ARMY AVIATION UNITS DUE FOR EXPANSION

5,000 Planes Now In Operation
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Director of Army Aviation

In this era of fantastic progress, we hear almost daily of some new development in earth satellites, lunar probes, projected space vehicles, commercial jet transports whose speeds approach that of sound and new military planes which can move twice as fast as sound.

Such developments are vitally important to the security of our nation and the world. They tend, however, to overshadow another story of aviation progress, one which is not quite as spectacular but which is nonetheless very important to our system of defense.

I refer to the continual growth of Army Aviation, which has contributed in great measure to the modernization of our land forces. We are constantly finding new methods of employment of the "low and slow" aircraft and helicopters which are the vehicles of Army Aviation, methods which add considerably to the mobility and flexibility so necessary in modern land warfare.

Army Aviation has been growing steadily. Today, the Army operates more than 5,000 aircraft. There are upwards of 5,000 officer aviators, and in addition, 1,200 warrant officer aviators and some 10,000 trained enlisted personnel who are aviation specialists. There are more than 40 aviation units in the active Army today, and there are plans to increase this number within the coming years. Aviation continues to receive priority consideration in the Army budget.

Despite the emphasis currently being placed on air operations, Army Aviation is not a cohesive branch of the service like the Infantry or the Artillery. It is instead an activity, the planes and their operators being assigned to support the operations of those branches.

Generally, there are two areas in which the air vehicle is highly effective in modern warfare. First, it greatly increases the ability of the
Wiring Assembly Saves
Time, Money

A lightweight wiring assembly apparatus—"a harness carrier"—developed by an aircraft company permits transfer of wires from harness board to aircraft with a minimum of chafing and bending, and saves manpower to boot.

The supersonic jet fighter manufactured by the company has a one-piece main harness which has more than 400 wires and is 40 feet long. The harness carrier is made from two and a half inch aluminum tubing and weighs only 75 pounds despite its 32-foot length. Once the harness is completed on the board, the carrier is lowered over it by electric crane and the wires transferred to its contoured shape and fastened by rubber strips. The carrier is then lifted off the board and rolled on its small wheels to the aircraft assembly line. There it is lifted alongside the fuselage of the plane and rotated 90 degrees. The carrier holds the harness in the exact shape in which it comes off the board.

Sixteen men were required to transfer the harness from the old transport cart to the plane but, with the new carrier, two men can do the job.

AIR QUOTE

"The astuteness, integrity and managerial skills of industry leaders will determine how soon new systems are brought into the operational inventory. They will also have a direct bearing on the size of the defense bill the taxpayers will have to pay. Since over 50 per cent of the Air Force appropriation goes toward these purchases, this effect on total cost will be significant.

"Designers, engineers, and production people, on the other hand, virtually have it in their hands to set the pace of our technological progress. They are the ones who must think their way through knowledge barriers. They are the ones who must transform theory into design, and design into highly efficient machinery. In the final analysis, they are the ones who will determine our success in maintaining the degree of superiority which our aerospace weapons and weapon systems currently possess.

"With ingenuity and vigorous productivity from industry... I am confident that we can fill this aim."—Hon. David S. Smith, Asst. Secretary of the Air Force, Sept. 23, 1958.
Army Developing New Plane Uses

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Army commander in a combat zone to acquire information so that he may make the most efficient use of the forces under his control. This mission requires day, night and all-weather surveillance of the battle area to locate and verify targets against which the commander's artillery or tactical missiles may be employed. To this mission the airplane has added two very significant elements; greater range of observation and more rapid transmission of the information obtained.

The second major mission is rapid movement of troops, weapons and supplies from one area to another within the battle zone. The mobility thus acquired is of the utmost importance. Our peacetime Army cannot match manpower with the forces available to our enemy. Thus, the ability to concentrate manpower and firepower where needed the most can offset a disadvantage in numbers. Mobility might be defined as "beating the other guy to the punch by moving faster and more purposefully than he does."

Army Aviation is a particularly important factor in view of the Army's requirement to be ready for either a nuclear or a non-nuclear war. Since the tempo of a nuclear war is much faster, speed of reconnaissance and transportation and the attendant high degree of dispersion of forces is enhanced by the airplane.

As for the organization of Army Aviation, we have today two types of units. First, there is the combat aviation company, consisting of about 70 officers, 150-200 enlisted men and about 50 aircraft of several varieties. This company is organic to the combat division; one company is assigned to each infantry and airborne division and may be used by the commander for a number of purposes ranging from liaison to reconnaissance.

The other type of unit is the transportation company, which may be equipped with either airplanes or helicopters. Generally, these companies are single-type aircraft companies. They usually have about 20 aircraft, and are broken down into light transport helicopter, medium transport helicopter and transport airplane units. They are staffed by 40 to 50 officer and warrant officer aviators and 100-150 enlisted aviation specialists. Their mission can be likened to that of the truck, except that they are not hampered by mud-bogged roads or blown-up bridges, and their speed is considerably greater.

In perfecting the techniques of the employment of aviation in Army operations, we are not without our problems. For one, our fliers must be trained in a basic branch of the service in addition to their piloting activities. This is particularly true with respect to the aircraft in the field side-by-side with the troops they support and under these adverse conditions maintenance of the aircraft becomes more difficult.

In addition, in modern warfare with its greatly improved weapons systems, there is an increased requirement for troops to take advantage of the cover afforded by weather—darkness, rain or fog. Since our planes must be ready when the soldier is ready, there is an obvious requirement for maximum all-weather capability.

Finally, we are continually working toward minimum altitude operations, in order to use terrain features as blocks to enemy radar scanning. This imposes additional problems of aircraft control, navigation, and fatigue.

We are working hard on all these problems and, in addition, we are constantly looking for new techniques and new equipment which will increase direction capability. In the area of techniques, for instance, a relatively new idea is armoring our reconnaissance helicopters with machine guns and rockets. This is by no means an infringement on the Air Force's tactical mission. It is, rather, an extension of ground reconnaissance methods. The firepower available to the helicopters permits them to pin down enemy ground fire, providing a degree of protection which increases their chances of performing their basic mission.

We have also worked out techniques for hauling and relocating certain of our tactical missiles which can be helicopter-lifted, increasing the efficiency of missile operations. As for equipment, there are a number of new developments forthcoming.

Among the most interesting is the "flying jeep." Currently, three manufacturers are working on this device and one of the machines is in flight test status. The aerial jeep will have as many as and varied uses as its ground counterpart.

For our reconnaissance mission, a new and greatly improved plane is scheduled to fly next year. Equipped with several information-gathering devices such as cameras and infra-red detection systems, the plane will have such "extras" as armor and low-altitude ejection seats for the crew of two.

Also under development are various types of convertiplanes (which rise and land like helicopters, but fly as airplanes), which could afford a greater degree of flexibility by combining several types of missions in a single airplane.

There are a number of other techniques and equipment under development or under consideration. We in Army Aviation have not yet found the perfect system or the perfect air vehicle, but we will continue to look for both.

Rate Boost Based on 'Competition'

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although the average increase granted was only 2.3 per cent.

Routing control of this traffic is largely in the hands of the Military Traffic Management Agency, and the aircraft and missile industry is largely without power through routing to exercise restraint upon the carriers in imposing rate increases. The manufacturer has the authority to route shipments of only 1,000 pounds or less owned by the government.

Air Mail Control handles shipments between 1,000 and 10,000 pounds and the MTMA handles all others.

The aircraft manufacturers can demonstrate that substantial sums could be saved by letting them handle movement of all government-owned and controlled shipment of the end article to its first destination. This would permit the development of more competition, which the manufacturers obviously believe is the ruling factor in their scheme of rate-making. In addition, it would be a logical part of the weapon system contract under which the prime contractor is handed full responsibility for the development of a weapon from idea to hardware.

In one single case, the AAA's Traffic Service was able to secure reduced rates on the movement of electronic equipment used in missiles which assure the manufacturers involved a savings of $100,000 a year.

Similar savings would be possible in aircraft and parts if the manufacturers can engender lower rates by giving them a free hand in all shipments.

Space Pilots To Receive Lengthy Preparation

Experience—not youth—will be the factor in choosing space pilots to man the Dyna-Soar—the most advanced weapon system under development today.

Dyna-Soar, a manned boost-glide vehicle with orbital flight potential, is being developed by two teams of airframe, propulsion and guidance companies.

Phantomworks, a branch of the RAND Corporation, is developing the aerodynamic shape of the vehicle, and is handling the guidance and control system. North American Aviation is developing the airframe, the launch vehicle and the propulsion system.

The pilots making the first flights will be hundreds of hours of preparation. They will fly in the fastest Air Force planes. They'll be whirled in huge centrifuges, make simulated space flights with many expected conditions duplicated.

Their job initially will be to help develop the boost cockpit and control system arrangements, to add the pilots' viewpoint to the solution of space-flight problems.

Height and weight of pilot will also count. Specifications: height—5 feet 10-10½ inches; weight—150-155 lbs.
Space Research Plane Represents Manufacturing Team Effort of 300 Large, Small Firms

Construction of the X-15, a rocket-powered manned research vehicle which will explore the problems of hypersonic space flight and re-entry into the atmosphere, represents the combined team effort of more than 300 firms, large and small, located in every section of the country.

The prime contract was held by an airframe manufacturer who directed the industrial team effort, along with the government agencies involved in the X-15 project—the U. S. Air Force, National Aeronautics and Space Administration and the U. S. Navy.

One of the major manufacturing problems was the use of materials which could withstand the extremely high and extremely low temperatures occurring almost simultaneously. These temperatures ranged from 1200 degrees Fahrenheit to minus 300 degrees Fahrenheit. A special steel alloy, which met the design and specification requirements, was selected but no detailed experience of welding aircraft structures with it was available. Specialized welding and handling equipment had to be developed.

Techniques for contouring skins were developed involving the use of hot machining, cold machining, over, freezers, slicers and rollers.

Despite the fact that the X-15 will wear an external skin of the special steel alloy, other metals were used. Titanium and stainless steel are used in the primary structure to handle the heat that may come through the skin. Aluminum is used in the secondary structure, where high heat and high internally, where high heat and high loads are not a problem. Approximately 65 per cent of the X-15 is welded structure and 35 per cent is fastened, compared to 100 per cent fastened for current operational aircraft.

Another problem unique to the X-15 is the control of the aircraft at extreme altitudes where normal controls will not work because of lack of air. The X-15's controllability will be dependent upon ballistic control rockets in the nose and wingtips. These work by moving the spacecraft opposite to the force of the jet streams of gas.

The research vehicle will carry more than 1,300 pounds of instrumentation involving about 600 temperature pickups and 150 pressure pickups.

The recent roll-out of the X-15 is a tribute to the team efforts of the aircraft and missile industry and its associated contractors.

New 'Ships and Aircraft' Published on Fiftieth Naval Air Anniversary

The Ships and Aircraft of the United States Fleet, by James C. Fahy, Associate, U. S. Naval Institute, Published by Ships and Aircraft, Box 548, Falls Church, Va. Seventh edition, 64 pages, profusely illustrated, price $2.50.

The U. S. Navy did not get its first airplane until 1912, but the concept of sea-borne aviation was inaugurated in 1908 with an investigation into the potential of Professor Langley's aircraft. So, in a sense, the year 1958 marks the fiftieth anniversary of naval air power.

Coincidental with this anniversary, James C. Fahy has published the seventh edition of his excellent "Ships and Aircraft." In great detail, Fahy's book includes every ship available to the Navy, active and inactive, with photos and vital statistics. Also included are details of several generations of Naval aircraft, guided missiles, target drones and test vehicles. Of particular note is the information on the Navy series of fleet ballistic missile launching submarines. An extremely accurate presentation, "Ships and Aircraft" is an invaluable reference work for the student of Navy surface, sub-surface and aviation operations.

Gas Gun Produces 13,500 mph Speeds

A gas-driven hypersonic gun capable of producing speeds of up to 13,500 miles an hour will be built by a U. S. aircraft company for advanced research on ballistic and other high-performance missiles and atmospheric re-entry problems of manned space vehicles.

The hypersonic gun may be used in two ways: One will be to drive projectiles through a 100-foot, three-inch gun barrel and into test chambers at velocities of up to 20,000 feet per second. The other method will be to shoot high-velocity, high-velocity gas past a stationary model suspended in a test chamber.

Both the projectile and stationary model testing will provide technical data useful in the design of missiles and winged space craft to insure proper control of the contents of the vehicle, whether these be a thermo-nuclear warhead in a ballistic missile or the crew of a space craft entering the atmosphere of the earth or another planet.

Missiles Now Have 'Exercise' Machine

A new type of missile handling vehicle which doubles as an "exercise" machine is giving one of this nation's air defense missiles a "western style" workout on the ground to insure reliability in the air.

At one aircraft plant 12 of the machines will be used in place of much more expensive missile-davit positions at a cost saving of $386,000.

Produced by an aircraft and missile manufacturer, the missile "dolly" is more than just a set of wheels to make a missile movable on the ground; it also automatically puts the weapons through a sequence of simulated flight attitudes to check out its guidance system.

The machine bounces, bucks, sways and rolls the missiles through a 9½-minute sequence of the kind of jobs it might expect in flight. In this way the guidance system's ability to correct for these buffeting motions can be assessed.

The man-made bucking brace represents a combined assembly vehicle, a "soft-mount" dolly and a missile exerciser. It will greatly reduce the amount of time a missile must be lifted from one kind of supporting structure to another. The missile can ride this one dolly from assembly, through inspection and testing.

"Soft-mount" refers to the four air springs on which the missile is carried. The air spring uses the natural bouncing motion of the missile to its spring energy. Any one of the four mounting springs can be fully extended or compressed simply by pumping in or bleeding off air.

The missile mounted on the dolly can be bounced easily by one man using one hand, a feat that formerly took three to four men using all the leverage they could muster.

Automatic Riveters Produce Huge Savings

Huge sums of taxpayer dollars are being saved in an aircraft plant with the installation of automatic riveting machines. The automatics can operate three to five times faster than the old hand-operated variety, eliminate the noise of regular riveting guns, and have saved the plant $152 million since the first ones were installed in 1953.

The big machines obey a reel of punched tape, jump over obstruc-

tions, move from one row of rivet pattern to the next, and stop by themselves. When engineering changes require revision of the rivet pattern in an aircraft panel, the tape can be cut and a new punched pattern inserted, as in movie film.