

SPACE

Russia's Ladder to the Moon

The developing space timetable shows the Soviet Union trying to put men on the moon at least a year before the United States, despite Khrushchev's off-and-on denials.

By WALTER WINGO

► RUSSIA WILL TRY to land a man on the moon in 1967, at least a year ahead of the United States, according to the way the space race timetable for the rest of this decade shapes up.

This is based on off-hand remarks by Russian scientists and cosmonauts, reports by Western observers and official statements made prior to Premier Nikita S. Khrushchev's recent conflicting pronouncements about whether the Soviets are in the moon race at all.

The Soviet Union's future program in space appears to call for the following order of events:

Orbiting of a cosmonaut for periods of five to ten days; unmanned shots to Venus and Mars; orbiting of weather satellites; landing of an instrument packet on the moon, and orbiting of a scientist.

Next: landing of a heavy unmanned spaceship on the moon; orbiting of a two-man spacecraft; launching of geomagnetic satellites; a manned orbit of the moon, and orbiting around the earth a capsule containing three or more men.

Then: assemblage of a rocket ship from parts orbiting in space; construction of a flying laboratory in space, and the actual attempt to land men on the moon.

The Soviets are expected to follow up with programs for manned flights to Mars and for orbiting manned platforms around the earth.

United States plans are more definite. If nothing goes awry—which is asking a lot—the first American attempt to land men on the moon would be in 1968.

Nevertheless, National Aeronautics and Space Administration officials still are predicting that the first men on the moon will be Americans.

There remains the possibility that the two nations will accept President John F. Kennedy's suggestion that they join hands in putting both a Russian and an American on the moon at the same time.

Other nations have less ambitious space programs. France, for example, plans to set itself up as a world leader in the exploration of near-earth outer space. French industries and the Government are sponsoring a big research program to achieve that goal.

Along with other major West European nations, France also is expected to join with the U.S. in developing a global communications system of satellites.

The European nations, Japan, Canada and Australia plan ultimately to concentrate on the exploration of those parts of space that Americans and Russians have only touched upon in their furious race to the moon.

The U.S. has encouraged active foreign participation in space exploration partly as a means of stemming the gold outflow. Whether this nation wins or loses the race to the moon, it is expected to remain the leading producer of supplies for the booming Space Age.

Timetable for Space

LATE 1963:

British atmospheric satellite, S-52, to be launched by a Scout rocket from Wallops Island, Va., followed soon thereafter by an enlarged version, the S-53.

Soviets expected to orbit a cosmonaut for periods of five to ten days.

The United States and the Soviet Union to establish a communications link, using an Echo II sphere to be launched from the Pacific Missile Range.

Soviets expected to try two unmanned shots—one toward Venus and the other toward Mars.

U.S. to launch Nimbus, a 710-pound weather satellite for polar, near-earth orbit.

EARLY 1964:

U.S. to launch a Ranger unmanned spacecraft designed to hard-land scientific payloads on the moon and take close-up pictures and measurements.

U.S. to launch the first of eight Imp satellites to measure radiation and solar flares.

Soviets to orbit a weather satellite and begin exchanging its data with the U.S., which will continue sending up weather satellites.

France to launch a cat on a sub-orbital space ride in the nose cone of a Veronique research rocket.

Project Fire, the U.S. study of reentry heat relating to manned moon missions, to get under way with the launching of an Atlas D rocket.

LATER IN 1964:

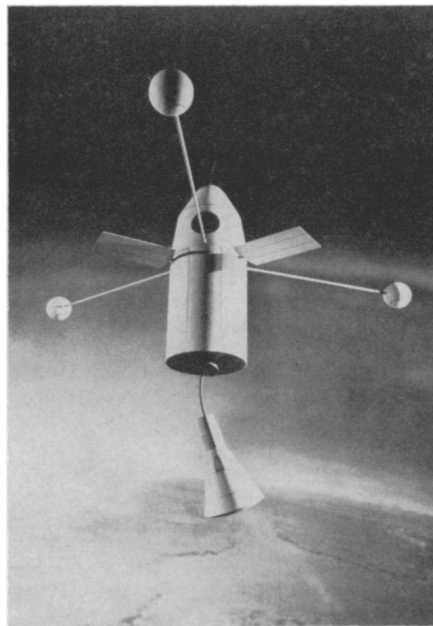
Soviets expected to launch several satellites and to land a rocket with scientific instruments on the moon.

European Space Research Organization to launch the first of 40 sounding rockets to be sent up during the year. The organization to send up 65 rockets in each of the following few years.

U.S. to launch another Anna satellite as a point in space for calculating distances and positions on earth.

Soviets expected to send a scientist into orbit.

French army to make available to Centre National d'Etudes Spatiales, France's version of NASA, its liquid-propelled Vesta rocket that can hurl a 440-pound payload



Republic Aviation Corporation

MANNED SPACE LABORATORIES
—Within several years astronauts may be orbiting the earth in a space station like this one conceived by scientists at Republic Aviation Corporation. Folded during launch, it would unfold three arms while in orbit to provide artificial gravity. While orbiting at 200 to 300 miles, it would accommodate a crew of six. Gemini or Apollo spacecraft or unmanned resupply modules could be docked on the station, as seen in the photo.

to an altitude of 216 miles or 2,200 pounds to 125 miles.

U.S. to launch six 1,000-pound unmanned satellites as geophysical observatories.

Soviets expected to send to the moon an unmanned spaceship big enough to carry one or two men.

France to launch a monkey along a ballistic trajectory in the nose cone of a Vesta research rocket.

U.S. to launch a 550-pound Mariner probe in an attempt to pass by Mars and send back information as did the 1962 Mariner sent past Venus.

Soviets expected to orbit a two-man spaceship.

LATE 1964:

U.S. to land a 750-pound Surveyor instrument package on the moon to examine its surface with TV cameras and sampling devices.

Saturn I, the first of NASA's new family of the giant launch rockets, to make its tenth and final flight carrying Project Apollo experiments.

U.S. to send its Gemini capsule, containing two astronauts, on its first manned flight.

Both the U.S. and the USSR to launch satellites equipped with magnetometers in a joint geomagnetic field program to take place during the period of the International Year of the Quiet Sun, or IQSY (1964-65).

France's first satellite, FR-1, to be launched with a U.S.-built Scout rocket, followed soon after by FR-2. They will examine the ionosphere.

France to launch Satmos, a four-pound satellite designed to study problems of re-entry from outer space, with a French army rocket.

EARLY 1965:

Centaur rocket, designed to launch large U.S. unmanned moon and planet probes, to become operational.

Two Soviet cosmonauts expected to try to orbit close to the moon's surface taking photographs and calculations and fly back to earth.

LATER IN 1965:

Saturn IB, America's big booster for Project Apollo test missions, to make first flight.

Scout rocket to launch Italian atmospheric density satellite from a platform in the Indian Ocean near the equator.

Soviets expected to orbit three or more cosmonauts in a single capsule for flights of ten days or longer.

Complete Titan III, carrying two strap-on boosters, to make its flight test. It is to be the workhorse of American military space missions.

First flight of a Bios, U.S. satellite for studying the effects of long space flights on different forms of life, including primates.

U.S. to orbit three 3,500-pound unmanned astronomical observatories.

France to send another monkey on a longer sub-orbital trip, launched with a Diamant I rocket.

First flight of a U.S. Pioneer, a 120-pound Delta package, slated to go 90 million miles as a sun probe.

IN 1966:

The U.S. Air Force's high altitude communication satellites to be ready for stringing around the globe in fixed (24-hour) orbits to form a wide-band radio system.

Soviet cosmonaut team expected to try to put together a spaceship from parts orbiting in space and ride it around the moon and return to earth.

First of five flights of U.S. Lunar Orbiter, an 800-pound unmanned photo reconnaissance spacecraft designed to help pick landing sites for American manned moon expedition.

U.S. to make its first manned orbital flight in the type of capsule that will be used for the moon trip. The Saturn I-B will do the boosting.

U.S. Scout rocket to launch UK3, the first satellite designed, built and tested entirely in Great Britain.

U.S. to launch advanced 1,000-pound Mariner on an unmanned mission to Venus.

U.S. to take advantage of favorable Mars-shot time in December by sending a Voy-

ager probe, weighing 5,500 pounds, to orbit around and land on that planet.

1967:

Soviets expected to attempt construction of a flying laboratory in space with crews of several men.

The European Space Research Organization to orbit small satellites.

U.S. to send an unmanned Voyager to Venus in June when conditions are especially favorable.

Soviet cosmonaut team expected to try to put together a spacecraft in an earth orbit, ride it to the moon, land there and return to earth.

U.S. to orbit a 900-pound advanced solar observatory.

Soviets expected to start concentrating on a program for manned flight to Mars and back.

France's second generation booster, Diamant 2, to be available for putting heavier satellites into orbit.

1968:

U.S. expected to try to climax Project Apollo by landing two astronauts on the moon, while a third orbits about the moon, and then bring all three back to earth safely.

Soviets expected to launch an orbital platform containing a large optical telescope operated by two men.

U.S. expected to make a decision on whether to build Nova, a launch vehicle three times as powerful as Saturn, for manned flights to the planets.

1969:

U.S. to launch an unmanned Voyager to Venus in January and one to Mars in March.

European Space Research Organization to orbit observatories weighing 1,100 to 2,200 pounds and send lighter unmanned payloads to the moon.

• Science News Letter, 84:315 Nov. 16, 1963

Nature Note

➤ CURSE of the ancient pioneers and hunters and mainspring of many legends is the gruff, unfriendly grizzly bear, a vanishing resident in the North American wilderness.

Longfellow called him "the grim, taciturn bear, the anchorite monk of the desert," which well describes his personality. He is distinguished from the black bear group by his larger size and iron-gray, sometimes silver gray, fur. The grizzly always has a pronounced hump, as his body builds up to a powerful pyramid of muscle where the neck and forelimbs join on his back.

Forest dwellers in the western states are getting their last glimpses of the great bear for this season, as the grizzly begins to hole up in his den. Contrary to popular belief the bear does not hibernate but only goes into a deep sleep, since winter forests do not afford much in the way of food.

Today the grizzly can be found in the wilderness areas of Alaska, Montana, Wyoming, Idaho and Washington, as well as parts of Canada. The largest single group is probably that at Yellowstone Park.

• Science News Letter, 84:315 Nov. 16, 1963



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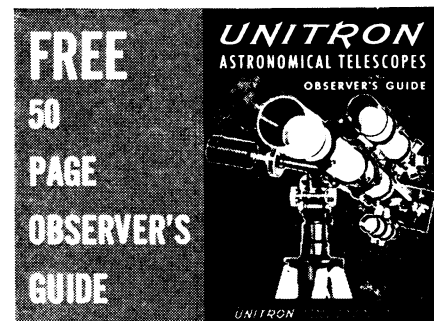
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