULT, STACK DOWN

Where: a = stack number

Explanation: Warning. There is a fault on Receive Site Stack a modem. The Stack is operational only in voice mode.

Action: Use the SPLIT SITE BIT screen to select the STACK a BIT option. This request causes BIT to be run on both the TXS and RXS Stack a. When a MODEM failure is reported by STACK BIT, correct the MODEM failure using normal maintenance procedures. This may require running off-line BIT on the MODEM at the RXS site. When STACK BIT does not report a MODEM failure, continue normal operational procedures.

RXS MODEM a, KG-84A ALARM FAULT, STACK DOWN

Where: a = stack number

Explanation: Warning. The Receive Site Stack a modem detected a fault in the KG-84A. Stack a is operational only in voice mode.

Action: Make sure the KG-84 is set up properly, i.e., variables loaded and switches on proper settings. Use the SPLIT SITE BIT screen to select the STACK a BIT option. This request causes BIT to be run on both the TXS and RXS Stack a. When a MODEM/KG failure is reported by STACK BIT, correct the MODEM/KG failure using normal maintenance procedures. When STACK BIT does not report a MODEM/KG failure, continue normal operational procedures.

RXS MODEM a, KG-84A OPERATIONAL FAULT, STACK DOWN

Where: a = stack number

Explanation: Warning. This is a status message relayed from Receive Site Modem a. The modem detects that the attached KG-84A is not working properly. The Stack is operational only in voice mode.

Action: Make sure the KG-84A is set up properly, i.e., variables loaded and switches on proper settings. Use the SPLIT SITE BIT screen to select the STACK **a** BIT option. This request causes BIT to be run on both the TXS and RXS Stack **a**. When a MODEM/KG failure is reported by STACK BIT, correct the MODEM/KG failure using normal maintenance procedures. When STACK BIT does not report a MODEM/KG failure, continue normal operational procedures.

RXS PRIME POWER CONDITIONER FAULT

Explanation: Warning. The system detected a fault in the prime power conditioner at the Receive Site.

Action: Use the SPLIT SITE BIT screen to select the CIU BIT option. This request causes BIT to be run on both the RXS and TXS CIU's. When the CIU BIT reports a PPC failure, correct the problem using normal maintenance procedures. When the CIU BIT does not report a PPC failure, continue normal operational procedures.

RXS PURGE OF CPU MEMORY BUFFER FAILED

Explanation: Informational. A failed memory cell has been detected in the Split Site Receive Site CPU. The RXS CPU was unable to initialize a buffer that contained the memory cell. The buffer has been removed from the list of available buffers.

Action: Continue operation. When the failure is reported frequently, follow normal CPU maintenance procedures.

RXS RADIO a FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. A Radio fault has been detected in Receive Site Stack **a**. Stack **a** is down.

Action: Use the SPLIT SITE BIT screen to select the STACK **a** BIT option. This request causes BIT to be run on both the TXS and RXS Stack **a**. When a RADIO failure is reported by STACK BIT, correct the RADIO failure using normal maintenance procedures. This may require running front panel BIT on the ECCM at the RXS site. When STACK BIT does not report a RADIO failure, continue normal operational procedures.

RXS RADIO a HAS NO VARIABLE, STACK DOWN

Where: a = stack number

Explanation: Warning. The Receive Site ECCM for stack a does not have a loaded cryptovariable. Stack a is down.

Action: At the RXS site, load a cryptovariable in the ECCM in stack a. se the SPLIT SITE BIT screen to select the STACK a BIT option after the cryptovariable has been successfully loaded. This request causes BIT to be run on both the TXS and RXS Stack a.

RXS RADIO a, PRE-POST SELECTOR FAULT, STACK DOWN

Where: a = stack number

Explanation: Warning. A fault has been detected in the Receive Site Pre-Post Selector a. Stack a is down.

Action: Use the SPLIT SITE BIT screen to select the STACK a BIT option. This request causes BIT to be run on both the TXS and RXS Stack a. When a RADIO PRE-POST SELECTOR failure is reported by STACK BIT, correct the RADIO PRE-POST SELECTOR failure using normal maintenance procedures. When STACK BIT does not report a RADIO failure, continue normal operational procedures.

RXS RFO FAULT, HEALTHY STACKS DOWN

Explanation: Warning. Receive Site RFO fault detected; all stacks down.

Action: Use the SPLIT SITE BIT screen to select the RFO BIT option. This request causes BIT to be run on both the TXS and RXS RFO's. When a RFO failure is reported by RFO BIT, correct the RFO failure using normal maintenance procedures. When RFO BIT does not report a RFO failure, continue normal operational procedures.

RXS SIGNAL ENTRY PANEL FAULT

Explanation: Warning. Receive Site SEP fault detected.

Action: Use the SPLIT SITE BIT screen to select the FT TO SPLIT SITE LINK BIT option. This request causes BIT to be run on both the TXS and RXS SEP's. A link checksum error could occur as a result of the LINK BIT. The BAD DATA RECEIVED FROM RXS notification can be ignored in this case. When a SEP failure is reported by FT TO SPLIT SITE LINK BIT, correct the SEP failure using normal maintenance procedures. When STACK BIT does not report a SEP failure, continue normal operational procedures.

RXS S-3 LINK a TIMED OUT

Where: **a** = line number

Explanation: Warning. A link between the TXS and RXS locations is down. This indicates a possible failure in the TXS KG, TXS SEP, telephone line, RXS KG, RXS SEP, or RXS equipment. Up to three of these audits, one for each line, may be output. If a single line is down it indicates that the RXS CPU is operational. The failure is thus isolated to the set of equipment on the specified link.

Action:

1. Verify the TXS KG is operating correctly. Reset the KG if required.
2. Check the TXS SEP fault light on the CIU front panel. Use the SPLIT SITE BIT screen to select the FT TO SPLIT SITE LINK BIT option to clear any faults.
3. Contact RXS maintenance for verification of the operational condition of RXS equipment.
4. Follow telephone line maintenance procedures.

RXS TIME UPDATE COMPLETED, RUN ALL STACKS BIT

Explanation: Informational. The Time-Of-Day has been loaded successfully at the Split Site RXS.

Action: Use the ALL STACKS option on the RADIO I/O BIT Screen to check the operational condition of all stacks.

RXS TRANSITION OF KG a CONNECTION TO bbb

Where: **a** = KG number
bbb = connection state (ON/OFF)

Explanation: Informational. Identifies the stack configuration secure/non-secure status of Receive Site KG **a**. The state of the KG reflects the level of message security permitted to be received or transmitted from the stack. Where ON means stack is operating in a secure mode and OFF means the stack is operating in a non-secure mode.

Action: Ensure that the secure/non-secure state of the stack is intended.

SECURITY LABEL MISMATCH, MSG aaa SRC TRM bbbb

Where: **aaa** = message number
bbbb = source terminal-ID

Explanation: Warning. The security labels in separate packets of a message do not match. The packets have been deleted.

Action: This condition is abnormal, in that the security features of the RN system make it highly improbable to occur. Inform the message originator that the message was not received. If the condition is repeated it may be indicative of a CPU error, in which case normal maintenance procedures for the CPU should be followed.

SHELTER DOOR IS CLOSED

Explanation: Switch S4 has detected a closing of the shelter door.

Action: None. Informational only.

SHELTER DOOR IS OPEN

Explanation: Switch S4 has detected an opening of the shelter door.

Action: Verify need for access of person entering shelter, or close the door.

SHELTER TEMPERATURE IS HIGH

Explanation: CPU exhaust air temperature has reached a temperature of at least 130 degrees Fahrenheit.

Action: Increase shelter cooling. If this does not decrease fan exhaust temperature to normal, notify your supervisor of possible defective CPU fan assembly located in the control rack.

SHELTER TEMPERATURE IS NORMAL

Explanation: CPU exhaust air temperature has decreased to a normal range of 115 degrees Fahrenheit.

Action: None. Informational only.

SIGNAL ENTRY PANEL FAULT

Explanation: Warning. An SEP fault has been detected.

Action: Use the RADIO I/O BIT screen to select the Signal Entry Panel BIT option. When a SEP failure is reported by STACK BIT, correct the SEP failure using normal maintenance procedures. When STACK BIT does not report a SEP failure, continue normal operational procedures.

STACK a DOWN, PERFORMING BIT

Where: **a** = stack number

Explanation: Informational. This notification indicates that BIT is being run on the ECCM (and MODEM if present) for stack **a**. The BIT has started as a result of your BIT request, after the Terminal Configuration is specified during set-up, after a DATA or RTTY stack is turned OFF.

Action: None. Informational only.

STACK a UP, BIT COMPLETED

Where: **a** = stack number

Explanation: Informational. This message appears after the successful completion of BIT.

Action:

1. When the stack is setup for DATA operation as a subnet member you need to rejoin subnet operations. Use the SUBNET MEMBER FUNCTIONS screen to select the SIGN INTO SUBNET option.

2. When the stack is setup for DATA operation as a subnet controller you need to restart subnet operations. Use the SUBNET CONTROLLER FUNCTIONS screen to select the CONSTITUTE SUBNET option.

3. When the stack is setup for DATA operation as a subnet monitor you need to restart monitor

operations. Use the SUBNET MEMBER FUNCTIONS screen to select the BEGIN MONITORING SUBNET option.

SURRENDERED CONTROL OF SUBNET aaa ON STACK b

Where: **aaa** = subnet number
b = stack number

Explanation: Informational. Your tier 1 terminal is no longer the controller of subnet **aaa**. This notification is given upon handing off control (TRANSFER SUBNET CONTROL option on the SUBNET CONTROLLER FUNCTIONS screen) or when a new controller has automatically taken over the subnet. This terminal is still active in subnet **aaa**. The subnet role has been changed from a T1SC to a T1SM. The functions available on the SUBNET CONTROLLER FUNCTIONS screen can no longer be used for subnet **aaa**. The SUBNET MEMBER FUNCTIONS are now available. Note: This audit has no bearing on NCS/ANCS functionality.

Action: None. Informational only.

T2 FROM aaaa FOR T1 bbb, I/O'S 0-5: c, c, c, c, c, c

Where: **aaaa** = terminal-ID
bbb = message number
c = execution status input by I/O

Explanation: Informational. Type 2 data was received from terminal **aaaa**. This audit was output because your CPU could not locate a type 1 table entry for Type 1 message **bbb**. This can occur when more than ten Type 1 messages have been transmitted by your terminal or when your terminal has undergone a warm or cold restart since the transmission of the Type 1 message **bbb**. All of terminal **aaaa** I/O's execution status **c** are provided in order from I/O 0 to 5. This notification follows the TYPE 2 ACK FROM TRM **aaa** BUT MSG **bbb** NOT IN LIST audit.

Action: The information provided in this audit is not available in Type 2 report format. Extract the desired information from the audit notification.

TAPE EXECUTION ERROR ON MTU

Explanation: Warning. Indicates faulty MTU or tape.

Action: Use the MTU maintenance procedure to clean the MTU Tape Transport and Head. Run MTU off-line BIT. If BIT passes, the tape is faulty. Replace with another tape. If BIT fails, correct the failure using normal maintenance procedures.

TAPE READ ERROR ON MTU

Explanation: Warning. Indicates faulty MTU or tape.

Action: Use the MTU maintenance procedure to clean the MTU Tape Transport and Head. Run MTU off-line BIT. If BIT passes, tape is faulty. Replace with another tape. If BIT fails, correct the failure using normal maintenance procedures.

TAPE WRITE ERROR ON MTU

Explanation: Warning. Indicates faulty MTU or tape.

Action: Use the MTU maintenance procedure to clean the MTU Tape Transport and Head. Run MTU off-line BIT. If BIT passes, tape is faulty. Replace with another tape. If BIT fails, correct the failure using normal maintenance procedures.

THIS TERMINAL IS ANCS CAPABLE

Explanation: The CPU has been loaded with ANCS capable software, as contained on the CPU Program Load tape and may assume an NCS or ANCS role depending upon where your terminal ID is specified on the NCS/ANCS/IT TERMINAL IDENTIFICATION screen.

Action: None. Informational only.

TIME DIFFERENCE DETECTED WITH RXS, CHECK RFO

Explanation: Warning. The Split Site TXS CPU has detected a Time-of-Day (TOD) difference between the TXS and the RXS. The TOD between the sites needs to be corrected before you start any DATA mode operations.

Action: Reload the RFO time at the TXS. If there is still a time difference, reload the RFO time at the RXS. When the times match, as indicated by the TXS AND RXS MATCH IN TIME audit line, continue normal operations.

TIME UPDATE COMPLETED, RUN ALL STACKS BIT

Explanation: Informational. The Time-Of-Day has been loaded successfully into the RFO. All stacks are currently down. ALL STACKS BIT is required to be run before the stacks can be used.

Action: Use the ALL STACKS option on the RADIO I/O BIT Screen to check the operational condition of all stacks.

TRANSITION OF KG a CONNECTION TO bbb

Where: **a** = KG number
bbb = connection state (ON/OFF)

Explanation: Informational. Your KG a has changed to state **bbb**. The ON state indicates secure mode. The OFF state indicates non-secure mode. The state reflects the level of message security permitted to be transmitted or received from that stack.

Action: Ensure that the secure/non-secure state of the stack is intended.

TX ATTEMPTED FROM RUN SILENT TERMINAL, I/O a

Where: **a** = I/O unit number

Explanation: Warning. The operator at I/O a entered a message for transmission. The CPU cannot transmit the message because the terminal is configured for run-silent operation. The message has been deleted.

Action: Notify all I/O operators at the run-silent terminal that transmissions are unauthorized.

TX NET MSG TIME OUT, MSG aaa SRC bbbb PURGED

Where: **aaa** = message number
bbbb = source terminal-ID

Explanation: Warning. The CPU allows a maximum of 24 hours to successfully transmit a complete message. If, after 24 hours, the whole message is not transmitted, the message is deleted.

Action: Investigate the transmission delay. Message traffic may be heavy or terminal outages may be causing a bottleneck in the network. Notify the originator of the message, terminal **bbbb**, that message **aaa** did not get transmitted before the 24 hour time out.

TXS AC/DC POWER SUPPLY FAULT

Explanation: Warning. The Split Site TXS CIU detected a fault in the AC/DC Power Supply.

Action: Correct the TXS AC/DC Power Supply failure using normal maintenance procedures.

TXS AND RXS MATCH IN TIME

Explanation: Informational. The Split Site TXS and RXS have the same RFO Time-Of-Day. You can now proceed with DATA mode operations.

Action: None. Informational only.

TXS CIU FATAL FAULT, ALL STACKS DOWN

Explanation: Warning. A fatal fault was detected in the CIU. All stacks are inoperative.

Action: Use the SPLIT SITE BIT screen to select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running front panel BIT on the CIU at the TXS. When CIU BIT does not report a CIU failure, continue normal operational procedures.

TXS CIU - SIGNAL ENTRY PANEL USART ERROR, SEP BAD

Explanation: Warning. A signal entry panel USART error was detected in the CIU at the TXS site. All stacks are inoperative.

Action: Use the SPLIT SITE BIT screen to select the FT TO SPLIT SITE LINK BIT option. This causes BIT to be run on the TXS and RXS SEP's. When a SEP failure is reported by FT TO SPLIT SITE LINK BIT, correct the SEP failure using normal maintenance procedures. When the BIT does not report a SEP failure, run ALL STACKS BIT and continue normal operational procedures.

TXS CPU - CIU LINK CHECKSUM ERROR, ALL STACKS DOWN

Explanation: Warning. A CPU to CIU link checksum error was detected at the TXS site. Communication between the CPU and CIU has failed. All stacks are inoperative.

Action: Use the SPLIT SITE BIT screen to select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running BIT front panel on the CIU at the TXS site. When CIU BIT does not report a CIU failure, run ALL STACKS BIT and continue normal operational procedures.

TXS CPU - CIU LINK SEQUENCE ERROR, ALL STACKS DOWN

Explanation: Warning. A CPU to CIU link sequence error has been detected at the TXS site. Communication between the CPU and CIU has failed. All stacks are inoperative.

Action: Use the SPLIT SITE BIT screen to select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running front panel BIT on the CIU at the TXS site. When CIU BIT does not report a CIU failure, run ALL STACKS BIT and continue normal operational procedures.

TXS CPU - CIU LINK TIMEOUT, ALL STACKS DOWN

Explanation: Warning. A CPU to CIU link timeout has been detected at the TXS site. Communication between the CPU and CIU has failed. All stacks are inoperative.

Action: Use the SPLIT SITE BIT screen to select the CIU BIT option. If a CIU failure is reported by CIU BIT, correct the CIU failure using normal maintenance procedures. This may require running front panel BIT on the CIU at the TXS site. When CIU BIT does not report a CIU failure, run ALL STACKS BIT and continue normal operational procedures.

TXS END OF TAPE ON MTU

Explanation: Warning. An unexpected END OF TAPE status has been returned from the MTU. This indicates that a read or write request to the Operational Parameters Tape can not been processed.

Action: Load a new Operational Parameters Tape.

TXS MODEM a, ECCM INTERFACE FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. The modem detected a fault in the ECCM interface. Stack is operational only in voice mode.

Action: Use the SPLIT SITE BIT screen to select the STACK **a** BIT option. This causes BIT to be run on the TXS and RXS stack **a**. When a MODEM failure is reported by STACK BIT, correct the MODEM failure using normal maintenance procedures. This may require running off-line BIT on the MODEM at the TXS site. When STACK BIT does not report a MODEM failure, continue normal operational procedures.

TXS MODEM a FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. There is a fault on Transmit Site Stack **a** modem. Stack is operational only in voice mode.

Action: Use the SPLIT SITE BIT screen to select the STACK **a** BIT option. This causes BIT to be run on the TXS and RXS stack **a**. When a MODEM failure is reported by STACK BIT, correct the MODEM failure using normal maintenance procedures. This may require running off-line BIT on the MODEM at the TXS site. When STACK BIT does not report a MODEM failure, continue normal operational procedures.

TXS MODEM a, KG-84A ALARM FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. The Transmit Site Stack **a** modem detected a fault in the KG-84A. Stack **a** is operational only in voice mode.

Action: Make sure the KG-84A is set up properly, i.e., variables loaded and switches on proper settings. Use the SPLIT SITE BIT screen to select the STACK **a** BIT option. This causes BIT to be run on the TXS and RXS stack **a**. When a MODEM/KG failure is reported by STACK BIT, correct the MODEM/KG failure using normal maintenance procedures. When STACK BIT does not report a MODEM/KG failure, continue normal operational procedures.

TXS MODEM a, KG-84A OPERATIONAL FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. This is a status message relayed from Transmit Site Modem **a**. The modem detects that the attached KG-84A is not working properly. Stack is operational only in voice mode.

Action: Make sure the KG-84A is set up properly, i.e., variables loaded and switches on proper settings. Use the SPLIT SITE BIT screen to select the STACK a BIT option. This causes BIT to be run on the TXS and RXS stack **a**. When a MODEM/KG failure is reported by STACK BIT, correct the MODEM/KG failure using normal maintenance procedures. When STACK BIT does not report a MODEM/KG failure, continue normal operational procedures.

Action: None. Informational only.

TXS MTU BIT COMPLETED

Explanation: Informational. This notification appears after the successful completion of MTU BIT.

Action: None. Informational only.

TXS MTU BIT STARTED

Explanation: Informational. This notification indicates that BIT is being run on the MTU. The BIT has started as a result of your BIT request.

Action: None. Informational only.

TXS MTU BUSY

Explanation: Informational. The Split Site MTU is busy executing a read/write function.

Action: Re-submit your read/write request when the MTU is idle. The MTU is idle when the yellow MTU light is off.

TXS MTU CHECKSUM ERROR ON A READ

Explanation: Warning. The CPU has detected that information it read from an AIG, Frequency, or Operational Parameters tape is in error. Either the MTU or the tape may be faulty.

Action: Use the MTU maintenance procedure to clean the MTU Tape Transport and Head. Reload the tape. If the problem persists, the tape is faulty. Replace with another tape.

TXS MTU HAS WRITE PROTECTED TAPE

Explanation: Informational. The CPU cannot write information on the tape loaded in the MTU. The tape is write protected.

Action: Verify that the correct tape is in the MTU. The AIG, Frequency, and Program load tapes are READ only (Write Protected). Operational Parameters tapes should be READ/WRITE capable, make sure it is not write protected.

TXS MTU TIMEOUT

Explanation: Warning. The MTU has not responded to CPU commands. It may be faulted.

Action: Use the SPLIT SITE BIT screen to select the MAG TAPE UNIT BIT option. When the MTU BIT reports a failure, correct the problem using normal maintenance procedures. When the MTU BIT does not report a failure, continue normal operational procedures.

TXS MTU WRONG TAPE PRESENT OR NO TAPE PRESENT

Explanation: Informational. Split Site MTU is trying to perform a Read/Write function but either the wrong tape has been inserted or the tape drive is empty.

Action: This error normally occurs when the operator is using the LOAD TAPES screen and has forgotten to load a tape or has loaded the wrong tape. When a tape is not present, insert the required tape. When a tape is present, replace the tape with the correct tape. The tape label indicates what data is stored on the tape.

TXS PRIME POWER CONDITIONER FAULT

Explanation: Warning. The system detected a fault in the prime power conditioner.

Action: Use the SPLIT SITE BIT screen to select the CIU BIT option. This request causes BIT to be run on both the RXS and TXS CIU's. When the CIU BIT reports a failure, correct the problem using normal maintenance procedures. When the CIU BIT does not report a failure, continue normal operational procedures.

TXS PURGE OF CPU MEMORY BUFFER FAILED

Explanation: Informational. A failed memory cell has been detected in the Split Site Transmit Site CPU. The TXS CPU was unable to initialize a buffer that contained the failed memory cell. The buffer has been removed from the list of available buffers.

Action: Continue operation. When the failure is reported frequently, follow normal CPU maintenance procedures.

TXS RADIO a FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. A Radio fault has been detected in Transmit Site Stack **a**. Stack **a** is down.

Action: Use the SPLIT SITE BIT screen to select the STACK **a** BIT option. This causes BIT to be run on the TXS and RXS stack **a**. When a RADIO failure is reported by STACK BIT, correct the RADIO failure using normal maintenance procedures. This may require running front panel BIT on the ECCM at the TXS site. When STACK BIT does not report a RADIO failure, continue normal operational procedures.

TXS RADIO a HAS NO VARIABLE, STACK DOWN

Where: **a** = stack number

Explanation: Warning. The Transmit Site ECCM for stack **a** does not have a loaded cryptovariable. Stack **a** is down.

Action: Load cryptovariable in the ECCM in stack **a**. se the SPLIT SITE BIT screen to select the STACK **a** BIT option after the cryptovariable has been successfully loaded. This causes BIT to be run on the TXS and RXS stack **a**.

TXS RADIO a, POWER AMP FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. A fault has been detected in Power Amplifier **a**. Stack **a** is down.

Action: Use the SPLIT SITE BIT screen to select the STACK **a** BIT option. This causes BIT to be run on the TXS and RXS stack **a**. When a RADIO POWER AMP failure is reported by STACK BIT, correct the RADIO POWER AMP failure using normal maintenance procedures. When STACK BIT does not report a RADIO failure, continue normal operational procedures.

TXS RADIO a, POWER SUPPLY FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. A fault has been detected in Power Supply **a**. Stack **a** is down.

Action: Use the SPLIT SITE BIT screen to select the STACK **a** BIT option. This causes BIT to be run on the TXS and RXS stack **a**. When a RADIO POWER SUPPLY failure is reported by STACK BIT, correct the RADIO POWER SUPPLY failure using normal maintenance procedures. When STACK BIT does not report a RADIO failure, continue normal operational procedures.

TXS RADIO a, PRE-POST SELECTOR FAULT, STACK DOWN

Where: **a** = stack number

Explanation: Warning. A fault has been detected in the Transmit Site Pre-Post Selector **a**. Stack **a** is down.

Action: Use the SPLIT SITE BIT screen to select the STACK **a** BIT option. This causes BIT to be run on the TXS and RXS stack **a**. When a RADIO PRE-POST SELECTOR failure is reported by STACK BIT, correct the RADIO PRE-POST SELECTOR failure using normal maintenance procedures. When STACK BIT does not report a RADIO failure, continue normal operational procedures.

TXS RFO FAULT, HEALTHY STACKS DOWN

Explanation: Warning. Transmit Site RFO fault detected; all stacks down.

Action: Use the SPLIT SITE BIT screen to select the RFO BIT option. This causes BIT to be run on the TXS and RXS RFO's. When a RFO failure is reported by RFO BIT, correct the RFO failure using normal maintenance procedures. When RFO BIT does not report a RFO failure, continue normal operational procedures.

TXS SIGNAL ENTRY PANEL FAULT

Explanation: Warning. Transmit Site SEP fault detected.

Action: Use the SPLIT SITE BIT screen to select the FT TO SPLIT SITE LINK BIT option. This causes BIT to be run on the TXS and RXS SEP's. When a SEP failure is reported by FT TO SPLIT SITE LINK BIT, correct the SEP failure using normal maintenance procedures. When BIT does not report a SEP failure, continue normal operational procedures.

TXS TAPE EXECUTION ERROR ON MTU
TXS TAPE READ ERROR ON MTU
TXS TAPE WRITE ERROR ON MTU

Explanation: Warning. Indicates faulty Split Site MTU or tape.

Action: Use the MTU maintenance procedure to clean the MTU Tape Transport and Head. Run MTU off-line BIT. If BIT passes, the tape is faulty. Replace with another tape. If BIT fails, correct the failure using normal maintenance procedures.

TXS TIME UPDATE COMPLETED, RUN ALL STACKS BIT

Explanation: Informational. The Time-Of-Day has been loaded successfully into the Split Site TXS RFO. All stacks are currently down. ALL STACKS BIT is required to be run before the stacks can be used.

Action: Use the ALL STACKS option on the SPLIT SITE BIT screen to check the operational condition of all stacks.

TXS TRANSITION OF KG a CONNECTION TO bbb

Where: **a** = KG number
bbb = connection state (ON/OFF)

Explanation: Informational. Identifies the stack configuration secure/non-secure status of Transmit Site KG **a**. The state of the KG reflects the level of message security permitted to be received or transmitted from the stack. Where ON means that the stack is operating in a secure mode and OFF means the stack is operating in a non-secure mode.

Action: None. Informational only.

TYPE 1 MSG FAILED IT LIST CHECK, MSG aaa SRC bbbb

Where: **aaa** = message number
bbbb = source terminal-ID

Explanation: Warning. The CPU received a Type 1 message from terminal **bbbb** that was not identified as an injector (IT) on the NCS/ANCS/IT TERMINAL IDENTIFICATION screen. The Type 1 message has been deleted.

Action: Use the NCS/ANCS/IT TERMINAL IDENTIFICATION screen to verify that the IT portion of the list is correct. Contact your controller terminal if you are unsure of the terminals that are currently the IT terminals.

TYPE 2 ACK FROM TRM aaa BUT MSG bbb NOT IN LIST

Where: **aaa** = terminal-ID
bbb = message number

Explanation: Informational. Terminal **aaa** responded with Type 2 information to Type 1 message **bbb**, but the CPU could not find message number **bbb** in the list of Type 1 messages transmitted from your terminal. The CPU retains a list of up to ten Type 1 message numbers for which it will collect Type 2 information. If more than ten Type 1 messages have been transmitted from your terminal or if your terminal has undergone a warm or cold restart since the transmission of Type 1 message **bbb**, the message number will not be in the list. The notification T2 FROM **aaaa** FOR T1 **bbb**, I/O'S 0-5: **c**, **c**, **c**, **c**, **c** will follow.

Action: None. Informational only.

TYPE 2 ACK FOR MSG aaa SRC bbb ACCEPTED, I/O c

Where: **aaa** = message number
bbb = source terminal-ID
c = I/O unit number

Explanation: Informational. The Type 2 response that I/O **c** entered from the SEND TYPE 2 screen has been accepted by the CPU. It will be transmitted to terminal **bbb**.

Action: None. Informational only.

TYPE 2 ACK RX'D FROM TERMINAL aaa FOR MSG bbb

Where: **aaa** = terminal-ID
bbb = message number

Explanation: Informational. A Type 2 Acknowledgement has been received for your Type 1 message number **bbb**.

Action: You may want to request the Type 2 Detailed Report to see the response.

UNABLE TO TX RTTY MSG, STACK a NON-SECURE

Where: **a** = stack number

Explanation: Warning. You attempted to transmit an RTTY message with a security level higher than the stack was permitted to send. There is either no KG present or the KG connection is in a non-secure state.

Action: Check the condition of the KG-84A in order to secure the stack. If the RTTY message is not supposed to be secure, check the security parameters for the message.

VALID MSG aaa, SRC TRM bbbb, SECURITY c c.c RX'ED

Where: **aaa** = message number
bbbb = source terminal-ID
c c.c = security labels

Explanation: Informational. The message **aaa** from terminal **bbbb** has been received. This notification can be used as a record of received messages.

Action: None. Informational only.

VALID MSG aaa SRC TRM bbbb TRANSMITTED

Where: **aaa** = message number
bbbb = source terminal-ID

Explanation: Informational. All packets of message **aaa** have been successfully transmitted from your terminal. This notification can be used as a record of transmitted messages. Note: This audit does not necessarily mean that the message has been successfully transmitted to all destination addresses. If other RN terminals must relay your message to its final destination(s), then those relay terminals are now responsible for delivery of the message.

Action: None. Informational only.

VALID NCS HANDOFF FROM aaa; bbb NOT ON ANCS LIST

Where: **aaa** = source terminal-ID
bbb = terminal-ID

Explanation: Warning. NCS terminal **aaa** has issued a directive handing off NCS control to ANCS **bbb**. Terminal **bbb** is not identified as an ANCS on your NCS/ANCS/IT TERMINAL IDENTIFICATION screen. The NCS handoff directive has been deleted. The NCS and ANCS terminals identified on the NCS/ANCS/IT TERMINAL IDENTIFICATION screen remain unchanged.

Action: Use the NCS/ANCS/IT TERMINAL IDENTIFICATION screen to verify the ANCS list. If terminal **bbb** should have been on the ANCS list, change the NCS terminal id to **bbb** and place terminal **aaa** on the ANCS list.

VALID TYPE 2 PACKET FOR MSG aaa TRANSMITTED

Where: **aaa** = message number

Explanation: Informational. The Type 2 Acknowledgement information for Type 1 message **aaa** has been successfully transmitted from your terminal. Note: This does not necessarily mean that the Type 2 packet has been successfully transmitted to the originator of Type 1 message **aaa**. If other RN terminals must relay your Type 2 packet to its final destination, then those relay terminals are now responsible for delivering the Type 2 packet.

Action: None. Informational only.

VOTE RX'D FOR aaa BUT ANCS/IT VOTING LIST FULL

Where: **aaa** = terminal-ID

Explanation: Informational. An ANCS or the NCS has issued a vote to add or remove an ANCS or IT, or an ANCS has issued a vote to replace the NCS. Your terminal is unable to process the vote. The voting database is full. The vote has been deleted.

Action: Contact your controller terminal if you are unsure of the terminals that are to be identified on the NCS/ANCS/IT TERMINAL IDENTIFICATION screen. Notify your NCS of this audit.

Section IV. I/O STATUS LINE MESSAGES

The following I/O status line messages are arranged alphabetically starting with the first letter of the messages.

ACKNOWLEDGE TRANSMISSION INITIATED

Appears when the FAN operator chooses the ACK option on the FAN Main Menu.

ADDR FIELD SKIPPED, ADDRS MUST BE SEQUENTIAL

Displayed when the MESSAGE DESTINATION screen is validated and one or more addresses are found after an unused address field. Addresses must be specified sequentially.

APPROACHING MAX MSG LENGTH, 20 CHARS REMAINING

Displayed when there are only 20 available characters before reaching the maximum message length. This is a warning message for the operator, so that the message can be completed within the allowed length.

AT LEAST ONE MEMBER MUST BE TRANSMIT CAPABLE

Displayed when the operator has filled in the Subnet Membership List with only Run-Silent members. The cursor returns to the first entry so that corrections may be made.

BAD TAPE LOAD, RELOAD TAPE

Displayed when the MTU discovers an error in the loading of the Operational Parameters tape. The arrow prompt remains at the Operational Parameters line on the screen, and the [ENTER] key is expected as the next keypress.

BOTTOM OF MESSAGE

Displayed when the [ROLL UP] key is pressed and the end of the message is already displayed on the screen.

CANCEL TRANSMISSION INITIATED

Appears when the FAN operator chooses the CANCEL option on the FAN Main Menu.

CTF CANNOT BE CHOSEN FOR MESSAGE OVER 200 CHARS

Displayed when the operator has chosen CTF as the Injection mode when transmitting a message over 200 characters long. The operator may choose a different Injection mode, or may ABORT so that he can shorten his message for CTF transmission.

CTF VARIABLE MAY NOT MATCH KG STACK VARIABLE

Displayed when the operator has chosen the same variable location for the stack and CTF variables on the KG Setup screen. The cursor returns to the first field so that the operator may make corrections.

DUPLICATE ADDRESS NOT ALLOWED

Displayed when a duplicate address is entered on the FAN DESTINATION HEADER screen. The cursor remains on the invalid Address field.

DUPLICATE SUBNET NUMBERS EXIST

Displayed when the same subnet number has been specified for two different stacks on the STACK CONFIGURATION screen. This condition is detected when the configuration is validated, at the [NEXT MENU] keypress. The cursor is re-positioned at the first field of the STACK CONFIGURATION screen so that the operator may make corrections.

INAPPROPRIATE DESTINATION SELECTED

Displayed on the MESSAGE DESTINATION screen when FAN is selected as the destination but the terminal has not been set up for FAN, or when RTTY-2 or RTTY-3 is selected but the terminal has not been set up for GLCM. The cursor remains on the Input Selection field.

INCOMPLETE TERM ID / IO ID ADDRESS

Displayed when either the Terminal ID or the I/O ID is not entered on the MESSAGE DESTINATION screen.

INITIALIZATION TRANSMISSION INITIATED

Appears when the FAN operator chooses the REINITIALIZE option on the FAN Main Menu.

INJ STACK MAY ONLY BE CHOSEN WHEN T2SM PRESENT

Displayed when an Injector stack is present on the STACK CONFIGURATION screen but no T2SM stack was entered. This condition is detected when the configuration is validated, at the [NEXT MENU] keypress. The cursor is re-positioned at the first field of the STACK CONFIGURATION screen so that the operator may make corrections.

INJECTOR OR CTF STACK REQUIRED FOR T2SM ROLE

Displayed when a T2SM stack is entered on the STACK CONFIGURATION screen and an Injector or CTF stack has not been set up. This condition is detected when the configuration is validated, at the [NEXT MENU] keypress. The cursor is re-positioned at the first field of the STACK CONFIGURATION screen so that the operator may make corrections.

INVALID FIELD

Displayed when an entry on the screen is out of range for the current field. Range is checked only when the [ENTER] key is pressed. When an out-of-range value is entered, the cursor is re-positioned at the beginning of the same field, and the [NEXT MENU] key is disabled.

INVALID KEY

Displayed when any key is pressed which is invalid for the current screen. For instance, pressing the [FAN FCTN] key when the terminal is not set up for FAN mode. This message is only enabled when a keystroke is expected. The cursor remains where it was on the screen.

INVALID TIER, LEVEL MUST MATCH PREVIOUS STACK

Displayed on the STACK CONFIGURATION screen when a Subnet Role is entered with a tier designation different from a previous Role, e.g., T2SC on one stack and T3SM on another. The cursor remains on the invalid Subnet Role field so that the operator may correct the entry.

LOCAL MESSAGE DIRECTORY FULL

Displayed when all available message space has been filled, or when the 48 allowable message entries on the MAIN MENU have been used.

MAX LINES REACHED, NO MORE LINES MAY BE ADDED

Displayed when the operator attempts to add one more than the maximum number of lines in a message. Further attempts to add lines will be ignored.

MAXIMUM MESSAGE LENGTH REACHED

Displayed when the operator enters the last allowed character, reaching the maximum message length.

ONLY ONE CONTROLLER ROLE ALLOWED FOR THIS TIER

Displayed on the STACK CONFIGURATION screen when a second non-Tier 1 Subnet Role with a controller designation (TxSC) is entered, e.g., entering T2SC on two stacks. The cursor remains on the invalid Subnet Role field so that the operator may correct the entry.

ONLY ONE MEMBER ROLE ALLOWED FOR THIS TIER

Displayed on the STACK CONFIGURATION screen when a second non-Tier 1 Subnet Role with a member designation (TxSM) is entered, e.g., entering T2SM on two stacks. The cursor remains on the invalid Subnet Role field so that the operator may correct the entry.

ONLY ONE STACK MAY BE SPECIFIED AS CTF

Displayed when the Stack Configuration screen is validated and it is found that CTF has been specified for more than one stack. The cursor returns to the first field so that the operator may make corrections.

OPTION INVALID FOR FAN-ONLY OPERATIONS

Appears when the FAN-only operator selects the save option on the SHOW MSG screen. Since the CPU is not present in FAN-only mode, messages cannot be saved.

OWN TERMINAL ID CANNOT BE ENTERED

Displayed when the operator attempts to enter his own terminal ID in the body of the Subnet Membership List. The cursor remains on the invalid Terminal ID field so that the operator may correct the entry.

STACK 4 MAY NOT BE DATA IN TIER 2 OPERATIONS

Displayed when the operator enters Stack Mode of "D"ata for Stack 4 when Tier 2 operations are in effect. This prompt is necessary because there are no legal monitor roles for Tier 2 terminals. The cursor remains on the invalid stack mode field so that the operator may correct the entry.

STATUS a TRANSMISSION INITIATED

Appears when the FAN operator loads a status from the FAN Main Menu. 'a' is the loaded status: 'A' - 'G'.

TOO MANY ROLES, ONLY 2 ACTIVE ROLES ALLOWED

Displayed when more than two stacks have been set up as active Data stacks (i.e., subnet controller, indigenous controller, subnet member, or indigenous member) on the STACK CONFIGURATION screen. This condition is detected when the configuration is validated, at the [NEXT MENU] keypress. The cursor is re-positioned at the first field of the STACK CONFIGURATION screen.

TOP OF MESSAGE

Displayed when the [ROLL DOWN] key is pressed and the beginning of the message is already displayed on the screen.

TRANSFER OPTION VALID FOR TIER 1 TERMINALS ONLY

Displayed when the operator attempts to select the Transfer Subnet Control option on the Controller Functions screen for a subnet in Tiers 2, 3, or 4. The cursor remains on the Select Option field for re-entry.

Section V. CIU FAULT INDICATORS

The fault indicators on the front of the Control Interface Unit (CIU) light when an equipment fault occurs. When this happens, an audit trail message is generated to report the fault. Section III of this appendix lists the audit trail messages and presents suggested actions to correct the failure.

The following table lists fault indicators and their corresponding equipment items or modules along with Terminal types in which the fault indicator is active:

FAULT INDICATOR	EQUIPMENT OR MODULE	ACTIVE IN		
		FT	SS TXS	SS RXS
ATU	Antenna Tuning Unit	X		
CIU	Control Interface Unit	X	X	X
CPU	Central Processing Unit	X	X	X
M I/O 1	Mission I/O Unit 1 (co-located or remote)	X		
M I/O 2	Mission I/O Unit 2 (remote)	X		
M I/O 3	Mission I/O Unit 3 (remote)	X		
M I/O 4	Mission I/O Unit 4 (remote)	X	X	
M I/O 5	Mission I/O Unit 5 (remote)	X	X	
MDM 1	Modem 1	X	X	X
MDM 2	Modem 2	X	X	X
MDM 3	Modem 3	X		
MDM 4	Modem 4	X	X	X
MTU	Magnetic Tape Unit	X	X	X
PA 1	Power Amplifier 1	X	X	
PA 2	Power Amplifier 2	X	X	
PA 3	Power Amplifier 3	X	X	
PPC	Prime Power Conditioner	X	X	
PPS 1	Pre/Post Selector 1	X	X	X
PPS 2	Pre/Post Selector 2	X	X	X
PPS 3	Pre/Post Selector 3	X	X	X
PPS 4	Pre/Post Selector 4	X		X
PPS 5	Pre/Post Selector 5	X		X
PS 1	PA Power Supply 1	X	X	
PS 2	PA Power Supply 2	X	X	
PS 3	PA Power Supply 3	X	X	
PS AC/DC	AC/DC Power Supply	X	X	X
RAD 1	Radio 1	X	X	X
RAD 2	Radio 2	X	X	X
RAD 3	Radio 3	X	X	X
RAD 4	Radio 4	X		X
RAD 5	Radio 5	X		X
RAD I/O	Radio I/O Unit (co-located or remote)	X	X	X
RFO	Reference Frequency Oscillator	X	X	X
SIG ENT	Signal Entry Unit	X	X	X

Section VI. FAN OPERATOR MESSAGES

The FAN KN-2 sends error messages, operator comments, and operator prompts to the I/O unit. These messages appear on line 2 of the I/O unit display and on the printer, if the printer is enabled.

	KN-2 Message	Explanation
10	OFF-LINE TEST FAILED	Off-line BIT failure status
11	OFF-LINE TESTS PASSED	Off-line BIT successful
12	OFF-LINE TESTS IN PROGRESS	Off-line BIT request started
14	BATTERY FAILED	on-line battery test error
15	KN-2 FAILED - RESET	on-line bus test error; on-line interval timer test error; on-line RAM test error
17	KN-2 SELF TEST COMPLETED	on-line tests successful
30	INVALID ENTRY	invalid operator entry; message greater than 15 slots; message greater than 593 characters
31	IMPROPER KEY VARIABLES	crypto-variable error; on-line future variable error
32	KEY VARIABLE LOADED	crypto-variable loaded
33	EAM FORMAT ERROR	E fields not equal
34	LOAD TERMINAL STATUS	* enter a terminal status through FAN Main Menu
35	MODEM DETECTED RECEIVE ERROR	error bit set in a CA RCW or a frame RCW
36	FRAME ERROR	frame message missed; mode character invalid; mode character unequal
38	MPU FAULT	Micro-Processor Unit Fault in I/O
39	LOAD FUTURE KEY VARIABLES	* load future variables using KOI-18
40	LOAD PRESENT KEY VARIABLES	* load present variables using KOI-18
42	MESSAGE RECEIVED CORRECTLY	Error free message received
43	MESSAGE RECEIVED IN ERROR	Received message has errors
44	SATELLITE MODE STRESSED	mode status notification - mode stressed
45	SATELLITE MODE UNSTRESSED	mode status notification - mode unstressed
46	PROCESSING AN EAM	Type 1 message received
47	TERMINAL PARAMETERS IN ERROR	TCP in error
48	TERMINAL STATUS LOADED	terminal status accepted
49	MODEM FAULT	tri-modem fault
50	KEY VARIABLE UPDATE COMING	variable update message received
51	ALARM CHECK COMING	alarm check, next frame boundary
52	ALARM CHECK MESSAGE	alarm check message received

	KN-2 Message	Explanation
53	VARIABLE UPDATE MESSAGE SENT	variable update message transmitted
54	MESSAGE TRANSMITTED	message has been sent
55	WAITING FOR FRAME SYNC	Data loaded, waiting for frame sync to start communications
56	CHANGE LOAD KEY SWITCH	* flip the toggle
57	OUT OF CRYPTO SYNC	Future keys or disrupted Crypto sync
60	TERMINAL STATUS DEFAULT SET	terminal status not updated for 4 frame times

* operator action required

Section VII. ODD/EVEN HOPSET INDEX REFERENCE

The second character of a hopset index determines whether the hopset is "odd" or "even". Only "odd" hopsets may be specified for top echelon (T1SC, T1SM, T2SM) subnet operations. Look at the second character of a hopset and refer to the list below to determine if the hopset is "odd" or "even".

Second Character	Odd/Even
A	odd
B	even
C	odd
D	even
E	odd
F	even
G	odd
H	even
I	odd
J	even
K	odd
L	even
M	odd
N	even
O	odd
P	even
Q	odd
R	even
S	odd
T	even
U	odd
V	even
W	odd
X	even
Y	odd
Z	even
0	odd
1	even
2	odd
3	even
4	odd
5	even
6	odd
7	even
8	odd
9	even

Section VIII. EQUIPMENT FAULT (E-fault) CODES

The Equipment Fault Codes are used to isolate equipment failures. Those equipments using codes to isolate failures are grouped as follows: Radio Equipments, CIU, Modem, and Power Equipment. The Radio Equipments consist of PA, ATU, P/PS, PAPS, and ECCM. The E-fault codes for the Radio Equipments are identical to the ECCM error codes that appear on the ECCM display during operation. The Power Equipments consist of the AC/DC PS and PPC.

The following abbreviations are used in the tables:

- AC/DC PS Power Supply PP-8095/G
- ATU Antenna Tuning Unit
- CUP Crypto Microprocessor
- CIU Control Interface Unit
- ECCM Electronic Counter-Counter Measures (C-11670/G)
- FT Force Terminal
- HSS High Speed Synthesizer
- LSG Linear Sequence Generator
- MP Manpack
- MUP Main Microprocessor
- PA Power Amplifier
- PAPS Power Amplifier Power Supply PP-8097/G
- PPC Prime Power Conditioner
- P/PS Pre-Post Selector
- PS Power Supply
- PUP Peripheral Microprocessor
- RAM Random Access Memory
- R/E Receiver/Exciter
- ROM Read-only Memory
- SEU Signal Entry Unit
- TOD Time-of-day
- TT Team Terminal
- USART Universal Synchronous/Asynchronous Receiver-Transmitter
- VA Vehicular Adapter

E-FAULT CODE TABLES

The A-1 consists of Equipment Fault (E-fault) codes from 11 through 155. Running a system Built-In Test (BIT) isolates the fault to the Control Interface Unit (CIU). Running off-line BIT on the CIU will isolate the fault to the following subassemblies (the panel must be removed to see the LED indicators): (1) Power Supply (PS1) Assembly, (2) Data Controller Circuit Card Assembly (CCA) A1, (3) Data Interface CCA A3, and (4) Front Panel Indicator CCA A4.

Table A-1. CIU Fault Codes

E-Fault Code	Explanation	Mode After Fault	Action
11	Power Supply Failure		Run off-line BIT. Remove and replace faulty assembly (refer to TM 11-5895-1373-24). Run BIT again, to check if problem has been fixed. If not, replace CIU.
21	Data Controller-CCA Processor Failure		Run off-line BIT. Remove and replace faulty assembly. Run BIT again, to check if problem has been fixed. If not, replace parallel I/O CCA A2. Run BIT. If still faulty, replace CIU.
22	Data Controller-RAM Failure		Run off-line BIT. Remove and replace faulty assembly. Run BIT again, to check if problem has been fixed. If not, replace parallel I/O CCA A2. Run BIT. If still faulty, replace CIU.
23	Data Controller-ROM Failure		Run off-line BIT. Remove and replace faulty assembly. Run BIT again, to check if problem has been fixed. If not, replace parallel I/O CCA A2. Run BIT. If still faulty, replace CIU.

E-Fault Code	Explanation	Mode After Fault	Action
31	Data Interface CCA-CPU Bus Loop Test Failure		Run off-line BIT. Remove and replace faulty assembly. Run BIT again, to check if problem has been fixed. If not, replace parallel I/O CCA A2. Run BIT. If still faulty, replace CIU.
32	Data Interface CCA-RF Bus Loop Test Failure		Run off-line BIT. Remove and replace faulty assembly. Run BIT again, to check if problem has been fixed. If not, replace parallel I/O CCA A2. Run BIT. If still faulty, replace CIU.
33	Data Interface CCA-SEU Bus Loop Test Failure		Run off-line BIT. Remove and replace faulty assembly. Run BIT again to check if problem has been fixed. If not, replace parallel I/O CCA A2. Run BIT. If still faulty, replace CIU.
151	Missing RF Bus TX or RX Interrupt		Run BIT on CIU. If problem persists, run BIT on each stack to identify problem.
152	CPU CIU USART Error		Run BIT on CIU, then run individual BIT on CPU.
153	RF Bus USART Error		Run BIT on CIU. If problem persists, run BIT on each stack.
154	SEU Bus USART Error		Run BIT on CIU. If problem persists, run off-line BIT on SEU.
155	A STATUS line was missed		Note: Informational only. This fault code applies to all E-fault categories.

The codes in Table A-2 appear when equipment other than the Electronic Counter-Counter Measures (ECCM) or radio is faulted. Before replacing units, run BIT to clear the problem.

Table A-2. ECCM Fault Codes (Group I)

E-Fault/ECCM Display Code	Explanation	Mode After Fault	Action
01	PA has a fault	N/A	Run BIT. Check cables. Replace PA.
02	ATU has a fault	N/A	Run BIT. Check cables. Replace ATU.
03	P/PS has a fault	N/A	Run BIT. Check cables. Replace P/PS.
04	P/S for PA has a fault	N/A	Run BIT. Check cables. Replace PS.
05-09	Reserved		

The codes in Table A-3 appear when operational faults occur. Operational faults result from improperly installed equipment or procedural errors. Recheck connections and try to continue operations.

Table A-3. ECCM Fault Codes (Group II)

E-Fault/ECCM Display Code	Explanation	Mode After Fault	Action
10	Invalid attempt to change to data mode. System thinks modem is not attached.	Voice	Check cables and modem connections. Retry.
11	Invalid mode change without a variable.	Voice	Fill the ECCM. Retry.
12	Invalid mode change without a TOD.	Voice	Supply valid TOD to ECCM. Retry.
13	Invalid mode change in MP configuration.	Voice	MP only allowed Voice modes. Retry.
14	Invalid cryptovariable change request.	N/A	Remove fill device. Retry.
15	Fill in Progress.		Successful fill.

E-Fault/ECCM Display Code	Explanation	Mode After Fault	Action
16	Zeroize Command.		Successful zeroize.
17	Modem or HSS disconnect during data mode operation.	Voice	Check modem to ECCM connection (FT/TT). Check ECCM to VA Connection (TT).
18-19	Reserved		

The codes in Table A-4 appear when ECCM hardware faults occur. If running BIT does not clear the problem, replace the unit.

Table A-4. ECCM Fault Codes (Group III)

E-Fault/ECCM Display Code	Explanation	Mode After Fault	Action
20	Internal ECCM communication fault (MUP/PUP)	N/A	Cycle R/E power off/on. Reload variables. Run BIT. Replace ECCM.
21	CUP RAM fault	N/A	Run BIT. Replace ECCM.
22	CUP ROM checksum fault	N/A	Run BIT. Replace ECCM.
23	Internal ECCM communication fault (MUP/CUP)	Voice	Run BIT. Replace ECCM.
24	Internal ECCM communication Timeout	Voice	Run BIT. Replace ECCM.
25	Internal audio fault	N/A	Run BIT. Replace ECCM.
26	MUP RAM fault	N/A	Run BIT. Replace ECCM.
27	MUP ROM checksum fault	N/A	Run BIT. Replace ECCM.
28	PUP RAM fault	N/A	Run BIT. Replace ECCM.
29	PUP ROM checksum fault	N/A	Run BIT. Replace ECCM.
30	Modem USART fault	N/A	Run BIT. Replace ECCM.
31	CIU USART fault	N/A	Run BIT. Replace ECCM.
32	Low Battery indicator (MP only)	N/A	Notify MMCT to replace batteries. Reload variables.

The codes in Table A-5 appear when security faults occur. Unless the unit has been zeroized or the fill variable has been loaded, the unit should be immediately replaced to ensure security integrity.

Table A-5. ECCM Fault Codes (Group IV)

E-Fault/ECCM Display Code	Explanation	Mode After Fault	Action
33-39	Reserved		
40	LSG fault	Voice	Replace ECCM.
41	KGV-10 fault	Voice	Replace ECCM.
42	Fill attempt unsuccessful	Voice	Check cable. Retry. Replace fill device. If problem continues, replace ECCM.
43	Unable to zeroize ECCM	Voice	Push the zeroize switch.
44-49	Reserved		

The codes in Table A-6 appear when Man Pack/Team Terminal (MP/TT) errors occur, which require replacement of the radio.

Table A-6. ECCM Fault Codes (Group V)

E-Fault/ECCM Display code   Explanation   Mode After Fault   Action

E-Fault/ECCM Display Code	Explanation	Mode After Fault	Action
*50	10 kHz not present	N/A	Defective R/E or ECCM. Replace radio.
51	Radio module fault	N/A	Replace HSS (FT) or vehicular adapter (TT).
52	MP radio PA fault	N/A	Defective R/E. Replace radio.
53	MP radio PA fault	N/A	Defective R/E. Replace radio.
54	MP radio synthesizer fault	N/A	Defective R/E. Replace radio.
55	MP radio translator fault	N/A	Defective R/E. Replace radio.

E-Fault/ECCM Display Code	Explanation	Mode After Fault	Action
56	Unable to report MP status	N/A	Defective R/E or ECCM. Replace radio.
*57	Unable to tune ATU	N/A	Replace radio.
58	PA Thermal Overload		Pause stack. Check ATU connections and reduce transmit power to stack.

*Note: These faults may also occur in the Force Terminal.

The codes in Table A-7 appear when FT radio faults occur. Most of these faults require Unit replacement of the radio. General Support (GS) maintenance personnel, however, are authorized to perform module replacement for ECCM codes 60-67 on site.

Table A-7. ECCM Fault Codes (Group VI)

E-Fault/ECCM Display Code	Explanation	Mode After Fault	Action
59	ECCM not securely connected	N/A	Ensure ECCM is properly seated in the radio. If problem continues, replace ECCM and/or radio.
60	Radio PS fault	N/A	Replace radio/or GS replace faulty subassembly.
61	Reference Oscillator fault	N/A	Replace radio/or GS replace faulty subassembly.
62	Audio Exciter fault	N/A	Replace radio/or GS replace faulty subassembly.
63	RF exciter fault	N/A	Replace radio/or GS replace faulty subassembly.
64	RF switch fault	N/A	Replace radio/or GS replace faulty subassembly.
65	RF receive fault	N/A	Replace radio/or GS replace faulty subassembly.
66	IF receive fault	N/A	Replace radio/or GS replace faulty subassembly.
67	Audio receiver fault	N/A	Replace radio/or GS replace faulty subassembly.
68-69	Reserved		

The codes in Table A-8 appear for various reasons. BIT should be attempted to clear the problem. If problem continues, replace the radio or follow the directions for the specific fault.

Table A-8. ECCM Fault Codes (Group VII)

E-Fault/ECCM Display Code	Explanation	Mode After Fault	Action
70	MP or TT radio fault	N/A	Run BIT. Replace radio if necessary.
71	Unable to set TOD	Voice	Run BIT. Check cables, replace RFO.
72	Radio did not tune	N/A	Run BIT. Replace ECCM and/or radio.
73	Invalid data received from CIU	N/A	Run BIT. Check CIU, check cables.
74	Attempted to change to invalid hopset	N/A	Run BIT. Replace frequency tape.
75	Software debugging code	N/A	Run BIT. Replace ECCM and/or radio.
76	Software debugging code	N/A	Cycle R/E power off/on. Reload variables. Run BIT. Replace ECCM and/or radio.
77	Software debugging code	N/A	Run BIT. Replace ECCM and/or radio.

E-fault codes from 11 to 118 for the Modem Fault Codes are determined by running a system BIT, which isolates the problem to the Regency Net (RN) Modem. Running an off-line BIT then isolates the fault to the following subassemblies: (1) Signal Processors CCA, (2) Data Controller CCA, (3) Data Interface CCA, and (4) Timing/Control/Viterbi Decoder CCA.

Table A-9. Modem Fault Codes

E-Fault Code	Explanation	Mode After Fault	Action
11	Parity fault		Run off-line BIT again. Remove and replace faulty subassembly. If problem persists, replace RN Modem.
12	ROM fault		Run off-line BIT again. Remove and replace faulty subassembly. If problem persists, replace RN Modem.
14	RAM fault		Run off-line BIT again. Remove and replace faulty subassembly. If problem persists, replace RN Modem.
21	USART fault		Run off-line BIT again. Remove and replace faulty subassembly. If problem persists, replace RN Modem.
31	DEMOD Self Test Fault		Run off-line BIT again. Remove and replace faulty subassembly. If problem persists, replace RN Modem.
32	DEMOD Passthrough		Run off-line BIT again. Remove and replace faulty subassembly. If problem persists, replace RN Modem.
41	Viterbi Decoder Fault		Run off-line BIT again. Remove and replace faulty subassembly. If problem persists, replace RN Modem.
42	Timer Fault		Run off-line BIT again. Remove and replace faulty subassembly. If problem persists, replace RN Modem.
51	AGC Limit Fault		Run off-line BIT again. Remove and replace faulty subassembly. If problem persists, replace RN Modem.
52	A to D Sample Fault		Run off-line BIT again. Remove and replace faulty subassembly. If problem persists, replace RN Modem.

E-Fault Code	Explanation	Mode After Fault	Action
111	KG-84A Full OP Fault		Recycle power to KG-84A, check for full OPR light. If no light, reload KG-84A variables. Check full OPR light. If still no light, check KG-84A setup.
112	ECCM Fault		Run off-line BIT to find particular fault. If blank, replace ECCM.
114	KG-84A Alarm Fault		Recycle power to KG-84A, check for full OPR light. If no light, reload KG-84A variables. Check full OPR light. If still no light, check KG-84A setup.
118	Random Data Fault		Run BIT on each individual stack to isolate fault.

Table A-10. Power Equipment Fault Codes

E-Fault Code	Explanation	Mode After Fault	Action
157	Prime Power Conditioner Fault		Check PPC. Check Power source. Reset power source.
158	AC/DC Power Supply Failure		Check Circuit Breakers. Check On/Off switch is in the on position. Run whole-terminal BIT.

SECTION IX. ERROR TRAP AUDIT TRAILS

A special category of audit trails has been installed in the RN software in order to monitor software operation. Most of these software error conditions will never occur but must be listed here for completeness. In the event that an error trap audit trail does occur, the operator should record the date, time, source module, error code, and any other relevant information that would help in investigating the problem. In addition, the incident should be reported to the terminal supervisor. Specific causes and actions are provided below for the possible error trap audit trails.

Source Module/Error Code: CPPACK 20

Cause: A processing error occurred while preparing a message for transmission.

Action: Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: CPPACK 40

Cause: A message destination error was detected while preparing a message for transmission.

Action: Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: CPPACK 120

Cause: An invalid command code was detected while preparing a message for transmission.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: CPPERM 10

Cause: An invalid command code was detected for a message in permanent storage.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: CPPERM 30

Cause: An invalid queue directory was detected for a message in permanent storage.

Action: Reset the I/O unit. Attempt to re-access permanent storage. If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: CPTEMP 01

Cause: An invalid command code was detected for a message in temporary storage.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: CPTEMP 128

Cause: An invalid message destination was detected for a message in temporary storage.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: CTTASK 01

Cause: An invalid data request was issued to the MTU.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: CTTASK 02

Cause: An invalid data tape is mounted on the MTU.

Action: Mount proper tape on the MTU. If the problem persists, mount the backup tape on the MTU.

Source Module/Error Code: CTTASK 03

Cause: A time out error occurred while accessing the MTU.

Action: Reload the operational parameters tape and continue normal operations. If the problem persists, notify the terminal supervisor and request maintenance support.

Source Module/Error Code: MMINPT 00

Cause: A packet code discrepancy was detected while attempting to assemble a received message.

Action: Associated message may have been purged. Record possible loss of message and notify terminal supervisor.

Source Module/Error Code: MMINPT 01

Cause: An invalid message path was detected while attempting to assemble a received message.

Action: Associated message may have been purged. Record possible loss of message and notify terminal supervisor.

Source Module/Error Code: MMINPT 02

Cause: An invalid number of packets was detected while attempting to assemble a received message.

Action: Associated message may have been purged. Record possible loss of message and notify terminal supervisor.

Source Module/Error Code: MMINPT 03

Cause: The maximum number of entries was exceeded in the redundancy data base while attempting to assemble a received message.

Action: Associated message may have been purged. Record possible loss of message and notify terminal supervisor.

Source Module/Error Code: MMOUTP 01

Cause: An invalid destination terminal status was detected while queuing a message for transmission.

Action: Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MMOUTP 03

Cause: An invalid classification label was detected while queuing a message for transmission.

Action: The associated message was purged. Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MMOUTP 10

Cause: An invalid command was detected while queuing a message for transmission.

Action: Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MMOUTP 11

Cause: An invalid queue type was detected while queuing a message for transmission.

Action: Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MMOUTP 19

Cause: An invalid necessity attribute was detected while queuing a message for transmission.

Action: The associated message was purged. Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MMOUTP 20

Cause: An invalid precedence attribute was detected while queuing a message for transmission.

Action: The associated message was purged. Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MMOUTP 25

Cause: An invalid necessity attribute was detected while queuing a message for transmission.

Action: The associated message was purged. Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start.

Source Module/Error Code: MMOUTP 26

Cause: An invalid precedence attribute was detected while queuing a message for transmission.

Action: The associated message was purged. Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MMOUTP 27

Cause: An invalid destination terminal role was detected while queuing a message for transmission.

Action: Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MMOUTP 29

Cause: An unexpected ACK was detected while queuing a message for transmission.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MMOUTP 30

Cause: An unknown ACK source was detected while queuing a message for transmission.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MMOUTP 31

Cause: An attempt has been made to route a message to a radio stack that is not configured for operation.

Action: Reconfigure the radio stack for data operations and retransmit the message.

Source Module/Error Code: MMOUTP 32

Cause: An invalid classification label was detected while queuing a message for transmission.

Action: The associated message was purged. Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MMOUTP 33

Cause: An invalid classification label was detected while queuing a message for transmission.

Action: The associated message was purged. Re-enter the associated message. If the problem persists, try another I/O unit. If the problem remains, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MVAUTH 00

Cause: An inter-module communications error occurred during message authentication.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MVAUTH 01

Cause: An invalid packet operation was requested during message authentication.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MVAUTH 02

Cause: An invalid message packet code was detected during message authentication.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MVAUTH 03

Cause: An invalid packet rate was detected during message authentication.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MVAUTH 04

Cause: No buffer was available for message authentication processing.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MVAUTH 05

Cause: An invalid operator input was detected during message authentication.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: MVAUTH 06

Cause: An invalid character input was detected during message authentication.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: PVPROG 00

Cause: An out of range packet code was detected during input packet validation.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor.

Source Module/Error Code: PVPROG 02

Cause: An out of range message path was detected during input packet validation.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor.

Source Module/Error Code: PVPROG 04

Cause: A command code error was detected during input packet validation.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor.

Source Module/Error Code: PVPROG 05

Cause: A buffer error was detected during input packet validation.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor.

Source Module/Error Code: PVPROG 06

Cause: An invalid precedence label was detected during input packet validation.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor.

Source Module/Error Code: PVPROG 07

Cause: An invalid integrity label was detected during input packet validation.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor.

Source Module/Error Code: PVPROG 08

Cause: An invalid necessity label was detected during input packet validation.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor.

Source Module/Error Code: PVPROG 09

Cause: An invalid classification label was detected during input packet validation.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor.

Source Module/Error Code: PVSTCK 00

Cause: An invalid buffer label was detected during input packet validation.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor. If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: PVSTCK 101

Cause: An invalid packet code was detected during input packet validation.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor.

Source Module/Error Code: SMINJM 00

Cause: A packet code discrepancy was detected during message processing.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor.

Source Module/Error Code: SMINJM 00

Cause: A command code discrepancy was detected during message processing.

Action: The associated input message was purged. Record loss of message and report the incident to the terminal supervisor.

Source Module/Error Code: SMINJM 01

Cause: An inter-module communications error occurred during message processing.

Action: If the problem persists, perform a CPU load verification. If the verification fails, perform a cold start. Otherwise, resume normal operations.

Source Module/Error Code: SSTRCV 00

Cause: An invalid command code was encountered.

Action: The associated message was purged. Record loss of message and report the incident to the terminal supervisor.

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APPENDIX B

GLOSSARY

SECTION I. ABBREVIATIONS

A

A .... Amperes
AC .... Alternating Current
ACC .... Alternate Cluster Controller
ACK .... Acknowledge
ADDR .... Address
ADP .... Automatic Data Processing
AGC .... Automatic Gain Control
AIG .... Address Identifier Group
AMP .... Amperes
AMPL .... Amplifier
ANCS .... Alternate Net Control Station
AO .... Area of Operation
ASCII .... American Standard Code for Information Interchange
ASSY .... Assembly
ATE .... Automatic Test Equipment
ATTN .... Attention
ATU .... Antenna Tuning Unit
AUX .... Auxillary
AV .... Audio/Visual (Alarm)

B

BCS .... Battery Charging System
BER .... Bit Error Rate
BIT .... Built-In Test
BITE .... Built-In Test Equipment
BPS .... Bits Per Second

C

C	Centigrade/Celsius
C^2	Command and Control
C^3	Command, Control, and Communications
CB	Circuit Breaker/Control Burst
CC	Cluster Controller
CCA	Circuit Card Assembly
CECOM	Communications Electronics Command
CEOI	Communications Electronics Operating Instructions
CFM	Cubic Feet per Minute
CHAN	Channel
CHG	Change
CIU	Control Interface Unit
CLR	Clear
COMSEC	Communications Security
CPU	Central Processing Unit
CRYPTO	Encryption/Decryption Device
CTF	Central Theater Flood
CTS	Clear To Send

D

D/K	Display/Keypad Assembly (Team Terminal I/O)
DB	Decibel
DBM	Decibel/Milliwatt
DC	Direct Current
DCA	Defense Communication Agency
DEMOD	Demodulate
DOD	Department of Defense
DTR	Data Terminal Ready

E

EA	Emergency Action
EAM	Emergency Action Message
EAMACK	Emergency Action Acknowledgement
ECCM	Electronic Counter-Countermeasure
ECU	Environmental Control Unit
EIR	Equipment Improvement Recommendation
ELBS	Emergency Lighting Battery System
EMI	Electromagnetic Interference
EMP	Electromagnetic Pulse
ENT	Enter
EPROM	Erasable Programmable Read Only Memory
ESD	Electrostatic Discharge
ETI	Elapsed Time Indicator
EUCOM	European Command
EXT	External

F

F .... Fahrenheit
FAN .... Flaming Arrow Network
FIFO .... First-In-First-Out
FMS .... Frequency Management System
FOT .... Frequency of Optimum Operation
FSK .... Frequency Shift Key
FT .... Force Terminal

G

GFE .... Government Furnished Equipment
GLCM .... Ground Launched Cruise Missile
GPFU .... General Purpose Fan Unit

H

HF .... High Frequency
HQ .... Headquarters
HR .... Hour
HZ .... Hertz

I

I/O .... Input/Output Unit
IAW .... In Accordance With
IC .... Indigenous Controller
ICB .... Injection Control Burst
ICS .... Interference Canceller System
ID .... Identification
INR .... Initial Nuclear Radiation
IT .... Injection Terminal

K

K/D .... Keyboard/Display Unit (Force Terminal)
KABS .... Keep-Alive Battery System
KBDU .... Keyboard/Display Unit
KDU .... Keyboard/Display Unit
KG .... Cryptographic Unit
KGM .... Kilogram
KHZ .... Kilohertz
KM .... Kilometer
KW .... Kilowatt

L

LCC .... Launch Control Center
LD .... Load
LED .... Light Emitting Diode
LOD .... Load
LQA .... Link Quality Analysis
LRU .... Line Replaceable Unit
LSB .... Least Significant Bit/Lower Sideband
LTS .... Lights
LUF .... Lowest Usable Frequency

M

MAC .... Maintenance Allocation Chart
MCPE .... Modular Collective Protection Equipment
MDCS .... Maintenance Data Collection Subsystem
MDM .... Modem
MHZ .... Megahertz
MIL .... Military
MIO .... Mission Input/Output
MLS .... Multi-Level Secure
MODEM .... Modulator/Demodulator
MS .... Millisecond
MSB .... Most Significant Bit
MSG .... Message
MTBF .... Mean-Time-Between-Failure
MTTR .... Mean-Time-to-Repair
MTU .... Magnetic Tape Unit
MUF .... Maximum Usable Frequency
MW .... Megawatt

N

NACK/NAK .... Not Acknowledged
NATO .... North Atlantic Treaty Organization
NBC .... Nuclear, Biological, and Chemical
NCS .... Network Control Station
NEG .... Negative
NET .... Network
NVIS .... Near Vertical Incidence Skywave (antenna)

O

OPR .... Operational
OPSEC .... Operations Security

P

P/PS .... Pre/Post Selector
PA .... Power Amplifier
PCC .... Platoon Control Center (Pershing II)
PCU .... Power Control Unit
PDP .... Power Distribution Panel
PDU .... Power Distribution Unit
PGM .... Program
PII .... Pershing II
PKT .... Packet
PMCS .... Preventive Maintenance Checks and Service
POS .... Positive
PPC .... Prime Power Conditioner
PPS .... Pre/Post Selector
PS .... Power Supply
PTT .... Push-To-Talk (switch)
PWR .... Power

R

R/E .... Receiver/Exciter
R/T .... Receiver/Transmitter
RATT .... Radio Teletype
RCER .... Raw Channel Error Rate
RCS .... Remote Control Set
RCU .... Remote Control Unit
RCV .... Receive
RF .... Radio Frequency
RFO .... Reference Frequency Oscillator
RG .... Receiving Group
RIO .... Radio Input/Output
RMT .... Remote
RN .... Regency Net
RNOS .... RN Operating System
RO .... Receive Only
ROM .... Read Only Memory
RR .... Round Robin
RTS .... Request To Send
RTY .... Ready
RTTY .... Radio Teletype
RWI .... Radio-wire Integration
RX .... Receive
RXS .... Split Site Receive Station

S

S/N .... Signal to Noise Rati
SCC .... Super Cluster Controller
SEC .... Section
SED .... Signal Entry Drawer
SEP .... Signal Entry Panel
SETAF .... Southern European Task Force
SIG .... Signal
SIU .... Signal Interconnect Unit
SNC .... Subnet Controller
SOP .... Standard Operating Procedure
SPEC .... Specification
SRC .... Source
SS .... Split Site
SSB .... Single Sideband
SSF .... Software Support Facility
STD .... Standard
SW .... Switch
SYNC .... Synchronize

T

TA .... Table of Allowances
TBD .... To Be Determined
TC0 .... Tier 1, Top Echelon TDMA Controller
TC1 .... Tier 2, Top Echelon TDMA Controller
TC2 .... Tier 3, Top Echelon TDMA Controller
TDM .... Time Division Multiplex
TDMA .... Time Division Multiple Access
TDR .... Transportation Discrepancy Report
TEL .... Telephone
TEMP .... Temperature
TM .... Technical Manual
TOD .... Time of Day
TRANSEC .... Transmission Security
TSEP .... Telecommunications System Engineering Plan
TSO .... Terminal Security Officer
TT .... Team Terminal
TT PS .... Team Terminal Power Supply
TTY .... Teletype
TX .... Transmit
TXS .... Split Site Transmit Station

U

UART .... Universal Asynchronous Receiver/Transmitter
UHF .... Ultra High Frequency
USA .... United States Army
USAF .... U.S. Air Force
USAFE .... U.S. Air Force, Europe
USART .. Universal, Synchronous/Asynchronous Receiver/Transmitter
USB .... Upper Sideband
USCINCEUR .... United States Commander-in-Chief, Europe
USEUCOM .... U.S. European Command
USNAVEUR .... U.S. Naval Forces, Europe

V

VA .... Vehicular Adapter
VAC .... Volts, Alternating Current
VAR .... Variable
VDC .... Volts, Direct Current
VHF .... Very High Frequency
VOL .... Volume

W

W .... Watt

X

XMT .... Transmit
XMIT .... Transmit
XMTR .... Transmitter

APPENDIX C

SUBJECT INDEX

A

B

C

D

E

F

G

H

I

O

P

R

S

T