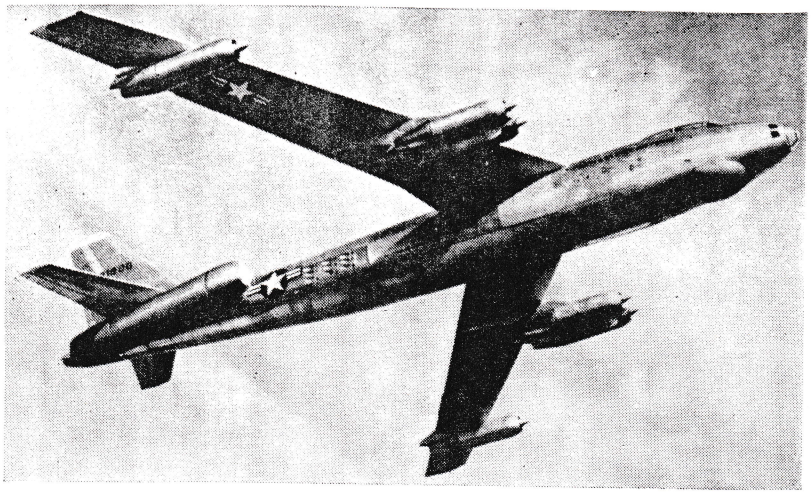

A Mount for the Iroquois

Orenda Engines' big new Iroquois turbojet will take to the air for the first time in the most unusual flying test bed yet to appear anywhere on the aeronautical scene.

As the accompanying artist's impression shows, the installation for the test engine is at the right rear of the fuselage, under the stabilizer of the USAF B-47B which has been loaned to the RCAF for flight testing of the Iroquois.

The conversion of the B-47 to its test bed role is being engineered and fabricated by Canadair Ltd. Far from being the straightforward job that it appears superficially, the installation design is so complex that it is occupying the attention of about 50 Canadair design engineers, who are being aided by special group of project men from Canadair's manufacturing division, and engineers from Orenda Engines Ltd.

The pylon which will hold the engine and pod will be attached to the right side of the fuselage near the rear of the aircraft, under the stabilizer, a unique departure from the more conventional types of test bed installations that have been utilized by various engine manufacturers in North America and abroad since the advent of the turbine engine.

In addition to designing, manufacturing and installing the engine-carrying pylon, Canadair will make provision for automatic panel observers, which will comprise facilities for recording tachometer readings, low and high pressure, altitude and air speed, jet pipe temperature, fuel flow, and the myraid other data which are necessary to assess performance of a new engine.

Although the Iroquois will be mounted relatively close to the aircraft's centreline, its power is so great (approx. 20,000 lb./st./th.) that it is expected to have an asymmetric effect on the B-47's flight characteristics. Because of this, when running the Iroquois it will be necessary to throttle back the jet bomber's three starboard General Electric J-47's.

While there will be discrepancies, naturally, in the behavior of the powerplant installed in the Canadair-designed test bed, and its behavior in aircraft for which it is specifically designed, the data gathered from the lengthy tests, even if they are not truly representative, are said to be accurate enough for engineers to make a reliable assessment of the engine's potential.

The conversion of the B-47 is expected to be completed by the end of this year, at which time the aircraft will be turned over to Orenda Engine Ltd. and the flight testing of the Iroquois will commence. These flight tests will be flown by Orenda Chief Test Pilot Mike Cooper-Slipper and his assistant, Len Hobbs, both of whom are soon to visit the U.S. to check out on the B-47.

It will be recalled that the Iroquois, formerly known as the PS-13 (Project Study 13), recently passed its U.S. 50-hour type test. Official designation of this test is the "Preliminary Flight Rating Test". Inspection of Iroquois parts following stripping of the engine after the test showed them to be in excellent condition, according to Charles A. Grinyer, vice president engineering & chief engineer of Orenda Engines Ltd.

It is well known that the USAF is following the development of the Iroquois with keen interest, and the use by Orenda Engines of the U.S. type test, in preference to its British equivalent, is undoubtedly a move on the part of the Canadian firm to stimulate this interest further. And if evidence of USAF interest is needed, it is to be found in the loan of an operational strategic bomber to the RCAF for purposes of flight testing the Iroquois.

The Iroquois was initiated by Orenda Engines as a private venture, and $8,000,000 was spent thereon by the firm before sponsorship was taken over this spring by the DDP on behalf of the RCAF.

burn to their right ears. The flight was realistic proof that protection against continuous radiant heat loads was most necessary.

Although many hundred projects in all are underway at IAM, a few of those requiring greatest laboratory space are described briefly in the following paragraphs.

Anthropometry, a term used to describe body measurements, is a project now underway in which 45 measurements of some 2,000 aircrew will be taken. Measurements include such dimensions as length of nose, width of palm, finger lengths and—one of the most important—thigh length. This latter measurement is used for cockpit designing in determining safe seat ejection from certain jet aircraft. Exact measurements are becoming increasingly important as well as a safety factor in the fitting of all flying clothing. In addition, results of the measurement analysis will be most useful for ordering quantities and sizes of clothing from manufacturers. Similar tests, but including a greater number of measurements, have been made in the USAF and from data available it is of interest that Canadian aircrew were found to average slightly over one inch more in height than their USAF counterparts.

The *High Altitude Pressure Suit,* presently undergoing tests, is expected to be in use very soon for aircrew whose flying duties take them beyond 45,000 feet. Intended as a "temporary replacement" for the pressurized cabin, the suit is in reality an emergency cut-fitting designed to bring the man down safely from very high altitude in the event cockpit pressure should fail or ejection be necessary. Lack of atmospheric pressure at very high altitude makes normal breathing even of pure oxygen insufficient to sustain life, hence a "pressure breathing system" has been incorporated in the suit. Through a face-mask within a helmet, oxygen is forced into the lungs, while an automatically inflated vest squeezes around the chest to assist him in breathing out.

The *Decompression Chamber,* a huge steel-bound chamber from which air can be pumped to simulate altitudes to any practical height, is used not only to familiarize aircrew with the effects of anoxia and pressure changes with altitude, but also to simulate the effects of explosive decompression. It is during

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