

# Practice makes perfect

## This year marks the 25th anniversary of shuttle's free-flight tests

By Lisa Tidwell

**L**ike a child who must learn to walk before running, the space shuttle had to prove it could safely land before it could become NASA's main mode of transportation into space. The shuttle's landing abilities were proven in the Approach and Landing Test (ALT) program, using the orbiter test vehicle called *Enterprise*.

This year marks the 25th anniversary of the successful ALT program. The *Enterprise* began its journey at Rockwell International's Space Division in Palmdale, Calif., where it was assembled. In January 1977, the *Enterprise* traveled 36 miles over land from Palmdale to the place of its first flight – NASA's Dryden Flight Research Facility at Edwards Air Force Base.

While at Dryden, eight captive flight tests, three of them crewed, took place with the orbiter mounted atop the Shuttle Carrier Aircraft (SCA). The captive tests verified the aerodynamics and handling of the orbiter/747 combination and the orbiter systems. After these successful captive flights, the *Enterprise* was ready to fly solo.

On August 12, 1977, the NASA Space Shuttle *Enterprise* made history with its first free flight when it was released from atop the SCA at an altitude of 24,000 feet and guided to a successful landing on Runway 17 at Edwards. The shuttle spent five minutes and 22 seconds gliding down to Earth.

Astronauts Fred W. Haise and C. Gordon Fullerton were in control of the *Enterprise* during the historic first free flight.

"Just about everything associated with the ALT program was new and untried," Fullerton said recently. "In addition to the orbiter itself, the simulator, the Shuttle Training Aircraft, the Shuttle Carrier Aircraft, the manufacturing and checkout facilities at Palmdale were all being used for the first time during the preparation for the ALT flights."

During the subsequent four free flights, the astronaut flight crew alternated between Haise and Fullerton to Joe Engle and Richard Truly. The crews continued to release the shuttle from its perch atop the SCA to simulate free-flight landing conditions of a shuttle returning from orbit. These five free-flight tests allowed the pilots and engineers to learn how the shuttle handled during low-speed flight



Astronauts Fred W. Haise, Jr., left, and C. Gordon Fullerton are pictured in the cockpit of the *Enterprise* prior to the fifth and final free flight.



and simulated how it would land at the end of an orbital mission. The final free flight test, which took place Oct. 26, 1977, proved the space shuttle could successfully land on a concrete runway. After the ALT program, the Space Shuttle *Enterprise* was ferried around the world for air shows and made an appearance at the 1984 World's Fair in New Orleans, La. After a few months visiting NASA Centers, *Enterprise* became the property of the Smithsonian Institution in 1985. It was moved to Washington, D.C., where it still remains.

Since the early days of the shuttle program, nearly 700 passengers have been carried into orbit aboard the five shuttles: *Columbia*, *Challenger*, *Discovery*, *Atlantis* and *Endeavour*. *Discovery* is the most flown shuttle with 30 flights to its credit. ❖

### The Approach and Landing Test Program

#### QUICK FACTS

- ☛ The program consisted of 13 flights in all – five captive, three captive-active and five free flights – all of which occurred during 1977.
- ☛ The first free flight occurred on August 12, 1977. *Enterprise* was released from atop the Shuttle Carrier Aircraft at an altitude of 24,000 feet and spent five minutes and 22 seconds gliding down to Earth.
- ☛ Astronauts Fred W. Haise and C. Gordon Fullerton were in control of the *Enterprise* during the historic first free flight.
- ☛ Haise, who had also been the lunar module pilot for Apollo 13, resigned from NASA in 1979 and retired as president of Northrop Grumman Technical Services in 1996. Fullerton was the pilot of STS-3, commander of STS-57F and currently is a research pilot at NASA's Dryden Flight Research Center at Edwards.
- ☛ *Enterprise*, the space shuttle flight test prototype, was originally to be named "Constitution" in honor of the U.S. Constitution's bicentennial. However, viewers of the popular television show "Star Trek" started a write-in campaign urging the White House to name the first shuttle *Enterprise* after the show's "starship."

