APPENDIX XII

SeaNet Update

Richard Findley

SeaNet - What is it?

- Method of providing INTERNET connectivity between the shore side INTERNET and the ship board LAN (local area network)
- Designed to be used with different physical links
  - MARSAT, Iridium, Satellite Cellular, Cellular

Hardware

Uses off the shelf hardware

- ABB NERA INMARSAT Saturn-B
  - Two voice channels
  - FAX
  - High speed 64 kbit ISDN line
- SeaNet Communications Node (SCN)
  - SparkStation 5

Software

Uses Standard Software Protocol

- TCP/IP
- PPP

Specialized routines

- Standard-B I/0 module was designed by Steve Lerner at WHOI

Background

Funds for system provided by NSF

Test Cruise

- JGOFS. Process 6 aboard RV THOMPSON
- Barney Balch Chief Scientist
- Gulf of Oman

Technical Support

- WHOI -- Andy Maffei
- UW -- Bill Martin, Mike Relander

Installation

Installed October 1995 in Oman

- Had some initial problems interfacing- Saturn-B to ship's gyro, due to incomplete or incorrect documentation.
- RS232 NEMA interface to gyro would be more straight forward if available.
- Unable to install with minimum obstructions specified by NERA.

Operations

Generally system worked as advertised.
Voice quality was acceptable, but not as good as Standard "A".
High Speed Data (HSD) is more sensitive to physical obstructions
than voice. Problems with antenna pointing into obstructions on some headings.

PPP and TCP/IP Connections

With no obstructions, it worked very well.
FTP, WWW, e-mail, telnet etc., worked "better than at home".
Setup times on ISDN/PPP connection was on the order of 5 10 seconds (Standard-A takes much longer).

Standard-B Rates

Voice

Ship-Shore	$5.50/min.
Ship-Shore	$11.00/min.

HSD (64 kbit/sec ISDN)

Ship-Shore (peak)	$17.50/min.
Ship-Shore (off peak)	$10.50/min.

Example Transfer Rates (preliminary)

Standard A BLAST/US Robotics Sportster modem @9600 baud

- Transfer speed = 593 bytes/ sec
    - $.0002/byte @ $7.00/min

Standard-B FTP file transfers with HSD

- Transfer speed compressed = 8000 bytes/sec
    - $.00005/byte @ $17.50/min, $.000035/byte @ $10.50/min
- Transfer speed no-compression =5000 bytes/sec
    - $.0001/byte @ $17.50/min, $.00006/bytes @ $10.50/min

In all cases, file is an 81K GIF satellite image

Results

System is capable of providing high speed interactive INTERNET access at sea.
Potential to save money.
Automation is not possible on THOMPSON at this time due to problem with antenna obstructions.
System is portable, it could be installed on other UNOLS ships

Next Steps

Continue to work closely with other UNOLS ships, with further development of standard B interface to SCN.
Identify a science cruise that requires high speed data requirements(Prefer THOMPSON).
Identify other UNOLS institutions planning upgrades to INMARSAT-B. to assist in data considerations.