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HISTORY OF CENTAUR

In 1957, almost one year before Congress created NASA, the Air Force studied an exhaustive proposal from General Dynamics/Astronautics Corp. to develop a new space booster that could give the U.S., in the shortest possible time, a means of orbiting heavy payloads.

That vehicle was to become the Centaur, a high-energy second stage with a new propulsion system using liquid hydrogen. Mixed with liquid oxygen, this new fuel afforded the promise of boosting payloads as great as 8,500 pounds.

By August of 1958, the government's Advanced Research Products Agency accepted from the Air Force a more elaborate proposal for the Centaur and assigned authority for its development to the Air Force.

Centaur promised new muscle in space. The U.S. needed it. Russia had taken the lead with the very first space flight: Sputnik I launched into earth orbit on Oct. 4, 1957, its "Bleep, Bleep" being heard around the world.

Centaur became an official hardware development program the same year NASA was established, in 1958. At that time the heaviest Russian satellite orbiting the earth was the 3,000-pound Sputnik III.

Reflecting long-range U.S. space strategy, on July 1, 1959, NASA took over jurisdiction of Centaur from the Department of Defense. Soon after, the first Centaur flight test was set for January, 1961.

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Centaur was not to be just another booster, but "the" rocket by which NASA would conduct extensive earth orbit missions, lunar investigations and planetary studies. Aside from military satellite missions assigned to Centaur, which were to be considerable, NASA planned to launch one operational Centaur every month for a period extending well into the 1970's and beyond.

That schedule became hopelessly over-optimistic, dogged by an avalanche of problems, failures, test-stand explosions and other delays. On May 8, 1962, the first Centaur rose, a perfect launch for 54 seconds. Then the Centaur upper stage exploded. DOD officials became convinced that operational Centaurs would not be available until 1966.

NASA rescheduled another first test flight for October, 1962. Now Dr. Abe Silverstein stepped forward and convinced the hard-pressed NASA organization that his Lewis Research Center could de-bug and manage the problem-ridden Centaur. Full responsibility for the ailing rocket was assigned to Lewis under Dr. Silverstein, its second director.

Engineers at Lewis were familiar with Centaur's liquid-hydrogen/liquid-oxygen cryogenic fuels, having developed the technology for safe handling of the -400 degrees F. propellants.

Finally on Nov. 27, 1963, it happened. Centaur made its first successful flight. No payload was carried but the powerful rocket scored a significant milestone: first in-flight burn of a liquid-hydrogen/liquid-oxygen engine. Major successes followed rapidly.

Coupled with already proven Atlas first stages, Centaur vehicles sent seven Surveyor spacecraft to probe the surface of the Moon between May 30, 1966 and Jan. 7, 1968, furnishing valuable data for the first manned landing on the Moon in July, 1969.

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Other important Atlas/Centaur missions followed, including boosting the Orbiting Astronomical Observatory to scan the stars from above the Earth's atmosphere . . . sending two Mariner spacecraft to chart the planet Mars . . . launching two Pioneers to Jupiter on a solar system escape trajectory and a Mariner to Venus and Mercury.

The Centaur stage combined with the Air Force Titan III booster provided a capability to launch larger spacecraft like Helios A and B around the Sun, two Vikings to Mars, and two Voyagers to Jupiter, Saturn and beyond.

Centaur has flown not only exploratory scientific missions but also those with terrestrial benefits such as Applications Technology Satellites and the Intelsat, Comstar and Fltsatcom communication satellites. Centaur has delivered these domestic and military communication satellites into geosynchronous orbit.

Centaur today is a mature, high-energy, still-viable upper stage with an overall operational reliability record of 96% . . . 100% since 1971.

As Centaur begins its third decade, it is being modified to fit into the Space Shuttle as a high-energy upper stage and will launch the Galileo spacecraft for further study of Jupiter and its moons as well as send the International Solar Polar spacecraft over the poles of the Sun, both launch events scheduled to take place in 1986.

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