Vertigyro

INGENIOUS COMBINATION OF HELICOPTER AND AUTOGYRO PRINCIPLES

The VG-1 is capable of true helicopter vertical take-off, and of hovering. In this picture the only power is that supplied by the compressed air to the rotor; the nose engine is cut and propeller dead

IF anyone wants to construct a rotating-wing aircraft quickly and relatively cheaply to flight-test a theory (writes Howard Levy, who also took the photographs) he might well do as the Vertigyro Company did. They took an aeroplane fuselage, modified the tail, removed the wings and replaced the fabric covering by metal skins; then they added a rotor system, with a gas turbine to supply compressed air to the rotor. Having done these things, they have an aircraft capable of take-off, landing and hovering as a helicopter, and of forward flight with the rotor rotating freely in the so-called autogyro mode. Should higher forward speeds be desired, continued power may be applied to the rotor while the nose engine is also under power; thus they have a heligyro.

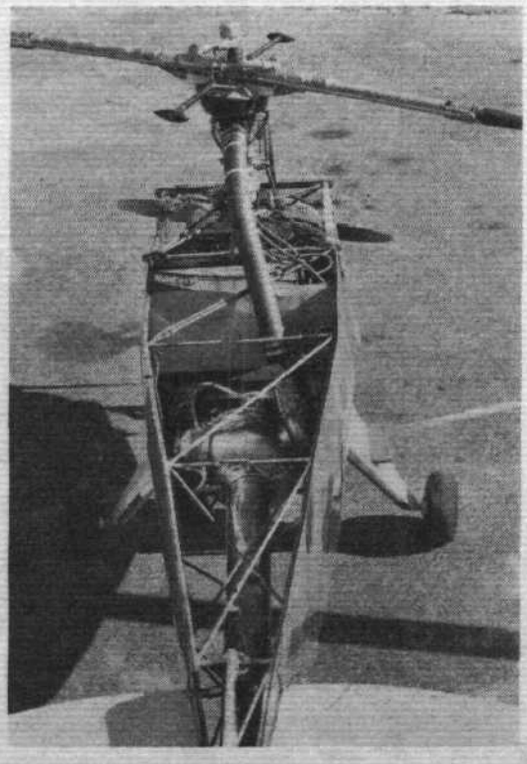
Of course, it is not as simple as all that, but this is the basic concept of the Vertigyro VG-1, successfully flown to prove out the helicopter/autogyro combination. The Vertigyro Company, of New York, with Bruno Nagler as chief designer, have actually used a Piper Colt fuselage with nose engine intact and added the rotor system of a Sud-Aviation Djinn plus an AiResearch GTC 85-90-2 turbine compressor. The tail assembly was also modified and helicopter controls added to the cockpit.

Designer Nagler feels that a helicopter/autogyro combination with continuous helicopter operation capabilities can be produced more cheaply than a pure helicopter, have lower maintenance costs, and be faster and more economical to operate. The VG-1 has flown at 75 m.p.h. in the helicopter mode, at 90 m.p.h. as an autogyro, and reached 110 m.p.h. in heligyro form with only partial power applied to the rotor.

The VG-2, the production machine now under construction, is a twin-boom pusher with fixed tricycle landing gear. Structure is steel tube, with glass-fibre or aluminium honeycomb skins. A Djinn rotor is again utilized, but the powerplant is a 230 h.p. Franklin with a compressor added to deliver air to the rotor at 3lb/sec. In order to provide twin-engine safety and overload capabilities, the VG-2 will also be flight-tested with a BMW turbine delivering air at 1.5lb/sec. This engine will be offered as optional equipment in the production aircraft. The first VG-2 is expected to fly by the end of the year and will be put through an FAA type-certificate programme. A four-seat version is also contemplated.

Principal Data

VG-1: rotor diameter, 36ft; overall height, 9ft; empty weight, 1,330lb; gross weight, 1,600lb.
VG-2: rotor diameter, 36ft; empty weight, 1,050lb; gross weight, 1,630lb; s.l. cruise, 150 m.p.h.; hover altitude out of ground effect, 5,000ft; range, 250 miles; seating, 2½ [*sic*].
VG-4: same performance as VG-2; rotor diameter, 40ft 6in; empty weight, 1,400lb gross weight, 2,600lb; powerplant, 230 h.p.; seating, 4.



The VG-1 uses a Djinn compressed-air rotor system (far left) raised some 5in to provide rotor clearance over the propeller and tail. The rotor shaft assembly is so designed as not to interfere with cabin area and is neatly mated to the Piper Colt airframe

Installation of the AiResearch GTC 85-90-2 turbine compressor aft of the cabin, with 18 US gal fuel tank above. The same fuel is used for both nose and rotor powerplants. The 7in-diameter, 7ft-long stainless-steel exhaust pipe leads aft to protrude under the end of the fuselage