Chapter 10

HEADING REFERENCE SYSTEM MK.2

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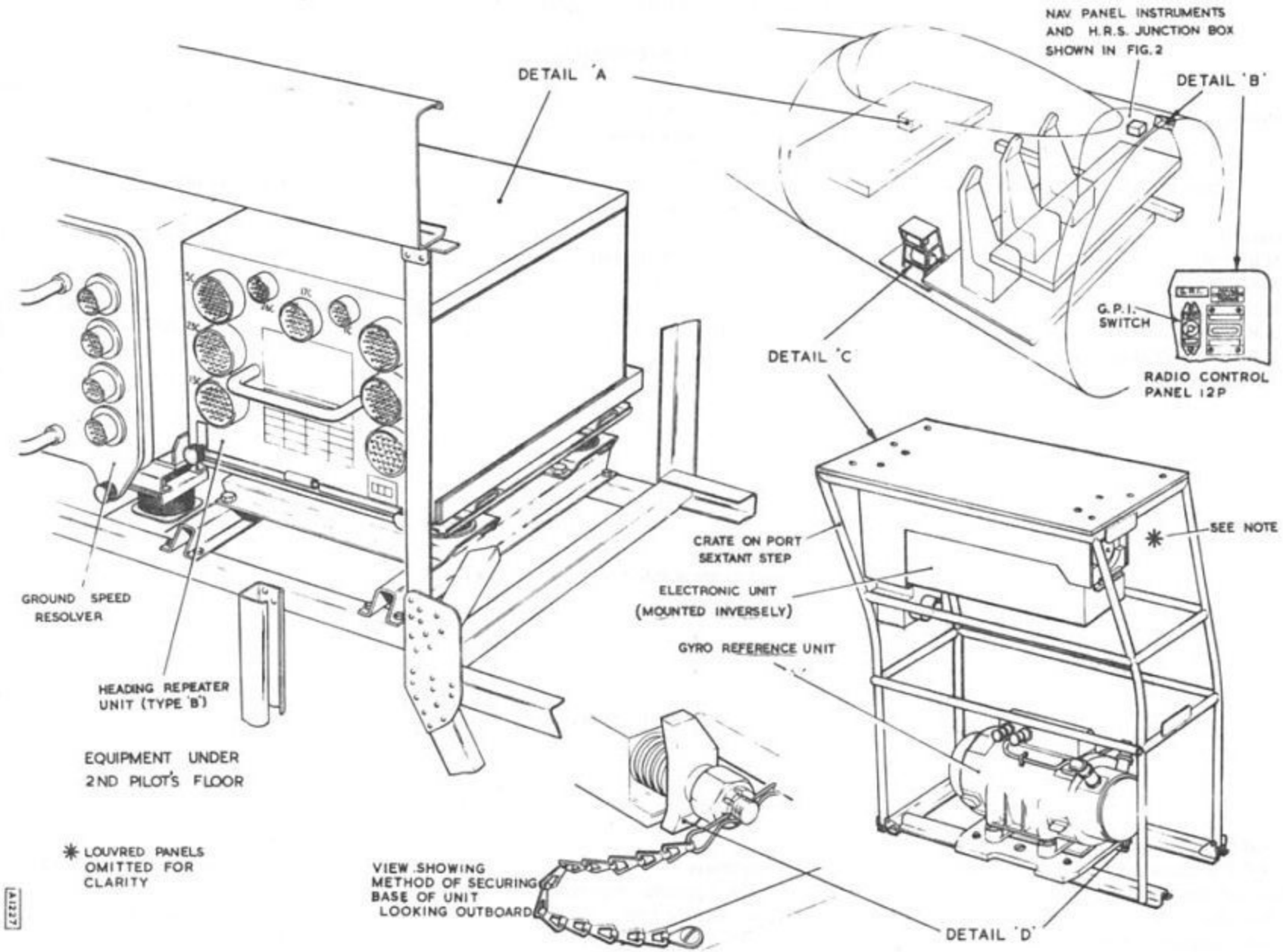


Fig. 1 H.R.S. equipment in cabin

Changes at Detail D and L

Introduction

1. The heading reference system (H.R.S. Mk.2) is a flight navigation instrument system, installed in aircraft designated 'free fall' only and designed to compute heading information and provide accurate heading referenced outputs for the navigator and associated systems in the aircraft. The H.R.S. Mk.2 is integrated with the N.B.S. (Chap.5), M.F.S. (Chap.7) and A.R.I.5972 (Sect.9, Chap.4) installations so that it can receive suitable corrections which when computed with a stable azimuth, produces a number of true north heading outputs.

2. The existing associated units concerned with the interconnection of the H.R.S. Mk.2 with the N.B.S., M.F.S. and A.R.I.5972 installations are the ground position indicator (G.P.I. Mk.6), ground speed resolver (G.S.R.), track control unit (T.C.U.), and the ground speed selector unit (G.S.S.U.). A brief description of the role that each unit mentioned above performs whilst functioning in the H.R.S. mode is given later in the text. A block diagram of the whole integrated system is contained in fig.3.

3. Details of the aircraft a.c. and d.c. supplies to the H.R.S. Mk.2 installation are included in the text. Illustrations showing the location of the various units which comprise the installation are included in this chapter together with routing charts.

The following modifications are included in this chapter:-

Mod.1908 – Introduction of H.R.S. Mk.2

Mod.2033 – Introduction of H.R.S. junction box Ref. No. 6TB/2199 in lieu of junction box Ref. No. 6TB/2045.

Mod.2034 – Introduction of N.B.S. junction box Type 343, Mk.4 by conversion of existing N.B.S. junction box, Type 343, Mk.2.

Mod.2187 – Introduction of new module Pt. No. 19620-0121, Ref. No. 9CD/28, in the heading repeater unit, and to modify the H.R.U. cable assembly (19620-0109) to prevent misalignment between H.R.S. and the ground speed resolver with in-flight start of M.R.G. Mk2 (Sperry Mod. Inst.B278).

Mod.2256 – To introduce A.R.I.5972 in lieu of A.R.I.5951 and make provision for new navigator's heading unit in lieu of Pt. No. 19286/0. Ref.No. 9CD/1065172.

Mod.2257 – To introduce navigator's heading unit Pt. No. 249901-0100, Ref. No. 9CD/111724 in lieu and by conversion of navigator's heading unit 9CD/1065172.

Mod.2348 – To transfer the bias rate adjustment on the H.R.S. control unit Ref. No. 9CD/1995337, to the existing potentiometer on the gyro reference unit.

Mod.2396 – Heading Reference System – to make provision for and introduce under voltage phase sequence unit and indicator.

Mod.2397 – Heading Reference System – to make provision for and introduce a fan to improve cooling of electronics unit.

▶ Mod.2434 – Introduces modified G.S.R. and H.R.S.J/B Mk.2 providing manual isolating facility on G.S.R. to obviate loss of primary heading data due to failure of heading servo.

Mod.2438 – Introduces a remote trimmer potentiometer and a monitoring jack socket, mounted on the electronics unit, for gyro drift correction. The gyro drift correction trimmer on G.R.U. is made redundant. ◀

DESCRIPTION AND OPERATION

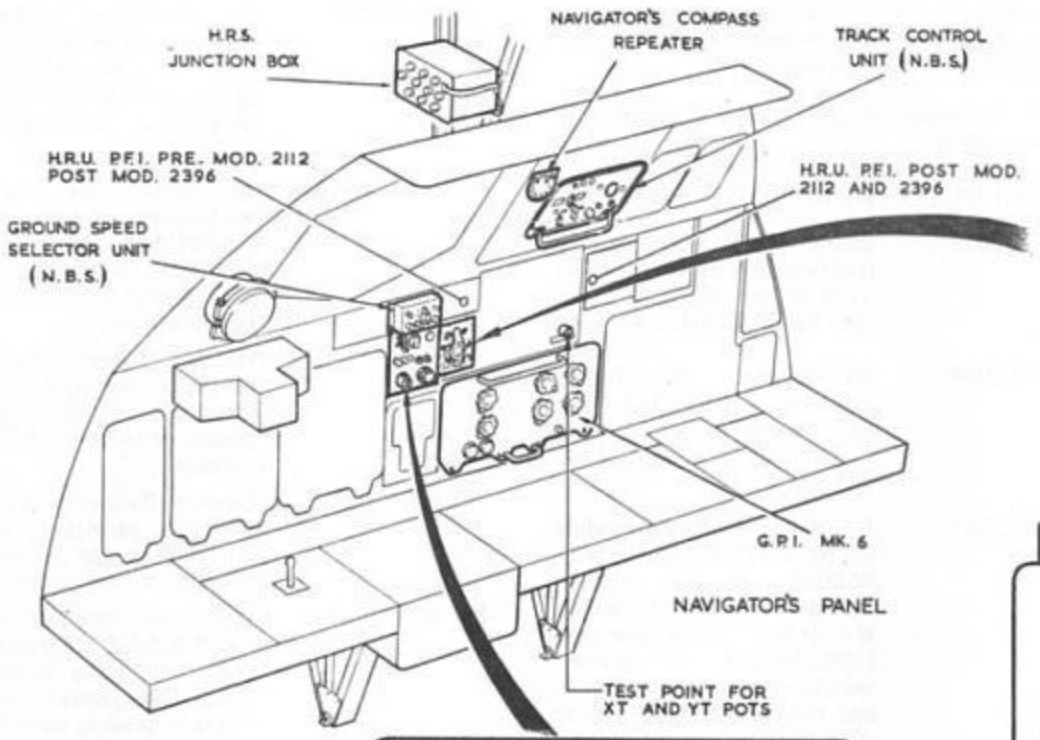
General

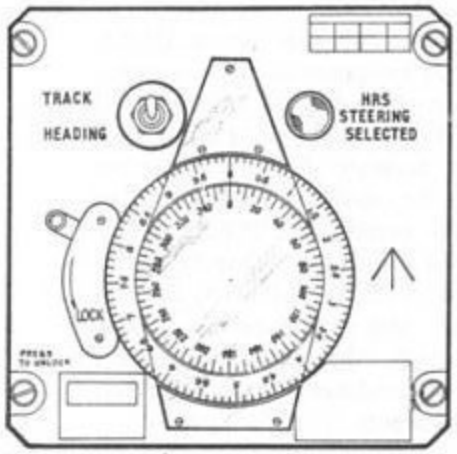
4. The H.R.S. Mk.2 consists of a master reference gyro (M.R.G. Mk.2), heading repeater unit (H.R.U.), heading reference system control unit (H.R.S.C.U.), navigator's compass repeater. Type B, (N.C.R.) and a junction box (H.R.S. J/B Mk.2).

5. The following paragraphs contain a brief description of the various functions of the H.R.S. Mk.2 units and also the role each associated unit mentioned in para.2 performs whilst operating in the H.R.S. mode.

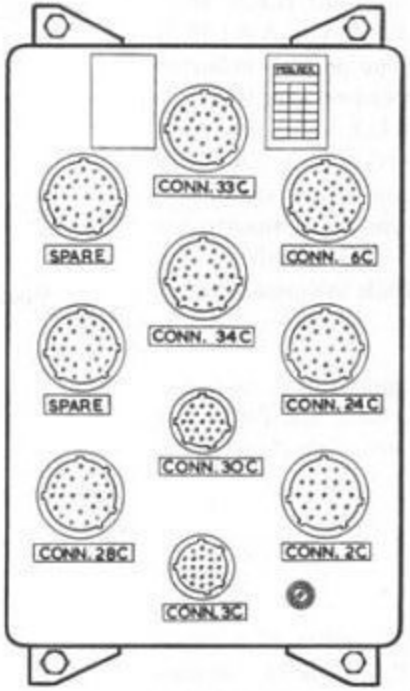
M.R.G. Mk.2

6. In the M.R.G. Mk.2, comprising electronic unit (E.U.) Type A or B, and gyro reference unit (G.R.U.) Type A or B, the G.R.U. provides the E.U. with a stable azimuth reference. This reference, an inertia gyro heading, is repeated and corrected in the E.U.





NAVIGATORS HEADING UNIT



H. R. S.
JUNCTION BOX MK.2
FRONT VIEW

Fig. 2 H.R.S. equipment at navigator's station

◂ *Mod. 2396 incorporated* ▸

for the earth rate and gyro bias drift for transmission to the H.R.U. as a great circle heading.

7. The earth rate correction is derived in the H.R.U. from a continuous supply of latitude information from the G.P.I. Mk.6 and the gyro bias drift correction is supplied from the H.R.S.C.U. The G.P.I. Mk.6 also supplies the H.R.U. with two corrections; a continuous synchro transmission of meridian convergence and also, on command, fix monitored azimuth (F.M.A.) correction signals. The H.R.U. is supplied from the M.F.S. with a continuous input of true heading that is based upon magnetic heading corrected for magnetic variation.

H.R.U., Type B

8. The H.R.U., Ref.No. 9CD/8, operates in a number of modes (selected at the H.R.S.C.U.) which control the computation of heading information and corrections which are used to generate eight synchro outputs of true north heading i.e., true heading with meridian convergence correction. In the H.R.S. Mk.2 installation, these synchro outputs are transmitted to the associated units as follows:-

(1) Two outputs for the heading servo in the ground speed resolver (G.S.R.).

(2) Two outputs for the heading/track display servo in the navigator's compass repeater, Type B.

(3) Single output for the calculator, Type 2 of the N.B.S. via the N.B.S. junction box, Type 343 Mk.4.

(4) Single output for the true north servo in the electronic unit (E.U.) of the M.R.G. Mk.2.

(5) Single output for the pilot readout.

(6) Single output for a transfer gyro.

H.R.S.C.U., Type B

9. The H.R.S.C.U., Ref.No. 9CD/12, provides the requisite controls and indicators that select and monitor the various modes of the H.R.S. Mk.2 operation. The control panel shown in fig.2 is contained in a light alloy case and the components, mounted to the inner face of the mounting panel, are enclosed by a box-shaped cover that is secured to the mounting (front) by four pillars and screws.

10. An electroluminescent panel is secured to the front face of the mounting panel by five screws and, in addition to the various apertures required for the control knobs, the panel is also engraved with the respective control function. These engravings and certain switch surrounds become illuminated with a white light when the H.R.S. is energized from the aircraft 115-volt, 400 c/s power supply. A panel dimmer control is also provided and is situated on the panel as shown in fig.2.

11. The control functions of the H.R.S.C.U. are to:-

(1) Switch the M.R.G. Mk.2 power supplies.

◀ (2) Start up the cooling fan introduced by Mod.2397. ▶

(3) Energize the H.R.U. and select mode of operation.

(4) Energize and provide manual operation of the slew control in the H.R.U.

(5) Energize and provide manual operation of the precession control in the H.R.U.

(6) Energize the demand fast erection relay in the electronic unit (E.U.) of the M.R.G. Mk.2.

(7) Provide a manual control of the bias draft correction signal to the M.R.G. Mk.2 integrator servo loop for gyro drift compensation.

The H.R.S.C.U. provides the following indications:-

(1) Erection cut back operation of the M.R.G. Mk.2.

(2) Heading output error relative to M.F.S. output that is above a pre-set level in the H.R.U.

12. The H.R.U. operational modes are effected by a 5-position 'FUNCTION SELECT' switch on the H.R.S.C.U. There are two normal modes of operation, D.G. and M.F.S. and one reversionary mode M.F.S. ONLY.

(1) In the D.G. (Directional Gyro) mode there is no closed loop monitoring of heading output in the H.R.U. There is also provision enabling periodic updating of heading using the F.M.A. technique.

(2) In the M.F.S. mode the heading output is continuously monitored by the M.F.S.

(3) In the M.F.S. ONLY mode, the H.R.U. is disconnected from the M.R.G. Mk.2 and the heading output is slaved to the M.F.S. output of magnetic heading plus variation.

H.R.S. Mk.2 junction box

13. The H.R.S. Mk.2 junction box (H.R.S. J/B Mk.2), Ref. No. 9DC/9, is used for interconnecting the various units of the H.R.S., and to provide plugs for connection to the associated systems in the aircraft. A pictorial view of the junction box is shown in fig.2.

14. The only operational part of the junction box is a relay (RLA) which is energized from the heading reference unit ON signal. When the relay is energized, the M.F.S. heading synchro is excited from the H.R.U., through the T.C.U. (M.F.S.) via pins A and C of plug 28C on the junction box. When the relay RLA is not energized the M.F.S. heading synchro is excited from the same supply that is being fed to the G.S.R. via pins G and H of plugs 3C and 2C.

H.R.U. Power failure indicator

14A. With Mod.2396 incorporated a green power failure indicator, labelled H.R.U.P.F.I. is fitted at the Navigator/Plotters station (fig.2). The indicator is controlled by an undervoltage phase sequence unit (U.V.P.S.U.) Type A.E.5601 fitted on the unscreened part of panel 11P. The indicator lamp lights when the correct supplies are available to the H.R.U. and goes out in the event of a power failure or incorrect phase rotation. A built-in press-to-test facility is incorporated in the indicator, to check the serviceability of the lamp filament. Dimming of the lamp is achieved by turning the lamp cover. For further details of the U.V.P.S.U. refer to AP 113D-0701-1.

Navigator's heading unit

15. The navigator's heading unit, located on the navigator's panel (fig.2) contains servo mechanisms, gearing and synchros for adding heading corrections to the best available heading. Further information will be found in A.P.112B-0318-1A.

16. Mod.2033 introduces a facility whereby the H.R.S. heading error signal may be monitored on the pilots' Director Horizon instrument via a selector switch mounted adjacent to the starboard side of the fuel contents panel 2P. The switch which is labelled H.R.S. - M.F.S., enables the pilot to select either the normal M.F.S. heading error signal, derived from the associated beam compass, or the H.R.S. error signal, derived from the H.R.S. pilot readout signal from the H.R.U., for display on the Director Horizon instrument. Further information will be found in Sect.7, Chap.7, (M.F.S.)

Track steering facility

17. Mod.2257 introduces a modified navigator's heading unit, Ref. No. 9CD/1117244 which provides a track steering facility, and an indication at the pilots' flight director indicator and a signal to the autopilot, of the difference between the required, and the actual track of the aircraft. This is achieved by the comparison of two track signals to give the actual deviation.

18. The modified unit functions as before in the 'heading' mode and gives an indication of track deviation when 'track' is selected by the track heading switch, the desired track being preset on the dial. In the event of the navigators heading unit synchros being misaligned by more than 180 deg. on selection of 'track', the H.R.S. steering lamp will flash. At this point 'heading' is selected on the front panel switch for eight seconds, after which time, selection of 'track' will provide correct alignment of the synchros.

NOTE . . .
It is not essential for Mod.2256 (A.R.I.5972) to be embodied beforehand or concurrently with Mod.2257. However, without Mod.2256, the track steering facility will not be available.

Navigator's compass repeater, Type B

19. The navigator's compass repeater, Type B, Ref.No.6TB/1557 is located next to the T.C.U. as shown in fig.2. The instrument provides as indication of the following three sources of compass information.

(1) M.F.S. aircraft heading or track

(2) G.S.R. aircraft track

(3) H.R.S. Mk.2 aircraft heading

The track or heading is displayed by a 360 deg. four digit reversible counter and by a pointer moving over a fixed compass dial.

20. The pointer and counter are controlled by a servo loop and the synchro associated with the compass information source is selected via a 3-position switch situated at the bottom left-hand corner of the instrument. A knob at the bottom right-hand corner of the instrument controls an index which can be set against any desired heading on the compass card for reference purposes. Further information will be found in A.P.4686B, Vol.1, Book 2, Sect.4.

Associated units

21. The following existing items are

normally associated with the N.B.S., M.F.S. and A.R.I.5972 installations but also perform certain functions when the aircraft heading is derived from the H.R.S. Mk.2. A brief outline of these functions are given in the following paragraphs.

G.S.R.

22. The principle function of the G.S.R., Ref. No. 9C/102, is to resolve the A.R.I.5972 derived ground speed into easterly and northerly components. Drift information is supplied to the G.S.R. by A.R.I.5972 whilst heading information is obtained from the H.R.S. Mk.2 or the M.F.S. The addition of drift and heading information within the unit provides track angle. Using the track angle and ground speed along track information, the unit provides outputs of aircraft ground speed in northerly and easterly components.

B.S. junction box

23. This unit, Ref. No. 9C/105, facilitates the interconnection of the H.R.S. Mk.2, N.B.S. and M.F.S. installations. The unit houses 37 relays and has 32 plug or socket connections.

G.P.I. Mk.6

24. The G.P.I. Mk.6 Ref. No. 9C/101, performs two main tasks related to the H.R.S. Mk.2 operation:-

(1) Processes the North/South and East/West resolved components of doppler derived ground speed from the G.S.R. into continuous computation of latitude and longitude information.

(2) Carries out a periodic comparison process in conjunction with N.B.S. by which dead reckoning navigational errors in the aircraft equipment may be corrected. This is called a Fix procedure and involves a process called the F.M.A. technique.

Ground speed selector unit

25. The ground speed selector unit, Ref. No. 9C/172, is located above the H.R.S. control unit as shown in fig.2. The purpose of the unit is to provide those functions which were previously performed by the inertia navigation control unit for Blue Steel aircraft. These functions are also required for 'free fall' aircraft carrying the H.R.S. installation in order to fully integrate the H.R.S. with the existing N.B.S., M.F.S. and A.R.I.5972 installations. These functions are as follows:-

(1) Manual selection of the A.R.I.5972 or N.B.C. derived ground speed components.

(2) Indication of automatic changeover of ground speed selection to the G.P.I. Mk.6 in the event of A.R.I.5972 inaccuracy.

(3) Control of the Coarse/Fine sequence of the G.P.I. Mk.6 Latitude servo.

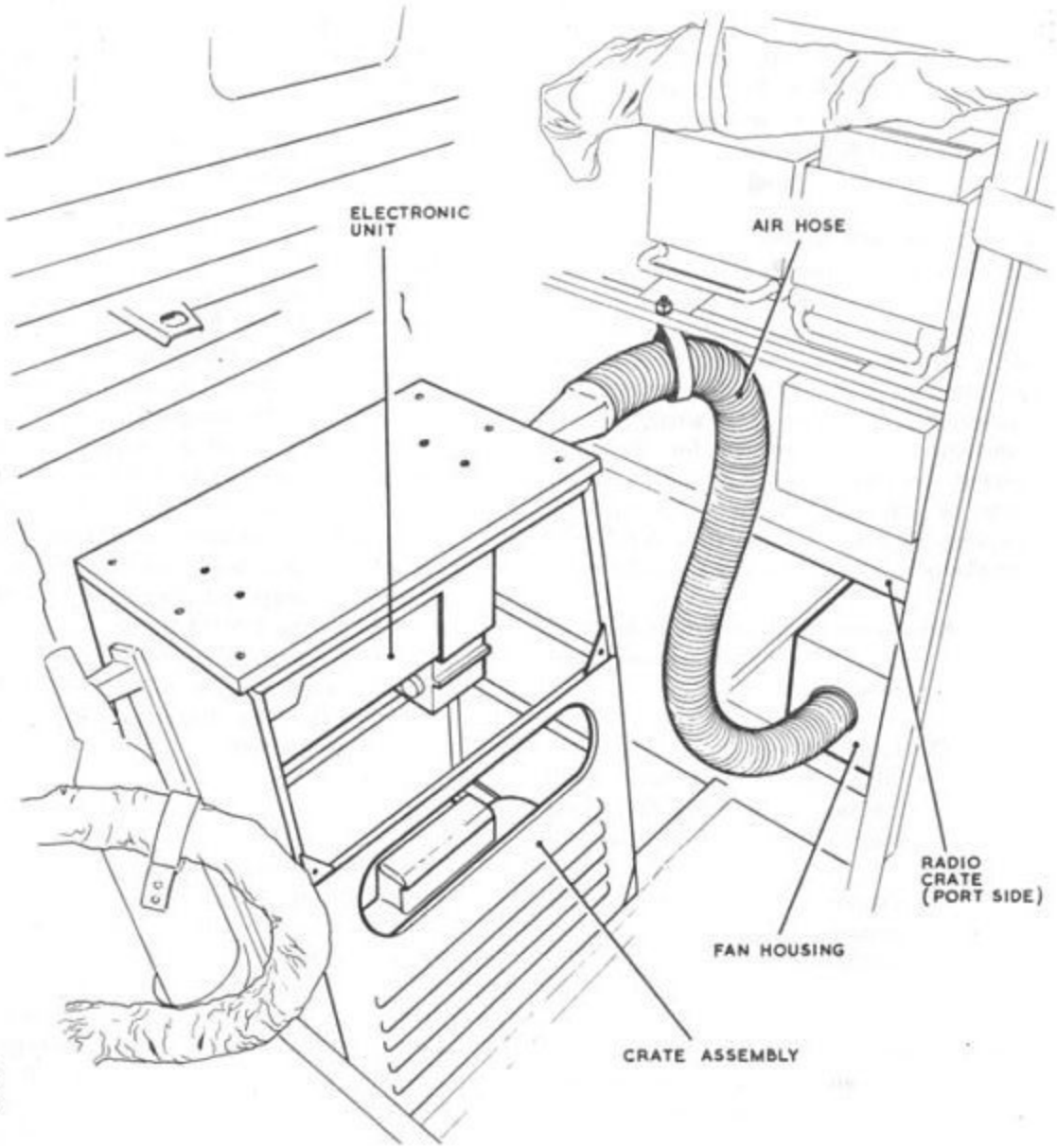
Power supplies

26. With reference to fig.5 it will be seen that the H.R.S. is supplied with 115-volt, 3-phase 400 Hz a.c. from the N.B.S. transformer via fuses 352R.B., 354R.B. and 355R.B. (one phase connected to earth) in panel 11P. and also 28-volt d.c. via fuses 716 and 722 in panel 48P. The a.c. supplies from fuses 352 and 354 are connected directly to the N.C.R., Type B, and H.R.U. respectively, whilst the a.c. supply from fuse 355R.B., is connected to the E.U. in the M.R.G. Mk.2 via the contacts of relay 321 in panel 11P.

Mod.2396

26A. With Mod.2396 incorporated, the supply from fuses 354R and B is fed to poles A and B of the U.V.P.S.U. If the correct supplies to the H.R.U. are available, a relay within the U.V.P.S.U. will be energized to close relay contacts 2-1. A 28-volt d.c. supply from fuse 716 in panel 48P (fig.4) is fed via the now closed relay contacts 2-1 and the H.R.U. power failure indicator normally closed push switch contacts, to light the green indicator lamp. If either undervoltage or incorrect phase rotation is sensed by the U.V.P.S.U. the internal relay will be de-energized and the power failure indicator warning lamp will not light. The supply for the lamp filament test is fed from fuse 694 in panel 48P.

27. When the switch labelled M.R.G. on the H.R.S.C.U. panel (fig.2) is switched to ON, a 28-volt d.c. supply (derived from fuse 716) energizes relay 321 and thus connects the 115-volt, 3-phase a.c. supply and the same 28-volt d.c. supply to the E.U. via the now closed contacts of relay 321. Fuse 722 supplies 28-volt d.c. to the N.C.R., Type B, for energizing relays within the N.C.R., Type B, which in turn selects the required source of



◀ Fig. 3 Installation of cooling fan, Post Mod. 2397 ▶

heading information, via a 3-position switch (para.19), for display on the dial of the instrument.

Power supplies G.P.I. Mk.6

28. The G.P.I. Mk.6 is fed with 115-volt, 3-phase, 400Hz a.c. from fuses 341-R and B (one phase connected to earth) in panel 11P, and 28-volt, d.c. from fuse 708 in panel 48P (fig.6). The supplies are controlled by a switch labelled G.P.I. - ON mounted on the radio control panel 12P (fig.1). With the switch selected to ON, a supply from fuse 708 is fed via the now closed G.P.I. switch contacts 2-1, to PL30A pole A of the blue steel junction box, and to the energizing coil of relay 540. Contacts 540/1 and 2 close connecting the a.c. supply from fuses 341-R and B to PL31A poles A and C respectively of the blue steel junction box.

Test socket

29. The test socket shown in fig.2 is used to monitor output voltages associated with the XT and YT potentiometers (located in the G.P.I. Mk.6) which are related to the functioning of the E.M.A. technique carried out by the G.P.I. Mk.6 in association with the N.B.S. Mk.1A.

SERVICING

General

30. All H.R.S. items of equipment should be checked for security of mounting and tightness of plug and socket connections. Before removing any item of equipment suspected of being defective, checks should be made for continuity and insulation on the associated cable assemblies. Complete instructions for servicing the items of equipment comprising the H.R.S. will be found in A.P.112B-0318-1A.

REMOVAL AND INSTALLATION

General

31. Access to the major units of the H.R.S. is straightforward and they may be easily removed or fitted with little or no difficulty. The only exception to this is the M.R.G. Mk.2 which as stated earlier comprises the G.R.U. and E.U. (mounted inversely) and are both fitted under the port sextant step as shown in fig.1. Therefore detailed instructions for the removal and installation of these particular items have been included in the following paragraphs.

M.R.G. Mk.2

G.R.U. Type A or B

32. To remove the G.R.U. from the port sextant step the following procedure should be adopted:-

CAUTION . . .

The G.R.U. is an extremely delicate instrument and must be handled with great care.

(1) Remove louvred panels from around the port sextant step to gain access to the G.R.U. and E.U. (See fig.1).

(2) Disconnect the two cable assemblies that are connected between the G.R.U. and the E.U. by removing the plugs from the sockets on the G.R.U.

(3) Disconnect the earth strap from the G.R.U. at the aft end of the unit.

(4) Release two locking plates (one shown in fig.1) used to secure the base plate of the G.R.U. in position.

(5) Slide the G.R.U. complete with base plate towards the crew's entrance door and then lift clear.

E.U. Type A or B

33. To remove the E.U. from the port sextant step, the following procedure should be adopted:-

(1) Remove louvred panels from around the port sextant step, also remove knee cushion fitted to the top of the step to allow access to six securing screws to be removed later.

(2) Disconnect the two cable assemblies that are connected between the G.R.U. and the E.U. by removing the plugs from the sockets on the G.R.U.

(3) Disconnect the two cable assemblies which are connected to sockets labelled 13C, and 18C on the E.U. and stow carefully to the adjacent aircraft structure.

(4) Remove the six securing screws mentioned in sub-para. (1), which secure the top plate to the port sextant step structure, and lift off the plate complete with E.U. and anti-vibration mounting tray.

(5) Separate the E.U. and anti-vibration mounting tray from the top plate by removing the four securing screws.

(6) When it is required to separate the E.U. from the anti-vibration mounting tray, reference should be made to A.P.112B-0318-1A where instructions for separating and re-assembling the two items are given in detail.

H.R.S. Mk.2 junction box

34. To remove the junction box, access must first be gained by lowering the navigator's sloping panel. Disconnect all plugs and sockets and stow cable assemblies to the adjacent aircraft structure to prevent damage. The junction box may then be removed by releasing four securing bolts (fig.2).

H.R.U. Type B

35. To remove this unit from its anti-vibration mounting tray, first disconnect all cable assemblies and stow them carefully to the adjacent aircraft structure to prevent damage. Unscrew two knurled locking screws and swing down so that the retainer collars disengage from the front panel catch of the H.R.U. Depress the retainer clip and slide the unit forward and lift clear of the mounting tray.

36. The H.R.U. is mounted and positioned on the mounting by placing the H.R.U. in the tray with its rear angled downwards so that the spring-loaded pins locate into their mating holes in the H.R.U. rear plate. With this engagement achieved, the H.R.U. is pushed rearwards against the action of the pins and lowered at the front so that the front panel engages with the retainer clip. Each locking screw is then swung upwards and operated so that the retainer collar engages with the clamps on to the front panel catch of the H.R.U.

H.R.S.C.U. Type B

37. To remove the control unit from the navigator's panel, release four quick-release fasteners, situated at each corner of the front panel, and slide the unit forward. Disconnect the cable assembly from the rear of the unit and stow the cable carefully to the adjacent aircraft structure to prevent damage.

TABLE 1

Unit location

Unit	Type and Ref. No.	Location
G.R.U.	Type A or B * Ref. No. 6G/39 or 6G/1050489	Port sextant step
E.U. Cooling fan (post Mod.2397)	Type A or B * Ref. No. 6G/4506307 or 6G/1037446 Ref. No. 10K/6215082	Port sextant step
H.R.U.	Type B Ref. No. 9CD/1117101	Under second pilots' floor
H.R.S.C.U.	Type B Ref. No. 9CD/1195337	Navigator's panel
H.R.U. U.V.P.S.U.	Type AE5601 Ref. No. 5UC/1098486	Panel 11P
H.R.U. P.F.I.	–	Navigator/Plotter's panel
▶ H.R.S. J/B Mk.2	Ref. No. 9CD/4491981	Behind navigator's sloping panel ◀
Navigator's compass repeater	Type B Ref. No. 6TB/1557	Sect.7, Chap.7
G.S.S.U.	Ref. No. 9C/172	Above H.R.S.C.U. navigator's panel
▶ G.S.R.	Ref. No. 9CD/1065171	Sect.7, Chap.5 ◀
B.S. J/B	Ref. No. 9C/105	Sect.7, Chap.5
G.P.I. Mk.6	Ref. No. 9C/101	Sect.7, Chap.5

* Type 'A' is of American Manufacture Type 'B' is of British Manufacture. These units are identical in construction and operation and may be substituted directly.

TABLE 2

Connectors for H.R.S. Mk.2

H.S.A. Part No.	Cable form	Connection
2/T6351	Rists Ref.No.54/2002/1 20-cores	H.R.U. plug 25C to E.U. plug 13C
	Rists Ref.No.54/502/1 5-cores	H.R.U. plug 25C to E.U. plug 18C
	Miniature 6C 5-cores	E.U. plug 13C to plug 198 panel 11P
3/T6351	Uninyvin 20 7-cores	H.R.U. plug 26C to plug 197 panel 11P and 48P
4/T6351	Uninyvin 20 5-cores	N.C.R. plug 1 to plug 195 panel 11P
5/T6351	Rists Ref.No.54/1202/6 12-cores	H.R.S. J/B socket 30C to G.S.R. plug 14A
6/T6351	Rists Ref.No.54/2102/1 27-cores	H.R.U. plug 15C to H.R.S.C.U. plug 15C
7/T6351	Rists Ref.No.54/302/13 6-cores	H.R.U. plug 1C to G.S.R. plug 1A
8/T6351	Rists Ref.No.54/302/13 3-cores	H.R.S. J/B socket 28C to G.S.R. socket 16A
	Uninyvin 20 6-cores	H.R.S. J/B socket 28C to T.C.U. plug 3
9/T6351	Rists Ref.No.54/502/1 5-cores	N.C.R. plug 2 to T.C.U. plug 6
10/T6351	Miniature 25C	H.R.S. J/B plug 33C to B.S. J/B socket 6A
11/T6351	Rists Ref.No.54/1202/6 12-cores	H.R.S. J/B plug 3C to B.S. J/B plug 2A
12T/6351	Rists Ref.No.54/2502/4 25-cores	H.R.S. J/B socket 34C to G.P.I. Mk.6 plug 7A
13T/6351	Rists Ref.No.54/302/13	H.R.U. plug 5C to B.S. J/B plug 8A
	Rists Ref.No.54/302/15 3-cores	H.R.U. plug 5C to B.S. J/B socket 5A
14T/6351	Rists Ref.No.54/1202/6 12-cores	H.R.S. J/B socket 2C to G.S.R. plug 2A
15T/6351	Rists Ref.No.54/2102/1 21-cores	H.T.U. plug 23C to N.C.R. plug 3
	Rists Ref.No.54/1002/1 10-cores	H.R.U. plug 23C to H.R.S. J/B socket 24C
	Rists Ref.No.54/302/13 3-cores	N.C.R. plug 3 to H.R.S. J/B socket 24C
16T/6351	Rists Ref.No.54/902 9-cores	H.R.U. plug 17C to N.B.S. J/B socket 29
19T/6351	Miniature 3C	H.R.S. J/B plug 6C to A.E.O. Monitoring test socket
18T/6286	Rists Ref.No.54/502 5-cores	H.R.U. plug 16C to G.S.R. socket 17A
	Rists Ref.No.54/502 5-cores	H.R.U. plug 16C to T.C.U. plug 5
	Rists Ref.No.54/802/4 8-cores	H.R.U. plug 16C to N.H.U. plug 1
19T/6286	Rists Ref.No.54/602/4 6-cores	N.H.U. socket 2 to M.F.S. J/B plug C2P
2/T5142	Miniature 18J	G.P.I. Mk.6 plug 24A to B.S. J/B socket 24A
3/T5142	Miniature 25C	G.P.I. Mk.6 socket 20A to B.S. J/B plug 20A
4/T5142	Miniature 12C	G.P.I. Mk.6 plug 25A to B.S. J/B socket 25A
8/T5142	Miniature 25X	G.P.I. Mk.6 plug 21A to B.S. J/B socket 21A
22/T5203	Miniature 12C	G.S.R. plug 3A to B.S. J/B socket 3A
24T/5203	Miniature 25C	G.S.S.U. plug to B.S. J/B socket 26A

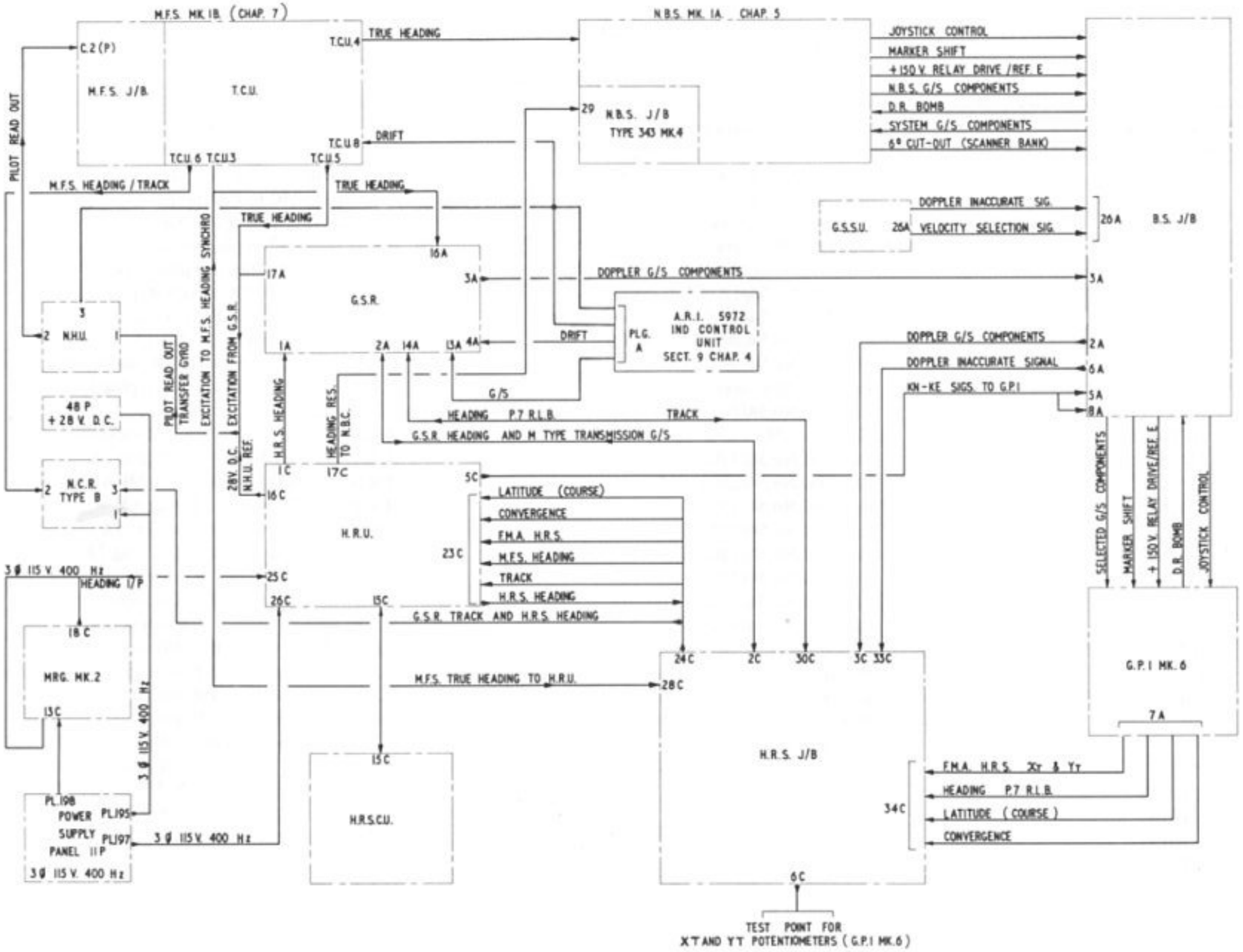


Fig.4 Block diagram of H.R.S. Mk.2 and associated systems

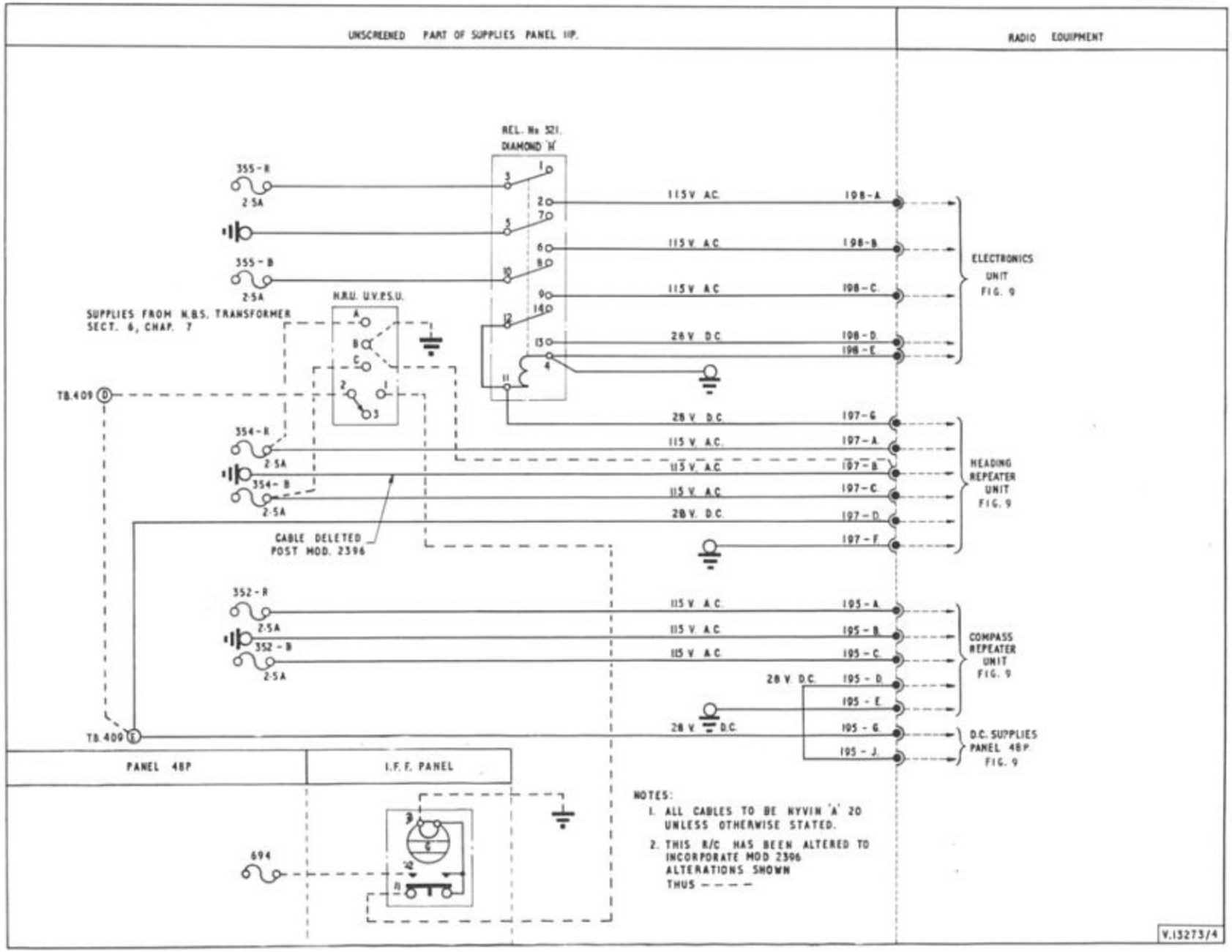


Fig. 5 H.R.S. Mk.2 supplies-Post Mod. 1908 and Pre and Post Mod. 2396

◀ Ref. made to Mod 1908 in title ▶

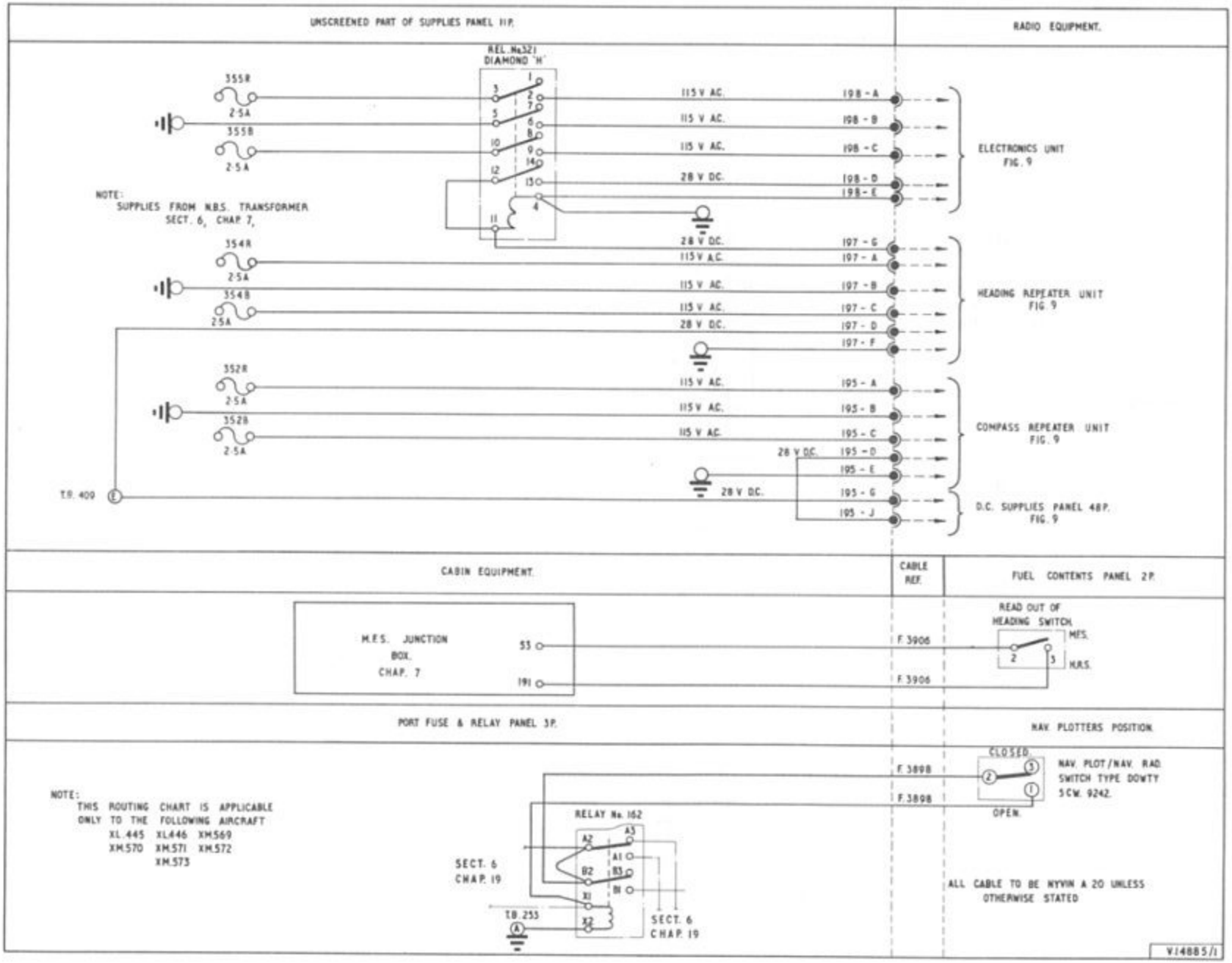


Fig. 6 H.R.S. MK.2 power supplies – Post Mod. 2112

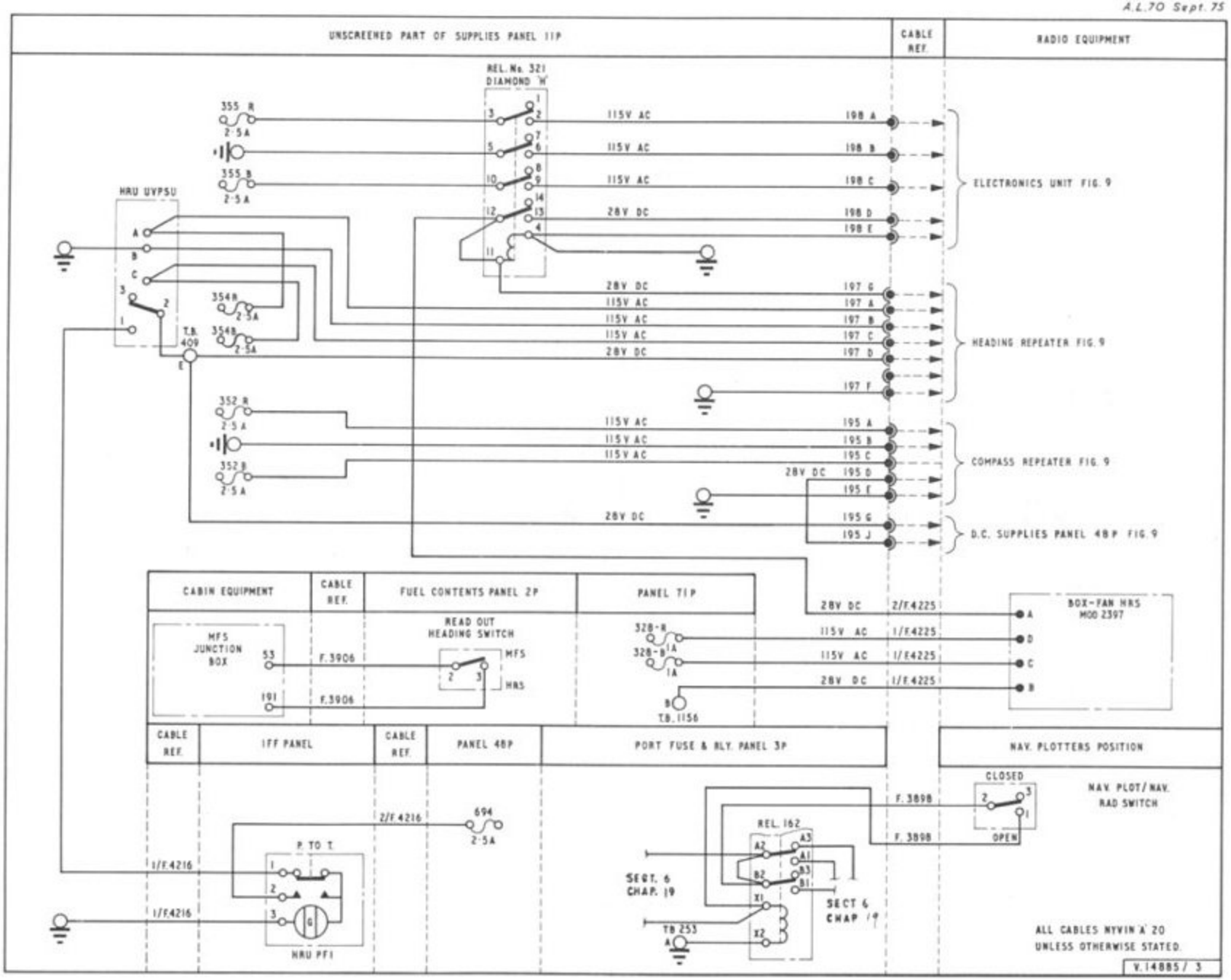


Fig. 7 H.R.S. Mk.2 supplies Post. Mod. 2112, 2396 and 2397

◀ New routing chart ▶

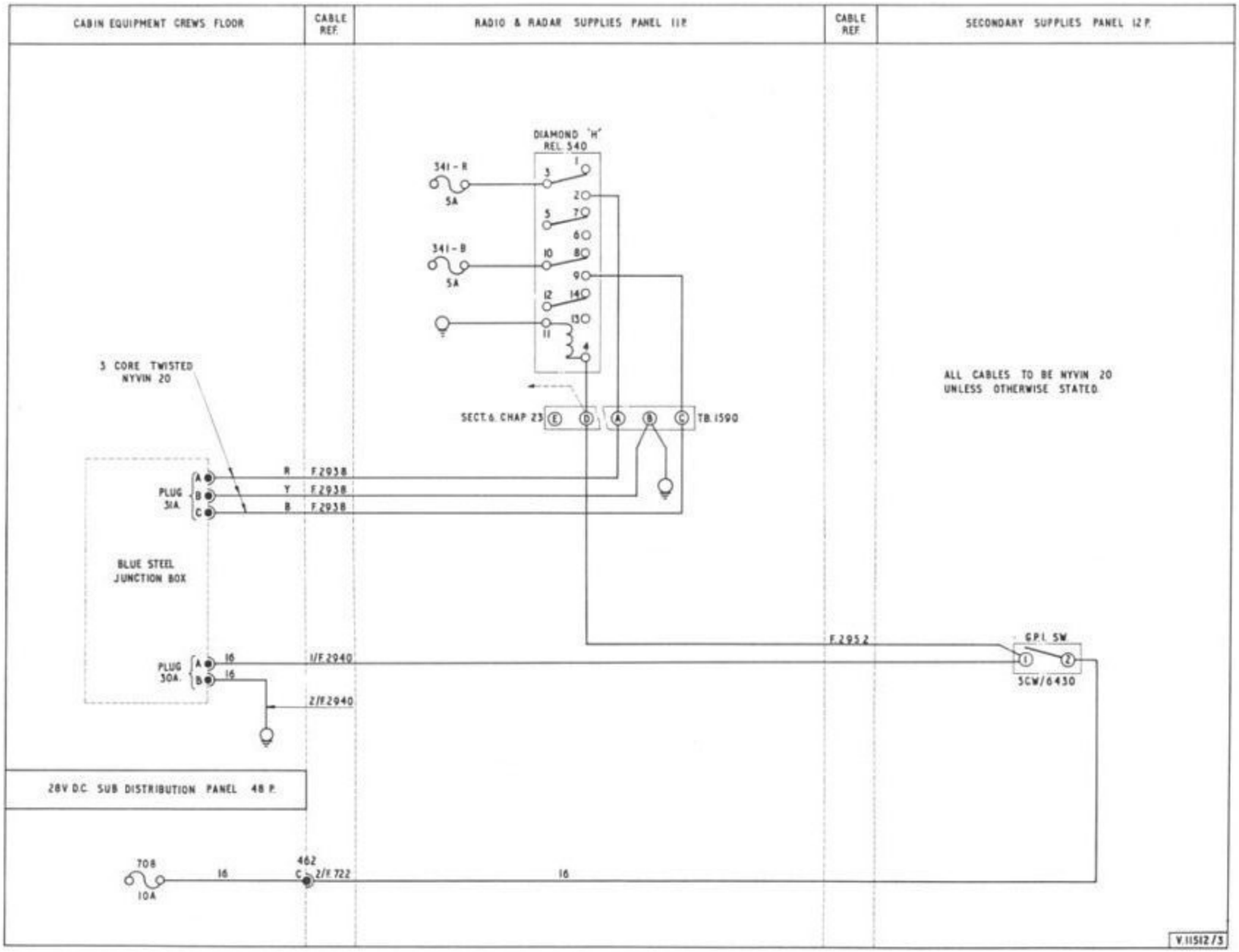


Fig. 8 G.P.I. Mk.6 power supplies

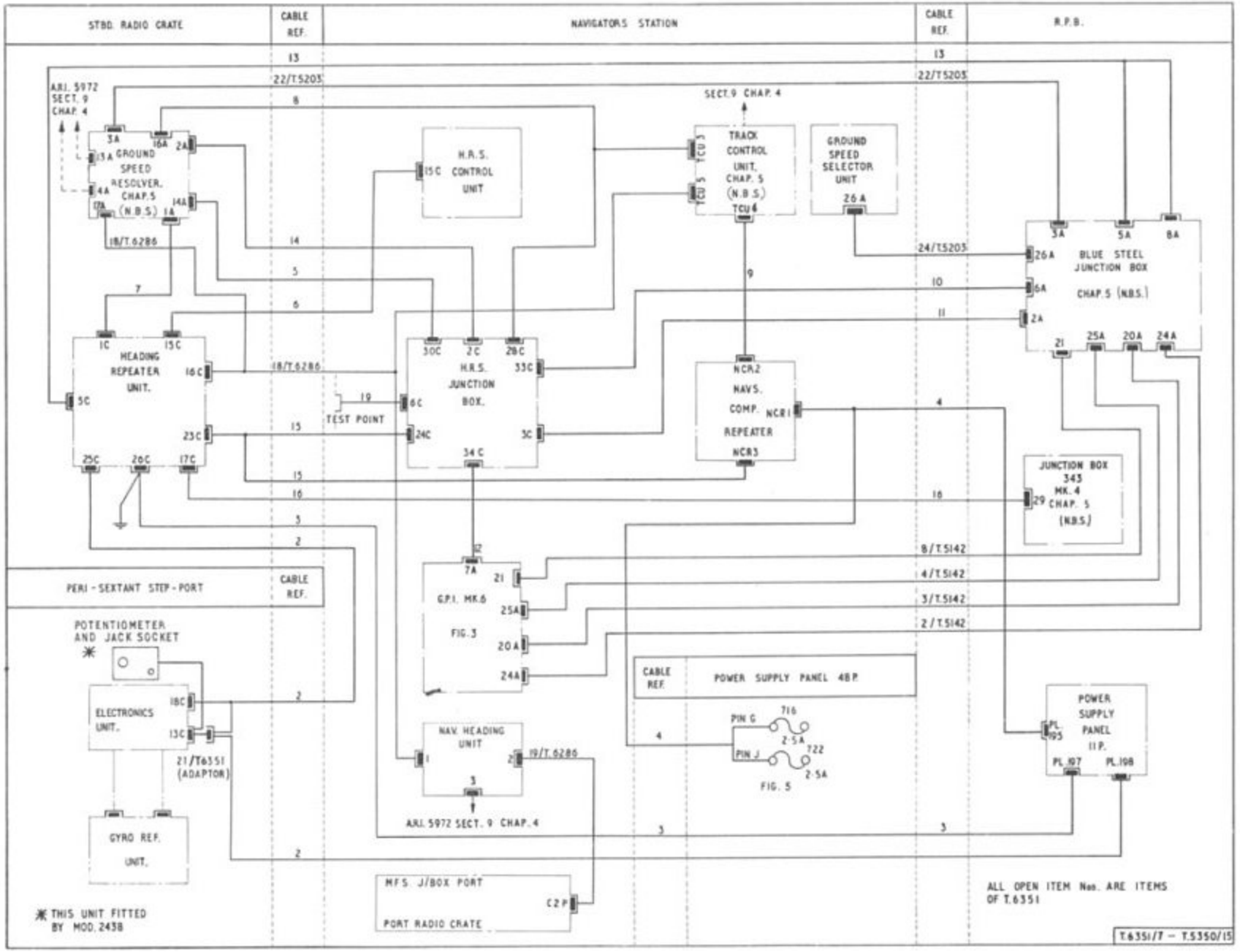


Fig. 9 H.R.S. MK. 2

▶ Mod 2438 ◀

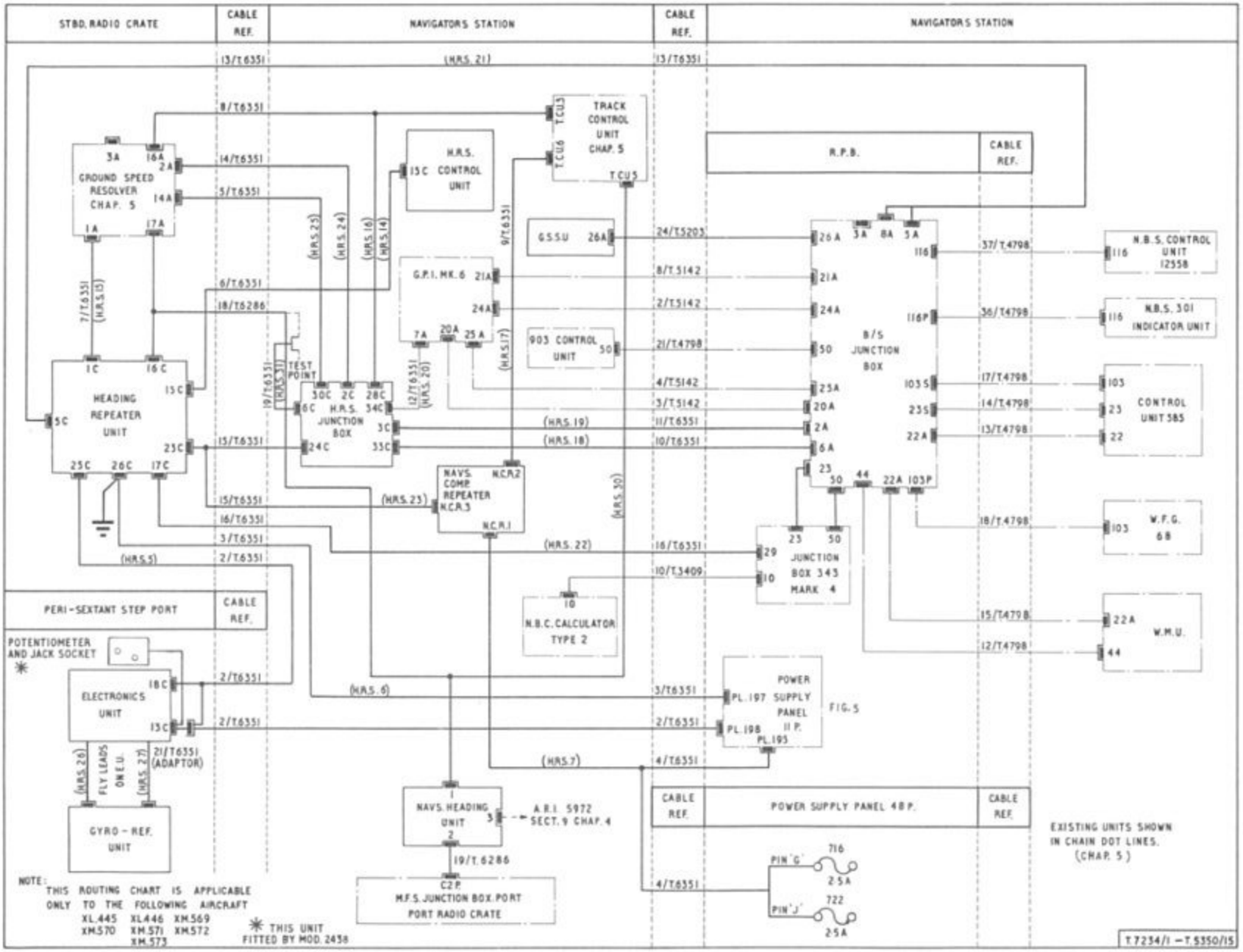


Fig. 10 H.R.S. MK. 2 – Post Mod. 2112

► *Mod. 2438* ◄