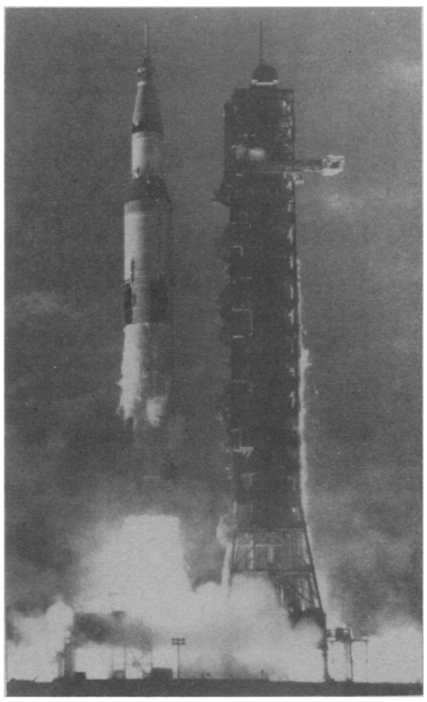
SPACE THRILLER

Apollo on the way



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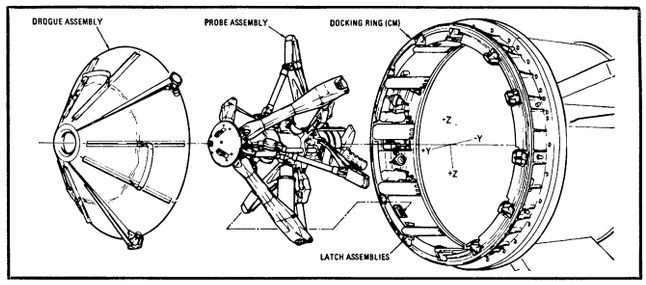
Apollo 14: Moonbound despite a troublesome docking.



NASA

It used to seem so easy to go to the moon.

That was before Apollo 13, when the world got a look at the complexities and the dangers of attempting such a feat. Now it seems that every major maneuver in space is as anxiety-producing as the launch itself, as six giant computers and hundreds of smaller ones measure and translate every heartbeat and breath of all 3 million spacecraft parts and display the data to the men in mission control.

If Apollo 13 and the unexpected had slipped from anyone's mind, which is doubtful, the problem on Apollo 14 with docking the command and lunar modules only three hours and three minutes after the cloud-plagued launch this week was a painful reminder. It occupied Astronauts Alan B. Shepard, Edgar D. Mitchell and Stuart A. Roosa for more than 12 hours in their first day in space.

The docking, which usually takes about 25 minutes, was a flawless exercise the previous nine times it had been done in space. This time, however, it took more than two hours to achieve the linkup and a worrisome half-day trying to figure out what went wrong.

After a tedious examination from earth via live television from space of the command module probe and the lunar module drogue, the two main docking components, space officials still could not determine what had prevented a successful docking for the first five tries. The preliminary guess was that an unknown particle or contaminant had been on one of the parts and had then disappeared into space on the sixth and successful attempt. But a better guess was that the capture latches on the end of the probe locked in instead of releasing inside of the drogue.

Docking is usually done twice in a lunar mission, once on the flight out and once when the LM rejoins the spaceship after leaving the surface. The command module pilot guides the probe assembly of the command module into the reception cup, the drogue, of the lunar module. On the side of the head of the probe assembly are three capture latches, which after insertion through the drogue hole should spring out to hold the two craft together in what is called a soft dock. This did not happen, it is believed, on the first five attempts, but on the sixth try the capture latches released. Then the retraction device, a nitrogen pressure system located inside the probe, activates, pulling the LM and command module docking ring together. Twelve latches on the command module's ring then snap the two craft together securely. This is called a hard dock, necessary for a successful flight.

The two craft were not to separate again until prior to LM descent to the lunar surface, and they would not have to dock again until after the LM liftoff. As with all maneuvers in space, however, this last docking procedure would have an emergency backup alternative. If docking was not successful at that time, Astronauts Shepard and Mitchell would crawl out the LM hatch into the docking tunnel of the command module, bringing with them the lunar rocks.

One other problem adding drama to the mission this week—a flight already loaded with the psychological burden of Apollo 13—was a 40-minute delay in the launch. For the lrst time in the Apollo program the Saturn 5 had to wait for clouds to pass and rumbled off the pad late. Thus the spacecraft had to play catch-up in order to maintain the original time line of landing on the moon at 4:16 A.M. EST Friday.

But if all proceeded as planned to that point, Astronauts Shepard and Mitchell were to begin their scientific chores on the surface of the moon in the Fra Mauro region about five hours after touchdown. They were to position live television cameras for coverage of the site, set up a scientific array of six instruments, pick up rocks at random, take pictures, and if time permitted inspect and take samples from several nearby small craters.

During their second four- to five-hour period outside of the LM home, to begin Saturday about 5:38 A.M., the two men would try to climb a mountain about a mile from the landing site. The mountain, called Cone Crater, is about 400 feet high. Around the rim of the crater lie huge boulders dug up from deep within the moon. These, it is thought, were to be the real scientific geological prize of this flight. If some of this material, perhaps dating more than 4.5 billion years old, could be brought back to earth, scientists could then get a base line for their ever evolving lunar history and chronology.

The first real scientific data from the flight of Apollo 14, however, was to begin earlier than touchdown, on Thursday, when the S4B third-stage of the Saturn 5 was to impact on the moon near the Apollo 12 seismometer. The next real-time scientific data would then begin on Friday with activation of the ALSEP—the Apollo Lunar Science Experiment Package.

Liftoff, scheduled for 1:47 P.M. Saturday, would lead to a splashdown at 4:04 P.M. Tuesday, Feb. 9. Then scientific dissection of the new lunar samples would begin again. □

FIVE NAMED

PSAC members

Five new members of the President's Science Advisory Committee were named by President Nixon last week. They are Drs. Daniel P. Moynihan, former Presidential adviser on urban and domestic affairs; Lee A. DuBridge, former President's Science Adviser; Herbert Friedman of the Naval Research Laboratory; Kenneth H. Olsen, president of Digital Equipment Corp., and John G. Truxal, vice president of Brooklyn Polytechnic Institute. The five new members replace four outgoing members and thus add one seat to bring the total membership to 19. □