

Office of
Aeronautics and
Space
Technology



PATHFINDER

*Technology for NASA Future Missions
an AIAA/NASA OAST Conference*

September 12-13, 1988
The Capital Hilton
Washington, DC

WAYNE R. HUDSON
JOHN MANKINS
JOHN L ANDERSON

51

N89-11762

68
22-12

SPACE R&T STRATEGY

OAST

REVITALIZE TECHNOLOGY FOR LOW EARTH ORBIT
APPLICATIONS

DEVELOP TECHNOLOGY FOR EXPLORATION OF THE
SOLAR SYSTEM

MAINTAIN FUNDAMENTAL R&T BASE

BROADEN PARTICIPATION OF UNIVERSITIES

EXTEND TECHNOLOGY DEVELOPMENT TO IN-SPACE
EXPERIMENTATION

FACILITATE TECHNOLOGY TRANSFER TO USERS

PATHFINDER PHILOSOPHY

OAST

PROVIDE A BROAD RANGE OF TECHNOLOGY OPTIONS FOR ROBOTIC AND HUMAN EXPLORATION OF THE SOLAR SYSTEM

SUPPORT A NATIONAL DECISION ON THE EXPLORATION PATHWAY IN THE EARLY 1990'S

PRODUCE CRITICAL TECHNOLOGY DELIVERABLES IN SUPPORT OF CHOSEN MISSION SCENARIO IN MID TO LATE 90'S

MAJOR TECHNOLOGY DEMONSTRATIONS ADDED WHEN PATHWAY DECISION IS MADE

KEEP TECHNOLOGY AS AN ACTIVE PARTICIPANT IN AGENCY PLANNING PROCESS

PATHFINDER STATUS

CAST

APPROVED FY1989 NEW START

PROGRAM AND PROJECT PLANS CURRENTLY BEING WRITTEN

PROGRAM ELEMENTS DISTRIBUTED AMONG NASA CENTERS

SOME ELEMENTS WILL BE DEFERED IN FY1989, BUT ALL
ELEMENTS WILL BE KEPT IN OUT YEAR PROGRAM

BUDGET STARTS AT \$40M IN FY89, IS PLANNED TO INCREASE
TO \$220M LEVEL BY FY92 AND CONTINUE OUT INTO 1990'S.

OFFICE OF EXPLORATION CASE STUDIES

OAST

HUMAN EXPEDITION TO PHOBOS

HUMAN EXPEDITIONS TO MARS

LUNAR OBSERVATORIES

LUNAR OUTPOST TO EARLY MARS OUTPOST

PATHFINDER THRUSTS AND ELEMENTS

OAST

MISSION STUDIES

EXPLORATION

PLANETARY ROVER
SAMPLE ACQUISITION, ANALYSIS
& PRESERVATION

SURFACE POWER
OPTICAL COMMUNICATIONS

HUMANS-IN-SPACE

EVA/SUIT
HUMAN PERFORMANCE
CLOSED-LOOP LIFE SUPPORT

TRANSFER VEHICLES

CHEMICAL TRANSFER PROPULSION
CARGO VEHICLE PROPULSION
HIGH ENERGY AEROBRAKING
AUTONOMOUS LANDER
FAULT-TOLERANT SYSTEMS

OPERATIONS

AUTONOMOUS RENDEZVOUS AND DOCKING
RESOURCE PROCESSING PILOT PLANT
IN-SPACE ASSEMBLY & CONSTRUCTION
CRYOGENIC FLUID DEPOT
SPACE NUCLEAR POWER (SP100)