

Chapter 2

MISCELLANEOUS SYSTEMS TEST CONSOLE MK. 2

LIST OF CONTENTS

	Para.		Para.
<i>Introduction</i>	1	OPERATION	
DESCRIPTION		<i>General</i>	42
<i>Construction</i>	3	SERVICING	
<i>Control panel</i>	7	<i>General</i>	43
<i>Contactor panel</i>	9	Console proving	45
<i>Fuel pressure adapter</i>	10	<i>Test No. 1 (safety switch)</i>	46
<i>Electrical connectors</i> ...	12	<i>Test No. 2 (nose-wheel steering)</i>	47
<i>Test circuit supplies</i> ...	14	<i>Test No. 3 (port undercarriage)</i>	48
Test circuits		<i>Test No. 4 (starboard undercarriage)</i>	49
<i>Undercarriage actuation</i>	15	<i>Test No. 5 (nose-wheel undercarriage)</i>	50
<i>Nose wheel steering</i> ...	18	<i>Test No. 6 (bomb doors)</i>	51
<i>Bomb doors</i>	20	<i>Test No. 7 (L.P. and C.F. cocks)</i>	52
<i>Fire extinguishers</i>	22	<i>Test No. 8 (sequence timer)</i>	53
<i>Sequence timers</i> ...	25	<i>Test No. 9 (fuel pumps)</i>	54
<i>L.P. and cross-feed cocks</i>	29	<i>Test No. 10 (fire extinguisher)</i>	55
<i>Fuel pumps</i>	30	<i>Test No. 11 (miscellaneous test circuit)</i>	56
<i>P.F.C. motors</i>	34	<i>Test No. 12 (P.F.C. test circuit)</i>	57
<i>A.A.P.P.</i>	36	<i>Test No. 13 (A.A.P.P. test circuit)</i>	58
<i>A.A.P.P. fire warning</i>	40	<i>Test No. 14 (A.A.P.P. fire warning)</i>	59
<i>Miscellaneous test</i>	41		

LIST OF ILLUSTRATIONS

	Fig.
<i>Miscellaneous systems test console Mk. 2</i>	1
<i>Control panel</i>	2
<i>Console wiring diagram</i>	3

LIST OF APPENDICES

	App.		App.
<i>Test schedules—aircraft systems</i>	1	<i>Schedule of parts</i> ...	2

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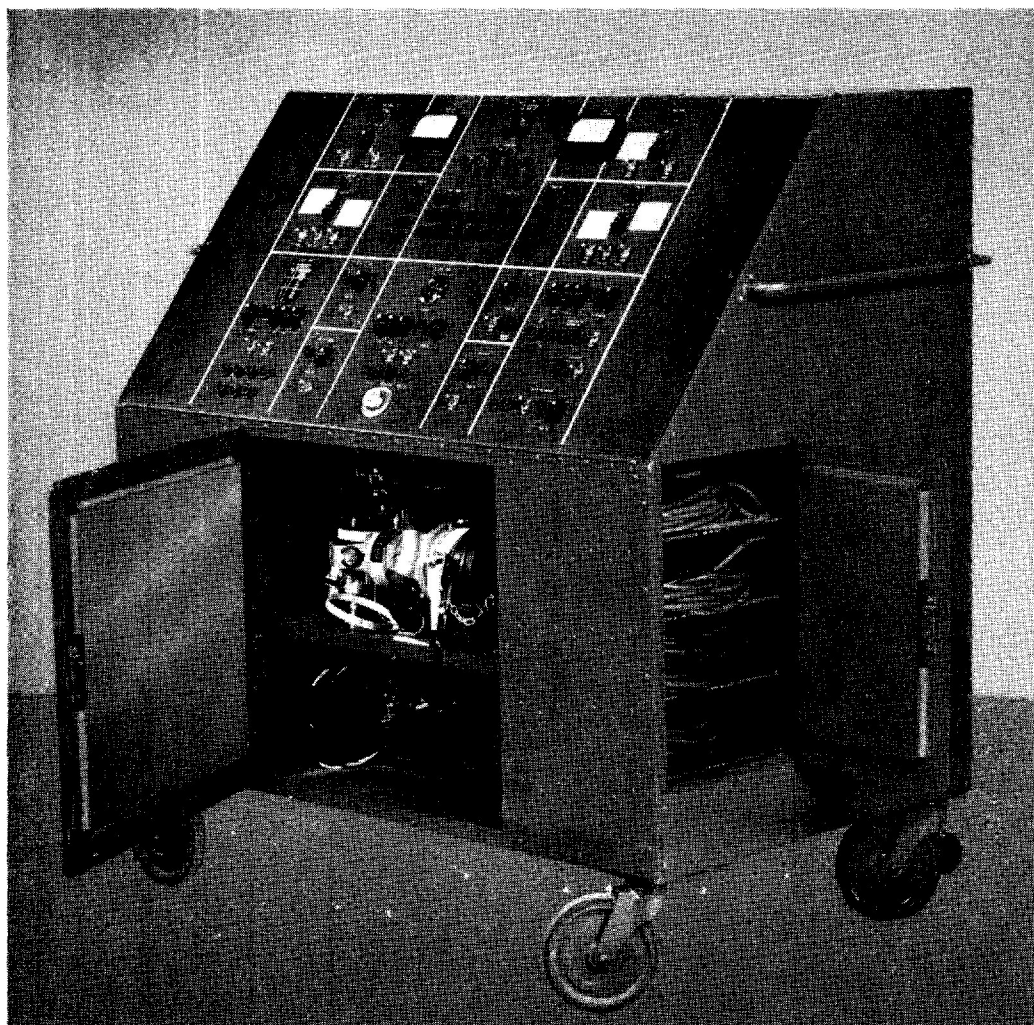


Fig. 1. Miscellaneous systems test console Mk. 2

LEADING PARTICULARS

<i>Part No.</i>		1/U.1522
<i>Ref. No.</i>		26DC/95294
<i>Dimensions:</i>		
<i>Length</i>		4 ft. 6 in.
<i>Width</i>		2 ft. 9 in.
<i>Height (overall)</i>		4 ft. 3 in.
<i>Weight</i>		464 lbs.
<i>Supply voltages</i>		28 volts d.c. 200 volts a.c. 3 phase

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Introduction

1. The miscellaneous system test console, Ref. No. 26DC/95294, is designed to facilitate ground servicing of the Vulcan Mk. 2 aircraft. It embodies thirteen test circuits each concerned with function testing a spec-

ified section of the aircraft electrical system.

2. This chapter contains a description of the test console and the servicing requirements. Test schedules for the respective aircraft systems and a schedule of parts are included as appendices.

DESCRIPTION

Construction

3. The test console (*fig. 1*) is a light alloy cabinet standing on four wheels, two of which castor, enabling it to be manoeuvred by the handles attached one at each end.

4. The console body is divided into two main sections front and rear by an inner panel. A control panel occupies the upper portion of the front section. This panel which is normally secured to the frame by five screws, is hinged at its lower end, and is equipped with two retaining chains to support it in the open position. The lower portion of the front section is divided vertically into three compartments. Both end compartments are fitted with detachable trays for extension cable stowage and the centre compartment is provided with a shelf for mounting a fuel pressure adapter. The space below the shelf is for storing a protective cover for the console. Access to the front compartments is by hinged doors, one positioned centrally in the front panel and one in each side panel.

5. Two ground supply plugs, Ref. No. 5CY/4314 and 5CY/5371, for 28-volt d.c. and 200 volt a.c. supplies respectively are mounted at the bottom left hand side of the front section. The plugs are accessible through an appropriately identified hinged flap in the console side panel.

6. The rear section is divided vertically into three compartments each sub-divided by detachable trays to form further stowages for the extension cables and for the console operating instructions. Access to these compartments is by double doors hinged at the rear of the console.

Control panel

7. The control panel carries all the controls and indicators associated with the test circuits. These components are arranged in groups (*fig. 2*) divided by white lines painted

on the panel face. Each group represents a particular test function and is suitably identified. Mounted at the bottom centre position on the panel is the main switch by means of which the external supplies are connected to, or disconnected from, the console circuit. The switch is the ON-OFF push button type, in which the green ON button moves through the centre of the red OFF button. Three indicator lamps, two red, one green, are mounted above the main switch. The red lamps are identified 28-VOLT and 200-VOLT respectively, and give indication when the supplies are coupled to the ground supply plugs. The green lamp is identified CONSOLE LIVE and operates in conjunction with the main switch to indicate that the 28-volt supply is connected to the console circuit.

8. Attached to the reverse side of the control panel are the circuit relays and also two hinged panels on each of which are mounted nine 10-way terminal blocks. The controls and system components are wired via these terminal blocks to bulkhead type plugs fitted on the inner panels of the extension cable stowage compartments.

Contactors panel

9. The contactor panel is attached to the framework between the upper and lower portions of the front section at the left-hand side of the console. Mounted on this panel are two contactors, one relay, one 2-way and two 10-way terminal blocks and a resistor. These components are part of the supply control circuit and are connected to the external supply plugs and to the test circuit components on the control panel. The two 10-way terminal blocks function as negative busbars for the system.

Fuel pressure adapter

10. The fuel pressure adapter is provided to obtain a pressure indication during fuel pump tests. It consists of a hose unit

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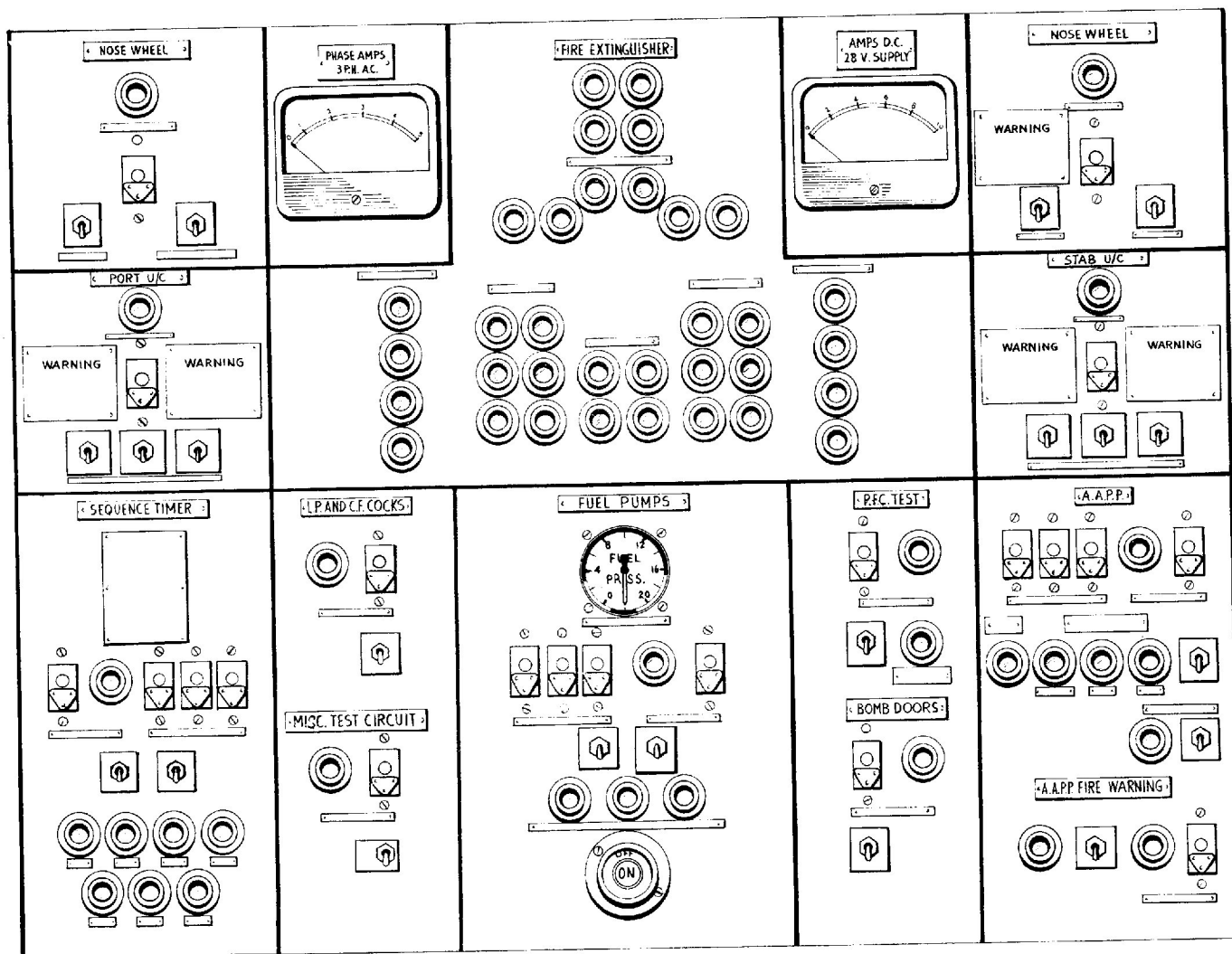


Fig. 2. Control panel

adapter with an Avery Hardoll refuelling hose fitted at one end for connection to the aircraft fuel system. A flexible hose connects the adapter to a Desynn fuel pressure transmitter which is supported in an anti-vibration mounting attached to the adapter body. A gas tap is fitted to the adapter for venting purposes. The fuel pressure transmitter is provided with a cable loom which connects via the appropriate extension cable and internal wiring to the fuel pressure indicator on the control panel.

11. When not in use the fuel pressure adapter is stowed on a wooden felt faced mounting fitted to the shelf in the console front centre compartment.

Electrical connectors

12. To connect the console to the aircraft systems, 28 extension cables, 12 adapter cables and an earth link cable are provided. The extension cables are connected into the console circuit through the plugs fitted in the respective stowage compartments, and normally remain connected to the console. At the aircraft end of the extension cables, all plugs and sockets have been modified to remove the connecting threads to enable the fittings to slide into their mating connections. To support the cables in the aircraft structure and ease the strain on the end connections, a strain wire is fitted to each cable. The cables and the cable stowage compartments are each identified to indicate the test circuit which the cables serve, and in addition, the cables are marked with the corresponding connecting plug number.

13. The adapter cables are used to link appropriate extension cables to the dual operating head fire extinguishers in the aircraft wing bays. The earth link cable is secured to the inner panel between the front and rear sections of the console, and terminates in a lug fitting for connection to the aircraft earth point.

Test circuit supplies

14. The 28-volt d.c. and 200-volt a.c. supplies are obtained from a suitable ground supply source, and are connected to the console via the plugs on the left-hand side panel. Indication that the supplies are available is given by the two red indicator lamps connected to the respective inputs. The 28 volts supply is routed to the main

switch, to No. 1 relay, and to the trip coil of a B.T.H. contactor. This latter connection ensures that the contactor is in the disengaged position when the 200-volt a.c. supply is subsequently connected to the test system. The 200-volt a.c. supply is routed via three 60 amp. fuses to a Rotax contactor. When the main switch centre ON push button is pressed, the 28-volt supply will energize No. 1 relay and the Rotax contactor, and the respective contacts will change over to connect the 28-volt supply to terminal block P, and the 200-volt supply to terminal block H. These terminal blocks serve as distribution points for the supplies from which feeders are taken to the control equipment for the individual test circuits. A hold in supply for No. 1 relay is provided via the main switch OFF contacts, so that the ON push button can be released. Indication that the 28-volt supply is connected is given by the CONSOLE LIVE green indicator lamp which is fed via the contactor.

TEST CIRCUITS

Undercarriage actuation

15. Separate test circuits are included for actuation of the port and starboard undercarriages and for the nose wheel. Each provides for retraction of the wheels, operation of the doors, and for the main wheels only, operation of the bogie trim. In the aircraft system, the wheels and doors operate in a definite sequence controlled by sequence switches. No provision is made on the console for this, and it is essential that the wheels are fully retracted before selecting the doors to the closed position. Warning labels to this effect are displayed on the control panel adjacent to the respective controls, and strict compliance with the recommended test procedure will assure safety of operation.

16. The circuits are supplied from the 28-volt system and each includes a circuit breaker, power on indicator lamp and two 3-position centre OFF switches labelled UP-DOWN for the wheels and OPEN-CLOSE for the doors. A 2-position ON-OFF switch is also included in the port and starboard systems for control of the down lock. Individual extension cables are provided to connect the respective circuits to the appropriate selector valves in the aircraft system.

17. Operating instructions for the under-

carriage systems are given in Schedules 1, 2 and 3.

Nose wheel steering

18. The controls for testing nose wheel steering consists of a circuit breaker, POWER ON indicator lamp, a 2-position ON-OFF switch and a 3-position centre OFF switch labelled PORT-STARBOARD. The switches control a 28-volt supply to the aircraft steer engage and steering valves respectively, through one extension cable.

19. The method of using this test circuit is given in Schedule 4.

Bomb doors

20. The console enables the bomb door normal control system to be tested. The controls consist of a circuit breaker, POWER ON indicator lamp and a 3-position, spring loaded to centre OFF switch labelled OPEN-CLOSE. For this test, one extension cable is provided which is fitted with two sockets for connection to the normal control selector valves located at the port side of the bomb bay.

21. Instructions for using the test circuit are contained in Schedule 5.

Fire extinguishers

22. For testing the aircraft fire extinguisher control system the fire extinguishers are represented by 35 indicator lamps. The lamp for the A.A.P.P. fire extinguisher is included in the section allocated for that system, and the remaining lamps are contained in one group, sub-divided and identified to correspond to their arrangement in the aircraft.

23. Power supplies for operation of the lamps are obtained from the aircraft system and control of operation is by the fire extinguisher controls and relays in the aircraft. Eleven extension cables and twelve adapter cables are provided for connection to the aircraft control system, the adapter cables being used for the dual operating head extinguishers.

24. When testing the fire extinguishers it must be remembered that operation or simulation of operation of the aircraft inertia switches will result in supplies being connected to all the circuits. It is therefore essential that ALL fire extinguishers are disconnected during tests. The procedure for this test is contained in Schedule 6.

Sequence timers

25. The console provides for two methods of testing the sequence timers, one using aircraft supplies, the other using supplies from the console. The controls for the test circuit consist of a 28-volt d.c. circuit breaker, a POWER ON indicator lamp, three 200-volt a.c. circuit breakers and two 2-position switches labelled START-STOP and AIRCRAFT-TEST SET respectively. Individual contacts within the sequence timer are represented by seven indicator lamps, and the contact open periods are shown on a label attached to the control panel adjacent to the controls.

26. The 28-volt d.c. and 200-volt a.c. supplies are controlled by the appropriate circuit breakers and are directed to the contacts of two relays. The relays are energised by supplies via the respective control switches. Selection of the supply control switch to TEST SET connects the 28-volt d.c. supply to the sequence timer and by setting the motor supply switch to START, the 200-volt a.c. supply is connected to the sequence timer motor. The indicator lamps are illuminated by a return supply from the sequence timer. For tests using aircraft supplies, control of circuit operation is by the aircraft auto-manual switch and the console serves only to give indication of sequence timer operation through the indicator lamps.

27. Three extension cables are provided of which only two are required for each method of testing. The sequence timer cable is used for both tests in conjunction with the motor supply cable for console supplies and the aircraft supply cable for aircraft supplies.

28. The procedure for testing the sequence timers is detailed in Schedule 7.

L.P. and cross-feed cocks

29. The console provides a 28-volt d.c. supply for testing the actuators of the fuel system low pressure and cross-feed cocks. A circuit breaker, POWER ON indicator lamp and a 2-position OPEN-CLOSE switch are provided and connection to the actuator of either type of cock is made by one extension cable. The method of testing is detailed in Schedule 8.

Fuel pumps

30. This circuit provides for testing each of the three types of fuel pumps, main, second-

dary and transfer, used in the aircraft fuel system. The main pumps are designed to run either at full speed when they will be delivering fuel to an engine, or at reduced speed when they will be idling. The secondary and transfer pumps run at one speed only.

31. The method of testing is to connect a 200-volt a.c. supply to the pump and by means of a fuel pressure indicator, measure the stall pressure developed by the pump. For the main pumps, two readings are required, one for each speed, and for the other pumps only one indication is necessary. To obtain a pressure indication, the fuel pressure adapter supplied with the console is connected into the system refuelling line in the main undercarriage bay. The pressure created reacts on a Desynn fuel pressure transmitter which is connected by an extension cable to an indicator on the console control panel.

32. In addition to the fuel pressure indicator, a 28-volt d.c. circuit breaker, a POWER ON indicator lamp, three 200-volt a.c. circuit breakers and two 2-position switches labelled ON-OFF and MANUAL-AUTO respectively, are provided. The 28-volt supply is controlled by the appropriate circuit breaker and is routed via the switches to the control coils of two relays. Selection of the supply switch to ON, energises No. 7 relay to connect the 200-volt a.c. supply to the fuel pumps. The secondary and transfer pumps are directly supplied, whilst the main pumps are supplied via the contacts of the second, No. 4 relay. This relay functions in conjunction with the selector switch to provide alternative supply connections to the main pump for operation at either speed. With the switch at MANUAL the pump will operate at full speed, and at AUTO the pump will be idling. Two extension cables are provided, one terminating in two separate end fittings for connection either to the main pump, or to the secondary or transfer pumps; the other cable is for connection to the fuel pressure adapter transmitter.

33. Schedule 9 details the procedure for testing the fuel pumps.

P.F.C. motors

34. In the aircraft system the P.F.C. motors

are normally started in groups of two for the rudder and groups of four for the elevons. These motors can be tested individually using the console. A circuit breaker, POWER ON indicator lamp, a spring loaded to centre OFF switch labelled START-STOP and a pressure failure warning lamp are provided in the test circuit. The 28-volt supply is routed via the control switch to the engage coil of the B.T.H. contactor. Selection of the switch to START will energise the contactor and closing of its contacts will connect the 200-volt a.c. supplies to the P.F.C. motors. The contactor is a latched type and, as a safety precaution in the test circuit, the trip coil is energised when the 28-volt supplies are coupled to the console ground plug. Two extension cables are provided, one for the supply and the other for pressure failure indication.

35. The method of using the test circuit is contained in Schedule 10.

A.A.P.P.

36. The airborne auxiliary power pack (A.A.P.P.) incorporates a cartridge firing system, and is provided with oxygen enrichment equipment and an oil sump heater to assist starting at altitudes. Facilities for testing the electrical circuits for these services are included in the console.

37. The controls consist of a 28-volt circuit breaker and POWER ON indicator lamp, three 200-volt a.c. circuit breakers and two 2-position switches labelled ON-OFF and START-STOP respectively. Indicator lamps are also provided, two for cartridge selection and one each for the sump heater and oxygen enrichment. The ON-OFF switch serves the sump heater system and in the ON position directs a 28-volt supply via the heater to illuminate the indicator lamp and to energise No. 8 relay. The 200-volt a.c. supply is now connected via the relay contacts to the heater. When the required oil temperature is reached, the heater switches off thermostatically, the relay is de-energised and the 200-volt a.c. supply to the heater is disconnected.

38. The start-stop switch controls a 28-volt supply to both the cartridge selector and

R E S T R I C T E D

oxygen enrichment circuit. Two extension cables are provided, one for connection to the oxygen enrichment time switch and cartridge selector, the other for the sump heater.

39. The method of using the test circuits is given in Schedule 11.

A.A.P.P. fire warning

40. The controls for testing the A.A.P.P. fire warning system and the associated control unit, consist of a circuit breaker and a 2-position ON-OFF switch each provided with an indicator lamp. The switches control a 28-volt supply to the warning system and

control unit, through one extension cable. Use of the test circuit is contained in Schedule 12.

Miscellaneous test

41. This test circuit is included to provide a protected 28-volt supply for system or component testing. A circuit breaker, associated indicator lamp, and a 3-position centre OFF switch are provided to control the supply to a 3 core extension cable. Fittings are not provided at the free end of the cable so that the user can make the necessary connection appropriate to the equipment being tested. When using this test circuit the normal precautions must be observed.

OPERATION

General

42. The test console should be located between the nosewheel compartment and the bomb bay for testing the fire extinguisher systems, and can be moved to any convenient position for all other tests. Supplies of 28-volt d.c. and 200 volts a.c. from a suitable ground source are required and are to be connected to the supply plugs at the bottom left-hand side of the console. Prior to

commencing tests, the earth link extension cable is to be connected to a suitable earth point in the aircraft. In addition, the console main switch should be checked for satisfactory operation by pressing the ON (green) push button when the CONSOLE LIVE indicator lamp will illuminate and then pressing OFF (red) push button when the indicator lamp should go out. The test schedules detailed in Appendix 1 should be fully understood before any test is made.

SERVICING

General

43. Servicing of the test console will normally be confined to periodic checking of the test circuit components for condition and security of connections and of the extension cables. The contactors, relays, ammeters and the fuel pressure indicator are to be checked in accordance with the relevant Air Publications.

44. The extension cables should be periodically examined for damage to the outer coverings and end connections. The plugs and sockets fitted to the aircraft end of the cables have been machined to remove the threads for ease of connection into the aircraft systems, and the strain wires provided must be used to prevent strain on the pin connections. After use, the cables should be wiped clean of oil or grease, and be properly coiled before stowing in the console.

CONSOLE PROVING

45. The console circuits can be proved using the following tests, which should be applied periodically to ensure correct performance of the console during service:—

Test No. 1 (Safety switch)

46. (1) Connect a 28-volt supply and a 200-volt 3 phase a.c. supply to the ground supply plugs. The 28-VOLT and 200 VOLT indicator lamps should light.
- (2) Engage the d.c. POWER ON circuit breakers in each test circuit. The associated POWER ON lamps should not light.
- (3) Press the centre (green) push of the console main switch. The CONSOLE LIVE lamp and the POWER ON lamps should light.
- (4) Press the outer (red) push of the console main switch. The CONSOLE LIVE and POWER ON lamps should go out.

Test No. 2 (Nose-wheel steering)

47. (1) Switch ON console main switch. The CONSOLE LIVE indicator lamp should light.
- (2) Engage the nose-wheel steering POWER ON circuit breaker. The POWER ON indicator lamp should light.

R E S T R I C T E D

(3) Switch ON the steer engage switch. A test lamp connected between pins A and B of the 2-pin socket on the extension cable (steer engage) should light.

(4) Set steer switch to STARBOARD. A test lamp connected between pins A and C of the 4-pin socket on the extension cable (steer) should light.

(5) Set steer switch to PORT. A test lamp connected between pins B and C of the 4-pin socket on the extension cable (steer) should light.

(6) Disengage the POWER ON circuit breaker. The indicator lamp should go out.

Test No. 3 (Port undercarriage)

48. (1) Switch ON console main switch. The CONSOLE LIVE indicator lamp should light.

(2) Engage the port undercarriage POWER ON circuit breaker. The POWER ON indicator lamp should light.

(3) Select wheels UP. A test lamp connected between pins B and C of the socket on the extension cable (wheels) should light.

(4) Select down lock switch ON. A test lamp connected between pins A and B of the socket on the extension cable (down lock) should light.

(5) Select door CLOSE. A test lamp connected between pins B and C of the socket on the extension cable (doors) should light.

(6) Select wheels switch OFF, and re-select doors CLOSE. The test lamp connected as in (5) above should not light.

(7) With doors switch OFF, select wheels DOWN. A test lamp connected between pins A and C of the socket on the extension cable (wheels) should not light.

(8) Select doors OPEN. The test lamp connected as in (7) above should light. A test lamp connected between pins A and C of the socket on the extension cable (doors) should light.

(9) Disengage the POWER ON circuit breaker. The indicator lamp should go out.

Test No. 4 (Starboard undercarriage)

49. (1) Switch ON console main switch. The CONSOLE LIVE indicator lamp should light.

(2) Engage the starboard undercarriage POWER ON circuit breaker. The POWER ON indicator lamp should light.

(3) Select wheels UP. A test lamp connected between pins A and C of the socket on the extension cable (wheels) should light.

(4) Select down lock switch ON. A test lamp connected between pins A and B of the socket on the extension cable (down lock) should light.

(5) Select doors CLOSE. A test lamp connected between pins A and C of the socket on the extension cable (doors) should light.

(6) Select wheels switch OFF, and re-select doors CLOSE. The lamp connected as in (5) above should not light.

(7) With doors switch off, select wheels DOWN. A test lamp connected between pins B and C of the socket on the extension cable (wheels) should not light.

(8) Select doors OPEN. The test lamp connected as in (7) above should light. A test lamp connected between pins B and C of the socket on the extension cable (doors) should light.

(9) Disengage the POWER ON circuit breaker. The indicator lamp should go out.

Test No. 5 (Nose-wheel undercarriage)

50. (1) Switch ON console main switch. The CONSOLE LIVE indicator lamp should light.

(2) Engage the nose-wheel undercarriage POWER ON circuit breaker. The POWER ON indicator lamp should light.

(3) Select wheels UP. A test lamp connected between pins A and C of the socket on the extension cable (wheels) should light.

(4) Select doors CLOSE. A test lamp connected between pins B and C of the socket on the extension cable (doors) should light.

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(5) Select the wheels switch to OFF, and re-select doors CLOSE. The test lamp connected as in (4) should not light.

(6) With doors switch OFF, select wheels DOWN. A test lamp connected between pins B and C of the socket on the extension cable (wheels) should not light.

(7) Select doors OPEN. The test lamp connected as in (6) above should light. test lamp connected between pins A and C of the socket on the extension cable (doors) should light.

(8) Disengage the POWER ON circuit breaker. The indicator lamp should go out.

Test No. 6 (Bomb doors)

51. (1) Switch ON console main switch. The console live indicator lamp should light.

(2) Engage the bomb doors POWER ON circuit breaker. The POWER ON indicator lamp should light.

(3) Select doors OPEN. A test lamp connected between pins B and C of the sockets on the extension cables should light.

(4) Select doors CLOSED. A test lamp connected between pins A and C of the sockets on the extension cables should light.

(5) Disengage the POWER ON circuit breaker. The indicator lamp should go out.

Test No. 7 (L.P. and C.F. cocks)

52. (1) Switch ON console main switch. The CONSOLE LIVE indicator lamp should light.

(2) Engage the L.P. and C.F. POWER ON circuit breaker. The POWER ON indicator lamp should light.

(3) Select cock switch CLOSE. A test lamp connected between pins C and A of the socket on the extension cable should light.

(4) Select cock switch OPEN. A test lamp connected between pins B and A of the socket on the extension cable should light.

(5) Disengage the POWER ON circuit breaker. The indicator lamp should go out.

Test No. 8 (Sequence timer)

53. Two separate tests are required on this section:—

(a) To prove the system for use with aircraft supplies.

(b) To prove the system for use with test set supplies.

Test (a)

(1) Switch ON console main switch. The CONSOLE LIVE indicator lamp should light.

(2) Engage the sequence timer POWER ON circuit breaker. The POWER ON indicator lamp should light.

(3) Set supplies selector switch to AIRCRAFT.

(4) Connect a wander lead between ground supply (28 volts) and pin 8 of the sequence timer extension cable 9-pin socket.

Bridge pins 8 and 1 } of the aircraft/
8 and 4 } sequence timer
8 and 5 } supply extension
8 and 7 } cable 9-pin plug.

Check that the appropriate indicator lamp on the panel lights.

(5) Connect a wander lead between ground supply (28 volts) and pin 9 of the sequence timer extension cable 9-pin socket.

Bridge pins 9 and 2 } of the aircraft/
9 and 3 } sequence timer
9 and 6 } supply extension
cable 9-pin plug.

Check that the appropriate indicator lamp on the panel lights.

(6) Disconnect the wander lead.

Test (b)

(1) Set supplies selector switch to TEST SET.

(2) Bridge pins
8 and 1 } of the sequence
8 and 4 } timer extension
8 and 5 } cable 9-pin socket
8 and 7 }

Check that the appropriate indicator lamp on the panel lights.

(3) Bridge pins
9 and 2 } of the sequence
9 and 3 } timer extension
9 and 6 } cable 9-pin socket

Check that the appropriate indicator lamp on the panel lights.

(4) Engage the three 200-volt a.c. circuit breakers and set start/stop switch to START.

(5) Check voltage, frequency and phase rotation at red, yellow and blue cables, on the connector assembly fitted to the end of the sequence timer motor extension cable.

(6) Disengage the POWER ON circuit breaker. All indicator lamps should go out.

Test No. 9 (Fuel pumps)

54. Switch ON console main switch. The CONSOLE LIVE indicator lamp should light.

(2) Engage the POWER ON circuit breaker. The POWER ON indicator lamp should light. A test lamp connected between pins D and E of the socket on the fuel pressure extension cable should light.

(3) Connect the 5 pin socket on the extension cable to a Desynn test set Ref. No. 6C/437. Observe movement of the fuel pressure indicator in reference to test set adjustments.

(4) Engage the three 200-volt, POWER ON circuit breakers.

(5) Set the fuel pump selector switches to MANUAL and ON respectively. Check for the presence of 200-volt a.c. at pins 2, 7 and 3 of the MAIN fuel pump extension cable. Ensure the phase rotation is 2 (red), 7 (yellow) and 3 (blue).

(6) Set the fuel pump switches to AUTO and ON respectively. Check for the presence of 200 volts a.c. at pins 8, 7 and 9 of the MAIN fuel pump extension cable. Ensure the phase rotation is 8 (red), 7 (yellow) and 9 (blue).

(7) With the fuel pump switch to ON check for the presence of 200-volts a.c. at pins 2, 3 and 7 of the SEC/TR fuel pump extension cable. Ensure the phase rotation is 2 (red), 3 (yellow) and 7 (blue). Ensure these supplies are not controlled by the AUTO-MANUAL fuel pump switch.

(8) Disengage the POWER ON circuit

breaker. The indicator lamp should go out.

Test No. 10 (Fire extinguisher)

55. (1) Apply 28 volts between pins A and B of each of the nose wheel bay, bomb bay, engine, leading edge and A.A.P.P. fire extinguisher extension cables. Ensure the appropriate indicator lamps light.

(2) Ensure adapters, item 368/U.1522, are connected to the wing tank fire extinguisher extension cables. Connect a 28-volt supply to pins A and B of the 2-pin plug of the adapter cable, and ensure the appropriate warning lamp lights. Connect a 28-volt supply to pins B and C of the 4-pin plug of the adapter cable. Ensure the appropriate warning lamp lights.

Test No. 11 (Miscellaneous test circuit)

56. (1) Switch ON console main switch. The CONSOLE LIVE indicator lamp should light.

(2) Engage the miscellaneous test POWER ON circuit breaker. The POWER ON indicator lamp should light.

(3) Set selector switch in the UP position. A 28-volt test lamp connected between the red and blue cores of the extension cable should light.

(4) Set selector switch in the DOWN position. A 28-volt test lamp connected between the green and blue cores of the extension cable should light.

(5) Disengage the POWER ON circuit breaker. The indicator lamp should go out.

Test No. 12 (P.F.C. test circuit)

57. (1) Ensure that the P.F.C. motor extension cable and fittings are insulated from earth and from each other.

(2) Switch ON the console main switch. The CONSOLE LIVE indicator lamp should light.

(3) Engage the P.F.C. test POWER ON circuit breaker. The P.F.C. POWER ON indicator lamp should light.

(4) Bridge the terminals of the pressure failure extension cable, and ensure the pressure failure warning lamp lights.

RESTRICTED

Remove the bridge and ensure the pressure failure warning lamp extinguishes.

(5) Select the P.F.C. control switch to START. Check for 200-volt a.c. supply and phase rotation at the motor extension cable. The phase rotation should be Red, Yellow, Blue.

(6) Select P.F.C. control switch to STOP. Ensure no supply exists at the motor extension cable.

(7) Repeat item 5. Trip the main safety switch, and ensure that the B.T.H. contactor fitted to the console is tripped.

(8) Disengage the POWER ON circuit breaker. The indicator lamp should go out.

Test No. 13 (A.A.P.P. test circuit)

58. (1) Apply 28 volts to the 2-pin plugs of the cartridge selection extension cable. The appropriate warning lamps should light.

(2) Switch ON the console main switch. The CONSOLE LIVE indicator lamp should light.

(3) Engage the d.c. POWER ON circuit breaker. The A.A.P.P. POWER ON warning lamp should light.

(4) Bridge pins 8 and 9 of the sump heater extension cable. Set the sump heater switch to ON. The sump heater indicator lamp should light. Engage the three 200-volt 3 phase circuit

breakers. Check for the presence of 200 volts 3 phase supply at pins 2 Red, 3 Yellow and 7 Blue. Disengage the 200-volt circuit breakers.

(5) Set the oxygen time switch to START. Bridge pins C and D on the oxygen time switch and cartridge selector cable socket, the oxygen solenoid indicator lamp should light. A 28-volt test lamp connected between pins A and B, and between pins A and M of the socket should light.

(6) Disengage the POWER ON circuit breakers. All indicator lamps should go out.

Test No. 14 (A.A.P.P. fire warning)

59. (1) Switch ON the console main switch. The CONSOLE LIVE indicator lamp should light.

(2) Engage the A.A.P.P. fire warning POWER ON circuit breaker. The POWER ON indicator lamp should light.

(3) Bridge pins 1 and 9 of the extension cable. The fire warning lamp should light.,

(4) Check for 28 volt supply between pins 1 and 7 of the extension cable.

(5) Depress the test switch and check for continuity between pins 4 and 8 of the extension cable.

(6) Disengage the POWER ON circuit breaker. The indicator lamp should go out.

Appendix 1

TEST SCHEDULES—AIRCRAFT SYSTEMS

LIST OF SCHEDULES

	<i>Schedule</i>
Port undercarriage actuation	1
Starboard undercarriage actuation	2
Nosewheel actuation	3
Nosewheel steering	4
Bomb doors	5
Fire extinguishers	6
Sequence timers	7
L.P. and cross-feed cocks	8
Fuel pumps	9
P.F.C's.	10
A.A.P.P.	11
A.A.P.P. fire warning	12
Miscellaneous test	13

RESTRICTED

SCHEDULE 1—PORT UNDERCARRIAGE ACTUATION

(a) Introduction

The controls for testing the port undercarriage are positioned at the centre L.H. side of the control panel. They consist of a POWER ON circuit breaker, an ON-OFF switch for the down lock, a 3 position switch labelled UP-DOWN for the wheels, and a 3-position switch labelled CLOSE-OPEN for the doors. An indicator lamp which operates in conjunction with POWER ON is fitted above the circuit breaker. A label is also fitted, giving warning against operating the wheels to UP at the same time as operating the doors to CLOSE. The aircraft circuit is sequenced such that the wheels must be retracted before the doors close. Such conditions cannot be simulated on the console and it is important that the warning conditions are observed.

(b) Pre-test requirements

- (1) The aircraft is to be jacked up.
- (2) The main wheel and door are to be clear of obstruction.
- (3) An external 28-volt d.c. supply is to be connected to the ground supply plug on the L.H. side panel of the console.
- (4) The down-lock, undercarriage, and door selector valves are to be disconnected from the aircraft electrical system in the port undercarriage bay. The port undercarriage extension cable is to be run out and the branch cables connected to the selector valves in accordance with the socket ident.
- (5) Ensure that the extension cable is adequately supported and clear of moving parts.

WARNING . . .

It is essential that the extension cable is so routed that there will be no danger of fouling the undercarriage or doors.

ALLOW FOR THE FACT THAT THE DOORS ARE TO BE CLOSED DURING THE TEST.

(6) Connect an external hydraulic rig to the aircraft.

(7) Check that the port undercarriage POWER ON circuit breaker is disengaged, and the test switches are in the OFF position.

(8) Switch ON the console main switch.

(c) Test procedure

To check Bogie trim

- (1) Engage POWER ON circuit breaker and note that the indicator lamp lights.
- (2) With down lock switch OFF, select wheels UP. The wheel bogie will take up the attitude for the wheels up condition.
- (3) With the door switch set to OPEN select wheels DOWN. The wheel bogie will take up the attitude normal for landing.

To check wheels and doors

- (1) Set down lock switch to ON.
- (2) Select wheels UP.
- (3) When the wheels are fully retracted and with the wheel switch set to UP, select doors CLOSE.
- (4) Set down lock switch to OFF.
- (5) Select doors OPEN.
- (6) With the door switch set to OPEN select wheels DOWN.
- (7) Switch OFF all control switches.

(d) After test

- (1) Disconnect the 28-volt supply from the console.
- (2) Disconnect hydraulic supplies from the aircraft.
- (3) Disconnect extension cable and stow in the console.
- (4) Re-connect aircraft services.

RESTRICTED

SCHEDULE 2—STARBOARD UNDERCARRIAGE ACTUATION

The controls for testing the starboard undercarriage are positioned at the R.H. side of

the control panel. The test procedure is identical to that specified in Schedule 1.

SCHEDULE 3—NOSEWHEEL ACTUATION**(a) Introduction**

The nosewheel differs from the main wheel in two respects. There is no bogie, and no electro-hydraulic down lock. In other respects it is similar, from the electrical viewpoint, to the main wheel. When carrying out tests on the nosewheel section of the undercarriage, therefore, it is essential that the safety precautions are observed. In particular, attention is again drawn to the warning label adjoining the control switches on the Test Console: **IF THE DOORS ARE SELECTED TO CLOSE AT THE SAME TIME AS THE UNDERCARRIAGE WHEELS ARE SELECTED UP** there is every danger of the two colliding, or of the doors closing before the wheels are fully retracted.

The controls for testing the nosewheel actuation occupy the top R.H. corner of the control panel and consists of a POWER ON circuit breaker, and two 3-position switches. The switches are labelled UP-DOWN for the wheels and CLOSE-OPEN for the doors.

(b) Pre-test requirements

- (1) The aircraft is to be jacked up.
- (2) The nosewheel and doors are to be cleared of any obstruction.
- (3) An external 28-volt supply is to be connected to the ground supply plug on the L.H. side panel of the console.
- (4) The nosewheel and the doors selector valves are to be disconnected from the aircraft electrical system. The nosewheel actuation extension cable is to be run out and the branch cables

connected to the selector valves in accordance with the socket identis.

(5) Ensure that the extension cable is routed and secured to permit free movement of wheels and doors without fouling the cable.

(6) Connect an external hydraulic supply to the aircraft.

(7) Check that the nosewheel POWER ON circuit breaker is disengaged and the test switches are in the OFF position.

(8) Switch ON the console main switch.

(c) Test procedure

- (1) Engage POWER ON circuit breaker and note that the indicator lamp lights.
- (2) Select wheels UP.
- (3) With wheels fully retracted and the wheel switch set to UP, select doors CLOSE.
- (4) Select doors OPEN.
- (5) With the door switch set to OPEN, select wheels DOWN.
- (6) Switch OFF all control switches.

(d) After test

- (1) Disconnect the 28-volt supply from the console.
- (2) Disconnect hydraulic supplies from the aircraft.
- (3) Disconnect extension cable and stow in console.
- (4) Re-connect aircraft services.

SCHEDULE 4—NOSEWHEEL STEERING**(a) Introduction**

The controls for testing the nosewheel steering system occupy the top L.H. corner of the control panel and comprise a POWER ON circuit breaker and two switches labelled ENGAGE and STEER. When the circuit breaker

is engaged the indicator lamp situated above it will light. The ENGAGE switch is an ON-OFF switch, which connects the 28-volt supply to the steering valve. The STEER switch is a 3-position spring loaded to centre OFF switch,

R E S T R I C T E D

with PORT and STARBOARD selections for control of nosewheel movement.

(b) Pre-test requirements

- (1) Position the console between the N/W bay and bomb bay.
- (2) The aircraft is to be jacked up.
- (3) The nose-wheel is to be clear of obstruction.
- (4) An external 28-volt supply is to be plugged in at the ground supply plug located on the L.H. side panel.
- (5) The main steering valve situated at the aft end of the N/W bay is to be disconnected. The nosewheel steering extension cable is to be run out from the console and the branch cable marked ENGAGE connected to the main steering valve.
- (6) The nose wheel steering valve at the forward end of the N/W bay is to be disconnected. The branch cable marked STEER is to be connected to the steering valve.
- (7) Ensure that the extension cable is adequately supported and clear of moving parts.
- (8) Connect an external hydraulic rig to the aircraft.
- (9) Check that the nosewheel steering POWER ON circuit breaker is disengaged

and the test switch is in the OFF position.

(c) Test procedure

- (1) Switch on 28-volt supply by pressing the green ON button of the console main switch.
- (2) Engage POWER ON circuit breaker and note that the indicator lamp lights.
- (3) Set the ENGAGE switch to ON.
- (4) Select PORT on the STEER switch. The nosewheel will be turned to port. Similarly, by selecting STBD. the nosewheel will be turned to starboard.
- (5) Return nosewheel to central position.

Note . . .

The nosewheel will return to the central position when the STEER switch is released.

- (6) Switch OFF all control switches.

(d) After test

- (1) Disconnect the 28-volt supply from the console.
- (2) Disconnect hydraulic supplies from the aircraft.
- (3) Disconnect extension cable and stow in the console.
- (4) Re-connect aircraft services.

SCHEDULE 5—BOMB DOORS

(a) Introduction

On the port side of the bomb bay are fitted the two electro-hydraulic selector valves associated with normal bomb door operation. When testing bomb doors using the test console, it will be necessary to run cables into the bomb bay, where they will be connected to the selector valves. The doors have to be closed and opened, therefore the cables must be run so that fouling of the cables cannot occur.

The controls consist of a POWER ON circuit breaker with indicator lamp and a 3-position spring loaded centre off control switch labelled OPEN and CLOSE.

(b) Pre-test requirements

- (1) Ensure that the bomb doors are clear of obstruction and that all personnel have been warned clear of the bomb bay.

- (2) Disconnect the selector valves from the aircraft electrical services.

- (3) Run out and connect the BOMB DOORS extension cable to the selector valves.

- (4) Connect an external hydraulic supply to the aircraft.

- (5) Connect an external 28-volt supply to the console.

(c) Test procedure

- (1) Switch ON the main console main switch.

- (2) Engage POWER ON circuit breaker and check that the indicator lamp lights.

- (3) Check and re-set the console main switch.

- (4) Select doors CLOSE.

RESTRICTED

- (5) Select doors OPEN.
- (6) Switch OFF all control switches.
- (d) After test
 - (1) Disconnect the 28-volt supply from the console.

- (2) Disconnect hydraulic supplies from the aircraft.
- (3) Disconnect extension cables and stow in the console.
- (4) Re-connect aircraft services.

SCHEDULE 6—FIRE EXTINGUISHERS

(a) Introduction

The aircraft is fitted with 35 Methyl Bromide fire extinguisher bottles of which 12 are of the dual operating head type and the remainder single operating head. The dual operating head type are fitted in the wing tank bays. Three single operating head bottles are fitted in each wing leading edge at a position forward of the main wheel undercarriage bay. Twelve further bottles are located in the bomb bay, two on the port side for No. 1 and No. 2 engines, two on the starboard side for No. 3 and No. 4 engines, and 8 for bomb bay fuel tanks. Four bottles of similar type are fitted in the nose-wheel bay, and one bottle is fitted on the A.A.P.P. pack aft of the starboard main wheel bay.

Before any test is carried out on the fire extinguisher system, remember

- (1) The operation of the firewire relay D.1760 either in the outboard or in the inboard fuel tank areas will set off **ALL SIX DUAL OPERATING HEAD BOTTLES** and **THREE LEADING EDGE BOTTLES** on that side of the aircraft.

(2) **OPERATION OF THE INERTIA SWITCHES** will set **OFF ALL BOTTLES; IN BOTH WINGS, IN THE BOMB BAY, IN THE NOSE-WHEEL BAY and in the A.A.P.P. PACK.**

In this test, the aircraft electrical system is tested. A 28-volt supply and a 200-volt 3 phase a.c. supply will have to be connected to the aircraft, and precautions should be taken to ensure that the aircraft is in an electrically safe condition before supplies are connected.

(b) Pre-test requirements

- (1) Disconnect *ALL* extinguisher bottles.

- (2) Run out extension cables from console and connect to the appropriate sockets in the wings, leading edges, bomb-bay, nose-wheel bay and A.A.P.P. bay. Ensure that positive contact between plugs and sockets is made and that the extension cables are adequately supported to prevent strain on the connections.

(c) Test procedure

Note . . .

At least two men are required to undertake the testing of the fire extinguisher system satisfactorily, one to operate the switches and relays in the system, and the other to observe results as registered on the indicator lamps on the test console.

- (1) Operate the firewire D1760 relay in the outboard fuel tank area of the port wing. The six lamps labelled PORT TANKS and three labelled LEADING EDGE will light.
- (2) Operate the firewire D1760 relay in the inboard fuel tank area of the port wing. The six lamps labelled PORT TANKS and three labelled LEADING EDGE will light.
- (3) Repeat operations (1) and (2) in the starboard wing.
- (4) Operate the firewire D1760 relay in the forward area of the nose-wheel bay. Two lamps labelled NOSE WHEEL BAY will light.
- (5) Operate the firewire D1760 relay in the aft area of the nose-wheel bay. Two lamps labelled NOSE WHEEL BAY will light.
- (6) Operate, either singly or simultaneously, the four engine fire push

RESTRICTED

switches on the coaming above the pilot's instrument panel. The lamps labelled ENGINE will light.

(7) Operate the A.A.P.P. fire push switch at the A.E.O's position. The lamp labelled FIRE EXT. in the A.A.P.P. section of the control panel will light.

(8) Operate the firewire D1760 relay in the bomb bay tank area. The eight lamps labelled BOMB BAY will light.

(9) If inertia switch sequence is to be checked, operate inertia switches No. 2 and No. 6.

Six starboard tank lamps	} will light
Six port tank lamps	
Three leading edge port lamps	
Three leading edge starboard lamps	
Four nose-wheel bay lamps	
Four bomb bay (engine) lamps	
One A.A.P.P. bay lamp	
Eight bomb bay (tank) lamps	

(d) After test

(1) Disconnect extension cables from aircraft and stow in the console.

(2) CHECK THAT BOTH INERTIA SWITCHES HAVE BEEN RESET AND THAT AIRCRAFT CIRCUITS ARE SAFE.

(3) Re-connect aircraft services.

SCHEDULE 7--SEQUENCE TIMERS

(a) Introduction

Two tests are possible, the first using the aircraft supply, and the second using an external supply via the test console. The control switches occupy the bottom L.H. corner of the panel and comprise one d.c. and three a.c. POWER ON circuit breakers, an indicator lamp, and two 2-position switches. One switch is labelled START-STOP, and the other, labelled AIRCRAFT-TEST SET, sets the circuit conditions necessary for either tests. At the bottom of the panel are seven lamps, each numbered so that it can be identified with one of the fuel tanks which the sequence timer controls.

Any test of the sequence timer would be incomplete without a check on the operating times of the cam-operated switches. A label showing the times during which the contacts are open is fitted adjacent to the POWER ON switch.

(b) Pre-test requirements (Test on aircraft supply)

(1) An external 200-volt 3 phase a.c. supply is to be connected to the aircraft.

(2) An external 28-volt d.c. supply is to be connected to the aircraft.

(3) Disconnect the 9-in plug at the sequence timer in the aircraft power compartment.

(4) Run out the sequence timer extension cables from the console. Connect tension cable identified AIRCRAFT/SEQUENCE TIMER SUPPLY to the socket

which was previously connected to the quence timer. Connect extension cable identified SEQUENCE TIMER to the sequence timer plug.

Note . . .

Do not disturb the 200-volt 3 phase connections for this test.

(c) Test procedure

(1) With the aircraft-test set switch set to AIRCRAFT, the d.c. supply for the indicator lamps and the a.c. supply to the motor will be available if the auto-manual switches on the aircraft centre console are at AUTO. Using a stop-watch, the times of the cam sequences can then be compared against the table provided for this purpose.

(d) After test

(1) Switch OFF all supplies.

(2) Disconnect extension cables from the aircraft services and stow in the console.

(3) Re-connect aircraft services.

(e) Pre-test requirements (Test on test set supply)

(1) Disconnect the 9-pin plug at the sequence timer in the aircraft power compartment.

(2) Run out the sequence timer extension cables from the console. Connect the SEQUENCE TIMER extension cable to the sequence timer plug. The AIR-

RESTRICTED

CRAFT/SEQUENCE TIMER SUPPLY extension cable is NOT TO BE CONNECTED.

(3) Remove the cover from the 200-volt, 3-phase connector block on the sequence timer. IT IS NOT NECESSARY TO DISCONNECT THE AIRCRAFT SYSTEM CABLES FROM THE CONNECTOR BLOCK.

(4) Connect the SEQUENCE TIMER MOTOR extension cable to the sequence timer connector block. The cable is provided with spring loaded connectors which will bear down on connecting screws in the connector block.

Note . . .

It may be necessary to remove the terminal cover on the adjacent fuel pump relay to fit the sequence timer motor extension cable.

(5) Connect a 28-volt d.c. and a 200-volt 3 phase a.c. supply to the console.

(6) Check that the sequence timer POWER ON circuit breakers are disen-

gaged and the test switch is in the STOP position.

(7) Switch ON the console main switch.

(f) Test procedure

(1) Engage the d.c. POWER ON circuit breaker and check that indicator lamp lights.

(2) Engage the three a.c. POWER ON circuit breakers.

(3) Select aircraft-test set switch to TEST SET.

(4) Select start-stop switch to START.

(5) Check cam sequence.

(g) After test

(1) Switch OFF all control switches.

(2) Disconnect the 28-volt and 200-volt supplies from the console.

(3) Disconnect extension cables from the aircraft services and stow in the console.

(4) Re-connect aircraft services.

SCHEDULE 8—L.P. AND CROSS-FEED COCKS

(a) Introduction

This test circuit is provided to enable the cross-feed cocks or L.P. cocks to be tested. Controls consist of a POWER ON circuit breaker and associated indicator lamp, and one switch labelled CLOSE-OPEN.

(b) Pre-test requirements

(1) An external 28-volt supply is to be connected to the console.

(2) The low pressure/cross feed cock to be tested is to be disconnected from the aircraft electrical system.

(3) The L.P./C.F. extension cable is to be run out from the console and connected to the cock actuator.

(4) Check that the POWER ON circuit breaker is disengaged.

(5) Switch ON the console main switch.

(c) Test procedure

(1) Engage POWER ON circuit breaker

and check that the indicator lamp lights.

(2) Select control switch to OPEN. Observe the 28-volt ammeter at top R.H. position on the control panel which will register actuator consumption. When the limit of actuator movement is reached the internal limit switch will cut off the supply and the ammeter pointer will return to zero.

(3) Select control switch to CLOSE. The ammeter will register the consumption up to the point when the internal limit switch again cuts off the supply with the cock fully closed.

(4) Switch OFF all control switches.

(d) After test

(1) Disconnect 28-volt supply from the console.

(2) Disconnect extension cable and stow in the console.

(3) Re-connect aircraft services.

RESTRICTED

SCHEDULE 9—FUEL PUMPS

(a) Introduction

Three types of fuel pump are fitted on the Vulcan aircraft. The main fuel pump, one of which is fitted in each tank, is required to run at one of two speeds, governed by the sequence timer. A secondary fuel pump, is fitted in each of the wing tanks, and a transfer pump, in each of the No. 1 and No. 7 tanks. The test console provides for the testing of each type of pump.

The controls occupy the lower centre position of the panel and consist of one 28-volt d.c. and three 200-volt a.c. POWER ON circuit breakers, an indicator lamp, and two switches labelled ON-OFF and MANUAL-AUTO respectively. A pressure indicator registers the stall pressure developed by the pump, and an a.c. ammeter fitted at the top L.H. position on the control panel, gives indication of the power consumption of the pump.

Fitted behind the control panel and operating in conjunction with the MANUAL-AUTO switch is a relay unit which determines the speed of the pump by switching pump motor windings in a manner similar to that achieved automatically by the sequence timer in the aircraft system.

For a satisfactory check on the efficiency of a fuel pump it is essential that the pump shall do work. In other words, fuel must be moved by the pump so that a measure of the pressure in the system consequent on the pump's operation can be obtained. For this function an adapter is connected into the fuel system. The adapter is fitted with a Desynn type fuel pressure transmitter which is connected to the pressure indicator on the control panel. When not in use the adapter is stored within the console.

(b) Pre-test requirements

- (1) The adapter is to be fitted into the refuelling line at the refuelling point in the main undercarriage wheel-bay and the FUEL PRESSURE extension cable connected to the adapter.
- (2) The pump to be tested is to be disconnected from the aircraft system.
- (3) The FUEL PUMP extension cable is to be run out and the appropriate branch cable connected to the fuel pump, i.e. for main pumps use cable identified MAIN and for secondary or

transfer pumps use SEC AND TRANS cable.

(4) A complete fuel circuit is to be made available between pump and adapter by opening the appropriate cocks. This task is to be undertaken only by a ground-crew member who is fully conversant with the fuel system lay-out.

(5) A 200-volt three phase a.c. ground supply is to be made available to the console.

(6) A 28-volt ground supply is to be made available to the console.

(7) Check that the fuel pump POWER ON circuit breakers are disengaged.

(c) Test procedure (main pump)

- (1) Switch ON the console main switch.
- (2) Engage the d.c. POWER ON circuit breaker and check that indicator lamp lights.
- (3) Engage the three a.c. POWER ON circuit breakers.
- (4) Select manual-auto switch to AUTO. In this position the pump will run at reduced speed.
- (5) Select ON-OFF switch to ON. Observe the reading on the a.c. ammeter. Observe pump stall pressure on the pressure indicator.
- (6) Select manual-auto switch to MANUAL. Observe the reading on the a.c. ammeter. Check that an increased pressure is registered on the pressure indicator.
- (7) Switch OFF all control switches.

(d) Test procedure (secondary and transfer pumps)

Repeat the test procedure detailed in (c) with the exception of operations (4) and (6). Throughout the test the manual-auto switch should be set to MANUAL. The secondary pumps operate a closed fuel circuit within the tank, therefore pump stall pressure will not be indicated.

(e) After test

- (1) Disconnect the 28-volt and 200-volt supplies from the console.

RESTRICTED

(2) Disconnect the extension cables and stow in the console.

(3) Remove the adapter from the aircraft fuel system and stow in the console.

Ensure that the aircraft system is returned to normal configuration.

(4) Reconnect the aircraft services.

SCHEDULE 10—P.F.C'S

(a) Introduction

This test circuit is intended for the function testing of individual P.F.C. pump motors.

A POWER ON circuit breaker serves as a master switch for the test circuit and operates in conjunction with an indicator lamp. A 3-position spring loaded to centre OFF switch labelled START-STOP, is provided to control the P.F.C. pump motor, and a warning lamp gives indication of pressure failure in the P.F.C. unit.

The control switches and indicator lamps occupy a section on the R.H. side of the control panel.

(b) Pre-test requirements

(1) The pump motor to be tested is to be disconnected from the aircraft electrical system.

(2) If it is intended to load the motor by displacing the aircraft control surfaces, ensure that such displacements can be effected safely.

(3) Run out extension cables and connect to the terminal blocks adjacent to the P.F.C. motor (Refer to routing charts in A.P.4505B, Vol. 1, Book 2, Sect. 6, Chap. 10).

(4) External 28-volt d.c. and 200-volt

3 phase a.c. supplies are to be connected to the ground supply plugs on the L.H. side of the console.

(c) Test procedure

(1) Switch ON the console main switch.

(2) Engage P.F.C. POWER ON circuit breaker and note that the indicator lamp lights.

(3) Check that the PRESSURE FAILURE indicator lamp lights.

(4) Select START on start-stop control switch.

(5) Check that the PRESSURE FAILURE indicator lamp goes out.

(6) On completion of test, select STOP on control switch.

(7) Disengage POWER ON circuit breaker.

(d) After test

(1) Switch OFF the console main switch.

(2) Disconnect the 28-volt and 200-volt supplies from the console.

(3) Disconnect extension cables and stow in the console.

(4) Re-connect aircraft systems.

SCHEDULE 11—A.A.P.P.

(a) Introduction

Facilities are provided for testing the electrical circuits for oxygen enrichment and cartridge firing, and also the operation of the sump oil heater with its associated thermostat.

The controls occupy the lower R.H. portion of the panel and consist of one d.c. and three a.c. POWER ON circuit breakers and an indicator lamp. Three indicator lamps and a switch labelled START-STOP are supplied for the oxygen enrichment and cartridge selec-

tion circuits, and one indicator lamp and a switch labelled ON-OFF for the oil sump heater and thermostat.

(b) Pre-test requirements

(1) The A.A.P.P. oxygen enrichment time switch, cartridge firing sockets and sump heaters are to be disconnected from the aircraft supplies.

(2) Run out the appropriate extension cables and connect the looms to:—

R E S T R I C T E D

- (i) The oxygen enrichment time switch.
- (ii) The cable removed from the oxygen time switch.
- (iii) The cables removed from the cartridge firing sockets.
- (iv) The oil sump heater.

(3) A 28-volt ground supply is to be made available to the console.

(4) A 200-volt 3 phase a.c. supply is to be made available to the console.

(5) Check that the A.A.P.P. POWER ON circuit breakers are disengaged.

(c) Test procedure

- (1) Switch ON the console main switch.
- (2) Engage the d.c. POWER ON circuit breaker and note that indicator lamp lights.
- (3) Engage the three a.c. POWER ON circuit breakers.

Sump heaters

- (4) Switch ON the sump heater control switch and check that thermostat indicator lamp lights. Note the current indicated on the a.c. ammeter. When the oil reaches operating temperature, the thermostat will function and extinguish the indicator lamp.

Oxygen enrichment time and cartridge selector switches

- (5) Select the start-stop control switch to START and observe the operation of the oxygen and cartridge firing indicator lamps.

(d) After test

- (1) Set all control switches to OFF.
- (2) Disconnect the 28-volt and 200-volt supplies from the console.
- (3) Disconnect extension cables from the aircraft and stow in the console.
- (4) Reconnect the aircraft systems.

SCHEDULE 12—A.A.P.P. FIRE WARNING

(a) Introduction

The controls for testing the A.A.P.P. fire detector system and its associated control unit occupy the lower right-hand portion of the panel.

Two controls are provided, one a POWER ON circuit breaker serving as a master switch for the test circuit, the other a spring loaded to OFF test switch. Each switch operates in conjunction with an indicator lamp.

(b) Pre-test requirements

- (1) The control unit under test is to be disconnected from the aircraft system.
- (2) Run out the extension cable identified A.A.P.P. FIRE WARNING. Connect the socket to the control unit and the plug to the socket removed from the control unit.
- (3) A 28-volt ground supply is to be made available to the console.

(c) Test procedure

- (1) Switch ON the console main switch.
- (2) Engage the 'POWER ON' circuit breaker and check that the associated indicator lamp lights.
- (3) Check that the appropriate warning lamp lights when the test switch is pressed, and extinguishes when the switch is released.

(d) After test

- (1) Switch OFF the console main switch
- (2) Disconnect the 28-volt supply from the console.
- (3) Disconnect the extension cable from the aircraft and stow in the console.
- (4) Reconnect the aircraft system.

SCHEDULE 13—MISCELLANEOUS TEST

(a) Introduction

This test circuit has been included to provide a controlled and protected 28-volt supply for the testing of miscellaneous

systems or components, and consists of a POWER ON circuit breaker with its associated indicator lamp, and a 3 position centre OFF control switch. The switch controls the

R E S T R I C T E D

supply to a 3-core cable, the aircraft end of which has been left free so that the required type of connector can be fitted.

A 28-volt supply will appear across the Red and Blue cores of the cable with the selector switch in the up position, and across

the Blue and Green cores with the switch in the down position.

(b) Pre-test requirements

These will be consistent with the safety requirements for the test, and should be agreed with a responsible person, e.g. Crew Chief.

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Appendix 2

SCHEDULE OF PARTS

Ref. No.	Part No.	Description	Qty.	Manufacturers Ref.
26DC/95294	1/U1522	Misc. system test console Mk. 2	1	
		Spares:		
		Contactor	1	B.T.H.LDG/35/Y2/2
		Contactor	1	Rotax D/6704/2
		Relay	1	Plessey BD/1CO/28/30
		Relay	5	Plessey CH/4CO/28/10
		Terminal block, 2 way	1	Plessey CZ.50186
		Terminal block, 10 way	18	Plessey CZ.50181
		Terminal block, 10 way	2	Plessey CZ.28961
		Commoning link	3	Plessey CZ.50211
		Commoning link	2	Plessey CZ.50218
		Resistor, 680 ohm	1	B.E.R. LW.20
		Fuse, Slydlock 60 amp.	3	Wilcox X/60411
5CX/1069		Lamp, warning (red)	62	
5CX/1635		Lamp, warning (green)	1	
5L/9951273		Lamp filament	63	
		Ammeter, d.c. (0-10 amps.)	1	Sangamo Weston S.156
		Ammeter, a.c. (0-5 amps.)	1	Sangamo Weston S.160
		Switch, ON/OFF	1	Sleeper MB.445
		Switch, D.P.	6	N.S.F.8820/K5
		Switch, S.P.	3	N.S.F. 8812/K7
		Switch, S.P.	10	N.S.F.8810/K6
		Switch, S.P.	1	N.S.F.8800/K/7
		Switch, S.P.	1	N.S.F.8804/K8
		Indicator, fuel pressure, 0-20 p.s.i.	1	Smiths 263 P.G.
5CY/4314		Plug, external power supply, 28V	1	
		Connector, external. power supply, 200V	1	Films and Equipment KD/066/56D
		Castor	2	Flexello XLF/TB/72A

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SCHEDULE OF PARTS—cont.

Ref. No.	Part No.	Description	Qty.	Manufacturers Ref.
		Castor	2	Flexello XLC/TB/724A
	23/U1340	Adapter, fuel pressure	1	
		Spares:		
		Hose, refuelling	1	Avery Hardoll H.U.204
		Transmitter, fuel pressure	1	Smiths 164 P.C.
		Hose, flexible	1	Palmer TH215
	23a/U1340	Cable assembly	1	
	343 to 368	Cables, extension		
	U1522			
	417 to 420	Cables, extension		
	U1522			
		Spares:		
	499/U1522	Connector	1	
5X/6374		Socket	5	
5X/6375		Socket	9	
5X/6376		Socket	3	
5X/6379		Socket	29	
5X/6384		Socket	1	
		Socket	1	Plessey CZ.49017
		Socket	18	Plessey CZ.56256
5X/6001		Plug	43	
5X/6006		Plug	1	
5X/6036		Plug	3	
5X/6086		Plug	1	
		Plug	12	Plessey CZ.49216