

SECTION 5SECONDARY SUPPLIES1. Introduction

The 200 volts 400 cycles primary supply is unsuitable for the operation of certain electrical, instrument and radio systems. These systems operate at different voltages and frequencies and are supplied from the outputs of the following:-

- a. Transformers (step down) - 115V 3 phase 400 cycles.
- b. Motor-generator sets (Frequency changers) 115V 1 phase 1600 cycles.
- c. Transformer Rectifier Unit (T.R.U.) 200V A.C/112V D.C.

A brief description of the systems begins in the following paragraph.

2. 3 kVA Transformers

Two Ferranti type transformers are fitted on the forward face of the bomb bay. Each is installed on the top of its associated distribution panel (27P 28P). The primary winding of each is a DELTA formation, and the secondary is in STAR, this type of winding ensures that third harmonic distortions are kept to a minimum.

3. 'Transin' Relay

This relay conveys alternator line current to energise the transformer primary winding. The 'Transin' relay is energised by selecting its associated control switch on 50P to 'ON'.

4. 'Transout' Relay

This relay conveys the transformer secondary output to the load. It is energised from the energised contacts of the TRANSOUT AND COUPLING CONTROL RELAY (see paragraph 5).

5. 'Transout' and Coupling Control Relay

This relay combines the functions of controlling its associated 'Transout' relay and providing circuits for indications during the coupling conditions. It is energised from its associated control switch via torque switch contacts.

6. Coupling Relay

In the event of a transformer failing, then the coupling relay on being energised will allow the sound transformer to supply the failed units load.

NOTE: The term 'coupling' should not be taken as transformer paralleling.

It is the load that becomes coupled and not the transformers.

7. Circuit Operation (No.1 Transformer)

Placing the transformer control switch on 50P to 'ON' allows fuse 614 to energise the 'transin' relay (R.222). The 'transin' relay in closing, energises the transformer, the output of which closes the torque switch contacts, which in turn energises the 'transout' relay to close and allows the transformer to supply loads in 24P and 27P. The 'transout' and coupling control relay contacts will have operated to indicate 'ON LINE' on the 'MIMIC' indicator fitted to 50P.

No.2 transformer operation is similar to No.1

8. Circuit Operation (Failure).

In the event of say No.1 transformer failing then the torque switch will de-energise with the following results. Relay 200 will de-energise allowing a 20V D.C. supply from fuse 687 to be conveyed to the coupling relay operating coil via the de-energised contacts of relay 221 and relay 200. At the same time the No.1 transformer indicator will show 'COUPLE' the supply for this presentation being obtained from fuse 687 via R.221, R.200, Coupling relay, R.201 and back through R.200. No.2 transformer will take on the No.1 Transformer loads.

9. Circuit Operation (Coupling)

Provision is made for manually coupling the transformer loads. Selecting say No.1 transformer control switch to 'COUPLE' energises the coupling relay and via the circuit described in paragraph 8 causes the No.1 indicator to show 'COUPLE'.

CAUTION: This switch operation should be carried out slowly when selecting from ON to COUPLE with Nos. 1 and 3 alternators running, since there exists a risk of these alternators becoming transiently paralleled through 221, 222, 223, 224 and 225, resulting in either fuses 190 MYB rupturing. The following procedure is recommended from the ON position:-

"OF" - "PAUSE" - "COUPLE"

10. The following services are supplied from the 3 kVA transformers:-

- | | |
|-------------------------------|-------------------------|
| a. Radio compass | j. Fluorescent lighting |
| b. Artificial horizon | k. Anti-Icing |
| c. Smiths flight system | l. Bomb bay heating |
| d. J.P.T. Gauges and limiters | m. Air conditioning |
| e. Oil pressure and gauges | n. Windscreen demisters |
| f. Fire detectors | o. auto-stabilisers. |
| g. Flowmeters | p. Auto-pilot MK 10A |
| h. U/V lighting | q. I.F.F. |
| | r. Gee MK.3 |

11. Time of Fall Calculator Transformer

The transformer for this unit is situated in the cabin under the crew's floor starboard side, its input supply of 200 volts, 3 phase 400 cycles A.C. is from panel 75P. This supply will be connected to the input side of the transformer when the calculator control switch is switched on. The output from the transformer is connected via fuses in panel 11P. A28 volt D.C. supply for the calculator is provided from panel 48P.

12. Green Satin Transformer

The transformer for this equipment is situated in a compartment to the rear of the port main undercarriage bay, its input supply of 200 volts, 3 phase, 400 cycles, A.C. is from panel 28P and is connected whenever control switch is placed on.

13. N.B.S. Transformer

The transformer for this equipment is situated at the forward end port side of the nosewheel bay, its input supply of 200 volts 3 phase, 400 cycles A.C. will be connected when the control switches on 12P are operated.

14. 115 Volts Single Phase 1600 cycles ACFrequency Changers

Alternating current at 115 volts, single phase, 1,600 cycles, is supplied from two frequency changers situated in the forward end of the nosewheel bay port side.

Each frequency changer, consists of a motor generator, the motor being supplied with 200 volts, 3 phase, 400 cycles. The control circuits from both machines are supplied at 28 volts DC from panel 48P.

Associated with each frequency changer are two push button type control switches, one for START and one for STOP and a power failure magnetic indicator. These are conveniently positioned on panel 12P at the navigator radar's station.

The supply from No.1 frequency changer is taken direct to the NBS equipment. The No.2 frequency changer supplies all other loads via fuses in panel 11P. The transfer of loads is effected by selecting the fail switch on 12P to No.1 Fail or No.2 Fail as required.

In the event of a failure effecting one of the frequency changers, its appropriate magnetic indicator will turn white. If, for example, No.1 frequency changer fails, warning of failure is given on No.1 magnetic indicator, by placing the frequency changer switch of No.1 fail, all the loads previously served by No.1 frequency changer will be transferred to the No.2 frequency changer. Similarly, if No.2 frequency changer fails and the failure switch is place to No.2 fail the opposite conditions will take place.

The following services are supplied from the frequency changers:-

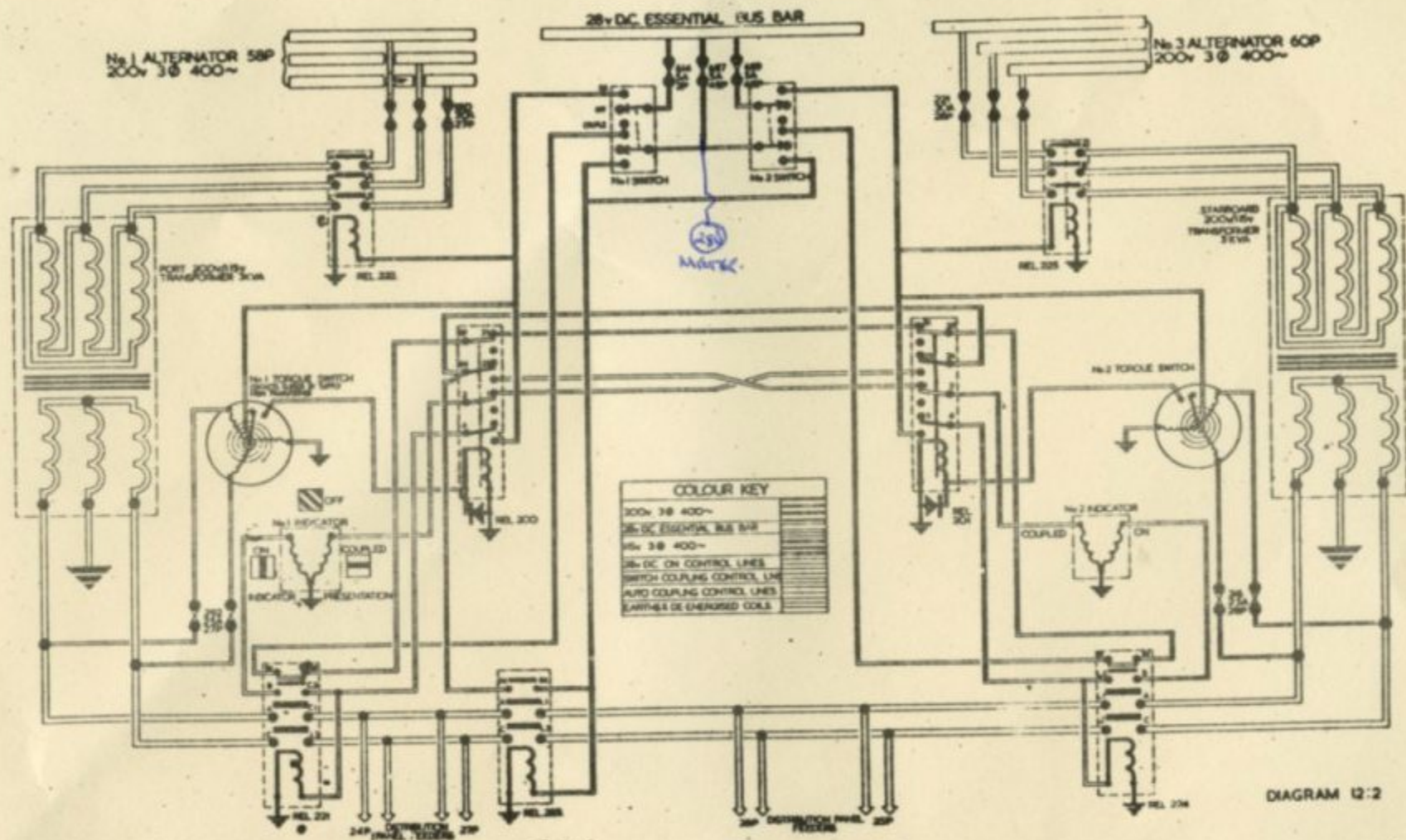
NBS Equipment
High Range Altimeter
T.4 Bombsight
Periscope Heater

15. 112 Volts DC Supply

This supply is provided by a Transformer Rectifier Unit, fitted in the nose fairing of the aircraft and supplies the 112 volt DC required for the H2S scanner.

16. Oil Pressure Gauges Transformer

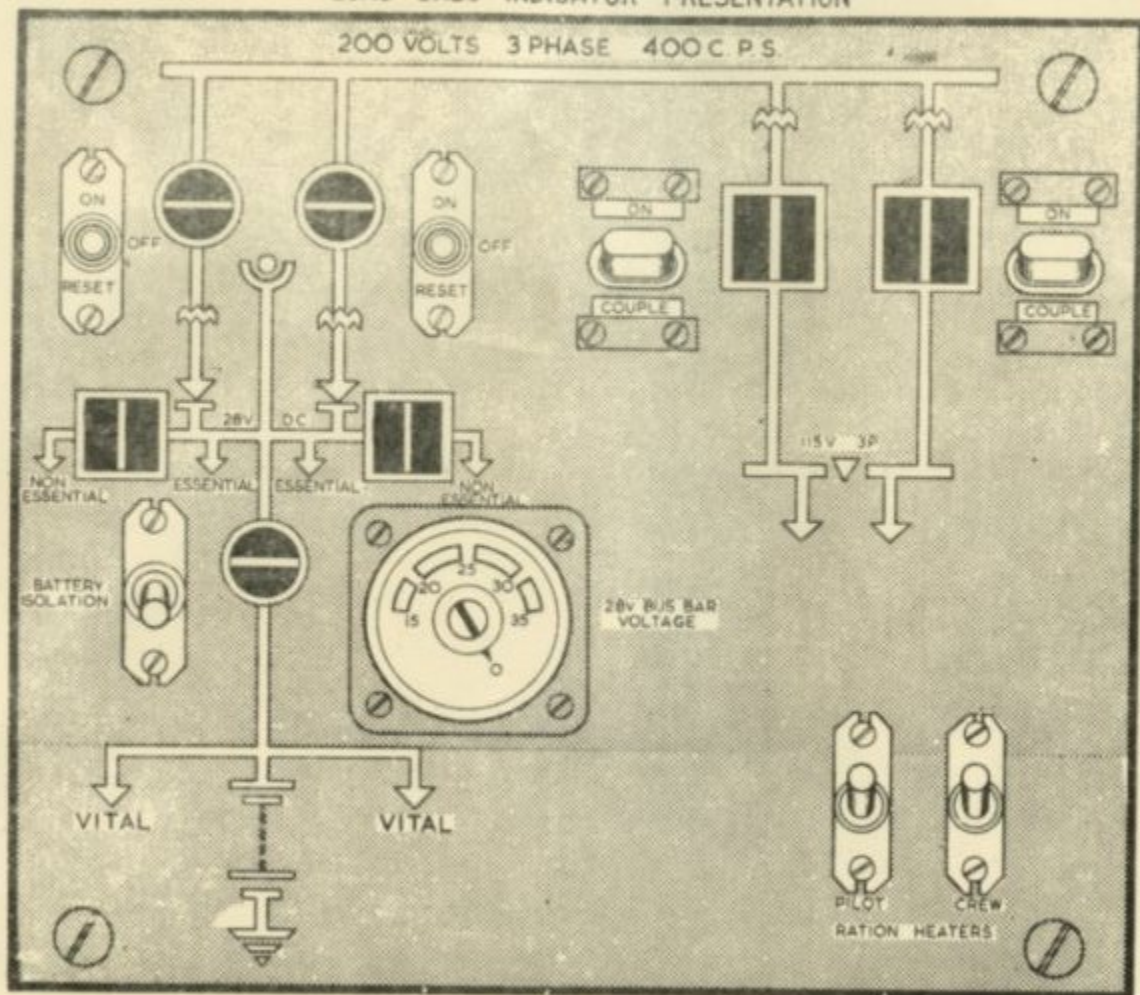
Four transformers, fitted in 27P and 28P are fitted to reduce the input volts of 115 V AC to 26 V AC for the operation of the engine oil pressure gauges.



115V 3 PHASE TRANSFORMERS

ON  ON  ON (R.A.T. LOAD SHED OVER-RIDE)

LOAD SHED INDICATOR PRESENTATION





A-V-ROE & CO LIMITED
MANCHESTER

FREQUENCY CHANGER CONTROL
& N.B.S. TRANSFORMERS

MOD NO. 1
ISSUE NO. 1

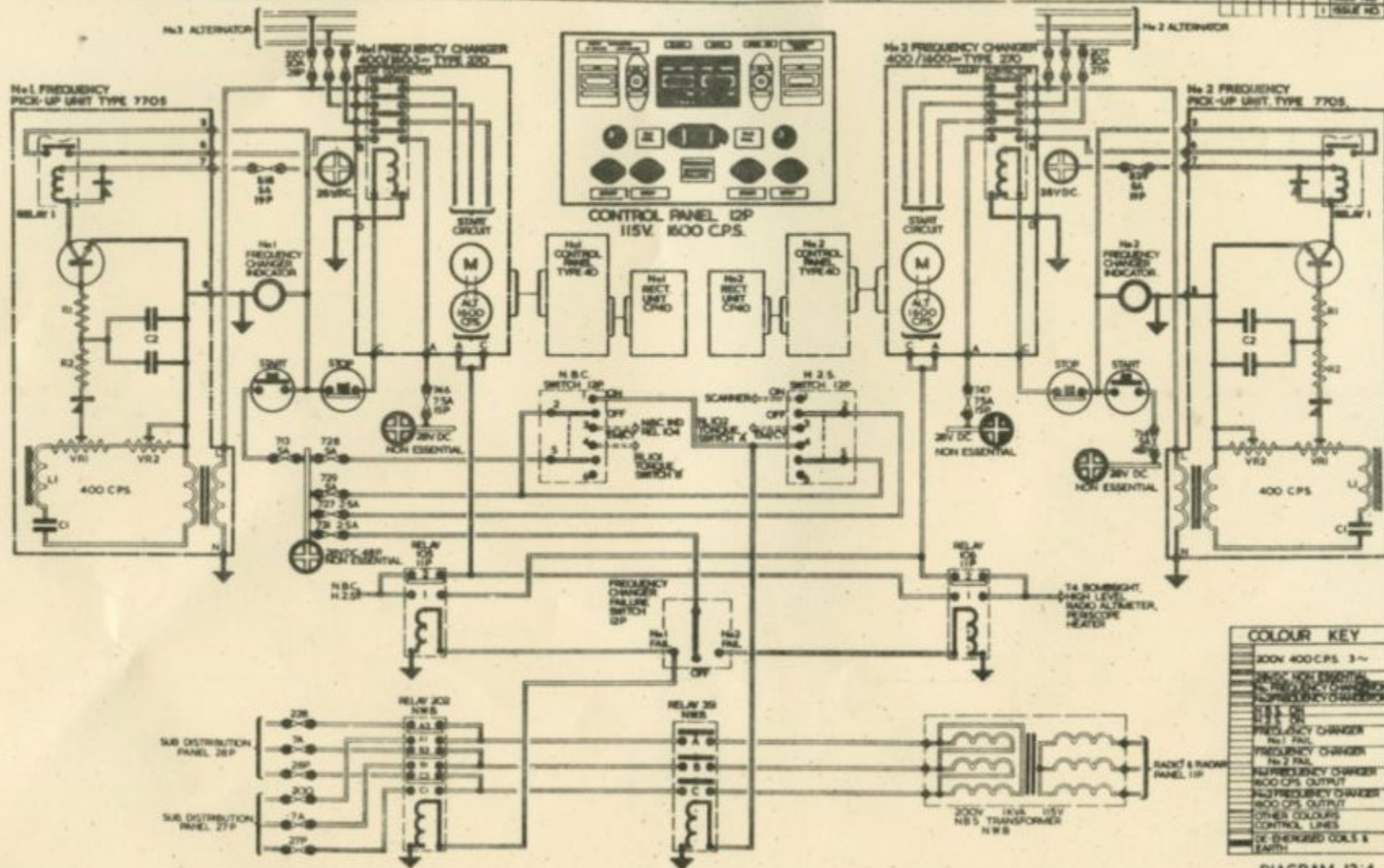


DIAGRAM 12-4

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