Chapter 13A A.R.I.18101 AND A.R.I.18157

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Introduction

1. The A.R.I.18101 and the A.R.I. 18157 operate in conjunction with the main receiving equipment of the second sonics installation (Chap.13, A.R.I.18108/1), and provide c/w homing facilities, thus permitting the aircraft to be homed to a sonobuoy transmitter. The A.R.I.18101

equipment provides the homing information, which is then fed to the A.R.I.18157 for visual indication; indicators being mounted at the pilot's and navigator's The A.R.I.18157 includes a stations. switch unit, under the control of the 1st pilot, which allows the homing indicators to display either sonobuoy homing information, or U.H.F. homing information

from the A.R.I.18120/4 (Chap.6).

2. Full information on the A.R.I.18101 and 18157 is contained in the publication quoted in Table 1, but a brief description of the various units is contained in the following paras. Installation details are shown in fig.1.



, Fig.1 Location of equipment

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DESCRIPTION AND OPERATION

A.R.I.18101

Power supplies

3. The A.R.I.18101 operates from 115-volt, single-phase a.c. and 28-volt d.c., connection being made into the sonics power distribution panel (Chap.13). The supply for switching the display on the A.R.I.18157 is fed from the A.R.I. being displayed on the indicators. Should the A.R.I.18101 supply fail, however, the A.R.I.18157 will automatically be selected to "U.H.F. homing".

Aerials

4. The aerial array consists of a quarter-wave blade, with a reflector and director, mounted on the underside of each outer mainplane, as shown in fig.2. To avoid any mismatch between the two aerials, the port and starboard feeder cables are manufactured equal in length.

Filter unit

5. A filter unit, Type 13402, is coupled into each aerial feeder cable to prevent interference to the homing signals from equipment operating on the same frequency band. The two filters are mounted on the navigators radio shelf at former 11. The inboard unit is in the starboard aerial feeder.

Comparator

6. The comparator unit operates in conjunction with either of the receivers in the "second" A.R.I.18108 installation (Chap.13), to provide homing and signal strength indications for display on the A.R.I.18157 electrical indicators, Type 7. The homing aerial inputs are switched alternately and the signal strengths compared. With equal signals, the indicators will show the sonobuoy to be directly ahead of the aircraft. With the sonobuoy to port or starboard of the aircraft centre line, the signal inputs from the homing aerials will be unequal. In this instance the indicators will show the change of direction required to restore the aircraft to the correct heading with respect to the sonobuoy. The horizontal pointer of the indicators is fed with signal strength information, whilst a dip in the needle reading indicates that the aircraft is over the top of the sonobuoy transmitter.

7. The comparator consists of several sub-modules mounted on a main chassis. R.F. connections to the unit are via three co-axial sockets on the front face; a 27pole unitor plug on the rear face provides for the remaining connections. The unit is mounted on the navigator's top shelf, between formers 10 and 11.

Backplate assembly

8. The backplate, Type 11810, is attached to the comparator tray and carries a 27-pole socket to mate with the plug on the comparator. In addition, the backplate carries two change-over relays, designated "A" and "B" controlled by a switch on the control unit, Type 11141. The relays allow either the "A" or "B" receiver of the "second" A.R.I.18108/1 installation to be selected into the homing system as required.

Control unit

9. The control unit, Type 11141, fitted on the routine attack navigator's panel, carries the operational controls for the A.R.I.18101. The unit also includes circuits for the signal strength indication, together with several associated pre-set controls. Connections to the unit are via two Mk.4 plugs and a Mk.4 socket.

A.R.I.18157

Switch unit

The switch unit, Type 11145, is 10. mounted below the 1st pilot's blind flying panel, and provides the pilot with overriding control of the system used for homing. The unit carries a two-position switch, identified RT, and SB, which controls the four switching relays in the junction box, Type 11143. With the switch set at SB, the homing indicators of the A.R.I.18157 will display sonics information whilst selecting the RT position will connect the indicators to the A.R.I.18120/4 installation. Should any failure occur in the switching circuits, however, the indicators will automatically revert to displaying RT homing information.

Indicator

11. The indicator, electrical, Type 7, is a crossed pointer instrument. The vertical pointer displays azimuth bearing information on the source of the signal transmitted, relative to the fore and aft When the A.R.I. axis of the aircraft. 18157 is selected to SB, the horizontal pointer acts as a signal strength indicator, the biasing being such that with no signal, the pointer is deflected fully down. It should be noted that the horizontal pointer is not used when the system is selected to RT homing.

12. With the selected homing equipment inoperative, warning flags are displayed on the indicator.

13. Two indicators are fitted as part of the A.R.I.18157, one on the routine attack navigator's panel and one on the 1st pilot's panel.



Fig.2 Assembly of aerial

Junction box, homing

14. This junction box is mounted below the level of the signaller's table, between formers 1 and A, and serves as an interconnecting point for the installation. Contained within the box are the four switching relays, mentioned in para.10.

SERVICING

Precautions

15. Before attempting any servicing, the warning notes and general servicing precautions in Chapter 1 of this section should be noted.

General instructions

16. At the appropriate servicing periods, the equipment should be examined for damage, corrosion and security. Where applicable, the bonding of the mountings should be checked, and the filaments replaced when necessary. Connectors should be examined for security and damage.

17. Full servicing information, including test equipment details, is contained in the publication listed in Table 1.

REMOVAL AND INSTALLATION

Precautions

18. Prior to the removal of any item of equipment, the notes in Chapter 1 of this section should be read.

General instructions

19. Removal of the major items of equipment is straightforward and detailed instructions are not considered necessary.

20. When replacing or reconnecting items, ensure that the plug pins are not damaged or distorted and that the plugs and sockets are free from corrosion.



Junction box, homing

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| ltem No. | Cable form | | Connecting | Ref.No. |
|----------|-------------|-----|--|-----------|
| 12/T5674 | Uniradio 67 | | Plugbreak No.794 to Inner wing break, (Starboard) | |
| 13/T5674 | Uniradio 67 | | Plugbreak No.793 to Inner wing break, (Port) | _ |
| 13/T4772 | Uniradio 67 | | Inner wing break, Port to Outer wing break, (Port, Front spar) | 10HB/9140 |
| 14/T4772 | Uniradio 67 | | Inner wing break Stbd., to Outer wing break (Stbd., Front spar) | 10HB/9141 |
| 15/T4772 | Uniradio 67 | | Outer wing break, Port, Fear spar to aerial break. (Port) | 10HB/9142 |
| 16/T4772 | Uniradio 67 | 2 | Outer wing break, Stbd. Fear spar to aerial break, (Stbd.) | 10HB/9142 |
| 17/T4772 | Uniradio 67 | 2 | Outer wing break, Port, Front spar to Outer wing break (Port, Rear spar) | 10HB/9144 |
| 18/T4772 | Uniradio 67 | * 2 | Outer wing break, Stbd., Front spar to Outer wing break (Stbd. Rear spar) | 10HB/9145 |

TABLE 2 (continued)

TABLE 3

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Connectors for A.R.I.18157

| Item No. | Cable form | Connecting |
|----------|---|---|
| 2/T5663 | Equipment wire (Spec. DEF.12B) Type 2, 23/.0076, 7 off | Junction box 11143C.U.(N) to Control unit 11141 J.B.H. |
| 3/T5663 | Equipment wire (Spec. DEF.12B) Type 2, 23/.0076, 12 off | Junction box 11143 SW.U to switch unit 11145 J.B.H. |
| 4/T5663 | Equipment wire (Spec. DEF.12B) | Junction box 11143 to junction box 9636 |
| 5/T5663 | Equipment wire (Spec. DEF.12.B) Type 2, 23/.0076, 12 off | Junction box 11143 Meter to Indicator elect (Navigator) |
| 6/T5663 | Equipment wire (Spec. DEF.12B) Type 2, 23/.0076, 8 off | Switch unit 11145 Meter to Indicator elect (Pilot) |

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TABLE 1

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Major items of equipment

| Item | Туре | Ref. No. | A.P. Reference |
|--------------------------|-------|-----------|-----------------|
| A.R.I.18101 | | > | |
| Control unit (Navigator) | 11141 | 10L/16363 | |
| Comparator unit | 7968 | 10D/21574 | |
| Backplate (Comparator) | 11810 | 10D/21576 | |
| Filter unit | 13402 | 10P/13292 | A.P.116G-0301-1 |
| A.R.I.18157 | | | |
| Switch unit (Pilot) | 11145 | 10F/20137 | |
| Junction box, (Homing) | 11143 | 10D/21575 | |
| Indicator (Electrical) | 7 | 10Q/61 | |

TABLE 2

Connectors for A.R.I.18101

| Item No. | Cable form | Connecting | Ref.No. |
|----------|-----------------------------------|--|---------|
| 2/T5674 | Miniature cable 1C (DEF.10) 2 off | Control unit 11141 JB9429 to No.2 junction box 9429 C.U.(N) | • |
| | Equipment wire (Spec.DFF.12B) | | |
| | Type 2, 23/.0076, 2 off | | |
| 3/T5674 | Uniradio 43 | No.2 receiver A,RF to relay A (A) (Comparator backplate) | - |
| 4/T5674 | Uniradio 43 | No.2 receiver B,RF to relay B (A) (Comparator backplate) | - |
| 5/T5674 | Uniradio 43 | No.2 amplifier 11144 REC.1 to relay A (B) (Comparator backplate) | |
| 6/T5674 | Uniradio 43 | No.2 amplifier 11144 REC-2 to relay B (B) (Comparator backplate) | - |
| 7/T5674 | Uniradio 43 | Filter unit 13402, Port, Out to Comparator 7968 (Port) | - |
| 8/T5674 | Uniradio 43 | Filter unit 13402, Stbd., Out to Comparator 7968 (Stbd.) | - |
| 9/T5674 | Uniradio 43 | Filter unit 13402, Port, AE.IN to Plugbreak No.793 | - |
| 10/T5674 | Uniradio 43 | Filter unit 13402, Stbd. AE.IN to Plugbreak No.794 | - |
| 11/T5674 | Miniature cable IC (DEF.10) 2 off | Comparator 7968 to relay A (white) (Comparator backplate) | - |
| | Equipment wire (Spec.DEF.12B) | Comparator 7968 to relay B (black) (Comparator backplate) | - |
| | Type 2, 23/.0076, 20 off | Comparator 7968 to Sonics P.D.P.6 | - |
| | | Comparator 7968 to Control unit 11141 | - |

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DECTDICTER

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Fig. 3 A.R.I. 18101

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