

## **Testbed for Development of Control Subsystem for an Earth Orbiting Scatterometer**

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The SeaWinds radar scatterometer instrument, currently in Earth orbit aboard the QuikScat spacecraft, contains a control subsystem capable of processing 40 kbits/sec of science and engineering data. Follow-on instruments under consideration will require the ability to process up to five times more data with no increase in central processing unit performance. In addition, the follow-on instrument must have open architecture for ease of upgrades in hardware and software, be cheaper by a factor of two, have the same mass and volume or lower, and have more operational flexibility.

To design and develop the architecture for this control subsystem, a testbed is developed that provides opportunity to try out design approaches. The testbed uses a flight-like RAD6000 processor board and commercial VME single-board computers with configurable Industry Pack interfaces. The VME single-board computers can be programmed to mimic the behavior of anticipated flight hardware, even becoming "smart" interfaces to relieve the central processor of a portion of its processing load. The testbed allows the execution of prototype multitasking flight software, and allows measurements of its performance under realistic data loading and interrupt conditions.

The paper describes the SeaWinds follow-on control subsystem requirements and interfaces, the simulation of the interfaces on the testbed, and the benchmarking and results to date.