System Specifications for Long-Range SeaSonde

Radiated Signal Specifications

Output Radiated Power: 80 watts peak, 40 watts average
Operating Frequency Range: 4.3 - 5.2 MHz (inquire about other frequencies)
Modulation Format: Pulsed Swept Frequency, Pulse Width: 1000-2000 µs
Pulse Repetition Frequency: 250 - 500 Hz
Duty Factor: 50%
Sweep Width: 12 - 25 kHz (typical)
Sweep Repetition Frequency: 1 Hz
Total Radiated Signal Bandwidth: (at - 20 dB level): 27 - 40 kHz
Polarization: vertical

Transmitter: SSTX 100

Input RF Drive Level: 0 dBm
Output RF Power Level: 100 watts peak, 50 watts average
Required Power: 120 VAC or 220 VAC; 50-60 Hz, 300 watts (specify when ordering)
Design: (gated FET): modular; all solid state
Operation: Class AB
Dimensions: (single chassis): 13H x 49W x 53D cm (5.25H x 19W x 21D in)
Weight: 15 kg (33 lb)

Receiver: SSRX 100A

Maximum In-band Input Level: +13 dBm (no damage)
Impedance: 50 ohm
Sensitivity: (noise level) -166 dBm in 1 Hz BW
Required Power: 120 VAC or 220 VAC; 50-60 Hz, 100 watts (specify when ordering)
Design: modular, all solid state three-channel
Operation: I/Q homodyne
Output: digital data at 4096 16-bit words/second per channel
Dimensions: (single chassis) 13H x 49W x 53D cm (5.25H x 19W x 21D in)
Weight: 14 kg (30 lb)
GPS Assisted Stability: >.0001 ppm and 50 nsec on PPS

Transmit Antenna: SSTA 100 Vertical Fiberglass Whip

RF Connection: (to Transmitter) Low-loss Co-Ax; Type N connectors
Height: 12.3 m (40 ft)
Weight: 59 kg (130 lb)

Receive Antenna: SSRA 100-LR

Design: (three element DF) passive vertical monopole,two crossed loops into preamplifiers
RF Connection: (to Receiver): lightweight Co-Ax; N and TNC end connectors
Dimensions: (weatherproof RF box) 13H x 25W x 25D cm (5H x 10W x 10D in)
Weight: 4.5 kg (10 lb)Whip Height/Radial Element Lengths 2.6 m (8.5 ft)

Radar Remote-Site Data Acquisition System: SSDA 100

Computer: Power Macintosh® G4 (Power PC 800 MHz) 256 MB RAM; 40 GB H.D.
Modem (for dial-up only, not leased-line operation)**:** up to 28,800 BPS
Monitor: 15" color
Keyboard: USB, extended

Output Surface Current Specifications

Surface Currents:
Maps of surface current vectors created from data taken at two radar sites 80 - 150 km apart.
Map Displays:
color monitor screen, laser-quality hardcopy, archived ASCII vector files.
Map Spatial Resolution: (vectors on square grid) 5 x 5 km typical spacing
Map Area Coverage: 200-400 km alongshore x 140- 220 km offshore
Map Temporal Interval: hourly; currents averaged over one hour typically
Map Vector Accuracies: (rms; typical for normal environmental speed: < 7 cm/s
conditions, i.e., noise/interference, siting, sea state), direction: < 10°

Data Communication: Automatic modem transfer of current and wave data products supported by software for dial-up lines and ethernet connections (recommended).

Remote Site Software Specifications

Program Name*... *Function*... *Output

Sentinel... orchestrates control of all operations... logs data events
SeaSonde Acquisition ... radar data acquisition/processing... unaveraged cross spectra
CSRAvnn... averages data over one hour... averaged cross spectra
WaitForCSA... detects arrival of averages... triggers hourly processing
Currents... calculates radial surface current map... writes file radial.dat
Waves... inverts echo to get wave information... wave spectral parameters
Archivist... archives data according to user selections... archived data
MacController... housekeeping functions, data transfers upon request

Central Station Software Specifications

MacCentral... retrieves hourly files from remote sites... radial current/wave data
WaitForRadials... detects arrival of radial files... triggers total vector processing
Combine... calculates total currents... total current vectors at map grid
SeaDisplay... prepare current map... current map for monitor or printer
WaveDisplay... prepare wave data displays... wave data plots

*These specifications are for the basic software for typical real-time operational use.