

## Safety Summary

The following general safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of the equipment.

**The manufacturer assumes no liability for the customers failure to comply with these requirements.**

**We strongly recommend you to read the manual in total before you start using the equipment.**

## MICROWAVE RADIATION HAZARDS



RADIO FREQUENCY RADIATION  
HAZARD - KEEP CLEAR  
2 METRES MINIMUM

During transmission this telephone emits radio frequency radiation from the front side of the antenna unit (the side facing the satellite). This radiation may be hazardous if exceeding 1 (one) milliwatt per square centimeter of the body. Hence, during transmission,

**DO NOT allow anyone to get closer to the front of the antenna than the recommended minimum safety distance (2 meters).**

## DO NOT DISASSEMBLE THE EQUIPMENT

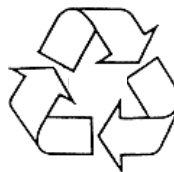


The handset, terminal, front-end amplifier and power supply contains no user serviceable parts. **DO NOT attempt to open or disassemble any of these parts. Risk of electrical shock.**

The ECI Netlink™ Satellite Terminal may be serviced by qualified service personnel only. **DO NOT try to disassemble the battery as this may present a**

**health risk.** Do not connect or disconnect peripherals to the terminal with the power cable or battery connected as this may damage the components.

## Environmental concerns



The product that you have purchased contains a number of recyclable parts inclusive of a rechargeable battery. The battery contains heavy metals and should be recycled at the end of its service life. Check with your local solid waste officials for details regarding recycling or proper disposal.

## About this Manual

This manual is supplied as an instruction to the **ECI NetLink™ Satellite Terminal** and to this system only. This document is the legal property of EuroCom Industries A/S, Denmark. All rights are reserved, including those relating to patents or registered designs. Reproduction, quoting in part or in total or any other use by any third party requires the written consent of EuroCom Industries A/S. The manual is divided into two sections. **Section 1:** A description of the basic operations that it is necessary to know to be able to master the use of this equipment. **Section 2:** A comprehensive description of the system and its many advanced features when used with a personal computer.

**Please read the Warranty & Disclaimer Statement on the rear inside of the cover carefully.**

## Warranty & Disclaimer

According to Danish Law, ECI SatCom grant you one year of warranty on all mechanical and electronic components on this NetLink™ Satellite Terminal, provided that:

- the equipment has been used for its intended purpose only.
- all instructions in the NetLink™ User Guide and other technical documentation accompanying the equipment have been strictly observed by the user.
- the equipment has not been subject to misuse or abuse such as, but not limited to, exposure to temperatures < - 20 °C or > 40 °C, excessively rough handling, direct exposure to water or any other liquid, exposure to lightning, static electricity or any other kind of electrical shock.

This warranty covers repair costs and spare parts for a period of one year from the invoice date. You are responsible for shipping the equipment **in its original packing, including all documentation, cables and accessories** to ECI Satellite Communication A/S, Porsvej 2, DK9200 Aalborg SV, or at ECI SatCom's discretion to its appointed distributor or reseller. Cosmetic damages are not covered by this warranty.

ECI Satellite Communication A/S accepts product liability under Danish law as expressed in the Products Liability Act of June 7<sup>th</sup>, 1989 and all the legal rights it grants you. However, under no circumstance and under no legal theory, tort, contract, or otherwise, shall ECI SatCom or its suppliers or resellers be liable to you or any other person for any indirect, special, incidental, or consequential damages of any character, including, but not limited to, damages for loss of goodwill, loss of profit or opportunity, loss of happiness or other mental distress, work stoppage, or any and all other commercial damages or losses.

In no event will ECI SatCom be liable for any damage in excess of the amount ECI SatCom has received from you as payment for the product, even if ECI SatCom shall have been informed of the possibility of such damages, or for any claim by any other party. This limitation of liability shall not apply to liability for death or personal injury to the extent

Danish law prohibits such limitation. In no event shall EuroCom Industries A/S be liable to issue compensations in excess of the maximum amount of any insurance taken out by EuroCom Industries A/S. This agreement is subject to the statutes of Danish law and venue is the local court in Aalborg, Denmark. Legal language is Danish. In case of disputes with parties outside Denmark, Act no. 733 of December 7<sup>th</sup> 1988 (International Sale of Goods Act) will not apply to the dispute.

*If you engage in **high-risk activities** such as, but not limited to, traveling in hazardous environments, mountains, jungles, deserts, arctic areas, remote or depopulated areas, civil war zones or zones of military, para-military, terrorist or guerilla activity, **or** if you utilize your NetLink™ PST in connection with operation of nuclear facilities, ship or aircraft navigation or communication systems, air traffic control, direct life support machines, weapons systems or other purposes for which it is not specifically intended and in which the failure of the product could lead directly to death, personal injury or severe physical or environmental damage, ECI SatCom **specifically disclaim** any express or implied warranty in connection with such and all similar activities.*

### ECI NetLink Satellite Terminal Operators Manual

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Contact ECI Documentation Department for questions or comments.

**Telephone:** +45 9634 6340

**Telefax:** +45 9634 6390

**E-mail:** dre@eci.dk

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Porsvej 2, DK9200 Aalborg SV, Denmark

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## ▶ About this user guide

The user guide consists of two elements. The **booklet** you are currently reading will guide you through the basics and teach you how to operate the **netlink™** satellite terminal and the **quick reference guide**, a short, illustrated guide that will enable even the untrained person to receive and make a phone call with the terminal. The use of the **netlink™ interface software** is facilitated by an on-screen HELP-function, a comprehensive yet easy to understand tool to using a PC with the **netlink™**

### Symbols

The following symbols will guide you through the text:

Beginning of a new paragraph: ▶

Continuation of a paragraph: ▶▶

Ending a paragraph: ■

### Abbreviations used

The following abbreviations are used in the guide:

#### AMBE

#### CdPN

**CLA** Cigarette Lighter Adaptor

**DID** Destination Identification

**GAN** Global Area Network

**GUI** Graphic User Interface

**IMN** InMarsat Number

**IPDS** Inmarsat Packet Data Service

**ISDN** Integrated Services Digital Network

**LCD** Liquid Crystal Display

**LED** Light Emitting Diode

**LES** Land Earth Station

**LESO** Land Earth Station Operators

**MES** Mobile Earth Station

**MMI** Man Machine Interface

**NCS** Network Coordination Station

**OID** Originated Identification

**RS232** A standard serial PC com port

**UDI** Unrestricted Digital Information

**USB** Universal Serial Bus

**X 21** Synchronous serial communication



## ► About the terminal

The ECI netlink™ satellite terminal is a state-of-the-art, portable communications tool designed to provide you with worldwide contact via the Inmarsat™ Global Area Network (GAN).

The netlink™ satellite terminal combines a rugged and reliable design with an elegant and functional appearance, equally suitable for the off-road voyager as for the discriminating business executive for whom uninterrupted contact with the world is a daily necessity.

The lightweight netlink™ terminal comes with a practical pilot case for safe transporting and is build up as a unit comprising a frame with sliding antenna panels and the terminal itself with the handset.

For indoor use of the terminal with the antenna placed outside or if you need to remove the terminal from the frame due to a steep elevation angle (i.e. near the Equator. See p. 4 for details), a 5 meter antenna cable is included. Longer cables are available as an option.

### Accessories included:

- User Guide
- Quick Reference Guide
- Power Supply
- Soft bag with backpack straps
- Compass
- Antenna Cable, 0,45 M
- Antenna Cable, 5 M

### Optional:

Please refer to the accessories list.



## Fit and charge battery

The ECI netlink™ satellite terminal can be operated with two kinds of power supply, either with the integrated NiMH Battery-Pack or with external power supply, either the CLA or the AC/DC Power Supply. The latter requires access to 90 - 265 Volt mains, 50 - 60 Hz.

When you initialize your terminal for the first time, the Battery-Pack will be empty and **must be charged**. In order to do so, the terminal must be connected to mains via the AC/DC Power Supply. The connector location is displayed on page 5.

When the Battery-Pack has been charged for the first time, power status can be monitored with the battery symbol in the display. A fully charged battery will show a "filled" symbol, an empty pack will show an "empty" symbol. When battery capacity is down to 20 percent, the symbol will flash.



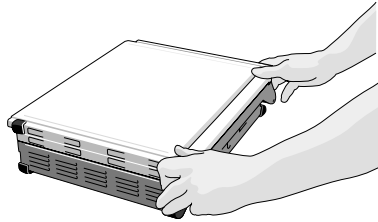
Average time for a full charge is 10 to 16 hours at 20 °C ambient temperature. To obtain maximum capacity, it is recommended that the battery receive a full charge the first five times it is charged.

**To avoid damage** to the battery it is recommended only to charge the battery within temperatures ranging from 0 °C to +55 °C. **Please note** that the Battery-Pack's performance will be significantly impaired by temperatures below -10 °C.

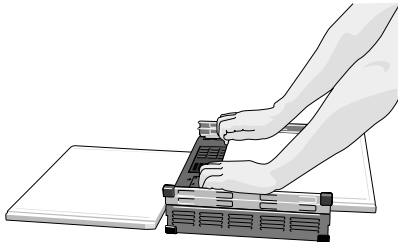
The Battery-Pack is located in a compartment in the base of the terminal.

## ► Mounting of the antenna panels

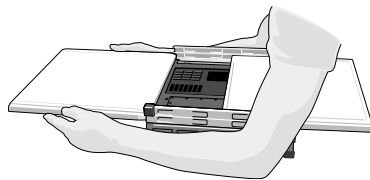
1. While the terminal is placed on a flat surface, push hard using your thumbs on the long side edge of the front antenna panel to unlock it. Pull the panel out of its guide.



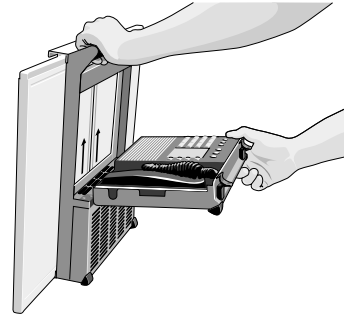
2. Repeat the procedure with the rear panel, but only pull it halfway out of its guide until it locks.



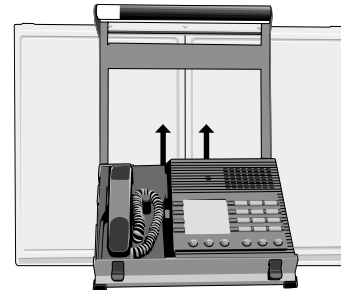
3. Insert the front panel into the same guide as the rear panel. The black arrows must be on the backside of the panels, pointing upwards.



4. Open the terminal frame and center the panels to locking position in line with the center of the frame.



4. Check that the panels are centered and locked, and that the arrows are on the backside of the antenna panels and facing upwards. You are now ready to proceed with "Positioning of the antenna" on p. 8.



5. If you are close to the Equator and the satellite thus is directly above you, the elevation angle of the antenna will be very steep. In this event, you will have to remove the terminal from the frame in order to be able to operate the terminal properly.

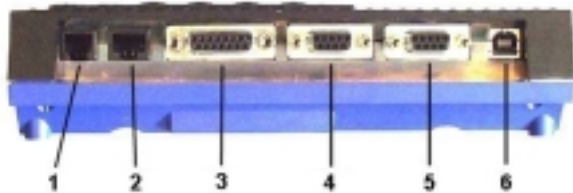
**Please note:** Do not paint the antenna panels or cover them while the terminal is in use as appropriate cooling is a necessity to prevent overheating and to secure proper function.





## Layout of the terminal

- |                            |                              |
|----------------------------|------------------------------|
| 1. Antenna connector       | 8. Clear Key                 |
| 2. SIM-Card slot           | 9. On-hook (Power On/Off)    |
| 3. Display                 | 10. Menu keys (Select/Enter) |
| 4. Signal loudspeaker      | 11. Phone connector          |
| 5. Power Indicator (green) | 12. Handset                  |
| 6. Alphanumeric keyboard   | 13. DC connector             |
| 7. Off-hook key            |                              |



- |                        |        |            |
|------------------------|--------|------------|
| 1. Fax/Modem connector | RJ-11  |            |
| 2. ISDN connector      | RJ-45  |            |
| 3. X.21 connector      | X.21   |            |
| 4. IPDS connector      | RS-232 | (optional) |
| 5. PC connector        | RS-232 |            |
| 6. USB connector       | USB    | (optional) |

## The keypad

The terminal is equipped with a standard 12-key keypad with digits and letters.

**Input digits:** press appropriate keys

**Input letters:** press the relevant key for at least 1 sec. Letters will change sequentially until you release the key.

## Multifunctional keys

**On-hook key:** switching on the terminal  
switching off the terminal  
terminating a menu function  
escape function



**Off-hook key:** handset hook-off  
answer incoming call  
perform outgoing call



**Clear key (C):** delete last character  
delete whole input (hold key down)



**Left menu key:** softkey menu function  
scroll down



**Centre menu key:** softkey menu function  
scroll up



**Right menu key:** softkey enter functions



## » Text and symbols on the Display

**Top row, left to right:** Arrows indicating signal level  
1 arrow = minimum signal  
6 arrows = maximum signal  
(-arrows are visible in *READY* and during antenna adjustments only)



Transmitting symbol  
(only visible when transmitting)

Battery symbol  
Shows: empty, 1/3 full, 2/3 full, full  
(not visible during transmitting)

„DC“-symbol  
(only visible when power supply is connected)  
„PF“-symbol,  
(only visible in the case of an error with the power supply)

**Centre rows:** Various functions display

**Bottom bar:** Choice of softkey functions

**Please note:** LCD displays functions their best at ambient temperatures between 5 °C and 55 °C. At temperatures below 10 °C the display will tend to slow down in function.

## Language

All commands in the display are in English. You are guided through all menus and settings by a user friendly and self-explanatory menu function. Simply follow on-screen instructions.

## LCD Display Backlight

As default the display backlight is on when the terminal is switched on. In the “READY” status the backlight is off automatically after 30 seconds. This function may be disabled via the NetLink™ Interface Software leaving the backlight on permanently.

**Please note:** Leaving the backlight on permanently will cause a significant drain on the battery and thus reduce stand-by time.

## Beeper

Antenna adjustment is supported by a beeper function (inaccurate antenna angle = low signal = low beeper frequency and vice versa). This function is recommendable, but if desired, the beeper may be switched off permanently via the softkey menu (p.16).

## Loudspeaker/Handset

The internal loudspeaker is active only with the hand set ON-HOOK. The loudspeakers sole function is to generate signals for incoming calls, for “free” tone and for “error” tone. There is no “handfree” function. The volume of the loudspeaker and the handset can be adjusted, and the loudspeaker function can be disabled permanently via the interface software.

## Power LED

The power LED is on continuously when the terminal is switched on. In Sleep Mode the LED flashes. Sleep mode is a power saving function and will initiate automatically after a few minutes of inactivity.



## ► Switching the terminal on and off.

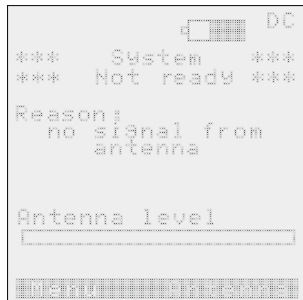
To turn on the terminal,

press:



for approx. two seconds. The power LED comes on, and the terminal initializes. The initialization may last up to 50 seconds.

If you are using your **netlink™** terminal for the very first time, the system will not be ready for transmission and the display will signal, that no connection with an Inmarsat™ satellite can be achieved:



In order to prepare the terminal for satellite communication, you must go through the steps described in the paragraph: “Positioning of the antenna” on page 8.

The antenna setup menu will require you to key in your present position, represented by the appropriate LATITUDE and LONGITUDE values. These values can be determined by looking at the azimuth map on page 27.

**Please note:** Whenever you change your geographical position significantly, the corresponding values for latitude and longitude must be keyed in.

When the terminal is ready for operation the display shows the status **READY**:



You can branch out to submenus by choosing **Menu, Book or R dial**



Depending on the status of the terminal, the following text may be displayed in part or in total:

Text:

**Phone is locked**  
**SIM Card inserted**  
**Call log memory**  
**nearly full**

**Accu nearly empty**  
**ERROR EXISTS**

Meaning:

PIN code required.  
SIM Card is OK

Call log buffer is almost full (priority display)  
Recharge battery  
Error has been detected

To switch off the terminal,

press:



for approx. 5 seconds. You will be prompted “**Yes**” or “**No**” whether you really want to turn off the terminal and must press the appropriate softkey.

# Getting started

## ANTENNA SETUP

### ► Positioning of the antenna

**Please note:** The antenna panels must be mounted as described on page 4 and a free line of sight to the selected Inmarsat™ satellite must be obtained (see p. 25 for details). **Observe the minimum safe distance of 2 meters from antenna front to any living entity.**

Turn on the terminal:

If the system is not ready (no signal is received) the display indicates no level (an empty box) in the LCD beam display.

```
DC
*** System ***
*** Not ready ***
Reason:
no signal from
antenna
Antenna level
[ ]
[ ]
```

Select:



and the antenna set menu is displayed.

The menu will display the last entered position and selected satellite. If you are using the terminal for the first time, default position (city of Aalborg, Denmark) and subsequent choice of satellite are displayed

If the position displayed represents your present latitude and longitude, select "OK" and proceed to the satellite select menu (p. 9)

If you wish to enter another position,

select:



```
DC
Atlantic O. East
Position:
57N/9W
Set Antenna to
Ele ation: 11
Azimuth : 227
Level: 34 dBHz
[ ] Pos [ ] OK
```

```
DC
Set new Position
old position
57N / 9E
Latitude (N / S):
```

The cursor appears at the input field for **LATITUDE**.

Key in your current latitude as a two-digit value, using the numeric keypad. The bottom bar of the display will automatically switch to a "North - South" select option.

**Example:**

The position for Salt Lake City in the United States is:

**Latitude:** 40:46:38N

**Longitude:** 111:55:48W

Key in: **41** for latitude and select "North"

Key in: **112** for longitude and select "West"

```
DC
Set new Position
old position
57N / 9E
Latitude (N / S):
41
```

Select:



and the cursor will appear in the input field for **LONGITUDE**

**Repeat the procedure.** Enter your current longitude as a two-digit value. The bottom bar will switch to an "East - West" select option. Select the appropriate.

When both longitude and latitude values are keyed in, you will be prompted to accept these values.

Select "OK"

and the display will switch to the satellite select option.



- **Selecting the satellite.** When you have entered your present latitude and longitude, you will be given a list of Inmarsat™ satellites within reach:



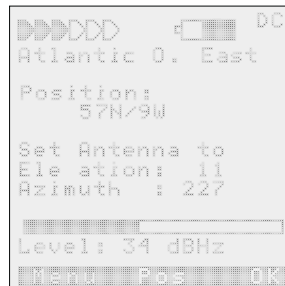
**Scroll with arrows:**



Having selected the desired satellite, you will be prompted to adjust the antenna in accordance with the azimuth and elevation stated (see p. 25 for details).

*In simple terms this means that you turn the antenna in the azimuth direction and apply the elevation stated.*

*You will be guided by a tone from the terminal - the higher the pitch, the better signal is received.*

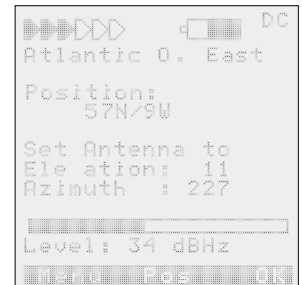


When you have positioned the antenna correctly, the signal from the satellite will be indicated by a reading on the display.

To adjust the antenna to its optimum, gently scan left and right a couple of degrees while you are watching the signal level indicator. When you have found the best position, try tilting the antenna up and down a couple of degrees until best result is obtained.

The actual received level is displayed both by the level indicator and as a numerical value (dBHz).

*For optimum results, a dBHz level of 50 or more should be achieved.*



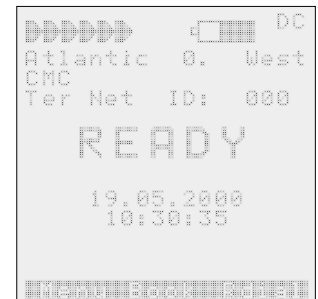
**Select:**



to acknowledge the choice of satellite, position and adjustment of azimuth and elevation. This concludes the antenna setup procedure.

The automatic System Update starts. After the system has updated the terminal is ready for receiving or making calls, and the system will show the **Ready** display:

*You are now ready to receive or send voice, fax or data transmissions or to make use of the MENU-functions as described on p. 13.*



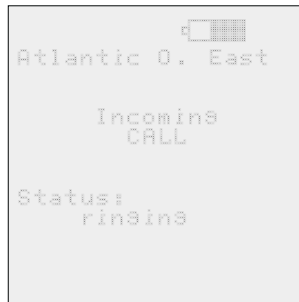
**Please note:**


- to determine your Azimuth precisely use a compass (do not estimate). Refer to page 25 for details.
- The last used position is stored automatically.
- Communication with a satellite north and south of 70° may prove difficult or impossible (see p. 25).

## ► Receiving calls

**Please Note:** Before you can make or receive calls on your NetLink™ Satellite Terminal, this must be set up as described in the section “Getting started”


The display will alert you that your terminal is receiving a call from the satellite selected.



Press: 

or pick up the handset.

When your call is terminated

Press: 

to disconnect.

## Making Calls

Press:  or

lift handset, press the numeric keypad to enter digits and letters

**Enter digits:** press appropriate keys

**Enter letters:** press the relevant key for 1 sec. Letters will change sequentially until you release the key.

The number may be completed with i.e. an extension code or other information.

**Maximum Input:**  
48 Characters



Select: 

to dial your selected number.

When your call is terminated

Press: 

to disconnect.

**Please note:** When connection is established, the connecting time is displayed (HH:MM:SS) and will count for the duration of the call.

You will only be charged for the time you are connected



## ▶ Re-dialling your last/previous call

### Select “Rdial”

in the READY display. Use the scrolling keys to select the desired number (the last 3 numbers can be retrieved).

### Select OK”

when the desired number is highlighted. The number will be dialled.

## International dialing

The complete international telephone number including the country code must be entered, i.e.:

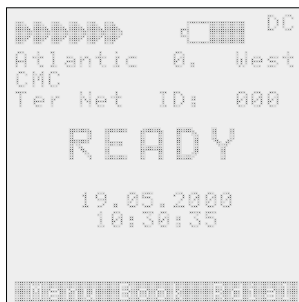
To call ECI **netlink™ Beta-test support** in Denmark, enter:

**+ 45 7013 7000**

and ask for the **Help Desk Centre**

## Phone Book

Your **netlink™** terminal is equipped with a phonebook feature that allows you to store and retrieve your most commonly used phone numbers.

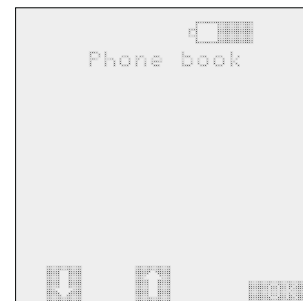


To access the phonebook you must be in the terminals “Ready” mode.

Select :



The Phone Book menu will be displayed. Use the scrolling softkeys to select the desired number. For fast selection the initial letter of the recipient can be entered.



Press:



to scroll, and select “OK” to dial the number

## About the Phone Book

- A maximum of 100 data records can be stored.
- Each data record consists of name, number and ‘short dial identifier’.
- A maximum of 10 data records can be provided with a shortcut digit (0 to 9) allowing you to select the assigned subscriber by pressing a single key.
- The displayed call number can be completed by further digits (until 48).
- Existing data records in the phone book cannot be deleted without connecting the terminal to a PC.
- The Phone Book data are stored in the terminal flash memory.

## Entries or changes in the Phone Book

Entries into the Phone Book, i.e.. adding, changing or deleting names or telephone numbers, requires that the terminal is linked to a PC. To learn more about this feature, see the section: “Using the terminal with a PC”

## ► Enter PIN

Your SIM Card may be furnished with a personal PIN Code to prevent misuse.

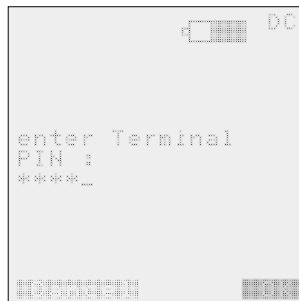
There are four different PIN Modes possible.

- SIM Card PIN
- Terminal User login
- Service PIN
- Supervisor PIN

## SIM Input

Insert your SIM card in the slot (2). See p. 5

Enter your PIN Code. Be careful to enter the code correctly as **the SIM-card will be locked after three incorrect entries**. Correct mistyping with the **C** key.



For safety reasons the terminal will display the entry as \*\*\*\*\*. (A PIN Code may consist of four to eight digits).

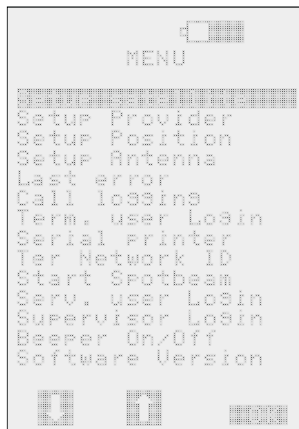
**Please note:** Should you block your SIM-card by mistyping three times, follow the instructions provided with the SIM-card. You will need to enter your MASTER PIN (PUK Code).

If you loose your MASTER PIN and/or your PIN Code, call your Service Provider to obtain a new code.

## ► Use of the Menu

The MENU function allows you to perform various operations such as setting up the antenna, satellite and provider information.

Select **"Menu"** in the READY display



to find the desired submenu

**Scroll:**



Select **"OK"** to enter the submenu.

Throughout most of the submenus you can revert directly to the main "MENU" or to the "READY" display this way:

**Press:**  to escape.

from the submenu.

## Setup Satellite

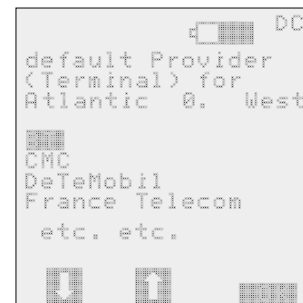
Setting up the satellite to communicate is described in details in the paragraph: "Positioning the antenna" on p. 8 in the "Getting started" section. Please refer to this page or to the Quick Reference Guide.

## Setup Provider

The service provider is the telephone company running or leasing time on a LES and thus capable of distributing satellite transmitted calls on the land based network.

The available providers are displayed alphabetically. Choose by using the softkeys or press the first character of the provider name.

Providers without name are displayed by their code. See more about this in "Using a PC with the netlink™"



**Scroll:**



Select **"OK"** to choose service provider.

## Setup Position

Setting up your position is described in details in the paragraph "Positioning the antenna" on p. 8 in the "Getting started" section. Please refer to this page.

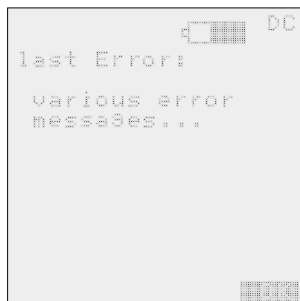


## ▶▶ Setup Antenna

Setting up the antenna is described in details in the paragraph "Positioning the antenna" on p. 8 in the "Getting started" section. Please refer to this page.

## Last Error

Displays the data of the last error log.



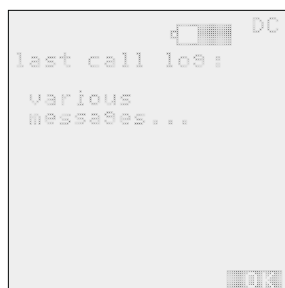
**Select:**



to acknowledge the data provided.

## Call logging

Provides data regarding the three latest calls made or received.



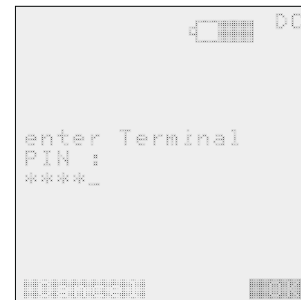
**Select:**



to acknowledge the data provided.

## Terminal User login

Allows for users to log in with their individual PIN-codes.



**Select:**



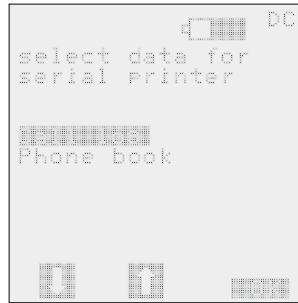
to enter PIN-code.





## Serial Printer

This feature provides you with the option of printing either the Phone Book or the Call Log data. The terminal must be connected to a printer via a PC.




*During the data transfer, the message: „Call Log/Phone Book data printing“ will be displayed.*

**Select:**

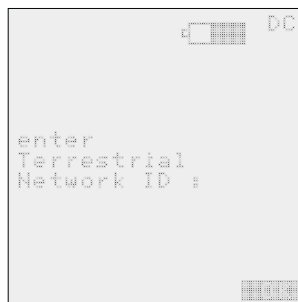


to print the selected data group.

**Press:**  if you want to abort printing.

## Terrestrial Network ID

The Terrestrial Network ID can be entered for the actual satellite. The entered ID is valid for all providers.



*Enter a three-digit number.  
Default is: 000  
The function “Enter Terrestrial ID” is not to be used in combination with a SIM Card.*

**Select:**



to enter the ID.

## Start Spotbeam

Starts the spotbeam selection procedure.



**Choose:**



to start the selection procedure.

## Service User Login

See paragraph „Enter PIN“

## Supervisor Login

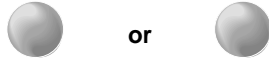
See paragraph „Enter PIN“

## » **Beeper On/Off**

The antenna beeper can be switched off permanently if desired.



**Choose:**



to turn beeper on or off.

## **Software version**

Displays the software version installed on your terminal.



**Select:**



to acknowledge the information provided.



## List of Inmarsat™ Services currently available with netlink™

Code	Service Type	Service Nature	Chan. Param.	
01H	01H	0H	03H	4.8kb/s telephony
02H	0 IH	IH	03H	4.8 kb/s telephony w/cred.card
07H	06H	0H	06H	64kbitts UD1
08H	06H	1 H	06H	64kbit/s UDI w/cred. card
09H	06H	0H	07H	56kbit/s Data
0AH	06H	1 H	07H	56kbit/s Data w/cred. card
0BH	06H	0H	I0H	64kbit/s 3.1kHz Audio
0CH	06H	IH	I0H	64kbit/s 3.1kHz Audio w/cred. card
0DH	0 IH	0H	0FH	64kbit/s Speech
0EH	01H	1H	0FH	64kbit/s Speech w/cred. card

## ► Physical properties:

### Weight:

Overall:	5,3 kg
Terminal, without battery:	
Battery:	
Frame with antenna panels:	

### Dimensions:

Overall:	H: 410 mm, W: 300 mm, D: 90 mm
Terminal	H: 50 mm, W: 290 mm, D: 200 mm
Antenna (unfolded)	H: 410 mm, W: 600 mm

### Battery life:

Standby	up to 70 hours
Voice transmission	up to 4 hours
ISDN/64 kbit/s transmission	up to 1 hour

### Power requirements:

DC input	10 - 32 VDC
AC input (with adapter)	90 - 265 VAC, 50 - 60 Hz

## Terminal error codes (course codes):

One of the following codes may be displayed as a result of terminal malfunction:

- **3000** spare
- **3001** BULLETIN\_BOARD\_COMPLETE
- **3002** BULLETIN\_BOARD\_UPDATE
- **3003** NSR\_VALID\_CHECK
- **3004** NO\_SPOTBEAM\_CAPABILITY
- **3005** HW\_ERROR
- **3006** ERROR\_IN\_CALL\_DETAILS
- **3007** NO\_MESRQ\_CHANNEL
- **3008** NO\_MESRQ\_BURST
- **3009** NO\_CHANNEL\_ASSIGNMENT
- **3010** SELECTIVE\_CLEAR
- **3011** POWER\_DOWN
- **3012** SHUTDOWN
- **3013** MRSII\_NOT\_EXPIRED
- **3014** WRONG\_SERVICE\_TYPE
- **3015** WRONG\_CHANNEL\_PARAMETER
- **3016** SYNC\_LOST
- **3017** WRONG\_CHANNEL\_ASSIGNMENT
- **3018** NO\_SCPC\_INITIAL\_SEQUENCE
- **3019** LES\_NOT\_AVAILABLE
- **3020** SPOTBEAM\_SELECTION

### Beta-test participants, please note:

These codes are valid in the beta-test phase for diagnostic purposes. You are requested to record the incidences, you may experience during the beta-test and state the course code on the appropriate CALL LOG.

The codes may appear automatically as a result of a malfunction or you may find the code in the submenu: **Last error log**.

If you experience a "FATAL ERROR", the terminal will lock and you will have to disconnect the DC mains and the battery and restart the terminal.

## ► Performance characteristics

### Transmit

- L-Band frequency 1626.5 – 1660.5 MHz
- EIRP Voice 8 - 14dBW
- EIRP 64kBit/s 19 - 25dBW

### Receive

- L-Band frequency 1525.0 – 1559.0 MHz
- G/T -7dBK

### Channel bandwidth

- Voice 5 kHz
- 64Kbit/s 40 kHz

### Modulation

- Voice QPSK
- 64Kbit/s 16QAM

### Operating modes

- 4,8Kbit/s AMBE Voice (mini-M)
- 64 Kbit/s Data
- 56 Kbit/s V.110 Data
- 64 Kbit/s 3.1kHz Audio
- 64 Kbit/s Speech
- 64Kbit/s IPDS

## User Interfaces

- Four wire Handset
- Two wire RJ 11 for ext.Phone
- Two wire RJ11 Modem/ FAX / STU
- X.21 Data interface ( old HSD)
- ISDN S0 Interface (NT1)
- RS232 IPDS Port
- RS232 PC Port (MMI, Maintenance)
- Integrated SIM card reader

## Others

- DC/DC Power Supply 9 - 32 VDC
- Integrated battery pack Nickel Metal Hydride or Lithium Ion and DC charger
- Battery Capacity NI-MH typically 4,5 Ah
- Antenna 2 Panel Patch Array Antenna, direct coupling Gain: 18dB
- Antenna Cable (Terminal to antenna) 0,45 M Max cable loss 15dB at L-Band, max 0.8 Ohm at DC



## ► Interfaces

### AMBE Voice

- 4 wire handpone, internal connected with OFF HOOK
- 2 wire RJ11 for external phone

### X.21 UDI (HSD)

- 64 Kbit/s Unrestricted Data Information or 56Kbit/s with V.110
- 15 Pin D-SUB Connector

### FAX / MODEM / STU

- 64 Kbit/s 3.1Kbit/s Audio Service for Group3 Fax, MODEM or STU
- 2 wire RJ11

### ISDN

- AMBE Voice,64kbit/s UDI, 56kbit/s V.110,64kBit/s 3.1khz Audio,64kBit/s Speech
- RJ-45 Connector as NT1 interface for max 8 ISDN devices, restricted power source

### IPDS (Optional)

- RS232 Interface
- AT Command Set for IPDS
- Autobaud and Autoword detection
- 9 Pin D-SUB Connector

### PC MMI (netlink™ Interface Software)

- RS232 Interface
- The Terminal can be programmed for special functions / restrictions (supervisor use)
- Diagnostic and maintainance
- SW Download
- 9 Pin D-SUB Connector

### USB (Optional)

- 4 Pin USB Connector
- SW Driver Optional

### MMI

- Internal 128 x 128 dot matrix display
- DTMF Keypad
- 3 function Keys
- 3 Soft Switches
- SIM Card features PC MMI for Terminal Programming, Configuration, Supervisor use

## Environmental

### Antenna

- Temperature Range
  - Operating - 25 °C to + 55 °C
  - Storage - 40 °C to + 80 °C
- Relative Humidity 95% at + 40 °C

### Terminal

- Temperature Range
  - Operating -25 °C to + 55 °C
  - Storage -40 °C to + 80 C

## ▶ Minimum requirements to the PC

You will need an IBM compatible PC or Laptop computer with the following specifications:

<b>CPU:</b>	486/33MHz minimum
<b>Harddisk:</b>	Minimum 5 Mb of free space (?)
<b>Memory:</b>	Minimum 8 Mb RAM
<b>OS:</b>	Windows 95/98 or NT
<b>Connector:</b>	Serial RS232

At this point, Interface Software is not available for the Macintosh and UNIX operative systems. This will be implemented at a later stage.

## Connecting the PC to the Terminal

Connect the PC COM Port (RS232 serial interface) connector with the terminal PC connector, using a standard 9/9 pin connector cable. Do not connect or disconnect while both devices are on.

## Installing the Interface Software

Insert the CD-ROM with the **netlink™** interface software in the CD drive of your computer. The installation will autostart. If autostart does not commence, select Windows "START", "RUN" and the letter for your CD-drive followed by \GUI\setup.exe, i.e.: **D:\GUI\setup.exe** (if your CD-drive is "D").

The Installation will initiate, prompting you to choose the directory where you want the software installed. Default installation directory is "**C:\Programs\netlink**". You may change this to a path of your own choice.

When installation is complete, the login window appears.

## Navigating the Interface Software

The netlink™ Interface Software contains a powerful "HELP"-function that can be accessed from the login window. All necessary details are described in this function.

## Upgrading the Interface Software

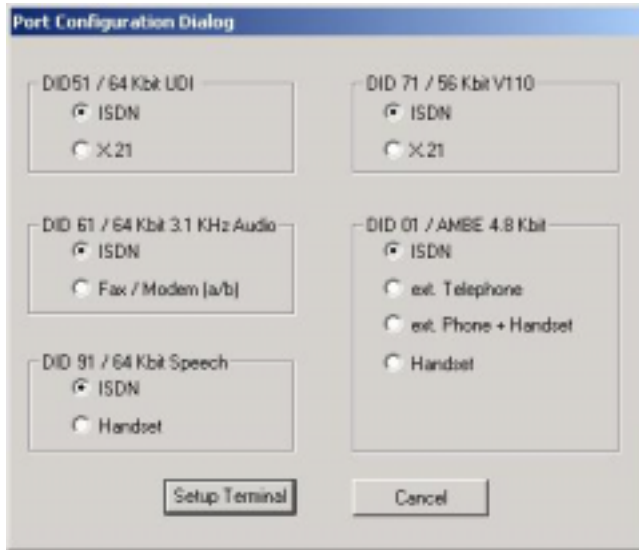
Upgrades will be made available for the end users as they are developed.





►► **Port configuration.**

Configures the routing of incoming calls to the various services available.



Relationship between Inmarsat service, NetLink Port and IMN's						
Inmarsat service	AMBE 64kbit/s	56kbit/s	64kbit/s	64kbit/s	IPDS	max IMN
NetLink port:	Voice	UDI	Data V.110	3,1 kHz	Speech	per terminal
Handset	1			1		2
ext. phone (RJ11)	1					1
ISDN NT1 (J45)	8	8	8	8		8
X. 21 (Dsub 15)		1	1			2
FAX/MOD. (RJ11)				1		1
IPDS RS232 (Dsub9)					1	1
Max. IMN per service	10	9	9	9	1	



Inmarsat Service 64kbit/s 3.1 kHz Audio				
64kbit/s 3.1kHz	OID	DID	Interface	Calling Party No.
IMN45	61	61/FF	J3 or J4	8760000201 (only ISDN)
IMN46	62	62	J4	8760000202
IMN47	63	63	J4	8760000203
IMN48	64	64	J4	8760000204
IMN49	66	66	J4	8760000205
IMN50	66	66	J4	8760000206
IMN51	67	67	J4	8760000207
IMN52	68	68	J4	8760000208
IMN53	69	69	J4	8760000209
IMN54-59	6A-6F	6A-6F	Not used	Not used

Inmarsat Service 64kbit/s UDI				
64kbit/s UDI	OID	DID	Interface	Calling Party No.
IMN15	51	51/FF	J5 or J4	8760000001 (only ISDN)
IMN16	52	52	J4	8760000002
IMN17	53	53	J4	8760000003
IMN18	54	54	J4	8760000004
IMN19	55	55	J4	8760000005
IMN20	56	56	J4	8760000006
IMN21	57	57	J4	8760000007
IMN22	58	58	J4	8760000008
IMN23	59	59	J4	8760000009
IMN24-29	5A-5F	5A-5F	Not used	Not used

Inmarsat Service 56kbit/s UDI				
56kbit/s UDI	OID	DID	Interface	Called Party No.
IMN30	71	71/FF	J5 or J4	8760000101 (only ISDN)
IMN31	72	72	J4	8760000102
IMN32	73	73	J4	8760000103
IMN33	74	74	J4	8760000104
IMN34	75	75	J4	8760000105
IMN35	76	76	J4	8760000106
IMN36	77	77	J4	8760000107
IMN37	78	78	J4	8760000108
IMN38	79	79	J4	8760000109
IMN39-44	7A-7F	7A-7F	Not used	Not used

Inmarsat Service AMBE Voice				
AMBE Voice IMN	OID	DID	Interface	Calling Party No.
IMN1	01	01 or FF	J1 or J1 & J2 or J2 or J4	87600000401 (only ISDN)
IMN2	02	02	J2	
IMN3	03	03	J4	87600000403
IMN4	04	04	J4	87600000404
IMN5	05	05	J4	87600000405
IMN6	06	06	J4	87600000406
IMN7	07	07	J4	87600000407
IMN8	08	08	J4	87600000408
IMN9	09	09	J4	87600000409
IMN10	0A	0A	J4	87600000410
IMN9-14	0B-0F	0B-0F	Not used	Not used

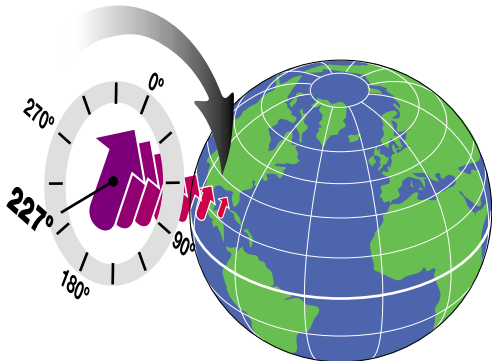
Inmarsat Service 64kbit/s Speech				
64kbit/s Speech	OID	DID	Interface	Calling Party No.
IMN60	91	91/FF	J4 or J1	87600000301
IMN61	92	92	J4	87600000302
IMN62	93	93	J4	87600000303
IMN63	94	94	J4	87600000304
IMN64	95	95	J4	87600000305
IMN65	96	96	J4	87600000306
IMN66	97	97	J4	87600000307
IMN67	98	98	J4	87600000308
IMN68-74	9A-9F	9A-9F	Not used	Not used

## ► What is latitude and longitude?

To facilitate navigation, the surface of the Earth has been divided into a grid by a pattern of lines named **longitudes** and **latitudes**. Longitudes consist of circles that intersect with both the North and the South Poles. Latitudes encircle the planet with regular intervals from the North Pole to the South Pole. The Equator is the latitude dividing the planet in a northern and a southern hemisphere. The distance between these imaginary lines is measured in degrees (°), minutes and seconds

**Please note:** When you are aligning your satellite antenna, you will need to know the latitude and longitude of your present position.

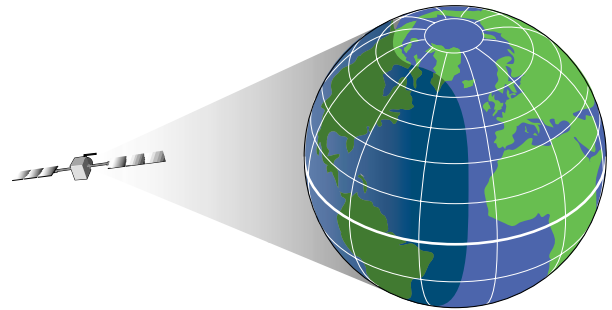
## What is azimuth & elevation?



Azimuth is the deviation in degrees from North. Thus, 90° is East, 180° is South and 270° is West. To find the azimuth of an Inmarsat™ satellite, find North with the help of a compass. Then turn clockwise until the compass displays the desired azimuth. The example shows 227° Azimuth.

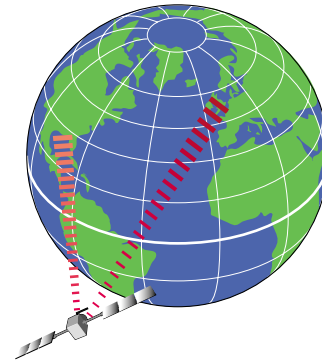
Elevation is the satellites height over the horizon, measured as an angle from a tangent line to the curve of the earth.

## Why a limited range?



Due to their position over the Equator and the curving of the Earth, it is not possible to obtain a free line of sight to the satellites from areas close to the poles.

## Why the delays in communication?



Radio waves travel at the speed of light (approx. 300.000 km/sec.) During your use of the ECI **netlink™** terminal you will experience minor delays in the communication as the radio waves trip to the satellite thus will take up to 550-650 milliseconds in each direction. Therefore you should conduct your conversation in a moderate pace, allowing the necessary time for your partners respond. This delay may also affect the transmission of data.

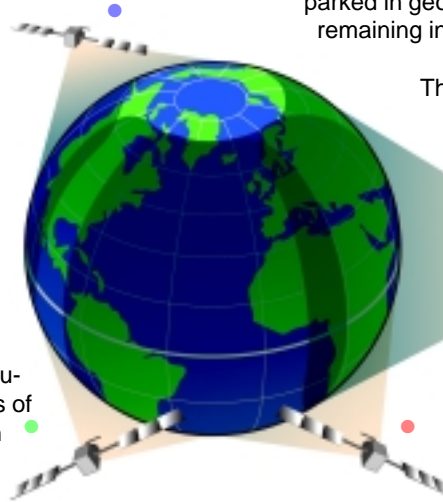
## ► What is satellite communication?

Although anything that is in orbit around the Earth is technically a "satellite" the term is normally used to describe a useful object placed in orbit on purpose to perform a specific mission or task, i.e. to facilitate electronic communication.

A communications satellite is usually in **geostationary orbit**, also referred to as a geosynchronous orbit. This means that the satellite is held in a fixed position over the Earth often in a **band along the equator**, with an altitude of approximately 22,000 miles. This "satellite parking strip" is thus gradually becoming congested with hundreds of television, weather, and communication satellites, and in turn this means that each satellite must be **precisely positioned** to prevent its signals from interfering with the signals from adjacent satellites.

## Why communicate via satellite

Radio signals travel in a straight line from the transmitting antenna, and will not "bend" with the curving of the Earth. Regular cellular phone communication thus requires a grid of antenna relay stations to carry the signals from transmitter to receiver, whereas communications satellites essentially function as relay stations in space that enable us to communicate with anyone within view of the satellite.



## Inmarsat™ satellite system

The Inmarsat™ 3 satellite system consists of four satellites parked in geostationary orbit over the Equator, each satellite remaining in the same relative position over the earth.

The Inmarsat™ satellite system is thus a world-wide communication system covering the area from 70°N to 70°S or more, the array of satellites ensuring that one or more satellites always will be within range of your terminal.

Each satellite covers a part of the earth, called an Ocean Region.

● Atlantic Ocean Region East	<b>(AOR-E)</b>	15.5° W
● Atlantic Ocean Region West	<b>(AOR-W)</b>	54° W
● Pacific Ocean Region	<b>(POR)</b>	178° E
● Indian Ocean Region	<b>(IOR)</b>	64.5° E

## Land Earth Stations

Your **netlink™** terminal is referred to as a Mobile Earth Station (MES) in the Inmarsat™ system. Linking and routing connections through the public telecommunications network is done by a Land Earth Station (LES). All coordination of the satellite traffic is done by a Network Coordination Station (NCS).

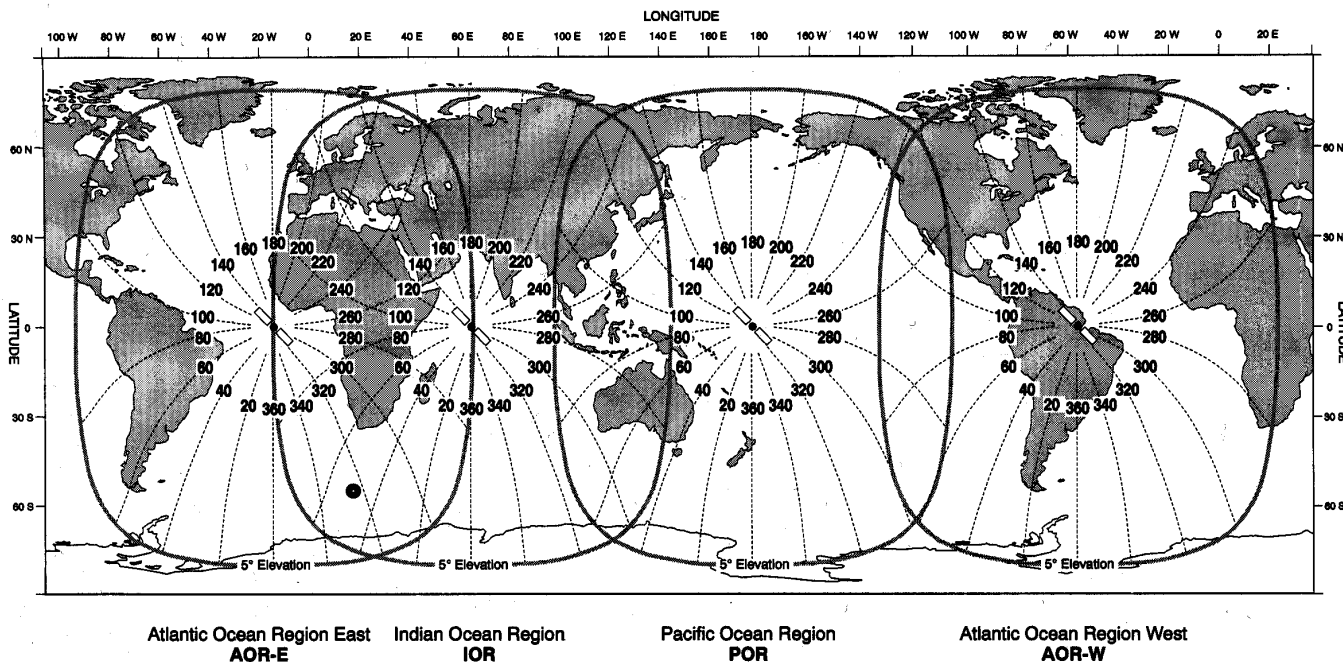
The Inmarsat™ Global Area Network (GAN) includes the options of voice (64 kbit/s ISDN), facsimile, Data (64/56 kbit/s), PCM and IPDS transmissions.

At each LES one or more Network Operators provide some or all of the Inmarsat™ GAN facilities. The user can select which Network Operator he wants to use by specifying a LES access code in the call (see page 13).

# Finding the Inmarsat™ satellite

AZIMUTH ANGLE

## Azimuth Map



### Example:

Azimuth angle for the plotted position ●

324° for the AOR-E satellite

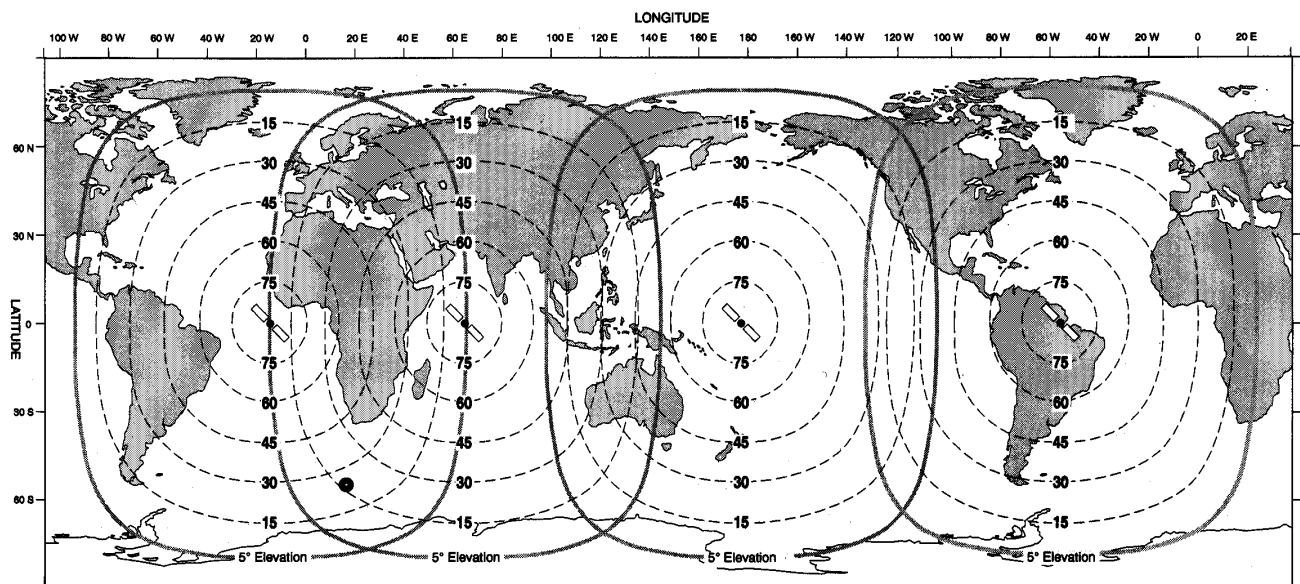
50° for the IOR satellite

Be careful not to read the wrong angle in areas where two satellites overlap.

# Finding the Inmarsat™ satellite

HORIZONTAL ELEVATION

## Elevation Map



Atlantic Ocean Region East  
AOR-E

Indian Ocean Region  
IOR

Pacific Ocean Region  
POR

Atlantic Ocean Region West  
AOR-W

### Example:

Elevation angle for the plotted position ●

24° for the AOR-E satellite

17° for the IOR satellite

Be careful not to read the wrong angle in  
areas where two satellites overlap.