

Chapter 3

CONTROL PANELS, TYPE 5 and 5A

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LEADING PARTICULARS

<i>Control panel, Type 5</i>	<i>Ref. No. 5UC/363</i>
<i>Voltage</i>	<i>28V d.c.</i>
<i>Incorporating—</i>	
<i>Voltage regulator, Type EU</i>	<i>Ref. No. 5UC/2544</i>
<i>Suppressor, Type B, No. 1</i>	<i>Ref. No. 5CY/870</i>
<i>Fuse box, Type A</i>	<i>Ref. No. 5CZ/445</i>
<i>Fuse, Type A (20 amp.)</i>	<i>Ref. No. 5CZ/204</i>
<i>Capacitor, bank (11+7 μF)</i>	<i>Ref. No. 5UC/398</i>
<i>Capacitor, Type 953 (0.1 μF)</i>	<i>Ref. No. 10C/2048</i>
<i>or</i>	
<i>Capacitor (0.1 μF)</i>	<i>Ref. No. 10CZ/116215</i>
<i>Switchbox, Type B</i>	<i>Ref. No. 5CW/543</i>
<i>Warning lamp, Rotax, Type H1104 (green)</i>	<i>Ref. No. 5CX/1552</i>
<i>Resistor, Type 343</i>	<i>Ref. No. 10W/10062</i>
<i>Trimmer resistor (100-ohm)</i>	<i>Ref. No. 5UC/3373</i>
<i>Plugs—</i>	
<i>One Type W196 (2-pole)</i>	<i>Ref. No. 10H/389</i>
<i>Four Type W204 (2-pole)</i>	<i>Ref. No. 10H/397</i>
<i>Control panel, Type 5A</i>	<i>Ref. No. 5UC/3783</i>
<i>Voltage</i>	<i>28V d.c.</i>

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LEADING PARTICULARS—*continued*

Incorporating—

Voltage regulator, Type EU2	Ref. No. 5UC/3886
Fuse box, Type A	...	...	...	Ref. No. 5CZ/445
Fuse, Type A (20 amp.)	...	...	...	Ref. No. 5CZ/204
Capacitor (0.1 μ F)	...	...	...	Ref. No. 10CZ/116215
Capacitor (11+7 μ F)	...	...	...	Ref. No. 5UC/4067
Trimmer resistor (50-ohm)	...	...	...	Ref. No. 5UC/5906

Plugs—

Two Type WW594 (2-pole)	...	...	...	Ref. No. 10H/4519
One Type WW597 (6-pole)	...	...	...	Ref. No. 10H/4522
One Type WW598 (6-pole)	...	...	...	Ref. No. 10H/4523

Introduction

1. The control panel, Type 5, is used to control the voltage output of the a.c. generators, Types U, V, U2 and U0, at 80-volts a.c. It is provided with various inter-connections to a number of plugs on the panel, thus forming a distribution box for both a.c. and d.c. supplies to the radio equipment. The control panel, Type 5A, serves the same purpose as the Type 5, but has no d.c. output.

DESCRIPTION

2. The components of both types of control panels are carried on a sheet steel base and front panel, a sheet steel screening cover sliding over this chassis; effective contact for screening purposes is provided by a number of spring-loaded contact fingers.

Control panel, Type 5

3. A circuit diagram for control panel, Type 5, is given in fig. 1. The a.c. input is fed through a capacitor unit, the links on which enable a capacitor of 11 or 18 μ F to be inserted dependent on the type of generator used. A 0.1 μ F capacitor is connected across the d.c. field supply, which is fed from the aircraft general services supply through a suppressor, Type B, and through the carbon pile of the voltage regulator. The a.c. output is fed through a 20-amp. fuse to the output plug, voltage regulation being obtained by a voltage regulator, Type EU. The d.c. supply to the panel is controlled by an on/off switch, and a pilot lamp indicates when the supply is on.

Control panel, Type 5A

4. A circuit diagram for control panel, Type 5A, is given in fig. 2. The a.c. input is fed through a capacitor unit, a terminal block being incorporated for making the correct connections. The connections appropriate to the particular type of generator are shown below the circuit diagram, and provide for a capacity of 11 or 18 μ F to be inserted. The a.c. output is fed through a 20-amp. fuse to the output plug, voltage regulation being obtained by an R.M.S. regulator, Type EU2. A trimmer resistor is fitted for making small voltage adjustments.

INSTALLATION

5. Care should be taken when installing the control panels to connect the leads in the manner indicated by the appropriate circuit diagram. A check should be made that the capacitor unit in each case is correctly connected for the type of generator in use.

SERVICING

6. Servicing of the control panels is normally confined to the voltage regulators Type EU (Type 5), which are covered in Book 1, Sect. 1 of this publication.

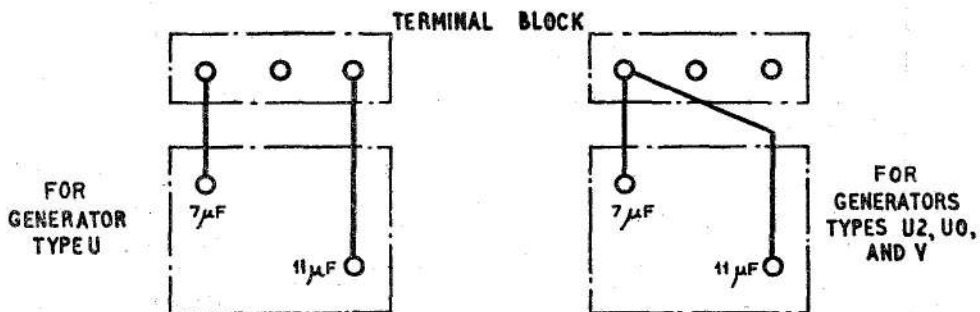
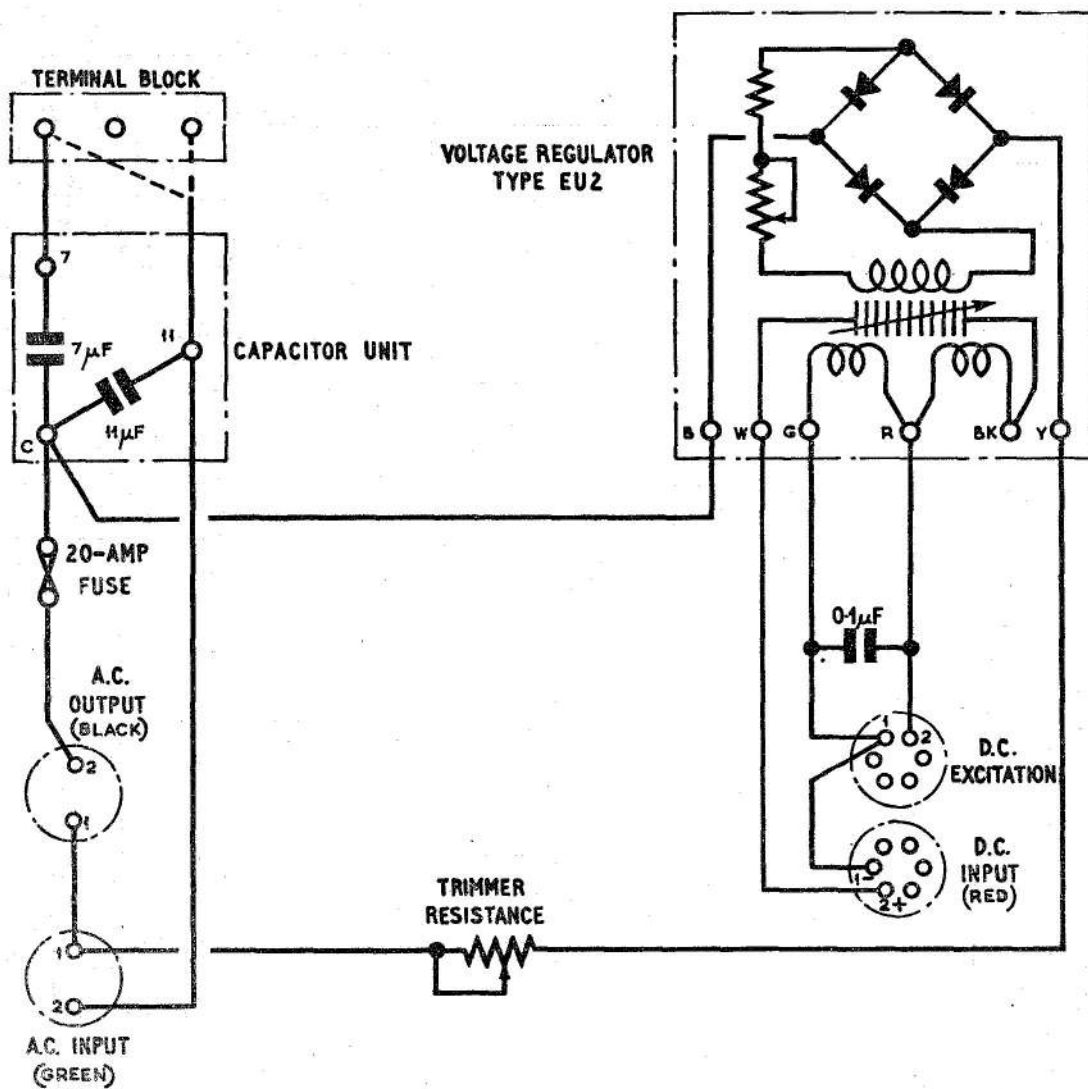
TESTING

Control panel, Type 5

7. For a test for correct operation of the control panel, it should be connected as follows:—

- (1) D.C. input plug (unmarked) to a 28-volt d.c. supply (pin 1 negative, pin 2 positive).

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CONNECTIONS FROM CAPACITOR UNIT
TO TERMINAL BLOCK

Fig. 2. Circuit diagram, Type 5A

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- (2) A.C. generator plug (green) to the a.c. terminals of a Type U generator.
 - (3) Generator field plug (unmarked) to the field terminals of the generator.
 - (4) A.C. output plug (black) to a non-inductive load set for 15 amp. at 85 volts, and to an a.c. voltmeter of the rectifier type, free from frequency errors up to 2,500 c/s.
 - (5) D.C. output plug (red) to a d.c. voltmeter (pin 1 negative, pin 2 positive).
 - (6) The capacitor link must be in the position appropriate to the generator used.
8. With the generator running, check that the a.c. and d.c. output plugs are alive, and that the generator field is excited when the panel switch is closed, and that the d.c. output circuit and the generator field circuit are interrupted when the switch is opened.
9. Tests should be made for correct regulation and stability as laid down in Book 1, Sect. 1 for the Type EU regulator.

Control panel, Type 5A

10. For a test for correct operation of the control panel, it should be connected as follows:—
- (1) D.C. input plug (top right-hand plug) to a 28-volt d.c. supply (pin 1 negative, pin 2 positive).
 - (2) A.C. input plug (marked green) to the a.c. terminals of a generator, Type U, or Type U2.

- (3) Generator field plug (bottom right-hand plug) to the field terminals of the generator.
- (4) A.C. output plug (marked black) to the load and instruments shown in fig. 3.
- (5) The capacitor link is to be in the position appropriate to the generator used.

Note . . .

The voltmeter V1 is to be of the thermal type and of first grade accuracy. The range of the meter is to be such that the readings required by the tests lie between half-scale and full-scale deflection.

11. With the adjustable arm of the trimmer resistance on the panel in the mid-position, the generator speed is to be increased from zero to 5,500 r.p.m., decreased to 3,500 r.p.m., increased again to 5,500 r.p.m., and then decreased to 3,500 r.p.m., the generator running under the following load conditions:—

- (1) No load.
- (2) Full load, the type of load being as showing in fig. 3.

Switches S1 and S2 are to be closed for the load test, and the load resistances R1 and R2 adjusted so that A1 reads 15 amp. at 80-volts a.c. (R.M.S.). Readings of a.c. voltage are to be taken during the second speed cycle (i.e. 3,500 r.p.m.—5,500 r.p.m.—3,500 r.p.m.) for each load condition. All the readings taken together must not vary by more than 3.0 volts, and must lie between the limits of

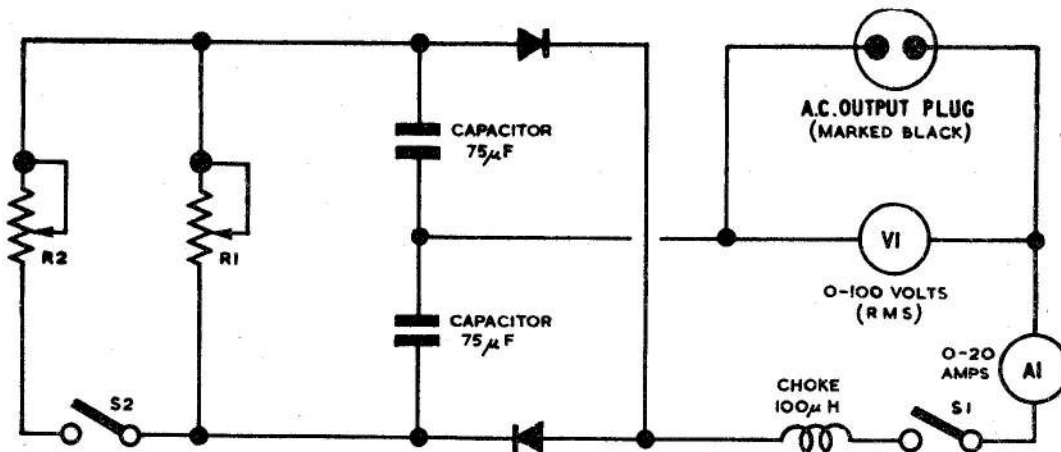


Fig. 3. Load diagram, Type 5A

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78-volts and 83 a.c. (R.M.S.). Adjustment should be made by means of the trimmer resistance, subject to a maximum movement of the arm of 45 deg. on either side of the mid-position.

12. To test for stability, the load resistances R1 and R2 are to be adjusted so that the

opening of S2 changes the reading on A1 from 15 amp. to 4 amp., both loads being measured at 80-volts a.c. (R.M.S.). With the generator running at 5,000 r.p.m., and at 6,000 r.p.m., the load is to be switched from 15 amp. to 4 amp. at least three times. Under these conditions the regulator must respond without tendency to hunt.

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