



Westinghouse Series 1000 Marine Satellite Telephone System

Features and Specifications

Through state-of-the-art digital satellite technology, **Wavetalk™** sports not only the smallest but the most lightweight antenna designed specifically for the marine world. Even more impressive is the fact that **Wavetalk™** has been designed to avoid the use of many complicated and fragile moving parts required by stabilized satellite phone antennas. Thus, a compact, lightweight antenna with increased reliability.

With flame retardant, low smoke, low toxicity, UV protected antenna cabling as standard equipment, **Wavetalk™** eases the concerns of the safety conscious boater, while also providing ample cable lengths to properly position the antenna. In addition, the **Wavetalk™** antenna is easy to mount, either flush to the deck or on a standard 1-inch marine mount. A marine conformal coated antenna board and stainless steel antenna mounting hardware top off the design of the **Wavetalk™** antenna insuring corrosion-free use. And Westinghouse stands behind **Wavetalk™** with a one year factory warranty.

Wavetalk™ Features

Components

The **Wavetalk™** telephone comprises four main components: the transceiver, the antenna electronics unit, the handset, and the contoured antenna with its windswept design.

Satellite Providers

Wavetalk™ operates on satellites owned and operated by American Mobile Satellite Corporation in the U.S., Telecomunicaciones de Mexico in Mexico, and TMI Communications Pty. Ltd. in Canada. Satellite coverage areas include North America and Central America extending 200 miles out to sea, the entire Caribbean, the northern tip of South America, Hawaii and its surrounding waters.

Satellite Service Providers

To operate, **Wavetalk**[™] must be commissioned on a satellite through a satellite service provider. Commissioning, airtime and equipment can be purchased from satellite service providers and their dealers, located throughout the U.S., Canada, Mexico and the Caribbean. For service and dealer information, please call the Westinghouse Customer Support Center at 1-800-851-4807.

Satellite Communications Services

Wavetalk[™] is capable of providing voice, dispatch radio, data and fax satellite communications. All communications are private; each call is protected from "eavesdroppers" by using dedicated frequencies and digitally scrambling the transmissions.

The voice quality is similar to that of a digital cellular telephone; however, all satellite communications experience a slight delay in transmission.

For dispatch radio, multiple satellite telephones can be linked as part of a private communication group, similar to a VHF/HF radio group. Conversations, too, are totally private. This capability is currently available on American Mobile Satellite Corporation's and TMI Communication's satellite systems.

Data is standard modem-to-modem interfacing at 2400 baud or 4800 baud depending on the satellite service provider.

Faxes can be sent and received by either personal computer (PC), containing facsimile software, or by fax machine. There are two different facsimile transmission methods, depending on which satellite service the phone is commissioned. The two methods are: (1) "*direct*" faxing via a standard fax machine connected to the transceiver, or (2) a "*store-and-forward*" method using a fax machine or a PC. **Wavetalk**[™] supports both methods.

Built-in Interfaces

An RS-232/DB25 pin data port is located on the transceiver, and is used to connect a PC or data terminal. To make this connection, an RS-232 cable from the PC or data terminal is needed. Since the phone is the modem, there's no need for a separate modem card in your PC. The phone supports most Hayes compatible AT commands. **Wavetalk**[™] supports standard consumer communications software such as Procomm, America Online, etc.

A GPS port, located on the transceiver, accepts an NMEA-0183 GPS data stream (strings GGA & ZDA), allowing the satellite transceiver to receive GPS data and display it on the handset.

An external speaker jack allows the caller to connect and use an external speaker while simultaneously using the handset.

An interface called a horn alert is provided for incoming calls to sound a horn, ring a bell, or activate a flashing light.

The standard **Wavetalk™** handset supports "Dispatch Radio" through handset commands. However, an optional handset with a push-to-talk button located on its side is also available. (Dispatch radio is referred to by American Mobile Satellite Corporation as *Skycell Plus* Dispatch Service.)

Other Optional Features

An optional Westinghouse FX-10 card allows the user to connect a cordless phone, touch-tone phone (with a current draw of up to 30ma), or a loop-start Private Branch Exchange (PBX) trunk line to **Wavetalk™**. This allows the user to retain the handset as part of the system while being connected to an extension phone or PBX trunk line.

An optional Satellite Telephone Interface provides the user with the ability to tie **Wavetalk™** to multiple touch-tone phones (if the current draw is less than 51ma) or a PBX loop-start or ground-start system. When using this option, however, the handset must be removed from the **Wavetalk™** system and the Satellite Telephone Interface connected between the handset port and the PBX trunk line or suite of touch-tone phones.

An optional 3-watt cellular transceiver connected to the satellite transceiver allows **Wavetalk™** to become a dual mode cellular/satellite telephone on one handset. The dual mode phone can be preset to search for a cellular signal first, then switch to satellite if one is not found. For this operation, the cellular transceiver requires activation through a cellular service provider and the addition of a cellular antenna.

Packet data software, for transmitting X.25 packet data streams, will be available later this year.

Frequently Asked Questions About *Wavetalk™*

What is *Wavetalk™*?

Wavetalk™ is a marine satellite telephone system that allows you to make or receive direct dial calls from within the satellite coverage area to or from anywhere in the world.

Where can I buy *Wavetalk™*?

For your nearest dealer and satellite service provider, call the Westinghouse Customer Support Center, toll free, at 1-800-851-4807.

How much does Wavetalk™ cost?

The Manufacturer's Suggested Retail Price for **Wavetalk™**, the medium gain system, is \$4,995(U.S.) and for **Wavetalk PLUS™**, the high gain system, is \$5,335(U.S.).

What are the air time costs?

Air time rates, activation and monthly access fees are set by the satellite service providers. Current U.S. satellite air time rates for **Wavetalk™** range from approximately \$.99 to \$1.49 per minute. This includes long distance service for calls terminated in the U.S. and Canada.

Is it complicated to use the Wavetalk™ telephone?

No, it's as easy to use as a cellular phone, just dial the complete telephone number, domestic or international, and press the "Send" key. When you finish the call, press the "end" key. For incoming calls, when the phone rings, just pick up the handset from the cradle or press the "send" key.

What data services does Wavetalk™ support?

Wavetalk™ provides the ability to communicate via personal computer to e-mail, on-line services, or dial up an Internet service provider. **Wavetalk™** supports any modem to modem data transfer.

How does facsimile work and where is it available?

Wavetalk™ supports two methods of faxing: "*direct*", and "*store and forward*."

Direct faxing requires the installation of an optional Westinghouse FX-10 card. Once installed, a group III fax machine can be connected directly to the RJ-11 fax port. To send a fax just dial the number on your fax pad and press the send key. This method is currently available on the Telecomunicaciones de Mexico satellite system.

Store-and-forward faxing requires a separate software package or a separate hardware module. To send a fax using a PC, the *store-and-forward* software package is needed, in addition to standard PC fax software. The PC is then connected directly to the satellite transceiver's RS-232 data port. To send a fax using a Group III fax machine, the *Store-and-forward* hardware module is needed. This module is connected between the fax machine and the satellite transceiver's RS-232 data port. To send a fax dial the number on your PC or fax pad and press the send key.

For customers commissioned on either American Mobile Satellite Corporation or TMI Communications satellites, please contact your satellite service provider for the facsimile service method and service availability date.

How does the Wavetalk™ antenna track the satellite?

The **Wavetalk**[™] antenna tracks, or rotates, within its molded shell 360 degrees in azimuth (horizontally) with a wide angle elevation beam, 45 degrees, pointed upward in the direction of the satellite. A rate sensor is used in the antenna to sense movement. Once movement is sensed, the antenna is turned left or right to maintain track of the satellite.

Why does Wavetalk[™] work without stabilization?

Stabilization platforms have fragile moving parts and a relatively slow reaction time. The unique design of the **Wavetalk**[™] antenna eliminates the need for stabilization, entirely. The 45 degree wide elevation beam in conjunction with the 360 degree azimuth tracking system turn at a rate of 70 degrees per second, enabling the **Wavetalk**[™] antenna to establish contact and continually track the satellite as a boat pitches, rolls and yaws. While technical specifications require optimum satellite tracking to be maintained from 15 to 60 degrees above the horizon, actual testing has resulted in satellite tracking from 5 to 75 degrees above the horizon. To illustrate the antenna's superb tracking ability in severe conditions, Westinghouse tested **Wavetalk**[™] mounted on a 30 foot boat in 12 to 15 foot seas at an approximate 10 degree look angle to the satellite. Satellite tracking was continually maintained.

How far can the Wavetalk[™] antenna be placed from its electronic components and handset?

Standard **Wavetalk**[™] antenna cabling is 40 feet long with optional 55 foot antenna cables available as special order items. **Wavetalk PLUS**[™] antenna cabling is 18 feet long. In addition, the handset on either system can be mounted up to 30 feet from the transceiver. Thus, for **Wavetalk**[™] the overall distance from the antenna to the handset, less routing obstructions, can be up to 85 feet, and for **Wavetalk PLUS**[™] the overall distance from the antenna to the handset, less routing obstructions, can be up to 48 feet.

How does the Wavetalk[™] antenna mount to a vessel?

The antenna base can be mounted flush to the flat surface of the deck, or to a standard 1-inch by 14 thread marine antenna mount.

Are the antenna cables easy to route through a vessel?

The antenna cables are relatively flexible and easy to route. The RF cable is 0.5 inches in diameter and is pre-terminated with a TNC connector on one end and an SMA connector on the other. The control/power cable is 0.25 inches in diameter and is unterminated on the antenna connection end for easy routing. A field-installable antenna connector is provided.

Why is the Wavetalk[™] antenna so much smaller than other marine antennas?

Since American Mobile Satellite Corporation, Telecomunicaciones de Mexico, and TMI Communications have launched extremely powerful satellites, less antenna gain is needed, so antennas can be smaller and still maintain satellite tracking. However, **Wavetalk™** with its patented antenna design, offers not only the smallest marine antenna, but the lightest one as well in either medium or high gain models.

How does Wavetalk™ compare to other satellite telephone products?

No other marine satellite telephone is comparable to **Wavetalk™** in antenna design, size or weight. Similar or less expensive products may be offered but are either heavier, bulkier in size, contain more moving and fragile parts, or are not marine warranted. Some satellite systems may offer faster data rates, but at a substantially higher cost for hardware and air-time, along with bulkier antennas.

What about product safety?

Wavetalk™ is designed to shut down in case of overheating or RF power overload. **Wavetalk™** displays all proper caution and warning labels required by law. Fuses are provided for the 12 VDC and ignition sense cables. **Wavetalk™** antenna cables are flame retardant, low-smoke, low-toxicity and UV protected. And, **Wavetalk™** has been independently tested by Underwriters Laboratories, Inc. and is UL/CUL listed in the U.S. and Canada.

Please call the Westinghouse Customer Support Center at 1-800-851-4807 if you have additional questions or comments concerning **Wavetalk™**.

Wavetalk™ Specifications

Communication

Modes

Voice	Full duplex digital voice Half duplex digital voice - dispatch Cellular analog voice (option)
Data	2400/4800 bps
Fax	PC or Group III facsimile

**Systems
Specifications**

Transmit Frequencies	1626.5 - 1660.5 MHz
Receive Frequencies	1525.0 - 1559.0 MHz
G/T	<i>Wavetalk™</i> -16 dB/°K from 15° - 60° elevation

	<i>Wavetalk PLUS™</i>	-13.5 dB/°K from 15° - 60° elevation
EIRP		12.5 -16.5 dBW
Polarization		Right-hand circular (RHCP)
Channel Spacing		6.0 kHz

Interface Specifications

Voice		RJ-45, Handset supports satellite voice, dispatch radio, and cellular; RJ-11, touch-tone telephone interface (option); push-to-talk handset (option)
Data		DB-25, RS-232 Hayes compatible AT Command Set
Fax	External	DB-25, RS-232; AMSC, TMI
	Internal	RJ-11/FX-10 card; Telecomunicaciones de Mexico
Power		12 VDC Nominal (11.5 - 15.6 V range) 2A receive, 6.5A transmit

Physical Specifications

Antenna - Dome		
	Size (LWH)	10.4" L x 9.4" W x 6.5" H oval (26.0 cm x 24.0 cm x 16.5 cm)
	Weight	2.2 lb (1 kg)
	<i>Wavetalk™</i> Cables	RF = 0.5" dia (1.27 cm) pre-terminated with TNC connectors; Control/Power = 0.25" dia (0.63 cm) unterminated with pins attached
	Length	40 ft (12.2 m), 55.0 ft (16.8 m) (option)
	<i>Wavetalk PLUS™</i> Cables	RF = 0.4" dia (1.02 cm) pre-terminated with SMA/TNC connectors Control/Power = 0.25" dia (0.63 cm) unterminated with pins attached
	Length	18.0 ft (5.5 m)
Antenna		

Electronics Unit

Size 9.0" L x 7.0" W x 2.5" H (22.6 cm x 17.8
(LWH) cm x 6.4 cm)
Weight 7.0 lb (3.2kg)

Transceiver

Size 12.0" L x 7.0" W x 2.0" H (30.5 cm x 17.8
(LWH) cm x 5.3 cm)
Weight 7.5 lb (3.4 kg)

Handset

Size
(LWH)
Weight 7.75" L x 1.5" W x 1.5" H (19.7 cm x 3.8
cm x 3.8 cm)
Cable 0.4 lb (0.2 kg)
30.0 ft (9.2 m) - 6.0 ft coil and 24.0 ft
straight

Cellular Module (option)

Size 8.0" x 3.3" x 1.0" (20 cm x 8.5 cm x 2.8
(LWH) cm)
Weight 1.3 lb (0.6 kg)

Dynamic Specifications

Antenna Turning
Rate 70° /sec, maximum

Antenna
Acceleration
Rate 500° /sec², maximum

Operating Temperatures

-22°F to +130°F (-30°C to + 55°C)