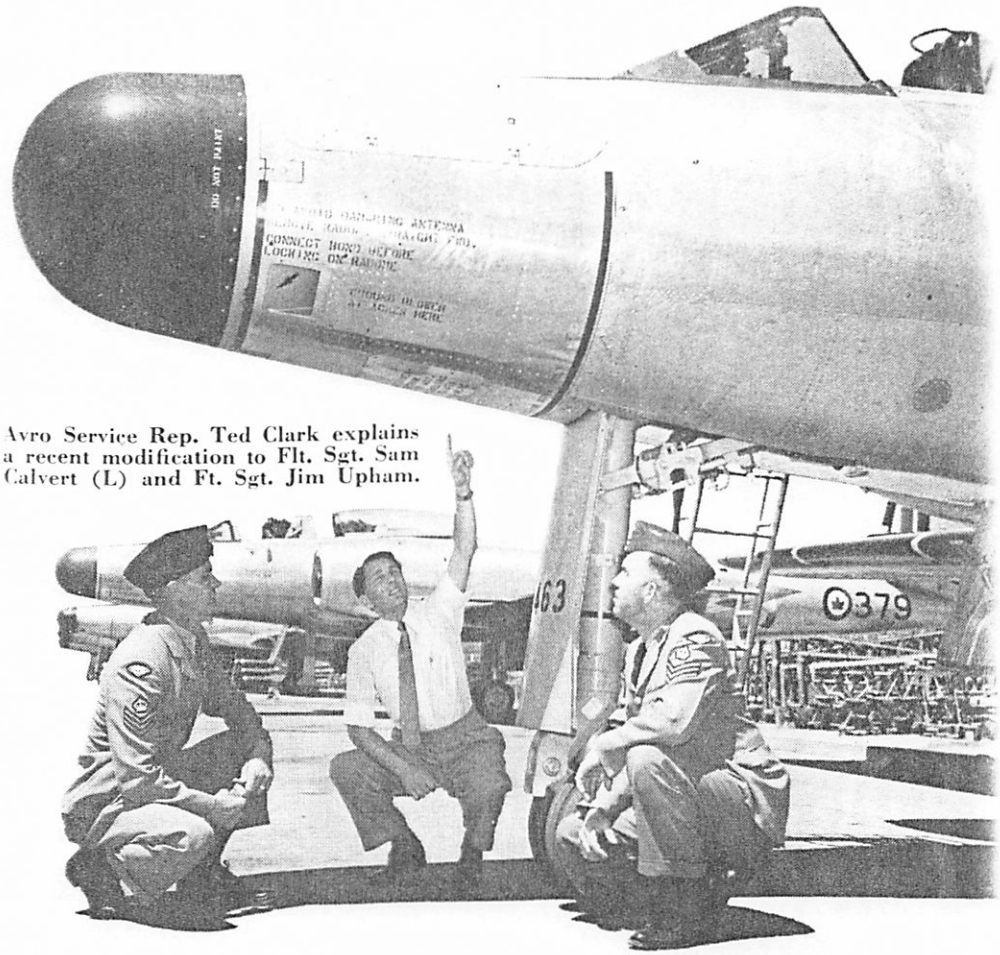

Avro Service Rep. Ted Clark explains a recent modification to Flt. Sgt. Sam Calvert (L) and Ft. Sgt. Jim Upham.

Operation of a Service Department

By HARRY McDOUGALL

AS AIRCRAFT themselves have become more complex, so have the problems of keeping them serviced. In the few years after the end of World War II, when the piston-engined Mustang-Mosquito era was drawing to a close and the Sabre and Canuck were ushering in the age of transonic and supersonic flight, the Air Force recognized that the great technological advances that were being made would bring in their wake a host of new problems. To "keep 'em flying" now requires teams of well-trained technicians whose work is becoming more and more specialized.

The training programs initiated for the benefit of ground crews have succeeded in keeping their skills at the same high level as those of the air crews. Nevertheless, when a new aircraft enters the Service in large numbers, problems arise which could not be foreseen either by the Service or by the manufacturer operating only a few prototypes. It is in the solving of these problems that the Air Force enlists the aid of the manufacturer's Service Department, a department set up for the specific purpose of ensuring that they receive the fullest possible cooperation from the men who designed and built the aircraft.

To operate efficiently, a Service Department is normally divided into two parts—a Field force of Technical Representatives who maintain a continuing liaison with the customer, and a Headquarters staff which analyses the reports received from the Technical Representatives and keeps them adequately supplied with the latest technical information.

Technical Representatives: If a large number of aircraft is operating from a single base, the Technical Representative has a semi-permanent appointment. If the aircraft are scattered through several bases he may be responsible for all aircraft within a defined area. In these days of global warfare the Technical Representative must be prepared to travel thousands of miles to be near the aircraft. In an emergency he may, on very short notice, be transferred from an eastern city to the west coast or from the shores of Hudson Bay to a base on the Gulf of Mexico.

The Technical Representative serves two principal functions. To the Service he is a general adviser and trouble-shooter, his main contact in a squadron being the Chief Technical Officer. To the company he is the principal liaison link with the users of the product. The steady flow of reports he sends in are analyzed and the conclusions drawn from them are transmitted to the various Engineering & Production departments and frequently form the basis of changes and modifications designed to improve the product. A Technical Representative's main qualifications are a good general technical background and an encyclopedic knowledge of the aircraft, gained from his training at the manufacturer's plant. A good Technical Representative can do much to help the users in assimilating a new product. With his advice and assistance the maintenance and ground crews are able to solve minor problems "on the spot". Only if a major problem arises should he have to refer back to his Headquarters for additional information.

The reports received from all the Representatives are continually collated and analyzed and information from them is entered into a file which forms a permanent record of the operational life of each aircraft. From these records it is possible to determine how aircraft are standing up in squadron use. If a particular component or system gives trouble it soon becomes apparent whether the incidents are isolated or whether there is any recognizable pattern of behaviour. The appropriate remedial action can then be taken on the required scale.

Headquarters Staff: The Headquarters Staff which backs up the Technical Representatives is composed largely of technicians with the same basic training as the Representatives. Since

they have access to all sources of information within the company they are in a position to answer any queries received from the Field without undue delay. On receipt of a query a member of the Headquarters staff is delegated to initiate the necessary investigation. The solution to the problem may be sent to the Technical Representative by mail or if urgent it may be telephoned.

One of the principal functions of the Headquarters Staff is to keep the Representatives supplied with the latest technical data in the form of manuals, service and modification bulletins etc. Most problems arise from the use of new equipment or the incorporation into the aircraft of new modifications. The Headquarters staff must see that the Technical Representative is "armed" with all the latest data as it becomes available.

up to date

AS THE Technical Publications Dept. is normally a part of the Sales & Service Div., the Headquarters and Field staff are assured of a steady flow of Maintenance Manuals, Operating Instructions and Part Lists. However, in certain instances where it is required to distribute new information quickly the Headquarters Staff prepares its own information for distribution. This may take the form of Service or Modification Bulletins.

The Service Bulletins issued by a manufacturer provide a means of disseminating preliminary information and advice to the Technical Representatives. The great advatage of the Service Bulletin is the rapidity with which it can be prepared and distributed. Within 24 hours of a problem arising, its solution in the form of a Service Bulletin may be on the way to the Technical Representatives at every operating unit in the Service.

Modification Bulletins are particularly useful in covering Retrofit Mods which are to be carried out on the units. The Bulletin details the work to be carried out, identifies the spares required and if necessary is illustrated by sketches showing the location of the Mod and the method to be employed in installing it. The manufacturer provides the Modification Bulletin to Air Materiel Command, who in turn issue it officially as an Engineering Order.

Preliminary Studies: The Service Department takes an interest in a new design long before the aircraft is delivered to the Air Force. When design conferences are held, the Service Department is usually represented, one of its tasks being to try to ensure that maintenance will be simplfied and that every component which needs periodical servicing will be readily accessible. By following the progress of the design as it gradually appears under the draftsman's pen, the Service Department is not only able to become thoroughly familiar with the new aircraft but it is frequently able to forestall problems which might otherwise cause many wasted manhours when the aircraft reaches the squadrons.

An aircraft designer values the opinions of members of the Service Department, since they are familiar with most of the operating and servicing problems liable to be encountered when the aircraft reaches the squadrons. Their problem will ultimately be to keep the aircraft flying when it is far away from the manufacturer's base of operations and their sympathies are fundamentally with the Air Force mechanic. In below zero weather, the parka'd be-gloved mechanic attempting to make an awkward adjustment may be inclined to judge an aircraft entirely on whether the access panel has been located in the right position. Part of the Service Department's task is to make every effort to ensure that it is, that the panel is the right shape —and that there are enough of them! The provision of access panels can be a thorny problem to the designer when Aerodynamics object to all excrescences, and Stress looks with disfavour on all potential sources of structural weakness. Only by having a strong influence on the usual Engineering compromises can servicing problems be forestalled.

Ground Handling: The Service Department invariably has strong opinions on the provisions which are made for the ground handling of an aircraft. How will the aircraft be towed? Can it be towed rearward in an emergency? Has proper provision been made for jacking? Are there a sufficient number of jacking points? Has the designer made provision for raising the aircraft in the event of a wheels-up landing? Are there a sufficient number of slinging points? Has provision been made for lifting the entire aircraft without dismantling? If, as is frequently the case, a Specialist Engineer is appointed to take responsibility for providing for ground handling equipment, he usually works in close liaison with the Service Department who are able to give him the benefit of their experiences with preceding aircraft.

To speed up the transition from prototype to serviceable production aircraft is one of the principal objects of today's design teams. The Service Department renders useful assistance in achieving this very desirable objective.

The Service Department's Headquarters staff is usually also responsible for Periodic Maintenance Schedules, which are prepared in rough draft form even before the aircraft is built. As new features are embodied into the aircraft and as experience with the prototype mounts, the Schedule is continually modified and brought up to date. When the first production aircraft is delivered, the manufacturer passes a copy of the schedule to the Air Force who use it to assist in preparing the official Inspection Schedule for distribution to the operating units.

mobile repair

THE CONSERVATION of manpower is a prime consideration in any Service. The repair of damaged aircraft is normally carried out by Service personnel but if a particular repair would consume the time of too many skilled personnel, the squadron or unit may, through Air Materiel Command, ask the manufacturer to send out a Mobile Repair Party with the necessary parts and tools to effect the repair. Contractor's Mobile Repair Parties come under the direction of the Service Department which is responsible for ensuring that the work is carried out in the most efficient manner. The Technical Representative provides the necessary technical liaison between the unit and the Company's personnel. On completion of the repair or modification, the Technical Representative ensures that it is acceptable to the Resident Technical Officer before the Mobile Repair Party returns to the plant.

When a new aircraft is being introduced into the Service, the manufacturer can often assist in the training of ground crews by setting up lecture courses. These are usually held at the

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Association's auditors will prepare a detailed breakdown of the way in which the money is used. Cheques should be made out to the Soaring Association of Canada World Contest Fund. Any contribution . . . to the Fund will be gratefully received by the SAC's directors and gliding enthusiasts in all parts of Canada.

Frank Brame
SOARING ASSOCIATION OF CANADA

Estimated Cost of Sending Team of Canadian Pilots to 1956 World Gliding Contest at St. Yan, France

Return air fare to and from Paris, France: 7 @ $550 per person	$3,850
Insurance of borrowed French equipment: @ $100 per machine	$400
Entry fees: @ $25 per person	$175
Retrieving expenses: 10 contest flights @ 10c per mile	$1,400
Total	$5,825

Ed.: The address of the Soaring Association of Canada is: P.O. Box 851, Ottawa, Ont.

PHILIPPINES OTTER

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engines in Beavers and Otters all over the world reduce this aspect to a modest level of importance. The pilots believe that the low stalling speed and extraordinary robustness of the Otter will take much of the peril out of a forced descent in the jungle tops. A glance round the cabin where a planter reads "Time" magazine and a young mother nurses her baby as we skim the mahogany forests under a low cloud base, with no navigation aids beyond the pilot's profound local knowledge and experience, quickly persuades one that the public are taking to the Otter with unreserved satisfaction.

Time & Money: Public enthusiasm is not hard to explain; take a glance at a map of the Philippines and consider these facts. The land journey from Gingoog to Buenavista takes five hours by car and costs 40 pesos. The Otter takes 20 minutes and the fare is nine pesos. Bislig to Davao is a 50-minute Otter flight. Alternatively you can spend a week on a coastal freighter which sails once a month. Lianga to Bislig is a 20-minute Otter flight or a 24 hour journey by outboard motorboat and truck for nine months of the year: during the monsoon there is no surface communication. North from Lianga, the flight to Buenavista takes 30 minutes by Otter and there is no land communication except a three-day foot-trail. Admittedly there is a five-day sea trip or a week on a river boat, when available. No wonder the Otter remains popular!

What then is wrong with the Otter? Well the entrance ladder which suits the Royal Canadian Mounted Police is pretty unsatisfactory. Women *do* wear high heels in the bush occasionally, praise be.

SERVICE DEPT.

(Continued from page 34)

manufacturer's plant and are organized by the Service Department.

Frequently the lectures are attended by not only Air Force personnel but also by the Technical Representatives before being sent into the Fied. In this way they can be kept up to date with the latest developments and made familiar with new equipment before it is delivered to the squadrons. Similarly, the Service Department sometimes arranges for courses of instruction to be given by the Representatives of equipment manufacturers whose components are fitted in the aircraft.

The opinions of members of the Service Department often have an important influence on the types and quantities of spares ordered. By analyzing its Representatives' reports, valuable conclusions can often be drawn on the future parts requirements of the units operating a particular type of aircraft. When Parts Provisioning Meetings are held at the manufacturer's plant, the Service Department is invariably represented, and acts in support of the Parts Department in advising the teams of Service Procurement specialists on the parts most likely to be required as spares and in estimating usage rates.

Perhaps the greatest benefit derived from an efficient Service Department is the contribution it makes to the steady improvement in the design of the aircraft, particularly in the simplfying of servicing techniques. Through the manufacturer's Technical Representatives, Service personnel who are actually working on the aircraft have a positive link with the men who design and build the aircraft, and a channel through which queries, constructive criticisms, and helpful suggestions can flow in both directions — a process which inevitably results in the production of a better, more efficient and more serviceable fighting unit.