SPACE

Delta Launches Syncom 3

A Thrust-Augmented Delta rocket was used to boost the Syncom 3 television satellite into orbit, bringing the Delta's unmatched success total to 23 in 25 attempts—By William McCann

➤ THE DELTA ROCKET, recovering from a run of bad luck earlier this year, lived up to its old title, "queen of the American space program," with its launching of the Syncom 3 television satellite.

The launch was Delta's first flight since the accidental firing of its third stage which killed three technicians last April during an indoor test at Cape Kennedy, Fla.

A new three-stage Delta rocket, called TAD for Thrust Augmented Delta, was used Aug. 19 to boost into space the Syncom, expected to relay telecasts of the Olympic games from Japan to America and Europe in October.

Last winter the Delta failed to get off the ground for the first time in 23 trys during an attempted launch of a beacon satellite.

The latest Syncom launching puts Delta's success total now at 23 in 25 attempts, a record unmatched by any other space booster. Among its top performances were the launchings of the first Echo balloon, eight Tiros weather satellites, Explorer X, the Orbiting Solar Observatory, the international satellite Ariel and Telstar I. The only other Delta launching this year was the successful orbiting of the Relay II satellite in January.

The Delta, built by the Douglas Aircraft Company, Santa Monica, Calif., evolved from the Thor-Able rocket and the earlier Vanguard.

The TAD, a muscular version of the Delta, had three solid rockets strapped to its first stage in the Syncom firing. This marked the first use of the "piggy-back" rockets in flight by the National Aeronautics and Space Administration, although the U.S. Air Force had previously experimented with them on Titan III. The three solid rocket motors increase the lift-off thrust from approximately 172,000 pounds to 333,550 pounds.

Launching the Syncom 3 was the maiden flight for TAD, which is designed to help put Syncom into the world's first stationary orbit in which the satellite appears to hang over a point on the earth. TAD is 90 feet long and weighs about 71 tons at lift-off.

Future Delta rockets are scheduled to launch biosatellites for studying the effect of space conditions on plant and animal life, Pioneer satellites to study sun-earth relationships, and additional scientific and weather satellites.

NASA plans to buy eight more improved Delta rockets from Douglas at a total cost of $15 million.

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SPACE TECHNOLOGY

Satellite to Collect Deep-Space Data

• A SATELLITE is being developed to reach 172,000 miles into space and gather data on micrometeoroids, tiny bits of matter no larger than grains of sand.

Called MDSS, the satellite is to be launched into a highly elliptical orbit ranging from about 460 to 172,000 miles. Martin Company is developing it in Baltimore, Md., under a National Aeronautics and Space Administration contract.

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TECHNOLOGY

High-Strength Steel For Rocket Casings

➤ A NEW high-strength steel, specially developed for solid fuel rocket casings, can reduce weight by as much as 25% of casings made from conventional steels.

Test casings made from the new steel have withstood stresses of more than 375,000 pounds per square inch, believed to be the highest burst stress ever reached in a solid fuel rocket motor case.

Curtiss-Wright Corporation developed the new 18% nickel "maraging" steel and built the test models under a contract with the Air Force Rocket Propulsion Laboratory, Edwards AFB, Calif.

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SPACE

Explosive Fuel Additive For Rockets Contained

➤ A HIGHLY EXPLOSIVE substance that could provide a 20% boost in energy over rocket fuels now used without any weight rise has been stored successfully in Cambridge, Mass.

Ozone, which consists of three atoms of oxygen, is so unstable that small shocks, or even contact with small amounts of organic matter can explode it.

Scientists found that adding the alkaline chemical, sodium hydroxide, to ozone increased its stability. The longest time they preserved ozone in a sodium hydroxide solution was 83 hours, with only a half of it decomposing.

The successful storage of ozone could be a boon to rocketry. Evidence suggests that this dangerous material could be stored on a large scale and transported safely in containers and pipes whose inner walls are lined with sodium hydroxide or some other alkaline substance.

Dr. Lawrence J. Heidt and Vincent R. Landi, both of the department of chemistry at the Massachusetts Institute of Technology, reported the discovery.

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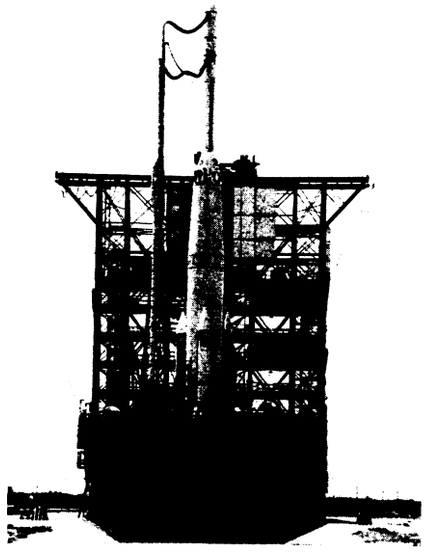

NASA

MOTORS ALIGNED—The Thrust Augmented Delta rocket, or TAD, built by Douglas Aircraft Company, Santa Monica, Calif., is shown after mating and alignment of solid stage motors for its maiden flight.

PHYSICS

Underground Atom Study Curbs Radiation Dangers

➤ SCIENTISTS will go underground to study the atom. A big hole in the ground in Pasadena, Calif., houses an atomic laboratory, not a fall-out shelter.

Beneath two feet of concrete roof, which is level with the ground, physicists at the California Institute of Technology will store and handle radioactive isotopes, as well as further examine the atom's nucleus. The laboratory, just completed, will augment the "hot lab," which has been used to provide isotopes for researchers requiring radioactive materials.

Each room of the $250,000 Isotope Handling Laboratory is equipped with a carbon dioxide fire-suppressing system. All rooms are continuously monitored for radioactivity.

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ENGINEERING

Giant Valve Ends Rocket Vibrations

➤ A 900-POUND VALVE is being used to prevent vibrations which damage equipment and cause ear-splitting noise during firings of the FI rocket engine. The FI has a thrust of 1.5 million pounds.

The valve can regulate 30,000 gallons of frigid liquid oxygen per minute through its foot-wide piping, an amount equal to that held by three railroad tank cars. The valve, which has special energy-absorbing holes inside, was designed for the National Aeronautics and Space Administration at Hammel Dahl/Foster, an International Telephone and Telegraph Corporation unit, Sacramento, Calif.

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