CHAPTER 1

ELECTRICAL INSTALLATION – SERVICING

Chapter 1

ELECTRICAL INSTALLATION—SERVICING

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

Introduction

1. This chapter contains notes on the servicing of the electrical installation, a table showing the means of access to various components, and diagrams giving the location of the electrical components and wiring of the services. For detailed information on the servicing of standard items of equipment, reference should be made to the list of relevant Air Publications given at the beginning of this book.

POWER SUPPLY

2. Pre-mod. 393 aircraft are equipped with a Type KX generator and a Type F 24 voltage regulator. Post-mod. 393 aircraft are fitted with a Type HX 2 generator and a Type A voltage regulator and cut-out combined unit. The output of the Type KX generator is 60 amp. at 29 volts, and that of the Type HX2 generator is 50 amp. at 29 volts. The generator charges two 12-volt, 25 amp. hr. accumulators connected in series, and the cut-out gives reverse feed protection should the generator voltage fall below the accumulator voltage. To prevent interference with the radio equipment, a suppressor is included in the circuit. A warning lamp, mounted on the centre instrument panel, indicates when the generator is not charging the accumulators, either because the generator has failed or the main fuse has broken. This lamp will indicate at all times when the engine has stopped and is unaffected by the position of the ground/flight switch.

INTERPRETATION OF DIAGRAMS

Location diagram

3. This diagram gives the positions of the electrical components, the layout of the instrument panels and the junction boxes. The location diagram will be of assistance if referred to when reading a routing chart.

Routing charts

4. The various electrical circuits are laid out in the form of routing charts, which have vertical columns, each representing either a junction box, a pin reference or an equipment panel, as indicated at the head of each column. The extreme left-hand column gives the circuit name and code letter. Where one routing chart bears more than one circuit, each circuit is separated by a heavy horizontal line.

Method of reading

5. As an example of the manner in which the routing chart may be read, reference should be made to the flap position indicator circuit in fig. 3. Commencing at fuse No. 21, in junction box J.B.1, a quintocel 4 cable coded F+ goes through conduits C5 and C5A, conduit pin W to J.B.2 and through loom C10, pin S to the transmitter. The circuit is then taken from the transmitter through cables, coded F1, F2 and F3, pins X, Y and Z, through loom C10 to J.B.2, and from J.B.2 to J.B.1 through conduits C5A and C5, pins T, U and V. It continues from J.B.1 through conduit C2, pins T, U and V to the flap position indicator on the instrument panel. The negative lead is connected from the transmitter to the negative terminal block in J.B.2 through loom C10, pin T.

INSTALLATION DETAILS

Wiring system

6. Wiring in the fuselage is carried out by a junction box system, the junction box interconnections being contained in polyvinyl conduits with sockets at each end. The system also includes cable loom assemblies, which consist of multi-pin sockets with loose cel type cables attached; these, in general, are used for distribution to components. The wing wiring, and that in the left-hand tail boom is by cable looms. Conduits and looms are identified by labels at each socket, which are prefixed by a letter, e.g., C followed by the conduit number to yield C1, C2, etc.

Fuses

7. The general service fuses are located on J.B.1, J.B.2 and on the voltage regulator panel. Their numbers, services and ratings are shown on the fuse box covers. A list of fuses used is given in Table 1 below.

TABLE 1

List of fuses

Circuit	Circuit code	Fuze size (amp.)	Fuse No.
Generator	GA	5, 5, 60	32, 33
Starter and booster coils	SA	10, 10	1, 31
Identification lamps....	J	10	5
Landing lamp	LL	20, 5	28, 17

TABLE I—*continued*

Circuit	Circuit code	Fuse size (amp.)	Fuse No.
Heated pressure head	P	10	3
Gyro gun sight	GS	10	24
Gun firing	GF	25	26, 27
		10	14
Camera gun	CG	10	10
R.P. firing control	RP	10	35
Bomb control	B	5	36
A.R.I. 5229 supply	QG	40	29
A.R.I. 5131 supply	QS	20	25
U.V. lamps	UV	5	6
Cockpit lamps	T	5	7
Cabin pressure warning	PW	10	15
R.I. compass	RI	5	2
Fuel boost pump	BP	10	13
Navigation lamps	N	5	4
Fire warning and extinguisher	FA	5	16
		20	8
Fuel contents gauges	S	5	20
Fuel pressure warning	PA	5	9
Undercarriage position indicator	U	5	22
Undercarriage lever lock	UL	5	23
Flaps position indicator	F	5	21
Oil temperature gauge	OA	5	11

Junction boxes

8. The junction boxes are prefixed by the letters J.B., and are referenced numerically i.e., J.B.1. They are referenced on the routing charts and their positions on the aircraft are shown on the location diagram. Multi-pin plugs on the junction boxes are each denoted by a label showing its number, the number being preceded by a letter as for the conduit identification i.e., C1 or J.B.1 etc. The conduit sockets are connected to the junction box plugs bearing the same identification reference. The internal wiring of the junction boxes and the conduits between junction boxes is carried out with vulcanized india rubber (V.I.R.) cable.

Terminal blocks

9. Terminal blocks are provided at convenient points in the aircraft; they bear no numbered labels and the numbers shown on the routing charts are arbitrary, being used solely to correlate them with the location and other diagrams.

Bulkhead plugs

10. The plugs are double-ended and are used to take wiring through metal panels as at firewalls or bulkheads. When they are utilized on the cockpit bulkheads, provision is made to seal them against air leaks.

FILAMENT LAMPS

11. A list of the filament lamps used is given in Table 2 below.

TABLE 2

List of filament lamps

Lamps	Stores Ref.	Voltage	Wattage
Navigation :—			
Port, Starboard	5L/1813	24	20
Tail	5L/244	24	10
Identification (downwards)	5L/50	24	80
Landing	5L/106	24	240

TABLE 2—*continued*

Lamps	Stores ref.	Voltage	Wattage
Floodlamps :—			
Ultra-violet	5L/302	12	7
Red—right-hand }	5L/112	24	2·8
Red—left-hand }			
Emergency	5L/553	2·5	0·75
Gun compartment	5L/264	24	6
Gun sight	5L/236	22	12
Undercarriage :—			
Position indicator....	5L/1928	24	2·8
Warning	5L/1928	24	2·8
Cockpit pressure warning	5L/1928	24	2·8
Fuel pressure warning	5L/1428	6	0·24
Generator power failure warning	5L/1428	6	0·24

SERVICING NOTES

General

12. The information given in the following paragraphs covers the procedure for certain inspections, tests and adjustments necessary when servicing electrical equipment in the aircraft, but does not cover all the operations that may be required for the servicing of the various components. The servicing of standard items of equipment fitted in the aircraft is covered in the appropriate Air Publications, a list of which is given at the front of this book.

Ground/flight switch

13. This switch, which is situated on rib No. 1, left-hand wing, and controlled from the cockpit, enables the aircraft accumulators to be isolated from the aircraft services when the switch is at GROUND. When in the GROUND position, tests on the electrical circuits can be made only by connecting an external supply of 24 volts to the socket on the left-hand mounting of the engine. The electrical connections at the switch should be checked, at frequent intervals, for tightness; if the connections become loose there is a possibility of a short circuit. The connections should be cleaned periodically to ensure good electrical contact.

External supply sockets

14. Two external supply sockets are fitted on the aircraft. One socket is for connecting an external supply to the engine starting circuit and the other for connecting an external supply to the aircraft electrical services so that they may be tested independently of the aircraft power supply. They are of similar type and require little servicing. After the external plug has been removed, the spring-loaded cover should return smartly to the full extent of its travel. Periodically, the cover should be removed, the internal spring and contacts examined for corrosion. At the same time the contacts should be cleaned, the moving parts lightly oiled, and the felt seal checked for effectiveness.

Accumulators

15. The aircraft lead-acid type of accumulators are readily accessible for removal and servicing; information on their servicing is given in A.P.1095C, Vol. I, Sect. 1, Chap. 1.

16. Instructions for charging the alkaline accumulator are given on a label attached to the side of the accumulator. The electrolyte should be changed if its specific gravity falls to the equivalent of 1·2 at 60 deg. F., or to 0·03 below the strength originally used.

Wiring

17. Every cable should be examined periodically throughout its entire length and all connections checked for possible looseness. In the case of soldered connections, inspections should be made at points where the soldered portion of the cable and the unsoldered flexible portion meet, breakage being liable to occur at these points. Deterioration of the insulation may be caused by excessive heat or by the action of oil or kerosene, and damage may be caused by accidental stresses or by chafing at the fixing points. Metal-braided cables should be so clipped that intermittent contact between the cables and metallic

aircraft parts is avoided. For cable insulation testing, refer to A.P.1095A, Vol. I, Sect. 3, Chap. 4 and for details of weatherproofing the electrical system to Sect. 3, Chap. 11 of the same A.P.

Generator

18. For detailed servicing information on the components in the power circuit, reference should be made to the following Air Publications :—

Generator, Type HX2	A.P.1095C, Vol. I, Sect. 5, Chap. 1 and 10.
Voltage regulator panel, Type A	A.P.1095C, Vol. I, Sect. 6, Chap. 4.
Cut-out, Type D2	A.P.1095C, Vol. I, Sect. 7, Chap. 2.
Suppressor, Type Y, No. 3	A.P.1095A, Vol. I, Sect. 5, Chap. 2.

Starter and booster coils

19. It is important to ensure that the flexible cover for the solenoid switches is always clipped in place and that the terminal lugs are kept free from oil, and adequately spaced to avoid the possibility of a short circuit between the terminals, as this may cause inadvertent operation of the starter motor. Tests to be applied to the starter system are given in A.P.1095C, Vol. I, Sect. 8, Chap. 2 and for servicing the starter motor, refer to Sect. 2, Chap. 1 and 10.

Landing lamp

20. To gain access to the lamp switchgear and motor, the lamp assembly should be removed from the aircraft by unscrewing the flange-securing screws. Cover plates on the lamp assembly, when removed, expose the contacts and motor gears. A.P.1095A, Vol. I, Sect. 8, Chap. 9, gives details of servicing and adjustments to the lamp assembly.

Heated pressure head

21. The following tests should be made periodically on the pressure head heater element :—

(1) Insulation resistance. A 24-volt supply should be connected to the pressure head connections and allowed to remain on until the head is too hot to be held by the naked hand and then switched off. Measure the insulation resistance of the head while hot. This should not be less than $\frac{1}{2}$ megohm, measured at 250 volts. Allow the head to cool and again measure the insulation resistance, which should not be less than 3 megohms at 250 volts.

(2) Continuity and resistance. Measure the resistance of the heating element across the electrical leads with a test meter ; the resistance should be approximately 6·0 ohms.

Gun firing

22. With the aircraft on the ground, there are two safety devices in the gun firing circuit ; one is in the safety flap on the selective firing switch and the other a micro switch in the nose wheel well. It is of vital importance that these safety devices are maintained in correct adjustment and in a good electrical condition. It is recommended that when the guns are loaded, and for additional safety, the electrical leads to the gun firing units are not connected until immediately prior to flight. Also, that before the leads are plugged into the firing units they are tested to ensure that the circuit is not closed. Adjustment of the micro switch, which is ganged with the nose wheel position indicator micro switches, must be done when an alighting gear retraction test is carried out. The setting of the gun firing circuit micro switch is the same as that for the nose switches, the adjustment of which is described in Sect. 4, Chap. 3 of this A.P. The gun firing relay switches should be inspected periodically for security, damage and cleanliness, and tested for correct functioning in conjunction with other components of the firing system. Details of servicing for the firing switch are given in A.P.1095B, Vol. I, Sect. 7, Chap. 4, and for the firing units in Sect. 7, Chap. 7 of that A.P.

Gyro gun sight

23. For servicing the voltage regulator and suppressor in the supply system to the control unit, Type B, Mk. 6, refer to A.P.1095C, Vol. I, Sect. 6, Chap. 1 and 3, and A.P.1095A, Vol. I, Sect. 5, Chap. 1 and 2 respectively.

Camera gun

24. When testing the camera circuit, the gun firing and R.P. release circuits must also be operated as well as the independent camera operating switch, since the camera

circuit is connected to each system. Two camera relays are fitted, one is on J.B.1, the other, which is not used, is ganged with the gun firing relays, and is wired only to the nearest conduit plug. The G.45 camera servicing is described in A.P.1355D, Vol. I, Sect. 1, Chap. 3.

R.P. firing control

25. The firing sockets on the R.P. mounting attachments should be kept free from oil and moisture and the cables maintained in a good condition. When carrying out insulation testing, this circuit should be tested separately from the main electrical system and the reading obtained for insulation resistance to earth should not be less than 200,000 ohms. There is a safety break in each wing cable loom in the wheel wells. If a series of test lamps mounted on a board are connected to the firing sockets, a functional test on the complete system can be readily carried out. Before the rocket firing leads are plugged into the firing sockets, a test lamp should be inserted in each socket and then the safety break opened. Immediately prior to flight a test-lamp should be inserted in the safety break socket before the connection is made. Information on the 4-way auto-selector switch is contained in A.P. 1095B, Vol. I, Sect. 2, Chap. 7.

Bomb control

26. The bomb circuit cable insulation is tested in a similar way to that for the R.P. circuit but the reading obtained for insulatio resistance to earth should not be less than 500,000 ohms. The cables must be maintained in a good condition ; also the wing external sockets, the bomb carrier plugs and wiring must be kept free from moisture. The complete bomb release circuit, master release, selector, salvo and distributor switches can be checked for correct functioning if small weights are hung on the cocked bomb carrier release jaws.

Ultra-violet and cockpit lamps

27. Full details for the servicing of the cockpit lighting equipment are given in A.P.1095A, Vol. I, Sect. 8, Chap. 13 and 14.

Cabin pressure warning

28. The warning lamp switch contacts, which are in the pressure control valve, are set by the manufacturers and should not require re-setting. To test the switch, remove the ground test union cap nut taking care not to loosen the lock-nut and insert an insulated rod of suitable diameter into the hole in the adjusting screw and press against the adjusting head until the switch closes.

R.I. compass

29. Particular care should be given to the condition of the braided cables and the tightness of the cable unions in the vicinity of the inverter and suppressor mounting panel, as they are liable to be damaged or loosened by the pilot's right foot when on the rudder pedal.

Fuel boost pump

30. A test on the efficiency of the pump and its circuit can be made with the low-pressure fuel cock ON and the high-pressure control OFF. If the pump is satisfactory, the fuel pressure warning light will go out almost immediately after the pump is switched ON. The pump requires little servicing but the vent gauze at the base of the pump should be kept clean to ensure efficient ventilation of the pump. For details of pump servicing refer to A.P.1095C, Vol. I, Sect. 4, Chap. 6.

Fire warning and extinguisher

31. The four fire warning flame switches can be tested individually as follows :—

Each flame switch cap in turn should be unscrewed two turns with a spanner ; this would allow the switch contacts to close and the warning lamp to illuminate. Re-set the switch by tightening the cap fully ; the warning light should go out. To test the extinguisher circuit, remove the socket from the extinguisher bottle and connect a test lamp across the socket contacts. Periodically the resistance, Stores Ref. 5C/3230, should be removed from the bottle for test ; the nominal resistance value should be 22 ohms. The insulation resistance to earth of the bottle should also be checked.

Fuel contents gauges

32. The fuel contents gauge and transmitter unit servicing is described in A.P. 1275A, Vol. I, Sect. 3, Chap. 12 and information on the Desynn tester for checking both gauges and transmitters is given in the same A.P., Sect. 6, Chap. 5.

Fuel pressure warning

33. The pressure-operated switch is set at 3 lb. per sq. in. and normally requires no servicing other than checking the tightness

of electrical connections and insulation resistance, which should not be less than 20 megohms at 250 volts. To test the setting, remove the switch from the aircraft and connect it to a rig which has a regulated air supply of 0 to 6 lb. per sq. in. Adjustment is effected by removing the switch end cover and screwing in or out the adjusting screw which is secured by a lock-nut.

Undercarriage position indicator

34. To minimize trouble in this circuit, the micro switches should be kept in a clean condition, free from mud, moisture and corrosion. The setting of the switches is important and is described in Sect. 4, Chap. 3 of this A.P. Particular attention should be given to the waterproofing of the cable connections at the micro switches, and to the switch contacts and tightness of the lamp filaments inside the position indicator on the instrument panel.

Undercarriage lever lock

35. The adjustment of the lever lock micro switch is given in Sect. 4, Chap. 3 of this A.P., also the tests to be applied when checking the lock function. With the left-hand compression strut fully extended or with the emergency switch ON, the alighting gear selector lever must not be allowed to compress the micro switch for more than a short period as this will tend to overheat the lock plunger solenoid.

Flap position indicator

36. The flap position indicator and transmitter may be tested for accuracy whilst in the aircraft by using the Desynn test equipment as described in A.P.1275A, Vol. I, Sect. 6, Chap. 5.

Oil thermometer

37. To test the oil thermometer and bulb, etc., refer to A.P.1275A, Vol. I, Sect. 4, Chap. 1.

Access to components

38. The position of the main electrical components can be ascertained from the location diagram, fig. 1. Table 3 given below lists those components whose location and accessibility are not obvious.

TABLE 3

Access to components

Components	Position and access
Generator controls :—	
Voltage regulator, Cut-out, Suppressor	In rear of the right-hand wing false spar inside rib No. 1. Accessible when flaps are lowered
Generator warning light resistance limit	In J.B.1
Engine starting :—	
Booster coils	On the top right-hand engine mounting tube
Starter micro switch	On the left-hand upperside of fire wall above throttle control torque type
Flap position indicator :—	
Transmitter	On the inboard side of the right-hand boom. Accessible when flaps are in the down position
Alighting gear warning lamp :—	
Micro switch	Adjacent to starter micro switch
Fuel pressure warning lamp :—	
Pressure switch	On top of the low-pressure fuel filter
Resistance unit	On J.B.1
Camera control :—	
Relay units	Under J.B.1
Gun firing :—	
Relay units	On right-hand diagonal bracing strut to the right of the fuselage tank
Micro switch	In nose wheel well adjacent to up limit micro switches

TABLE 3—*continued*

Components	Position and access
R.P. control :—	
Relay and resistance unit	Above J.B.2
Bomb release :—	
Two-way distributor	On bulkhead No. 2 under pilot's seat
Gun sight control :—	
Voltage control Suppressor Control unit, Type B	On a panel under the ozygen economizer
Relay unit	Below J.B.1
Fuel boost pump :—	
Suppressor	On underside of floor right-hand outer gun belt feed mechanism

Bonding

39. All the metal parts of the aircraft are connected together to form an electrically-continuous system of low and unvarying resistance, and also to provide a large and constant capacity for the radio earth. In addition, bonding reduces the risk of fire by minimizing the difference of potential between metallic components. In the fuselage, this is carried out by using four main strips of 26 S.W.G. tinned copper with soldered branch strips which are bolted to individual components, or by braided, copper flex soldered to the strips and bolted or clipped to pipes, controls, etc. There are no earth strips in the wings, tail unit or booms but where bonding is necessary, as for instance between moving control surfaces, pipes, etc., the connections are made with copper flex. The wings are bonded separately to the main fuselage strips, which in turn are earthed, when the aircraft is on the ground, through the nose wheel hub and tyre. Where flexible bonding is used, the length should not exceed 6 in. and care should be taken to prevent intermittent contact with metallic parts. When making bonding connections, the contacting faces should be scraped clean, and when soldering connections, the flux used must be acid free and all traces of flux removed after soldering. The ohmic resistance between any selected point and the main earth strips must not exceed 0·05. The electrical conductivity of the nose wheel type should be checked periodically with a 500-volt megger; the resistance should not exceed 10 megohms.

G2166 M12158 12/48 360 C.B.&S.Ltd. Gp.30

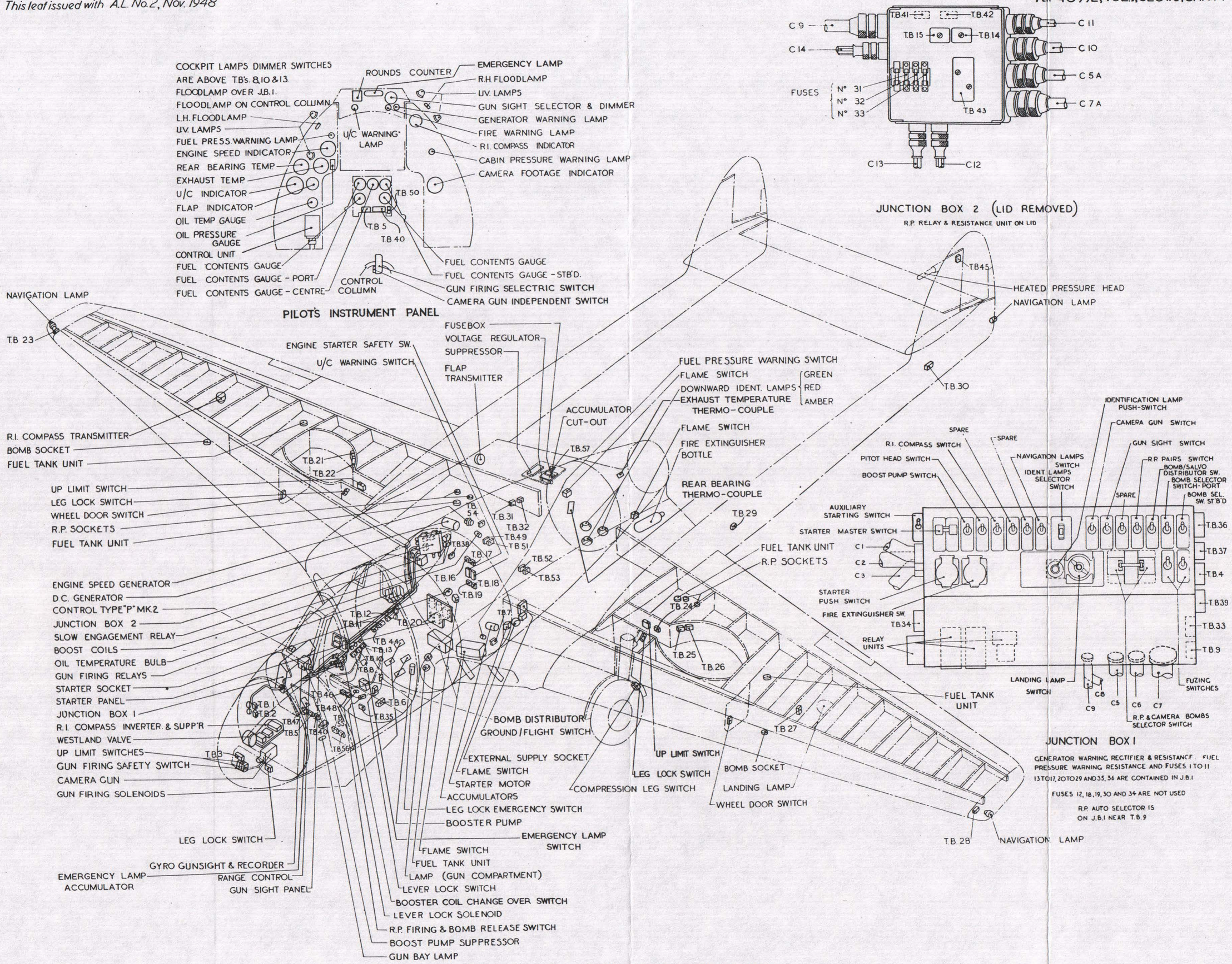


FIG. 1 LOCATION DIAGRAM

G2167 M12159 12/48 360 C.B.& S. LTD. GP55.

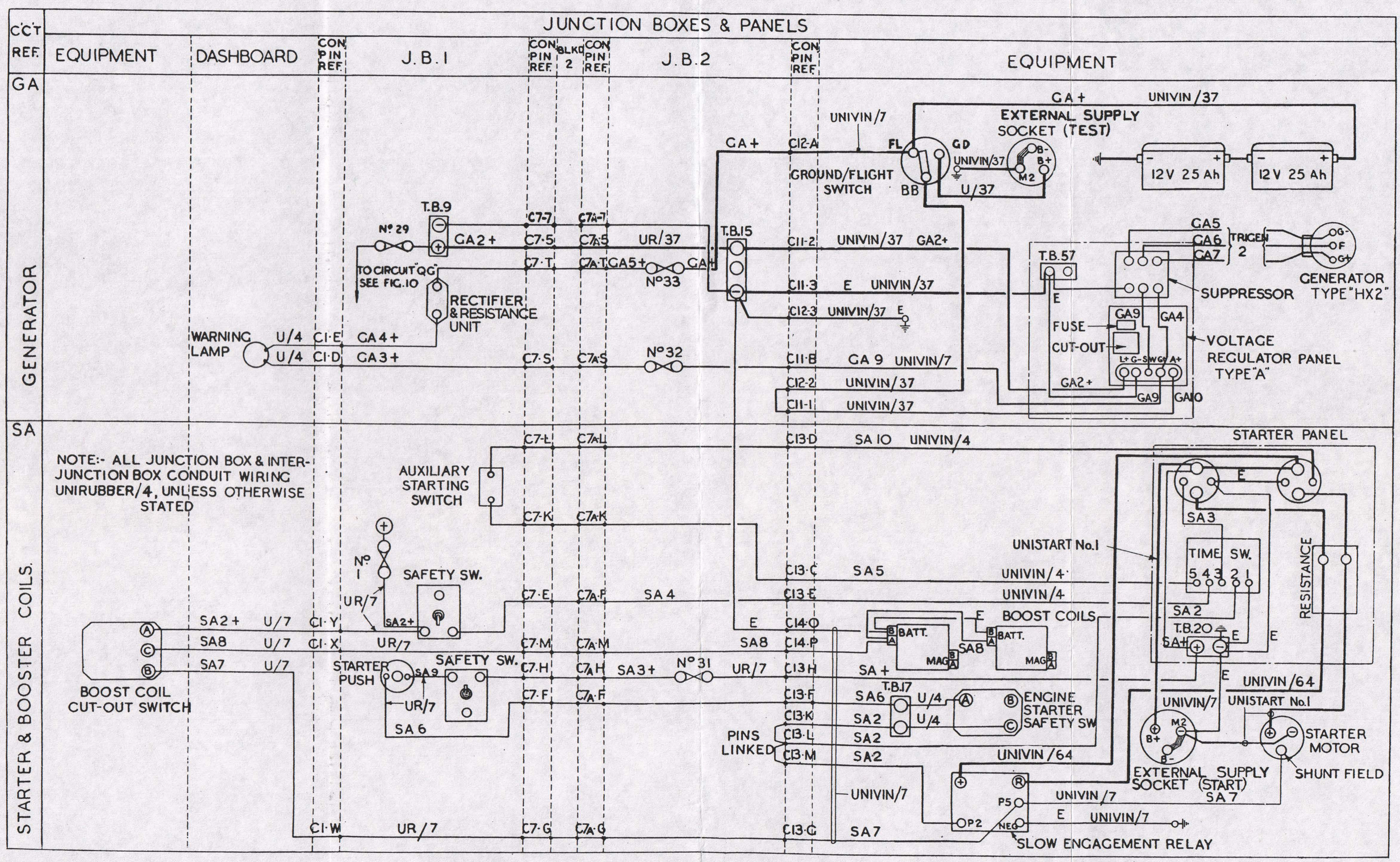


FIG. 2 ROUTING CHART, CIRCUITS: GA - SA

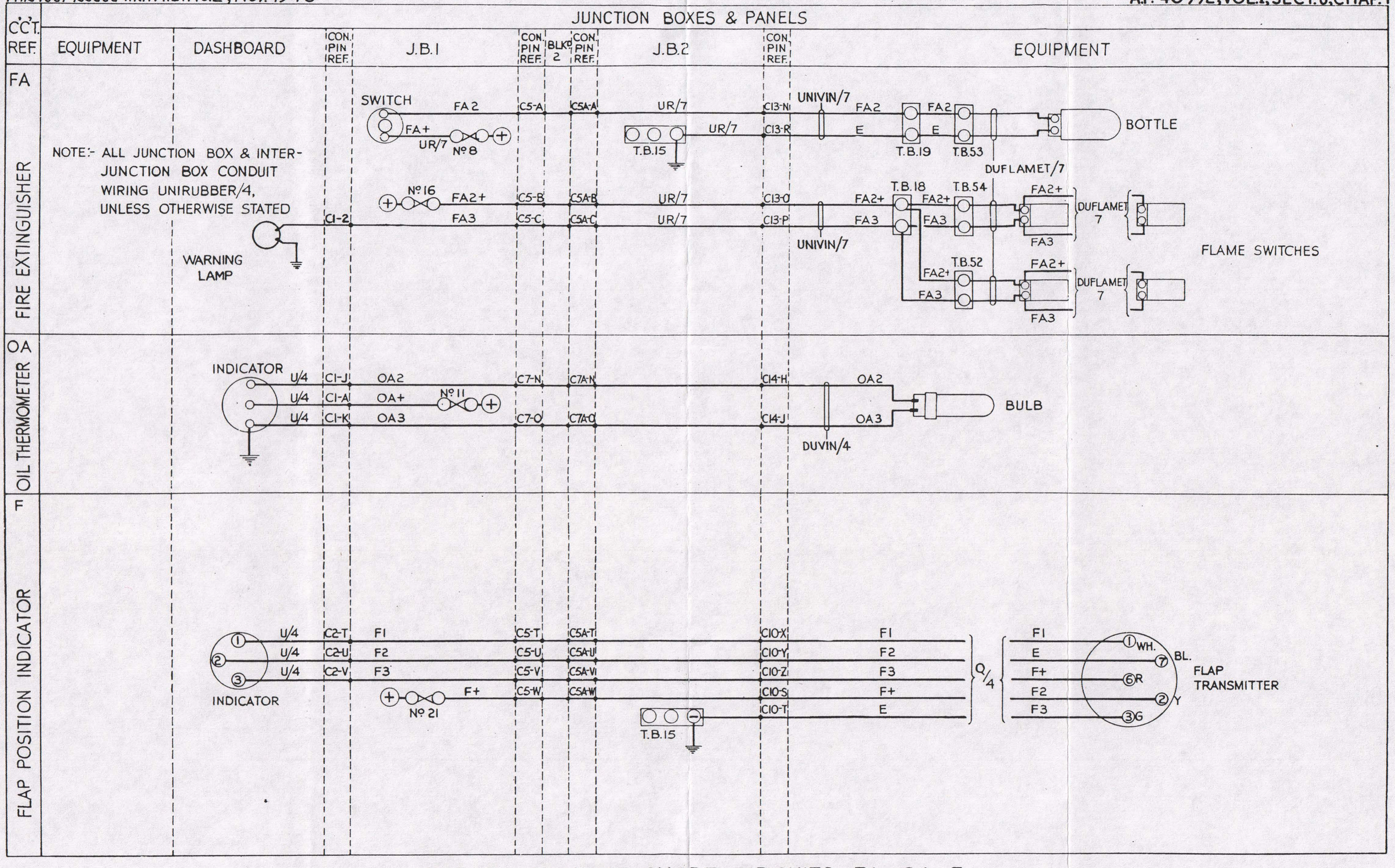


FIG. 3 ROUTING CHART, CIRCUITS: FA-OA-F

G2167 M12159 12/48 360 C.B.& S. LTD. GRESS.

JUNCTION BOXES & PANELS

EQUIPMENT	DASHBOARD	CON PIN REF.	J.B.1	CON PIN REF.	BLKD 2	CON PIN REF.	J.B.2	CON PIN REF.	EQUIPMENT

NOTE:- ALL JUNCTION BOX & INTER-JUNCTION BOX CONDUIT WIRING UNIRUBBER/4 UNLESS OTHERWISE STATED

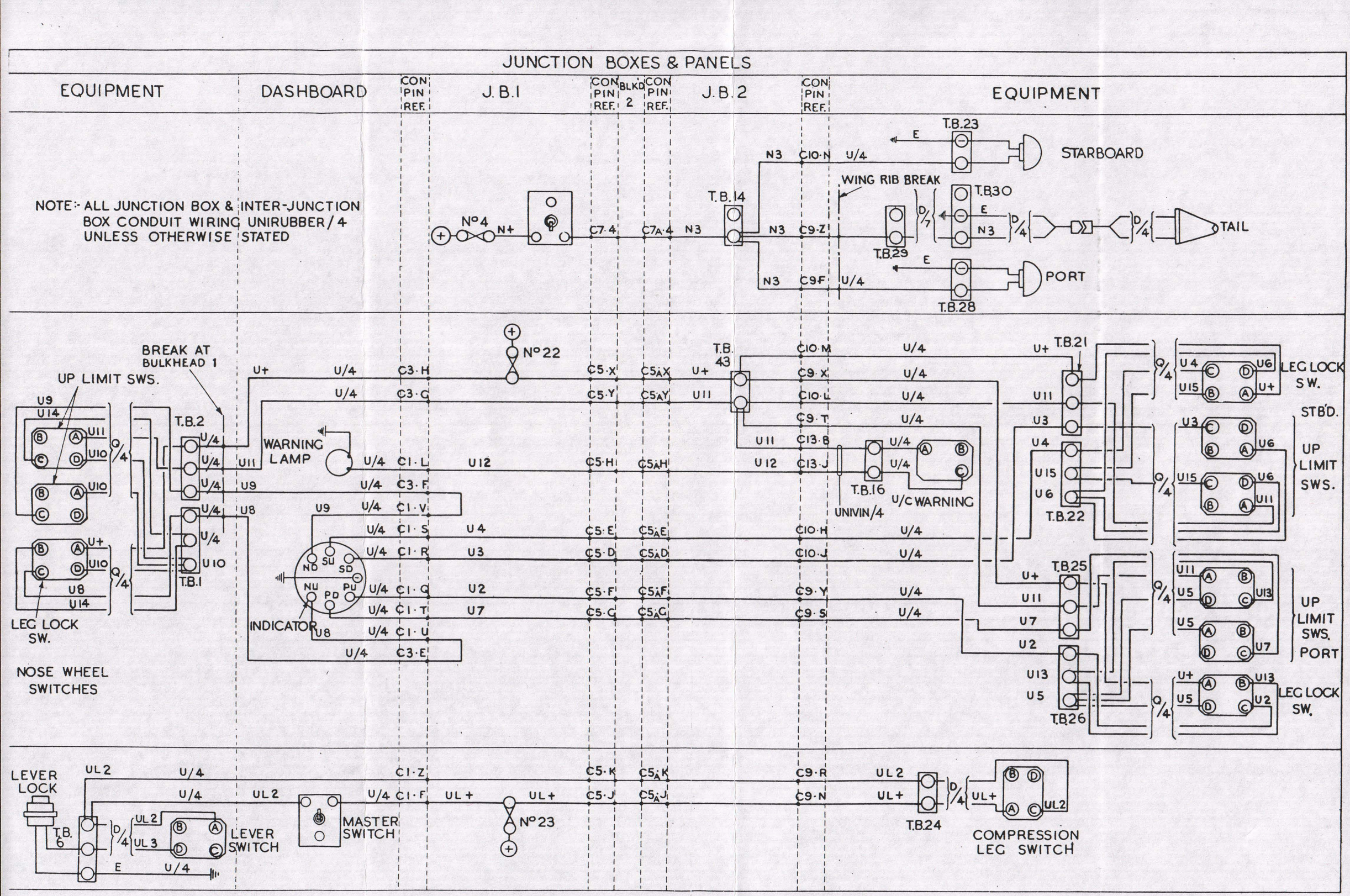


FIG. 4 ROUTING CHART, CIRCUITS: N-U-UL

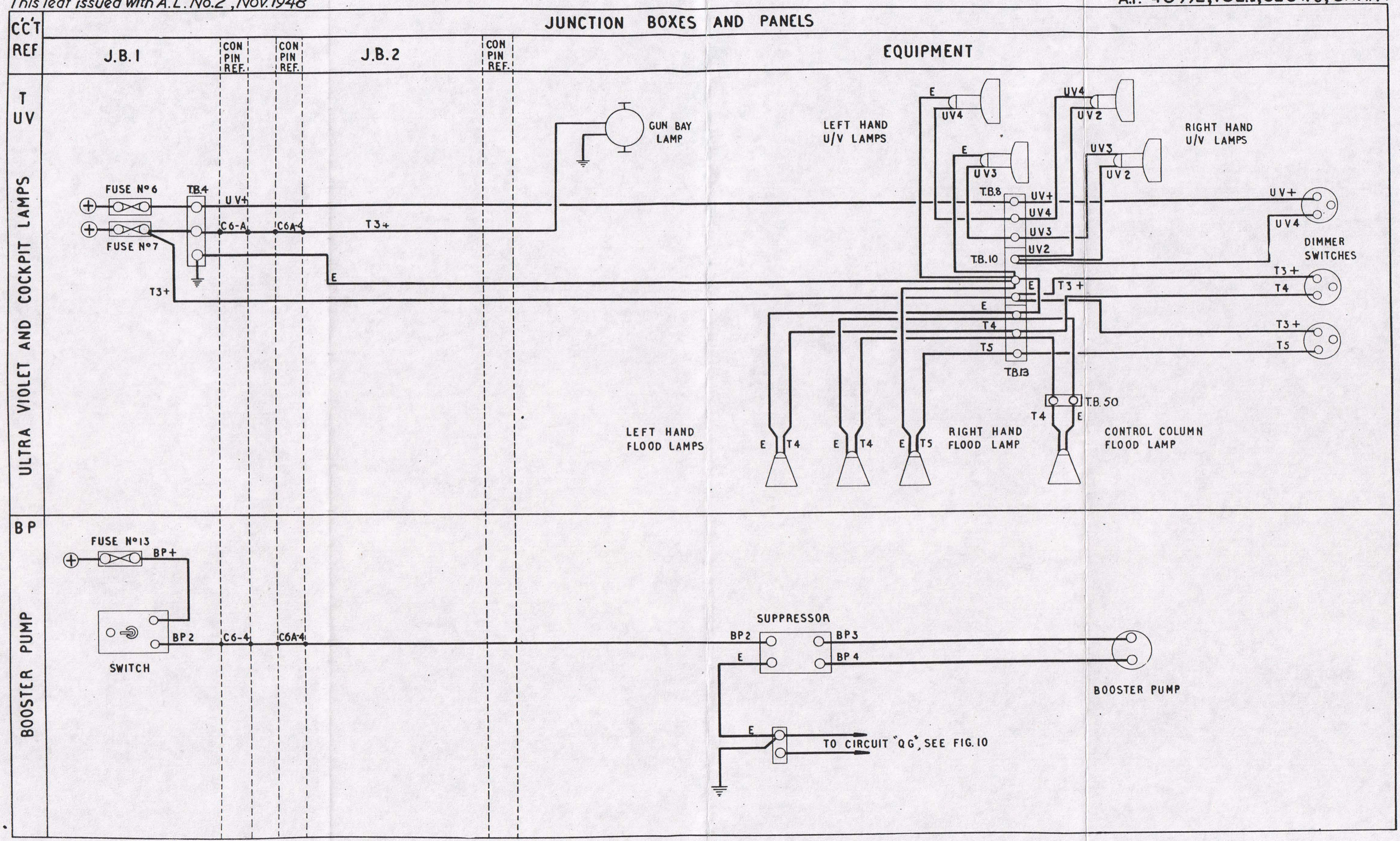


FIG. 5 ROUTING CHART, CIRCUITS: T-UV-BP

G2167 M12159 12/48 360 C.B.& S.LTD. GRSS.

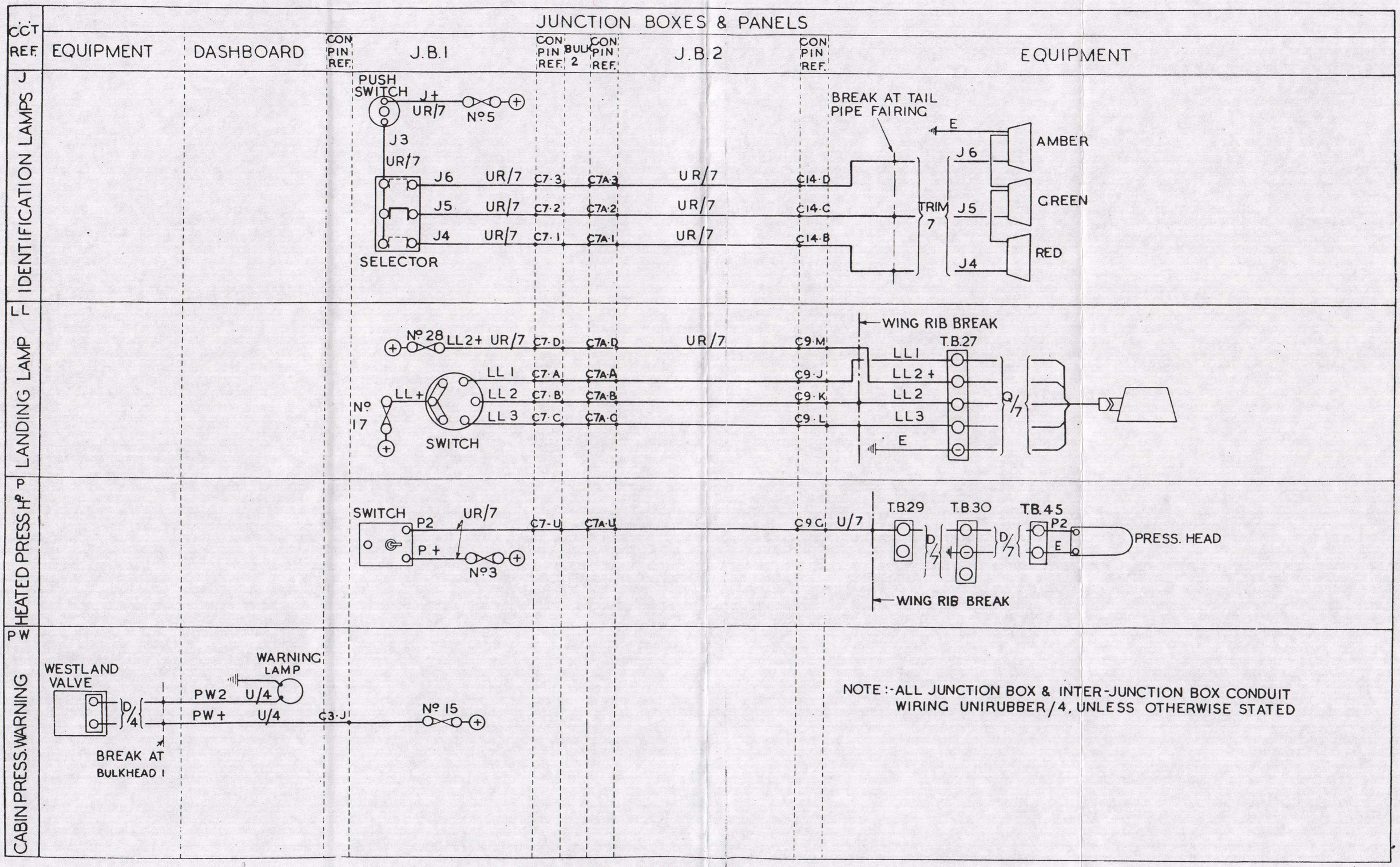


FIG.6 ROUTING CHART, CIRCUITS: J-LL-P-PW

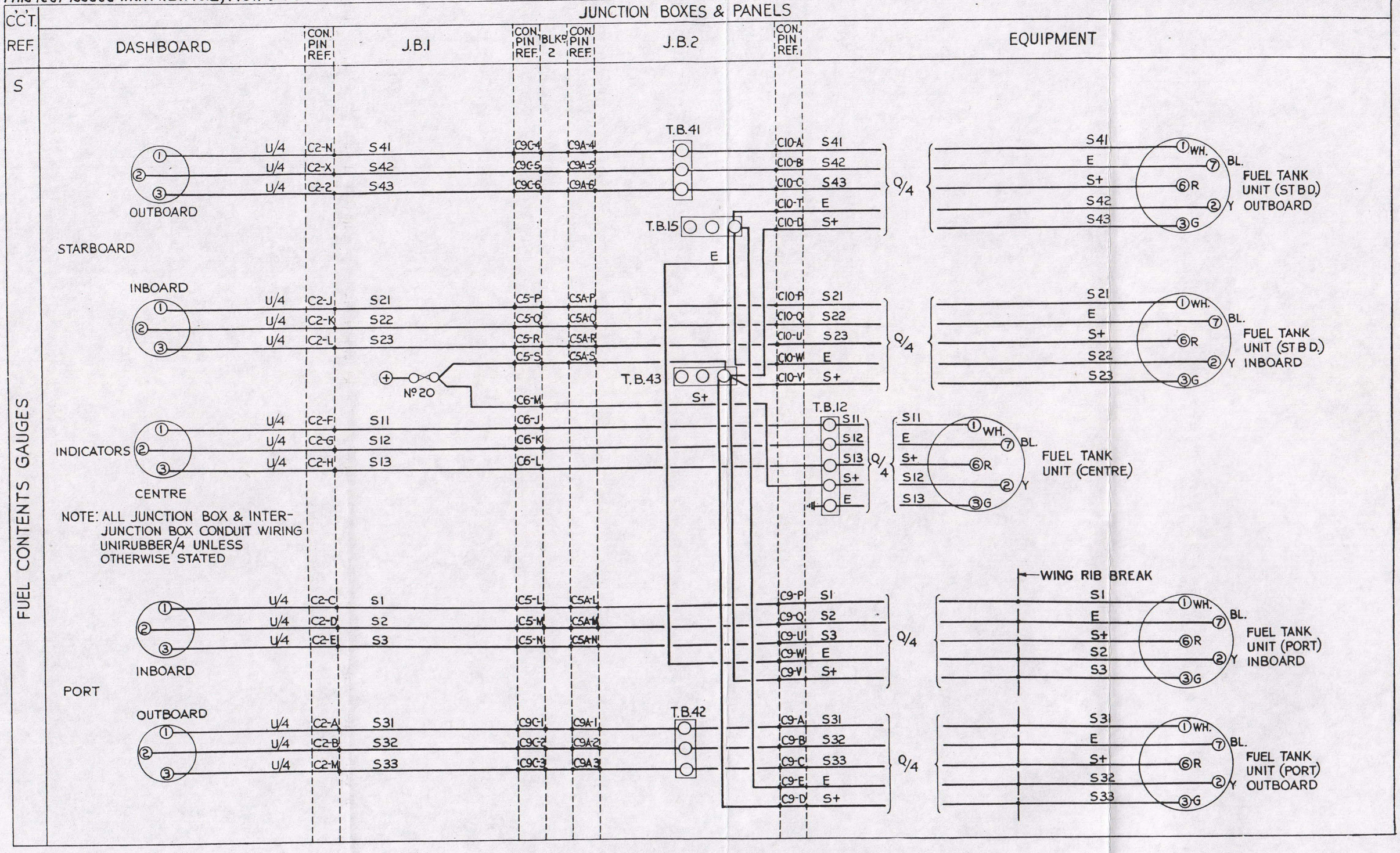


FIG. 7 ROUTING CHART, CIRCUIT - S

G2167 M12159 12/48 360 C.B.& S.LTD. GRSS.

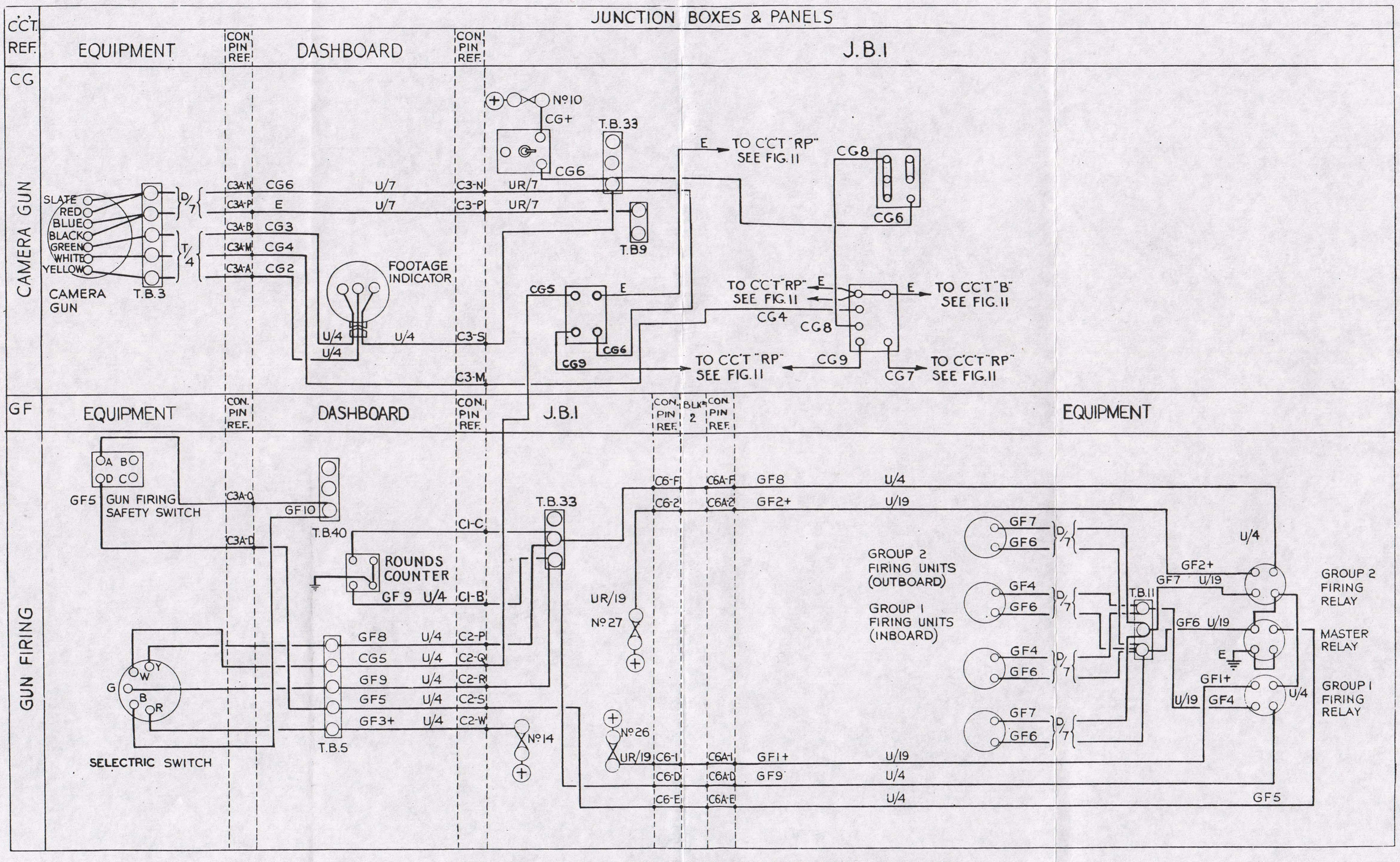


FIG. 8 ROUTING CHART, CIRCUITS: CG-GF

JUNCTION BOXES & PANELS

CCT REF. | EQUIPMENT | DASHBOARD | CON. PIN REF. | J.B.1 | CON. PIN REF. | BLKD 2 | CON. PIN REF. | J.B.2 | CON. PIN REF. | EQUIPMENT

PYROMETER

EXHAUST TEMPERATURE — BLUE 3–3, RED 4–4 — T.B.51, T.B.31 — TAIL PIPE

REAR BEARING — BLUE 1–1, RED 2–2 — T.B.49, T.B.32 — REAR BEARING

P A FUEL PRESS. WARNING LAMP

RESISTANCE UNIT — PA+, PA3 — PA+ FUSE No 9 — C6-H — T.B.7 PA3 — FUEL PRESSURE SWITCH

WARNING LAMP — PA2 — C1-1 — C6-G — T.B.7 PA2 — E

GS GYRO GUN SIGHT

COLOUR CODE	
R	RED
B	BLUE
G	GREEN
Y	YELLOW
W	WHITE
BK	BLACK
BR	BROWN OR SLATE
R_B	RED-BLUE
R_G	RED-GREEN
R_Y	RED-YELLOW

FUSE No 24 — GS+ — SWITCH — GS2 — T.B.39 — T.B.9 E — E

VOLTAGE REGULATOR — E — R — B — SUPPRESSOR R, B — DUMET/4

CONTROL UNIT, TYPE B — LINKED (FOR CLASS 2A SENSITIVITY 6-SECONDS) — SELECTOR DIMMER — E.T — SEPTOMET/4

GYRO GUN SIGHT — PLUG, TYPE W — DECAFLEXMET /2·5 — QUINTOMET/4 — TRIMET/4 — RECORDER, MK.2 R, B, G — 1, 2, 3

TO CCT RP SEE FIG. 12 — GS7, GS6 — DUCEL/4 — U/4

CONTROL TYPE P — SUPPRESSOR R, B, G — TRIMET/4

FIG. 9. ROUTING CHART, CIRCUITS: PYROMETERS-PA-GS

G1836 Mz6544 9/49 360 C.B.&S.LTD. GP55.

CCT REF.	EQUIPMENT	DASHBOARD	CON. PIN REF.	J.B.1	CON. PIN REF.	BLKD 2	CON. PIN REF.	J.B.2	CON. PIN REF.	EQUIPMENT
R1 R.I. COMPASS SUPPLY	SUPPRESSOR TO JUNCTION BOX	R12 U/4	C3-T	SWITCH R1+ FUSE 2						NOTE:- ALL JUNCTION BOX AND INTER-JUNCTION BOX CONDUIT WIRING UNIRUBBER/4, UNLESS OTHERWISE STATED
QG A.R.I.5229 SUPPLY				FUSE 29	C6-3		C6A-3	QG+		E QG+ TO T.R.1464 T.B.44
RA ENGINE SPEED INDICATOR	INDICATOR RA.3 RA.2 RA.1	U/4 U/4 U/4	C1-P C1-N C1-M	RA 3 RA 2 RA 1	C7-R C7-Q C7-P		C7A-R C7A-Q C7A-P		C14-G C14-F C14-E	TRIVIN/4 RA2 RA.3 RA.1 GENERATOR
QS A.R.I. 5131 SUPPLY				FUSE 25 E E				QS+		TO R.3121

FIG.10 ROUTING CHART, CIRCUITS: R1-QG-RA-QS

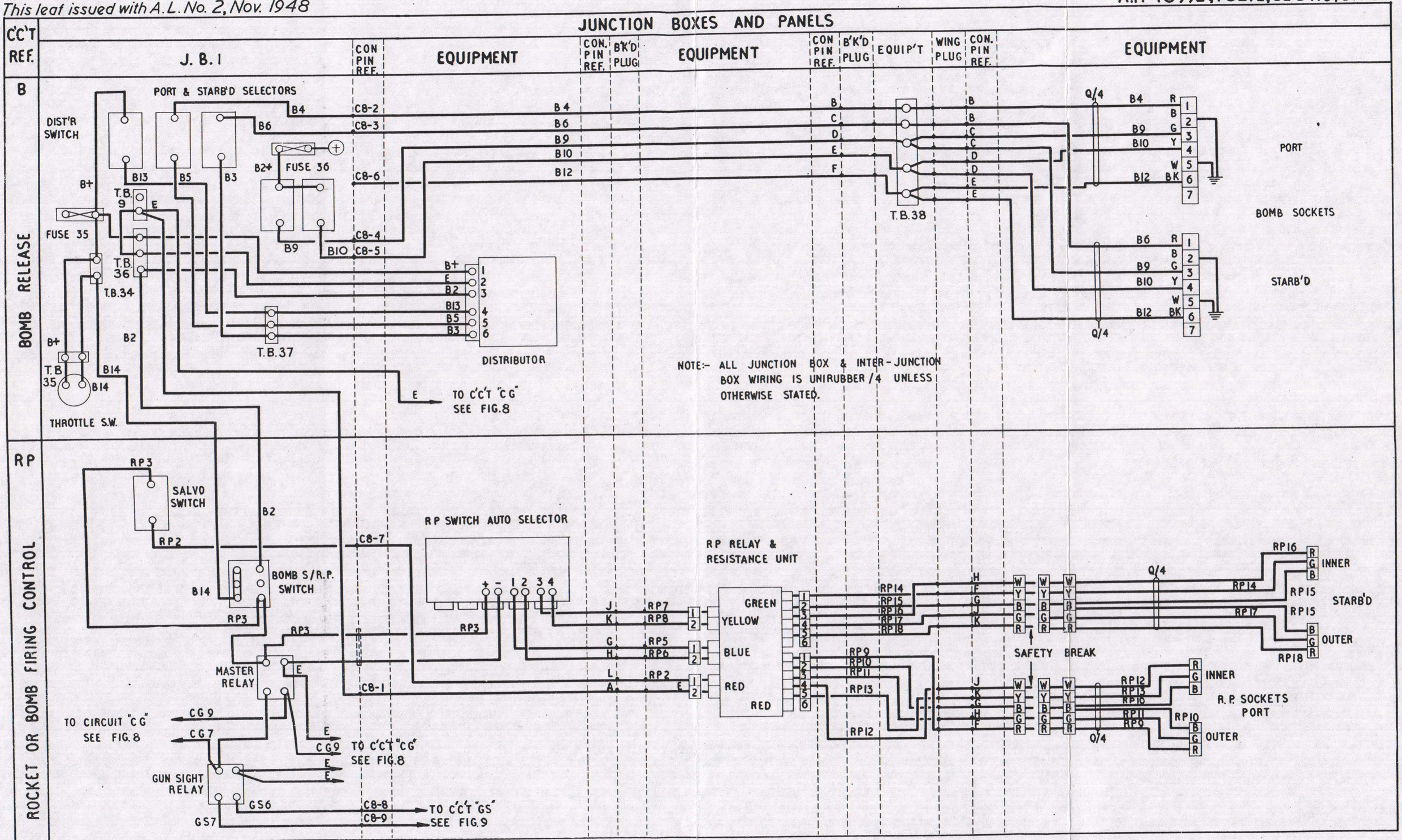
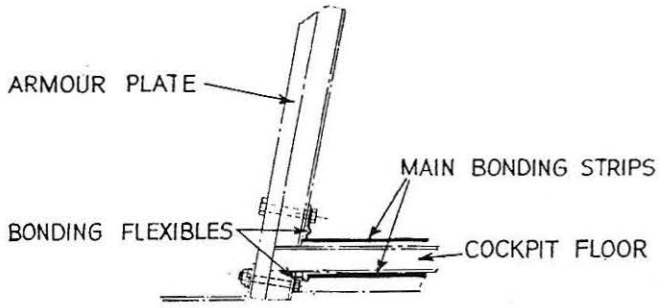
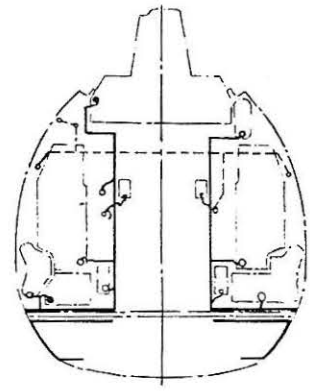


FIG. 11 ROUTING CHART, CIRCUITS: B-RP

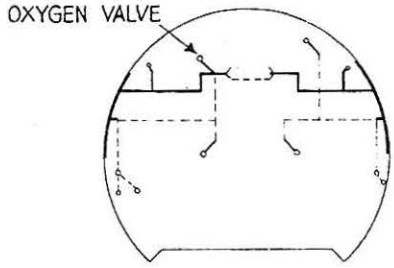
G2167 M12159 12/48 360 C.B.& S.LT'D. GP55.



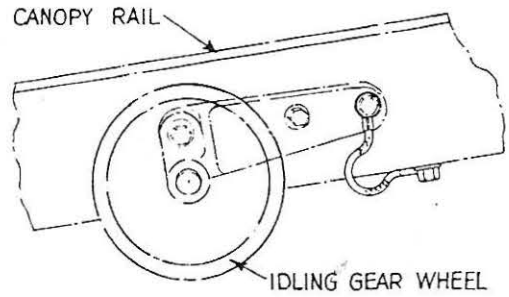
DETAIL OF FIXING AT BULKHEAD Nº1



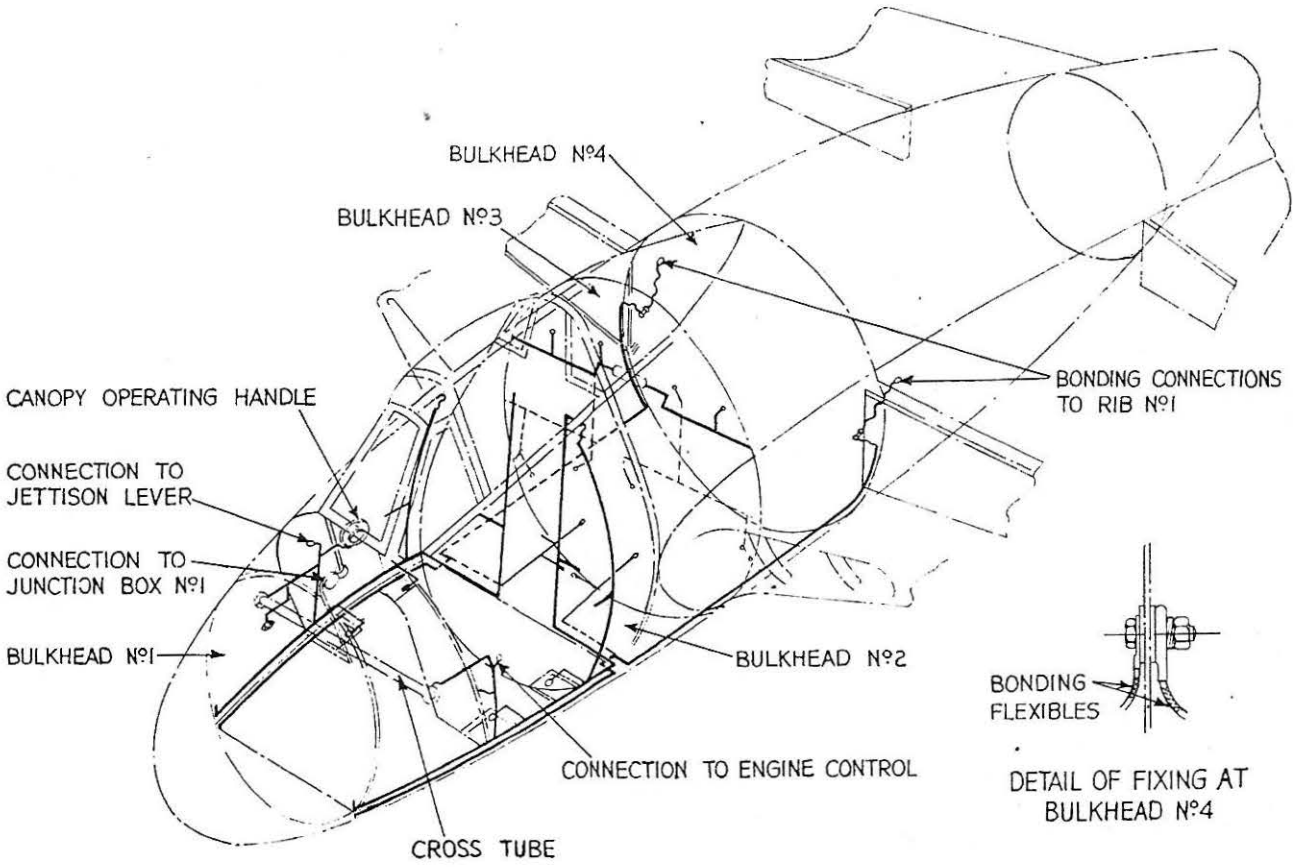
VIEW ON BULKHEAD Nº2 LOOKING AFT.



REAR FACE BULKHEAD Nº3



BONDING OF CANOPY OPERATING GEAR



DETAIL OF FIXING AT BULKHEAD Nº4

FIG.12 BONDING DIAGRAM