8. GENERAL PARTICULARS (CONT'D)

8.5. ELECTRICAL SYSTEM: (CONT'D)

8.5.2. (cont'd)

Feathering Circuit:

Propellor feathering is accomplished by the normal Hamilton standard control consisting of a feather button on the Pilots header panel, an electrically driven oil pump on the engine side of each firewall, a pressure cut out switch on each propellor governor nd a relay in the main relay panel.

The Feathering circuits have no protectivefuses.

NOTE: Current Indicator: When any heavy starter or feathering load is placed on the circuit a small red indicating lamp lights on the Flight Engineers panel.

8.5.3. Electrical Services Control:

Situated on the lower left hand side of the Flight Engineers panel consists of:

- Aircraft master switch
- Domestic master switch
- Cabin master switch
- Emergency Cabin lighting switch
- Inspection sockets switch
- Panel lighting switch

The aircraft master switch controls the battery master relay and all electrical services. When it is "ON" the aircraft batteries are connected to all loads. When it is OFF all the electrical services except those connected to the Emergency bus circuits are isolated and off.

The domestic master switch controls the electrical services operated by individual control switches from the electrical panel in the galley such as the urns, and ovens.

The Cabin master switch controls the lighting system throughout the upper and lower deck passenger cabins.

The emergency cabin lighting is controlled by a switch drawing its power direct from the batteries throughthe emergency bus.

8.5.4. Location of Components:

The aircraft electrical system is required to operate, in general, the following units:-

(a) All external and internal lights, signs, and call signals.

8. GENERAL PARTICULARS (CONT'D)
8.5. ELECTRICAL SYSTEM (CONT'D)

8.5.4. Location of Components (cont'd)

(b) Electrically controlled instruments.
(c) Warning and indicating devices.
(d) Pitot tube heater.
(e) Starter motor, propeller feather pump motor, and any other electric motor called for in the operation of the aircraft.
(f) Starter inducation vibrators.
(g) Radio
(h) Inverters.

Main junction boxes, heavy duty switches, fuses, control boxes, and other principal units of the electrical system, are grouped together to form the main electrical distribution boxes, located in a position convenient for checking adjustments, and normal servicing, and are grouped above the aircraft batteries on the port side near the flight engineers station.

A complete assortment of spare fuses and spare bulbs are carried at all times in the aircraft.

Solenoid switches, in place of direct switches, are used in all circuits, carrying substantial current, for example, starter circuit, landing lights circuit, propeller feathering pump motor circuit. Solenoid switches so used obviate the necessity of running heavy wiring to and from the switch panel, and installing heavy duty direction switches. These are contained in the relay panel above the aircraft batteries.

Fuses and circuit breakers, for the various radio junction boxes, flight instruments and the 115 volt AC power inverter junction boxes are all conveniently marked and accessible near the radio rack on the flight deck.
For complete listing of all these components and circuits refer to the electrical Load Data manuals carried on the aircraft.

8.5.5. Electrical Control Panels:
Situated overhead at the pilot's station.

Switches as follows:
Pitot head heater
Seat Belt switch

8. GENERAL PARTICULARS (CONT'D)
8.5. ELECTRICAL SYSTEM (CONT'D)

8.5.5. (cont'd)

No smoking switch
Landing light switches, LH and RH.
Landing Light switches lower and Raise.
Steaming light Navigation lights switch
Anti-collision beacon
Instrument panel lights rheostat
Propeller feathering controls
Instrument light Rheostats
Flap selector control switch
Cockpit lights switch
Steward call light
Cockpit side light rheostats
Fire detection test switch
Fire detection reset switch
Emergency alarm switch

On Pilots' Instrument panel:
LH Side: Check list scroll light rheostats
Windscreen wipers rheostats
Flap indicator switch

On Flight Engineers Panel:
Various engine instrumentation switches as follows:
Fuel contents gauge switch
Fuel pressure warning lights switch
Fuel Booster pump port
Fuel Booster pump Starboard.
Fuel Flowmeters switch
Oil contents gauge switch
Oil temperature gauge switch
Carburettor air temperature switch
Outside air temperature gauges switch

Instrument panel and cockpit lighting: available from -
(a) Six panel lights mounted overhead and on either side of the cockpit and controlled by rheostats on each side of the overhead panel.

(b) Two cockpit lights; one on either side of the cockpit controlled by a switch on the LH side of the overhead panel.

8. GENERAL PARTICULARS (CONT'D)

8.5. ELECTRICAL SYSTEM (CONT'D)

8.5.5. Cont'd

(c) Small individual red lights directed onto each instrument controlled by rheostats on each side of the overhead panel.

8.5.6. Loss of a Generator:

In the event of the loss of one or more generators, all unnecessary electrical loads must be switched off to prevent overloading of the remaining generators.

To this end:

(1) Turn all unnecessary flight deck lights "OFF".
(2) Turn "OFF" Domestic and Cabin Master Switches.
(3) ONLY the minimum radio equipment consistent with flight safety ON.

It must be remembered that if the above precautions are not carried out and the loss of all generators results, it would not be possible to feather an engine should this become necessary, once the ships' batteries are exhausted.

However, if all generators fail and the batteries are isolated by means of switching the Aircraft Master switch to OFF, at least one and possibly two feathering operations should be possible by turning the Master Switch ON prior to pressing the feathering button.

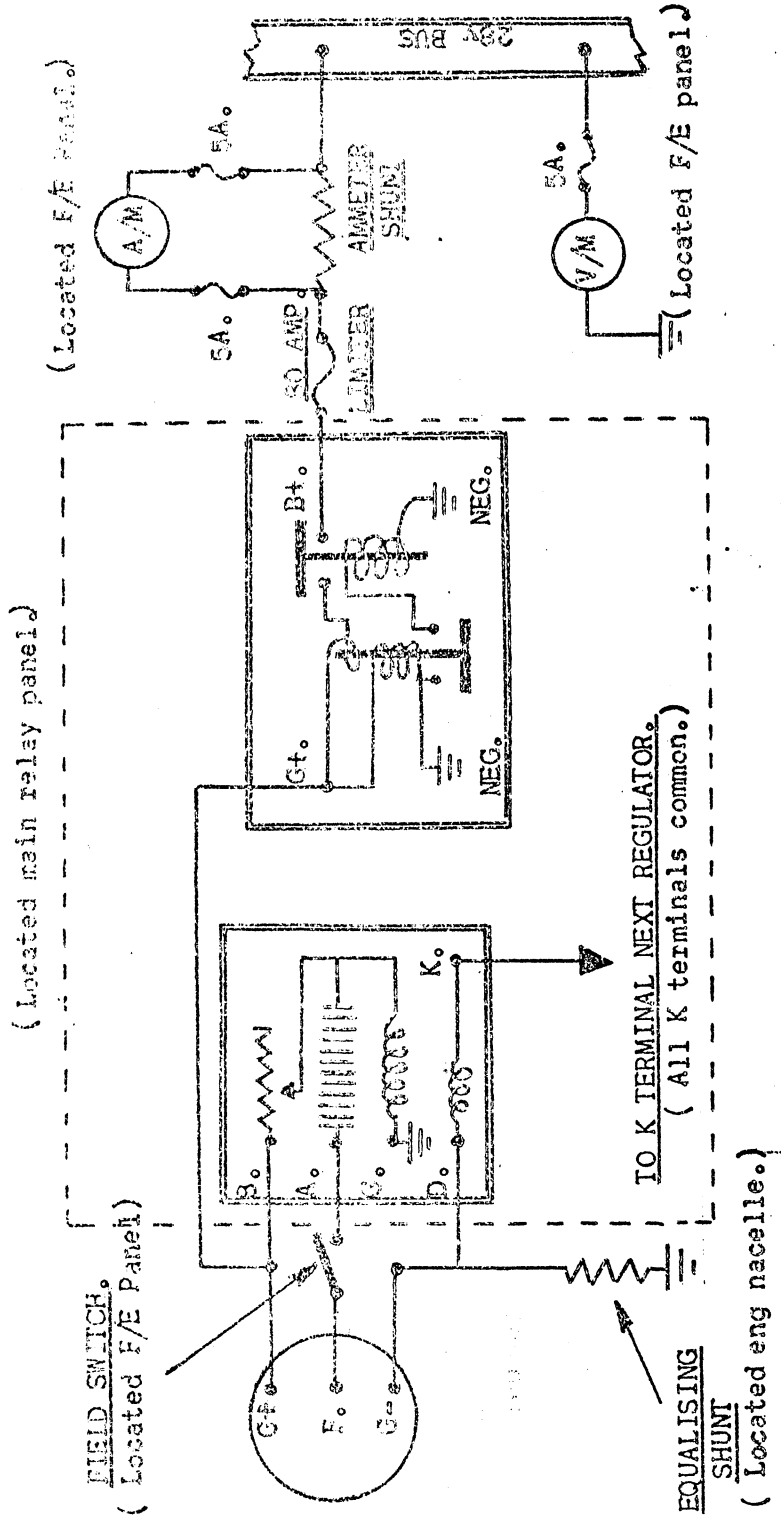
8.5.7. Emergency Services:

With the generator field switches OFF and the aircraft master switch OFF power will be removed from all services on the aircraft except:-

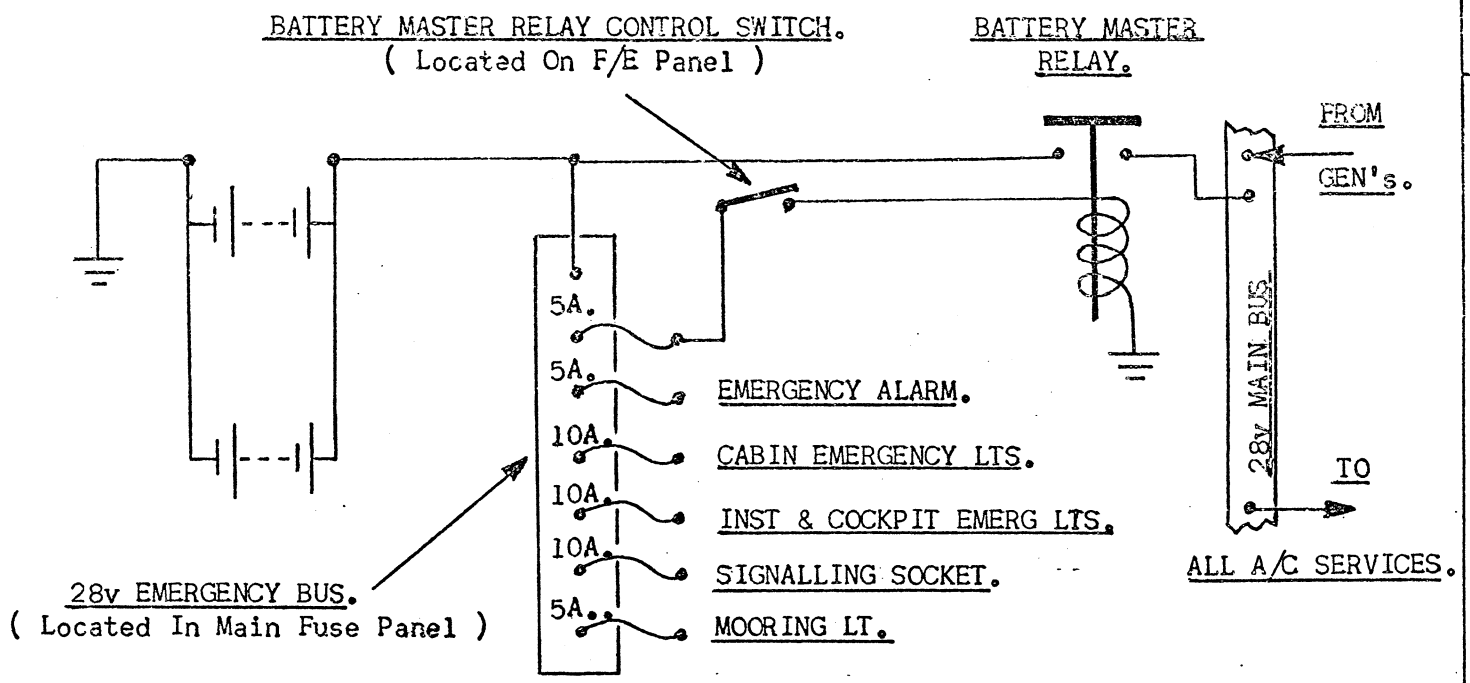
1. Emergency alarm
2. Cabin emergency lighting
3. Instrument and Cockpit emergency lights.
4. Signalling socket
5. Mooring light

8.5.8. Auxiliary Power Unit:

An auxiliary power unit is installed and located at the F/E's station. It consists of a Villiers 1½ HP 4-stroke motor driving a 500 watt generator, the output of which is controlled by a rheostat mounted on the A.P.U. control panel.



MAIN GENERATOR CIRCUIT



AIRCRAFT BATTERY SUPPLY.

8. GENERAL PARTICULARS (CONT'D)

8.5. ELECTRICAL SYSTEM (CONT'D)

8.5.8. cont'd

Starting the unit is accomplished by selecting the stbd. main fuel tank, turning the APU "ON-OFF" fuel cock to the "ON" position and pressing the electric starter button on the control panel. For cold weather starting a choke is fitted to the carburettor, and in the case of low battery voltage provision is made so that it can be started by use of a starting cord. Normal charging rate is 15 - 18 amps.

Stopping of the APU can be carried out by two methods - one is by means of the cut-out switch mounted on the flywheel back-plate, and the other by turning off the fuel at the APU ON-OFF cock. The latter method is recommended as it empties the carburettor and lines of fuel, thus minimising the fumes and fire hazard.

A Hartnell governor is fitted to control engine r.p.m. and the fuel is supplied from the main starboard fuel tank. Fuel comsumption is approx. 2.5 pints per hour.

8.6. INSTRUMENTS

8.6.1. Electrically Operated Instruments:

Electrically operated instruments, power for which is supplied by the aircraft battery.

Voltmeter
Ammeters
Fuel contents gauges
Oil Temperature gauges
Carburettor air temperature gauges
Outside air temperature gauges
Oil contents gauges
Fuel Flowmeters
Flap Position Indicator
Gyrosyn Compass C4A
Artifical Horizons H6B

8.6.2. Electrical Instruments:

Electrical instruments which are independent systems and are not connected to the aircraft battery system.

Engine RPM indicators
Cylinder head temperature gauge.

8. GENERAL PARTICULARS (CONT'D)

8.6. INSTRUMENTS (CONT'D)

8.6.3. Pressure Operated Instruments:
Engine oil pressure
Engine fuel pressure
Auto Pilot hydraulic pressure
Manifold pressure

8.6.4. Suction Operated Instruments:
Vacuum gauge
Directional gyro control box
Artifical horizon control box
Turn and bank indicators.

Air filters are provided on all suction operated instruments, and, if clogged, will cause sluggish operation of the instruments concerned, and will indicate low vacuum gauge readings.

8.6.5. Pitot Static Instrument:
Air speed indicator.

8.6.6. Static Instruments:
Altimeter
Rate of climb

8.6.7. Pitot Heads and Boundary Plates:
Two pitot heads are fitted above the pilots windshield. Electrical heating elements are provided in each pitot head for the prevention of ice formation. They shouldbe switched on at all times when flying under icing conditions.

The pitot head by means of the centre opening registers the forward air ram, which varies with the speed of the aircraft and four static boundary plates fitted two on each side of the hull register static air pressure, which varies with altitude.

Ice forming around the outside of the boundary plate will cause loss of static pressure for all static operated instruments. Ice forming in the centre tube of the pitot head will cause loss of air speed indication.

8.6.8. Air speed Indicator:
The airspeed indicator is a differential pressure gauge, which measures the difference between static and pitot pressure, the instrument is connected by pipelines to the static boundary plate and pitot connection of the pitot head.

8. GENERAL PARTICULARS (CONT'D)

8.6. INSTRUMENTS (CONT'D)

8.6.9. Alternate Static Source:

Two complete sources of static pressure vacuum are for all air speeds, altimeters and rate of climb instruments. Selection for either source is made by a switch on the First Officers instrument panel. There is no alternative emergency system for pitot static operated instruments.

8.6.10. Altimeter:

The altimeter is a modification of the aneriod barometer made very sensitive and calibrated in feet; it is connected to the boundary plates and reads static pressure.

8.6.11. Rate of Climb Indicator:

The rate of climb indicator measures the rate of change of air pressure caused by the changing altitude of the aircraft; it is connected to the static side of the pitot static system.

All the above instruments have sealed cases and the pipelines by which they are connected must be free from leaks; a cracked or broken glass in any one of them would seriously affect the accuracy of all of them.

8.6.12. Ammeters: and Voltmeter:

The ammeter is a moving coil instrument connected in parallel with a shunt , which is connected in series with the changing circuit of the generators.

The voltmeter is a capacity meter which measures the capacity of the battery under load.

8.6.13. Fuel Contents Gauges:

The fuel contents gauge is a ratio meter which retains its accuracy within close limits irrespective of battery voltage.

One in each tank is connected to its individual tank gauge on the Flight Engineer's panel. The tank units consist of a potentiometer, which has a wiper arm actuated by a float in the fuel tank.

8.6.14 Oil Temperature Gauge:

The oil temperature gauge is a moving coil instrument employing a Wheatstone Bridge circuit, one resistance of which is a bulb that is placed in the oil on the pressure side of the engine oil pump.

8. GENERAL PARTICULARS (CONT'D)
8.6. INSTRUMENT (CONT'D)

8.6.15. Carburettor Air Temperature:
Same as oil temperature, but bulb is placed in the carburettor air intake.

8.6.16. Outside Air Temperature:
Same as oil temperature, but bulbs are placed on top of the aircraft projecting into the air stream.

8.6.17 Tachometer:
The tachometer consists of a 3-phase AC generator mounted on the engine and driven at half engine speed. The indicator is a 3-phase synchronous motor directly coupled to a magnetic drag mechanism, which indicates the speed of the engine in revs. per minute. The generator and indicator are connected by suitable wiring.

8.6.18 Cylinder Head Temperature Indicator:
The cylinder head temperature is a moving coil instrument operated by an EMF generated by a thermocouple of copper and constantin situated under the rear spark plug of No.3 cylinder an each engine. The copper and constantin leads run right onto the instrument and have a resistance of 2 ohms.

8.6.19. Pressure Operated Instruments:
The engine oil pressure, fuel pressure, auto pilot hydraulic pressure gauges are all Bowden tube type instruments connected to their respective sources of pressure by pipelines.

8.6.20. Manifold Pressure Gauge:
The manifold pressure gauge is operated by a sealed capsule in a sealed case. The pressure in the intake manifold of the engine is transmitted by suitable piping to the case of the instrument; as this pressure is either raised or lowered, the capsule expands, or contracts and the movements registered on the dial in inches of mercury.

8.6.21. Artificial Horizon: (Auto Pilot)
The artificial horizon is a gyroscipically operated instrument consisting of a gyroscope mounted in 2 gymbal rings, the fact that the gyro maintains its position in space makes it possible to use it as a fixed reference for lateral and longitudinal attitude of the aircraft. It is driven by vacuum, which should be between 3.75 and 4.25 inches of mercury.

8. GENERAL PARTICULARS: (CONT'D)
8.6. INSTRUMENTS (CONT'D)
8.6.21 cont'd

NOTE: The auto pilothorizon has stops fitted, limiting its operation to 55° bank and is only used as a standby instrument in the event of power failure or unserviceability of the H6B artificial horizon.

8.6.22. Directional Gyro (Auto Pilot)
The directional gyro operates on the same principal as the artificial horizon, but the gyro is mounted in a vertical plane, thus it is used as a direction reference.

The azimuth scale is set on a heading by reference to the magnetic compass, but as the instrument drifts from this heading by a process known as precession, it should be reset frequently.

Maximum allowable precession is 4° in 15 min.

This instrument is used as a standby in the event of power failure or unserviceability of the Gyrosyn Compass C4A.

8.6.23 Bank and Turn Indicator:
Actually comprises two instruments, the turn indicator being a gyroscopic instrument using the principle of precession for its operation, and the bank instrument being a pendulous ball, which is affected by centrifugal force, thus indicating if a correct or incorrect turn is being made.

NOTE: 1. The turn and bank instrument gives only a rate of turn.
When the needle is displaced its own width, the aircraft is performing a 3° per second or rate 1 turn.

2. Vacuum pressure on this instrument is controlled by a restrictor valve to 1.9" Hg.

8.6.24 Gyro Horizon Sperry type H6B
The H6B type Sperry gyro horizon operates on 115 V 3 phase AC power supplied by either inverter.
Fast erection of the gyro is done by means of a caging device operated by a pull knob in the front casing. The gyro should be caged as soon as the AC power is available, by pulling the knob until an internal stop prevents further

8. GENERAL PARTICULARS (CONT'D)
8.6. INSTRUMENTS (CONT'D)
8.6.24 Cont'd

movement and held in that position until the horizon bar and bank index cease to oscillate. The gyro should settle within 8-10 seconds maximum. The gyro is normally kept erect by a series of steel balls in a rotating cage. The bezel glass is continually warmed electrically to prevent condensation fogging.

Pitch bar adjustment can be made within 5° UP and 15° DOWN by means of a knob in the lower LH corner. Maximum horizon bar travel is $\pm 27^{\circ}$. The gyro is free up to $\pm 85^{\circ}$ in pitch and free through 360° in roll.

8.6.25 Gyrosyn Compass System:
A sperry type C4A compass system is employed in the aircraft. The system consists of the following basic components.

1. Compass control with an electrically driven gyro.
2. Flux valve, positioned in the extreme tail of the fuselage, which serves as a reference for slaving the gyro of the compass control to the earth's magnetic meridian.
3. Compass amplifier which interprets the error signals.
4. Repeater indicator which is electrically connected to the amplifier and provides the pilot with heading information.

The system has the following units in the instrument panel;-
1. A "free-slaved gyro" switch.
   (a) In the normal "SLAVE" position, the flux valve and amplifier will control the gyro to correct any drift.
   (b) In the "FREE" position the system operates as a directional gyro.
2. A set-heading switch marked "INCREASE-DECREASE". This 2 way spring-to-centre-off switch when held to the selected position will override the flux valve control and cause the heading indication to increase or decrease as selected. When the system is operating as a directional gyro the set heading switch can be used to realign the indicator following any directional drift.
3. A centre-pointer annunciator
   A steady deflection of the pointer either side of the centre line will indicate that the gyrosyn control unit is receiving slaving signals from the flux valve and

8. GENERAL PARTICULARS (CONT'D)
8.6. INSTRUMENTS (CONT'D)
8.6.25 cont'd

and amplifier to either increase or decrease the indicated heading. During flight a constant small oscillation about the centre line is normal.

A motionless annunciator pointer could indicate loss of slaving action due to some system fault and possible drift in heading direction.

Indications:
Turning of the aircraft in azimuth will, through the electrical coupling synchro cause the heading card to rotate under a fixed vertical rubber mark giving indication of the aircraft heading. The heading indicated on the Captains compass indicator will be duplicated on the rotating card of the First Officers compass repeater indicator.

Both AC and DC power is necessary for the system. Approximately 3 minutes should be allowed for the gyros to run up to speed and the amplifiers to warm up. Any large errors in initial heading indication will be "slaved out" at a fast rate, between 60° and 100° per minute for a period of $2\frac{1}{2}$ minutes $\pm \frac{1}{2}$ minute. The normal slow slaving rate is between 2° and 4° per minute. Gyro precession when initiated by the set heading switch will occur at the fast rate.

8.6.26 Pitot- Static System:
Description : The pitot-static system is used to transmit pitot and static air pressures from the outside of the airplane to those instruments which use these pressures for their operation. Pitot pressure is dynamic pressure caused by the impact of the air through which the airplane is moving. Static pressure is equivalent to the air pressure surrounding the airplane.

Heating:- The pitot-static tube is fitted with an electrical heating unit in the forward end of the tube. This unit prevents the collection of ice on the tube, and the consequent erroneous reading of instrument which depend on the tube. The "ON"-"OFF" control switch for the heating element is located on the pilot's switch panel.

Caution - This heating element is designed to operate during the periods of fast heat dissipation. Operating the element when the airplane is on the water will cause the element to overheat, and will shorten its useful life.

8. GENERAL PARTICULARS
8.6. INSTRUMENTS (CONT'D)

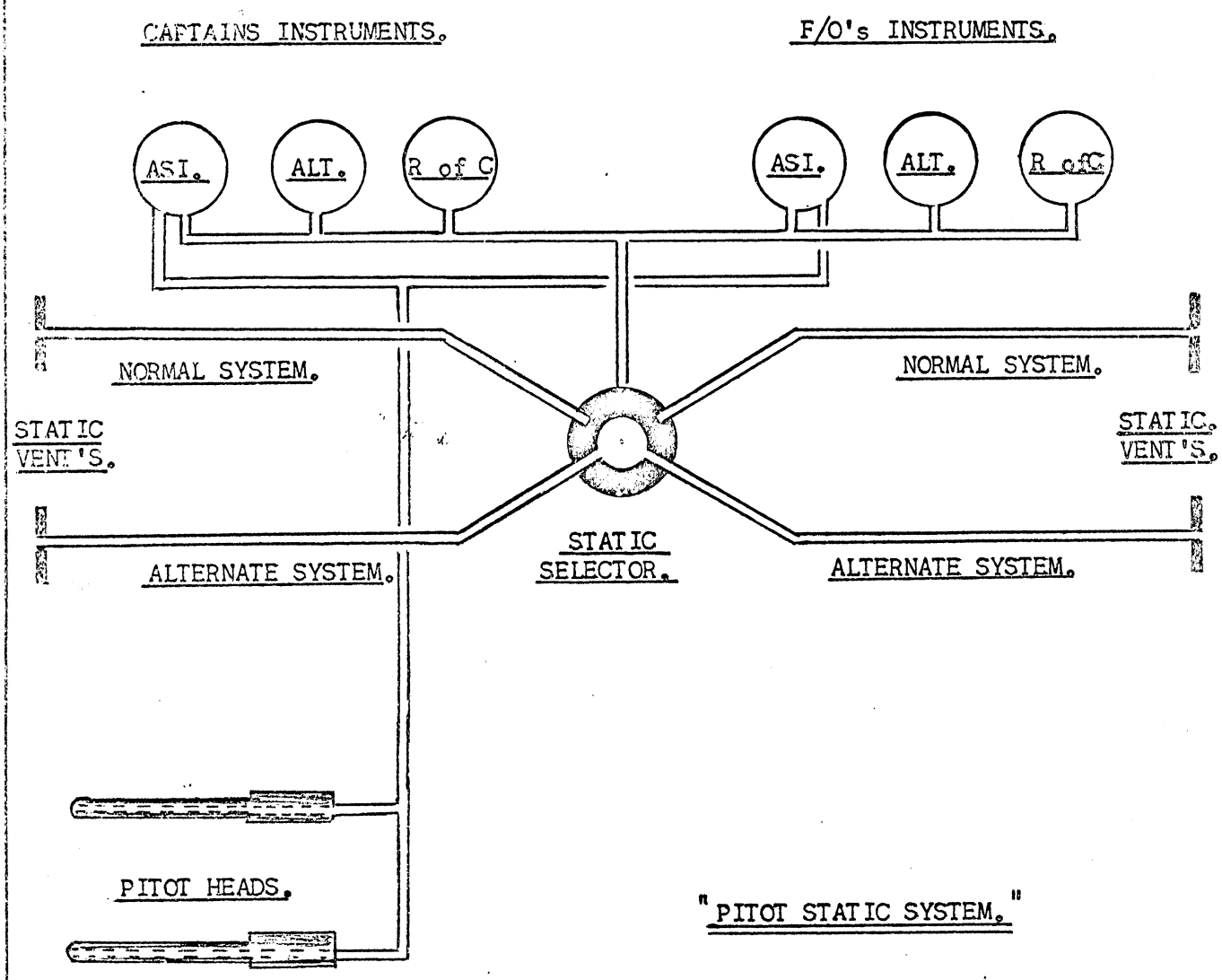
8.6.26. cont'd
Drains - Airspeed tubes are designed to operate satisfactorily under all operating conditions, including those in which rain and ice are encountered. Snoww and ice are melted by the heated element and the resulting water and rain are prevented from entering the connecting tubing by drain traps in the nose.
An accessible drain plus is incorporated in the lowest point of each system of connecting tubing to remove water which may have entered the connecting tubing, as well as water which may have condensed therein.

8.6.27 Vacuum System:
Description - A self-contained vacuum system is provided. The system is used to provide a vacuum for the gyro-pilot, and two gyroscopic flight instruments. Two engine-driven vacuum pumps, one on each starboard engine, provide the vacuum source. A vacuum regulator provides a control over the system. This is an adjustable valve and should be set to maintain a vacuum of four in Hg. at the instrument panel, when the airplane engines are at cruising rpm.
A check valve is located in the vacuum line to each pump. In the event of an vacuum pump failure no manual selection is necessary as these check valves make change over automatic.

The vacuum lines extend to a vacuum control valve, which also act as a distributor manifold. The valve on the left side of the panel controls the pressure for the pilot's turn and bank indicator. The valve on the right side of the panel controls the vacuum to the gyro pilot, and the co-pilot's turn and bank indicator. Needle valves are located on the vacuum control valve outlet to the turn and bank indicators to reduce the vacuum from four in Hg. to 1.9 in. Hg.
An air filter is located beneath the instrument panel to provide filtered air for the gyropilot.

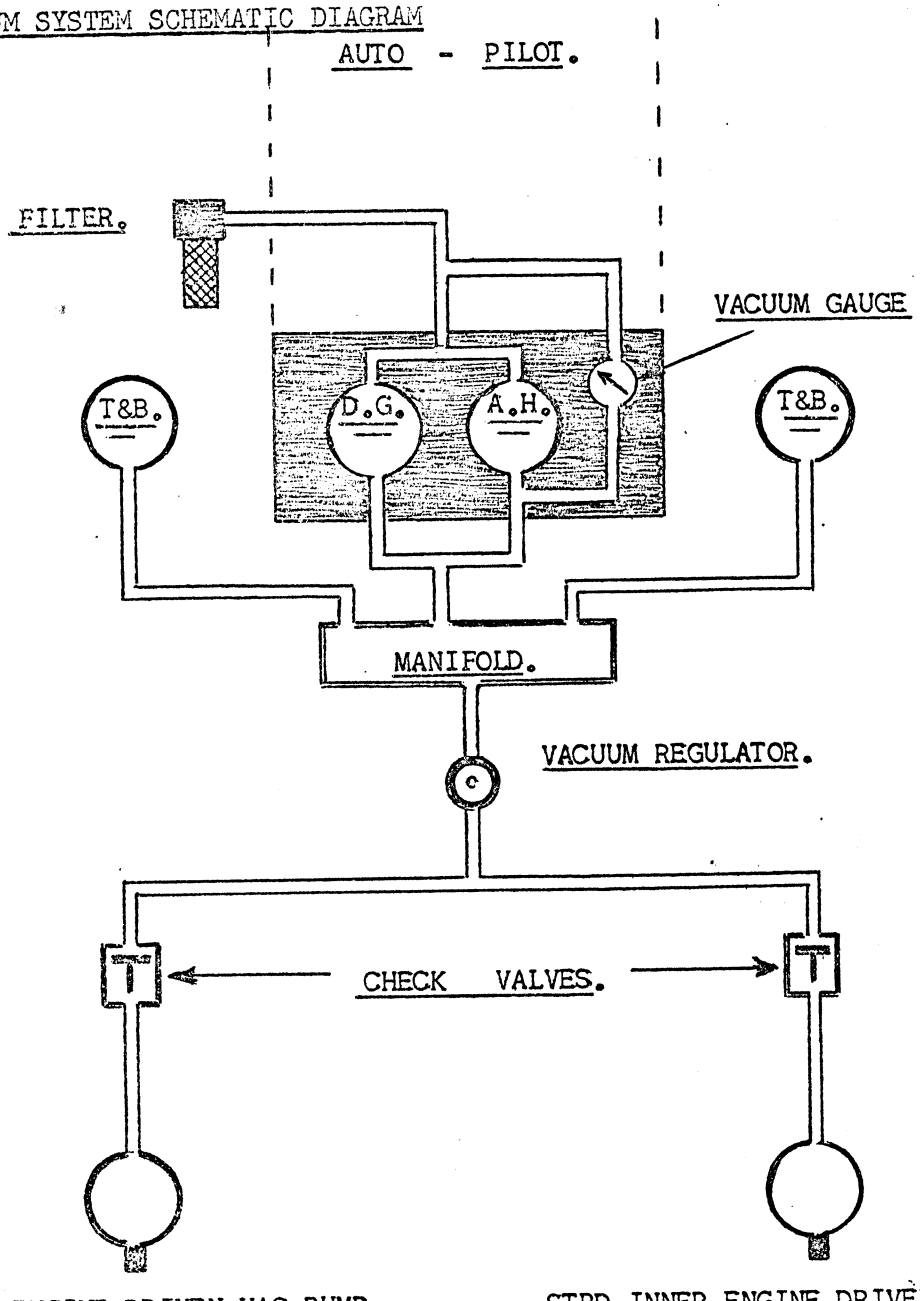
8.6.28 Vacuum gauge:
A differential gauge is fitted to the auto pilot box which measures the pressure differential between filtered air led into the box and the low pressure inside the box, it is also effected by airflow through the box, therefore if the filter becomes blocked the airflow will fall off and the differential pressure will fall and a lower indication will be read.

8.6.29 PITOT STATIC SYSTEM SCHEMATIC DIAGRAM



"PITOT STATIC SYSTEM."

8.6.30 VACUUM SYSTEM SCHEMATIC DIAGRAM



" VACUUM SYSTEM."

8. GENERAL PARTICULARS: (CONT'D)

8.7. FIRE CONTROL SYSTEM:

8.7.1. Components:

The fire control system consists of four essential parts:-

1. Detecting and indicating system.
2. Prevention of combustible fluids reaching fire.
3. Localizing of fire.
4. Extinguishant system.

8.7.2. Detecting and Indicating System:
This system comprises detectors, which are situated at strategic points around the engine and in the nacelle; these detectors are connected in series and connected with a sensitive relay.

Local heating of any detector generates sufficient electric current to close the sensitive relay. When this relay closes it completes the circuit with the aircraft electrical system and switches on warning lights and a warning bell.

Test of System:
A test and reset circuit is incorporated, the operating switches are located on the pilot's header panel and are suitably identified.

1. To check the operation of the fire detector system hold the switch to the position marked "test", when all four warning lights come on and the audible warning bell is heard, release switch which is spring loaded.
2. To "Reset" system, operate switch "Reset" when all lights should go out and audible warning should cease.

False Alarm: (Treat all alarms as genuine)
When the fire detecting system alarms, immediately complete the appropriate fire drill in accordance with the procedures listed in Section 5.

8.7.3. Prevention of Combustible liquids Reaching an Engine Fire:
Valves (F.W.S.O.V's) have been fitted in each nacelle to shut off fuel, engine oil and hydraulic oil in the event of fire. These valves are interconnected and are worked manually by a single control for each engine. As the nacelle shut-off valves cut off lubricating oil as well as fuel, it

8. GENERAL PARTICULARS: (CONT'D)
8.7. FIRE CONTROL SYSTEM (CONT'D)

8.7.3. cont'd
is obvious they must not be closed with the motor turning over.

8.7.4. Localizing of Fire:
To prevent fire reaching the aircraft structure from the motors, all holes in the bulkhead and firewall have been replaced with fire resistant materials.

8.7.5. Fire Extinguisher System:
Is of the two shot type and each of the two bottles are fired independently.

The firing switches are located on the pilot's header panel and are suitably identified, i.e.

"P.O. 1 & 2 etc".

the bottles themselves are located on the front spar at the rear of each engine.

The bottles containing methyl bromide are discharged electrically by the closing of contacts of a switch by the pilot. The bottle (2 off in each engine) is a solid drawn copper container containing 6 pounds of methyl bromide and pressurised to 100 p.s.i. at zero degree centigrade by the addition of dry nitrogen. The bottle is mounted in a head down position. The head is provided with an integral annular diaphragm, varying a concentric spigot to which a charge plug is screwed. The space between the diaphragm and charge plug contains an explosive charge which is fired electrically.

DISCHARGE: No.1 Methyl bromide bottle is discharged first then the second bottle. It is exhausted to zone 2 and the carburettor air intake manifold. The contents of all Methyl Bromide bottles are checked by weighing the bottles and are checked at six monthly intervals. The maximum weight of each bottle when fully charged, is stamped on the side of the bottle.

8.7.6. Location of Hand Extinguishers:

In each passenger compartment one (1) CO_2 bottle and one (1) water container.

8. GENERAL PARTICULARS. (CONT'D)

8.7. FIRE CONTROL SYSTEM.

8.7.6. (Cont'd)

Flight Deck one (1) CO^2 adjacent to flight engineers seat.

See diagram in section 5 showing location of Fire Extinguisher.

8.8. FLIGHT CONTROLS.

8.8.1. Limiting Stops For Control Surface Movement:

Ailerons, Elevators, & Rudder. Mechanical stops are incorporated in the gust lock mechanism. Each control is fitted with a limit stop so that when full travel is obtained with the control column 3/32" clearance is obtained on the full travel stop of the control itself.

8.8.2. Flight Control Gust Lock.

Operated from the Flight Deck by means of a pronged control which can lock all flight controls either in the Full Up, Full Down or Neutral position.

8.8.3. Control Surfaces: (Setting and range of movement).

Aileron Setting.....0° - 30' Up.
Aileron Movement.....18° - 30' Each Way.
Elevator Movement.....19° - 30' Each Way.
Rudder Movement.....22° - 30' Each Way.
Elevator Trim Tab Movement.....14° - 0' Each Way.
Rudder Trim Tab.Movement.....14° - 0' Each Way.
Flap Movement.....25° - 0' Down.

8.8.4. Trim Tab Mechanism.

Elevator and Rudder: Consist of crank handles and sprockets mounted in the cockpit roof. These manual controls serve to operate control cables and chains which in turn operate the tabs themselves thus allow-allowing adjustments to the elevator and rudder trim.

Ailerons: Two fixed tabs are fitted to each aileron , these are pre-set and are not controllable from the cockpit.

8.9. AIR CONDITIONING.

8.9.1. Heating System. (Janitrol Heaters).

Sequence Of Operation.

Outside air is drawn into the heating units via two ducts , one on each side of the nose of the aircraft forward of the cockpit, the air then passes around the two heating units.

8. GENERAL PARTICULARS. (CONT'D)

8.9. AIR CONDITIONING. (CONT'D)

8.9.1. (cont'd)

Fuel for the heater systems is supplied from the stbd inner engine. The electrical control system is as follows: When the heater master S/W on the flight engineers panel is closed an electrically operated fuel solenoid valve situated in the S.I. engine nacelle opens and allows fuel to the heater system. At the same time and providing the aircraft has attained a speed in excess of 104 Kts the air-pressure micro switch contacts will have closed and the system is ready for starting. (NOTE. The micro switches are positioned in the heater ducting and will only operate when the pilot operated air duct valves are manually opened.)

Final starting of the heaters is accomplished by pressing of the START button located on the flight engineers panel , when the button is pressed the circuit is completed , the heater fuel supply valve is open , and the igniter operating. (The control lights situated on the flight engineers panel are now indicating:- RED Fuel Pressure Warning Light OFF. , GREEN Normal Operating Light ON. , RED Igniter Warning Light ON.)

When the duct temperature reaches 120°C the RED Igniter Warning Light will go OFF thus indicating that the igniter has cut out and the system is operating normally.

NOTE. Should for any reason the flame in the heater combustion unit be extinguished the RED igniter warning light will again come ON , and it will be necessary to press the START button for continued operation of the heater.

If due to malfunction of the system the temperature of the heated air should reach 350°C the contacts in the OVER-HEAT SWITCH will OPEN , thus breaking the supply to the main relay , which in turn closes the fuel solenoid in the fuel distribution panel and so closing down combustion. Whilst the temperature remains in excess of 350°C no indicating lights will show on the control panel , however providing the master switch is in the on position the RED and GREEN lights will indicate when the duct temperature has fallen within the normal operating range. (NOTE: no attempt should be made to restart the heater until the cause of the OVER-HEAT condition has been asertained).

Should the heaters be inadvertently left ON prior to landing the air-pressure micro switch contacts will open when the airspeed drops to below 104 Kts , thus breaking the supply to the Master Relay and closing down the system.

Method Of Operation: For port or starboard heater.

(a) Open Air Duct Valve. (Below pilots seat).

(b) Turn on Master Switch, check that fuel pressure warning goes out. (Fuel is delivered at engine fuel pressure 16 - 18 lbs sq in.

8. GENERAL PARTICULARS
8.9. AIR CONDITIONING (CONT'D)

8.9.1. Cont'd.

(c) Press fuel igniter button, the green and red lights should light. If after a period of 3 minutes, the red light is still on -- heater must be considered unserviceable and turned off.

NOTE: Green light - normal operation
Red light - ignitor alight

IF the fuel pressure warning light comes on indicating low fuel pressure, heater is to be turned off. Heating system should not be used below 104 knots.

8.9.2. Ventilating System:
Ventilation may be obtained though the "Air Vent" system. Air enters via a controllable duct situated between the port inner engine nacelle and the hull on the leading edge of the wing root.

The control for the system is a lever on the flight engineers control panel. Air is then ducted to adjustable louvres above each passenger seat.

Ventilation may also be utilised through the heater channels by selecting the main air duct "ON" for either port or starboard system, situated below each pilots seat. Fresh air is then ducted through the cabin's via the normal heating channels.

8.9.3. Cabin and Toilet Extraction System
Extraction ducts, located throughout the cabins, galley and toilets draw air continuously from the aircraft via a vent located on top of the leading edge of the port wing root.

During smoke or fumes evacuation, toilet doors should be open to afford maximum extraction throughout the aircraft.

8.9.4. Cabin Air Conditioning:
Aircraft in the air:
1. If the weather is warm to hot check "air vent" control open, all cabin louvres open, cabin fans "ON" and main air ducts port and starboard of the heating channels "OPEN".

8. GENERAL PARTICULARS CONT'D

8.9. CONT'D.

8.9.4. CONT'D.

2. Draw curtains to exclude rays of sun.
3. With the Captains permission the door between the upper deck passenger cabin and the Flight Deck may be opened to induce a cooling draft through the cabin and hence to atmosphere via any open cockpit windows.

Aircraft on the ground:
In hot weather conditions all hatches, port holes, entrance doors and windows should be left open while the aircraft is on the water to assist in providing cooling draft. Frequent use of a cabin spray will help give an impression of coolness by means of deoderant.

8.10. ANTI-ICING SYSTEM:

8.10.1. General:

Aerofoils:	Nil
Airscrews:	Nil
Carburettors:	Hot air only controlled from flight engineers panel.
Pitot Heads:	Electrical heating switch on pilot's header panel.

8.10.2. Windscreen Wipers:
Two electric motors drive an independent hydraulic pump at the base of each wiper unit. One located on the port outer cockpit windscreen panel and oneon the starboard outer windscreen panel.

A seperate rheostat for each windscreen wiper is located on the cockpit instrument panel to vary the speed of operation.

8.11. OXYGEN SYSTEM

8.11.1. General:
Emergency supply only carried, ANO sets out provisions and use of oxygen.

Two portable oxygen bottles fitted with contents indicators and flowmeters calibrated in litres per min. are located in the Linen Locker., at the head of the rear passenger

8. GENERAL PARTICULARS (CONT'D)

8.11. Oxygen System (cont'd)

8.11.1. General (cont'd)

gangway. The masks for use with the portable bottle attach to the bottle and are disposable.

8.11.2. Method of checking

Prior to each flight, the oxygen bottles should be inspected to ensure that the contents are "FULL". Instructions to cover this are placarded on the bottle. Where oxygen is used, this must be noted on the trip record so that a bottle may be replaced with a full unit.

8.11.3. Method of use:

Hostesses are familiar with the method of fitting the disposable masks and adjusting the flow rate which in normal circumstances should be 3-5 litres per min. Each bottle has a normal supply to last 15 minutes.

NOTE: Pilots should note that an additional oxygen supply will have to be carried for flights planned in excess of 3 hours at altitudes between 8500 and 10400 feet. In no cases should flights be carried out in excess of 10400 feet, without oxygen.

8.12. PROPELLER GOVERNOR CONTROLS SYSTEM :

8.12.1. Propellors.

The aircraft is equipped with 3 paddle blade HAMILTON STANDARD full feathering, constant speed propellors the blade angle of which is controlled by the propeller governor so as to hold the engine speed constant to that selected, irrespective of changing flight conditions. The degree of blade angles being FINE PITCH 19° and FEATHERED 90° and the pitch change mechanism is contained within the dome which acts as a stationary cylinder in which a piston operates. Propeller blade adjustment is accomplished by engine oil being led to the front or rear of this piston which, by its forward and aft movement, causes the blades to change angle through a coaxial cam and gear arrangement. The reciprocating movement of the piston is transferred to a rotary movement of the gear by means of the co-axial cams and as this gear is in constant mesh with a bevel gear at the root end of each blade the blade angles are therefore changed by the movement of the piston relative to the dome. Three main forces work together to control the blade angle in flight.

8. GENERAL PARTICULARS (CONT'D)
8.12 PROPELLER GOVERNOR CONTROLS SYSTEM: (CONT'D)

8.12.1. (cont'd)

(a) Centrifugal twisting moment of the bladestoward fine pitch which is used to decrease the blade angle.

(b) Normal engine oil pressure to supplement this twisting moment at low engine speeds.

(c) Engine oil boosted by the governor booster pump to approximately 250 psi which moves the blades toward coarse pitch to increase the blade argle.

The governor, mounted on the reduction gear of the engine and driven by engine gearing, consists primarily of a pilot valve, an oil pump, a pair of flyweights, a speeder spring and an electric head. Tension of the speeder spring is varied by the electric head, which is controlled by means of a switch on the cockpit control pedestal, and a balance is established between the flyweights and the speeder spring. If this selective balance is not maintained the pilot valve will be raised or lowered so controlling the blade angle to maintain the RPM selected.

8.12.2. Constant Speed Operation:

Underspeed: When the engine speed drops below that for which the governor is selected, due to the aircraft taking a nose up attitude, the centrifugal loading of the flyweights falls off and the pilot valve is lowered under the force of the speeder spring. This action allows oil to drain away from the rear of the piston in the dome and permits the twisting moment, assisted by normal engine oil, to move the blades to a finer pitch until the engine RPMS are regained and the balance of the flyweights and speeder springs is re-established.

Overspeed: When the engine speed rises above that for which the governor is selected, due to the aircraft taking a nose down attitude, the centrifugal loading on the flyweights increase and overcomes the force of the speeder spring so raising the pilot valve. This action allows boosted governor pump oil pressure to be led to the rear of the piston in the dome which is sufficient to overcome twist-

8. GENERAL PARTICULARS.(CONT'D)

8.12. PROPELLER GOVERNOR CONTROLS SYSTEM.(CONT'D).

8.12.2. (con't)

ing moment and so move the piston forward to increase the blade angle , slowing down the engine until the balance of the flyweights and speeder spring is re-established.

Onspeed: In this position the pilot valve has blocked both ducts leading to the propeller and the blades are therefore maintained in their angle by a hydraulic lock.

8.12.3. Feathering.

The pressure is delivered by the governor booster pump is only sufficient for normal coarse pitch operating , this could be increased , but the reason for feathering may be complete loss of engine oil or a sheared governor drive shaft so the pressure required for feathering is obtained by means of an auxiliary pump (Feathering Pump). The feathering pump obtains its oil supply from a reserve of approx 1.75 gallons maintained in the bottom of each oil tank by means of a stand pipe and is activated by pressing the appropriate feathering button on the cockpit header panel. Pressing of the feathering button completes the circuit and activates the feathering pump (Electrically Driven) the oil is then fed via an external fire resistant line to the auxillary connection of the constant speed unit , where it moves an oil shuttle valve across to bypass the normal governor oil ducts. The feathering oil is then fed to the rear of the piston in the propeller dome moving the piston further forward until the major portion of the blades are parallel to the airflow , the feathering cut-out switch will then open thus breaking the circuit and stopping the feathering pump.

8.12.4. Unfeathering.

The feathering button is held"IN"to start the feathering pump once again , the oil pressure follows the same path to the governor , but before entering the dome moves an oil transfer valve in the oil transfer housing located in the propeller shaft so reversing the oil flow to the dome , thus directing oil to the front of the piston and so moving the blades towards the fine pitch setting.

8. GENERAL PARTICULARS. (CONT'D).

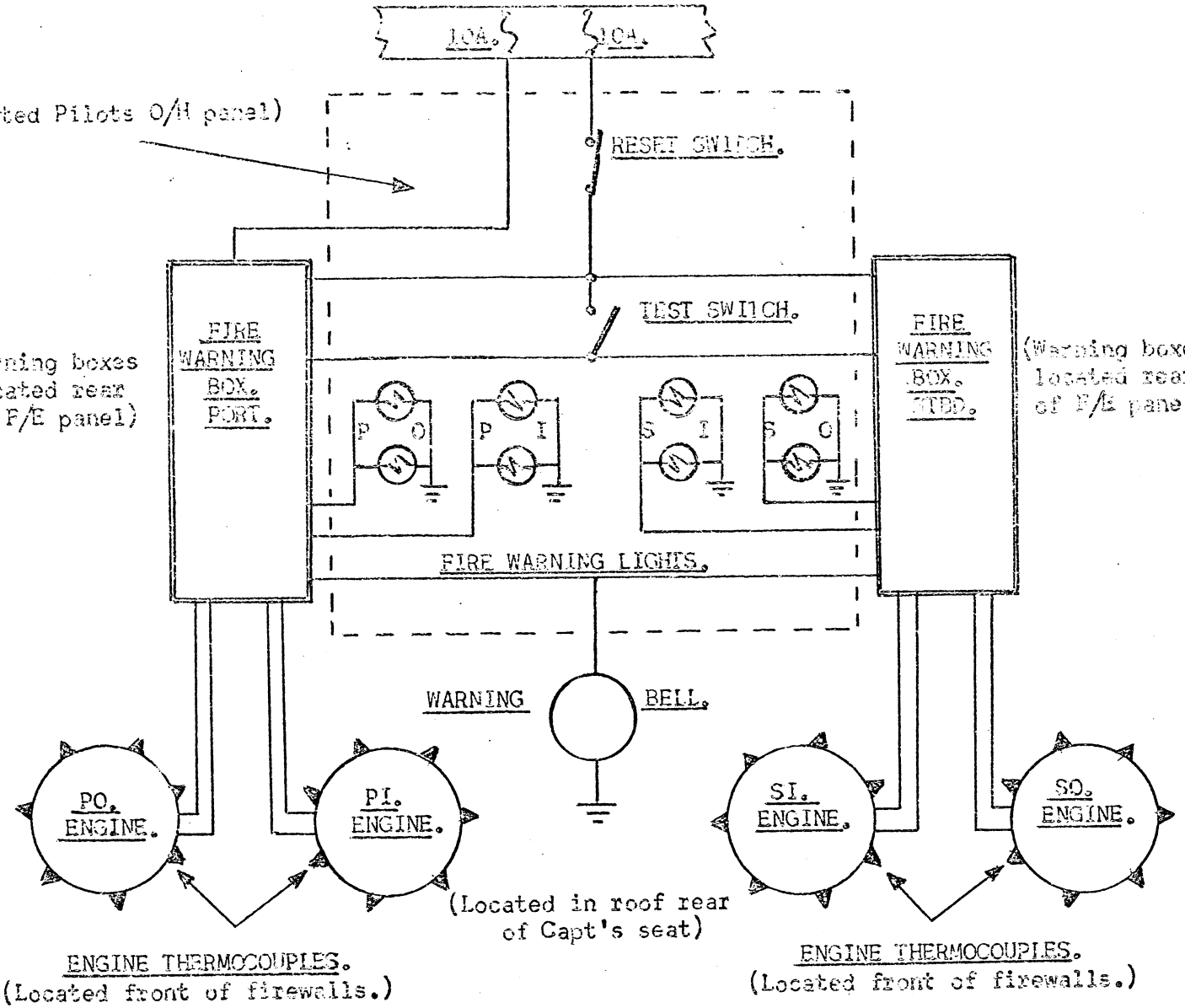
8.12. PROPELLER GOVERNOR CONTROLS SYSTEM. (CONT'D).

8.12.5. Manual Pitch Control.

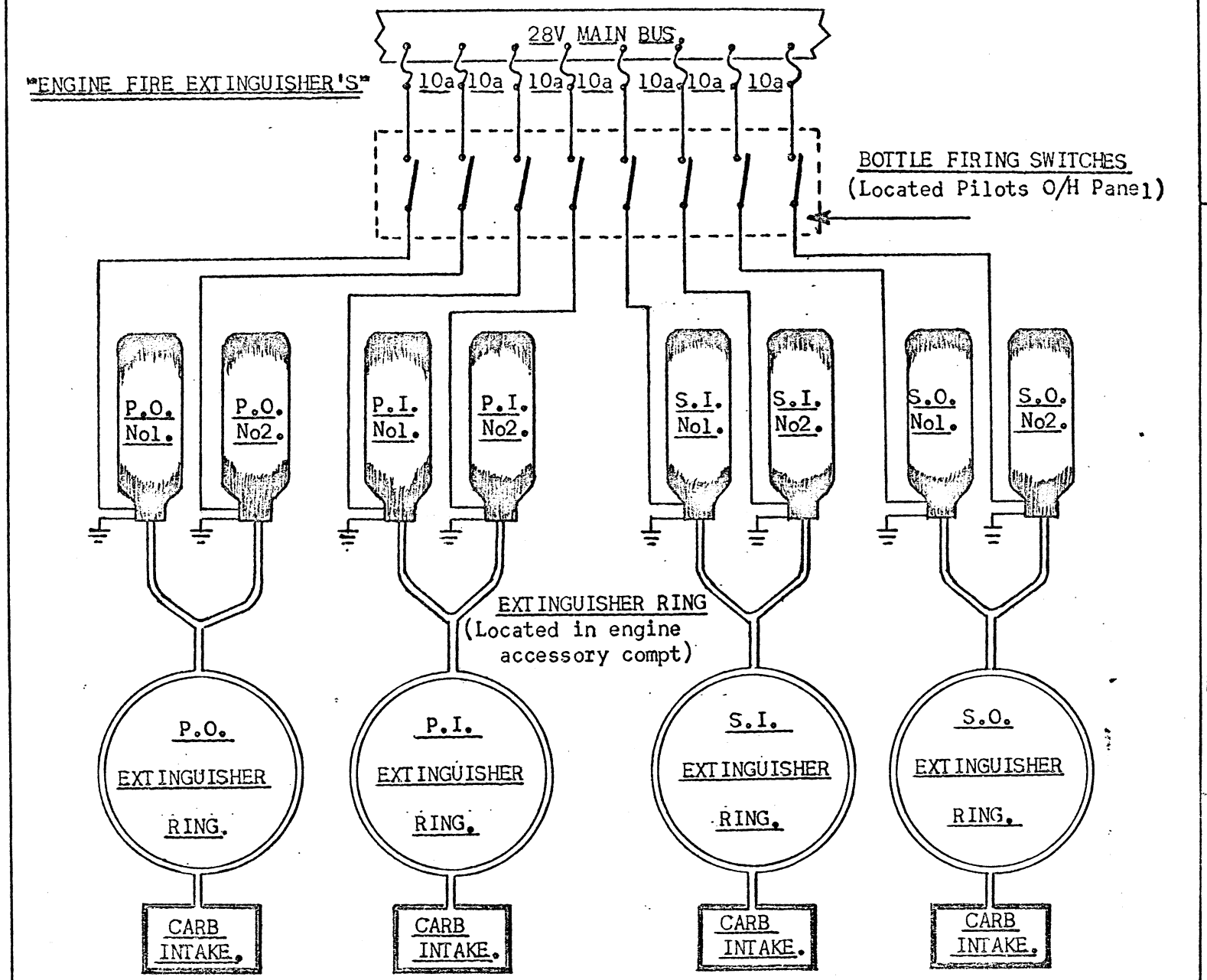
Each engine propeller governor is fitted with a Hamilton Standard Electric Control Head, operation of which is by means of a "Centre OFF" spring loaded switch located in the throttle pedestal immediately below the mixture controls.

A RED warning light is fitted adjacent to each of the four operating switches , and will indicate to show when either the "FULL FINE" or the "FULL COARSE" position is reached.

The pitch control operating switches may be operated individually , or all four together by making use of the connecting plate fitted above and below the switches.



"ENGINE FIRE DETECTION & TEST SYSTEM."


"ENGINE FIRE EXTINGUISHER'S"
28V MAIN BUS.
10a
10a
10a
10a
10a
10a
10a
BOTTLE FIRING SWITCHES
(Located Pilots O/H Panel)
P.O. No1.
P.O. No2.
P.I. No1.
P.I. No2.
S.I. No1.
S.I. No2.
S.O. No1.
S.O. No2.
EXTINGUISHER RING
(Located in engine accessory compt)
P.O. EXTINGUISHER RING.
P.I. EXTINGUISHER RING.
S.I. EXTINGUISHER RING.
S.O. EXTINGUISHER RING.
CARB INTAKE.
CARB INTAKE.
CARB INTAKE.
CARB INTAKE.

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Appendix
Page

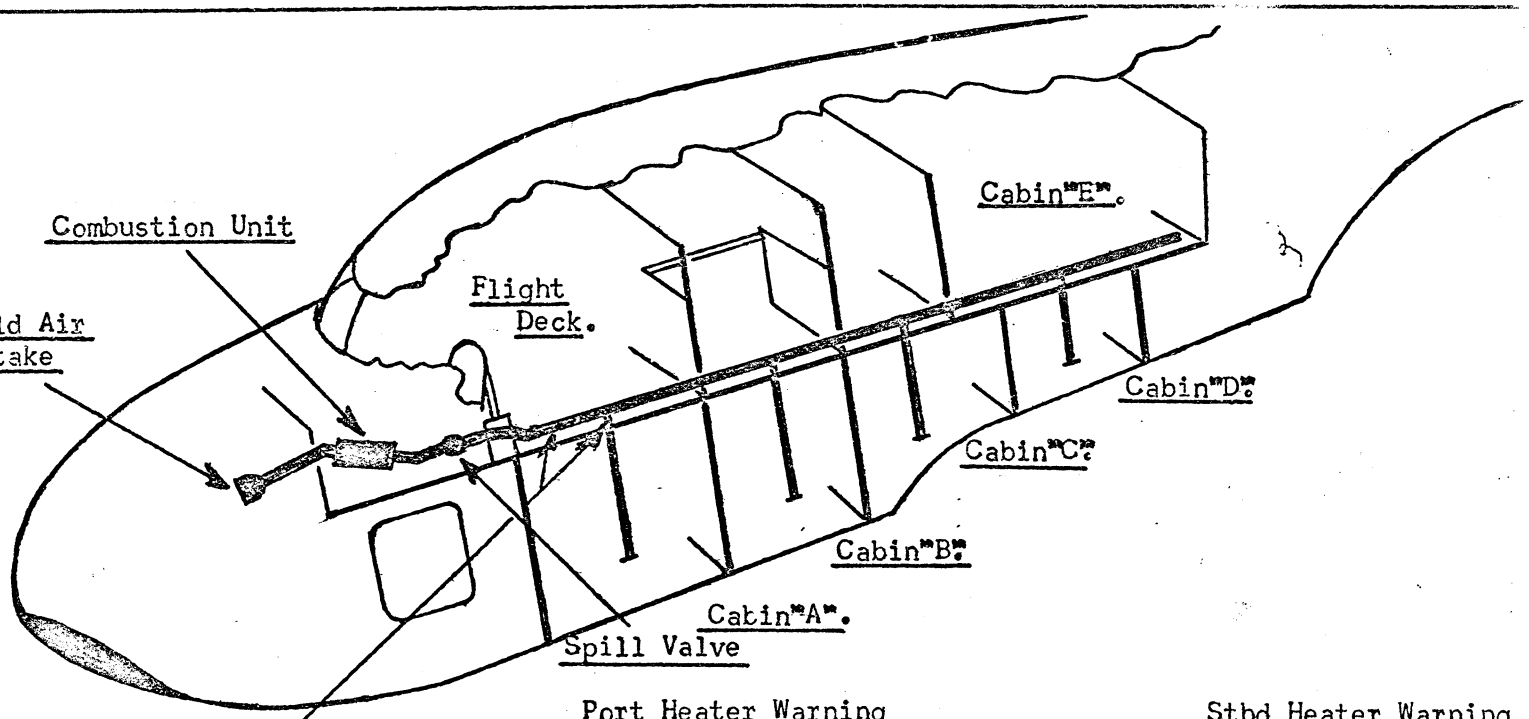
ANTILLES AIR BOATS LTD.

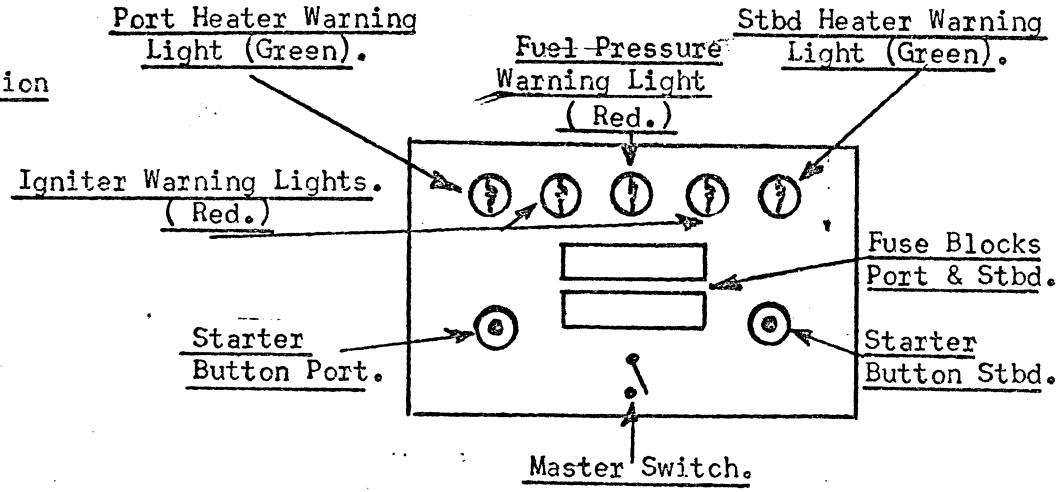
SANDRINGHAM S.25.

SYSTEMS.

CABIN HEATING.

SCHEMATIC DIAGRAM.





JANITROL HEATER CONTROL PANEL.

(Located at Flight Engineers panel)

" NOTE." 1.

Port heater shown in diagram Stbd heater is inentical.

" NOTE " 2.

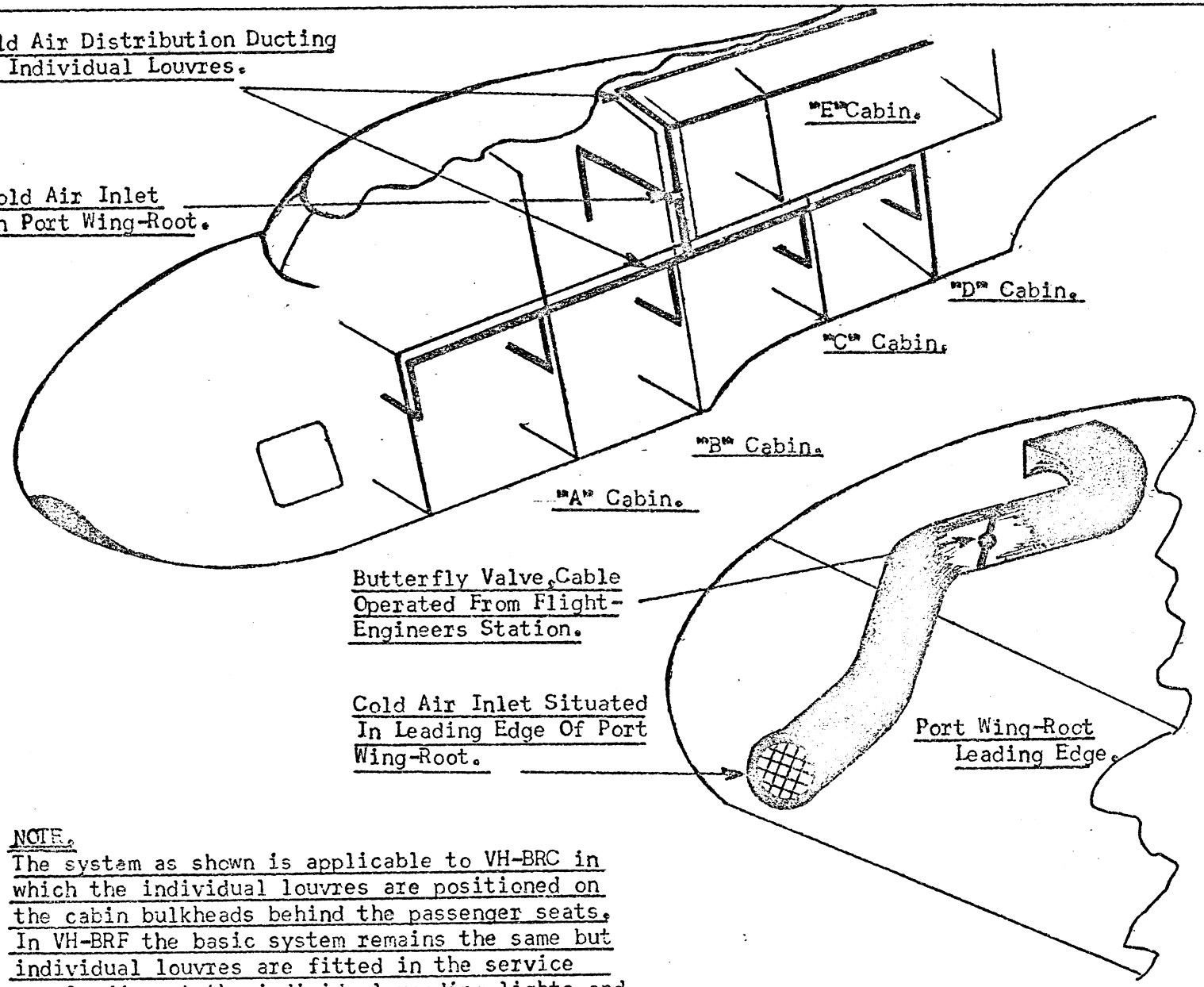
When janitrol master switch is operated, fuel shut-off solenoid situated in Stbd Inner engine nacelle is energised, allowing fuel to both heaters.

ANTILLES AIR BOATS LTD.

SANDRINGHAM. S.25.

SYSTEMS.

CABIN COOLING.



NOTE.

The system as shown is applicable to VH-BRC in which the individual louvres are positioned on the cabin bulkheads behind the passenger seats. In VH-BRF the basic system remains the same but individual louvres are fitted in the service panel adjacent the individual reading lights and run fore and aft along the cabin walls.

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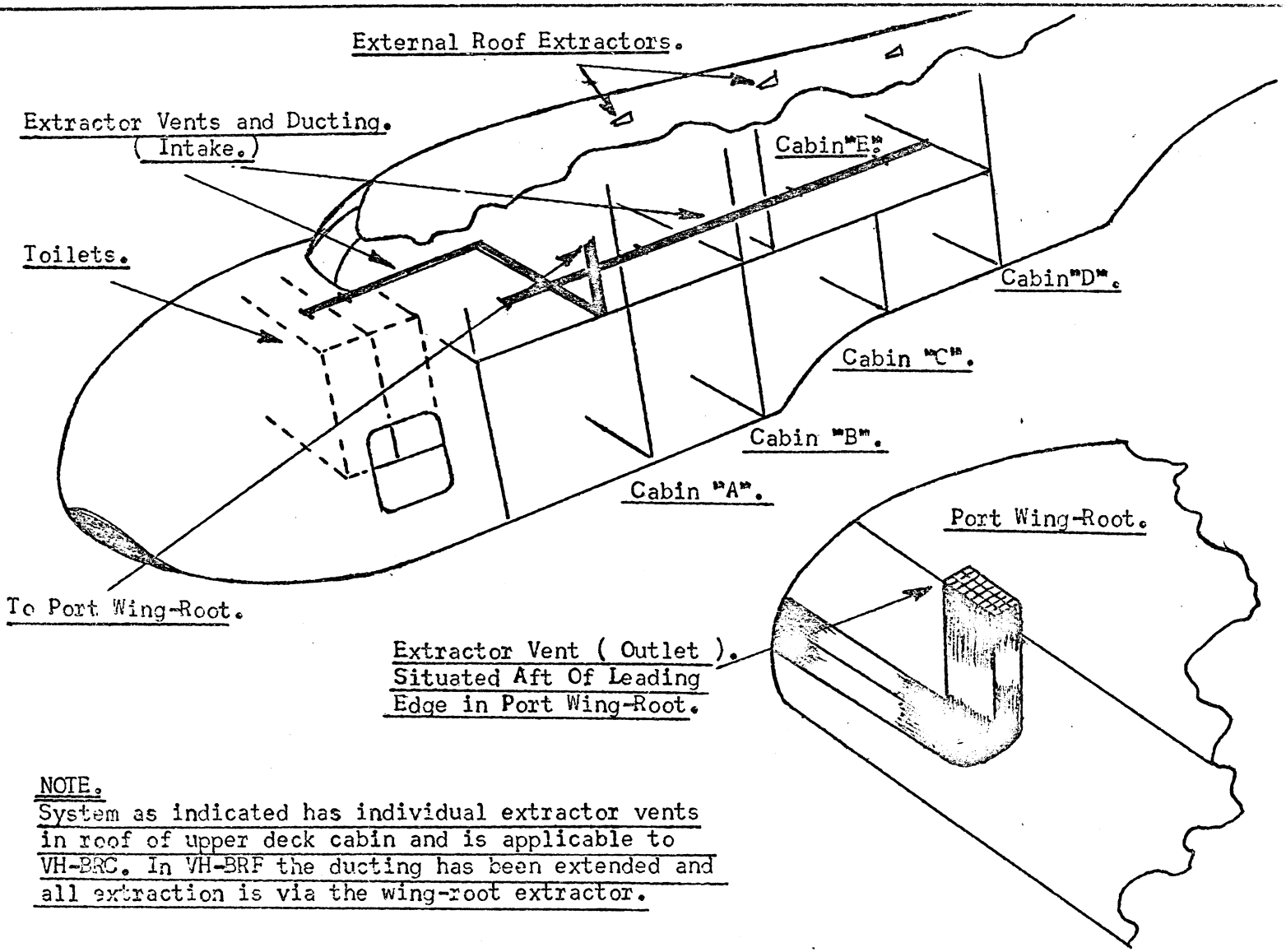
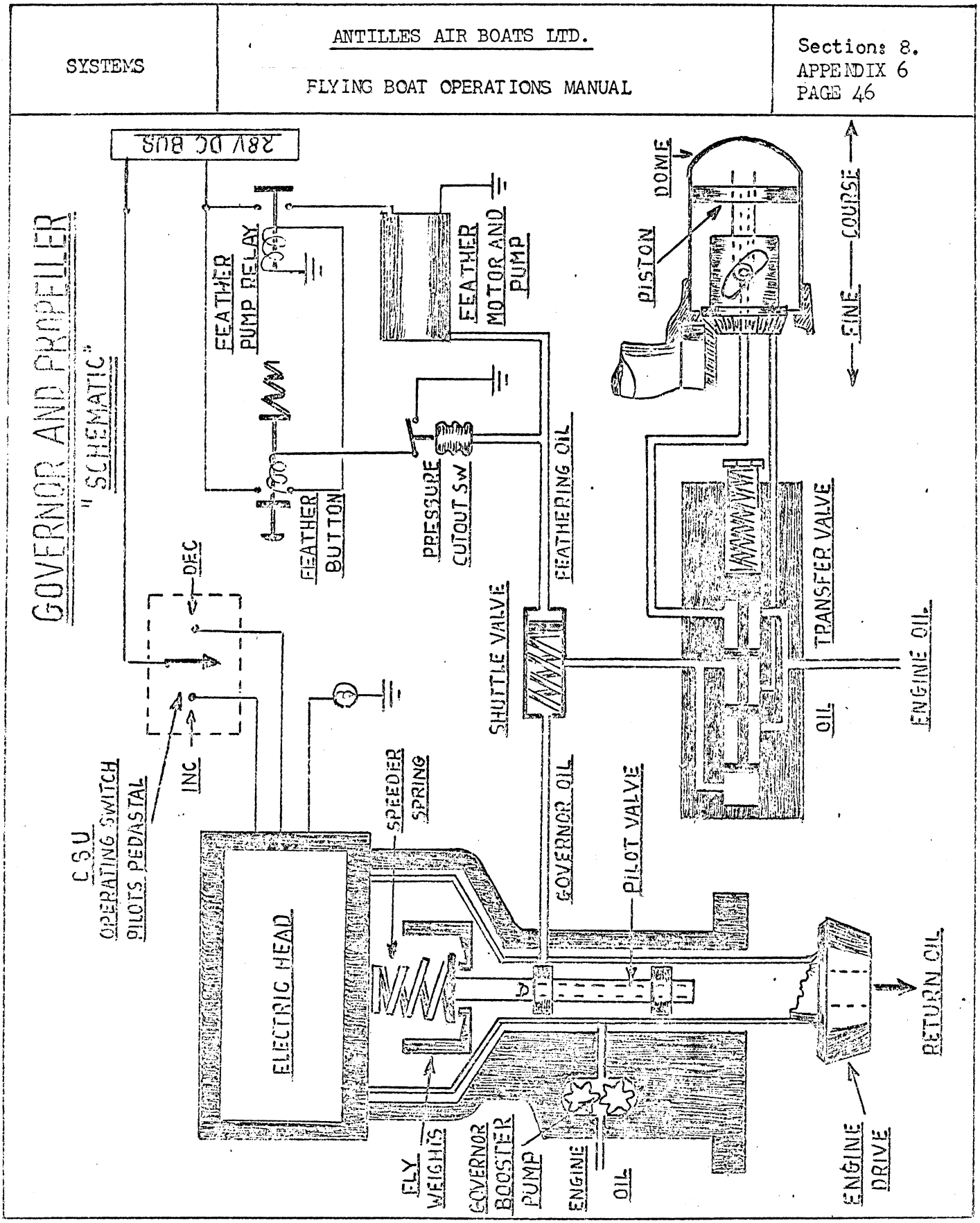
ANTILLES AIR BOATS LTD.

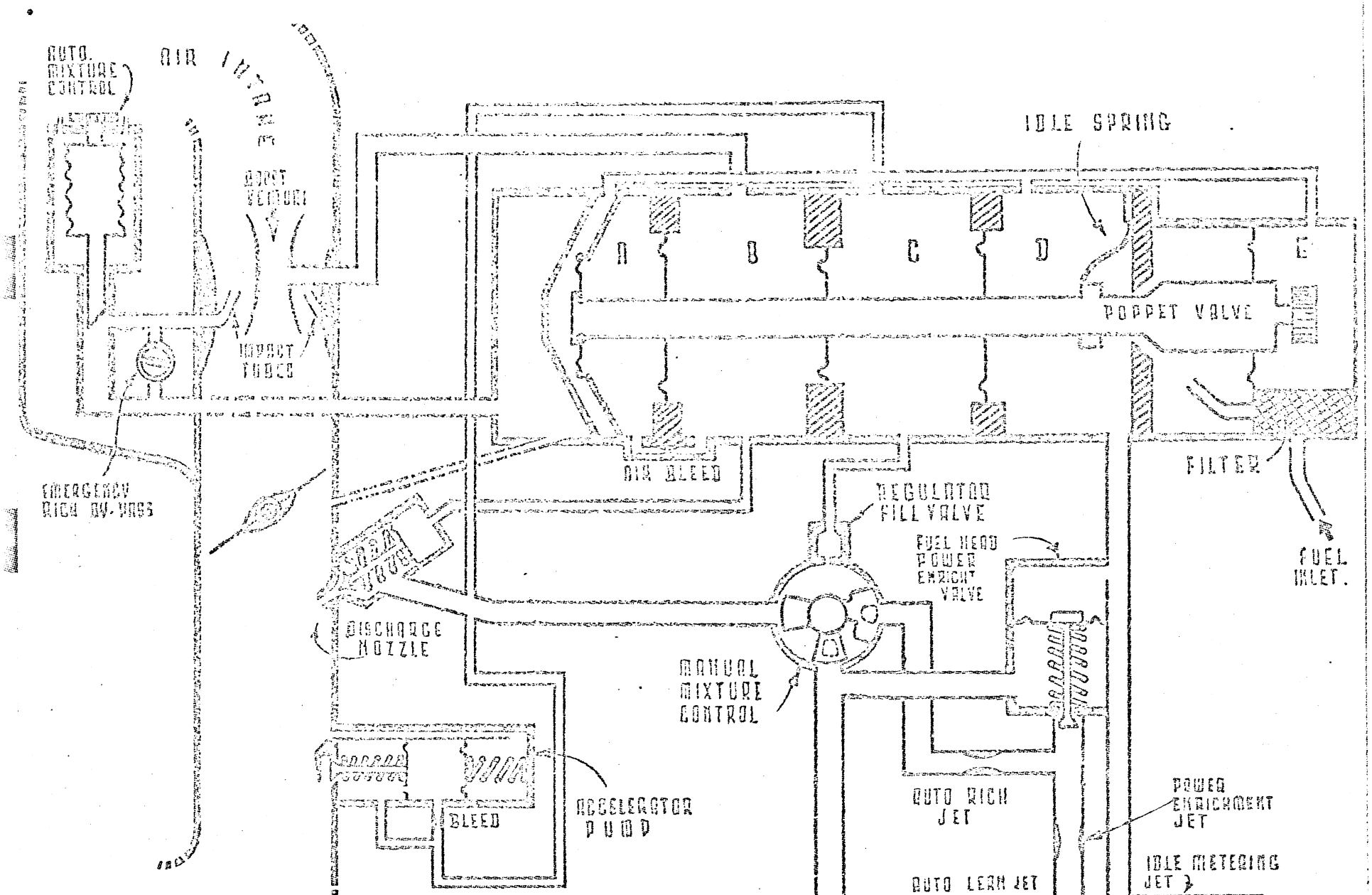
SANDRINGHAM S.25.

SYSTEMS.
CABIN EXTRACTION.
SCHEMATIC DIAGRAM.



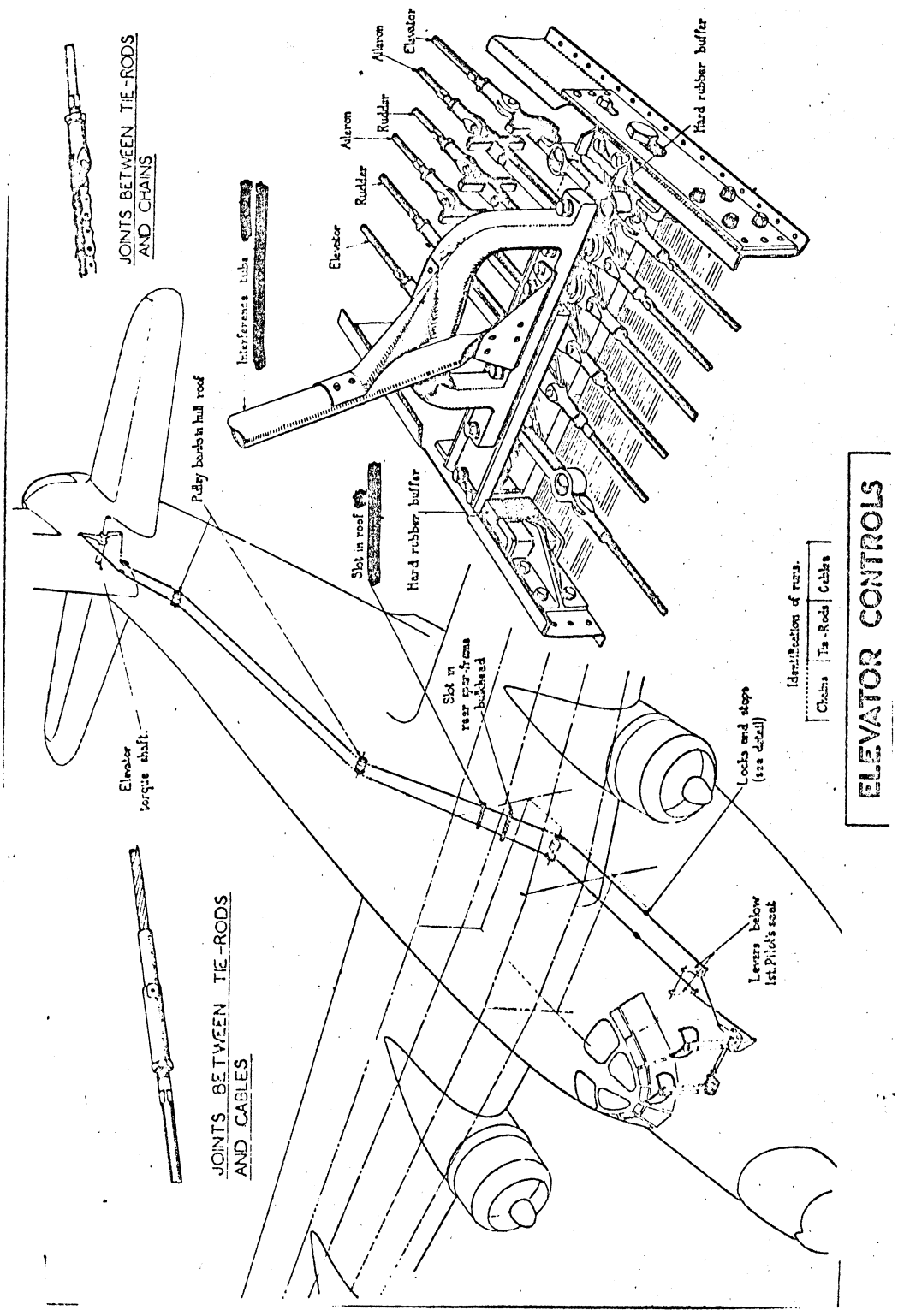
NOTE.
System as indicated has individual extractor vents in roof of upper deck cabin and is applicable to VH-BRC. In VH-BRF the ducting has been extended and all extraction is via the wing-root extractor.


GOVERNOR AND PROPELLER
"SCHEMATIC"
28V DC BUS
FEATHER PUMP RELAY
FEATHER MOTOR AND PUMP
DOME
PISTON
FINE
COURSE
FEATHER BUTTON
PRESSURE CUTOUT SW
FEATHERING OIL
DEC
INC
C S U
OPERATING SWITCH
PILOTS PEDASTAL
SHUTTLE VALVE
TRANSFER VALVE
OIL
ENGINE OIL
SPEEDER SPRING
GOVERNOR OIL
PILOT VALVE
ELECTRIC HEAD
RETURN OIL
FLY WEIGHTS
GOVERNOR BOOSTER PUMP
ENGINE OIL
ENGINE DRIVE



STROMBERG INJECTION CARBURETTOR - PDI2H

APPENDIX 8: ELEVATOR CONTROLS DIAGRAM:



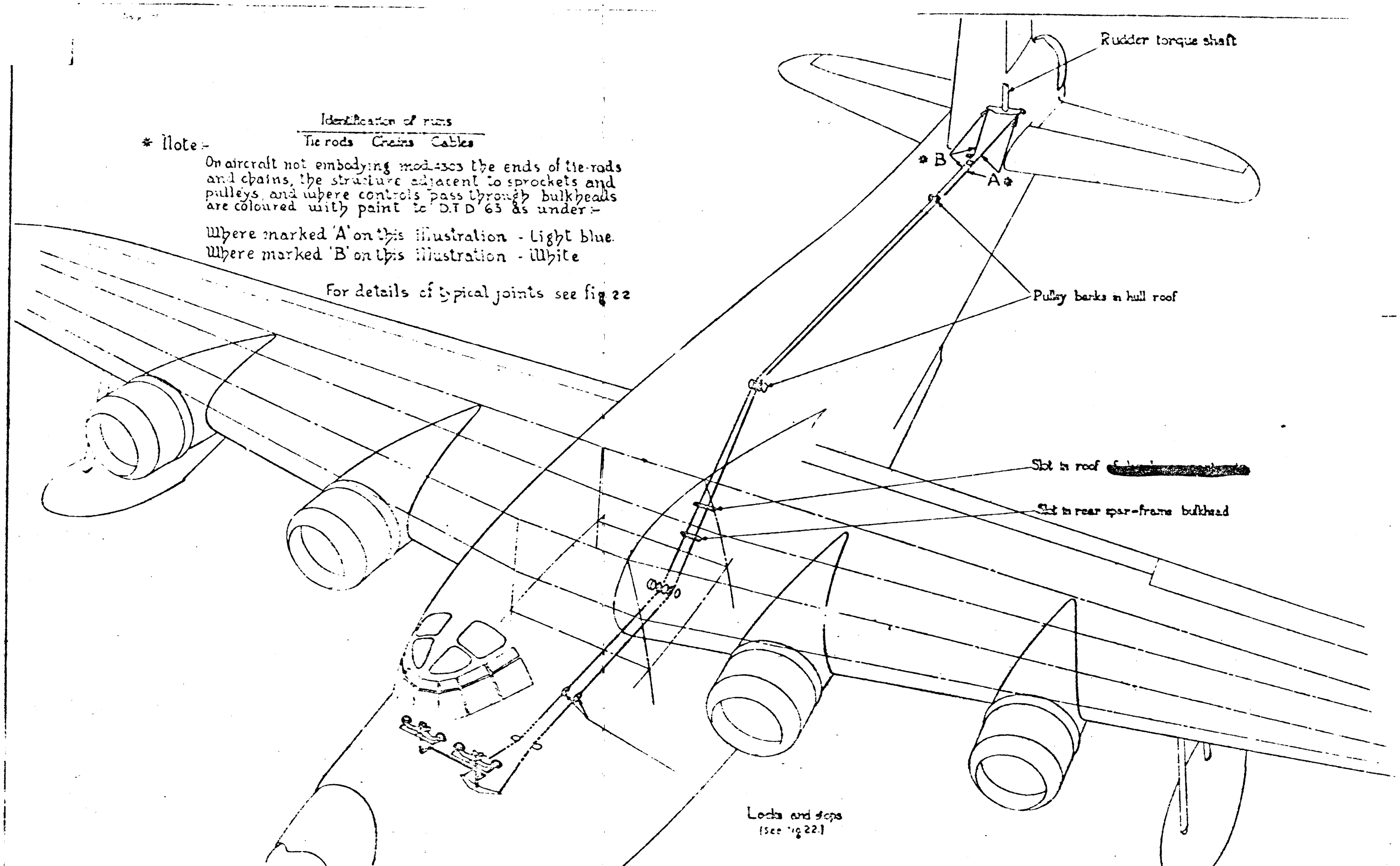
* Note :-

Identification of runs
Tie rods Chains Cables

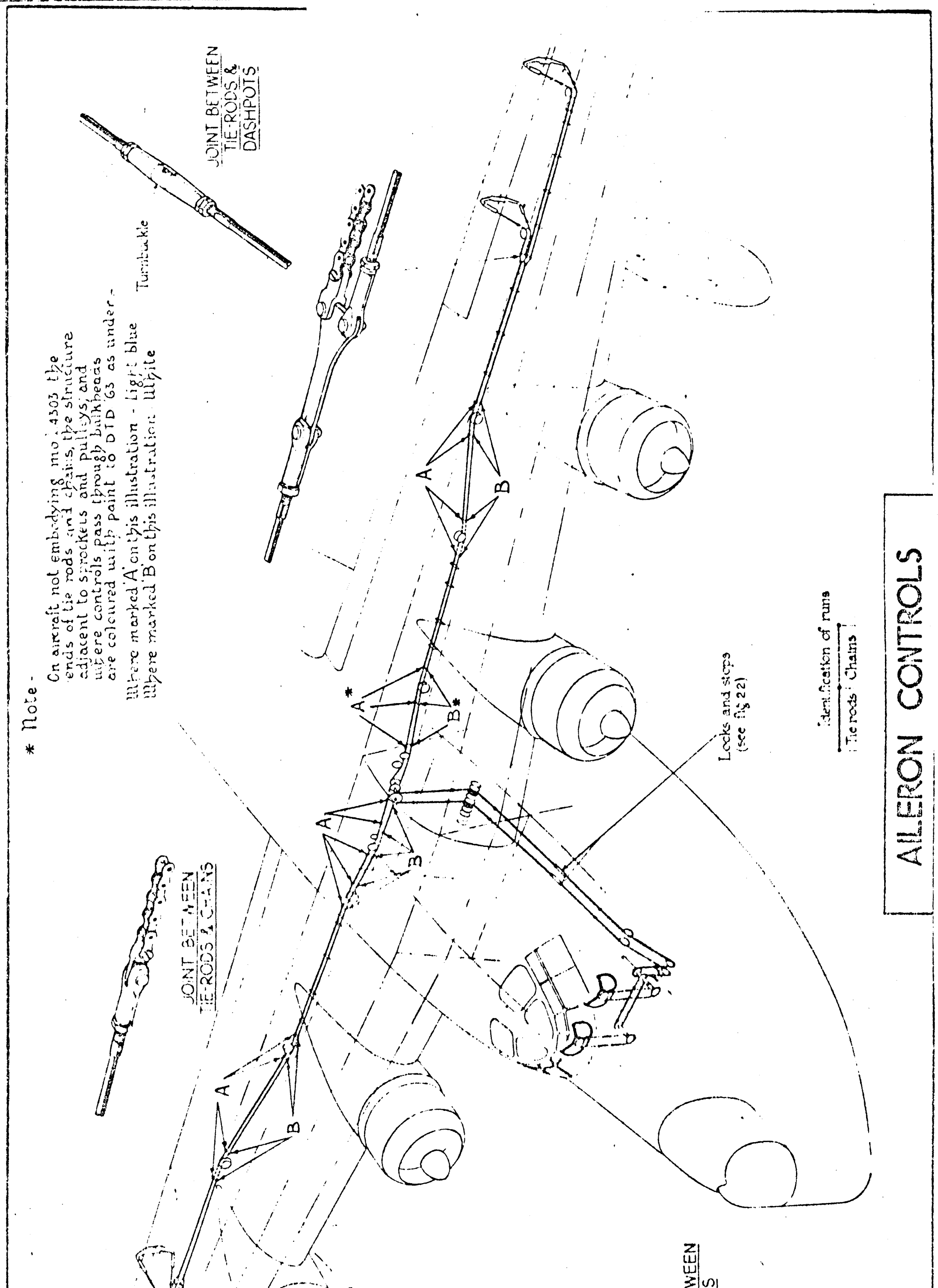
On aircraft not embodying mod.305 the ends of tie-rods and chains, the structure adjacent to sprockets and pulleys, and where controls pass through bulkheads are coloured with paint to D.T.D 63 as under:-

Where marked 'A' on this illustration - Light blue.
Where marked 'B' on this illustration - White

For details of typical joints see fig 22



RUDDER CONTROLS


AILERON CONTROLS
* Note -
On aircraft not embodying mod. 4303 the ends of tie rods and chains, the structure adjacent to sprockets and pulleys, and where controls pass through bulkheads are coloured with paint to DTD 63 as under -
Where marked 'A' on this illustration - light blue
Where marked 'B' on this illustration - White
Turnbuckle
JOINT BETWEEN TIE-RODS & DASHPOTS
JOINT BETWEEN TIE-RODS & CHAINS
JOINT BETWEEN CHAINS
Locks and stops (see fig 22)
Identification of runs
Tie rods' Chains
A
B
A*
B*

RADIO	ANTILLES AIR BOATS LTD. SANDRINGHAM S.25	SECTION 9 INDEX

9. RADIO

9.1. EQUIPMENT PROVIDED

9.1.1. General:

The basic installation comprises:-

(a) H.F. Communications transmitter (Type ART-13)
(b) H.F. Communications receiver (Type-RA-1B)
(c) H.F. Communications tranceiver (Type 18S4-A)
(d) VHF Communications transceiver (Type 618F-1A)
(e) Distance Measuring Equipment (Type KN 65)
(f) Two radio compass receivers (type MN-62A)
(g) VHF/NAV Receiver (type 51X-3A)
(h) 75 Mc/s Marker Receiver (type 51Z-4)
(i) Selector panels (type ACA-1A)
(j) Public Address Amplifier (type 346D-1)
(k) Tape recorder G-825

9.1.2. Communications System:

The communications equipment is divided into three distinct systems.

1. The No.1 H.F. communications transceiver (type 18 S 4) is operated by remote control from below the pilot's instrument panel.

2. The No.2 HF communications system consists of the (ART-13) transmitter (together with the power supplies) and the (RA-1B) receiver and power supplies and are located so that they can be operated directly from the cockpit.

3. The VHF system consists of the transceiver (type 618 F-1A) which provides multi-channel communication from 108-135 mc/s, and is controlled from the cockpit.

9.1.3. Navigational Systems:

The installation comprises:-

(a) The 51X-3A VHF-NAV. receiver which is remotely controlled from the cockpit. The indicator is mounted on the instrument panel.

(b) The 51Z-4 Marker receiver which is used in conjunction with the VHF/NAV receiver for the reception

9. RADIO (CONT'D)

9.1. EQUIPMENT PROVIDED (CONT'D)

9.1.3. cont 'd

of Marker Signals. The receiver is switched ON and OFF by means of the ON/OFF switch, and also incorporates a "HI-LO" sensitivity switch. Indication is by means of a lamp indicator unit mounted on the instrment panel.

(c) The two MN62A Radio Compass receivers are remotely controlled from the cockpit. The dual indicator is mounted on the Captain's instrument panel.

(d) The VAN-4 Distance Measuring Equipment (DME) is also remotely controlled from the cockpit. The Digital type indicator is mounted on the Captain's instrument panel.

9.2. DISPOSITION OF EQUIPMENT

9.2.1. Primary Units:
The various primary units are located in the radio rack on the starboard side of the fuselage aft of the cockpit, except for the H.F. receiver type 18S4 which is located on the port side of the fuselage at approximately Frame 13.

9.2.2. Remote Controls:
A description of the use of the various remote controls is included in Section 9.3.

The location of remote controls is as follows:

1. Jackboxes:
These are locate on the left and right hand sides of the cockpit beneath the Pilot's and Co-Pilot's windows, and the Flight Engineers Station and provide for the selection of any particular facility or facilities, by either or both pilots, or the Flight Engineer.

Headsets and microphones are plugged into the jacks provided.

9. RADIO (CONT'D)
9.2. DISPOSITION OF EQUIPMENT (CONT'D)

9.2.2. Cont'd.

2. HF Systems:
The remote control for the No.1 HF transceiver is located on the right-hand side of the cockpit. The HF 2 transmitter and receiver are located behind the Co-Pilot's seat.

3. VHF Systems:
The remote control for the 618 F-1A transceiver is on the starboard side below the instrument panel.

4. D.M.E.
The controls for the KN 65 DME equipment are located below the instrument panel oh the left hand side of the cockpit.

5. Radio Compass Receiver:
The remote control for the red radio compass is mounted on the extreme left of the instrument panel. The remote control for the green compass is mounted on the extremem right of the instrument panel.

6. VHF/NAV Receiver:
The remote controls for the VHF/NAV receiver are located on the instrument panel in front of the Captain.

7. 51Z-4 Marker Receiver:
The only remote controls for this receiver is the ON/OFF switch "HI/LO" sensitivity switch located on the VHF/NAV unit, which is mounted on the instrument panel.

9.2.3. Power Supplies and Fuses:

1. The equipments are all primarily supplied by the Ship's 24-28V DC supply. The radio compass and VAN 4 receivers are also supplied from a 115V 400 cycle AC Inverter which is powered by the Ship's 24-28V DC supply.

2. The primary power circuits are generally protected by fuses, the HF, VHF compass and range equipment fuses and circuit breakers are located in

9. RADIO (CONT'D)
9.2. DISPOSITION OF EQUIPMENT (CONT'D)

9.2.3. cont'd.

the radio fuse box aft of the radio rack.

Additional circuit breakers and fuses for the No.2 HF transmitter is mounted on the power supply. An H.T. fuse for the No.2 HF receiver is mounted under the power supply.

The procedure to be adopted in the checking of these fuses is set out in Section 9.5. in the sub-section relevant to each equipment. Spare fuses are carried on the cover of the Radio Junction Box.

The Radio Master Switch controls a relay which supplies 28V.DC to all radio equipment. The Radio Master Circuit is fused by means of the "Radio Master Solenoid" fuse (5 amp), on the radio fuse panel. Failure of this fuse would cause failure of all radio equipment.

The amplifiers contained in the ACA1A Jackboxes operate from the Ship's 28V.DC supply, through a 5 amp fuse located in the radio junction box. Failure of this fuse would cause failure of isolation and intercom facilities at both jackboxes, and "Emergency" operation only of the jackboxes would be available.

9.2.4. Aerial System:

9.2.4.1. HF Communications:
The aerials used in conjunction with No.1. HF Transceiver and the No.2 HF transmitter and receiver is a single wire and runs above the fuselage from a mast above the radio compartment to the top of the tail fin.

9.2.4.2. VHF Communcations:
The aerial used in conjunction with the VHF transceiver is a VHF sword and is located the top centre of the fuselage aft of the wing.

9.2.4.3. Radio Compass:
Two aerials are used with each radio compass receiver. The automatic loop aerials are mounted at the top centre of the fuselage just forward of wing, and the single wire,

9. RADIO Cont'd

9.2. DISPOSITION OF EQUIPMENT (CONT'D)

9.2.4. cont'd.

9.2.4.3. Cont'd

sense aerials are mounted adjacent to the loops.

9.2.4.4. D.M.E.
The D.M.E. aerial is a stub aerial located on the top of the fuselage aft of the wing.

9.2.4.5. 51X-3A VHF/NAV Receiver:

The aerial VHF/NAV receiver is above the cockpit roof.

9.2.4.6. 51Z-4 Marker Receiver:
The aerial for this receiver is mounted under the wing behind the No.2 engine.

9.3. OPERATION OF EQUIPMENT:
The entire radio installation is normally operated from the cockpit by the appropriate remote controls and crew station jackboxes.

9.3.1. ACA1A Jackboxes
The jackboxes adjacent to each pilot provides for the selection of the audio outputs of any of the aircraft's radio equipment, voice modulation of either HF or VHF transmitters, and for intercommunication between Pilot, Co-Pilot and Flight Engineer.

The type ACA1A jackbox contains a combined Isolation and Inter-communication amplifier.

Any combination of receiver outputs may be selected at each box without interference with those selected at the other.

Jacks are provided for the connection of headsets and microphones. A volume control is provided on the jackbox for the purpose of controlling the level of signal at the headset. However, to avoid overloading of the isolation amplifier (causing distortion and cross talk), this control should be operated near maximum at

9. RADIO (cont'd)

9.3. OPERATION OF EQUIPMENT:(CONTD)

9.3.1. cont'd

at all times, and the volume regulated by means of the individual volume controls of each receiver.

"A" "Voice-Range Filter" switch is provided on the jackbox. This switch is not wired into circuit.

9.3.1.1. Operation of Jackboxes:

To obtain the audio output of any receiver or receivers:

1. Place Radio Master Switch ON
2. Switch on equipment required.
3. Select output of receiver at jackbox by placing appropriate toggle switch ON (UP).

To modulate wither HF or VHF transmitters:

1. Place Radio Master Switch ON.
2. Switch on Transmitter required.
3. Select channel (and PHONE if HF)
4. Place "MIC" switch on jackbox to HF or VHF as required.
5. Place appropriate Receiver Selector switch ON to monitor sidetone, and operate "push-to-talk" switch on microphone.

To use Interphone:
1. Place Radio Master SwitchON.
2. Place "INTERCOM" Output selector ON.
3. Call other party by means of "call" light and microphone, then place "MIC" switch on "INTER".

On receipt of a call the "INTERCOM" output selector switch is placed ON. To reply - place "MIC" switch on "INTER".

If amplifier should fail in flight, "EMERGENCY" operation only is available. On emergency operation, only one receiver output

9. RADIO (CONT'D)

9.3. OPERATION OF EQUIPMENT (CONT'D)

9.3.1. cont'd

9.3.1.1. cont'd

will be available at a time. All other receiver output selectors must be OFF. Intercom facilities also will be U/S. (See 9.5.0. "Failure of all Receiving Equipment".)

It will be noted that if two or more receivers are selected on Emergency, the only one heard will be the one nearest the left hand edge of the box.

9.3.2. Type 18S4 Transceiver:

The Transceiver is remotely controlled from the cockpit Channel selection is digital from 1 to 20. An ON/OFF switch, PHONE/CW switch, and AF volume and RF gain controls are provided.

A frequency chart is provided adjacent to the unit on the starboard sode.

Selection of the desired channels, AF volume to maximum and RF gain as desired, are the basic requirements for operation. The CW/PHONE switch should be in the PHONE position.

The jackboxes selector switches should be selected to the HFI positions.

9.3.3. Type ART-13 Transmitter:
The transmitter provides CW, MCW or radiotelephony transmissions on HF.

Full control of the equipment is available at the transmitter unit itself.

9.3.3.1. Radiotelephony Transmissions:
Turn jackbox selector switch to HF2.
Turn on-off switch ON - RED light will glow.
Turn frequency Selector to desired channel.
Turn TRANSMISSION SELECTOR TO PHONE POSITION.

9. RADIO (CONT'D)
9.3. OPERATION OF EQUIPMENT (CONT'D)
9.3.3. (cont'd)

9.3.3.1. cont'd
Press the microphone "press-to-talk" switch and modulate the transmitter by speaking into the microphone. The Transmission may be monitored by means of the sidetone provided at the head sets. To receive, release the microphone switch.

9.3.3.2. CW Telegraphy Transmissions:
Turn jackbox selector switch to HF2.
Turn ON/OFF switch to ON.
Turn FREQUENCY SELECTOR to desired channel - TRANSMISSION SELECTOR to CW position.
Operate the telegraph key and monitor the transmission using the headsets.
Reception is possible whenever the key is not depressed.

9.3.3.3. MCW Telegraphy Transmissions:
Turn jackbox selector switch to HF2.
Turn ON/OFF switch to ON.
Turn FREQUENCY SELECTOR to desired channel.
Turn TRANSMISSION SELECTOR to MCW position.
Operate the telegraph key and monitor the transmission using the headsets.
Reception is possible whenever the key is not depressed.

NOTE: Selection of new frequency may take up to 45 seconds due to time taken for frequency change mechanism to operate.

9.3.3.4. Operating Notes:
It is recommended that the transmitter ON/OFF switch should be ON, and the "TRANSMISSION SELECTOR" on "PHONE" at all times when the aircraft is under tower control. This will permit instantaneous operation of HF in the event of VHF failure. When operating the transmitter under these conditions, ensure that the transmitter is not being inadvertently keyed by the telegraph key or faulty microphones, etc. This would block all HF reception and interfere with other aircraft.

9. RADIO (CONT'D)

9.3. OPERATION OF EQUIPMENT (CONT'D)

9.3.4. RA-1B Receiver:

The RA-1B receiver is normally operated at the receiver itself.
Place the LOCAL-REMOTE switch on receiver to LOCAL position.
Place the power ON-OFF switch to the ON position.
Select appropriate frequency band, being careful to adjust the selector so that the frequency ban guide line coincides with the lubber line on the panel.
Tune to desired spot frequency by rotating the tuning crank.
Set the CW ON-OFF switch to OFF for the reception of telephony or MCW signals and to ON for CW signals.
Advance the volume control for satisfactory head set level.
The headset may be plugged into the socket provided on the front of the receiver.

9.3.4.1. Operating Notes:

When using AVC OFF, do not advance the receiver volume control too far, particularly on stations at close range, as overloading of the receiver may occur resulting in the distoration or total absence of a signal.

NEVER: operate both the CW and AVC switches in the ON position simultaneously. Complete absence of signal in the headset will result. It is preferable the AVC switch should be off during transmission.

9.3.5. V.H.F. Transceiver:

9.3.5.1. Operation:

1. Place ON/OFF switch to ON.
2. Rotate channel selector to the number corresponding to the frequency desired.
3. To transmit, close the microphone "press-to-talk" switch and speak into the microphone. Check sidetone in the headset.
4. Reception is possible whenever the "press-to-talk" switch is not closed.
5. The squelch control should be set to just eliminate background noise.

9. RADIO (CONT'D)

9.3. OPERATION OF EQUIPMENT (CONT'D)

9.3.6. D.M.E.

9.3.6.1. Operation:

1. Switch ON/OFF switch on remote control to ON
2. Select desired channel.
3. When the equipment "locks on" to the ground beacon, the indicator will show the distance and the warning flag will disappear.
4. Aurally monitor station idenficiation signals.

9.3.7. MN62A Radio Compass Receivers:

9.3.7.1. Operation:

As a communication receiver:

(a) Rotate function switch to ANT position.
(b) Select required frequency band by operation of band-selector knob and tune in desired station frequency by rotating the tuning crank until the required frequency is indicated against the line on the tuning dial.
(c) Adjust tuning slightly so that tune meter indicates maximum.
(d) Aurally identify station and check that only one station is being received.
(e) Adjust gain control to desired level.

9.3.7.2. For Aural Null Loop Reception:

(a) Repeat (a) to (e) in 9.3.71. above.
(b) Rotate function switch to loop position.
(c) Throw CW switch to ON.
(d) Turn L.R. switch and hold until signal in phones reach minimum.
Two speeds of rotation are available. For slow rotation turn knob - for fast rotation press, then turn knob.
Adjust gain control as necessary.

The indicator on the instrument panel will then indicate the relative bearing (or its reciprocal) of the selected radio transmitter.

NOTE: It is preferable that volume control on the audio selector panel be at maximum during the operation.

9.3.7.3. A.D.F. Operations:

(a) Repeat (a) to (e) in 9.3.7.1. above.
(b) Rotate function switch to A.D.F. position.

9. RADIO (CONT'D)

9.3. OPERATION OF EQUIPMENT (CONT'D)

9.3.7.3. cont'd

The indicator on the instrument panel will then rotate to indicate the relative bearing of the selected radio transmitter.

NOTE: On ANT and Loop Positions the operation of the gain (or volume control) will affect the deflection of the Tune, or Max. meter. On A.D.F. no effect will be noted. Hence, on ANT and Loop, tuning may be difficult if the gain control is set too low.

NOTE: The left hand side radio compass is known as the ADF 1 RED and the right hand side radio compass is known as the ADF 2 GREEN.

Where dual radio compasses are fitted as in this case, frequently check each unit against the other.

9.3.8. 51X-3A VHF/NAV Receiver:

9.3.8.1. Operation:

1. Switch the ON/OFF switch to ON.
2. Rotate the digital selector to desired frequency.
3. Aurally identify station and check for correct deflection of the vertical pointer and flag and adjust VC as desired.

9.3.8.2. Before Starting:

Check on one channel for correct operation of the VHF/NAV equipment.

9.3.8.3. Before Flight:

Check on any frequency where no signal is being received for deflection of the warning flag which could be caused by ignition interference.

9.3.8.4. Before Use:

1. Check on any frequency where no signal is being received that indications are not being affected by ignition or other electrical interference.

9. RADIO (CONT'D)
9.3. OPERATION OF EQUIPMENT (CONT'D)
9.3.8. (cont'd)

9.3.8.4. cont'd
2. Ignore visual course indications where flag indicator is visible. VHF/NAV indications should also be ignored if they cannot be aurally identified.

9.3.8.5. During Use:
1. Check at intervals as in (1) above.

2. Check for any indications of sticking pointer.

NOTE: Audible interferences indicate that particular care should be taken to guard against erroneous indications.

Like any radio navigation system the VHF/NAV equipment is only an aid, and should be checked for accuracy against the other aids or against known positions.

It is of the utmost importance to fully check the system prior to commencing a descent.

If change of aircraft attitude causes noticeable change of visual indication, VHF/NAV operations should be considered unserviceable.

9.3..9 51Z-4 Marker Receiver:
This unit is switched on by means of the ON/OFF switch on the VHF/NAV Receiver.

The audio output is also selected simultaneously with the output of the VHF/NAV receiver, when selecting VHF/NAV at the jackbox.

NOTE: The exact "Over Marker" position is indicated by maximum brilliance of the lamp. However, the audio output of the Marker Receiver should be monitored at all times to ensure positive identification of the marker beacon, and to ensure that the marker shall not be "missed"

because of possible lamp failure.

9. RADIO (CONT'D)

9.3. OPERATION OF EQUIPMENT (CONT'D)

9.3.9. (cont'd)

The "HI/LO" sensitivity switch on the VHF/NAV Receiver, adjusts the receiver sensitivity to two fixed positions. The "LO" position shortens the duration of the marker indications.

This switch should normally be on "HI", but may be switched to "LO" if the indications at any particular marker are excessively broad, or audio signals oppressively loud.

The sensitivity switch should be returned to "HI" immediately after passing the marker, eliminating the possibility of the next marker being "missed" because of reduced receiver sensitivity.

9.3.10. Passenger Address Amplifier (346D-1)

Interphone:

This unit provides for telephone communication between the Captain's station and the Galley. It consists of a party line system terminating in handsets near the Captains' jackbox and on the aft galley bulkhead.

Operation: press Steward Call button to alert, select INTER on switch adjacent to handset and operate "press to talk switch" to listen or speak.

Public Address:

The public address system is a high quality amplifier designed to provide a means of information to passengers.

Operation: As for interphone except that the Captains' switch must be selected for P.A.

9.3.11 Tape Recorder 6-825

Operated from the gallery by an ON/OFF switch and volume control through 22 speakers disposed throughout the cabins.

9.4. PRE-DEPARTURE TESTS AND INSPECTIONS:

9.4.1. Radio Daily Schedule:

At Ports where no Aircraft Maintenance Engineer (Radio) is stationed and where an aircraft has remained overnight, an authorised Flight Crew Member must perform an inspection known as the "Radio Daily Schedule", in accordance with the

9. RADIO (CONT'D)

9.4. PRE-DEPARTURE TESTS AND INSPECTIONS: (CONT'D)

9.4.1. cont'd

information contained below.

The Radio Daily Schedule shall consist of the following:

1. A thorough inspection as laid down in sub-section 9.4.2. of Section 9.4. of this Manual.
2. A test of all Radio equipment in accordance with sub-sections 9.4.2, 9.4.4., 9.4.5., 9.4.6., 9.4.7., 9.4.8., and 9.4.9., of this Manual.
3. A check of both the Company Trip Record and the Radio Trip Record for any reported Radio unserviceability.
4. The Radio Trip Record (Form AD63) to be endorsed "Radio Daily Schedule completed", and signed by the Crew Member performing the inspection.
5. Any details requiring the attention of the Radio Engineer at the next port to be endorsed on the Radio Trip Record together with details of any work performed by The Crew Member during the inspection. (Fuses changed, etc).
6. A yellow copy of the Radio Trip Record on which the endorsement is made is to be removed, and handed to the Company representative at the Port where the inspection is made with explicit instructions that it be forwarded to the Company's Radio Section, by means other than the aircraft.

NOTE: The tests and inspections laid down in sub-section 9.4.2. and 9.4.9. (inclusive), of this Manual, are to be performed prior to departure from all ports, but it is not necessary to carry out points 4,5, and 6 of the Radio Daily Schedule at Ports other than those specifically mentioned in this sub-section.

9.4.2. Pre-Departure Inspections:

Subject all aerials and their fittings, lead-ins, and terminations to a thorough inspection.

Inspect thoroughly all units and accessories, to ensure correct attachment of all plugs, aerial and earth connections and mountings.

9. RADIO (CONT'D)

9.4. PRE-DEPARTURE TESTS AND INSPECTIONS (CONT'D)

9.4.3. ART-1B Transmitter Tests:

Check the operation of the frequency changing mechanism by selecting each of the channels to be used in flight by operating the FREQUENCY SELECTOR. Check the operation of the TRANSMISSION SELECTOR on all positions.

Conduct an operating test with the tower or aeradio station on the working frequency.

Check that sidetone is audible in the headset.

NOTE: When pre-flight testing, never operate equipment in the transmitting condition on the ship's batteries, unless the APU is running normally and charging the aircraft batteries.

9.4.4. RA-1B Receiver Tests:

Check operation on one band for:-

(a) PHONE reception
(b) CW reception
(c) AVC action
(d) MANUAL volume control
(e) Tuning
(f) BAND SELECTION
(g) REMOTE operation
(h) Check PHONE reception on other bands.

Conduct an operating check with the tower and /or aeradio station on one of the channels to be used in flight. (Where possible) Check that output of the receiver is available from both jackboxes, and both headsets.

9.4.5. 6 18F-1A VHF Transceiver Tests:

Conduct an operating test with the tower and/or aeradio station on the working frequency, where possible.
Check that sidetone is audible in the headset.
Check that receiver output is available from both jack-boxes and both headsets.

9.4.6. KN 65 DME Tests:

Check system for correct operation with nearest DME beacon. Where DME beacon is not available for ground testing the system should be checked as soon as possible after take-off.

9. RADIO (CONT'D)
9.4. PRE-DEPARTURE TESTS AND INSPECTION (CONT'D)

9.4.7. Checking Radio Compass Operation:

1. Before Flight:
Carry out all steps of Paragraphs 9.3.6.1., 9.3.6.2., 9.3.6.3.

2. In Addition:
(a) Check that bearing indicated on A.D.F. function agrees approximately with known bearing of radio transmitter.
(b) Check that indicator on A.D.F. will approach indicated bearing from either side.

Method: Switch to loop. Rotate indicator with L.R. switch to 175° from A.D.F. indicated bearing and switch to A.D.F. Repeat on other side of indicated bearing.

(c) Check A.D.F. operation on each of the three higher frequency bands. It is not necessary to repeat step 2 (b) above on each band.

3. In the air:
(a) Check accuracy of bearing indicated on A.D.F. as soon as possible.

NOTE: Under adverse conditions better operation as a communications receiver may be obtained by operation of the receiver on the Loop position. In this use the indicator should be rotated until it indicates approx. 90° from relative bearing of station.
Under adverse conditions better bearings may be obtained by using the Aural Null Function.

NOTES:
1. The Radio Compass must be switched ON and tuned to the appropriate N.D.B. prior to all take-offs where the climb is under I.F.R. conditions.

9.4.8. 51X-3A VHF/NAV Receiver Tests:
Check on one channel for correct operation of the VHF/NAV equipment.
Check on a frequency where no signal is being received for warning flag indication.

9. RADIO (CONT'D)

9.4. PRE-DEPARTURE TESTS AND INSPECTIONS (CONT'D)

9.4.8. cont'd

Check operation of channel SELECTOR switch.
Check for excessive ignition or electrical interference during run-up, with the receiver on a channel not in use. Make sure audio output is available at the headphones by advancing the volume control with the channel selector on the appropriate beacon position.
Check the indicator to see "flags hidden".
Check that receiver output is available from both jackboxes and both headsets.
Make sure that the aural and visual indications received correspond to the position of the aircraft with respect to the frequency selected.
Where a ground station is not available for checking receiver operation, the system is to be checked for correct operation as soon as possible after take-off.

9.4.9. 51Z-4 Marker Receiver Tests:
It is not possible to make a pre-departure test on this unit without special equipment.

A check for correct receiver operation should be made as soon as possible after take-off, by flying over a marker beacon (Where possible).

9.4.10. ACA1A Jackbox Tests:
Check that output of each equipment required for the flight is available at each jackbox on the normal function.

Make sure all transmitters can be modulated from either box.

9.5. FAILURE IN FLIGHT:

CAUTION : : : : : : : : : : : HIGH VOLTAGES EXIST WHICH CAN BE DANGEROUS TO LIFE.

If normal operation of the equipment is not obtained, the following corrective measures should be adopted:-

9.5.0. FAULT	PROCEDURE
Failure of all Radio equip.	(1) Check the "Radio Master Solenoid" fuses on the Radio fuse panel.

9. RADIO (CONT'D)

9.5. FAILURE IN FLIGHT (CONT'D)

9.5.0. cont'd.

FAILURE	PROCEDURE
Failure of all receiving equipment.	(1) The "Normal Emergency" switch on the bottom of the jackbox to "Emergency" and select one receiver at a time. (2) Check the 5A fuse in the Radio Fuse Box (see 9.5.8.)

9.5.1. V.H.F.

FAULT	CAUSE	ACTION
No Transmission or Reception	Incorrect positioning of switches.	Check all switches.
	No power to unit.	Check fuse in Radio Junction Box.
	Unit not correctly positioned in rack.	Push main unit Home.
	Aerial disconnected.	Check aerial connection on front of receiver. Try other frequencies.
No Transmission.	Incorrect positioning of switches.	Check microphone selector on Audio Selector Box. Try other Frequencies.
Continuous transmission (no reception).	Faulty microphone.	Select interphone on one selector box, and try other microphone. (Repeat on opposite selector box).
No reception	Incorrect positioning of switches. Faulty Unit.	Check Audio Selector switch. Check at phone outlet on front panel of unit. Try other frequencies.

9. RADIO (CONT'D)

9.5. FAILURE IN FLIGHT (CONT'D)

9.5.2. H.F. - ART - 13/RA-13:

FAULT	CAUSE	ACTION
No Transmission or Reception.	Incorrect positioning of switches.	Check all switches.
	Aerial disconnected.	Check aerial connections. Try other frequencies.
	Antenna not selected to correct equipment.	Check selection.
	Plugs not attached correctly.	Check plugs.
No Transmission.	Faulty microphone	Check other microphone.
	No HT from Dynamotor	Check fuses and C/B on dynamotor.
	Incorrect positioning of switches.	Check microphone selector buttons on selector panels. Try other frequencies for functions.
	Plugs not attached, correctly.	Check plugs.
No Reception.	Incorrect position of controls.	Check Audio Selector switches on Audio panel. Check gain controls. Try other frequencies.
	Aerial disconnected.	Check aerial connections.
	Plugs not attached correctly.	Check plugs.
	Incorrect positioning of switches.	Check all switches.
	Faulty Remote Control.	Check operation at Receiver.

9. RADIO (CONT'D)
9.5. FAILURE IN FLIGHT (CONT'D)

9.5.2. cont'd

FAULT	CAUSE	ACTION
No Reception (cont'd)	No power to unit	Check fuses, including fuse under dyn amotor.
	Closed P. to T. switch.	Check key and microphone.

9.5.3. Radio Compass:

FAULT	CAUSE	ACTION
No Reception	Incorrect positioning pf controls.	Check all controls.
	No power to unit	Check fuses. Try other band. Check Inverter fuses in Electrical Junction box.
No ANT. reception	Aerial faulty	Check connection on front of receiver for security. Try other band.
No Loop reception	Aerial faulty	Check plug on front of receiver. Try other band.
Faulty A.D.F. Indication	Faulty unit	Check plug on front of receiver. Try Aural Null reception. Try other band.

9.5.4. VHF/NAV Marker:

FAULT	CAUSE	ACTION
No visual or aural reception.	Incorrect positioning of controls or switches, No power unit.	Check all controls & switches. Check fuses in Radio Junction Box.
	Faulty connections	Check plugs in front of unit.
No aural reception	Incorrect positioning of controls.	Check audio selector switches. Check volume control.
No markers, visual or aural.	Aerial disconnected.	Check connection on front of unit.
	No power to unit	Check fuses.

9. RADIO

9.5. FAILURE IN FLIGHT (CONT'D)

9.5.5. D.M.E.

FAULT	CAUSE	ACTION
No indication on meter.	Faulty installation, or Unit.	Check on another channel when within range.
No aural identification.	Faulty audio panel.	Check audio switch.

9.5.6. Audio Selector Panels and Isolation Amplifier:

FAULT	CAUSE	ACTION
No reception any receiver.	Faulty amplifier	Operate on emergency
Noisy reception any receiver.	Faulty amplifier	Operate on emergency
No reception both ACA-1A.	No power to unit.	Check fuse in Radio Junction Box.

9.5.7. Reporting of Radio Defects:

All defects must be reported by filling in the Radio Trip Record Form AD63.

Enter on this form all details of any unserviceability of Radio units or their accessories, together with details of any action taken which subsequently rectified the fault. (Circuit Breakers reset - fuses replaced etc).

Enter on the Company Trip Record the remarks "Radio U/S, See Radio Trip Record".

When reporting radio faults, endeavour to describe accurately the effects of malfunctioning of the equipment, and include any suggestions that may assist the Ground Engineer in locating the trouble.

Where interference is apparent, endeavour to localise it by switching off temporarily inverters, generators etc. and noting the effects thereof.

When filling in the Radio Trip Record, make sure all details such as aircraft registration, flight number, date, time etc. are included, as these details may be required in tracing faults due to causes exterior to the aircraft.

RADIO	ANTILLES AIR BOATS LTD. SANDRINGHAM S.25	SECTION 9 APPENDIX 1

Form AABL No. 16

DATE

Aircraft VP-

RADIO DAILY SCHEDULE

PORT

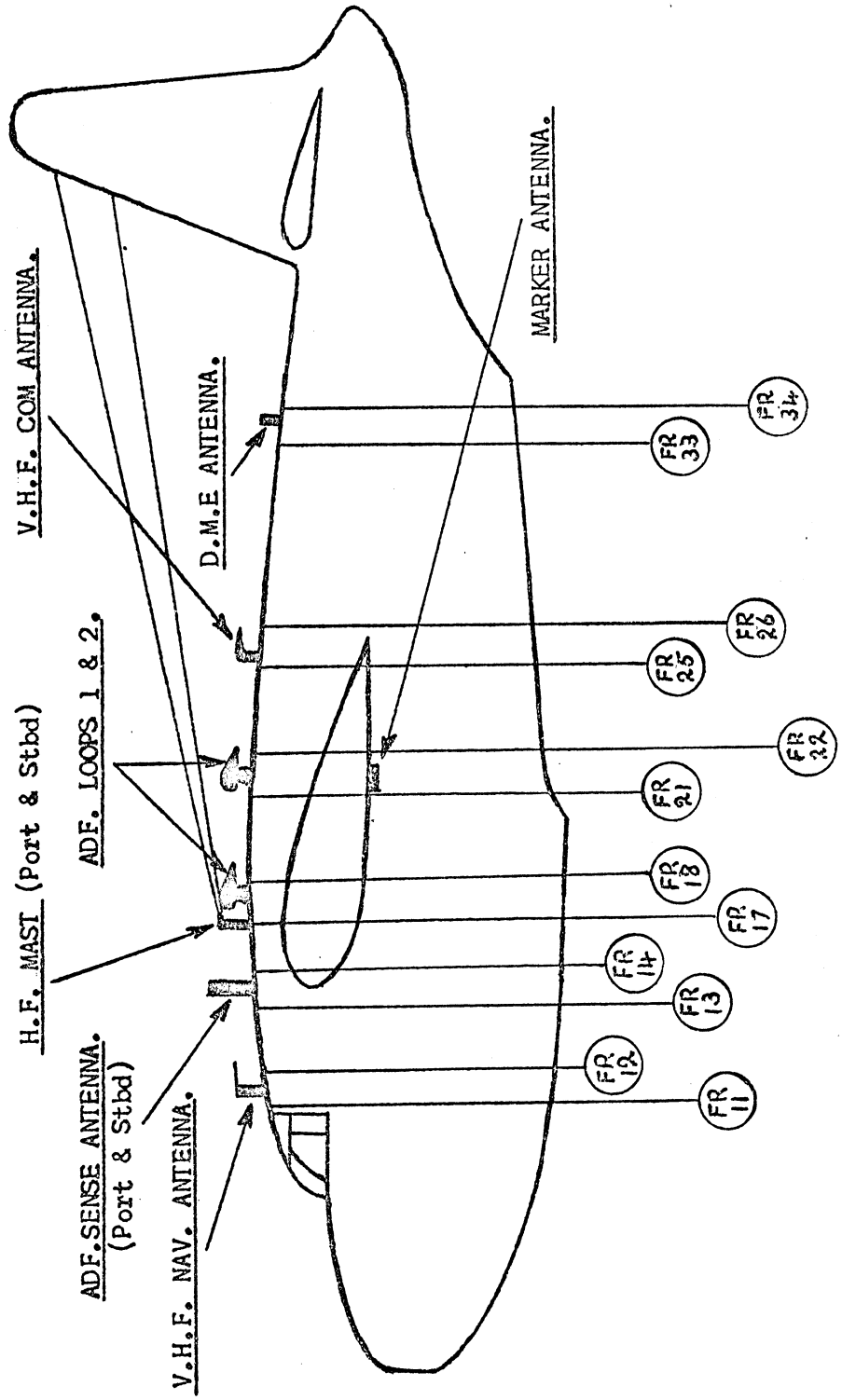
NOTE: (a) Applicable only to aircraft based overnight at places where licensed Aircraft Maintenance Engineers (Radio) are not normally available.
(b) To be carried out only by persons so authorised.
(c) All items to be carried out in accordance with Sec.9.-Page 14-Para 4-1 of Ops.Manual.

NO	ITEM	PILOT'S SIGNATURE
	GENERAL:	
1	Check relevant records for any reported radio unserviceability.	
2	Ensure that the Maintenance Release will be valid for the period of the proposed operation.	
	AERIAL SYSTEMS:	
3	Visually inspect all aerial systems.	
	RADIO EQUIPMENT:	
4.	Check all units of equipment for security of attachments and inspect plugs and interwiring to units.	
5.	Functionally test the HF Transmitters.	
6.	Functionally test HF Receiver(s).	
7.	Functionally test the VHF Transmitter/Receiver.	
8.	Functionally test the Radio Compass Receivers.	
9.	Functionally test the VHF/NAV Receiver.	
10.	Functionally test DME.	
11.	Functionally test the Interphone system.	
12.	Functionally test P/A and Tape Recorder systems.	
13.	Reset all controls.	

CERTIFICATION: I hereby certify that the above schedule has been satisfactorily carried out and properly certified.

Signature:(Pilot) Lic.No. Date:

NOTE: Enter applicable details of this schedule in Radio Trip Record and certify for same. Yellow copy to be torn out and left at port of departure.


V.H.F. COM ANTENNA.
D.M.E ANTENNA.
MARKER ANTENNA.
ADF. LOOPS 1 & 2.
H.F. MAST (Port & Stbd)
ADF.SENSE ANTENNA.
(Port & Stbd)
V.H.F. NAV. ANTENNA.
FR 34
FR 33
FR 26
FR 25
FR 22
FR 21
FR 18
FR 17
FR 14
FR 13
FR 12
FR 11

10. LOADING.

10.1. WEIGHT AND BALANCE LIMITS:

10.1.1. Allowable Gross Weights:

Maximum take-off weight (at sea level) 59,000 lbs.

NOTE: 100 lbs. taxying fuel, consumed prior to take-off, may be added to this figure, at the Captain's Discretion.

Maximum landing weight (at sea level) 56,000 lbs

Effective from the 2nd October, 1963, thetemperature correction to be applied to the Sandringham Flying Boat is as follows.

15°C and below Max. A.U.W. 59000 lbs. for every 1°C the temperature increases, the A.UEW. is decreased by 100 lbs.

Variations in maximum gross weights due to airport limitations are covered at end of Section.

10.1.2. Centre of Gravity Limitations:

VP-LVE (42 seat configuration)

To ensure the stability of the aircraft the Centre of Gravity must be between the following limits:-

For all aircraft weights:
Maximum forward position.... 28% M.A.C.
Maximum rearward position... 35% M.A.C.
(M.A.C. - Mean Aerodynamic Chord).

VP-LVF (43 seat configuration)

A.U.W.	FORWARD LIMIT	AFT LIMIT
59000	29.2% M.A.C.	34.2% M.A.C.
56000	29.2% M.A.C.	34.2% M.A.C.
54000	29.2% M.A.C.	34.2% M.A.C.
40000	29.9% M.A.C.	33.8% M.A.C.

To ensure that the Centre of Gravity is between these limits the aeroplane must be loaded in accordance with the loading schedule or Trim Sheet provided for that particular aircraft.

10. LOADING (CONT'D)

10.1 WEIGHT AND BALANCE LIMITS:

10.1.2. cont'd

The aircraft datum (which is constant) for VP-LVE from which Centre of Gravity locations are normally specified is at the Centre line of Frame 18 or 343.5 inches aft of the nose. For VP-LVF the aircraft datum is 359 inches aft of the nose.

10.1.3. Cargo Compartments:
Locker loads and capacities.

VP-LVE

Cargo Compartments	Max. Compt. Load (lb)	Max. Floor Loading (lbs/ sq.ft.).
Bow Compartment No.1	2250	70
Aft Compartment No.2 FWD.	880	70
Aft Compartment No.2 Rear	1120	70

VP-LVF

Cargo Compartments	Max. Compt. Load (lb)	Max. Floor Loading (lbs /sq. ft).
Bow Compartment No.1	2250	70
Bow Compartment No.2	880	70
Aft Compartment No.3	1120	70

10.1.4. Passenger Compartments:

VP-LVE (42 seat configuration):

Passenger Compartment.	Maximum No. of Passengers	Maximum Load (lbs)	Maximum Floor Load (lbs/sq.ft).
A.	8	1360	150
B.	5	850	150
C.	8	1360	150
D.	7	1190	150
E.	14	2380	75

10. LOADING (CONT'D)
10.1 (cont'd)

10.1.4. cont'd.

VP-LVF (43 seat configuration)

Passenger Compartment	Maximum No. of Passengers	Maximum Load (lbs)	Maximum Floor Load (lbs/sq.ft)
A.	8	1360	150
B.	19	3230	150
C.	16	2720	70

10.1.5. Loading Information:

(a) A complete and up to date list of aircraft empty and basic weights is maintained at Rose Bay. This list is issued by the Chief Inspector, St. Croix and is amended when necessary.

(b) The maximum zero fuel weight is 49648 lbs. with 18 gallons of oil in each tank.

(c) Freight may be carried in cabins forward of passengers up to the placarded weights, loads must be apportioned uniformly and securely, aisles, entrances and emergency exits kept clear.

(d) For VP-LVE the combined load (i.e. passenger compartments and cargo compartments) between frame 25 to 32 is not to exceed 4000 lbs.

(e) Cabin C in VP-LVF must not be floor-loaded.

(f) When carried on VP-LVF the Hostess is to be added and shown as per cocktail lounge passenger scale at 120 lbs.

10. LOADING (CONT'D)

10.2. DEFINITION OF TERMS:

10.2.1. Empty Weight:

The aircraft empty weight includes all fixed equipment. Common items listed as fixed equipment are:-

(a) Wash basins and closet pans.
(b) Water in toilet and galley tanks.
(c) Sick bag containers.
(d) Fixed racks and drawers including hot and cold boxes.
(e) Life Jackets.
(f) All floor coverings.
(g) Seats (Total including extra crew seats)
(h) Electric fans.
(i) All fire extinguishers.
(j) Very pistol and cartridges.
(k) Radio equipment.
(l) Hydraulic Fluid
(m) First Aid Kits.
(n) Emergency torches.
(o) Navigation equipment (Drift Sight, Astro compass and bracket, Sextant).
(p) Mooring and water handling equipment (Drogues, Anchor, Fog Bell, Boat Hook)
(q) Maintenance platforms and plank.
(r) Aldis Lamp.

10.2.2. Basic Weights:

As applicable to VP-LVE

Basic (or Set) Weight and Index is the aircraft empty weight and index, plus weight and index of hostess in Cabin D if carried.

Laden Weight is the all-up weight of the loaded aircraft.

Laden Weight = Basic (set) weight + fuel and oil weight + Nav. Flight Equipment weight + Galley and Stores weight + Payload.

Service Weight:

Service Weight = Basic weight + Fuel and oil weight + Crew weight + Nav. Flight Equipment weight + galley and Stores weight.
No fuel weight is the T/O weight of the aircraft, minus the fuel weight.

10. LOADING (CONT'D)

10.2. DEFINITION OF TERMS (CONT'D)

10.2.2. (cont'd)
As applicable to VP-LVF

Basic weight and Index is the aircraft empty weight and index plus 2 Pilots, 1 Flight Engineer with crew baggage at 30 lbs per crew member and 1 Flight Steward located in the galley.

10.2.3. Standard Basic Weight Additions for VP-LVE

Crew:	2 Pilots.....	340 lbs.
	1 Flt. Eng.....	170 lbs.
	1 Steward.....	150 lbs.
Removeable Equipment:	Galley & Stores.....	400 lbs.
	Nav. Flt. Equip.....	100 lbs.
	Oil (72 Imp.Galls)..	648 lbs
	TOTAL	1808 lbs

10.3. Loading Systems:

10.3.1. Freight in Passenger Cabins:

Maximum weight on one seat	=	170 lbs
Maximum weight on seat plus adjacent floor	=	200 lbs

Freight shall be of low density type and of a nature such as not to damage upholstery and cabin lining. It shall preferably be loaded as little as possible above seat back height.

Freight shall be secured by standard freight nets lashed with rope to seat legs near floor not to armrests etc.

10.3.2. General:
The presentation of loading information in the form of a schedule of locker or compartment loads results from an endeavour to provide a direct route to correct loading, without the necessity of intermediate centre of gravity calculations.

10.3.3. Trim Sheets:
For all loading operations the precise location of the C. of G. of the loaded aircraft is determined

10. LOADING (CONT'D)

10.3. LOADING SYSTEMS (CONT'D)

10.3.3. (cont'd)
by using the appropriate Trim Sheet. These Statements, consist of a succession of scales, the divisions of which represent the magnitude of the index units at a particular location. The first scale represents index units for the Basic Aircraft Weight and C of G. By working downwards from the Basic Index scale through the various Compartment loads or passenger cabin scales and fuel scales, the effect is to add these items graphically to the Basic Index of the Aircraft. By preceeding vertically downwards from the last scale involved to the appopriate all-up weight on the lower grid scale, the precise C. of G. of the loaded aircraft can be located.

The detailed steps for using the Trim Sheet for VH-BRC are as follows:

(a) Obtain the Basic Weight and Index of the Particular aircraft VP-LVE from the appropriate Load Data Sheet located in the Traffic Office.

(b) Make any adjustments necessary to these figures if carrying any non-standard set weight additions as detailed on the loading manifests and enter these adjusted figures on the Load Statement.

(c) Enter on the right of the form the load items and add to the service weight to give the take off weight, or laden weight.

(d) Move vertically downward from the Basic Index scale to the fuel scale or scales and add the fuel weights by moving Horizontally, in the direction of the arrow at the end of the scale, the appropriate number of divisions.

(e) Passenger cabin loads or Compartment loads are then added by moving vertically to the next appropriate scale and repeating the same procedure as for the fuel scale.

NOTE: Providing the C. of G. is located within the prescribed limits for condition of:

10. LOADING (CNT'D)

10.3. (cont'd)

10.3.3. (cont'd)

(a) Actual fuel at depature.
(b) Zero fuel, and both the take-off and landing weights are within permissible limits, then the aircraft loading regarding weight and weight distribution can be considered satisfactory.

The detailed steps for using the Trim Sheet No. 922 for VP-LVF are as follows:

(a) obtain the Basic Weight and Index of the particular aircraft VP-LVF from the appropriate Load Data Sheet located in the Traffic Office.

(b) Check to ensure the Basic weight and index is correct for the particular aircraft configuration and adjust accordingly if dinghies are carried.

(c) Enter the applicable basic weight and index in the appropriate places at the top right hand side of the trim sheet.

(d) obtain the weight of the applicable galley provisions if carried and enter in the appropriate line.

(e) Enter the payload and fuel weights opposite tthe appropriate scales in the weight column on the right hand side of the page.

(f) Add all items above 'the zero fuel weight' line to determine the actual zero fuel weight and check to ensure the maximum zero fuel weight is not exceeded.

(g) Add the weight of fuel to the actual zero fuel weight to obtain the "Take-off" weight.

(h) Deduct the estimated fuel burn-off weight from the take-off weight to determine the estimated landing weight.

(i) From the aircraft Basic Index Location on the top scale move vertically down to the engine oil scale and add the weight indicated in the appropriate weight column by moving horizonally in the direction of the arrow heads at each end of the scale the appropriate number of weight units.

10. LOADING (CONT'D)

10.3. (cont'd)

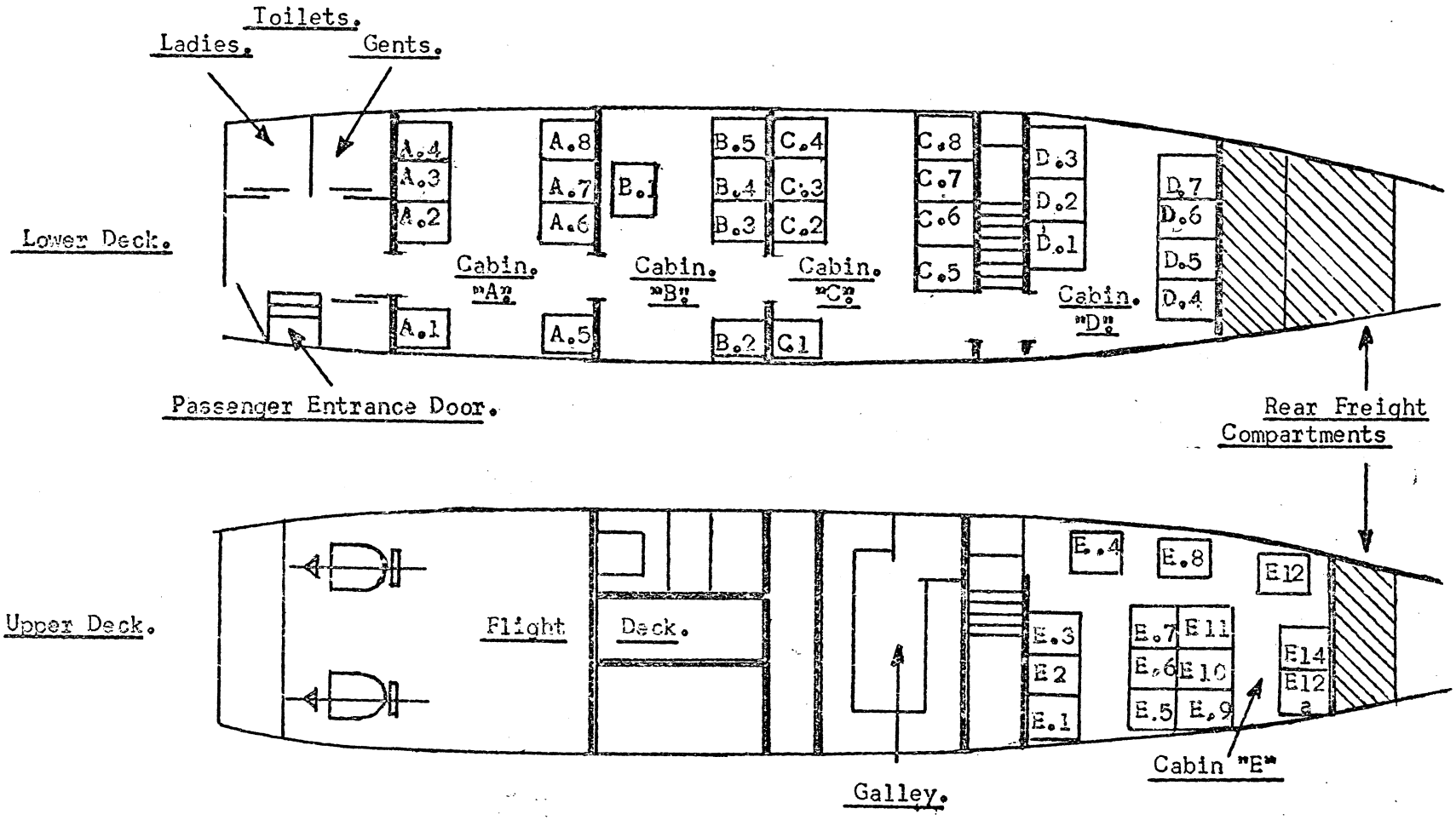
10.3.3. (cont'd)

(j) Repeat the above procedure(i) for the remaining scales by moving vertically down from scale to scale until the bottom scale is reached.

(k) By moving vertically down from the last scale used to intercept the A.U.W. line on the lower grid, and then moving obliquely in the direction of the nearest adjacent sloping C. of G. position line the precise C. of G. location of the loaded aircraft expressed as a percentage of the Mean Aerodynamic Chord(M.A.C.)is obtained.

10.4. WATER AIRPORT LIMITATIONS:

Airport Landing Weight Limitations - 56,000 lbs.

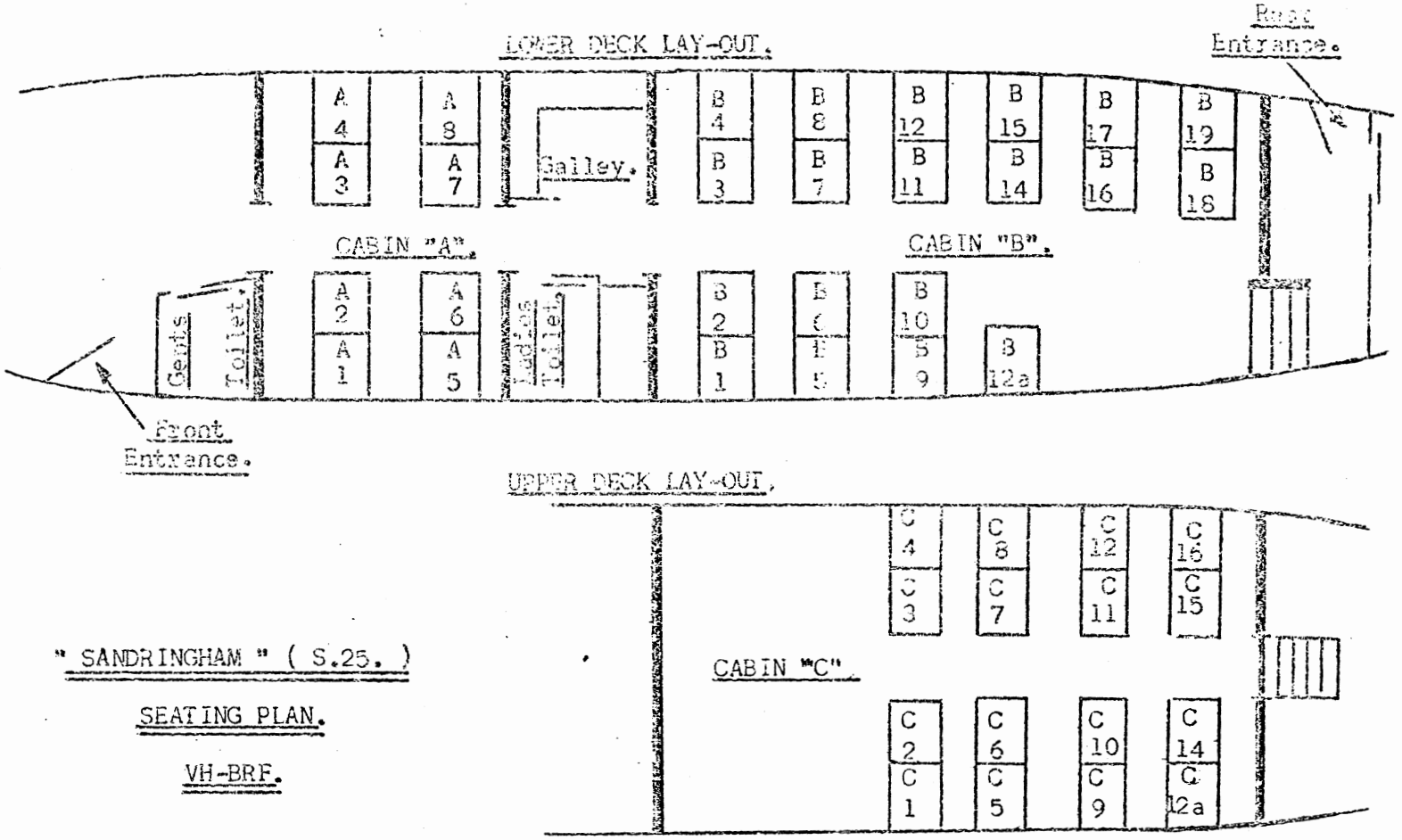


" SANDRINGHAM." (S.25)

SEATING - PLAN.

VH-BRC.

Prepared By	[signature]
Date	21/3/65
ANTILLES AIR BOATS LTD.	



" SANDRINGHAM " (S.25.)

SEATING PLAN.

VH-BRF.

Prepared by.....

Date.....15/7/65.....

ANTILLES AIR BOATS LTD.