aerospace

APOLLO 10

Hiding the action

As with the Apollo 8 mission, much of the action during Apollo 10's return visit will take place while the spacecraft is on the far side of the moon, completely out of contact with earth.

Now set to blast off at 12:49 p.m. EDT on May 18, Apollo should lock into orbit around the moon at 5:38 p.m. on May 21, by firing its service propulsion engine on the moon's far side. In addition, five of the 10 scheduled firings of the lunar module's engines, as well as the do-or-die firing that must kick the spacecraft back toward earth, will all take place in suspenseful radio silence. Splashdown is due at 12:57 p.m. on May 26, southeast of Samoa.

Apollo 10 will spend more than two and a half days around the moon, compared with about a day originally planned, to evaluate the effects of lunar mass concentrations on the spacecraft's orbit (SN: 3/22, p. 277). During the flight, Astronauts Thomas Stafford and Eugene Cernan will spend more than eight hours separated from the command module, as they fly the lunar module down to an altitude of 50,000 feet. They will reach a low point about 237 miles ahead of the planned Apollo 11 landing site, before jettisoning the LM descent stage, igniting the ascent engine and rejoining Astronaut Donn Eisele in lunar orbit for the trip home.

SATURN 5

Shutdown to remedy shakes

In an effort to overcome longitudinal vibrations which occurred in the second-stage booster on both the Apollo 8 and 9 flights, engineers at Marshall Space Flight Center in Alabama have been studying shutting down the center engine in Apollo 10's second stage just over a minute early.

These vibrations, much smaller than oscillations that were corrected after having shaken up the first two unmanned Saturn 5 flights, have not been detrimental to the booster's operation. But engineers would like to weed them out as a precaution.

The second stage of the Saturn 5 has five engines, arranged in an X with one at the center, developing slightly more than a million pounds of thrust. Because the vibrations have been traced to the center structure, Marshall engineers have recommended shutting down the center engine after 299 seconds of the normal 368-second burn, and letting the outer four engines burn for 17 seconds extra to make up the difference.

MISSION PLANNING

Initial landing site changed

The site of the first Apollo lunar landing has been moved to a different location from the one that, for more than a year, was the leading candidate.

The change is due to the success of Apollo 8's moon-circling flight last December. That mission provided observational data and photography of the area known as Site 1, about a third of the moon's diameter in from the eastern edge, just north of the equator.

In an effort to obtain as much data on various sites as possible, Apollo 10 will therefore be aimed at Site 2, about 190 miles west of Site 1. Because officials wish Apollo 10 to be as exact a rehearsal as possible for the landing mission, Apollo 11 will also be aimed at Site 2.

Since lunar lighting conditions change each day for a given site, the decision for Site 2 means that both Apollo 10 and 11 will be launched on the second days of their launch windows—May 18 and July 16 respectively—to meet the space agency's lighting constraints. If Apollo 10 is delayed on the pad, present plans are that it will still try for its low pass over Site 2, though under less-than-ideal lighting, while Apollo 11 will still aim for July 16.

APOLLO 12

Patient astronaut gets a ride

The crew scheduled to fly the second U.S. lunar-landing mission, Apollo 12, will include, besides a pair of old Gemini shipmates, a man who has waited longer than any other active astronaut for a chance at space.

He is Alan L. Bean, a Navy lieutenant commander who joined the astronaut program with 13 other men as part of the third astronaut crop in October 1963, making a total then of 30. Twenty-three of that 30 have been in space; five more (plus two who had already flown) were killed in accidents, and one, Donald K. Slayton, now director of astronaut flight crew operations in Houston, was removed from flight status because of a heart murmur. Bean will have waited six years for his chance, but as Apollo 12 lunar module pilot he could be the fourth man ever to set foot on the moon.

With him on the mission will be spacecraft commander Charles Conrad Jr. and command module pilot Richard F. Gordon, who together flew Gemini 11 to rendezvous and dock with an Agena target vehicle in less than a single orbit of the earth. Conrad was also co-pilot of Gemini 5.

SPACECRAFT ENGINEERING

Reusable Apollos proposed

The builder of the Apollo spacecraft, North American Rockwell Corp.'s space division in Downey, Calif., is studying the possible reuse of Apollo command modules, which the company says could save at least 60 percent of the cost of building new vehicles estimated at about $26 million.

The idea, proposed to the National Aeronautics and Space Administration, would involve replacing metal parts corroded by saltwater after immersion, as well as shaving and replacement of burned areas of the ablative heat shield. Electronic and mechanical components would be reused, repaired, reworked or replaced depending on mission requirements.

The present command module design could be adapted into an earth-orbital rescue vehicle, for example, the company says, that could operate without the need for a service module, thus permitting launch by a relatively inexpensive Titan 3C booster. Four-, six- and nine-man configurations would be possible, with relatively minor modifications.