

Honeywell
Aerospace Electronic Systems
CES-Phoenix
P.O. Box 21111
Phoenix, Arizona 85036-1111
U.S.A.

TO HOLDERS OF SYSTEM DESCRIPTION AND INSTALLATION MANUAL,
PUB. NO. A15-5111-002,
SCS-1000 MINI-M AERO SATCOM SYSTEM

REVISION NO. 2 DATED 15 MAY 2001

HIGHLIGHTS

Pages that are added and revised are identified below together with the highlights of this revision.
Revision bars show where changes are made in the manual.

Remove the out-of-date pages and put the added and revised pages into your copy of this manual.

Page	Descriptions of Change
T-1, T-2, LEP-1 thru LEP 4, TC-4 thru TC-10	Revised to show where changes are made in the manual.
RR-1	Revised to add entry for revision 2.
3-13 thru 3-24	Updated information in this section. Added warranty conditions information and warning and installation labels location diagram.
8-4 thru 8-8	Updated information in this section. Added PIC Wire and Cable information. Updated telephone and facsimile numbers for Omni-Pless.

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Honeywell
Aerospace Electronic Systems
CES-Phoenix
P.O. Box 21111
Phoenix, Arizona 85036-1111
U.S.A.

SCS-1000 Mini-M Aero SATCOM System

System Description and Installation Manual

23-20-28

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REVISED 15 MAY 2001
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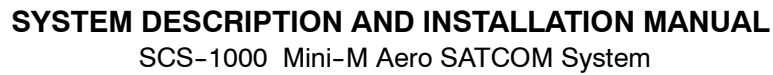
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INTRODUCTION

1. General

This manual provides general system maintenance instructions and theory of operation for the SCS-1000 Mini-M Aero Satellite Communications (SATCOM) System. It also provides interface information and interconnect diagrams to permit a general understanding of the overall system.

The purpose of this manual is to help you install, operate, maintain, and troubleshoot the SCS system in the aircraft. Common system maintenance procedures are not presented in this manual. The best established shop and flight line practices should be used.

2. Reference Documents

Publications on subsystems installed as part of the SCS system are identified in the list that follows:

Document Title	Honeywell Publication Number
Handling, Storage, and Shipping Procedures Instruction Manual for Honeywell Avionics Equipment	A09-1100-01

3. Weights and Measurements

Weights and measurements in this manual use both U.S. and S.I. (metric) values.

4. Acronyms and Abbreviations

The letter symbols for abbreviations are the same as shown in ANSI/IEEE Std 260 and ASME Y1.1, except as identified in the acronyms and abbreviations table.

Acronyms and Abbreviations Table

Term	Definition
AAU	Aero Antenna Unit
ACU	Antenna Control Unit
ASD	Asynchronous Data
AT	Attention
ATB	Antenna Tracking Board
CHV2	Card Holder Verification Level 2
CPM	Control Processor Module
CRC	Cyclic Redundancy Check
CTS	Clear to Send
ECS	Electronic Cable Specialist
DCD	Data Carrier Detect
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-Frequency
DTR	Data Terminal Ready
EEPROM	Electrically Erasable Programmable Read-Only Memory
EIRP	Effective Isotropic Radiated Power
ESDS	Electrostatic Discharge Sensitive
FAA	Federal Aviation Administration
G/T	Antenna Gain-to-System Noise Temperature Ratio
GMT	Greenwich Mean Time
GPS	Global Positioning System
HSU	Handset Unit

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Acronyms and Abbreviations Table (cont)

Term	Definition
I/O	Input/Output
IMN	Inmarsat Mobile Number
Inmarsat	International Maritime Satellite Organization
IPC	Illustrated Parts Catalog
ISN	Inmarsat Serial Number
ISP	Internet Service Provider
LES	Land Earth Station
LNA	Low Noise Amplifier
LRU	Line Replaceable Unit
MES	Mobile Earth Station
MMI	Man Machine Interface
NCS	Network Coordination Station
NIMS	Nera Internet Message Service
NVRAM	Nonvolatile Random Access Memory
OEM	Original Equipment Manufacturer
PC	Personal Computer
PIN	Personal Identification Number
PLL	Phase Lock Loop
PSTN	Public Switched Telephone Network
PSU	Power Supply Unit
RF	Radio Frequency
RFB	RF Board
RNR	Receiver Not Ready
RR	Receiver Ready
RTS	Request to Send
RX	Receive
S/A	Stand Alone
SATCOM	Satellite Communications
SCPC	Single Carrier Per Channel
SIM	Subscriber Identity Module
SPM	Signal Processor Module
SRAM	Static Random Access Memory
SW	Software

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

SCS-1000 Mini-M Aero SATCOM System

Acronyms and Abbreviations Table (cont)

Term	Definition
TNID	Terrestrial Network Identification Digit
TPU	Telephone Unit
TX	Transmit
UTC	Coordinated Universal Time
VSWR	Voltage Standing Wave Ratio

5. Special Precautions

Warnings, cautions, and notes in this manual give the data that follows:

- A WARNING is an operation or maintenance procedure or condition, which, if not obeyed, can cause injury or death
- A CAUTION is an operation or maintenance procedure or condition, which, if not obeyed, can cause damage to the equipment
- A NOTE gives data to make the work easier or gives directions to go to a procedure.

All personnel who operate and do maintenance on the applicable test equipment, must know and obey the safety precautions. The warnings and cautions that follow apply to all parts of this manual.

WARNING: HIGH VOLTAGES MAY BE PRESENT ON SYSTEM INTERCONNECT CABLES. MAKE SURE THAT SYSTEM POWER IS OFF BEFORE YOU DISCONNECT LINE REPLACEABLE UNIT (LRU) MATING CONNECTORS

WARNING: TO AVOID POTENTIALLY DANGEROUS EXPOSURE TO RADIO FREQUENCY ENERGY OF MORE THAN 5 MW/CM² WITHIN A FEW FEET OF THE ANTENNA, DO NOT OPERATE THE SCS SYSTEM WHEN ANY PERSONNEL ARE WITHIN 3 FEET (0.9 M) OF THE ANTENNA FOR PERIODS OF LONGER THAN 3 MINUTES PER HOUR.

CAUTION: THE SYSTEM CONTAINS ITEMS THAT ARE ELECTROSTATIC DISCHARGE SENSITIVE (ESDS). IF YOU DO NOT OBEY THE NECESSARY CONTROLS, A FAILURE OR UNSATISFACTORY OPERATION OF THE UNIT CAN OCCUR FROM ELECTROSTATIC DISCHARGE. USE APPROVED INDUSTRY PRECAUTIONS TO KEEP THE RISK OF DAMAGE TO A MINIMUM WHEN YOU TOUCH, REMOVE, OR INSERT PARTS OR ASSEMBLIES.



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6. Customer Assistance

For assistance with installation, operation, or maintenance of the Mini-M Aero SATCOM System contact your local Honeywell Dealer or regional Honeywell Customer Support Engineer. Additional assistance can be obtained from:

Honeywell
Business, Regional and General Aviation (BRGA)
Customer Support Engineering
5353 W. Bell Road
Glendale, AZ 85308-9000
U.S.A.

TEL: (602) 436-4400

FAX: (602) 436-4100

SYSTEM DESCRIPTION

1. General

The SCS system is a mobile aviation communications system that provides highly reliable telephone, data, and facsimile communications to and from the aircraft via the International Maritime Satellite Organization (Inmarsat) Mini-M Aero satellite system. The SCS system interfaces with the antenna through L-band RF signals that emanate (and are received) from satellites in geostationary orbit. These satellites then convey the information to and from ground stations that interface with the terrestrial telephone networks. The SCS system does not support safety of flight operations.

The Inmarsat satellites are placed in geostationary orbits above various regions of the earth to provide worldwide coverage. The SCS system locks onto and continually tracks the chosen satellite regardless of the aircraft's direction of flight and orientation. The SCS system also compensates for the Doppler shift of the transmitted and received signals.

The total aviation satellite communications system, shown in Figure 1-1, is made up of the following:

- Mobile Earth Station (airborne SCS system)
- Space Segment (satellite network)
- Land Earth Stations (terrestrial data and voice networks).

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

SCS-1000 Mini-M Aero SATCOM System

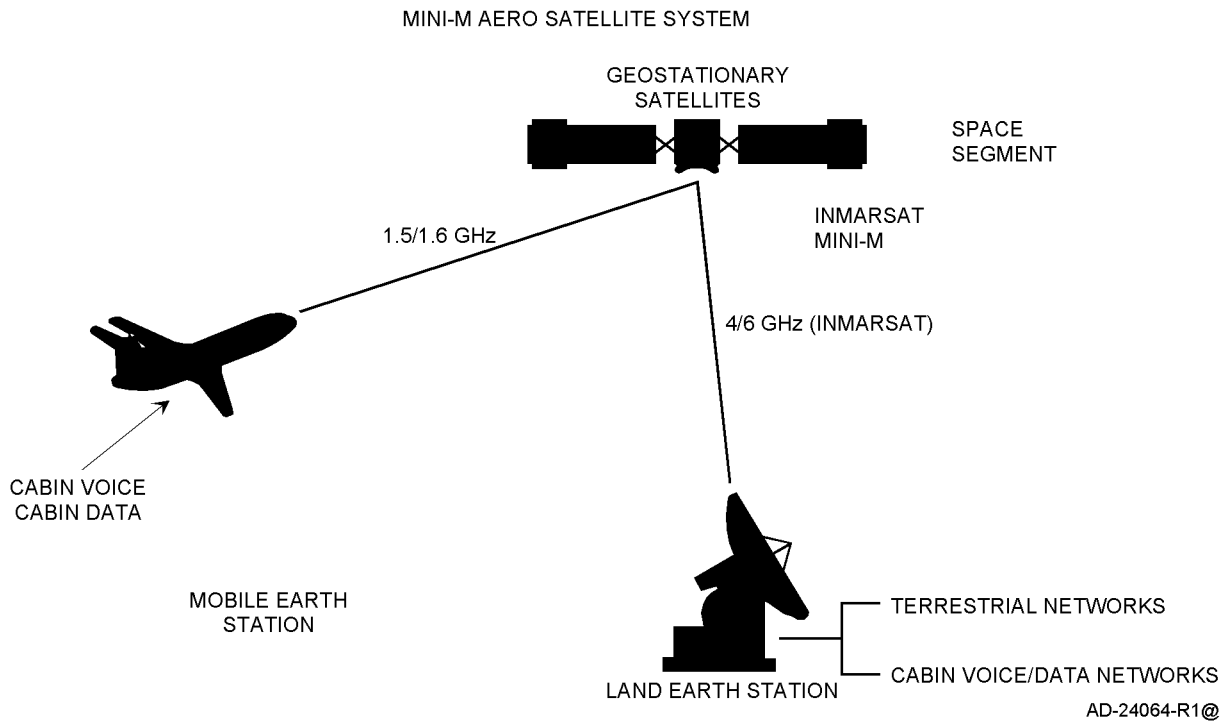


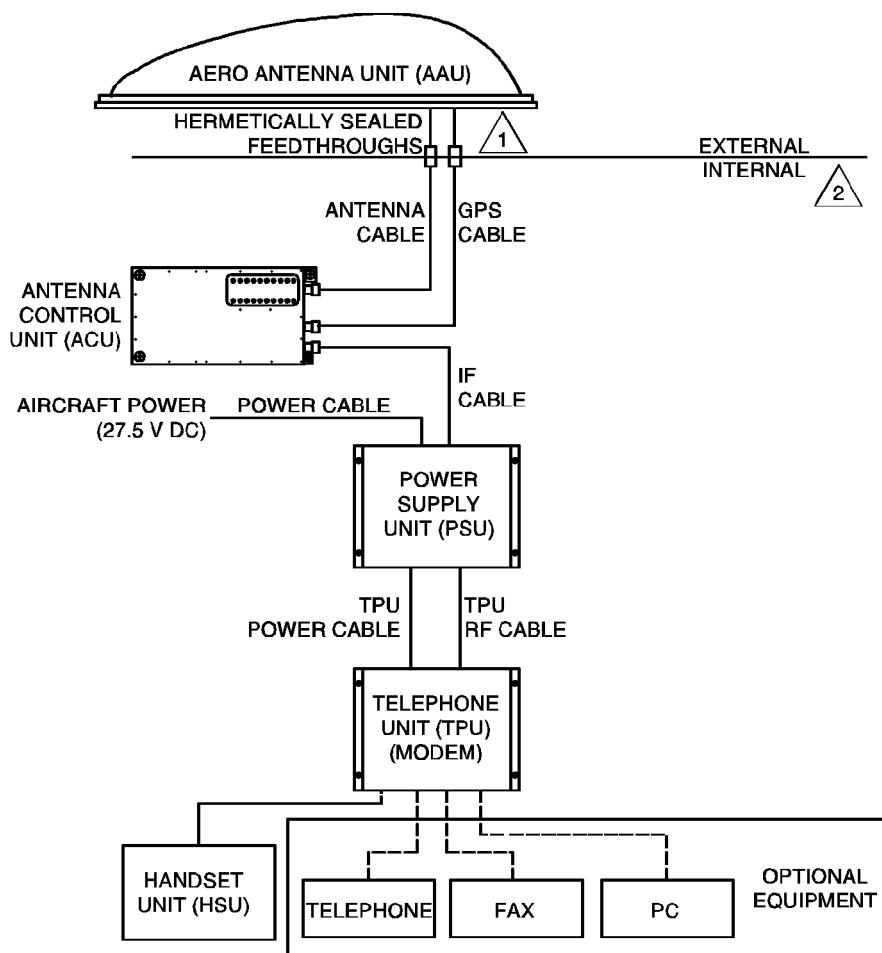
Figure 1-1. Mini-M Aero Communications System

A. Mobile Earth Station

The main component of the Mobile Earth Station (MES) is the SCS system, which is made up of the antenna and four electronic units. The system interfaces with the optional voice, PC data and facsimile equipment to accept voice, PC data, or facsimile information. The electronic units encode and modulate this information onto appropriate RF carrier frequencies, which are then transmitted by the antenna to the space segment for relay to the Land Earth Station (LES). These electronic units also receive Radio Frequency (RF) signals from the LES via the satellite, demodulate these signals, perform the necessary decoding of encoded messages, and output the voice or data messages for use by the user. The SCS system diagram is shown in Figure 1-2.

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

SCS-1000 Mini-M Aero SATCOM System



NOTES:

- 1** INCORRECT CONNECTIONS MAY CAUSE DAMAGE TO EQUIPMENT.
- 2** THE COMPONENTS INTERNAL TO THE AIRCRAFT MUST BE INSTALLED IN A PRESSURIZED/TEMPERATURE CONTROLLED ENVIRONMENT.

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Figure 1-2. SCS System Diagram

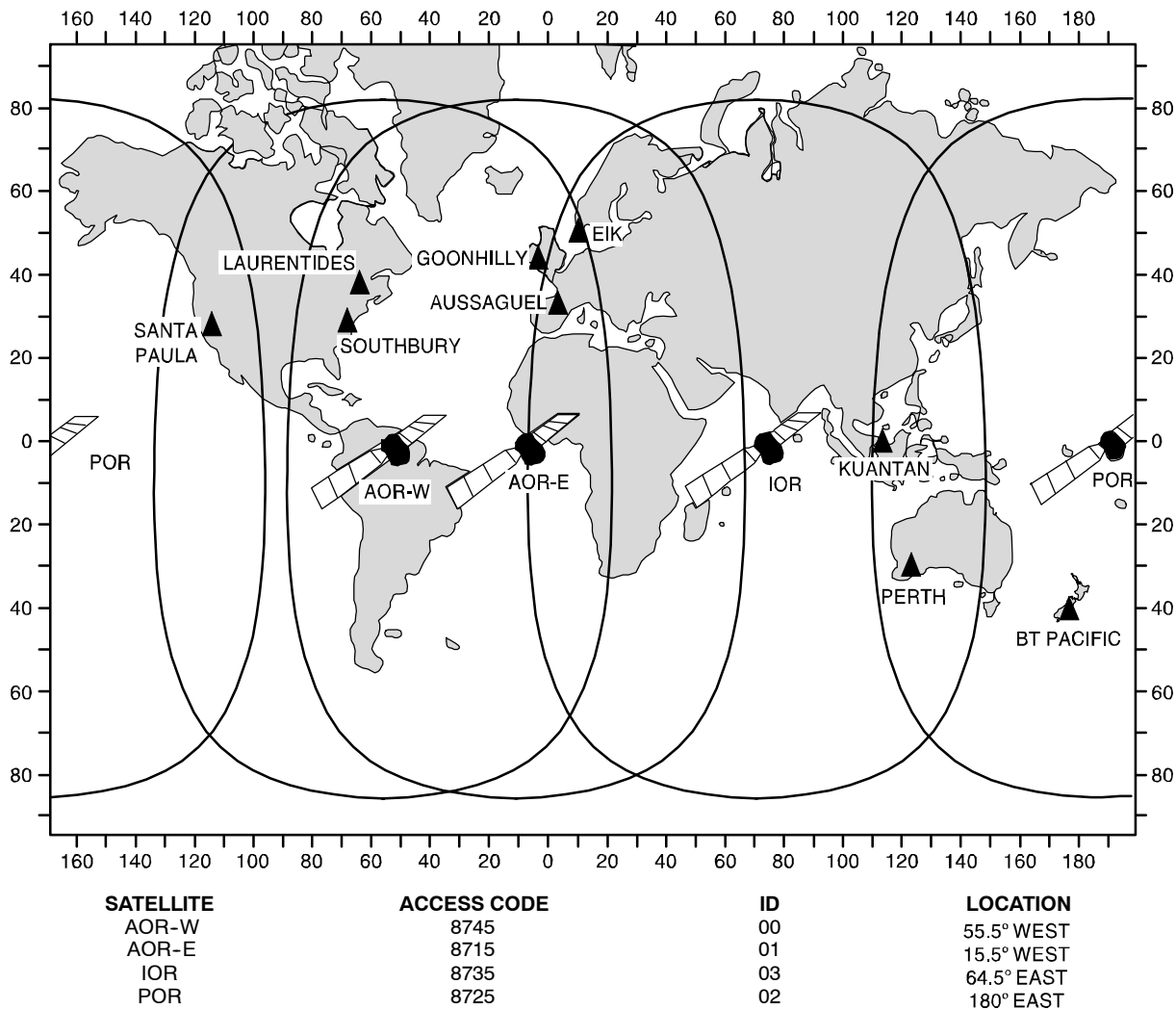
B. Space Segment

The space segment is made up of the Inmarsat satellites that support Mini-M Aero operations. The satellites function as communication transponders to support L-band links to and from the MES, and provide links to and from the LES. The space segment provider for aeronautical satellite communications is the Inmarsat. The four-region satellite system provided by Inmarsat is shown in Figure 1-3.

The area covered by each satellite is comprised of a number of zones called spot beams. Separate spot beams are covered by separate antennas on the satellite, allowing for frequencies to be reused for communications in different areas of the earth.

INMARSAT Four - Region Service

Satellite Coverage and Land Earth Station Networks



AOR-W LAND EARTH STATIONS

Goonhilly (Skyphone)
 Southbury (Skyways)
 Eik (Skyphone)
 Aussaguel (Aircom) *
 Laurentides (Aircom)

AOR-E LAND EARTH STATIONS

Goonhilly (Skyphone)
 Aussaguel (Aircom) *
 Eik (Skyphone)
 Laurentides (Aircom)
 Southbury (Skyways)

POR LAND EARTH STATIONS

BT Pacific (Skyphone)
 Santa Paula (Skyways)
 Perth (Aircom) *

IOR LAND EARTH STATIONS

Kuantan (Skyways)
 Eik (Skyphone)
 Perth (Aircom) *

* SPOT BEAM CAPABLE

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Figure 1-3. Inmarsat Four-Region Satellite Coverage

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

SCS-1000 Mini-M Aero SATCOM System

C. Land Earth Station

Mini-M Aero communications, via Inmarsat satellites, are transmitted to and from the terrestrial phone and data networks through the LES. Each LES provides the user with a diverse routing of national and international voice and data communications via submarine cable, satellite, and microwave links to all destinations. Automatic traffic management systems ensure efficient routing of communications by using optimum links into Public Switched Telephone Networks (PSTN) and avoiding multiple satellite connections whenever possible.

The Land Earth Stations (LES) are located strategically around the world to provide redundancy and diversity in the terrestrial extension of communications. Some problems may be encountered when the aircraft flies in polar regions with a latitude greater than 75 degrees. The present worldwide complement of LES including location, operator, and coverage region are summarized in Table 1-1.

Table 1-1. Land Earth Stations

Country	Location	Operator	Coverage Region
Australia	Laurentides	Australian Telstra	Atlantic Ocean West
Canada	Laurentides	Canadian Stratos	Atlantic Ocean West
France	Aussaguel	France Telecom	Atlantic Ocean West
Norway	Eik	Norwegian Telenor	Atlantic Ocean West
United Kingdom	Goonhilly	British Telecom	Atlantic Ocean West
USA	Southbury	COMSAT	Atlantic Ocean West
Australia	Laurentides	Australian Telstra	Atlantic Ocean East
Canada	Laurentides	Canadian Stratos	Atlantic Ocean East
France	Aussaguel	France Telecom	Atlantic Ocean East
Norway	Eik	Norwegian Telenor	Atlantic Ocean East
United Kingdom	Goonhilly	British Telecom	Atlantic Ocean East
USA	Southbury	COMSAT	Atlantic Ocean East
Canada	Perth	Canadian Stratos	Indian Ocean
France	Aussaguel	France Telecom	Indian Ocean
Malaysia	Kuantan	COMSAT	Indian Ocean
Norway	Eik	Norwegian Telenor	Indian Ocean
Australia	Perth	Australian Telstra	Pacific Ocean
Canada	Perth	Canadian Stratos	Pacific Ocean
France	Perth	France Telecom	Pacific Ocean
New Zealand	BT Pacific	British Telecom	Pacific Ocean
New Zealand	BT Pacific	Norwegian Telenor	Pacific Ocean
USA	Santa Paula	COMSAT	Pacific Ocean

2. System Components

The SCS system is made up of a mechanically steered antenna mounted in a radome on top of the fuselage and four electronic units mounted internal to the aircraft in a pressurized and temperature controlled environment. The system operates independently of the aircraft. The only functional interface to the aircraft is the supply of primary power to the Power Supply Unit (PSU).

Table 1-2 gives the components supplied by Honeywell. Table 1-3 gives a summary of the performance characteristics for the SCS system.

Table 1-2. System Components Supplied by Honeywell

Component	Model No.	Honeywell Part No.
Aero Antenna Unit (AAU)	AU-100	7519371-901
Antenna Control Unit (ACU)	AC-100	7519373-901
Handset Unit (HSU)	HS-100	7519379-901
Power Supply Unit (PSU)	PS-100	7519375-901
Telephone Unit (TPU)	TP-100	7519377-901

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Table 1-3. Summary of Performance Characteristics

Function	Measurement
Receive Frequency	1525.0 to 1559.0 MHz
Transmit Frequency	1626.5 to 1660.5 MHz
Global Positioning System (GPS) RF Received Frequency	1575.42 ± 2 MHz
Antenna Gain-to-System Noise Temperature Ratio (G/T)	-17dB/K
Minimum Coverage	85% of the volume 5° above the horizon
Effective Isotropic Radiated Power (EIRP) ...	Minimum 12 dBW, maximum 16 dBW
Gain	7.8 dB minimum, 9.5 dB maximum
RF Output Power	5.1 dBW maximum
Supply Voltage from Aircraft	27.5 V dc nominal (20.5 to 32 V dc)
Supply Current	1A (nominal)
Inrush Current	<17A for 0.13 seconds when supplied by 27.5 V dc
Circuit Breaker Rating:	
• Continuous Current	1.95 A at 20.5 V (minimum voltage)
• Inrush Current (See Note)	20.1 A for 0.11 second at 32.2 V (maximum voltage) 12.8 A for 0.18 second at 20.5 V (minimum voltage)
NOTE: For example, the Klaxon 2TC, 3 A circuit breaker, or equivalent, should be sufficient for most installations.	

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

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Table 1-4. DO-160D Environmental Categories

Description	Category for Aero Antenna Unit (AAU)	Category for All Other Units
Temperature and Altitude	[E1X]	[(A1)(A4)X]
Temperature Variation	A	B
Humidity	C	A
Shock	E	E
Vibration	[(RCC1)(SLM)]	[(RCC1)(SLM)]
Explosion Proofness	X	X
Waterproofness	S	X
Fluids Susceptibility	F	X
Sand and Dust	D	X
Fungus Resistance	F	X
Salt Spray	S	X
Magnetic Effect	A	A
Power Input	B	B
Voltage Spike	B	B
Audio Frequency Susceptibility	B	B
Induced Signal Susceptibility	A	A
RF Susceptibility	[VVX]	[VVX]
Emission of RF Energy	H	M
Lightning Direct Effects	[2A]	X
Icing	A	X
Electrostatic Discharge	A	A

3. System Functional Description

The system functional description gives a general overview and summary of the features and interfaces in the SCS system. Figure 1-4 shows a functional block diagram of the SCS system.

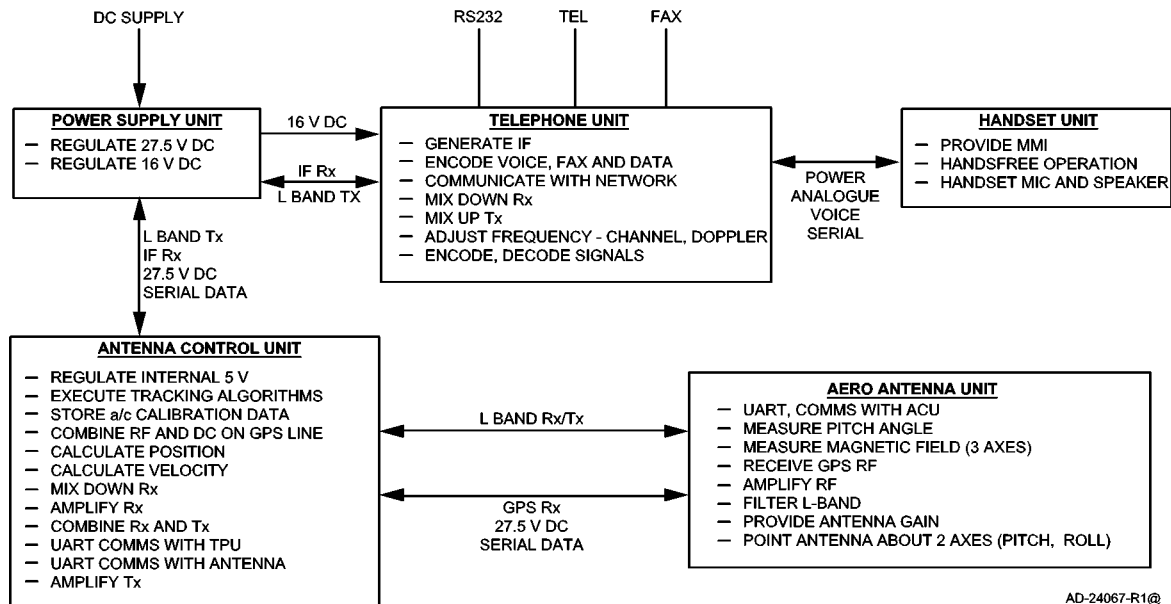


Figure 1-4. System Functional Block Diagram

A. Aero Antenna Unit

The primary function of the Aero Antenna Unit (AAU) is to complete the communications link between the land earth station, the satellite, and the SCS system. The AAU contains a two axis mechanically steered antenna for tracking a geostationary satellite from a moving base. The gimballed antenna transmits and receives signals in the 1.6 GHz band. In addition to the mechanically steered antenna, the AAU also contains a Global Positioning Sensor (GPS) antenna, angular sensors, and electronics for producing global positioning sensor inputs for the tracking algorithm, which is performed in the Antenna Control Unit (ACU). The AAU contains a microcontroller that is used to read the sensors, communicate this sensor data serially to the ACU, process the serial inputs from the ACU, and translate the serial input data into motor commands to drive the antenna to the correct position. The interfaces to the aircraft are through two RF pigtail cables, which exit from underneath the AAU toward the forward end.

B. Antenna Control Unit

The Antenna Control Unit (ACU) is required for the mechanically steered AAU. The ACU serves as an interface module between the AAU and the Telephone Unit (TPU). The ACU performs three main functions for the SCS system:

- Points the antenna at the satellite
- Calculates the relative speed between the aircraft and the satellite for the Doppler shift correction
- Calculates the distance that the aircraft travels so that new spot beams are selected and new working frequencies are chosen when the aircraft moves into an area covered by a different spot beam antenna on the satellite.

The ACU is made up of an RF Board (RFB), an Antenna Tracking Board (ATB), GPS engine, and a diplexer/low noise amplifier. The RFB amplifies L-band signals in the transmit path and sets the transmitted power for the signals. In the receive path, the RFB down-converts L-band signals to IF signals and provides signal amplification. The RFB also communicates serially with the Telephone Unit (TPU).

The ATB executes the tracking algorithms based on sensor inputs from the AAU and the GPS engine. These algorithms enable the ATB to generate steering commands to mechanically steer the antenna in the direction of the satellite. In addition, the ATB superimposes 27.5 V dc voltage onto the GPS line to provide operating power to the AAU. The ATB also stores aircraft calibration data.

The GPS engine calculates the position and velocity of the aircraft in relation to the geostationary satellite based on inputs from the GPS antenna in the AAU. The GPS engine then provides inputs into the tracking algorithm based on these calculations.

The diplexer is a three-port device (antenna, transmit, and receive), which provides signal routing and filtering functions for the RF signals. Receive signals are routed from the antenna port to the receive port; transmit signals are routed from the transmit port to the antenna port. The Low Noise Amplifier (LNA) establishes the noise floor of the communication system by boosting the RF signals and noise received from the antenna to a level much greater than the noise level of subsequent components in the receive path.

C. Power Supply Unit

The voltage source for the Power Supply Unit (PSU) is the 28 V dc supply from the aircraft. From this dc source, the PSU supplies regulated 16 V dc power to the TPU, and 27.5 V dc to the ACU. The PSU also acts as a conduit for the RF signal between the TPU and ACU. The PSU monitors the 12 V dc voltage superimposed onto the RF signal. The PSU removes this dc component and replaces it with 27.5 V dc, which serves as the voltage source for the ACU. When the dc voltage from the TPU drops below 7 V dc, the 27.5 V dc to the ACU is turned off. The maximum power output of the PSU is 30 Watts.

D. Telephone Unit

The TPU interfaces with the handset unit and the optional accessory equipment (telephone, PC, fax machine) through serial Input/Output (I/O) ports. The function of the TPU is to modulate and demodulate signals being received and transmitted by these communication devices. The TPU is responsible for handling the communication protocol, frequency adjustment resulting from Doppler shift and channel changes, the encoding and decoding of signals, and generating IF signals for processing. In the transmit path, analog voice, fax, or PC data signals from the communication devices are modulated and encoded by the TPU, converted to an IF signal, and then up-converted to an RF signal for transmission. In the receive path, IF signals from the ACU are demodulated and decoded into analog voice, fax, or PC data signals for the communication devices.

The TPU can interface with an ordinary Dual Tone Multi-Frequency (DTMF) telephone for basic voice communications. The fax port allows the TPU to interface with a telefax machine to support Group 3 fax transmissions at a rate of 2.4 kilobits per second (kbps). The telefax machine is assigned a separate incoming call number.

A personal computer can be connected to the TPU through an RS-232 port for individual setup and operation of all functions of the SCS system. The computer also allows the use of the built-in data transmission service without the aid of a modem or data card. The TPU provides access to Asynchronous Data (ASD) services through its built-in modem capability. The ASD system provides 2.4 kbps data transmissions between an SCS system and the fixed international network. The data transmission service is assigned a separate call number. The data transmission service can be used with standard dial-up connection software to connect the Internet and e-mail services of most Internet Service Providers (ISP).

The TPU also contains a card slot for a Subscriber Identity Module (SIM) card. The SIM card carries subscription information from the Inmarsat service provider or network service provider on an integrated circuit. The SCS system used with the SIM card assumes the identity of the card. Each SIM card contains its own set of numbers on which the user can be contacted regardless of the SCS system being used. All outgoing calls are billed to the owner of the SIM card.

E. Handset Unit

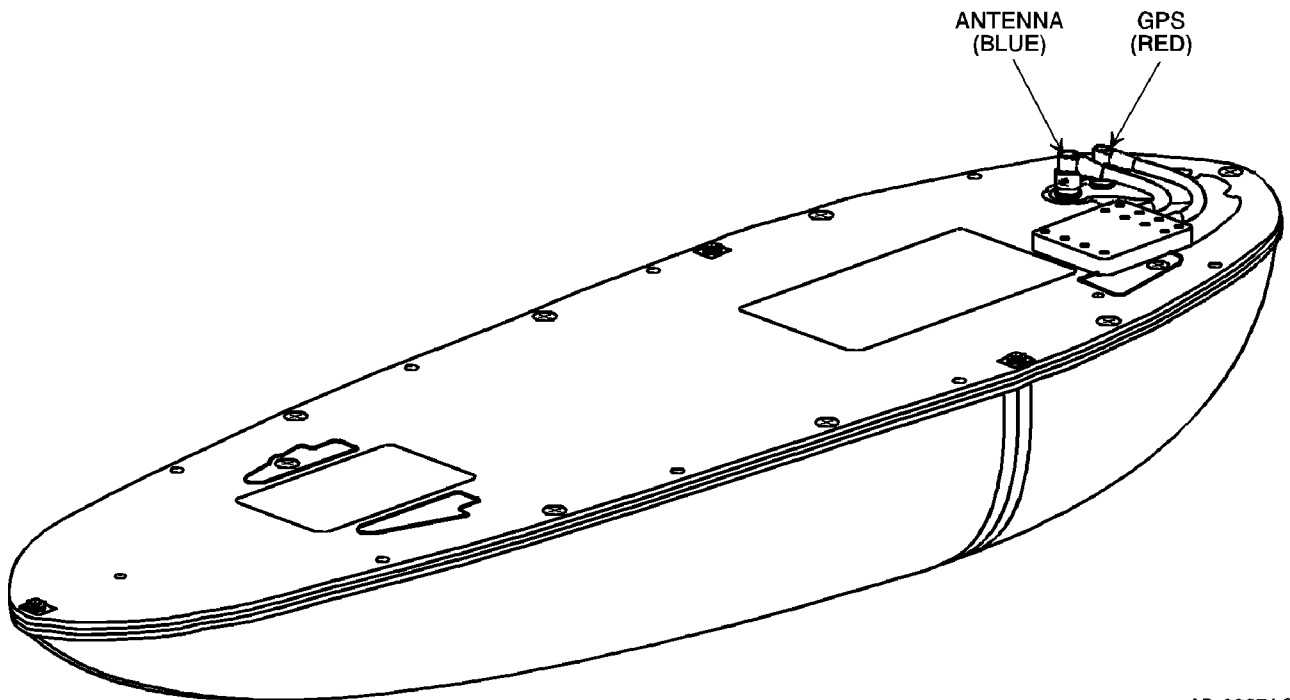
The Handset Unit (HSU) is the primary communication device for the SCS system and is used for telephone calls and basic functions. A 12-character, alphanumeric display screen allows the system to display messages requesting information from the user such as a Personal Identification Number (PIN) and to display the status of the system. The user can also use the display screen to access all functions that the system supports. The HSU has a keypad that allows the user to enter PINs and dial telephone numbers, select functions, and turn off and on the speaker phone function. An ON/OFF key on the keypad allows the user to switch the system on and off. A handset microphone and loudspeaker allows handsfree operation for the user. In addition to normal voice communications, the HSU provides the following options:

- PIN Protection
- Access to the phone book entries
- Manual selection of the satellite ocean region
- Selection of the default network service provider.

4. System Component Descriptions

A. Aero Antenna Unit

The AAU contains a mechanically steered antenna for transmitting and receiving RF signals to and from a geostationary satellite. The AAU is mounted in a radome on top of the fuselage. See Figure 1-5 for a graphic view of the AAU. Refer to Table 1-5 for the AAU leading particulars.



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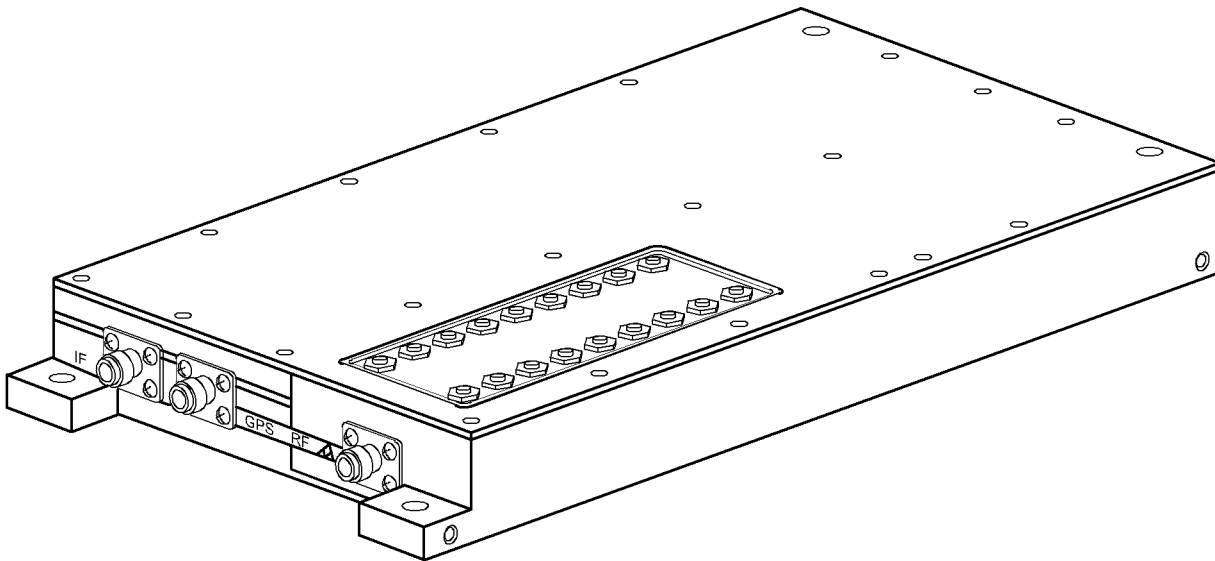
Figure 1-5. Aero Antenna Unit

Table 1-5. Leading Particulars for the Aero Antenna Unit

Item	Specification
Dimensions (maximum):	
• Height	4.88 in. (124 mm)
• Width	5.96 in. (151.3 mm)
• Length	22.09 in. (561 mm)
Weight (maximum)	5.30 lb (2.4 kg)

B. Antenna Control Unit

The ACU serves as an interface between the AAU and the TPU. The ACU is mounted in the pressurized/temperature controlled cabin as close as possible to the AAU within the limitations imposed by the allowable RF cable loss (less than or equal to 0.75 dB at 1.6 GHz) and the RF cable selection. Generally this is limited to less than 3m (10 ft) with the best available cables. See Figure 1-6 for a graphic view of the ACU. Refer to Table 1-6 for the ACU leading particulars.



NOTE:
THE ACU CONNECTORS ARE COLOR CODED.
THE IF CONNECTOR IS YELLOW, GPS IS RED, AND RF IS BLUE.

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Figure 1-6. Antenna Control Unit

Table 1-6. Leading Particulars for the Antenna Control Unit

Item	Specification
Dimensions (maximum):	
• Height	1.38 in. (35 mm)
• Width	5.01 in. (127.2 mm)
• Length	9.29 in. (236 mm)
Weight (maximum)	3.2 lb (1.45 kg)

C. Power Supply Unit

The PSU provides the operating power for the system. The PSU and TPU may be mounted together in the pressurized/temperature controlled cabin. The maximum distance between the PSU and the ACU is defined by the cable requirements and the cable selection. See Figure 1-7 for a graphic view of the PSU. Refer to Table 1-7 for the PSU leading particulars.

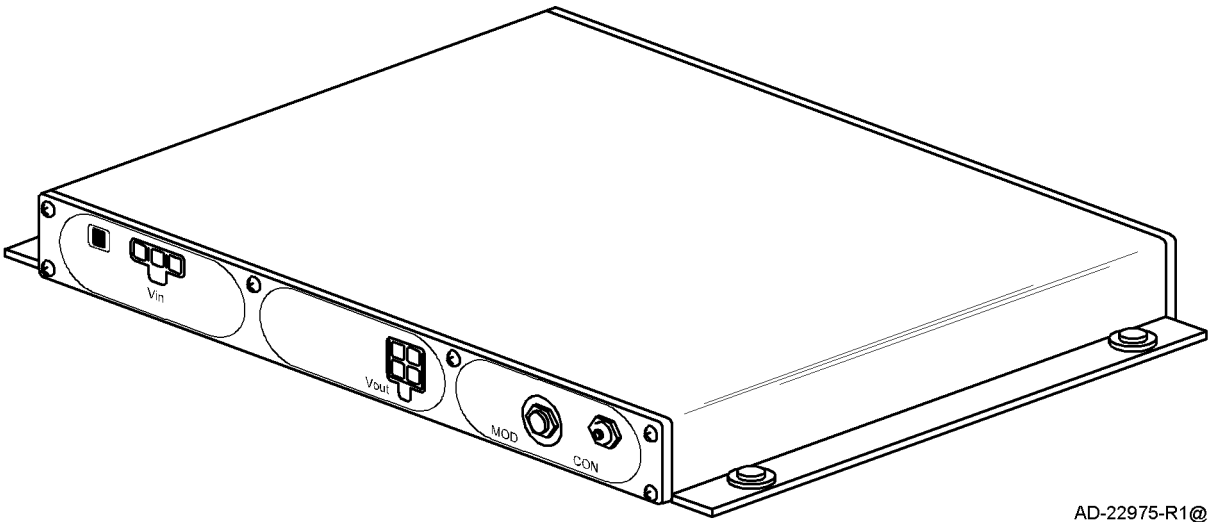


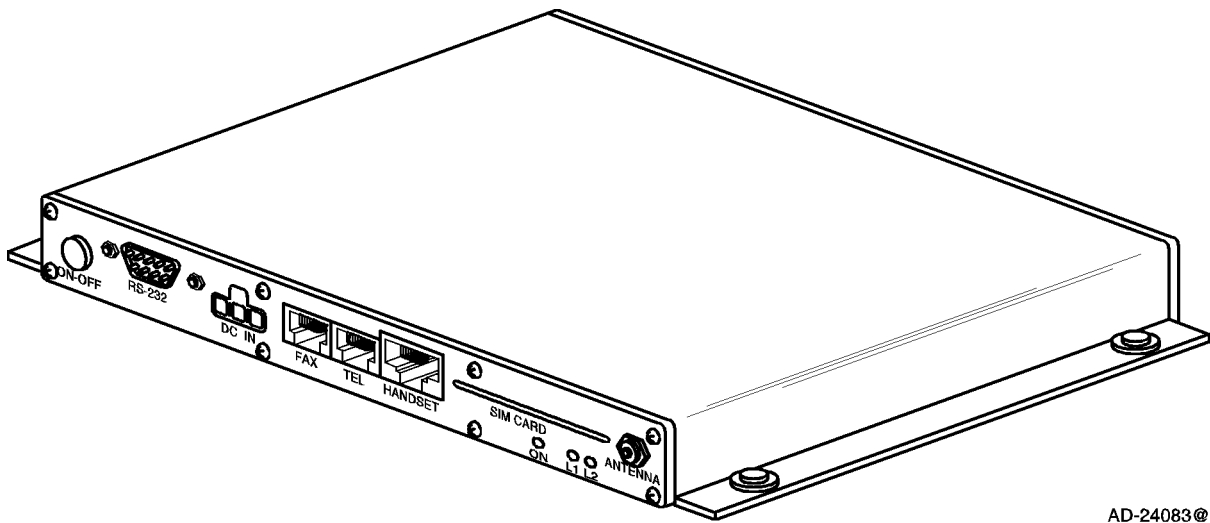
Figure 1-7. Power Supply Unit

Table 1-7. Leading Particulars for the Power Supply Unit

Item	Specification
Dimensions (maximum):	
• Height	1.20 in. (30.5 mm)
• Width	8.33 in. (211.5 mm)
• Length	6.12 in. (155.5 mm)
Weight (maximum)	2.4 lb (1.09 kg)

D. Telephone Unit

The TPU serves as the interface between various user devices, such as the HSU, PC, telephone, and fax machine, and the network. The HSU interface is through a RJ45 jack. The interface with the PC is through a standard RS-232 port, while the telephone and fax machine use a standard RJ11 jack. The TPU and PSU may be mounted together in the pressurized/temperature controlled cabin. The maximum distance between the TPU and the PSU is defined by the cable requirements and the cable selection. See Figure 1-8 for a graphic view of the TPU. Refer to Table 1-8 for the TPU leading particulars.



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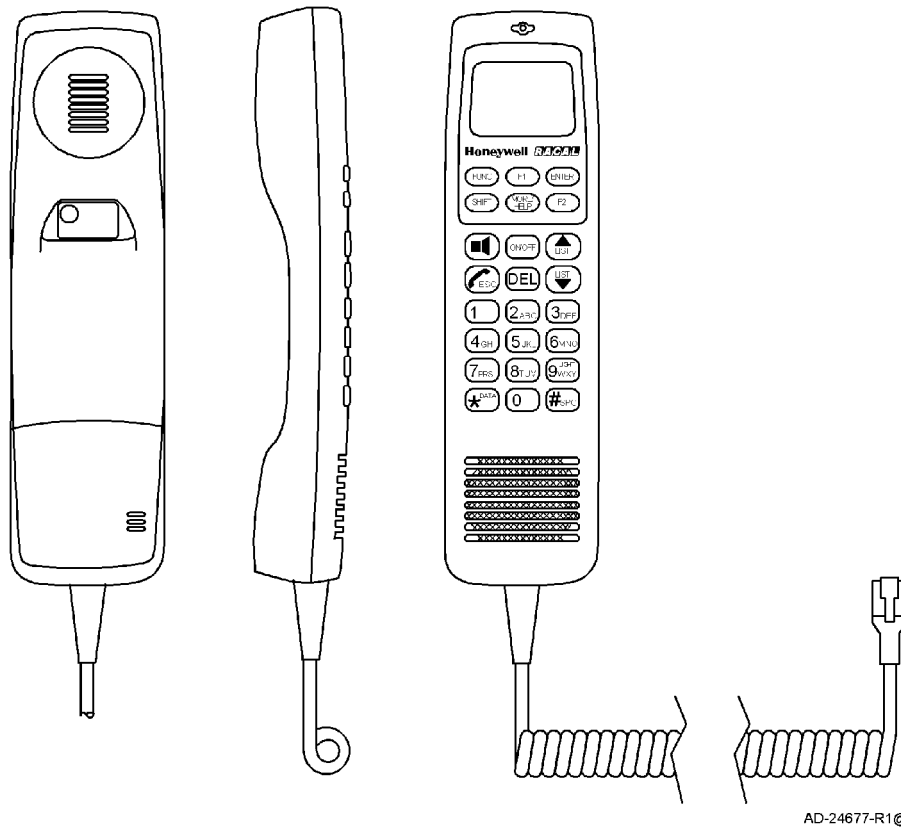
Figure 1-8. Telephone Unit

Table 1-8. Leading Particulars for the Telephone Unit

Item	Specification
Dimensions (maximum):	
• Height	1.20 in. (30.5 mm)
• Width	8.33 in. (211.5 mm)
• Length	6.12 in. (155.5 mm)
Weight (maximum)	2.2 lb (1.0 kg)

E. Handset Unit

The HSU interfaces with the TPU to supply a telephone handset and a display screen for the user. The handset connects to the TPU through an RJ45 jack and comes with a coiled cord, extendable to a maximum of 1.8 meters (5.9 feet). A coiled cord extension up to 15 feet is acceptable. This restricts where the HSU and TPU can be mounted in the pressurized/temperature controlled cabin. Also, the HSU must be mounted so it cannot be removed from its cradle in the forward direction. See Figure 1-9 for a graphic view of the HSU. Refer to Table 1-9 for the HSU leading particulars.



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Figure 1-9. Handset Unit

Table 1-9. Leading Particulars for the Handset Unit

Item	Specification
Dimensions (maximum):	
• Height	1.46 in. (37 mm)
• Width	2.13 in. (54 mm)
• Length	7.87 in. (200 mm)
Weight (maximum)	0.85 lb (0.39 kg)

5. System Interfaces

The system interfaces and cables are shown in Figure 1-10. Refer to Table 1-10 for the system interfaces leading particulars.

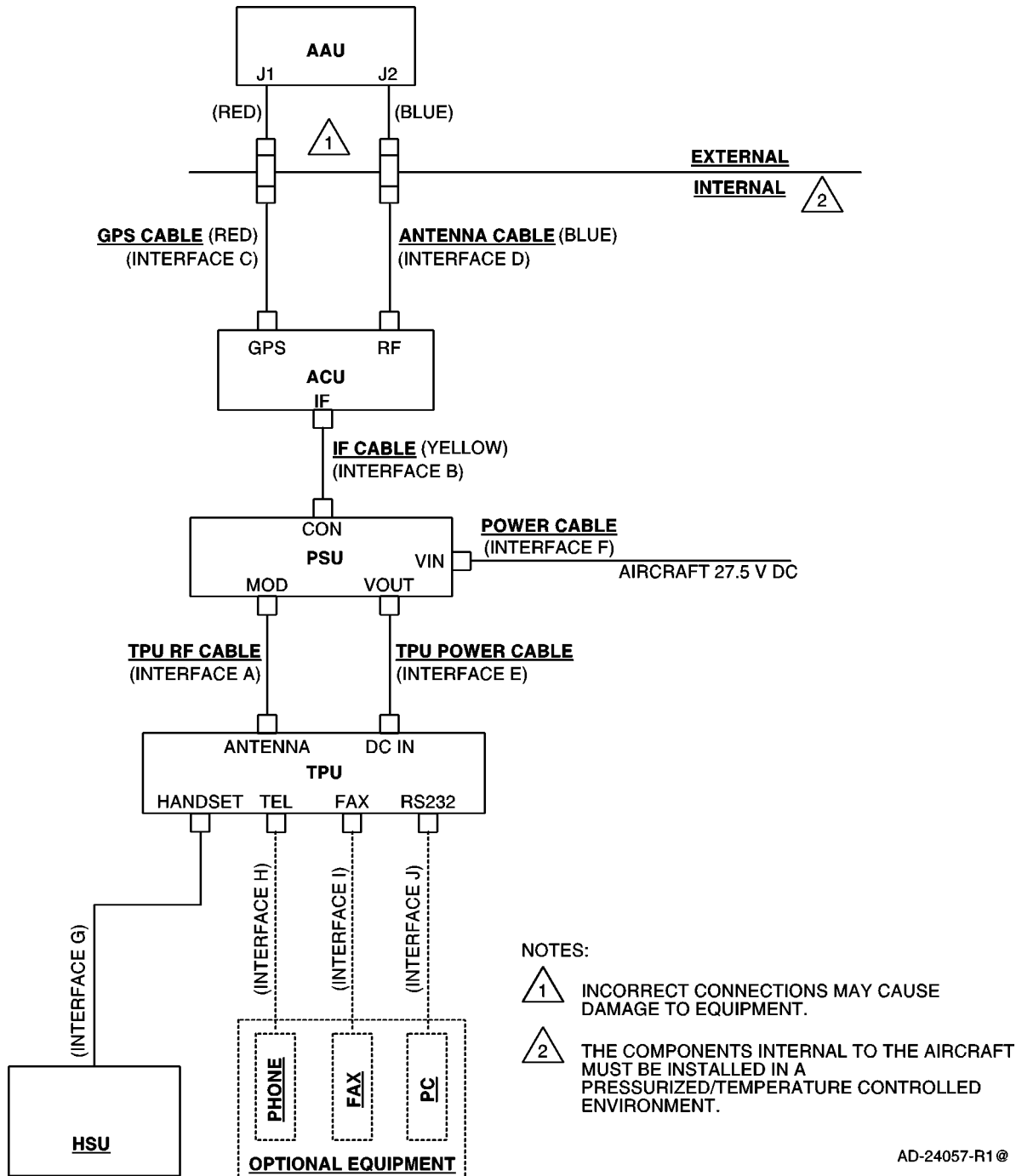


Figure 1-10. System Interfaces

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Table 1-10. Leading Particulars for the System Interfaces

Item	Specification
Interface A (TPU RF Cable)	
Mechanical Interface:	
• TPU	QLA Jack (Antenna)
• Power Supply	SMA Jack (TPU)
Electrical Interface:	
• Loss	≤ 2 dB at 1.6 GHz
• VSWR	$< 1.4:1$
• Impedance	50 ohm
• DC Signal	27.5 ± 0.5 V dc, 30 W max
• TX Signal	1626.5 to 1660.5 MHz
• RX Signal	101.5 MHz carrier
Interface B (IF Cable)	
Mechanical Interface:	
• ACU	TNC Jack (IF)
• Power Supply	QLA Jack (CON)
• Color Coding	Yellow
Electrical Interface:	
• Loss	≤ 8 dB at 1.6 GHz
• VSWR	$< 1.4:1$
• Impedance	50 ohm
• DC Signal	27.5 ± 0.5 V dc, 30 W max
• TX Signal	1626.5 to 1660.5 MHz
• RX Signal	101.5 MHz carrier
Interface C (GPS Cable)	
Mechanical Interface:	
• ACU	TNC Jack (GPS)
• Antenna	TNC Jack (J2)
• Color Coding	Red

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Table 1-10. Leading Particulars for the System Interfaces (cont)

Item	Specification
Electrical Interface:	
• Loss	≤ 10 dB at 1575.42 MHz
• VSWR	< 1.4:1
• Impedance	50 ohm
• DC Signal	27.5 ± 0.5 V dc, 15 W max
• RX Signal	1575.42 MHz carrier (GPS)
Interface D (Antenna Cable)	
Mechanical Interface:	
• ACU	TNC Jack (RF)
• Antenna	TNC (J1)
• Color Coding	Blue
Electrical Interface:	
• Loss	≤ 0.75 dB at 1.6 GHz
• VSWR	< 1.4:1
• Impedance	50 ohm
• TX Signal	1626.5 to 1660.5 MHz
• RX Signal	1525 to 1559 MHz
Interface E (TPU Power Cable)	
Mechanical Interface:	
• TPU	Molex Mini-Fit Jr™: 5569**A2* 3 circuits single row. Mates with Molex Mini-Fit Jr™ type 5557, P/N 39-01-4030 or 39-01-4031 on cable (DC in).
• Power Supply	Molex Mini-Fit Jr: 5569**A2* 4 circuits 2*2 dual row. Mates with Molex Mini-Fit Jr™ type 5557, P/N 39-01-2040 or 39-01-2045 on cable (Vout).
Electrical Interface:	
• Voltage	27.5 V dc nominal
• Current	< 1 A
• Resistance	< 0.5 ohm

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Table 1-10. Leading Particulars for the System Interfaces (cont)

Item	Specification
Interface F (Power Cable)	
Mechanical Interface:	
• TPU	Molex Mini-Fit Jr: 5569**A2* 3 circuits single row. Mates with Molex Mini-Fit Jr™ type 5557, P/N 39-01-4030 or 39-01-4031 on cable (Vin).
Electrical Interface:	
• Input Voltage	27.5 V dc nominal
• Power	30W maximum
Interface G (RJ45 Jack for Handset)	
• Connector	8-pin RJ45 jack on TPU
Interface H (RJ11 Jack for Telephone and Fax)	
• Speech Level	+2.5 dBm
• Receive Level	-9 dBm
• Dial Tone	425 Hz, -19dBm
• DTMF (Dialing)	-20 dBm
• Minimum	30 V dc
• Line Voltage	35 Vrms, 25 HZ (maximum of two telephones/faxes)
• Ringing Signal (Hook off)	> 20 mA
• Signaling (Hook on)	< 9 mA
Interface J (RS232 Jack for PC)	
• Connector	9-pin D-type sub miniature female connector
• Data Protocol	Hayes AT compatible
• Bit Rate	1.2 to 38.4 kbps
• Parity	No parity (AT programmable: odd, even, mark, or space)
• Data Bits	8 bits (AT programmable: 7 or 8 bits)
• Stop Bits	1 bit (AT programmable: 1 or 2 bits)
• Flow Control	RTS/CTS (AT programmable: ON, XON/XOFF or RTS/CTS)



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SYSTEM OPERATION

1. General

The SCS system provides direct telephony, telefax, Nera Internet Message Service (NIMS), and data connection to international public networks via the Inmarsat satellite system. For basic operation, the system requires the following:

- Aero Antenna Unit (AAU)
- Antenna Control Unit (ACU)
- Power Supply Unit (PSU)
- Telephone Unit (TPU)
- Handset Unit (HSU).

For additional functionality, the following equipment may be added:

- Personal Computer (PC) for control and settings
- Telefax machine
- Telephone.

The network service provider issues the user license and Inmarsat Mobile Numbers (IMN). The service provider is also responsible for the billing of calls. The services supported by the system are as follows:

- Telephone calls – basic telephony services
- Telefax – CCITT Group 3 facsimile services, 2.4 bps
- Data communication – Hayes compatible 2.4 bps data service
- Mail service – NIMS.

Figure 2-1 shows the communication path for calls to and from the SCS system.

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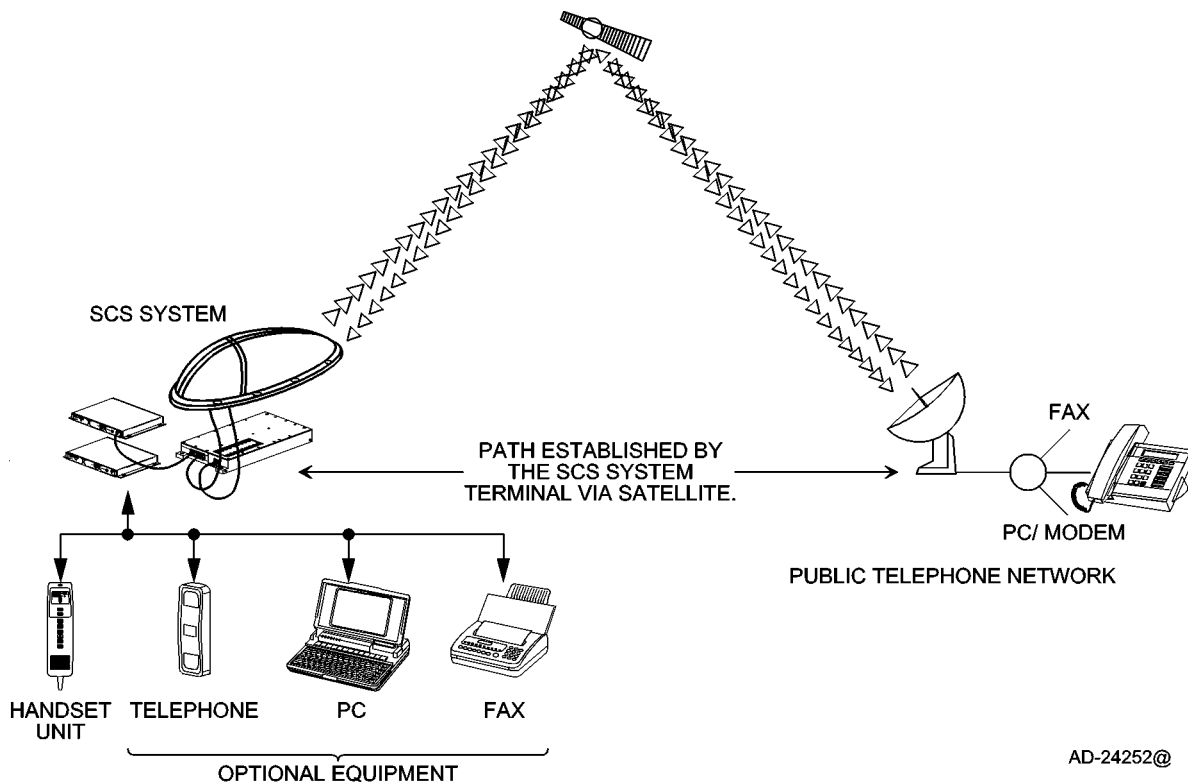


Figure 2-1. Communications Path

2. Making a Call Using the SCS System

A. Calls from the SCS System

To make an outgoing call, you use a standard international telephone number with the 00 prefix. The MES automatically includes information to identify the system and the particular port that originates the call. The SCS system has four ports configured for:

- Handset Unit Calls
- Telephone Calls
- Telefax Service
- Data Service (personal computer).

The LES uses the port identifying information (OI) for billing purposes. The system transmits the dialling information on a channel specially assigned by the Network Coordination Station (NCS) to the LES, which also has been instructed to tune to the same channel. The LES routes the call over the public telecommunications networks to the intended destination. When the called party responds, the call proceeds.

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B. Calls to the SCS System

The SCS system receives incoming calls via the Inmarsat Mobile Number (IMN) phone numbers. The IMN numbers are assigned to the following ports:

- Handset Unit (HSU port)
- Telephone (TEL port)
- Data service (DATA port)
- Telefax service (FAX port)
- NIMS service.

Calls are made as ordinary international (satellite) calls where each ocean region has an international country code (see Appendix A for a list of telephone country codes). If an area is covered by more than one satellite, it is necessary that the caller knows which satellite (ocean region) the MES is using. The international codes for the ocean regions are as follows:

- | | |
|-------------------------------|-----|
| • Atlantic Ocean East Region: | 871 |
| • Pacific Ocean Region: | 872 |
| • Indian Ocean Region: | 873 |
| • Atlantic Ocean West Region: | 874 |

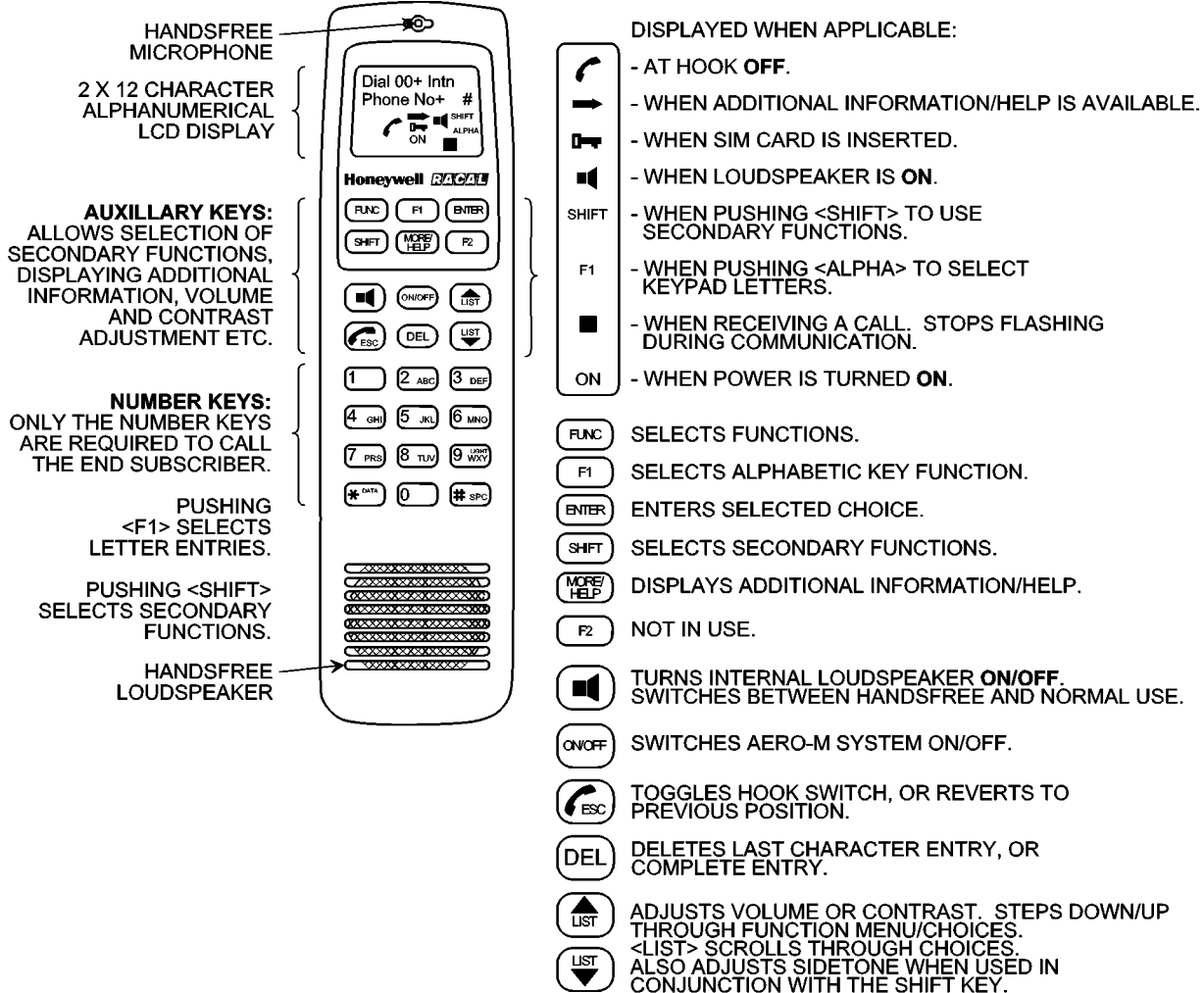
NOTE: Some network service providers support the common ocean region access number 870, which connects the call to the dialed SCS system regardless of the ocean region the user is currently communicating through.

C. Calls from the Handset Unit

The handset unit is used for telephone calls and basic functions. Additional control of functions must be performed from a PC connected to the RS-232 jack of the TPU. Figure 2-2 shows the display and keys of the handset unit. Table 2-1 describes the features of the handset unit.

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AD-24253-R1@

Figure 2-2. Handset Unit Display and Keys

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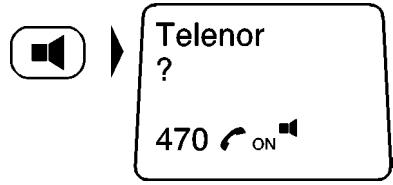
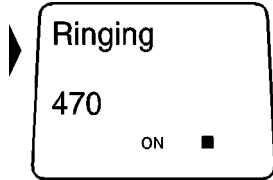
Table 2-1. Features of the Handset Unit

Feature	Description
Auxiliary Keys	The auxiliary keys allow selection of secondary functions, displaying additional information, and volume and contrast adjustment.
Number Keys	Only the number keys are required to call the end subscriber. Pushing the F1 key selects the letter entries. Pushing the SHIFT key selects the secondary functions.
IDLE Mode	The following message appears in the in the display screen when in IDLE mode: Dial 00+Intn Phone No+ # 470 ON AD-24254@
HOOK ON/OFF	The handset unit is secured in a desk- or wall-mounted bracket. A magnet toggles the internal hook switch: CLICK! HOOK ON/OFF MAGNET AD-24255@ The switch can also be toggled with the combined HOOK ON/OFF and ESCAPE key: ESC Telenor ? 470 ON AD-24256@

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Table 2-1. Features of the Handset Unit (cont)

Feature	Description
Beeps in the Handset Unit	Before contact is established with the selected satellite, beeps indicate attempts.
Loudspeaker	When off-hook, the loudspeaker key toggles the handset loudspeaker ON and OFF. The following symbol is displayed in the display screen when the loudspeaker is on:  AD-24257®
Volume Control	The received volume in the handset unit may be adjusted during a call: - Reducing the volume:   - Increasing the volume:   The volume is reset when clearing the call.
Light in Display and Keys	- Turns on during activity (default) - For permanent light, push the SHIFT key LIGHT key together once. - Repeat the key strokes to turn the light off, and repeat again to revert to the activity mode of illumination.
Incoming Call Indicator	The incoming call indicator ■ flashes when receiving a call to the handset unit. The indicator turns off when the call is established.  AD-24258®
PIN Code	The user is prompted for the 4-8 digit Personal Identification Number (PIN) each time the SCS-System is switched on: - SIM PIN (with SIM card) - Phone PIN (without SIM card) NOTE: The PIN code may also be entered from the PC, if it is connected. Be aware that the PIN protection may have been disabled.
Sidetone Adjustment	To adjust the sidetone level, push the SHIFT key once. - Reducing the side tone level:   - Increasing the side tone level:   To terminate side tone control, push the SHIFT key again. The display will show ACCEPTED. Volume control is now active as usual. The sidetone setting is stored between calls and when the power is cycled.

3. Operation of the Handset Unit

A. Switching On the System

To switch on the system, perform the following:

- (1) Insert the SIM card (if the SIM card is to be used with the system).

NOTE: There are three ways to power up/down the system. Power can be applied/removed via the HSU, TPU, or aircraft power (circuit breaker).

- (2) Apply power to the system. The red ON indicator on the TPU should turn on. Refer to Figure 2-3.

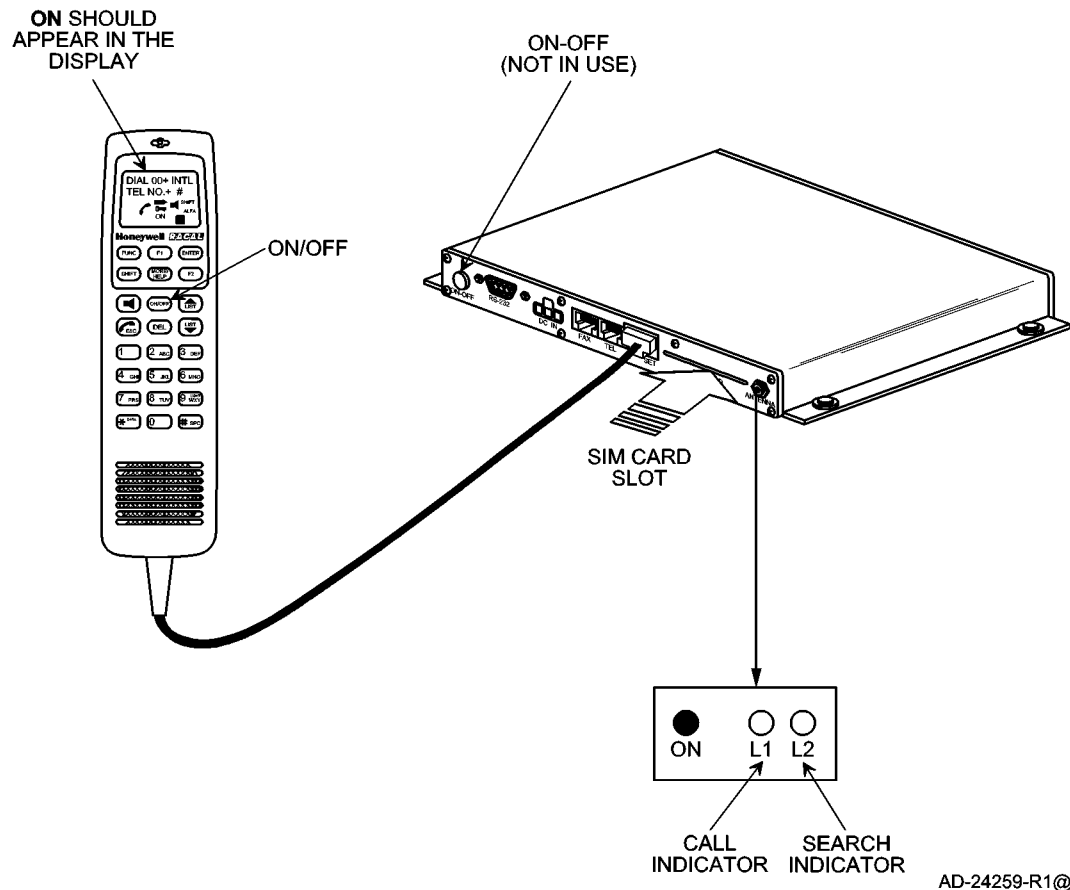
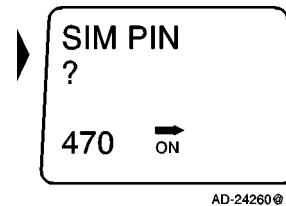


Figure 2-3. Switching On

- (3) Enter the SIM PIN code, followed by the pound (#) key. If no SIM card is inserted, the Phone PIN must be entered.



B. Satellite Searching

To search for a satellite, perform the following:

- (1) Push the loudspeaker key to turn on the loudspeaker.
- (2) Push the LIST up arrow and LIST down arrow keys to adjust the volume of the loudspeaker.
- (3) During the satellite search, beep tones are heard in the HSU (green indicator L2 on the TPU) flashes in step with the tones:

■ ■ ■ ■ ■ ■ ■ ■ Slow intermittent tones when searching for any satellite.

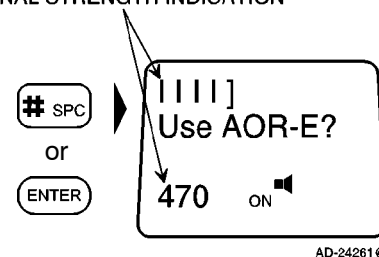
■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ Rapid intermittent tones when searching for a specific satellite (faster when searching for a single satellite).

- (4) When receiving a satellite signal, a short tone is sounded. If it is an Inmarsat satellite, a continuous tone is sounded with varying frequency. When closing in on a satellite, the tone should increase in frequency.

NOTE: Searching all satellites is the normal mode of operation.

- (5) Push the pound (#) key or the ENTER key to accept the satellite selection, e.g., AOR-E.

SIGNAL STRENGTH INDICATION



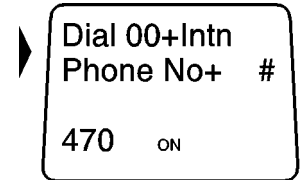
NOTES:

1. Push the ESC key once to restart the satellite search, or twice to choose another region. Refer to paragraph 3.E. for a description on how to manually select a Satellite Ocean Region.
2. With no user intervention, the SCS system automatically searches and logs on to an appropriate ground earth station via a satellite.

C. Making a Call Through Any Network Service Provider

To make a call through any network service provider, perform the following:

- (1) Key in the international call prefix 00, followed by the country code and subscriber code (maximum of 22 digits):



AD-24262

NOTE: For an explanation of call numbers and a list of the telephone country codes, see Appendix A.



AD-24263

- (2) Initiate the call by pushing the pound (#) key or the ENTER key. Slow beeps are heard during the call setup. The ringing tone is heard until the call is answered. The call indicator L1 on the TPU turns on.



AD-24264

NOTE: Pushing the FUNC key displays the duration of the call as it proceeds (hours:minutes:seconds).



AD-24265

- (3) Clear the call when finished by pushing the ESCAPE key:



AD-24266

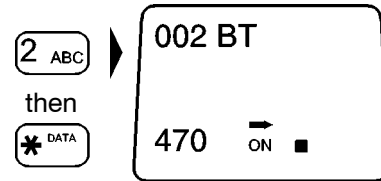
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D. Making a Call Through a Selected Network Service Provider

To make a call through a selected network service provider, perform the following:

- (1) Push the No. 2 key then the star (*) key to enter the network service provider reference code.



AD-24267 ©

- (2) Repeat all of the steps in paragraph C., Making a Call Through Any Network Service Provider.

NOTE: Availability of this function depends on the service provider.

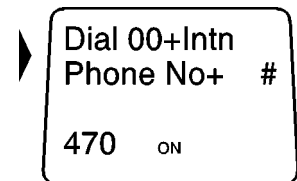
E. Manually Selecting a Satellite Ocean Region

Some geographic locations allow contact with more than one Ocean Region satellite. It is recommended that the user choose an Ocean Region providing good signal quality and cost-effective communication. Use the satellite coverage map in Figure 1-3 to select the Ocean Region at your location:

- AOR-W Atlantic Ocean Region West: (1)
- AOR-E Atlantic Ocean Region East: (2)
- POR Pacific Ocean Region: (3)
- IOR Indian Ocean Region: (4)

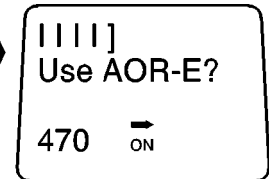
To select a satellite ocean region, starting from idle, perform the following:

NOTE: The following message appears in the display when in the idle mode:

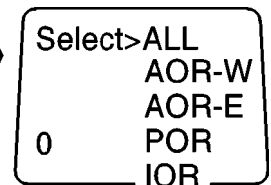


- (1) Push the SHIFT key then the No. 7 key to enter the Ocean region selection.

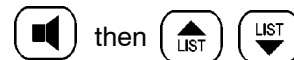
NOTE: This mode can also be entered by pushing the ESC key twice during the satellite search function.



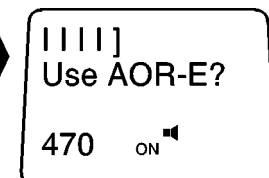
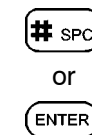
- (2) Push the FUNC key to enter the Satellite Region list. Use the LIST-down and ENTER keys to scroll down to the desired region.



NOTE: Turn on the loudspeaker to hear the search tone and adjust the volume. Pushing the ESC key stops the search.



- (3) Push the pound (#) key or ENTER key to accept the satellite selection, e.g., AOR-E.



F. Selecting the Default Network Service Provider

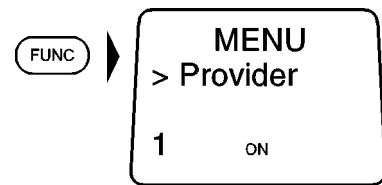
The default Inmarsat Network Service Provider (ISP) for a satellite (Ocean Region) is automatically used if the user does not select another service provider when making a call. When using a SIM card, the selection of an ISP is restricted to one of the allowed network service providers. When the restricted network function is enabled, and with some SIM cards, the selection of default network service provider is not possible.

To select the default network service provider, perform the following:

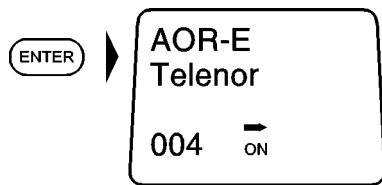
NOTE: The following message appears in the display when in the idle mode:



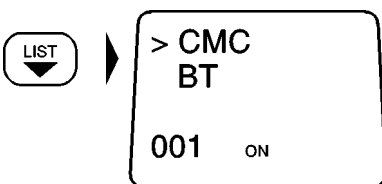
(1) Push the FUNC key to open the function MENU:



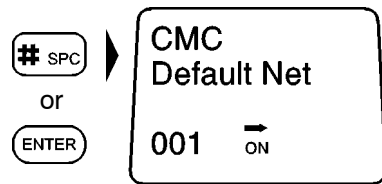
(2) Push the ENTER key to display the current default network:



(3) Use the LIST down key to scroll down through the list to the desired network service provider:



(4) Push the pound (#) key or the ENTER key to store the selected network service provider as the default:



(5) Push the ESC key twice to revert to the idle mode.



G. IMN Numbers Readout

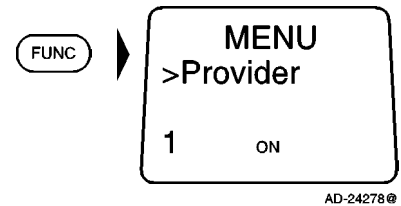
This function lists the IMN numbers assigned to the Mini-M Aero SATCOM System. Editing of the numbers on the telephone or SIM card can only be performed from the PC when connected.

To readout the IMN numbers, perform the following:

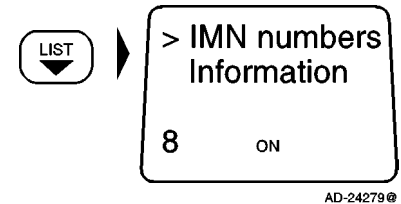
NOTE: The following message appears in the display when in the idle mode:



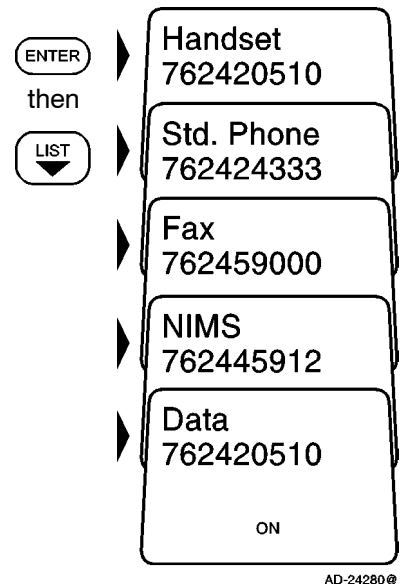
(1) Push the FUNC key to open the function MENU:



(2) Use the LIST down key to scroll down to the IMN numbers:



(3) Push the ENTER key to enter the list, and then use the LIST down key to display the assigned IMN numbers:



(4) Push the ESC key twice to revert to the idle mode.



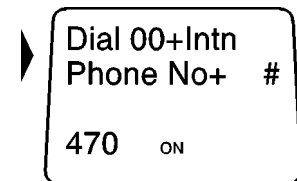
H. Information Readout

The following information is provided:

- TPU version number
- Forward ID number that identifies the user's particular Mini-M Aero System and SIM card, if installed
- System version numbers of the internal software programs.

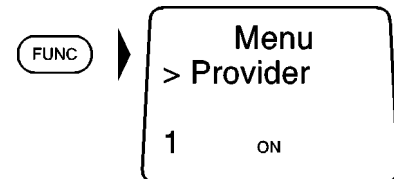
To readout the information, perform the following:

NOTE: The following message appears in the display when in the idle mode:



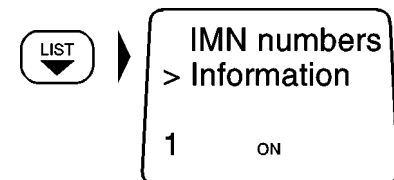
AD-24281 @

- (1) Push the FUNC key to open the function MENU:



AD-24282 @

- (2) Use the LIST down key to scroll down to the information:

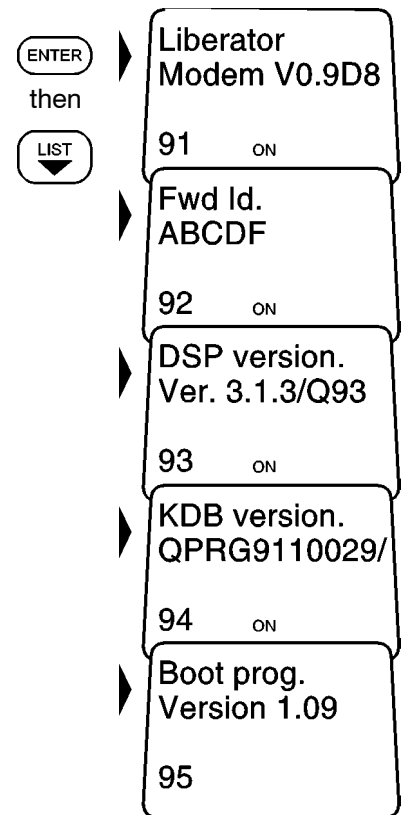


AD-24283 @

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- (3) Push the ENTER key to access the list, and then use the LIST down key to display the information available:



AD-24284®

- (4) Push the ESC key twice to revert to the idle mode.



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I. Calls from the Telephone

A telephone connected to the RJ-11 jack in the TPU can be used to make calls. (Refer to Table 1-10 for specifications.) Additional control of functions must be done from the HSU or a PC connected to the RS-232 port of the TPU. Table 2-2 gives the telephone features.

Table 2-2. Telephone Features

Function	Description
Call through Default Network Service Provider	0 0 4 GHI 7 PRS 6 MNO 7 PRS 2 ABC 4 GHI 4 GHI 7 PRS 0 0 # SPC routes the call through the default network service provider for the satellite (Ocean Region) that the user is using.
Call through Selected Network Service Provider	4 GHI * DATA 0 0 4 GHI 7 PRS 6 MNO 7 PRS 2 ABC 4 GHI 4 GHI 7 PRS 0 0 # SPC routes the call through the network service provider Telenor (4) in Norway.
Last Number Redialing	0 # SPC retransmits the last number.
Last Number Redialing through the Selected Network Service Provider	4 GHI * DATA 0 # SPC retransmits the last number through the selected network service provider (Telenor = 4).
Short Number Dialing (Prefix 23)	2 ABC 3 DEF 1 0 5 JKL # SPC fetches and sends the telephone number stored on the SIM card under the number 105.
Short Number Dialing (Prefix 23) through the Selected Network Service Provider	4 GHI * DATA 2 ABC 3 DEF 1 0 5 JKL # SPC fetches and sends the telephone number stored under the number 105 through the selected network service provider (Telenor = 4).
Call through Selected Network Service Provider and Terrestrial Network	Dialing through a terrestrial network is only possible using a selected network service provider. The number may be in the range of 0 to 127. Example of a call through the selected network service provider, e.g., Telenor, and terrestrial network 1: 4 GHI * DATA 1 * DATA 0 0 4 GHI 7 PRS 6 MNO 7 PRS 2 ABC 4 GHI 4 GHI 7 PRS 0 0 # SPC

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Table 2-2. Telephone Features (cont)

Function	Description
Service Calls	Special information services are accessible with a 2-digit service address code. See Appendix B for a list of service address codes. The following is an example of obtaining assistance from the international operator. Dial: 1 1 # SPC NOTE: Not all network service providers offer every service listed.
Call the SCS-1000	To call the SCS-1000, dial the international prefix followed by the 87X IMN number, for example from the U.S., 011 871 762420510. The X in 87X depends on which satellite the SCS-1000 is currently using: 1 - AOR-E (Atlantic Ocean Region East) 2 - POR (Pacific Ocean Region) 3 - IOR (Indian Ocean region) 4 - AOR-W (Atlantic Ocean Region West) NOTE: Some network service providers support the common Ocean Region access number 870, which connects the call to the dialed SCS-1000 regardless of the Ocean Region the user currently communicates through.

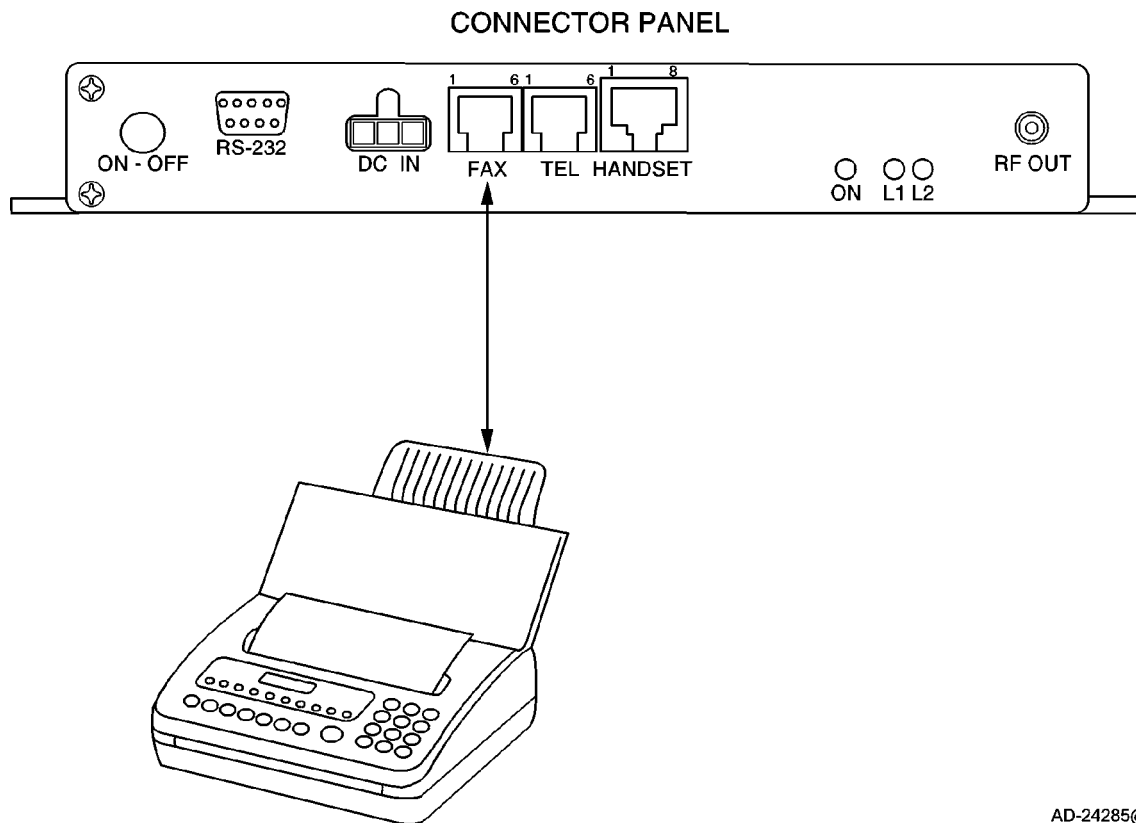
4. Telefax Service

The TPU provides access to a telefax service at a transmission rate of 2.4 kpbs. The TPU is fully compatible with the world's leading telefax machines and telefax software standards.

NOTE: Transmission may not be possible through some of the telefax machines available on the market. Check with the network service provider before purchasing a telefax machine for use with the SCS system.

A. Setup

Connect the telefax machine to the FAX port on the TPU connector panel as shown in Figure 2-4. (Refer to the telefax machine owner's manual to set the default transmission rate to 2.4 kpbs.) Verify that the FAX port is configured for telefax service. Refer to the advanced functions port configuration paragraph 7.K.(4)(a) in this section for information on how to configure the FAX port for telefax service. Paragraph 3. of this section describes the operation of the HSU.



AD-24285@

Figure 2-4. Telefax Communications with the SCS System

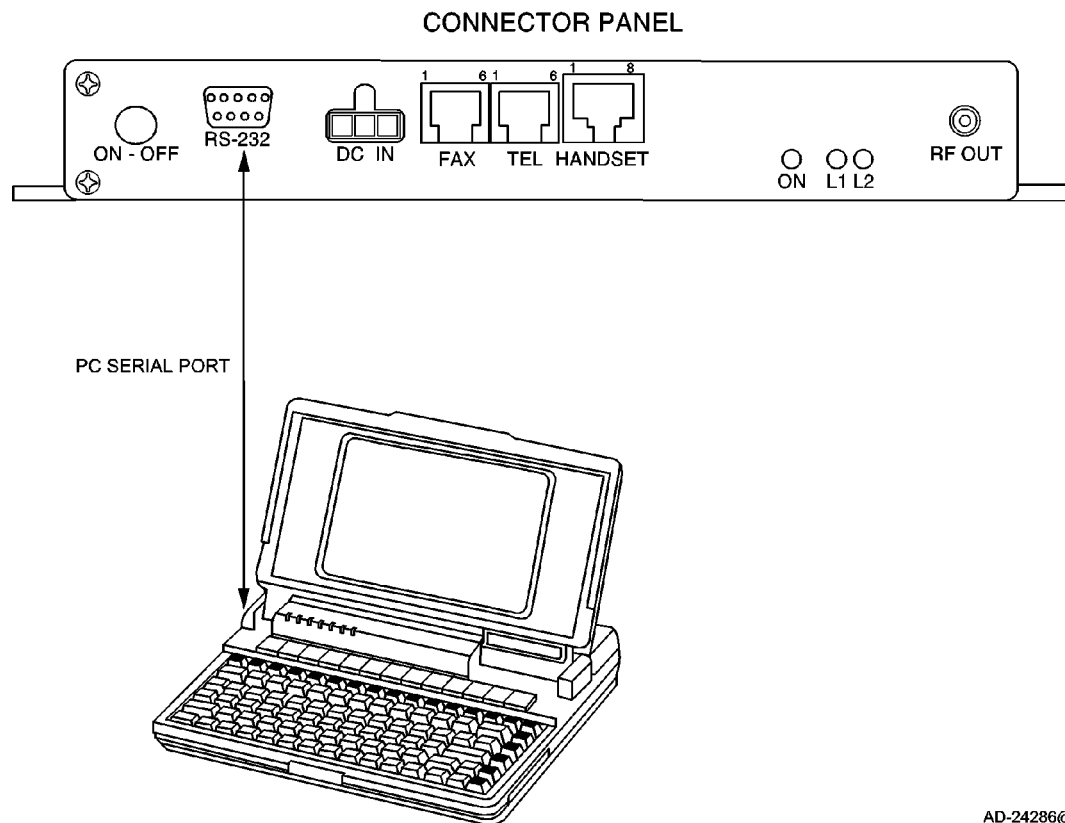
B. Transmission

Telefax calls made by the SCS system are telefax only. Any telephone handset connected to the telefax machine is for dialing purposes only. To send a facsimile, use the same dialing sequences as when making a call, either through the default network service provider or a selected network service provider. Enter the pound (#) key as the last digit before starting the transmission.

Telefax transmissions normally take 1.5 minutes per standard text page using standard resolution. Using superfine or halftone resolution doubles the transmission time. To save time, avoid using a separate cover page. If a call failure should occur while sending a multi-page document, re-send only the failed pages.

5. Data Service

Access to all system functions is obtained by connecting a PC to the RS-232 port on the TPU connector panel as shown in Figure 2-5. With a VT100 compatible terminal emulator, such as Windows 95 - HyperTerminal, the menu is displayed on the PC screen. The TPU also provides access to asynchronous data services through its built-in modem capability. The transmission rate over the satellite is 2.4 kpbs, and any standard PC with a serial port can be used.



AD-24286@

Figure 2-5. PC Connections to the SCS System

A. Data Port Setup

The DATA port on the TPU may be set to operate with a PC, or with a printer. To operate with a PC, the initial settings of the DATA port must be as follows:

- Speed, normally 38,400 bps
- 8 data bits
- No parity
- 1 stop bit.

B. Initial Settings on PC

Use a PC terminal emulator program, such as HyperTerminal, to make the following initial settings:

- (1) Start the HyperTerminal
- (2) Enter a name for the terminal, for example: TPU_test
- (3) In the phone number window, select Direct to COM1 (or the COM port the TPU is connected to)
- (4) In the COM1 Properties window, set as follows:
 - Bits per second: 38,400 bps
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: None.
- (5) In the File menu, select Properties then click Settings and select Terminal.
- (6) Select ANSI in the Emulation list box.
- (7) In the view menu, click Fonts. Select Terminal in the fonts list. Set the size to 11 points.
- (8) Click on Ok.

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C. Testing the Installation

Enter a command on the PC keyboard to verify that an OK is displayed on the PC screen. An example command is shown below:



If there is no response, check that the baud rate setting is the same for both the PC and the TPU.

D. Procedures for Starting PC Data Services

Perform the following procedures for starting the data service from the PC:

- (1) Turn on the TPU. See paragraph 3.A. for procedures to turn on the system.
- (2) Open the terminal emulator on the PC and connect. Key in the start prompt **at+wneradte**. Refer to Figure 2-6.

NOTE: When using the terminal emulator, the data/printer port Data Terminal Equipment (DTE) is busy and is not capable of receiving a data call.

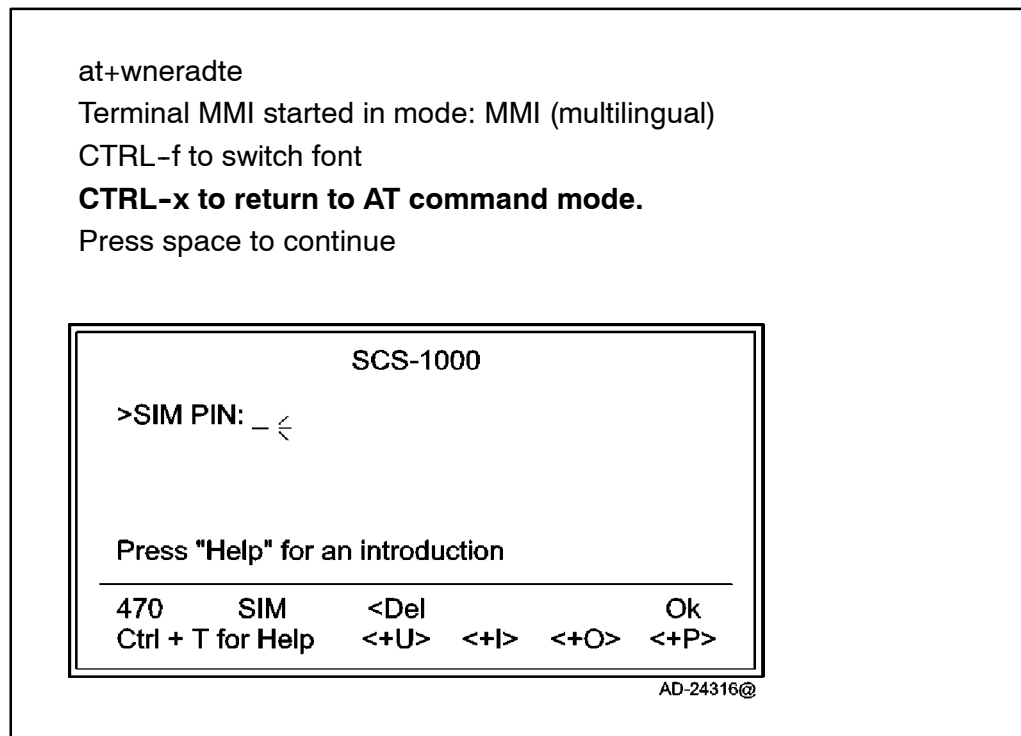


Figure 2-6. Keying in the Start Prompt

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NOTE: The user is prompted for the 4-8 digit PIN each time the system is switched on.

- (3) Enter the SIM PIN code and push the CONTROL key and P key.

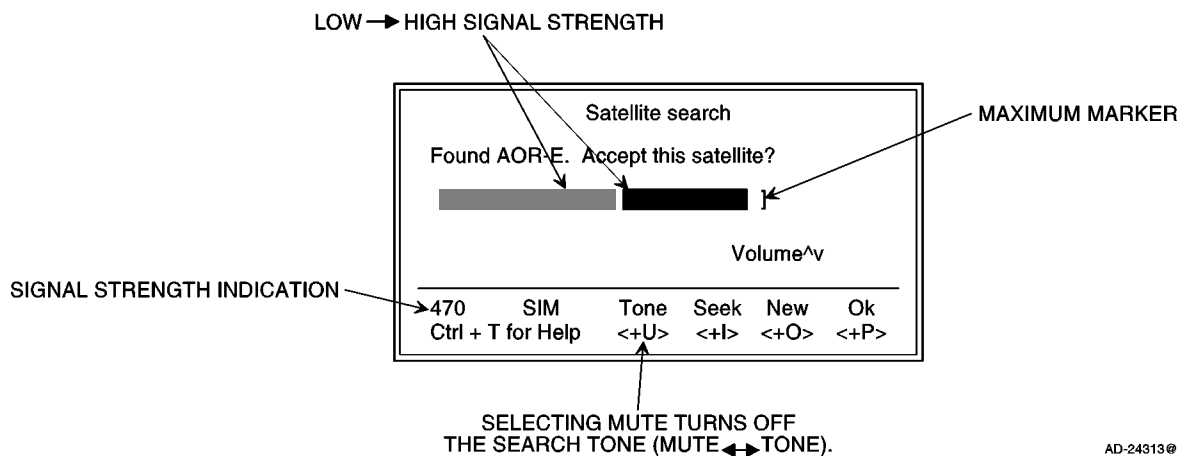
NOTE: If no SIM card is installed, the user is prompted to enter the Phone PIN.

- (4) During the satellite search, beep tones are heard in the handset as follows:

■ ■ ■ ■ ■ ■ ■ ■ Slow intermittent tones when searching for any satellite.

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ Rapid intermittent tones when searching for a specific satellite (faster when searching for a single satellite).

- (5) When receiving a satellite signal, a short tone is sounded. If it is an Inmarsat satellite, a continuous tone is sounded with varying frequency provided the tone is on. When closing in on a satellite, the tone should increase in frequency.
- (6) A signal strength bar appears on the PC display screen. The longer the signal bar or higher the signal strength indicator value, the better the signal quality. The bar becomes dashed when the signal strength value reaches 400. The maximum marker indicates the highest signal strength achieved during the current satellite search. Refer to Figure 2-7.



NOTE: The VOLUME indicator appears when the **Tone** is **ON**.

Figure 2-7. Signal Strength of Satellite Search

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- (7) Selecting the SEEK function starts the satellite search again. The NEW function allows the selection of a specific satellite. Scroll down to the desired satellite and select. An example is given below:

Searching for the		New search satellite	
		> All AOR-W AOR-E V POR	
470	SIM	Sele	Quit
Ctrl + T for Help	<+U>	<+I>	<+O> <+P>

AD-24314©

NOTE: Searching for a new satellite should be done under special circumstances only. Searching for any satellite is the normal (default) mode of operation.

- (8) Selecting OK initializes the system.
- (9) The equipment is ready for use when the main window appears as shown below:

27 June 1998 10:54					
Telenor in AOR-E					
Dial 00 + country code + subscriber no					
470	SIM	Book	Last	Menu	Seek
Ctrl + T for Help	<+U>	<+I>	<+O>	<+P>	

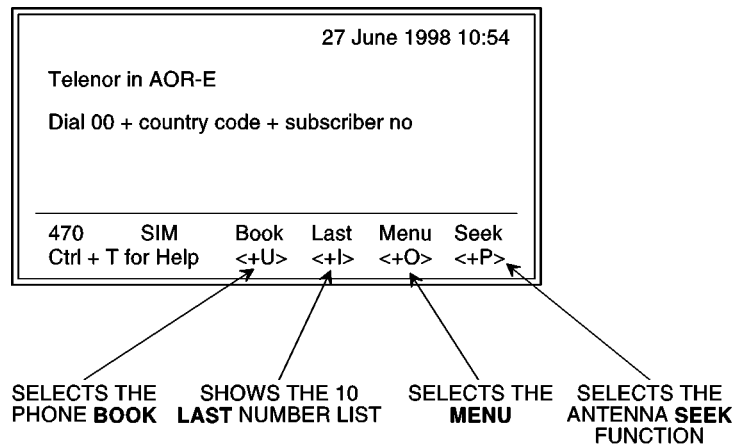
AD-24315©

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E. Selecting Functions Using a PC

The display screen shows the function currently assigned to each soft key: <U, I, O, or P>. The function is selected by pushing the CONTROL key and the U, I, O, or P key simultaneously. The example below shows the function that can be selected when starting the system:

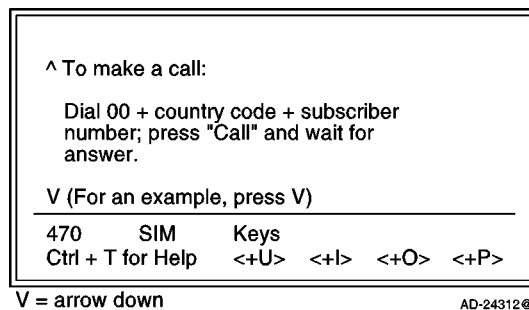


AD-24311@

NOTE: The function selected by pushing the keys varies with the opened window. Refer to paragraph 7. in this section for an overview of the functions provided by the SCS system.

F. Help

Pushing the CONTROL key and T key selects the HELP function whenever it is needed by the user. See the example below:



AD-24312@

Pushing the CONTROL key and U key selects the KEYS function for a direct explanation of the various tasks performed by the four soft keys.

G. Printing

When printing, such as a NIMS message or traffic log, the display screen switches to the text mode. The system must be restarted to revert to the data mode.

6. Procedures for Sending and Receiving NIMS Messages

Sending and receiving NIMS messages is only possible through network service providers that support the NIMS service. The procedures for sending NIMS messages through the PC are provided in Table 2-3. The procedures for receiving NIMS message through the PC are provided in Table 2-4.

Table 2-3. Procedure for Sending NIMS Messages

Task	Key Strokes	PC Screen Display
1. Select Menu .	 	27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24306 ©
2. Select Mail to open the Mail manager window.	 	470 SIM Lock Mail Selct Quit Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24307 ©
Example: YOU HAVE RECEIVED 6 MESSAGES 3 ARE NOT READ ONE MESSAGE IS NOT SENT		Mail manager In Box: 6 mail 3 unread Out Box: 2 mail 1 unsent You have new mail 470 IN SIM In Out Setup Quit Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24308 ©
3. Selecting the Out menu option on the Mail manager window opens the Out Box screen. Use the DOWN key to scroll down to the desired message. a. Selecting the Remov menu option (pushing the CONTROL and U keys) on the Out Box window erases the selected message.	 	INDICATES THAT THE MESSAGE IS NOT YET SENT Out Box 001> * Have a nice day 002 Happy Birthday 470 IN SIM Remov Edit New Print Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24309 ©

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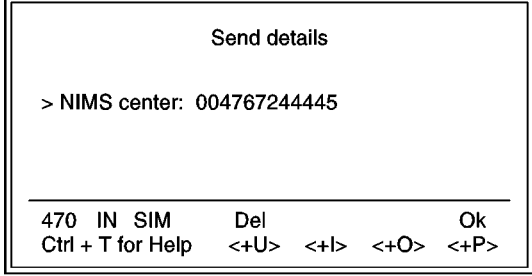
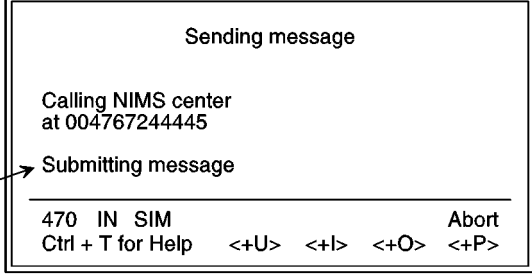
Table 2-3. Procedure for Sending NIMS Messages (cont)

Task	Key Strokes	PC Screen Display
b. Selecting the Print menu option (pushing the CONTROL and P keys) on the Out Box window outputs the message to the display screen. NOTE: The Print menu option appears only if a printer is enabled. Refer to paragraph 7.G. in this section.		
c. Selecting the Setup menu option on the Out Box window opens the Setup for sending mail window. NOTE: Selecting Ok (pushing the CONTROL and P keys) returns the user to the mail manager window.	 	Setup for sending mail User name : Kari Nordmann NIMS center : 004767244445 470 IN SIM Edit Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24310 ©
d. Pushing the right arrow key on the Out Box window opens the Out Box message details window.		Out Box message details To: hal@nera.no < Subject: Have a nice day Status : Unsent V 470 IN SIM Edit Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24301 ©
e. Selecting the New menu option on the Out Box window opens a window for a new message. NOTE: Selecting Del (pushing the CONTROL and U keys) deletes the message without sending it.	 	> To: < Subject 470 IN SIM Del Send Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24302 ©

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Table 2-3. Procedure for Sending NIMS Messages (cont)

Task	Key Strokes	PC Screen Display
f. Selecting the Edit menu option on the Out Box window allows the user to edit a message. Use the DOWN key to scroll down to the desired line. NOTE: Selecting Edit (pushing the CONTROL and U keys) on the Out Box message details window also opens the Edit window. NOTE: Pushing the ESC key on the Edit window opens a window that gives the choice of sending the mail later.	 	 AD-24303@
g. Selecting the Send menu option on the Edit window shows the send details of the mail message. NOTE: Selecting Send (pushing the CONTROL and P keys) on the New message window also opens the Send details window. NOTE: Selecting Del (pushing the CONTROL and U keys) deletes the message without sending it.	 	 AD-24304@
h. Selecting Ok on the Send details window opens a window showing that the message is being sent. NOTE: The Abort menu option (pushing the CONTROL and P keys) stops NIMS after confirmation.	 	 STATUS INFORMATION, CHANGES DURING CALL AD-24305@
NOTE: The IMN number of the NIMS service must have been entered into the SCS System to allow communication. Refer to the advanced functions information available paragraph 7.K.(5) in this section.		

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Table 2-4. Procedure for Receiving NIMS Messages (cont)

Task	Key Strokes	PC Screen Display
c. Selecting Get on the In Box window calls the NIMS server to read out stored NIMS messages.	 	Get new mail < NIMS center : 004766844445 _ < 470 IN SIM <Del Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24291 @
(1) Selecting Ok opens a window showing that the NIMS server is checking for new mail. (2) Modify the server number if required by selecting Del (pushing the CONTROL and U keys).	 	Checking for new mail Calling NIMS center at 004767244445 Dialing the NIMS center 470 IN SIM Abort Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24292 @
NOTE: Selecting Abort (pushing the CONTROL and P keys) stops the request to the NIMS server.		
d. Pushing the right arrow key on the In Box window opens the In Box message details window.		In Box message details Type: NIMS < From: Knut Knutsen Sent: 26 June 1998 15:57 Arrived: 26 June 1998 15:58 Status: Unread 470 IN SIM Read Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24300 @
(1) Selecting Ok (pushing the CONTROL and P keys) on the In Box message details window returns the user to the In Box window. (2) Selecting Read on the In Box message details window or selecting Read (pushing the CONTROL and O keys) on the In Box window allows the user to read the desired message.	 	
NOTE: See the following examples.		

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Table 2-4. Procedure for Receiving NIMS Messages (cont)

Task	Key Strokes	PC Screen Display
Example 1: (Hello ! message from the In Box)		Date: 03 Jan 1998 15:57 From: Knut Knutsen Reply - to : kk@nera.com Subject : Hello ! How are you my friend ? V Here in Norway the sun is shining and 470 IN SIM Reply Next Remov Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24293®
NOTES: 1. Selecting the Next menu option (pushing the CONTROL and I keys) displays the next message. 2. Selecting the Remov menu option (pushing the CONTROL and O keys) erases the message. 3. Selecting Ok (pushing the CONTROL and P keys) returns the user to the In Box window. 4. Selecting Reply (pushing the CONTROL and U keys) opens the following window that allows the user to send a reply message:		>To : kk@nera.com Subject : Re : Hello 470 IN SIM <Del abc CR/LF Send Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24294® (1) Selecting Del (pushing the CONTROL and U keys) on this window deletes the reply message. (2) Selecting Send (pushing the CONTROL and P keys) on this window sends the reply message.

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Table 2-4. Procedure for Receiving NIMS Messages (cont)

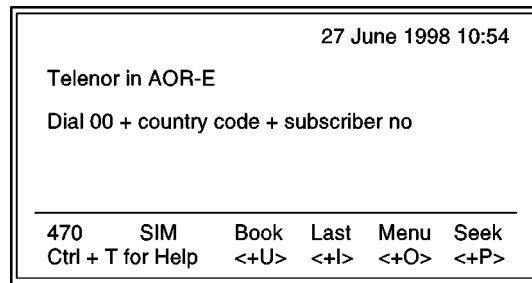
Task	Key Strokes	PC Screen Display
Example 2: (Voice mailbox message from In Box)		Mailbox access Voice mail at Telenor Call to : 57 < 470 IN SIM <Del Remov Call Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24295@
NOTES: 1. Selecting the Del menu option (pushing the CONTROL and U keys) on the Mailbox access window deletes the message. 2. Selecting the Remov menu option (pushing the CONTROL and I keys) on the Mailbox access window erases the alert message. 3. Selecting the Call menu option (pushing the CONTROL and O keys) on the Mailbox access window dials the mailbox to read out the voice message. 4. Selecting Ok (pushing the CONTROL and P keys) on the Mailbox access window returns the user to the In Box window.		

7. Functions

A. General

The SCS system provides the following functions (see Figure 2-8):

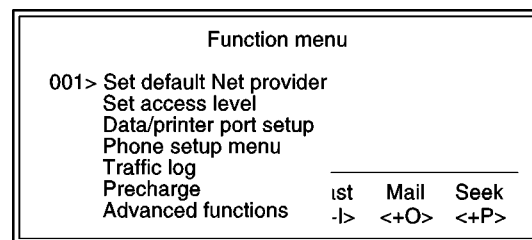
- Phone Book (Book)
- Last number list (Last)
- Setting up (Seek)
- Menu.



AD-24287 ©

Figure 2-8. PC Main Window

Selecting Menu (pushing the CONTROL and O keys) on the Main window opens the Function menu window as shown in Figure 2-9. Use the up or down arrow on the keyboard to scroll up or down and select the desired function. The reference number can also be keyed in for direct selection. Table 2-5 gives the description of each function.



AD-24290 ©

Figure 2-9. Function Menu Window

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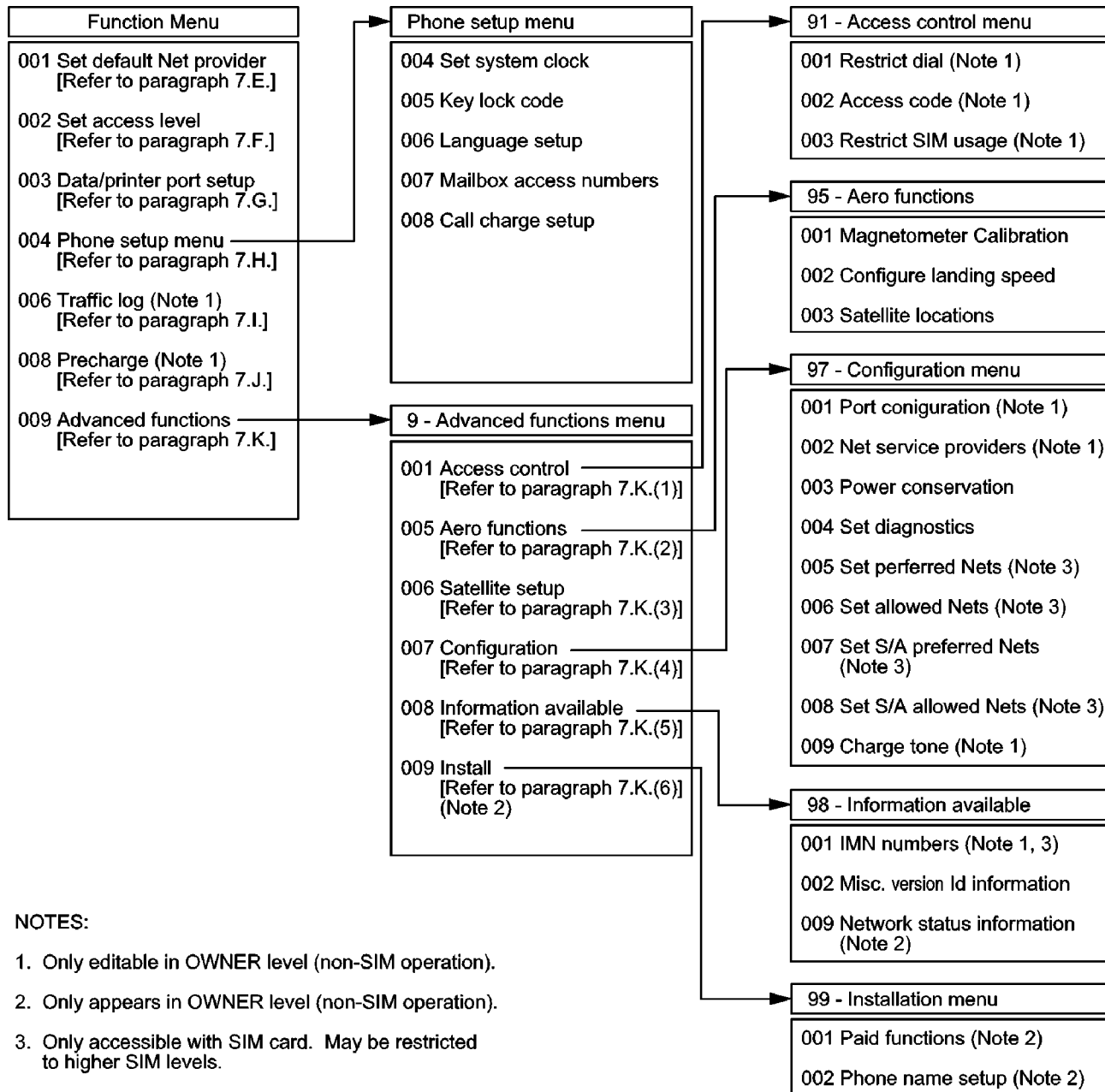
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Table 2-5. Function Menu Descriptions

Reference	Function	Description
001	Set default network provider	Lets the user change the network service provider and terrestrial network. For a detailed description, refer to paragraph 7.E. in this section.
002	Set access level	Allows shifting between the user level and the owner/CHV2 level (non-SIM/SIM operation). This function also lets the user change the phone/SIM PIN code and the owner/CHV2 password. For a detailed description, refer to paragraph 7.F. in this section.
003	Data/Printer port setup	Enables the port for connection of a printer or PC and sets the transfer bit rate. For a detailed description, refer to paragraph 7.G. in this section.
004	Phone setup menu	Sets the following: • Display backlight and contrast • Receive volume • System clock • Key lock code • Language • Mailbox access numbers • Call charge. For a detailed description, refer to paragraph 7.H. in this section.
006	Traffic log	Logs outgoing calls and supplies a detailed printout. For a detailed description, refer to paragraph 7.I. in this section.
008	Precharge	Allows preprogramming of the total duration of a call. For a detailed description, refer to paragraph 7.J. in this section.
009	Advanced functions	Sets or allows viewing of the following: • Access control • Aero functions • Satellite setup • Configuration • Information available • Install. For a detailed description, refer to paragraph 7.K. in this section. See Figure 2-10.

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AD-24288-R1@

Figure 2-10. Overview of Menu Functions

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B. Last Number List

The last 10 numbers called are stored in the TPU memory or on the SIM card. Each number may be up to 22 digits. If the number is already stored in the phone book, the subscriber's name appears in the list.

NOTE: The last used number list stored on the SIM card replaces that of the phone when inserting the card. (It is restored when removing the SIM.)

To readout the last number list, perform the steps in Table 2-6.

Table 2-6. Procedure for Last Number List Readout

Task	Key Strokes	PC Screen Display
1. Select Last from the Main window.	 	27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P>
2. Scroll up or down to the desired number on the list.	 	Last used number list 001> 0044816865701 Nera Ltd Croydon 004766843120 004766724700 Nera SatCom AS 470 SIM Erase Save Ctrl + T for Help <+U> <+I> <+O> <+P>
3. Selecting the Save menu option (pushing the CONTROL and P keys) copies the number to the phone book.		
NOTE: A name is prompted.		
4. Selecting Erase (pushing the CONTROL and O keys) deletes all entries in the Last used number list.		

C. Phone Book

The following may be stored for abbreviated dialing from the Handset Unit or telephone:

- 99 entries (No. 1 to 99) with names of up to 29 characters in the TPU.
- Up to 100 entries (No.100 and up) with names of up to 10 characters on the SIM card (varies with type).

NOTE: The list is sorted by name. The SIM card entries and phone entries merge when the card is inserted.

The following is an example of short number dialing:



fetches and sends the telephone number stored in the phone book under the short number 8.

To make a phone book entry, edit an entry, or copying an entry, perform the procedures in Table 2-7.

Table 2-7. Phone Book Procedures

Task	Key Strokes	PC Screen Display
To make a phone book entry, perform the following:		
1. Select Book on the Main window.		AD-24340®
2. Scroll up or down to the desired name on the list or search for the first letter(s) of the subscriber name.		AD-24341®
3. Pushing the right arrow button display all of the data.		AD-24342®

SHORT NUMBER
100 AND UP
WHEN STORED
ON SIM CARD

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Table 2-7. Phone Book Procedures (cont)

Task	Key Strokes	PC Screen Display
4. Pushing New on the Phone book window opens the New entry in the Phone book window. a. Selecting Save (pushing the CONTROL and P keys) saves the entry. b. Selecting Del (pushing the CONTROL and U keys) deletes the digit to the left of the cursor.	 	New entry in the Phone book > Name: -< Number: Net provider: Default Net Terrestrial net: Default no. (SIM): 102 470 SIM <Del <+U> <+I> <+O> Save <+P> Ctrl + T for Help AD-24337®
To edit a phone book entry or copy an entry, perform the following: 1. Perform steps 1 thru 3 above. 2. Pushing Edit on the Phone book window opens the Edit mode in the Phone book window.		
a. Selecting Save (pushing the CONTROL and P keys) saves the entry. b. Selecting Remov (pushing the CONTROL and I keys) deletes the entry. c. Selecting Del (pushing the CONTROL and U keys) deletes the digit to the left of the cursor. d. Selecting New on the Edit mode in the Phone book window copies the entry (from a non-SIM phone book to a SIM book, for example)	 	Edit mode in the Phone book > Name: Nera Satcom AS -< Number: 004766724700 Net provider: Default Net Terrestrial net: 00 no.: 4 470 SIM <Del Remov New Save <+U> <+I> <+O> <+P> Ctrl + T for Help AD-24338®
a. Selecting Save (pushing the CONTROL and P keys) saves the entry. b. Selecting Remov (pushing the CONTROL and I keys) deletes the entry. c. Selecting Del (pushing the CONTROL and U keys) deletes the digit to the left of the cursor. d. Selecting New on the Edit mode in the Phone book window copies the entry (from a non-SIM phone book to a SIM book, for example)	 	Edit mode in the Phone book > Name: Nera Satcom AS -< Number: 004766724700 Net provider: Default Net Terrestrial net: 00 no. (SIM): 102 470 SIM <Del Remov New Save <+U> <+I> <+O> <+P> Ctrl + T for Help AD-24339®
NOTE: The entry is assigned the first free short number on the SIM card.		

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D. Key Lock

The key lock function prevents unauthorized use when the system is on, but still allows reception of incoming calls. When the lock is set no dial tone is produced, and the PC AT commands are unavailable. Entering a login password (Phone PIN / SIM PIN) still unlocks the phone.

NOTE: If Phone PIN / SIM PIN is disabled, turning power off and then on will not unlock the phone.

This function is only accessible when the system is restricted for use with a specific SIM card, or with no SIM card. Refer to the advanced functions access control paragraph 7.K.(1) in this section.

To initiate the key lock and enter or change the unlock code, refer to the key lock setup paragraph 7.H.(2) in this section.

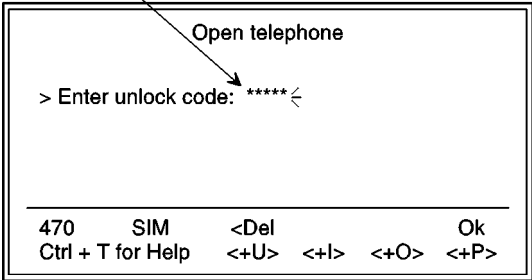
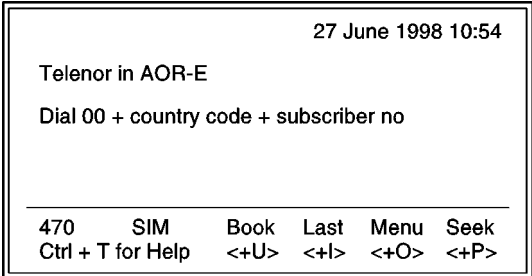
To set the lock or unlock, perform the procedures in Table 2-8.

Table 2-8. Key Lock/Unlock Procedures

Task	Key Strokes	PC Screen Display
To lock, perform the following:		
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24340®
1. Selecting Menu on the Main window opens the Function menu window.	 	Function menu 001> Set default Net provider Set access level Data/printer port setup Phone setup menu Traffic log 470 SIM Lock Mail Selct Quit Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24333®
2. Select Lock on the Function menu window.	 	27 June 1998 10:54 Telenor in AOR-E Phone locked, incoming calls only 470 SIM Open Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24334®

NOTE: A warning is displayed in the Main window.

Table 2-8. Key Lock/Unlock Procedures (cont)

Task	Key Strokes	PC Screen Display
To unlock, perform the following:		
1. Selecting Open on the Main window with the key lock enabled allows the user to enter the unlock code.	 	1 - 6 DIGITS  AD-24335®
2. Selecting Ok on the Open telephone window opens the Main window.	 	 AD-24340®

E. Default Network Service Provider and Terrestrial Network

The default ISP for a satellite (Ocean Region) is automatically used if the user does not select another one when making a call. To set the default network service provider, perform the steps in Table 2-9.

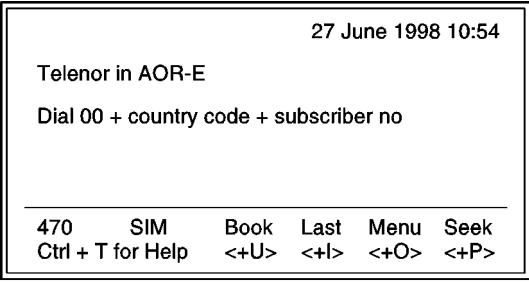
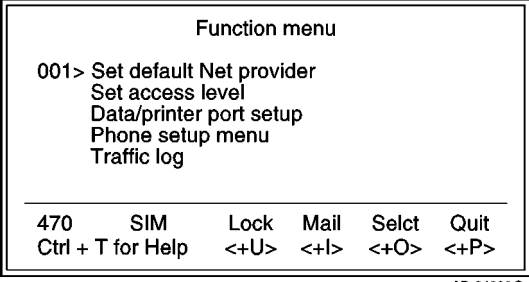
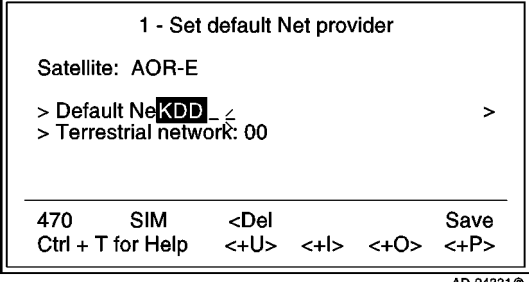
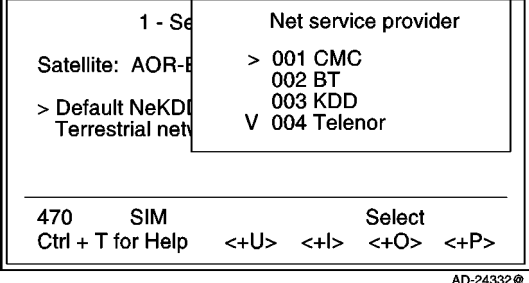
NOTES:

1. When using SIM card, selection of an ISP is restricted to one of the allowed network service providers.
2. When the Restricted network function is enabled, and with some SIM cards, selection of the default network service provider is not possible. In this case, the entry "001 Set default Net provider" will not appear in the Function menu window.

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Table 2-9. Default Network Service Provider and Terrestrial Network Procedure

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window. 2. Selecting Selct or pushing the right arrow button opens the Set default Net provider window. 3. Key in the network service provider code, or push the right arrow button to display a list of the available networks.	    	 AD-24340 ©
		 AD-24333 ©
		 AD-24331 ©
4. Scroll up or down to select the desired network.		 AD-24332 ©
5. Selecting Selct (pushing the CONTROL and O keys) enters the chosen network.		
6. Repeat steps 3 thru 5 for entering the terrestrial network code.		
7. Selecting Save (pushing the CONTROL and P keys) on the Set default Net provider window stores the selected network service provider and terrestrial network as the default.		

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F. User Access

The Mini-M Aero SATCOM System user program is accessible from two levels:

- USER LEVEL – accessed by Phone PIN or SIM PIN.

NOTE: If the Phone PIN is accidentally lost, it is possible to reset the user's password to the default password by logging in as the owner: "Phone PIN: the star button (*) plus the owner's password". (Resetting is not possible on the SIM card.)

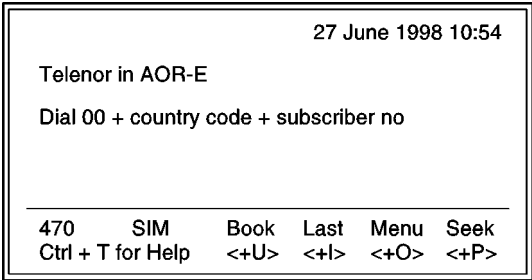
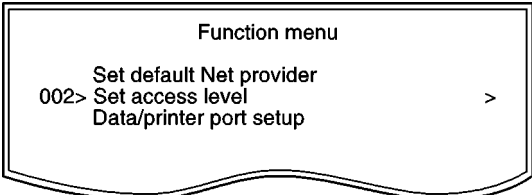
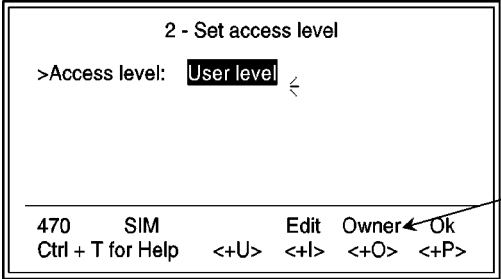
- CHV2 LEVEL / OWNER LEVEL – accessed by CHV2 or owner-level passwords. With a SIM card inserted, the password allows access to CHV2 level SIM functions. Without a SIM card the password allows access to owner level phone resident functions.

WARNING: TO PREVENT MISUSE, THE DEFAULT PASSWORD MUST BE CHANGED BEFORE PUTTING THE SCS SYSTEM IN OPERATION.

(1) User Level/Changing the PIN Code (SIM or Phone PIN)

To change the SIM PIN or Phone PIN at the user level, perform the procedures in Table 2-10.

Table 2-10. User Access Procedures

Task	Key Strokes	PC Screen Display
		 AD-24340 ©
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24327 ©
2. Scroll down to Set access level.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Set access level window.	 	 AD-24328 © VISIBLE IN NON-SIM MODE ONLY

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Table 2-10. User Access Procedures (cont)

Task	Key Strokes	PC Screen Display
4. Selecting Edit on the Set access level window opens the Edit phone PIN window.	 	Edit phone PIN > Old PIN: ***** New PIN: ***** Retype new PIN: -< 470SIM<DelOk Ctrl + T for Help<+U><+I><+O><+P>
5. Key in the following: • Current PIN code • New PIN code • Retype the new PIN code to confirm.		
6. Select Ok (pushing the CONTROL and P keys) following each entry, and to store the new PIN code.		
NOTES: 1. Selecting Ok without entering any numbers for New PIN and Retype new PIN disables the SIM PIN/Phone PIN. 2. The “Old” PIN code must be entered to reactivate the SIM PIN/Phone PIN.		

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(2) Shifting to CHV2/Changing the Password

To shift to CHV2 and change the password, perform the procedures in Table 2-11.

Table 2-11. Shifting to CHV2/Changing the Password Procedures

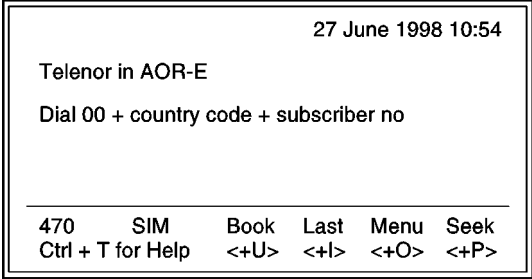
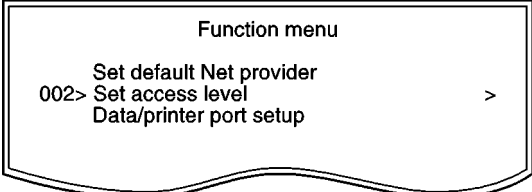
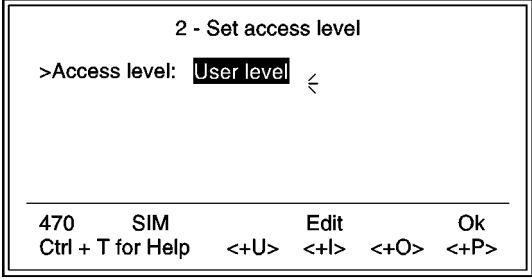
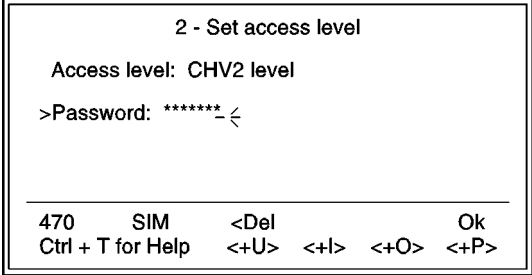
Task	Key Strokes	PC Screen Display
To shift to CHV2, perform the following:		
		 AD-24340®
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24327®
2. Scroll down to Set access level.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Set access level window.	 	 AD-24323®
4. Key in 2002 to open the window for entering the password.		
5. Key in the password.		
6. Selecting Ok (pushing the CONTROL and P keys) activates the CHV2 level.		 AD-24324®

Table 2-11. Shifting to CHV2/Changing the Password Procedures (cont)

Task	Key Strokes	PC Screen Display
To change the password, perform the following:		
1. Open the Set access level window again.		2 - Set access level >Access level: CHV2 level < 470 SIM Edit User Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24325 ©
2. Selecting Edit on the Set access level window opens the Edit password window.	Control I	Edit Password Old password: ***** New password: ***** > Retype new password: - < 470 SIM <Del Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24326 ©
3. Key in the following:		
• Current password • New password • Retype the new password to confirm.		
4. Select Ok (pushing the CONTROL and P keys) following each entry, and to store the new password.		
NOTE: To revert to the User level, reselect the Set access level function and select User.		

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(3) Shifting to Owner Level/Changing the Password

To shift to the owner level and change the password, perform the procedures in Table 2-12.

Table 2-12. Shifting to Owner Level/Changing the Password Procedures

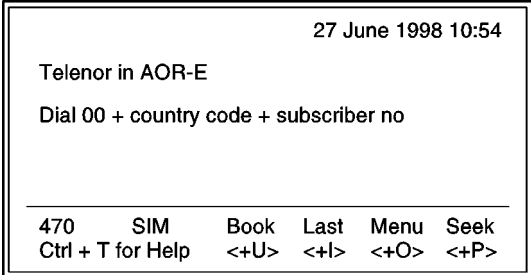
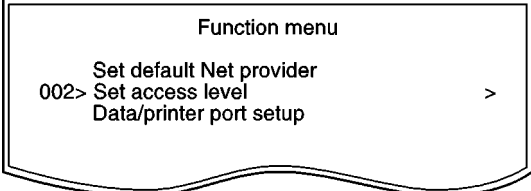
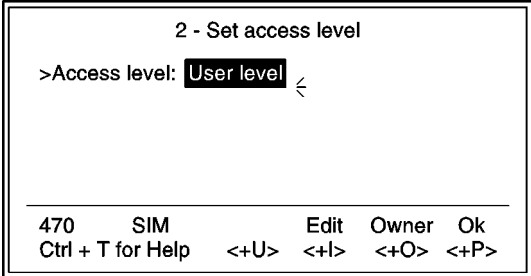
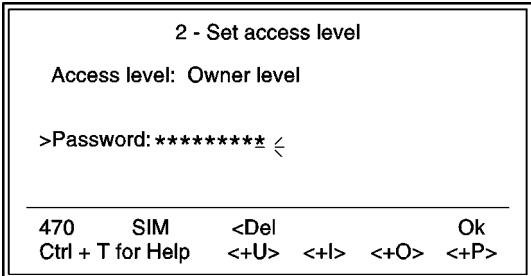
Task	Key Strokes	PC Screen Display
To shift to the owner level, perform the following:		
		 AD-24340®
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24327®
2. Scroll down to Set access level.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Set access level window.	 	 AD-24318®
4. Selecting Owner on the Set access level window opens the window for entering the password.	 	 AD-24319®
NOTE: The default password is 1234567890.		
5. Key in the password.		
6. Selecting Ok (pushing the CONTROL and P keys) activates the Owner level.		

Table 2-12. Shifting to Owner Level/Changing the Password Procedures (cont)

Task	Key Strokes	PC Screen Display
To change the password, perform the following:		
1. Open the Set access level window again.		2 - Set access level >Access level: Owner level < 470 SIM Edit User Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24320 ©
2. Selecting Edit on the Set access level window opens the Edit password window.	 	Edit Password Old password: ***** New password: ***** > Retype new password: - < 470 SIM <Del Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24326 ©
3. Key in the following:		
• Current password • New password (10 to 12 digits) • Retype the new password to confirm.		
4. Select Ok (pushing the CONTROL and P keys) following each entry, and to store the new password.		
NOTE: To revert to the User level, reselect the Set access level function and select User.		

G. Data/Printer Port Setup

The DATA port may be set to operate with a PC or, for example, to output a Traffic log directly to a printer.

NOTE: The bit rate setting applies for both the PC and printer transfer.

When printing the Traffic log to the PC, for example, the screen enters the text mode. To revert to the data mode, the system must be restarted.

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(1) Setup for Data Communication

Setup for data communication as follows:

- Speed as selected using the procedure in Table 2-13, normally 9600 bps (See Note 1.)
- No parity (See Note 2.)
- 8 data bits (See Note 2.)
- 1 stop bit (See Note 2.).

NOTES:

1. The bit rate set between the PC and the SAT-2000 must be higher than the nominal 2400 bps SAT-2000-to-satellite bit rate to ensure maximum speed transfer.
2. These parameters can only be changed using AT commands. Refer to Appendix D.

(2) Setup for Output to the Printer

A printer must have serial interface, and is set as follows:

- Speed as selected using the procedure in Table 2-13, for example, the bit rate specified for the printer to be connected
- No parity
- 8 data bits
- 1 stop bit.

(3) Procedure

To setup the data/printer port, follow the steps in Table 2-13.

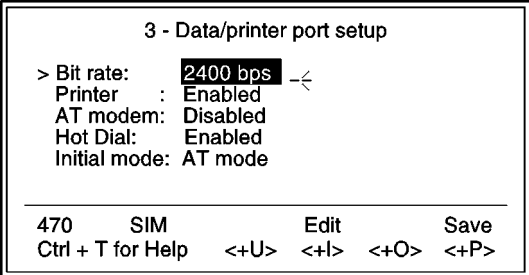
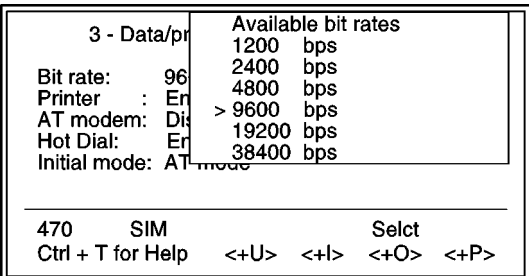
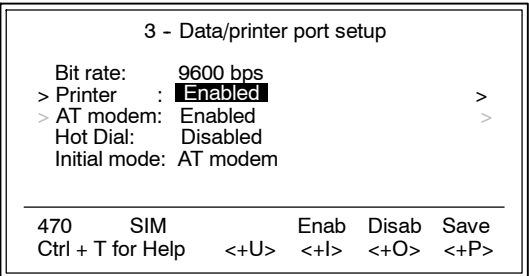
Table 2-13. Data/Printer Port Setup Procedure

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window. 2. Scroll down to Data/printer port setup.	Control 	27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24340 © Function menu Set access level 003> Data/printer port setup Phone setup menu > AD-24382 ©

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

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Table 2-13. Data/Printer Port Setup Procedure (cont)

Task	Key Strokes	PC Screen Display
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Data/printer port setup window. NOTE: The Bit rate is the first item in the list.	 	 AD-24383 ©
4. Selecting Edit on the Data/printer port setup window opens the list of bit rates. 5. Scroll up or down to the required data/printer bit rate.	 	 AD-24384 ©
NOTE: It is recommended to use 9600 bps for data communication. 6. Selecting Selct (pushing the CONTROL and O keys) enters the chosen rate. NOTE: For output to the printer, select the bit rate according to the printer specifications.		
7. Scroll down to Printer and Enable/Disable the DATA port for printing, as required. 8. Scroll down to AT modem and Enable/Disable the DATA port for AT modem, as required.		 AD-24385 ©
NOTE: Refer to Table 2-14 for the recommended data/printer port setup.		

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Table 2-13. Data/Printer Port Setup Procedure (cont)

Task	Key Strokes	PC Screen Display
Hot Dial: When enabled, this function monitors the Data Terminal Ready (DTR) pin on the DATA port. If the DTR-pin is pulled high by equipment connected to the DATA port, a data call is automatically initiated to a pre-programmed number. The number is automatically stored under short number 99.		
9. Scroll down to Hot Dial.		3 - Data/printer port setup Bit rate: 9600 bps Printer : Enabled AT modem: Disabled > Hot Dial: Enabled > > Initial mode: AT mode > 470 SIM Setup Enab Disab Save Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24378@
10. Selecting Setup on the Data/printer port setup window open the Edit mode in the Phone book window.	 	Edit mode in the Phone book > Name : Hot <- Number : 004766779016 Net provider: Default Net Terrestrial net: 00 Hot dial 470 SIM Save Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24378@
a. Enter the name, for example, Hot. b. Fill in the required number. c. Change the provider and network, if needed.		
Initial mode: The mode is set to AT modem as the default mode. When selecting any of the MMI (Man Machine Interface) settings, the PC screen automatically displays the system menu.		
11. Scroll down to Initial mode on the Data/printer port setup.		3 - Data/printer port setup Bit rate: 9600 bps Printer : Enabled AT modem: Disabled > Hot Dial: Enabled > > Initial mode: AT mode > 470 SIM Setup Enab Disab Save Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24378@

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

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Table 2-13. Data/Printer Port Setup Procedure (cont)

Task	Key Strokes	PC Screen Display
12. Selecting Setup on the Data/printer port setup window opens the list on Initial mode options.	 	3 - Data/p Initial mode > AT modem MMI (ASCII) MMI (extended ANSI) MMI (multilingual) Bill rate: Printer : AT modem: Hot Dial: > Initial mode: AT mode 470 SIM Selct Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24380 ©
13. Selecting Selct enters the chosen mode.	 	3 - Data/printer port setup Bill rate: 9600 bps Printer : Disabled AT modem: Disabled Hot Dial: Enabled Initial mode: AT mode 470 SIM Setup Enab Disab Save Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24381 ©
14. Selecting Save (pushing the CONTROL and P keys) stores the settings.		

Table 2-14. Recommended Data/Printer Port Setup

Mode	Output to Printer	Data Communication (AT)	Data Communication (DTR dialing)
Printer	Enabled	Disabled	Disabled
AT Modem	Disabled	Enabled	Disabled
Hot Dial	Disabled	Disabled	Enabled

H. Phone Setup

This function sets the following:

- Date and time
- Key lock (which prevents unauthorized use)
- Language
- Mailbox access numbers
- Call charge.

(1) Date and Time Setup

The date and time is set to Coordinated Universal Time (UTC) Greenwich Mean Time (GMT) at the factory. It is recommended to leave this setting if correct. To set the date and time, perform the steps in Table 2-15.

WARNING: THE SYSTEM IS AUTOMATICALLY RESTARTED WHEN ACCEPTING NEW TIME SETTINGS. ALL CALLS WILL BE DISCONNECTED.

Table 2-15. Procedure to Set the Date and Time

Task	Key Strokes	PC Screen Display
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P>
1. Selecting Menu on the Main window opens the Function menu window.	 	Function menu Data/printer port setup 004> Phone setup menu Traffic log
2. Scroll down to Phone setup menu.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Phone setup menu window.	 	4 - Phone setup menu Volume control 004> Set system clock Key lock code Language setup Mailbox access numbers Call charge setup
4. Scroll down to Set system clock.		
		470 SIM Lock Mail Selct Quit Ctrl + T for Help <+U> <+I> <+O> <+P>

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

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Table 2-15. Procedure to Set the Date and Time (cont)

Task	Key Strokes	PC Screen Display
5. Selecting Selct or pushing the right arrow button on the Phone setup menu opens the Set system clock window.	 	44 - Set system clock > Hour: 13 - < Minute: 02 Day: 29 Month: 06 Year: 1998 470 SIM <Del Ok Ctrl + T for Help <+U> <+I> <+O> <+P>
6. Scroll down to change each entry, if needed.		AD-24376@
7. Select Ok on the Set system clock window when the entries are completed.	 	New system clock setting 13:02:00 29 June 1998 Proceed to system reset? 470 SIM Yes No Ctrl + T for Help <+U> <+I> <+O> <+P>
8. Selecting Yes (pushing the CONTROL and U keys) confirms that the settings are correct.		AD-24377@
NOTE: The system is now restarted.		

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(2) Key Lock Setup

The SCS-1000 system must be set for use with a specific SIM, or with no SIM. Refer to the advanced functions access control paragraph 7.K.(1) in this section. To set the key lock, perform the steps in Table 2-16.

Table 2-16. Procedure to Set the Key Lock

Task	Key Strokes	PC Screen Display
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P>
1. Selecting Menu on the Main window opens the Function menu window.	 	Function menu Data/printer port setup 004> Phone setup menu Traffic log >
2. Scroll down to Phone setup menu.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Phone setup menu window.	 	4 - Phone setup menu Set system clock 005> Key lock code Language setup Mailbox access numbers >
4. Scroll down to Key lock code.		
		470 SIM Lock Mail Selct Quit Ctrl + T for Help <+U> <+I> <+O> <+P>

Table 2-16. Procedure to Set the Key Lock (cont)

Task	Key Strokes	PC Screen Display
5. Selecting Selct or pushing the right arrow button on the Phone setup menu opens the Key lock window. 6. Enter the unlock code (1 to 6 digits).	Control O	1 - 6 DIGITS 45 - Key lock >Enter unlock code: ***** < 470 SIM <Del Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24372®
7. Select Ok. 8. Repeat the unlock code to confirm it. 9. Select Ok (pushing the CONTROL and P keys) again.	Control P	45 - Key lock >Confirm unlock code: ***** < 470 SIM <Del Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24373®

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

SCS-1000 Mini-M Aero SATCOM System

(3) Language Setup

The display language may be changed as described in Table 2-17.

Table 2-17. Language Setup Procedure

Task	Key Strokes	PC Screen Display
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24340 ©
1. Selecting Menu on the Main window opens the Function menu window.	 	Function menu Data/printer port setup 004> Phone setup menu Traffic log > AD-24374 ©
2. Scroll down to Phone setup menu.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Phone setup menu window.	 	^ 4 - Phone setup menu Key lock code 006> Language setup Mailbox access numbers > 470 SIM Lock Mail Selct Quit Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24367 ©
4. Scroll down to Language setup.		
5. Selecting Selct or pushing the right arrow button on the Phone setup menu opens the Language setup window.	 	46 - Language setup >Language: English < > 470 SIM Edit Save Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24368 ©

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

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Table 2-17. Language Setup Procedure (cont)

Task	Key Strokes	PC Screen Display
6. Selecting Edit on the Language setup window opens the list of available languages.	 	4 ^ Available languages English > Deutsch Espa-ol Fran-ais Portugu-s Русский >Language: 470 SIM Selct Ctrl + T for Help <+U> <+I> <+O> <+P>
7. Scroll up or down to the desired language.		AD-24369@
8. Selecting Selct (pushing the CONTROL and O keys) reads out the selected language in the setup window.		
9. Selecting Save (pushing the CONTROL and P keys) changes the display text to the selected language.		
Language reset: When starting the system with the display language set to Portuguese, for example, the Eng function key supplies an easy way to restore the default English display language.		
1. Select Eng.	 	SCS - 1000 > Pin do SIM: _ < Tecla "Help" para uma apresentac-o 470 SIM <Apag Eng Ok Ctrl + T for Help <+U> <+I> <+O> <+P>
		AD-24363@
2. Select Sim (Yes) to reset the language to English.	 	
3. Select No (pushing the CONTROL and P keys) to keep the current display language.		Do you want to reset the language to English ? ("SIM" = "Yes" and "No" = "No") Quer substituir para l'ngua inglesa ? 470 SIM Sim No Ctrl + T for Help <+U> <+I> <+O> <+P>
		AD-24364@

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(4) Mailbox Access Numbers Setup

When receiving a mail alert (voice, fax, or data), the user must call the server mailbox to retrieve the message. To call the mailbox, normally the default number 57 can be used. The mailbox dial-up number may be changed as described in Table 2-18.

Table 2-18. Mailbox Access Numbers Setup Procedure

Task	Key Strokes	PC Screen Display
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24340 ©
1. Selecting Menu on the Main window opens the Function menu window.	 	Function menu Data/printer port setup 004> Phone setup menu > Traffic log AD-24374 ©
2. Scroll down to Phone setup menu.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Phone setup menu window.	 	^ 4 - Phone setup menu Language setup 007> Mailbox access numbers Call charge setup 470 SIM Lock Mail Selct Quit Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24361 ©
4. Scroll down to Mailbox access numbers.		
5. Selecting Selct or pushing the right arrow button on the Phone setup menu opens the Mailbox access numbers window.	 	47 - Mailbox access numbers > Voice: 57 ← Fax: 57 Data: 57 Default numbers for mailbox access 470 SIM Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24362 ©
6. Key in the new numbers.		
7. Select Ok (pushing the CONTROL and P keys) to store the new mailbox number(s).		

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(5) Call Charge Setup

With the Call charge function enabled, the cost of the call is displayed during the call and for 10 seconds after the call is terminated. Later the charge can be fetched using the Traffic log function. The price per unit and minimum charge time is set as described in Table 2-19.

Table 2-19. Call Charge Setup Procedure

Task	Key Strokes	PC Screen Display
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24340®
1. Selecting Menu on the Main window opens the Function menu window.	 	Function menu Data/printer port setup 004> Phone setup menu Traffic log AD-24374®
2. Scroll down to Phone setup menu.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Phone setup menu window.	 	^ 4 - Phone setup menu Mailbox access numbers 008> Call charge setup AD-24357®
4. Scroll down to Call charge setup.		

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Table 2-19. Call Charge Setup Procedure (cont)

Task	Key Strokes	PC Screen Display
5. Selecting Selct or pushing the right arrow button on the Phone setup menu opens the Call charge window.	 	48 - Call charge Charge time unit (s): 6 Price per charge unit: 3.00 Minimum charge time (s): 60 470 SIM Setup Enab Disab Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24358@
a. Selecting Enab (pushing the CONTROL and I keys) activates the values. b. Selecting Disab (pushing the CONTROL and O keys) disables the Call charge indication. c. Selecting Ok (pushing the CONTROL and P keys) activates the Call charge indication.		
d. Selecting Setup on the Call charge window allows the user to modify the entries. e. Selecting Save stores the new values.	 	48 - Call charge > Charge time unit (s): 6 ← Price per charge unit: 3.00 Minimum charge time (s): 60 470 SIM <Del Save Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24359@

I. Traffic Log

This function logs all outgoing calls both with and without the SIM card inserted. Every call is logged with the following:

- Subscriber number, start time, and duration
- Service (voice, fax, data, NIMS)
- Network provider and satellite
- User name (if access code is enabled) / SIM card FWD.

The system owner may set the log output mode as follows:

- Off (stops logging)
- Cleared (stops logging and clears the log)
- For automatic printout after 1 or 10 calls (auto print limit)
- For display on the screen
- Logging of incoming calls.

For traffic log readout, perform the steps in Table 2-20. An example of a traffic log printout is shown in Figure 2-11. Table 2-21 gives the traffic log settings procedure, which is accessible at the owner level only.

Table 2-20. Traffic Log Readout Procedure

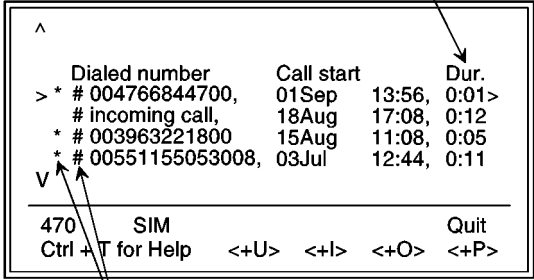
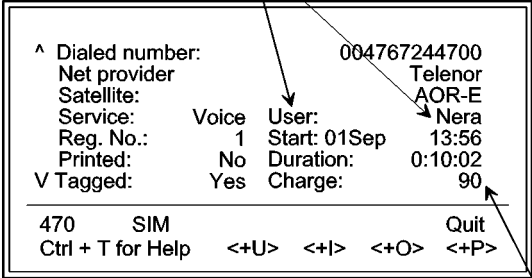
Task	Key Strokes	PC Screen Display
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24340@
1. Selecting Menu on the Main window opens the Function menu window.	 	^ Function menu Phone setup menu 006> Traffic log Precharge > AD-24352@
2. Scroll down to Traffic log.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Traffic log window.	 	6 - Traffic log Log mode: Unprinted calls: Auto print limit: To Printer 0 1 470 SIM View Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24353@

ONLY APPEARS
WHEN LOG MODE IS
SET FOR OUTPUT
TO PRINTER.

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Table 2-20. Traffic Log Readout Procedure (cont)

Task	Key Strokes	PC Screen Display
4. Selecting View on the Traffic log window displays the list of calls. 5. Scroll up or down to the desired call.	 	MINUTES:SECONDS  # ENTRY TAGGED FOR PRINTOUT BY OWNER * ENTRY NOT YET PRINTED AD-24354@
6. Pushing the right arrow button shows the detailed call data.		APPEARS WHEN "ACCESS CODE" IS ENABLED. (FOR SIM CARD CALL D SIM Id: ABCDF) SEE ADVANCED FUNCTIONS: ACCESS CONTROL.  WHEN CALL CHARGE IS ENABLED, THE "CHARGE" FIELD APPEARS SHOWING THE COST OF THE VIEWED CALL. AD-24355@

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#: RECORD PRINTED PREVIOUSLY.
"NO HASH" WHEN PRINTED FIRST TIME.

SUBSCRIBER NUMBER

START DATE AND TIME

PORT

SYSTEM USER (ONLY APPEARS WHEN ACCESS CODE IS ENABLED)

Ref	Dialed number	Call start	Dur.	Port	Net	User
001 #	004767243669	980711 09:20	4:05	H.set	CMC	Aslaug
002	0044222534555	980711 10:56	2:33	H.set	BT	Bob
003 #	004722259024	980711 13:24	11:22	TEL	Telenor	John
004	00494088251	980711 15:46	10:05	TEL	Teleglobe IDG	Franz
005 #	00871765421392	980712 08:45	5:32	H.set	AOR-E	Charlie
006	Incoming call	980712 09:33	6:14	H.set	BT	Bob
007 #	00494088251	980712 10:47	9:11	TEL	Teleglobe IDG	Franz
008 #	0044816865701	980712 13:55	5:20	TEL	BT	George
009	004722259024	980712 16:09	15:44	TEL	Telenor	John
010 #	044222534555	980712 16:53	9:10	H.set	BT	Bob
Total duration is 2:05:28 (125.46 minutes)						
10 records printed 08.07.12 17:34						

NUMBER OF RECORDS

DURATION IN HOURS, MINUTES AND SECONDS

ACCUMULATED TIME IN MINUTES AND 1/100 OF A MINUTE

CALL DURATION IN MINUTES AND SECONDS

NET SERVICE PROVIDER

NOTE:

WHEN CALL CHARGE IS ENABLED, THE DURATION FIELD WILL BE REPLACED BY A CALL CHARGE FIELD SHOWING THE COST OF EACH CALL.

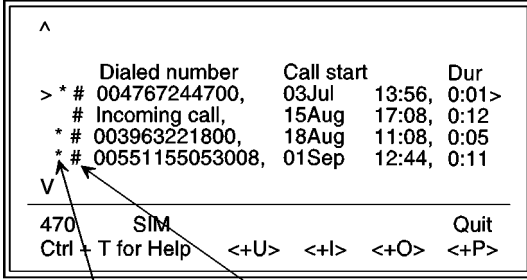
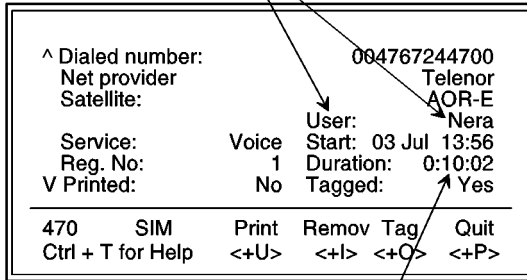
AD-24351@

Figure 2-11. Example of a Traffic Log Printout

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

SCS-1000 Mini-M Aero SATCOM System

Table 2-21. Traffic Log Settings Procedure (cont)

Task	Key Strokes	PC Screen Display
4. Selecting View on the Traffic log window displays the list of calls. 5. Scroll up or down to the desired call.	 	 AD-24349® NOT PRINTED TAG FOR PRINTOUT
6. Pushing the right arrow button shows the details of the call. a. Selecting Tag (pushing the CONTROL and O keys) tags the entry. Repeat to untag it. b. Selecting Print (pushing the CONTROL and U keys) outputs the selected entry to the printer without header and footer. c. Selecting Remov (pushing the CONTROL and I keys) erases the entry from the log. d. Selecting Quit (pushing the CONTROL and P keys) reverts back to the Main window.		APPEARS WHEN "ACCESS CODE" IS ENABLED. (FOR SIM CARD CALL - SIM Id: ABCDF) SEE ADVANCED FUNCTIONS: ACCESS CONTROL.  HOURS: MINUTES: SECONDS AD-24350®

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J. Precharge

NOTE: For use with a SIM card, refer to paragraph 7.J.(4) in this section.

The SCS-1000 system can be preprogrammed with a total call duration limit of up to 44640 minutes (744 hours). The owner stores a special telephone number under short number 00. This allows the user to call the owner to buy more time even when the time limit has been exceeded. During a call the remaining time is displayed next to the call duration in hours and minutes (seconds for the last minute).

NOTE: For users, the Precharge function only appears in the menu when enabled, for example when bought time is loaded.

(1) Precharge Readout

To readout the precharge, follow the steps in Table 2-22.

Table 2-22. Precharge Readout Procedure

Task	Key Strokes	PC Screen Display
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24340®
1. Selecting Menu on the Main window opens the Function menu window.	 	Function menu ^ Traffic log 008> Precharge Advanced functions > AD-24345®
2. Scroll down to Precharge.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Precharge window which displays the time used and time remaining in hours, minutes, and seconds.	 	8 - Precharge Time used: 2:33:45 Time remaining: 0:56:15 470 SIM Code Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24346®

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(2) Buying More Remaining Time

There are three ways to load precharge time:

- Call the owner via short number 00 and get the buy code during the conversation. (Calling short number 00 can be done even if exceeding the remaining time limit and does not influence the limit value.)
- Fax or mail the Forward ID and Index to the owner who generates the buy code and returns this by fax, mail, etc.
- The owner loads the new Precharge limit into the SCS-1000 system.

(a) Buying Time by Calling the Owner

To buy time by calling the owner, follow the steps in Table 2-23.

Table 2-23. Procedure to Buy Time by Calling the Owner

Task	Key Strokes	PC Screen Display
1. Dial 00.	 	> Number: 00  Net provider: Telenor Terrestrial network: 00 470 SIM Call Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24397@
2. Select Short.	 	Calling Owner 00:07 / 0:00 via Telenor in AOR-E Status: Connected Handset Volume^v 470 SIM On Mute Menu Clear Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24398@
3. Selecting Menu displays the IMN numbers.	 	IMN numbers Handset: 762420510 Phone: 762420511 Fax: 762420512 Data: 762420513 NIMS: 762420513 470 SIM Time Book Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24399@

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Table 2-23. Procedure to Buy Time by Calling the Owner (cont)

Task	Key Strokes	PC Screen Display
4. Selecting Time opens the Precharge window which displays the Forward ID, Index, and user code entry field. 5. Read the Forward ID, Index, and the new call duration you want to buy to the owner.	 	8 - Precharge Forward ID: 6955B9 Index: 827660941 > Code: 123456 - < 470 SIM <Del Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24400 ©
6. Key in the code that the owner reads back to you. The code contains the time information. 7. Selecting Ok loads the new remaining time limit. 8. Select Ok (pushing the CONTROL and P keys) again and then push ESC to return to the conversation window.	 	8 - Precharge Time used: 2:33:45 Time remaining: 3:56:15 470 SIM Code Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24401 ©

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(b) Buying Time Via Fax or Mail

To buy time via fax or mail, follow the steps in Table 2-24.

Table 2-24. Procedure to Buy Time Via Fax or Mail

Task	Key Strokes	PC Screen Display
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24340®
1. Selecting Menu on the Main window opens the Function menu window.	 	Function menu ^ Traffic log 008> Precharge Advanced functions > AD-24345®
2. Scroll down to Precharge.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Precharge window.	 	8 - Precharge Time used: 2:33:45 Time remaining: 0:56:15 470 SIM Code Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24346®
4. Selecting Code opens the Precharge window which displays the Forward ID, Index, and user code entry field.	 	8 - Precharge Forward ID: 6955B9 Index: 827660941 > Code: 123456 – < 470 SIM <Del Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24400®
5. Fax or mail the Forward ID, Index, and the new call duration you want to buy to the owner.		
6. Key in the code that is faxed or mailed back to you. The code contains the time information.		
7. Selecting Ok loads the new remaining time limit.		

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(c) Buying Time by Owner Loading Precharge Time

For the owner to load precharge time, perform the steps in Table 2-25.

NOTE: The SCS system must be set to the Owner level.

Table 2-25. Owner Loading Precharge Time Procedure

Task	Key Strokes	PC Screen Display
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24340 ©
1. Selecting Menu on the Main window opens the Function menu window.	 	Function menu ^ Traffic log 008> Precharge Advanced functions > AD-24345 ©
2. Scroll down to Precharge.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Precharge window.	 	8 - Precharge Time used: 2:33:45 Time remaining: 0:56:15 470 SIM Clear Buy NewK Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24391 ©
a. Selecting Buy allows the keying in of a new time limit.	 	8 - Precharge > Buy minutes: 250 - < 470 SIM <Del Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24392 ©

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Table 2-25. Owner Loading Precharge Time Procedure (cont)

Task	Key Strokes	PC Screen Display
b. Selecting Clear disables the Precharge function. NOTE: The Precharge menu is now no longer visible from the user level.	 	8 - Precharge Precharged disabled 470 SIM Clear Buy NewK Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24393 ©
NOTES: - Precharge is enabled when buying minutes. - Remember to revert to the user level when done.		

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(3) Key Readout

Using the Precharge Administrator program (QPRG 9110039) to generate a buyer's Precharge code requires both the owner's password and a key that is generated by the SCS system. Perform the steps in Table 2-26 for the key readout.

NOTE: The SCS system must be set to the Owner level.

Table 2-26. Key Readout Procedure

Task	Key Strokes	PC Screen Display
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24340 ©
1. Selecting Menu on the Main window opens the Function menu window.	 	Function menu ^ Traffic log 008> Precharge > Advanced functions AD-24345 ©
2. Scroll down to Precharge.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Precharge window.	 	8 - Precharge Time used: 2:33:45 Time remaining: 0:56:15 470 SIM Clear Buy NewK Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24391 ©
4. A new key is generated every time the NewK key is selected.	 	8 - Precharge Time used: 2:33:45 Time remaining: 0:56:15 Key: 200 085 213 056 149 115 094 470 SIM Clear Buy NewK Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24389 ©

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(4) Precharge on a SIM Card

When using a SIM card, any Precharge set on the telephone itself is overridden. If no Precharge is set on the SIM card, the SCS system may be used freely. During a conversation, the time remaining and call duration are displayed as for calls without using a SIM card. Some SIM cards may have a prepaid option. Contact your SIM vendor for more information on how to upgrade your SIM card.

To readout the precharge on a SIM card, follow the steps in Table 2-27.

Table 2-27. SIM Card Precharge Readout Procedure

Task	Key Strokes	PC Screen Display
		27 June 1998 10:54 Telenor in AOR-E Dial 00 + country code + subscriber no 470 SIM Book Last Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24340 ©
1. Selecting Menu on the Main window opens the Function menu window.	 	Function menu ^ Traffic log 008> Precharge Advanced functions > AD-24345 ©
2. Scroll down to Precharge.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Precharge window which displays the time used and time remaining in hours, minutes, and seconds.	 	8 - Precharge Time used: 2:33:45 Time remaining: 0:56:15 470 SIM Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24386 ©
NOTE: This window is the same as the Precharge window without a SIM card except for the Code function, which is not required.		

K. Advanced Functions

Some of the Advanced functions are accessible from the Phone OWNER LEVEL or CHV2 LEVEL only. The OWNER LEVEL and CHV2 levels are protected by passwords. For shifting to owner/CHV2 level and assignment of password, see paragraph 7.F. in this section, User Access.

The advanced functions menu are given in Table 2-28.

Table 2-28. Advanced Functions Menu

Menu Item	Related Functions
Access Control	• Restrict dial • Access code • Restrict SIM usage
Aero Functions	• Magnetometer calibration • Configure landing speed • Satellite locations
Satellite Setup	• Net service provider and terrestrial network • S/A operator and terrestrial network
Configuration	• Port configuration • Net service providers • Power conservation • Set diagnostics • Set preferred Nets (with SIM card only) • Set allowed Nets (with SIM card only; CHV2 level or higher) • Set S/A preferred Nets (with SIM card only) • Set S/A allowed Nets (with SIM card only; CHV2 level or higher) • Charge tone
Information Available	• IMN numbers • Miscellaneous version ID information • Network status information (owner level, or in user level when diagnostics is ON. See Configuration: Set diagnostics.)
Install: Installation and Debug Menu	• Paid functions (owner level) • Phone name setup (owner level)

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(1) Access Control

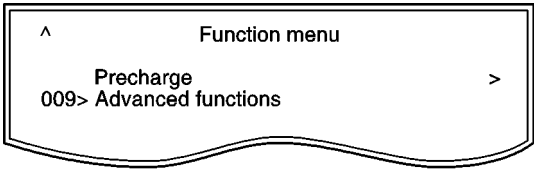
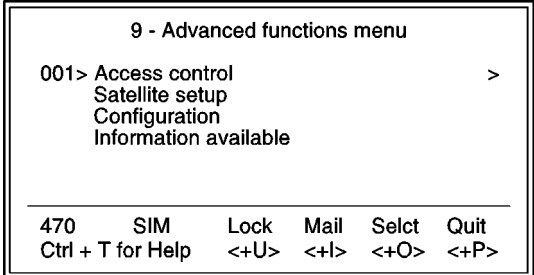
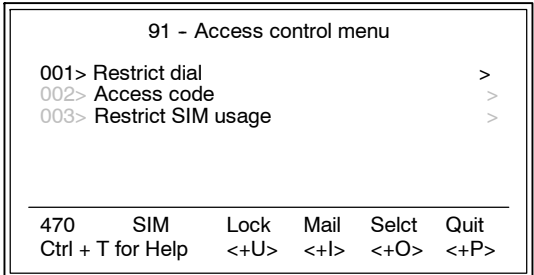
The following functions are available for controlling the use of the SCS system:

- Restrict Dial – allows the owner to establish a Barred list of subscriber numbers that cannot be called, or set the system for dialing from Phone Book only.
- Access Code – opens the system for up to 25 authorized users.
- Restrict SIM Usage – permits the owner to control the use of SIM card with the system.

NOTE: The functions are editable in owner level only.

To setup the access control function, perform the procedures in Table 2-29.

Table 2-29. Access Control Setup

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402®
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24403®
4. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Access control menu which allows selection of the submenus.	 	 AD-24404®

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

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(a) Restricted Dialing

The SCS system provides three choices of controlling calls:

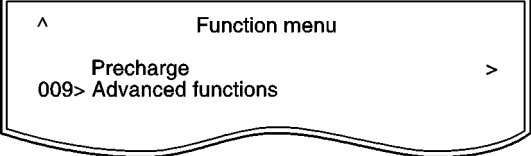
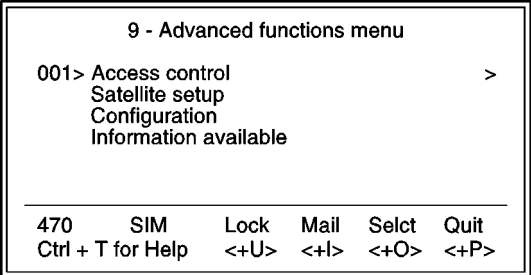
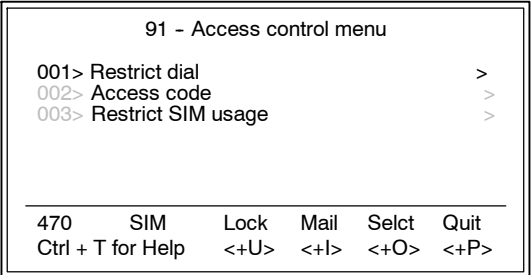
- No restrictions.
- Barred List – may contain up to 10 phone numbers or part of numbers that can not be called, for example, the entry “0087” in the barred list prevents all mobile-to-mobile calls.
- Dial From Book Only – restricts calls to the numbers in the Phone Book (in the SCS system). It is still possible to append, for example a short number entry with number field “0047” means that it is possible to dial all Norwegian numbers. When a SIM card is inserted, the SIM entries will not be merged with the “phone” entries.

The function is active for non-SIM operation. For one specific SIM card, see the paragraph on Restricted SIM usage. It applies to all ports of the system. Only one of the lists can be activated at one time.

1 Check the Restrict Dial Setup

To check the restricted dialing setup, perform the procedures in Table 2-30.

Table 2-30. Check the Restrict Dial Setup

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 Function menu Precharge 009> Advanced functions AD-24402@
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 9 - Advanced functions menu 001> Access control Satellite setup Configuration Information available 470 SIM Lock Mail Selct Quit Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24403@
4. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Access control menu.	 	 91 - Access control menu 001> Restrict dial 002> Access code 003> Restrict SIM usage 470 SIM Lock Mail Selct Quit Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24404@

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

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Table 2-30. Check the Restrict Dial Setup (cont)

Task	Key Strokes	PC Screen Display
5. Select Selct or push the right arrow button on the Access control menu to open the Restricted dialing window, which shows the active list: No restrictions	 	911 - Restricted dialing Current mode : No restrictions 470 SIM Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24421 ©
Dial from Book only NOTE: Book (pushing the CONTROL and O keys) is similar to Phone Book.		911 - Restricted dialing Current mode: Dial from Book only 470 SIM Book Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24424 ©
Barred list.		911 - Restricted dialing Current mode : Barred list 470 SIM List Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24422 ©
6. Selecting List on the Restricted dialing window opens the Blocked numbers window.	 	911 - Blocked numbers 001> 004767244700 0044816865701 470 SIM Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24423 ©

NOTE: The list to be active is selected by the owner.

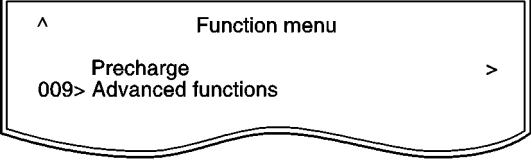
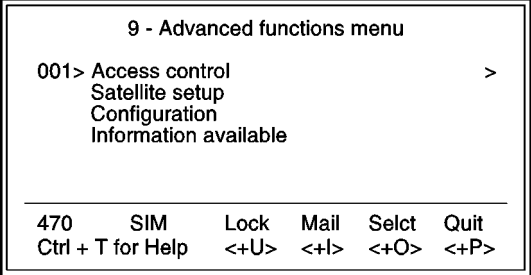
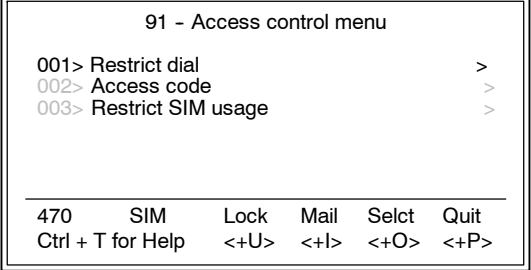
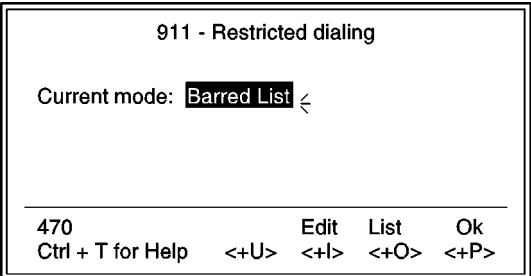
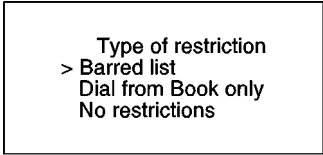
SYSTEM DESCRIPTION AND INSTALLATION MANUAL

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2 Restricted Dialing Setup (Owner Level Only)

To set up the Barred list and phone book, perform the procedures in Table 2-31.

Table 2-31. Barred List and Phone Book Setup

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402@
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24403@
4. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Access control menu.	 	 AD-24404@
5. Select Selct or push the right arrow button on the Access control menu to open the Restricted dialing window, that shows which list is currently active.	 	 AD-24415@
6. Selecting Edit on the Restricted dialing window allows selection of the restriction mode.	 	
7. Scroll up or down to select.		 AD-24416@

NOTE: Selecting Selct enters the chosen mode.

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Table 2-31. Barred List and Phone Book Setup (cont)

Task	Key Strokes	PC Screen Display
8. Selecting List on the Restricted dialing window opens the Blocked numbers window.	 	911 - Blocked numbers 001> 0047800xxx 0044816865701 470 Remov Edit New Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24417®
9. Scroll up or down to select. a. Remov (pushing the CONTROL and U keys) deletes the number.		
b. Selecting Edit on the Blocked numbers window allows modification of the barred number.	 	911 - Blocking number > Barred root: 0047800 470 <Del Save Ctrl + T for Help <+U> <+I> <+O> <+P> NOTE: EMPTY FIELD WHEN SELECTING NEW. AD-24418®
NOTES: 1. The Barred root field is empty when selecting New to add a phone number to the list.		
2. Selecting Save (pushing the CONTROL and P keys) stores the changes.		
10. When the restriction mode "Dial from Book only" is active, selecting Book allows the entering of short numbers.	 	911 - Restricted dialing Current mode: Dial from Book only < 470 Edit Book Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24419®
NOTE: Remember to revert to the User level.		

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(b) Access Code

When the access code function has been enabled, the user is prompted for a 1 to 8 digit personal code when making a call. The code opens the system for one call. Up to 25 authorized users can be allocated access codes. The function is active for non-SIM use and for one specific SIM card, see the paragraph on Restricted SIM usage in this section. It applies to all ports of the SCS system.

NOTE: The access code can only be entered from owner level.

To make a call, check the setup, or setup the access code, perform the procedures in Table 2-32.

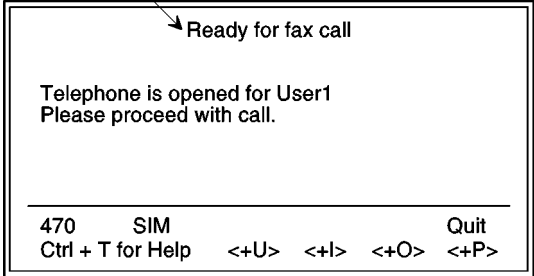
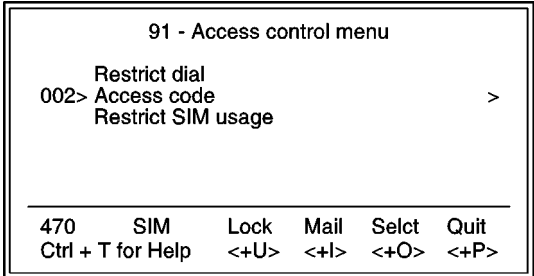
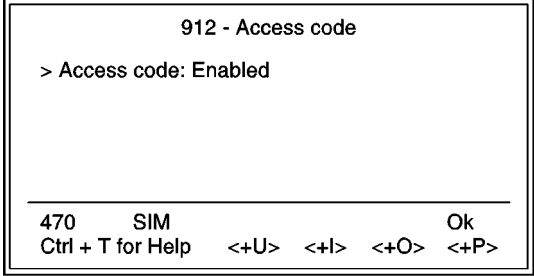
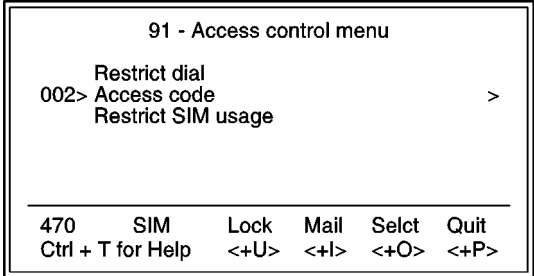
Table 2-32. Access Code Procedures

Task	Key Strokes	PC Screen Display
Making a Call:		27 June 1998 10:54 Telenor in AOR-E Enter access code to call 470 SIM Menu Seek Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24409@
1. At hook-off or when attempting to dial a phone number from the main window, the Access code login window opens, prompting the user to enter the access code.	1 TO 6 DIGITS	Access code login > Access code: *****< 470 SIM Phone Fax Data Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24410@

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Table 2-32. Access Code Procedures (cont)

Task	Key Strokes	PC Screen Display
2. Selecting Fax or Data (pushing the CONTROL and P keys) on the Access code login window shows which users are allowed to make a telefax or data call. NOTE: Selecting Phone on the Access code login window opens a window for entering the phone number.	 	OR DATA CALL  AD-24411©
Checking the Setup: 1. Selecting Selct or pressing the right arrow via the Advanced functions window opens the Access control menu. 2. Scroll down to Access code.	 	 AD-24412©
3. Selecting Selct or the right arrow again opens the Access code window, which indicates whether the Access code function is Enabled or Disabled.	 	 AD-24413©
Access Code Setup: 1. Selecting Selct or pressing the right arrow via the Advanced functions window opens the Access control menu. 2. Scroll down to Access code.	 	 AD-24412©

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Table 2-32. Access Code Procedures (cont)

Task	Key Strokes	PC Screen Display
3. Selecting Selct or the right arrow again opens the Access code window. a. Enab (pushing the CONTROL and I keys) enables the access code function. b. Disab (pushing the CONTROL and O keys) disables the access code function. c. Selecting Setup displays the list of authorized users. NOTE: Scroll down to the desired user.	   	912 - Access code > Access code: Enabled _ < 470 Setup Enab Disab Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24406® Access codes 001> User1 User2 470 Remov Edit New Quit Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24407® Access code edit Name: Abc > Code: *****_< 470 <Del ABC abc Ok Ctrl + T for Help <+U> <+I> <+O> <+P> NOTE: STARTS WITH EMPTY NAME FIELD WHEN SELECTING NEW. CODE IS PROMPTED WHEN NAME IS ENTERED. AD-24408®
4. Select Edit on the Access codes window to modify the code, or select New (pushing the CONTROL and O keys) to add a user to the list. a. Del (pushing the CONTROL and U keys) modifies the entries. b. Select ABC (pushing the CONTROL and I keys) or abc (pushing the CONTROL and O keys) to enter uppercase or lowercase letters, as required. c. Ok (pushing the CONTROL and P keys) stores the modified user name.	 	

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(c) Restricted SIM Usage

1 Allowed SIM

The Mini-M Aero System can be set to operate from:

- One specific SIM card (Any other SIM users will be rejected.)
- No SIM card (All SIM users will be rejected.)
- Any SIM card.

2 Restricted SIM

The restrictions “Restrict dial” and “Access code” can be set to be active for:

- One specific SIM card (in addition to non-SIM usage)
- No SIM card (only active for non-SIM usage).

NOTE: The setting can only be made from owner level. Refer to paragraph 7.K.(1)(c)6.

3 When Restricted to SIM Provider

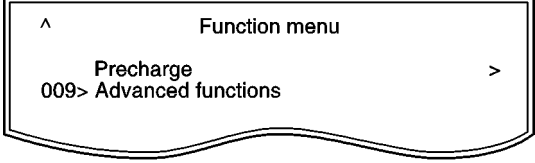
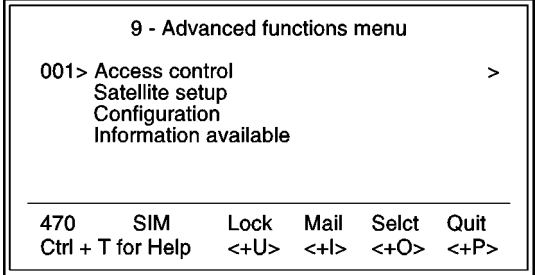
The service provider can lock the Mini-M Aero System to a specific type of card, e.g. a “MOBIQ” SIM card. The restrictions will then be:

- Any “MOBIQ” SIM card
- One specific “MOBIQ” card
- No SIM card at all.

4 Check SIM Restrictions

To check SIM restrictions, perform the procedure in Table 2-33.

Table 2-33. Procedure to Check SIM Restrictions

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	
2. Scroll down to Advanced functions.		AD-24402®
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	
		AD-24403®

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Table 2-33. Procedure to Check SIM Restrictions (cont)

Task	Key Strokes	PC Screen Display
4. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Access control menu.	 	91 - Access control menu Access code 003> Restrict SIM usage > 470 SIM Lock Mail Selct Quit Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24433@
5. Scroll down to Restrict SIM usage.		
6. Select Selct or push the right arrow button on the Access control menu to open the SIM restrictions window.	 	ALTERNATIVES: SEE ALTERNATIVE RESTRICTIONS 913 - SIM restrictions Allowed SIM: Any Restricted SIM: No restrictions SIM provider Id: 8012 470 SIM Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24434@ APPEARS IF CARD IS LOCKED BY SIM PROVIDER 913 - SIM restrictions Allowed SIM: Locked to one Card number: 89013000513658144571 Restricted SIM: Locked to one Card number: 89013000513658144571 SIM provider Id: 8012 470 SIM Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24435@ APPEARS IF CARD IS LOCKED BY SIM PROVIDER

5 Alternative Restrictions

When Allowed SIM is set to:

- Any – no restrictions apply.
- No SIM – SIM cards are not accepted.
- Locked to one – one specific card is allowed.

When Restricted SIM is set to:

- No restrictions – Access code and Restricted dial only apply for non-SIM operation.
- Locked to one – Access code and Restricted dial apply for non-SIM operation and operation with the specified SIM card.

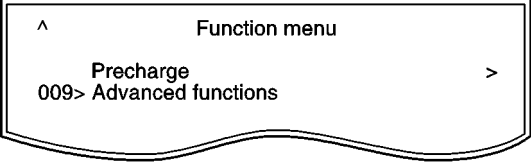
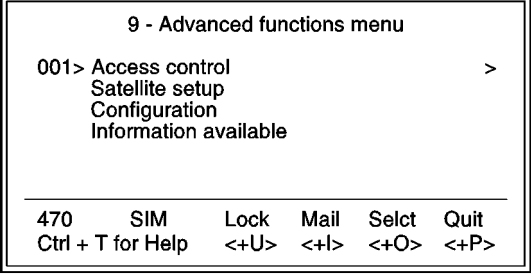
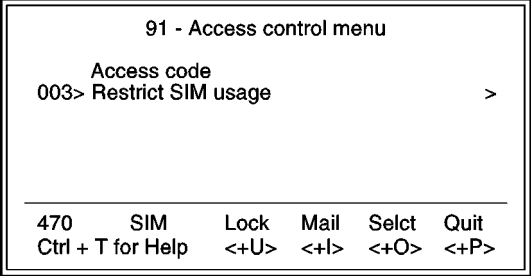
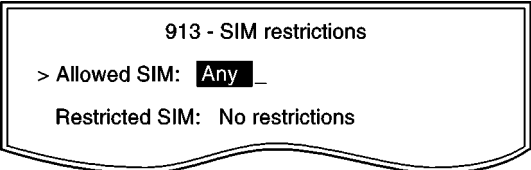
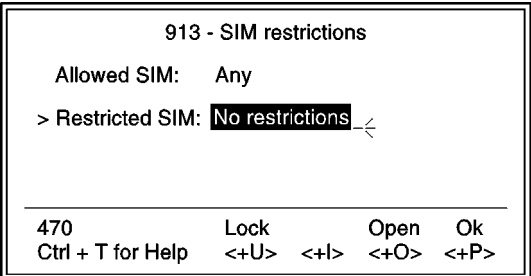
SYSTEM DESCRIPTION AND INSTALLATION MANUAL

SCS-1000 Mini-M Aero SATCOM System

6 Set the SIM Restrictions (Owner Level Only)

To set the SIM restrictions, perform the procedures in Table 2-34.

Table 2-34. Procedure to Set the SIM Restrictions

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402 ©
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24403 ©
4. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Access control menu.	 	 AD-24433 ©
5. Scroll down to Restrict SIM usage.		
6. Select Selct or push the right arrow button on the Access control menu to open the SIM restrictions window.	 	 AD-24426 ©
7. Scroll down to Restricted SIM.		 AD-24427 ©

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Table 2-34. Procedure to Set the SIM Restrictions (cont)

Task	Key Strokes	PC Screen Display
8. Select Lock and insert the actual SIM card. NOTE: The system can now be operated with that specific card only.	 	913 - SIM restrictions Allowed SIM: Any > Restricted SIM: No restrictions < Please insert the actual SIM card. 470 Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24428® 913 - SIM restrictions Allowed SIM: Any > Restricted SIM: Locked to one < Card number: 8980120000166470336 Please retract the SIM card. 470 Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24429® 913 - SIM restrictions Allowed SIM: Any > Restricted SIM: Locked to one Card number: 8980120000166470336 SIM provider Id: 8012 470 Lock Open Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24430® APPEARS IF CARD IS LOCKED BY SIM PROVIDER
9. Selecting Ok (pushing the CONTROL and P keys) stores the settings. NOTE: When retracting the SIM card, the ID of the SIM provider is displayed.		
NOTE: To set the Allowed SIM, follow the same procedures as above with the marker remaining on Allowed SIM instead of Restricted SIM.		

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(2) Aero Functions

Allows re-calibration of the magnetometer, setting of the aircraft landing speed, and location of the satellites to be used.

(a) Calibrating the Magnetometer

The antenna unit contains a three-axes magnetometer for tracking purposes, which must be calibrated after installation of the system in the aircraft.

Recalibration is required when the Antenna Control Unit (ACU) is replaced or when the magnetic characteristics of the aircraft have changed. Calibration is performed while the aircraft is being turned slowly through 360 degrees on a smooth flat level surface, away from any large hangers or buildings that could disturb the terrestrial magnetic field.

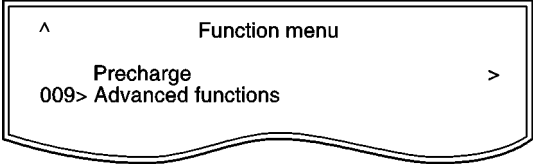
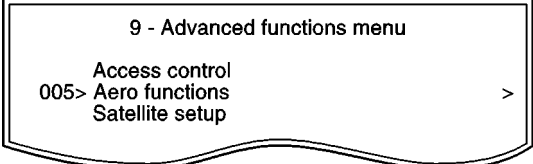
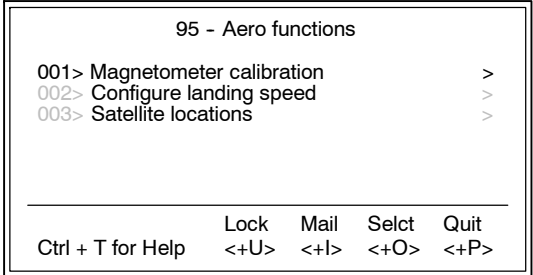
1 Preparation

Park the aircraft on the selected site. Note that all aircraft systems must be powered and running, to create the aircraft magnetic environment that would be experienced in flight.

2 Magnetometer Calibration (Owner level only)

To calibrate the magnetometer, perform the procedures in Table 2-35.

Table 2-35. Magnetometer Calibration Procedure

Task	Key Strokes	PC Screen Display
1. Wait until the SCS system has completed initializing after power up.		
2. Selecting Menu on the Main window opens the Function menu window.	 	
3. Scroll down to Advanced functions.		AD-24402@
4. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	
5. Scroll down to Aero functions.		AD-24490@
6. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Aero functions menu.	 	
		AD-24491@

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SCS-1000 Mini-M Aero SATCOM System

Table 2-35. Magnetometer Calibration Procedure (cont)

Task	Key Strokes	PC Screen Display
7. Select Selct or push the right arrow button on the Aero functions menu to open the Magnetometer calibration window.	 	951 - Magnetometer calibration Press "Start" to initiate the calibration process for the aeronautical antenna magnetometer. Ctrl + T for Help Start <+U> <+I> <+O> Abort <+P>
8. Select Start (pushing the CONTROL and U keys) to start the calibration procedure.		AD-24492@
9. Turn the aircraft through 360 degrees. NOTE: The duration of the 360 degree turn should be more than one minute and less that 5 minutes.		951 - Magnetometer calibration >Turn aircraft 360 degrees Press "Stop" when completed. Ctrl + T for Help Stop <+U> <+I> <+O> Abort <+P>
10. Select Stop (pushing the CONTROL and U keys) when the turn is completed. This will terminate the calibration process.		951 - Magnetometer calibration >Calibration succeeded. Calibration score: 30 Amount of hard Iron: 0 Successful calibrations: 84 Ctrl + T for Help <+U> <+I> <+O> Ok <+P>
NOTE: Refer to the ADJUSTMENT/TEST section for interpretation of the calibration scores.		

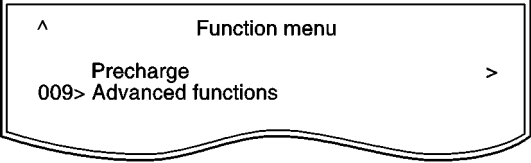
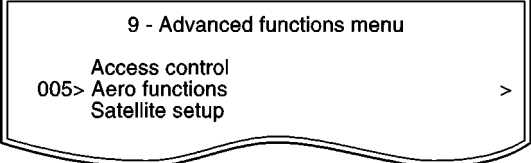
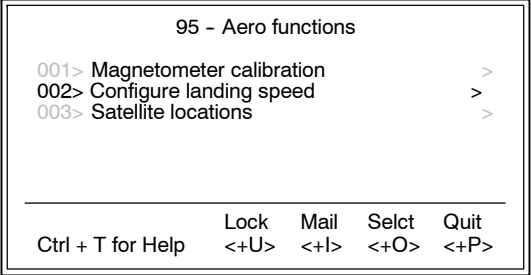
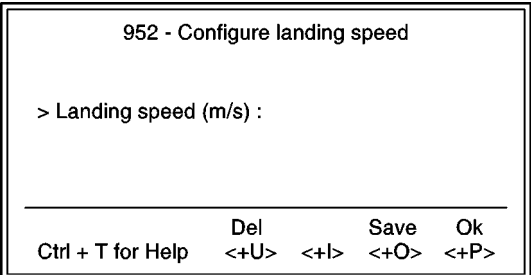
SYSTEM DESCRIPTION AND INSTALLATION MANUAL

SCS-1000 Mini-M Aero SATCOM System

(b) Configure Landing Speed (Owner Level Only)

To configure the landing speed, perform the procedures in Table 2-36.

Table 2-36. Procedure to Configure Landing Speed

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402@
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24490@
4. Scroll down to Aero functions.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Aero functions menu.	 	 AD-24487@
6. Scroll down to Configure landing speed.		
7. Select Selct or push the right arrow button on the Aero functions menu to open the Configure landing speed window.	 	 AD-24488@
8. Enter the nominal landing speed in meter per second.		
9. Save (pushing the CONTROL and O keys) saves the entry.		
NOTE: Refer to the ADJUSTMENT/TEST section for additional information about configuring landing speed.		

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

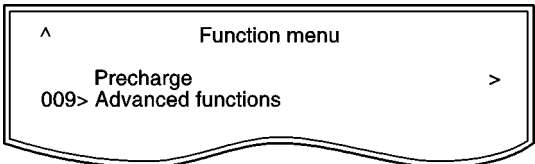
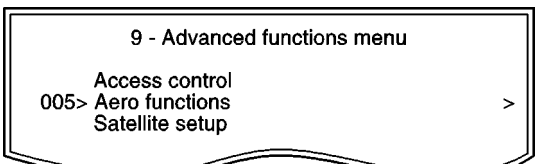
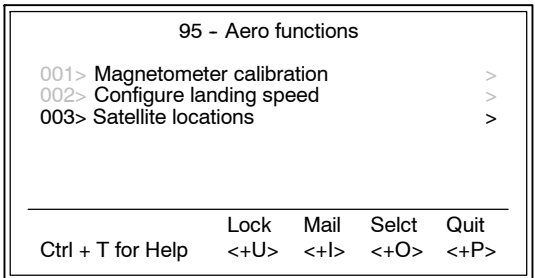
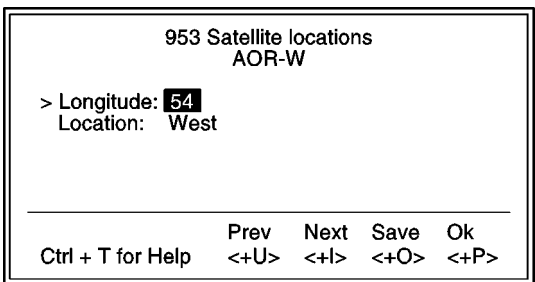
SCS-1000 Mini-M Aero SATCOM System

(c) Satellite Locations (Owner Level Only)

This option is provided to modify the stored locations of the INMARSAT satellites. This would be required in the (unlikely) event of a satellite being moved to another longitude, or when a new INMARSAT satellite is brought into service at a different location to the existing satellites.

To modify the stored satellite locations, perform the procedures in Table 2-37.

Table 2-37. Satellite Locations Procedure

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 Function menu Precharge 009> Advanced functions AD-24402®
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 9 - Advanced functions menu Access control 005> Aero functions Satellite setup AD-24490®
4. Scroll down to Aero functions.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Aero functions menu.	 	 95 - Aero functions 001> Magnetometer calibration 002> Configure landing speed 003> Satellite locations Ctrl + T for Help Lock Mail Selct Quit <+U> <+I> <+O> <+P> AD-24481®
6. Scroll down to Satellite locations.		
7. Select Selct or push the right arrow button on the Aero functions menu to open the Satellite locations window.	 	 953 Satellite locations AOR-W > Longitude: 54 Location: West Ctrl + T for Help Prev Next Save Ok <+U> <+I> <+O> <+P> AD-24482®
8. Select the appropriate satellite using Prev (pushing the CONTROL and U keys) and Next (pushing the CONTROL and I keys).		
9. Enter the satellite longitude in degrees.		

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Table 2-37. Satellite Locations Procedure (cont)

Task	Key Strokes	PC Screen Display
10. Scroll down to Location.		953 Satellite locations AOR-W Longitude: 54 > Location: West > Ctrl + T for Help Prev Next Save Ok <+U> <+I> <+O> <+P> AD-24483®
11. Pushing the right arrow button opens the list of locations, East or West. 12. Scroll up or down to choose the location. 13. Select Selct (pushing the CONTROL and O keys) and then Save (pushing the CONTROL and O keys) to store the new location.		953 - a Select location EAST > WEST Longitude: 4 > Location: E > Ctrl + T for Help <+U> <+I> Selct <+O> <+P> AD-24484®

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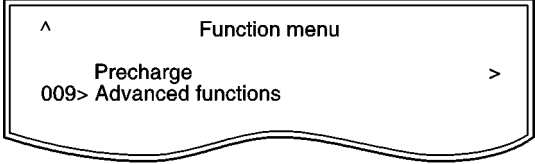
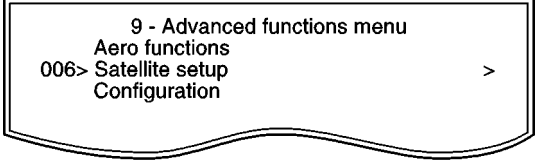
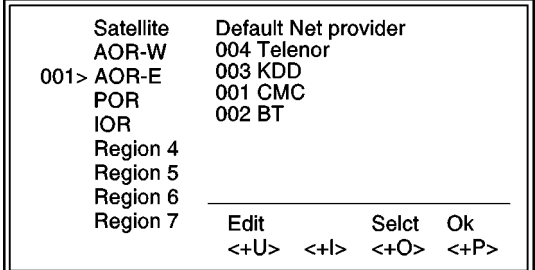
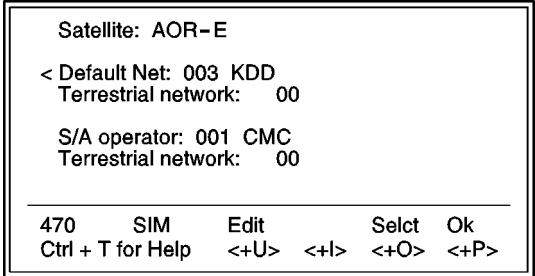
SCS-1000 Mini-M Aero SATCOM System

(3) Satellite Setup

This function allows preprogramming of the default network service provider, Stand Alone (S/A) operator, and terrestrial network for each satellite region (Ocean Region).

To set up the satellite, perform the procedures in Table 2-38.

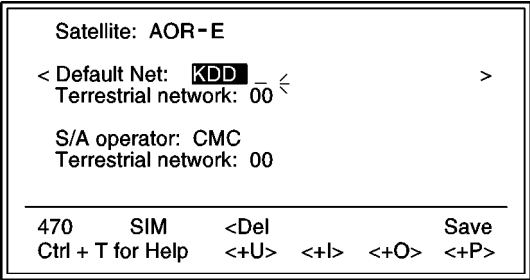
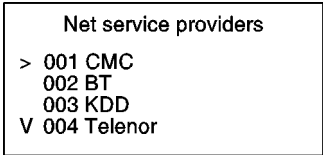
Table 2-38. Satellite Setup Procedure

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402®
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24474®
4. Scroll down to Satellite setup.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the list of satellites and default network service providers.	 	 AD-24475®
6. Scroll up or down to the desired satellite.		
NOTE: Pushing the right arrow button displays the selected satellite information. Scroll down to the desired satellite.		 AD-24476®
7. Selecting Selct (pushing the CONTROL and O keys) initiates a search for the specified satellite.		

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

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Table 2-38. Satellite Setup Procedure (cont)

Task	Key Strokes	PC Screen Display
8. Selecting Edit opens the setting window for the selected satellite. 9. Scroll up or down to the desired satellite.	 	 AD-24477®
10. Pushing the right arrow button opens the list of available network service providers. 11. Scroll up or down to the desired network service provider.		 AD-24478®
12. Selecting Selct (pushing the CONTROL and O keys) enters the new default network service provider. 13. Repeat step 10, scroll down to Terrestrial network, and key in the code. 14. Selecting Save (pushing the CONTROL and P keys) stores the selected network service provider and terrestrial network as the default for that particular satellite. NOTE: To set up the Stand Alone (S/A) operator and terrestrial network, repeat steps 10 thru 14 with the marker on S/A operator and Terrestrial network.		

(4) Configuration

(a) Port Configuration

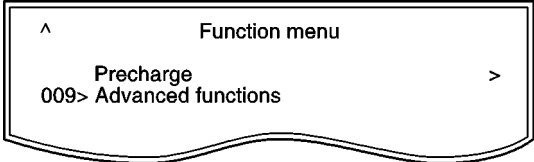
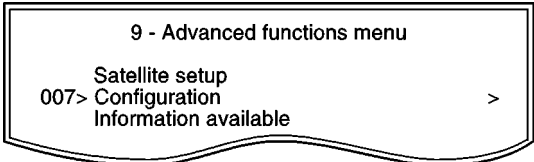
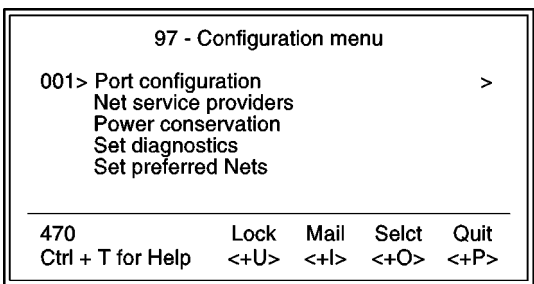
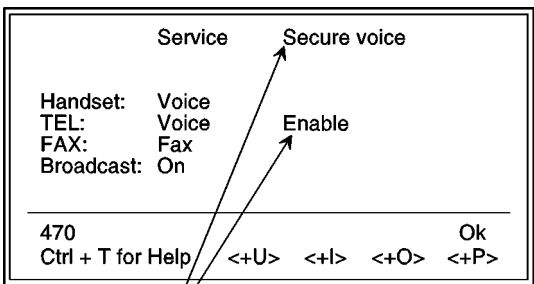
- Displays current configuration. Reconfiguration can be made in the Owner level only (non-SIM operation).
- With Broadcast On, incoming calls initiate ringing on all ports configured for voice communication.
- With Broadcast Off, only the dialed port rings.
- The secure voice function allows selected port(s) to be used with an encrypted telephone. Refer to paragraph 7.K.(4)(b) in this section.

To set the port configuration, perform the procedures in Table 2-39.

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Table 2-39. Port Configuration Procedure

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402®
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24470®
4. Scroll down to Configuration.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Configuration menu.	 	 AD-24471®
6. Selecting Selct or pushing the right arrow button on the Configuration menu opens the Port configuration window, which shows the present service of the ports, and the incoming call response.	 	 SECURE VOICE APPEARS WHEN BOUGHT AD-24472®

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(b) Secure Voice Option

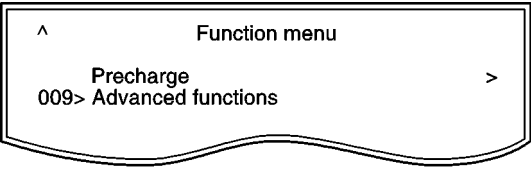
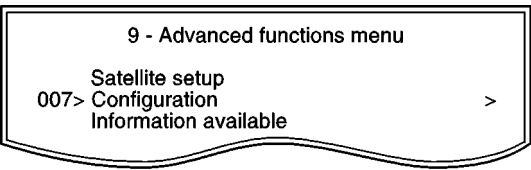
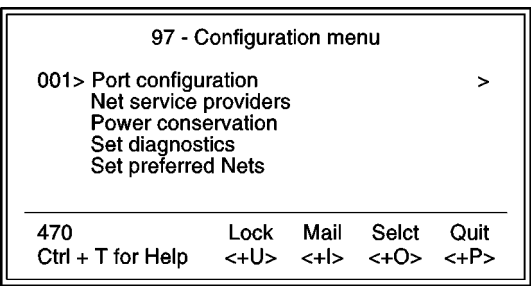
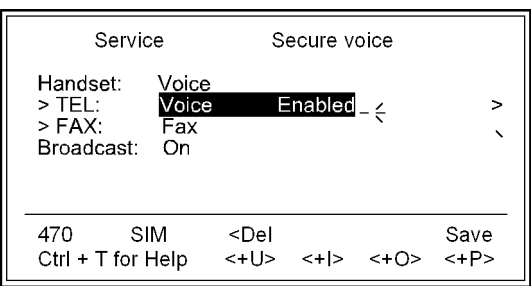
The SCS system can be programmed to allow the operation of encrypted speech through the telephone (TEL) port and FAX port when configured for voice service.

NOTES:

1. The STU IIB/III is enabled as the default on ports configured for voice service.
2. Verify that your service provider supports secure voice operation.

To set up the secure voice option, perform the procedures in Table 2-40.

Table 2-40. Secure Voice Option Setup Procedure

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402@
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24470@
4. Scroll down to Configuration.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Configuration menu.	 	 AD-24471@
6. Selecting Selct or pushing the right arrow button on the Configuration menu displays which ports are enabled or disabled for use with secure voice.	 	 AD-67197@

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Table 2-40. Secure Voice Option Setup Procedure (cont)

Task	Key Strokes	PC Screen Display
7. Selecting Edit or pushing the right arrow button again allows the user to enable or disable secure voice.	 	Service / Secure voice > Voice / Enabled Voice / Disabled AD-67198@
8. Scroll up or down and then select Selct (push the CONTROL and O keys) to choose the desired mode.		
NOTE: To set up the FAX port for secure voice operation, repeat the steps above with the marker on FAX instead of TEL.		Service / Secure voice > Fax Voice / Enabled Voice / Disabled AD-67199@

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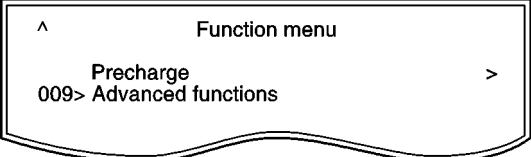
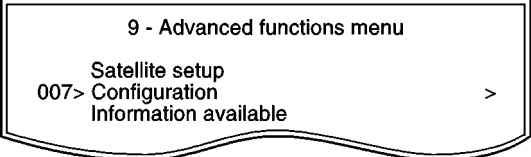
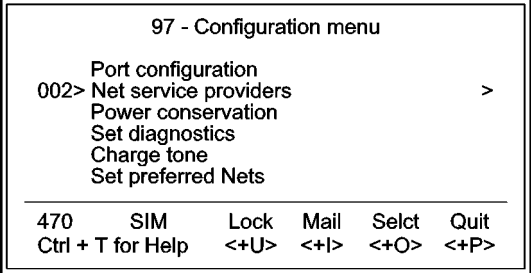
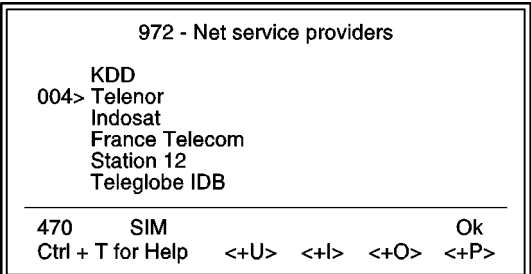
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(c) Net Service Providers

Each network service provider has a station code. The Net service provider window displays a list which matches the codes to the station owners. Names can be edited in the Owner level (non-SIM operation).

To set the network service providers, perform the procedures in Table 2-41.

Table 2-41. Network Service Providers Setup Procedure

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 Function menu Precharge 009> Advanced functions AD-24402@
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 9 - Advanced functions menu Satellite setup 007> Configuration Information available AD-24470@
4. Scroll down to Configuration.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Configuration menu.	 	 97 - Configuration menu Port configuration 002> Net service providers Power conservation Set diagnostics Charge tone Set preferred Nets 470 SIM Lock Mail Selct Quit Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24467@
6. Scroll down to Net service providers.		
7. Selecting Selct or pushing the right arrow button on the Configuration menu opens the list of Net service providers.	 	 972 - Net service providers KDD 004> Telenor Indosat France Telecom Station 12 Teleglobe IDB 470 SIM Ok Ctrl + T for Help <+U> <+I> <+O> <+P> AD-24468@
8. Scroll up or down to the desired service provider.		
9. Selecting Ok (pushing the CONTROL and P keys) stores the chosen service provider.		

SYSTEM DESCRIPTION AND INSTALLATION MANUAL

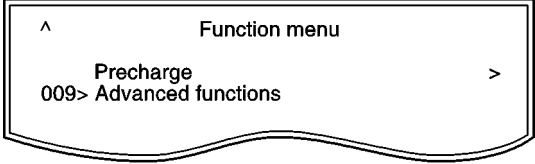
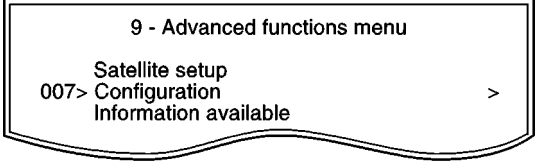
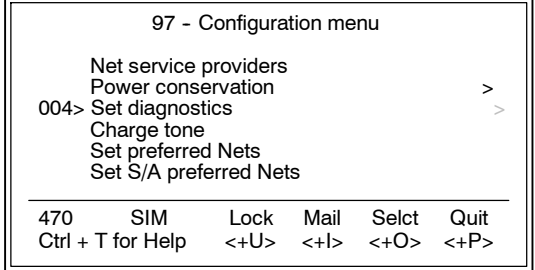
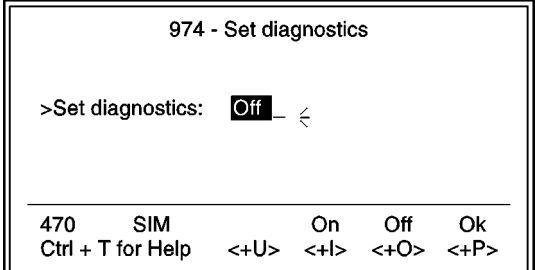
SCS-1000 Mini-M Aero SATCOM System

(d) Set Diagnostics

NOTE: This mode is not necessary for normal telephone use.

Additional system information is displayed when diagnostics is turned On. To set the diagnostics, perform the procedure in Table 2-42.

Table 2-42. Procedure to Set the Diagnostics

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402®
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24470®
4. Scroll down to Configuration.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Configuration menu.	 	 AD-24463®
6. Scroll down to Set diagnostics.		
7. Selecting Selct or pushing the right arrow button on the Configuration menu opens the Set diagnostics window.	 	 AD-24464®
8. Select On or Off by choosing On (pushing the CONTROL and I keys) or Off (pushing the CONTROL and O keys) and then Ok (pushing the CONTROL and P keys).		

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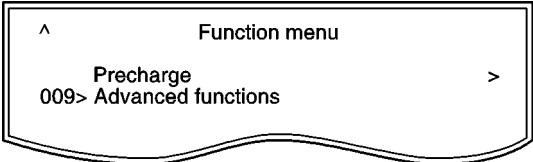
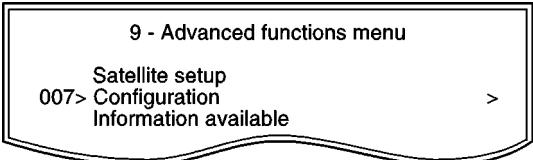
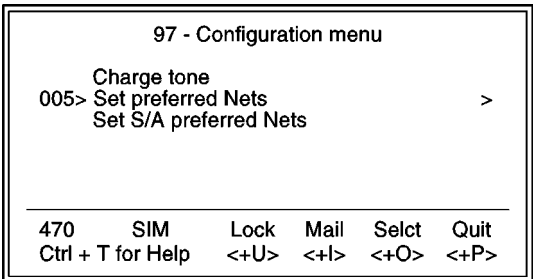
- (e) Storing of Preferred/Allowed Net Service Provider and Stand Alone Operator on the SIM Card

These functions allow you to store the preferred/allowed network service provider and preferred/allowed Stand Alone operator for each satellite region on a SIM card.

NOTE: The access level required to operate this functions depend on the SIM card supplier.

To store the provider and operator information, perform the procedures in Table 2-43.

Table 2-43. Procedure to Store Net Service Providers/Operators

Task	Key Strokes	PC Screen Display
Preferred Net Service Provider:		
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402®
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24470®
4. Scroll down to Configuration.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Configuration menu.	 	 AD-24458®
6. Scroll down to Set preferred Nets.		

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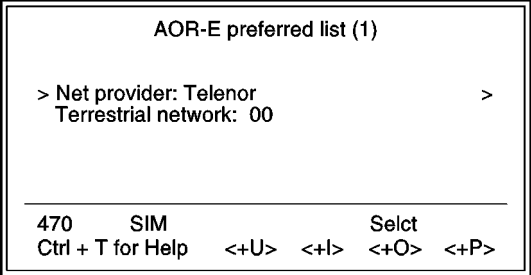
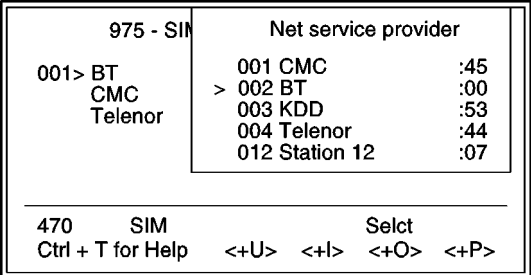
Table 2-43. Procedure to Store Net Service Providers/Operators (cont)

Task	Key Strokes	PC Screen Display
7. Selecting Selct or pushing the right arrow button on the Configuration menu opens the Set preferred Nets window.	 	<pre> 975 - Set preferred Nets AOR-W 001> AOR-E POR IOR Region 4 Region 5 Region 6 Region 7 Selct Ok <+U> <+I> <+O> <+P> </pre>
8. Scroll up or down to the desired satellite.		AD-24459®
9. Selecting Selct or pushing the right arrow button on the Set preferred Nets window show the current Net and Terrestrial Network Identification Digits (TNID).	 	<pre> 975 - Set preferred Nets AOR - E 001> BT TNID: 00 CMC TNID: 09 Telenor TNID: 44 </pre>
10. Remov (pushing the CONTROL and U keys) deletes the Net entry.		<pre> 470 SIM Remov Edit Ok Ctrl + T for Help <+U> <+I> <+O> <+P> </pre>
11. Selecting Edit on the Set preferred Nets window opens the list of available Nets.	 	<pre> 975 - SIM Net service provider 001> BT 001 CMC :45 CMC > 002 BT :00 Telenor 003 KDD :53 004 Telenor :44 012 Station 12 :07 </pre>
NOTE: If the SIM card is not restricted, selecting Edit opens the satellite preferred list. See If the SIM Card is Not Restricted below.		<pre> 470 SIM Selct Ctrl + T for Help <+U> <+I> <+O> <+P> </pre>
12. Scroll up or down to the desired Net.		AD-24453®
13. Selct (pushing the CONTROL and O keys) enters the new default network service provider.		

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Table 2-43. Procedure to Store Net Service Providers/Operators (cont)

Task	Key Strokes	PC Screen Display
If the SIM Card is Not Restricted:		
1. Selecting Edit on the Set preferred Nets window opens the satellite preferred list window.	 	 AD-24454@
2. Selecting Edit on the Set preferred Nets window opens the list of available Nets.	 	 AD-24453@
3. Scroll up or down to the desired Net.		
4. Selct (pushing the CONTROL and O keys) enters the new default network service provider.		
NOTES: - To set the S/A preferred Nets (Stand Alone Operator), repeat the steps for Preferred Net Service Provider, except place the marker on Set S/A preferred Nets. - To set the allowed Nets or set the S/A allowed Nets, repeat the steps for Preferred Net Service Provider, except place the marker on Set allowed Nets or Set S/A allowed Nets. This function is restricted to the CHV2 level or higher, depending on the network service provider.		

(f) Charge Tone

When the charge tone function is enabled, a single frequency tone or DTMF is transmitted once the call has been established. The tone informs an external debiting system, for example, a pay phone (connected to the TEL port) that charging can start.

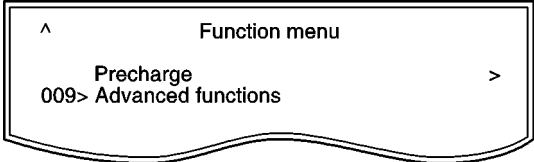
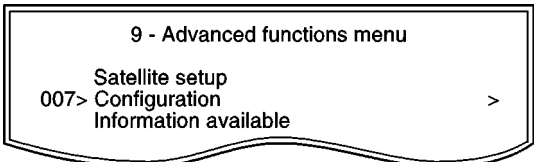
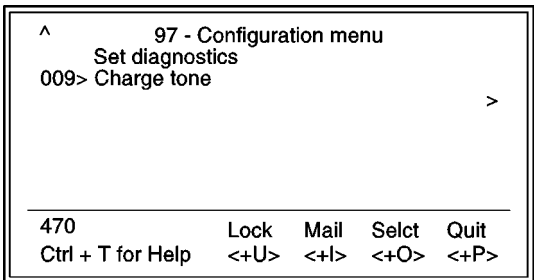
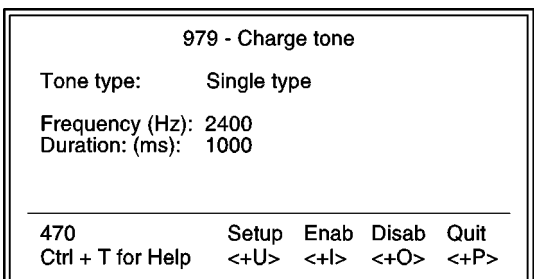
NOTE: Settings can only be made in the owner level.

To set the charge tone, perform the procedure in Table 2-44.

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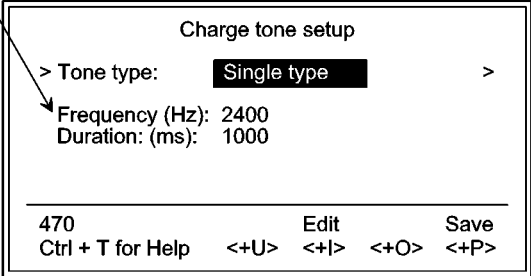
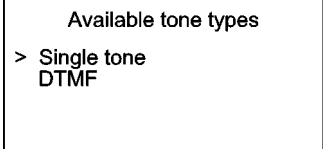
Table 2-44. Procedure to Set the Charge Tone

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402®
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24470®
4. Scroll down to Configuration.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Configuration menu.	 	 AD-24449®
6. Scroll down to Charge Tone.		
7. Selecting Selct or pushing the right arrow button on the Configuration menu opens the Charge tone window.	 	 AD-24450®

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Table 2-44. Procedure to Set the Charge Tone (cont)

Task	Key Strokes	PC Screen Display
8. Selecting Setup opens the Charge tone setup window, which allow the user to set the required single frequency tone or DTMF, and its duration in milliseconds. NOTE: Valid settings are as follows: Frequency: 400 to 3400 Hz Duration: 10 to 5000 ms DTMF key: 0 to 15	  KEY NO. WHEN SELECTING DTMF.	 AD-24451@
9. Selecting Edit or pushing the right arrow button opens the Available tone types window.	 	 AD-24452@
10. Scroll up or down to choose Single tone or DTMF and then select Selct (push the CONTROL and O keys) to enter the chose settings.		

(5) Information Available

The following information is provided:

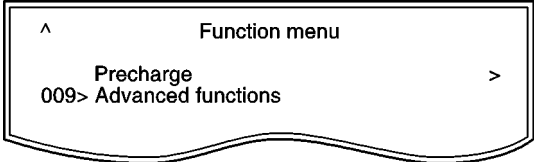
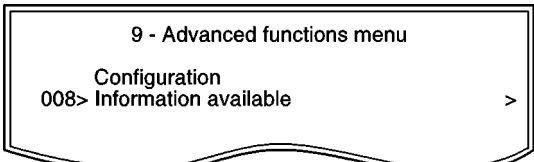
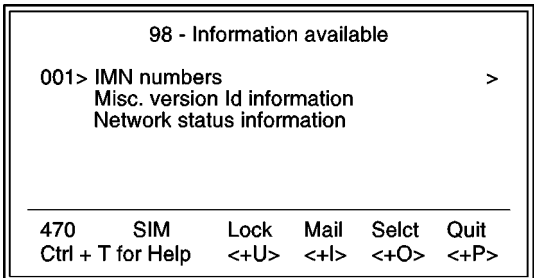
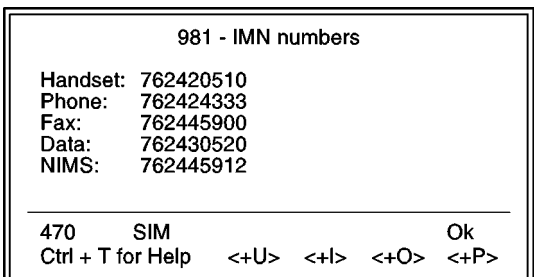
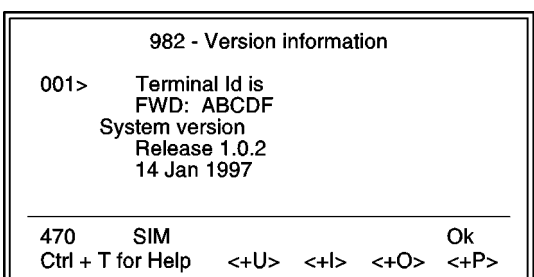
- The IMN numbers assigned to the SCS system. The access level must be set to Owner for editing of the numbers on the telephone or CHV2 for editing of the numbers on the SIM card.
- Forward ID number which identifies your particular system and SIM card if installed.
- System version numbers of the internal software programs.
- Network status information (only appears when **Set diagnostics** is On, or the access level is set to Owner).

To view the information, perform the procedure in Table 2-45.

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Table 2-45. Procedure to View Information

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402®
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24443®
4. Scroll down to Information available.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Information available window.	 	 AD-24444®
6. Selecting Selct or pushing the right arrow button again opens the Information available window.	 	 AD-24445®
NOTE: To view the Miscellaneous version ID information, select Selct or push the right arrow button on the Information available window with the marker on Misc. version Id information.	 	 AD-24446®

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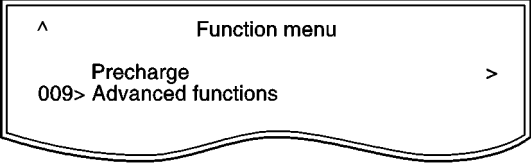
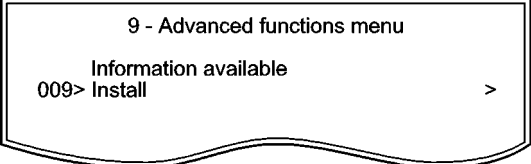
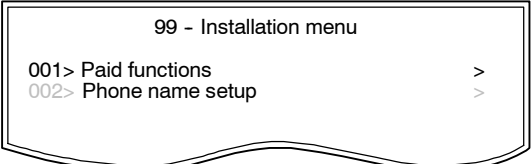
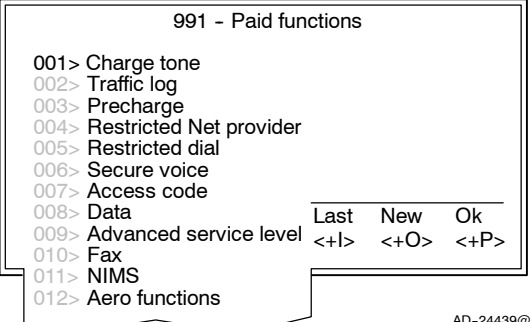
SCS-1000 Mini-M Aero SATCOM System

(6) Installation

(a) Paid Functions

This function appears only in the Owner level (non-SIM operation). To set up the paid functions, perform the procedure in Table 2-46.

Table 2-46. Paid Functions Setup Procedure

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402@
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24437@
4. Scroll down to Install.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Installation menu.	 	 AD-24438@
6. Selecting Selct or pushing the right arrow button again opens the Paid functions list.	 	 AD-24439@

NOTE: The list only shows the purchased functions.

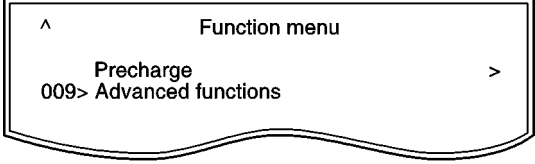
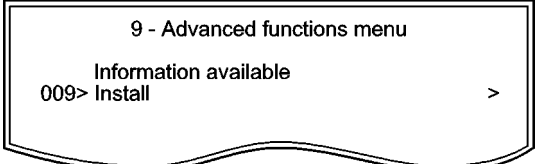
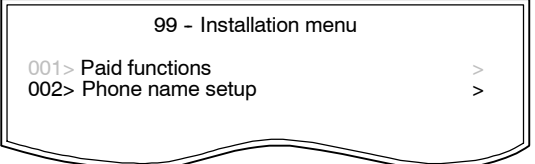
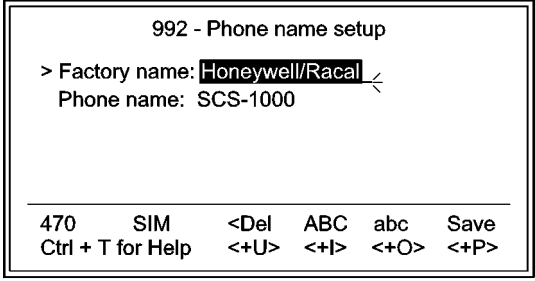
SYSTEM DESCRIPTION AND INSTALLATION MANUAL

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(b) Phone Name Setup

This function appears only in the Owner level (non-SIM operation). To set up the phone name, perform the procedure in Table 2-47.

Table 2-47. Phone Name Setup Procedure

Task	Key Strokes	PC Screen Display
1. Selecting Menu on the Main window opens the Function menu window.	 	 AD-24402@
2. Scroll down to Advanced functions.		
3. Selecting Selct or pushing the right arrow button on the Functions menu opens the Advanced functions menu.	 	 AD-24437@
4. Scroll down to Install.		
5. Selecting Selct or pushing the right arrow button on the Advanced Functions menu opens the Installation menu.	 	 AD-24438-1@
6. Selecting Selct or pushing the right arrow button on the Installation menu opens the Phone name setup window.	 	 AD-24441@
a. Del (pushing the CONTROL and U keys) modifies the entries. b. ABC (pushing the CONTROL and I keys) enters uppercase letters, as required. c. abc (pushing the CONTROL and O keys) enters lowercase letters, as required. d. Save (pushing the CONTROL and P keys) stores the modified phone name.		

MECHANICAL INSTALLATION

1. General

This section contains information on how and where to mount each component of an SCS system installation. For new installations, plan installation in two stages. First, determine location of the LRUs in the aircraft. Next, determine the length of RF and electrical interconnections for selected locations.

2. Equipment and Materials

Contact the aircraft Original Equipment Manufacturer (OEM) for a list of materials necessary to install the SCS system.

3. Mechanical Installation Provisions

A. Circuit Breaker Provisions

The SCS system must be protected by a circuit breaker and switch. The rating of the circuit breaker depends on the breaker slowness, due to the surge that occurs at switch on. The circuit breaker requirements are as follows:

Continuous Current:	1.95 A at 20.5 V (minimum voltage)
In-rush Current:	• 20.1 A for 0.11 second at 32.2 V (maximum voltage) • less than 17A for 0.13 seconds when supplied by 27.5 V dc • 12.8 A for 0.18 second at 20.5 V (minimum voltage).
For example, the Klixon 2TC, 3 A circuit breaker, or equivalent, should be sufficient in most installations.	

B. Aero Antenna Unit Provisions

Mechanical installation data for the AAU is shown in Figure 3-1.

The AAU is attached to the fuselage with eight screws. Structural modifications must be made to the aircraft to accommodate the extra loads and adapt the flat underside of the AAU to the curvature of the fuselage. An installation kit is available to simplify this task. Refer to Section 8, Vendor Equipment.

C. Antenna Control Unit Provisions

Mechanical installation data for the ACU is shown in Figure 3-2.

The ACU is designed to be placed in the area of the pressurized/temperature controlled cabin. It is preferable that the ACU be placed between the insulator and the inner cabin liner and not between the outer skin and the insulation, due to the extreme low temperatures on the skin. The ACU can be placed between the cabin liner and the fuselage. To minimize cable attenuation, place the ACU as close to the antenna as possible. The ACU needs to be grounded to aircraft common.

NOTE: Make sure that the ACU is not placed against dissimilar metals.

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D. Power Supply Unit Provisions

Mechanical installation data for the PSU is shown in Figure 3-3.

The PSU is designed to be placed in the area of the pressurized/temperature controlled cabin. The PSU must be mounted against a prepared aluminum surface and cannot be against the base aluminum. It is preferable that the PSU be placed between the insulator and the inner cabin liner and not between the outer skin and the insulation due to the extreme low temperatures on the skin. The PSU can be placed between the cabin liner and the fuselage. The distance between the PSU, ACU, TPU, and HSU is not critical.

E. Telephone Unit Provisions

Mechanical installation data for the TPU is shown in Figure 3-4.

The TPU is designed to be placed in the area of the pressurized/temperature controlled cabin. The TPU must be mounted against a prepared aluminum surface and cannot be against the base aluminum. It is preferable that the TPU be placed between the insulator and the inner cabin liner and not between the outer skin and the insulation due to the extreme low temperatures on the skin. The TPU can be placed between the cabin liner and the fuselage. The distance between the TPU, ACU, PSU, and HSU is not critical.

NOTE: The TPU can accommodate a SIM card. If this option is required, place the TPU in an area where it can easily be accessed.

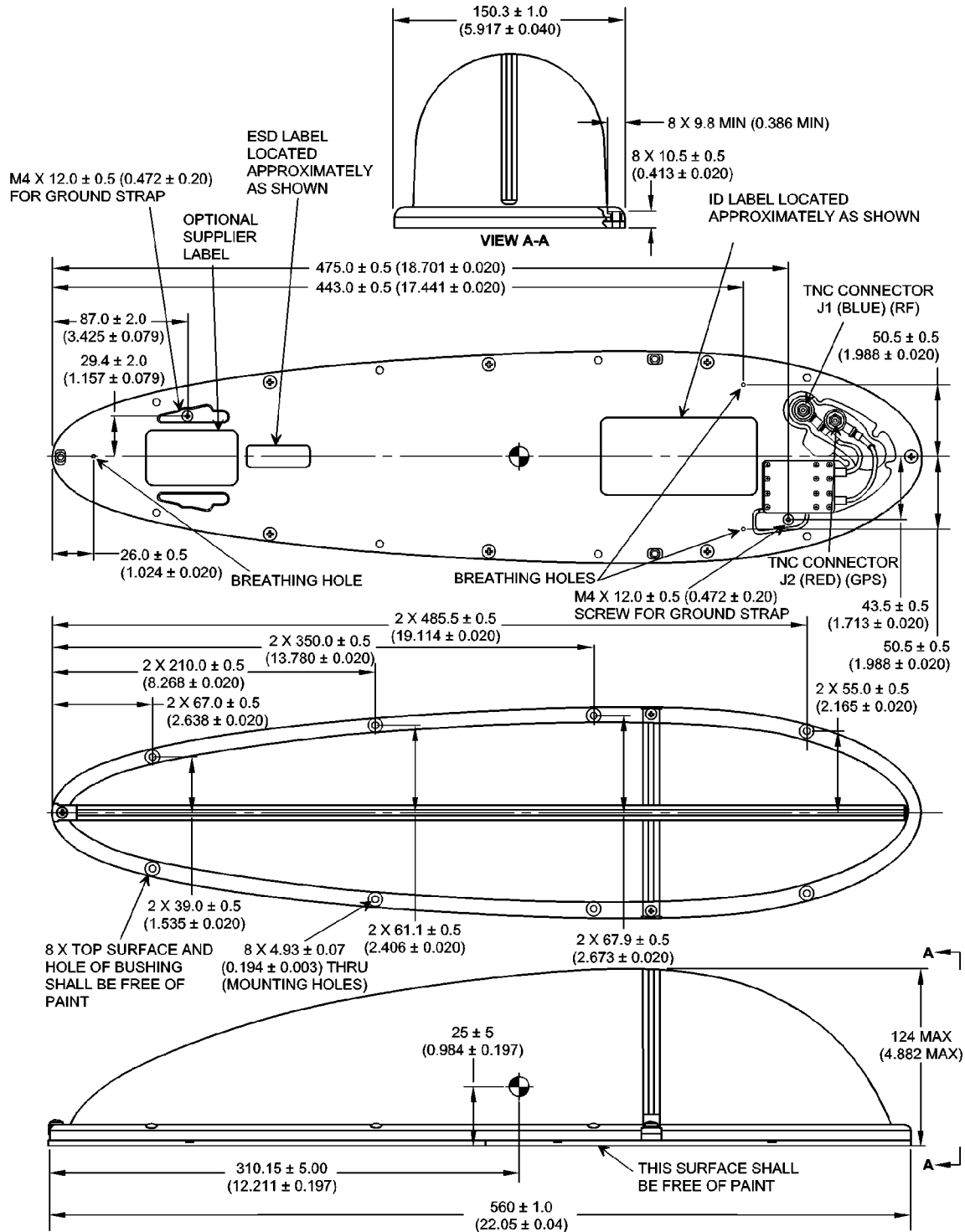
F. Handset Unit Provisions

Mechanical installation data for the HSU is shown in Figure 3-5. The HSU is held in a handset clip.

CAUTION: TO PREVENT THE HANDSET FROM INADVERTENTLY DISLODGING DURING A HARD LANDING, THE HANDSET CRADLE SHOULD BE MOUNTED FACING THE REAR, STARBOARD, OR PORT SIDE OF THE AIRCRAFT. THIS PREVENTS THE HSU FROM BECOMING A LOOSE OBJECT HAZARD.

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NOTES:

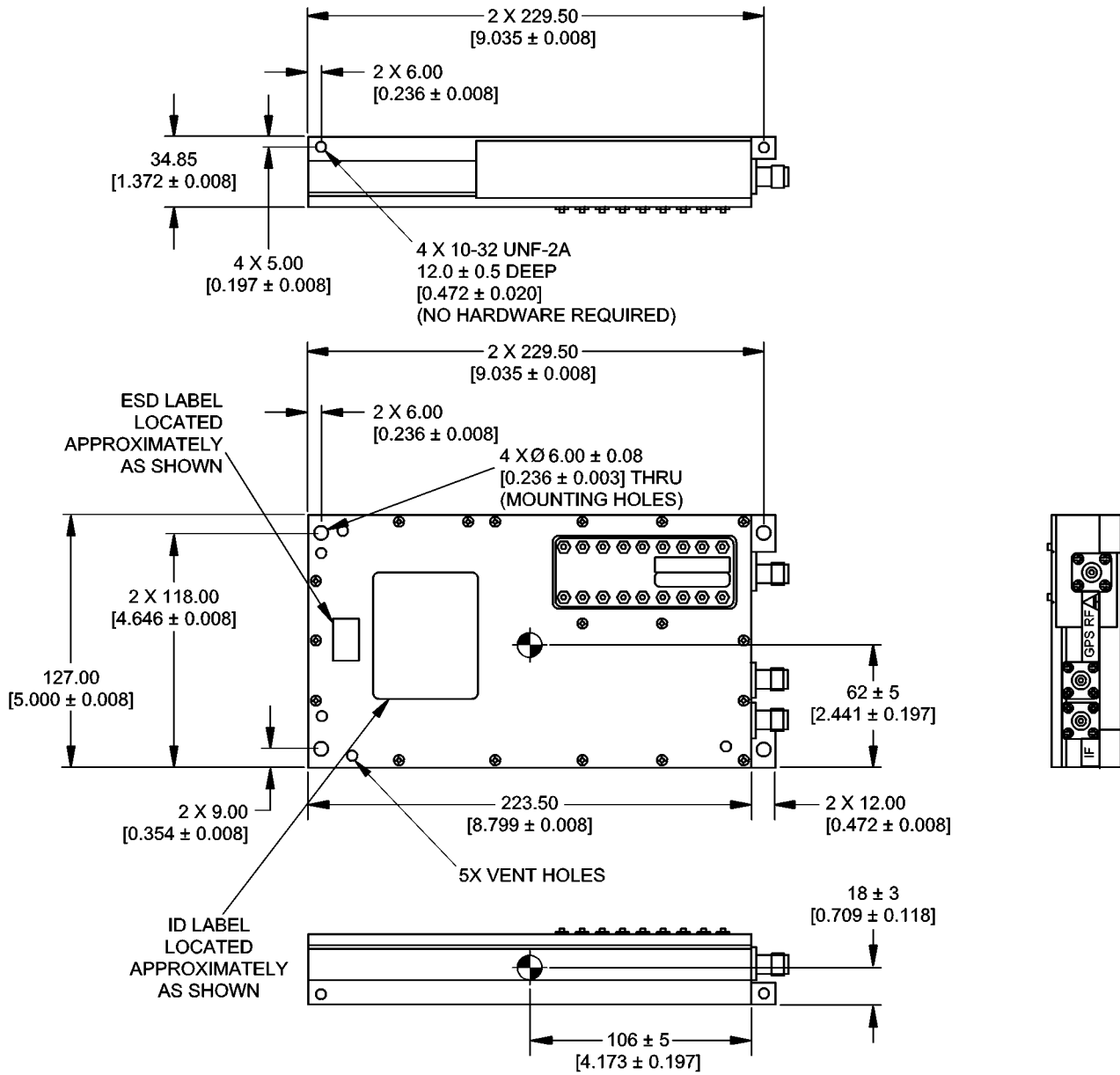
1. ALL DIMENSIONS ARE IN MILLIMETERS/(INCHES).
2.  DENOTES APPROXIMATE CENTER OF GRAVITY.

AD-22970-R2@

Figure 3-1. AAU Outline and Installation Drawing

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SCS-1000 Mini-M Aero SATCOM System



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS/[INCHES].
2. DENOTES APPROXIMATE CENTER OF GRAVITY.

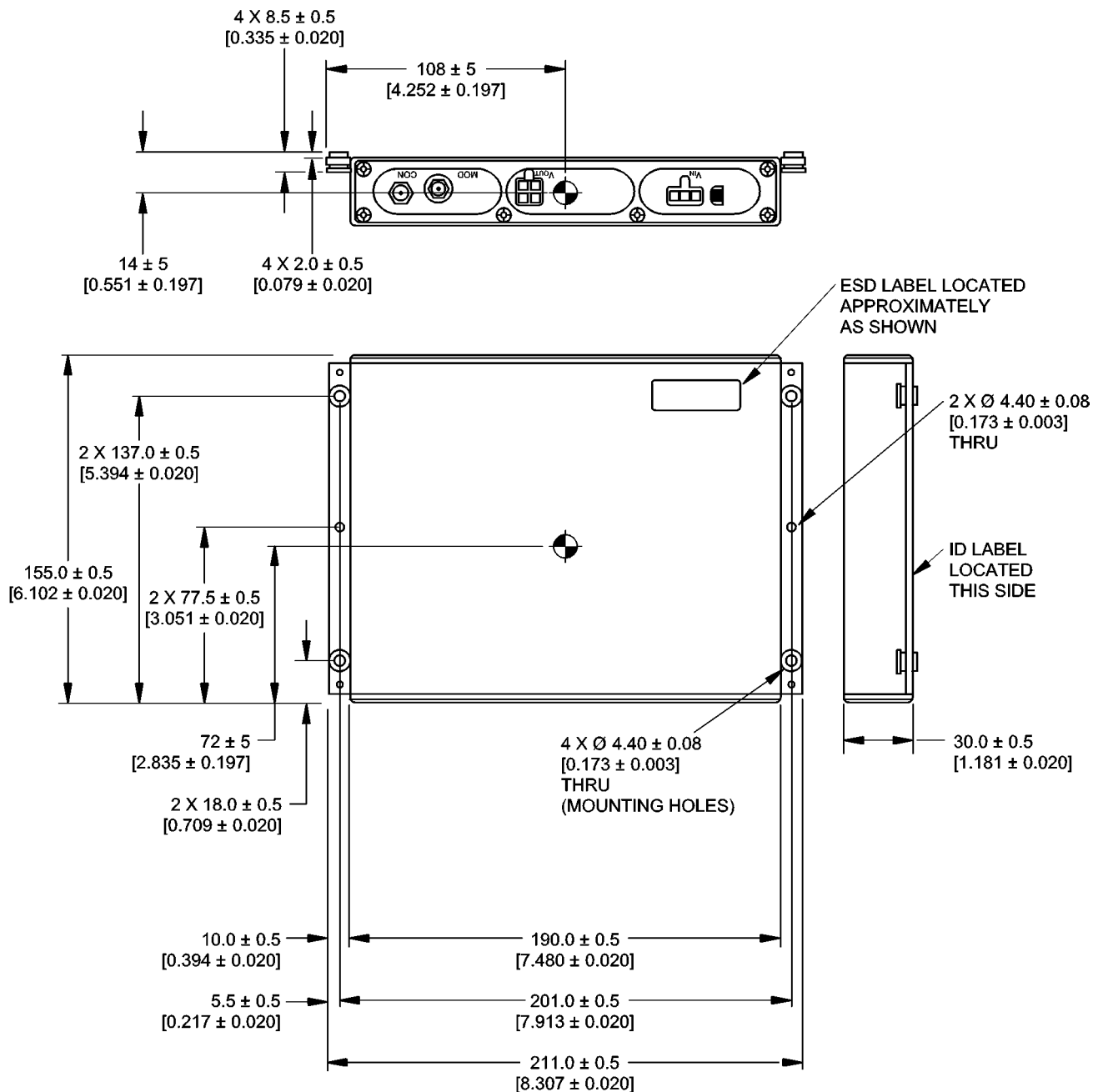
CONNECTOR DEFINITION		
NAME	COLOR	TYPE
RF	BLUE	TNC FEMALE
GPS	RED	TNC FEMALE
IF	YELLOW	TNC FEMALE

AD-22972-R2@

Figure 3-2. ACU Outline and Installation Drawing

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NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS/[INCHES].
2.  DENOTES APPROXIMATE CENTER OF GRAVITY.

AD-22974-R2@

Figure 3-3. PSU Outline and Installation Drawing

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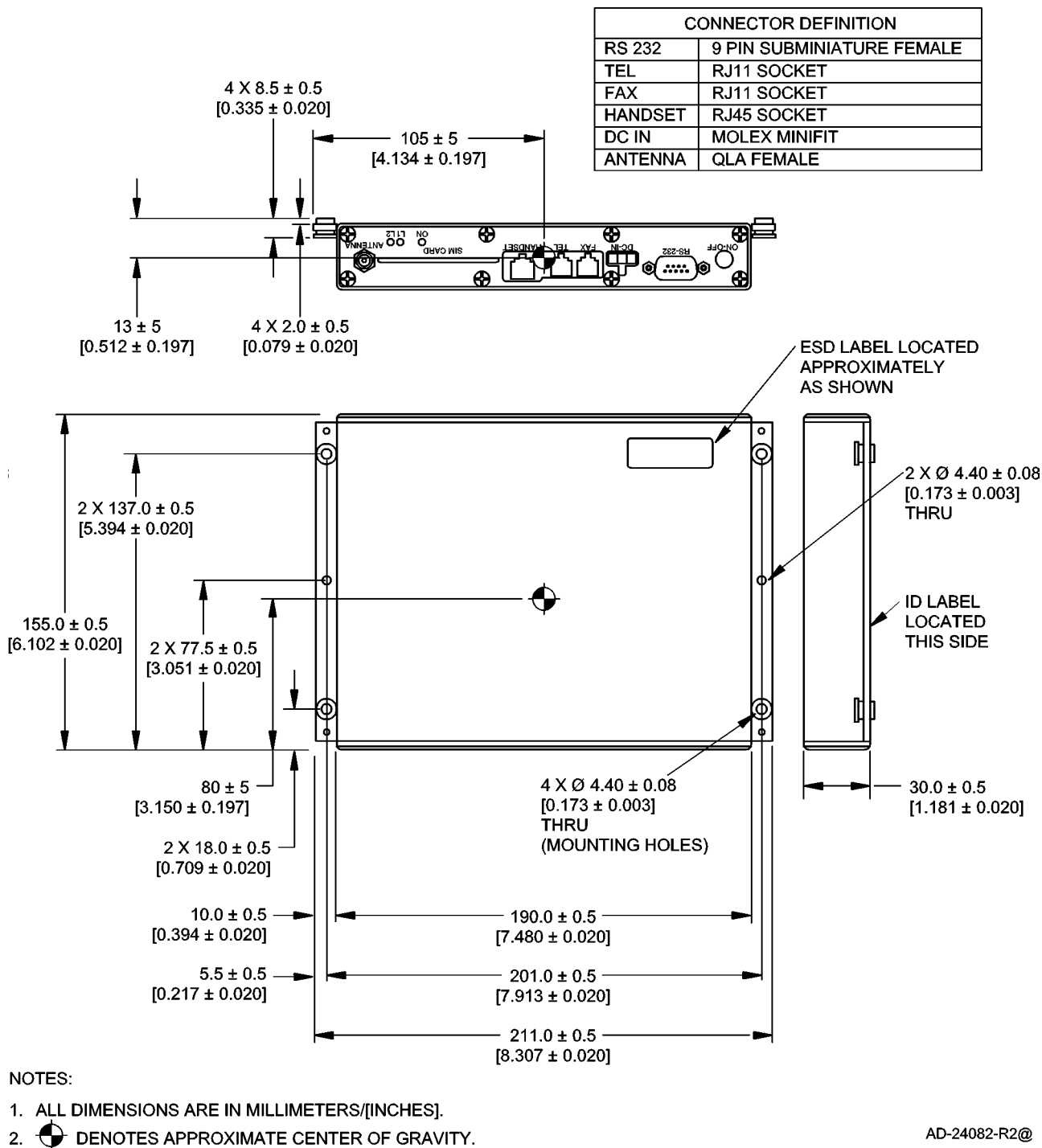
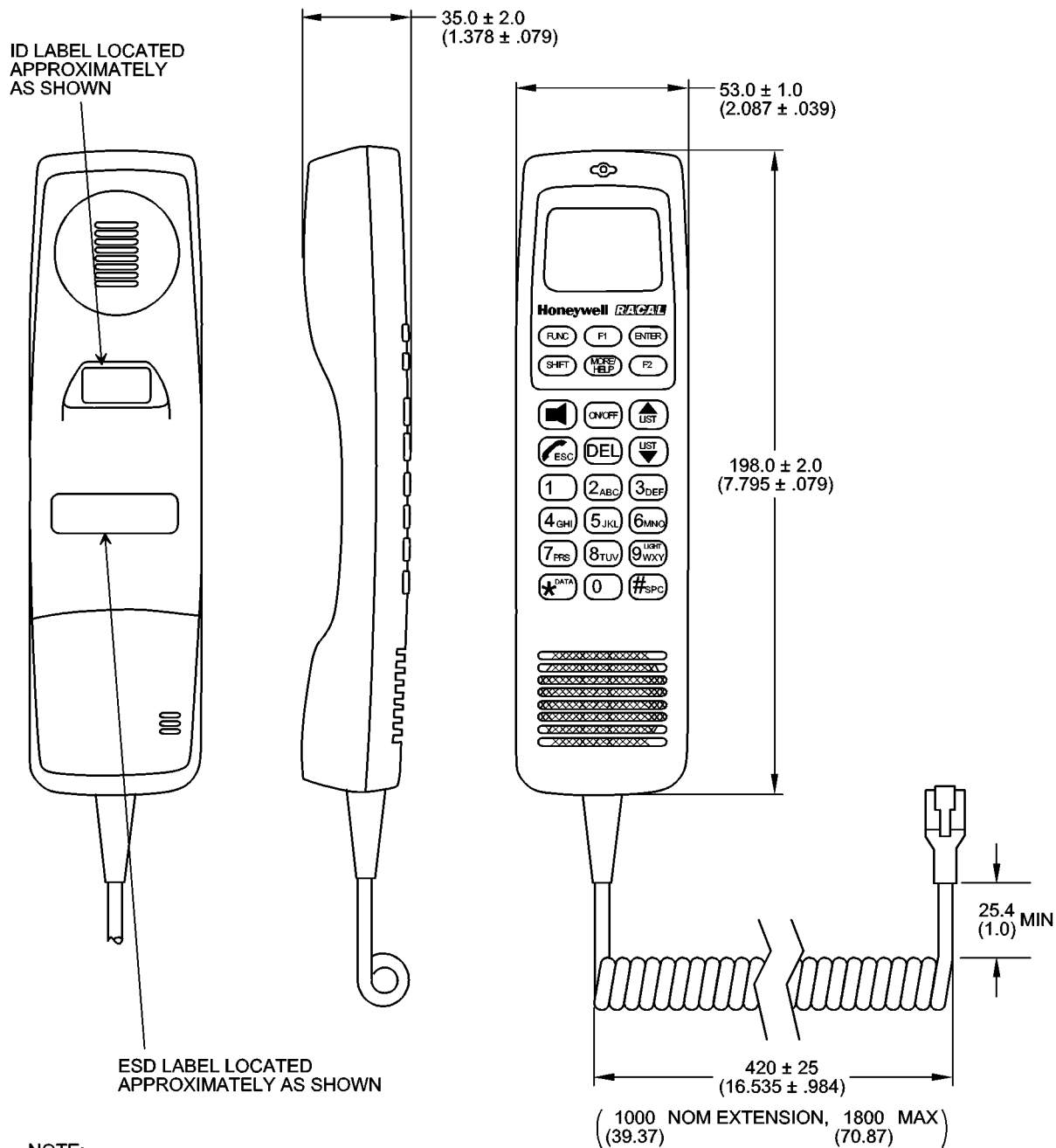


Figure 3-4. TPU Outline and Installation Drawing

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NOTE:
DIMENSIONS ARE IN MILLIMETERS/(INCHES).

AD-24084-R2@

Figure 3-5. HSU Drawing

G. Cable Provisions

(1) Antenna Cable Assembly

The cable length is installation and cable loss dependent. It is made up of one TNC 50 Ohm right-angle connector, one TNC 50 Ohm straight connector, and double-shielded 50 Ohm coaxial cable. The cable loss must be equal to or less than 0.75 dB. Figure 3-6 shows the antenna cable assembly.

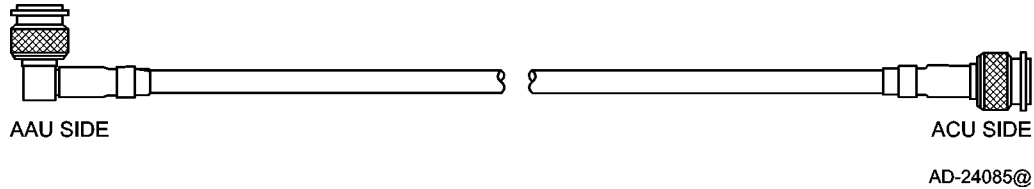


Figure 3-6. Antenna Cable Assembly

(2) GPS Cable Assembly

The cable length is installation dependent. It is made up of one TNC 50 Ohm right-angle connector, one TNC 50 Ohm straight connector, and double shielded 50 Ohm coaxial cable. The cable loss must not exceed 10 dB. Figure 3-7 shows the GPS cable assembly.

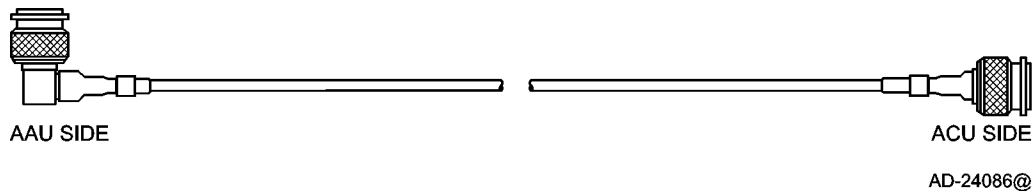


Figure 3-7. GPS Cable Assembly

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(3) IF Cable Assembly

The cable length is installation dependent. It is made up of one QLA 50 Ohm right-angle connector, one TNC 50 Ohm straight connector, and double shielded 50 Ohm coaxial cable. The cable loss must not exceed 8 dB. Figure 3-8 shows the IF cable assembly.

NOTE: The cable loss sum of the IF and TPU RF cables must not exceed 10 dB.

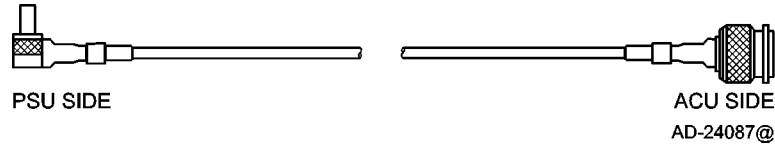


Figure 3-8. IF Cable Assembly

(4) TPU RF Cable Assembly

The cable length is installation dependent. It is made up of one QLA 50 Ohm right-angle connector, one SMA 50 Ohm right-angle connector, and double shielded 50 Ohm coaxial cable. The cable must not exceed 2 dB. Figure 3-9 shows the TPU RF cable assembly.

NOTE: The cable loss sum of the IF and TPU RF cables must not exceed 10 dB.

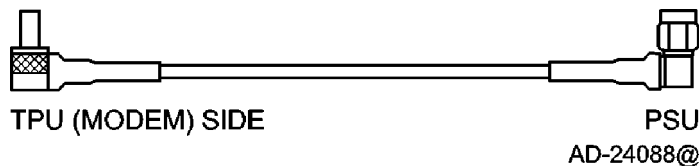


Figure 3-9. TPU RF Cable Assembly

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(5) TPU Power Cable Assembly

The cable length is installation dependent. There is no recommended maximum length as long as the cable performance requirements are met, which is a resistance of less than 0.5 ohms. Figure 3-10 shows the TPU power cable assembly.

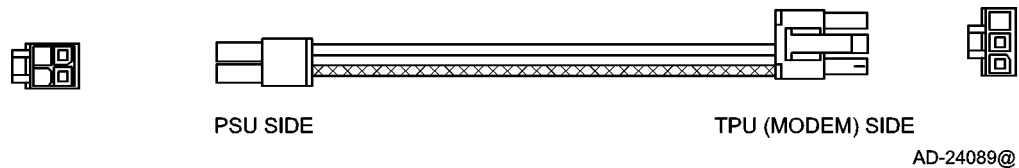


Figure 3-10. TPU Power Cable Assembly

(6) Power Cable Assembly

The cable length is installation dependent. There is no recommended maximum length as long as the cable performance requirements are met, which is a resistance of less than 0.5 ohms. Figure 3-11 shows the power cable assembly.

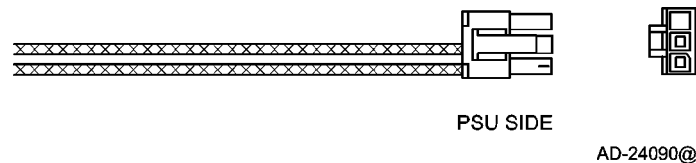


Figure 3-11. Power Cable Assembly

4. Mechanical Installation Instructions

A. AAU Installation

(1) Positioning the AAU

Because the AAU communicates with satellites, the AAU must be positioned on the top of the fuselage. Try to position the AAU near the middle of the cabin area or slightly to the rear. Many factors influence the performance of the system. Factors that influence the final position are as follows:

- Tail Plane RF Blockage

The tail plane and ventral strake block a small amount of the RF beam. For small aircraft (less than 12,500 lb [5700 kg]), place the AAU at least 10 ft. (3 m) forward of the base of the tail plane.

- Other Antennas

Transmissions from the AAU may affect other RF systems. The GPS antenna is most likely to be affected. Mount the AAU at least 1.65 ft (0.5 m) from the GPS antenna. For GPS antennas with poor filtering or high gain, mount the AAU at least 5 ft (1.5 m) away. Mount the AAU at least 15 inches (381 mm) from the ADF antenna.

- Magnetic Environment

The AAU contains magnetometers that can be affected by ferrous materials, magnets, or large currents in cables located nearby. Do not place the AAU directly above speakers.

- Fuselage Structure

The AAU is designed to be positioned above the pressurized area, but other locations are acceptable. It can be positioned on either side the the center line of the fuselage, but keep the offset to a minimum. Use the template to determine the best position so that the required holes do not interfere with structure components.

- Distance from Front

Position the AAU as far from the front of the cabin as possible to reduce drag, wind noise, lightning strikes, and damage from airborne objects.

- Engines and APU Inlets

Position the AAU out of the engine zone of influence and APU inlets.

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(2) Warranty Conditions

CAUTION: THE WARRANTY FOR THE ANTENNA (AAU) IS VALID ONLY IF THE WARRANTY CONDITIONS ARE MET.

The warranty conditions for the AAU are as follows:

- Adapter plate design is approved. Adapter plates produced by the vendors listed in the VENDOR EQUIPMENT section have been approved.
- Drainage slots in the adapter plate must remain uncovered after installation.
- Breathing holes must be covered/left open according to the instructions in paragraph 4.A.(3)(b).
- The two grounding lug holes must be blocked by a grounding strap mounting screw.

(3) Installing the AAU

WARNING: TO AVOID POTENTIALLY DANGEROUS EXPOSURE TO RADIO FREQUENCY ENERGY OF MORE THAN 5 MW/CM² WITHIN A FEW FEET OF THE ANTENNA, DO NOT OPERATE THE SCS SYSTEM WHEN ANY PERSONNEL ARE WITHIN 3 FEET (0.9 M) OF THE ANTENNA FOR PERIODS OF LONGER THAN 3 MINUTES PER HOUR.

CAUTION: TO PREVENT RECALIBRATION OF THE AAU, USE DEMAGNETIZED HARDWARE AND TOOLS.

Figure 3-12 shows a cross section of a typical AAU installation. Figure 3-13 shows the holes required on the fuselage in a typical AAU installation. Perform the following:

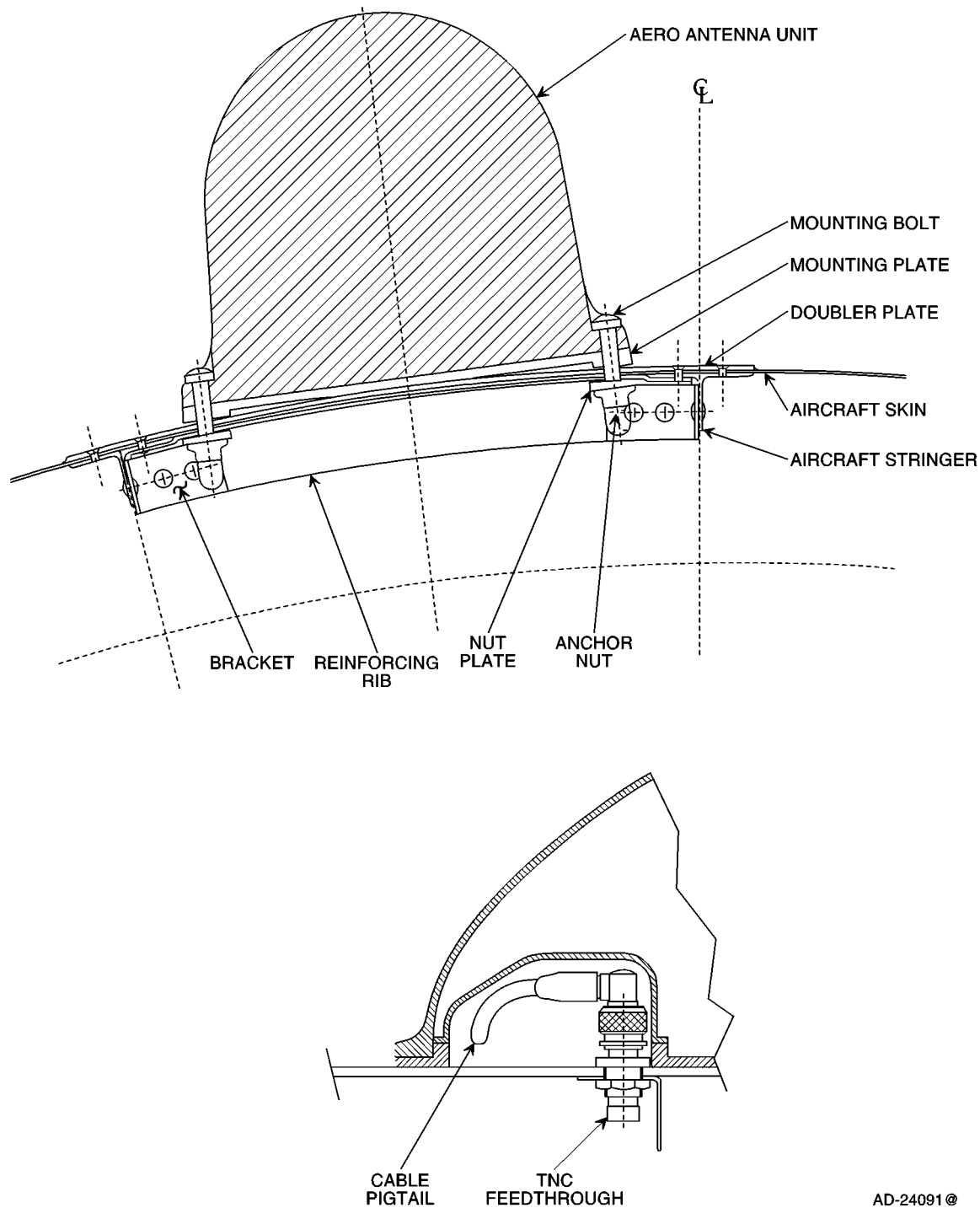
- (a) Determine the best position for the AAU.
- (b) Determine which breathing holes need to be sealed. The AAU has three breathing/drainage holes in its base, as indicated in Figure 3-1, to accommodate different orientations left and right of centerline. If all of the breathing holes are left open, water can potentially enter the AAU directly or air can potentially flow continually through the AAU, giving rise to excessive condensation inside the AAU. Two of the three holes must be blocked off. The two holes which must be blocked off are the rear breathing hole and the highest of the two forward holes. This will allow gravity to drain any collected water when on the ground. For the case where the AAU is mounted horizontally level and neither forward breathing hole is higher than the other, then either one of the two forward holes can be blocked.

CAUTION: FAILURE TO COVER THE TWO BREATHING HOLES DESCRIBED ABOVE WILL RESULT IN WATER ENTERING THE ANTENNA. EXCESSIVE INGRESS OF WATER INTO AAU WILL RESULT IN DAMAGE TO INTERNAL ELECTRONICS.

- (c) Apply sealing compound to the doubler plate. Install the doubler plate in the selected position.

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Figure 3-12. Cross Section of a Typical AAU Installation

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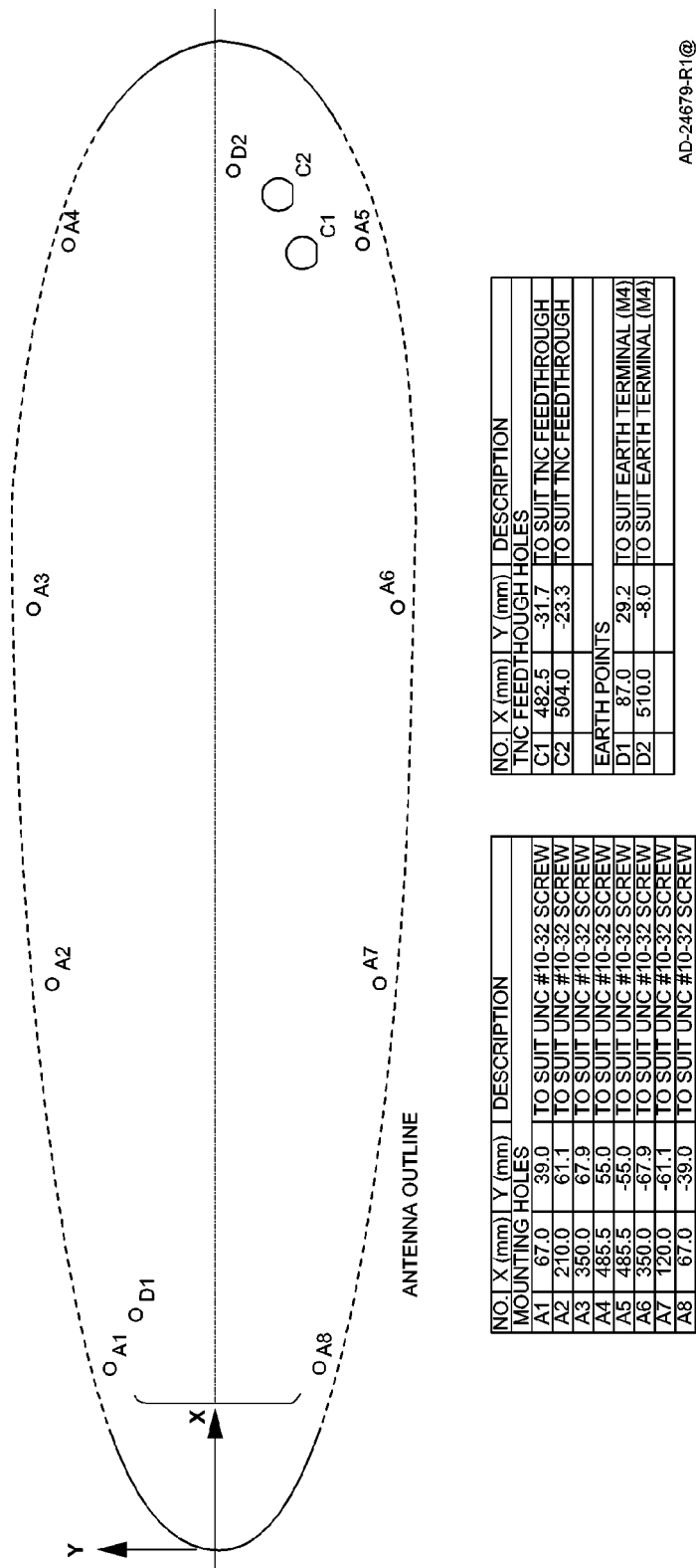


Figure 3-13. Fuselage Holes Required in Typical AAU Installation

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- (d) Apply sealing compound to the transverse ribs. Install four transverse ribs to correspond with the mounting holes. The foremost rib must be wide enough to accommodate the connector feedthrough holes. Figure 3-14 shows a typical installation of the transverse ribs.

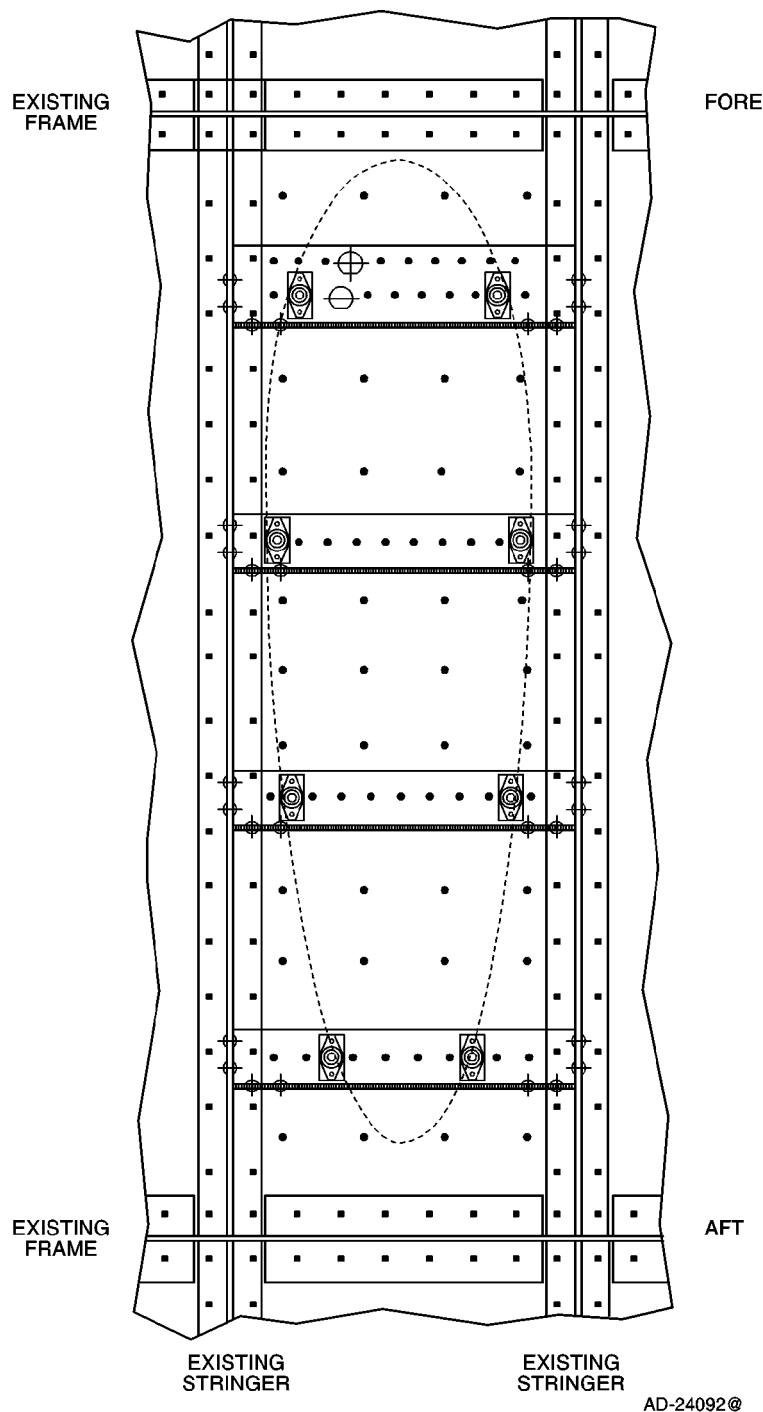


Figure 3-14. Installation of Transverse Ribs

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- (e) Position the mounting plate and template on the fuselage. Using the marks supplied on the template, align the mounting plate to the fore-aft axis of the fuselage. Drill eight 0.138 in. (3.5 mm) starting holes for the mounting holes shown in Figure 3-15. The final drilled mounting holes must be 0.189 in. (4.8 mm) minimum and 0.197 in. (5.0 mm) recommended.

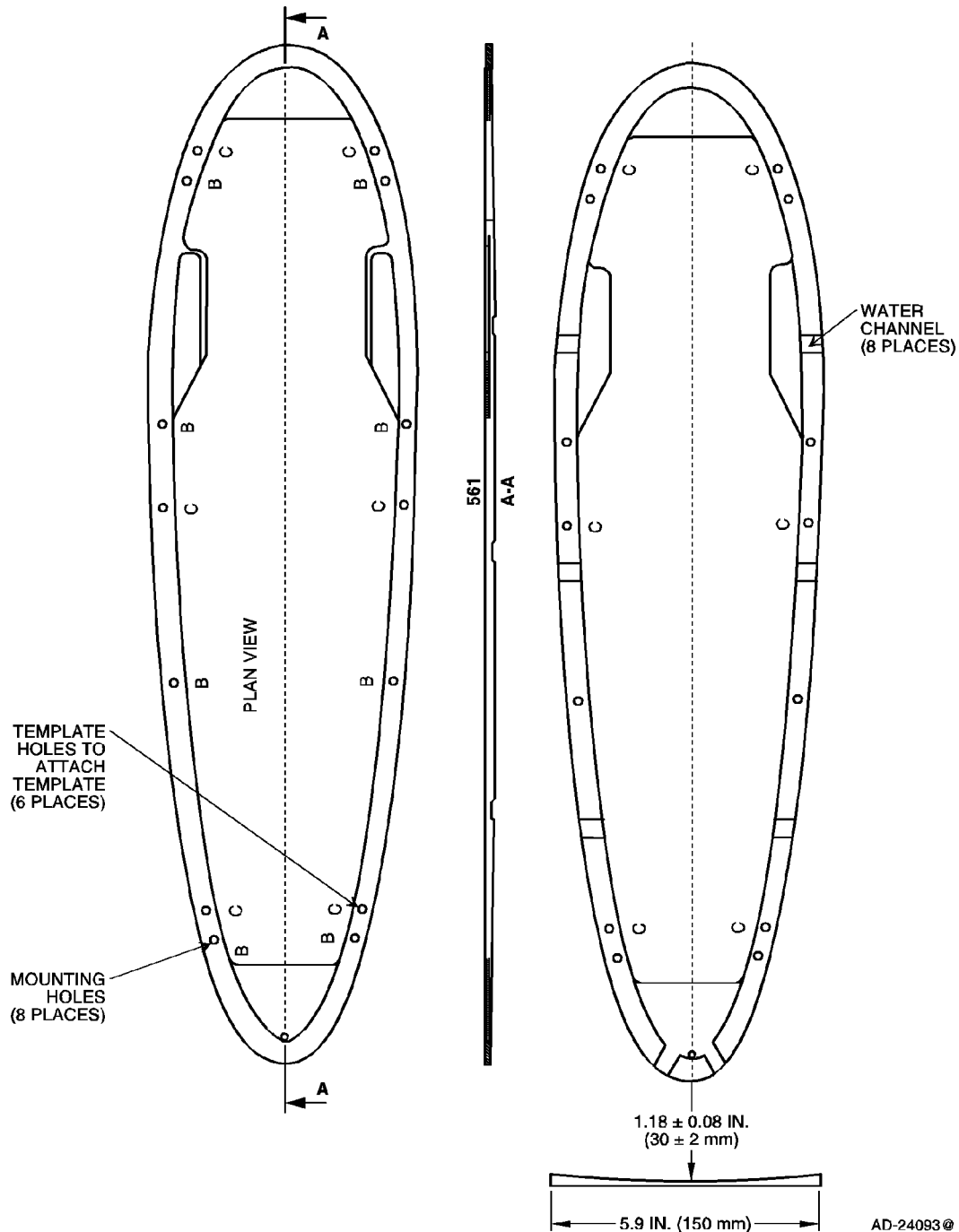


Figure 3-15. Mounting Plate

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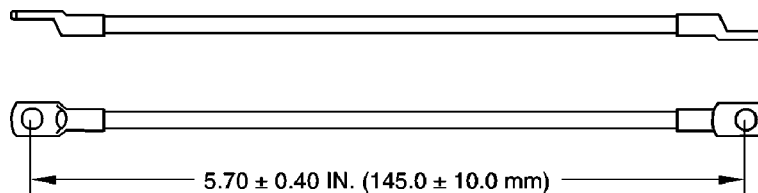
- (f) Install eight nut plates and anchor nuts on the transverse ribs. Figure 3-14 shows the position of the nut plates and anchor nuts.
- (g) Apply a sealing compound to the curved surface of the mounting plate. Assemble the mounting plate to the fuselage using eight mounting bolts. Make sure the water channels of the mounting plate are free of sealing compound. Allow the sealing compound to cure.

CAUTION: COVERING THE ADAPTER PLATE WATER CHANNELS CAN ALLOW WATER TO GET INTO THE AAU.

- (h) Remove the template from the mounting plate. Six threaded holes are left by the removal of the template. Fill them with a sealant to prevent water accumulation. Figure 3-13 shows the position of the template holes.
- (i) Drill two TNC feedthrough holes. Figure 3-14 shows the position of the holes. Install two TNC feedthrough connectors with the O-ring to the outside of the fuselage and the nut on the inside. Safety wire the two nuts together. Color code the connectors with heat shrinkable tubing on both the inside and outside. Use red tubing for the GPS feedthrough and blue tubing for the antenna feedthrough. Figure 3-13 shows the feed through connectors.

NOTE: The O-ring can be on either side with sealant applied to the opposite side.

- (j) Attach two ground straps to the fuselage. Align each strap to face forward. Figure 3-16 shows a ground strap.



NOTES:

1. THE TERMINATIONS MUST HAVE OPPOSITE ORIENTATIONS.
2. THE CABLE MUST BE 16 AWG MINIMUM.

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Figure 3-16. Ground Strap

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- (k) Place the adapter plate over the mounting holes.
- (l) Apply seals to the two breathing holes that were selected in paragraph 4.A.(3)(b).

NOTE: The adapter plates come in two different configurations: one with three rubber seals for covering the breathing holes installed on the adapter plate and the other with the rubber seals for the breathing holes not installed. If the seals are already installed on the adapter plate, the rubber seal to cover the breathing hole that needs to be open should be removed. (Refer to paragraph 4.A.(3)(b)). If the seals are not installed, the two rubber seals needed to cover the breathing holes identified in paragraph 4.A.(3)(b) should be installed in the proper location on the adapter plate to make sure the holes are covered.

- (m) Remove the following warning and installation labels. Figure 3-17 shows the locations of these labels.
 - warranty void label
 - magnetic sensitive device label
 - sealant protection label.

NOTE: The paint warning decal cannot be removed and should be left alone.

- (n) Place the AAU over the mounting holes and tilt up. Attach the ground straps to the AAU base plate.

CAUTION: FAILURE TO INSTALL GROUNDING STRAPS CAN RESULT IN POOR PERFORMANCE OR WATER GETTING INTO THE AAU THROUGH THE GROUNDING STRAP HOLE.

- (o) Connect AAU RF cables to TNC feedthrough connectors. Ensure that they are aligned so that they will fit in the hollow provided in the base plate. Safety wire the connectors together.
- (p) Align the AAU with the mounting holes. Secure the AAU with eight screws. Torque the screws to a value of 44 lb-inch to make sure that the AAU is firmly seated on the fuselage. Apply a sealant to the mounting screw heads to prevent water seepage.

CAUTION: DO NOT SEAL THE AAU/ADAPTER PLATE INTERFACE WITH SEALANT.

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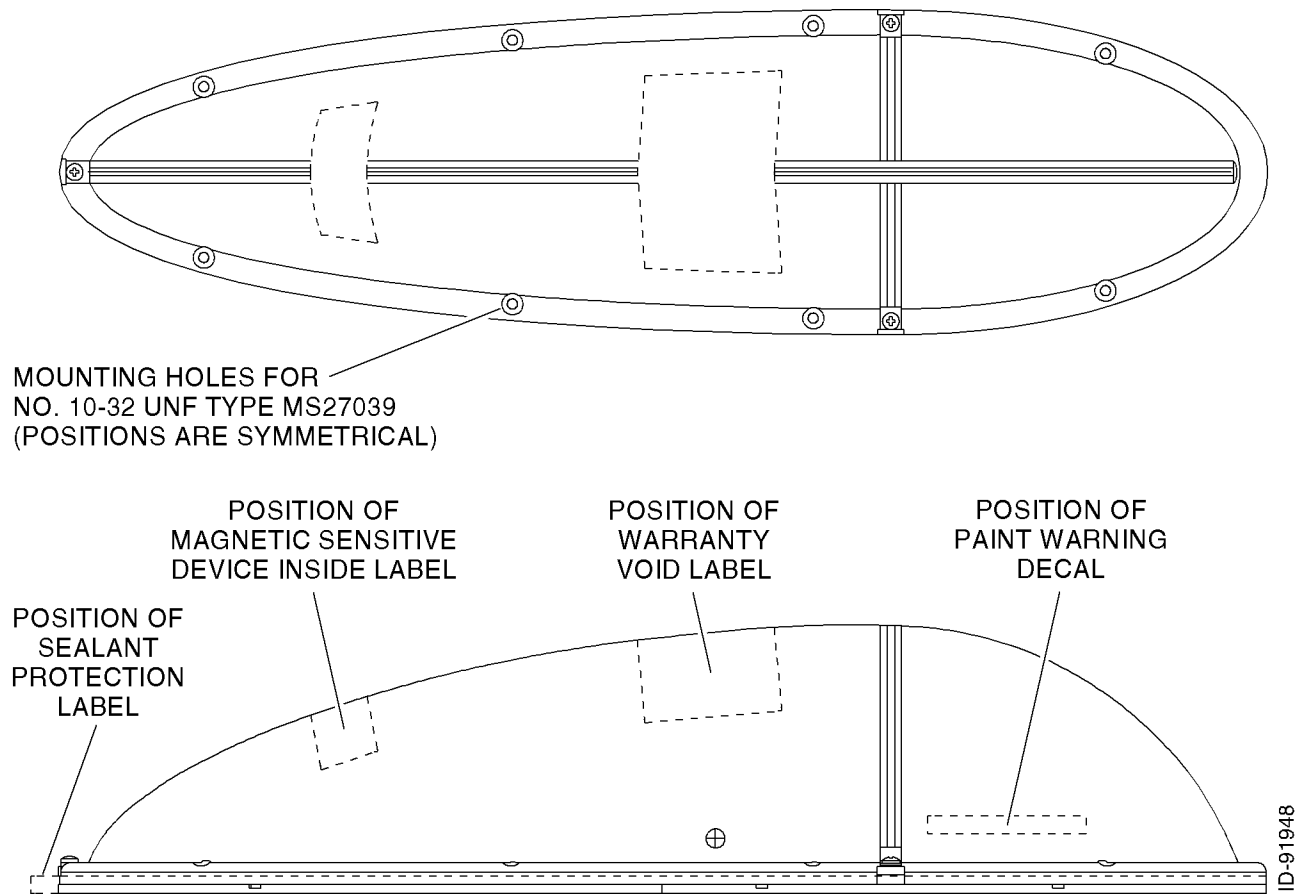


Figure 3-17. Warning and Installation Labels Locations

B. ACU Installation

Place the ACU in the area of the pressurized/temperature controlled cabin. It is preferable that the ACU be placed between the insulator and the inner cabin liner and not between the outer skin and the insulation, due to the extreme low temperatures on the skin. The ACU can be placed between the cabin liner and the fuselage. To minimize cable attenuation, place the ACU as close to the antenna as possible. Maximum cable attenuation is 0.75 dB at 1.6 GHz.

NOTE: Make sure the ACU is not placed against dissimilar metals. A prepared aluminum surface using Alodine or equivalent is acceptable.

C. PSU Installation

Place the PSU in the area of the pressurized/temperature controlled cabin. The PSU must be mounted against a prepared aluminum surface and cannot be against the base aluminum. Prepare the aluminum surface using Alodine or equivalent, per Honeywell Manufacturing Specification M690278-2 (MIL-C-5541, Class 3). It is preferable that the PSU be placed between the insulator and the inner cabin liner and not between the outer skin and the insulation due to the extreme low temperatures on the skin. The PSU can be placed between the cabin liner and the fuselage. The distance between the PSU and the ACU, TPU, and HSU is not critical. Maximum cable attenuation is 10 dB at 1.6 GHz.

The TPU and PSU may be installed together using a installer or user supplied bracket. Figure 3-18 shows a typical installation of the PSU and TPU together.

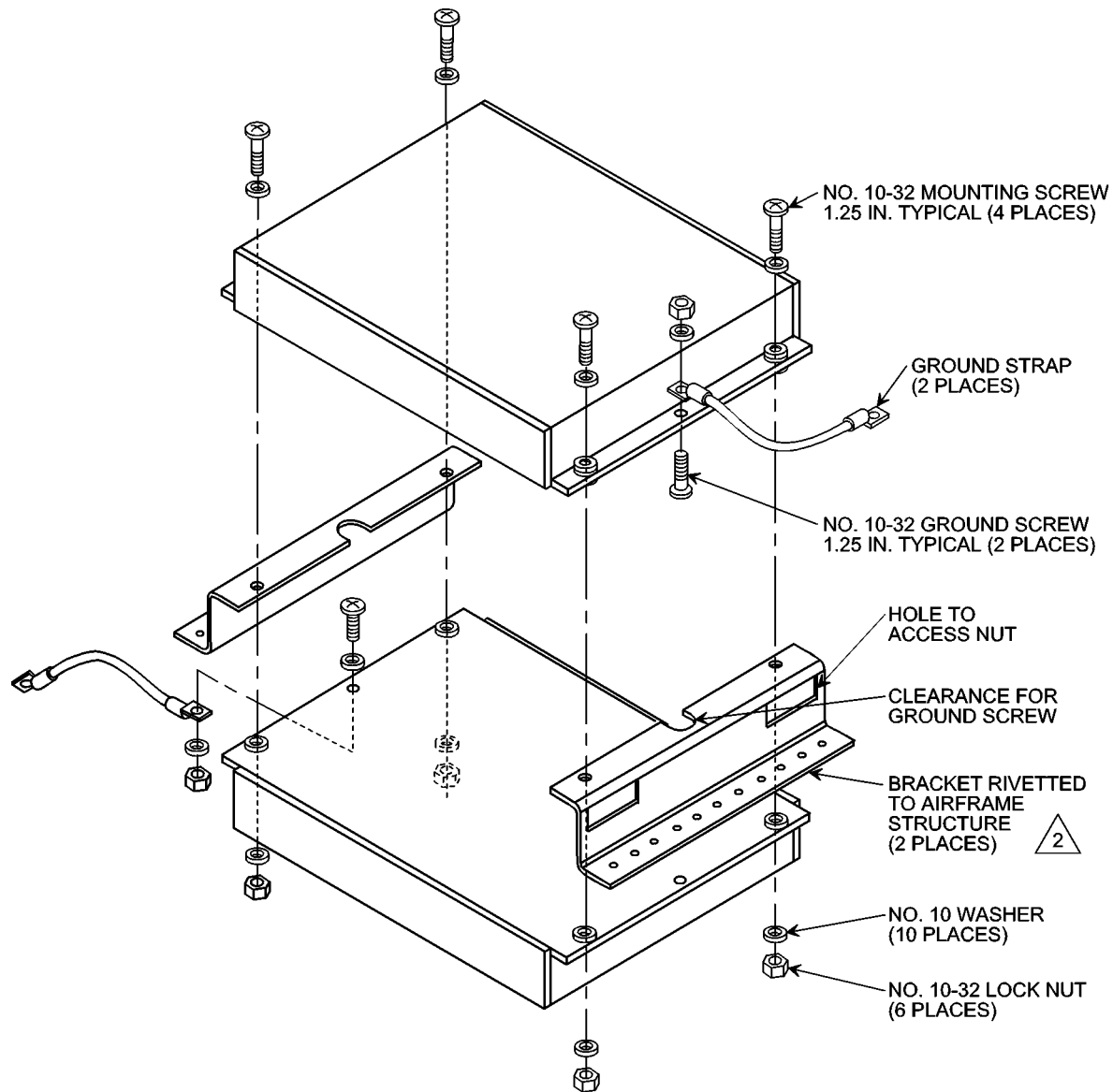
D. TPU Installation

Place the TPU in the area of the pressurized/temperature controlled cabin. The TPU must be mounted against a prepared aluminum surface and cannot be against the base aluminum. Prepare the aluminum surface using Alodine or equivalent, per Honeywell Manufacturing Specification M690278-2 (MIL-C-5541, Class 3). It is preferable that the TPU be placed between the insulator and the inner cabin liner and not between the outer skin and the insulation, due to the extreme low temperatures on the skin. The TPU can be placed between the cabin liner and the fuselage. The distance between the TPU and the ACU, PSU, and HSU is not critical. Maximum cable attenuation is 10 dB at 1.6 GHz.

The TPU and PSU may be installed together using a installer or user supplied bracket. Figure 3-18 shows a typical installation of the PSU and TPU together.

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NOTES:

1. THE TPU AND PSU ARE NOT REQUIRED TO BE INSTALLED TOGETHER.



- THE BRACKET IS NOT SUPPLIED BY HONEYWELL. IT IS INSTALLER OR USER SUPPLIED.

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Figure 3-18. Typical Installation of Telephone Unit and Power Supply Unit Together

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E. HSU Installation

The HSU is held in a handset clip. Figure 3-19 shows the handset cradle.

CAUTION: TO PREVENT THE HANDSET FROM INADVERTENTLY DISLODGING DURING A HARD LANDING, THE HANDSET CRADLE SHOULD BE MOUNTED FACING THE REAR, STARBOARD, OR PORT SIDE OF THE AIRCRAFT. THIS PREVENTS THE HSU FROM BECOMING A LOOSE OBJECT HAZARD.

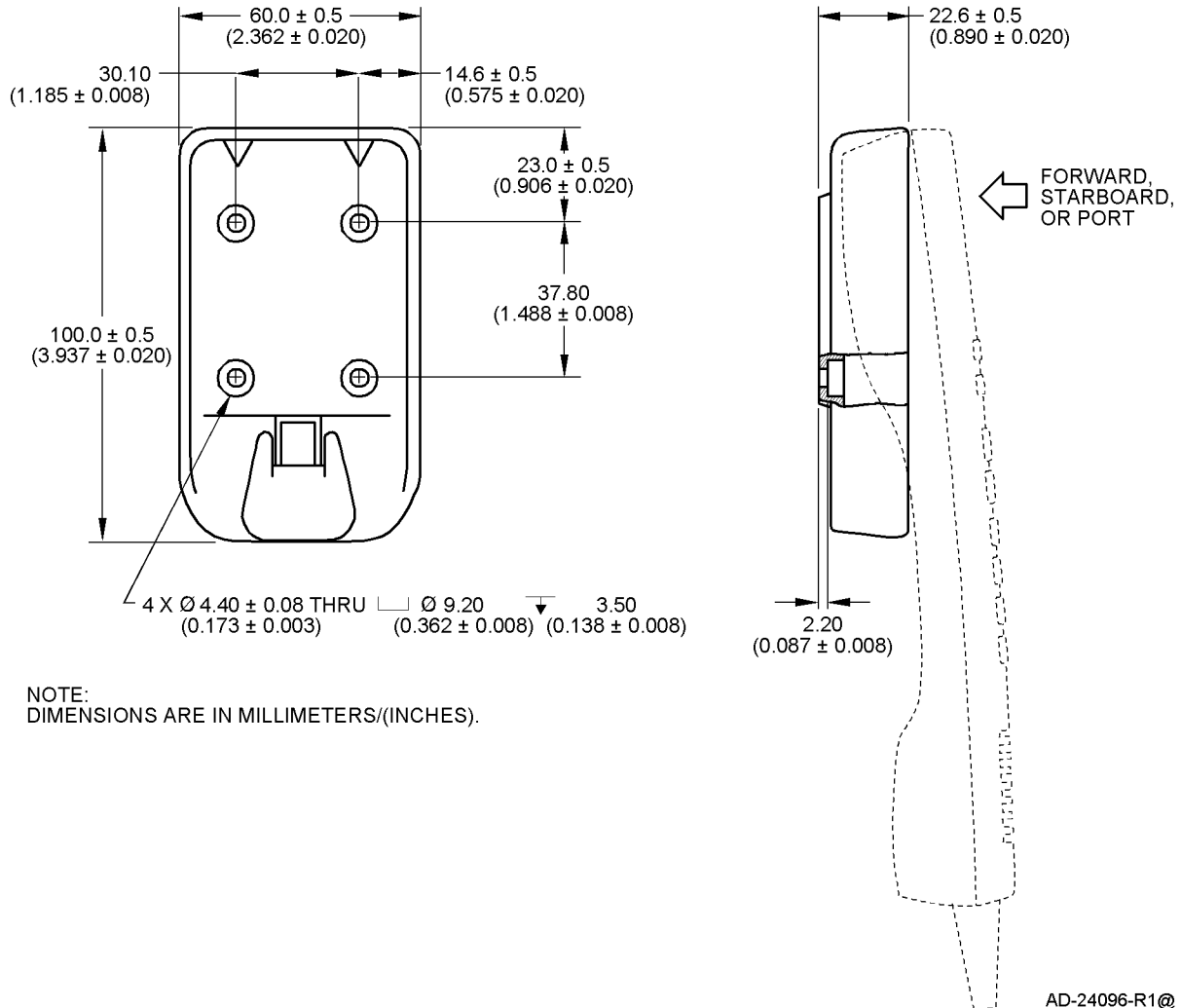


Figure 3-19. Handset Cradle



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ELECTRICAL INSTALLATION

1. General

This section provides electrical installation information, power and ground requirements, and an interconnect diagram for the SCS-1000 system.

2. Equipment and Materials

None.

3. Electrical Installation

A. Power Requirements

The aircraft dc power supply must be 27.5 V dc (nominal). The normal minimum and maximum allowable voltages are 20.5 and 32.2 V dc respectively.

B. Ground Requirements

Proper grounding is a key factor in ensuring proper system operation under normal conditions. The AAU is grounded to the fuselage using two ground straps. For proper grounding, the mating surfaces must be free of all paint and other non-conductive elements and are burnished to ensure a good bond. Make sure that the impedance between the AAU and the fuselage is less than 5.0 milliohm. The ACU must be grounded to the aircraft common.

■ C. Circuit Breaker Requirements

Refer to Section 3, Mechanical Installation.

D. Interconnect Information

The information necessary to provide the electrical interconnects is shown in Figure 4-1.



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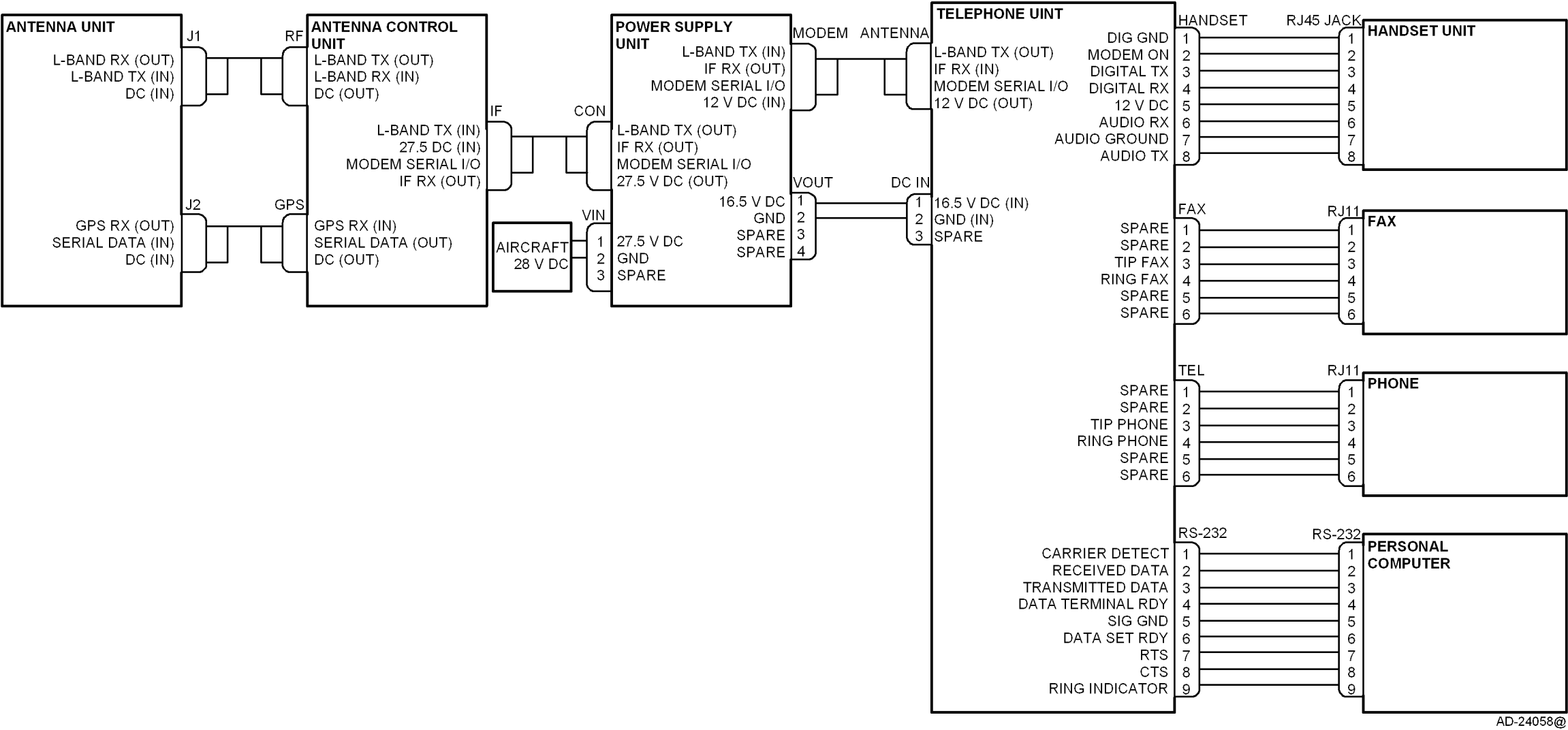
Honeywell

RACAL

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SCS-1000 PIN TO PIN DIAGRAM



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Figure 4-1. SCS-1000 System Interconnect Diagram

ADJUSTMENT/TEST

1. General

This section contains instructions on how to set up the SCS system after it has been installed in an aircraft.

2. Setting Up the System

The following procedures must be performed while the system is connected to an external PC in order to access all of the internal functions. The PC must be set as a VT100 emulator. Refer to PC set up procedures in OPERATION section of this manual.

A. Set Up the Owner Mode

The SCS system must be in the owner mode before the **Aero functions** menu is accessible. To set up the owner mode, perform the following steps:

- (1) Remove the SIM card.

NOTE: The SIM card must be removed before the system is switched on to be able to enter the owner mode.

- (2) Switch the system ON and wait until it has completed initialization. (**INITIALIZING** is displayed on the HSU during initialization and disappears when the initialization is complete.)
- (3) Select the **Menu** function and scroll down to **Set access level**.
- (4) Push **Selct** to open the **Select access level** window.
- (5) Push **Owner** to open the window for entering the owner password.
- (6) Key in the password and push **ENTER**. If the owner mode password has not yet been set, then the default password is **1234567890**.
- (7) Push **OK** to activate the owner mode. (If the access level window is opened again, **Owner level** is displayed if the above procedure has been successful.)
- (8) **Aero functions** should now be accessible from the **Advanced functions** menu.

B. Calibrate the Magnetometer

The AAU contains a three-axes magnetometer for tracking purposes. The magnetometer must be calibrated after installation of the SCS system on the aircraft. Recalibration is only required when the ACU is replaced or when the magnetic characteristics of the aircraft have changed. The calibration can also be affected by iron and steel cargo. Calibration of the magnetometer is performed while the aircraft is slowly being turned through 360 degrees on a smooth flat level surface, away from any large hangars or buildings that could disturb the terrestrial magnetic field.

To calibrate the magnetometer, perform the following steps:

- (1) Park the aircraft on a suitable flat-level surface away from any large hangars or buildings, and ready to be turned through 360 degrees. All aircraft electrical systems must be powered and running to create the aircraft magnetic environment as would be experienced during nominal flight conditions.
- (2) If the SCS system is OFF, switch it ON and access the owner mode using the procedure in paragraph A.
- (3) Select the **Menu** function and scroll down to **Advanced functions**.
- (4) Select **Select** or push **right arrow** and scroll down to **Aero functions**.
- (5) **Select** or **right arrow** opens the **Aero functions** menu.
- (6) Activating **Select** or **right arrow** again opens the **Magnetometer calibration** window.
- (7) Select **Start** to start the calibration procedure and then turn the aircraft through more than 360 degrees. The radius of the circle is not important. The duration of the 360 degree turn should be more than one minute and less than 5 minutes.
- (8) Select **Stop** when the turn is completed. This terminates the calibration process.
- (9) Wait for the calibration result. (Please be patient since the calculation of the calibration result can take up to 1 minute.)

The calibration score indicates the quality of calibration and varies between 15 and 0. The score is defined in Table 5-1.

Table 5-1. Magnetometer Calibration Score

Score	Definition
14 - 15	Excellent
12 - 13	Acceptable
11	Marginal
< 11	Unacceptable
0	Indicates complete calibration failure

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If the calibration score is less than 11, the procedure should be repeated. Consistently low calibration scores may be caused by a noisy magnetic environment near the AAU, which does not necessarily affect the tracking performance of the AAU. This can be verified by rotating the aircraft through 360 degrees while monitoring the signal strength on the HSU. A low calibration score but with a consistent signal (variation < 10) should be accepted. If in doubt, contact your local Honeywell Dealer or regional Honeywell Customer Support Engineer.

The hard iron score indicates the amount of hard iron magnetism relative to the local magnetic field (Table 5-2).

Table 5-2. Magnetometer Hard Iron Score

Score	Definition
15	< 7 percent
14	< 13 percent
13	< 20 percent
12	< 27 percent
11	< 33 percent
10	< 40 percent
9	< 47 percent
8	< 53 percent
7	< 60 percent
6	< 67 percent
5	< 73 percent
4	< 80 percent
3	< 87 percent
2	< 93 percent
1	< 100 percent
0	≤ 100 percent
NOTE: The number of successful calibrations is also shown. A value of 0 indicates that the factory set values are valid and that no successful calibration has been performed yet.	

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C. Configure the Landing Speed

The AAU requires the nominal landing speed for tracking purposes. This parameter only needs to be entered once after installation of the SCS system or when the ACU is replaced. To configure the landing speed, perform the following steps:

- (1) If the SCS system is OFF, switch it ON and access the owner mode using the procedure in paragraph A.
- (2) Select the **Menu** function and scroll down to **Advanced functions**.
- (3) Select **Selct** or push **right arrow** and scroll down to **Aero functions**.
- (4) Select **Selct** or push **right arrow** and scroll down to **Configure landing speed**.
- (5) **Selct** or **right arrow** displays the **Configure landing speed** window.
- (6) Enter the nominal landing speed of the aircraft in meters per second. (To convert from knots to meters per second, refer to Table 5-3.)
- (7) **Save** stores the entered landing speed.

Table 5-3. Conversion Chart

Knots	Meters per Second (Approximately)
80	41
85	44
90	46
95	49
100	51
105	54
110	57
115	59
120	62
125	64
130	67
NOTE: This conversion chart is for reference only.	

D. Satellite Locations

This option is provided to modify the stored locations of the Inmarsat satellites. This would be required in the unlikely event of a satellite being moved to another longitude, or when a new Inmarsat satellite is brought into service at a different location from the existing satellites. Contact your service provider for more information about this option.

To enter a satellite location, perform the following steps:

- (1) If the SCS system is OFF, switch it ON and access the owner mode using the procedure in paragraph A.
- (2) Select the **Menu** function and scroll down to **Advanced functions**.
- (3) Select **Selct** or push **right arrow** and scroll down to **Aero functions**.
- (4) Select **Selct** or push **right arrow** and scroll down to **Satellite locations**.
- (5) **Selct** or **right arrow** displays the **Satellite locations** window.
- (6) Select the appropriate satellite using **Prev** and **Next**.
- (7) Enter the new satellite longitude in degrees.
- (8) Scroll down to **Location**.
- (9) The **right arrow** opens the list of locations, **EAST** or **WEST**.
- (10) Scroll up or down to choose the location.
- (11) Select **Selct** and then **Save** to store the new location.

E. Example Screens

The following figures are examples of the screens that the user sees on the PC when setting up the system.

```
9 - Advanced functions menu

Access control >
002> Aero functions
    Satellite setup
    Configuration
    Information available

                                Lock Mail Selct Quit
Ctrl+T for Help <+U> <+I> <+O> <+P>
```

```
95 - Aero functions

001> Magnetometer calibration >
    Configure landing speed
    Satellite locations

                                Lock Mail Selct Quit
Ctrl+T for Help <+U> <+I> <+O> <+P>
```

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951 - Magnetometer calibration

Press "Start" to initiate the
calibration process for the
aeronautical antenna magnetometer.

	Start	Abort
Ctrl+T for Help	<+U> <+I> <+O>	<+P>

951 - Magnetometer calibration

Turn aircraft 360 degrees.

Press "Stop" when completed.

	Stop	Abort
Ctrl+T for Help	<+U> <+I> <+O>	<+P>

951 - Magnetometer calibration

Calibration succeeded.
Calibration score: 15
Amount of hard iron: 15
Successful calibrations: 1

	Ok
Ctrl+T for Help	<+U> <+I> <+O> <+P>

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95 - Aero functions

Magnetometer calibration

002>Configure landing speed >

Satellite locations

Lock Mail Selct Quit

Ctrl+T for Help <+U> <+I> <+O> <+P>

952 - Configure landing speed

>Landing speed (m/s):

Del Send Ok

Ctrl+T for Help <+U> <+I> <+O> <+P>

95 - Aero functions

Magnetometer calibration

Configure landing speed

003>Satellite locations >

Lock Mail Selct Quit

Ctrl+T for Help <+U> <+I> <+O> <+P>

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953 - Satellite locations

AOR-W

>Longitude: 54

Location: WEST

Prev Next Save Ok

Ctrl+T for Help <+U> <+I> <+O> <+P>

953 - Satellite locations

AOR-W

Longitude: 54

>Location: WEST >

Prev Next Save Ok

Ctrl+T for Help <+U> <+I> <+O> <+P>

953 - Select location

EAST

>WEST

Longitude: 4

>Location: E >

Selct

Ctrl+T for Help <+U> <+I> <+O> <+P>



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FAULT ISOLATION

1. General

This section provides fault isolation guidelines as an aid to troubleshooting the SCS system. The purpose of the fault isolation procedures is to help determine which component of the SCS system has failed.

2. TPU Subsystem Self-Tests

TPU subsystem self-tests include TPU memory alarms, TPU synthesizer alarms, and power output alarms. Refer to Table 6-1 thru Table 6-3.

Table 6-1. TPU Memory Alarms

Failure Annunciation	Description	Maintenance Action
Program code self check failed	Flash memory area containing the program code is corrupted.	Cycle power on the system. If the problem persists, return the TPU to Honeywell for repair.
Terminal ID Cyclic Redundancy Check (CRC) failure	Memory area containing the Inmarsat Serial Number (ISN) is corrupted.	Cycle power on the system. If the problem persists, return the TPU to Honeywell for repair.
Electrically Erasable Programmable Read-Only Memory (EEPROM) CRC failure	Flash User 1 Memory is corrupted.	Cycle power on the system. If the problem persists, return the TPU to Honeywell for repair.
Nonvolatile Random Access Memory (NVRAM) CRC failure	Flash User 2 Memory is corrupted.	Cycle power on the system. If the problem persists, return the TPU to Honeywell for repair.
Functionality is lost	Flash memory containing the security/options is corrupted.	Cycle power on the system, re-enter the configuration data and cycle the power again. If the problem persists, return the TPU to Honeywell for repair.
Traffic log data is lost	Flash memory containing the Traffic Log is corrupted.	Call Honeywell for advice and direction.

Table 6-2. TPU Synthesizer Alarms

Failure Annunciation	Description	Maintenance Action
TX sync lock failed	Transmitter Phase Lock Loop (PLL) main frequency control is out of lock.	Call Honeywell for advice and direction.
RX sync lock failed	Receiver local PLL (101.045 MHz) is out of lock.	Call Honeywell for advice and direction.

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Table 6-3. Power Output Alarms

Failure Annunciation	Description	Maintenance Action
Unauthorized transmission	• Unwanted output power that can disturb channels. • The RFB detects TX active when TX is ON and TX Enable is set to OFF.	Cycle power. If the problem persists, clean and check the connections. If the problem still persists, return the TPU and ACU to Honeywell for repair.
TX active in the idle state	• Mismatch between the CPM-SPM-RFB states. • The Signal Processor Module (SPM) has the transmitter in the idle state, but the RFB reports that it is transmitting.	Cycle power. If the problem persists, clean and check the connections. If the problem still persists, return the TPU and ACU to Honeywell for repair.
TX enabled in the idle state	• Mismatch between the CPM-SPM-RFB states. • The RFB has the transmitter in the idle state, but the SPM reports that it is transmitting.	Cycle power. If the problem persists, clean and check the connections. If the problem still persists, return the TPU and ACU to Honeywell for repair.
TX on in the idle state	• Mismatch between the CPM-SPM-RFB states. • The SPM has switched the transmitter OFF, but the RFB still reports that TX is active.	Cycle power. If the problem persists, clean and check the connections. If the problem still persists, return the TPU and ACU to Honeywell for repair.
Missing output	• No output power in the Single Carrier Per Channel (SCPC) mode. • The RFB is in the SCPC mode and does not detect output power at the end of the transmission.	Cycle power. If the problem persists, clean and check the connections. If the problem still persists, return the TPU and ACU to Honeywell for repair.
Burst not sent	• No output power in the Burst mode. • The RFB is in the Burst mode and does not detect output power at the end of the burst.	Cycle power. If the problem persists, clean and check the connections. If the problem still persists, return the TPU and ACU to Honeywell for repair.

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Table 6-3. Power Output Alarms (cont)

Failure Annunciation	Description	Maintenance Action
Missing TX off	• The RFB detects output power after switching off TX.	Cycle power. If the problem persists, clean and check the connections. If the problem still persists, return the TPU and ACU to Honeywell for repair.
Voice/data call aborted	• Missing communication between the SPM and RFB. • The CPM sends the SCPC mode to the RFB and does not get a response from the RFB within 390 milliseconds.	Cycle power. If the problem persists, clean and check the connections. If the problem still persists, return the TPU and ACU to Honeywell for repair.

3. ACU Antenna Tracking Board Subsystem Self-Tests

ACU Antenna Tracking Board (ATB) subsystem self-tests include ATB memory alarms, ATB sensor monitoring alarms, communications alarms, and ATB software alarms. Refer to Table 6-4 thru Table 6-7.

Table 6-4. ATB Memory Alarms

Failure Annunciation	Description	Maintenance Action
ATB flash memory failure	Flash memory area storing the program code read/write test failed.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.
ATB Static Random Access Memory (SRAM) failure	SRAM memory used by the program code read/write test failed.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.
ATB EEPROM failure	EEPROM memory area storing the program code read/write test failed.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.
ATB flash memory CRC error	Flash memory area storing the program code is corrupted.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.
ATB EEPROM CRC error	EEPROM memory area storing the program code is corrupted.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.
ATB calibration data CRC error	Calibration data is corrupted.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.
ATB software (SW) version mismatch	Software has incompatible versions of the program modules.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.

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Table 6-5. ATB Sensor Monitoring Alarms

Failure Annunciation	Description	Maintenance Action
ATB inclinometer failure	Reported sensor values are consistently out of range.	Cycle power. If the problem remains, return the AAU to Honeywell for repair.
ATB magnetometer failure	Reported sensor values are consistently out of range.	Cycle power. If the problem remains, return the AAU to Honeywell for repair.
ATB motor failure	Motor controller reports failure.	Cycle power. If the problem remains, return the AAU to Honeywell for repair.
ATB motor thermal failure	Excessive heat is detected by the motor controller.	Cycle power. If the problem remains, return the AAU to Honeywell for repair.
AAU endstop sensor failure	Endstops are not triggered after a timeout or incompatible sets of endstops are simultaneously triggered.	Cycle power. If the problem remains, return the AAU to Honeywell for repair.

Table 6-6. Communications Alarms

Failure Annunciation	Description	Maintenance Action
AAU serial communication failure	ATB cannot communicate with the AAU.	Cycle power. If the problem persists, check the cable connections. If the problem still remains, return the AAU and ACU to Honeywell for repair.
GPS serial communication failure	ATB cannot communicate with the GPS engine.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.
TPU to ATB packet CRC error	Excessive number of corrupted data packets on communication link from the TPU to the ATB.	Cycle power. If the problem persists, check the cable connections. If the problem still remains, return the TPU and ACU to Honeywell for repair.
AAU to ATB packet CRC error	Excessive number of corrupted data packets on communication link from the TPU to the ATB.	Cycle power. If the problem persists, check the cable connections. If the problem still remains, return the AAU and ACU to Honeywell for repair.

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Table 6-7. ATB Software Alarms

Failure Annunciation	Description	Maintenance Action
Doppler compensation error	Doppler correction frequency calculated by the TPU is out of range.	Cycle power. If the problem persists, call Honeywell for advice.
ATB repoint timeout	Duration of the re-pointing state is too long. The AAU is unable to move to the required position to point in the direction of the satellite.	Cycle power. If the problem persists, return the AAU to Honeywell for repair.
ATB floating point error	Arithmetic overflow, underflow, or division by zero.	Cycle power. If the problem persists, call Honeywell for advice.
ATB matrix inversion error	Control algorithms have become unstable.	Cycle power. If the problem persists, call Honeywell for advice.
ATB reset by watchdog	Control code crashed or hung causing the system to reboot the processor.	Cycle power. If the problem persists, call Honeywell for advice.
ATB illegal address exception	Program attempting to read or write to a memory address that is out of range.	Cycle power. If the problem persists, call Honeywell for advice.

4. AAU Subsystem Self-Tests

AAU subsystem self-tests include AAU memory alarms, and AAU system alarms. Refer to Table 6-8 and Table 6-9.

Table 6-8. AAU Memory Alarms

Failure Annunciation	Description	Maintenance Action
AAU flash memory failure	Flash memory area storing the program code read/write test failed.	Cycle power. If the problem persists, return the AAU to Honeywell for repair.
AAU SRAM failure	SRAM memory used by the program code read/write test failed.	Cycle power. If the problem persists, return the AAU to Honeywell for repair.
AAU EEPROM failure	EEPROM memory area storing the program code read/write test failed.	Cycle power. If the problem persists, return the AAU to Honeywell for repair.
AAU flash memory CRC error	Flash memory area storing the program code is corrupted.	Cycle power. If the problem persists, return the AAU to Honeywell for repair.
AAU calibration data CRC error	Calibration data is corrupted.	Cycle power. If the problem persists, return the AAU to Honeywell for repair.

Table 6-9. AAU System Alarms

Failure Annunciation	Description	Maintenance Action
AAU initialization timeout	Initialization process of moving the AAU to the endstop position timeout.	Cycle power. If the problem persists, return the AAU to Honeywell for repair.
AAU power failure	Measure voltage is low.	Check connections and cycle power. If the problem persists, return the ACU and AAU to Honeywell for repair.
AAU floating point error	Arithmetic overflow, underflow, or division by zero.	Cycle power. If the problem persists, return the AAU to Honeywell for repair.
AAU reset by watchdog	Control code crashed or hung causing the system to reboot the processor.	Cycle power. If the problem persists, return the AAU to Honeywell for repair.
AAU illegal address exception	Program attempting to read or write to a memory address that is out of range.	Cycle power. If the problem persists, return the AAU to Honeywell for repair.
AAU unexpected reset	AAU system reset while operating in the normal state.	Cycle power. If the problem persists, return the AAU to Honeywell for repair.

5. GPS Subsystem Self-Test

The GPS subsystem self-test consists of GPS alarms. Refer to Table 6-10.

Table 6-10. GPS Communications Alarms

Failure Annunciation	Description	Maintenance Action
GPS serial communication failure	GPS engine is not communicating with the ATB.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.
GPS hardware failure	GPS detects a hardware failure.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.
GPS not navigating	GPS is unable to locate sufficient GPS satellites to calculate position.	Call Honeywell for advice.
GPS state error (navigation to acquisition)	GPS internal error.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.
GPS state error (acquisition to navigation)	GPS internal error.	Cycle power. If the problem persists, return the ACU to Honeywell for repair.



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MAINTENANCE PRACTICES

1. General

This section provides instructions for removing, reinstalling, and adjusting each LRU of the SCS-1000 Mini-M Aero SATCOM System that has been previously installed by the aircraft manufacturer or completion center. Adjustment information is called out as required.

WARNING: TO AVOID POTENTIALLY DANGEROUS EXPOSURE TO RADIO FREQUENCY ENERGY OF MORE THAN 5 MW/CM² WITHIN A FEW FEET OF THE ANTENNA, DO NOT OPERATE THE SCS SYSTEM WHEN ANY PERSONNEL ARE WITHIN 3 FEET (0.9 M) OF THE ANTENNA FOR PERIODS OF LONGER THAN 3 MINUTES PER HOUR.

CAUTION: SHOULD ANY INSTALLATION CRITICAL CASES ARISE WITH THE REINSTALLATION OF ANY UNIT, YOU MUST COMPLY 100 PERCENT WITH THE INSTRUCTION.

CAUTION: TO PREVENT DAMAGE TO EQUIPMENT, TURN AIRCRAFT POWER OFF WHEN REMOVING OR INSTALLING LRUS.

2. Equipment and Materials

Contact the aircraft OEM for a list of materials necessary to install the SCS system.

No additional special equipment or materials other than those commonly used in the shop are required to install the units in existing trays and clamps, and to adjust the system.

3. Procedure for the AAU

A. Removal and Reinstallation Procedure

CAUTION: TO PREVENT RECALIBRATION OF THE AAU, USE DEMAGNETIZED TOOLS AND HARDWARE.

- (1) Remove the AAU.

CAUTION: TO PREVENT DAMAGE TO THE TNC CONNECTORS, COVER THEM WITH SEALED, SCREW ON END CAPS AND WIRE TOGETHER WITH SAFETY WIRE IF THE AIRCRAFT IS TO BE FLOWN WITHOUT THE AAU.

- (a) Pull the appropriate circuit breakers.

NOTE: To prevent damage to the AAU, do not apply pressure to or pry on plastic housings.

- (b) Remove eight mounting screws.
 - (c) After removing and saving the hardware, cut the bond line of any installer-applied sealant between the AAU and the mounting area.
 - (d) Carefully pull the AAU away from the mounting area far enough to disconnect the cable connectors.
 - (e) Disconnect the AAU RF cables from the TNC feed through connectors.
 - (f) Remove the ground straps from the AAU.

- (2) Reinstall the AAU.

- (a) Clean the airframe at the AAU mounting area to remove any foreign material.
 - (b) Apply a weather sealant around the periphery of the AAU base to prevent seepage of water and condensation and to preclude corrosion. If a sealant or aerodynamic smoother is used around the periphery of the AAU base, apply it after the AAU has been torqued down. Use a non-adhering sealant to allow removal of the AAU at a later time, if necessary. Chromatic tape is recommended.

CAUTION: CONTACT THE AIRCRAFT ORIGINAL EQUIPMENT MANUFACTURER (OEM) TO VERIFY THE PROPER WEATHER SEALANT NEEDED TO PREVENT WATER SEEPAGE.

- (c) To prevent water seepage on top mounted AAUs, it may be necessary to apply a sealant to the mounting screw heads.
 - (d) Place the AAU over the mounting holes and tilt up. Attach the ground straps to the AAU base plate.

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- (e) Connect AAU RF cables to TNC feedthrough connectors. Ensure that they are aligned so that they will fit in the hollow provided in the base plate. Wire the connectors together with safety wire.
- (f) Align the AAU with the mounting holes. Secure the AAU with eight mounting screws. The torque for the mounting screws is 44 lb-inch.

CAUTION: DO NOT EXCEED THE TORQUE LIMITS OF THE MOUNTING SCREWS.

- (g) Apply a sealant to the mounting screw heads to prevent water seepage.

B. Reinstallation Inspection Procedure

Inspect and repair in accordance with Table 7- 1.

Table 7- 1. AAU Reinstallation Inspection

Inspection	Repair Action
Measure the resistance from the base plate of the AAU to the fuselage. The resistance must be less than 5 milliohms.	Remove the AAU. Clean and check all grounding areas. Replace the AAU.
Measure resistance from the tab end (not the screw) of each lightning diverter strip to the fuselage. The resistance must be less than 5 milliohms.	Remove the screws at the tab ends. Clean off all signs of corrosion on the top and bottom of the tab and the screw. Care must be taken not to stress the junction between the tab and the strip that is bonded to the radome. Tighten and recheck.
Check that the AAU is securely fastened to the fuselage.	Tighten any loose screws.
Check for any cracking of the fuselage over the area covered by the doubler plate.	Repair the cracks in accordance with accepted procedures.
Check that the lightning diverter strips are secure on the radome.	Reattach the diverter strip ends with epoxy adhesive if they are loose (up to 0.47 in. [12mm]). Carefully, lift the loose ends and clean with alcohol. Abrade the painted surface of the radome and underside of the strip with No. 220 sandpaper or finer. Apply adhesive to both surfaces and press the parts together. Wipe away any excess adhesive. Tape the strips down until the epoxy has cured. If the loose part of the diverter strip is greater than 0.47 in. (12 mm), replace the radome or return to the supplier for repair.
Check the radome for cracks.	Replace the radome.
Check the radome for excessive erosion.	Replace the radome.



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C. Adjustment Procedure

The magnetometer must be recalibrated after the AAU has been installed. Refer to procedures in ADJUSTMENT/TEST section of this manual.

D. Return to Service Procedures

Refer to procedures in ADJUSTMENT/TEST section of this manual.

4. Procedure for the ACU, PSU, TPU, and HSU

A. Removal and Reinstallation Procedure

(1) Removal.

- (a) Remove all cables as applicable. Separate the units from the mounting brackets.
- (b) Remove nuts, washers, screws, and ground straps from each unit as applicable.

(2) Reinstallation.

- (a) Secure a ground strap to each unit with one screw, washer, and nut as applicable.
- (b) Secure each unit to the mounting brackets with screws, washers and nuts as applicable.
- (c) Secure the cables to each unit as applicable.

B. Reinstallation Inspection Procedure

Inspect and repair in accordance with Table 7- 2.

Table 7- 2. ACU, PSU, TPU, and HSU Reinstallation Inspection

Inspection	Repair Action
Measure the resistance from the base plate of each unit to the fuselage. The resistance must be less than 0.25 Ohms.	Remove the unit. Clean and check all grounding areas. Replace the unit.
Check that each unit is securely fastened to the fuselage.	Tighten any loose screws.
Check for any cracking of the mounting structure.	Repair the cracks in accordance with accepted procedures.
Check that all interconnecting cables are secure and the connectors properly tightened.	Secure the cables and tighten the connectors.

C. Adjustment Procedure

After replacement of the ACU, reinitialization is required and the magnetometer must be calibrated. Refer to procedures in ADJUSTMENT/TEST section of this manual.

After replacement of the TPU, the new TPU must be registered with the service provider. Reprogramming may be required unless a SIM card is used. Refer to procedures in ADJUSTMENT/TEST section of this manual.

D. Return to Service Procedures

Refer to procedures in ADJUSTMENT/TEST section of this manual.

5. Procedure for the TPU and PSU When Installed Together

A. Removal and Installation Procedure

Figure 3-18 shows a typical installation of the TPU and PSU together.

(1) Remove the TPU and PSU.

(a) Remove all cables from the TPU and PSU. Separate the units from the mounting brackets.

(b) Remove four nuts, washers, and screws.

(c) Remove one nut, washer, screw, and ground strap from each unit.

(2) Install the TPU and PSU.

(a) Secure a ground strap to each unit with one screw, washer, and nut.

(b) Secure the TPU and PSU to the mounting brackets with four screws, washers and nuts.

(c) Secure all cables to the TPU and PSU.

B. Reinstallation Inspection Procedure

Inspect and repair in accordance with Table 7- 2.

C. Adjustment Procedure

After replacement of the TPU, the new TPU must be registered with the service provider. Reprogramming may be required unless a SIM card is used. Refer to procedures in ADJUSTMENT/TEST section of this manual.

D. Return to Service Procedures

Refer to procedures in ADJUSTMENT/TEST section of this manual.

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6. Instructions for Continued Airworthiness, FAR 25.1529 Compliance

Maintenance requirements and instructions for Continued Airworthiness of the Mini-M Aero SATCOM System components are contained in the paragraphs that follow:

Installation of the Mini-M Aero SATCOM System on an aircraft by Supplemental Type Certificate obligates the aircraft operator to include the maintenance information provided by this manual in the operator's Aircraft Maintenance Manual and the operator's Aircraft Scheduled Maintenance Program.

- A. This manual contains Maintenance information for the Mini-M Aero SATCOM System (system description, removal, installation, testing, etc.).
- B. Put Line Replaceable Unit (LRU) part numbers and other necessary part numbers contained in this manual into the aircraft operator's appropriate aircraft Illustrated Parts Catalog (IPC).
- C. Aircraft wiring diagrams applicable to the operator's Mini-M Aero SATCOM System installation need to be incorporated into the operator's aircraft Wiring Diagram Manual.
- D. The Mini-M Aero SATCOM System components require no periodic maintenance action. Component failure(s) are self-annunciating. Refer to Section 6 for fault isolation procedures and refer to Section 7 for component removal and replacement instructions.
- E. The Mini-M Aero SATCOM System components can be repaired only at a factory authorized repair center or an appropriately rated Federal Aviation Administration (FAA) Part 145 repair station.
- F. Once repaired, reinstall the Mini-M Aero SATCOM System component in the aircraft in accordance with the design data used for the initial installation. Perform a return to service test of the Mini-M Aero SATCOM System using the procedures specified in Section 6. When the RTS test is successful, note this maintenance action in accordance with FAA approved procedures.
- G. Scheduled Maintenance Program tasks to be added to the aircraft operator's appropriate aircraft maintenance program are as follows:

(1) Recommended Periodic Scheduled Servicing Tasks: None Required.

(2) Recommended Periodic Equipment Inspections: None Required.

NOTE: The (applicable LRUs) used with this system have test and inspections that are required by FAR 91.413 to be completed every 24 calendar months.

(3) Recommended Periodic Equipment Installation Inspections, including primary structure elements (antenna installation): Interval specified by approved installation design data using the inspection method specified.



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VENDOR EQUIPMENT**1. General**

This section contains information on vendor-manufactured equipment that can be installed on an aircraft configured for the SCS-1000 Mini-M Aero SATCOM System. Installation of this equipment is dependent on the specific requirements of the operator. Therefore, information in this section is supplied as a courtesy to the SCS-1000 equipment operators.

2. Electronic Cable Specialists

The following paragraphs contain information on how to select installation provisions offered by Electronic Cable Specialists (ECS) for the SCS-1000 Mini-M Aero SATCOM System. ECS designs and manufactures the installation provisions described in the following paragraphs and can provide either individual components or complete installation kits. ECS offers several options for each kit to accommodate the variety of requirements specific to each aircraft installation. The address for Electronic Cable Specialists is as follows:

Electronic Cable
5300 W. Franklin Drive
Franklin, WI 53132
U.S.A.

Telephone: (414) 421-5300
FAX: (414) 421-5301

A. Mini-M SATCOM Master Kit

The Mini-M SATCOM Master Kit contains the items given in Table 8-1.

Table 8-1. Mini-M SATCOM Master Kit, Part No. 120-84552-1XX

Kit Part No.	Item Part No.	Description	Quantity
120-84552-101	500-84475-101	Aero-M SATCOM RF coax kit	1
	600-84544-101	Aero-M SATCOM wire harness	1
	BTF101	TNC bulkhead adapter	2
	120-84565-101	SATCOM power supply modem (TPU) mounting kit	1
120-84552-102	500-84475-102	Aero-M SATCOM RF coax kit	1
	600-84544-101	Aero-M SATCOM wire harness	1
	BTF101	TNC bulkhead adapter	2
	120-84565-101	SATCOM power supply modem (TPU) mounting kit	1

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Table 8-1. Mini-M SATCOM Master Kit, Part No. 120-84552-1XX (cont)

Kit Part No.	Item Part No.	Description	Quantity
120-84552-103	500-84475-103	Aero-M SATCOM RF coax kit	1
	600-84544-101	Aero-M SATCOM wire harness	1
	BTF101	TNC bulkhead adapter	2
	120-84565-101	SATCOM power supply modem (TPU) mounting kit	1

B. Aero-M SATCOM RF Coax Kit

The Aero-M SATCOM RF Coax Kit contains the items given in Table 8-2.

Table 8-2. Mini-M SATCOM RF Coax Kit, Part No. 500-84475-XX

Kit Part No.	Item Part No.	Description	Length (in.)	Length (mm)	Quantity
500-84475-101	500-84475-01	GPS cable	40.0	1016.0	1
	500-84475-02	Antenna cable	40.0	1016.0	1
	500-84475-03	IF cable	240.0	6096.0	1
	500-84475-04	TPU RF cable	12.0	304.8	1
500-84475-102	500-84475-03	IF cable	240.0	6096.0	1
	500-84475-04	TPU RF cable	12.0	304.8	1
	500-84475-05	GPS cable	80.0	2032.0	1
	500-84475-06	Antenna cable	80.0	2032.0	1
500-84475-103	500-84475-03	IF cable	240.0	6096.0	1
	500-84475-04	TPU RF cable	12.0	304.8	1
	500-84475-07	GPS cable	150.0	3810.0	1
	500-84475-08	Antenna cable	150.0	3810.0	1

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C. Aero-M SATCOM Wire Harness Kit

The Aero-M SATCOM Wire Harness Kit contains the items listed in Table 8-3.

Table 8-3. Aero-M SATCOM Wire Harness Kit, Part No. 600-84544-1XX

Kit Part No.	Item Part No.	Description	Quantity
600-84544-101	600-84544-102	Modem (TPU) power harness assembly	1
	600-84544-103	Power harness assembly	1
	600-84544-104	Loose parts kit	1
600-84544-102	MIL-W-22759/16-20-0	Wire, 20 AWG, black, 12 in.	1
	MIL-W-22759/16-20-9	Wire, 20 AWG, white, 12 in.	1
	TMS-SCE-1/4-2.0-9	Label, white heat shrink, 0.25 in.	1
	39-00-0213	Crimp terminal, 18-24 AWG	4
	39-01-2045	Receptacle, four-way double row	1
	39-01-4031	Receptacle, three-way single row	1
600-84544-103	MIL-W-22759/16-20-0	Wire, 20 AWG, black, 120 in.	1
	MIL-W-22759/16-20-9	Wire, 20 AWG, white, 120 in.	1
	TMS-SCE-1/4-2.0-9	Label, white heat shrink, 0.25 in.	1
	39-00-0213	Crimp terminal, 18-24 AWG	2
	39-01-4031	Receptacle, three-way single row	1
600-84544-104	39-00-0213	Crimp terminal, 18-24 AWG	4
	39-01-2045	Receptacle, four-way double row	1
	39-01-4031	Receptacle, three-way single row	2

D. SATCOM Power Supply Modem (TPU) Mounting Kit

The SATCOM power supply modem (TPU) mounting kit contains the items listed in Table 8-4.

Table 8-4. SATCOM Power Supply Modem Mounting Kit, Part No. 120-84565-101

Item Part No.	Description	Quantity
200-85417CC-01	Bracket	2
MS25083-2BB12	Cable jumper	2
MS21042L3	Lock nut, No. 10-32 Thread	6
NAS1149D0332J	Washer, No. 10, 0.032 in. thick x 0.44 in. O.D.	12
NAS603-20P	Pan head screw, No. 10-32 x 1.25 in. long	4
NAS603-10-P	Pan head screw, No. 10-32 x 0.62 in. long	2

3. PIC Wire and Cable

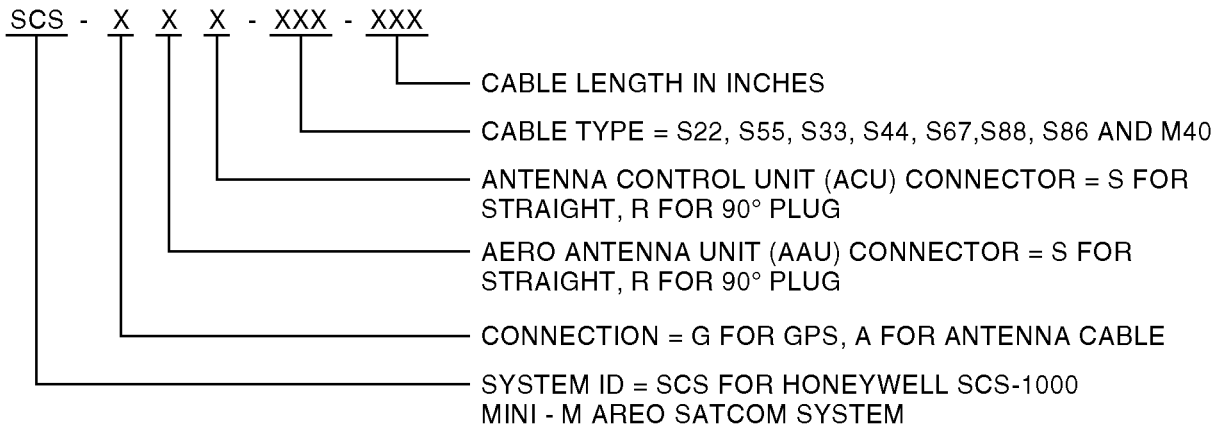
The following paragraphs contain information on how to select installation RF cable assemblies offered by PIC Wire & Cable for the SCS-100 Mini-M Aero SATCOM System. PIC designs and manufactures RF cable assemblies that are tailored to system and installation requirements. Contact PIC as follows:

PIC Wire & Cable, Division of the Angelus Corporation
N53 W24747 South Corporate Circle
P.O. Box 330
Sussex, WI 53089-0330

Phone: (800) 742-3191 or (262) 246-0500
Fax: (262) 246-0450
e-mail: sales@picwire.com

A. Antenna and GPS RF Cable Assemblies

Figure 8-1 shows the numbering scheme for the antenna and GPS cable assemblies. Figure 8-2 shows a typical AAU to ACU interface using the antenna and GPS cable assemblies. The antenna and GPS cable assemblies are defined in Table 8-5.



NOTES:

1. Cable section = cable run from the AAU to the ACU consists of one cable assembly.
2. Example part number: SCS-ARS-S22-120 = SCS-1000 - antenna cable, 90° TNC connector at the antenna, straight TNC at the Antenna Control Unit - cable type S22089 - length 120 inches (10 FT).

ID-74903

Figure 8-1. Antenna and GPS RF Cable Assemblies Numbering Scheme

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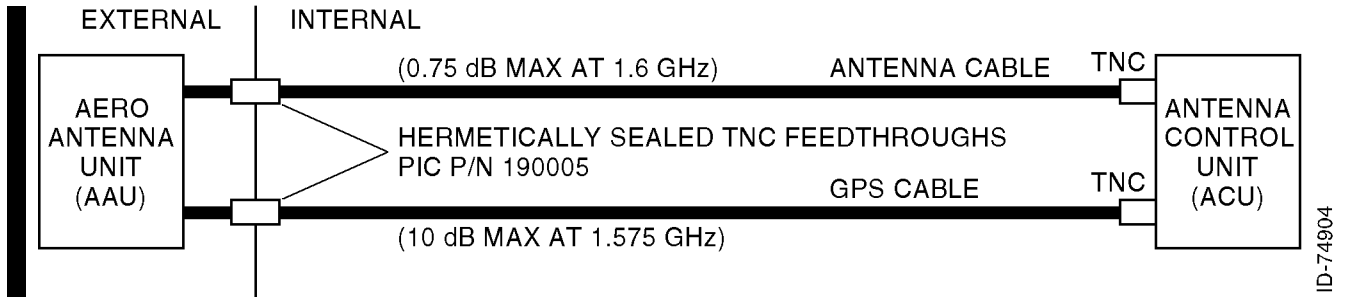


Figure 8-2. Typical Antenna and GPS RF Cable Assemblies Interface

Table 8-5. Antenna Cable and GPS RF Cable Assemblies Description

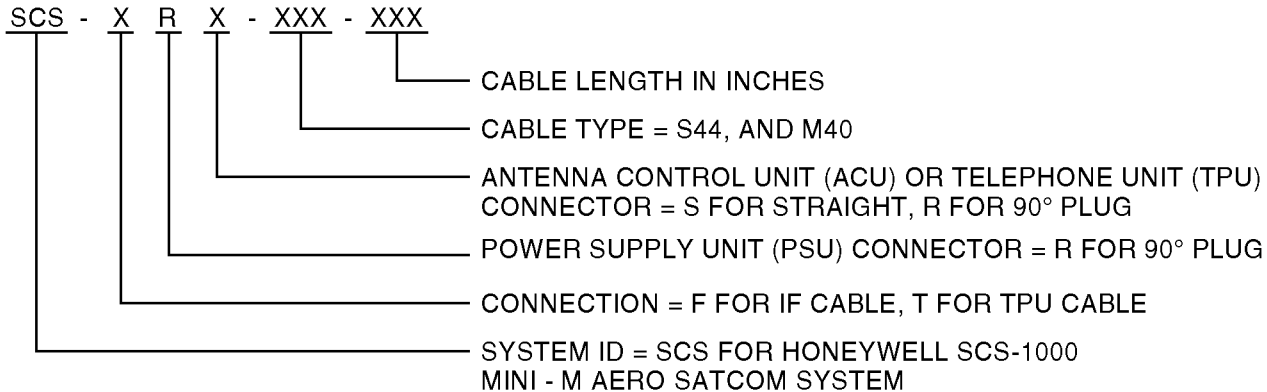
Cable Pin No.	Cable Code	Max Length Antenna Cable (Note)	Max Length GPS Cable (Note)
S22089	S22	150 inches (12.5 ft)	2460 inches (205 ft)
S55268	S55	109 inches (9.08 ft)	1860 inches (155 ft)
S33141	S33	83 inches (6.91 ft)	1404 inches (117 ft)
S67163	S67	74 inches (6.16 ft)	1212 inches (101 ft)
S44193	S44	47 inches (3.91 ft)	804 inches (67 ft)
S86208	S86	40 inches (3.33 ft)	672 inches (56 ft)
M40019	M40	36 inches (3.00 ft)	612 inches (51 ft)
NOTE: Max cable length is calculated including total losses associated with the hermetically sealed TNC feedthroughs, both cable connectors and the cable at 1.6 GHz			

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B. IF and TPU RF Cable Assemblies

Figure 8-3 shows the numbering scheme for the IF and TPU cable assemblies. Figure 8-4 shows a typical IF and TPU cable assemblies. The IF and TPU cable descriptions are defined in Table 8-6.

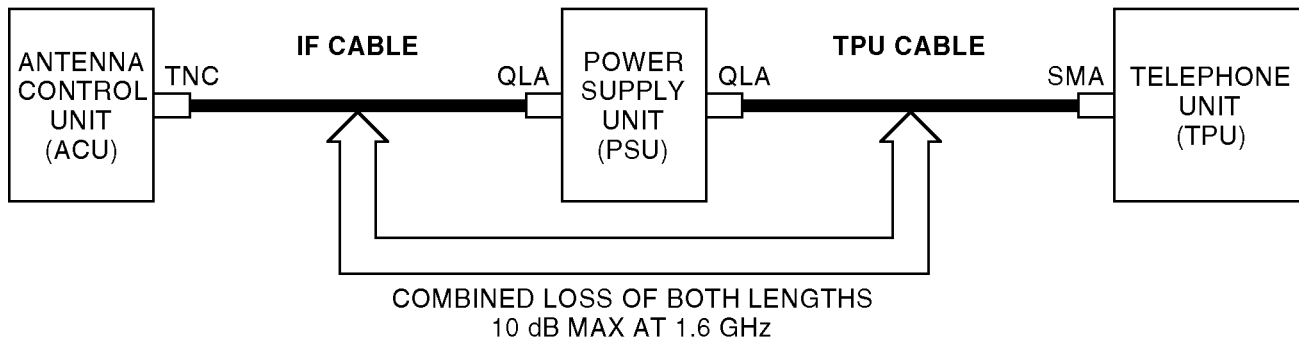


NOTE:

Example part number: SCS-TRR-S44-120 = SCS-1000 - TPU cable, 90° QLA at the PSU, 90° SMA connector at the TPU - cable type S44193 - length 120 inches (10 FT).

ID-74905

Figure 8-3. IF and TPU RF Cable Assemblies Numbering Scheme



NOTE:

The PSU connections (QLA connectors) for this part-numbering scheme is available only in 90 degrees for cable part numbers S44193 and M4001. If the combined installation length is greater than 64 FT, contact PIC for alternatives which use lower loss cable for longer lengths.

ID-74906

Figure 8-4. Typical IF and TPU RF Cable Assemblies

Table 8-6. IF and TPU RF Cables Description

Cable Pin No.	Cable Code	Combined Max Length for IF and TPU Cables
S44193	S44	768 inches (64 ft)
M40019	M40	612 inches (51 ft)
NOTE: Combined max cable length is calculated including total losses associated with all four connectors and both cables at 1.6 GHz		

4. Omni-Pless

Contact Omni-Pless for antenna kit information.

A. Omni-Pless Antenna Systems

Omni-Pless (PTY) LTD. Registration number 87\06391\07

Corner of Main Road and Riverside Terrance Hout Bay 7800
Hout Bay 7872 South Africa

+27 21 799 7000	Telephone
+27 21 790 6078	Facsimile



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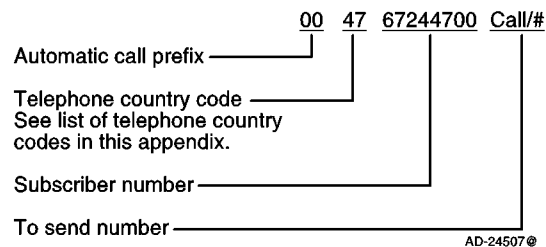
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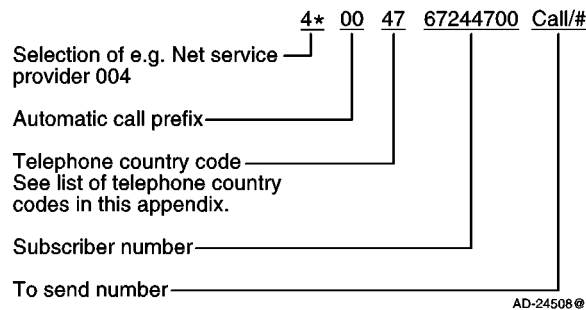
APPENDIX A TELEPHONE COUNTRY CODES

This appendix has the telephone country codes and examples of how to place a call using the SCS-1000 system.

To place a call from the SCS-1000 system to a fixed subscriber through the default network, key in the automatic call prefix, followed by the country code and the subscriber number (22 digits maximum). See the example below:



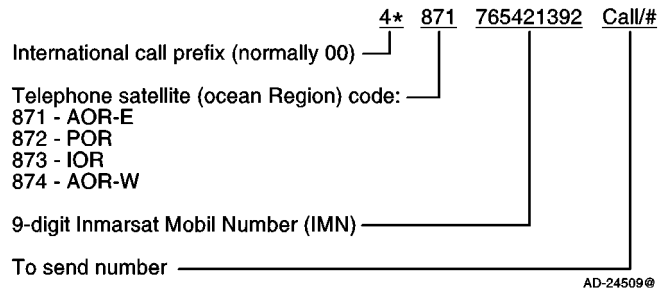
To place a call from the SCS-1000 system to a fixed subscriber through a selected network service provider, follow the same procedure as above preceded by selection of the network service provider (reference code). See the example below:



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To place a call from a fixed subscriber or the SCS-1000 system to another SCS-1000 system, key in the international call prefix, followed by the satellite code and the 9-digit IMN. See the example below:



NOTE: Some network service providers support the common Ocean Region Access No. 870, which connects the call to the dialed Mini-M System regardless of the Ocean Region the user currently communicates through.

The telephone country codes are given in Table A-1.

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Table A-1. Telephone Country Codes

Country	Code
Afghanistan (Islamic State of)	93
Albania (Republic of)	855
Algeria (People's Democratic Republic of)	21 (Note 2)
American Samoa	684
Angola (Republic of)	244
Anguilla	1 (Note 1)
Antigua and Barbuda	2 (Note 1)
Argentine Republic	54
Armenia (Republic of)	7 (Note 7)
Aruba	297
Ascension	247
Atlantic Ocean East Region (AOR-E) (Inmarsat)	871
Atlantic Ocean West Region (AOR-W) (Inmarsat)	874
Australia	61
Australian External Territories	672
Austria	43
Azerbaijani Republic	994
Bahamas (Commonwealth of the)	1 (Note 1)
Bahrain (State of)	973
Bangladesh (People's Republic of)	380
Barbados	1 (Note 1)
Belarus (Republic of)	7 (Note 7)
Belgium	32
Belize	501
Benin (Republic of)	223
Bermuda	1 (Note 1)
Bhutan (Kingdom of)	975
Bolivia (Republic of)	591
Bosnia and Herzegovina (Republic of)	887
Botswana (Republic of)	267

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Table A-1. Telephone Country Codes (cont)

Country	Code
Brazil (Federative Republic of)	55
British Virgin Islands	1 (Note 1)
Brunei Darussalam	673
Bulgaria (Republic of)	859
Burkina Faso	226
Burundi (Republic of)	257
Cambodia	355
Cameroon (Republic of)	237
Canada	1 (Note 1)
Cape Verde (Republic of)	238
Cayman Islands	1 (Note 1)
Central African Republic	236
Chad (Republic of)	235
Chile	56
China (People's Republic of)	86 (Note 8)
Colombia (Republic of)	57
Comoros (Islamic Federal Republic of the)	269
Congo (Republic of the)	242
Cook Islands	682
Costa Rica	506
Croatia (Republic of)	385
Cuba	53
Cyprus (Republic of)	357
Czech Republic	42 (Note 6)
Democratic People's Republic of Korea	850
Denmark	45
Diego Garda	246
Djibouti (Republic of)	253
Dominican Republic	1 (Note 1)

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Table A-1. Telephone Country Codes (cont)

Country	Code
Ecuador	593
Egypt (Arab Republic of)	20
El Salvador (Republic of)	503
Equatorial Guinea (Republic of)	240
Eritrea	291
Estonia (Republic of)	372
Ethiopia	251
Falkland Islands (Malvinas)	500
Faroe Islands (Denmark)	298
Fiji (Republic of)	679
Finland	358
France	33 (Note 6)
French Polynesia	68
Gabonese Republic	241
Gambia (Republic of the)	220
Georgia (Republic of)	7 (Note 7)
Germany (Federal Republic of)	49
Ghana	233
Gibraltar	350
Greece	30
Greenland (Denmark)	299
Grenada	1 (Note 1)
Guadeloupe (French Department of)	590
Guam	671
Guatemala (Republic of)	502
Guiana (French Department of)	594
Guinea (Republic of)	224
Guinea-Bissau (Republic of)	245
Guyana	592

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Table A-1. Telephone Country Codes (cont)

Country	Code
Haiti (Republic of)	509
Honduras (Republic of)	504
Hongkong	852
Hungary (Republic of)	36
Iceland	354
India (Republic of)	91
Indian Ocean Region (IOR)(Inmarsat)	873
Indonesia (Republic of)	62
Iran (Islamic Republic of)	98
Iraq (Republic of)	964
Ireland	353
Israel (State of)	972
Italy	39
Ivory Coast (Republic of)	225
Jamaica	1 (Note 1)
Japan	81
Jordan (Hashemite Kingdom of)	962
Kazakhstan (Republic of)	7 (Note 7)
Kenya (Republic of)	254
Kiribati Republic of)	686
Kuwait (State of)	965
Kyrgyzstan (Republic of)	7 (Note 7)
Lao People's Democratic Republic	856
Latvia (Republic of)	371
Lebanon	961
Lesotho (Kingdom of)	266
Liberia (Republic of)	231

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Table A-1. Telephone Country Codes (cont)

Country	Code
Libya (Socialist People's Ubyan Arab Jamahiriya)	21 (Note 3)
Liechtenstein (Principality of)	41 (Note 6)
Lithuania (Republic of)	370
Luxembourg	352
Macau	853
Macedonia (the former Yugoslav Republic of)	389
Madagascar (Republic of)	261
Malawi	265
Malaysia	60
Maldives (Republic of)	960
Mali (Republic of)	223
Malta	356
Marshall Islands (Republic of the)	692
Martinique (French Department of)	596
Mauritania (Islamic Republic of)	222
Mauritius (Republic of)	230
Mexico	52
Micronesia (Federated States of)	691
Moldova (Republic of)	373
Monaco (See also code 377)	33 (Note 6)
Mongolia	976
Montserrat	1 (Note 1)
Morocco (Kingdom of)	21 (Note 4)
Mozambique (Republic of)	258
Myanmar (Union of)	95
Namibia (Republic of)	264
Nauru (Republic of)	674
Nepal	977
Netherlands Antilles	599

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Table A-1. Telephone Country Codes (cont)

Country	Code
Netherlands (Kingdom of the)	31
New Caledonia	687
New Zealand	64
Nicaragua	505
Niger (Republic of the)	227
Nigeria (Federal Republic of)	234
Niue	683
Northern Mariana Islands (Commonwealth of the)	670
Norway	47
Oman (Sultanate of)	968
Pacific Ocean Region (POR)(Inmarsat)	872
Pakistan (Islamic Republic of)	92
Palau (Republic of)	680
Panama (Republic of)	507
Papua New Guinea	675
Paraguay (Republic of)	595
Peru	51
Philippines (Republic of the)	63
Poland (Republic of)	48
Portugal	351
Qatar (State of)	974
Reunion (French Department of)	262
Romania	40
Russian Federation	7 (Note 7)
Rwandese Republic	250

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Table A-1. Telephone Country Codes (cont)

Country	Code
Saint Vincent and the Grenadines	1 (Note 7)
Saint Luda	1 (Note 1)
Saint Kitts and Nevis	1 (Note 1)
Saint Helena	290
Saint Pierre and Miquelon (French Department of)	508
San Marino (Republic of)	378
Sao Tome and Principe (Democratic Repulic of)	239
Saudi Arabia (Kingdom of)	966
Senegal (Republic of)	221
Seychelles (Republic of)	248
Sierra Leone	232
Singapore (Republic of)	65
Slovak Republic	42 (Note 6)
Slovenia (Republic of)	386
Solomon Islands	677
Somali Democratic Republic	252
South Africa (Republic of)	27
Spain	34
Sri Lanka (Democratic Socialist Republic of)	94
Sudan (Republic of the)	249
Suriname (Republic of)	597
Swaziland (Kingdom of)	268
Sweden	46
Switzerland (Confederation of)	41 (Note 6)
Syrian Arab Republic	963
Tajikistan (Republic of)	7 (Note 7)
Tanzania (United Republic of)	255
Thailand	66
Togolese Republic	228
Tokelau	690

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Table A-1. Telephone Country Codes (cont)

Country	Code
Tonga (Kingdom of)	676
Trinidad and Tobago (Code actually used: +1)	296
Tunisia	21 (Note 5)
Turkey	90
Turkmenistan	7 (Note 7)
Turks and Caicos Islands	1 (Note 1)
Tuvalu	688
Uganda (Republic of)	256
Ukraine	7 (Note 7)
United Arab Emirates	971 (Note 9)
United States of America, + Puerto Rico, Virgin Islands	1 (Note 1)
United Kingdom of Great Britain and Northern Ireland	44
Uruguay (Eastern Republic of)	598
Uzbekistan (Republic of)	7 (Note 7)
Vanuatu (Republic of)	678
Vatican City State	379
Venezuela (Republic of)	58
Viet Nam (Socialist Republic of)	84
Wallis and Futuna	681
Western Samoa (Independent State of)	685
Yemen (Republic of)	967
Yugoslavia (Federal Republic of)	381

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Table A-1. Telephone Country Codes (cont)

Country	Code
Zaire (Republic of)	243
Zambia (Republic of)	260
Zanzibar (Tanzania)	259
Zimbabwe (Republic of)	263
NOTES: 1. Integrated numbering area. 2. Integrated numbering area with subdivisions: 213, 214 and 215 for Algeria. 3. Integrated numbering area with subdivisions: 218 and 219 for Libya. 4. Integrated numbering area with subdivisions: 210, 211, 212 (212 in service) for Morocco. 5. Integrated numbering area with subdivisions: 216, 217 for Tunisia. 6. Integrated numbering plan. 7. Will form part of numbering zone 7. 8. Code 866 has been allocated to the province of Taiwan. 9. United Arab Emirates (U.A.E.) includes: Abu Dhabi, Ajmna, Dubai, Fujeirah, Ras Al, Khaimah, Sharjah, Umm al Oaiwain.	



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APPENDIX B
SERVICE ADDRESS CODES**Table B-1. Service Address Codes**

Abbreviated dialing	23
Access to maritime packet assembly/disassembly	20
Administration specialized use	6(X)
Automatic	00
Automatic line test	91
Collect call	35
Credit card call	36
Commissioning tests	92
Databases	70
Faxmail	26
International outgoing operator	11
International information service	12
Mail retrieval	57
Maritime assistance	39
Maritime enquiries	31
Medical advice	32
Medical assistance	38
Meteorological reports	41
Navigational hazards and warnings	42
National operator	13
National information service	14
Person-to-person call	34

Table B-1. Service Address Codes (cont)

Ship position reports	43
Technical assistance (on network)	33
Telephone call booking	17
Time and duration	37
Time announcement	50

APPENDIX C

DTE INTERFACE

1. General

This appendix describes how Data Terminal Equipment (DTE) interfaces with the SCS-1000 system.

2. Pin Assignments

The TPU RS-232 jack pin assignments for interface with DTE is given in Table C-1.

Table C-1. RS-232 Jack to DTE Interface Pin Assignments

Pin	Signal	CCITT Circuit	Signal Source	Description
1	CD	109	DCE	Carrier detect
2	RXD	104	DTE	Received data
3	TXD	103	DCE	Transmitted data
4	DTR	108	DTE	Data terminal ready
5	GND	102		Signal ground
6	DSR	107	DCE	Data set ready
7	RTS	105	DTE	Request To Send
8	CTS	106	DCE	Clear To Send
9	RI	125	DCE	Ring indicator
NOTES: 1. Signal source DTE means the signal goes from the PC to the SCS system. 2. Signal source DCE means the signal goes from the SCS system to the PC.				

3. Signal descriptions

Table C-2 describes the DTE interface signals.

Table C-2. DTE Interface Signal Descriptions

CCITT Circuit	Signal Name	Description
102	Signal Ground	Digital ground, return line.
103	Send Data	Data transmitted from the DTE to the DCE.
104	Receive Data	Data received from the DCE to the DTE.
105	Request To Send	OFF requests DCE to suspend transmission to DTE. ON requests DCE to resume transmission to DTE.
106	Clear to Send	OFF indicates that the DCE cannot accept data from the DTE. ON indicates that the DCE is prepared to accept data from the DTE.
107	Data Set Ready	Signal from the SCS system. ON indicates that a data call setup is in progress.
108	Data Terminal Ready	Signal from the PC. This signal is used in the Hotline mode. When going from OFF to ON, this signal indicates that the PC wants to make a data call. The PC clears the call by setting the signal from ON to OFF.
109	Receive Signal Indicator	Signal from SCS system. ON indicates that connection is established and received data will be delivered on circuit 104, Received Data.
125	Ring Indicator	Signal from SCS system. This signal is used in the Auto answer OFF mode. ON indicates that an incoming call is in progress. The signal goes OFF when the call is answered by the PC (turning circuit 108 Data Terminal Ready ON).
NOTES: 1. DTE means the signal goes from the PC to the SCS system. 2. DCE means the signal goes from the SCS system to the PC.		

APPENDIX D

AT COMMANDS

1. General

The Attention (AT) command set allows the user to configure the SCS system Asynchronous Data (ASD) transmission function directly from your PC keyboard. The AT characters are a prefix to the commands that the user issues to the SCS system ASD service.

NOTE: Most communication applications do not require knowledge of AT commands.

Every time **AT** is typed, the user is essentially asking for the SCS system ASD's **AT**tention. For instance, if the user wants to answer an incoming data call, type **ATA** and then push the **RETURN** (or **ENTER**) key to answer.

NOTE: When a value associated with a command is not entered, it is assumed to be zero, for example, typing **AT&D** equals **AT&D0**.

2. Hanging Up - Escape Sequence

Once the the SCS system ASD is online to another system, the only command it recognizes is an escape code that contains three typed pluses (+), which forces the SCS system ASD back to the command mode.

The following should be done, when issuing the escape command:

- Wait 1 second after sending the last item of data.
- Type +++ with less than 1 second between the characters.
- Wait 1 second, and then an **OK** response should appear.

NOTE: Do not type the AT prefix or push the **RETURN** (or **ENTER**) key. The guard time of 1 second before and after the code prevents the SCS system ASD from misinterpreting the occurrence of +++ in the transmitted data stream.

In response to +++, the SCS system ASD returns to the command mode.

If necessary, the character used in the escape code or the duration of the guard time can be changed by altering Register S2 or S12, see the paragraph on S-register commands.

To hang up or return to the online mode, perform the following:

- To hang up, type **ATH** and then push the **RETURN** (or **ENTER**) key.
- To return to the online mode, type **ATO** and then push the **RETURN** (or **ENTER**) key.

3. Operating Modes

The SCS system ASD function may operate in three modes given in Table D-1.

Table D-1. ASD Function Modes of Operation

Mode	Description
Command Mode	The SCS system ASD responds to AT commands. No remote communication occurs.
Online Command Mode	A data call is taking place and an escape sequence has been initiated, after which the SCS system ASD responds to AT commands during the call.
Online Data Mode	Once the SCS system ASD is connected, anything arriving from the PC is interpreted as data and sent to the remote end and vice versa.

4. Basic AT Commands

Table D-2 gives the basic AT commands and their descriptions.

NOTE: AT commands may be entered in either upper or lower case (not mixed).

Table D-2. Basic AT Commands

Command (Note 1)	Description
ATA	Instructs the SCS system ASD to connect the line and start the answer sequence of the incoming call. Used when not configured for auto answer.
ATD004767244700	Instructs the SCS system ASD to dial the number 00 47 67 24 47 00 via the default network service provider.
ATD4*004767244700	Instructs the SCS system ASD to dial the number 00 47 67 24 47 00 via the selected network service provider, for example, Telenor (Norwegian Telecom, code No. 4).
ATD2311	Dials the telephone number stored under short number 11.
ATE [n]	Turns the local echo of the keyboard commands OFF or ON.
• ATE0	Turns the local echo OFF.
• ATE1 (Note 2)	Turns the local echo ON.
ATH	Hook control. Sets the SCS system ASD ON-hook when in the Online Data Mode. Disconnects the line and terminates the call.
ATO	Returns to the Online Data Mode when in Online Command Mode during a data call.
ATQ [n]	Sets responses sent by the SCS system ASD.
• ATQ0 (Note 2)	The SCS system ASD returns responses like OK or ERROR.

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Table D-2. Basic AT Commands (cont)

Command (Note 1)	Description
• ATQ1	The SCS system ASD does not return responses.
ATS	Sets and displays S register values. See the paragraph on S-register commands.
ATV [n]	Sets the SCS system ASD response format to words or numbers.
• ATV0	Selects numeric response.
• ATV1 (Note 2)	Selects verbal response.
ATX [n]	Selects the CONNECT result code format (dial tone detection - busy detection).
• ATX0	Selects the basic message set: OK, CONNECT, RING, NO CARRIER, and ERROR.
• ATX1	Selects the basic message set extended with CONNECT xxxx-yyyy.
• ATX2	Selects the basic message set extended with NO DIALTONE.
• ATX3	Selects the basic message set extended with BUSY.
• ATX4 (Note 2)	Selects the basic message set extended with all of the above.
ATZ	Resets the SCS system ASD configuration to the last saved command. Also clears the call if used when in the Online Command Mode.
A/	Repeats the last command. Re-executes the last AT command string issued to the SCS system ASD, including redialing a telephone number.
NOTES: 1. Push the RETURN (or ENTER) key after typing each command, except the command A/ . 2. This is the default setting.	

5. Extended AT Commands

Table D-3 gives the extended AT commands and their descriptions.

Table D-3. Extended AT Commands

Command (Note 1)	Description
AT&C [n]	Determines the Data Carrier Detect (DCD) behavior.
• AT&C0	Sets DCD always ON.
• AT&C1 (Note 2)	Sets DCD, only when connected.
AT&D [n]	Selects the Data Terminal Ready (DTR) behavior.
• AT&D0	The SCS system ASD ignores DTR.
• AT&D1	The SCS system ASD enters the Online Command Mode when DTR goes inactive.
• AT&D2 (Note 2)	The SCS system ASD clears the call when DTR goes inactive.
AT&F	Resets the SCS system ASD to the factory default. The factory default is not saved like it is with the AT&W command, so ATZ revokes to last saved values.
AT&S [n]	Selects the Data Set Ready (DSR) behavior.
• AT&S0 (Note 2)	Sets DSR permanently ON.
• AT&S1	Sets DSR ON when the satellite link is established.
AT&V	Displays the stored configuration profile.
AT&W	Saves the active configuration profile. (May be recalled using the ATZ command.)
NOTES: 1. Push the RETURN (or ENTER) key after typing each command. 2. This is the default setting.	

6. Extended AT+I, +G and +W Commands

The extended AT+I, AT+G and AT+W commands are non-standard features, some of which are designed specially for the Inmarsat Mini-M system. Table D-4 gives the extended AT+I, AT+G and AT+W commands and their descriptions.

Table D-4. Extended AT+I, +G, and +W Commands

Command (Note 1)	Description
AT+GCAP	Displays capabilities supported by SCS system terminals.
AT+GMI	Displays manufacturer identification.
AT+GMM	Displays equipment identification.
AT+GMR	Displays software revision.
AT+ICF = [n<format>], [m<parity>]	Specifies the local serial port start-stop (asynchronous) character framing between the PC and the SCS system. The format reference number n is defined as follows: • 1 = 8 data bits, 2 stop bits • 3 = 8 data bits, 1 stop bit (default setting) • 4 = 7 data bits, 2 stop bits • 5 = 7 data bits, 1 parity bit, 1 stop bit. The parity reference number m is defined as follows: • 0 = odd • 1 = even • 2 = mark • 3 = space (default setting). <u>EXAMPLE:</u> AT+ICF=3,3 Specifies a data format of 8 data bits, 1 stop bit, and space parity.
• AT+ICF ?	Displays current settings.
• AT+ICF =?	Displays available settings.

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Table D-4. Extended AT+I, +G, and +W Commands (cont)

Command (Note 1)	Description
AT+IFC = [n<WP-to-PC>] [,m<PC-to-WP>];	Specifies the local flow control between the PC and the SCS system. The system-to-PC reference number n is defined as follows: • 0 = no flow control • 1 = XON/XOFF (software flow control stripped of control characters) • 2 = RTS (hardware flow control) [default setting] • 3 = XON/XOFF (software flow control with pass-through of control characters). The PC-to-system reference number m is defined as follows: • 0 = no flow control • 1 = XON/XOFF (software flow control) • 2 = CTS (hardware flow control) [default setting].
• AT+IFC ?	Displays current settings.
• AT+IFC =?	Displays available settings.
AT+IPR = [r(PC-to-WP rate)]	Specifies the data rate at which PC - system interface accepts commands. Selectable data rates r are defined as follows: • 1200 bps • 2400 bps • 4800 bps • 9600 bps • 19200 bps • 38400 bps. <u>EXAMPLE:</u> AT+IPR=9600 Specifies a data rate of 9600 bps between the PC and the SCS system TPU.
• AT+IPR ?	Displays current settings.
• AT+IPR =?	Displays available settings.
AT+W	Indicates which PCCA standard the SCS system ASD complies with.
AT+WKSIZE = [n]	Sets the maximum ARQ window size for subsequent data calls using the ARQ mode. The ARQ window determines the size of the buffer that keeps in memory the data not yet acknowledged by the other end. A valid setting for n is between 1 and 63. The default number for n is 15.
• AT+WKSIZE?	Displays current settings.
• AT+WKSIZE=?	Displays available settings.

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Table D-4. Extended AT+I, +G, and +W Commands (cont)

Command (Note 1)	Description
AT+WINMARSAT	Lists the Inmarsat specific functions supported by the SCS system ASD.
AT+WLES = [n]	Selects the Net service provider for the next outgoing call. The parameter nnn specifies the Net service provider Access Code. Three digits must be keyed in. If omitted, the default Net service provider set from the SCS system is selected. A valid setting for n is between 0 and 255. The default number for nnn is 000.
AT+WNERAHSKAKE = [n]	Selects the handshake setup. The number n is defined as follows: • 0 = Routes handshake transitions from the PC directly to the Net service provider. Minimizes transmission delays when handshake is seldom used. This is the default setting. • 1 = Fills the SCS system buffer before handshaking with the Net service provider.
AT+WRATE = [<sat_rate>] [,<ter_rate>]	Sets the wanted satellite data rate, and the terrestrial data rate used for outgoing data calls. The sat_rate is the requested data rate to use over satellite channel, for the SCS system to permanently set to, for example, 2400 bps. The ter_rate is the data rate to use on the terrestrial modem. Valid rates are as follows: • 1200 bps • 2400 bps • 4800 bps • 9600 bps (default setting) • 14400 bps. <u>EXAMPLE:</u> AT+WRATE=2400,2400 Sets both the satellite rate and the terrestrial modem rate to 2400 bps.
• AT+WRATE?	Displays the selected rates.
• AT+WRATE =?	Displays the available rates.

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Table D-4. Extended AT+I, +G, and +W Commands (cont)

Command (Note 1)	Description
AT+WRTL = [<low>] [<high>]	Sets the lower and upper threshold level in bytes of the buffer used in the Net service provider-to-system direction (SCS system receive buffer). The low parameter specifies the lower threshold at which point the SCS system ASD should issue an Receiver Ready (RR) packet signalling that it is ready to receive data from Net service provider. Valid values are between 0 and 511. The default value is 120. The high parameter specifies the upper threshold at which point the SCS system ASD should issue an Receiver Not Ready (RNR) packet signalling that it is not ready to receive any more data from Net service provider. Valid values are between 1 and 512. The default value is 240. NOTE: The high value must be larger than the low value. When the high value is omitted, it becomes the low value + 120.
• AT+WRTL?	Displays the selected threshold levels.
• AT+WRTL =?	Displays the available threshold levels.
AT+WS45 = [n]	Sets the requested satellite and terrestrial error correction scheme for data calls. The parameter reference number n is defined in Table D-5. NOTE: The default setting for n is 1.
• AT+WS45?	Displays the current setting.
• AT+WS45 =?	Displays the available setting.
AT+WS46?	Shows that the Inmarsat Mini-M ASD standard is to be used for data communication. This is fixed and may not be changed.
AT+WTNID = [<nnn>]	Sets the terrestrial network for the next outgoing data call. The parameter nnn specifies the terrestrial network ID. If omitted, it is set to 000, which means that the terrestrial network is unspecified. The range of this parameter is between 0 and 255.
• AT+WTNID?	Displays the selected Terrestrial Network Identification Digit (TNID).
• AT+WTNID =?	Displays the available TNIDs.

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Table D-4. Extended AT+I, +G, and +W Commands (cont)

Command (Note 1)	Description
AT+WTTL = [<low>] [<high>]	Sets the lower and upper threshold level in bytes of the buffer used in the WORLDPHONE-to-Net service provider direction (SCS system transmit buffer). The low parameter specifies the lower threshold at which point the SCS system ASD should issue an XON, or raise the Clear to Send (CTS) line signaling that it is ready to receive data from the PC. Valid values are between 0 and 511. The default value is 120. The high parameter specifies the upper threshold at which point the SCS system ASD should issue an an XOFF, or lower the CTS line signalling that it is not ready to receive data from the PC. Valid values are between 1 and 512. The default value is 240. NOTE: The high value must be larger than the low value. When the high value is omitted, it becomes the low value + 120.
• AT+WTTL?	Displays the selected threshold levels.
• AT+WTTL =?	Displays the available threshold levels.
AT+WXR = [n]	Determines the format of a CONNECT response from the SCS system ASD. The format reference number n is defined as follows: • 0 = CONNECT <(See Note 3)> • +WXSr:<satellite rate>,<ARQ I NARQ> +WXTR:<terrestrial rate>,<ARQ I NARQ> +WXKR:<ARQ window size> CONNECT <PC-WP rate> • 2 = CONNECT <(See Note 3)>,<ARQ I NARQ> [default setting] • 3 = XON/XOFF (software flow control with pass-through of control characters).
• AT+WXR?	Displays the selected format.
• AT+WXR =?	Displays the available formats.
NOTES: 1. Push the RETURN (or ENTER) key after typing each command. 2. This is the default setting. 3. This value is the lowest value of the PC-WP rate, satellite rate and terrestrial rate.	

Table D-5. Parameter Reference Number n for AT+WS45 Command

n	Satellite Error Correction	Terrestrial Error Correction	End-To-End
0	non-ARQ	non-V.42	NARQ
1	ARQ	V.42	ARQ

Table D-5. Parameter Reference Number n for AT+WS45 Command (cont)

n	Satellite Error Correction	Terrestrial Error Correction	End-To-End
200	non-ARQ	V.42	NARQ
201	ARQ	non-V.42	NARQ

7. S-Register Commands

S-registers are special memory locations in the SCS system System for storing specific configuration and operating parameters. The S-register commands are given in Table D-6.

Table D-6. S-Register Commands

Command (Note 1)	Description
ATS0 = [n]	Specifies automatic answer at the n th ring. The parameter n is defined as follows: • 0 = OFF • 1 thru 255 = ON.
• ATS0 = <n>	Sets the value of the register.
• ATS0 ?	Displays the current value of the register.
• ATS0 =0 (Note 2)	Turns automatic answer OFF.
• ATS0 =1	Answers after one ring. NOTE: The SCS system ASD will terminate incoming calls after 95 sec.
ATS2 = [n]	Stores the ASCII decimal code for the escape character. Authorized codes are between 0 and 255. NOTE: n = 128 disables the escape sequence.
• ATS2 = <n>	Sets the value of the register.
• ATS2 ?	Displays the current value of the register.
• ATS2 =43 (Note 2)	Sets the ESCAPE code to 43 (+ key).
ATS3 = [n]	Stores the ASCII decimal code for the carriage return character (RETURN or ENTER key). Authorized codes are between 0 and 127.
• ATS3 = <n>	Sets the value of the register.
• ATS3 ?	Displays the current value of the register.
• ATS3 =13 (Note 2)	Sets the CARRIAGE RETURN code to 13 (RETURN or ENTER key).
ATS4 = [n]	Stores the ASCII decimal code for the line feed character. Authorized codes are between 0 and 127.

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Table D-6. S-Register Commands (cont)

Command (Note 1)	Description
• ATS4 = <n>	Sets the value of the register.
• ATS4 ?	Displays the current value of the register.
• ATS4 =10 (Note 2)	Sets the the LINE FEED code to 10 .
ATS5 = [n]	Stores the ASCII decimal code for the editing character. Authorized codes are between 0 and 127.
• ATS5 = <n>	Sets the value of the register.
• ATS5 ?	Displays the current value of the register.
• ATS5 =8 (Note 2)	Sets the the BACK SPACE code to 8 .
ATS25 = [n]	Sets a delay before examining DTR (108/2) after dialing and when online with a system-to-Net call. The value of n ranges from 0 to 255 in hundredths of a second.
• ATS25 = <n>	Sets the delay value.
• ATS25 ?	Displays the current delay value.
• ATS25 =5 (Note 2)	Sets the delay to 5 (corresponding to 50 milliseconds).
NOTES: 1. Push the RETURN (or ENTER) key after typing each command. 2. This is the default setting.	



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