***Simpler times**—The Downey Vultee facility in 1937, before a world war began to reshape its tranquil visage.*

Preface

The Downey plant has been the site and creative center of more major space programs, initiatives, developments, and accomplishments than has any other locale in the nation. If Southern California is the birthplace of aerospace, Downey is where America began its journey to the stars. The photographs and accounts in this brochure are more than highlights of that still-unfolding voyage—they are a tribute to the men and women whose vision and dedication made the destination possible.

Whatever your age, your life has been or will be touched by the events and achievements depicted here. The brochure is principally a chronicle of the past, but there is promise for the future. The story begins on the following page.

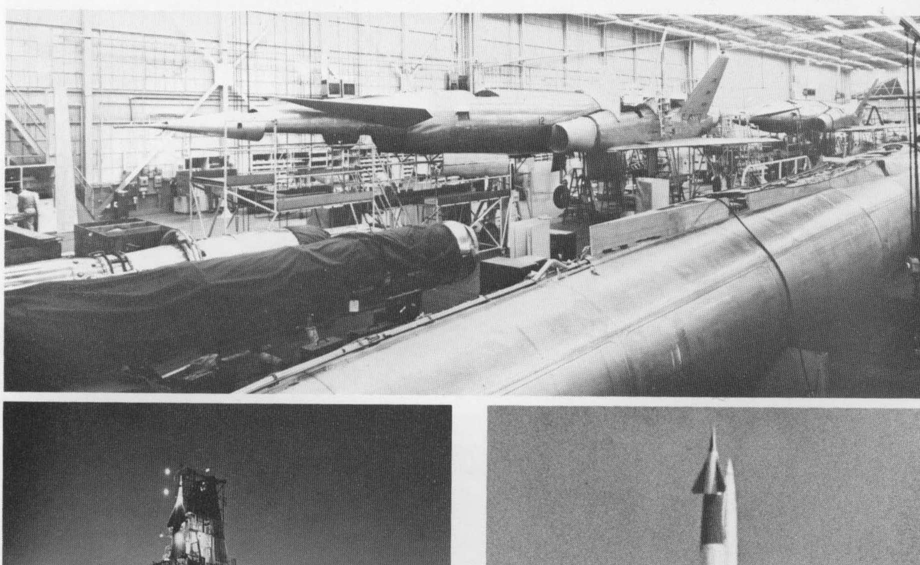
Rockwell International
Space Transportation Systems Division

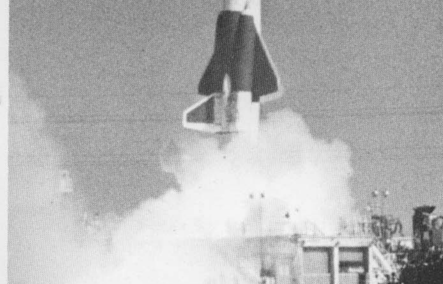
The Missile Makers

At the end of the Second World War in Europe, American and British troops "liberated" scores of German rocket engineers and scientists along with Germany's V-2 ballistic missile components and literature. Most of the human and hardware elements of this technological treasure were distributed among America's defense centers and contractors, becoming the nucleus of the nation's awakening rocket capability. Downey was soon to be reborn.

Downey's first brush with rocketry—a Consolidated Vultee undertaking in 1946 called Project MX-774—failed when the government canceled the contract. The plant was closed and remained unoccupied until North American Aviation (Rockwell's aerospace predecessor) moved in, not to develop rockets but to

Below, two X-10s (flight prototype of the Navaho surface-to-surface missile) in final assembly at Downey, with a Navaho booster in foreground; bottom, checkout and launch of Navaho, which embodied much of the advanced technology in structures, propulsion, and guidance and control from which America's space systems evolved.



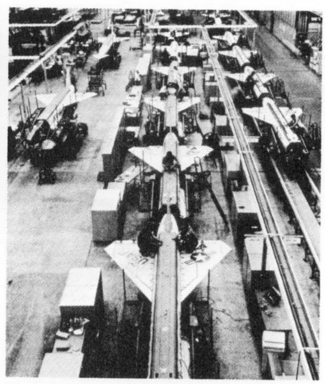


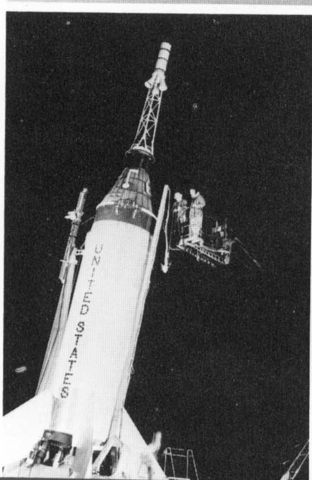
accommodate the overflow of its aircraft production in Los Angeles. It was 1947.

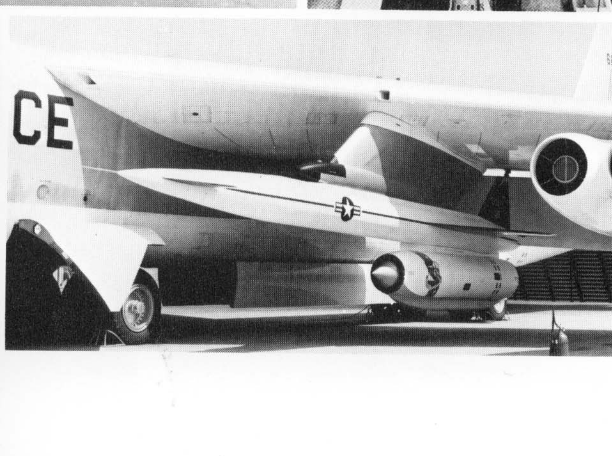
Meanwhile, at the Los Angeles facility, a group of rocketeers in the Aerophysics Laboratory had begun to grow in importance and number. In 1948, needing more room for its burgeoning expertise, the laboratory moved to Downey. From this cadre of missile, rocket propulsion, and guidance and control experts eventually sprang four operating divisions: Downey's Missile Development and Rocketdyne, Autonetics, and Atomics International. The Downey division pioneered advances in missile technology that became a cornerstone of America's rocket industry, and its major development, the Navaho missile, has been called the foundation of America's space program. Shrinking of the hydrogen warhead size had made nuclear-tipped ICBMs feasible, however, and the aerodynamic Navaho was canceled by the government in 1957, just three months before the Soviet Union startled the world by orbiting Sputnik 1. The Downey plant was soon producing the GAM-77 Hound Dog, an air-to-surface nuclear missile carried under the wings of B-52 bombers, but a new frontier was on everyone's mind.

By the end of the 1950s, the Soviets had landed a probe on the moon, America was scrambling to catch up, and space had become much more than a place where the stars hung out at night. Downey, then named the Missile Division, was about to take on an awesome new challenge.

Below, clockwise, GAM-77 Hound Dog production line at Downey; Hound Dog missile ready for action under wing of B-52; Little Joe booster with Mercury capsule; Hound Dog missile on the scent.



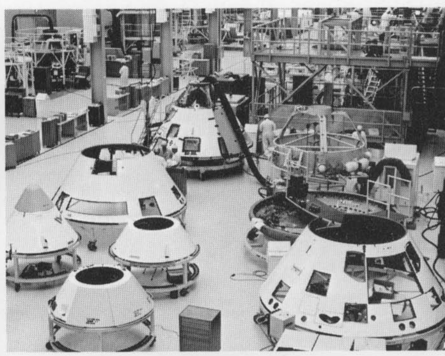


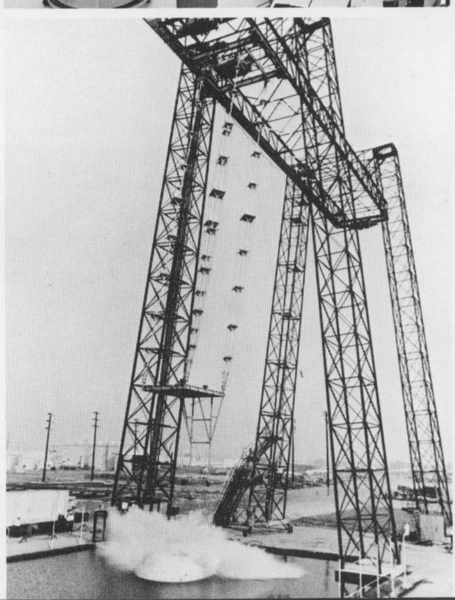


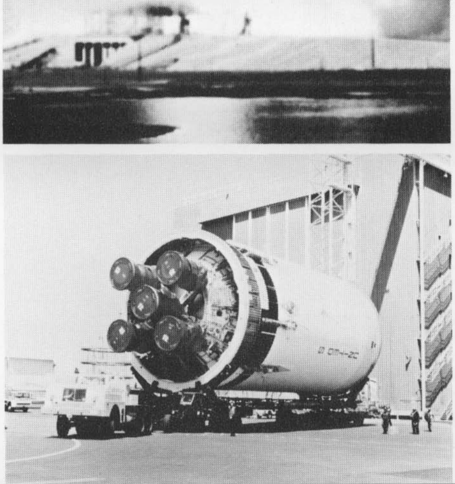
Moon Missions and More

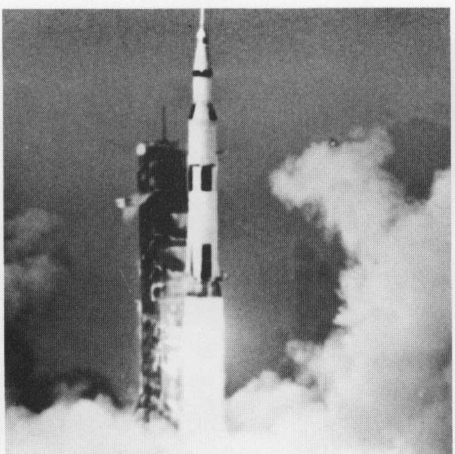
The 1960s were Downey's decade. By December 1960, the division had a new president and a new name—Space and Information Systems Division—and was studying things such as lunar landers and bases. It also had many new talents, including the company engineers who developed the X-15 research craft and a core of experts in rocket propulsion who had transferred from the company's Rocketdyne Division. In May 1961, President John F. Kennedy committed the nation to a manned lunar landing before the decade was out; in September, the division won a contract to pro-

Below, clockwise, "tepee village" in Downey manufacturing area at peak of Apollo spacecraft production; Apollo drop tower; Saturn S-II, largest hydrogen-powered rocket in the world; lift-off for the moon.







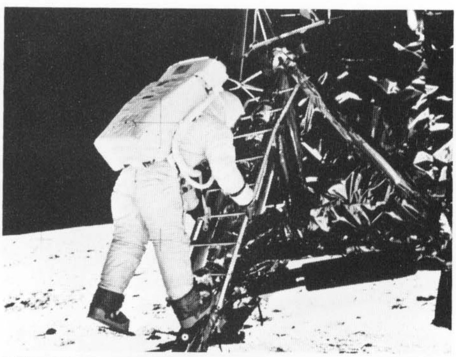


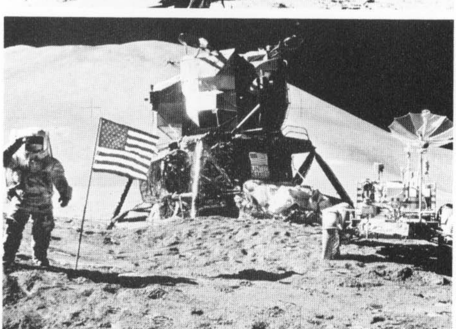
duce the Saturn S-II, second stage of the Saturn V lunar launch vehicle; in November, NASA chose the division to develop and build the Apollo command and service modules, effectively making the division NASA's principal contractor in the lunar-landing program. Less than eight years later, Apollo 11 landed on the moon.

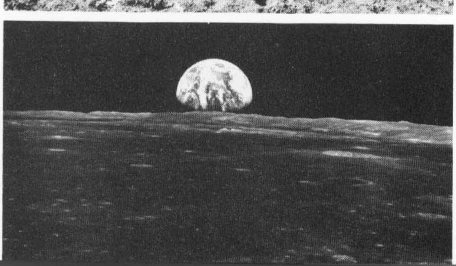
The Space Division became "Apollo Central" during the lunar program, serving not only as the industrial center for Apollo development but also as host for a constant parade of VIP visitors. At the peak of the Apollo program in 1965, more than 35,000 people were employed by the division, about three fourths of whom worked at Downey. Besides producing 15 Saturn S-IIs (assembled at the division's Seal Beach facility), the Space Division built 15 Apollo command and service modules (CSM), which carried nine crews to the moon, six of which landed. The division also modified the CSMs that transported three crews to and from the Skylab workshop and developed the docking system and docking module for the Apollo-Soyuz linkup in space.

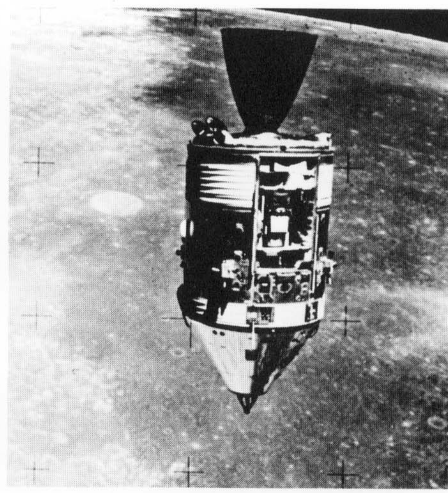
When the last Apollo command module and crew splashed down in the Atlantic Ocean in July 1975, Downey was already at work on the next "giant leap."

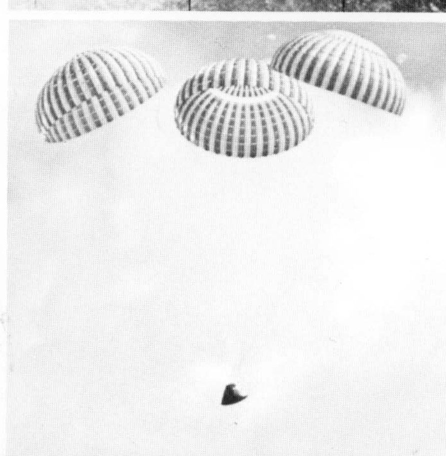
Below, clockwise, instrumented Apollo CSM in lunar orbit; Apollo command module descending toward splashdown in the Atlantic; earthrise; planting the American colors in lunar soil; Edwin E. Aldrin, Jr., second man on the moon.







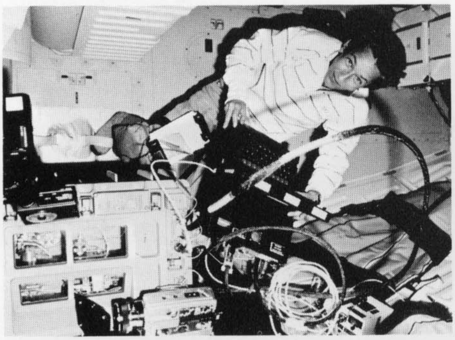


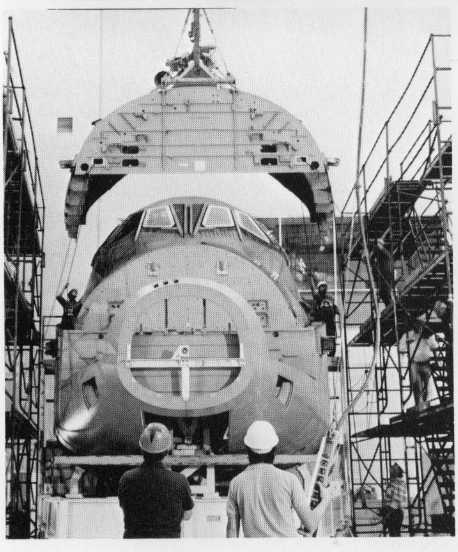


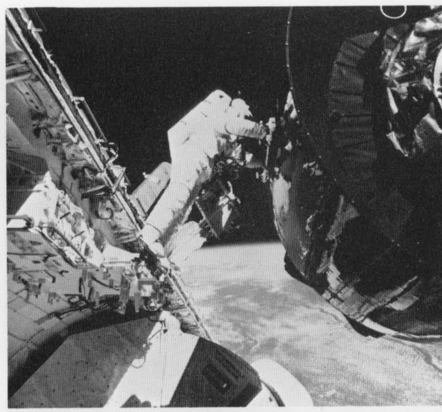
Reusable Space Machines

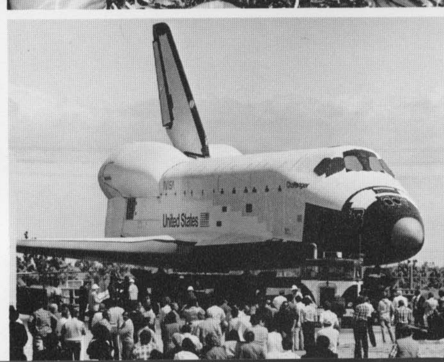
In 1972, several years before the final Apollo flight, the Downey division was given another historic assignment by NASA: to develop the Space Shuttle orbiters, the world's first reusable spacecraft. Over the next 13 years, the division built and delivered four space-rated orbiters—*Columbia*, *Challenger*, *Discovery*, and *Atlantis*—plus the *Enterprise*, a test craft used in atmospheric flight to

Below, clockwise, repairing and saving a satellite; wiring a bulkhead; rolling out a spaceship; assembling an orbiter; tending an experiment in space.





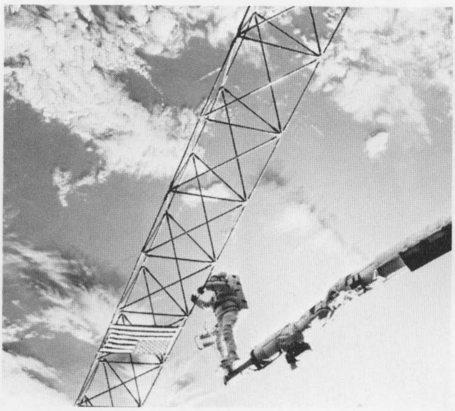


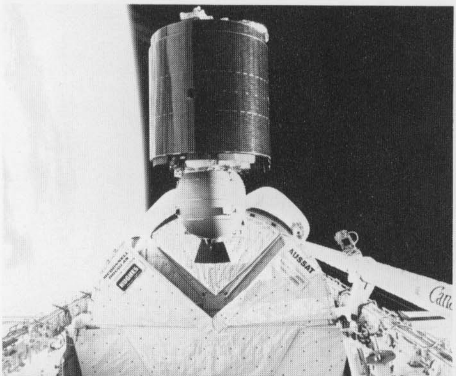


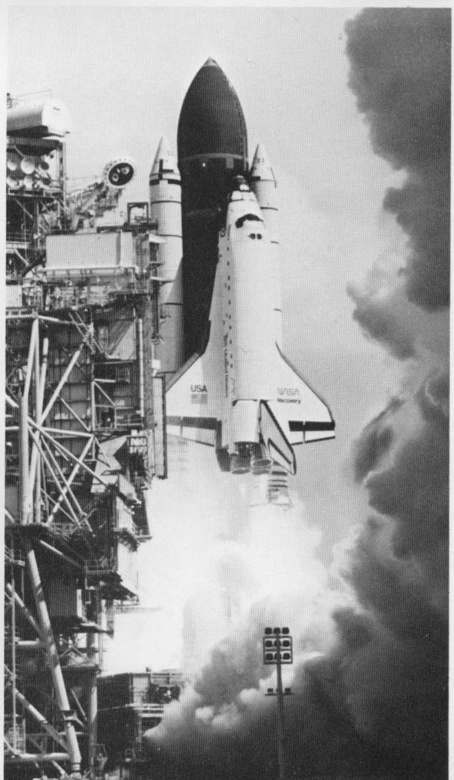
verify the aerodynamic and control characteristics of the orbiter design. Production of a new orbiter, *Endeavour,* to replace *Challenger* was started in August 1987, with delivery to NASA scheduled for April 1991. Besides building the orbiters and maintaining their technical integrity and configuration, the Space Transportation Systems Division assists NASA with the integration of the Shuttle system, helps users develop and integrate their payloads, and serves as NASA's STS operations contractor.

Endeavour will join a Shuttle fleet that gives America almost routine access to space. In dozens of flights since the maiden mission in 1981, the Shuttle orbiters have repeatedly demonstrated unique capabilities as space transporters, scientific platforms, research centers, and repair ships, serving the scientific and commercial needs of an international community of users as well as national defense requirements. The heart of the nation's Space Transportation System, the Shuttle is a key to our long-range goals in space.

Below, clockwise, monitoring a Shuttle flight in Mission Control; Discovery *returning America to space; deploying a communication satellite; touchdown at Edwards Air Force Base; practicing the erection of a space structure.*





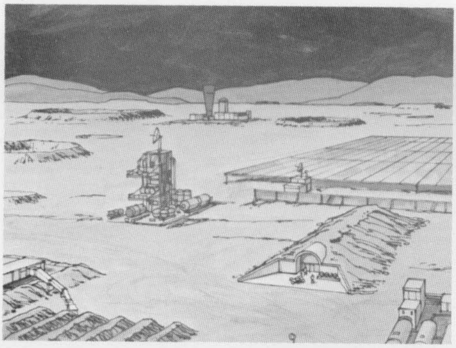


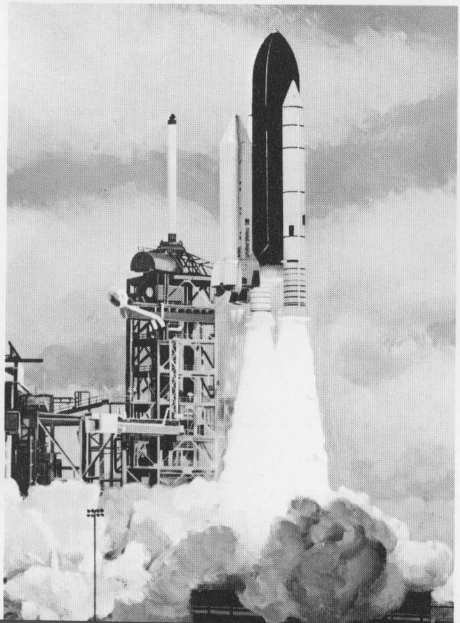
Visiting VIPs: President Ronald Reagan meeting a well-wisher; STS-26 crew members have a home-coming; Queen Elizabeth II touring the Downey plant.

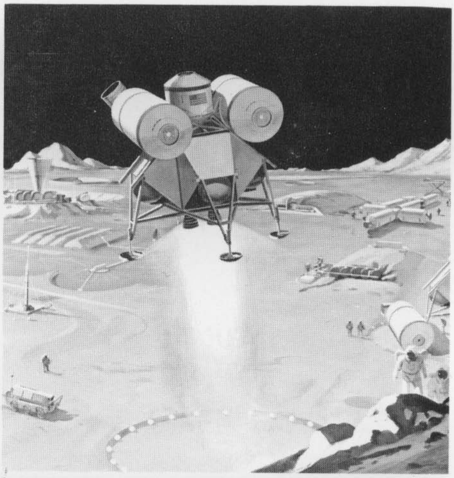
The Next Challenge

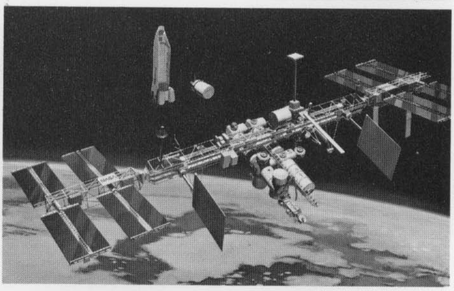
America's long-range goals in space are much in mind at the Space Transportation Systems Division. Division programs with long-term implications include extended-duration orbiter, Shuttle-C, Assured Crew Return Vehicle, Space-Based Interceptor, and National Aero-Space Plane. Looking further ahead, the division is working with NASA in the study of concepts ranging from space transportation elements to support and assembly facilities, from earth-orbital platforms to lunar and Martian bases. If some of these objectives seem beyond

Artist's views, clockwise: lunar excursion vehicle landing at lunar base; Shuttle-C on logistic support mission to the Space Station; Shuttle-C launch; mining operations at lunar base.









the cutting edge of technology, they are nevertheless in agreement with the vision of the National Commission on Space. Responsible for examining what course the United States should be following in space over the next 50 years, the commission has profiled a program that would "see growing numbers of people working at Earth orbital, lunar, and eventually Martian bases, initiating the settlement of vast reaches of the inner solar system." This is the challenge for which the division is preparing.

President George Bush, demonstrating his strong support of America's leadership in space, has enunciated a bold, aggressive space policy, directing Vice President Dan Quayle and the National Space Council to develop a plan for implementing an exploration program that includes a lunar base and an outpost on Mars. That Downey will have a leading role in these undertakings

Below, clockwise, artist's concepts of National Aero-Space Plane; propellant-processing facility on Mars moon Phobos; extended-duration orbiter.