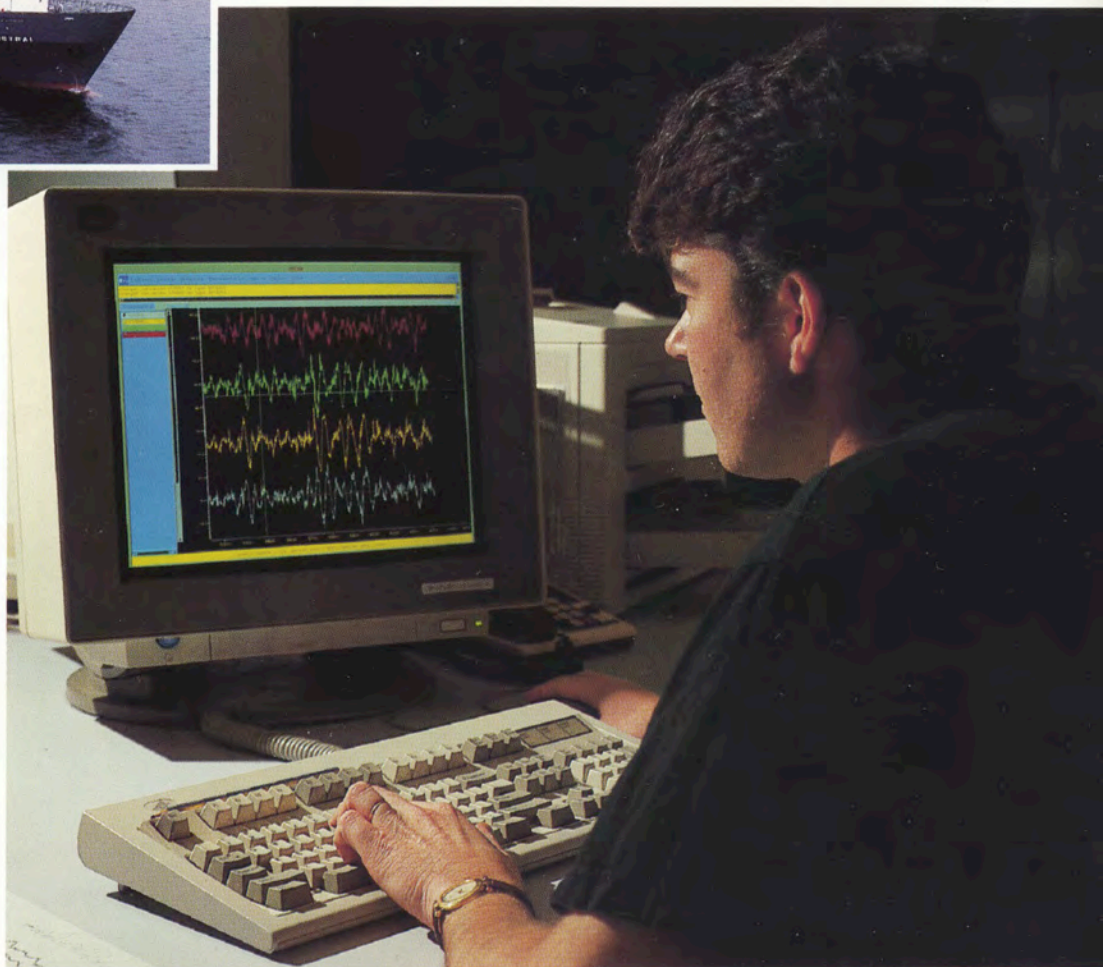


GEONAV: ON-BOARD NAVIGATION PROCESSING



OVERALL REDUCTION IN TURNAROUND TIME

ON-BOARD QUALITY ASSURANCE

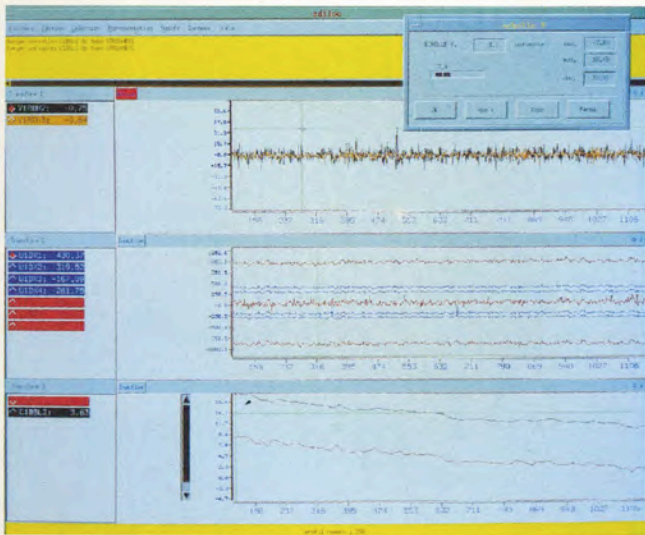
REAL-TIME NAVIGATION CHECKS



TECHNICAL DESCRIPTION

GEONAV processes marine navigation data on board seismic vessels, thus providing final processed navigation tapes at the same time that seismic data acquisition is completed. As a direct result, onshore data processing centers can immediately begin work on processing the seismic data, thereby reducing overall turnaround time by several weeks or even months.

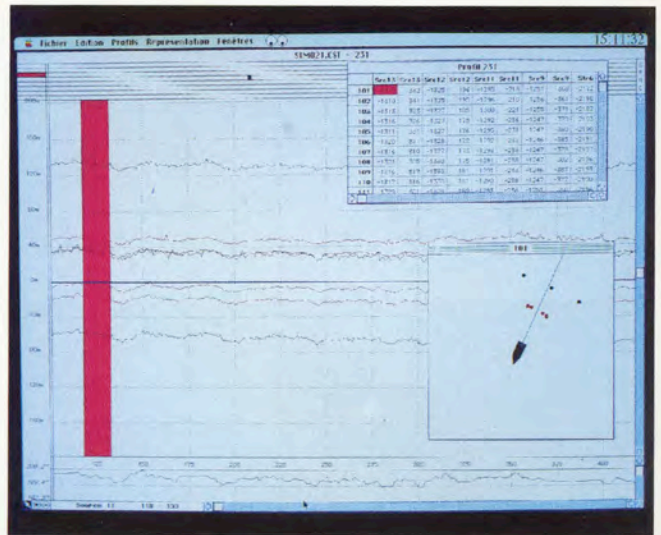
GEONAV uses all the navigation software modules routinely implemented by CGG's geophysical data processing package Geovecteur® in its onshore data processing centers, thus guaranteeing quality and compatibility while providing the ability to handle the large volumes of complex data required for modern 3D seismic surveys.



Multi-window GEONAV plot showing radiopositioning of vessel, acoustic positioning of sources and streamers, and compass checks.

Quality assurance is enhanced by the ability to check all navigation and positioning functions for the vessel, streamer tail buoys, sources and streamer heads. This quality control can remove doubt in certain cases or enable corrections to be made to acquisition parameters when required. The following methods are employed:

- redundancy analyses (comparative checks of separate readings)
- statistical analyses in tabular or graph form
- time series plots of each separate positioning function (raw + filtered)
- network adjustment
- final coverage plot.

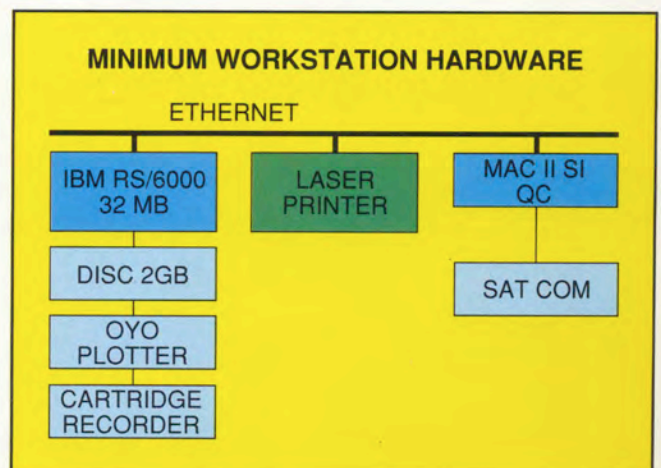


Macintosh® connected via Ethernet® provides acoustic positioning charts complete with tabular data and overhead view.

TECHNICAL SPECIFICATIONS

The on-board system runs on IBM RS 6000 RISC-technology workstations with UNIX®, OSF/Motif® and X Window. An Ethernet® link connects with a Macintosh® computer for certain QC functions. Identical software runs on Cray and Convex mainframes in onshore processing centers. In all cases GEONAV is fully compatible with Geovecteur®.

® Geovecteur: CGG registered trademark
 ® UNIX: AT&T Bell Laboratories registered trademark
 ® OSF/Motif: Open Software Foundation, Inc. trademark
 ® X Window System: Massachusetts Institute of Technology trademark
 ® Ethernet: Xerox registered trademark
 ® Macintosh: Apple Computer Inc. registered trademark



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