GROUP B—FLYING INSTRUMENTS (ELECTRICAL AND MAGNETIC)

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

Introduction

1. The information contained in this group relates to those flying instruments which are electrically and/or magnetically operated. The electrical power supplies are dealt with in Chap. 1, Group A of this Section. The components used are described in the specialist Air Publications listed below.

Equipment	Air Publication	Equipment	Air Publication
Artificial horizon, Mk.4	1275A, Vol.1, Sect.2, Chap.16	GM4F gyro unit, Type A) GM4F detector unit, Type A) GM4F amplifier, Type A) GM4F corrector control box, Type A)	1275B, Vol.1, Sect.3, Chap.15
Turn and slip indicator, Pullin Mk.3	1275A, Vol.1, Sect.13, Chap.14		
Desynn transmitter, Type D) Desynn indicator, Type A)	1275A, Vol.1, Sect.16, Chap.2		
Alighting gear position indicator, Type D	4343E, Vol.1, Sect.18, Chap.4	Standby compass, Type E2A	1275B, Vol.1, Sect.10, Chap.8

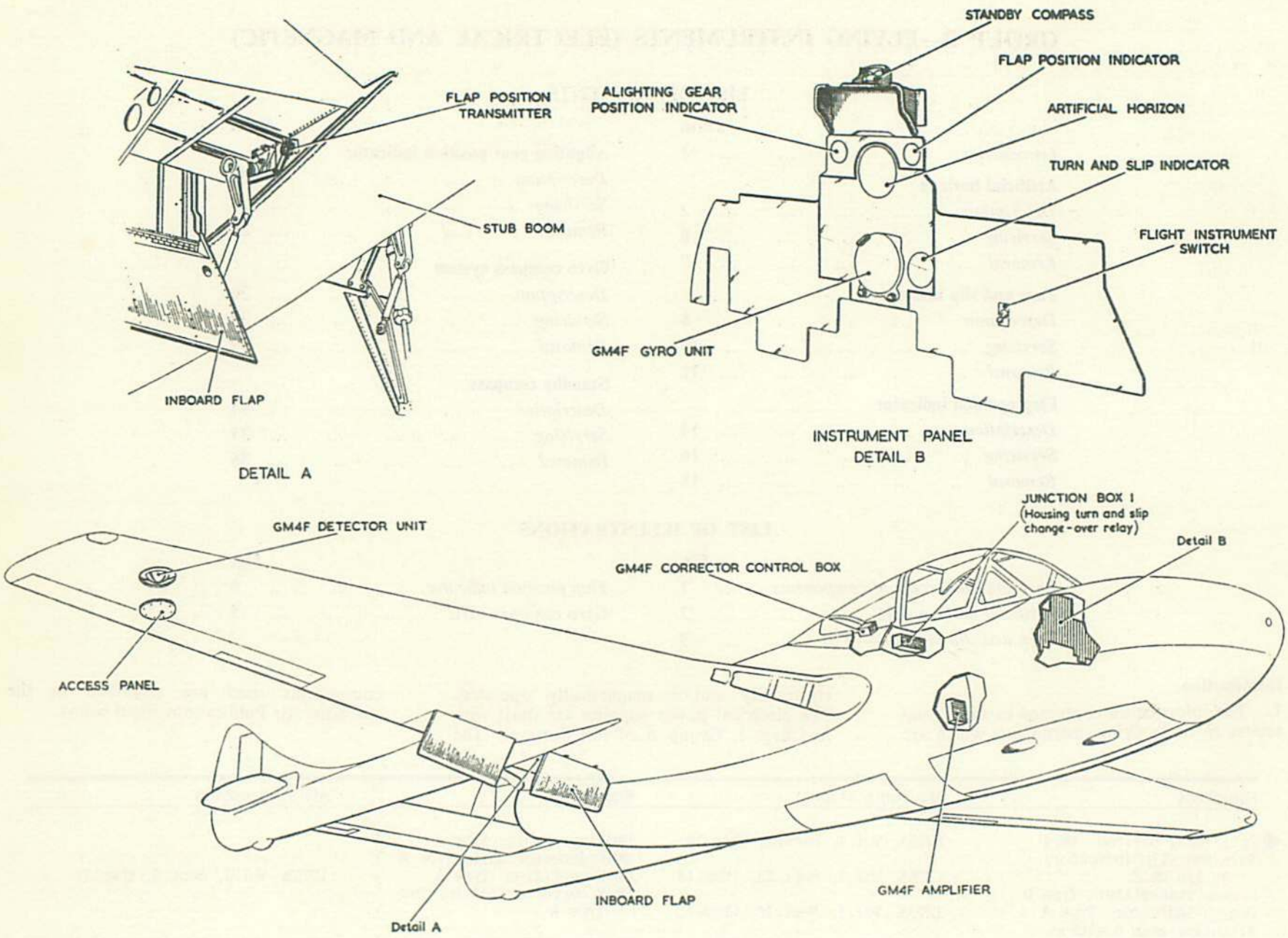

Fig. 1 *Location and access of components*

ARTIFICIAL HORIZON

Description

2. This instrument is fitted to the centre of the instrument panel, and provides a continuous indication to the pilots of the attitude of the aircraft in pitch and roll relative to the natural horizon.

3. The instrument incorporates an horizon bar and a roll indicator, coloured white, which move over a black background. The face glass of the instrument incorporates a miniature aeroplane symbol to indicate the aircraft's attitude above or below the natural horizon, represented by the horizon bar. The roll indicator reads against two graduations either side of a lubber line.

4. The electrical gyro is supplied with 115 volts, three phase, 400 c.p.s., a.c., this supply being dealt with in Chap. 1, Group A. The circuit is controlled by the flight instrument switch fitted to the main instrument panel.

5. A power failure indicator is incorporated in the form of a flag showing OFF through a window in the face of the instrument. A fast erection push-switch is fitted to the bottom left-hand side of the instrument face.

Warning . . .

The fast erection push-switch must only be operated during straight and level steady flight and/or shallow climbs and dives. A false climb or dive attitude will be indicated if the switch is pressed during acceleration or deceleration in the fore and aft plane, while a false indication of straight and level flight will result if the switch is pressed during a banked turn.

Servicing

6. The instrument is described, together with all servicing data, in the specialist Air Publication listed in para. 1. The standard serviceability test for the instrument is contained in the Appendix 1 to the specialist publication mentioned above.

Removal

7. Removal of the instrument will be self-evident when viewed on the aircraft. The instrument panel must first be lowered (Gen. Inf).

TURN AND SLIP INDICATOR

Description

8. The turn and slip indicator, fitted to the instrument panel, provides the pilot with an indication of the lateral attitude of the aircraft in relation to level flight and indicates yaw, side-slip or correct banking during turns. The amount of side-slip of the aircraft is shown by a fluorescent pointer bob at the bottom of the dial while the rate of turn is indicated by a pointer over a fixed scale at the top of the dial. A power failure indicator is provided in the left centre of the dial; it indicates OFF when the rotor speed drops below approximately 2,000 r.p.m.

9. As the aircraft can be safely flown on this instrument alone its electrical supply has been safeguarded for all contingencies (Chap. 1, Group D).

Servicing

10. The specialist Air Publication, listed in para. 1, gives the servicing information for this instrument. The Appendix 1 to the aforementioned specialist publication contains the instrument's standard serviceability test

11. Periodically, the instrument should be functionally tested as described in Chap. 1, Group D.

Removal

12. Removal of the instrument will be self-evident when viewed on the aircraft, the instrument panel first being lowered (Gen. Inf.).

13. The relay, fitted inside junction box 1, is secured to the inboard end of the J.B. by two 4 BA screws and stiffnuts.

FLAP POSITION INDICATOR

Description

14. A conventional desynn indicator system is employed to convey to the pilots the position of the flaps relative to the aircraft longitudinal datum.

15. A transmitter, located in the starboard inboard flap shroud, is linked to the flap torque tube assembly as described in Sect. 3, Chap. 4. The signal from this transmitter is conducted to the indicator fitted to the instrument panel, a single pointer indicating the position of the flaps. The pointer, when at the bottom, centre position indicates flaps down, and when at the top, centre position indicates flaps up.

Servicing

16. The components in this instrument system are described in the specialist Air Publication listed in para. 1.

17. In situ testing of the individual system components is described, using the desynn test set, in A.P.1275T, Vol. 1, Sect. 5, Chap. 1. The setting up procedure for synchronising the transmitter with the flap is described in Sect. 3, Chap. 4 of this book.

Removal

18. The method of removing the indicator will be self-evident when viewed, the instrument panel first being lowered (*Gen. Inf.*).

19. To remove the transmitter it is first necessary to disconnect the transmitter link from the operating link (*Sect.* 3, *Chap.* 4, *fig.* 9). The transmitter bracket may then be removed, the transmitter afterwards being removed from the bracket complete with its link.

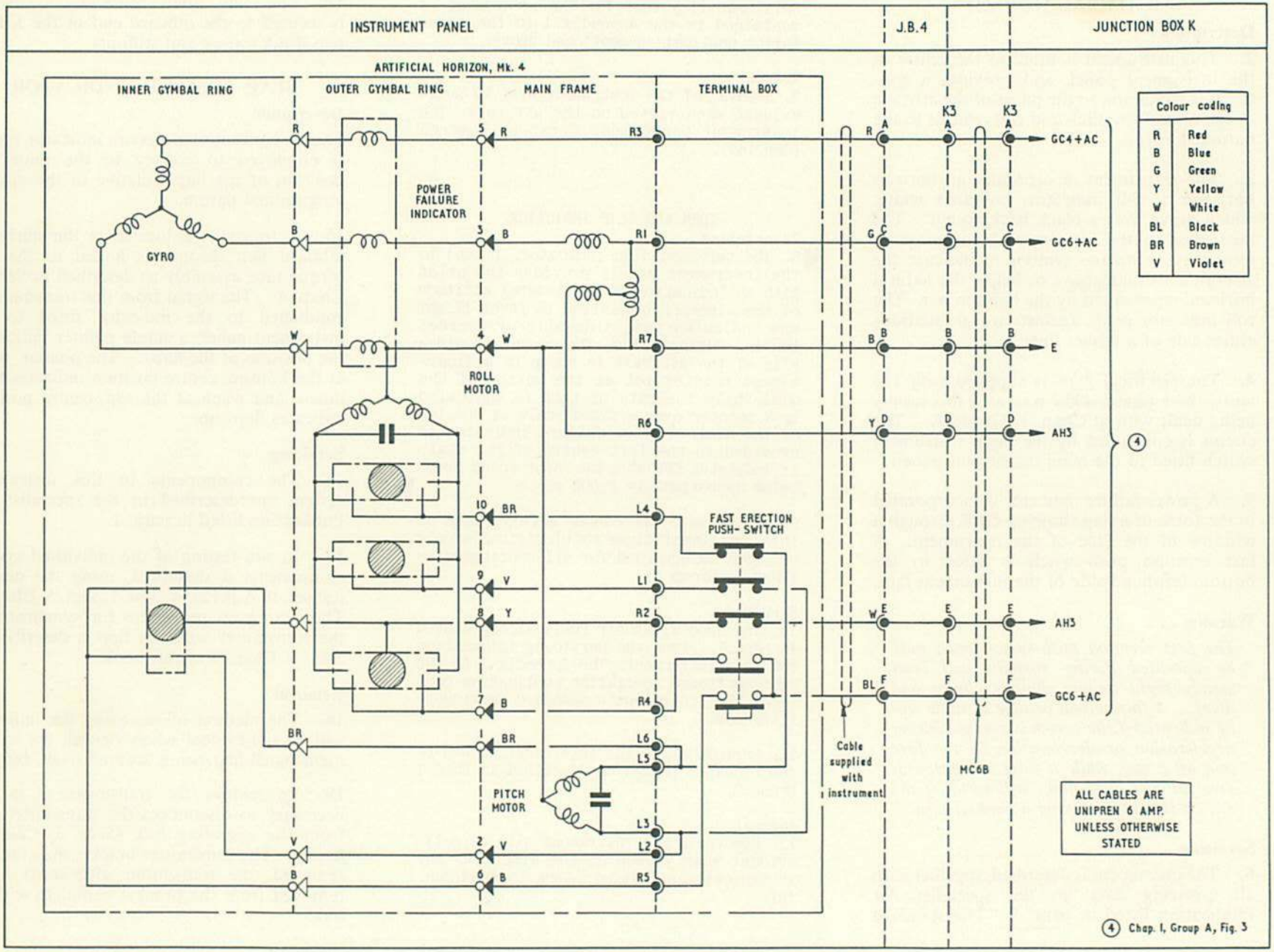

Fig. 2 Artificial horizon - GC

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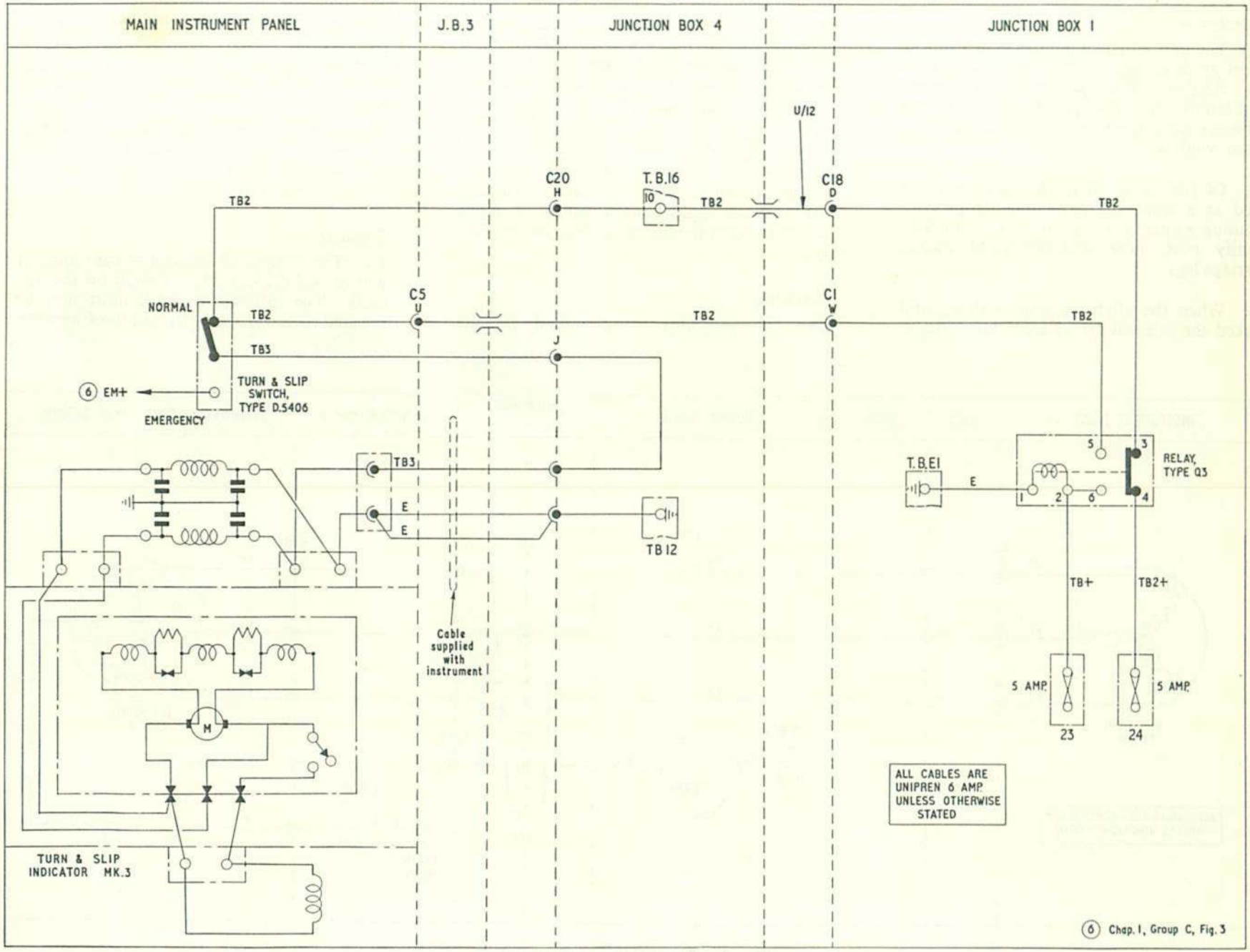

Fig. 3. Turn and slip indicator–TB

ALIGHTING GEAR POSITION INDICATOR

Description

20. The indicator is fitted to the instrument panel as described in Chap. 1, Group F of this Section. The indicator incorporates nine lamps, three of which are covered by red windows while the remainder are covered by green windows.

21. Of the six green lamps three only are used at a time, the remaining lamps constituting a spare set. Each set is divided to signify port, nose and starboard undercarriage legs.

22. When the alighting gear is down and locked the selected set of green lamps light. With the alighting gear unlocked, or in a travelling state, the green lamps circuit is disconnected and the red lamps light. With the alighting gear locked up both red and green lamps circuits are disconnected. The lamps are controlled by micro switches, as described in Chap. 1, Group F of this Section.

23. In the event of any of the selected set of green lamps failing, the spare set may be switched into circuit by turning the horizontal-lugged switch of the indicator. Turning the vertical-lugged switch causes a night screen to cover the lamps, thereby eliminating glare.

Servicing

24. The indicator is described in the specialist Air Publication listed in para. 1. When it is necessary to renew any lamp in the indicator, the complete lamp assembly may be withdrawn from the casing by unscrewing the knurled knob at the centre of the dial.

Note . . .

When refitting the lamp assembly, ensure that the assembly keys engage with the keyways in the casing. Under no circumstances must force be applied.

Removal

25. The method of removal of the indicator will be self-evident when viewed on the aircraft. The instrument panel must first be lowered (*Gen. Inf.* para 10 (2) of this Chapter).

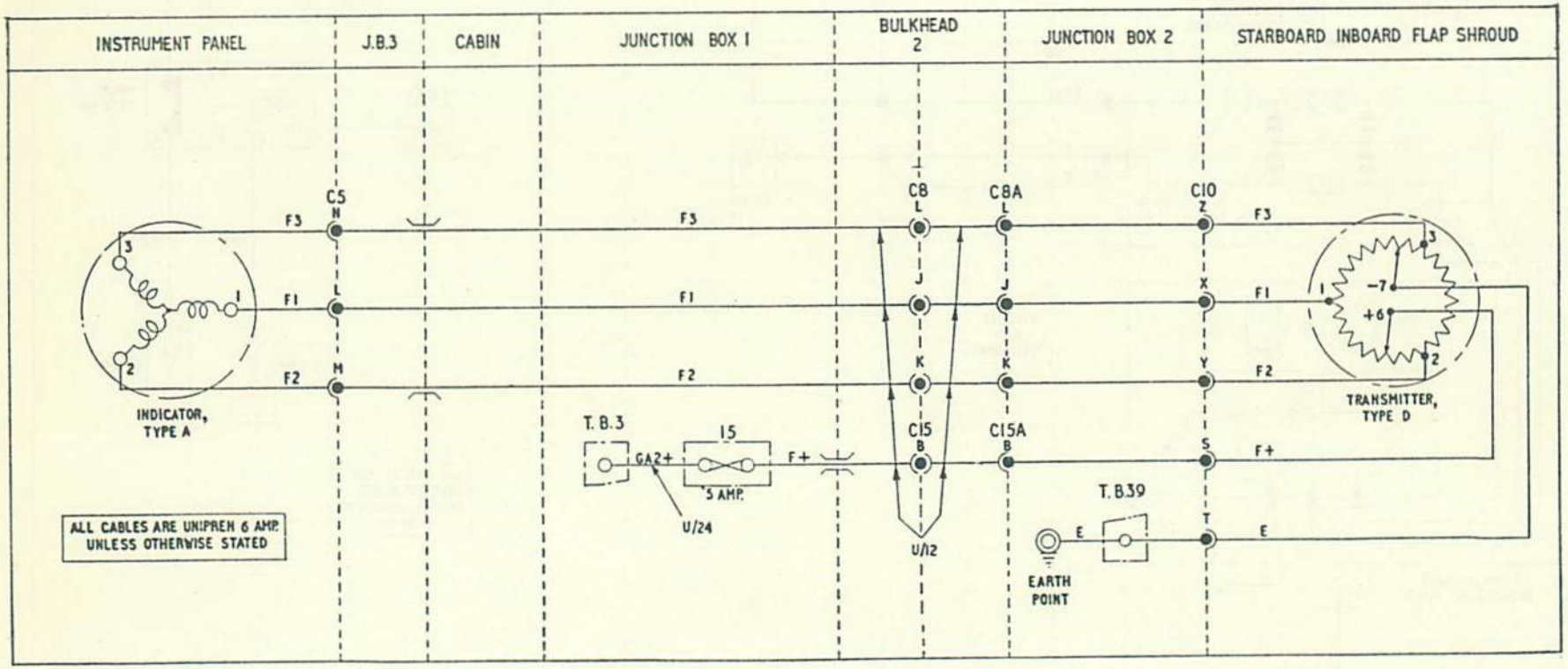

Fig. 4 *Flap position indicator-F*

GYRO COMPASS SYSTEM

Description

26. This compass system is essentially a gyro compass which is synchronised to the earth's magnetic field, being controlled by a magnetic flux valve known as the detector unit. This control eliminates gyro wander.

27. The detector unit is fitted in the outboard tip of the starboard main plane, this being the position in the aircraft least subject to magnetic effects set up by the other aircraft electrical systems.

28. The signal from the detector unit is amplified and conducted to the gyro unit, this unit being the pilots' compass indicator and consequently fitted in the centre of the instrument panel. It may be found that the gyro unit has a shield fitted to obviate any interference to the standby compass.

29. The system comprises, in addition to the detector unit, amplifier and gyro unit already mentioned, a corrector control box which is supplied with three-phase a.c. at 115 volts, 400 c.p.s., and 24 volts d.c. (*Chap. 1, Group A*).

Servicing

30. The compass system is described, and the servicing given, in the specialist Air Publication listed in para. 1.

31. Appendix 1 to the aforementioned specialist Publication contains the standard serviceability test, while A.P.1275B, Vol. 1, Sect. 3, Chap. 14 contains, in Appendix 3, the method of adjusting and calibrating the compass system.

Note . . .

Whenever the detector unit has been disturbed, or any unit renewed, the aircraft must be compass-swung to calibrate the compass system.

Removal

32. All of the equipment in the compass system, except for the detector unit, is readily accessible in the cabin, the method of removal of each individual component being self-evident when viewed on the aircraft.

Note . . .

The instrument panel must first be lowered (Gen. Inf.) before the gyro unit may be removed.

33. The detector unit is accessible through an access panel in the lower skinning of the starboard wing tip, and is secured to a bracket by three bolts.

STANDBY COMPASS

Description

34. A miniature magnetic compass is fitted to a bracket above the centre of the instrument panel, its function being that of a standby compass should the gyro compass system fail. It is shrouded on either side by a metal screen so that the luminous compass card markings will not confuse the pilots during night time gyro gun sight usage.

Servicing

35. The compass is described in the specialist Air Publication listed in para. 1. A.P.1275B, Vol. 1, Sect. 3, Chap. 11 details the calibration procedure necessary for magnetic compasses, the correctors for co-efficients B and C only being incorporated in the top of the E.2A compass.

Note . . .

Whenever the compass has been disturbed, the aircraft must be compass-swung to calibrate the compass.

Removal

36. The compass is fitted to its bracket by two 4 BA bolts, the compass being lined up with the aircraft's lubber line.

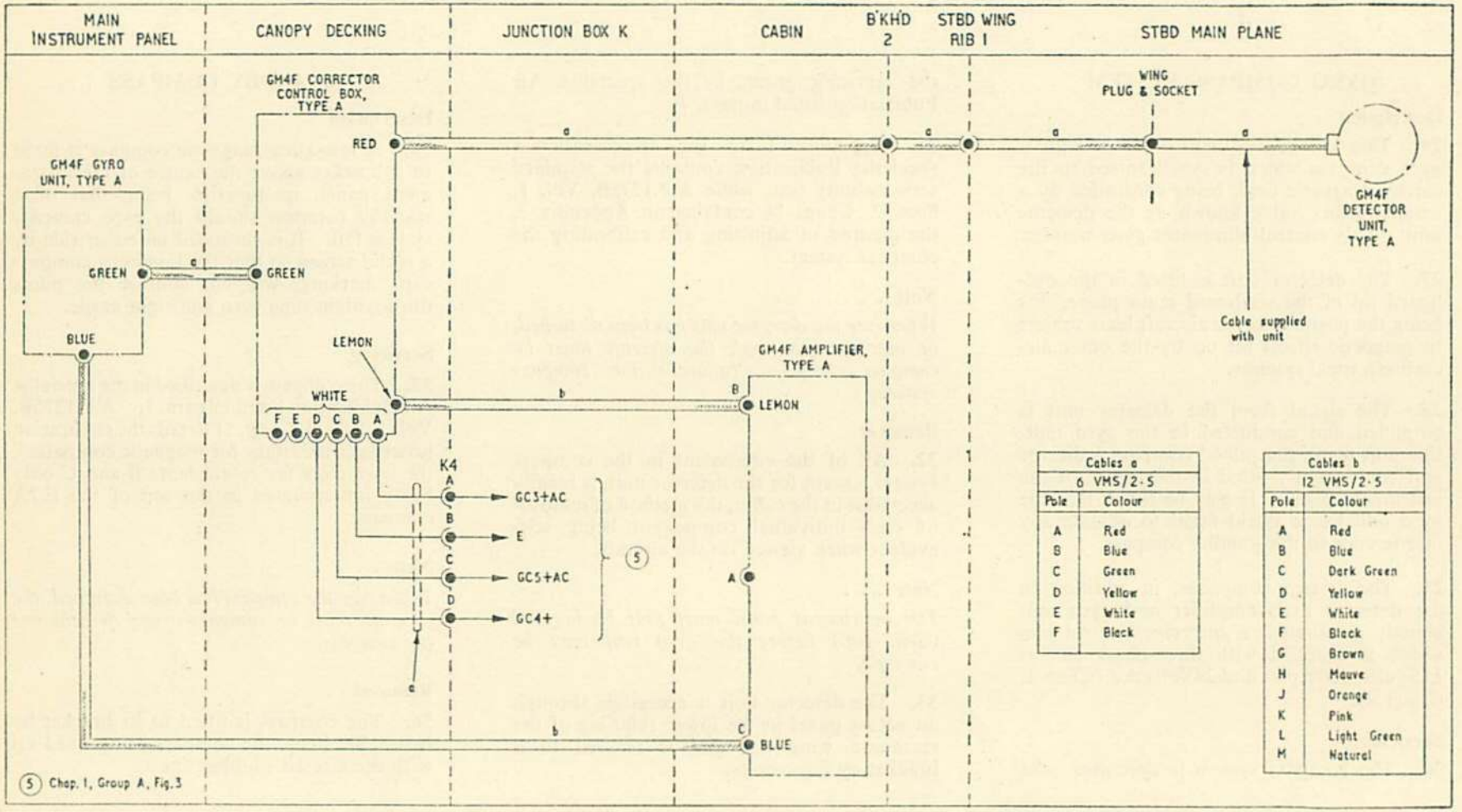

Fig. 5 *Gyro compass-GC*