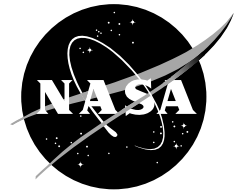


Hubble Facts

National
Aeronautics and
Space
Administration



FS-96(11)-023-GSFC

HST Second Servicing Mission (SM-2) COST TO TAXPAYERS

NASA's Hubble Space Telescope is the first observatory designed for routine maintenance, upgrade, and refurbishment on orbit. The program is a 15-year mission with scheduled service by Shuttle astronauts every three years. Hubble's modular design allows for more than 90 spacecraft components and all of the scientific instruments to be replaced on orbit. Servicing maintains the spacecraft, ensures operation at maximum scientific efficiency and allows for incorporation of new technologies.

Hubble was launched on April 24, 1990 with a full component of six scientific instruments. At that time, three new scientific instruments were already planned and an inventory of spare HST hardware had been acquired under the initial development contracts. HST budgets were sized to develop new instruments, maintain the spare hardware, sustain hardware expertise, plan and develop servicing activities, and test and integrate the payloads with the Shuttle.

NASA has spent approximately \$347 million on the Second Servicing Mission, reflecting the costs of building and testing replacement instruments, ground operations and other related activities. The Shuttle flight will cost \$448 million.

The primary objectives of the Second Servicing Mission are: install two new scientific instruments, the Near Infrared Camera and Multi-Object Spectrometer (NICMOS) and the Space Telescope Imaging

Spectrograph (STIS); replace a degraded Fine Guidance Sensor (FGS) with an upgraded spare; replace two failing tape recorders, one with a spare and the other with a state-of-the-art Solid State Recorder (SSR). Development cost for the two scientific instruments are estimated at \$105 million for NICMOS and \$125 million for STIS. The upgrade to the FGS cost \$8 million and the balance of the hardware, including tools comes to \$35 million. Associated ground activities in support of the mission include new software and operations procedures development and testing, and mission planning and training, and cost \$74 million.

The accomplishment of these objectives will expand and improve on the observatory's scientific capability and efficiency. NICMOS will expand Hubble's observing range to infrared light. STIS will replace the two spectrographs from the original payload, providing more efficient spectroscopy and discovery potential. The FGS is part of the pointing control system for the observatory and is also used for scientific observations. The spare FGS replaces a unit that is degrading and predicted to fail before 1999 (the next scheduled servicing). The upgrades to the replacement FGS will increase pointing efficiency and reliability and increase the scientific potential of the telescope. The new Solid State Recorder will have 10 times the storage capacity of the old tape recorders and because it is solid state, it has no moving parts to wear out.

HST Programs & STS-82 Costs

Servicing Mission Costs — HST

NICMOS	105
STIS	125
FGS	8
Other Flight Hardware	35
Simulators/Testing	46
Ops/Software Development	28
Total	347 Million

Servicing Mission Costs — Shuttle

Nominal Shuttle Flight Costs 448 Million

Total STS-82 Mission Costs

Shuttle	448
HST	347
Total	795 Million

For additional information contact:

Tammy Jones
Goddard Space Flight Center
Office of Public Affairs
(301) 286-5566
Internet: <http://pao.gsfc.nasa.gov>

Don Savage
NASA Headquarters
Office of Public Affairs
(202) 358-1600
Internet: <http://www.nasa.gov>