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The evaluation and purchase of an Ardent Titan Superworkstation is described.			
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Final Scientific Report

on

"Purchase of Computer Superworkstation"

AFOSR Contract No. AFOSR-89-0089

Reporting Period: December 1, 1988 to November 30, 1989

by

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I. Summary

After a six month evaluation period, in which workstations manufactured by Digital Equipment, Hewlett-Packard, Apollo Computer, Silicon Graphics, Ardent Computer and Stellor were evaluated, an Ardent Titan Superworkstation was purchased. This computer was configured with 64 MB of memory and two processors, both of which have vector-processing capability. The machine also permits sophisticated use of three-dimensional graphics. The final purchase price from Ardent was \$118,200 which reflects a 54% discount negotiated from Ardent. In addition, two one-GB SMD Fujitsu disks were purchased from a third party, Software Associates, in Emmaus, Pennsylvania. The total cost of the system was \$137,000. The Ardent computer was judged to have a better architecture than its competitors, to be more flexible in the method of adding peripherals and to have substantial price/performance advantages.

The computer was delivered in July 1989 and is currently being used extensively for computational fluid mechanics research as well as imaging associated with the experimental programs. The purchase cost included new CPU boards which will automatically be installed when available.

The total cost was met as follows. There was a total of \$46,748 in the DoD equipment grant. An additional \$25,000 was raised through the sale of a VAX 8300; a portion of these funds had been awarded under a previous AFOSR grant in 1985 to purchase the VAX 8300, and thus represents a recovery of contract funds. A further \$62,000 was committed by Lehigh University as cost sharing for the DoD equipment grant. In addition, Lehigh University has agreed to maintain the system.

II. Projects Using the Equipment

1. "Three-Dimensional Vortex Interactions in Turbulent Boundary Layers", C. R. Smith and J. D. A. Walker, Air Force Office of Scientific Research, 1985-1988, \$745,435.
2. "Unsteady Flow Structure from Swept Edges Subjected to Controlled Motion", D. O. Rockwell, Air Force Office of Scientific Research, 1986-1988, \$304,000.
3. "Structure of Unsteady Flow at Leading- and Trailing-Edges", D. O. Rockwell, Office of Naval Research, 1986-1989, \$270,000.
4. "Heat Transfer in Three-Dimensional Turbulent Boundary Layers", J. D. A. Walker, NASA-Lewis Research Center, 1987-1990, \$120,000.

5. "Embedded Function Methods for Compressible High Speed Turbulent Flow", J. D. A. Walker, NASA-Langley Research Center, 1988-1991, \$300,000.
6. "Flow-Induced Vibration of Structures", D. O. Rockwell, Volkswagen Foundation, 1982-1989, \$214,000.
7. "Single Vortex- and Vortex Array-Edge Interactions", D. O. Rockwell, National Science Foundation, 1986-1989, \$240,000.
8. "Particle Image Velocimeter", D. O. Rockwell, National Science Foundation, 1988-1989, \$120,000.
9. "Three-Dimensional Vortex Interactions in Turbulent Boundary Layers", Air Force Office of Scientific Research, C. R. Smith and J. D. A. Walker, 1988-1990, \$542,692.
10. "Control of Flow Structure from Delta Wings in Unsteady Motion", Air Force Office of Scientific Research, 1988-1990, \$260,000.

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