

## AUTOMATION

### Gemini electronics used for V/STOL

Electronic guidance equipment once used in Gemini spacecraft is now coming closer to earth as an aid to researchers developing automated landing devices for V/STOL aircraft.

During landing, the crew of a V/STOL aircraft must handle five separate controls: thrust, lift, ailerons, elevators and rudders. The inertial guidance systems used in spacecraft can enable some of these functions to be done automatically.

The National Aeronautics and Space Administration expects to land a helicopter automatically by 1970, and flight-test an advanced integrated landing system in a V/STOL transport by 1972.

## WEAPONRY

### Cost-cutting target adds realism

The dollar-squeeze has become so tight that the Army is finding even target practice to be an expensive venture. It is therefore evaluating a new kind of aerial target made of little more than paper and plastic, designed to replace costly radio-controlled drone aircraft and the target banners they tow.

The new target consists of glass-reinforced nosecone and fins and a rolled paper tube for a body. Propulsion comes from three 2.75-inch rockets, of a type already in use as armament. Called LOCAT, it will reportedly be able to reduce target flight costs by about 50 percent.

Developed by Philco-Ford Corp.'s Aeroneutronic division in Newport Beach, Calif., the target is 15 feet long and weighs 155 pounds. By simply launching it at different angles, range can be varied from 2,000 to 11,000 feet, altitude from 300 to 2,000 feet, flight time from 4 to 24 seconds and speed from 345 to 520 miles per hour.

An advantage, besides low cost, according to program manager Arthur Moskowitz, is that "troop motivation is high, because of the realistic simulation of an actual aerial foe." With conventional targets, gunners are told to avoid the drones themselves and shoot for the towed banners.

## PROPULSION

### Stronger turbine rotors sought

A particular problem with small, high-efficiency gas turbine aircraft engines now being developed is that the high performance loads often pose manufacturing difficulties. The U.S. Army Aviation Materiel Laboratories at Ft. Eustis, Va., are therefore supporting a search for the best way of attaching the turbine blades to the central disks—a weak point in turbine design.

The high rotational speed and air flow in such turbines produce temperatures that require special cooling. With high temperatures and small size, conventional manufacturing techniques can often result in blades that break away from the disk, Army engineers report.

AiResearch Manufacturing Co. of Phoenix, Ariz., will spend a year looking at both attachment methods and manufacturing techniques, aimed at producing turbines long-lived enough for the Army's future aircraft needs.

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## V/STOL

### Warplane goes researching

An aircraft designed for, and just becoming operational in, Vietnam is about to take up double duty doing research into ways of cutting down aircraft landing field needs.

The plane is the OV-10A Bronco, a light armed reconnaissance craft. Various modifications will be experimentally built into or onto the plane, possibly including such devices as a high-speed rotating cylinder in each wing to enhance the wing's lifting ability. Another idea might be to couple the plane's two propellers with a shaft so that even if one engine fails, the remaining power plant could turn both propellers rapidly enough for safe low-speed flight.

The Bronco is already a short-takeoff-and-landing aircraft, but the modifications could bring its landing speed down from 83 miles per hour to as low as 58, and trim the amount of necessary landing strip from 1,030 feet to only 700. The National Aeronautics and Space Administration is supporting the project.

## HELICOPTERS

### Auxiliary equipment for firefighting

The use of helicopters to fight forest fires will be improved by two new devices: a synthetic fiber net and barrel clamps.

The net, in 10-by-10-foot squares, is made of polypropylene rope. It provides a standard item to replace a wide variety of articles, from surplus bomb chutes to bur-lap webbing, that have been slung under U.S. Forest Service helicopters to carry firefighting tools.

The barrel clamps have been used in industry for such jobs as moving barrels around warehouses, but application to firefighting is new. Previously barrels of such things as diesel fuel have been carried in nets, but this involves slow difficult work getting them in and out. With the clamps, helicopters can pick up barrels from the ground.

Both of the new applications were developed by the Forest Service's Forest Fire Laboratory in Riverside, Calif.

## TELEMETRY

### Ocean buoy test

The U.S. Coast Guard program to develop a network of unmanned buoys to collect and report oceanographic data will get a test in the Northern Pacific this fall.

A single buoy will be moored about 1,500 miles north of Hawaii. It will transmit its data to a receiving station at San Diego via the synchronous satellite ATS-1, which hovers approximately over Christmas Island, near the equator south of Hawaii.

The buoy itself will serve three masters—the Coast Guard, Navy and Scripps Institution of Oceanography—testing a variety of data-measuring and communications equipment. The Coast Guard test will be the first use of a satellite to relay data from an unmanned buoy moored in the deep ocean.

If the test is successful, the Coast Guard plans to deploy such buoys in a number of remote locations.