



RESEARCH

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Past Projects - ERAST

Centurion

The Centurion's genesis began in 1997, when a challenge to reach 100,000 ft with a remotely piloted vehicle was given to the ERAST Program. A solar-powered airplane called the Pathfinder which was a span loaded flying wing had proven so effective, that expanding on this concept and all the proven technology was viewed by the ERAST Program as the lowest risk approach toward meeting the altitude goal. Therefore the design of Centurion resulted in an aircraft that looks very much like the Pathfinder but had a much longer wingspan of 206 ft. Although the Centurion shape resembles the Pathfinder, the structure was designed to be stronger and capable of carrying numerous payloads (up to 600 lbs.) more efficiently.



The aircraft arrived at NASA Dryden Flight Research Center in September of 1997 to begin preparations for its maiden flight. The initial flight test series were conducted at altitudes no greater than 500 feet above the floor of Roger's Dry Lake and were all to be battery powered. (Solar cells are very expensive and to reduce risk to the program it was decided early on that they would not be installed until the airplane configuration is thoroughly tested.) The aircraft showed up with 14 motors and weighed in at 1,385 lbs (including a 150 lb. steel anvil hanging on its centerline to simulate a payload) for it's first flight. The maiden flight took place on November 10 and lasted a total of 1 hr and 24 minutes. The flight was nearly flawless and was followed by a second similar performance on November 19, this time before a crowd of VIP's and Media. It lasted 1 hr and 29 minutes. The third and final flight of the low altitude test series took place on December 3. On this flight the vehicle was loaded down to its maximum gross weight of 1806 lbs. to test its weight carrying capability. Total flight time on this flight was 30 minutes. The flight was shortened because high winds were anticipated by mid-morning. Flight data is currently being analyzed, but it appears that all major objectives were successfully met with these three flights and the Centurion is operating as designed.



The next step for Centurion was the addition of a 6th wing panel to bring the overall wingspan up to 250 ft. This was being done

primarily because although Centurion is designed to reach 100,000ft, the primary goal for solar powered aircraft is to someday fly at high altitudes for months at a time. Rather than building a separate aircraft, the Centurion would be slowly modified over the years into what is called the "Helios" Prototype in order to save money. The Helios Prototype would perform the 100,000ft flight and then be modified into an aircraft capable of performing a long duration flight demonstration of 100 hours. The Centurion was designed, built and test flown by AeroVironment with support from the NASA ERAST Program Office, Dryden Flight Research Center and Langley Research Center.

Project Milestones

Feb. 10, 1997	Centurion fabrication begins at the AeroVironment facility in Simi Valley, CA.
Mar. 4, 1997	Quarter scale model of Centurion takes to the air for the first time at El Mirage Dry Lake in California.
Sept. 1, 1998	Centurion arrives at NASA Dryden Flight Research Center at Edwards Air Force Base, CA.
Nov. 10, 1998	Centurion first flight takes place over Rogers Dry Lake at Edwards Air Force Base.
Jan. 1999	Modifications started to modify Centurion into Helios Prototype.

Centurion Links

- Fact Sheet
- Photos
- Movies

Find this article at:  
<http://www.nasa.gov/centers/dryden/history/pastprojects/Erast/centurion2.html>