fuselage and the junction is covered by readily removable fairings.

The flying controls are similar in design and construction. Ailerons, elevators and rudder all have inset hinges, geared tabs and projecting horns carrying adjustable mass balances. They are all of two spar construction with an intermediate spanwise stiffening diaphragm. The rudder and elevators have a minimum of ribs, but the 24 swg light-alloy skin is stiffened by pressed-in beads. The aileron has a smooth 26 swg skin with closely-spaced ribs. The starboard aileron and elevators tabs are also trim tabs. Control and trim runs are mainly by tie-rod with cable inserts round bends and for the whole of the aileron run in the wing to the differential units. The trim tabs are actuated by screw jacks at the control surfaces.

The plain flaps are of similar construction to the ailerons and they are actuated by a single hydraulic jack operating on a common torque shaft. Flap settings are 30° for take-off and 50° for landing.

The undercarriage units are by Dowty, piston-type main legs and lever-action nosewheel with a liquid-spring shock-absorber working in compression. Disc brakes are standard. One large double-acting hydraulic jack under the cockpit floor raises and lowers the nosewheel directly and the main wheels through a drum-and-cable/sprocket-chain system. Mechanical linkages actuate the wheel doors, but down locks for all legs and the up lock on the nosewheel are operated by small hydraulic jacks.

The Armstrong Siddeley Viper is installed on a simple triangulated tubular mounting carried from the junctions of the floor and the wing spar frames. The bifurcated air intake ducts incorporate fuselage boundary-layer bleeds which spill under the wing root fillets. There is no cylindrical settling duct, the intakes leading directly to port and starboard halves of the compressor eye. An extension drive from the compressor shaft powers a Rotol accessory gearbox mounted on the cockpit rear bulkhead. The combustion zone is isolated between firewalls and is fitted with continuous Fire-wire detectors. Both sections of the engine bay have Graviner spray rings. The jet pipe, which slides in and out on a rail in the top of the rear fuselage, is insulated with Refrasil blankets. The engine change unit (ECU) consists of the bare engine, the engine-mounted portion of the front firewall and the oil system.

The Viper ASV 8 is a seven-stage axial compressor turbojet with a maximum thrust of 1,750 lb. at 13,800 rpm. Under these conditions the air mass flow is 32 lb./sec., turbine temperature 850°C and the specific fuel consumption 1.12. Control is by a throttle lever and LP and HP cocks. The throttle is cable operated as far as the engine, with a push-pull system for the fuel

OLD FRIENDS: Two former factory bench hands working on Fairey seaplanes in 1923, met recently in Halifax. At the left is C. E. Hibbert, managing director of Fairey Aviation Co. of Canada Ltd., and on the right is Sir Roy Dobson, board chairman of A. V. Roe Canada Limited.

control unit, while the fuel cocks are operated by Teleflex.

The fuel system consists of three interconnected flexible bag tanks in each wing, with a total capacity of 186 imp. gals.—the tip tanks give another 100 imp. gals. The port and starboard main systems are regarded as single tanks and they feed by gravity to a collector tank in the bottom of the fuselage, where a booster pump feeds the engine direct and maintains a two-gallon recuperator which is pressurized to 7 lb./sq. in. by compressor bleed. The fuel system is pressurized from ram-air and compressor-bleed sources, this system being used to transfer fuel from the tip to the main tanks.

The aircraft systems include crew oxygen, heating and ventilation for the cockpit—there is no pressurization—and windscreen de-misting and de-icing by compressor bleed air. Engine intake ice detectors (P.S.C. Mk. 8) can be fitted to S.O.O. The electrical system is supplied from a 28-volt Rotax generator, with a 115-volt 400 cps three-phase alternator for navigational instrument and fire-warning supplies. Two 24-volt, 25-amp hour batteries are mounted in the fuselage nose. The hydraulic system is powered by a Dowty Mk. 4 "live-line" pump with a 60 cu. in. accumulator. The normal operating pressure is 1,400 psi. The system operates the undercarriage, flaps, air brakes and wheel brakes. In the event of pump or engine failure, the accumulator gives one operation of air brakes and flaps—the wheel brakes have their own reserve accumulator. There is no separate emergency system and the handpump is for servicing use only.

GUNNERY

(Continued from page 55)

came home wearing the flag."

Too Close: It was good for a laugh too. Nobody mentioned the other pilot who pressed an attack too close. The flag wrapped itself around his canopy and he never got out before hitting the water 15,000 feet below. You push the thought away.

In succession, the first three Sabres peel off. Number three shows an oil-stained belly as he rolls into the dive. You watch until he starts reversing his turn. Time to go.

"Blackbird Four is in."

And almost as an echo comes the transmission:

"Blackbird Two is off."

It means that the circuit is working right. With four aircraft in the gunnery pattern, good timing is essential. As the leader pulls off the flag, the Three-man should be coming off the perch. At the same instant the Two-man should be reversing his turn onto the flag. If anyone goofs, the whole pattern is fouled up.

On Target: Now you are nursing it around the last turn. Dragging the pipper toward the flag. Concentrating on holding it on the fluttering gray banner. Smoothly now, hold it there, gentle squeeze of trigger. Machine gun fire and a vibration. Smoke trails and a jumping pipper.

Thirty minutes is about par for actual time-on-the-flag. Thirty arm-aching minutes of violent maneuver and sweaty concentration. Roll-off the perch, roll-into the attack, roll-out of