GROUP D — MISCELLANEOUS INSTRUMENTS

LIST OF CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

Introduction

1. This group contains information related to the miscellaneous instruments fitted to the aircraft, some of which are operated electrically and derive their supplies from the aircraft generator system described in Chap. 1, Group A of this Section. The following list gives the component specialist Air Publication references.

Equipment	Air Publication
Accelerometer Mk. 2	1275A, Vol. 1, Sect. 12, Chap. 3
Brake pressure gauge Mk. 1D	1275A, Vol. 1, Sect. 15, Chap. 9
Cabin altimeter Mk. 18	1275A. Vol. 1. Sect. 22. Chap. 14
Clock Type V308	1275A, Vol. 1, Sect. 19, Chap. 12
Oxygen regulator Mk. 11D Oxygen regulator Mk. 11E	1275G, Vol. 1, Sect. 2, Chap. 5
Oxygen economiser Mk. 4	1275G, Vol. 1, Sect. 2, Chap. 6
Gyro gun sight Mk. 5	1275A, Vol. 1, Sect. 5, Chap. 5
Control unit Type T1, Mk. 1 (Twist grip) Control unit Type RA, Mk. 1 (Amplifier) Control unit Type S, Mk. 1 (Selector/dimmer) Control unit Type P, Mk. 2 (Guns/R.P.)	1275A, Vol. 1, Sect. 7, Chap. 1
Recorder, camera, Mk. 3	1355D, Vol. 1, Sect. 3, Chap. 2
Voltmeter	4343A, Vol. 1, Sect. 16, Chap. 3
Fuel contents system Mk. 5A	1275A, Vol. 1, Sect. 18, Chap. 14

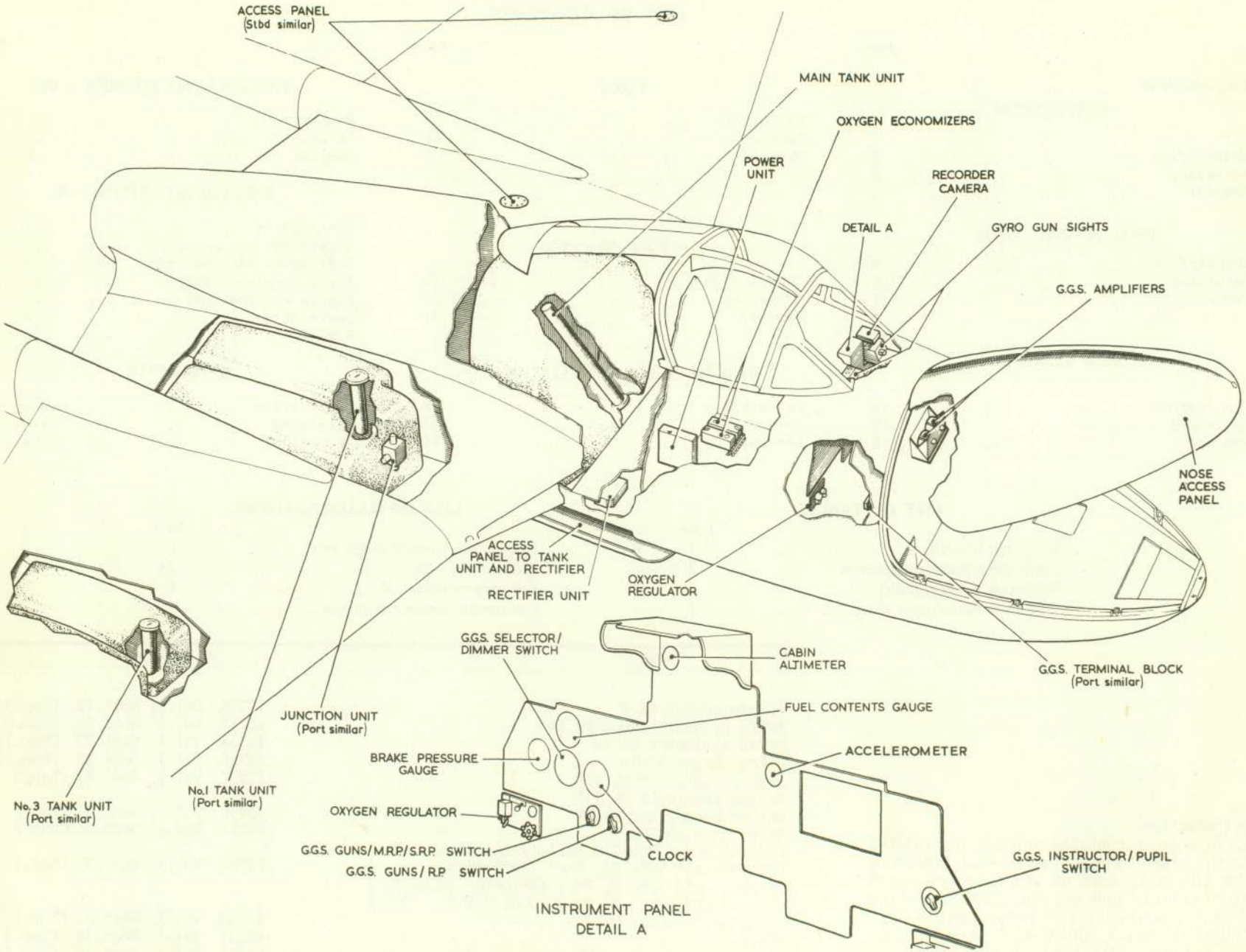

Fig.1. Location and access of components

ACCELEROMETER

Description

2. An indicating accelerometer is fitted to the top left of the right-hand side of the main instrument panel. It provides an indication of acceleration along the plane of the vertical axis of the aircraft and is calibrated in units of 'g', this being equal to the rate of acceleration due to the earths gravitational pull.

3. Three pointers are employed, the main one providing instantaneous readings from -5g to -10g while the remaining two pointers show the maximum 'g', positive and negative respectively, until they are reset by operation of the re-set knob.

4. When the aircraft is at rest on the ground the main pointer will read -1g provided that the aircraft is in its normal flying attitude.

Servicing

5. The instrument is described, together with servicing information, in the specialist Air Publication listed in para.1.

Removal

6. To remove the instrument the main instrument panel must first be lowered (Gen. Inf. para.8); the instrument may then be detached by removing two screws.

Note...

Whenever the instrument is removed from the aircraft, the weight arms must be locked by pulling out and rotating the knob located at the rear of the case, in the direction marked on the instrument case. Also care must be taken when handling the instrument to ensure that no extraneous accelerations are imposed on it.

7. Installation is the reverse process to removal.

BRAKE PRESSURE GAUGE

Description

8. A multiple reading gauge is fitted to the instrument panel to show to the pilots the pneumatic pressure available for wheel braking purposes.

9. The gauge employs three Bourdon tubes which, through suitable pointer mechanisms, indicate the total pressure in the pneumatic system and the pressure being applied at any instant to the port or starboard brakes, or both, simultaneously. The three resultanr dials are calibrated in p.s.i., the main dial reading from zero to 600 p.s.i., whilst the two subsidiary dials read from zero to 200 p.s.i. The pneumatic system is described in Section 3, Chapter 7 of this book.

Servicing

10. The gauge is described, together with servicing information, in the specialist Air Publication listed in para.1.

11. The Appendix 1 to the aforementioned specialist publication contains the standard serviceability test for the gauge.

Removal

WARNING...THE BRAKE PRESSURE GAUGE PIPE UNIONS ARE NOT TO BE LOOSENED UNTIL THE PNEUMATIC SYSTEM PRESSURE HAS BEEN EXHAUSTED. (Sect.3, Chap.7).

12. The instrument panel must first be lowered (Gen. Inf., para.8 of this Chapter), the pipe unions to the gauge removed (Warning preceding this para) and the 2BA screws, nuts and distance pieces removed. The gauge will now be free for removal from the aircraft.

13. When re-fitting the gauge, ensure that the pipe unions are properly tightened to effect leakproof conditions.

CABIN ALTIMETER

Description

14. This instrument is fitted tothe instrument panel to indicate to the pilots the cabin pressure, in terms of altitude, so that they may regulate their oxygen equipment accordingly.

15. As oxygen is not required until 10,000 feet, the instrument range has been calibrated from that figure, the maximum reading being 40,000 feet.

Servicing

16. The altimeter is described, together with servicing data, in the specialist Air Publication listed in para.1.

17. The standard serviceability test is contained in the Appendix 1 to the specialist publication mentioned above.

Note...

It is essential that the vent holes in th instrument case are kept clear at all times

Removal

18. The method of removing the instrument from the aircraft will be self-evident when viewed, the instrument panel first being lowered (Gen. Inf., para.8 of this Chapter).

CLOCK

Description

19. An eight day clock with chronograph movement for the centre seconds hand and the time of trip hands is fitted to the instrument panel.

20. The clock has conventional hour and minute hands, a centrally pivotted sweep second hand and a subsidiary 12 hour time-of-trip dial at the top of the main dial.

Servicing

21. The clock is described, together with servicing information, in the specialist Air Publication listed in para. 1.

22. Three knobs at 4, 6 and 8 o'clock control the operation of the clock. The knob at 8 o'clock is turned for winding and pulled out and turned for setting the main hands. The chronograph knob at 4 o'clock starts, stops and returns to zero the time-of-trip and centre seconds hands by successive pressings. The arrestor knob at 6 o'clock is for interupting the travel of the time-of-trip hands; a flag coloured green and red, visible through an aperture just above 6 o'clock, indicates recording and waiting respectively

23. Normal regulation of the clock mechanism is afforded by a lever at the back of the instrument.

Note...

For the servicing periods of clocks see A.P.3158, Vol. 2, Leaflet B.11.

Removal

24. This will be self-evident when viewed on the aircraft, the instrument panel first being lowered (Gen. Inf., para. 8 of this Chapter).

OXYGEN INDICATOR

Description

25. An oxygen high pressure indicator is fitted to the pupil pilot's Mk. 11D regulator, together with an ON/OFF wheel valve and a high and lower pressure flow gauge. The instructor pilot's oxygen regulator is a Mk. 11E, having no indicator or wheel valve.

26. The regulators are fitted one either side of the cabin below the instrument panel, whilst the two Mk. 4 oxygen economizers are located on the cabin floor aft of the pupil pilot's ejection seat. The oxygen system is described in Sect. 3, Chap. 10 of this book.

Servicing

27. The oxygen system components detailed above are described, together with the servicing instructions, in the specialist Air Publication listed in para. 1.

WARNING...UNDER NO CIRCUMSTANCES MUST OIL OR GREASE BE APPLIED TO ANY PART OF THE OXYGEN SYSTEM.

Removal

28. The method of removal of each component will be self-evident whem viewed on the aircraft, and should be effected in conjunction with the airframe tradesman. The pupil pilot's ejection seat will first have to be removed to allow access to the economizers.

GYRO GUN SIGHTS INSTALLATION

Description

29. Each retractable mounting (Sect. 5, Chap. 1, Group G) provides a movable platform for a gyro gun sight, allowing the sight, when not required, to be retracted out of the pilot's view.

30. A twin gun sight installation is provided to allow both pupil and instructor pilots to participate in gyro gun sight training. For this reason, both sights may be used concurrently by selection of the individual retraction unit switches, these switches controlling the sights besides running the retraction units to their combat position.

31. The system comprises two gyro gun sights, the ranging of each being applied by the motor fitted to, and forming part of, the sight. The direction and amount of rotation of the range motor is controlled by the out-of-balance state of a Wheatstone bridge, the two arms of which are formed by the throttle twist grip potentiometer and the range motor potentiometer with a sensitive relay assembly, contained in the amplifier unit, connected across the bridge.

32. Two d.c. supplies are applied to the installation, one at 28 volts and a second at 22 volts 9.5 volt, the latter being regulated as described in Sect. 5, Chap. 1, Group C.

33. A selector switch, fitted to the starboard side of the instrument panel, governs which pilot is to apply ranging to the sights, as this switch connects either the instructor or pupil pilot's ranging circuit (para. 31) to both sights, simultaneously.

34. A further control, the GUNS/M.R.P./S.R.P. switch, is fitted to the port side of the instrument panel and, when switched to the M.R.P. or S.R.P. position, applies fixed ranging and gravity drop settings to the sight head. The manual ranging from the throttle twist grips is therefore eliminated.

35. The optical display of each sight is controlled by a conventional selector/dimmer switch and GUNS/R.P. switch. Both these controls, although appearing to be single units, are twin controls, one half supplying each sight, the twin halves being mechanically linked.

36. The brilliancy of the two lamps, housed in each sight head to illuminate the optical systems, is controlled by a rheostat fitted to the selector/dimmer switch mounted at the left of the instrument panel. The selection of this switch provides for conventional FIXED, FIXED AND GYRO, or GYRO DAY graticule displays of each sight optical system.

37. The GUNS/R.P. switch, when set to GUNS, allows the sight to be used for gun firing but, when set to R.P., produces a 1 degree drop of the graticule system to allow the bottom diamond graticule display to be used for sighting during R.P. firing. This allows for the much more appreciable gravity drop of a rocket projectile whilst in flight.

Servicing

38. The components in the range system of

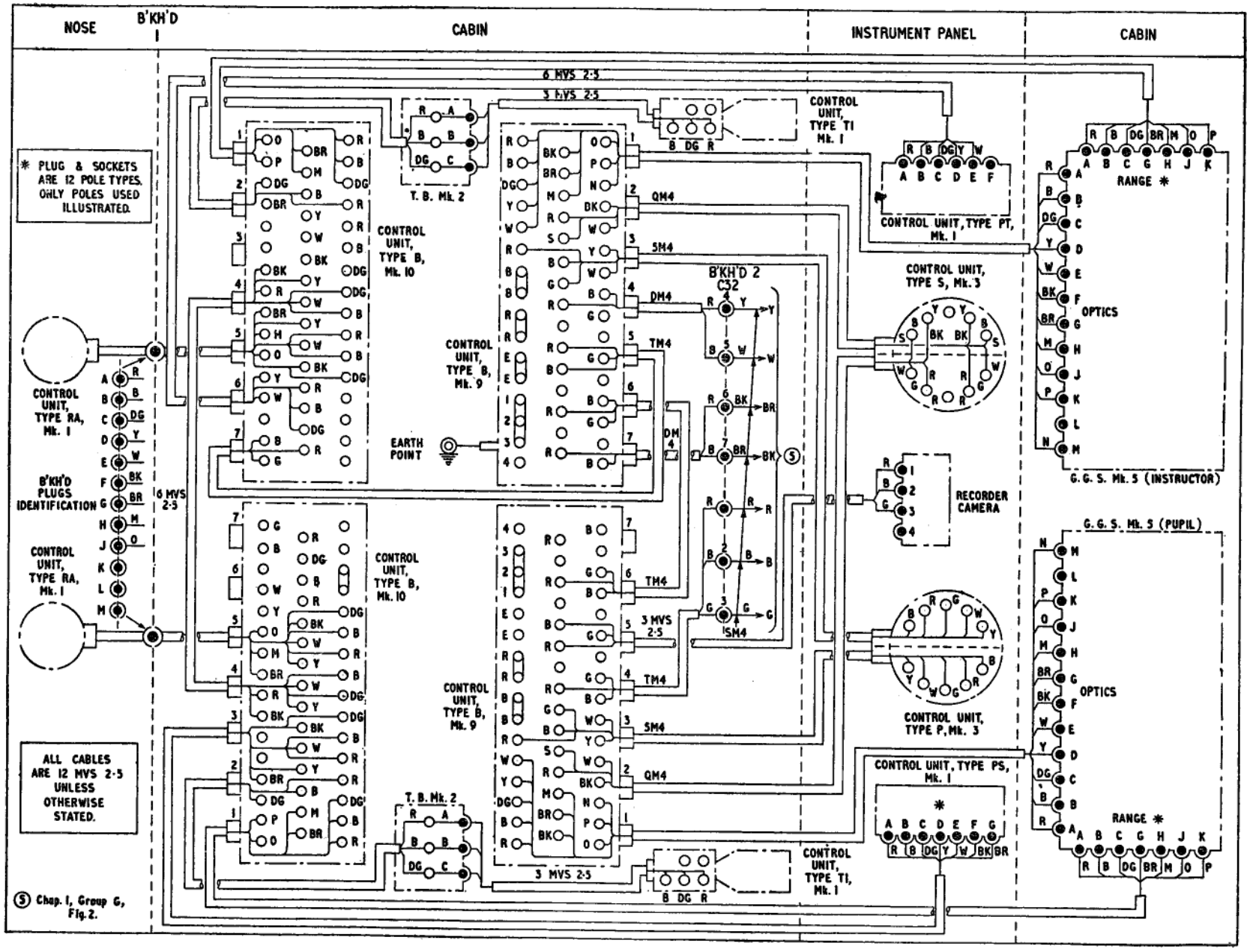

Fig. 2. G.G.S. wiring—GS

TABLE I

G.G.S. test schedule

Note . *Tests* 19 *to* 36 *inclusive are identical to tests* 1 to 18 *inclusive, except that where, in tests* 1 *to* 18, *the word INSTRUCTOR appears, the word PUPIL is substituted for the parallel test in tests* 19 *to* 36 *inclusive.*

Test No.	1	2	3	4	5	6	7	8
SELECTOR/ DIMMER SW.	FIXED	FIXED	FIXED	FIXED	FIXED	FIXED	FIXED AND GYRO	FIXED AND GYRO
GUNS/M.R.P./ S.R.P. SW.	GUNS	M.R.P.	S.R.P.	GUNS	M.R.P.	S.R.P.	GUNS	M.R.P.
INSTRUCTOR/ PUPIL SW.	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR
GUNS/R.P. SW.	GUNS	GUNS	GUNS	R.P.	R.P.	R.P.	GUNS	GUNS
THROTTLE TWIST GRIP	RANGE DRIVE FUNCTIONS FROM INSTRUCTOR'S	NONE	NONE	RANGE DRIVE FUNCTIONS FROM INSTRUCTOR'S	NONE	NONE	RANGE DRIVE FUNCTIONS FROM INSTRUCTOR'S	NONE
G.G.S. SPAN CONTROL	NIL	NIL	NIL	NIL	NIL	NIL	RANGE FUNCTIONS ON BOTH	SET TO R.P.
INSTRUCTOR'S OR PUPIL'S GRATICULES	SAME	SAME	SAME	SAME	SAME	SAME	SAME	SAME
DIMMER CONTROL	DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH
GRATICULES: FIXED GYRO	ON OFF	ON OFF	ON OFF	ON OFF	ON OFF	ON OFF	ON ON	ON ON

TABLE I—*continued*

9	10	11	12	13	14	15	16	17	18
FIXED AND GYRO	FIXED AND GYRO	FIXED AND GYRO	FIXED AND GYRO	GYRO	GYRO	GYRO	GYRO	GYRO	GYRO
S.R.P.	GUNS	M.R.P.	S.R.P.	GUNS	M.R.P.	S.R.P.	GUNS	M.R.P.	S.R.P.
INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR	INSTRUCTOR
GUNS	R.P.	R.P.	R.P.	GUNS	GUNS	GUNS	R.P.	R.P.	R.P.
NONE	RANGE DRIVE FUNCTIONS FROM INSTRUCTOR'S	NONE	NONE	RANGE DRIVE FUNCTIONS FROM INSTRUCTOR'S	NONE	NONE	RANGE DRIVE FUNCTIONS FROM INSTRUCTOR'S	NONE	NONE
SET TO R.P.	RANGE FUNCTIONS ON BOTH	SET TO R.P.	SET TO R.P.	RANGE FUNCTIONS ON BOTH	SET TO R.P.	SET TO R.P.	RANGE FUNCTIONS ON BOTH	SET TO R.P.	SET TO R.P.
SAME	SAME	SAME	SAME	SAME	SAME	SAME	SAME	SAME	SAME
DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH	DIMS BOTH
ON ON	ON ON	ON ON	ON ON	OFF ON	OFF ON	OFF ON	OFF ON	OFF ON	OFF ON

the gyro gun sight, together with the sight head, are described, together with the servicing, in the specialist publication listed in para. 1. The selector/dimmer and GUNS/R.P. switches are similar to those listed, but differ in that they are twin components. The selector/dimmer used is classified as a Control unit, Type S, Mk. 3, while the GUNS/R.P. switch used is classified as a Control unit, Type P, Mk. 3. The instructor/pupil selector switch is a simple change-over switch and is classified as a Control unit, Type PT, Mk. 1.

39. An operating test schedule is included in Table 1. This test schedule is not in true operational sequence, but has been devised to fully check every function of the range and optics systems of both sights.

(1) In tests 8, 11, 14, 17, 26, 29, 32, and 35, the range drive is at a pre-set value and should take up a position at 200 yards.

(2) In tests 9, 12, 15, 18, 27, 30, 33 and 36, the range drive is at a pre-set value and should take up a position at 265 yards.

(3) When switching the GUNS/R.P. switch from GUNS to R.P., note that the moving graticule display drops to 1 degree below the gun line.

40. The reflectors, sunscreens and exposed surfaces of the gun sight lenses should be kept clean by wiping with cotton wool lightly damped with carbon tetrachloride, ensuring that no foreign matter exists which may damage the surfaces being cleaned. The silica gel drying cells on the gun sights should be renewed when pink in colour.

Removal

41. To remove either gun sight, or any one of the control units fitted to the instrument panel, both retraction units should be extended to their combat positions and the instrument panel lowered (Gen. Inf., para. 8 of this Chapter).

42. To remove a gun sight, the relevant circuit breaker on the instrument panel must now be tripped. The range control and gyro and optics control plug and socket connections should now be broken, and the star nut holding the gun sight to the retraction unit removed. The sight may now be removed.

Note...

The range control and gyro and optics control plug and socket connections are interchangeable. The former is therefore marked with RED paint whilst the latter is marked with GREEN paint to aid identification.

43. The four control units fitted to the instrument panel, namely the INSTRUCTOR/PUPIL switch, the GUNS/R.P. switch, the GUNS/M.R.P./S.R.P. switch and the selector/dimmer switch, are conventionally fitted, the latter unit being mounted with the aid of four distance pieces.

44. Both relays, which supply the gun sights and retraction units, are mounted on a plate fitted to the cabin floor beneath the instructor piloy's rudder pedal controls. Both these relays are secured to the plate with two 4BA bolts.

45. Both amplifier units are mounted to a common bracket which is itself fitted, with anti-vibration mountings, to a bracket secured to the forward face of bulkhead 1. Access to them is in the nose bay. Each amplifier is secured to the bracket by three of the nuts which secure the amplifiers base plate to the amplifier body.

GYRO GUN SIGHT RECORDER

Description

43. Provision is made to fit a recorder camera to the pupil pilot's gun sight to effect a photographic record of the target and of the moving graticule of the sight itself. The camera is actuated from the cannon firing push-switch on either control column handle.

Servicing

47. All servicing, including installation and loading of the magazine, is described in the specialist Air Publication listed in para. 1.

Removal

48. The recorder camera is spring-clipped to two side clips screwed to the pupil pilot's gun sight. The electrical connection between the camera and the supply socket fitted to the retraction unit is effected by use of an adaptor supplied with the camera, the adaptor three-pole socket engaging with the retraction unit plug and the adaptor telephone socket engaging with the camera telephone plug.

FUEL CONTENTS SYSTEM

Description

49. A Mk. 5A Pacitor fuel contents system is installed incorporating provision for empty and full calibrations of the system at the rectifier unit. The indicator is calibrated in mass units (lb).

50. The system is based upon the fact that all other factors remaining unchanged, the capacitance of a capacitor depends upon the dielectric constant of the substance between the plates.

51. The tank units, of which there are five in the system, utilize the air, fuel or both as their dialectric, and are consequently variable capacitors.

52. They are located one in each wing tank No. 1, one in each wing tank No. 3, and one in the main fuselage tank. The collective fuel contents of these tanks is depicted by the total capacitance of the tank units, the resultant current being applied through the deflector coil of a ratiometer, the control coil being supplied with a steady current.

53. The system incorporates a power unit which converts the aircraft's 24 volt d.c. supply to approximately 70 volts, 19.1 kc/s a.c. for application to the tank units. A rectifier unit then transforms and rectifies the a.c. back to d.c., and applies both the control and deflector currents to the ratiometer indicator.

Servicing

54. The Mk. 5A Pacitor fuel contents system is described, together with general servicing information, in the specialist Air Publication listed in para. 1.

55. Where incorrect gauge readings have been experienced, all tank units and gaskets between the units and the tank flanges should be checked for serviceability. The

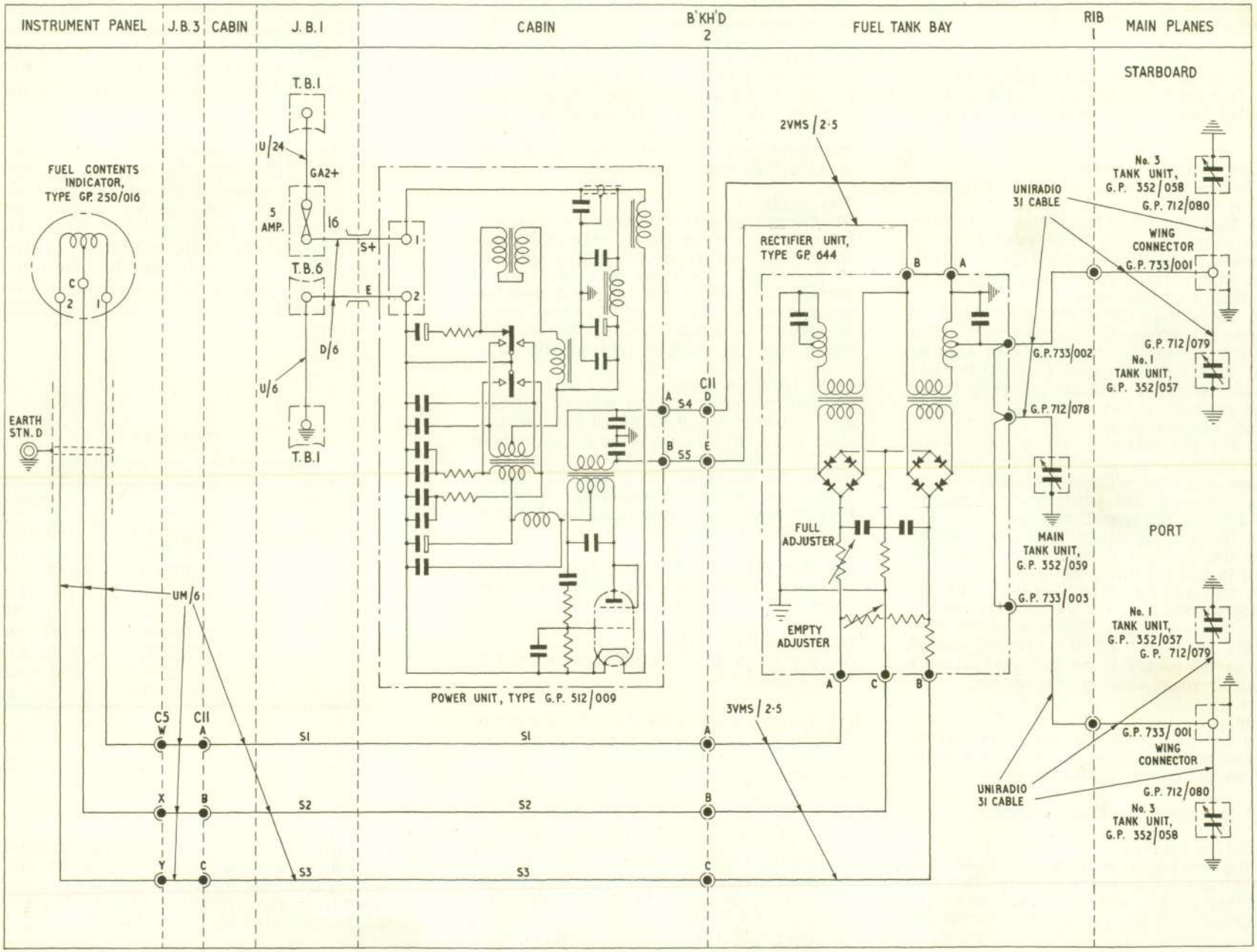

Fig. 3. Fuel contents system – S

tank unit insulation resistance should be not less than 3 megohms using a 250 volt insulance resistance tester. The capacitance test, using a Pacitor test set (Ref. No. 6C/962), should give the capacitance values indicated in Table 2.

Note...
The co-axial cables interconnecting the rectifier unit and the tank units must at no point have a bend radius of less than 4 in.

Setting up the indicator
56. To set up the mass units indicator proceed as follows:-

(1) When setting up the indicator in situ the aircraft must be rigged in a -5 degrees nose-up attitude. Rigging detail and instructions are contained in Sect. 2, Chap. 4 of this book.
(2) Check that the system as a whole is correctly wired and switched ON. Allow 20 minutes for the power unit to warm up.
(3) With fully drained fuel tanks, adjust the EMPTY resistor, marked E, on the rectifier, so that the indicator reads exactly zero.
(4) Put 290 gallons, 1 per cent., into the aircraft by first filling the wing tanks and then putting the remainder in the fuselage tank, checking the amount of fuel on the bowser's gauge.
(5) Using an accurate hydrometer, measure the specific gravity of the fuel used within the tolerance of 0.002
(6) Multiply 290 gallons by ten times the ascertained S.G. of the fuel to obtain the total weight of fuel now in the aircraft, and adjust the FULL trimmer, marked F, on the rectifier so that the indicator pointer reads exactly this weight.

Note...
The indicator reading should be multiplied by 100 to read the correct weight, as marked on the indicator gauge.

(7) The system is then aligned.

Insulation testing
57. The insulation resistances of the cable assemblies and tank units measured from each co-axial cable, where it has been disconnected from the rectifier unit, should be not less than 5 megohms using a 250 volt megger.

Rectifier units
58. Incorrect gauge readings may be experienced due to the weakening of the spring grip of the plugs (Ref. No. 10H/3930) connected to the rectifier unit; this results in loosening or disconnection due to vibration. To prevent this the spring must be tightenes by winding a length of 20 s.w.g. copper wire around the indented ring in the spring grip and twisting the two ends until a firm grip is obtained.

Tank units
59. Ingress of water through the tank connector at the cable gland entry will cause incorrect readings on the gauge; this can be prevented by the use of a seal placed between the face of the tank unit head and the face of the cable end. This seal should be made of tank material, 0.026 in. thick using jointing compound (Ref No. 34B/523).

Fault location tests
60. General notes, in the form of a Table, are included in A.P. 1375A, Vol. 1, Sect. 3, Chap. 17 to help in locating a fault shown at the indicator. A more detailed procedure for checking the power unit, rectifier, and indicator separately, using the Pacitor test set, is described in A.P. 1275T, Vol. 1, Sect. 5, Chap. 3.

61. When refitting the rectifier lid, treat the Dowty O-ring seal with Kingsnorth compound No. 1026 (Ref. No. 33C/810).

Cables and tank units
62. For these tests references should be made to Table 2.

(1) Connect a 26 to 28 volts d.c. supply to the D.C. IN terminals of the test set.

(2) Main Tank: Connect junction unit G.P.30694 to the co-axial plug marked CAPACITY on the test set. Plug aircraft cable GP.712/078 to junction unit GP.-30694, and set switch C to the nearest value below 191. Switch ON the external supply, press the FREQ. CAP. switch and note the reading on meter A. Add this reading to 191, the result should be within the limits of 208 and 191 pF. Switch OFF the external supply.

(3) Starboard Tanks: Disconnect aircraft cable GP.712/078 from the junction unit and connect aircraft cable GP.733/002 to it. Switch ON the external supply, set switch C to the nearest value below 582, press the FREQ. CAP. switch and note the reading on meter A. Add this to 582, the result should be within the limits of 616 and 582 pF. Switch OFF the external supply.

(4) Port Tanks: Disconnect aircraft cable GP.733/002 from the junction unit and connect aircraft cable GP.733/003 to it. Switch ON the external supply, set switch C to the nearest value below 634, press the FREQ. CAP. switch and note the reading on meter A. Add this to 634, the result should be within the limits of 668 and 634 pF. Switch OFF the external supply.

TABLE 2
Cable and tank unit capacitances

Component	Part No.	Capacitance (pF)
Tank unit	GP352/059	159—147
	GP352/058	106— 98
	GP352/057	86— 80
Cable assembly	GP733/003	150—145
	GP733/002	98— 93
	GP733/001	45— 40
	GP712/080	220—215
	GP712/079	61— 56
	GP712/078	54— 44

63. If these three tests have proved satisfactory, all cables and tank units are serviceable. The test set then may be removed from the aircraft and all aircraft cables connected to the rectifier.

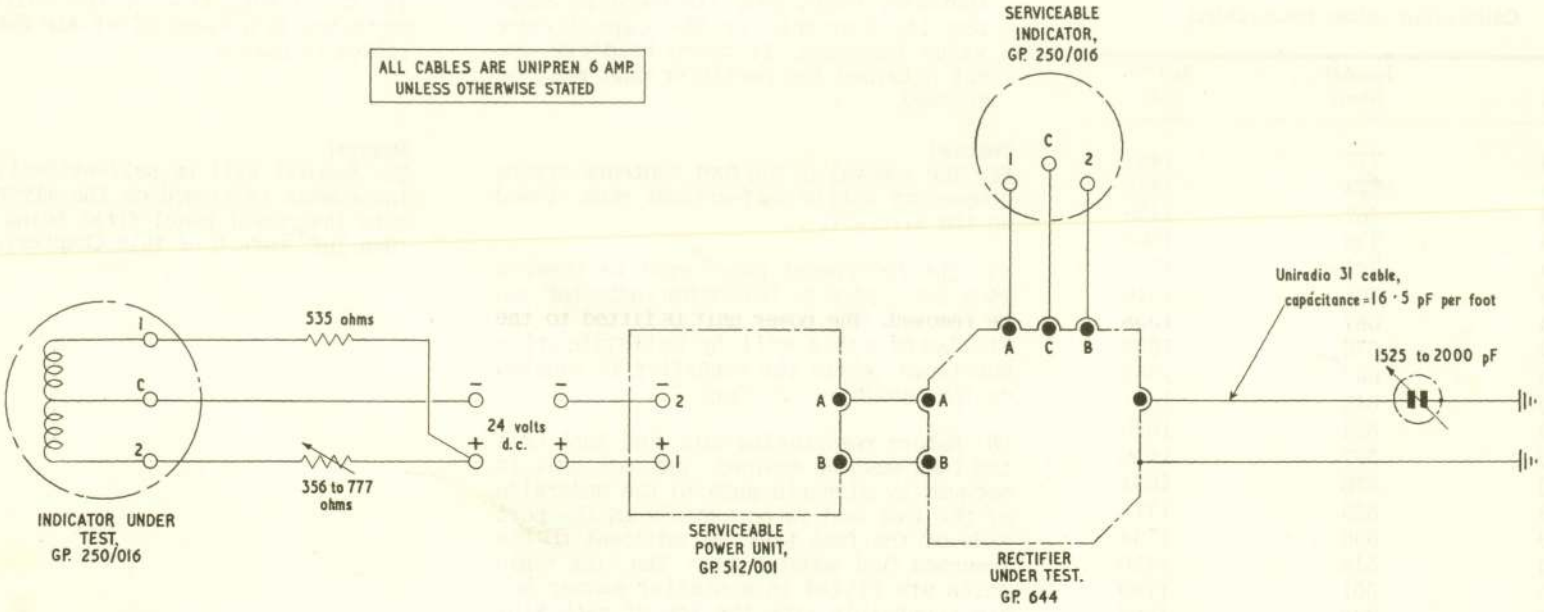

Fig. 4. Fuel contents system test circuits

64. If any of the three tests has proved faulty, reference should be made to fig. 3 and each cable tested separately, being disconnected at each end for this purpose. The cable capacitances are shown in Table 2.

Note...
On satisfactory completion of the foregoing tests, the system must be re-set as detailed in the relevant setting up procedure.

Bench tests
65. The following table is included to facilitate complete range testing on the bench of the indicator and rectifier units.

TABLE 3

Calibration values (mass units)

lb.	Indicator (ohms)	Rectifier (pF)
0	777	1468
100	773	1472
200	757	1488
300	738	1506
400	721	1523
500	704	1540
600	687	1558
700	676	1568
800	662	1583
900	645	1601
1000	623	1626
1100	597	1656
1200	576	1684
1300	553	1711
1400	536	1734
1500	518	1756
1600	501	1780
1700	483	1806
1800	466	1831
1900	449	1857
2000	434	1880
2100	421	1902
2200	410	1918
2300	402	1932
2400	392	1950
2500	382	1968
2600	376	1980
2700	356	2020

(1) Indicators: connect an external test circuit, as shown in fig. 4, between the suspected indicator and a stable 24 volt supply. Adjust the variable resistor to the values shown in Table 3 and check that the indicator reads over its complete range the lb. content for the resistance value inserted. If the indicator fails this test it should be renewed.
(2) Rectifier: connect an external test circuit, as shown in fig. 4, to any coaxial plug of the suspect rectifier. The power unit and indicator must be of tested serviceability. Adjust the variable capacity to the values shown in Table 3 taking into account the capacitance of the interconnecting Uniradio 31 cable (16.5pF. per ft.) and checks that the indicator reads, over its complete range, the lb. content for the capacitance value inserted. If these readings are not obtained the rectifier unit must be renewed.

Removal
66. The removal of the fuel contents system components will be self-evident when viewed on the aircraft.

67. The instrument panel must be lowered (Gen. Inf., para. 8) before the indicator can be removed. The power unit is fitted to the starboard cabin wall by anti-vibration mountings, while the rectifier is mounted on the cannon bay roofing.

68. Before removing the main fuel tank unit the tank must be drained. The tank unit is secured by pinnacle nuts to the underside of the tank and is accessible in the port side of the fuel tank bay adjacent to the immersed fuel booster pump. The wing tanks units are fitted in a similar manner but are accessible from the top of each wing via access panels

69. When refitting any tank unit a new gasket made up from plain Hallite Aero, D.T.D. 378A (Ref. No. 32B/689), should be fitted; no sealant is necessary. Seal the tank connector cable after connection using Boscoprene No. 2100 (without hardener) around the milled nut and refit the rubber sleeve. When refitting the access panels to the wing use Boscoprene No. 2100 (without hardener).

VOLTMETER

Description
70. A coloured-sector voltmeter is fitted to the bottom of the main instrument panel in front of the first pilot to show d.c. voltage available at all times.

71. When the generator is not charging and the cut-out consequently open the voltmeter will indicate the main batteries' voltage. When the generator is charging, however, the cut-out will be closed and the instrument will then show the generator output voltage.

Servicing
72. The description of the voltmeter is contained in the specialist Air Publication listed in para. 1.

Removal
73. Removal will be self-evident when the instrument is viewed on the aircraft, the main instrument panel first being lowered, (Gen. Inf. para. 2 of this Chapter).