SPACE

Man-on-Moon Plan Speeded by Lunar Orbit

➤ THE National Aeronautics and Space Administration plans to send two men on a four-day moon exploration expedition months ahead of previously announced schedules, probably by mid-1965.

The landing will be made by a special lunar ferry operating from a mother ship launched directly from earth into orbit around the moon.

Original plans called for landing three men on the moon before 1970 in Project Apollo. NASA said the two-man plan should save 10% to 15% in costs, estimated at $20 to $40 billion.

NASA said its decision was made after more than a year of study of different lunar flight techniques.

The Apollo craft and its three-man crew would be fired into an orbit no more than 100 miles above the moon. Two of the crew then would transfer to the ferry and descend to the moon's surface while the mother ship, with the third astronaut still aboard, remained in lunar orbit.

After exploring the moon for up to four days, the two-man team would blast off in their ferry for rendezvous with the mother craft.

After the landing crew transferred to the mother ship, the lunar landing craft would be cut loose to orbit the moon. The three men aboard the Apollo would take off for earth. Their ship would be powered by a service module rocket generating 20,000 pounds of thrust.

Just before reentering the earth's atmosphere, the service module would be jettisoned and the command module would descend by parachute.

• Science News Letter, 82:38 July 21, 1962

SPACE

Astronaut Slayton Assigned to New Duties

➤ DONALD K. SLAYTON, one of the seven Mercury astronauts, has been assigned new operational and planning responsibilities in the U.S. space program as a result of extensive observation and thorough examinations of his irregular heart action, known as atrial fibrillation.

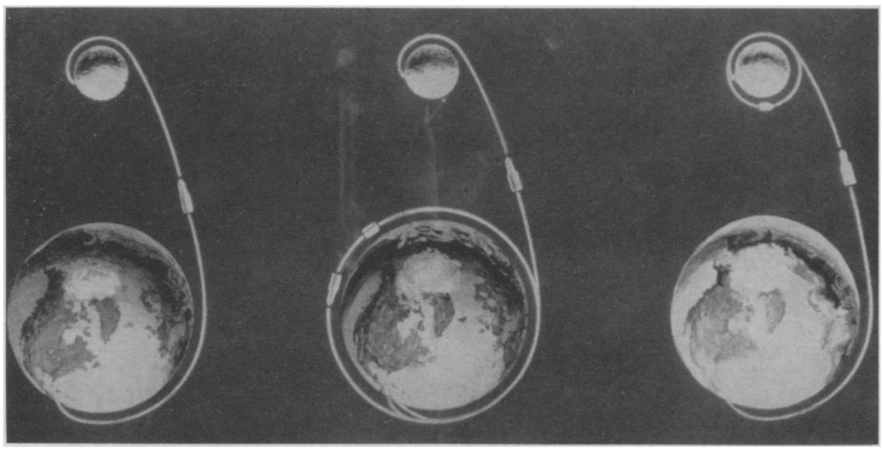
The principal conclusion of the examinations is that the hazards from the arrhythmia, under the particularly stressful circumstances of current manned space flight operations, are too great to recommend that he should make a one-manned solo space flight.

• Science News Letter, 82:38 July 21, 1962

Pure *molybdenum* has been discovered to be a superconducting element.

The largest single use of *energy* in the United States is for residential and commercial heat and power.

Mitochondria are tiny bundles of enzymes which catalyze the major oxidative and energy-producing reactions of cell chemicals.



PROJECT APOLLO—Lunar landing flight techniques for putting man on the moon. NASA will put prime emphasis on lunar orbit rendezvous (LOR), the pattern on the right, using a Saturn C-5 launch vehicle.

SPACE

Scientist on Moon Team

➤ A SCIENTIST will be a member of the Project Apollo three-man astronaut crew scheduled to land on the moon by 1970.

Plans for including a scientist in the nation's manned space flight program "at the earliest possible date" were discussed at a meeting between officials of the National Aeronautics and Space Administration and a group of distinguished scientists. Astronomers, geologists, geophysicists and astrophysicists were among those attending the meeting.

The scientists, fully united, argued successfully that if, as the Glenn and Carpenter flights demonstrated, astronauts who are not scientists can learn to make scientific observations, then scientists can learn to be astronauts.

However, scientific unity was shattered when a participant asked from which scientific discipline the scientific astronaut should be selected. With few exceptions, each specialist urged priority for his field of research and, in some instances, declared a personal eagerness to train for space flight.

No selection was made, nor has any priority to a science been assigned. Those attending the meeting finally joined in recommending that a group of qualified scientists from several different fields be selected, with priority to be determined at a later date.

Among those possibly qualifying are Dr. John A. O'Keefe, NASA astronomer, Dr. Robert Jastrow, geophysicist and director of NASA Institute for Space Studies at Columbia University, Dr. James Gordon MacDonald, University of California at Los Angeles geophysicist, Dr. Harry H. Hess, Princeton University geologist, Dr. Thomas Gold, astronomer at Cornell University, Ithaca, and Dr. Harold Urey, Nobel prize winner.

By skiing, running, swimming, cycling, mountain climbing and a variety of other physical activities, these scientists have attained fitness needed to reach the moon.

For an astronomer astronaut, the trip to the moon would provide an opportunity to get "dark adapted." Free from the curtain of the earth's atmosphere, he then could observe the sky's brightness, the zodiacal light and the sun's corona.

He might see clustering nebulae not visible even through the largest space telescope on earth. If he were a slender, compact-sized astronomer, five feet five inches tall, such as Dr. O'Keefe, there would be room for a telescope. Once on the moon, he could set up the telescope for additional astronomical observations.

A geophysicist could take radiation measurements as he took the cosmic road to the moon, but his real research would begin when landing. Radioactive dating equipment used on the lunar surface would give clues to the moon's history for the past four billion years, the role the sun may have played, the formation of life, and the history of planets in the solar system.

The first step onto the moon's surface by astrophysicists would settle the debate whether the moon's surface is largely a thick layer of loose dust or primarily rock and stone covered with just a few feet of dust.

For the geologist, landing on the moon would provide an opportunity to study its surface and interpret the forces that have shaped the lunar landscape. In addition, the geologist could contribute to the lunar colonization program by devising methods for releasing water believed to be trapped in lunar rock.

According to informed sources, it is likely that the first astronaut scientist would be a geologist because of the practical contribution geology can make. Geophysicists will also have a high priority, with astronomers farther down the list since they can make essential observations in orbital flights and, for their purposes, physical landing on the moon is not essential.

• Science News Letter, 82:38 July 21, 1962