



THE McDONNELL CONVERTIPLANE

BALTIMORE, MD. — The XV-1 Convertiplane, the first military aircraft of this type ever developed in the United States, was rolled out of its hangar at the McDonnell Aircraft Corporation in St. Louis, Missouri, the Air Research and Development Command announced here (Baltimore) on February 8th.

The Convertiplane, a joint development of the Air Force's Air Research Transportation Corps of the U. S. Army and McDonnell Aircraft Corporation, embodies a completely new concept of flight. This new concept is known as the "unloaded rotor" principle—a machine equipped with a rotor for verticle flight and wings and propeller for forward flight.

Its primary function will be the exploration of the application of the Convertiplane principle to larger aircraft. Studies will also be made on the tactical military use of the Convertiplane for reconnaissance and other related missions.

In vertical flight or hovering, the rotor provides all the lift; in forward flight the wings provide essentially all the lift. This allows the rotor to autorotate at its lowest drag configuration. This avoids the speed limitation encountered by conventional helicopters due to stalling of blades when they must lift at high speeds.

Each of the three blades of the rotor is powered by a McDonnell-developed pressure jet unit located at the

top of the blade. A Continental reciprocating engine is provided on the aft fuselage to supply air to the pressure jet units during vertical flight and power to the propeller during forward flight.

The enormous power available from the pressure jets allows the use of a rotor having approximately half the drag of a conventional helicopter rotor. Since the wings do not provide the lift during takeoff or landing, they are approximately half the size of the wings for conventional fixed wing aircraft. Therefore, speed performance of the convertiplane is not greatly penalized by utilizing both rotor and wing.

The research program on the new type of aircraft will require exhaustive ground testing, instrumentation, and preliminary flight test work, including full scale wind tunnel testing. The first actual flight is not expected to take place for several months.

The XV-1 is designed to carry three passengers or two litter patients and medical attendant in addition to the pilot. The craft is approximately 30 feet long, ten feet high and spans 26 feet in width.

The Convertiplane's unique tail assembly consists of two vertical fins and rudders attached to the extremities of tail booms. The horizontal surfaces consists of a single stabilizer with tabs, mounted between the ends of the tail booms.

The crew compartment in the fuselage is equipped with large plastic windows which provide exceptionally wide range of vision. It is separated from the engine section by a structural firewall. Pilot and co-pilot-observer sit in tandem, with removable dual controls provided. Exit doors may be jettisoned in the event of a flight emergency.

The non-retracing skids comprise the landing gear of the XV-1. The skid gear differs from previous skids in that energy is absorbed during hard landing by yielding replaceable stainless steel straps.

Fuel is fed to the three pressure-jet tip burners through a rotor fuel governor driven from the rotor hub accessory drive. The pressure jets operate on the principle of ignition and expansion of the fuel gases, then exhausting rearward through nozzles to provide thrust. The application of power directly to the blade tips eliminates the torque which in conventionally driven helicopters must be eliminated by mechanical means.

5th OSTIV CONGRESS

The OSTIV, ("Organization Scientifique et Technique Internationale du Vol à Voile") is organizing its 5th Congress to be held at Buxton (Derbyshire) in England during the same time as the World Gliding Championships, viz from July 21st-August 5th. 1954. Buxton lies about 12 miles from Great Hucklow where the World Championships for 1954 will take place.

The objects of the OSTIV are to encourage and co-ordinate internationally the science and technology of Soaring and the development and use of the sailplane in pure and applied research.

To this end the OSTIV organizes a Congress every two years to afford scientists and experts, interested in gliding as a medium for scientific research, an opportunity to come together to discuss and read papers on the technical and scientific development of gliding and its application in science and technique.

The last OSTIV-Congress was held in 1952 at Madrid and attended by scientists and experts from all over the world.

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