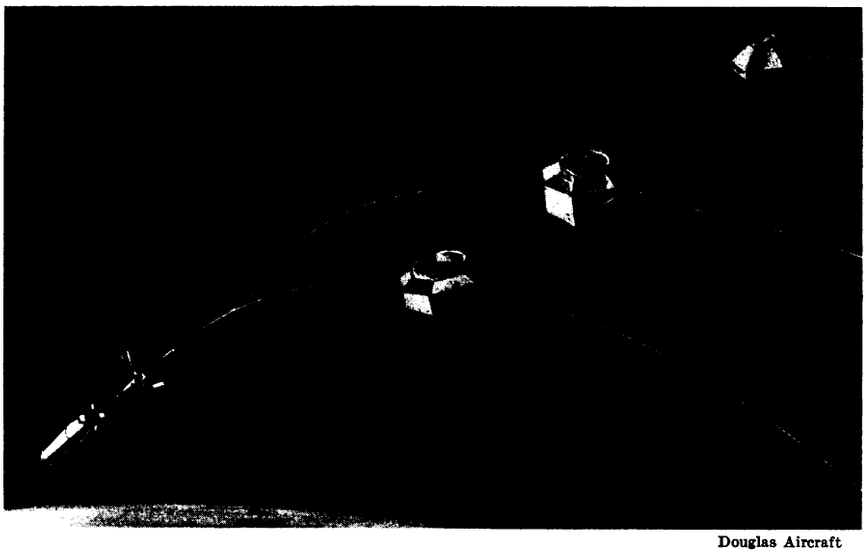

Douglas Aircraft

SPACE TRIPLETS — Even quintuplets — could be launched into separate orbits by the same booster rocket, using the MOMS (Multiple Orbit-Multiple Satellite) system, developed by Douglas Aircraft Company.

SPACE

Five Launchings at Once

A new multiple launching system that uses one booster rocket to send a bundle of satellites aloft may cut expenses by hurling "five at one blow"—By Jonathan Eberhart

➤ "FIVE AT ONE BLOW" could mean big savings when the satellites of the future are launched.

A system recently presented to the National Aeronautics and Space Administration would enable as many as five satellites to be launched by a single booster rocket. MOMS, short for Multiple Orbit-Multiple Satellite, consists of a number of satellites fastened together by explosive bolts.

With MOMS, individual or group experiments would be designed for a specific orbit and placed in their own satellites. They would be launched with other experiments intended for different orbits. One launch vehicle could carry several payloads, even though their assigned orbits might vary from hundreds to tens of thousands of miles.

Developed by Douglas Aircraft Company, Santa Monica, Calif., the bundle would be carried aloft by Douglas' Delta booster with the satellite intended for the lowest orbit riding on top. At the proper altitude, the explosive bolts would be automatically detonated allowing individual rocket motors on the satellites to separate them into their various orbits.

The MOMS satellites would all have a standard cylindrical core to house the orbital rockets. A number of adequate rockets are already in existence, varying in thrust and burning time.

The satellites would be octagonal or round, like an over-size hatbox. Solar cells on the outer surfaces would provide electrical power.

Launches of two satellites at once have taken place a number of times since June 22, 1960, when the Navy's Transit II-A carried two spherical satellites aboard a Thor/Able-Star two-stage launch vehicle.

Since that time a number of multiple satellite packages have been launched, among which are the Venus probe of February 12, 1961, another Transit (the IV-A), and Discoverers XXX and XXXI, both on September 20, 1961.

The most recent multi-satellite firings include Project Vela Hotel, the top secret Air Force project designed to detect any nuclear testing going on in outer space. The first Vela shot was last October.

A triple flight was successfully launched July 17. The "extra" satellite has its own orbit, from which it will relay data on the Van Allen radiation belts. The other two satellites share an orbit, but on opposite sides of the globe from each other to provide surveillance of nuclear tests in violation of the test ban treaty.

The Soviet Union also has a very recent multiple launch to its credit. Electron-3 and Electron-4 were launched July 11, by a single booster rocket, carrying experiments designed to measure radiation "from the depth of cosmic space," as well as the earth's magnetic field.

Multiple satellite packages might not, however, be the best way to save money on space launches, said one NASA official. In many cases, such as Syncom III, a communications satellite that will assume a fixed position over a spot near the equator, the booster rocket has just enough power to get the payload where it is supposed to go. It might cost more to uprate the existing booster for a mutiple satellite package, he said, than to have a separate launch for each satellite.

• Science News Letter, 86:51 July 25, 1964

SPACE

Rockets Seek Difference Between Day and Night

➤ WHEN DAWN CAME to the ionosphere on July 15, three Nike-Apache rockets were there taking notes.

The rockets were fired at intervals between 4 a.m. and 6:25 a.m. (EDT), loaded with equipment for measuring changes in the ionosphere from darkness through the first rays of sunlight to full illumination.

Sunlight has a great effect on the ionosphere, freeing electrons from the molecules in the air, thereby increasing the ionization of the atmosphere. This ionized layer, or ionosphere, absorbs radio transmissions, and greatly lowers the listening range of stations. The dawn changes in this layer, 30 to 60 miles above the earth, cannot be fully investigated from the ground.

Ion and electron density devices from England and Japan were also aboard the flights, which are part of NASA's International Quiet Sun Year (IQSY) series.

• Science News Letter, 86:51 July 25, 1964

PHYSICS

Vibration-Free Lab For Ultra-Fine Accuracy

➤ IN A NEW WINDOWLESS, dust-free and vibration-proof laboratory calibration standards will be accurate to one-millionth of an inch in size, one-millionth of a gram in weight and to one part in 100 million in radio frequency.

The new laboratory built by Lockheed-California Company, Burbank, Calif., will maintain the ultra-fine accuracy of 30,000 measurement instruments used in production of the present and coming generation of aircraft.

With temperature and air moisture strictly controlled, the laboratory also tests electronic equipment to be installed in Lockheed-built Navy and Air Force planes. This sensitive gear includes radio, radar, navigation, fire control and submarine detection devices.

The building's 16-foot deep basement is surrounded by walls nine inches thick and houses reference standards laboratories called "clean rooms."

Used for extremely fine precision measurements, the clean rooms have isolated floors to make them vibration-free. Cushioning glass fiber blocks separate the top one-foot thick concrete slabs from another floor 12 inches below.

All Lockheed-California measurements are based on the "master" standards in the clean rooms. These, in turn, are calibrated by the U. S. Government National Bureau of Standards in Washington, D. C.

• Science News Letter, 86:51 July 25, 1964