The Avrocar
Canada's Flying Saucer

by Palmiro Campagna, P. Eng

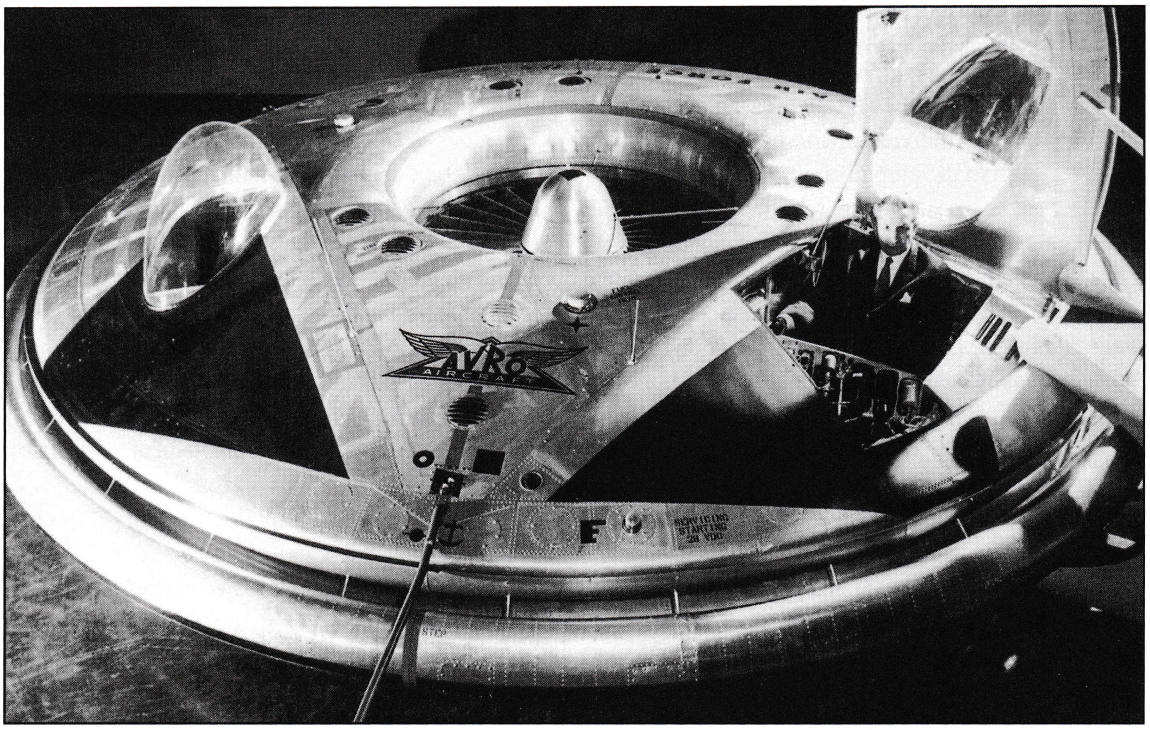


Photo courtesy of National Archives of Canada

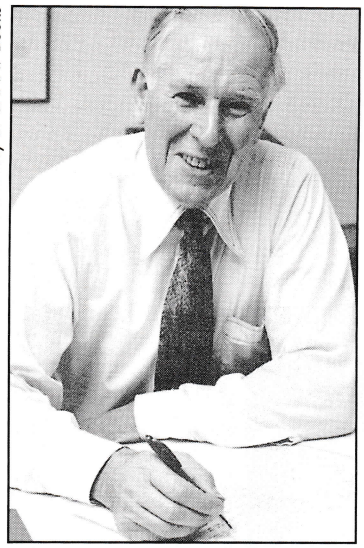
Official USAF press release photo of the Avrocar.

Canadian developments in aircraft design are well represented in literature. For example, one can read about Canadian efforts in the production of Lancaster bombers or in the subsequent design of the CF-100 Canuck jet fighter. Even the Avro Jetliner and the controversial Arrow have been the subjects of books. Squirreled away in Ottawa's National Archives of Canada though, are files which detail aspects of our aviation history which have not been extensively covered in the mainstream literature but which are nevertheless a very real part of our aviation heritage. These files discuss the Canadian Government's involvement in the study of unidentified flying objects (UFOs) and in the design and development of an actual "flying saucer" for the United States Air Force (USAF).

Towards the end of WW II, some allied fighter pilots reported that strange luminous globes sometimes followed their aircraft during sorties over Germany. The *Washington Star* of July 6th 1947 recalled an extensive account of one such sighting by the USAF 415th Night Fighter Sqn. To this day, it is not known exactly what the objects were, hallucinations, Nazi secret weapons, some form of battle fatigue or extraterrestrial spacecraft. The objects were never known to have attacked and were dubbed "Foo Fighters." Today, this is the name of a popular musical group.

In April of 1950, the Right Hon Brooke Claxton, then Canadian minister of national defence, requested that the Joint Intelligence Council investigate the matter of flying saucers in earnest. A committee was to be established comprised of representatives from the Directorate of Air Intelligence, Naval Intelligence, Military Intelligence and Scientific Intelligence, with the Defence Research Board (DRB) acting as chair. Liaison was to be established with the Royal Canadian Mounted Police. Were flying saucers prototype weapons or extraterrestrial in origin? In a report sent to the Canadian DRB in 1953, the American Central Intelligence Agency (CIA) noted that German engineers had filed patents for flying-saucer-like craft they had supposedly developed towards the end of the war.

Photo courtesy of CANAV Books



Avro engineer John Frost was project director for the Avrocar. Prior to that he was a project engineer on the CF-100 jet fighter.

The CIA had interrogated a number of former German soldiers who claimed of having worked on saucer-like aircraft. As it turned out, members of the RCAF and National Research Council (NRC) had also interrogated some of these German engineers about this strange work.

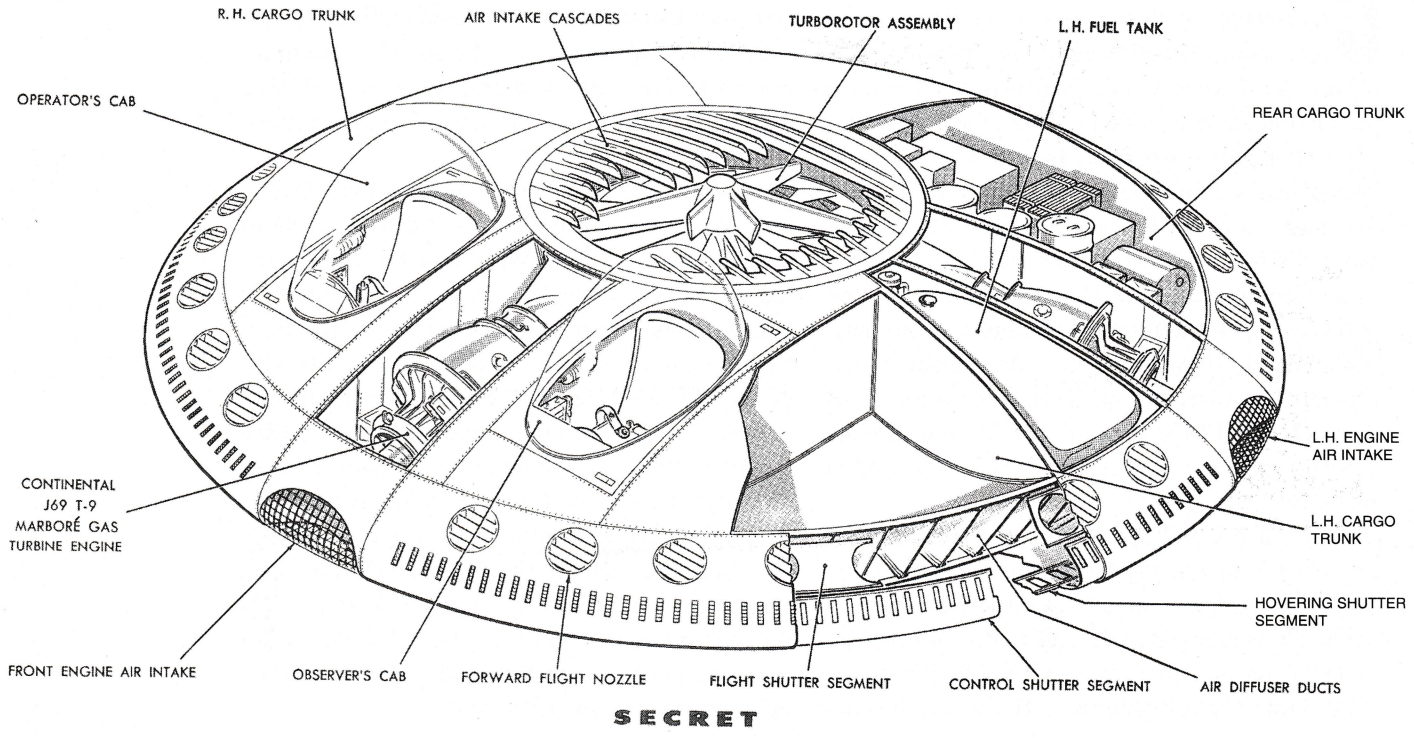
In 1959, a book entitled, "German Secret Weapons of the Second World War," claimed the Foo Fighters were the product of Hitler's war machine. One individual who believed the Nazis had developed such devices was aeronautical engineer John C. Frost of A.V. Roe Canada Limited. Avro, as the company came to be called, had succeeded in designing, building and flying the Jetliner, the first commercial, inter-city jet transport to fly in North America, back in 1949. Frost himself had been brought in from the U.K. to work on the CF-100 and now, the company was embarking on its most ambitious project, the CF-105 Arrow. A flying saucer seemed a natural progression for such an advanced high technology aeronautical firm.

Frost was made chief design engineer for Special Projects A.V. Roe (SPAR). By 1952, not to be left behind in the technological race for vertical take-off and landing vehicles, he had co-authored two technical reports for the design of a circular wing vehicle or, flying saucer. Initially the vehicle was more of a horseshoe or spade shape design. It was called Project *Y*. It would sit on its tail at an angle, with the pilot looking skyward, as he would if he were in a rocket. He would land in a similar fashion. This made take-off and landing rather difficult and uncertain for the pilot. Frost abandoned Project *Y* and eventually settled on the complete circular wing planform. It became known as Project *Y2* in 1954 and was to be developed under intense security at the Avro plant in Malton, Ont.

The designs caught the interest of Dr Omond Solandt, then chairman of DRB and chair of Project *Second Storey*, the flying saucer committee that had been established as requested in 1950, by the minister of national defence. Dr Solandt encouraged Frost in his work and provided approximately $300,000 in development funding. He also brought the project to the attention of the British military, and Duncan Sandys, Britain's minister of supply. The ministry though had reservations about the project. Eventually, Dr Solandt put Frost in touch with Gen D.C. Putt, head of the USAF Air Research and Development Command.

At that time, the U.S. had been investigating the feasibility of a number of vertical take-off concepts put forward by companies such as Goodyear, Chrysler and Hiller.

Structure cutaway diagram of the Avrocar.



Impressed by Avro's work on their other projects and convinced by Frost's technical proposals, the USAF settled on Project *Y2* and awarded Avro a contract worth $758,000. Top secret reports recently declassified from the U.S. show they had a real concern that the West might be lagging behind the Soviets in this type of development, especially if the latter had inherited the work of captured German aeronautical specialists. Like Frost, the Americans had a genuine interest in exploiting the capabilities of this type of technology.

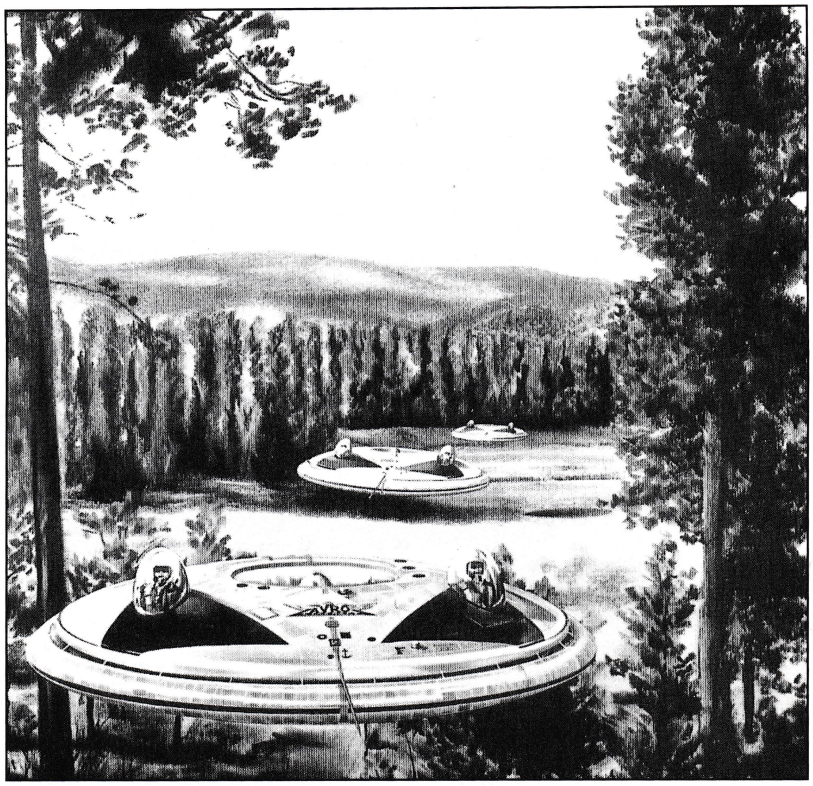
With its vertical take-off and landing capabilities, *Y2* obviated the need for conventional runways and could theoretically be deployed almost anywhere. As a completely circular craft, it would also have embodied inherent stealth characteristics against detection by radar. Specifications were for the vehicle to reach speeds of between 1,720 and 2,300 mph. Maximum altitude attainable was to be between 71,000 and 80,600 feet with a capability to hover at 18,000 feet.

By 1957, Avro had invested nearly $2.5 million of its own money into the project while the USAF had added another $1.8 million. Encouraged by wind tunnel test results on scale models, the U.S. Army also decided to join the venture. An integrated USAF/Army program was established with funding of $4,432,497 for the development and test of two vehicles.

Back at Avro, there was some skepticism among the executive, concerning the feasibility of the project. James Floyd, vice-president of engineering and chief design engineer of the Jetliner and the Avro Arrow, was concerned at the amount of time, space and money that was being put against the project. He did not believe such a device would work as advertised. He had engineering specialists from the U.K. examine the design and they too were not convinced.

The U.S. Army was interested in a subsonic version of *Y2*. They felt that perfecting a subsonic craft would be simpler than attempting the full supersonic model, while still proving out the concept. The USAF and Avro agreed and the subsonic Avrocar was born. Also known as Weapon System 606A, the VZ-9A, and covertly as Project *Silver Bug*, the first prototype was unveiled in May of 1959, followed by the second vehicle in August of that year.

The Avrocar was approximately 18 feet in diameter. It had a gross weight at take-off of about 5,680 pounds. This included 840 pounds of fuel plus the weight of the pilot. It was "...equipped with a five-foot diameter fan situated in its centre, exhausting via an internal duct system to a peripheral nozzle. The fan was driven by means of a tip turbine which used the exhaust from three [Continental] J-69-T-9 engines... The hot exhaust from the turbine was mixed with the cold flow from the fan in a duct immediately below the fan. This duct passes from the bottom of the fan beneath the cockpits, engine bays, and cargo compartments to the peripheral nozzle around the circumference of the vehicle..."

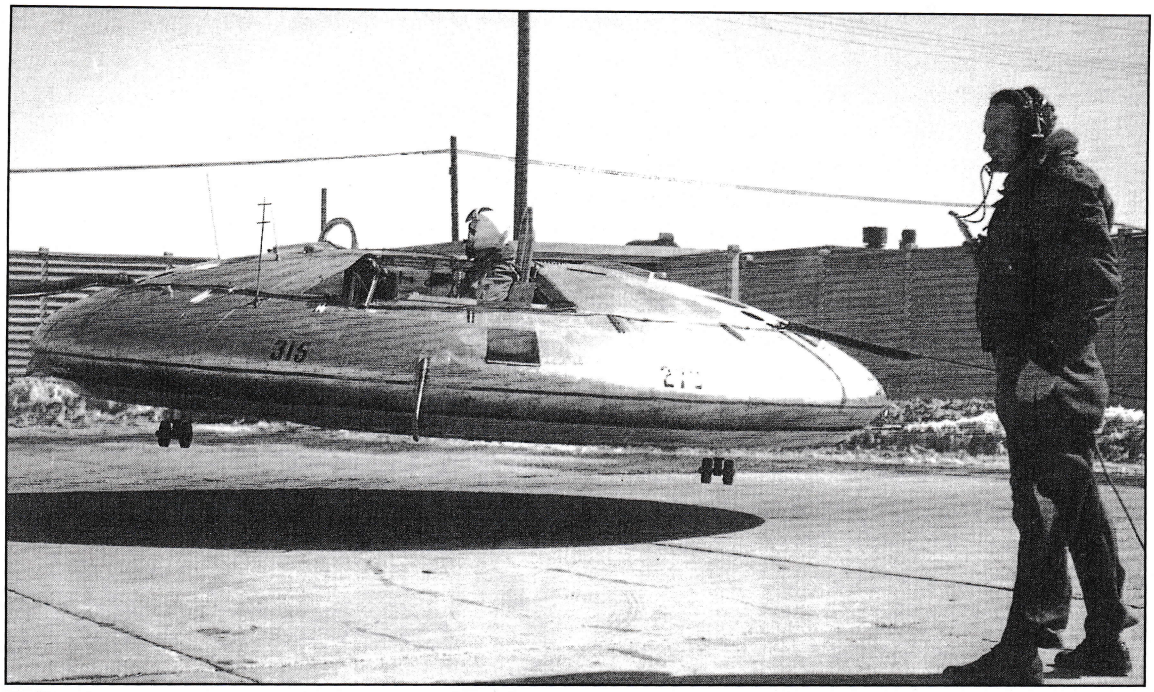


U.S. Army Transportation Museum photo

An Avro Canada Ltd artist's conception of military versions of the Avrocar in an operational setting.

The first free-flight test was conducted in Nov 1959 with Avro test pilot Wladyslaw "Spud" Potocki at the controls. He would hover and zoom as the exhaust from beneath the vehicle blew ice and other debris across the tarmac. Still, it was readily apparent that the design was running into difficulty. The Avrocar rose only three feet off the ground and achieved a forward speed of 55 kph in a sort of skittering motion. It was plagued by instability and power problems.

Several years later, John Frost noted that in 1953, what Avro had actually discovered before anyone else, was the principle of the hovercraft. Had Avro not been so intent on trying to fly out of the ground-cushion effect created by the downward exhausting air, they could have gotten into the hovercraft business. Instead, they chose to try to solve the instabilities in order to fly like an aircraft, first at subsonic and then supersonic speeds.



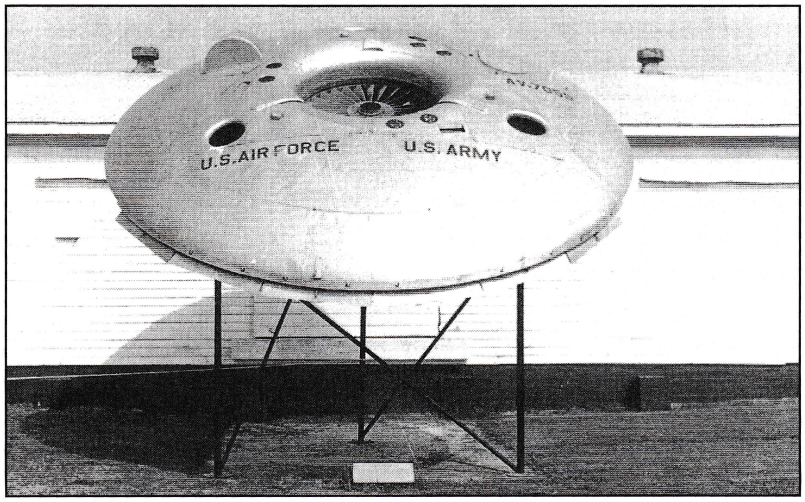
U.S. Army Transportation Museum photo

Avro test pilot "Spud" Potocki test flies the Avrocar at Malton, Ont. The craft proved unstable and was barely able to lift off, then wobble and skitter along the tarmac.

The U.S. Air Force Flight Test Centre at Edwards Air Force Base in California examined the design and concluded with the following comment: "Performance, stability and control of the Avrocar in its present configuration prevents accelerating in ground effect to a free air flight speed. Full-scale wind tunnel results indicate that sufficient control is available to conduct a transition into high speed flight... provided that 35 to 40 knots can be obtained with the focusing ring control system..." The report went on to list the areas that would require modification in order to fly.

Avro completed several of the modifications by 1961. According to Frost, technical solutions to the instability problems were also at hand but, the U.S. decided not to renew Avro's contract. One of the prototypes ended up in a warehouse at the Smithsonian Institute in Washington, DC, while the other is mounted on a pedestal in Fort Eustis, Virginia. With the demise of this project hot on the heels of the Avro Arrow cancellation, and with no further funding for the Avrocar from the Canadian Government, other than the money provided early on by DRB, Avro Canada closed its doors for good.

All that remains of the once-vaunted Avrocar programme is this forlorn display at the U.S. Army Transportation Museum at Fort Eustis, Virginia, and a second prototype gathering dust in a Smithsonian Institute warehouse in Washington, DC.



U.S. Army Transportation Museum photo

Was the Avrocar a failure? The answer is debatable. When one reads the technical reports on the aircraft, it is stated quite clearly that this was a research effort intended for the study of vertical take-off and landing principles. Indeed, the project was watched closely by the British and it has been said that some of the knowledge gained migrated years later into the British Harrier fighter. Still, the fact remains that the Avrocar did not fly as originally expected.

Following termination of the Avrocar project, John Frost moved to New Zealand. He worked on a variety of projects for Air New Zealand before his death in 1979, having never realized his dream of the circular wing aircraft and its military potential.

(Ed note: Palmiro Campagna of Ottawa is author of "The UFO Files: The Canadian Connection Exposed," which includes a detailed discussion of the Avrocar. He also wrote the best-selling "Storms of Controversy: The Secret Avro Arrow Files Revealed."

The author seeks information about Projects Y *and* Y2*, and UFO incident reports by military personnel, including NORAD. He may be contacted through* Airforce *magazine.)*