

Group A.1

SYSTEM DETAILS

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Introduction

1. This group contains a general description of the electrical system as a whole, together with wiring details and general servicing information. Tables listing the ratings and Reference numbers of the fuses, circuit breakers and filament lamps are also given, together with circuit coding details and a circuit index. For detailed information concerning the standard items of equipment, reference should be made to the appropriate Air Publications, which are quoted at the beginning of each group of this chapter.

2. This system is of the 28-volt, single-pole, earth return, voltage regulated type. It is supplied by two Type 517 generators, connected in parallel and stabilized by two Type J, 24-volt, 25 amp. hour batteries, which are connected in parallel and float across the output of the generators. The batteries are coupled into circuit by Cannon type plugs and are provided with protective covers which are vented to atmosphere. A test socket is also provided for checking the state of charge of the batteries, by voltage, as no specific gravity check is possible. A 24 volt standby supply, obtained from two 12-volt, 4 amp. hour batteries in series, is also provided for certain services should the normal supply fail.

3. The wiring cable assemblies are run between junction boxes and panels located at points convenient for distribution to the equipment and for breaking down the air-

craft. The majority of the cable assemblies are provided with fully weatherproof multi-pole plug and socket breakdown points. Whenever possible the cable connections to the plug and socket pins are crimped. To facilitate servicing and testing, the earth return connections are restricted in number and taken to stud type earth points, which are shown on the cable assembly layout, (Group A.3, fig.1) and listed on the supply and earth routeing chart, fig.1 of this group.

4. The generators are mounted on, and driven by the auxiliary gearbox situated in the engine bay, and their control equipment is mounted on a panel located on the starboard side of the radio bay. The batteries are mounted on a platform also located in the radio bay. The supply from the generators and batteries to the fuse bus-bars is shown, together with the earth return points, on fig.1 of this group.

DESCRIPTION

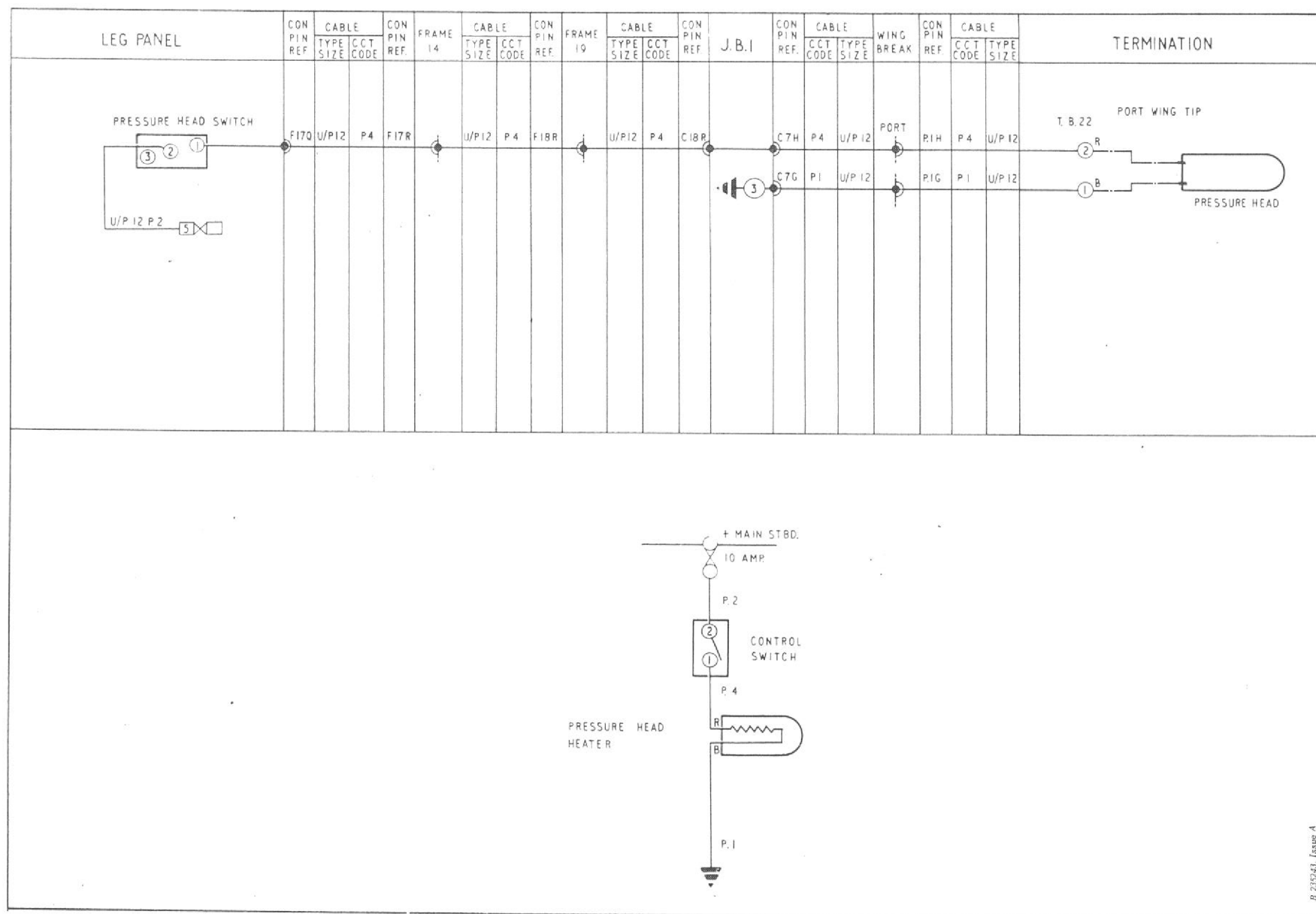
Interpretation of diagrams

General

5. The wiring of all the circuits in this aircraft is shown by means of routeing and theoretical diagrams. The routeing diagrams show the complete wiring for each individual circuit and the physical relationship between the electrical components. The diagrams are divided into a number of columns which bear the names of the junction box and equipment panels through which the wiring passes and also the circuit code, connector pin references, and

cable type, together with all break points and terminations. A plug and socket connection is shown by a small semi-circle embracing a black dot; the semi-circle denotes the socket insert and the black dot the plug pin. Terminals in the junction boxes and on equipment panels are represented by small circles with their reference numbers enclosed. Fuses are numbered and, in most instances, are shown in the equipment panel columns. These numbers refer only to the terminals and fuses in the box or on the panel concerned, each unit having its own series of numbers, as shown on the diagrams. The external connections to the equipment are shown in their correct relationship, but the internal wiring is not shown as this is given in the theoretical diagrams.

6. In the theoretical diagrams, the equipment is shown by symbols complete with internal wiring. Each symbol is annotated and designed to make the operation of the circuit readily understandable; brief explanatory notes are also given where necessary. As the diagrams are drawn for ease of reading, the symbols are not given in their correct physical relationship, but are positioned to give a straight-forward presentation, the connections being arranged to assist in this direction. The fuse rating is given adjacent to each fuse and each section of the circuit is referenced at suitable points with the circuit code. It must be noted that these circuit codes are for reference only and will not be found



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Fig.2. Typical routing and theoretical diagram

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on the cables in the aircraft, but are shown in every terminal connection through which the wire may pass, by means of a label or wiring diagram. It will assist when reading theoretical and routeing diagrams to refer to the cable assembly layout in Group A.3 and to note that all positive cables are given in an even reference number, while all negative cables bear an odd number.

7. Unless indicated otherwise all the routeing and theoretical diagrams are drawn with the circuits in the condition found when the aircraft is at rest on the ground with its alighting gear down, the throttle closed, the engine stopped and electrical power off

Method of reading a theoretical diagram

8. Reading theoretical diagrams is a straightforward matter if a start is made at the fuse or circuit breaker, given at the top of each circuit, and the diagram followed through to the earth point at the bottom. As an example, consider the pressure head heater circuit given in fig 2. From the 10-amp. fuse, the positive supply, referenced P.2, is taken to the control switch, which is a single-pole switch marked OFF and ON. From the switch, the positive supply cable, referenced P.4, passes to the heater element in the pressure head. The negative return from the heater, which is referenced P.1 is connected to earth.

9. From the above example and a study of the diagram, it will be seen that, when

the switch is closed, the heater element will be supplied with current and will thus heat the pressure head.

Method of reading a routeing diagram

10. Routeing charts are divided into a number of columns, and all circuits commence from the fuse or circuit breaker shown in one of the shelf, panel, or termination columns. As an example of how to read a routeing chart, consider the pressure head heater circuit given in fig.2.

11. From fuse number 5, on the leg panel, the positive supply is conducted by a unipren 12 cable, referenced P.2, to terminal 2 of the pressure head switch, which is also mounted on this panel. From terminal 1 of the switch, a further unipren 12 cable, referenced P.4, connects with pin Q of plug F17, which is mounted on the leg panel. Cable assembly F17 mates with this plug and a further unipren 12 cable, also referenced P4 and connected to pin Q of the socket, continues the supply to pin R of a plug and socket break at frame 14.

12. After this break, the cable assembly number changes to F18 and the unipren 12 cable, still referenced P4, is connected to pin R and continues to another plug and socket break at frame 19. At this point, the cable assembly number changes to C18 and the unipren 12 cable, still referenced P4 continues to pin R of plug C18 attached to J.B.1. The cable passes through the junction box and leaves it, still referenced P.4, via pin 11 of plug C7, which is also

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attached to the box. Cable assembly C7 mates with this plug and runs to the port wing plug and socket break.

13. After this break, the cable assembly number changes to P.1 and the unipren 12 cable, still referenced P 4, is connected to pin H of the socket on this cable assembly and continues to terminal 2 of T.B.22 in the port wing-tip. From this terminal the red core of the pressure head heater cable continues the supply to the heater element.

14. The negative return from the heater is the blue core. It is connected to terminal 1 of T B 22 and a unipren 12 cable referenced P 1 from the terminal block enters cable assembly P.1 and is connected to pin G of the plug and socket break in the port wing. After this break, the cable assembly number changes to C7 and the cable, still referenced P1, is connected to pin G of the plug on this cable assembly and runs to J.B.1, where it is connected to pin G of plug C7 attached to the junction box. From the plug a further length of unipren 12 cable connects with earth terminal 3 in J B.1.

Circuit coding and group references

15 Each circuit of this aircraft is coded by means of a letter or letters, which normally consist of the initials of the circuit title, e.g. the fire warning circuit is coded FW. It must be noted that these code letters are for reference only and will not be found on the cables in the

SERVICE	MAX. LOAD IN AMPS				REMARKS	MAX. FLIGHT LOAD IN AMPS						AVERAGE POWER CONSUMPTION IN AMP. MINUTES												
	CODE	LEG PANEL	PORT COCKPIT SHELF	STBD COCKPIT SHELF		SUPPLY PANEL	ENGINE START TO TAKE OFF DAY	ENGINE START TO TAKE OFF NIGHT	TAKE OFF TO LANDING APPROACH DAY	TAKE OFF TO LANDING APPROACH NIGHT	LANDING APPROACH TO ENGINE STOP DAY	LANDING APPROACH TO ENGINE STOP NIGHT	10 MIN. UP TO TAKE-OFF		1 HOUR FLIGHT		1 HOUR FLIGHT		2 HOUR FLIGHT		3 HOUR FLIGHT		10 MIN. APPROACH AND LANDING	
													DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
AILERON TRIA INDICATOR	AD	-	-	-	0.15	ON ALL THE TIME	0.15	0.15	0.15	0.15	0.15	1.50	1.50	4.50	4.50	9.00	9.00	18.00	18.00	27.00	27.00	1.50	1.50	
AILERON THIA CONTROL	A	-	55	-	-	OCCASIONAL USE 10% OF FLIGHT	0.55	0.55	0.55	0.55	0.55	0.55	0.55	1.65	1.65	3.30	3.30	6.60	6.60	9.90	9.90	55	55	
AIR BRAKE CONTROL	AB	-	1.10	-	-	IN USE FOR 15% OF FLIGHT	-	-	1.10	1.10	1.10	-	-	4.45	4.45	9.90	9.90	19.80	19.80	29.70	29.70	11.00	11.00	
A.C. SUPPLIES PANEL	CH	-	-	15.00	-	1 INVERTER ON ALL TIME & 1 ON 50% OF FLIGHT	15.00	15.00	15.00	15.00	15.00	118.75	118.75	337.50	337.50	675.00	675.00	1350.00	1350.00	2025.00	2025.00	118.75	118.75	
ARTIFICIAL HORIZON INST ALL H	H	-	-	-	-	ON ALL THE TIME A.C. SUPPLIED FROM INVERTERS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
AUTOSTABILIZER (Pre Mod. 1074)	AS	-	1.60	-	-	NIGHT ONLY 75% IN USE ALL THE TIME	-	1.60	1.60	1.60	1.60	-	12.00	-	36.00	-	72.00	-	144.00	-	216.00	-	12.00	
CABIN LIGHTING	CP	-	3.20	-	-	ON-OFF ONCE PER FLIGHT	-	3.20	3.20	3.20	3.20	-	-	6.40	6.40	6.40	6.40	6.40	6.40	6.40	6.40	-	-	
CABIN PRESSURE & TEMP. CONTRL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CAMERA GUN G.90.	CG	4.0	-	-	-	2 AMP HEATER - 2 AMP WHILE RUNNING	2.00	2.00	2.00	2.00	2.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	
CAMERA RECORDER	-	-	0.55	-	-	ON FOR MOST OF FLIGHT	0.55	0.55	0.55	0.55	0.55	5.50	5.50	16.50	16.50	33.00	33.00	66.00	66.00	99.00	99.00	5.50	5.50	
COMPASS INSTALLATION G4F	C	-	-	-	0.12	ON ALL THE TIME A.C. SUPPLIED FROM INVERTERS	0.12	0.12	0.12	0.12	0.12	1.20	1.20	3.60	3.60	-	-	-	-	-	-	-	-	
DROP TANK OUTBD. EXPT. IND.	FC	-	-	-	-	ON FOR FIRST HOUR OF FLIGHT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
REAR TANKS EXPLOSION SUPPRESSION	EX	-	-	-	-	A.C. SUPPLIED FROM INVERTERS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ENGINE TEMP. CONTROL	ET	-	1.00	-	-	ON FOR 30 SEC. AT TAKE-OFF ONLY	1.25	1.25	1.25	1.25	1.25	-	-	18.75	18.75	8.75	18.75	18.75	18.75	18.75	18.75	-	-	
ENGINE ANTICLING	EA	-	-	1.25	-	OCCASIONAL USE 15 MIN. PER FLIGHT	212.00	212.00	-	-	-	28.26	28.26	-	-	-	-	-	-	-	-	-	-	
LIQUID FUEL STARTER	S	-	-	-	-	DIRECT BATTERY LOAD AT START ONLY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
ENGINE STARTER CONTROL	SA	-	-	-	5.90	AT START AND REFLIGHT ONLY	5.90	5.90	5.90	5.90	5.90	-	-	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	5.90	
ENGINE SPEED INDICATOR	RA	-	-	-	-	SUPPLIES ITS OWN POWER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
FUEL LOW LEVEL	FL	-	-	-	-	-	0.01	0.01	0.01	0.01	0.01	0.03	0.03	0.30	0.30	0.60	0.60	1.20	1.20	1.80	1.80	0.03	0.03	
FLAP ANGLE INDICATOR	FD	-	-	-	0.01	ON ALL THE TIME	0.01	0.01	0.01	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-	-	
FIRE WARNING & EXTINGUISHER	FW&F	-	-	-	1.26	OCCASIONAL USE ONLY EMERGENCY	-	-	-	-	-	44.00	44.00	132.00	132.00	264.00	264.00	528.00	528.00	792.00	792.00	44.00	44.00	
FUEL CONTENTS GAUGE	FC	-	-	-	4.4	ON ALL THE TIME	4.40	4.40	4.40	4.40	4.40	35.00	35.00	105.00	105.00	210.00	210.00	420.00	420.00	630.00	630.00	35.00	35.00	
FUEL TANK PUMP	BP	-	-	35.00	-	ON ALL THE TIME EXCEPT FOR BALANCING	35.00	35.00	35.00	35.00	35.00	-	-	0.60	0.60	0.60	0.60	1.25	1.25	1.25	1.25	1.25	1.25	
FUEL LOW PRESSURE WARNING LT.	FP	-	-	0.12	-	INDICATES LOSS OF FUEL PRESSURE	0.12	0.12	0.12	0.12	0.12	-	-	-	-	-	-	-	-	-	-	-	-	
FUEL FILTER DEICING	-	-	-	-	-	SOURCE OF ALL POWER SUPPLY REF ONLY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
GENERATOR & ACCUMULATOR	GA	-	-	-	-	0.37 AMP DIRECT BATTERY LOAD WHEN GENS. FAIL	4.00	4.00	4.00	4.00	4.00	40.00	40.00	120.00	120.00	240.00	240.00	480.00	480.00	720.00	720.00	-	-	
GENERATOR FAILURE WARNING	GS	-	4.00	-	-	ON FOR MOST OF FLIGHT	-	-	-	-	-	-	-	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	-	-	
GYRO-GUNSIGHT	-	-	-	-	-	-	-	2.10	2.10	-	-	-	-	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	-	-	
GUN VENTILATION	GV	-	-	-	2.10	ON FOR 15 SEC. PER GUN BURST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
GUN FIRING	GF	-	-	-	4.3	ON FOR 8 SEC. PER FLIGHT	-	4.33	4.33	-	-	-	-	-	-	-	-	-	-	-	-	5.00	5.00	
HOOD CONTROL	HC	-	10.0	-	-	ON FOR TAKE OFF & LANDING	10.00	10.00	-	10.00	10.00	5.00	5.00	-	-	-	-	-	-	-	-	1.60	1.60	
HYDRAULIC POWER FAILURE	HP	-	-	-	0.16	ON ONLY WHEN HYDRAULICS FAIL	0.16	0.16	0.16	0.16	0.16	-	-	-	-	-	-	-	-	-	-	-	-	
JET TEMPERATURE GAUGE	ET	-	-	-	-	SELF-GENERATING	0.40	0.40	0.40	0.40	0.40	4.00	4.00	12.00	12.00	24.00	24.00	48.00	48.00	72.00	72.00	4.00	4.00	
LANDING FLAPS	F	-	0.40	-	-	2 VALVES. 1 ON ALL THE TIME	-	7.20	7.20	2.20	2.20	-	-	22.00	22.00	66.00	66.00	132.00	132.00	264.00	264.00	396.00	396.00	
NAVIGATION LIGHTS	N	-	-	2.20	-	ON ALL THE TIME AT NIGHT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
OIL PRESSURE GAUGE	OP	-	-	-	-	ON ALL THE TIME A.C. SUPPLIED FROM INVERTERS	0.06	0.06	0.06	0.06	0.06	0.06	0.06	1.00	1.00	3.60	3.60	7.20	7.20	10.80	10.80	0.60	0.60	
OXYGEN FLOW INDICATOR	OX	-	-	-	0.06	-	1.00	1.00	1.00	1.00	1.00	10.00	10.00	30.00	30.00	60.00	60.00	120.00	120.00	180.00	180.00	10.00	10.00	
POWER ASSISTED CONTROLS	PA & PE	-	1.00	-	-	ON FOR POWER CONTROLS OFF	6.00	6.00	6.00	6.00	6.00	60.00	60.00	180.00	180.00	360.00	360.00	720.00	720.00	1080.00	1080.00	60.00	60.00	
PRESSURE HEAD HEATER	P	6.00	-	-	-	ON ALL THE TIME	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PRESSURE RE-FUELLING	PR	-	-	-	1.20	ON WHILE RE-FUELLING ONLY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
R.P. INSTALLATION	-	-	-	-	12.00	SPECIAL SERVICE SHOCK CHARACTERISTIC	0.55	0.55	0.55	0.55	0.55	0.55	0.55	1.65	1.65	3.30	3.30	6.60	6.60	9.90	9.90	0.55	0.55	
RUDDER TRIA CONTROL	R	-	0.55	-	-	OCCASIONAL USE. 10% OF FLIGHT	0.15	0.15	0.15	0.15	0.15	1.50	1.50	4.50	4.50	9.00	9.00	18.00	18.00	27.00	27.00	1.50	1.50	
RUDDER TRIA INDICATOR	RD	-	-	-	0.15	ON ALL THE TIME	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SERVICING LAMPS	L	0.26	-	-	0.26	NOT USED IN FLIGHT	3.00	3.00	3.00	3.00	3.00	15.00	15.00	45.00	45.00	90.00	90.00	180.00	180.00	270.00	270.00	15.00	15.00	
SUB-MIN RADIO COMPASS	-	-	-	3.00	-	OCCASIONAL USE 50% OF FLIGHT	12.08	12.08	12.08	12.08	12.08	36.24	36.24	108.72	108.72	217.44	217.44	434.88	434.88	652.32	652.32	36.24	36.24	
TAILPLANE ACTUATOR & INDR.	T & TO	-	12.0	-	0.08	FREQUENT USE 30% OF FLIGHT	0.25	0.25	0.25	0.25	0.25	2.50	2.50	7.50	7.50	15.00	15.00	30.00	30.00	45.00	45.00	2.50	2.50	
TURN AND SLIP INDICATOR	TS	0.25	-	-	-	ON ALL THE TIME	0.41	0.41	0.41	0.41	0.41	2.00	2.00	6.00	6.00	12.00	12.00	24.00	24.00	36.00	36.00	2.00	2.00	
UNDERCARRIAGE CONTROL	UC	-	0.41	-	-	2 VALVES. EITHER ONE ON ALL THE TIME	0.50	0.50	0.50	0.50	0.50	5.00	5.00	15.00	15.00	30.00	30.00	45.00	45.00	60.00	60.00	5.00	5.00	
UNDERCARRIAGE INDICATOR	U	-	0.50	-	-	ON FOR TAKE-OFF & LANDING	6.00	6.00	6.00	6.00	6.00	60.00	60.00	180.00	180.00	360.00	360.00	720.00	720.00	1080.00	1080.00	60.00	60.00	
D.M.E.	DM	-	-	-	6.00	ON ALL THE TIME	33.00	33.00	33.00	33.00	33.00	330.00	330.00	990.00	990.00	1980.00	1980.00	3960.00	3960.00	5940.00	5940.00	330.00	330.00	
I.F.F. RADAR SET MK.10	IF	-	-	-	6.50	ON JUST BEFORE AIRBORNE	12.00	12.00	12.00	12.00	12.00	120.00	120.00	360.00	360.00	720.00	720.00	1440.00	1440.00	2160.00	2160.00	120.00	120.00	
U.H.F. & STDBY U.H.F. RADIO	RT	-	-	-	12.00	ON ALL THE TIME	7.50	7.50	7.50	7.50	7.50	82.50	82.50	165.00	165.00	330.00	330.00	660.00	660.00	990.00	990.00	82.50	82.50	
RADIO V.H.F. IN LIEU OF U.H.F.	RT	-	-	-	7.50	2 SETS. 1 ON ALL THE TIME	30.00	30.00	30.00	30.00	30.00	150.00	150.00	450.00	450.00	900.00	900.00	1800.00	1800.00	2700.00	2700.00	150.00	150.00	
RADAR RANGE	RS	-	-	-	30.00	USUALLY ON 50% OF FLIGHT TIME	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

NOTE - WHERE SERVICES ARE ALTERNATIVE THE GREATEST LOAD ONLY HAS BEEN TAKEN

LOAD ANALYSIS IN AMPS.		
	DAY	NIGHT
MAX. POSSIBLE LOAD ON GROUND CHECK	224.39	224.39
MAX. LOAD ON TAKE-OFF	105.00	410.00
MAX. LOAD DURING FLIGHT	198.00	197.00
MAX. LOAD DURING APPROACH AND LANDING	202.00	206.00
AVERAGE LOAD DURING FLIGHT	142.45	146.34
MAX. OUTPUT FROM 2 - 517 GENERATORS - 400 AMP	AMP. CONT.	

2 VARLEY BATTERIES
24 V. 25 A.H. IN PARALLEL = 50 A.H.

* BATTERY IS ASSUMED CAPABLE OF HOLDING ONLY 90% RATED CAPACITY

BATTERY CHARGING EFFICIENTLY = 90%

POWER ANALYSIS IN AMP. MINUTES			1/2 HOUR FLIGHT		1 HOUR FLIGHT		2 HOUR FLIGHT		3 HOUR FLIGHT	
	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
BATTERY CAPACITY AT ENGINE START -	a	2400	2400	2400	2400	2400	2400	2400	2400	2400
POWER GENERATED UP TO TAKE-OFF -	b	1629	1666	1629	1666	1629	1666	1629	1666	1666

aircraft. They are, however, shown at every terminal connection in the aircraft by means of a label or wiring diagram. The code letters will also be found on the theoretical and routing diagrams in the various groups of this chapter, because each section of a particular circuit is also referenced by a number preceded by the circuit code letters e.g. FW2, FW4 etc. A list of the various circuits employed in this aircraft together with their code letters and the chapters and group references of this Section is given in Table 1.

Cable abbreviations

16. Table 2 should be used in conjunction with the cable type and size column on the routing charts to define the type of cable employed in the various circuits of this aircraft

Loading chart and circuit index

17 This chart (fig.3) contains the loading for each circuit and remarks giving the duration of load, together with the total power available. An analysis of the maximum load and the power used during the duration of flight is also given. The chart may also be used as a circuit index as it gives the circuit letters and codes

Junction box, panel, and shelf wiring diagrams

18 To facilitate servicing each junction box equipment panel, and shelf of this aircraft contains a diagram of its electrical

wiring. These diagrams give the cable size terminal numbers and plug references, together with the fuse numbers ratings and the services that they serve. A record of the modification state of the box or panel is also included on the diagram.

Junction, control, and distribution boxes

19. These are of welded aluminium waterproof constructions with the insides suede finished to obviate chafing and condensation. They contain terminal blocks and certain other equipment. Junction boxes are referenced numerically, with the exception of those which are labelled according to the circuits they feed, the numbers being preceded by the letters J.B. Each box contains a wiring diagram. The terminals in the boxes are numbered and may be identified by reference to the wiring diagrams, spare terminals being starred on the diagrams to denote that they are spares. When a cable passes through a box without connecting to a terminal the cable is wired pin to pin between its associated plugs i.e. pin A to pin A or pin B to pin B, etc. The cable outlets on the junction boxes are either multi pole plugs and sockets or rubber grommets.

20. Junction box 1 is the major box and is located at the bottom of the centre fuselage on the rear face of the main spar. Junction box 2 is located in the front fuselage above the cabin port shelf between frames 11 and 12 and is used mainly for distribution to the equipment

on the port side of the cabin. Junction box 3 is mounted on the engine library gearbox access door and is used to interconnect the engine starting equipment. Junction box 4 is situated in the cabin on the starboard side of the floor behind the seat, and is employed in the a.c. supplies circuit.

21. The A.C. junction box is mounted aft of the cabin starboard shelf, and is used to supply the flight instruments and radar installation. The G4F compass and autostabilizer junction box is mounted in the fin between frames 51 and 52 just above the tailplane actuator, and is used to feed the G4F compass and the autostabilizer circuits. The power controls junction box is located in the front fuselage, on the starboard side under the cabin floor between frames 11 and 12, being mounted on the aft end of the cabin well. It contains a terminal block and fuses which are part of the elevator and aileron power control circuit.

22. The R.P.J.B. is located on the forward face of the starboard fuel tank access panel on frame 19, above the battery platform. The bomb/R.P. release and camera J.B. is mounted aft of the cabin port shelf. The bomb/R.P. selector J.B. is mounted in the fairing aft of the hood. All these junction boxes are used as breakdown and distribution points for the armament services. ►

TABLE 1

Circuit codes and group references

Circuit	Code	Chapter	Group	Circuit	Code	Chapter	Group
A.C. supplies	CH	1	E.1	Exhaust gas thermometer and top temperature control	ET	2	2.B
Aileron trim controls	A	1	D.1	Fatigue meter	FM	2	5 A
Aileron trim indicators	AD	2	3.B	Fire warning	FW	1	C.2
Aileron power controls	PA	1	D.2	Fire extinguisher	FE	1	C.2
Alighting gear control	UC	1	D.7	Flap control	F	1	D.4
Alighting gear control	U	2	5.A	Flap position indicator	FD	2	3.B
Air brake control	AB	1	D.7	Fuel content gauges	FC		2.A
Artificial horizon	AH	2	3.B	Fuel filter de-icing	EFD	1	C.5
Autostabilizer(<i>Pre Mod. 1026</i>)	AS	1	D.9	Fuel transfer pressure warning	FP	2	2.A
Bomb fusing and SSD control	BF	1	G.1	Fuel low level warning	FL	2	2.A
Bomb jettison and drop tank jettison	BJ	1	G.1	Generators and batteries	GA	1	B.1
Bomb release	BR	1	G.1	Gyro compass	GC	2	3 B
B+ distribution	B+	1	B.1	Gyro gun sight and camera recorder	GS	2	4.A
Cabin lighting	M	1	F.1	Gun firing	GF	1	G.1
Cabin pressurization and temperature control	CP	1	D.6	Gun ventilation	GV	1	G.1
Camera gun	CG	1	G.1	Hood control	HC	1	D.5
D.M.E. radio	DM	1	H.1	Hydraulic pressure warning	HP	2	5.A
Drop tank empty warning	FC	2	2.A	I.F.F. radio	IF	1	H.1
Drop tank jettison	BJ	1	G.1	L+ distribution	L+	1	A.1
Explosion suppression (<i>Pre Mod.1271</i>) EX		1	C.6	Navigation lamps	N	1	F.2
Ejector release	BR & BJ	1	G.1	Oil pressure gauge	OP	2	2.C
Engine anti-icing	EA	1	C.4				
Engine starting and control	S & SA	1	C.1				
Elevator power controls	PE	1	D.2				

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TABLE 1
Circuit codes and group references (Continued)

Circuit	Code	Chapter	Group	Circuit	Code	Chapter	Group
Oxygen flow indicator	OX	2	5.A	Spare wiring	*	1	A.1
Pressure head heater	P	2	3.A	Tachometer	RA	2	2.C
Pressure refuelling	PR	1	C.3	Tail plane control	T	1	D.3
Parachute brake	TC	1	D.8	Tail plane position indicator	TD	2	3.B
Radar ranging	RS	1	H.1	Tank pumps	BP	1	C.3
Radio compass	RC	1	H.1	Target towing	TT	1	G.2
R.P. firing	RP	1	G.1				
Rudder trim controls	R	1	D.1	Turn and slip indicator	TS	1	3.B
Rudder trim indicators	RD	2	3.B				
Service lamps	L	1	F.3	V.H.F. and U.H.F. radio	RT	1	H.1

TABLE 2
Cable Abbreviations

Abbreviation	Definition	Abbreviation	Definition
U/P	Unipren	D/PM	Duprenment
D/P	Dupren	T/PM	Triprenment
T/P	Tripren	U/NYP	Uninypren
D/P SHEATH	Duprensheath	U/FIRE	Unifire
T/P SHEATH	Triprensheath	D/CS	Ducralsil
Q/P SHEATH	Quinprensheath	D/CV	Ducralvin
U/PM	Uniprenmet	MIN.2C etc.	Miniature cables 2C (etc.)

23. The A.C. distribution box is located on the starboard side of the cabin aft of the pilot's seat and is mounted on the upper surface of the longeron tie member at frame 13. Internally it contains terminal blocks and fuses, while mounted on the lid, externally, is a suppressor. Its function is to distribute the a.c. supply to the engine temperature control and the autostabilizer circuits. The top temperature a.c. control box is mounted on the port side of the front fuselage at frame 17A in the radio bay above the radio sets. It contains a torque switch and relay, both of which are employed in the engine top temperature control circuit. The air-

brake relay control box containing the relays employed in the airbrake control circuit, is situated in the cabin over the port shelf between frames 10 and 11.

Leg panel

24. This panel is in the form of a box, being bolted to the cabin floor, below the centre instrument panel and just forward of the control column. It is provided with a hinged door on the port side and a sloping plate carrying the plugs for the cable assemblies on its forward face. The rear face carries the oil pressure gauge, generator power failure warning lamps, ignition and starter switches, together with the gyro gun sight circuit breaker and a number of control switches. The box contains relays, terminal blocks and fuse blocks, these latter components being mounted on the inside face of the door for easy accessibility.

Generator control and supply panels

25. These two panels are located together between frames 16 and 19 on the starboard side of the radio bay in the front fuselage. The supply panel is outboard of the generator control panel and is curved to conform with the inside contour of the fuselage skin, being attached by studs on frames 17 and 18, which engage with channel members on the panel. The panel carries a number of terminal blocks, fuse boxes and relays, together with plugs for the cable assemblies to and from the panel.

The generator control panel is hinged to the top longeron and fits over the supply panel to form a lid, being attached to the latter panel by four Dzus fasteners along the lower edge. The panel contains all the generator control components, fuse boxes and testing equipment. When raised for access to the supply panel, the generator control panel may be retained in the up position by a hook attached to a length of chain secured to the radio mounting structure.

Radio relay box

26. This box is mounted on the underside of the top radio mounting structure and contains the radio supply fuses and control relays, together with a number of plugs for the radio connectors to and from the box. For further details of this box, reference should be made to Sect.6, Chap. 1 of this volume.

Cabin port shelves

27. The cabin port shelf, as a whole, extends between frames 8 and 12, and the two portions about to be described form removable parts of this structure. The forward portion is located just inboard of the throttle lever at the forward end of the structure, while the rear portion extends aft from just behind the throttle lever to the end of the structure. Each portion is attached to the fixed structure by a number of screws and Dzus fasteners and is in the form of a panel with a side member. The rear portion is also provided with an end plate which carries the plugs for connection

with the cable assemblies to and from this shelf. The panels carry the radio controllers, control switches, warning lamps and indicators, while below a hinged door, in the top surface of the rear portion, are a number of terminals and fuse blocks supplying the equipment.

Cabin starboard shelf

28. This shelf, of which the removable portion about to be described is the major part, extends between frames 8 and 12. The removable portion is attached to the fixed structure by a number of Dzus fasteners and is in the form of a panel with a side member and end plate. The end plate carries the plugs for the cable assemblies to and from the shelf and the panel incorporates a number of switches and circuit breakers, together with the fuel content gauges. Below a hinged door, at rear end of the panels are a number of fuse and terminal blocks supplying the equipment

Gun-firing panel

29. This panel is bolted below the radio mounting structure on the port side of the front fuselage and carries the gun-firing equipment, consisting of a number of relays, together with terminal and fuse blocks supplying the equipment.

Cable assemblies

30. These consist of a number of cables assembled together, most of which are fitted at each end with multi-pole plugs or sockets. The assemblies are referenced

numerically, the number being prefixed with a letter denoting their location in the aircraft, or with special circuits, the service which they supply. Front fuselage cable assemblies are prefixed by the letter F, centre fuselage assemblies by the letter C and rear fuselage assemblies with the letter R. Cable assemblies in the port wing are prefixed by the letter P, while those in the starboard wing carry the letter S. The artificial horizon, GM-4F compass and armament cable assemblies are prefixed with the letters AH, GC and A respectively. The cable assemblies in the engine bay hot zones consist of Nypren insulated cables.

Cables

31. The ends of each cable are identified, in one of two ways, by means of rubber sleeves. At the equipment, the sleeve gives the item and terminal to which the cable core is connected, while at the terminal blocks the sleeve gives the equipment and terminal from where the cable core originated. For the type of cable employed in the various circuits, reference should be made to the routeing diagrams and the table of cable abbreviations.

Multi-pole plugs and sockets

32. Plessey standard and pressure-proof plugs and sockets, together with the Mk.4 miniature types, are used on the cable assemblies, junction boxes and panels, etc. These are fully described in A.P.

4343C, Vol.1, Book 3, Sect.5, Chap.1 and 8, and consist of internal mouldings, holding the plug pins and socket inserts, which float in fully weather-proof metal housings. The plug pins and socket inserts are each identified by a letter or number on the internal moulding and are arranged in a pattern so as to prevent incorrect assembly with their associated component, thus preventing cross-connection or short-circuiting.

33. Those plugs and sockets fitted to cable assemblies outside junction boxes and panels etc., are provided with rubber sleeves and bungs, which seal the cable entry to prevent the ingress of moisture. The sleeves and bungs are retained in position by inner and outer ferrules locked by a coupling nut. Each socket may be identified by the cable assemblies to which it is attached, the reference being printed on the rubber sleeve or P.V.C. conduit. Each plug is also identified by its associated cable assembly reference or colour which is painted on the junction box or panel to which the plug is attached. Where two or more identical plugs or sockets are situated together, they are coloured for easy identification.

Fuses

34. The circuit fuses are contained in quick-release fuse blocks in the A.C. junction box and attached to the various panels and cabin shelves carrying the electrical equipment. They are referenced

*A.P.101B-1307-1, Sect.5, Chap.1, Group A1
A.L.208, Sept.74.*

numerically, each panel and shelf having its own series of numbers. In most instances, these numbers, together with the fuse rating and the code letters of the circuit it serves, appear on the associated wiring diagram in the box concerned. In certain instances this information is given on a photographic label attached to the appropriate fuse block. The majority of the fuses are of the type S series, but a few Type 33 fuses are used on the gun firing panel and reference should be made to Table 3 for the rating and fuse numbers. The fuses should be examined periodically to ensure that they are serviceable and of the correct value.

Circuit breakers

35. All the circuit breakers, apart from those on and below the generator control panel and that on the gun-firing panel, which are located in the radio bay, are accessible from the cabin. They are not referenced, but may be identified by the name of the circuit which they protect, this being given adjacent to each breaker. Table 4 lists the circuit breakers together with their ratings and References.

Relays

36. The relays are located in the junction boxes and on the various panels and shelves carrying the electrical equipment. They are referenced alphabetically, the letters being given adjacent to each unit and on the wiring diagrams.

Terminal blocks

37. Apart from those inside junction

TABLE 3 - FUSES

Location	Fuse	Size (Amp.)	Service	Location	Fuse	Size (Amp.)	Service
Supply panel	1	2.5	Hydraulic pressure warning	A.C. junction box	1	-	Dummy
"	2	10	Ignition (starboard)	"	2	2.5	Compass d.c. bias
"	3	10	Ignition (port)	"	3	5	Altimeter inverter d.c. supply ▶
"	4	2.5	Engine top temperature control.	"	4	10	No.2 inverter supply
"	5	2.5	Service lamps	"	5	2.5	Radar ranging blue phase
"	6	5	IFF/SSR relay	"	6	2.5	Radar ranging red phase
"	7	2.5	Flap position indicator	"	7	5	Radar ranging d.c. bias and indicator
"	8	5	Pressure refuelling	"	8	2.5	◀ Main altimeter supply ▶
"	9	5	Fire warning	"	9	2.5	Oil pressure blue phase
"	10	10	Fuel filter de-icing	"	10	2.5	Temperature amplifier blue phase
"	11	5	Fuel filter de-icing	"	11	2.5	Artificial horizon blue phase
"	12	5	IFF/SSR test socket	"	12	2.5	Compass blue phase
"	13	10	IFF/SSR relay	"	13	2.5	Oil pressure red phase
"	14	2.5	Tail plane position indicator	"	14	2.5	Temperature amplifier red phase
"	15	2.5	Aileron trim indicator	"	15	2.5	Artificial horizon red phase and vibrator unit
"	16	2.5	Rudder trim indicator	"	16	2.5	Compass red phase
"	17	5	IFF/SSR transponder	"	1	-	Dummy
"	18	5	IFF/SSR relay	Cabin port shelf	2	2.5	Alighting gear control
"	19	10	Gun firing	"	3	5	Gyro gun sight
"	20	5	R.P. reset	"	4	-	Dummy
"	21	5	Fuel content gauges	"	5	5	Tail plane control
"	22	5	Fuel content gauges	"	6	20	Tail plane control
"	23	2.5	Tank pumps	"	7	2.5	Tail plane control
"	24	2.5	Tank pumps	"	8	10	Tail parachute control
"	25	20	Fire extinguisher	"	9	5	Aileron power controls
"	26	5	Fire extinguisher	"	10	5	Hood control
"	27	10	Target towing (Mod.1046 only)	"	11	2.5	Aileron trim control
"	28	5	Target towing (Mod.1046 only)	"	12	-	Dummy
"	29	5	Power controls	"	13	-	Dummy
"	30	2.5	Oxygen regulator				
"	31	2.5	Artificial horizon				
"	32	5	Elevator power controls				

TABLE 3 - FUSES (Continued)

Location	Fuse	Size (Amp.)	Service	Location	Fuse	Size (Amp.)	Service
Cabin port shelf	14	—	Dummy	Generator control			
"	15	—	Dummy	panel	1	5	Generator test socket No.2
"	16	—	Tail parachute control	"	2	5	Generator test socket No.2
"	17	5	Engine top temperature control	"	3	5	Generator test socket No.1
"	18	2.5	Alighting gear indicator	"	4	5	Generator test socket No.1
"	19	5	Alighting gear control	"	5	5	Power failure indicator
"	20	5	Flap control	"			No.2
"	21	5	Cabin pressurization control	"	6	5	Power failure indicator
"	22	5	Cabin pressurization control	"			No.1
"	23	5	Cabin pressurization control	"	7	10	A.C. supplies
"	24	5	Airbrake control	"	8	—	Dummy
Cabin starboard shelf	1	5	Navigation lamps	Leg panel	1	2.5	Nose wheel bay service lamp
"	2	5	Fuel low level indicator	"	2	10	Fire extinguisher
"	3	2.5	Port outboard drop tanks	"	3	2.5	Turn and slip indicator
"	4	2.5	Starboard outboard drop tanks	"	4	2.5	Turn and slip indicator
"	5	2.5	Cabin panel lamps	"	5	10	Pressure head heater
"	6	2.5	Cabin lamps (starboard)	"	6	10	G.90 camera gun
"	7	2.5	Cabin lamps (port)	"	7	—	Dummy
"	8	5	Engine anti-icing	"	8	—	Dummy
"	9	2.5	Fuel pressure	"	9	—	Dummy
"	10	10	A.C. supplies	"	10	—	Dummy
"	11	5 HRC	IFF/SSR (Mod.1369) ▶	"	11	—	Dummy
"	12	5	Radio compass	"	12	—	Dummy
"	13	—	Dummy	"	13	5	Engine starter
"	14	5 HRC	IFF/SSR (Mod.1369) ▶	"	14	2.5	G.G.S. caging
"	15	2.5	Fuel contents	"	15	20	Engine starter
"	16	2.5	Fuel contents	"	16	—	Dummy
				Bomb/R.P. selection			
				Junction box	1	5	Tail fuzing
				"	2	5	Nose fuzing

TABLE 3 - FUSES (Continued)

Location	Fuse	Size (Amp.)	Service	Location	Fuse	Size (Amp.)	Service
A.C. distribution				Radio relay box	10	-	Dummy
box	1	-	Spare	"	11	-	Dummy
"	2	2	Engine top temperature control	"	12	2.5	Set selection
"	3	2	Engine top temperature control	Gun firing panel	1	2 H.R.C.	Starboard outer gun
"	4	-	Spare	"	2	2 H.R.C.	Starboard inner gun
"	5	-	Spare	"	3	2 H.R.C.	Port inner gun
				"	4	2 H.R.C.	Port outer gun
Radio relay box	1	10	Standby battery supply	"	5		Gun ventilation
"	2	5	Tele-briefing	"	6	5	Gun selection
"	3	20	Standby set supply (Dummy when V.H.F. is fitted)	Tail cone front former		0.5	Parachute brake test circuit
"	4	-	Dummy	Power controls			
"	5	10	Test Circuit	Junction box	-	2.5	Elevator indicator
"	6	-	Dummy	"		2.5	Aileron indicator
"	7	-	Dummy (20 amp. when V.H.F. fitted)	Target towing control box	1	10	Port release unit
"	8	-	Dummy (20 amp. when V.H.F. fitted)	"	2	10	Port release unit
"	9	10	Standby set supply	"	3	10	Starboard release unit
				"	4	10	Starboard release unit
				Top instrument panel	-	7	Target towing

boxes and on the panels carrying electrical equipment, terminal blocks are also used as distribution and breakdown points throughout the aircraft. These are of the Plessey quick-release 2, 3, 5, 10 and 20-way types together with a few Air Ministry 2 and 3 way types. The blocks are referenced numerically, the numbers being preceded by the letters T.B. Each terminal carries a coding plate on which is marked the terminal numbers quoted in the wiring diagrams. The terminal blocks may be located

on the cable assembly layout and location diagrams contained in Group A.3 of this chapter.

◀ Note . . .

Terminal Blocks 11, 22, 24, 32, 42, 43, 44, 45, 46, 47, 48, 73, 79, 87, 97, 98 should not be fitted with perspex covers (introduced by STIs 182A and 262). ▶

Filament lamps

38. When renewing filament lamps, reference should be made to Table 5 to ensure that the correct type is used.

Earth points

39. Apart from the guns, engine starter, inverters, suppressors and radio sets, which are earthed internally or adjacent to their mountings, all the other earth leads are grouped, for ease of servicing and in-

sulation resistance testing, and connected to the aircraft structure a number of stud-type main earth points. All the main earth points are numbered and may be located on the cable assembly layout in Group A.3 and on the supply and earth routing chart (fig.1) of this group.

SERVICING

External supply socket

40. This is mounted on the battery support structure below the batteries; access is gained by opening the radio access panel. It is used to connect an external supply to the aircraft services by means of a standard plug and it is most important that, when servicing, the external supply is used to prevent the aircraft batteries from being discharged. When the external supply is in use, the generators are automatically isolated to prevent a reverse feed (Group B.1) and it is recommended that the battery master switch, located on the leg panel, is placed in the OFF position to prevent discharge of the aircraft batteries should the external supply voltage fall below that of the batteries.

Rendering aircraft electrically safe

41. When not required for flight, and during any servicing operations not requiring the electrical supply, the aircraft must be rendered electrically safe to eliminate the possibility of a short-circuit resulting in the accidental operation of the guns, hydraulic units, etc., with consequent damage to the aircraft or injury to person-

TABLE 4
Circuit Breakers

Circuit	Rating (Amp)	Ref.No.
Gun-firing panel	5	5CY/2559
Parachute brake	6	
Gun sight	10	5CY/2560
No.1 generator, field	15	5CY/2561
No.2 generator, field	15	5CY/2561
D.M.E.	10	5CY/2560
Flight instrument control		
Normal	15	5CY/2561
Stand-by	15	5CY/2561
Tail plane control	24	5CY/5312
Hood Control	15	5CY/2561
U.H.F. main supply		5CY/
(ARC.52)	25	9992777
Tank pumps Port	25	5CY/2562
Starboard	25	5CY/2562
Armament supply	45	5CY/2564
R.P. Service	18	5CY/5330
Bomb service	12	5CY/5311
Guns service	12	5CY/5311
Jettison 1 service	12	5CY/5311
Jettison 2 service	12	5CY/5311
Engine starting	45	5CY/2564
U.H.F. services	45	5CY/2564
Radar ranging	45	5CY/2564
◀ I.F.F. (pre Mod.1369 only) ▶	45	5CY/2564
No.1 generator, main	200	5CY/2853
No.2 generator, main	200	5CY/2853

nel. When electrical power is required, during servicing, an external supply should

A.P.101B-1307-1, Sect.5, Chap.1, Group A.1
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be used. To render safe, it is recommended that the leads from the batteries be disconnected, as operation of the battery master switch will not render the system completely safe. Also ensure that the external supply is disconnected.

Servicing of junction, distribution and control boxes.

42. A regular examination of these boxes should be carried out to ensure that they are correctly supported, clean and undamaged. All the components in the boxes should also be examined for security and an examination of the wiring and terminals made for damage and corrosion.

43. The boxes are provided with readily detachable lids and have been designed for ease of removal, being supported on quick-release mountings. When major servicing is necessary, it is recommended that the boxes are removed from the aircraft and replaced with fully serviced components, thus reducing the time in which the aircraft is unserviceable. The faulty boxes should then be made serviceable, on the bench, and returned to store to be held as spares. The method of removing the boxes is described in Group A.2 of this chapter.

Servicing of panels and shelves

44. The equipment panels and cabin shelves should be regularly examined to ensure that they are correctly supported, clean and undamaged. All the components should likewise be examined for security, and an examination of the wiring and

TABLE 5
Filament Lamps

Lamp	Circuit	No.off	Voltage	Wattage	Ref.
Failure warning	IFF/SSR	1	28	3.5	5L/9951273
Parachute indicator	Parachute brake	2	28	3.5	5L/9951273
Power failure warning	Generators and batteries	2	28	3.5	5L/9951273
Fuel pressure warning	Fuel pressure	1	28	3.5	5L/9951273
Cabin pressure warning	Cabin pressurization and temperature control	1	28	3.5	5L/9951273
Alighting gear indicator	Alighting gear indicator	9	28	2.5	5L/9951286
Alighting gear warning	Alighting gear indicator	1	28	3.5	5L/9951273
Ultra-violet lamps	Cabin lighting	2	12	7.5	5L/9952261
Red lamps	Cabin lighting	9	24	2.8	5L/9951263
Red stand-by lamps	Cabin lighting	2	24	2.8	5L/9951263
Wing-tip navigation	Navigation lamps	2	28	24	5L/9952431
Tail navigation	Navigation lamps	1	24	10	5L/9952276
Service lamps	Service lamps	2	24	6	5L/9952254
Gun sight	Gun sight	4	22	12	5L/9951260
Radar locked-on and range	Gun sight (Post Mod.378 and 700 only)	2	28	1.1	5L/9959118
Hydraulic pressure	Hydraulic pressure indicator	1	28	3.5	5L/9951273
U.H.F. control	U.H.F.	2	28	1.1	5L/9959118
Tele-briefing	U.H.F.	1	28	3.5	5L/9951273
Radar locked-on	Radar ranging and supply	1	28	3.5	5L/9951273
Fire warning	Fire warning and extinguisher	1	28	3.5	5L/9951272
Refuelling indicator	Pressure refuelling	6	24	2.4	5L/9959211
Tank pump	Tank pumps	2	28	3.5	5L/9951273
E.2B compass	Cabin lighting	1	28	1.1	5L/9959121
Fuel low level	Fuel contents	2	28	3.5	5L/9951273

terminals made for signs of damage and corrosion. The Dzus fasteners securing these panels and shelves should also be examined to ensure that they are correctly engaged and not damaged or distorted in any way, paying particular attention to the springs. Any fasteners found to be unlocked must be re-engaged and any found defective renewed as described in the relevant equipment servicing A.P.

45. When major servicing is necessary to these panels and shelves, it is recommended that they are removed from the aircraft and replaced with fully serviceable components, thus reducing the time in which the aircraft is unserviceable. The faulty panel or shelf should then be serviced, on the bench, and returned to store to be held as a spare. The method of removing these components is given in Group A.2 of this chapter.

Cable assemblies

46. A periodical examination of the cable assemblies should be made for signs of oil soakage and to ensure that they are properly supported and not chafing, cut or damaged in any way. Damaged cables must be renewed or repaired as described in the relevant equipment servicing A.P., and all slack support-clips re-tightened.

Multi-pole plugs and sockets

47. The plugs and sockets should be examined periodically for signs of corrosion which, if found, must be removed.

When removing corrosion, care must be taken not to damage the plated surface of the plug pins or socket inserts or early re-corrosion will result. The importance of cleanliness and the need for regular lubrication of the plug and socket screw threads cannot be over-emphasized if seizing of these threads is to be avoided. Grease MS-4 (Ref.33H/9424829) is to be used and the excess wiped off. On no account should a lubricant with a graphite base be employed. When it is required to examine or service the cable connections to plugs and sockets incorporating rubber sleeves and bungs, access may be gained by releasing the sleeve at the coupling nut and rolling it back until clear of the connections.

Circuit breakers

48. The interior of the circuit breakers is inaccessible and servicing is therefore restricted to the functional and insulation tests given in A.P.4343B, Vol.1, Book 2, Sect.10, Chap.6.

Note . . .

The starter and booster pump circuit breakers and those below the generator control panel are fitted with rubber packing at their mountings to prevent tripping due to vibration (S.T.I/Hunter/290). When replacing these circuit breakers ensure that this packing is re-fitted.

Dummy fuses

49. Dummy fuses are fitted in NOT IN USE circuits to prevent inadvertent operation of the circuit. These fuses, in red

plastic, are identifiable by feel by their square section centre and corrugated sides. One side is embossed "NOT IN USE". Whenever a live fuse is removed while servicing it is to be temporarily replaced by a dummy fuse fitted with a 9 inch by 1 inch streamer. Dummy fuses are referenced:-

2 amp. size fuse dummy	10H/21790
2.5 amp. size fuse dummy	10H/21791
5 amp. size fuse dummy	10H/21792
10 amp. size fuse dummy	10H/21793
40 amp. size fuse dummy	10H/21793

Relays

50. Relays should be inspected at regular intervals to ensure that the contacts are kept clean and that the units are undamaged and secure. They should also be subjected periodically to the functional test given in A.P.4343C, Vol.1, Book 2, Sect.3.

Note . . .

Relays that are operating correctly are best left alone and it is, therefore, recommended that the covers are not removed or the contacts cleaned, unless absolutely necessary.

Switches

51. The switches employed in this aircraft are sealed units and cannot be readily dismantled for servicing, they should, however, be examined for cracks and signs of strain, paying particular attention to the

switch dollies.

Insulation resistance testing

52. As an interim measure, pending the introduction of a full insulation resistance test, the following procedure, which only covers the minimum requirements, should be carried out.

- (1) Remove all lamps.
- (2) Disconnect the inverters.
- (3) Disconnect earth points (1 to 20).
- (4) Remove the white compass plug from the A.C. junction box.
- (5) Remove the red and green radar plugs from the A.C. junction box.
- (6) Remove the plugs from the fire extinguishers.
- (7) Remove the supply plug to both fuel contents gauge amplifiers.
- (8) Disconnect the gun sight suppressor F5.
- (9) Remove the voltmeter, if this has been fitted.
- (10) Remove the lamps from the Type A cut-outs.
- (11) Bridge all other suppressors.
- (12) Remove the engine igniter plugs.
- (13) Disconnect the Rebecca Mk.8
- (14) Place all switches to the ON position.
- (15) Connect a 250-volt insulation resistance tester to positive terminal and to an earth point of the aircraft.

Note . . .

It is not necessary to disconnect the suppressors if an insulation resistance tester, Type C (Ref. No. 5G/152) is used.

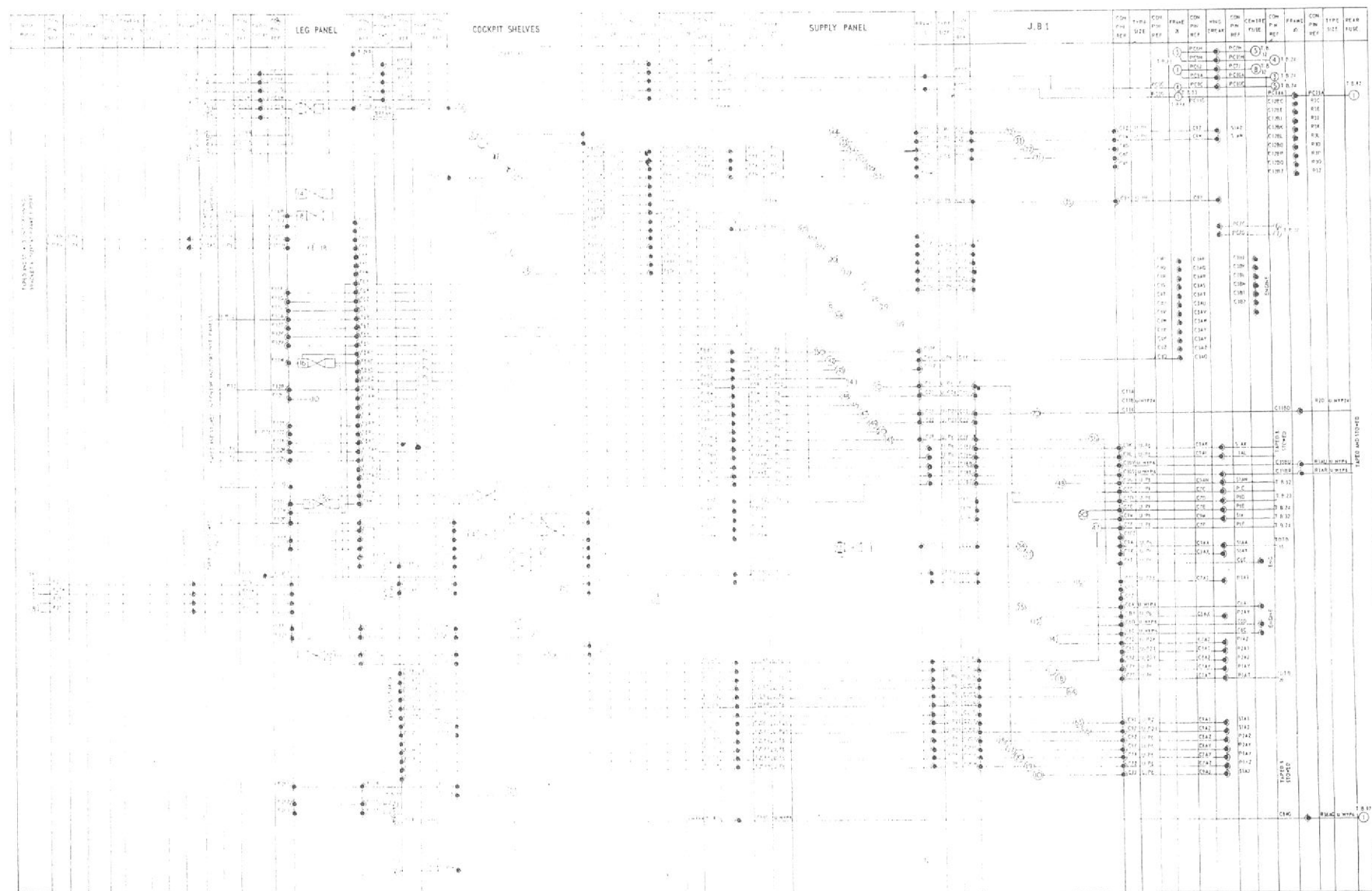


Fig.4 Available spare wiring

RESTRICTED

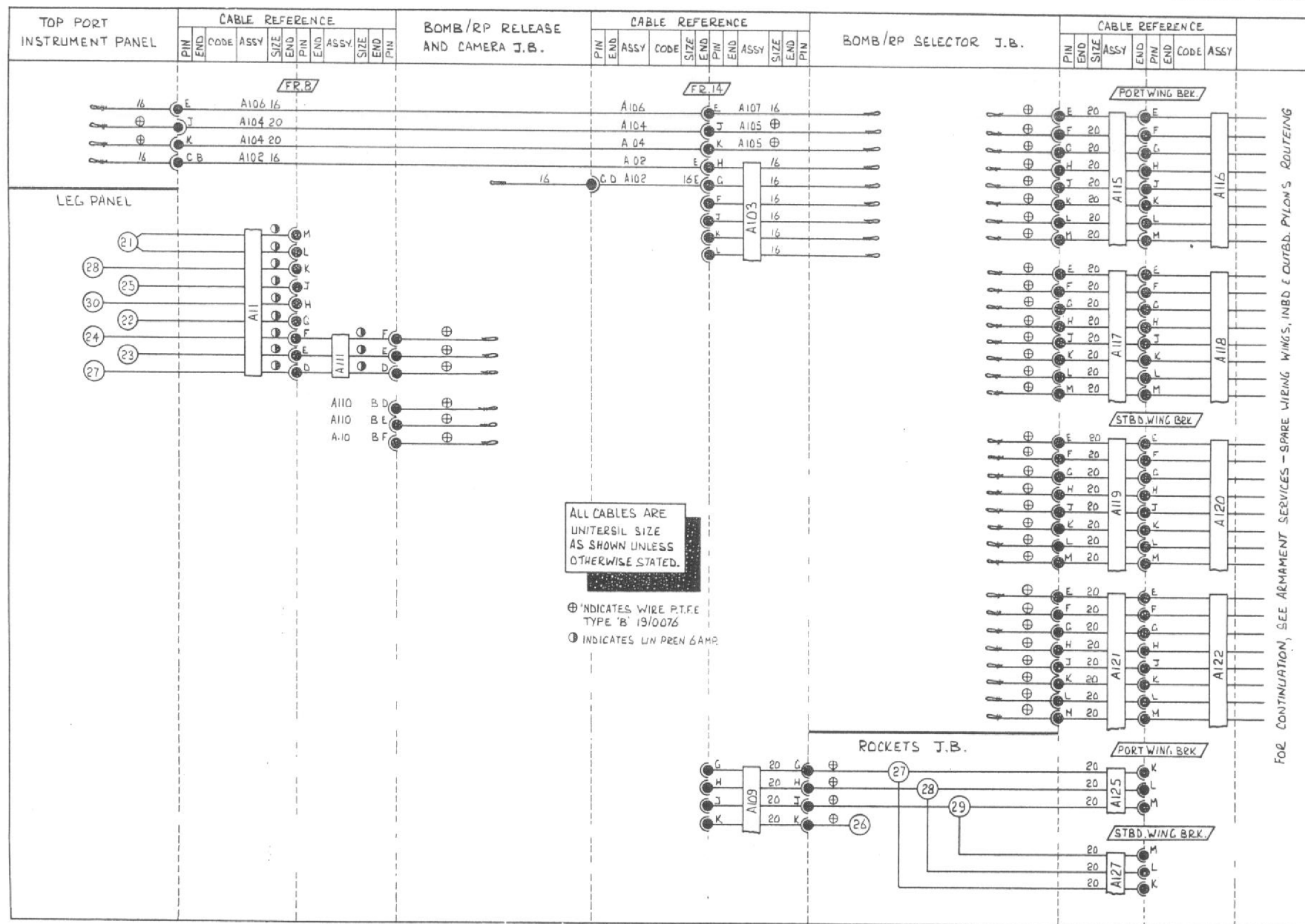


Fig. 5. Available spare wiring-Armament (fuselage)

RESTRICTED

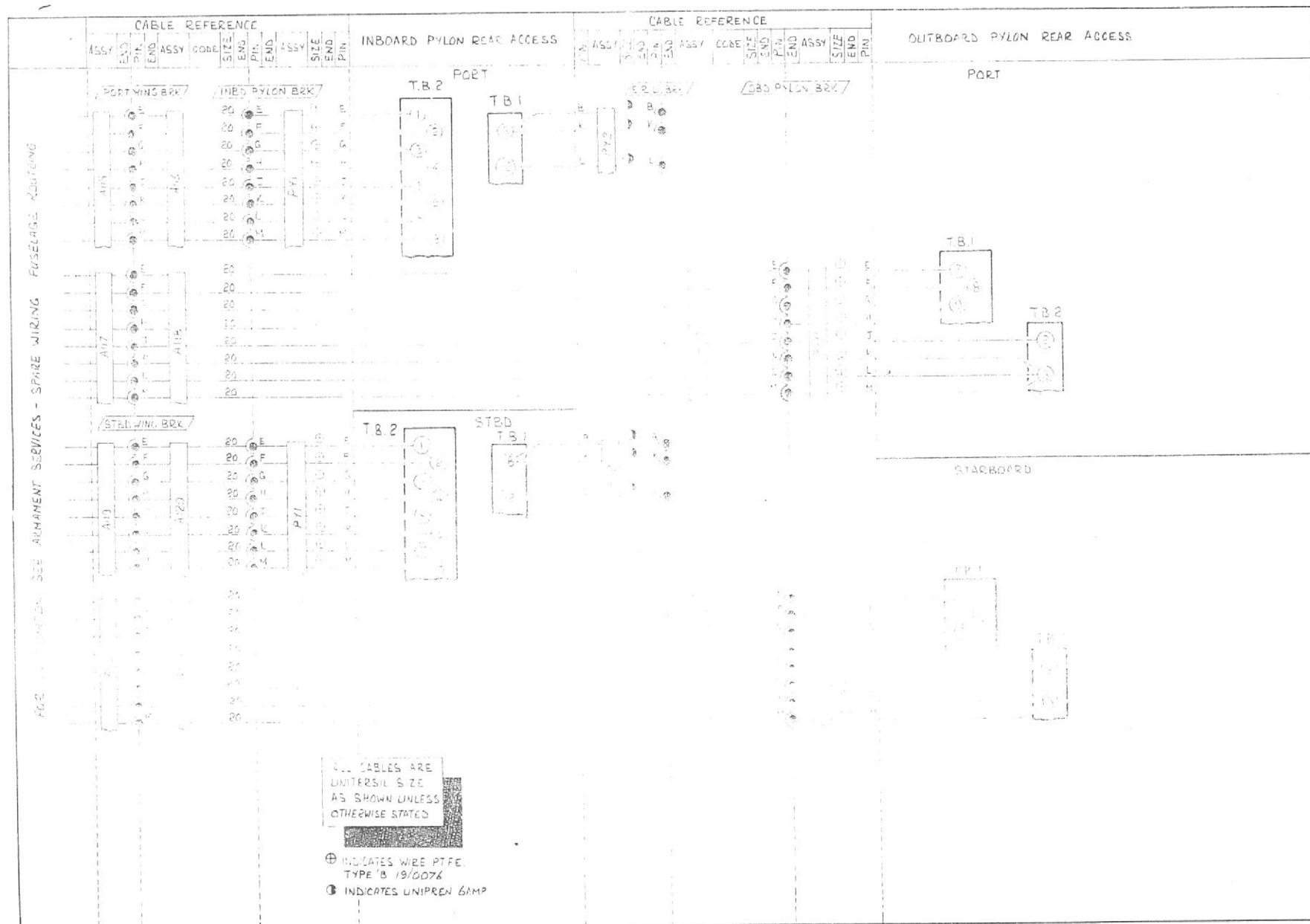


Fig.6. Available spare wiring-Armament (wings and pylons)

RESTRICTED

Bonding checks

53. It is not required to carry out bonding checks on those parts of the airframe, or airframe systems which are capable of movement, or of being moved over an electrically conductive bearing (e.g. control columns, rudder bars, etc.), physical examination that these items are correctly bonded being sufficient. The following items should, however, be checked using a Safety Ohmmeter Ref.5G/1006388 or other suitable Safety Ohmmeter:-

- (1) Metal frames of radio and radar equipment.
- (2) Aerial mounting brackets
- (3) Electrical control and distribution panel.
- (4) Fuel pipelines
- (5) Hydraulic pipelines.
- (6) Engine.
- (7) Jet pipe.

With the battery master switched OFF and the external supply disconnected, check each item from an aircraft main earth point. The maximum permissible resistance is 4.5 ohms.

Use of spare cables for emergency servicing

54. Fig.4, 5 and 6 show the spare cables available in the cable assemblies. These are provided for future modifications and additions to the existing installations, but may also be used, in an emergency, to replace a defective cable. Under this

condition, having found the defective portion of cable, refer to the spare wiring figures to find a similar cable, which can be used. At suitable points, modify the existing cable run to use the spare cable and isolate the defective cable. Amend the junction box, panel and shelf wiring diagrams to agree and note the fact of this change in the aircraft log book, with the instruction that the cable assembly containing the defective cable must be changed or repaired at the next available opportunity.

Note . . .

The above procedure is only to be adopted as a temporary measure to keep the aircraft operational and must not be allowed to carry on indefinitely.

Electrical cables on throttle lever

55. The engine throttle lever carries the gyro gun sight ranging twist grip control unit, which incorporates the radio press-to-transmit and air brake control switches. The cables from these switches are clamped to the throttle lever and pass through a grommet in the cabin port shelf. To avoid accidental operation of the hood control switch due to fouling by these cables, it is important that all excessive slack be eliminated as follows:-

- (1) With the throttle lever fully forward, i.e. throttle open, draw the cables through the grommet on the cabin port shelf so that all slack between the throttle lever and grommet is taken up. Care must be taken during

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this operation to avoid kinking the cables at the clamp block on the throttle lever.

- (2) Reposition the cable strapping to clear the guard on the hood control switch box.

Main undercarriage electrical cables-replacement

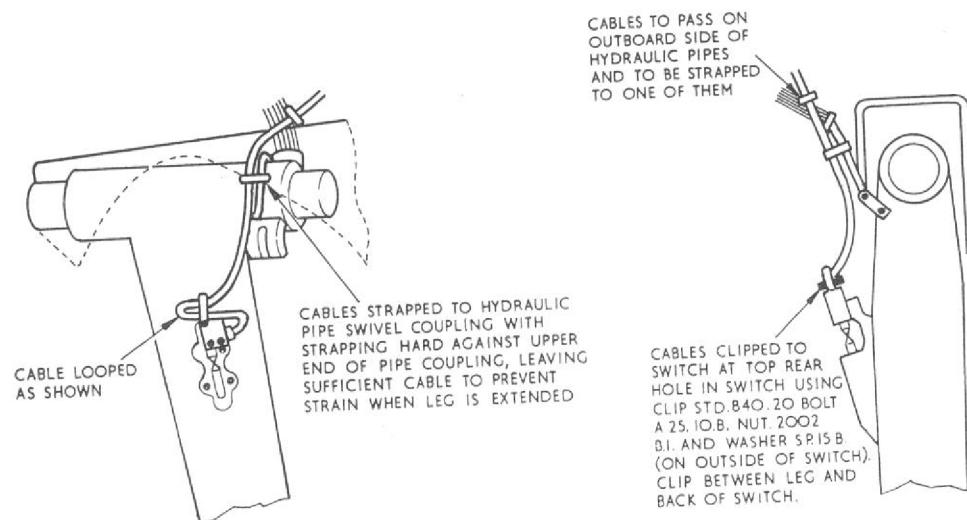
56. When replacing the electrical cable looms from the compression microswitches on each main undercarriage leg, as called for during Major Servicing, the following points must be observed:-

- (1) The run and strapping of the cables is to be in accordance with fig.7.
- (2) Uninyvin 20 cable must *not* be used in this connection, because of its lack of flexibility. Unisersil 20 cable should be used.
- (3) Hellerman Twin Grip Ring Tags (Ref. 5X/7553) should be fitted to the cable terminations at the microswitches when the cable looms are changed.

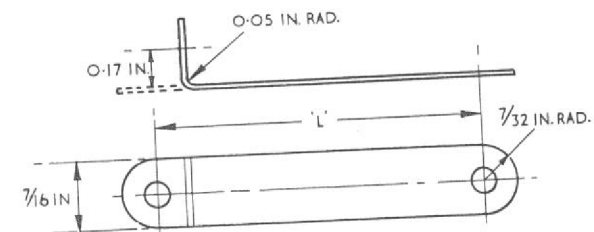
REMOVAL AND ASSEMBLY

Disconnection of sockets

57. Before an attempt is made to remove a Plessey standard or pressure-proof socket from its associated plug, the coupling nut, retaining the sleeve and bung or ferrule and P.V.C. assembly to the socket, must be slackened. This is necessary as

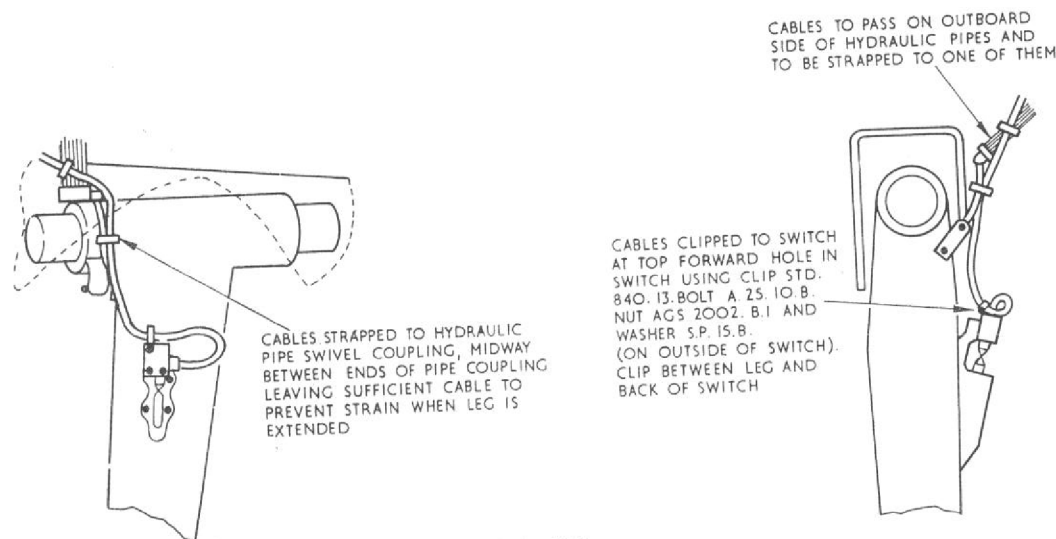


PORT LEG



DETAIL OF STD. 840 CLIP
MAKE FROM 22 G. L.A.

STD. 840.13 'L'=1.31 IN.
STD. 840.20 'L'=2.0 IN.
HOLES MORSE No. 0



STARBOARD LEG

CABLES STRAPPED WHERE SHOWN WITH HELLERMAN STRAPS AND STUDS, HV.3341 (1/2 IN. WIDE) AND HV 3342 ON POST MOD. 178 OR MOD. 197 AIRCRAFT. ON PRE MOD. AIRCRAFT CABLES CLIPPED TO SWITCH AS SHOWN BUT STRAPPED TO FLEXIBLE HYDRAULIC PIPES AS BEFORE

Fig. 7 Clipping of cables from undercarriage compression switch

RESTRICTED

the coupling nut also serves to lock the socket when it is mating with its plug. It should also be noted that this nut should be slackened before fitting the socket and the socket screwed in by hand, being assisted home by pushing on the back. A spanner or undue force must *not* be used, or damage will result.

Refitting earth leads

58. When refitting earth leads, care must be taken to ensure that the surfaces in contact are perfectly clean and in particular, free from grease and paint. Completed assemblies should be protected against corrosion by applying one coat of blue oil-base paint to D.T.D. Spec.827.

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