

## Chapter 1

## UNIVERSAL TEST RIG CABINET Mk. 1

(Ref. No. 4C/2634)

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**Introduction**

1. The universal test rig cabinet is intended for the use of aircrew in the crew room prior to flight to enable them to apply functional tests to their flying clothing and associated equipment.

**DESCRIPTION**

2. The rig is contained in a cabinet mounted on a tubular metal stand having four legs fitted with castoring wheels. Folding lifting handles are provided on two sides of the cabinet. Three sides of the cabinet are adapted to accommodate its instruments and equipment, the fourth panel is an access door; the associated fittings, air and oxygen cylinders are stowed inside the cabinet. On top of the cabinet are a mirror and frames enclosing cards bearing the appropriate instructions for the tests conducted by using the instruments mounted below each card. These instructions are repeated in later paragraphs for easy reference. The rig is intended to operate on an electrical power supply of 230 volts A/C.

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**Oxygen panel**

3. This panel (*fig. 1*) has provision for testing demand system oxygen masks type A-13A, Type A-13A/1 and Type P, oxygen economiser, pressure jerkin, partial pressure suit and head piece and the full pressure suit when this becomes available. The following are fitted to the panel:—

- Oxygen regulator Mk. 17
- Pressure breathing gauge capacity 0 to 5 p.s.i.
- Control valve Mk. 10
- Hose connections terminating in a Mk. 10A socket
- Oxygen economiser Mk. 4
- Oxygen regulator Mk. 11C
- Manual selector valve
- Hose connections terminating in Mk. 1 socket

**Anti-g suit panel**

4. This panel (*fig. 1*) is fitted with:—  
Air supply valve  
Pressure gauge

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Pressure hose connections terminating  
in a socket

Radio panel (fig. 2)

5. The following instruments are fitted:—  
Test set Type 376  
Switch, main, ironclad Type 486-250V.  
Contents gauges for the air and oxygen  
cylinders.

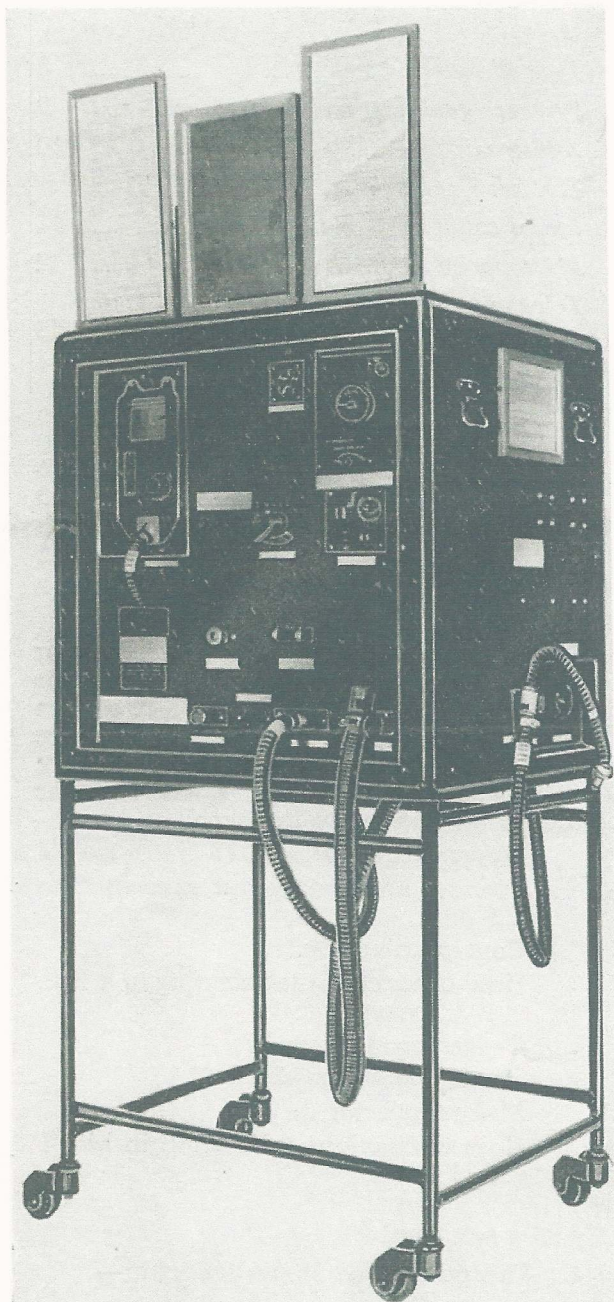


Fig. 1. Oxygen and anti-g suit panel

## INSTRUCTIONS FOR TESTING EQUIPMENT

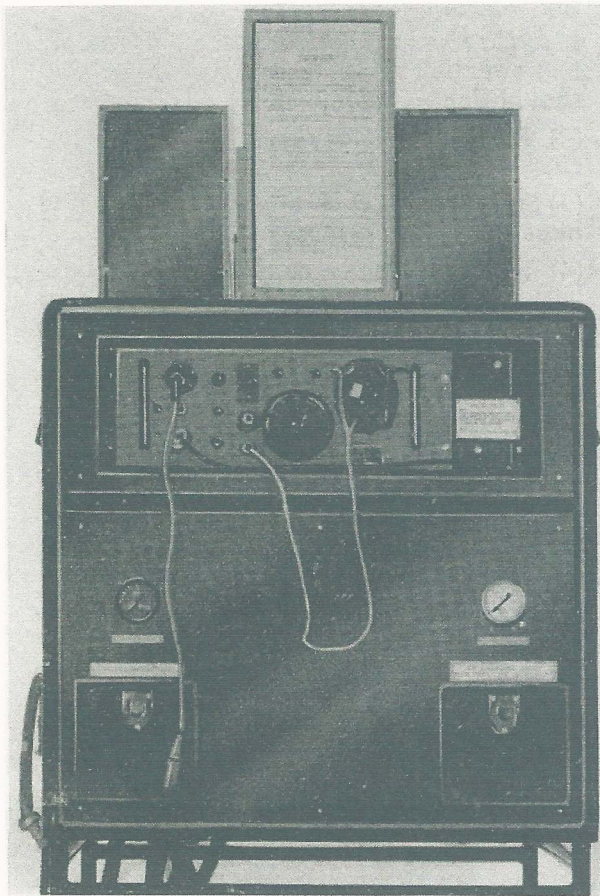
### Type M mask and pressure breathing waistcoat

6. (1) Ensure that the connection on the supply tube mates with the coupling on the mask tube assembly.  
(2) Adjust mask and helmet as for flight.  
(3) Pinch the mask tube assembly between the finger and thumb. Inhale and exhale quickly. If it is functioning correctly, breathing will be easy and the inspiratory valve will "click" shut sharply at the end of each inspiration.  
(4) Fit and adjust waistcoat.  
(5) Ensure that the blanking off plug is fitted in the emergency oxygen connections.  
(6) Attach the connecting disc to the connecting flange on the waistcoat and ensure that it has "clicked" in position.  
(7) Connect the mask tube assembly to the supply hose.  
(8) Turn knob on the expiratory valve to "high" and breath out forcibly to check if leaks occur at the edges of the mask. Adjust the straps if necessary.  
(9) Turn the connector valve to pressure breathing (PB) position.  
(10) Turn the regulator "on" "off" valve to fully "on" position.  
(11) Turn "emergency" lever on the regulator to "on" position.  
(12) Pressure should now build up in the waistcoat showing that the system is satisfactory.  
(13) Turn the knob on the expiratory valve to the "off" position.

### Type A-13A, A-13A/1 and P masks

7. (1) Before fitting the mask, suck on the end fitting to ensure that the inspiratory valves hold without flow.  
(2) Fit mask and helmet as for flight.  
(3) Connect the mask tube assembly to the demand system supply hose.  
(4) Ensure that the oxygen/air mixture lever is in "100 per cent oxygen" position.  
(5) Turn the demand system supply valve to fully "on" position.  
(6) Turn regulator to "on" position.  
(7) Select "emergency" oxygen on regulator.

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**Fig. 2. Radio panel**  
(note . . . lead shown shortened)

- (8) Draw in a deep breath and hold it.
- (9) Providing the mask is properly fitted, the blinker on the flow indicator should now show black since oxygen has now ceased to flow to the mask.
- (10) If the blinker on the flow indicator remains white, and providing the mask is properly fitted, the expiratory valve is not holding pressure and is unserviceable.

#### **Type H mask**

8. (1) Ensure that the connection tube on the supply mates with the coupling on the mask tube assembly.
- (2) Adjust mask and helmet as for flight.
- (3) Connect mask tube to mask supply hose on rig.
- (4) Turn selector valve to "economiser" breathing position.
- (5) Set regulator selector switch to "high" position.

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- (6) Turn regulator "on" "off" valve to fully "on" position.

- (7) Breathe normally and watch the economiser plate. It should move in as the wearer inhales and out as he exhales. If the plate does not respond freely to breathing the mask does not fit correctly and must be adjusted or, if necessary, changed for another size.

#### **Pressure garments and head piece**

9. (1) Fit pressure garment and head piece.
- (2) Turn supply valve to fully open position.
- (3) Connect pressure garments and head piece to rig, preferably with the wearer in the sitting position.
- (4) Turn on the regulator at 100 per cent oxygen and manual selector level to normal. The regulator pressure gauge should read 250 to 450 p.s.i. There should be no undue resistance to breathing. The blinkers will register each inhalation. Breathe quietly for a few cycles.
- (5) Move lever to emergency. Continue breathing quietly when a slight increase of pressure should be felt in the head piece. There should also be a slight resistance to exhalation but not to inhalation.
- (6) Move lever to HP test momentarily. *See important note below.* Pressure in the head piece should increase and the suit should inflate fully at the first inhalation after movement of the lever. Return lever to mask test, breathe quietly for a few cycles when there should be no undue resistance to breathing.
- (7) Take a breath and hold it. An assistant should see that there is no audible leakage from any part of the equipment.
- (8) Return selector lever to normal.
- (9) Disconnect head piece and pressure garment from rig.
- (10) Turn supply valve to fully "off".

#### **Note . . .**

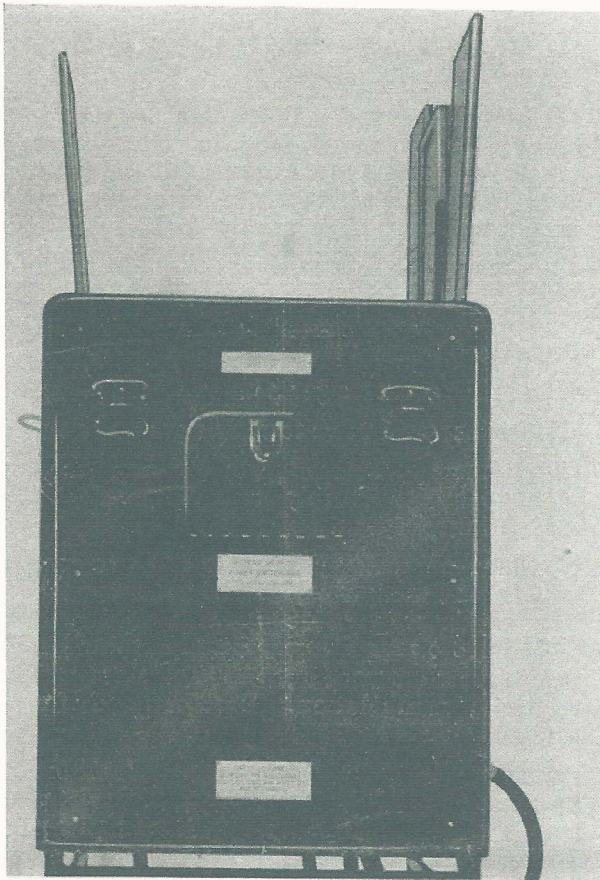
*IMPORTANT. Test inflation of pressure garments should be undertaken each time they are donned prior to flight. It should be limited to 10 seconds at a helmet pressure of 1 p.s.i. indicated on the breathing gauge.*

#### **Anti-g suit**

10. After donning the suit the sliding

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**Fig. 3. Access panel**

fasteners at the waist and legs should be closed and the back straps tightened. Clothing worn underneath the suit should be free from folds and creases. It is important that the lacing is fairly tight, as pressure must take effect immediately it is applied. Time lost by the bladder taking up looseness will reduce the "G" protection for the wearer. The test must be applied in a sitting position as follows:—

- (1) Connect the suit to the suit supply hose on the test set.
- (2) Gently turn the air supply valve to the "on" position. Pressure should now build up in the suit and the suit pressure gauge should read 5 p.s.i.
- (3) Turn the air supply valve to the "off" position. Ensure that the suit is comfortable and examine it for obvious leaks.

### **Test set Type 376**

#### **Initial calibration of test set**

**11.** (1) Connect test set to mains supply and switch "on", when amber pilot lamp should light.

(2) Rotate calibrate control fully counter-clock-wise.

(3) Set selector switch to "calibrate". Red pilot lamp will now come on.

(4) Rotate calibrate control slowly clockwise until red lamp is switched "off" and green one switched "on". Test set is now ready for use.

(5) To avoid any possible errors it is advisable to repeat operations (3) and (4) before any test is carried out.

#### **Microphone sensitivity tests**

**12.** (1) Set selector switch to "test mic" when green lamp will go out and red lamp light.

(2) Plug in microphone or microphone-telephone assembly to be tested. Make sure that switch on back of microphone is set to "on".

(3) Speak into microphone at a normal speech level. Indicator lamps should immediately change from red to green if microphone output is satisfactory.

#### **Telephone sensitivity tests (Pilot lamp not used)**

**13.** (1) Switch to "tel test (high)" or "tel test (low)", whichever may be appropriate.

(2) Plug microphone-telephone assembly into socket type 359, or in the case of headsets terminated in a plug Type 1, plug in socket marked "tels."

(3) Press key switch to "comparison", when a tone should be heard in telephone receivers.

(4) In cases of doubt, standard receiver should be unclipped from its holder and used for comparison. The tone may be heard alternately in standard telephone or telephones under tests by pressing and releasing "standard/comparison" key switch. If output from standard receiver appears louder than that of telephone under test, then this should be rejected.

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