

Chapter 2

GENERAL SERVICING INFORMATION

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INTRODUCTION

1. The servicing information contained in this Chapter is of a general nature and applies to the majority of the main units, modules etc. which comprise the homing installation ARI.18120. Specific instructions concerning individual items of the installation are given in the appropriate publication units in this series.

CLEANLINESS

2. In order to minimize the risk of damage and subsequent servicing delays due to dirt and/or corrosion, clean servicing conditions are essential. Where modules are of a mechanical nature, containing moving parts such as tuning capacitors, gears, rotary switches etc., such modules should be placed in polythene bags for normal storage and during periods between servicing.

REMOVAL OF COVERS AND MODULES

3. Before removing the cover from the R.F. Unit Type 11037, take off the cap from the Schrader valve on the front panel and release the internal pressure. Using a hexagon wrench, 5120-99-942-9651, slacken each of the eleven socket head screws on the front panel a half-turn at a time, in the order shown in fig. 1, until all are fully released. Remove the cover and sealing gasket from the unit.
4. For servicing and testing, it is normally necessary to remove only the amplifying unit (R.F.) Type 11681 and the tuning unit Type 11683 from the R.F. unit; each of these modules is secured to the chassis assembly Type 11680 by three red-painted captive screws which are accessible from the underside of the chassis. Three coaxial connectors must be uncoupled from the sockets on the amplifying unit before removal.
5. Removal of the cover from the A.F. unit Type 9635 is achieved after releasing two screws at the rear of the unit. The amplifying unit (A.F.) Type 11678 and the relay unit Type 11679 are each secured to the frame of the chassis assembly Type 11677 by four red-painted captive screws. The screws for the amplifying unit are accessible from the underside of the chassis while those for the relay unit are released from the top.
6. The junction box Type 9636 is fitted with a rear cover plate which may be removed after extracting two screws.

CLEANING

7. Cleaning fluids and solvents should be used sparingly and only when necessary. Cleaning materials are as follows:-
 - (1) Soft bristle-free brush
 - (2) Lint-free cloth, Ref. No. 32B/250
 - (3) Low-pressure supply of clean, dry, compressed air
 - (4) Trichloroethane (Inhibisol), 6810-99-220-1949

WARNING

WHERE SERVICING REQUIRES THE USE OF INHIBISOL AS A CLEANING AGENT, THE FOLLOWING PRECAUTIONS MUST BE TAKEN:-

- (1) ENSURE MAXIMUM VENTILATION
- (2) DO NOT SMOKE, PARTAKE OF FOOD OR DRINK

- (3) DO NOT INHALE THE VAPOUR
- (4) AVOID CONTACT WITH THE SKIN
- (5) DO NOT IMMERSE ANY COMPONENTS FOR MORE THAN 1 MINUTE
- (6) DRY ALL COMPONENTS THOROUGHLY BEFORE RE-ASSEMBLY AND IF VARNISHED DRY IN AN OVEN OR IN WARM AIR.
- (7) AFTER COMPLETING THE OPERATION ALWAYS WASH BEFORE PARTAKING OF FOOD OR SMOKING

8. Preparatory to examination, test, alignment or repair all main unit, modules etc. must be thoroughly cleaned in the following manner:-

- (1) Loosen any dirt and foreign matter with the soft-bristled brush.
- (2) Apply a jet of clean compressed air to remove the loosened dirt and foreign matter.

WARNING

CERTAIN SHAFTS WITHIN THE EQUIPMENT ARE FITTED INTO OILITE BEARINGS: EXTREME CARE MUST BE TAKEN NOT TO ALLOW INHIBISOL TO COME INTO CONTACT WITH THESE BEARINGS SINCE IT WILL CAUSE IRREPARABLE DAMAGE.

- (3) Where necessary, use a lint-free cloth, moistened with Inhibisol, to clean the metallic parts and then dry these parts with compressed air. Areas in close proximity to Oilite bearings should be carefully wiped clean with a clean, dry, lint-free cloth (see Warning).

CAUTION...

WHERE ANY DIRT OR FOREIGN MATTER IS PRESENT ON AN EQUIPMENT WHICH IS NORMALLY CONTAINED IN A SEALED, PRESSURIZED COVER, THIS MUST BE INVESTIGATED AND REMEDIAL ACTION TAKEN.

PHYSICAL EXAMINATION

9. After cleaning, the main units, modules etc., must be carefully examined as described below:-

- (1) Examine the item to verify its modification state.
- (2) All metal components must be securely mounted and free of any

evidence of damage, corrosion or distortion.

- (3) Examine all non-metallic and electrical components for:-
- (a) Evidence of damage, overheating or perishing
 - (b) Signs of cracking, chipping, cuts or abrasions
 - (c) Deterioration caused by contact with contaminating agents.

CAUTION

CERTAIN WIRING EMPLOYED IN THE EQUIPMENT IS OF THE SINGLE STRAND TYPE; THIS WIRE IS RATHER BRITTLE, PARTICULARLY AFTER SOLDERING, AND CARE MUST BE TAKEN TO AVOID BREAKING ANY OF THIS WIRING.

(4) Visually examine the wiring and printed circuit boards for evidence of short or open circuits, ensuring that all electrical connections are firmly soldered and that cableforms are correctly laced.

(5) Examine the plugs and sockets for frayed or broken connections and cracked mouldings. If a plug or socket which has a cracked moulding is still electrically and mechanically sound, it is not always necessary to effect a replacement. However, if the moulding is cracked such that the poles have become loose, or there is danger of a short circuit between poles, then the item must be replaced.

(6) Verify that all switch contacts rotor surfaces, relay contacts etc. are clean and without any signs of burning or excessive wear.

(7) All gears, cams, couplers etc. shall be securely fitted to their respective shafts by means of the associated pins, grub screws etc; verify that these items and their bearings are undamaged and free from foreign matter and excessive lubrication. Examine all moving parts to verify smoothness of action.

WIRING AND COMPONENTS

10. Where it is necessary to renew wiring, the replacement wiring must be of the same gauge, colour coding and length as the original wiring and dressed to follow the original route; full details are given in the appropriate publication units of this series.

WARNING

MOST OF THE WIRING EMPLOYED HAS P.T.F.E. INSULATION. WHEN THIS WIRING IS SOLDERED, THE HEATED INSULATION GIVES OFF FUMES WHICH CAN BE INJURIOUS TO HEALTH; UNDER NO CIRCUMSTANCES MUST THESE FUMES BE INHALED.

11. When replacing a component, the new component must be fitted in the exact position previously occupied by the fault item. To replace a component on a printed circuit board, first remove the faulty component by clipping the wires as close as possible to the body of the component, leaving the wires, still soldered to the board; solder the new component to these wires in accordance with para. 13 and then clip off all surplus wire.

12. Special care must be taken when replacing semi conductors and electrolytic capacitors to ensure that they are correctly connected with regard to polarity, since reversing the polarity of the connections can permanently damage these components. Care should also be taken to avoid bending the wires at the point of weakness where the wires enter the component. Excessive heat can also irreparably damage these components and particular attention should therefore be paid to the soldering instructions given in para. 13(1) to (3).

SOLDERING

13. All soldered connections should be made using a fine gauge 60/40 low temperature solder with a non-corrosive flux. Under no circumstances should a soldering iron exceeding 50W be used; in most cases a 20W soldering iron will suffice. In order to effect a good soldered joint the following points should be observed:-

- (1) Always use a soldering iron of the correct size, shape and thermal capacity.
- (2) Although great care should always be taken to avoid excessive heat, it must be appreciated that dry joints are often caused by removing the soldering iron before the joint has reached the temperature of the solder; therefore, the amount of heat applied must be compatible with a satisfactory joint.
- (3) Care must be taken to protect the wiring, components etc. adjacent to the joint to be soldered; where possible a metal guard should be used. A heat shunt should also be employed to protect the component being soldered and should be connected to the wire as close

to the joint as possible. A suitable heat shunt may be made from $\frac{1}{8}$ in. thick copper plate, with a triangular area of approximately 1 sq. in., soldered to the operating arm of a crocodile clip.

(4) Terminals should be cleaned and tinned and the wire similarly prepared. Where a terminal is without holes the wire should be hooked loosely (not clenched) around the terminal. For a terminal with holes, bend the wire at a right angle and hook it through the hole; the wire must not be clenched or bent further. Attention to these points will facilitate subsequent unsoldering and disconnection and minimize damage to components.

(5) Care must be taken to ensure that exposed wires and terminals are not in such close proximity as to result in arcing or short circuits.

(6) When soldering more than one wire to a terminal, the wires must not be twisted together; each wire must be connected separately.

(7) Wires must not be soldered directly to metal braiding. The end of the braiding must be combed out and formed into a pigtail to which the wire may then be soldered.

(8) The point where the solder terminates on stranded wire is one of potential weakness; care must therefore be taken to minimize the distance that the solder travels along the wire.

LUBRICATION

14. It is important to ensure that all gears are correctly lubricated; great care must be taken to avoid applying excessive lubrication. The gear teeth should be lubricated by applying a very thin film of grease XG-287; for the idler gear shafts apply one drop of oil OX-14 to each shaft.

LOCKING OF SCREWS AND NUTS

15. Where servicing has necessitated removing any screws or nuts which are not provided with any form of locking device, these must be locked with an approved locking varnish upon re-assembly; a small amount of varnish shall be applied under the head of a screw at the thread junction with a nut, as appropriate.

EXAMINATION

16. On completion of testing, servicing etc., the equipment should be examined

to ascertain that all applicable modifications, repairs etc. have been effected correctly, that no damage has been sustained during handling and that the equipment is in a clean and generally satisfactory condition.

REFITTING MODULES AND COVERS

17. Before refitting the amplifying unit (R.F.) Type 11681 and the tuning unit Type 11683 into the chassis assembly Type 11680, the couplers in the chassis and on the modules must be orientated so that they will mate correctly when the modules are fitted. The amplifying unit should be fitted first, taking care that the coaxial connectors are correctly coupled. When fitting the tuning unit it may be necessary to rock the gear train in the chassis in order to effect correct engagement of the couplers.
18. Fit the sealing gasket and cover on the R.F. unit Type 11037 by adopting the reverse of the removal procedure given in para. 3. Using a pump, pressurizing, 4320-99-104-7435, pressurize the unit to 5 p.s.i. and then fit the cap on the Schrader valve.
19. Fit the amplifying unit (A.F.) Type 11678 and the relay unit Type 11679 into the chassis assembly Type 11677 and then fit the cover, securing it by means of two screws at the rear.
20. Fit the rear cover to the junction box Type 9636 and secure it with two screws.

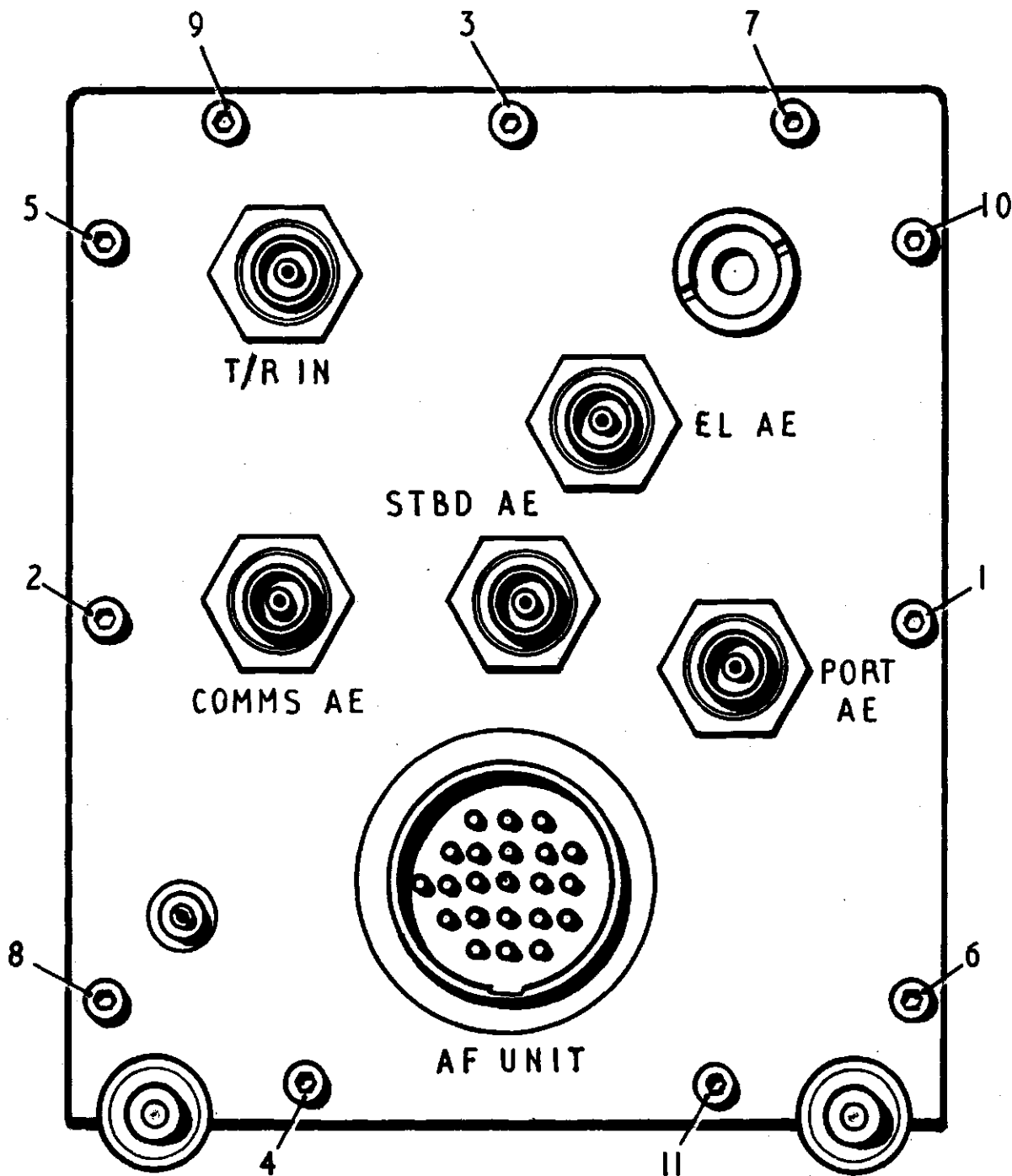


Fig. 1 Order of loosening and tightening securing screws Fig. 1

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LIGHTNING MK. 1
COVER PITOT HEAD
EB2-88-5111