

# PROBLEM IN SHUTTLE IS REPORTED SOLVED; WAY CLEAR FOR TEST

## Countdown Resumes With Liftoff Planned for Today — Timing of Computers Is Altered

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CAPE CANAVERAL, Fla., April 11 — Space agency officials announced today that they had resolved a computer problem on the space shuttle Columbia, clearing the way for another launching attempt tomorrow morning.

Launching crews at the Kennedy Space Center resumed the countdown at 6 P.M. today, aiming toward a liftoff at 7 A.M. for the shuttle's first orbital flight. Predictions of cloudy weather, however, added some uncertainty to the prospects.

[Depending on the weather, the launching might be moved up to 6:45 A.M., United Press International said.]

If the Columbia does make its debut as now planned, the mission would occur on the 20th anniversary of the first flight of a human in space. Yuri A. Gagarin, the Soviet astronaut, made his one-orbit flight April 12, 1961.

### Timing Problem Is Found

The Columbia astronauts, John W. Young and Capt. Robert L. Crippen of the Navy, were reported ready and eager to try again to undertake the scheduled 36-orbit mission to test the performance of the world's first re-usable spaceship. They were briefed on the Columbia's condition, including the resolution of the computer trouble that disrupted yesterday's launching attempt, before they went to bed at 4 P.M.

Engineers and electronics experts at the Johnson Space Center in Houston traced the momentary computer breakdown to a random, subtle timing problem in the primary computers that handle nearly all of the spaceship's operations. Because of a one-in-a-million quirk in the computer's programmed instructions, they said, the machines began functioning 40 milliseconds, or a 25th of a second, earlier than they should have.

After they discovered the nature of the failure late yesterday, project engineers reactivated the Columbia's computers and ran tests in the night. This time the computers' timing meshed completely.

Since the timing can be skewed only when the computers are started, project officials expressed confidence that the failure should not recur.

In the test, Richard P. Parten, deputy director of data systems and analysis at

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the Johnson Space Center, said that engineers "have not had this problem before and do not expect it to recur during the countdown or in flight."

The computers, which were switched on at T minus 30 hours in the countdown, will continue operating throughout the countdown and the mission so as to avoid having to restart them, which would run the risk of another such random failure.

Mr. Parten said that the malfunction was "very unique, very insidious" and had not shown up in any previous tests of the machines.

The decision to resume the countdown was reached after project officials here and at the Johnson Center held a tele-

phone conference during most of the morning.

George F. Page, the launching director, said, "All of our people and contractors are ready to go. At the present time, we have a small amount of turn-around work. We have very little in the way of physical work to do." The preparations were to be a repetition of the final countdown conducted before yesterday's attempted launching, Mr. Page said at a news conference, but "hopefully with a more successful completion."

## Refueling of Spacecraft

At about 11:00 P.M., liquid oxygen and hydrogen began to be pumped back into the shuttle's huge external fuel tank. These are the supercold propellants for Columbia's three main rocket engines.

An inspection of the external tank indicated that its cork-epoxy insulation was undamaged from the temperature and pressure stresses of the previous fuel loading.

Once the spaceship was fully fueled, and if no problems were outstanding, the astronauts were to be awakened to prepare for their journey and go to Launching Pad 39A in the predawn hours.

Asked why the new launching time was set at 7 A.M., rather than 6:50 as previously announced, Mr. Page said that he "decided to shoot for an even 7, since it's easier to keep track of even times."

The mission plan, if all goes well, is for Mr. Young and Captain Crippen to test Columbia over a 54½-hour flight and then land the vehicle at Edwards Air Force Base in California. The landing is sched-

uled for 1:28 P.M., New York time, on Tuesday.

Columbia is a 122-foot-long winged vehicle designed to operate in orbit like a spacecraft and return to a runway landing like a giant glider so that it can be flown many times, perhaps 100 times.

The National Aeronautics and Space Administration, which started work on the space shuttle in 1972 and has spent nearly \$10 billion on its development, plans to put Columbia through four orbital tests over the next year before the shuttle is cleared for full operations carrying a scientific laboratory, satellites and planetary probes into space. At least three other shuttles are under construction and all should be flying by 1985, if Columbia passes its test runs.