

## CRAY 2 MODULE TEST PROCEDURES

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Due to the nature of the construction of the Cray 2, testing of its modules presents unique problems and challenges never before encountered. All modules, when inserted in the Cray 2 mainframe, are immersed in liquid coolant, and are inaccessible for probing. Very little troubleshooting can be done on a machine level. All modules must be sent from the Module Test Department to Systems Check Out trouble-free. Therefore, testing and debugging of all module types must be as thorough as possible in Module Test. In addition, the three dimensional design of the Cray 2 modules requires the use of some unconventional troubleshooting methods.

To overcome these problems, certain methods of testing and troubleshooting were developed. These methods, as outlined below, will be described in detail.

### I. Module Testing at Machine Speed.

- A. Description of Tester Operation and Procedures.
- B. Advantages of Testing "at speed".

### II. Cray 2 Module Testing and Troubleshooting.

- A. Full Power Testing.
- B. Pulse Power Testing.
- C. Troubleshooting Techniques on Three Dimensional Modules.
  - 1) Documentation.
- D. Memory Module Testing - Special Procedures.