Chapter 12

STATIC INVERTER, FERRANTI, TYPE F.I.2(A) AND CONTROL PANEL, TYPE F.C.7B

LIST OF CONTENTS

	Para.
Introduction	1
Description	
Inverter F.I.2(A)	
General	6
Outer cover	10
Electrical connection	11
Mounting tray	12
Control panel F.C.7B	13
Operation	
Inverter F.I.2(A)	
General	14
Normal operation	19
Emergency operation	21
Engine starting	23
Regulator	24
Sinewave inverter	40
Inverter output	43
Control panel	
General	44
Power failure	51
Normal and fast erection	54
Servicing	
Functional testing	55
Testing static inverter, Type F.I.2(A)	57
Testing control unit, Type F.C.7B	59
Routine inspection	61

LIST OF TABLES

	Table
Test sequence for inverter	1
Details of adapter lead	2
Test sequence for control panel	3
Possible defects	4

LIST OF ILLUSTRATIONS

	Fig.
External view of inverter unit	1
External view of control panel	2
Block schematic diagram of inverter	3
Switch control waveform	4
Inverter test socket	5
Control panel test lead	6
Circuit diagram	7

LEADING PARTICULARS

Static inverter, Ferranti, Type F.I.2(A)	**Ref. No. 5UB/7638**
Input	
a.c. (single-phase)	115*V*±10%, 400 *c/s*±5%
d.c.	21 *to* 29*V d.c.*
Power consumption	20 *watts (approximately)*

Output	
a.c.	*115V±10%. 400 c/s±5%*
d.c.	*21 to 31V d.c.*
Inverter operating	
Input	
d.c.	*21 to 29V d.c.*
Power consumption	
Normal	*25 watts*
Emergency	*45 watts*
Output	
a.c. (single-phase)	*115V±5V, 400 c/s±5%*
d.c.	*21 to 29V d.c.*
Power output	
Normal	*15 watts*
Emergency	*33 watts*
Dimensions	*8·3 in. × 4·9 in. × 4·7 in.*
Fixing centres	*2·75 in. × 2 in.*
Gas filling	*80 per cent Helium and 20 per cent Nitrogen at one atmosphere pressure, the gas being dry*
Weight	*5 lb.*
Control panel, Ferranti, Type, F.C.7B	**Ref. No. 5UC/7091**
Associated artificial horizon Ferranti, Type F.H.7A ...	**Ref. No.**

Introduction

1. The Ferranti inverter unit, Type F.I.2(A) (fig. 1), provides a stabilized 115V, 400 c/s, single-phase, a.c. supply from a nominal 24V d.c. input. The unit operates in conjunction with the control unit Ferranti, Type F.C.7B (fig. 2) and Artificial Horizon, Ferranti, Type F.H.7A.

2. The inverter unit provides straight through connections for a single-phase a.c. supply to operate the Artificial Horizon, via the control unit under normal conditions, but automatically continues to supply a single-phase a.c. from the aircraft d.c. source, when the normal aircraft a.c. supply fails.

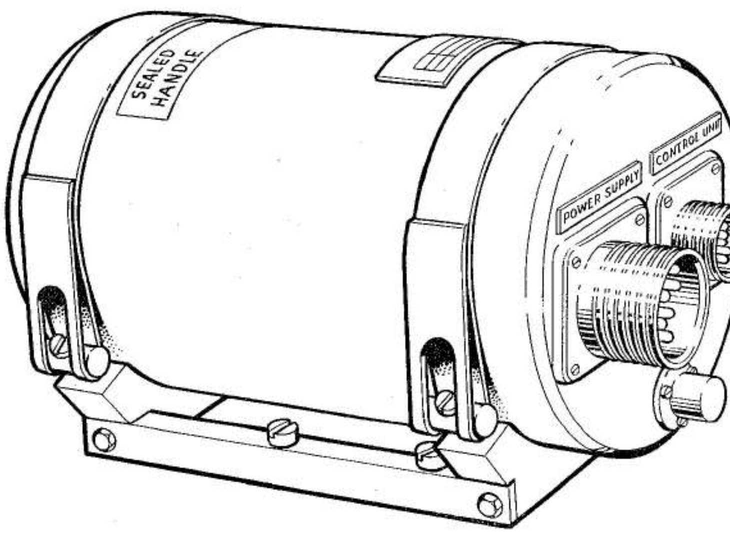


Fig. 1. External view of inverter unit

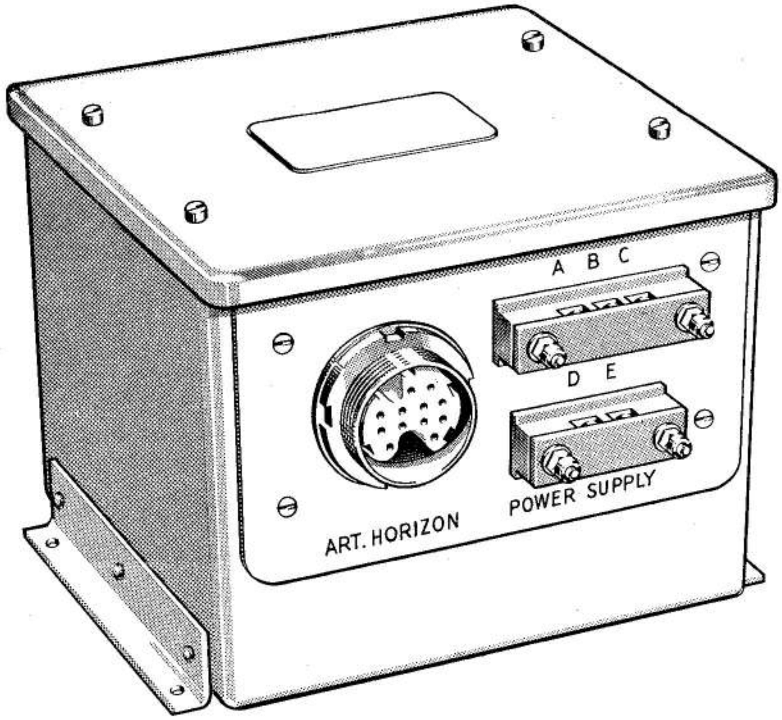


Fig. 2. External view of control panel

3. The Artificial Horizon system operates from a 115V, 400 c/s, single-phase supply; the 3-phase necessary to drive the gyro wheel being simulated by a phase splitting capacitor within the Ferranti control unit, Type F.C.7B.

4. In addition, during engine internal starting conditions, the inverter unit provides the necessary 115V, a.c. power required to operate number 2 and number 3 engine fire warning systems.

5. The associated Artificial Horizon, Ferranti, Type F.H.7A (Mk. 6 series), is described in A.P.1275A, Sect. 13.

DESCRIPTION

Inverter F.I.2(A)

General

6. The regulator, inverter and relay switching components are fitted to a light alloy chassis. The chassis consists of six component plates; four rectangular side plates forming the square section body, with two circular section plates forming the end plates.

7. The rear plate carries the three transistors, VT1, VT2 and VT3, and the two diodes, D2 and D8. This plate is bolted to a heat dissipation block by six 4BA screws and 4BA Nyloc nuts.

8. The forward plate carries the miniature relay $\frac{RLB}{4}$, resistor R12, suppressor L4 and capacitors C9 and C10.

9. The four side plates are numbered 1 to 4 for convenience and carry the following components:

(1) Plate 1. Choke L1 and L3 and transformers T4 and T5.

(2) Plate 2. Choke L2 and transformer T1.

(3) Inverter panel, plate 3. Capacitors C4, C11 and C8, diodes D1, D9 and D10 and resistors R1 and R2.

(4) Regulator panel, plate 4. Capacitors C2, C3, C5, C6 and C7, transformer T2 and T3, diodes D3, D4, D5 and D6,

transistors, VT4 and VT5, Zener diode D7 and resistors R3 to R11 and R13.

Outer cover

10. A two part aluminium cover consisting of a cylindrical outer casing which is soldered to the heat dissipation block, and an end plate completely enclose the chassis and components. A band which is soldered around the joint between the cover and end plate seals the unit. The end cover incorporates a gas filling point and a pin, the latter for radial location of the end cover in the outer cover. On assembly the unit is sealed and filled with inert gas at one atmosphere pressure.

Electrical connection

11. Electrical connection to the unit is by way of a 14-pole, cannon connector to the aircraft a.c. and d.c. supplies, and a 5-way cannon connector for connection to the control unit F.C.7B. The cannon plugs of both the 14-pole and 5-pole connectors are secured to the front panel.

Mounting tray

12. The mounting tray consists of a base to which is riveted four ¼ in. B.S.F. Nyloc nuts to provide aircraft structure attachment points. Saddles at each end of the base locate two straps which secure the inverter unit to the base; the straps being secured to the saddles by four trunnions and lock screws. A bonding lead is secured between the tray and the inverter unit.

Control panel F.C.7B

13. The control panel consists of a chassis to which the circuit components are fitted, and is attached to the base of the case. Provision is made on the chassis for attaching the lid and side panels. The side panel which is secured to the chassis by four 6 BA csk.hd. screw carries two terminal boards, one 3-way for the a.c. input supplies and one 2-way for the d.c. input supplies. Connection to the Artificial Horizon is by way of a 12-pole Plessey type socket also fitted to this panel. A lid and gasket complete the assembly and is secured to the top of the box by four 6BA ch. hd. screws.

OPERATION

Inverter, F.I.2(A)

General

14. A block schematic diagram of the inverter is given in Fig. 3, and a complete circuit diagram of the inverter and control panel in Fig. 7. For details on the basic principles and operation of transistors reference should be made to the chapter on semi-conductors given in A.P.4343, Vol. 1, Sect. 1.

15. The inverter F.I.2, consists of a d.c. voltage regulator followed by a sinusoidal power inverter giving a 115V, 400 c/s, single-phase a.c. output to drive the Artificial Horizon, through the control unit F.C.7B.

16. The d.c. voltage regulator accepts input voltages between 21 and 29V d.c. and supplies the inverter with a regulated d.c. of approximately 19·5V d.c. The input voltage is fed through a series transistor switch, the ratio of ON to OFF time being controlled by the output from a magnetic amplifier. A square wave oscillator, operated from the regulated d.c. output, provides the supply for the

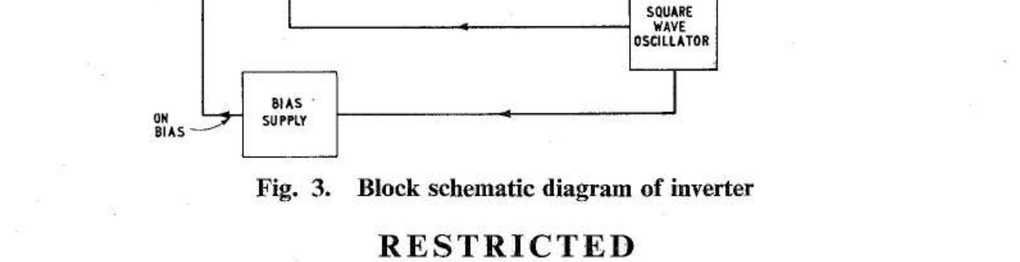


Fig. 3. Block schematic diagram of inverter

magnetic amplifier and a bias for turning the transistor switch ON.

17. The inverter is of the resonant transformer type with positive feedback to the bases of two power transistors. An inductance in series with the d.c. supply gives an almost constant current input to the inverter and improves the sinusoidal output waveform.

18. A switching relay is included, so that the regulator inverter is inoperative when the normal single-phase, 400 c/s supply is connected.

Normal operation

19. When the aircraft a.c. and d.c. supplies connected to the inverter are switched ON, a 115V, 400 c/s supply appears across the primary of transformer T4 (fig. 7), through pins A and B of the 14-pole connector. Relay $\frac{\text{RLB}}{4}$ is thereby energized by the 28V d.c. from the full wave rectifier circuit consisting of the secondary of transformer T4 and diodes D9 and D10.

20. The 115V, 400 c/s supply is also connected to pins A and B of the 5-pin connector through contact B4 (11 and 12). The 28V d.c. produced from the full wave rectifier is fed to pins D and E of the 5-pin connector; the positive being supplied via contact B3 (8 and 9). The negative line is connected to pin H of the 14-way connector.

Emergency operation

21. When the aircraft a.c.. supply fails or is switched OFF, the supply to the primary of transformer T4 is removed and the relay coil of $\frac{\text{RLB}}{4}$ becomes de-energized. The aircraft d.c. supply is then connected to the regulator and inverter via the relay contacts B1 and B2. At the same time the d.c. supply is connected to pins D and E of the 5-pin connector; the positive of the supply being made through the relay contacts B3 (7 and 8).

22. The inverter will start operating and the 115V, 400 c/s a.c. single-phase output is connected to pin L of the 14-way connector. Pin N is linked to pin K of the 14-pin connector (and thus to the red phase via the relay contact B4 (10 and 11)) by a 2-way switch interlocked with the aircraft battery change-over switch, so that for flight conditions the inverter output is connected to the Artificial Horizon, via the control unit.

Engine starting

23. For engine starting the battery change-over switch actuates the 2-way switch so that pin K is disconnected from pin L and the inverter output (33 watts maximum) is, available for essential aircraft services during engine starting through pins B and L.

Regulator

24. The regulator accepts a d.c. input between 21 to 29V d.c. and supplies the inverter with a regulated 19·5V d.c. The input d.c. voltage is fed through transistor VT3 (acting as a series switch) the ratio of the ON to OFF time being controlled by the output from the magnetic amplifier which consists of transductor T3 and diodes D5 and D6. The output from VT3 is then compared with a Zener reference diode D7 in a reference bridge and the resulting error current flows through a control winding on transductor T3.

25. A square wave oscillator comprising transistors VT4 and VT5 and their associated capacitors and resistors, provide the supply for the magnetic amplifier and a bias for switching on VT3. Details of the regulator operation are described in the following paras. 26–38.

26. *Switching transistor and filter circuit.* This circuit comprises transistor VT3, choke L3, capacitor C4 and diode D2. Transistor VT3 operates as a series switch and is switched ON by a d.c. bias current of approximately 300mA derived from the square wave oscillator. Initially on starting the transistor VT3 is switched on by the transient starting circuit consisting of capacitor C6 and resistor R6. It is switched OFF by the square wave output from the magnetic amplifier.

27. The ON and OFF sequence results in a switched output across D2 with a variable mark-space ratio. The filtering of this waveform is achieved by L3 and C4 and approximately 0·5V ripple appears across C4. Diode D2 prevents interruption of the current L3 when the transistor VT3 is switched OFF since L3 would otherwise create a high voltage surge on the collector of VT3.

28. *Square wave oscillator.* The oscillator consists of two transistors VT4 and VT5 operating as switches with heavy positive feedback from the saturable core transformer T2. The transistors are connected to the centre tapped primary winding of T2 which also carries two secondary output windings.

29. When operating, the transistor that is ON, takes a linearly rising magnetizing current until the core of the transformer T2 saturates. The base drive is therefore lost and the reversal of flux in transformer T2 causes the other transistor to repeat the process. Resistors R4 and R5 establish the feed-back base current at a safe maximum value, and capacitors C2 and C3 improve the switching times.

30. The oscillator is initially started by a positive, supplied to the centre tap of transformer T2, from the regulated side of the inductor L3. Resistor R3 provides forward bias for transistor VT4 to ensure starting.

31. The oscillator operates at a frequency of 2 kc/s and gives two outputs. One output provides the excitation voltage required by the magnetic amplifier and the other d.c. bias for the transistor VT3 in conjunction with diodes D3 and D4.

32. *Bias*. This circuit comprises diodes D3 and D4 and reservoir capacitor C5. The push-pull supply from the oscillator is full-wave rectified by diodes D3 and D4, producing approximately 4V d.c. across capacitors C5 for switching ON transistors VT3 through R7 and R13.

33. *Magnetic amplifier*. The magnetic amplifier consists of a half-wave, push-pull, auto-excited, transductor T3 and two self-excitation diodes C5 and C6, with resistors R7 and R13 as the effective load. The amplifier is supplied, by the 2 Kc/s square wave from the push-pull winding on the oscillator and is the controlling element of transductor T3.

34. The amplitude of the output voltage from T3 when saturated is greater than the voltage of the bias supply which is also fed to transistor VT3 through resistors R7 and R13. Thus when transductor T3 is saturated a voltage larger than the bias voltage appears across R7 and R13 thereby switching transistor VT3 OFF. The amplitude of the output from T3 is approximately 8V, and Fig. 4, shows the waveform, and mark space ON/OFF ratio of transistor VT3 for varying saturation conditions of transductor T3.

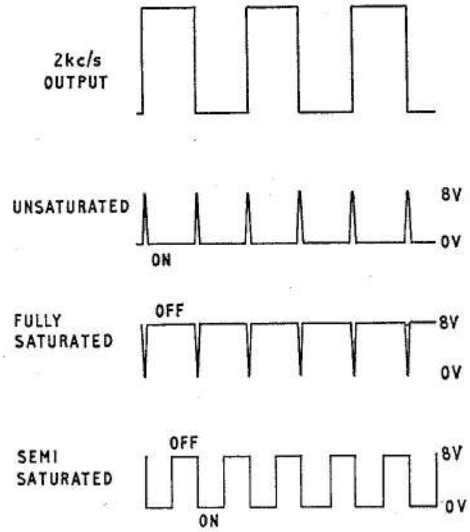


Fig. 4. Switch control waveform

35. Considering one half cycle of the square wave supply, one winding of T3 is excited in such a direction that its associated diode conducts. A magnetizing current then flows and the bias supply is absorbed by the winding as long as the core is unsaturated. During this period VT3 is closed by the bias. When the core saturates, the major part of the excitation supply is developed across R7 and R13, and VT3 is switched OFF.

36. At the end of the half cycle, the sense of the bias supply is reversed and the other winding of T3 is energized in its conducting direction. Transistor VT3 is then switched ON by the bias supply until the core is saturated. Transistor VT3 is thus operated at double the excitation frequency, i.e. at 4 kc/s.

37. The time taken for the cores to saturate is determined by the d.c. error current obtained from the reference bridge. This current passes through the main control winding and sets the flux level in the two cores, thus controlling the mark-space ratio of the switch and hence the mean output voltage according to the error.

38. *Reference Bridge*. The reference bridge comprises resistors R8 to R11 with a reference voltage Zener diode D7 in one arm. The regulated output produced across capacitor C4 is fed to the reference arm consisting of resistor R8 and diode D7. The unsmoothed waveform across the diode D2 feeds the other half of the detecting bridge R9, R10 and R11. An error voltage is thus developed at the junctions of D7 and R8, and R9 and R10 and fed to the control winding of the magnetic amplifier.

39. Capacitor C7 feeds transient signals to the magnetic amplifier to allow the magnetic amplifier to respond to faster signals than its own response will allow.

Sine wave inverter

40. The inverter is of the resonant transformer type and consists of transformer T1 and capacitor C1, with feedback from T1 to the bases of transistors VT1 and VT2 via transformer T5. Transistors VT1 and VT2 operate in a switching mode giving low power dissipation in the transistors, i.e. each transistor has either zero current and maximum inverse voltage or maximum current and zero voltage respectively.

41. Consider transistor VT1 ON and VT2 OFF with the feedback base-emitter voltage of transistor VT1 in the reverse direction. A feed-back current then flows from the centre tap on T5 through inductor L1, resistor R1, diode D1 and the emitter-base diode of VT1. Inductor L1 keeps this feedback current constant whilst R1 limits the current to the maximum value necessary to keep transistor VT1 bottomed at all times whilst VT1 is ON. Resistor R1 and the diode D1 provide a forward bias for starting purposes, but once the oscillations commence, D1 is closed and the bias provided by resistor R2 from the negative line is inoperative.

42. The operation of the circuit for transistor VT2 ON and transistor VT1 OFF, is similar to that described in the previous para. 41.

Inverter output

43. The input d.c. negative line is connected to the tuned circuit through choke L2, and the positive of the d.c. supply is connected to alternative ends of the circuit depending upon which transistors is ON. Even harmonic currents of the resonant frequency flow into the supply line, depending on the magnitude of L2 and a voltage waveform resembling a fully rectified sinewave then appears at the centre tap of T1. The mean value of this waveform must equal the applied d.c. voltage (less the d.c. voltage drop in L2 which, for practical purposes, can be ignored). The voltage across each half alternately of the primary of T1 is, therefore, a sinewave.

Control panel

General

44. The control panel F.C.7B consists of a number of control circuits and components required between the a.c. and d.c. supplies (normal and emergency), and the Artificial Horizon, to ensure correct operation of the Artificial Horizon.

45. The circuits are power failure detection/indication, (P.F.I.), normal and fast erection, phase splitting and radio interference suppression.

46. Power failure detection is implemented by the current transformer T2 in the a.c. supply line. Current is fed to the base of transistor VT1 and diode D1 when there is a current flowing in the a.c. line. Diode D1 and the base emitter diode of VT1 ensure that a low impedance is reflected into the supply line. The current flowing in the base of VT1 is amplified in its collector circuit. The d.c. component of this current energizes the P.F.I. coil in the Artificial Horizon through pin L of the 12-pole plug, the a.c. component being by-passed by capacitor C3.

47. Normal and fast erection is controlled by relay $\frac{\text{RLA}}{5}$. Transformer T1 supplies the normal erection, fast erection being obtained from the full supply voltage.

48. The blue phase supply to the gyro motor is supplied from the red phase supply via capacitor C1 which is in parallel with inductor L1. This circuit causes sufficient phase shift to run up the gyro from standstill and maintain it efficiently in the running condition.

49. Radio interference is suppressed at the input terminals of the control box by capacitors C4, C5, C6 and C7.

50. The white phase of the a.c. supply and the d.c. negative terminals are connected to a common earth point in the Artificial

Horizon. Resistor R1 provides a high resistance path to the d.c. and thus prevents the d.c. current flowing in the white phase to the inverter unit.

Power failure indicator

51. The power failure indicator is controlled by the circuit consisting of transformer T2, diode D1, transistor VT1 and capacitor C3. The function of this circuit is to act as a switch between the positive of the d.c. input (pin E, of the 2-way terminal block), and the power failure indicator (P.F.I.) coil in the Artificial Horizon Type F.H.7A (pin L on the 12-way socket).

52. The primary winding of current transformer T2 carries the line current to the gyro wheel, the secondary winding of the transformer T2 carrying 10 per cent of this current to diode D1 and the base emitter diode of transistor VT1.

53. The two diodes conduct alternately and hence maintain the current transforming action of T2, i.e. a low impedance is reflected into the supply line. Transistor VT1 conducts on every other half cycle of the 400 c/s signal supplied to the base. The resulting d.c. component of current flows through the P.F.I. coil in F.H.7A and operates the indicating flag on the instrument dial. The alternating component of the amplified signal passes through the capacitor C3 to the emitter of VT1.

Normal and fast erection

54. The normal and fast erection is determined by relay $\frac{RLA}{5}$, which is energized by the fast erection push button on the Artificial Horizon F.H.7A. In the de-energized condition, the relay contacts are so connected that a normal erection voltage of approximately 20V, 400 c/s supply (obtained from auto transformer T1), is applied to the instrument through relay contacts A3. In the energized condition, (i.e. when the fast erection push button is depressed), relay contacts A3 are opened, and relay contacts A2 closed, connecting a 115V supply to the pitch torque motor. Contacts A1 change over, disconnecting the gyro wheel from the supply and applying a 115V supply to the roll torque motors in the instrument. Relay contacts A4 and A5 are opened on fast erection to disconnect the pitch and roll mercury switches from each other, i.e. they break the Pitch-Bank connection.

SERVICING

Functional testing

55. In accordance with the appropriate Servicing Schedule the inverter and control panel should be functionally tested. The procedure for testing should be as follows:

(1) Connect the aircraft to a suitable ground supply.

(2) Switch on the aircraft main instrument supplies inverter.

(3) Switch on the Artificial Horizon switches, and check that the phase failure flag disappears from the aperture in the dial of the Artificial Horizon.

(4) Thirty seconds after switching on the supplies, depress the fast erection button on the Artificial Horizon for a period of not more than one minute. The Horizon bar should settle to within ½ degree of the datum lines. The phase failure flag should reappear whilst the button is depressed.

(5) Disconnect the a.c. supply to the static inverter by switching off the main inverter. Check that the Artificial Horizon continues to operate as before, it being supplied with a single-phase a.c. supply from the static inverter unit.

(6) Switch off the d.c. supply and check that the phase failure flag reappears in the dial aperture.

(7) Switch off the Artificial Horizon supply switches and remove the ground supply.

56. Where the static inverter or control panel are suspect the unit or units should be removed from the aircraft and bench tested. The following paragraphs details the test procedure for the static inverter and control panel.

Testing static inverter, Type F.I.2(A)

57. Connect the inverter to the appropriate supply voltages through a 14-pole, free socket, details of which are given in Fig. 5. Switch

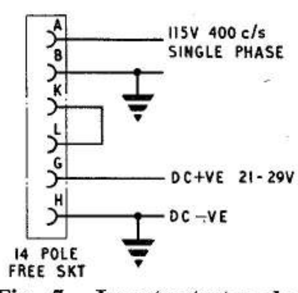


Fig. 5. Inverter test socket

TABLE 1
Test sequence for inverter

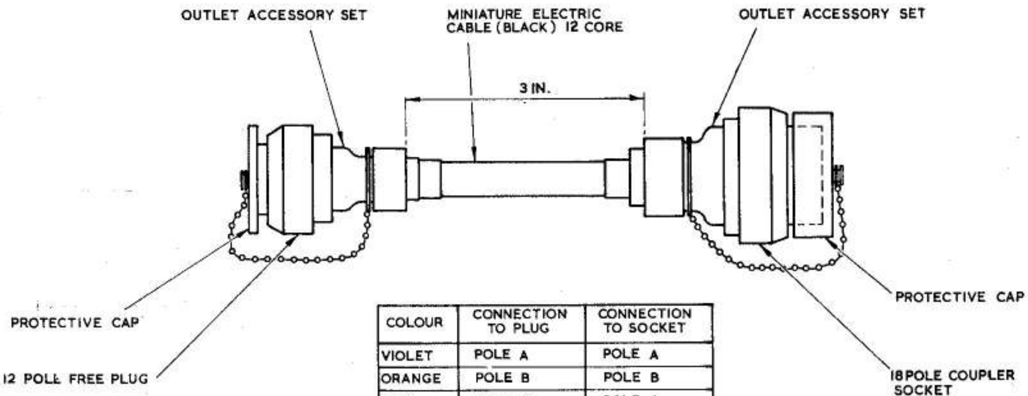
SUPPLY		5-way CANNON PINS	Voltage output	
115 Volts 400 c/s	21–29 d.c.		a.c.	d.c.
ON	ON	A–B	110–120	
ON	ON	D–E		21–29
OFF	ON	A–B	110–120	
OFF	ON	D–E		21–29

on the supply and measure the outputs at the 5-way cannon plug with the input supplies, switch as shown in Table 1.

58. A faulty inverter should be replaced by a new or reconditioned unit, the old unit should be returned to stores and dealt with according to current authorized procedure.

Testing control unit, Type F.C.7B

59. To carry out the tests on the control unit it will be necessary to use the Ferranti Test Set TG/164/162, Ref. No. 6C/2046. A test lead will also be required, Ferranti Part No. TG/64/208–2, details of which are given in Fig. 6 and Table 2.



COLOUR	CONNECTION TO PLUG	CONNECTION TO SOCKET
VIOLET	POLE A	POLE A
ORANGE	POLE B	POLE B
PINK	POLE C	POLE C
BROWN	POLE D	POLE D
RED	POLE E	POLE F
BLUE	POLE F	POLE E
LT. GREEN	POLE G	POLE H
RED-BN	POLE H	POLE J
BLUE	POLE J	POLE K
BLACK	POLE K	POLE L
YELLOW	POLE L	POLE N
GREY	POLE M	POLE P

Fig. 6. Control panel test lead

TABLE 2
Details of adapter lead

Item	Inter-service Ref.	Type
Socket, coupler 18-pole	Z560670	
Socket, Free 12-pole	Z560360	
Outlet accessory set		2CZ 108017
Outlet accessory set		2CZ 108027
Protective cap	Z970053	
Protective cap	Z970054	
Cable electric miniature, 12 core 7 in. approx.		Type A unscreened

The procedure for the test is as follows:—

(1) Connect the test set to the appropriate supply as follows

115V$\pm$2V, 3-phase and 24V d.c.$\pm$2V.

(2) Connect the supplies to the appropriate terminal block on the control panel as follows:

115V red phase	...	Terminal A
115V white phase	...	Terminal B
24V d.c. positive	...	Terminal E
24V d.c. negative	...	Terminal D

(3) Connect the output socket of the control panel to the test set using the adapter lead, and with the a.c. and d.c. meters wired to the appropriate terminals on the test set, check the control panel in the test sequence as given in Table 3.

60. The unit should be replaced by a new or reconditioned unit if it fails to compare with the test figures quoted in Table 3. Unserviceable units should be returned to stores and dealt with according to current authorized procedure.

Routine inspection

61. In accordance with the appropriate Servicing Schedule the inverter unit should be checked for cleanliness, damage, security of attachments, the serviceability of the cable and connections and locking. Check that the hermatic seal on the inverter is intact. Table 4 lists faults and probable causes in this system. If the cables, connections and supplies are correct, carry out the functional tests as described in para. 55.

TABLE 3

Test Sequence for Control Panel

Test No.	Test set switch position			Operation	a.c. Meter volts	d.c. Meter volts	Circuit checked
	Sw.1	Sw.2	Sw.3				
1	1	1	1	S4 to "1" a.c. and d.c. "ON"	115$\pm$2	22–26	P.F.I. Supply R–W phase
2	2	1	1	S4 to "1"	115$\pm$2	22–26	B–W phase
3a	3	1	1		0–5	22–26	Pitch fast erection
b	3	1	3		115$\pm$2	7–9	Contact A1
4a	4	1	1		0–5	22–26	Roll fast erection
b	4	1	3		115$\pm$2	7–9	Contact A2
5a	5	1	1	Set a.c. Meter to 100V range	20$\pm$2	22–26	Normal erection
b	5	1	3		0–5	7–9	Contact A3
6a	7	1	1	Set a.c. Meter to 400V range	115$\pm$2	22–26	Contact A4
b	7	1	3		0–5	7–9	
7a	8	1	1		115$\pm$2	22–26	Contact A4
b	8	1	3		0–5	7–9	
8	9	1	1		115$\pm$2	22–26	0·25 μF Capacitor
9	1	1	1	S4 to "Off"	115$\pm$2	zero	P.F.I. supply switch Off

TABLE 4
Possible defects

Fault	Cause	Remedy
Artificial horizon bars and roll pointer do not erect, or wander off datum	Power supply failure Damaged cables or connectors	Check the a.c. and d.c. power supplies: d.c. positive should be connected to pin G of the 14-way connector
Artificial horizon phase failure flag appears in the aperture Gimbal system spins	Damaged cables or connectors	Check the cables and connectors for security and that they are free from damage. Particular attention should be paid to the connection of the cable from the inverter unit at the control unit terminal blocks

P31714 235107/1846 6/62 2000 C & P Gp 375

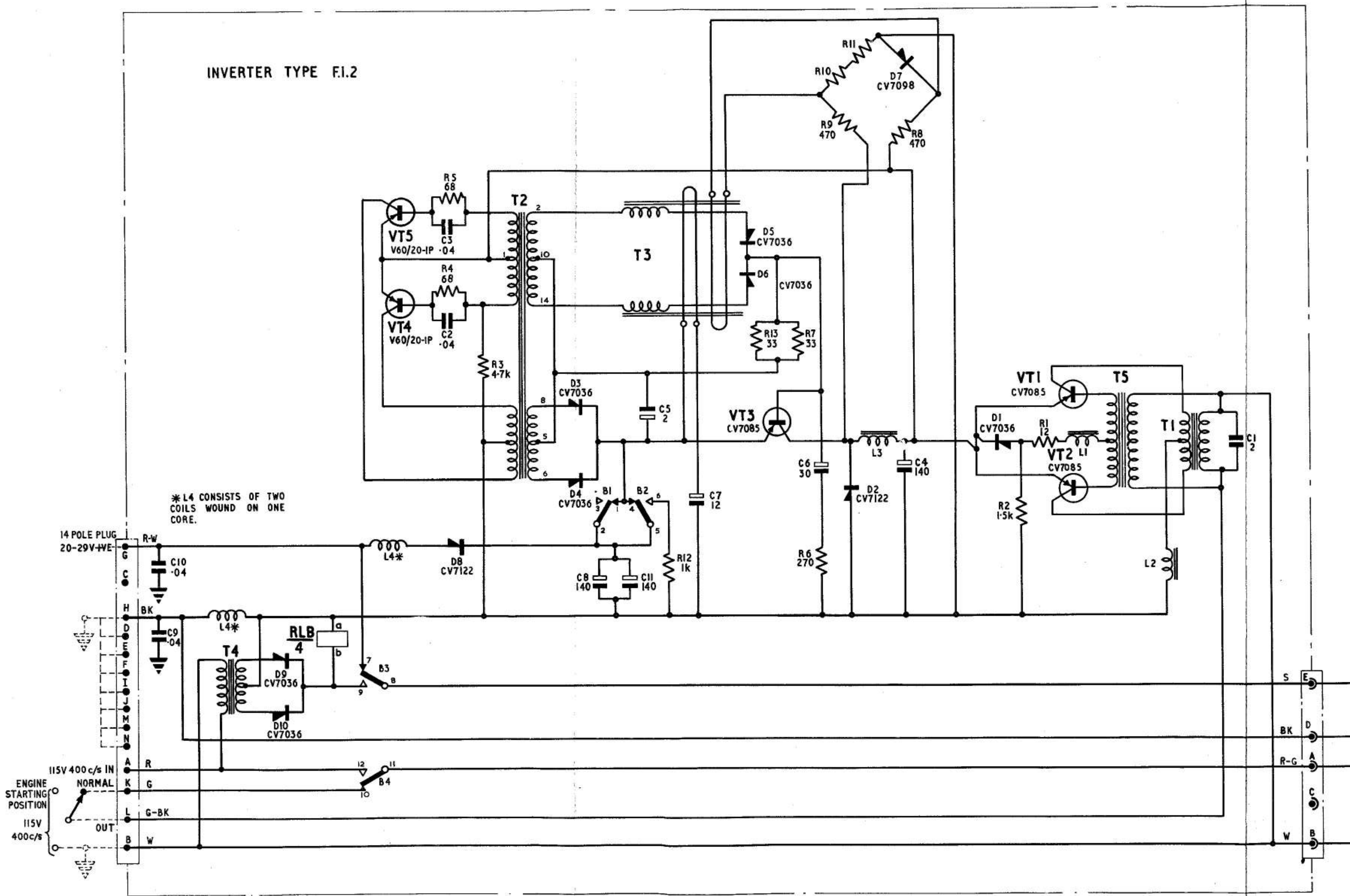


Fig.7

Circuit diagram

RESTRICTED

PP9029 235108/1847 4/62 2006 C&P Gp. 924 (4)

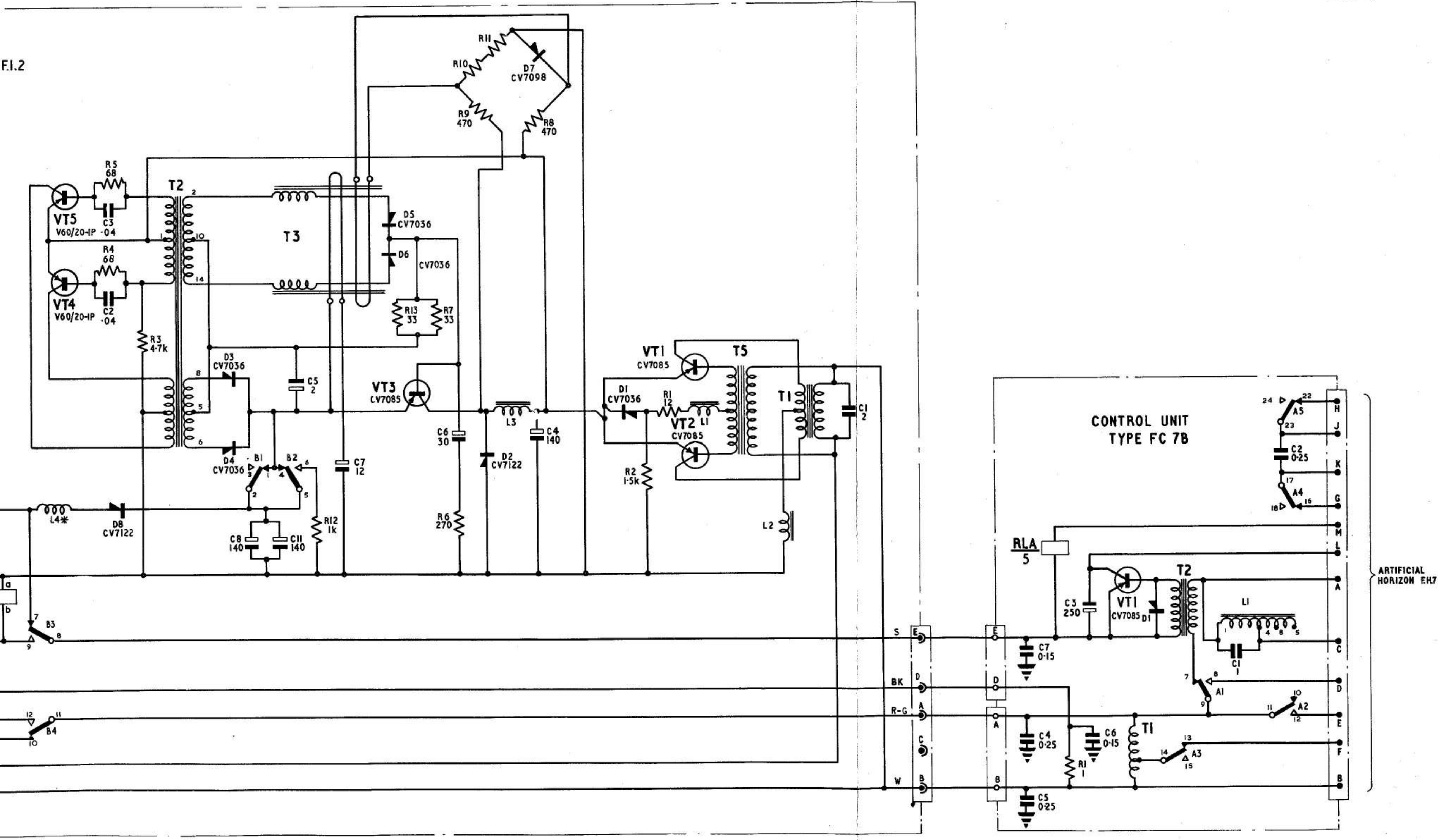


Fig.7

Circuit diagram

RESTRICTED

235108/1847 4/62 2006 C&P Gp. 924 (4)


MIG PILOT
MIKOYAN