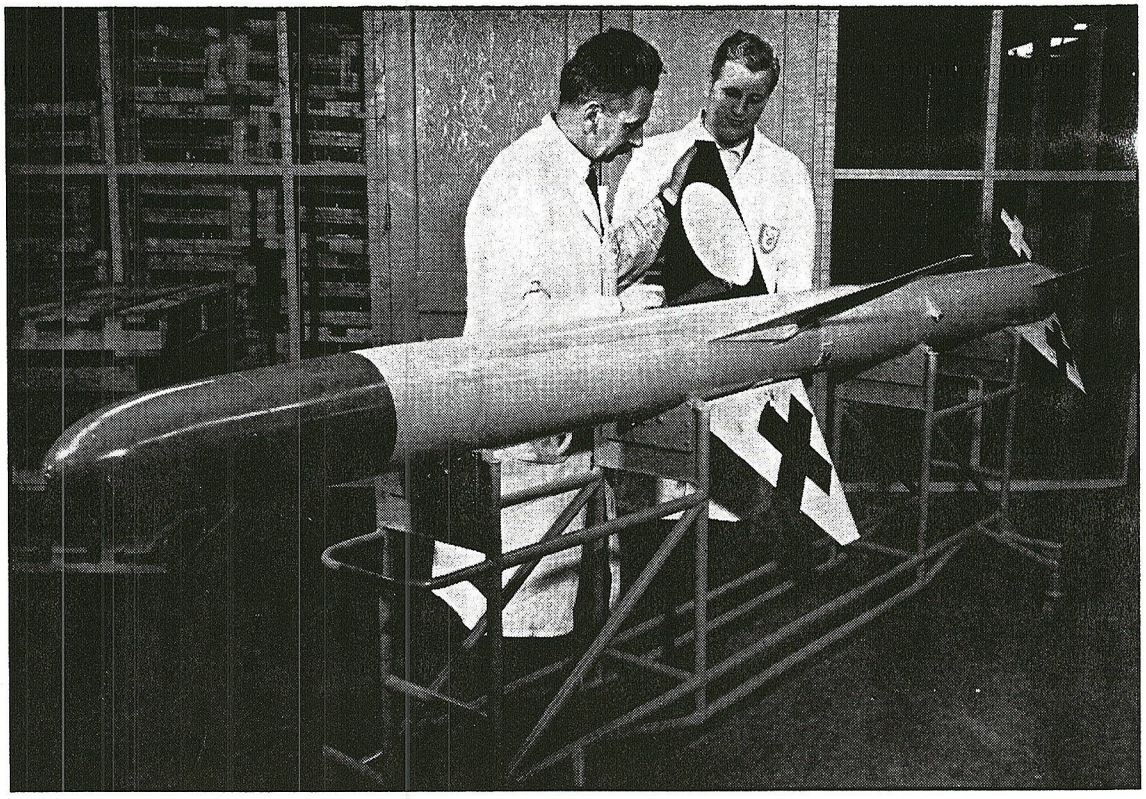


Canadair technicians examine a Sparrow 2 air-to-air missile at the company's Cartierville plant.

The Egg Hatches

It is said that the elephant has a gestation period of from eighteen to twenty-one months, an impressive pregnancy which is exceeded only by that of the Canadian Sparrow. Ornithologists attribute the fact that it takes more than twenty-four months to hatch a Sparrow in Canada to the country's rigorous northern climate.

—THE MISSILE BIRDMAN'S HANDBOOK

ON APRIL 17, the long awaited announcement came that the last obstacles to manufacture in Canada of the Sparrow 2 had been cleared away and the air-to-air guided missile had been ordered into production.

Specifically, the official announcement said that . . . "Canadair Ltd. of Montreal has been commissioned by the Department of Defence Production and the RCAF to go into immediate production on one of the world's most modern, high performance, air-to-air guided missiles."

No Numbers: Under the terms of the contract, Canadair has been appointed co-ordinating contractor, and as such has the overall responsibility for the manufacture, assembly and flight testing of the missile. The number of units involved has not been revealed.

Canadian Westinghouse Co. Ltd. has been appointed an associate contractor to produce the guidance system. Firms who will do sub-contract work for Canadair are Aviation Electric Ltd., The de Havilland Aircraft of Canada Ltd., and Sperry Gyroscope Co. of Canada Ltd. It is understood that others involved include Computing Devices of Canada Ltd. Avro Aircraft will also undoubtedly play an important role in the Sparrow 2 program, by token of the fact that the missile is primarily intended for use with the Arrow bomber destroyer.

The Sparrow 2 is being produced in Canada under a license agreement negotiated between the Canadian Government and Douglas Aircraft Co. Inc., Santa Monica, Calif., with the concurrence of the U.S. Navy, for which the missile was originally developed. As part of the agreement, Douglas will provide technical assistance to Canadair and Canadian Westinghouse.

First Time: Douglas says that this is the first time a U.S. guided missile has been turned over to a foreign government for production as well as use.

The Sparrow 2 differs principally from the Sparrow 1 in the advanced nature of its guidance system designed to meet different tactical situations (for other details of the various members of the Sparrow family of missiles, see AIRCRAFT, March, 1958, p. 88).

A fully automatic fire control system relieves the pilot of the responsibility placed on him by the less advanced systems. The relatively small amount of equipment required by the Sparrow 2 also simplifies aircraft installation.

Designed with a view to mass production, the Sparrow 2 can be used both on day fighters and all-weather interceptors, according to Douglas. Its extreme maneuverability, even at high altitudes, makes it possible for it to be launched against small jet fighters, as well as bombers, at all levels.

Compatible: The Sparrow 2 is compatible with all AI (Airborne Inter-

(Continued on page 80)

around space and room for furnishings have brought the comfort of home and the convenience of the office to the executive user.

Justify the Expense: Any Replacement can beat almost any of these features or performances of DC-3/C-47, but how can one beat—or match—enough of them to justify its expense? Maybe that phase of aviation should come down to earth, and try for lower and slower, rather than higher and faster.

The way Replacements seem to be headed off in the wrong direction may eventually make the DC-3 end up looking for a replacement for people, although it may not really need them. Everybody bailed out of an Air Force C-47 when it ran out of gas on a night training flight over western Missouri on October 12, 1957, but it didn't make a lot of difference to the airplane. All by itself, it picked out a nice field and landed quite comfortably, thank you, except for minor damage to an engine and wing when it hit a bale of hay near the end of its landing roll. Apparently, after all of its experience, it's learning how to fly by itself.

Last year marked the 21st birthday of the DC-3/C-47. It looks like the various retirement ceremonies and sad farewells planned for it have turned into a coming out party instead.

PUSH BUTTON OR PILOT

(Continued from page 26)

to fly it to a predetermined position in space through a preset flight plan.

An Estimation: Automatic navigation in the aircraft, however, utilizes the sensors of pressure, temperature, and magnetic field to enable it to perform. Basically, the dead reckoner, whether human or mechanical, merely estimates present position from past and present speed, direction, and drift data. In an automatic system, this is done by transforming pressures and temperatures to true air speed, proportioning it into north-south and east-west components, and then counting up the miles. To the pilot, the gadget is an educated little slave who provides a very good guess at present position, or direction and distance to a destination, at a glance. This guess becomes most excellent if it is permissible to flash a bit of radar light about, for the use of Doppler makes it possible to measure ground speed and drift directly, eliminating the shaky problem of determining the wind vector accurately.

But with all of the advancements in the art of automatic navigation, the crew is still very necessary. All that the gadgetry does is relieve some members of the crew of some tedious work and some dangerous guessing, allowing them to concentrate on the more difficult tasks which await them in the cockpit of that new jet airliner.

In summation, the original questions are answerable.

Why bother with a crew? Because the human element remains more economic than black boxes in the fields of judgement and of decision-making.

When will the automatic transport plane appear? Probably never, in the sense which we recognize transports, for conveying human souls about the earth requires high orders of judgment and decision.

Thus the skeptical professional pilot need not worry about being automated out of business.

SPARROW

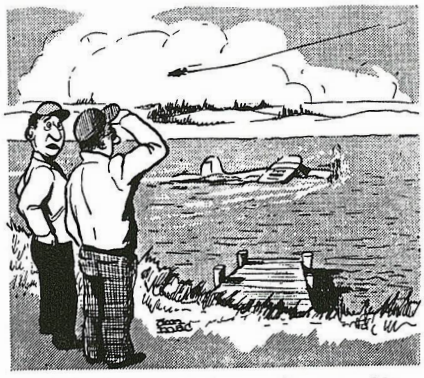
(Continued from page 18)

cept) radars and requires minimum of airplane auxiliaries.

Similar to the Sparrow 1 in general appearance, the Sparrow 2 is relatively light, under 500 lbs., and compact — a few inches over 12 feet in length. It can be carried in multiple units by fighter-type aircraft.

Douglas, whose missile experience dates from 1941, has been actively engaged in the Sparrow program since 1947. It had the responsibility for design and production of airframe elements of Sparrow 1 as a subcontractor to Sperry Gyroscope Co.

Prime contract for the Sparrow 2 was awarded to Douglas early in 1950. Originally, the missile was intended



"Can't seem to get her on the step, eh?"

for use with the Douglas F5D Skylancer, a naval interceptor which never went through its full cycle of development. When the Skylancer program was terminated by the USN, plans to produce the Sparrow 2 came to an untimely end also.

The Sparrow 2 was developed at the Douglas missile facility at Santa Monica. Field tests were conducted at the U.S. Naval Air Missile Test Centre, Point Mugu, Calif., where a Canadian team of Avro Aircraft and RCAF personnel are currently engaged, with two CF-100/5's, in a series of test firings of Sparrow 2's. The Canadian team's six-month stay at Point Mugu has about two months to go.

ARGUS

(Continued from page 17)

throttles and provided free braking action.

Limited Pressure: For the latter part of the landing roll, Scouten used the pedal-operated wheel brakes. Though brake pressure is supplied by the normal 3,000 psi hydraulic system, a restrictor in the lines limits the usable brake pressure to between 400 and 500 psi.

"But", warns Scouten, "You've got to be gentle with them. We've blown tires on the Argus using only 300 psi. An anti-skid device is planned for it, but they haven't decided on which one yet."

For taxying, the Argus is steered by the conventional wheel control in the cockpit. Normal hydraulic pressure is utilized here, and the co-rotating nosewheels are steerable through 50° either side of the centre line. A warning horn is incorporated to arouse the wheelhouse if that limit is being crowded.

Bill Kidd finished reading off the post-landing check with:

". . . flaps up, ADI off, and controls locked."

The anti-detonation injection switches are above the pilots' heads. The control locks are operated by levers in front of the captain; throwing these locks illuminates large amber warning lights on the panel. The fully-floating flight control surfaces on the Argus are hydraulically locked. On lock release, the spring-loaded ailerons move from up to the down position, allowing groundcrew to check for full travel movement.

Pilot's Dream: It seemed strange to witness the shutting-down of the engines by the flight engineer while the pilots sat with hands in their laps. As the last of the big fans swirled into silence one of them asked:

"We got everything on the snag sheet?"

"What about this movable map light?"

"What's wrong with it?"

"Won't move and won't light."

Halfway down the tarmac I turned for a final look at the Argus. It stood silent now, like a giant bird of prey, waiting and brooding in the dusk. A final shard of sunlight lanced across the infield to rim the towering fin with gold. I watched the flight test crew walking away from it in groups of two or three, like a football team trooping off the field still talking about the game. They were a team all right, but only a part of the bigger team that conceived and designed and built and flew that superb aircraft. The Argus . . . not only Canadair's achievement, but that of Canada's entire aircraft industry.