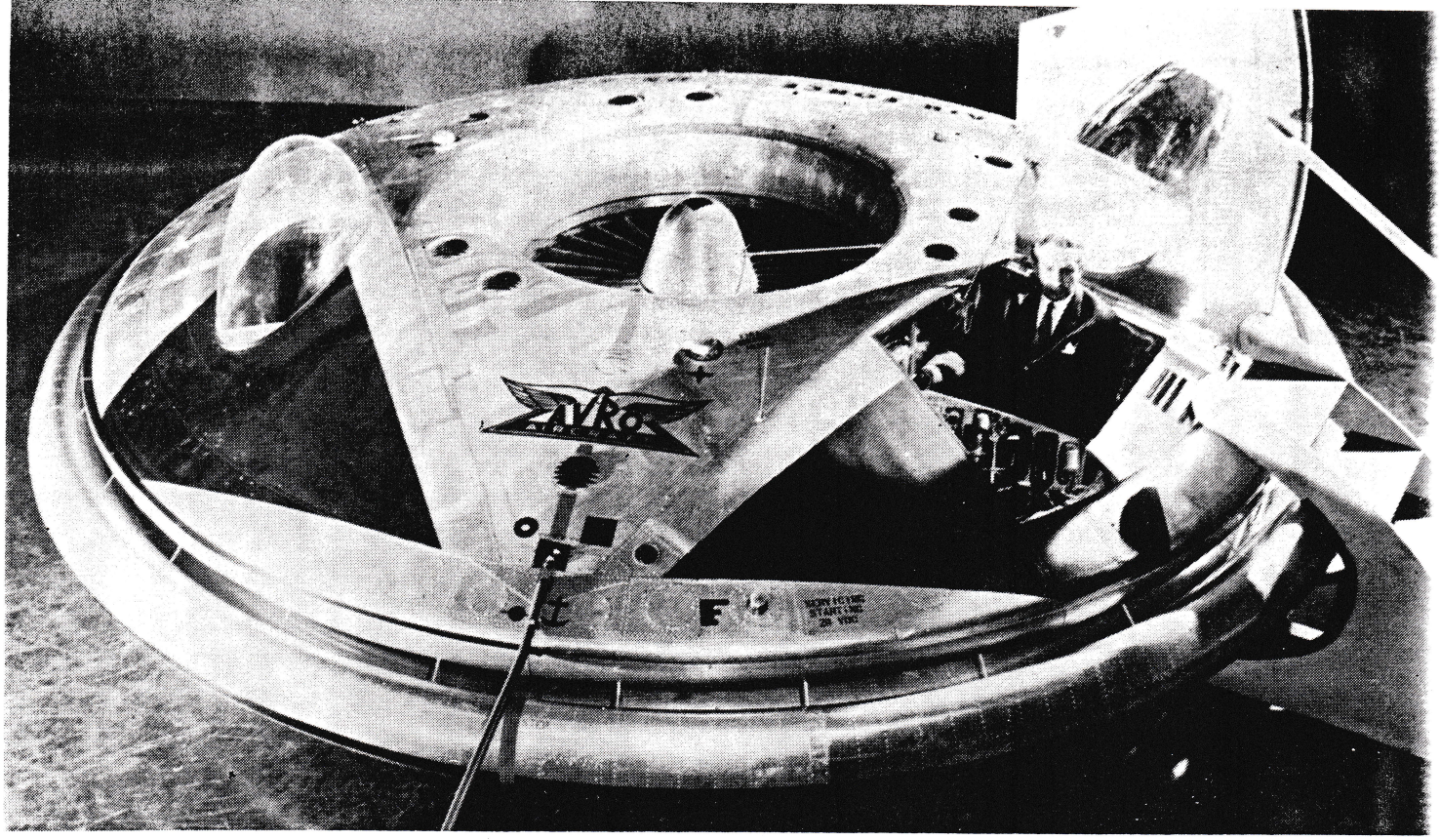


Front view of subsonic model Avrocar. Pilot's cockpit is at right; at left is flight test observer's position.

RL. 894-1960

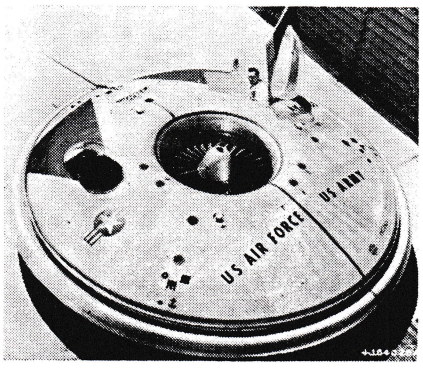
The Avrocar Revealed

AVRO AIRCRAFT Ltd.'s VTOL research aircraft is reported to be still undergoing wind tunnel testing at the U.S. National Aeronautics & Space Administration's Ames Research Centre, Moffet Field, Calif. Continued support for the development of the unique vehicle by both the USAF and U.S. Army depends upon the outcome of these tests. The Canadian Government recently promised $300,000 to help keep the pot boiling.

Early results obtained in the huge (40 x 80 ft.) Ames wind tunnel were encouraging enough to warrant a continuation of the full-scale tests following a few modifications to the aircraft. Chief problem encountered so far is said to be that of stability at low speeds both in and out of ground effect.

Air Cushion: The Avrocar, which utilizes an air cushion to achieve vertical take-off is powered by three Continental J69 turbojets (Turbomeca Marbore license) which drive a large centrally mounted fan. The cushion of air is supplied by discharging an annular jet of air downward from the rim of the circular wing. The primary flow of air from the main fan is augmented as it exhausts around the circumference of the wing by passing it through a nozzle which sets up a jet pump effect, sucking in a large volume of low speed air. The large opening on the edge of the wing is the intake for the augmentation air flow.

Thrust needed for horizontal flight is obtained by deflecting the annular jet of air to the rear. Since the annular jet cannot be deflected through a full 90 degrees, it is always contributing to the aircraft's total lift. Stability of the vehicle during its transition from vertical to horizontal flight, depends on keeping the airflow smooth during its deflection rearward.



Avrocar uses air cushion for vertical take-off and landing, and low-level hovering; wing generates lift in normal way in horizontal flight.

The test vehicle shown here, one of two built, is designed for subsonic operation. Avro has design studies for a supersonic version of this same aircraft which has sharp leading edges and a modified inlet system for annular jet augmentation flow.

Future Potential: Militarily, the circular wing design has great potential because it is structurally light, it is compact, and is an ideal airfoil for low altitude high speed missions. Avro Aircraft Ltd., as well as other companies working in the field, anticipate that the most efficient aircraft for low level flight at transonic and supersonic speeds will likely be of wingless design.

Although the wind tunnel testing so far performed on the Avro model has not been 100% successful, it has shown that the stability and transition problems associated with the saucer design are not impossible to overcome.