Chapter 12

TRANSFORMER-RECTIFIER UNIT, ROTAX, TYPE U 3102

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LEADING PARTICULARS

Transformer-rectifier unit, Rotax, Type U 3102	*Ref. No.* 5*UC*/6480
Type U 3102/1	*Ref. No.* 5*UC*/7089
Input (1)	100 *amp. at* 208 *V.*
(2)	200 *amp. at* 104 *V.*
Output (*max.*)	2·8 *kW at* 28 *volts d.c.*, 22·5 *kW at* 112 *volts d.c. plus* 32 *kVA a.c.* (*p.f.* 0·95 *lagging*)
Speed range	7,000–10,000 *shaft r.p.m.*
Rating	*Continuous*
Reduced ratings (*at reduced speed*)	3,300 *r.p.m.*
Temperature range	−70 *deg. C. to* +50 *deg. C.*
Altitude	60,000 *ft.* (*max.*)
Overall dimensions	
Height	29·302 *in.*
Length	18·800 *in.*
Width	15·346 *in.*
Weight	162 *lb.*

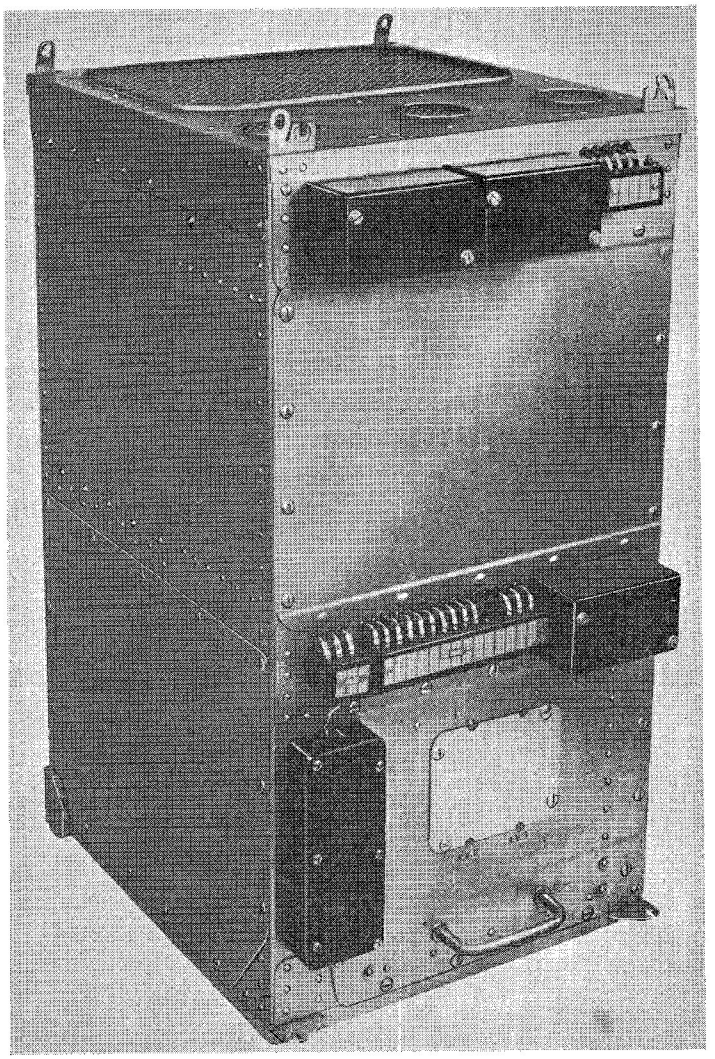


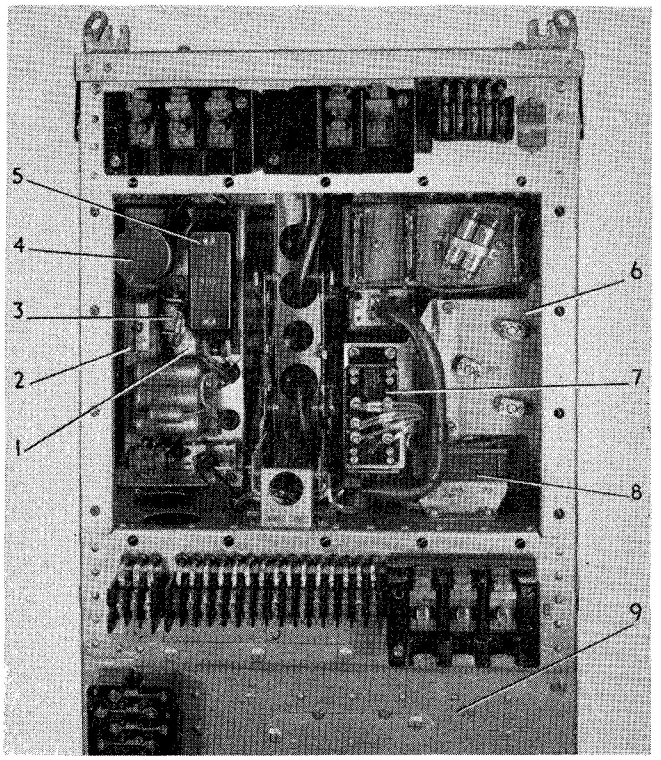
Fig. 1. General view of Type U3102 transformer-rectifier unit

Introduction

1. The U 3102 transformer-rectifier unit is similar to the U 3101/2 which it supersedes except that a surge suppression unit (N. 143515) is incorporated in the U 3102. The U 3102 replaced the U 3101/2 by means of retrospective modification, and is designed to convert the output of a 73 kVA, three-phase alternator into stabilized direct current at 28 volts and 112 volts. It also supplies and controls part of the alternator excitation; an unstabilized a.c. supply is provided. For the significance of U 3102/1, reference should be made to the note following para. 21.

2. The unit is specifically designed for use in conjunction with the Type 154 alternator (Rotax N 0603) and compounding unit (Rotax U 3001); when the transformer-rectifier unit is used in conjunction with suitable contactors and reverse current relay between it and the bus-bar, the generating system is fully protected against damage in the event of an internal or external fault.

3. The generating system, of which this unit forms a part, is designed for use in parallel with a number of similar systems. The unit therefore incorporates circuits for sharing



1 FREQUENCY SENSITIVE UNIT F5301/1
2 RELAY RL14
3 RECTIFIER MR16
4 INDUCTANCE L1
5 CONTACTOR RL10
6 PROTECTION UNIT F5402
7 TIME DELAY RELAY F7002 (X3)
8 TRANSFORMER TR6
9 REGULATOR UNIT ZA6405/1

Fig. 2. View with front panel removed

the load on the complete aircraft system equally, and for isolating any system in which a fault may occur (see A.P.4343 Vol. 1, Sect. 2, Chap. 7).

4. The unit is designed to give satisfactory operation in air temperatures between −70 deg. C. and +50 deg. C. and at altitudes up to 60,000 ft.

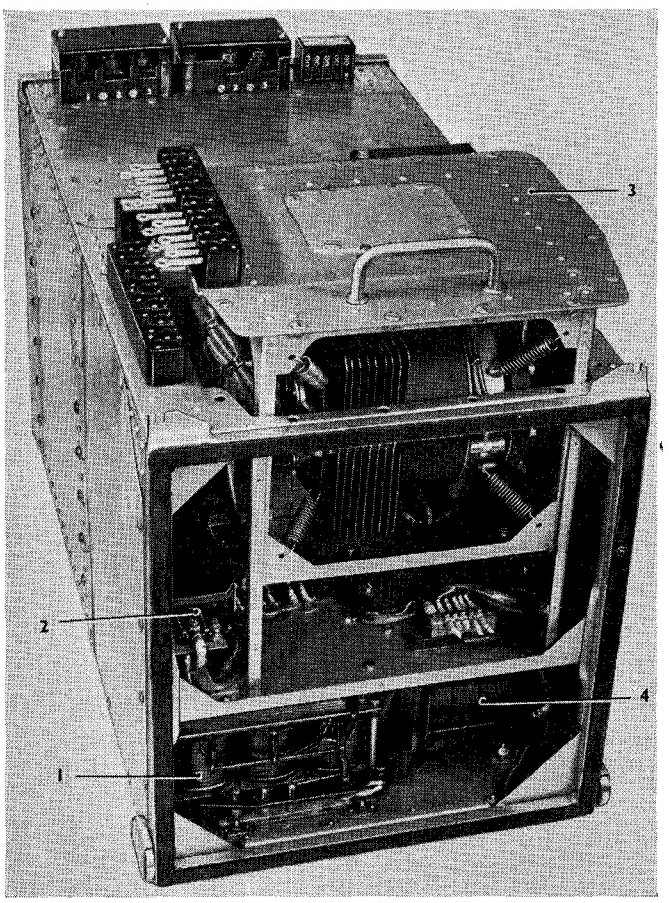
DESCRIPTION

5. The unit consists of a main frame assembly inside which are bolted the various sub-assemblies. The main frame is closed along its longer sides, detachable panels being fitted to provide access to components. The air outlet end of the transformer rectifier unit is left open but the air inlet end has a grid fitted to prevent ingress of foreign bodies. The regulators are anti-vibration mounted and the regulator assembly (Type ZA 6405/1) can easily be removed from the unit. The major components of the unit are listed in Table 1 together with the symbols by which they may be identified in fig. 7.

TABLE 1
Major components of unit

Rotax nomenclature	Rotax Part No.	Function	Circuit symbol
Transductor	P 3201	L.V. voltage regulator control	TD1
Transformer	P 3301	Main transformer	TR2
Transformer	P 3102	Booster transformer	TR3
Transformer	P 3501	M.V. load sharing transformer	TR4
Transformer	P 3401	L.V. load sharing transformer	TR5
Transformer	N 127836	M.V. stabilizing transformer	TR7
Shunt	N 105960	Main rectifier shunt	SH1
Regulator unit assembly	ZA 6405/1		
Regulator	F 5502	M.V. regulator	X1
Regulator	F 4603	L.V. regulator	X2
Rectifier	N 118879/1	For operation of RL9	MR2
Rectifiers (2 off)	N 105937	M.V. and L.V. load sharing	MR3, MR4
Main rectifier assembly	N 122075	M.V. and L.V. rectifiers	MR8, MR9
Contactor	D 6286	Thermal overload	RL3
Contactor	D 6712	Excitation contactor	RL4
Contactor	N 157020	Load sharing isolation relay	RL9
Protection unit	F 5402	(replaces F 5401/1)	
Transformer	P 3602		TR6
Rectifiers (3 off)	N 105773		MR5, MR6, MR7
Relays (2 off)	N 105744/1		RL7, RL8
Relay	N 106996/1		RL5
Relay	N 105744		RL6
Thermal delay switch	N 124586/1	(Deleted)	*X3 (F 5401/1)
Time delay relay	F 7002	(Added)	*X3 (F 5402)
Resistor bank	ZA 6203	Protection unit	R2, R3, R4, R5
Frequency sensitive unit	F 5301/1	Frequency sensistive unit	
Rectifiers (2 off)	N 80433		MR10, MR11
Rectifier	N 105489		MR12
Rectifier	N 134953–1		MR16
Relay, Type P1	F 1504/1		RL10
Inductance	F 3602		L1
Relay	N 105478		RL14
Capacitor	N 129541		C3
Capacitor	N 129540		C4
Capacitor	N 129540		C5
Capacitor	N 129540		C6
Surge suppression unit	N 143515/1	M.V. and L.V. surge Suppression	N 143515/1
Relay	N 143432/1	L.V. surge suppression	RL15
Relay	N 143431/3	M.V. surge suppression	RL16
Rectifier	N 147249–61		MR13
Rectifiers (2 off)	N 140816/3		MR14, MR15
Resistor	N 69671/3		RV14
Resistor (2 off)	N 113591/5		R13, R14
Capacitor (3 off)	N 140828/1		C7, C8, C9

* X3, circuit symbol for F 7002 time delay relay (fig. 7) is a part of the F 5402 protection unit incorporated in the U 3102 transformer-rectifier unit, and supersedes the previous X3, thermal delay switch (N 124586/1) used in the F 5401/1 protection unit incorporated in the U 3101/2 transformer rectifier unit.



1 TRANSFORMER, TR.2
2 CONTACTORS, RL.3 AND RL.4
3 REGULATOR UNIT ASSEMBLY
4 TRANSDUCTOR, TD.1

Fig. 3. General view on base of unit

6. Fig. 2 to 5 show the positions of these components in their housing, which a framework of light alloy angle with panelled sides and a perforated top cover; the remaining end is left open to provide an exit for cooling air. Parts of the side panels are attached to the main framework by quick release fasteners and are easily removed when required, to gain access to the components for the purpose of servicing. To further facilitate servicing, the voltage regulators are assembled on their own chassis which may be completely withdrawn from the unit as described in para. 23.

7. The circuit diagram is shown in the central position of the composite circuit diagram of the generator system (fig. 7). The unit is air cooled and requires 575 cu. ft. of cooling air per minute when in operation.

Operation

112-*volt circuit*

8. The circuit diagram (fig. 7) shows the complete generating system, including components such as the alternator, compounding unit and external contactors; the 112-volt circuit consists basically of a three-phase full wave rectifier (MR9) connected across the a.c. output of the alternator, and delivers 112V d.c. to the output terminals. The load sharing transformer (TR4 is connected in the three phase line between the input terminals and

the rectifier. This component functions as follows:—

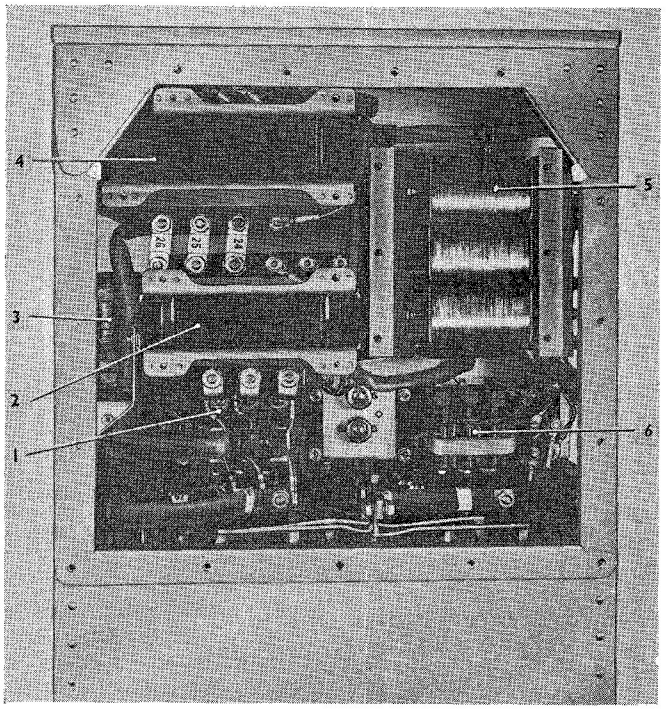
9. Regulation of this circuit is effected by a carbon pile regulator (XI) connected in the main excitation circuit of the alternator. The action of the regulators is controlled mainly by the value of the M.V. star point to negative voltage, but an additional controlling voltage is derived from the load sharing circuit. This circuit operates by developing across a resistance (RV10) a voltage proportional to the load on the system. The resistance is connected through an auxiliary winding on the regulator to similar circuits in the other generating systems. As long as each system is handling the same load, the regulator is unaffected, but if the load on one system differs from the loads on the other systems by more than a certain factor (i.e., 10 per cent of full rated load), the auxiliary winding of the regulator is energized and the alternator outputs are consequently adjusted to bring the system back to a balanced condition.

10. Should a fault develop in one system (or if the system is shut down), the relay RL9 isolates the load sharing circuit in order to prevent the reduction in output of the remaining systems that would otherwise automatically follow. A stabilizing transformer (TR7) for the prevention of "hunting" is connected in the regulator circuit.

28-volt circuit

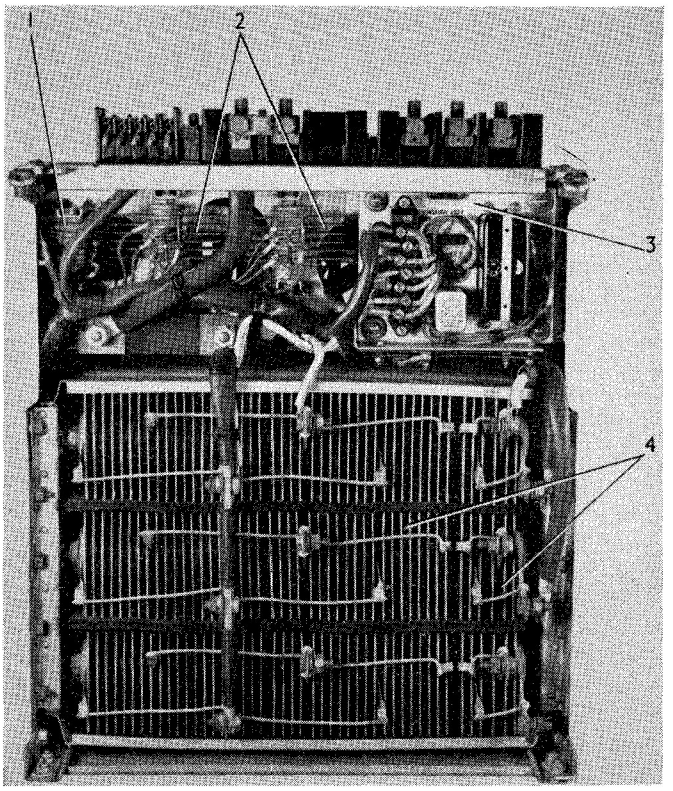
11. The 28-volt d.c. supply is obtained by stepping down the alternator output voltage via the main transformer TR2, and then rectifying the low voltage a.c. by a three-phase full wave rectifier (MR8) feeding the output terminals.

12. It is not possible to use two field regulators operating on the same alternator, and an independent system of regulation is employed for the 28-volt supply. Regulation is effected by injecting an alternating voltage into the low voltage a.c. line by means of the "booster" transformer TR3. The value and



1 TRANSFORMER, TR.5
2 TRANSFORMER, TR.3
3 TRANSFORMER, TR.7
4 TRANSFORMER, TR.2
5 TRANSDUCTOR, TD.1
6 TRANSFORMER, TR.4

Fig. 4. View with rear panel removed



1 RECTIFIER MR2
2 RECTIFIERS MR3 AND MR4
3 SURGE SUPPRESSION UNIT
4 RECTIFIERS MR8 AND MR9

Fig. 5. View with top cover removed

phase relationship of this voltage is controlled by the transductor TD1 which forms a variable reactance in the boosting circuit and which is itself controlled by the regulator X2. The regulator operaitng voltages are derived from the 28-volt d.c. output and from a load sharing network similar to that used in the 112-volt circuit.

Excitation supply circuit

13. The excitation is supplied from two sources consisting of :—

(1) Approximately 20 amp. at full load from the compounding unit (U 3001).

(2) A regulated d.c. supply from the 28-volt rectifier (MR1), fed to terminal A1 and thence to regulator X1.

14. The rotor is protected by the thermal overload contactor RL3 and the excitation contactor RL4. If a fault arises on the unit, the balance between the phases of the a.c. lines will be destroyed and the potentials of the neutral points of the three phase systems will move away from their values in relation to the common negative. Both of these effects are used, through suitable rectifying circuits and bridge networks, to close relays that energize the trip coils of the thermal overload contactor RL3. The excitation contactor RL4 then opens and remains open until the fault is cleared and system reset. The thermal trip also operates should there be any risk of burning out the rotor, if for instance the engine was shut down with the bus-bar connected to the rotor.

Frequency sensitive unit (*F*5301)

15. In order to maintain good regulation of the 28-volt d.c. supply, with alternator speeds and frequencies below 4,670 r.p.m. and 233·5 c/s respectively, the a.c. input of the booster transformer TR3 must be taken, at frequencies below 233·5 c/s, from a lower voltage than that given by the 208-volt

alternator winding. This is effected by transferring the transformer input to the 104-volt winding of the alternator by means of two contactors RL1 and RL2. These contactors are interlocked, RL1 taking the a.c. input from the alternator 208-volt winding and RL2 from the 104-volt winding. Both a.c. outputs feed the primary winding of the booster transformer via the transductor a.c. winding; at frequencies below 233·5 c/s the frequency sensitive unit applies a feed to the 104-volt contactor via the contacts of RL14, whilst at frequencies above this, the frequency sensitive unit causes the 208-volt contactor to be energized via the contacts of RL10. The above requirement results from the alternator's wide frequency range, e.g. the a.c. de-icing load should be switched on at a frequency above 233·5 c/s.

16. The frequency unit operates by utilizing the variation of reactance with frequency in two circuits, one of which is mainly inductive and the other mainly capacitive. The current in each circuit is rectified and used to energize one coil of a differential relay. The two circuits are so arranged that their reactances are equal at a frequency of 233·5 c/s.

17. The inductive circuit has the lower reactance at lower frequencies and its associated coil exercises the greater influence on the relay armature. At higher frequencies the capacitive circuit has the lower reactance. Thus above 233·5 c/s the supply to the booster transformer circuit is obtained from the 208-volt winding of the alternator by the 208-volt contactor, but below 233·5 c/s the supply is obtained from the alternator 104-volt winding, via the 104-volt contactor. The a.c. input to the frequency sensitive unit is taken from two of the low voltage three-phase lines.

Surge suppression unit

18. A surge suppression unit (N 143515/1) has been incorporated in the U 3102/1 transformer-rectifier unit, to reduce M.V. bus-bar surge voltage, and automatically decrease the surge on the L.V. busbar.

19. The suppression unit comprises two relays, a Hendry Type D4485 (RL15), and an S.T.C. miniature 2-pole changeover sealed type relay (RL16), three Lucas diodes (MR13, MR14 and MR15), three resistors (R13, R14 and RV14) and three Plessey castanet electrolytic capacitors (C7, C8 and C9).

20. The unit functions as follows:—

(1) When relay RL15 is energized, contacts 7 and 7a close, ready for operation of relay RL16; the short circuit is removed from MR13, this diode preventing feed back of pre-energizing current to M.V. bus-bar via main transformer and M.V. rectifier. Contacts 5 and 5a of relay RL15 close to supply the regulator pre-energizing circuit.

(2) When relay RL15 is de-energized, it does not release for approximately 40 mS due to capacitors C8 and C9 and resistor R14 connected across the relay coil. A 28-volt supply is connected to terminals B and A of the surge suppression unit.

(3) Relay RL16 is energized via contacts 7 and 7a of relay RL15 when made, and terminals B and C are open circuited; this in turn breaks the supply to the boost contactors RL1 and RL2.

(4) Relay RL15 releases and relay RL16 is de-energized, but does not release for approximately 300 milli-seconds, due to capacitor C7 and resistor R13 being connected across the coil of relay RL16; therefore boost is held off until such time as relay RL16 releases.

INSTALLATION

21. The unit is to be installed so that, in normal flight, its longer axis is vertical and terminal blocks A and B are uppermost. Four fixing feet, slotted 0·260 in. wide and counter-bored 0·5 in., are provided, two at 13·875 in. centres at the base and two at 12·375 in. centres on the uppermost edge. Four lifting lugs are provided at the air inlet end of the box. For the purpose of sealing and linking with the ventilating air outlet, the unit is provided with a base edge mounting comprising a $\frac{1}{2}$ in. square channel filled with soft black rubber, upon which the unit rests when fully installed. An installation diagram is given in fig. 6.

Note . . .

The ZA 6405/1 *regulator unit and U* 3102 *transformer-rectifier unit are tested as a complete unit; however, prior to dispatch from the manufacturer, the ZA* 6405/1 *regulator unit is removed from the U* 3102 *transformer-rectifier unit. As a transport precautionary measure, the regulator is then specially packed and dispatched separately under its Rotax code, i.e. ZA* 6405/1*; the U* 3102 *transformer-rectifier unit is also dispatched from the manufacturer separately, and the code number is raised to U* 3102/1 *for identification that a regulator is not included.*

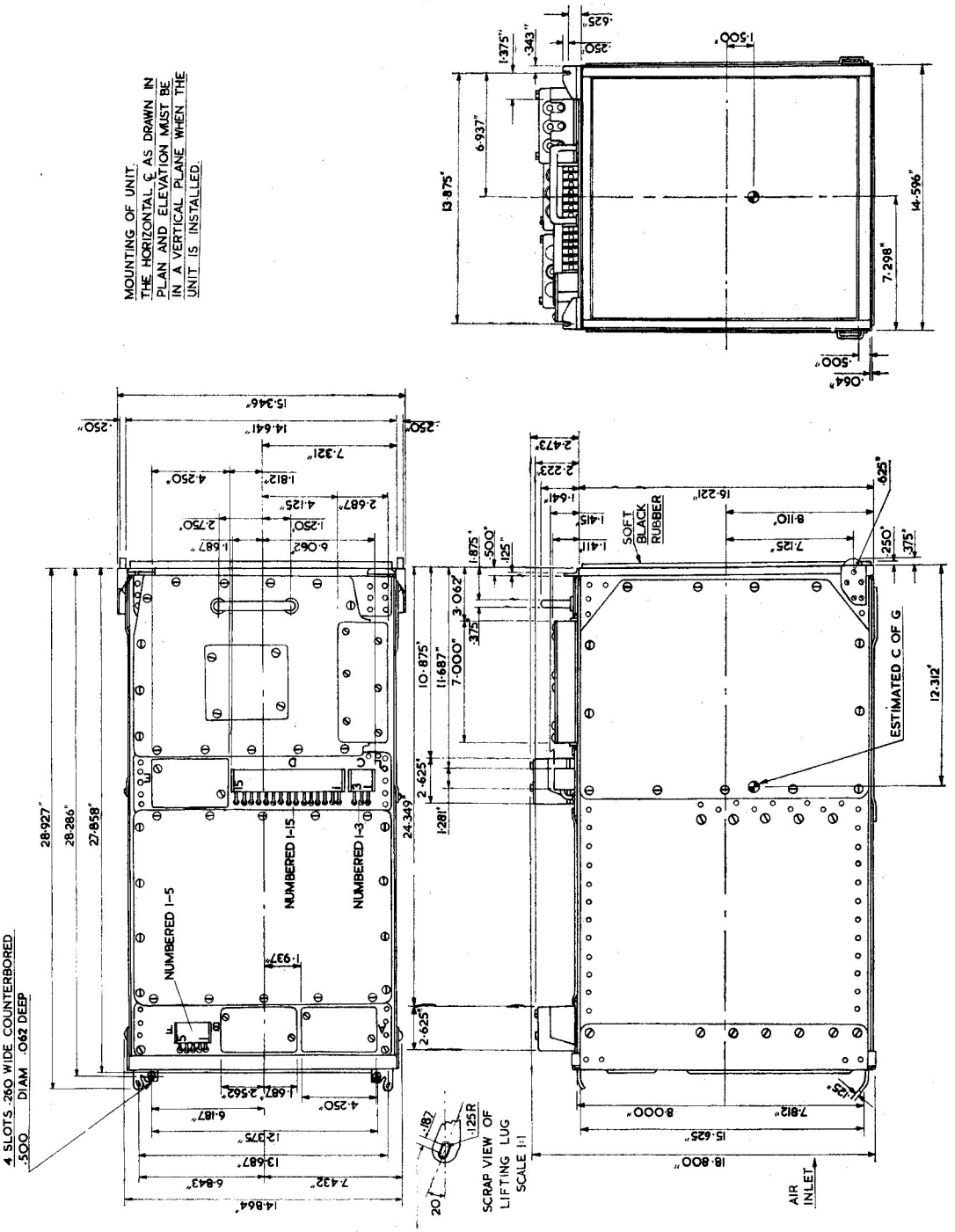


Fig. 6. Installation diagram

Electrical connections

22. Electrical connections to the unit are made as shown in Table 2.

TABLE 2
Terminal connections

Terminal Block	Type of Terminal	Cable Lug or Ferrule and Ref. No.
A (positive output)	$\frac{3}{8}$ in. B.S.F. studs to suit Prenal cable lugs	Terminal 1 (1 off)–5X/6555 Terminal 2 (1 off)–5X/6572 Terminal 3 (1 off)–5X/6558
B (earthing block)	$\frac{3}{8}$ in. B.S.F. studs to suit Prenal cable lugs (shorting link fitted)	Terminals 2 and 3 (2 off) 5X/6572
C (transductor a.c.)	3-way S.B.A.C. terminal block (19 amp.)	19 amp. ferrule–5H/26
D (miscellaneous leads)	15-way S.B.A.C. (19 amp.)	4 amp. ferrule–5H/24
E (a.c. input)	$\frac{3}{8}$ in. B.S.F. studs to suit Prenal cable lugs	Terminals 1, 2 and 3 (2 off per terminal)–5X/6558
L (electrostatic earth)	2 B.A. stud to suit Prenal cable lug	Prenal lug 5X/6503 (1 off)
F (load sharing leads)	5-way S.B.A.C. terminal block (19 amp.)	4 amp. ferrule 5H/24

SERVICING

23. Make a visual examination of the unit to ensure that it has not sustained any physical damage and that it is secure on its mounting. Remove the terminal box covers and examine the mouldings for signs of cracks or distortion; renew any terminal block if its condition is unsatisfactory. Check that the electrical connections are clean and secure and that there are no signs of corrosion. Unscrew the sixteen quick release fasteners securing the front panel to the main framework and remove the panel. Remove the nuts securing the connecting links to terminals +, — and A to M on the terminal block at the lower end of the main frame, and unscrew the fourteen quick release fasteners which hold the regulator unit assembly in position. This assembly which is mounted on its own chassis may then be withdrawn from the unit as shown in fig. 3.

24. When the front panel, regulator assembly and the detachable parts of the side panel are removed, make a visual examination of the internal components to ensure that there are no signs of damage or chafed leads and that electrical connections are secure. Make a similar examination of the regulator assembly paying particular attention to the suspension springs; any faulty springs must be renewed.

25. Replace both the regulator assembly and the front panel on completion of the examination, but carry out the following tests prior to replacing the terminal covers.

Insulation resistance test

26. The insulation resistance should be measured with a 250-volt insulation resistance tester between the points enumerated below, and should not be less than 2 megohms.

(1) Terminals B1, D3, D4, D5, D6, D12, F1, F2, F3 and F4 connected together and frame.

(2) Terminal C1 and frame.

Reforming of selenium rectifiers after storage

27. If a selenium rectifier has been stored for longer than six months, it will require reforming before satisfactory operation can

be guaranteed. If a transformer-rectifier unit is being taken from storage after a period exceeding six months, the following procedure should be adopted, before the unit is installed in an aircraft, to ensure that the rectifiers are serviceable. If a replacement rectifier which has been stored for more than six months is being fitted to a unit, it should first be fitted and the relevant part of the procedure be applied.

28. Prepare the unit for the reforming procedure as follows. Remove the links from the link panel of regulator ZA6405/1, and remove the plug from the protection unit F5401/1 or F5402. The pins of plugs disconnected should be wrapped in insulation material to ensure that they do not make contact accidentally with the frame of the unit. During the reforming procedure, the unit should be supplied with cooling air at a rate of not less than 100 cu. ft. per minute, the air to be drawn in at the rectifier end of the unit.

29. *Low-voltage* (28-*volt*) *rectifier.*

(1) Connect a variable d.c. supply to terminals A3 and B3.

(2) Set the applied voltage from zero to 40 volts and maintain for 10 minutes.

(3) Increase the applied voltage to 48 volts and maintain for 10 minutes.

(4) Increase the applied voltage to 56 volts and maintain for 10 minutes.

The L.V. rectifier is now reformed.

30. *Medium-voltage* (112-*volt*) *rectifier.*

(1) Disconnect the supply from the L.V. rectifier, and connect to terminals A2 and B3.

(2) Set the applied voltage from zero to 160 volts and maintain for 10 minutes.

(3) Increase the applied voltage to 192 volts and maintain for 10 minutes.

(4) Increase the applied voltage to 224 volts and maintain for 10 minutes.

The M.V. rectifier is now reformed.

31. Disconnect the supply from the M.V. rectifier. Re-fit the plug (having removed the temporary insulation material) and the links which were disconnected. Finally apply an insulation resistance test between each terminal and the frame, using a 250-volt insulation resistance tester.

TABLE 3

Circuit component details

Circuit Symbol	Description	Value	Rotax No.
TD1	L.V. regulator control transductor	—	P 3201
TR1	Compounding transformer (in U 3001)	—	P 3002
TR2	Main transformer	—	P 3301
TR3	Booster transformer	—	P 3102
TR4	M.V. load sharing transformer	—	P 3501
TR5	L.V. load sharing transformer	—	P 3401
TR6	Protection transformer (in F 5402)	—	P3602
TR7	M.V. stabilizing transformer	—	—
RL1	Switch, magnetic, Type 3Y, No. 1	—	D 6703/2
RL2	Switch, magnetic, Type 3Y, No. 1	—	D 6703/2
RL3	Thermal overload contactor	—	D 6286
RL4	Excitation contactor	—	D 6712
RL5	Protection relay (in F 5402)	—	—

TABLE 3—*continued*

Circuit Symbol	Description	Value	Rotax No.
RL6	Protection relay (in F 5402)	—	—
RL7	Protection relay (in F 5402)	—	—
RL8	Protection relay (in F 5402)	—	—
RL9	M.V. and L.V. load sharing relay	—	—
RL10	Relay, Type P1 (in F 5301/1)	—	F 1504/1
RL11	L.V. relay (reverse current cut-out, Type 1B, No. 1)	—	F 2207
RL12	M.V. relay (reverse current cut-out, Type 1A, No. 1)	—	F 2208
RL13	M.V. relay (magnetic switch, Type 11A, No. 2)	—	D 9502
RL14	Frequency sensitive relay (in F 5301/1)	—	5H6 Carpenter
RL15	Surge suppression relay (in N 143515/1)	—	—
RL16	Surge suppression relay (in N 143515/1)	—	—
MR1	Rectifier (in U 3001)	—	N 123522
MR2	Rectifier	—	N 118879/1
MR3	Rectifier	—	N 105937
MR4	Rectifier	—	N 105937
MR5	Rectifier (in F 5402)	—	N 105773
MR6	Rectifier (in F 5402)	—	N 105773
MR7	Rectifier (in F 5402)	—	N 105773
MR8	L.V. rectifier	—	N 124047
MR9	M.V. rectifier	—	N 122075
MR10	Frequency sensitive rectifier (in F 5301/1)	—	N 80433
MR11	Frequency sensitive rectifier (in F 5301/1)	—	N 80433
MR12	Frequency sensitive rectifier (in F 5301/1)	—	N 105489
MR13	Surge suppression rectifier (in N 143515/1	—	N 147249–61
MR14	Surge suppression rectifier (in N 143515/1)	—	N 140816–3
MR15	Surge suppression rectifier (in N 143515/1)	—	N 140816–3
MR16	Frequency sensitive rectifier	—	N 134953/1
RV1	Potentiometer	300 ohms	N 69671/13
RV2	Potentiometer	300 ohms	N 105775
RV3	Potentiometer	90 ohms	N 108415–3
RV4	Potentiometer	25 ohms	ZA 5702
RV5	Potentiometer	9·5 ± 0·5 ohms	N 69671/30
RV6	Potentiometer	300 ohms	N 105775
RV9	Potentiometer	25 ohms	ZA 5702
RV10	Potentiometer	15 ohms	N 69671/31
RV11	Potentiometer	60 ohms	N 69671/16
RV12	Potentiometer	12 ohms	N 69671/2
RV13	Potentiometer	300 ohms	N 105775
RV14	Potentiometer (in N 143515/1)	33 ohms	N 69671/3

TABLE 3—*continued*

Circuit Symbol	Description	Value	Rotax No.
R2	Resistors (fixed)	1000 ohms	ZA 6203
R3	Resistors (fixed)	1000 ohms	ZA 6203
R4	Resistors (fixed)	100 ohms	ZA 6203
R5	Resistors (fixed)	100 ohms	ZA 6203
R6	Resistors (fixed)	30W, 1000 ohms	N 148255
R8	Resistors (fixed)	30W, 1000 ohms	N 148255
R10	Resistors (fixed)	30W, 1000 ohms	N 148255
R12	Resistors (fixed)	200 ohms	N 69671/23
R13	Resistors (fixed) (in N 143515/1)	15 ohms	N 113591/5
R14	Resistors (fixed) (in N 143515/1)	15 ohms	N 113591/5
C1	Capacitor	0·5 μF	ZA 3403
C2	Capacitor	0·5 μF	ZA 3403
C3	Capacitor (in F 5301/1)	0·25 μF	N 129541
C4	Capacitor (in F 5301/1)	2·0 μF	N 129540
C5	Capacitor (in F 5301/1)	2·0 μF	N 129540
C6	Capacitor (in F 5301/1)	2·0μF	N 129540
C7	Capacitor (in N 143515/1	140 μF	N 140828/1
C8	Capacitor (in N 143515/1)	140 μF	N 140828/1
C9	Capacitor (in N 143515/1)	140 μF	N 140828/1
C10	Capacitor	40 μF	N 124859/1
C11	Capacitor	40 μF	N 124859/1
SH1	Shunt	—	N 105960
SW1	Switch, manual	—	SR 1515D, Santon
SW2	Switch, manual	—	D 5507
L1	Variable choke (in F 5301/1)	—	F 3602
X1	M.V. regulator (Newton 4/60136) (in ZA 6405/1)	—	F 5504
X2	L.V. regulator (Newton 37/59491)	—	F 4603
X3	Thermal delay switch (N 124586/1)	—	F 5401/1
X3	Time delay relay (F 7002)	—	Part of F 5402

P31704 234533/1804 6/62 2125 C & P Gp 375

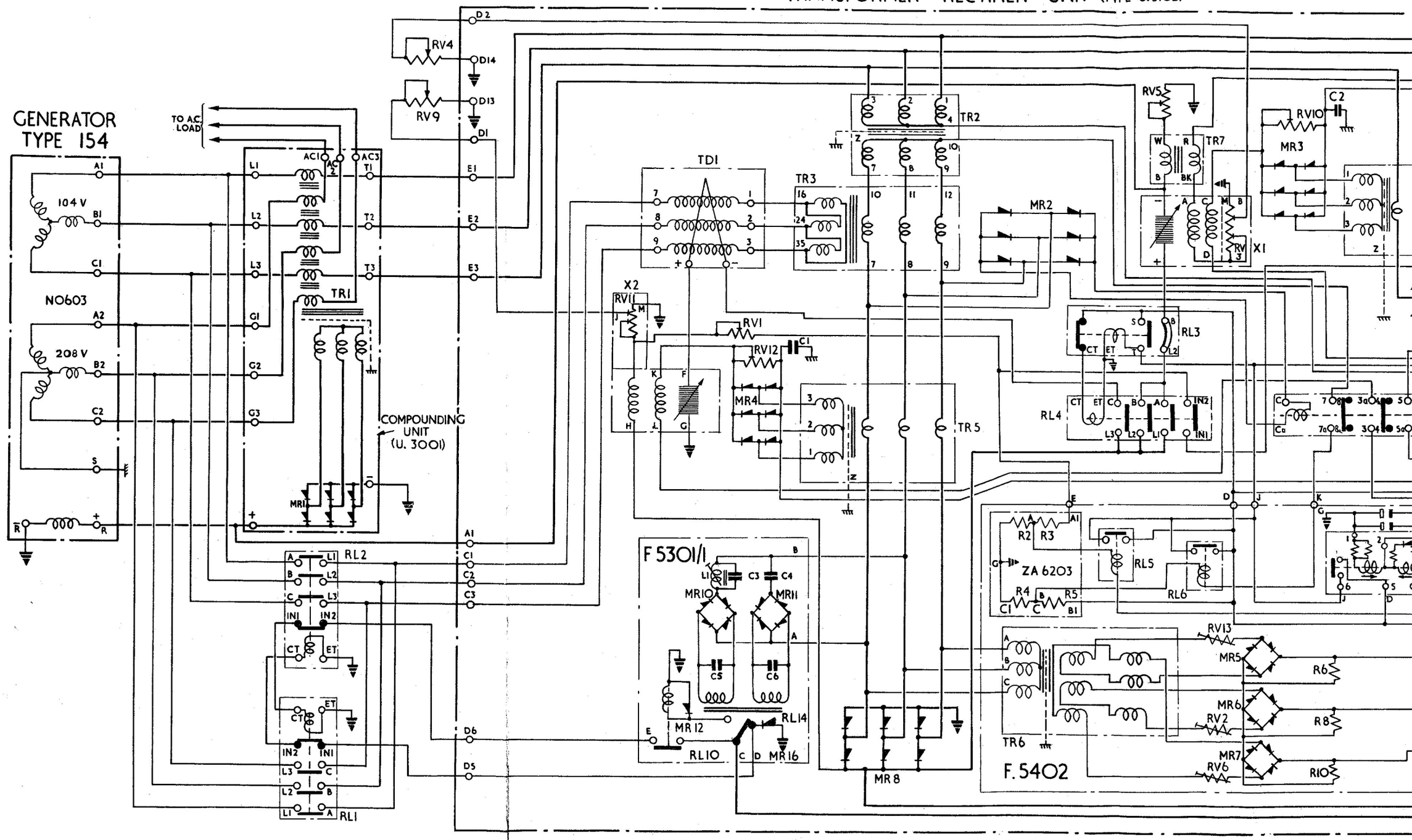


Fig. 7

Composite circuit diagram

RESTRICTED

PP9028 234534/1805 4/62 2006 C & P Gp. 924 (4)

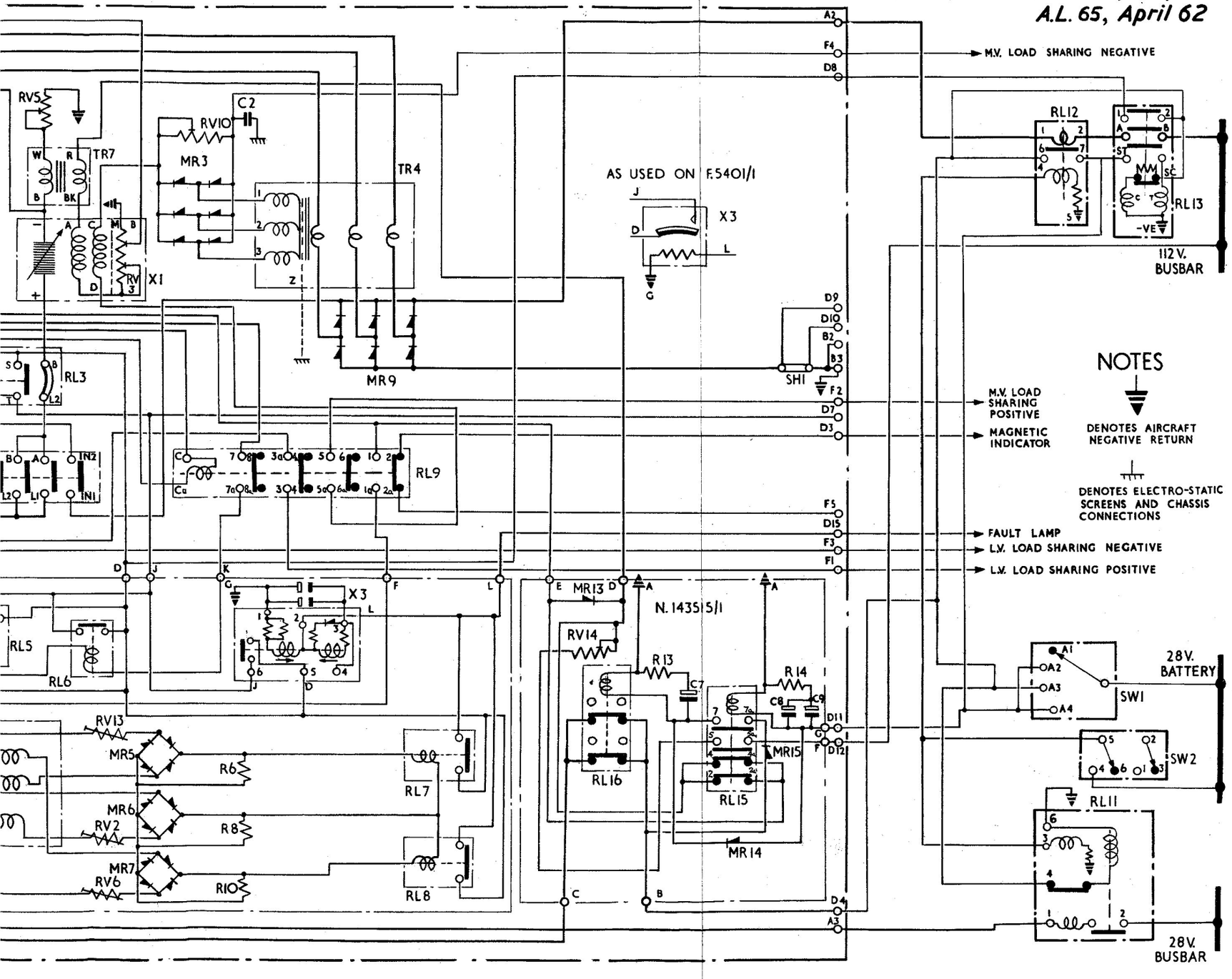

M.V. LOAD SHARING NEGATIVE
RL12
RL13
112 V. BUSBAR
AS USED ON F.5401/1
X3
TR4
TR7
MR3
MR9
RV5
RV10
C2
X1
RL3
SH1
NOTES
M.V. LOAD SHARING POSITIVE
MAGNETIC INDICATOR
DENOTES AIRCRAFT NEGATIVE RETURN
DENOTES ELECTRO-STATIC SCREENS AND CHASSIS CONNECTIONS
FAULT LAMP
L.V. LOAD SHARING NEGATIVE
L.V. LOAD SHARING POSITIVE
RL9
RL5
RL6
X3
MR13
N. 143515/1
RV14
R13
R14
C7
C8
C9
MR15
RL16
RL15
MR14
RV13
MR5
R6
RL7
MR6
RV2
R8
MR7
RV6
R10
RL8
28V. BATTERY
SW1
SW2
RL11
28V. BUSBAR

Fig. 7

agram
D