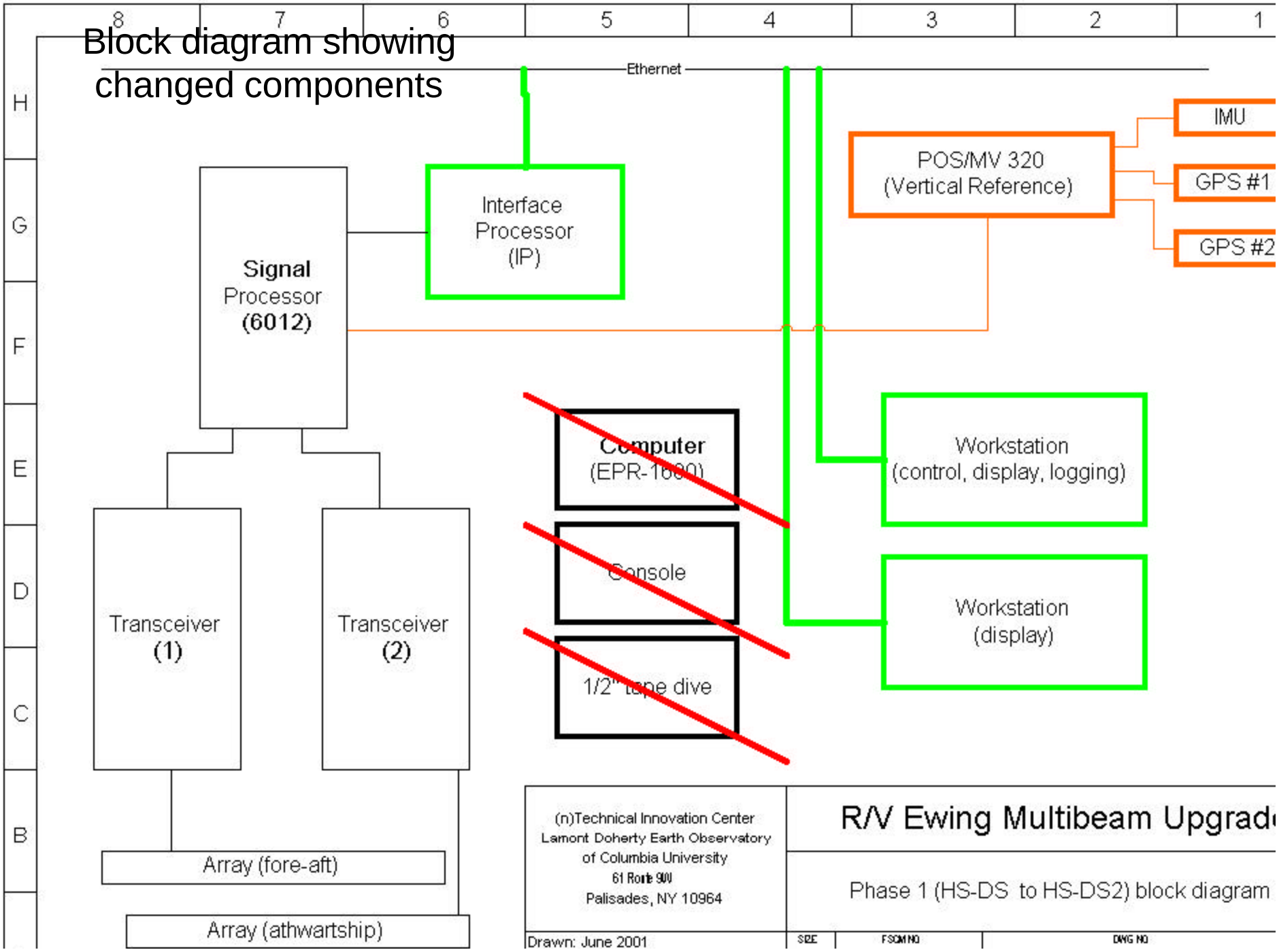
Hydrosweep DS to DS2 upgrade on R/V Ewing

- Install May ‘01during Panama Canal transit
  - POS/MV-320
  - DS-> DS2 hardware
- Updates and tests on transits through Summer ‘02

Multibeam (HS-DS -> DS2)

- Expands swath width to 120 degrees
- Adds “soft” beams (118 <X < 140) to 59 “hard’ beams
- Adds “sidescan”
- Adds “true” amplitude (backscatter) capability
- Convert to modern workstation interface
- Adds ECDIS, survey planning & autopilot
- Removes archaic hardware

Block diagram showing changed components



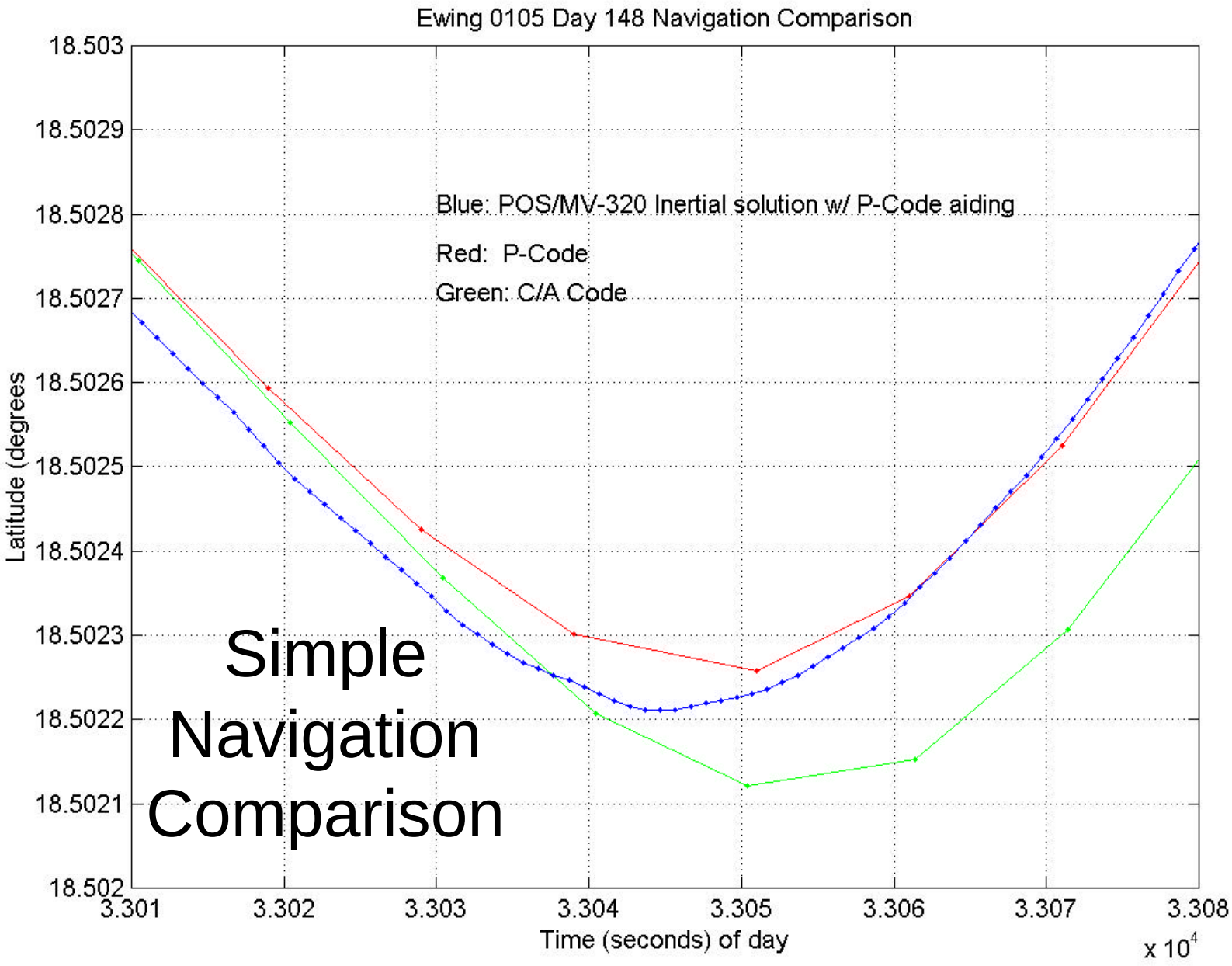
New Vertical Reference (POS/MV-320)

- Vastly better heading (~0.03 degrees)
- Vastly better pitch and roll (~0.03 degrees)
- Adds heave
- Improved real-time navigation

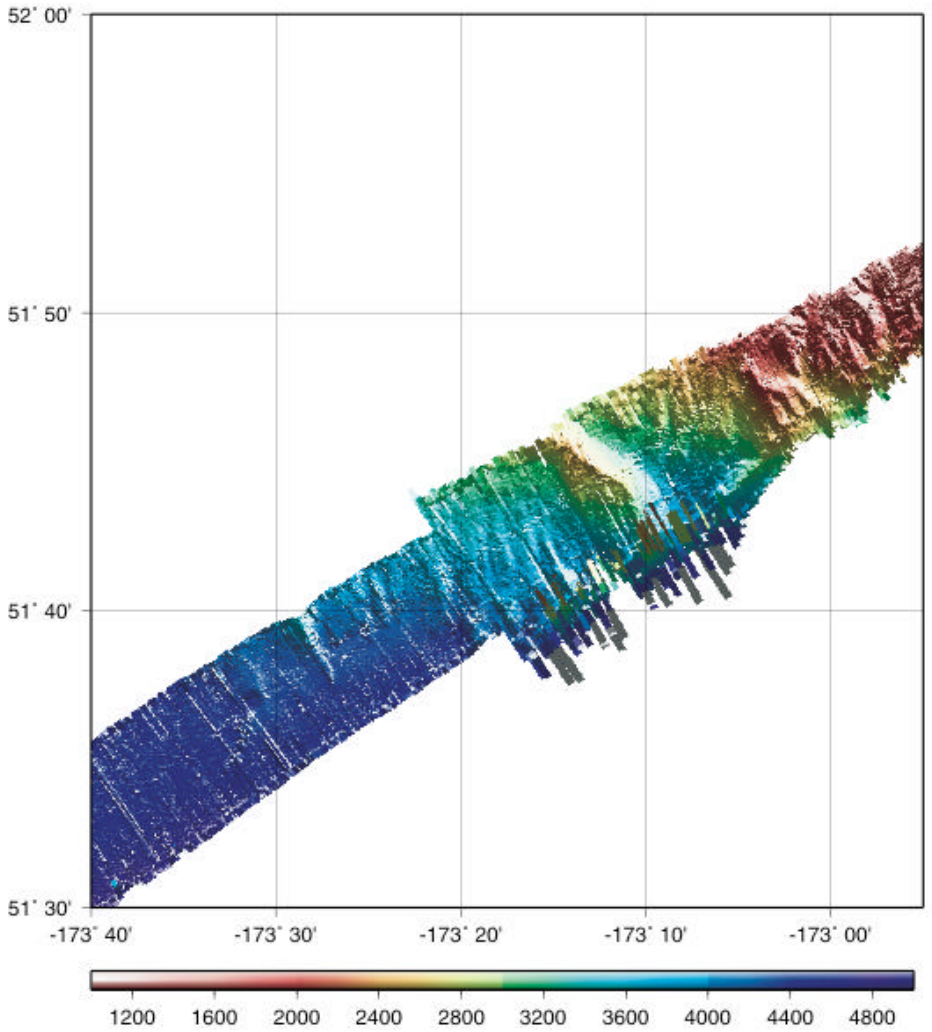
The POS/MV GPS antennas on the Ewing

POS/MV Inertial Measurement Unit (IMU)

Surveying for offsets (on the Knorr)


Ewing 0105 Day 148 Navigation Comparison
Blue: POS/MV-320 Inertial solution w/ P-Code aiding
Red: P-Code
Green: C/A Code
Simple Navigation Comparison
Latitude (degrees
18.503
18.5029
18.5028
18.5027
18.5026
18.5025
18.5024
18.5023
18.5022
18.5021
18.502
3.301
3.302
3.303
3.304
3.305
3.306
3.307
3.308
Time (seconds) of day
x 10^4

R/V Ewing Hydrosweep DS2 Automatic transition from 90 degree, deep sea mode to 120 degree medium depth mode during EW0204 transit from Guam to Dutch Harbor.

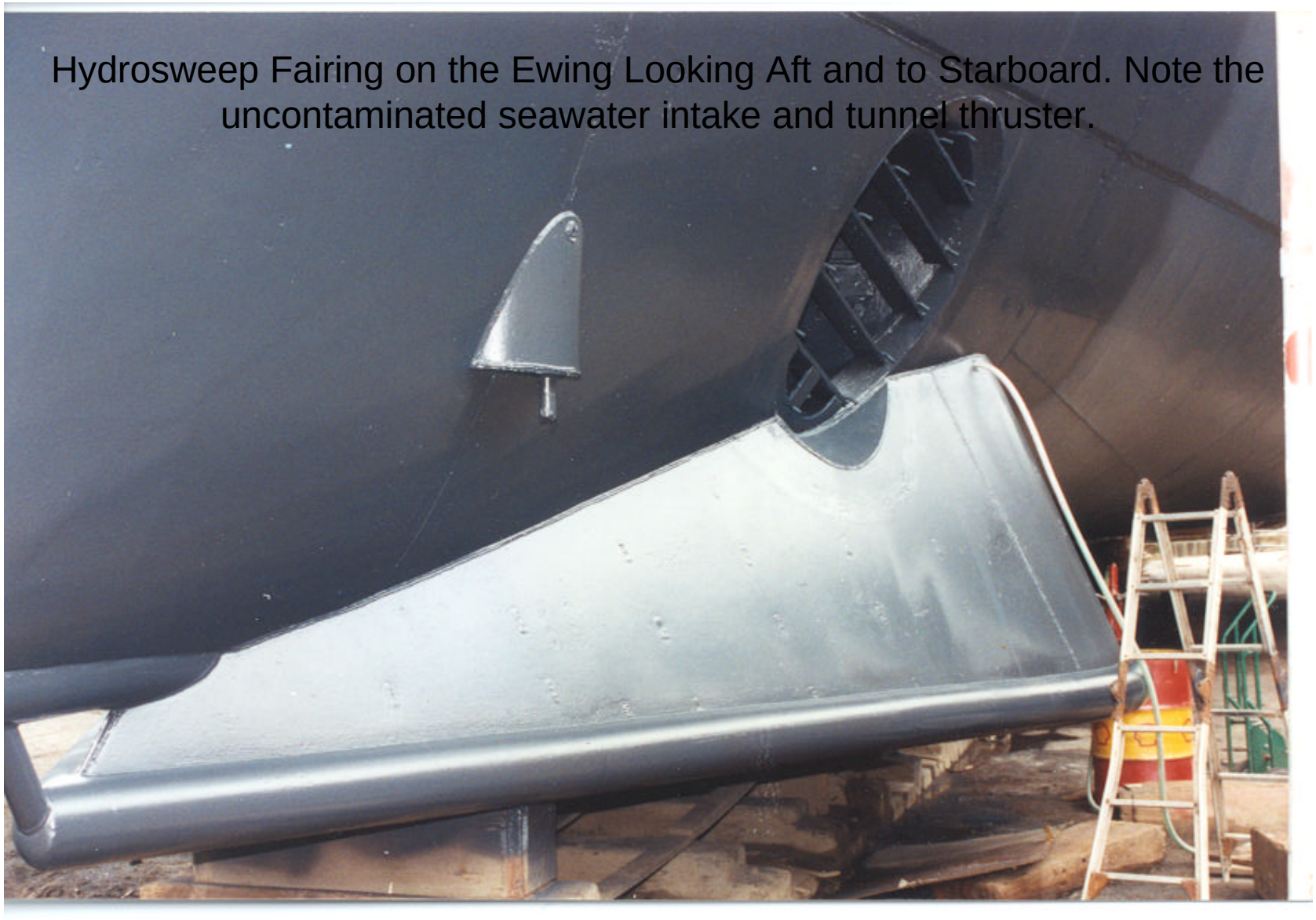


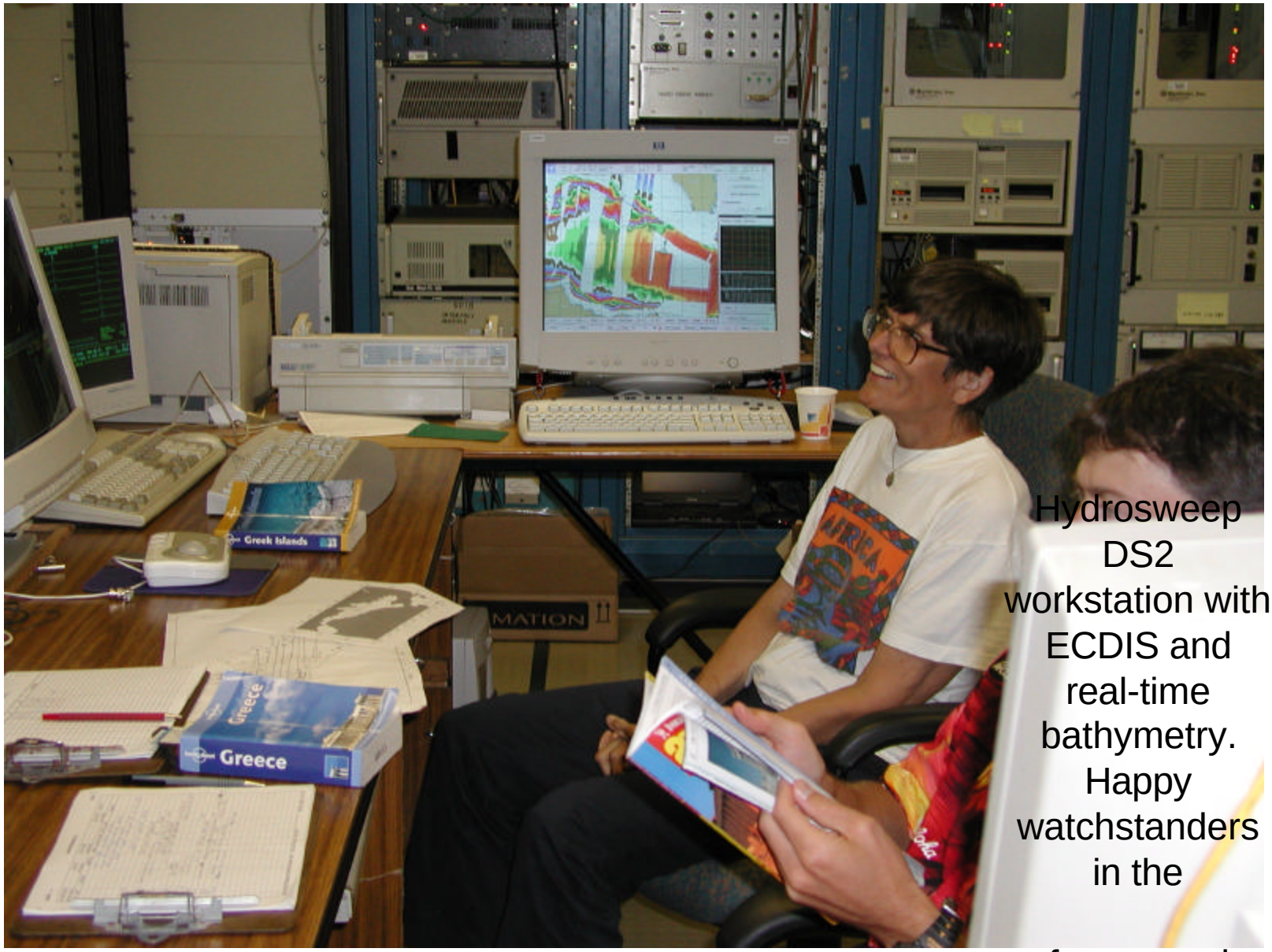
EW0204 - jd127

November 13, 2002 Date

Hydrosweep Fairing on the Ewing Looking Aft. Lyttleton, NZ, 1990

Hydrosweep Fairing on the Ewing Looking Aft and to Starboard. Note the uncontaminated seawater intake and tunnel thruster.





Hydrosweep DS2 workstation with ECDIS and real-time bathymetry. Happy watchstanders in the foreground