COLD LAKE WARMS UP
—and prepares for the Arrow: a visit to the R.C.A.F. Weapons Range in Alberta

TAKE-OFF from Edmonton Airport and head north-east. In just under an hour as the Dakota flies you may well be cleared for a straight-in approach to one of two long runways forming a vee and bounding a further vee of hangars and a wide, well-planned array of barrack blocks, offices and other buildings. This highly organized community is set in the midst of a vast undeveloped area of muskeg and forest: a few miles away lie the shores of Cold Lake, from which the station takes its name.

The station is a unit of Air Defence Command of the Royal Canadian Air Force, and it has a twofold function. On the one hand it carries out operational and refresher weapons training for CF-100 crews and also trains ground controllers; and on the other hand it is the home of the Air Armament Evaluation Detachment of the Central Experimental and Proving Establishment. This latter reference means that the Cold Lake area will shortly become a very noisy place for the servicemen, trappers, Indians, pelicans, moose, bears and other local inhabitants, with the advent of the CF-105 Arrow on its weapon-firing trials. It also means it will be worth the while of a wandering English journalist to brave the twin hazards of mosquito-bites and station hospitality to learn something about the place.

It so happened that the nine two-man crews of Course 58 of No. 3 Operational Training Unit were graduating their graduation on the evening of my arrival at Cold Lake. Commanded by W/C. E. W. Smith, D.S.O., the O.T.U. provides a 13-week course divided into basic, conversion, and advanced phases during which time crews are brought up to operational standard on the CF-100.

Students come to the O.T.U. either from the training pipeline or from other Commands. Pilots arrive at Cold Lake via a jet instrument course on T-33 “T-birds” at Saskatoon, and observers from the air-interception course using Mitchells at Winnipeg. An interesting feature of the O.T.U. course which has worked well is that the teaming-up of pilot and observer into CF-100 crew is left until after the students themselves. Early experience on the CF-100 is gained in dual-control CF-100 Mk 3s and also on two of the CF-100 simulators built by Canadian Aviation Electronics at Montreal. On the Advanced Flight, interceptions and navigation exercises by day and night are practised until proficiency is complete, the course graduates, and the resident Avro Aircraft representative presents the students with their CF-100 lapel-pins in between speeches at the celebration party in the mess.

Refresher training in rocket-firing for operational CF-100 squadron personnel is provided at Cold Lake by the Weapons Practice Unit commanded by S/L. W. H. Vincent. Most of the two-week course consists of live attacks on “Rapids” targets towed by T-33s over the Primrose weapons area, described later in this article. The radar reflectors inside the target, which resembles a 1,000 lb bomb, give a radarscope indication equivalent to that of a high-flying bomber. Two main safety precautions are taken: rocket-firing is carried out only when the towline weather is good; and the tow-plane as well as the target is first identified (the normal length of towline is 3,000-8,000 ft).

Another unit works in conjunction with W.P.U. to give similar operational practice to the ground controllers who direct the aircraft on their rocket-firing runs. This is the Controller Proficiency Unit, which was established at the base in January of last year and is commanded by S/L. S. E. Collins. Controllers temporarily assigned to C.P.U. are evaluated simultaneously with the W.P.U. aircrew carrying out their live rocket firing.

At first sight it appears strange that the station’s lodge unit, the Aircraft Armament Evaluation Detachment of the Central Experimental and Proving Establishment (a unit of Air Materiel Command) was in fact the first unit to be based at Cold Lake. This was in June 1954, when its job was the evaluation of the CF-100. The need for a weapons range where the R.C.A.F. could test its future rockets and missiles had earlier been realised in the selection of the Cold Lake area for such a range and its associated airfield site.

The weapons area itself is a wide strip of land, measuring 100 miles from east to west and 40 miles north-south, lying across the Alberta-Saskatchewan border on the 55th parallel. This is the general area in which the W.P.U. rocket-firing practice is carried out; while the Primrose evaluation range, a fully instrumented section based on Primrose Lake near the southern boundary of the range area, is the particular interest of the armament evaluation experts of C.E.P.E. It is here that the evaluation of CF-100 was carried out; it is currently the scene of the unit’s work with the Canadair Argus; and it will be here that Canada’s mightiest aircraft project yet, the Arrow, will be proved as a weapon system.

The R.C.A.F. approach to its evaluation of the Arrow, as described recently by S/L. A. W. Armstrong, consists of eight stages of which the aircraft weapon-system is the subject of the seventh. In addition, at least two of the earlier phases will be carried out at Cold Lake.

The first phase, being carried out by Avro Aircraft at Malton Airport at present, is devoted to airworthiness and equipment functioning. This initial flight programme is designed to check the aircraft as a flying machine over as much of the flight envelope as possible. This will be followed by the second phase, a preliminary R.C.A.F. evaluation, also at Malton, for the Service to obtain an initial first-hand appreciation of the handling characteristics and performance of the aircraft.

After a period of checking of any modifications found necessary, the fourth phase will consist of complete performance and handling trials by the R.C.A.F. Fifth comes the all-weather evaluation; sixth a period of intensive flying trials; and seventh the aircraft weapon-system evaluation, covering the airborne part of the complete weapon-system and its kill capability against specified targets. Finally, operational suitability trials will check the complete weapon-system in the defence system as a whole, and will enable maximum-effectiveness tactics to be devised.

In this overall programme, phases 2, 4, 5 and 7 and are the responsibility of C.E.P.E., of which the armament evaluation of phase 7 is by far the most complex part. The complete evaluation system which is needed, primarily for phase 7 but also for phases 4 and 5 and which was being prepared at the time of my Cold Lake visit last month, has been indicated by S/L. Armstrong in the diagram on the opposite page.

The officer commanding the armament evaluation detachment at Cold Lake is W/C. R. D. H. Ellis, who took time off to show me the unit’s facilities and to speak of its past, present and future work. Project K, the evaluation of the armament-control system of the CF-100, had been the first major project on which the group had cut its teeth. For the Defence Research Board, facilities had been provided for research and development work on Canada’s Velvet Glove air-to-air missile, while the current primary project concerned the Canadair Argus.

This programme included a study of the trajectories of various stores dropped from an Argus over a full range of speeds and heights, with observation by means of the cine-theodolites fringing Primrose Lake and also specially mounted cameras in the weapons bays, at the rear of the engine nacelles and beneath the wings and fuselage of the aircraft.

Before heading for the base camp at Primrose Lake, we took a quick look at the detachment’s facilities at its Cold Lake headquarters in No. 7 hangar. (There are, in fact, six hangars at Cold Lake, numbered 1, 2, 3, 4, 5 and 7.) Particularly impressive were the large photographic laboratory, the environmental test laboratory (including a large cold chamber, a smaller altitude/temperature chamber, and vibration rigs), the standards laboratory and the computer-equipped data-reduction section operated by Comput-