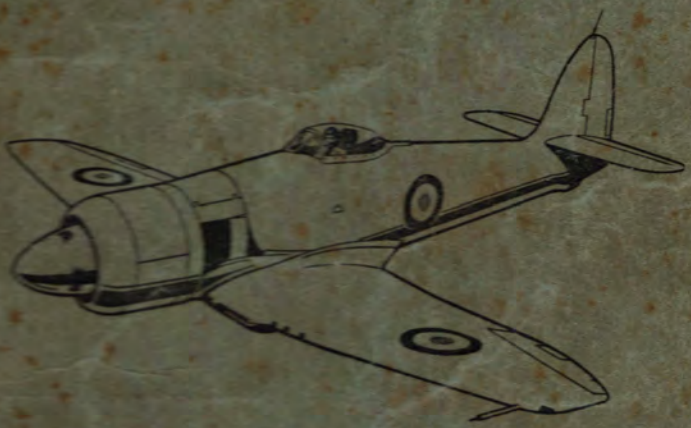
3rd Edition

A.P. 4013B.—P.N.

PILOT'S NOTES

FOR

SEA FURY F.B.II



PREPARED BY DIRECTION OF THE MINISTER OF SUPPLY

A. C. Rowlands

PROMULGATED FOR INFORMATION AND GUIDANCE OF ALL CONCERNED BY COMMAND OF THEIR LORDSHIPS

J. G. Lang

AMENDMENTS

Amendment lists will be issued as necessary and will be gummed for affixing to the inside back cover of these notes.

Each amendment list will, where applicable, be accompanied by gummed slips for sticking in the appropriate places in the text.

Incorporation of an amendment list must be certified by inserting date of incorporation and initials below.

A.L. NO.	INITIALS	DATE	A.L. NO.	INITIALS	DATE
1	[illegible]	28.1.54	7		
2			8		
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5			11		
6			12		

NOTES TO USERS

These Notes are complementary to A.P. 2095 Pilot's Notes General, and assume a thorough knowledge of its contents. All pilots should be in possession of a copy of A.P. 2095 (*See* A.F.O. 3789/48).

Additional copies may be obtained from Head of Military Branch (Books), Admiralty Block C, Station Approach Buildings, Kidbrooke, by application on Royal Navy Form S134D or D397. The number of the publication must be quoted in full —A.P. 4018B—P.N.

Comments and suggestions should be forwarded through the usual channels to the Admiralty (D.A.W.).

LIST OF ASSOCIATED PUBLICATIONS

	AP
Aero-engine fuel pumps	2241
Air compressors	1519
Airborne relay equipment 10-channel V.H.F.	2538 HA
Aircraft fuel and oil tanks	4117 A
Aircraft gun firing control mechanisms	1641 E
Aircraft hydraulic and undercarriage equipment, Dowty	1803 D, E
Aircraft operation and servicing under low temperature conditions ...	1441 A
Armament installations—Sea Fury	(N) 1023 (2)
Cartridge starters	1181
Cine cameras ...	1355 D
Electrical equipment manual	1095 A to C
Engine—Centaurus Mk. 18	4146 B
Hispano 20 mm. guns	1641 F
Hobson-RAE fuel injection equipment	2239 A
Instrument manual	1275 A to E
Parachutes, harnesses and safety harness ...	1182 A, B
Power plant (A)—Sea Fury	4158 A
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Sea Fury aircraft	4018 B
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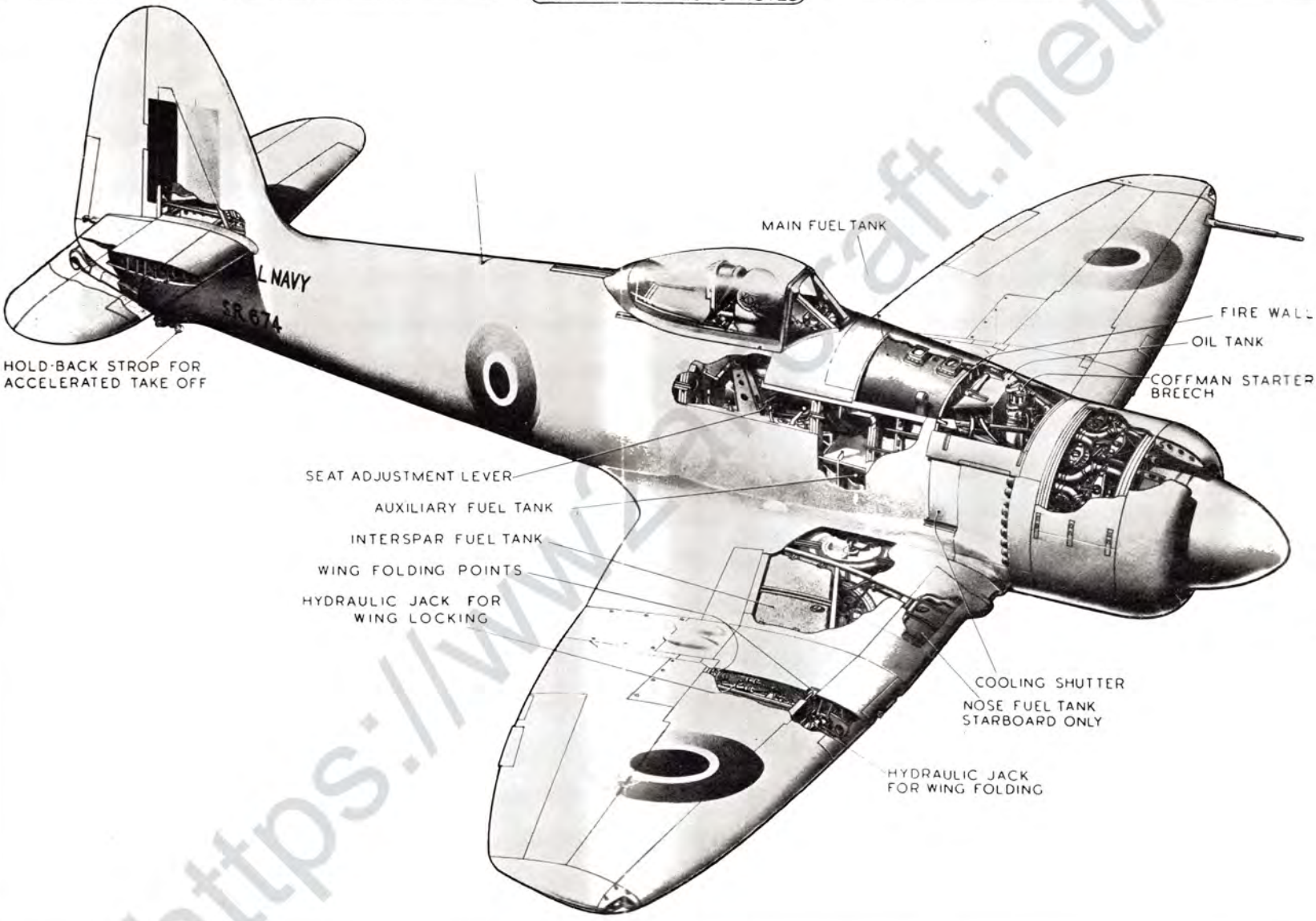

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May, 1952

A.P. 4018B—P.N.
Pilot's Notes
3rd Edition

SEA FURY FB11

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This edition supersedes all previous issues.

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SEA FURY FB11

PILOT'S CHECK LIST

(Excluding Items of Operation Equipment)

ITEM	CHECK
External checks	
N.B.—Start at the cockpit entrance on the port side and work clockwise round the aircraft.	
Port mainplane	Condition of upper surface
	Panels secure
	Wing locking indicator not showing
	Condition of flap
	Condition of ZBX aerial
Port aileron	Condition
	External control lock removed
Port navigation light	Condition
Port mainplane	Condition of leading edge
	Pressure-head cover removed
	Security of drop tank (if fitted)
	Condition of amber identification light
	Condition of lower surface
Port undercarriage	Extension of oleo leg
	Tyre for cuts and creep
	Valve free
	Brake lead secure
	Condition and security of fairing doors
	Condition of attitude light
Oil cooler	Condition
	Condition and position of shutter
Engine cooling shutter	Position
Port air intake	Clear
Fuselage undersurface	Condition
	All panels secure
Engine	Cowling secure
	Absence of oil leaks
	Condition of propeller and spinner
Engine cooling shutter	Position
Starboard air intake	Clear
Starboard undercarriage	Extension of oleo leg
	Tyre for cuts and creep
	Valve free
	Brake lead secure
	Condition and security of fairing doors
	Spare cartridge container full
Starboard mainplane	Condition of leading edge and lower surface
	Security of drop tank (if fitted)
	Condition of red and green identification lights
Starboard navigation lights	Condition
Starboard aileron	Condition.
	External control lock removed
Starboard mainplane	Condition of upper surface
	Panels secure
	Wing locking indicator not showing
	Condition of flap
	Condition of I.F.F. aerial
Rear fuselage	Condition of starboard and under surfaces
	Panels secure

ITEM	CHECK
Tailwheel	Condition of tyre Extension of oleo leg Fairing doors, condition and security Condition of attitude light
Starboard tailplane	Condition of leading edge, upper and lower surfaces
Starboard elevator	Condition External control lock removed Condition of trimming tab
Tail light (starboard)	Condition
Fin	Condition of starboard side
Rudder	Condition External control lock removed Condition of trimming tab
Arrester hook	Condition and security
Tail light (port)	Condition
Port elevator	Condition External control lock removed Condition of trimming tab
Port tailplane	Condition of upper and lower surfaces Condition of leading edge
Fin	Condition of port side and leading edge
Rear fuselage	Condition of port side Condition of V.H.F. aerial Operation of footstep Canopy external jettison toggle secure

ITEM	CHECK
Mount the wing and check:—	
Canopy	Condition and security Jettison pins projecting Locking pin in shallow slot
Fuselage top panels	Condition and security
Internal checks	
Internal control locks	Removed and stowed
Wing folding lever	SPREAD Locking catch engaged
Undercarriage lever	DOWN Locking catch engaged
Seat	Adjust for height
Rudder pedals	Adjust for reach
Flying controls	Full and correct movement
Wheel brakes	On
Cockpit checks	
N.B.—Set the GROUND/FLIGHT switch to FLIGHT and then work from left to right.	
Hydraulic handpump	Operation
Bomb rack jettison	Fully down
Arrester hook release	Forward Indicator light out
Training switch	OFF
Trimmers	Full and correct movement
RATOG master switch	OFF
Supercharger gear change lever	M (up)
Fuel cut-off lever	CUT-OFF
Throttle	Full and free movement Adjust friction
R.p.m. control lever	Full and free movement Set to MAXIMUM

ITEM	CHECK
Flap lever	UP
Undercarriage indicator switch	ON Green lights on Change-over switch and dimmer screen
Ignition switches	OFF
R.I. compass (if fitted)	Reading
Flap position indicator	Reading
Altimeter	Set as required
Direction indicator (if fitted)	Caged
Magnetic compass	Serviceability Reading
Mk. 4F compass (if fitted)	Condition Warning light on
Cockpit lighting	Test all lamps Set as required
Windscreen de-icing pump	Operation
Generator warning light	On
Oxygen	Contents and delivery
Engine cooling shutters switch	Operation Set to OPEN
Boost gauge	Static reading
Canopy jettison handle	In
Canopy	Operation of winding handle
Undercarriage and flaps emergency levers	Back Locking pin secure
Main fuel cock	ON
Drop tanks jettison lever	Forward (if tanks fitted) Back and locking plate in position (if tanks not fitted)
Wing drop tanks cock	OFF
Mixer switch	R/T position
Cockpit heater	As required

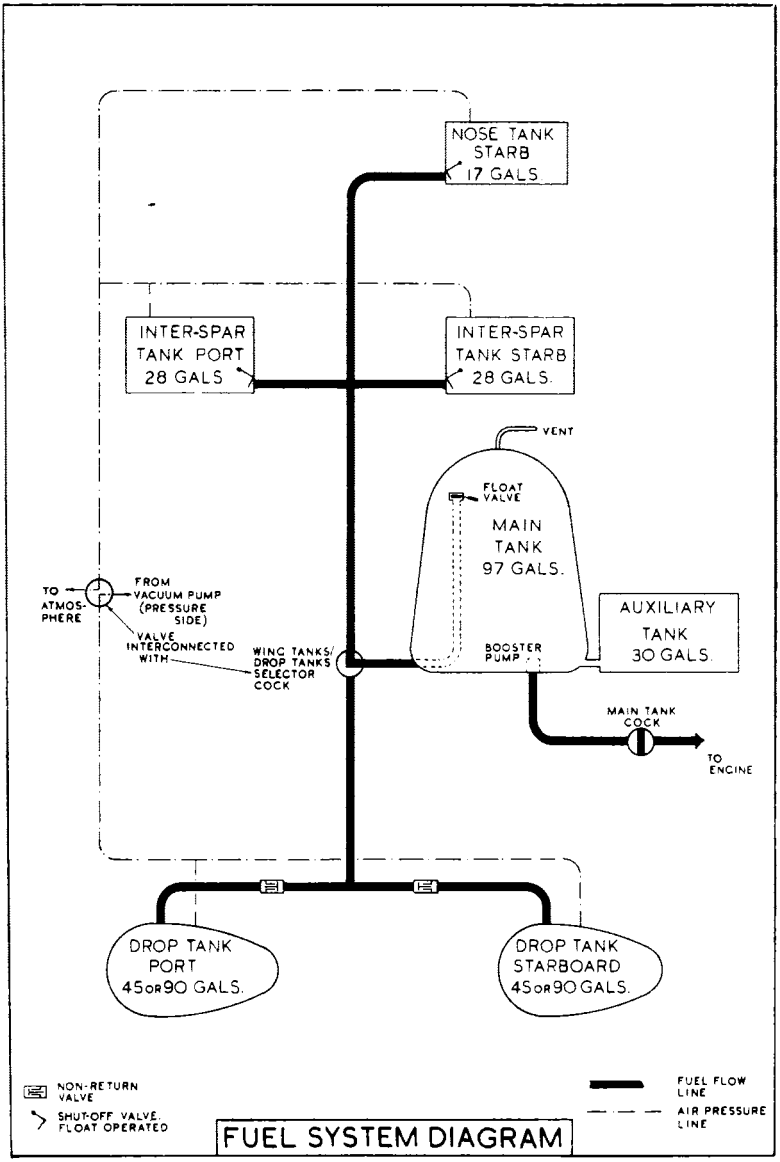
ITEM	CHECK
Tailwheel locking lever	FREE (back)
Fuel gauges	Contents
Identification and navigation lights	As required
Pressure-head heater	OFF
Air-intake filter control	Operation and warning lights Set to FILTER
Mk. 4F compass (if fitted)	OFF Circuit breaker in
Air-intake heat control	NORMAL
Fuel pump circuit breaker	On
Harness	Adjust
Checks before starting	
Ignition switches	OFF
Booster pump	OFF
Main fuel cock	ON
Fuel cut-off control	CUT-OFF
Throttle	½-1" open
R.p.m. control lever	MAXIMUM
Air-intake heat control	NORMAL
Air-intake filter control	FILTER
Engine cooling shutters	OPEN
Supercharger control	M (low gear)
Ground/Flight switch	FLIGHT
Checks after starting	
Direction indicator (if fitted)	Set with R.I. compass Uncage
Flaps	Operation
Radio	Test V.H.F. and other radio aids
Altimeter	Set
Pneumatic pressure	Supply increasing

ITEM	CHECK
Checks before taxying	
Tailwheel	FREE
Wheel brakes	Operation
Flight instruments	Serviceability Mk. 4F compass OFF (if fitted)
Pressure-head heater	As required
Checks before take-off	
Trimming controls:	
Elevator	Neutral (without flap) ½ Div. nose up with flap)
Rudder	Fully left
Throttle	Friction adjusted
R.p.m. control lever	MAXIMUM
Fuel	Main cock ON Contents Booster pump ON
Flaps	UP (airfield) MAX. LIFT (catapult) TAKE-OFF (carrier)
Wings	SPREAD and locked
Instruments	Set Mk. 4F compass ON (if fitted)
Engine cooling shutters	OPEN
Supercharger control	M (low gear)
Air-intake heat control	NORMAL
Air-intake filter control	FILTER NORMAL (carrier)
Canopy	Locked open
Harness	Locked
Checks before landing	
Fuel	Contents Booster pump ON
Undercarriage	DOWN and locked Three green lights Visual indicators protruding
R.p.m. control lever	2,400 r.p.m.
Brakes	Off Pressures
Supercharger control	M (low gear)
Air-intake heat control	NORMAL
Air-intake filter control	FILTER NORMAL (carrier)
Flaps	MAX. LIFT Then as required
Tailwheel	LOCK (airfield) FREE (carrier)
Canopy	Open and locked
Engine cooling shutters	SHUT
Checks after landing	
Booster pump	OFF
Flaps	UP
Engine cooling shutters	OPEN
R.p.m. control lever	MAXIMUM
Brakes	Sufficient pressure

ITEM	CHECK
Pressure-head heater	OFF

Checks after stopping the engine

Ignition switches	OFF
Electrical services	All off
Fuel cock	OFF
Ground/Flight switch	GROUND
Direction indicator (if fitted)	Caged
Chocks	In position
Brakes	Off


NOSE TANK STARB 17 GALS.
INTER-SPAR TANK PORT 28 GALS.
INTER-SPAR TANK STARB 28 GALS.
VENT
FLOAT VALVE
MAIN TANK 97 GALS.
AUXILIARY TANK 30 GALS.
TO ATMOS-PHERE
FROM VACUUM PUMP (PRESSURE SIDE)
VALVE INTERCONNECTED WITH
WING TANKS/ DROP TANKS SELECTOR COCK
BOOSTER PUMP
MAIN TANK COCK
TO ENGINE
DROP TANK PORT 45 OR 90 GALS.
DROP TANK STARBOARD 45 OR 90 GALS.
NON-RETURN VALVE
SHUT-OFF VALVE, FLOAT OPERATED
FUEL FLOW LINE
AIR PRESSURE LINE
FUEL SYSTEM DIAGRAM

PART I

DESCRIPTIVE

NOTE.—Throughout this publication the following conventions apply:—

(a) Words in capital letters indicate the actual markings on the controls concerned.

(b) The numbers quoted in brackets after items in the text refer to the illustrations in Part V.

(c) Unless otherwise stated all speeds quoted are indicated airspeeds.

INTRODUCTION

1. The Sea Fury FB11 is a single-seat naval fighter/bomber powered by a Centaurus Mk. 18 piston engine driving a 5-bladed constant speed propeller. It is a low wing monoplane and is fully equipped for universal airfield and carrier operation.

FUEL AND OIL SYSTEMS

2. **Fuel tanks**

(i) Fuel is carried in five self-sealing tanks, two in the fuselage aft of the fireproof bulkhead, one inter-spar tank in each inner wing and one in the leading edge of the starboard inner wing. The two fuselage tanks and the leading edge tank are of flexible construction where-

as the inter-spar tanks are of rigid construction. The fuselage tanks are inter-connected and may be regarded as forming one unit.

(ii) Two 45 or 90 gallon wing drop tanks may be carried, one under each wing. The drop tanks jettison lever (62) is on the cockpit starboard shelf.

(iii) There is no provision for isolating separate tanks, the wing tanks or the drop tanks being used as a group. Transfer from either group to the fuselage tank, by means of air pressure from the exhaust side of the vacuum pump, commences when the contents of the fuselage tanks have fallen to 117 gallons. The rate of transfer is controlled by a float-operated valve in the main tank and the fuel level is maintained at 117 gallons until transfer is complete.

(iv) The tank capacities are:—

Main fuselage tank ...	97 gall.
Auxiliary fuselage tank ...	30 gall.
Inter-spar tanks 2 × 28 gall.	56 gall.
Leading edge tank	17 gall.
Total (internal)	200 gall.
Wing drop tanks 2 × 45 or 90 gall.	90 or 180 gall.
Total (all tanks)	290 or 380 gall.

3. Fuel cocks

(i) *Fuel transfer cock*

The transfer of fuel from the wing tanks or from the drop tanks is controlled by a selector lever (61) on the cockpit starboard shelf. When the lever is moved forward to ON fuel is transferred from the drop tanks; when it is pulled back to OFF fuel is transferred from the wing tanks. The group of tanks not in use is automatically turned off and vented to atmosphere.

NOTE.—When drop tanks are not carried the selector lever must be OFF otherwise transfer of fuel from the wing tanks will be prevented; a restriction plate should be screwed in place to prevent accidental movement of the lever.

(ii) *Main fuel cock*

The flow of fuel from the main tank, which is not pressurised, is controlled by the cock (60) on the starboard shelf. The cock should be rotated clockwise to ON.

4. Fuel booster pump

(i) An electrical fuel booster pump is fitted in the sump of the main tank to assist in supplying fuel to the engine. The pump is automatically switched on when the engine oil pressure rises above 30 lb./sq. in. and is switched off again when the pressure falls below this figure. When Mod. 309 is incorporated the pump is manually controlled by a switch (80) at the forward end of the starboard shelf. The switch should be ON before flight and OFF after landing.

(ii) Should the booster pump fail when the engine is running, fuel will still be supplied to the engine by the injector pump.

(iii) A circuit breaker (71) at the aft end of the starboard shelf protects the booster pump circuit. A test push-button (91) and an ammeter test socket (92) are on the starboard shelf.

5. Fuel contents gauges

(i) The fuel contents gauges (83), (84) and (77) for the built-in tanks are on the starboard shelf and indicate whenever electrical power is available. The fuselage tanks gauge will not register correctly until its power unit warms up, approximately half a minute after switching on.

(ii) No contents gauges are fitted for the drop tanks.

6. **Fuel level warning light**

(i) A warning light (79) forward of the fuselage tanks gauge comes on when the contents of the main tank have fallen to approximately 107 gallons, thus indicating that fuel transfer has ceased.

(ii) No fuel pressure warning light is fitted.

7. **Fuel tanks air pressure gauge**

A gauge (59) marked TANK AIR adjacent to the fuel transfer lever shows the air pressure available for fuel transfer. It should normally read between $3\frac{1}{4}$ and 5 lb./sq. in. Should the pressure fall below $3\frac{1}{4}$ lb./sq. in. transfer will be unsatisfactory at high altitudes.

8. **Priming system**

(i) *Carburettor priming*

The INJECTOR PRIMING pushbutton (82) is at the forward end of the starboard shelf. Before priming, the main fuel cock should be ON, and in order to complete the electrical circuit to the pushbutton and to prevent accidental flooding of the engine, the fuel cut-off lever must be at CUT-OFF. When the button is pressed it starts the main tank booster pump which delivers fuel to the injector. Excess fuel is returned to the main tank.

(ii) *Cylinder priming*

(a) The CYLINDER PRIMING pushbutton (81) is at the forward end of the starboard shelf. The letters H.P. on the spring flap indicate that a high-pressure priming pump is fitted. When the fuel cut-off lever is at CUT-OFF and the priming button is pressed the booster pump and the priming pump are started and the priming pump injects fuel into the induction system. When the fuel cut-off lever is at NORMAL the booster pump is out of circuit and only the high-pressure pump is operated by the push-button. This condition is intended for induction priming during starting after the engine has fired, if it is necessary to assist the engine to pick up on the injection carburettor.

(b) Provision is made for induction priming with high volatility fuel from an outside container, via a connection in the port wheel well.

9. **Oil system**

(i) The oil tank, situated in the engine bay forward of the fireproof bulkhead, has a capacity of 14 gallons of oil with a 4 gallon air space. A negative "g" valve ensures a continuous supply of oil to the engine under all conditions of flight.

(ii) The oil cooler, in the port wing root, incorporates a thermostatically controlled automatic shutter.

(iii) An oil dilution system is fitted, the operating pushbutton (90) being situated on the starboard shelf.

ENGINE CONTROLS

10. **Throttle control**

The throttle control lever (10) moves in a quadrant, marked SLOW RUN—E.C.B.—TAKE-OFF, on the engine controls box. Economical mixture strengths are obtained at r.p.m. below 2,250 with the PROPELLER OVERRIDE control at AUTO.

11. **R.p.m. control**

(i) The interconnected throttle and propeller controls enable both boost and r.p.m. to be varied by movement of the throttle lever alone.

(ii) When the PROPELLER OVERRIDE control lever (12) is set forward to MAXIMUM, engine r.p.m. will be governed by the C.S.U. at 2,700 r.p.m. At throttle settings below TAKE-OFF the r.p.m. will not necessarily be governed at 2,700 but will depend on the selected boost and the forward speed of the aircraft.

(iii) (a) When the control lever is fully back at AUTO a cam and follower are brought into action and together ensure that for any throttle setting the most suitable r.p.m. are selected, which are then governed by the C.S.U.

(b) Except when TAKE-OFF boost is selected, it is always possible to select more r.p.m. than normally

obtainable in AUTO by moving the OVERRIDE control lever forward to an intermediate position. The range of automatic control is however reduced by this action, since the C.S.U. will govern at the selected r.p.m. until the throttle lever is moved to give a boost pressure requiring higher r.p.m.

(c) Indiscriminate use of the OVERRIDE control when using method (b) will considerably increase fuel consumption.

(iv) A friction control (14) serves both the throttle and propeller override control levers.

12. **Supercharger control and warning light**

(i) The supercharger gear change control is the black-topped lever (13) at the rear of the engine controls box.

(ii) A warning light (33), on the port side of the instrument panel, indicates when the supercharger is in S gear below 7,000 ft.

13. **Fuel cut-off control**

(i) The fuel cut-off control (16) is the red-topped lever at the rear of the engine controls box. It may be moved downwards from NORMAL to CUT-OFF after first releasing the spring-loaded catch (15) on the side of the controls box.

(ii) The control must be at CUT-OFF before the injector priming pushbutton will work, and in order to ensure the booster pump is operated when the cylinder priming pushbutton is used.

14. **Air intake controls**

(i) The AIR INTAKE NORMAL-HOT manual intake heat control lever (96) is on the cockpit starboard shelf. Just forward of this control is the AIR INTAKE CONTROL NORMAL-FILTER electrical switch (74) together with PORT AIR and STARBOARD AIR intake actuator warning lights (75). These lights indicate when the electrical jack motors are in operation. Should failure of a motor cause the jack to remain in an intermediate position the appropriate light will remain on.

(ii) When the air intake filter switch is at NORMAL ram air is obtained through intakes in the wing root leading edges. When the switch is set to FILTER the wing root intakes are blanked off and filtered air is obtained via the engine underpanel.

(iii) Should the air intake heat control lever be set to HOT with the filter switch at NORMAL, micro switches in the circuit ensure that the filter switch is overridden and the intake shutters are moved to the filtered position.

15. **Engine cooling shutters**

(i) The two shutters are operated electrically by a three-position OPEN-OFF-SHUT switch (50) on the starboard side of the instrument panel. The OFF position permits selection of any intermediate setting, but the motor cuts out automatically after completion of its movement when either OPEN or SHUT is selected.

(ii) The undercarriage indicator switch is connected in circuit with the shutter motor. When the switch is moved to OFF it overrides the shutter selector switch and opens the shutters providing electrical power is available.

(iii) No position indicator is fitted, but as opening the shutters causes a nose-down change of trim in flight, it is possible to check their operation.

16. **Engine starting controls**

(i) The ignition switches (32) are on the port side of the instrument panel. A sliding bar attached to the undercarriage position indicator switch prevents their use unless this latter switch is ON.

(ii) The combined starter and booster coil pushbutton (78) is at the forward end of the starboard shelf. At the aft end is a pushbutton (70) to enable the booster coil to be tested without firing a starter cartridge.

(iii) The starter re-indexing toggle (29) at the bottom port side of the instrument panel should be pulled out and returned gently when re-indexing the starter breech.

MAIN SERVICES

17. **Hydraulic system**

(i) An engine-driven pump maintains a pressure of 1,800 lb./sq. in. in the system for the operation of the:—

Flaps.

Undercarriage units and doors.

Wing folding mechanism.

(ii) In the event of failure of the engine-driven pump, or if the engine is not running, all services may be operated by means of a handpump (25), on the port side of the pilot's seat.

18. **Pneumatic system**

(i) An engine-driven compressor charges a single air bottle to a pressure of 450-470 lb./sq. in. for the operation of the:—

Wheel brakes.

Undercarriage and flaps emergency system.

(ii) A triple pressure gauge (52) is mounted at the bottom starboard corner of the instrument panel.

19. **Electrical system**

(i) A single engine-driven generator charges two aircraft batteries, connected in series, which together supply the whole of the aircraft electrical system.

(ii) A generator failure warning light (47) on the upper starboard side of the instrument panel indicates whenever the generator is not supplying power through the voltage regulator and cut-out.

(iii) The GROUND/FLIGHT MASTER SWITCH (89) is situated on the starboard shelf and the external supply socket is on the starboard wing fillet.

20. **Vacuum system**

An engine-driven vacuum pump is used to operate the suction driven flight instruments. No vacuum gauge is

fitted. The exhaust air from the pump is used for pressurising the fuel tanks.

AIRCRAFT CONTROLS

21. Flying controls

(i) The control column is of the spade grip pattern and incorporates the wheel brake lever and gun firing control (55) which also operates the cine-camera and controls bomb release and RP firing.

(ii) The rudder pedals can be adjusted for reach by a foot-operated wheel in the centre of the rudder bar.

(iii) When Mod. 335 is incorporated the inertia weight of the elevators is increased to compensate for the simultaneous fitting of ARI 5491 and a Mk. 4F compass. *Should any of this equipment not be carried subsequent to the incorporation of Mod. 335 appropriate ballast must be carried in lieu.*

22. Flying controls locking gear

(i) *Internal locking*

(a) The gear, which consists of four cables attached to a hinged clip, is stowed in a bag on the cockpit starboard side behind the pilot's seat.

(b) To engage the locking gear proceed as follows:—

(i) Lower the seat fully.

(ii) Attach the clip to the control column 4″ below the spade grip.

(iii) Hook the short pair of cables to the holes on the outside flanges of the rudder pedals.

(iv) Hook the long pair of cables to the holes on the seat.

(v) Tension the cables by adjusting the rudder bar and raising the seat.

(ii) *External locking*

It is essential that the control surface clamps are fitted whenever the internal locking gear is engaged, as other-

wise damage may be caused to the rudder and aileron spring tabs which are connected through torsion bars to the control column. The clamps which are supplied as ground equipment should be fitted last and removed first.

23. **Trimming and spring tabs**

(i) Pre-set trimming tabs are situated at the inboard end of each aileron.

(ii) The rudder and elevator trimming tabs may be adjusted by means of two handwheels. These handwheels, together with tab position indicators (22), are on the port shelf. The horizontal handwheel (23) controls the rudder trim tab, and the large vertical handwheel (21) controls the elevator tabs. Both controls work in the natural sense.

(iii) Torsion bar operated spring tabs are fitted to each aileron and to the rudder.

24. **Undercarriage control**

(i) The UNDERCARRIAGE selector lever (19) is mounted in a gated quadrant on the side of the port shelf. It has two positions UP and DOWN. A safety catch (18) on the quadrant must be pushed upwards before the lever can be moved to the UP position. When DOWN is selected the catch automatically locks the lever in that position.

(ii) On no account should the safety catch be pushed up preparatory to taxying, since if a member of the ground crew should in error attempt to close the footstep connected to the undercarriage selector lever, the lever may thereby be moved to UP.

(iii) The control (58) for the operation of the emergency system is on the starboard shelf.

25. **Undercarriage position indicators**

(i) The standard indicator (30) at the bottom port side of the instrument panel shows:—

3 green lights ...	All wheels LOCKED DOWN
2 red lights	All wheels UNLOCKED
No lights	All wheels locked up

The tailwheel shows a green light when locked down. but has no red light indication.

(ii) The UNDERCARRIAGE INDICATOR ON-OFF SWITCH (31), is situated above the indicator. It incorporates a sliding restriction bar, which, when the switch is OFF, prevents operation of the ignition switches. An electrical interconnection is provided with the engine cooling shutters circuit.

(iii) An U/C WARNING light (39) above the centre instrument panel comes on if the throttle is less than $\frac{1}{3}$ open when the undercarriage is not locked down.

(iv) A mechanical visual indicator protrudes through the upper surface of each inner wing when the main wheels are locked down.

(v) An external indicator light, fitted to the port undercarriage leg comes on when the leg is down and locked *and* the arrester hook is lowered or the training switch is ON.

26. **Arrester hook control**

(i) The arrester hook is lowered by gravity and the action of an oleo-pneumatic damper after the control (26) on the side of the port shelf has been pulled back. Once lowered the hook cannot be raised again in flight. Should the hook be accidentally lowered, an airfield landing can be made without damage to the hook or structure.

(ii) A green indicator light (28) beside the control indicates, and an attitude light inside the tailwheel port door comes on, when the hook is lowered or the training switch is ON.

(iii) The TRAINING SWITCH (27) when ON simulates the action of the arrester hook control, but does not lower the hook.

27. **Flaps control and position indicator**

(i) The flaps are hydraulically controlled by a selector lever (17) in a quadrant on the cockpit port shelf. Four main positions, DOWN—MAX. LIFT—TAKE-OFF—UP are gated but any intermediate position may be selected.

(ii) A relief valve in the circuit ensures that at any airspeed the flaps will not lower beyond a safe setting for that speed, but when speed is decreased the flaps will then lower to the position for which the selector is set.

(iii) The setting of the flaps is shown on an indicator (36) on the port side of the instrument panel.

(iv) The control (57) for the operation of the emergency system is on the starboard shelf.

28. **Wing folding control**

(i) The wing folding and locking circuit is hydraulically operated and is controlled by a lever (94) on the starboard shelf. There are two positions SPREAD and FOLD. Before the lever can be moved to FOLD a catch (95), similar to the undercarriage safety catch, must be operated. Folding will not commence unless the flaps have previously been fully raised.

(ii) A red painted visual indicator on the top surface of each inner wing lies flush with the surface when the wings are spread and locked and rises above the surface when the locks are withdrawn. *A check that both indicators are flush with the surface should always be made prior to take-off*

(iii) In the event of hydraulic pump failure or when the engine is not running, the mechanism can be operated by the hand pump. In the event of complete hydraulic failure the wings can be folded manually.

29. **Wheel brakes**

The brakes control lever (54) is on the control column spade grip, and incorporates a parking catch. Differential control of the brakes is provided by a relay valve connected to the rudder bar. A triple pressure gauge (52) shows the air pressure in the main system, 450-470 lb./sq. in. max. and at each wheel brake, 100 lb./sq. in. max.

30. **Tailwheel lock**

The control (100) is on the side of the starboard shelf. To LOCK the tailwheel, the knob (99) at the side of the

control should be pulled out, allowing the lever to spring forward. When the control is pulled aft the tailwheel is FREE to caster.

31. **Accelerated take-off gear**

The hook for the bridle of the accelerated take-off gear is bolted to the front spar immediately forward of the wheel bays. The hold-back strop is mounted just forward of the arrester hook.

32. **Rocket-assisted take-off gear (RATOG)**

(i) When fitted, the rockets are carried beneath the fuselage immediately below the cockpit. The RATOG MASTER SWITCH (9) is situated on the windscreen port pillar and must be ON before it is possible to operate the firing pushbutton. This pushbutton may be either in the end of the throttle lever (11), or (38) mounted above the contacting altimeter.

(ii) The RATOG JETTISON pushbutton (3) is situated on the port shelf adjacent to the trim tab controls.

ANCILLARY EQUIPMENT

33. **Windscreen de-icing system**

The WINDSCREEN ANTICER combined on/off cock and pump (46) is mounted on the cockpit starboard decking. The $\frac{1}{2}$ gallon capacity de-icing fluid tank is mounted on the front spar in the port wheel bay and the spray unit is mounted forward of the windscreen.

COCKPIT EQUIPMENT

34. **Access to cockpit**

Three footsteps and a handhold are provided on the port side. The first footstep and the handhold are interconnected so that when the footstep is pulled down the handhold cover is opened. Then, when the cover is closed, the footstep is retracted. The second, walkway, footstep opens when the foot is inserted. The third footstep, situated just below the jettisonable panel, is opened when the undercarriage control lever is moved to DOWN

and closed again when the undercarriage is retracted. NO attempt should ever be made to close this footstep forcibly.

35. **Sliding canopy**

(i) *Operation*

To operate the winding gear, the spring loaded knob on the crank lever (49) should be pulled out while the crank lever is rotated in the required direction. When the knob is released and engaged in a hole in the bracket the canopy is locked in position. Before leaving the cockpit the knob should be pulled out as far as possible and turned until a projection on the knob engages in a small recess in the crank lever; this permits the canopy to be moved from outside by hand.

(ii) *Opening from outside*

The canopy should be drawn back, by inserting two fingers in the holes at the rear of the canopy, sufficiently to enable the winding gear to be operated. If the canopy has been locked in the closed position, the spring-loaded locking bolt (7) on the port side above the footstep, should be pushed in and rotated one quarter of a turn with a screwdriver.

(iii) *Locking from outside*

The knob on the crank lever should first be set as described in (i) and the canopy closed by hand. Then the locking bolt should be rotated one quarter of a turn with a screwdriver to engage the bolt with the deep locking slot.

(iv) *Jettison control*

The canopy may be jettisoned from inside by the PULL TO JETTISON T-handle (51) and from outside by means of a toggle above the port wing fillet.

(v) *Precautions to be observed*

Before flight the following precautions should be observed:—

(a) Check that the locking bolt is in the fully unlocked position, with the slot lining up with two black lines

marked on the jettisonable panel. If this is not done vibration in flight may cause the bolt to revolve and lock the canopy. This will prevent normal operation and may prevent its emergency release.

(b) Check that the jettison pins are protruding through the channels by about one-eighth inch. This is necessary to prevent inadvertent jettisoning.

36. **Cockpit lighting**

(i) *Ultra-violet and red lighting*

Two u/v and four red lamps together form the cockpit lighting. The two u/v lamps are controlled by an on/off dimmer switch (45) above the starboard side of the flight instrument panel. The two red lamps which illuminate the instrument panel are controlled by a master switch and a dimmer switch (43), both situated above the instrument panel. The port and starboard red lamps for the shelves are directly controlled by on/off dimmer switches (20) (68) just forward of each lamp.

(ii) *Emergency lighting*

A single emergency lamp above the instrument panel is controlled by a nearby switch. The power supply is obtained from a separate battery.

37. **Cockpit heating and ventilation**

(i) Warm air, obtained from behind the oil cooler, and cold air from forward of the cooler, feed separately to a control valve. Two outlet pipes from the valve are directed to:—

(a) Two adjustable louvres.

(b) Two outlets directing air to the pilot's feet.

(ii) Control of the system is effected by a handwheel (101) forward of the tailwheel locking lever. WARM or COLD air may be selected to supply the lower part of the cockpit, but the system permits only COLD air to be supplied to the louvres.

38. **Seat and harness adjustment**

(i) The seat may be adjusted for height by means of a lever on the starboard side of the seat. When the knob at the

top of the lever is pressed the lever may be used in the natural sense to raise or lower the seat.

(ii) The harness release control (66) on the cockpit port wall should be pushed forward and up to enable the pilot to lean forward without unfastening the safety harness.

(iii) The pilot's headrest is not adjustable.

39. **Oxygen system**

Two high pressure oxygen cylinders are mounted in the fuselage beneath the cockpit floor. From the cylinders oxygen flows to a Mk. 11C regulator (48) on the starboard side of the instrument panel, and thence to a Mk. 2 economiser beneath the cockpit floor. A flexible tube connects the economiser to the pilot's oxygen mask.

40. **Instrument flying practice equipment**

This equipment consists of three flat panels for the windscreen and three shaped panels for the canopy. The latter are not intended to be fitted or removed during flight, but the windscreen panels, which are fixed in position by press fasteners, are so intended. When not in use the windscreen panels, together with tinted goggles, are stowed in a bag (5) on the jettisonable panel.

NAVIGATIONAL AND RADIO EQUIPMENT

41. **Compasses**

(i) *Mk. 4F compass*

(a) A Mk. 4F compass (53) may be fitted, in the position formerly occupied by the directional gyro, replacing the R.I. compass.

(b) When the Ground/Flight switch is at FLIGHT and electrical power is available an amber warning light adjacent to the repeater and marked COM, indicates the necessity to switch ON the inverter which supplies A.C. to the compass. The switch (73), together with a circuit breaker (72), is mounted on the starboard shelf. It is important that the inverter should

not be switched ON until just before take-off; otherwise, if the engine is running at low r.p.m. below generator cut-in speed, the drain on the aircraft batteries will be excessive.

(c) No indication is given of inverter failure in flight other than the incorrect functioning of the compass.

(d) The compass corrector unit (93) is at the extreme aft end of the starboard shelf.

(ii) *R.I. compass*

This is fitted on all aircraft not yet embodying a Mk. 4F compass. The master unit is automatically switched on whenever electrical power is available. A repeater is fitted on the port side of the instrument panel.

(iii) *P.11 compass*

This is mounted on a pedestal beneath the instrument panel.

42. **Radio and radar controls**

(i) *V.H.F.—TR 1520*

A four channel control box is fitted on the starboard wall. The MIC TEL socket (98) is clipped to the chartboard case, and the press-to-transmit pushbutton is on top of the control column. On some aircraft the pushbutton may be fitted in the end of the throttle lever twist grip.

(ii) *V.H.F. airborne relay—ARI 5491*

When fitted this replaces the TR1520 and comprises a 10 channel TR1934/1935. The control unit (65) is fitted on the cockpit starboard side (see para. 21 (iii)).

(iii) *Z.B.X.—ARI 5307*

The control unit (67) is mounted on the starboard wall. An adjacent mixer box (64) enables the selection of either V.H.F. or Z.B.X. or both together.

(iv) *I.F.F.*

The selector (2) and control units (1) are mounted on the

port shelf, while the auxiliary control unit (69) is on the starboard wall.

43. **External lighting**

(i) *Navigation lights*

Four navigation lights are fitted, one at each wing tip and two in the tail. The navigation lights OFF-DIM-BRIGHT switch (87) is on the starboard shelf. The circuit is so arranged that whenever the arrester hook is lowered the navigation lights come on at full brilliance to assist the batsman in assessing the aircraft's attitude.

(ii) *Identification lights*

The red or green downward identification lights are mounted under the starboard wing and the amber light under the port wing. The colour selection switch (85), the OFF-MORSE-STEADY switch (76), and the morse pushbutton (86) are mounted together on the starboard shelf.

(iii) *Attitude lights*

The indicator light on the port undercarriage leg comes on when the leg is down and locked and the arrester hook is lowered. The attitude light inside the tailwheel port door comes on whenever the arrester hook is lowered.

44. **Pressure head heater**

The heater element in the pressure head (88) is controlled by a switch on the starboard shelf.

45. **Chartboard and Pilot's Notes stowage.**

This (97) is positioned on the side of the starboard shelf.

OPERATIONAL CONTROLS

46. **Gyro gunsight Mk. 4B**

(i) This (42) is mounted above the instrument panel. The

GGS master switch (40) is on the top port side of the instrument panel, the SELECTOR DIMMER control (37) is above the contacting altimeter, and the GUNS/RP selector switch (44) is on the right of the GGS. Two skid indicator lights (41) are mounted one on each side of the GGS.

(ii) When the GGS is used in conjunction with R.P. the knob on the span scale should be set to R.P.

47. **Guns/R.P. firing**

(i) The four 20 mm. guns are fired electrically and the gun-firing control consists of a selective switch (55) mounted on the control column spade grip, the same switch controlling the bomb, R.P. or cine camera operation.

(ii) A safety relay coupled to the undercarriage locks prevents inadvertent firing of the guns when the aircraft is on the ground. A butt test switch is fitted in the starboard centre wing to enable the guns to be tested at the stop-butts.

48. **Bomb release**

Bomb release is controlled by the R.P. portion of the selective switch when the BOMBS/R.P. master switch is at BOMBS. The appropriate fuzing and selector switches (8) are on the port wall. The bomb racks jettison control (24) is on the port shelf aft of the trimming tab controls.

49. **Cine camera and camera recorder**

A cine camera is mounted in the leading edge of the port wing and is operated independently by the selective switch when set to SAFE and the camera portion pressed. This action also operates the camera recorder which, when fitted, is mounted over the gunsight. The camera master switch (40) is on top of the instrument panel together with a SUNNY/CLOUDY switch (40) for adjusting the aperture according to weather conditions.

50. **P.R. cameras**

On most aircraft provision is made for carrying vertical and oblique cameras for photographic-reconnaissance duties, the control box being mounted on the port wall.

51. **Camera container**

The master switch (4) is on the port shelf. This controls the camera carried in the wing container, when fitted.

52. **Flares container**

The flare container door switch (4) is on the cockpit port shelf and has three positions, OPEN-OFF-SHUT. Two red warning lights come on when the doors are open.

53. **"Window" launcher**

(i) The "window" launcher speed control unit is mounted on the starboard wall. It has four speed settings and an off position.

(ii) The override control unit (63), mounted just below the speed control unit, has two on/off switches, each with an indicator light, and a light testing pushbutton. As each packet is ejected the appropriate light flashes.

54. **Contacting altimeter**

This (35) is mounted on the upper port side of the instrument panel, with an adjacent ON-OFF switch (34) for the telephone warning signal.

FINAL CHECKS FOR TAKE-OFF

TRIM	ELEVATOR : NEUTRAL RUDDER : FULLY LEFT
R.P.M. CONTROL	MAX. R.P.M.
FUEL	MAIN COCK : ON CONTENTS BOOSTER PUMP : ON
FLAPS	UP (AIRFIELD) MAX. LIFT (CATAPULT) TAKE-OFF (CARRIER)
WINGS	SPREAD AND LOCKED
TAIL WHEEL	LOCKED

FINAL CHECKS FOR LANDING

FUEL	...	CONTENTS BOOSTER PUMP : ON
WHEELS	...	DOWN AND LOCKED
R.P.M. CONTROL	...	2,400 R.P.M.
BRAKES	...	OFF PRESSURES
FLAPS	...	DOWN
TAIL WHEEL	..	FREE (CARRIER) LOCKED (AIRFIELD)

PART II
HANDLING

55. Management of the fuel system

(i) When flying without drop tanks, the drop tank selector lever should be OFF, and the main fuel cock ON.

(ii) To transfer fuel from the drop tanks, both the drop tank selector lever and the main tank fuel cock should be ON. When the fuel level warning light comes on, indicating that all drop tank fuel has been transferred, select drop tanks OFF. The main tank will then be replenished with fuel from the inter-spar and leading edge tanks and the fuel level warning light will go out. When the light comes on again it indicates that the transfer of fuel is complete, fuel now being drawn from the main tank.

56. Checks before starting:—

(i) Before starting check:—

Ignition switches	OFF
Booster pump	OFF
Main fuel cock ...	ON
Fuel cut-off control	CUT-OFF
Throttle	½″ to 1″ open
R.p.m. control lever ...	MAXIMUM
Air-intake heat control ...	NORMAL
Air-intake filter control	FILTER
Engine cooling shutters ...	OPEN
Supercharger control	M (low gear)
Ground/Flight switch ...	FLIGHT

Press the booster pump circuit breaker if necessary.

57. **Starting the engine**

(i) Have the propeller turned through at least two revolutions by hand to minimise the risk of hydraulic shock damage

(ii) Prime the injector with the appropriate pushbutton for 5-15 seconds.

(iii) Prime the cylinders with the appropriate pushbutton for 2-10 seconds according to the air and engine temperatures.

(iv) Move the fuel cut-off control to NORMAL, index the starter breech and switch ON the ignition.

(v) Press the combined starter and booster-coil pushbutton, and if necessary the cylinder priming pushbutton until the engine is running smoothly.

(vi) (a) If a cartridge fires, but the engine fails to start, carry out any priming or other actions that may be necessary before indexing a fresh cartridge. Then proceed as in (v) above without delay. If for any reason it is decided not to fire the fresh cartridge at once, a period of 30 seconds must elapse before any personnel may approach the engine or propeller.

(b) If a cartridge fails to fire a period of 30 seconds must elapse before re-indexing the starter breech.

(c) If the engine fails to start after three cartridges have been fired no further priming should be performed, and after four cartridges have been fired unsuccessfully starting should be abandoned and the cause investigated.

(vii) Check the oil pressure. If it does not rise within 5 seconds after starting, the engine should be stopped.

(viii) Run the engine at 1,200 r.p.m. and warm up at this speed.

58. **Checks after starting:—**

Direction indicator (if fitted) ... Set with R.I. compass. Uncage

Flaps	Operation
Radio ...	Test VHF and other radio aids
Altimeter ...	Set
Pneumatic pressure	Supply increasing

59. **Testing the engine and services**

NOTE.—A period of 30 seconds is required to warm up the Mk. 4F compass and in order to check the serviceability and at the same time to avoid excessive drain on the aircraft batteries it should be switched ON immediately prior to commencing the run up and switched OFF again as r.p.m. are reduced below generator cut-in speed.

After warming up to a cylinder-head temperature of 120°C. and an oil temperature of 15°C.:—

(i) Test each magneto as a precautionary check before increasing power further.

(ii) Holding the control column well back to prevent any tendency for the aircraft to nose over, open up to the static boost reading and check that the generator failure warning light is out.

(iii) At the same boost:—

(a) Exercise and check the operation of the constant-speed propeller by moving the control lever over its full range at least twice. Then return it to MAXIMUM.

(b) Exercise the supercharger by changing to high gear. Note the momentary drop in oil pressure as high gear is engaged, that the static boost reading is maintained and that the r.p.m. drop by 80-100. After about 30 seconds change back to low gear. The oil pressure should flicker and the r.p.m. should be restored.

(c) Check that the r.p.m. are within 50 of the reference r.p.m. noted in the Form 700.

(d) Test each magneto in turn. If the single ignition drop exceeds 50 r.p.m. a full power check should be

carried out; if there is marked vibration the engine should be stopped and the cause investigated.

(iv) A full power check should also be carried out after repair, inspection other than daily, or at the discretion of the pilot. Except in these circumstances, if the checks above are satisfactory, no useful purpose will be served by a full power run-up. For a full power check the tail of the aircraft must be securely lashed down and the check carried out as follows:—
(a) Open the throttle fully and check take-off boost and r.p.m.
(b) Throttle back until the r.p.m. fall just below the take-off figure and test each magneto in turn.
(c) If the single ignition drop exceeds 50 r.p.m. the aircraft must not be flown.

(v) After completing the checks, either at the static boost reading or at full power, steadily move the throttle to the fully closed position, and check the minimum idling r.p.m., then open up to 1,000/1,200 r.p.m.

(vi) *Maintenance ground running*
(a) Piston and sleeve seizure may occur due to excessive temperatures when ground running for maintenance purposes, particularly when making control adjustments and power checks. On the ground the cooling air is less well distributed and in consequence the upper limit of 100°C for oil temperature is excessive for maintenance ground running.
(b) Periods of ground running installed engines for maintenance purposes must therefore be kept to a minimum and the oil temperatures restricted to a maximum of 85°C on these occasions.

60. **Checks before taxying**

Tail wheel	FREE
Wheel brakes ...	Operation
Flight instruments	Serviceability Mk. 4F compass OFF (if fitted)
Pressure-head heater ...	As required

61. **Checks before take-off**

Trimming controls:—	
Elevator	Neutral (without flap) ½ Div. nose up (with flap)
Rudder	Fully left
Throttle ...	Friction adjusted
R.p.m. control lever	MAXIMUM
Fuel	Main cock ON Contents Booster pump ON

Flaps	UP (airfield) MAX. LIFT (catapult) TAKE-OFF (carrier)
Wings ...	SPREAD and locked
Instruments	Set Mk. 4F compass ON (if fitted)
Engine cooling shutters	OPEN
Supercharger control ...	M (low gear)
Air-intake heat control	NORMAL
Air-intake filter control	FILTER NORMAL (carrier)
Canopy	Locked open
Harness	Locked

62. **Take-off**

(i) When lined up on the runway lock the tailwheel.

(ii) Full throttle should always be used at take-off, even though the aircraft may become airborne before the full throttle position is reached.

(iii) The tendency to swing to the right can be controlled easily by the rudder particularly if the aircraft is flown off tail down.

(iv) When taking off with flaps at TAKE-OFF or MAX. LIFT the aircraft should be flown off tail down.

(v) Brake the wheels and retract the undercarriage as soon as possible after take-off. Should the undercarriage red lights fail to go out, throttle back and reduce speed when the reduction in airflow should allow the wheels to lock up.

(vi) When comfortably airborne move the r.p.m. control lever smoothly back to AUTO before reducing boost.

(vii) For a carrier take-off use TAKE-OFF flap and trim the elevator slightly nose up. The engine should be opened up against the brakes as far as is practicable and the aircraft flown off tail down.

(viii) For a catapult take-off, trim the elevator slightly nose up and select MAX. LIFT flap. The tailwheel *must* be locked and the rudder held neutral.

63. **R.A.T.O.**

(i) Determine the correct firing point from Fig. 4 Part V and note the actual position on the take-off run at which the rockets should be fired. It is *essential* that the rockets should be fired at the correct firing point.

(ii) Check list as for normal take-off but in addition:—

Trim	Elevator 1-1½ divs. nose down
Flaps	TAKE-OFF
Tail wheel control	LOCKED
R.A.T.O.G. master switch	ON

(iii) The run should be started as for a normal take-off, extra care being taken to keep the aircraft straight. After release of the brakes, the control column should be held firmly and approximately central fore and aft and slightly offset to port.

(iv) When opposite the firing point, press the firing button. The rockets should fire simultaneously within half a second of pressing the button. If they do not do so the take-off should be abandoned.

(v) During the firing of the rockets there is a nose-up change of trim and the reverse when they have expired. These changes are fairly strong, and should be corrected if the aircraft tends to assume a steeper nose-up attitude than the normal ground attitude. *No attempt should be made to pull the aircraft off, as this can cause a stall and starboard wing drop.*

(vi) When clear of the ship and having reached a safe height, the flaps should be raised, the R.A.T.O.G. master switch switched OFF and locked, and then the rocket carriers jettisoned in level flight at a speed not exceeding 150 knots. Jettisoning the rocket carriers induces a slight nose-down change of trim.

WARNING.—If the take-off is cancelled make sure that the R.A.T.O.G. master switch is OFF and locked before leaving the cockpit.

64. Climbing

(i) If the take-off was made with the air-intake control set to FILTER change to NORMAL when clear of the dust layer.

(ii) The speed for maximum rate of climb is 165 knots from sea level to 20,000 ft., thereafter reducing speed by 5 knots for each 4,000 ft. increase in height. There is little loss in rate of climb and the aircraft handles much better if the climbing speed is increased to 185 knots.

(iii) If the climb is made at 2,700 r.p.m. and $+9\frac{1}{2}$ lb./sq. in. boost change to high gear when the boost in low gear has fallen to $+4\frac{3}{4}$ lb./sq. in. If the climb is made at 2,400 r.p.m. and +4 lb./sq. in. boost, change to high gear when the boost in low gear has fallen to $+1\frac{3}{4}$ lb./sq. in.

(iv) For economical climbing ensure the r.p.m. control lever is set to AUTO, set the throttle to give not more than 2,250 r.p.m. and climb at the speed for maximum rate of climb given above.

65. General flying

(i) *Flying controls*

All the controls are light and effective and generally the aircraft is pleasant to fly at all altitudes and throughout its speed range; there is, however, a slight tendency to tighten in turns at high altitudes. There is little change of longitudinal trim with change of speed for a given power setting.

(ii) *Engine controls*

(a) The engine may cut momentarily when negative "g" is applied. This is more likely to occur at altitudes above 15,000 ft. and is due to air in the fuel system. If such a cut occurs the throttle should be closed and

then slowly opened again when the engine is running normally (see para. 85).

(b) In order to avoid sludging of the clutch plates, every endeavour should be made to change the supercharger gear at least once during each flight and in any case on entering the circuit prior to landing. The change to high gear should normally be made at engine conditions not exceeding 0 lb./sq. in. boost and 2,400 r.p.m.

(iii) *Changes of trim*

Undercarriage down	Slight nose down
Undercarriage up ...	Nose up
Flaps down ...	Nose down
Flaps up	Nose up
Engine cooling shutters open ...	Nose down
Engine cooling shutters closed ...	Nose up

There is a large change in directional trim with alterations in speed and power, moreover changes in directional trim induce variations in longitudinal trim. Operation of the engine cooling shutters produces a marked change of trim and no attempt should be made to operate them in a high speed dive.

(iv) *Flying at reduced airspeed*

Reduce speed to below 170 knots, open the cockpit canopy and lower the flaps to MAX. LIFT. Set the r.p.m. control lever to give 2,200 r.p.m. and fly at about 145 knots.

(v) *Flying in conditions of severe turbulence*

The safe speed range is 150-300 knots.

66. **Flight planning charts**

(i) The purpose and method of use of the three charts in Part V is fully explained in A.P. 2095 Pilot's Notes General.

(ii) The charts are based on the following weights:—

(a) Fighter reconnaissance

Mean weight	11,610 lb.
Take-off weight (200 gall.)	12,370 lb.

(b) Long-range fighter reconnaissance

Mean weight	13,215 lb.
Take-off weight (380 gall.)	13,865 lb.

NOTE.—R.p.m. which promote airframe vibration should be avoided.

(iii) The approximate fuel consumptions in the rich mixture range at full throttle heights are:—

Supercharger Gear	Approx. Full Throttle height (ft.)	Boost lb./sq. in.	R.p.m.	Gall./hr.
Low	8,500	$+9\frac{1}{2}$	2,700	260
High	20,000	$+9\frac{1}{2}$	2,700	260
Low	11,500	+4	2,400	170
High	22,500	+4	2,400	160

NOTE.—With the air intake filter control set to FILTER the full throttle heights are reduced by 3,000-4,000 ft.

67. **Pressure error corrections**

(i) The A.S.I. pressure error corrections are:—

From	140	180	220	260	300	knots
To	180	220	260	300	340	knots
Add ...	2	0	—	—	—	knots
Subtract ...	—	0	2	3	4	knots

68. **Stalling**

(i) The approximate stalling speeds, engine off, engine cooling shutters closed, in knots are:—

	at 12,400 lb.	at 14,650 lb.
Flaps and undercarriage up ...	105	115
Flaps and undercarriage down	90	100
Power on, typical approach conditions	80–82	

NOTE.—With the undercarriage and flaps down the position of the engine cooling shutters has little effect on the stalling speeds and characteristics. With undercarriage and flaps up, however, buffeting may set in about 20 knots above the quoted stalling speeds or increase progressively as speed is reduced. Buffeting can become marked just before the stall which, in this condition, occurs some 5 knots higher than the quoted speeds.

(ii) Warning of the approach of the stall is given by tail buffeting and at the stall the nose will drop gently. If the control column is pulled back at all sharply, however, the ailerons will snatch and the nose and port wing will drop. Warning of a stall under typical approach conditions is given by aileron snatching. In addition the attitude will be markedly nose-up and a large amount of left rudder will be necessary to maintain directional trim. When the stall occurs the starboard wing drops sharply, and since this action is assisted by torque, the throttle should be closed when initiating recovery action; if this is not done difficulty in regaining control at once may be experienced, resulting in an unnecessary loss of height.

(iii) Ample warning of the approach of a stall in a steep turn is given by aileron snatching and a tendency for the aircraft to flick out of the turn.

69. **Spinning**

Intentional spinning is prohibited. Should an accidental spin occur, normal recovery action should be applied immediately, and a speed of 175 knots should be attained before recovery from the resulting dive is attempted.

70. **Diving**

(i) There is little change of trim when diving to the limiting speeds.

(ii) Speed is gained very rapidly and care should be taken to avoid exceeding the limiting speeds.

(iii) The tendency to yaw should be countered by accurate use of the rudder trimming tab. This control, like the elevator trimming tab control, becomes extremely sensitive at high speeds.

71. **Aerobatics**

All normal aerobatics are easy to perform.

The following speeds are recommended:—

Roll	200 to 250 knots
Loop ...	320 to 360 knots
Roll off loop	320 to 360 knots
Upward roll	350 to 400 knots

72. **Checks before landing**

Fuel	Contents Booster pump ON
Undercarriage	DOWN and locked Three green lights Visual indicators protruding
R.p.m. control lever ...	2,400 r.p.m.
Brakes	Off Pressures
Supercharger control ...	M (low gear)
Air-intake heat control	NORMAL
Air-intake filter control	FILTER NORMAL (carrier)
Flaps	MAX. LIFT Then as required

Tailwheel	LOCK (airfield) FREE (carrier)
Canopy	Open and locked
Engine cooling shutters	SHUT

73. **Approach and landing**

(i) The recommended final approach speeds in knots are:—

	At typical service load 12,400 lb.	At max. landing weight 14,000 lb.
Flaps down, engine on	100	110
Flaps up, engine on ...	115	125

The initial approach should be made at a speed of some 10-15 knots higher than those quoted above.

(ii) Power-off landings should not normally be made with full flap as the glide path is very steep and the rate of descent very high. When a power-off landing is to be made the following technique is recommended:—

(a) The flaps should be lowered to the TAKE-OFF position and a speed of 130 knots maintained during the initial approach.

(b) When it is certain that the airfield can be reached MAX. LIFT flap should be selected.

(c) The round-out should be started at a speed of 130 knots in plenty of time to allow for the change in attitude and to enable a speed of 115 knots to be attained over the airfield boundary; from this point a normal hold-off and landing can be made.

(d) There is very little increase in the landing run over that obtained when using full flap.

(iii) Before attempting to turn off the runway place the tailwheel lock control to FREE.

(vi) *Decking landing*

(a) Lower the arrester hook and check the indicator light.

(b) Ensure the tailwheel is unlocked.

(c) With the r.p.m. control lever set to give 2,400 r.p.m. approximately −1 lb./sq. in. boost will be necessary during the initial turn in, decreasing to about −3 to −4 lb./sq. in. towards the later stages of the approach as the turn is slackened.

(d) The recommended speed for deck landing is 90-92 knots. It is necessary to pull the control column well back to effect a three-point touchdown.

74. Going round again

(i) The aircraft will climb away easily, flaps and undercarriage down, at climbing power.

(ii) Raise the undercarriage and climb at 125 knots.

(iii) Raise the flaps in stages retrimming as required.

75. Instrument approach

The following speeds together with approximate flap and power settings are recommended for use during instrument approaches with the undercarriage down, engine cooling shutters closed:—

	Boost lb./sq. in.	R.p.m.	Flaps	Airspeed (knots)
Pattern	0	1,500	TAKE-OFF	145
Final	0	2,400	MAX LIFT	130
Glide Path	−2	2,400	DOWN	110

76. Checks after landing

Booster pump	OFF
Flaps	UP
Engine cooling shutters	OPEN
R.p.m. control lever ...	MAXIMUM
Brakes ...	Sufficient pressure
Pressure head heater ...	OFF

77. Running down and stopping the engine

(i) If the serviceability of the engine is in doubt such items of the run-up given in paragraph 59 as may be necessary should be carried out. The engine should be run at static boost and the supercharger exercised if this has not already been done in the air. In all cases the engine should be idled at 800 to 1,000 r.p.m. and if no other check of the ignition has been made the magnetos should be tested for a dead cut.

(ii) Stop the engine by closing the throttle and setting the fuel cut-off control to CUT-OFF.

78. Checks after stopping the engine

Ignition switches	OFF
Electrical services	All off
Fuel cock	OFF
Ground/Flight switch	GROUND
Direction indicator (if fitted) ...	Caged
Chocks	In position
Brakes	Off

PART III
LIMITATIONS

79. Engine data—Centaurus Mk. 18

The principal engine limitations are as follows:—

	Supercharger gear	R.p.m.	Boost lb./sq. in.	Temp. °C. Cyl.	Temp. °C. Oil
Take-off and operational necessity *5 Mins. Limit*	M	2,700	+9½	310	100
Intermediate *1 Hr. Limit*	M } S }	2,400	+6½*	300	90
Max. continuous Rich	M } S }	2,400	+6½*	300	80
Max. continuous Weak	M } S }	2,400	+2½	300	80

* The interconnected throttle and propeller controls permit only +4 lb./sq. in. boost to be obtained at 2,400 r.p.m. and not the full permissible boost of +6½ lb./sq. in.

Oil pressure

Minimum in flight — 80 lb./sq. in.

Oil temperature

Normal minimum for take-off — +15°C.

Emergency minimum for take-off ... — +5°C.

Cylinder temperature

Maximum for stopping engine — 230°C.

80. Flying limitations

(i) (a) The aircraft is designed for the duties of a fighter-bomber. Intentional spinning is prohibited. When external stores or drop tanks are carried aerobatics are prohibited and violent manoeuvres are to be avoided.

(b) Catapult and rocket-assisted take-offs are permitted "clean" or with any permissible combination of external stores.

(c) Arrested landings are permitted when "clean" or when carrying:—

Drop tanks
ASR apparatus, type G
Sonobuoys T1945
Bombs or R.P. (*in emergency only*)

(d) Airfield landings are permitted with RATOG fitted only when the rockets have been discharged.

(ii) *Weight limitations*

Take-off, catapult take-off, RATO and gentle manoeuvres only	14,650 lb.
Aerodrome landings ...	14,000 lb.
All permitted forms of flying, ADDL's and arrested landings	12,400 lb.

(iii) *Loading limitations*

(a) Mixed loads of drop tanks and:—

ASR apparatus, type G;

Armament stores up to:—
2×500 lb. bombs
or 8×60 lb. R.P. (centre and outer-stations only)

are permitted, subject to the observance of the appropriate limitations.

(b) Mixed loads of drop tanks and Sonobuoys T1945 are prohibited.

(c) When 2 × F24 cameras are carried the inter-spar tanks must not be filled. Drop tanks may be carried.

(iv) *Maximum speeds in knots "clean," with drop tanks, or with R.P.*

Altitude	Clean or with R.P.	45. gall. Drop tanks	90. gall. Drop tanks
Up to 5,000 ft.	425	400	380
From 5,000 ft. to 10,000 ft.			360
„ 10,000 ft. to 15,000 ft.	385	360	340
„ 15,000 ft. to 20,000 ft.	355	340	320
„ 20,000 ft. to 25,000 ft.	320	300	300
„ 25,000 ft. to 30,000 ft.	285	—	—
„ 30,000 ft. to 35,000 ft.	255	—	—

(v) *Maximum speeds, in knots, for carriage, release and jettisoning of external stores*

Store	Max. speed for			Max. angle of dive	
	Carriage	Release	Jettison	Release	Jettison
Bombs					
1,000 lb. MC ..	400	400	—	80°	—
500 lb. MC ..	425	425	—	80°	—
500 lb. SAP (77 tail)	425	425	—	40°	—
500 lb. SAP (11 tail)	425	400	—	80°	—
500 lb. smoke ..	425	300	—	Level	—
25 lb. practice	425	425	—	85°	—
11½ lb. or 10 lb. practice	425	400	—	85°	—
Mines					
Mk. 7 Type A ..	270	215	—	Level	—
Mk. 8 Type A ..	380	260	—	Level	—
Depth charge Mk. 11	290	250	—	Level	—
Smoke float ..	310	260	—	Level	—
SCI	270	250 (full)	—	Level	—
		200 (empty)	—	Level	—
Flares recce. ..	300	250	—	Level	—
***Sonobuoys**					
T1945 (modified)	250	220	250	20°	20°
T1945 (non-modified)	160	160	250	20°	20°
ASR apparatus, Type G	300	170	200 (full)	Level	Level
			150 (empty)	Level	Level
†**RATOG**	150	—	150	—	Level
100-1,000 lb. bomb carrier					
Stores attached ..	—	—	350	—	40°
No stores ..	—	—	290	—	20°
Drop tanks	See (iv) above		150-260	—	Level
R.P.'s	See (iv) above		—	60°	—

* Altitude for release restricted to between 200 ft. min. and 3,000 ft. max.
† Altitude when RATOG retained restricted to 1,500 ft.

(vi) *Other speed limitations, in knots*

Undercarriage DOWN	185
Flaps at MAX. LIFT	185
Flaps DOWN	140
Canopy open	260

(vii) *C.G. limitations*

Reference should be made to A.P. 4018B Vol. 1, Section 4, Chapter 1.

PART IV
EMERGENCIES

EMERGENCY CONTROLS AND EQUIPMENT

81. **Undercarriage and flaps emergency operation**

(i) *Operation by handpump*

If the engine-driven hydraulic pump fails the undercarriage and flaps may be lowered by means of the hydraulic handpump. The following procedure should be adopted.

(a) Select undercarriage DOWN. If the undercarriage does not lower, or the red lights come on, return the selector to UP.

(b) Select flaps at MAX. LIFT and operate the handpump until the flaps have lowered sufficiently.

(c) Reduce speed to 115 knots.

(d) Select undercarriage DOWN and operate the handpump until the green lights come on. This is a lengthy operation and should the red lights not come on during the first 12 strokes the use of the handpump should be abandoned and use made of:—

(ii) *Operation by the pneumatic emergency system*

NOTE.—If, for any reason, the pneumatic pressure is less than 300 lb./sq. in. and cannot be built up any higher, no attempt should be made to lower the undercarriage by the emergency system unless one or both of the main wheels have already been partially lowered and cannot be re-engaged in the up position.

The levers (58) and (57) controlling the injection of air under pressure into the hydraulic pipe lines of the undercarriage and flap jack may be used to *lower* both undercarriage and flaps irrespective of the position of

the normal selector levers. Once the emergency pneumatic system has been used the services cannot be raised again until the hydraulic system has been bled.

The following procedure should be adopted in the event of abandoning method (i).

(a) Ensure the aircraft is flying straight and level, at about 115 knots (130 knots if the flaps cannot be lowered by the handpump as in (i) (b)).

(b) Withdraw the locking pin (56) from the emergency controls quadrant.

(c) Push the *undercarriage* emergency lever fully forward to engage with the spring retaining catch.

(d) If the undercarriage does not lock down, still maintaining an airspeed of 115 knots (130 knots if flaps not lowered), yaw the aircraft. If the flaps have not been lowered, this yawing may have to be of a more drastic nature before the undercarriage will lock down, and will be more effective if the throttle is first closed, due to the lower attitude of the nose, "engine-off".

(e) When the undercarriage is locked down push the *flaps* emergency lever fully forward to engage with the spring retaining catch. The flaps will not lower fully until speed and power have been reduced on the approach.

(f) Check the pneumatic pressure before landing.

The tailwheel will often lower automatically if the hydraulic system fails; if not it will be released when the undercarriage emergency system is operated.

82. **Canopy jettisoning**

(i) The sliding canopy together with the port side panel may be jettisoned by pulling the T-handle (51) on the lower starboard side of the instrument panel.

(ii) A minimum airspeed of 210 knots is essential to ensure satisfactory jettisoning.

(iii) Before jettisoning, open the canopy about 1 inch to ensure that the locating catches are disengaged, unless Mod.

339 is embodied when the canopy may be jettisoned from the fully closed position.

(iv) Before jettisoning, the seat should be lowered fully and the pilot should keep his head well down.

(v) The canopy may be jettisoned from outside by pulling the toggle behind a small transparent panel above the port wing fillet. The panel should be broken to gain access to the toggle.

83. Universal stores carrier jettisoning

The universal stores carrier may be jettisoned, together with stores if carried, by pulling the toggle just aft of the rudder trimming control. Reference should be made to para. 80(v) for the limiting speeds for satisfactory jettisoning.

84. Emergency equipment

(i) *First-aid pack*

The pilot's first-aid pack is carried in a container on the cockpit starboard wall.

(ii) *Signal pistol*

This is carried in a stowage on the cockpit floor in front of the pilot's seat. A firing aperture. (6) is provided in the cockpit port wall.

EMERGENCY HANDLING

85. Engine failure in flight due to fuel starvation

If the engine cuts due to sustained negative "g" or inverted flight conditions and cannot be re-started when normal flight is resumed and the throttle closed, the fuel cut-off lever should be set to CUT-OFF for approximately 5-10 seconds and then returned to NORMAL. This action facilitates the re-priming of the injector pump and the restoring of power.

86. Landing with a burst tyre

If it is known that a tyre has burst no attempt should be made to land with the undercarriage lowered. Greater safety to the pilot and less damage to the aircraft will result from a wheels up landing.

87. Flapless landing

(i) Flapless landings present no unusual difficulty, a runway of normal length being adequate even in conditions of light wind.

(ii) The approach should be made flat and large movements of the throttle avoided as it is difficult to lose excess speed.

(iii) At typical service load (12,400 lb.) the approach should be commenced at 120 knots reducing to 110 knots final, when, if the aircraft has been brought in low, the throttle should be cut and a three-point landing effected. When making a flapless landing in the overloaded condition these speeds should be increased by 10 knots.

NOTE.—To avoid the possibility of pre-stall buffeting and increased stalling speed described in the note to para. 68 flapless landings should be made with the engine cooling shutters closed.

88. Crash landing

In the event of an engine failure necessitating a crash landing:—

(i) Initiate the distress procedure on the R/T.

(ii) Jettison all external stores and fuel tanks.

(iii) Jettison the sliding canopy, together with the side panel.

(iv) Tighten and lock the harness.

(v) Lower the flaps to the TAKE-OFF position and maintain a speed of 130 knots while manoeuvring for the final approach. The glide may be considerably

lengthened, if oil pressure is still available, by moving the r.p.m. control lever to AUTO.

(vi) If the landing is being made with engine off, switch off the fuel and ignition, place the fuel cut-off control to CUT-OFF and set the Ground/Flight switch to GROUND.

(vii) When it is certain that the chosen landing area can be reached, lower the flaps to MAX. LIFT and carry out a normal glide landing (see para. 73).

(viii) For the minimum landing run lower the flaps fully just before touchdown. Full flap should only be used on the approach to correct overshooting.

(ix) If the flaps cannot be lowered a shallower approach will result and a final approach speed of 120 knots should be maintained.

(x) Keep the undercarriage retracted.

(xi) Additional protection will be afforded if, immediately before touchdown the left arm is placed across the forehead and a convenient handhold is grasped.

(xii) When the aircraft has come to rest switch OFF the fuel and ignition if this has not already been done, and set the Ground/Flight switch to GROUND.

89. **Ditching**

NOTE.—The ditching characteristics of the aircraft are known to be satisfactory, with or without drop tanks fitted, provided that all external armament stores are jettisoned or dropped.

(i) If it is decided to ditch, the following procedure should be adopted:—

(a) Initiate the distress procedure on the R/T.

(b) Jettison bombs and R.P., if carried.

(c) Jettison the canopy and side panel and disconnect the R/T plug. Keep the safety harness tightly adjusted and locked.

(d) If engine power is still available, lower the flaps fully and use the engine to help make the touchdown in a tail-down attitude at as low a forward speed as possible. If the engine has failed, do not lower the flaps more than 30°, otherwise, the rate of descent will be very high and judgment of the hold-off will in consequence be rendered more difficult.

(e) If engine power is not available move the fuel cut-off control to CUT-OFF, switch OFF the fuel and push the throttle lever fully forward, as in the closed position it is liable to obstruct the exit. If the engine is being used, push the throttle fully forward when the aircraft has come to rest.

(f) Ditching should be along the swell, or into wind if the swell is not steep.

(g) Additional protection will be afforded if, immediately before touchdown, the left arm is placed across the forehead and a convenient handhold grasped.

(h) After the aircraft has come to rest, release the harness and if possible leave by the port side.

90. **Abandoning the aircraft**

(i) Initiate the distress procedure on the R/T.

(ii) Reduce speed as much as possible.

(iii) Jettison the canopy and side panel.

(iv) Disconnect R/T and oxygen leads.

(v) Move the fuel cut-off control to CUT-OFF, switch OFF the fuel and ignition and push the throttle lever fully forward.

(vi) The aircraft may then be abandoned as follows:—

(a) Leave the cockpit head first over the port side, diving downwards towards the trailing edge of the mainplane and keeping the body as compact as as possible, or

(b) Trim the aircraft nose heavy, invert the aircraft and when completely inverted release the safety harness and drop out. Any tendency for the nose to drop when the aircraft is inverted may prevent the pilot from leaving the aircraft. It is essential that a clean exit be made since if snagging occurs, e.g., on the throttle lever, the pilot may be unable to free himself.

Whenever possible it is recommended that method (a) be used.

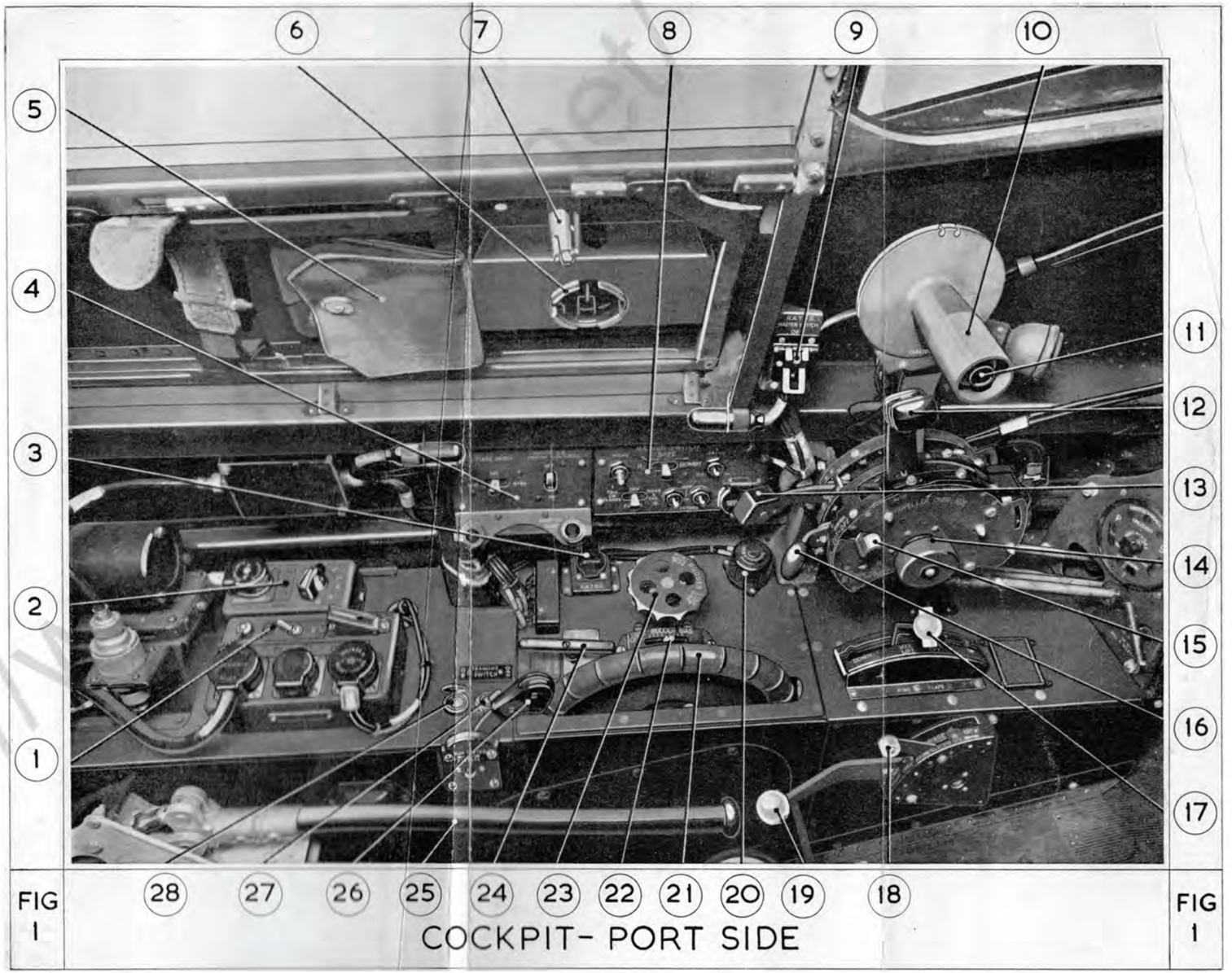
PART V

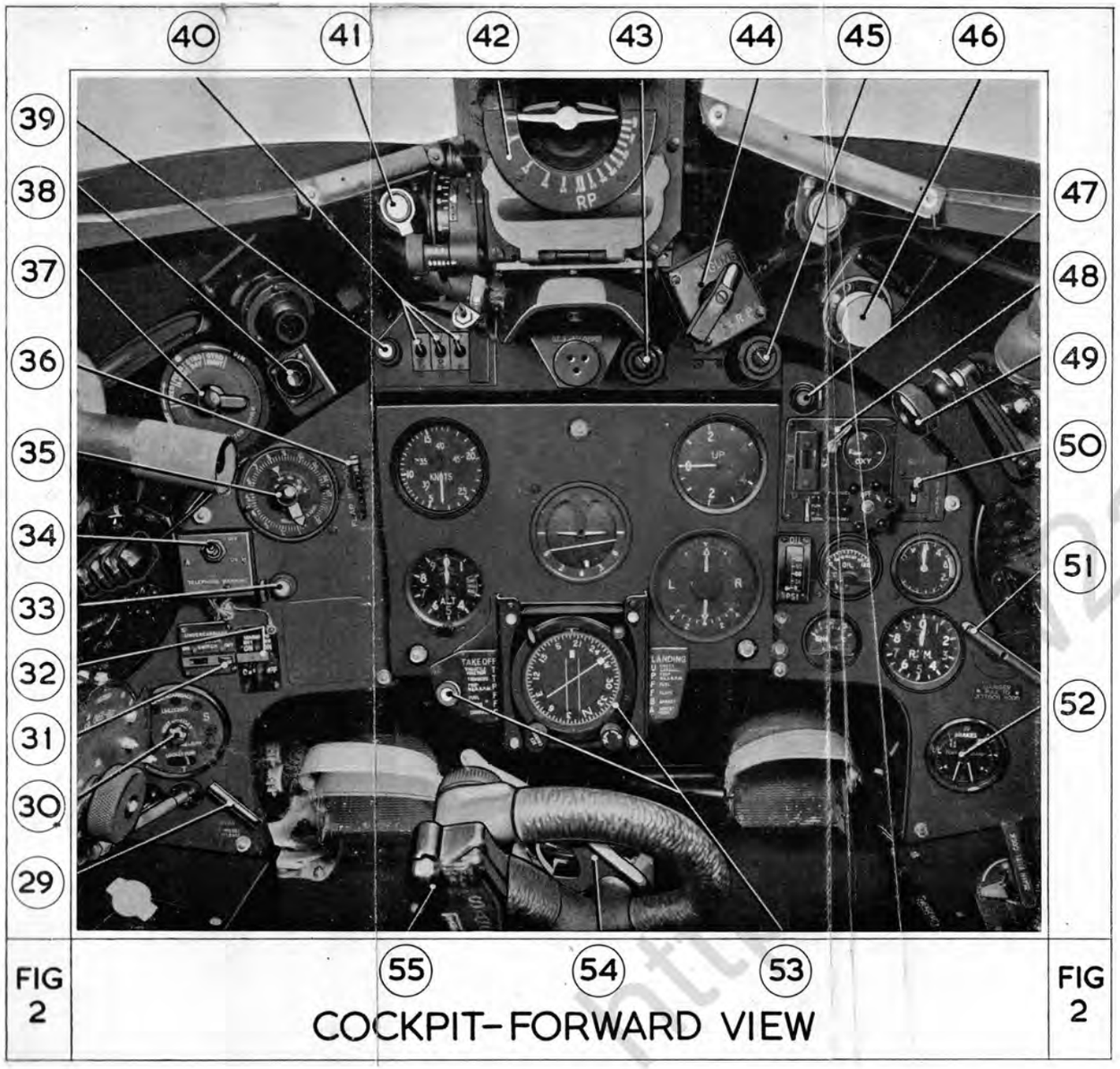
ILLUSTRATIONS AND CHARTS

KEY TO *Fig.* 1

COCKPIT PORT SIDE

1. IFF control unit.
2. IFF selector unit.
3. RATOG jettison pushbutton.
4. Camera container and flare doors controls.
5. Stowage for instrument flying practice goggles.
6. Signal pistol firing aperture.
7. Canopy locking bolt.
8. Bombs/R.P. control panel.
9. RATOG master switch.
10. Throttle lever and GGS range control.
11. Press-to-transmit pushbutton (Mod. 223) or RATOG firing pushbutton.
12. R.p.m. control lever.
13. Supercharger gear change lever.
14. Throttle and r.p.m. levers friction control.
15. Fuel cut-off control safety catch.
16. Fuel cut-off control.
17. Flaps selector lever.
18. Undercarriage control lever safety catch.
19. Undercarriage control lever.
20. Cockpit (port) lamps dimmer switch.
21. Elevator trim tab control.
22. Rudder and elevator trim tabs position indicators.
23. Rudder trim tab control.
24. Bomb racks jettison T-handle.
25. Hydraulic handpump.
26. Arrester hook control. Repositioned by Mod. 310.
27. Arrester hook training switch. Repositioned by Mod. 310.
28. Arrester hook indicator light. Repositioned by Mod. 310.





KEY TO *Fig.* 2

COCKPIT—FORWARD VIEW

29. Starter re-indexing control.
30. Undercarriage position indicator
31. Undercarriage position indicator master switch.
32. Ignjtion switches.
33. Supercharger warning light.
34. Contacting altimeter switch.
35. Contacting altimeter.
36. Flaps position indicator.
37. GGS selector dimmer control.
38. RATOG firing pushbutton (Mod. 223).
39. Undercarriage warning light.
40. Switches: left to right:—
    GGS master switch.
    Ciné-camera master switch.
    Ciné-camera aperture switch.
41. GGS skid indicator light.
42. GGS Mk. 4B.
43. Cockpit lamps dimmer switch.
44. Guns/R.P. selector switch (concealing cockpit lamps master and emergency lamp switches).
45. U/v lamps dimmer switch.
46. Windscreen de-icing pump.
47. Generator failure warning light.
48. Oxygen regulator.
49. Canopy winding handle.
50. Engine cooling shutters control.
51. Canopy jettison T-handle.
52. Triple pressure gauge.
53. Mk. 4F compass and warning light.
54. Brakes control lever.
55. Guns/Bombs/R.P. firing switch.

KEY TO *Fig.* 3

COCKPIT—STARBOARD SIDE

56. Locking pin for emergency hydraulic levers.
57. Flaps emergency selector lever.
58. Undercarriage emergency selector lever.
59. Fuel tank air pressure gauge.
60. Main fuel cock.
61. Drop tanks selector lever.
62. Drop tanks jettison control.
63. "Window" launcher control.
64. Mixer box.
65. VHF relay control unit.
66. Harness release unit.
67. ZBX control unit.
68. Cockpit (Stbd.) lamps dimmer switch.
69. IFF auxiliary control unit.
70. Starter test pushbutton.
71. Fuel booster pump circuit breaker.
72. Mk. 4F compass circuit breaker.
73. Mk. 4F compass on/off switch.
74. Air intake filter control switch.
75. Air intake filter control warning lights.
76. Identification lights OFF MORSE/STEADY switch.
77. Main tank fuel gauge.
78. Engine starter switch.
79. Fuel level warning light.
80. Fuel booster pump control switch.
81. Cylinder priming pushbutton.
82. Injector priming pushbutton.
83. Nose tank fuel gauge.
84. Inter-spar tanks fuel gauges.
85. Identification lights RED AMBER/GREEN switch.
86. Identification lights morse pushbutton.
87. Navigation lights switch.
88. Pressure head heater switch.
89. Ground/Flight switch.
90. Oil dilution pushbutton.
91. Fuel booster pump test pushbutton.
92. Fuel booster pump ammeter test socket.
93. Mk. 4F compass corrector unit.
94. Wing folding control lever.
95. Wing folding control lever safety catch.
96. Air intake heat control.
97. Map case.
98. Mic/tel socket.
99. Tail wheel lock control catch.
100. Tail wheel lock control.
101. Cockpit heat control.

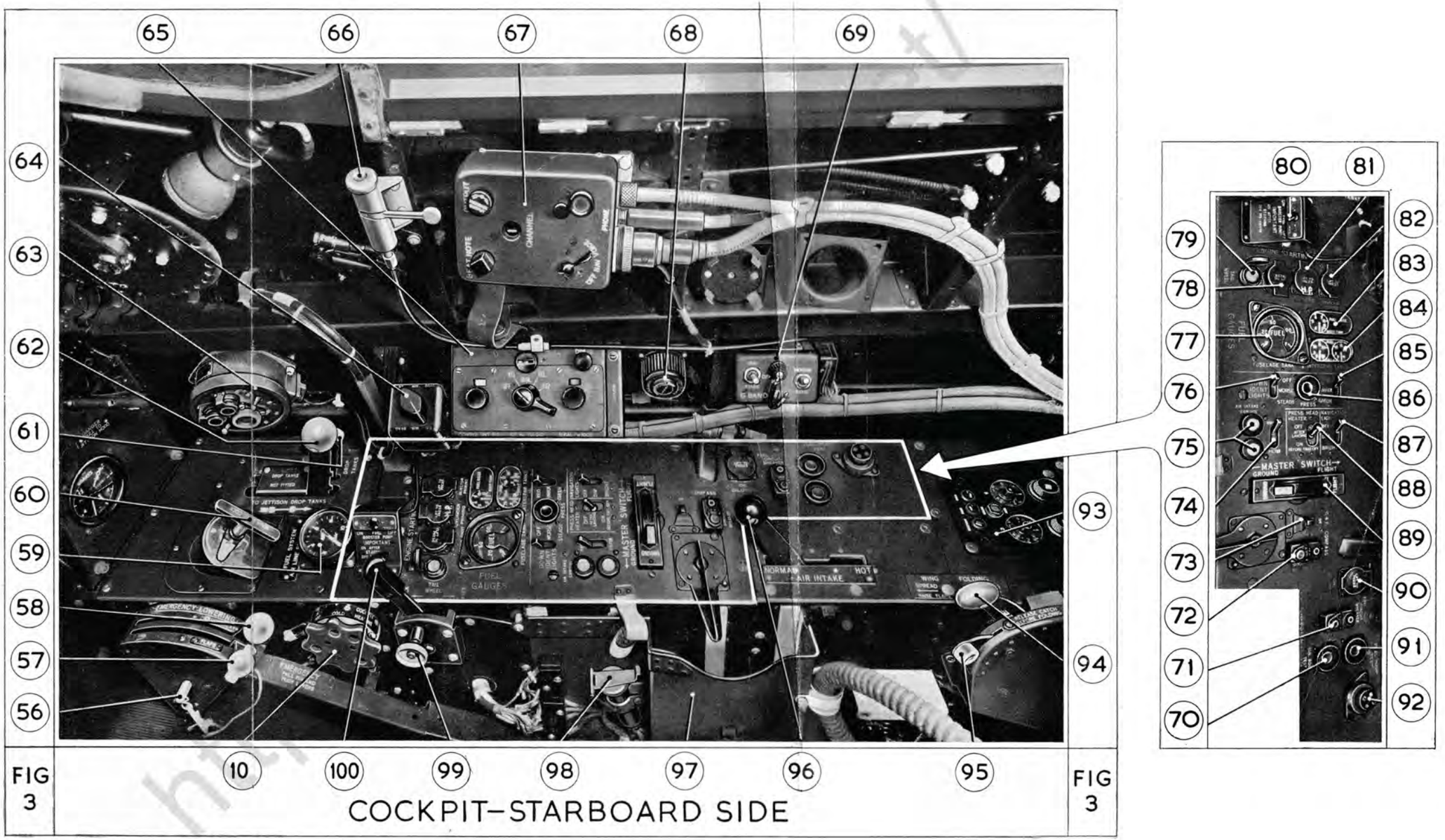


FIG 3

COCKPIT—STARBOARD SIDE

FIG 3

ROCKET ASSISTED TAKE-OFF CHARTS

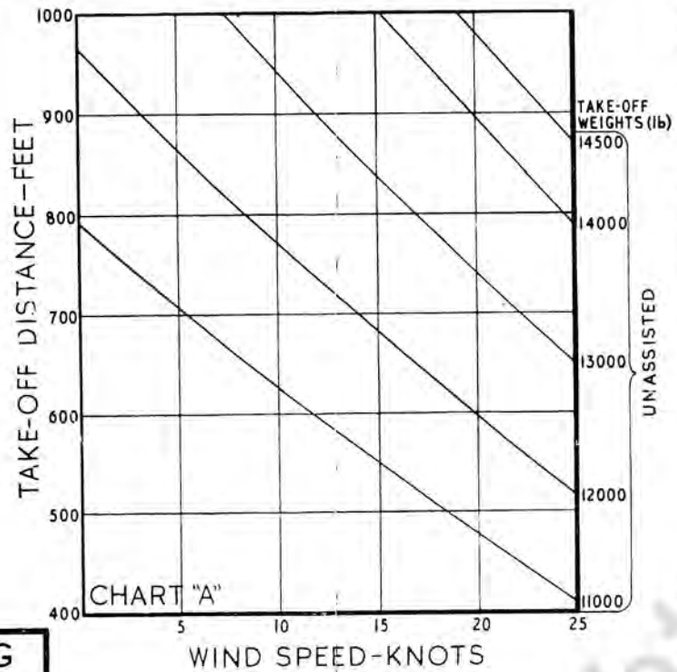
INSTRUCTIONS FOR USING CHARTS

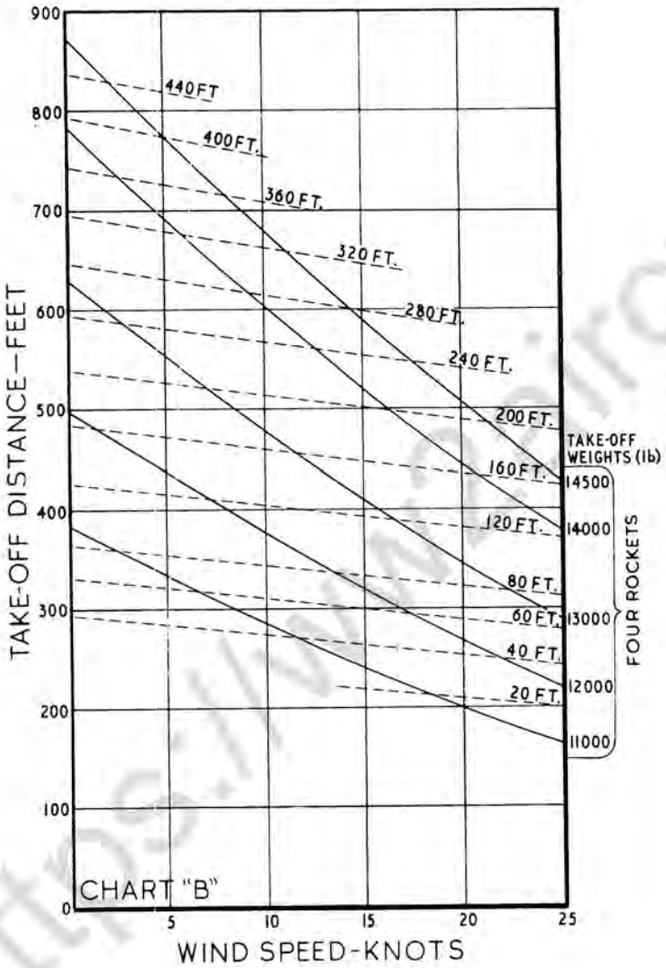
1 Measure the wind speed over the deck and on the charts plot the available take-off distance against the wind speed. If the point obtained lies above the curves on Chart A corresponding to the aircraft weight, assistance is unnecessary.

2 If rocket assistance is found to be necessary select the point on Chart B (if two rockets per side are to be fitted) or on Chart C (if three rockets per side are to be fitted). Read off the value of this point on the vertical scale. The take-off distance so obtained is a minimum and an allowance of 50 ft. should be added as a safety margin.

3 The same point on the "assisted" curve gives the distance of the correct firing point from rest by interpolation between the dotted lines. The rockets should never be fired at less than 20 ft from rest.

NOTE. — The all up weight of the aircraft must be ascertained by reference to the appropriate Volume I.





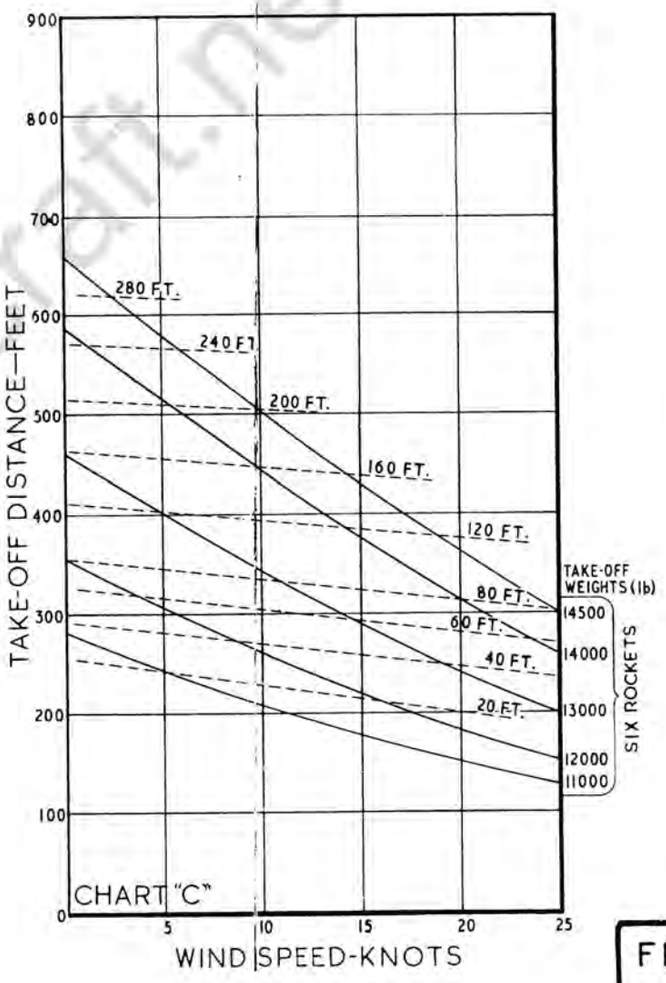


FIG 4

FIG 4

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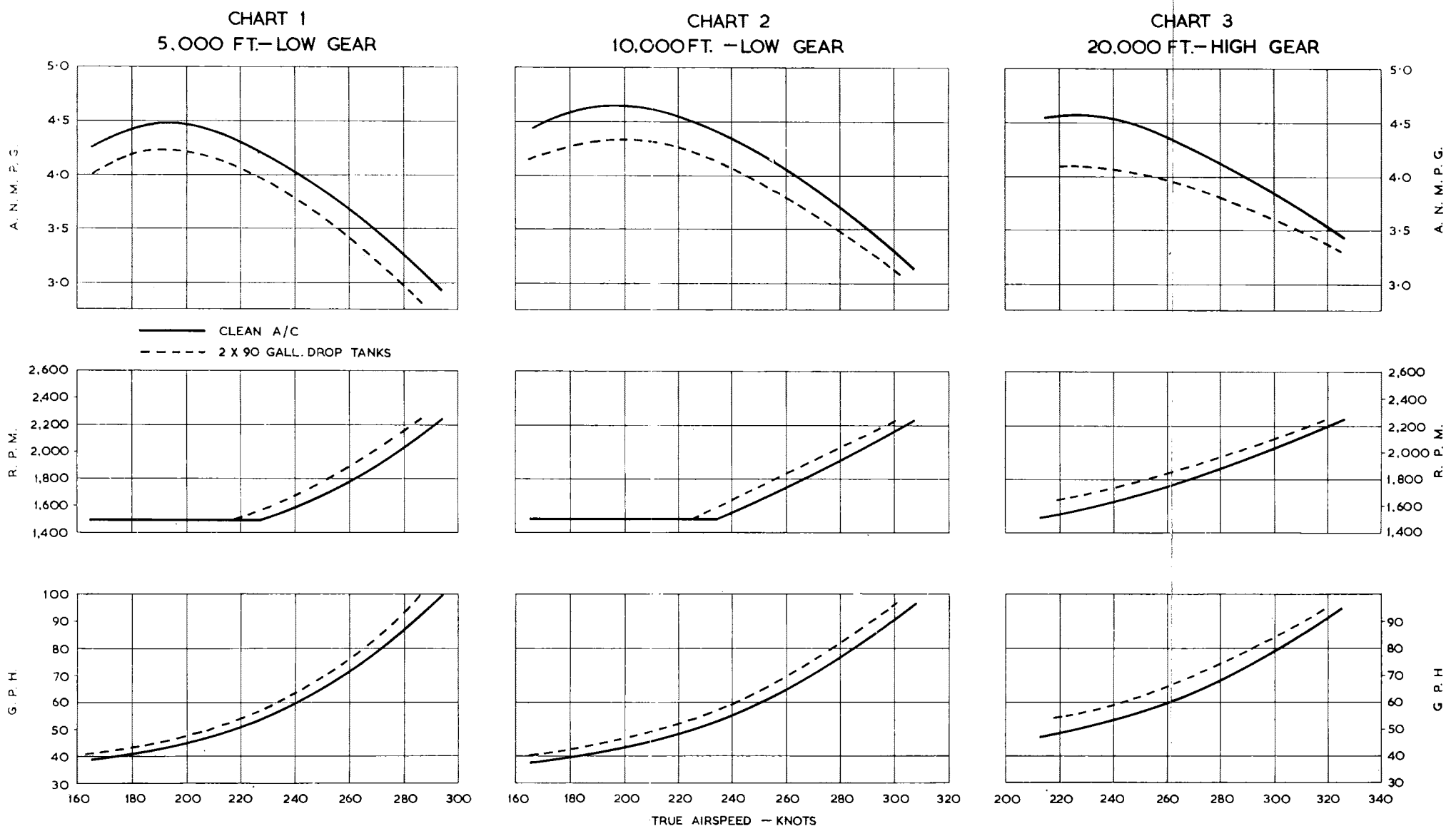
FLIGHT PLANNING CHARTS



ADMIRALTY
September, 1953

Amendment List No. 1
to A.P. 4018B—P.N.
Pilot's Notes

SEA FURY F.B.11

NOTE.—1. Incorporation of this Amendment List must be certified by inserting the date of incorporation and initials in the spaces provided on the inside front cover of the Notes.

2. When the Amendment List is fully incorporated; *affix* this sheet to the inside back cover of the Notes.

PAGE	PARA.	AMENDMENT
34	59 (iv)(v)(vi)	*Amend* by gummed slip supplied herewith.

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