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# *HSD*

Aeronautical Transceivers

# User's Guide

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<b>Revision</b>	<b>Sections revised</b>	<b>Release Date</b>	<b>Comments</b>
A	All	22/03/02	Initial Release
B	All	2/08/02	Release of combined product document, addition of bonded calls, low-speed voice calls, revision of initial release

**HSD Aeronautical Transceivers  
User's Guide  
Document No. EMS-MN-1110-10048  
Revision B  
© EMS Technologies Canada  
August 2, 2002**

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## Preface

This User's Guide provides an overview of Inmarsat services and operating instructions for EMS Technologies High-Speed Data (HSD) Aeronautical Transceivers.

Although the HSD transceivers support a variety of user interfaces and configuration options, the purpose of this document is to provide an example of a basic system set-up only. Consult with your corporate Information Services personnel to customize the system to meet your specific system and user needs.

This document uses Microsoft® Windows 98® as the example operating system for illustrating the set-up and configuration process of dial-up connections. However, performance results vary between operating systems.

At the time of printing, Windows 2000® is the best performer of Microsoft operating systems for satellite network communications using HSD transceivers.



**Figure 1 HSD aeronautical transceiver**

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# 1 Introduction

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- ▶ ***HSD aeronautical transceivers***
- ▶ ***Inmarsat***
- ▶ ***ISDN services***
- ▶ ***Satellite communications***

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## **Introducing HSD aeronautical transceivers**

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HSD aeronautical transceivers provide a digital connection, between aircraft and ground communication networks, using the Inmarsat Satellite Communications system and the international public telephone network.

HSD products support EIA/TIA-232, ISDN, and Ethernet connectivity between an aircraft and selected Land Earth Stations, using the Inmarsat Satellite Communications system and the international Public Switched Telephone Network (PSTN).

The HSD transceivers act as a Mobile Earth Station (MES)—sending and receiving voice, fax, video, and data over satellite links.

### **Services and features**

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HSD transceivers' services and features vary depending on the model and installation configuration-mode. The following section provides descriptions of all HSD models and configuration-modes documented in this User's Guide.

HSD transceivers are available in models that are installed as stand-alone systems or integrated into existing SATCOM systems.

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## Installation modes

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### *STAND-ALONE mode*

HSD transceivers in Stand-Alone mode provide one or two channels of Swift64 data service. The HSD transceiver controls both the antenna and the High Power Amplifier (HPA).

Features:

- Operation with any Inmarsat approved Aero-H antenna
- Antenna and HPA are controlled by the HSD system
- Stand-Alone with ARINC 741 SATCOM

Supported services:

- Bi-directional data throughput for sending and receiving e-mail, surfing the Web, video conferencing, and connecting to internal intranets and Bulletin Board Systems (BBS)
- ISDN interface
- Voice and fax transmission (with terminal adapter or ISDN Phone)
- Single channel (64 k) or dual channel (128 k)
- Ethernet and Mobile Packet Data (future availability)

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### *SELECTIVE mode (Non-Stand-Alone mode)*

In Selective mode, the HSD transceiver operates with an AERO H/H+ system. The HSD hardware is installed in the AERO H/H+ HPA equipment position.

Selective mode provides one or two channels of Swift64 data *or* AERO H/H+ calls.

If one or more Swift64 calls are in progress when an AERO H/H+ call is attempted, any incoming or outgoing Swift64 calls are preempted to allow the AERO H/H+ call to proceed.

If any AERO H/H+ calls are in progress, Swift64 calls are not allowed by the system.

To operate in Selective mode, version 3.45 or higher of the control software is required.

#### Features:

- Operation with any Inmarsat approved Aero-H High Gain antenna
- Integrates with ARINC 741 SATCOM
- Configures to operate as either a single or dual channel system

#### Supported services:

- Bi-directional data throughput for sending and receiving e-mail, surfing the Web, video conferencing, and connecting to internal intranets and Bulletin Board Systems (BBS)
- ISDN interface
- Voice communication through the existing Aero-H/H+ SATCOM System
- One or two channels of 64 kb/s channels Ethernet and Mobile Packet Data (future availability)

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*COMBINED mode:*

At time of printing, systems do not operate in this mode. Software modifications are underway to enable this mode of operation.

In Combined mode, the HSD transceiver operates with an AERO H/H+ system. The HSD hardware is installed in the AERO H/H+ HPA equipment position.

This system configuration provides one channel of Swift64 data **and** allows AERO H/H+ calls. (Simultaneous Swift64 and AERO H/H+ calls can be placed at the same time providing there is sufficient HPA power available.)

If one or more Swift64 calls are in process and an AERO H/H+ call is attempted (either incoming or outgoing), the AERO H/H+ call is allowed to proceed if there is sufficient HPA power available to process all of the calls.

If any AERO H/H+ calls are in process, Swift64 calls are allowed—providing that there is sufficient HPA power available to process both the high-speed data and AERO H/H+ calls.

Features:

- Configures to operate as a single channel system only

Supported services:

- Bi-directional data throughput for sending and receiving e-mail, surfing the Web, video conferencing, and connecting to internal intranets and Bulletin Board Systems (BBS)
- ISDN interface
- Voice and fax transmission (with terminal adapter or ISDN Phone)
- Swift 64 high-speed data service
- Ethernet and Mobile Packet Data (future availability\*)

\* Available via an optional service bulletin

### CO-OPERATIVE mode:

At time of printing, systems do not operate in this mode.

In Co-operative mode, the HSD transceiver operates with an AERO H/H+ system. The HSD hardware is installed in the AERO H/H+ HPA equipment position.

A communications link, between the AERO H/H+ system and the HSD system, coordinates the use of the HPA.

This mode provides one or two channels of Swift64 data **and** allows AERO H/H+ calls. (Swift64 and AERO H/H+ calls can be placed at the same time—providing there is sufficient HPA power available.)

If one or more Swift64 calls are in process and an AERO H/H+ call is attempted (either incoming or outgoing), the AERO H/H+ call is allowed to proceed if there is sufficient HPA power available to process all of the calls.

If any AERO H/H+ calls are in process, Swift64 calls are allowed—providing that there is sufficient HPA power available to process both the high-speed data and AERO H/H+ calls.

#### Features:

- Configures to operate as either a single or dual channel system

#### Supported services:

- Bi-directional data throughput for sending and receiving e-mail, surfing the Web, video conferencing, and connecting to internal intranets and Bulletin Board Systems (BBS)
- ISDN interface
- Voice and fax transmission (with terminal adapter or ISDN Phone)
- Swift 64 high-speed data service
- Ethernet and Mobile Packet Data (future availability\*)

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## **About Inmarsat**

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Inmarsat (International Maritime Satellite Organization) is an international organization that operates and maintains the satellites and satellite networks. Inmarsat operates four strategically placed geostationary satellites. Each satellite is located over an oceanic region; the ocean regions are named as follows:

- Atlantic Ocean Region-East (AOR-E)
- Atlantic Ocean Region-West (AOR-W)
- Indian Ocean Region (IOR)
- Pacific Ocean Region (POR)

Inmarsat satellites provide worldwide telecommunication services for aviation, shipping, and land mobile terminal users. These satellites connect to ground telecommunication systems through Land Earth Stations (LES).

Inmarsat offers a range of satellite services and utilizes Inmarsat service providers to provide a range of multimedia and voice communications.

To find out more about Inmarsat visit their Web site at [www.inmarsat.com](http://www.inmarsat.com).

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## Inmarsat Swift64 services

Inmarsat's Swift64 service supports high-speed ISDN communications and TCP-IP Internet connectivity. HSD Aeronautical Transceivers provide the connection between the aircraft and the Swift64 service.

Inmarsat Swift64 service supports the following:

- Toll-quality voice
- Four ISDN bearer Services (using Euro ISDN):
  - 64 kb/s UDI (supports ISDN to ISDN connections)
  - 56 kb/s (supports connections to terminals in switched 56 k networks)
  - Speech (supports voice connections between ISDN phones or analogue handsets connected to a Terminal Adapter)
  - 3.1 kHz audio (supports connections between analogue devices commonly used over the PSTN):
    - › ISDN Modems
    - › Group 3 fax machines
    - › Secure communications
    - › 4.8 k low-speed voice

Inmarsat and Inmarsat service providers work together to provide these services anywhere within the coverage of the Inmarsat Swift64 satellite system. The coverage provided by Inmarsat's Swift64 service is illustrated in the Annex of this User's Guide.

For further information about Swift64 services, visit Inmarsat's Web site: [www.inmarsat.com/swift64](http://www.inmarsat.com/swift64) or contact their Customer Care Service at:

Tel: +44 20 7728 1777

Fax: +44 20 7728 1142

E-mail: [customer\\_care@inmarsat.com](mailto:customer_care@inmarsat.com)

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## Land Earth Stations (LES)

Inmarsat Service Providers (ISPs) operate Land Earth Stations (LES). The ISPs are typically public telephone companies of the country where the LES is located.

Using satellite communications antenna and up-and-downlink communications equipment, the LES converts the space segment to a format compatible with public and private telephone and data networks.

Each satellite is associated with a number of Land Earth Stations that fall within its coverage.

## Mobile Earth Stations (MES)

The Mobile Earth Station (MES) provides ISDN service over the Satellite network similar to the ISDN services installed by telecommunications companies for land-based data communication.

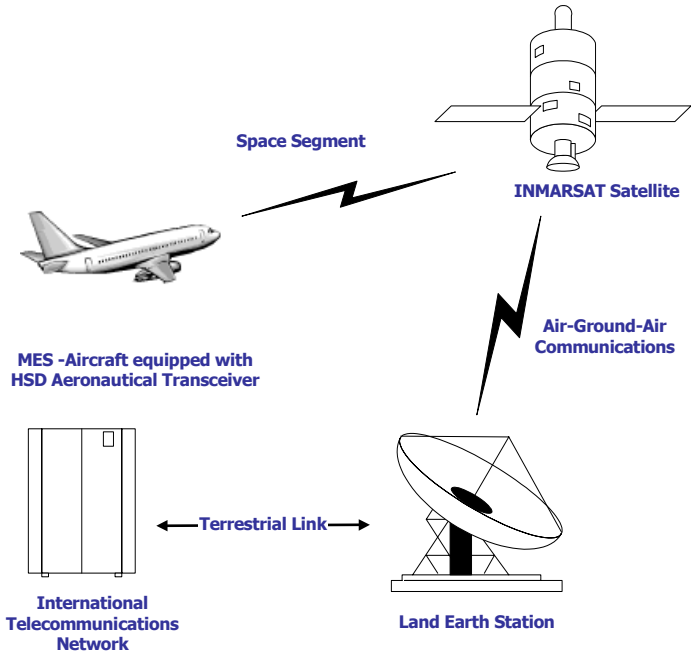
The HSD Aeronautical Transceiver acts as a Mobile Earth Station providing the connection to the Inmarsat Swift64 service.

Figure 2 shows the basic connection between the MES, Satellite, LES, and land network connections.

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**Figure 2 Satellite communication network**

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## **About ISDN**

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ISDN (Integrated Services Digital Network) is a digital telecommunications technology that provides Internet, voice, fax, video, and data services.

ISDN is digital, which allows for greater speed, flexibility (supports a broad range of applications), and reliability.

### **Accessing the Internet using ISDN**

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To access the Internet using ISDN service, the user needs to:

- Establish a connection to the Internet through Dial-up Networking using a terminal adapter or router to connect to the Internet Service Provider
- Run a Web browser to access Web sites

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## ISDN components

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The components required for ISDN service over the satellite network are listed below:

- Euro ISDN terminal adapter or router
- Euro ISDN line
- ISDN Service Provider account
- Computer
- Dial-up Networking capabilities
- Web browser

The three main components required for ISDN service (terminal adapters, ISDN lines, and ISDN protocols) are described in the following sections.

Although routers are also an interface option, only an example set-up using a terminal adapter is described in this User's Guide.

## Terminal adapters—ISDN devices

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Terminal adapters are ISDN devices that function similarly to a modem.; they dial and answers calls, and receive and transmit data.

Use a Euro S/T ISDN model terminal adapter with the HSD Aeronautical Transceiver. Inmarsat Swift64 service and the HSD Aeronautical Transceivers do not support the North American ISDN variant.

## ISDN protocols

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Terminal adapters use ISDN protocols to format data between the ISDN line and the user's computer.

HSD Transceivers support all ISDN protocols that run over a B channel on an ISDN line. These protocols are implemented and configured through the user's operating system.

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## Performance considerations of satellite ISDN

The transmission of data over satellite networks differs from land-based ISDN applications. Satellite communications experience factors such as transit delay and bit errors caused by signal fading and blockages.

ISDN protocols are designed specifically for ground-based ISDN networks. Performance of different ISDN protocols varies depending on the properties of each application.

Because of these challenges, it is sometimes necessary to optimize the system to achieve peak performance over the satellite network.

## Optimizing ISDN protocols for satellite networks

ISDN protocols are not designed specifically for use over satellite communication networks. To improve data transfer rates most ISDN protocols require minor adjustments.

For best results, consider how the ISDN protocol you intend on using sends data over the network and adjust the configuration taking into account the unique operating environment of satellite network communication.

As examples, consider the ISDN protocols TCP/IP over PPP and V.120.

As a basic protocol, PPP is typically operated under the networking protocol TCP/IP. PPP has error checking properties but does not offer flow control. TCP/IP is flexible and designed to run over different networks including the Internet which like satellite networks experiences high transit delays. Used together, PPP and TCP/IP protocols perform well over the Inmarsat ISDN service.

The protocol V.120 includes error correction and flow control applications. Flow control limits or fixes the amount of data that can be in transit at any one time and waits for acknowledgment of receipt from the other end of the connection before sending more data.

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The default parameters of V.120 limit the maximum transit size of the data package to approximately 1764 bytes causing poor performance results over satellite ISDN networks.

Improve the performance of V.120 over satellite ISDN by changing the default parameters. Increase the maximum size of data allowed in transit at one time to a value up to approximately 8000 bytes. (Some applications of V.120 permit the user to change the 'window-size' just for this purpose.)

When choosing an ISDN protocol for satellite ISDN networks consider a flexible solution that allows for modifications to the operating parameters to suit the unique environment of satellite ISDN.

System performance also depends on which operating system you are using. **At the time of printing, Windows 2000 is recommended for optimal performance.**

For more details, refer to the *Troubleshooting* section.

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## 2 Getting started

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- ▶ ***Registering your HSD transceiver***
- ▶ ***Activating service***
- ▶ ***Operating considerations***
- ▶ ***Setting up***
- ▶ ***Creating new dial-up networking connections***

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## Registering your HSD transceiver

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The HSD transceivers act as a Mobile Earth Station (MES) providing the connection to the Inmarsat Swift64 service.

Before operating an HSD transceiver, you must register with an Inmarsat service provider to activate an account and have Inmarsat Mobile Numbers assigned.

At the time of printing, TELENOR and Satcom Direct, Inc. are the only service providers offering this service. For more information, contact their Customer Activation Department at the following numbers:

### *Telenor*

In North America:	1-800-685-7898
Outside North America:	1-301-214-3100
Fax:	1-301-214-7092
E-mail:	<a href="mailto:activations@telenor-usa.com">activations@telenor-usa.com</a> <a href="mailto:customercare@telenor-usa.com">customercare@telenor-usa.com</a>

### *Satcom Direct Inc.*

Telephone:	321-777-3000
Fax:	321-777-3702
E-mail:	<a href="mailto:activations@satcomdirect.com">activations@satcomdirect.com</a>

Download an electronic copy of the Mobile Earth Station registration form from Telenor's Web site at [www.telenor-usa.com/Inmarsat\\_aero.pdf](http://www.telenor-usa.com/Inmarsat_aero.pdf) or from Satcom Direct Inc at [www.satcomdirect.com](http://www.satcomdirect.com).

For an up-to-date listing of service providers, contact INMARSAT at 44-0-20-728-1777.

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## Activating service

Once registration is complete, your HSD Aeronautical Transceiver is assigned a Forward ID number—one for each channel card installed. These numbers act as ‘aircraft telephone numbers’.

Each Forward ID is assigned INMARSAT Mobile Numbers (IMN). A different IMN is assigned to each type of communication service supported by Inmarsat Swift64 (speech, 3.1k audio, 56k data, and 64k data, and 4.8 k). Two-channel systems are therefore assigned two IMNs for each service type.

Each service type also has a Multiple Subscriber Number (MSN) associated with it. The MSNs are programmed into the terminal adapter or other routing device. They serve to identify the service type requested on outgoing calls and to recognize and route incoming calls to the appropriate system device (telephone, fax, or computer).

Dial code prefixes are also associated with each type of service. Although the HSD Transceiver automatically selects the appropriate service, these dial code prefixes are used to override defaulted service types on a call-by-call basis.

Table 1 shows the factory default assignments associated with each service—as defined by the HSD Transceiver’s channel card.

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**Table 1 HSD transceiver default settings**

<b>IMN (Numbers assigned to aircraft)</b>	<b>MSN</b>	<b>Service Type</b>	<b>Dial code prefix (Forces service selection)</b>
60xxxxxxx	40	Speech	<b>* 81 *</b>
60xxxxxxx	20	3.1 k audio	<b>* 82 *</b>
60xxxxxxx	30	56 k data	<b>* 83 *</b>
60xxxxxxx	10	64 k data	<b>* 84 *</b>
76xxxxxxx	40	4.8 k Low-Speed Voice	<b>* 80 *</b>

When connecting external devices to the HSD Transceiver, ensure that the service type required by the device has been configured (or assigned) the correct setting.

Speech, 3.1k audio, 56 k data, and 64 k data are typically assigned 9-digit IMNs that begin with 60. Low-speed (4.8 k) voice is assigned a 9-digit IMN beginning with the digits 76.

Low-speed (4.8 k) is an inexpensive service option for placing voice calls—but it provides lower audio quality.

Both low-speed voice and 64 k speech calls use the MSN of 40; however, they are assigned different IMNs.

To select low-speed voice for outbound calls, use the dial code prefix **\*80\***. The default service type for outbound calls (if no dial code prefix is used) is 64 k voice.

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## Operating considerations

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The following section provides information on operating considerations that apply to HSD Transceivers.

### Satellite transitions

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The satellite beam used by the HSD transceiver changes as the aircraft moves from region to region at approximately the following coordinates:

- **AORW** (54°W) to **AORE** (15.5°W) at 34.75°W
- **AORE** (15.5°W) to **IOR** (64.5°E) at 24.5°E
- **IOR** (64.5°E) to **POR** (178°E) at 121.5°E
- **POR** (178°E) to **AORW** (54°W) at 118°W

Calls in progress (longer than ten minutes in duration) during beam crossover and satellite hand-off are terminated. Your connection needs to be re-established once the beam crossover and satellite hand-off are complete.

### Satellite communications

---

Satellite communications have unique operating considerations:

- Communication, audio background-noise varies depending on the quality of the aircraft's sound insulation and handset quality
- Satellite communications experience a slight delay during two-way communication

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## **Setting up**

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HSD Transceivers provide a transmission link from the aircraft to the satellite network. This data link is compatible with a range of devices and operating systems providing the user with choice and flexibility in customizing their system.

This section provides general guidelines and instructions for a basic, system set-up only.

Consult the user manuals or help files of the devices and operating system installed in your onboard network for more system-specific instructions.

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## ISDN data call requirements

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The following equipment is required to make an ISDN connection using a HSD Transceiver:

- Computer
- Euro ISDN terminal adapter with an RJ-45 connector (standard ISDN connector)
- RJ-45 to RJ-45 cable (ISDN cable)
- Details of your Internet Service Provider: ISDN and International dial-up access, Dial-up number, account name (User ID), and password

Another set-up option is to use a router instead of a terminal adapter.

Figure 3 and Figure 4 illustrate system set-up options.

## Bonded calls (two-channel systems only)

---

Bonded calls are possible with HSD transceivers that have two channel cards installed. Bonded calls utilize both 64 k channels to provide a single 128 k data channel. The terminal adapter or router places two separate calls to combine the data transfer over both channels.

Although bonded calls provide a single 128 k channel, the actual link capacity is application and protocol dependant. Typical throughput on a Multilink PPP TCP/IP connection is only 80 to 90 % of the link capacity (running Windows 2000).

The system can only make bonded calls if both channels are available. If another device is using one of the B Channels, then the data call proceeds—but as a single channel call.

If a bonded call is in progress, (using both B channels) the system is busy and denies all other calls until a channel is free.

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## Powering up HSD transceivers

HSD aeronautical transceivers are typically powered up when the aircraft crew activates the avionics systems.

## System readiness

HSD transceivers need Inertial Reference System (IRS) navigational data to operate. The avionics systems must be powered on and warmed up before the HSD is system-ready.

With all avionics systems ready, HSD transceivers only require a minute to warm-up. Dial tone, heard through a handset, indicates that the HSD transceiver is ready for use.

HSD transceivers automatically perform the following functions:

- Select a satellite
- Select a Spot Beam
- Select a Land Earth Station (LES)
- Log-on (register)
- Control satellite and Spot Beam handovers

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## User interfaces

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HSD Aeronautical transceivers connect to a variety of interface options. The physical interface is EURO S/T, which supports several types of connections to user equipment.

Terminal adapters and routers must be EURO ISDN S/T models.

HSD transceivers provide either one or two ISDN S Bus interfaces (depending on which model and service mode is installed).

Each Bus is capable of hosting up to eight, EURO ISDN devices—which means a two-channel system supports connections to up to sixteen, EURO ISDN devices.

Each channel card provides one, 64 k B channel that is available to either ISDN Bus. If the channel (or channels) is “busy” or “in-call”, the request for service is denied (the system is busy).

For ISDN data devices that support bonding and are connected to a two-channel card HSD transceiver, the device will attempt to use both B channels to increase data throughput as long as no other devices are “in call”. (See the section *Bonded calls (two-channel systems only)*.)

Figure 3 and Figure 4 illustrate a variety of interface options. Each system set-up configures to meet specific user needs.

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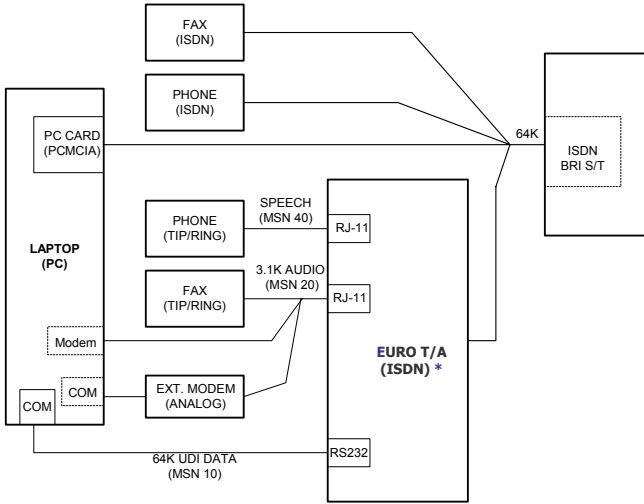


Figure 3 System set-up options: terminal adapter

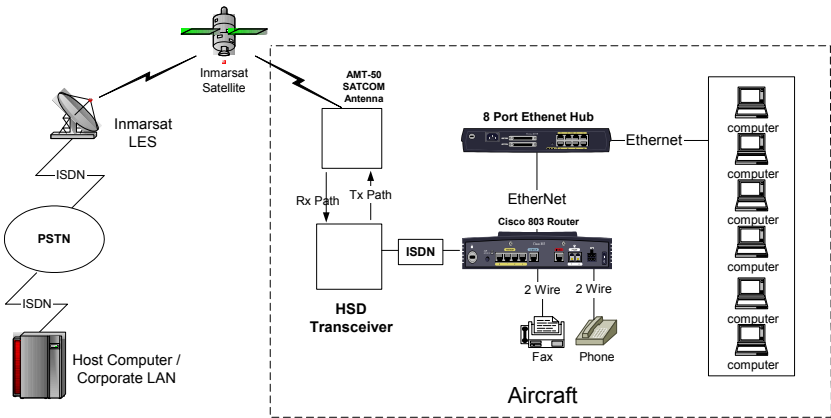


Figure 4 System set-up options: router

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## System set-up recommendations

Start with a basic system set-up—then expand to a more complex system configuration. Note that although terminal adapters work well with Group 3 fax, using a router (as shown in Figure 4) is also an option.

A list of the recommended devices tested with HSD Aeronautical Transceivers is provided in the Annex of this User's Guide. This list is subject to change and is not intended to exclude other manufacturers' devices.

This document uses Windows 98 as an example operating system to illustrate the set-up and configuration process of dial-up connections. However, performance results vary between operating systems.

At the time of printing, Windows 2000 is the best performer of Microsoft operating systems for satellite network communications using HSD transceivers.

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## Configuring a terminal adapter

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This section provides basic instructions on how to configure a terminal adapter.

Various combinations of operating systems, equipment models, and configurations are possible; therefore, consider the following procedure as a guideline only.

**Important:** Ensure that you are using a EURO ISDN model—*not* a North American model.

---

### To configure a Terminal Adapter:

1. Select EURO ISDN as your switch type.
2. Select an ISDN protocol. It should be the same at both ends of the connection. (Contact your service provider for the appropriate protocol.)
3. Enter both the Directory Number (DN) and Service Provider ID (SPID) provided by your Internet Service Provider (IPS).
4. Enable the phone ports that you are using, and if necessary assign each port a Multiple Subscriber Number (MSN) number. (See Table 2 for default settings.)

The terminal adapter uses the MSN numbers to identify outgoing calls, and to recognize and route incoming calls to the appropriate device.

It is possible to have multiple devices on the ISDN line. Each service type has a MSN associated with it. The MSN defaults, as defined in the HSD transceiver channel card(s), are listed in Table 2 ISDN default MSN settings.

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**Table 2 ISDN default MSN settings**

<b>Service Type</b>	<b>MSN</b>
Speech	40
3.1 k audio	20
56 k data	30
64 k data	10
4.8 k voice	40

Configure the ISDN numbers to be the same as the default MSNs as defined in Table 2.

5. In the Configure Modem dialog box:
  - Choose **International** as the geographical region; country or location for **Where you are calling from**
  - Select **Multi-link PPP**
  - Check **Dynamic Bandwidth Allocation**

The terminal adapter is configured. You are ready to set-up your dial-up networking connections.

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## To configure a Terminal Adapter for bonded calls (two-channel systems only):

If the HSD Transceiver has two channel cards, bonded calls provide the potential for higher throughput. For bonded calls, configure the terminal adapter and connections to use Multilink PPP as the protocol.

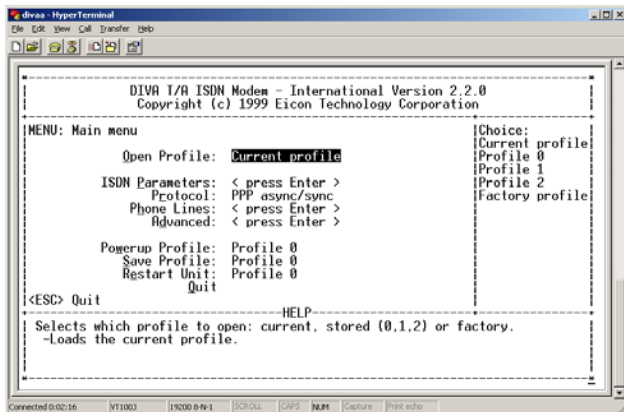
The system can only make bonded calls if both channels are available. If another device is using one of the B Channels, then the data call proceeds—but as a single channel call.

If a bonded call is in progress, (using both B channels) the system is busy and denies all other calls until a channel is free.

The following is an example configuration for bonded calls using a DIVA Terminal Adapter. Other manufacturer's terminal adapters or if used routers may require different or more complex configurations to configure the system for bonded calls.

1. Using Hyperterm, connect to the DIVA T/A ISDN modem.
2. Type AT@MENU.

The following screen appears.

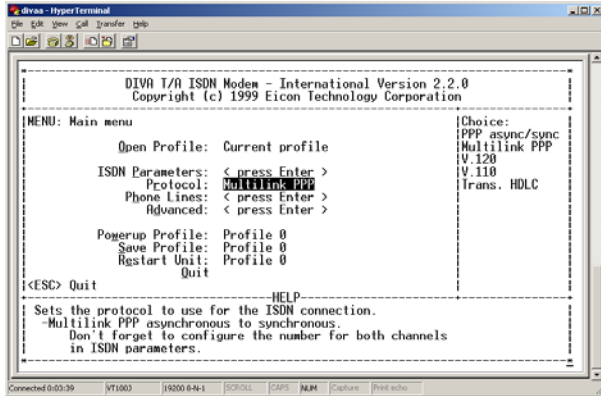


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- In the protocol field, select **Multilink PPP**.

The protocol filed now shows Multilink PPP as the selected protocol.



- When prompted, select yes to save the profile and then reboot.
- Using the AT@MENU command, confirm the settings are correct.

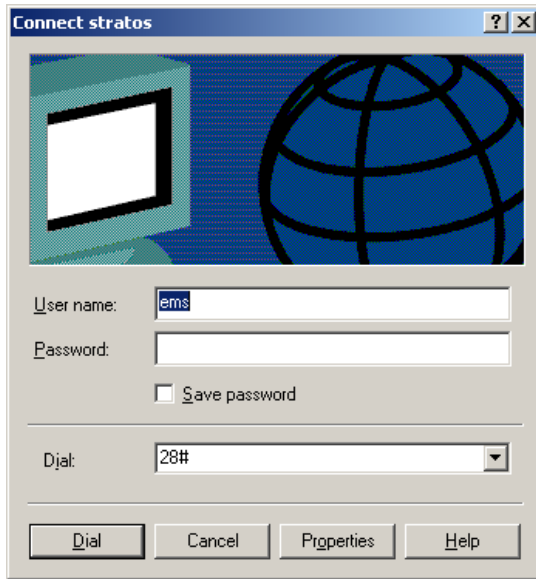
The Diva T/A is now configured to place bonded Multilink calls.

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If you are dialing a EURO ISDN phone number or a North American ISDN number that has a “HUNT” group assigned, then no changes are required to the Dial-up networking set-up of the users computer.

The following screen illustrates a dial-up networking connection with a “HUNT” group assigned.



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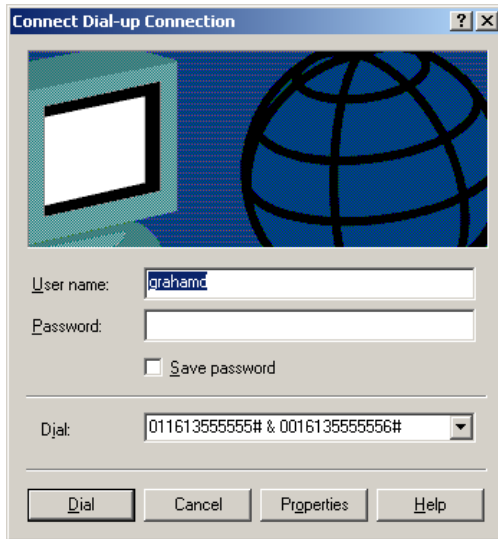
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If you are dialing a North American ISDN number, both SPID numbers must be included in the dial-up networking connection to place Multilink calls.

To configure the dial-up connection to include both SPID numbers, type in both numbers separated by the “&” symbol.

The following screen illustrates the configuration of a Multilink connection to a North American number.



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## Creating new dial-up networking connections

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Every operating system and version varies in the style, content, and order of dial-up networking connection procedures.

For specific instructions, refer to your operating system's help or user guide.

This document provides examples using Microsoft Windows 98—for illustration purposes only. Performance between different operating systems varies.

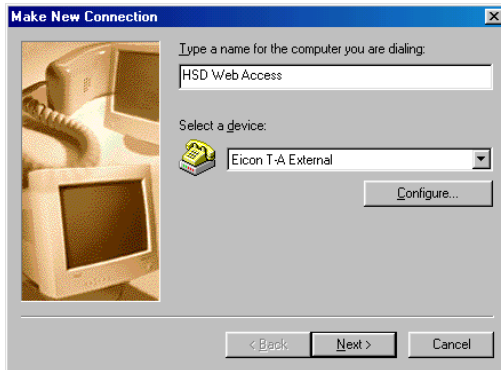
**At the time of printing, Windows 2000 is the best performer of Microsoft operating systems for use over the satellite communications network.**

---

### To set up a new dial-up networking connection to access the Internet—using a Windows 98 system:

1. Using Windows Explorer, open **Dial-up Networking**.
2. Double click on **Make New Connection**.

The **Make New Connection** dialog box appears.



3. In the **Type a name for the computer you are dialing** text box, type in a name for the connection you are creating (for example, **HSD Web Access**).

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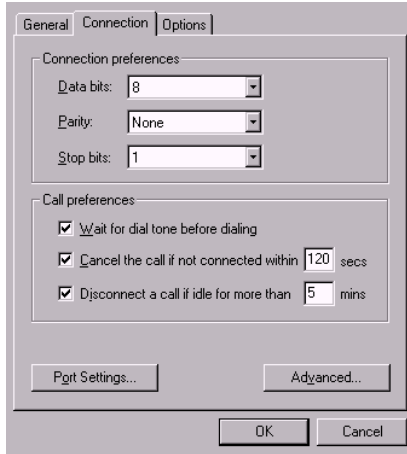
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4. In the **Select a device** text box, select the model of EURO ISDN modem installed on your system.
5. Click **Configure**, and then click on the **Connection** tab.

The **Connection** tab sheet appears.



The default configuration is normally correct—change it only if you know the details are different.

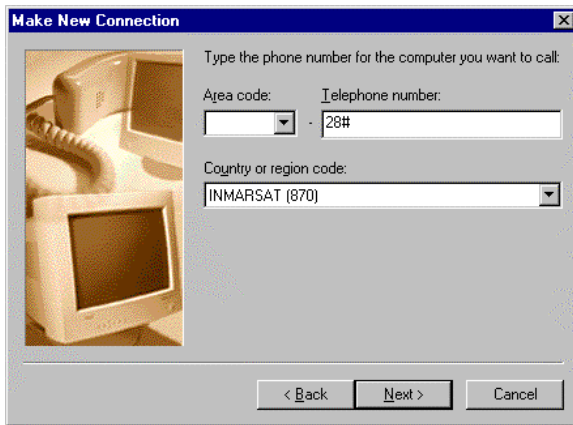
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6. In Call preferences, *if the option is available*:
  - Check **Wait for dial tone before dialing**.
  - Check **Disconnect a call if idle for more than**, and type in your preferred disconnect time.
  - Click **OK**.

**Note:** Satellite communication charges are expensive; to avoid charges on open, idle connections, select a short 'hang up period'. (A typical hang up period is 5 minutes.)

You return to the **Make New Connection** dialog box.



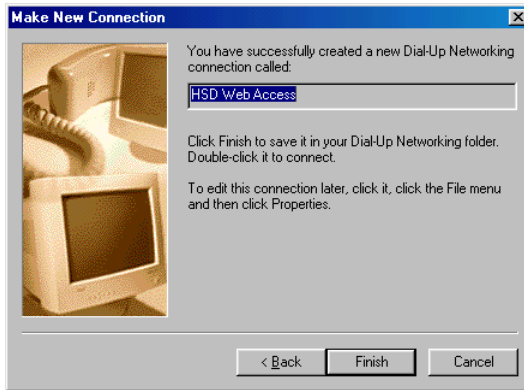
7. In the Telephone number box, type in **28[#]** as the telephone number, and then select **INMARSAT (870)** as the **Country Code**.

**Note:** Telenor offers Direct Internet Access from the Land Earth Station for seamless connection to the Internet. No additional registration is required; just program your new dial-up connection to call 28 [#].

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8. Click **Next>**, and then click **Finish**.



The creation of your New Dial-up Connection for Internet access is complete. Now you are ready to configure this connection.

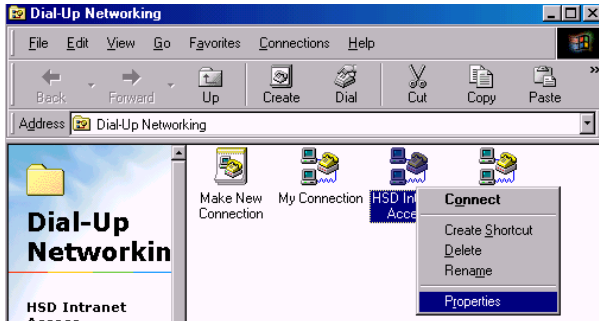
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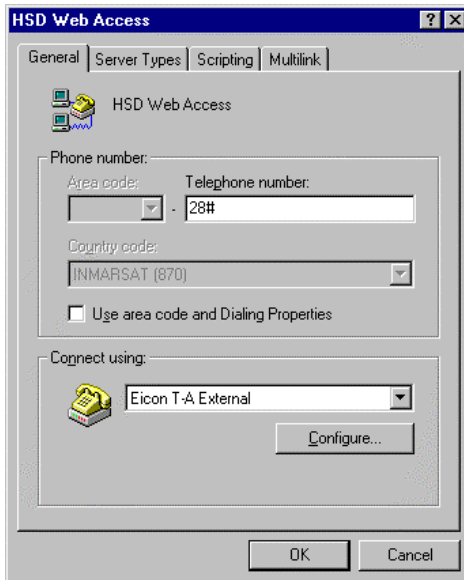
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## To configure your new Internet dial-up network connection:

1. In **Dial-up Networking**, with the **right mouse button** click on the new connection you created for Internet access.  
The **Connect** submenu appears.
2. Select **Properties**.



The Properties dialog box for the Internet connection you created appears.

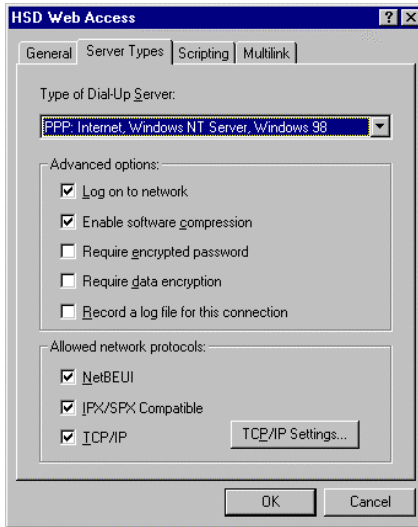


3. Click the **General** tab.

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4. Make sure that the telephone number displayed is **28#**.
5. Do not **Use Area code and Dialing Properties**. If it is checked, clear it.
6. Click the **Server Types** tab.

The **Server Types** tab sheet appears.

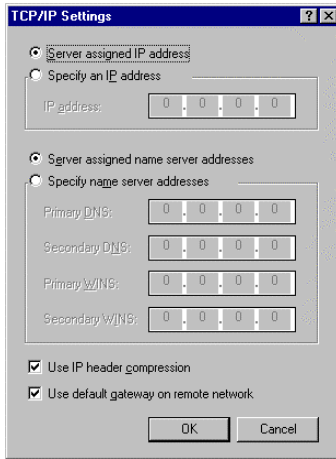


7. Select **PPP: Internet, Windows NT Server, Windows 98** (or PPP: Windows 95/98/NT4/2000, Internet for other versions of Windows) as the **Type of Dial-up Server**, and then check the following:
  - ✓ **Log on to network**
  - ✓ **Enable Software compression**
  - ✓ **TCP/IP**
8. Click **TCP/IP Settings**.

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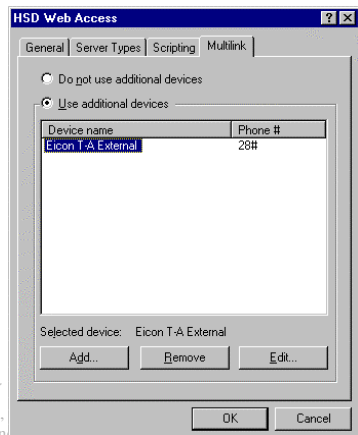
The **TCP/IP Properties** dialog box appears.



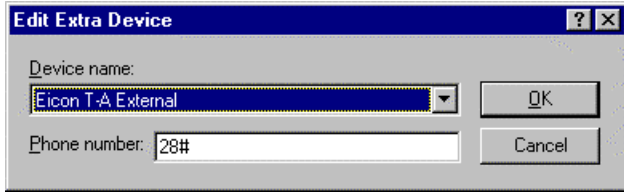
9. Ensure that **Server assigned name server addresses** is selected and then click **OK**.

10. Click the **Multilink** tab, and then click **Use additional devices**:

- **If** the terminal adapter (ISDN modem) you have installed is not listed;
- Click **Add**.
- **If** the terminal adapter (ISDN modem) you have installed is listed under Device name;
- Select the terminal adapter, and then Click **Edit**.



The **Edit Extra Device** dialog box appears.



11. Verify that the **Device name** shows the terminal adapter (Euro ISDN modem) you have installed, and that the **Phone number** is **28#**, and then click **OK**.

You return to the **Multilink** tab sheet.

12. To complete your dial-up connection configuration, click **OK**.

Your new Dial-up Connection to Internet is configured.  
You are ready to access the Internet using the HSD Transceiver.

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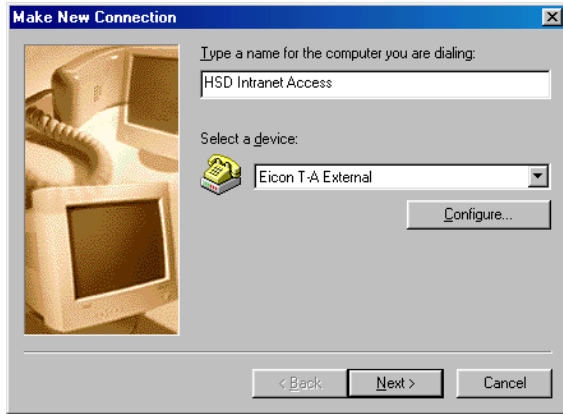
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## To set up a new dial-up networking connection an intranet—using a Windows 98 system:

1. Using Windows Explorer, open **Dial-up Networking**.
2. Double click on **Make New Connection**.

The **Make New Connection** dialog box appears.



3. In the Type a name for the computer you are dialing text box, type in a name for your connection. (For example, HSD Intranet Access.)
4. Select the **Terminal Adapter/ Euro ISDN modem** as the 'device'.

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- Click **Configure**, and then click on the **Connection** tab.

The screenshot shows a dialog box with three tabs: 'General', 'Connection', and 'Options'. The 'Connection' tab is active. It is divided into two sections: 'Connection preferences' and 'Call preferences'. In the 'Connection preferences' section, there are three dropdown menus: 'Data bits' (set to 8), 'Parity' (set to None), and 'Stop bits' (set to 1). In the 'Call preferences' section, there are three checked checkboxes: 'Wait for dial tone before dialing', 'Cancel the call if not connected within 120 secs', and 'Disconnect a call if idle for more than 5 mins'. At the bottom of the dialog, there are buttons for 'Port Settings...', 'Advanced..', 'OK', and 'Cancel'.

The default configuration is normally correct—change it if you know the details are different.

- In Call preferences, *if the option is available*:
  - Check **Wait for dial tone before dialing**;
  - Check **Disconnect a call if idle for more than**, and type in your preferred disconnect if idle, time-period, and then click **OK**.

**Note:** Satellite communication charges are expensive; to avoid charges on open, idle connections, select a short 'hang up period'. (A typical hang up period is 5 minutes.)

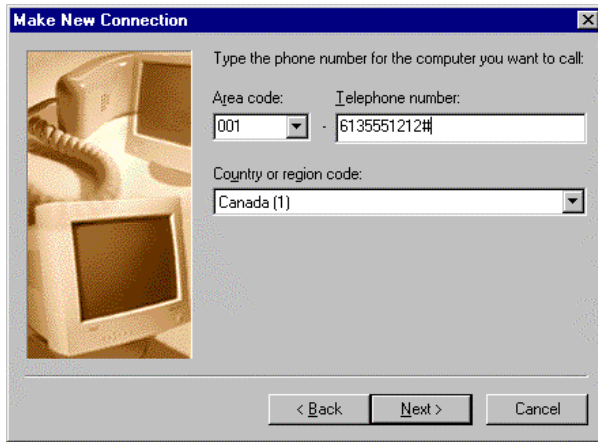
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7. Click **OK**.

You return to the **Make New Connection** dialog box.



8. In the text boxes, type in the **International Code (00)**, **Country Code**, **Area Code and/or City code**, and **Telephone number**, for your intranet. Ensure that you have ended the dialing sequence by pressing #.
9. Click **Next>**, and then Click **Finish** to complete the creation of your New Connection.



You have successfully created a new Dial-up Networking connection to an intranet. Now you are ready to configure this connection.

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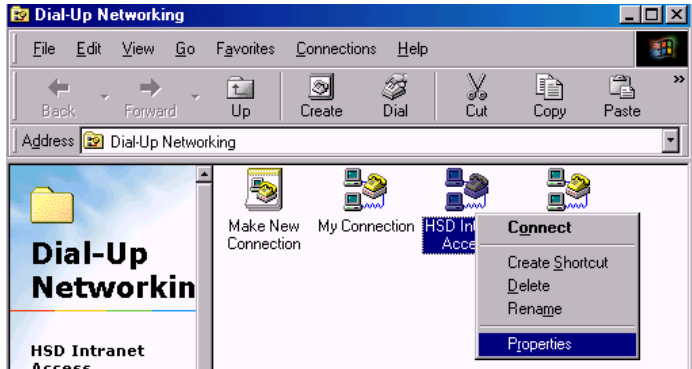
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## To configure your new intranet dial-up network connection:

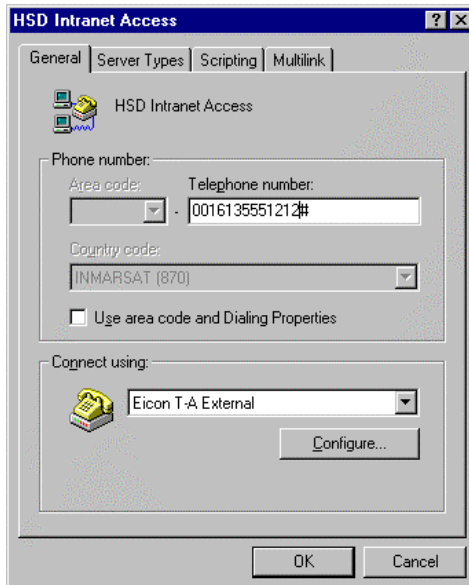
1. In **Dial-up Networking**, with the **right mouse button** click on the icon of your new intranet connection.

The **Connect** submenu appears.

2. Select **Properties**.



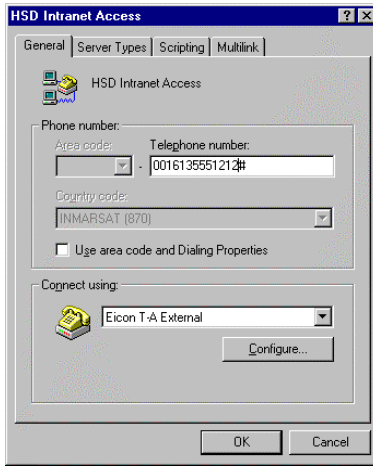
The **Properties** dialog box appears.



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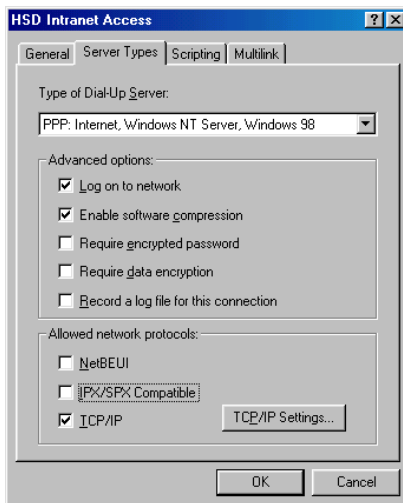
3. Click the **General** tab.

- In the text boxes, verify that the **International Code (00)**, **Country Code**, **Area Code and/or City code**, and **Telephone number** are correct for your intranet. Ensure that you have ended the dialing sequence by pressing #.
- Do not **Use Area code and Dialing Properties**. If it is checked, clear it.



- Click the **Server Types** tab.

The **Server Types** tab sheet appears.



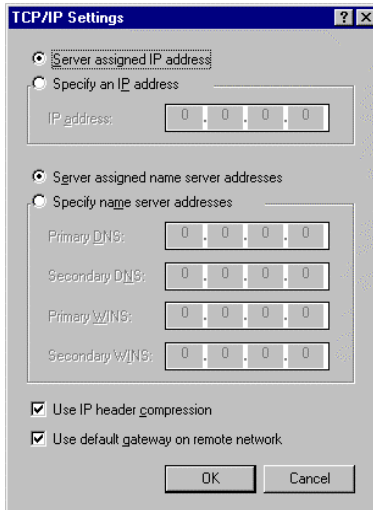
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7. Select **PPP: Internet, Windows NT Server, Windows 98** (or PPP: Windows 95/98/NT4/2000, Internet for later versions of Windows) as the **Type of Dial-up Server**, and then check the following:
  - ✓ **Log on to network**
  - ✓ **Enable Software compression**
  - ✓ **TCP/IP**
8. Click **TCP/IP Settings**.

The **TCP/IP Properties** dialog box appears.



9. Ensure that **Obtain an IP address automatically** is selected, and then click **OK**.

**Note:** The remote access must also be configured to **Obtain an IP address automatically**.

If the remote access is configured to a specific IP address:

- Select **Specify name server addresses**.
- Type in the required **IP address** and **Subnet Mask** information, and then click **OK**.

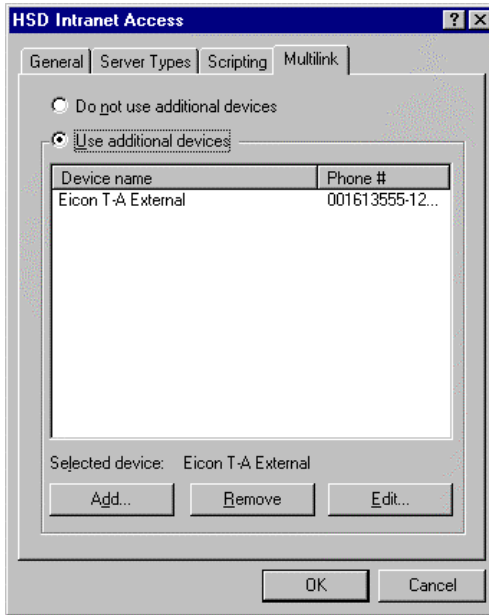
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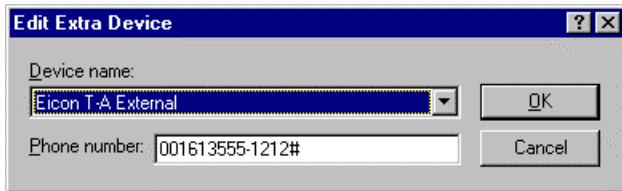
- Click the **Multilink** tab, select **Use additional devices**, select the ISDN terminal adapter listed, and then click **Add**.

The ISDN terminal adapter you have connected to your computer shows as the **Selected device**.



- Click **Edit**.

The **Edit Extra Device** dialog box appears.



- Verify that the phone number of the remote network you are dialing is correct, and then click **OK**.

Your new Dial-up Connection to a remote network (intranet) is now configured. You are ready to access the network using the HSD Transceiver.

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## **3** Getting connected

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- ▶ ***Connecting to the Internet***
- ▶ ***Connecting to an intranet***
- ▶ ***Connecting to a remote computer***

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## Connecting to the Internet

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This section provides basic instructions on how to connect to the Internet.

If you have not set-up a new dial-up networking connection, go to **Chapter 2, Getting started** and follow the instructions provided.

How to access your dial-up connections varies depending upon which operating system and computer hardware you are using. Consult your operating system's help or user manual for specific instructions.

The following procedures provide general instructions on how to connect to the Internet using the HSD Transceiver. The example provided uses Windows 98 for illustration purposes only. Performance between operating systems varies.

**At the time of printing, Windows 2000 is the best performer of Microsoft operating systems for use over the satellite communications network.**

---

### To connect to the Internet:

1. Open the **Dial-up Networking** window.
2. Double click on the connection you created for connecting to the Internet called **HSD Web Access**.

The **Connect To** window appears.





3. Type in your **User Name** and **Password**. Ensure that the phone number shown **28#**. This is the number for direct connection to the Internet from the Land Earth Station.
4. Click **Connect**.

Connection is made with the Satellite Communication Network. The LES will route your call directly to the Internet.

Once your Internet connection is established, launch your Web browser to surf, send and receive e-mails, and use the Internet the same as you would at home or office.

**Important:** If you are finished, be sure to disconnect. Charges continue to apply on open connections.

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## Connecting to an intranet

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This section provides basic instructions on how to connect to remote networks (intranets).

If you have not set-up a dial-up networking connection for this remote location, go to **Chapter 2, Getting Started**, and follow the instructions provided for setting up a new connection to a remote network.

Accessing your dial-up connections varies depending upon which operating system you are using. Consult your operating system help or user manual for specific instructions.

The following procedure provides general instructions on how to connect to an intranet.

The example provided uses Windows 98 for illustration purposes only. Performance between operating systems varies.

**At the time of printing, Windows 2000 is the best performer of Microsoft operating systems for use over the satellite communications network.**

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## To connect to an remote network:

1. Open the **Dial-up Networking** window.
2. Double click on the connection you created for connecting to your intranet called HSD Intranet Access.

The **Connect To** window appears.

3. In the User name and Password boxes, type in your **User Name** and **Password**.
4. Verify that the correct phone number of your intranet is displayed in the **Phone number** text box.

**A complete phone number includes the international calling code (00), a country code, area code and/or city code, a telephone number, and must end with the # symbol.**

**Example: 00 +1 + 613 + 5551212 + #**

5. Click **Connect**.

Your dial-up connection is now in progress. Once the connection is established, access your intranet as usual.

**Important:** If you are finished, be sure to disconnect. Charges continue to apply on open connections.

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## Making a terminal to terminal connection

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Using FTP, you can establish a connection between remote terminals (computers).

### Accessing remote files

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Using the HSD Transceiver, you are able to upload (get) and download (put) files from remote computers.

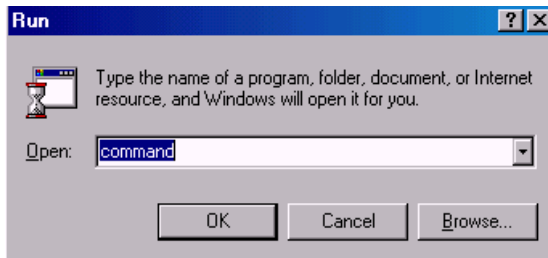
#### To transfer files from a remote terminal using FTP:

1. Establish a connection to the remote server.
2. Check that the connection is established—ping the remote computer you are dialing. If the connection is established, you will receive a reply.
3. Open the command window.

#### For example, in Windows 98:

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- Click Start⇒Run⇒Type in **command**, and then click **OK**.



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The MS-DOS window appears.



4. Type **FTP** [IP address of the remote computer], and then press **ENTER**.



5. If prompted, type in your **User ID** and **Password**, and then press **ENTER**.

You are now ready to transfer files with the target (remote) computer.

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**To “get” files from the target computer:**

- In the MS-DOS window, type **get** *filename*, and then press **ENTER**.

The file will now begin to transfer. When the transfer is completed, open the file as usual.

---

**To “put” files on the target computer:**

- In the MS-DOS window, **type** *put filename*, and then press **ENTER**.

The file will now begin to transfer. When the transfer is completed, open the file as usual.

**Important:** If you are finished transferring files, be sure to disconnect. Charges continue to apply on open connections.

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## 4 Placing voice calls

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- ▶ ***Voice calling overview***
- ▶ ***Placing air-to-ground calls***
- ▶ ***Placing ground-to-air calls***

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## Voice calling overview

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Placing voice calls from the aircraft to the ground is similar to placing an international telephone call. Air-to-ground calls need to include the following codes:

- An international access code (The international access code for all airborne equipment is 00. For ground-to-air calls, use the international code of the location the call is originating from.)
- The country code of your call destination
- The area code and city code (if applicable) of your call destination

Before making calls, make sure that the HSD transceiver system is ready. Pick up the handset and listen for dial tone. Dial tone indicates that the system is ready.

Satellite calls take longer than normal ground communications to complete—expect a short delay before your call rings through (approximately 30 seconds).

To complete or ‘send’ your call, you must end your dialing sequence by pressing the pound key #. Pressing # signals the system to send your call.

**NOTE:**

- Always remember to complete your dialing sequence by pressing #. This sends your call.
- After a call is terminated, wait for the system to ‘clear down’ before placing new calls (approximately 30 seconds).

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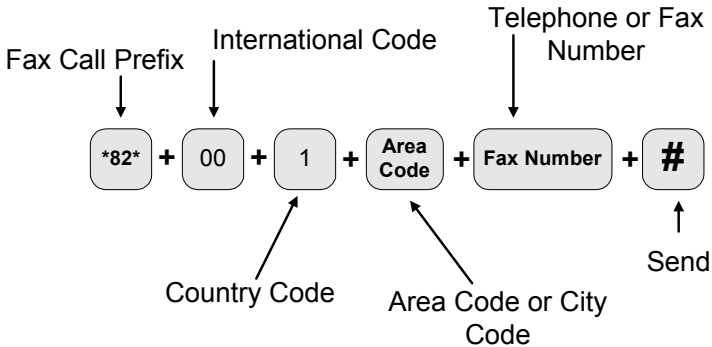
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## Dialing sequence explanation

The following diagram explains the different components of a typical dialing sequence required when placing voice and fax calls from air-to-ground using a HSD Transceiver. The components are described as follows:

- The Fax Call Prefix is only used when sending fax. The prefix indicates to the system the type of service being requested.
- The International Code of [00] is required for all calls from the aircraft.
- The Country Code, Area Code or City Code, and Telephone or Fax Number are dialed the same as ground-based calls.
- The pound key [#] must be included at the end of the dialing string to initiate (send) the call.



## Getting assistance

If you need assistance or have questions about placing calls, contact the Land Earth Station operator.

To contact the LES operator:

- Dial 33, and then press #

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## Placing air-to-ground voice calls

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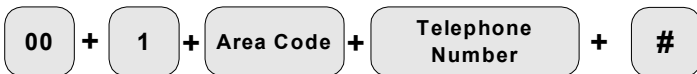
This section provides detailed instructions on how to place a variety of air-to-ground voice calls.

### Calling to North America

---

#### To place a voice call from air-to-ground to North America:

1. Listen for dial tone before placing a call; it indicates that the system is ready.
2. Dial **00**.
3. Dial **1** (the country code for North America).
4. Dial the area code, and then the telephone number.
5. Press **#**.



The call is routed through the satellite link and the Land Earth Station (LES) and connecting to the PSTN; you may experience up to a 30 second delay before your call rings through.

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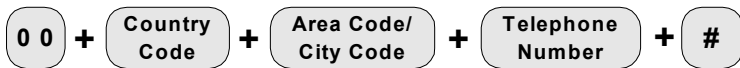
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## Calling outside of North America

---

### To place a voice call from air-to-ground to countries outside of North America:

1. Listen for dial tone before placing a call; it indicates that the system is ready.
2. Dial **00**.
3. Dial the country code.
4. Dial the city/area code.
5. Dial the telephone number.
6. Press **#**.



The call is being routed through the satellite link and the Land Earth Station (LES), then connecting to the PSTN; you may experience up to a 30 second delay before your call rings through.

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## Placing voice calls from ground-to-air

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This section provides detailed instructions on how to place a variety of voice calls from ground-to-air (calling to an aircraft).

### Using Auto Attendant

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#### To place a voice call from ground-to-air (from North America) using Auto Attendant:

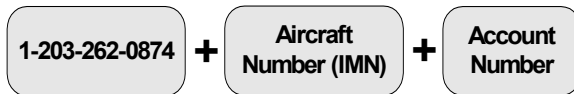
1. Dial the Auto Attendant number, 1-203-262-0874.

An automated voice prompt asks you to dial the aircraft number.

2. Dial the aircraft number—the Inmarsat Mobile Number (IMN).

An automated voice prompt asks for your account payment information (account charge number).

3. Enter your account number.



The call is being routed through the Land Earth Station (LES) to the satellite link and aircraft; you may experience up to a 30 second delay before your call rings through.

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**To place a voice call from ground-to-air (from outside of North America) using Auto Attendant:**

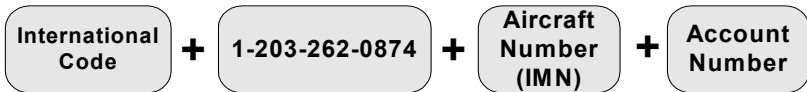
1. Dial the International Code required in the country you are calling from.
2. Dial the Auto Attendant number, **1-203-262-0874**.

An automated voice prompt asks you to dial the aircraft number.

3. Dial the aircraft number—the Inmarsat Mobile Number (IMN).

An automated voice prompt asks for your account payment information (account charge number).

4. Enter your account number.



The call is being routed through the Land Earth Station (LES) to the satellite link and aircraft; you may experience up to a 30 second delay before your call rings through.

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## Using TELENOR Network 1—for voice calls

TELENOR Mobile Communications Network 1 service provides easy access to an INMARSAT terminal. Network 1 service directly connects the ground caller to Telenor's network.

Callers must be registered for Network 1 service. Currently this service is only available in the U.S. For more information or to register for Network 1 call, contact TELENOR at 1-301-214-3100.

This section provides instructions on how to place a ground-to-air call using TELENOR Mobile Communications Network 1 service.

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**To place a voice call from ground-to-air using Network 1 service (available only in the U.S.):**

1. Dial **10 + 10 + 222**.
2. Dial **011**.
3. Dial the Ocean Region number that the HSD Transceiver is logged onto. Refer to Table 4 for a list of Ocean Region numbers.

**Note:**

- You may have to try each Ocean Region number before determining the correct Ocean Region the HSD Transceiver is logged-on to. For more information on using Network 1, contact Telenor at 1-301-214-3100.
- For offices with PBXs, the calling line identity for the main PBX number should be subscribed to Network 1.

4. Dial the INMARSAT Mobile Number (IMN).



The call is being routed through the Land Earth Station (LES) to the satellite link and aircraft; you may experience up to a 30 second delay before your call rings through.

**Table 3 Satellite Ocean Region codes**

Satellite Ocean Region	Ocean Region Number
Atlantic Ocean Region East (AOR-E)	871
Atlantic Ocean Region West (AOR-W)	874
Pacific Ocean Region (POR)	872
Indian Ocean Region (IOR)	873

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## **5** Sending and receiving fax

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- ▶ ***Sending faxes from air-to-ground***
- ▶ ***Sending faxes from ground-to-air***

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## **Introduction to sending and receiving fax**

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Sending and receiving faxes using an HSD Transceiver is a similar operation to sending faxes on the ground.

Consult your fax machine's user manual for detailed operating instructions.

**Note:** Terminal adapters support Group 3 fax.

## **Sending air-to-ground faxes**

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Consult your fax machine's user manual for detailed operating instructions. The following procedures provide dialing instructions specific to the HSD Transceiver and satellite communication networks.

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---

## To send a fax to North America:

1. If a handset is available, listen for dial tone.  
Dial tone indicates that the system is ready.
2. Dial **\* 82 \***.
3. Dial **00**
4. Dial **1**.
5. Dial the area code.
6. Dial the fax number.
7. Press the pound key **#**.



The call is being routed through the satellite link and the Land Earth Station (LES), then connecting to the PSTN; you may experience up to a 30 second delay before your call rings through.

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### To send a fax to outside North America:

Consult your fax machine's user manual for operating instructions, and then follow the steps below:

1. If a handset is available, listen for dial tone.  
Dial tone indicates that the system is ready.
2. Dial **\* 82 \***.
3. Dial **00**.
4. Dial the country code.
5. Dial the city/area code.
6. Dial the fax number.
7. Press the pound key **#**.



The call is being routed through the satellite link and the Land Earth Station (LES), then connecting to the PSTN; you may experience up to a 30 second delay before your call rings through.

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## **Sending ground-to-air faxes**

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Consult your fax machine's user manual for operating instructions, and then follow the steps below:

### **Using Auto Attendant**

---

#### **To place a fax call from ground-to-air, from North America using Auto Attendant:**

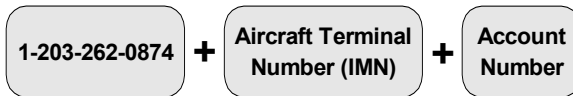
1. Dial the Auto Attendant number: **1-203-262-0874**.

An automated voice prompt asks you to dial the aircraft number.

2. Dial the aircraft number.

An automated voice prompt asks for your account payment information (account charge number).

3. Enter your account number.



The call is being routed through the Land Earth Station (LES) to the satellite link; you may experience up to a 30 second delay before your call rings through.

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**To place a fax call from ground-to-air (from outside of North America) using Auto Attendant:**

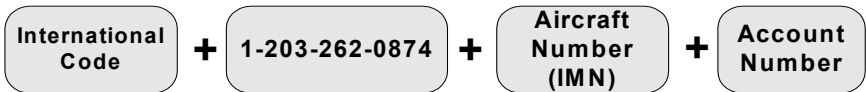
1. Dial the International Code required in the country you are calling from.
2. Dial the Auto Attendant number: **1-203-262-0874**.

An automated voice prompt asks you to dial the aircraft number.

3. Dial the aircraft number.

An automated voice prompt asks for your account payment information (account charge number).

4. Enter your account number.



The call is being routed through the Land Earth Station (LES) to the satellite link and aircraft; you may experience up to a 30 second delay before your call rings through.

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## Using TELENOR Network 1—for fax calls

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Callers must be registered for Network 1 service. Currently this service is only available in the U.S. For more information or to register for Network 1 call, contact TELENOR at 1-301-214-3100.

This section provides instructions on how to place a ground-to-air call using TELENOR Mobile Communications Network 1 service.

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**To place a FAX call from ground-to-air using Network 1 service:**

1. Dial **10 + 10 + 222**.
2. Dial **011**.
3. Dial the Ocean Region number that the mobile terminal is logged onto—refer to Table 6 for a list of Ocean Region numbers.

**Note:**

- You may have to try each Ocean Region number before determining the correct Ocean Region the HSD Transceiver is logged-on to. For more information on using Network 1, contact Telenor at +1-301-214-3100.
- For offices with PBXs, the calling line identity for the main PBX number should be subscribed to Network 1.

4. Dial the Aircraft Number (IMN).



The call is being routed through the Land Earth Station (LES) to the satellite link and aircraft; you may experience a 30 to 60 second delay before your call rings through.

**Table 4 Satellite Ocean Region codes**

Satellite Ocean Region	Ocean Region Number
Atlantic Ocean Region East (AOR-E)	871
Atlantic Ocean Region West (AOR-W)	874
Pacific Ocean Region (POR)	872
Indian Ocean Region (IOR)	873

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## 6 Troubleshooting

---

- ▶ ***Troubleshooting calls***
- ▶ ***System and connection checks***
- ▶ ***System optimization***
- ▶ ***Product support***

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## Troubleshooting calls

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The following section provides basic troubleshooting information that includes symptoms and suggested solutions.

### Troubleshooting voice calls

---

Symptom	Solution
---------	----------

---

***Call does not ring through.***

**The number you have dialed may be incomplete or incorrect.**

***No tone is audible even after 30 to 60 seconds.***

Check your number and try again. For the correct number format, refer to the calling instructions provided in this User's Guide.

---

**A toll-free number was dialed.**

Most toll-free numbers do not work with the aeronautical Satcom Network.

---

**The pound key # was not pressed.**

When placing a call from air-to-ground, the # pound key must be pressed to initiate the calling sequence.

Try your call again, making sure that you end your dialing sequence by pressing #.

---

**Physical connection to the HSD Transceiver or attached user devices may be broken.**

Check all wiring connections and try your call again.

---

***Call does not ring through.***

**System has not cleared previous calls.**

***Fast busy signal is audible in handset.***

Dial tone must be audible; dial tone indicates that the system is ready. If dial tone is not audible, hang up and wait 30 seconds for the system to clear, and then try your call again.

---

**The System is busy or is in a transient state. (The system may be logging-on, changing beams, or acquiring a satellite or LES.)**

**Listen for dial tone before placing your call.**

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## Troubleshooting data calls

---

***Cannot establish an Internet or intranet connection.***

**Physical connection to devices may be broken.**

Check to make sure that all device (computer, ISDN modem, phone, fax) lines and cables are connected properly.

---

**The connections are not configured correctly.**

Check your dial-up connection to ensure that you have configured it properly.

---

**Dialing error.**

For intranet connections, ensure that the dialing sequence begins with the international code (00) and ends with the # symbol.

For direct Internet access, ensure that the phone number dialed is **28#**.

---

***Internet/intranet connection or file transfer drops unexpectedly.***

**The Aircraft has crossed into a new satellite beam region.**

During beam crossovers, connections longer than 10 minutes are dropped.

If your connection drops, wait 30 seconds and re-establish your connection.

---

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## Verifying the log-on status HSD transceivers

- Press \*\*
- Dial 11
- Press #

You hear one of three different tones: a busy tone, two beeps repeated, or a high-pitched tone. Table 5 provides an explanation of what each tone implies.

**Table 5 System log-on status tones**

<b>Tone heard</b>	<b>Log-on Status</b>	<b>Action</b>
<b>Busy tone</b>	<ul style="list-style-type: none"> <li>• The HSD Transceiver is 'busy'. It may be acquiring a satellite or LES, or logging-on</li> </ul>	<ul style="list-style-type: none"> <li>• Wait for the system to 'clear down' and then try your call again</li> </ul>
<b>Two beeps repeated</b>	<ul style="list-style-type: none"> <li>• The HSD Transceiver is waiting for further commands after acquiring a satellite and LES</li> </ul>	<ul style="list-style-type: none"> <li>• Wait for the system to be ready and then try your call again</li> </ul>
<b>High-pitched tone</b>	<ul style="list-style-type: none"> <li>• System logged-on and ready to use</li> </ul>	<ul style="list-style-type: none"> <li>• Place your calls</li> </ul>

If you continue to experience difficulties completing your call, contact the LES operator for assistance (no charges apply).

To contact the LES operator for assistance—dial **33#**.

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## Checking connections

---

System failures are often the result of incorrect, damaged, or disconnected cables and wiring.

Make sure that the following connections are made:

- Computer cables to the terminal adapter or router are all connected properly
- Connection to the HSD Transceiver is confirmed
- All external devices (fax, telephones, computers) are connected properly

## Resetting the system

---

If a number of call or connection attempts are unsuccessful, the system may need resetting.

---

### **To reset the HSD Transceiver:**

- Press the reset button on the front panel of the HSD Transceiver or the remote cabin reset button (if installed).

The HSD Transceiver will automatically reset and log-on to the LES.

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## Optimizing your system

---

The data rate performance varies due to the following factors:

- Satellite system or Internet congestion
- Satellite communication properties (high transit delays)

For best results:

- Optimize both ends of the connection
- Ensure that the protocol settings are identical on both ends of your connection
- Choose TCP/IP run over PPP as your protocol
- Use Windows 2000 as an operating system
- Check your modem manufacturer's configuration guidelines—changing the default settings (e.g. window size) may improve data transfer rates

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## Repair and product support

For product support concerning HSD Transceivers, contact EMS Technologies at:

---

### **EMS Technologies Canada**

**1725 Woodward Drive**

**Ottawa, Ontario, Canada, K2C 0P9**

EMS Reception: (613) 727-1771

EMS Product Support:

(USA and Canada): (888) 300-7415

Other countries: (613) 727-5338

EMS Product Support E-mail Address:

[hsd.help@emstechnologies.ca](mailto:hsd.help@emstechnologies.ca)

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## 7 Annex

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- ▶ ***Acronyms and abbreviations***
- ▶ ***Glossary***
- ▶ ***Inmarsat satellite beam map***

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## Acronyms and abbreviations

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AOR-E	Atlantic Ocean Region East
AOR-W	Atlantic Ocean Region West
BBS	Bulletin Board System
BRI	Basic Rate ISDN
DN	Directory Number
DOS	Disc Operating System
FTP	File Transfer Protocol
HPA	High Power Amplifier
HSD	High Speed Data
HST	High Speed Satcom Transceiver
IMN	INMARSAT Mobile Number
INMARSAT	International Maritime Satellite Organization
IOR	Indian Ocean Region
IP	Internet Protocol
IRS	Inertial Reference System
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
Kbps	Kilobits per second
LES	Land Earth Station
MES	Mobile Earth Station
MPDS	Mobile Packet Data Service
MSN	Multiple Subscriber Number
POR	Pacific Ocean Region
PPP	Point-to-Point Protocol
PSTN	Public Switched Telephone Network
SATCOM	Satellite Communications System
SPID	Service Provider ID
T/A	Terminal Adapter
TCP/IP	Transmission Control Protocol/Internet Protocol

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## Glossary

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<b>bit rate</b>	The number of bits transmitted per second (bps).
<b>INMARSAT</b>	The international organization that operates the satellite system network.
<b>Inmarsat Mobile Number (IMN)</b>	Assigned by Inmarsat, these numbers act as 'aircraft telephone numbers'.
<b>ISDN</b>	Integrated Service Digital Network is a telecommunications technology that provides high-speed data transfer over a range of communication services: Internet, fax, voice, and data.
<b>Land Earth Station (LES)</b>	Land Earth Stations are operated by Inmarsat Service Providers. They provide the connection between the orbiting satellites and the international ground communications network.
<b>Mobile Earth Station (MES)</b>	The mobile terminal that provides the communication link between the aircraft and the satellite network. The HSD Transceiver acts as a Mobile Earth Station.
<b>Ocean Region</b>	The beam coverage area of an Inmarsat satellite.
<b>subnet mask</b>	A subnet mask is used to determine what subnet an IP address belongs to. Subnetting allows the network administrator to divide the host part of the address into two or more subnets.
<b>terminal adapter</b>	An ISDN modem device.

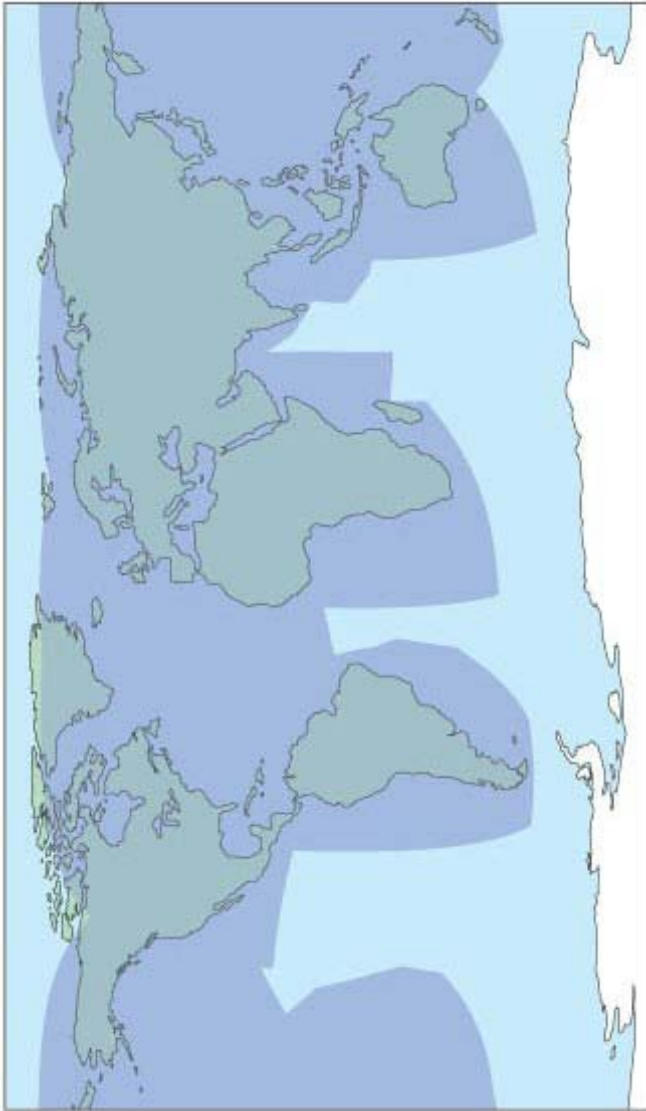
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## Inmarsat satellite-beam coverage map

Inmarsat Swift 64 Coverage



Inmarsat Aeronautical Spot Beam Coverage



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## **Recommended devices**

---

The following is a list of the recommended devices tested with HSD Transceivers. This list is subject to change and is not intended to exclude other manufacturers' devices.

### **Terminal Adapters (Aircraft):**

Diva T/A ISDN Modem (Euro ISDN model, PN 810-194-02)

### **ISDN PCMCIA CARD**

Eicon Diva Pro PC Card (International) - Eicon PN, 305-195

### **Terminal Adapters (Ground):**

US Robotics Courier I Modem ISDN with V.Everything

### **Router (Aircraft):**

803 Cisco Systems Euro Router

### **Router (Ground):**

1604 R Cisco Systems North American Router

### **Compression Box (Aircraft and Ground):**

Expand Networks, Expand Accelerator 2800 series

## **Recommended operating system**

---

This document uses Windows 98 as an example to illustrate the set-up and configuration process of dial-up connections. However, performance results vary between operating systems.

At the time of printing, Windows 2000 is the best performer out of all available Microsoft operating systems for satellite network communications.

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## **Customer feedback**

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To help us improve the quality of our product documentation, we would appreciate your comments on this publication.

Please complete and submit the following Customer Comments Form to notify us of any errors or omissions in this document.

Mail comments regarding this publication to:

---

**Satcom Product Support**

**EMS Technologies Canada Ltd.**

**1725 Woodward Drive**

**Ottawa, Ontario**

**Canada, K2C 0P9**

**E-mail: [hsd.help@emstechnologies.ca](mailto:hsd.help@emstechnologies.ca)**

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## Customer comment form

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### Publication Information

**Publication title:** \_\_\_\_\_  
**Publication number:** \_\_\_\_\_  
**Publication date:** \_\_\_\_\_  
**Revision date:** \_\_\_\_\_

---

### Customer Information

**Name:** \_\_\_\_\_  
**Position:** \_\_\_\_\_  
**Telephone:** \_\_\_\_\_  
**Email address:** \_\_\_\_\_  
**Company's name & address:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

---

### Customer Comments:

\_\_\_\_\_  
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## Important numbers

### Aircraft Numbers

Inmarsat Mobile number: \_\_\_\_\_

Aircraft Registration number: \_\_\_\_\_

Aircraft Manufacturer's number: \_\_\_\_\_

### Inmarsat Mobile Numbers (IMN)

ISDN Speech number: \_\_\_\_\_

ISDN Audio 3.1 kHz number: \_\_\_\_\_

ISDN HSD 56k number: \_\_\_\_\_

ISDN HSD 64k number: \_\_\_\_\_

Low-speed voice: \_\_\_\_\_

MPDS (future availability): \_\_\_\_\_

### User Numbers

Corporate telephone number: \_\_\_\_\_

Corporate fax number: \_\_\_\_\_

Intranet dial-up number: \_\_\_\_\_

Internet Service Provider: \_\_\_\_\_

Account charge number: \_\_\_\_\_

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**Ottawa, Ontario**  
**Canada, K2C 0P9**

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EMS Sales and Marketing: (800)-600-9959

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*USA and Canada:* (888) 300-7415

*Outside North America:* (613) 727-5338

EMS SATCOM E-mail Support: [hsd.help@emstechnologies.ca](mailto:hsd.help@emstechnologies.ca)

EMS Web site: [www.ems-t.com](http://www.ems-t.com)

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