Hubble Facts

National Aeronautics and
Space Administration

Goddard Space Flight Center
Greenbelt, Maryland 20771

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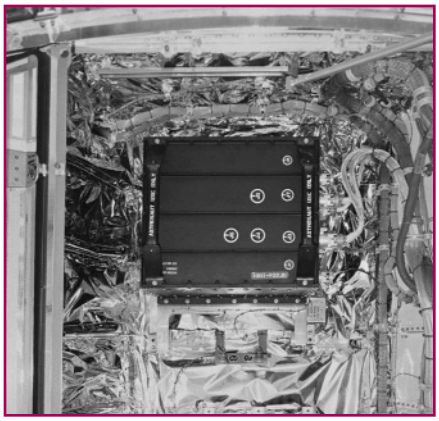
Hubble Space Telescope Servicing Mission 3A

NEW ADVANCED COMPUTER

Hubble's main computer is responsible for monitoring the health of its many systems, for controlling the movement of the telescope from target to target, and for holding the telescope steady when observing. The computer, called the DF-224, was designed in the late 1970's and its capabilities are much less than today's modern computers. Programming requires very specialized skills, unique to this computer, and maintaining the software is difficult and expensive.



DF-224, located in Bay 1, will be replaced with a new advanced computer.

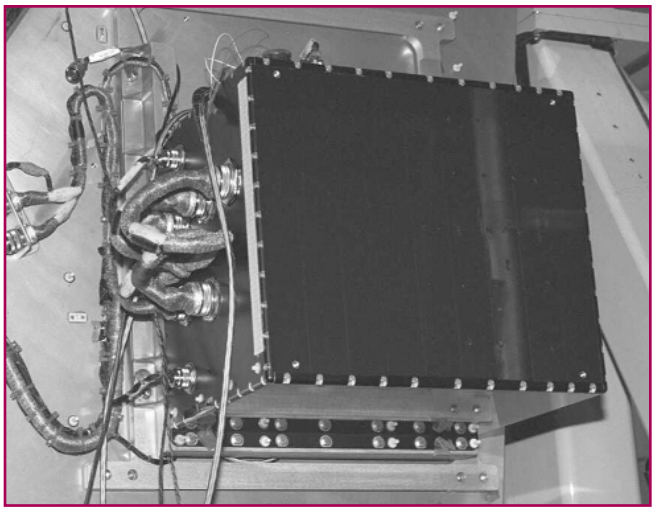
The DF-224 computer has degraded over time and during the First Servicing Mission in 1993 it was augmented with an additional computer called a co-processor. The design of the co-processor was based on the Intel 80386 microchip.

Replacing Hubble's Main Computer

During the next servicing mission, astronauts will replace this DF-224/coprocessor combination with a completely new computer based on the Intel 80486 microchip. This new computer will be 20 times faster, and have six times as much memory, as the current computer on Hubble.

In a good example of NASA's goal of "faster, cheaper, better," commercially developed, commonly available equipment was used to build this new computer at a fraction of the price it would cost to build a specialized computer designed specifically for the spaceflight environment. NASA performed a battery of mechanical, electrical, radiation and thermal tests to guarantee that the computer would survive the trip to orbit, withstand bombardment by cosmic and solar radiation and work flawlessly in the extreme temperatures of space for the rest of Hubble's life. As a final check, NASA carried the computer to space in the Space Shuttle for 10 days in 1998. The computer worked perfectly.

The greater capabilities of the new computer will increase productivity for the Hubble observatory by performing more work in space and less work by people on the ground. The computer software will be programmed in a modern programming language. The result will be decreased cost for software maintenance.



Hubble's new computer provides twenty times the processing speed and six times more memory than the computer it replaces.

NEW COMPUTER CHARACTERISTICS

Size	18.8 x 18 x 13 inches
Weight	70.5 pounds

FOR ADDITIONAL INFORMATION CONTACT

Nancy Neal
Goddard Space Flight Center
Office of Public Affairs
(301) 286-0039