

Next in Space: A THREE-MAN TRIP AROUND THE MOON

*This rocket expert looks ahead
to America's first fully piloted spaceship*

By **WILLY LEY** AUTHOR OF ROCKETS AND SPACE TRAVEL AND THE CONQUEST OF SPACE



ONE DOESN'T have to be a prophet to predict that within the next few years men will travel in various orbits around the earth. It is quite certain that about six years from now there will be a permanent, manned, artificial satellite—most likely two: one American and one Russian. And there will be the first attempts to get a manned rocket-ship to loop around our natural moon without landing there.

Project Mercury, as you know, aims at putting a man into orbit around the earth in a capsule. But what follows after the Mercury capsule has carried a man into space and back?

It is necessary to realize that the man in the Mercury capsule is more a passenger than he is a pilot. Of course, he will be kept busy with various experiments, observations, and assignments, but actually he won't have to do a thing for the successful completion of the trip. For example, he will throw the firing switch for the retro-rockets which make his capsule slow down for re-entry. But if for any reason he can't do this, it will be done for him by remote control.

The next step after the Mercury capsule, then, is evidently a space flight in which the pilot functions as a pilot.

A plan for such a flight has existed for more than a year. Called "Mrs. V" (from the initials of Maneuverable and Recoverable Space Vehicle), the idea was to have an airplane-shaped space vehicle which would re-enter the atmosphere, slow down mainly by taking advantage of air resistance, and finally land on a runway in the same way a fast jet does.

While this plan was developed by one group of scientists and engineers, another group built something that, with some modifications, could be called

"Mrs. V," namely the X-15 rocket research plane. The so-called "final flight" of the X-15 is going to be a gigantic arc 400 miles long, with its highest point 100 miles above the ground, terminating in a landing on a conveniently located runway.

Today, space scientists tend to return to the thinking which was taken for granted by the pioneers of rocketry some 30 years ago. Both the Mercury capsule and the current X-15 are designed for just one man. But after Mercury has done its job, the goal will be to put entire crews into space rather than a single man!

The reasons are easy to see. The flight of the Mercury capsule has been carefully planned so that the man inside will be there for not more than about nine hours. But for a mission lasting 36 hours, we obviously need more than one man. Somebody has to sleep awhile to be rested and alert for the difficult re-entry.

THIS SOUNDS simple, but there are many hidden problems, the most important of which centers around the word "sleep." Eating and drinking should be possible under weightlessness because in these functions medical researchers know precisely which muscle does what.

But in the case of sleep, we don't know. And since we don't know just what being asleep depends on, we can't make a good prediction, except that apparently a man falls asleep when he is tired enough, no matter what goes on around him.

Our hope is to replace the "Mrs. V" project (which still had a single-seater ship in mind) with Project Apollo, which will accommodate three men. The Apollo may be considered the first full-fledged American spaceship. For with a Saturn rocket as the first stage, Apollo could not only go into orbit,

it could fly around the moon. For this trip, it would first go into orbit around the earth, then accelerate into an orbit which would carry it toward the spot where the moon will be when the spaceship gets there.

To make sure that the ship does not hit the moon, or pass it at too great a distance, so-called "mid-course corrections" will be needed. This means that the ship must move in the right direction with precisely the right velocity. This can be established by a combination of radar tracking from the ground and astronomical observations by the men aboard. The problem will then be fed into a computer (on the ground), and the ship will be given the necessary guidance.

When near the moon—say not farther than 1,000 miles away—the moon's gravitational pull will bend the ship's path into a hairpin curve. The crew may wish to circle the moon, taking pictures. In that case the ship would have to reduce its speed when near the moon so that it is "captured," as astronomers call it.

Just as a capsule has to "do something" to break out of an orbit around the earth, the spaceship would have to use rocket power to break out of its lunar orbit. It would have to accelerate in order to get back into an orbit which would bring it back to earth.

All this is an easily foreseeable development. But whether this ship will be a rather drastic development of the present X-15, or be derived from the Mercury capsule, or be a completely new design cannot be predicted so easily. The odds favor the last possibility, however.

In any event, we can count on the fact that after Project Mercury it will no longer be "man in space" but "crews in space."

COVER:

Artist Gordon Johnson's male bowler seems depressed—and with good reason. Take a look at the score sheet and you'll learn why. How does the average lady bowler compare with her male counterpart? See page 19.

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