314 SIGNALS SQUADRON

TRANSMITTER, RADIO, C11

TECHNICAL HANDBOOK - MODIFICATION INSTRUCTION

SUB-TITLE: Replacement of reactor assembly

Note: This Issue 2, Pages 1 - 4 supersedes Issue 1, Pages 1 - 4, dated 19 Apr 62. The stores requirement has been amended, the distribution class and code of the EMER changed and the modification detail at para 7(g) amplified. No further action on modified equipments which are operating correctly is required.

1. Introduction

The ferrite core of the original reactor X1 in the sealed master oscillator (m.o.) compartment of the Transmitter, radio, C11 has been found, in practice, to be unsatisfactory in that it causes frequency instability. This regulation details the replacement of the complete reactor X1 by another type and the fitting of an additional temperature compensating capacitor.

2. Priority: Group 'B' (ACI 407/58 refers)

3. Estimated time required: 1 man-hour

4. Items affected

Transmitter, radio, C11. Serial No 0001-1599 inclusive

Master oscillator unit

Note: All equipments of Serial No 1600-1630 inclusive are fitted with the new reactor specified in this instruction, but not all have the additional temperature-sensitive capacitor. Despite this omission, these particular sets operate satisfactorily and will not be so fitted unless the reactor has, at any time, to be replaced. In this event the capacitor required will be demanded as a maintenance item.

5. Action required by:-

(a) Units and establishments holding equipment

(i) Submit AF G1045 to REME requesting this instruction to be carried out.

(b) Units authorized to carry out field or base repairs

(i) When requested by units demand stores for and carry out this modification.

(ii) Demand stores for and carry out the detail of this modification on all equipments received for repair or overhaul.

6. Stores, tools and equipment

(a) Stores to be demanded

VAOS, Section	Part No	Designation	Qty per eqpt
Z1	ZA 52937	Kit, modification, Wireless set C11, reactor assembly	1
		comprising:-	
Z1	ZA 54607	Transformer, reactor assembly, No 3	1
Z1	ZA 54606	Brackets, angle, m.s., 2.25/32 in. x 1.7/8 in. x 1 in. diameter overall	1
Z	5910-99-011-8270	Capacitor, fixed, ceramic dielectric, tub, insulated, 2.2pF ± 0.5pF, 750V d.c. wkg	1

Stores will be demanded through the normal Ordnance channels using this EMER No as the authority and endorsing the indent 'War Office controlled item (Ord 8)'.

(b) Stores to be obtained locally

Part No	Designation	Qty per eqpt
Y3/6145-99-910-0167	Wire, elect, equip, type 2, 7/.0076, yellow	6 in.

(c) Stores to be discarded

Part No	Designation	Qty per eqpt
ZA 43969	Transformer reactor assemblies	1
	Resistor, 100kΩ	2

The transformer is to be returned to R.S.G. Donnington, Salop. The resistors are to be disposed of locally.

7. Sequence of operations

(a) Stand the set on its front panel, loosen the four retaining screws at the rear of the case. Remove the set from its case.

(b) Turn the equipment bottom uppermost and remove the four No 2 BA nuts and washers which retain the cover of the sealed oscillator unit. Remove the cover.

(c) Unsolder the following leads (see Tels D 122, Part 2, Fig 2013 for location of components):-

(i) The blue and orange leads from the end tags of the terminal strip attached to the reactor bracket.

(ii) The end of the heavy gauge wire, which connects the reactor X1 to the precision capacitor C3, from the reactor tag.

(iii) The end of the heavy gauge wire, which connects the calibrator coil L2 to the oscillator coil L1, from the tag of L1.

(iv) The end of the mauve lead, which connects the variable 1MΩ resistor RV1 to the insulated lead-through terminal at the side of the oscilator box, from the lead-through terminal.

(d) Adjust the front panel CALIBRATE control in a clockwise direction as far as it will go, then if necessary move it back though a small distance, to leave the tongue and slot of the coupling (which connects the control shaft to the slug of L2) vertical. This is to ensure that the tongue and slot disengage easily when the reactor bracket assembly is being removed.

(e) Remove the reactor bracket assembly from the oscillator unit after first removing the two No 6 BA screws, nuts and washers.

(f) Remove the following components from the bracket at (e):-

(i) The calibrator coil L2.

(ii) The variable resistor RV1.

(iii) The tagstrip.

(g) Unsolder all leads from the reactor. Unsolder and remove the two 100kΩ resistors R1a and R1b from the second and fourth tags of the tagstrip; remove also, that connection which links one of these tags to the end tag from which the blue lead was disconnected at (c)(i). Remove the 0.01μF capacitor C1 from the reactor. Retain any wires removed but leave the wires on the variable resistor tags connected ie, disconnect these from the far ends.

(h) Refit RV1, L2 and the terminal strip on to the new reactor bracket assembly and secure them.

(j) Solder the 0.01μF capacitor C1 between the second and fourth tags of the terminal strip on the side adjacent to RV1.

(k) Connect the free end of the mauve wire on the centre (slider) contact of RV1 to terminal 1 of the new reactor. Connect the slider of RV1 also to one end of the 0.01μF capacitor C1 (refitted at (j)) using the mauve wire which connected two 100kΩ resistors to the original reactor.

(l) Connect terminal 6 of the reactor to the end of the calibrator coil L2 nearest the bracket.

(m) Connect the tag at the free end of C1 (see (k)) and terminal 4 of the reactor each to the earth tag behind L2, using P.V.C. covered equipment wire, colour yellow.

(n) Clean off and,if necessary, tin the insulated lead-through terminal at the side of the oscillator box (this is the terminal mentioned at (c) (iv)). Preparation of the terminal is essential at this stage owing to its inaccessibility after the new reactor bracket is fitted.

(o) Carefully slide the new reactor bracket into position and carry out the procedure detailed in Tels D 129 Misc Instr No 3, sub-para (d) to (g). Secure the bracket in position with the screws, washers and nuts removed at (e).

(p) Solder the free end of the remaining mauve lead from RV1 to the lead-through terminal on the oscillator box (see (n)).

(q) Solder the lead from the precision capacitor (disconnected at (c)(ii)) to terminal 3 of the reactor, shortening it as necessary.

(r) Resolder the leads disconnected at (c)(i) and (c)(iii) to the terminal strip (original tags) and to the oscillator coil L1, respectively.

(s) Solder the 2.2pF capacitor provided, in parallel with capacitor C5 (see Tels D 122, Part 2, Fig 2013): one end is to be connected to the previously unused stator terminal on the trimmer capacitor C4 and the other to the earth connection to the rotor of C4. The leads will be kept as short as possible and a heat shunt used while soldering. This shunt can conveniently be a pair of long-nose pliers gripping the capacitor leads between the body of the capacitor and the joint being soldered.

(t) Replace the oscillator box cover (removed at (b)) and secure with the original nuts. Carry out complete drying and resealing of the oscillator unit (see Tels D 124, para 41).

(u) Strike through the figure 3 on the radio set modification record plate.

(v) Replace the set in its case and secure the four retaining screws.

(w) Carry out a complete functional check of the equipment.

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END

TRANSMITTER, RADIO, C11

TECHNICAL HANDBOOK - MODIFICATION INSTRUCTION

SUB-TITLE: Improved ventilation of modulator valves

Introduction

1. Overheating of the modulator valves V8 and V9 in the Transmitter, radio, C11 due to inadequate air circulation, can lead to flash-over between the electrodes. To prevent this, the efficiency of the cooling system is to be improved by the fitting of an air-scoop to the blower unit. The effect of this air-scoop is to increase the turbulence of air around the modulator valves. This regulation gives details of the modification required.

2. Priority: Group 'B' (ACI 407/58 refers).

3. Estimated time required: 1 man-hour.

4. Items affected

Transmitter, radio, C11
Ventilator unit

5. Action required by:-

(a) Units and establishments holding equipment

(i) Request REME to modify the equipment.

(b) Units authorized to carry out field or base repairs

(i) When requested by units demand stores and carry out this modification.
(ii) On repair or overhaul demand stores and carry out modification
(iii) Ensure that the figure 2 on the equipment modification record plate is struck through after modification.
(iv) If equipments are received which have been modified as described in this regulation, but on which the figure 2 on the modification record plate has not been struck through, this will be done before returning the equipment.

6. Stores, tools and equipment

(a) Stores to be demanded

Stores will be demanded through the normal Ordnance channels. Authority for demand (to be quoted on all indents) - T/W/HB/7

Part No	Designation	Qty per eqpt
ZA 54049	Scoop, air flow, m.s., 1.9/16 in. x 7/16 in. high	1
G1/5305-99-941-9090	Screws, steel, BA, ch.hd., No 6 x 1/4 in. long, rustproof	2
G1/5310-99-941-6374	Washers, shakeproof, spring steel, internal, flat, zinc coated	2

7. Sequence of operations (The para references refer to Tels D 123)

(a) Remove the set from its case (para 11).

(b) Remove the blower motor (para 14(a)-(d)).

(c) Remove the two screws at the rear of the blower motor (adjacent to the cooling fins) and withdraw the motor and fan from the outer housing.

(d) Drill and tap the blower motor housing as shown at Fig 1. Note that these holes are on the opposite side to the designation plate and on the same side as the red, direction-indicating, arrow.

(e) Fit the Scoop, air flow (ZA 54049) to the housing as shown at Fig 2 using two No 6 BA screws and washers.

(f) Replace the motor and fan in the blower motor housing and secure with the screws removed at (c). Note that the motor will go in only one way.

(g) Replace the assembled blower motor and scoop into the clamping band but do not secure it at this stage.

(h) Reverse the sequence of operations given at para 14(a)-(c).

(j) Position the blower motor assembly so that the scoop is pointing directly at the rear modulator valve on the a.f. unit, that it is horizontal and is bearing up against the motor retaining band. Tighten the screw of the clamp to secure the motor assembly in position. Reconnect the motor supply leads (para 14(e)).

(k) Verify that air is expelled from the rear of the blower unit when running, ie: that the fan is running in the proper direction.

(l) Replace the set in its case (reverse the order of operations at para 11).

(m) Strike through the figure 2 on the equipment modification record plate.

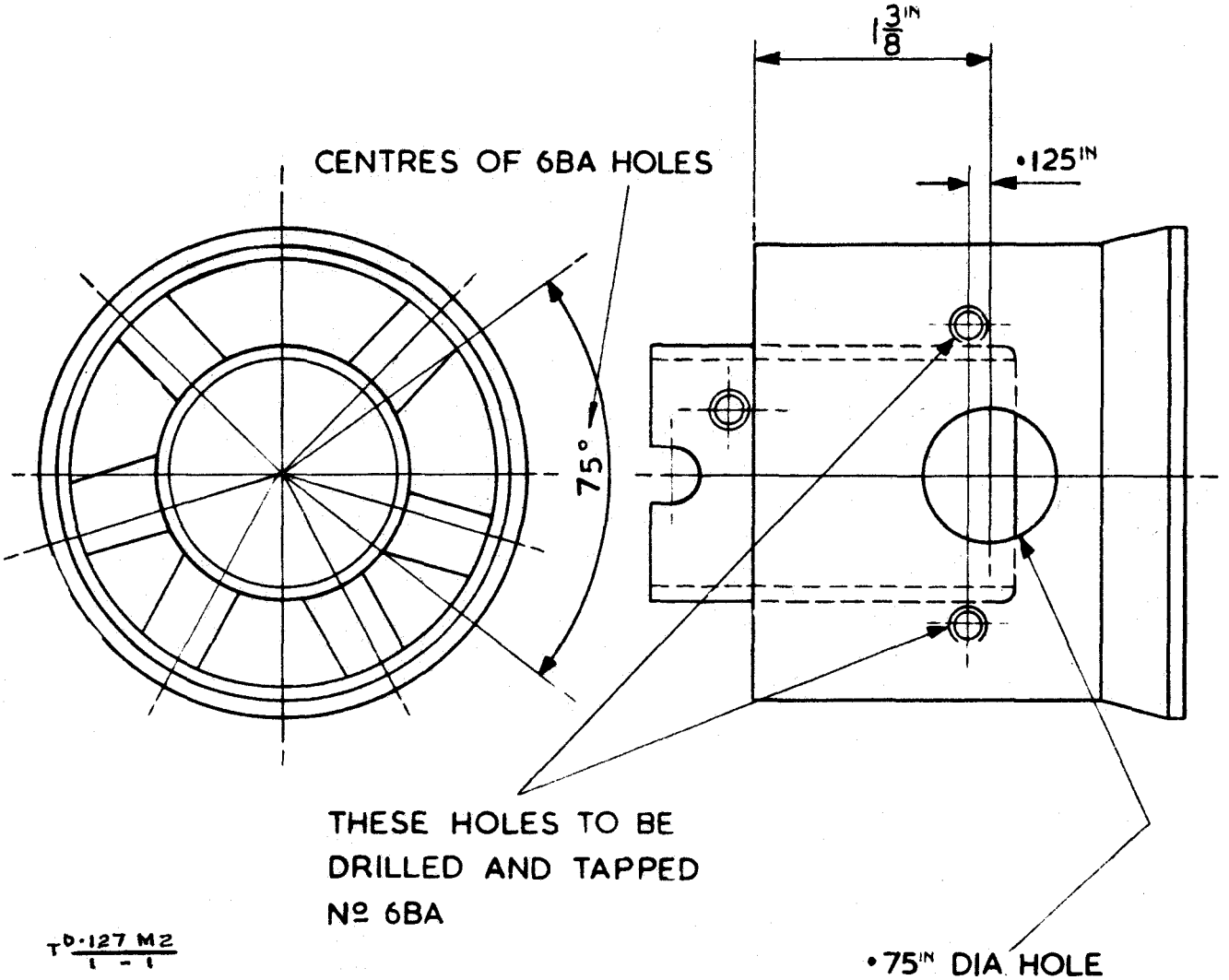

Fig 1 - Drilling details for housing

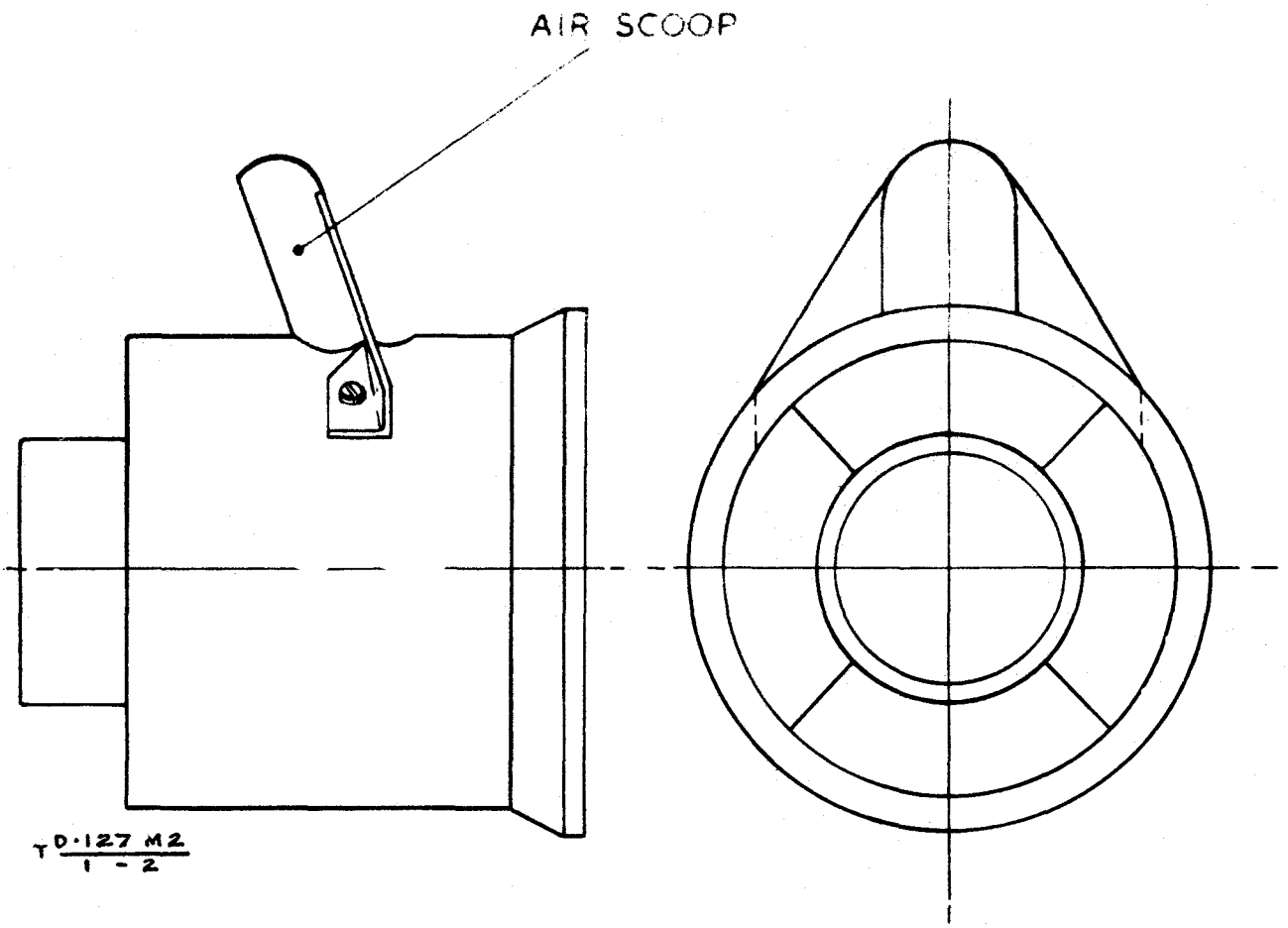

Fig 2 - Fitting details for scoop

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END

TRANSMITTER, RADIO, C11

TECHNICAL HANDBOOK - MODIFICATION INSTRUCTION

SUB-TITLE: Correction of calibrator circuit operation

1. Introduction

During early production of the Transmitter, radio, C11 it was found that if the system switch S-B was switched rapidly to the INT-CAL position the frequency of the calibrator tended to be determined by the constants of the cathode circuit of the oscillator rather than by the crystal XL1 (100kc/s). This defect was corrected in later production by fitting an additional capacitor across those already existing in the cathode circuit concerned. This regulation gives detail for the modification of early equipments.

2. Priority: Group 'B' (ACI 407/58 refers).

3. Estimated time required: 1/4 man-hours.

4. Items affected

Transmitter, radio, C11.

5. Action required by:-

(a) Units and establishments holding equipment

(i) Request REME to modify equipment.

(b) Units authorized to carry out field or base repairs

(i) When requested by units demand stores and carry out this modification.
(ii) On repair or overhaul demand stores and carry out the modification.
(iii) Ensure that the figure 1 on the equipment modification record plate is struck through on modified equipment.

6. Stores, tools and equipment

(a) Stores to be demanded

Stores to be demanded through the normal Ordnance channels. Authority for demand (to be quoted on all indents) - T/W/HB/6.

J.S. Part No	Designation	Qty per eqpt
Z/5910-99-012-4705	Capacitor, fixed, mica dielectric, met rect moulded case, 0.0015μF ±10%, 350V d.c. wkg	1

7. Sequence of operations

(a) Release the four screws at the rear of the equipment case and withdraw the set.

(b) Turn the set on its side so that the a.f. unit (which includes the 100kc/s crystal XL1) is uppermost.

(c) Locate the two capacitors C69 and C70 (680pF and 0.0015µF respectively) which are situated on the tag strips directly below the crystal holder. (See Tels D 122, Part 2, upper diagram of Fig 2011).

(d) Fit the 0.0015µF capacitor between capacitors C69 and C70 and solder it in parallel with these capacitors. The new capacitor becomes 'C70A'. (see Fig 1).

(e) Strike through the figure 1 on the equipment modification record plate.

(f) Replace the set into its case and carry out a complete functional check.

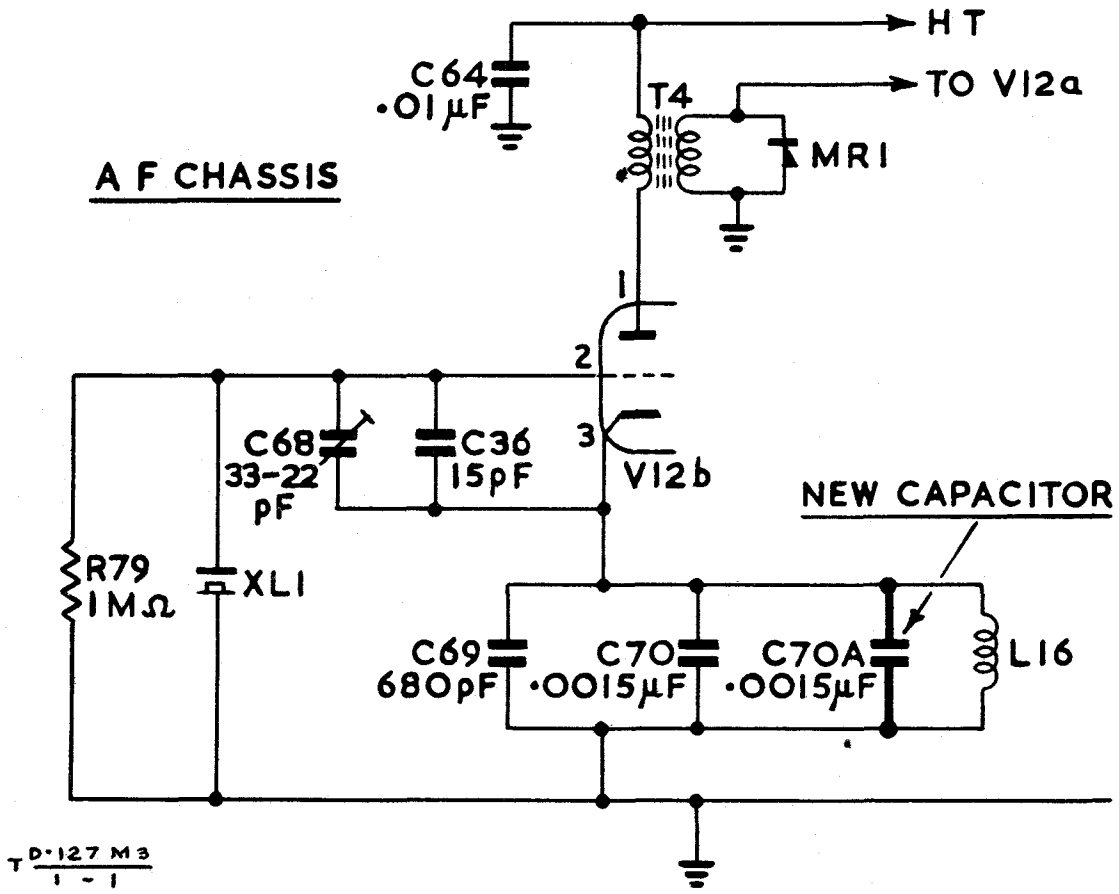

Fig 1 - Calibrator (oscillator section)

END

ELECTRICAL AND MECHANICAL ENGINEERING REGULATIONS (By Command of the Army Council)

314 SIGNALS SQUADRON

TELECOMMUNICATIONS D 127 Mod Instr No 4

TRANSMITTER, RADIO, C11

TECHNICAL HANDBOOK - MODIFICATION INSTRUCTION

SUB-TITLE: Replacement of relay RLD

1. Introduction

The existing relay RLD in the a.f. unit of the Transmitter, radio, C11 has a rated contact life of 1.5×10^6 operations. This corresponds to an operational life of 67 hours at a morse speed of 25 w.p.m. if an average of three contact operations per letter is assumed. As some equipments are operated for long periods on c.w. trouble has been experienced with the relay due to the contacts sticking and becoming erroded. This instruction details the action required to replace the existing relay by a type which has, on test, reached 9×10^7 operations before contact failure. As the original type of relay has been superseded as a replacement item by the new type, this modification must be implemented when failure of relay RLD occurs.

2. Priority: Group 'C' (ACI 407/58 refers)

3. Estimated time required: 1 man hour

4. Items affected:-

Transmitter, radio, C11
A.F. chassis

5. Action required by:-

(a) Units and establishments holding the equipment:

When failure of the keying relay RLD occurs, request REME to modify the equipment.

(b) Units authorized to carry out field or base repairs:-

(i) Field workshops only: When equipments are received for repair or overhaul, and have faulty keying relays RLD demand stores and carry out modification.

(ii) Base workshops only: When equipments are received for repair or overhaul, demand stores and carry out modification.

(iii) Ensure that the figure 5 is struck through in the equipment modification record plate in completion of this modification.

6. Stores, tools and equipment:-

(a) Stores to be demanded:-

VAOS, Section	Part No	Designation	Qty per eqpt
Y1	5945-99-901-3221	Relay, armature, sealed, normal duty 500 + 500Ω, one changeover, type 130D	1

This item to be demanded through the normal Ordnance channels. This EMER is authority for the demand.

(b) Stores to be discarded:-

Description	Qty per eqpt
Relay, high-speed, min, sealed	1

This item to be disposed of locally.

7. Sequence of operations

(a) Remove the set from its case and open out the chassis as described in Tels D 123 para 11-12.

(b) Place the set upside down.

(c) Locate relay RLD (See Tels D 122 part 2, Fig 2009 (ref F5) and Fig 2011 (ref C8)).

(d) Identify and remove the connections to the relay located at (c). Care must be taken not to damage adjacent components or wiring as space is limited.

(e) Release the two No 8 BA nuts and bolts securing the relay and carefully remove it from the chassis.

(f) Fit the new relay (Y1/5945-99-901-3221) in place of the one removed at (e), securing the relay in the same orientation as the original and using the two No 8 BA nuts and bolts previously removed.

(g) Solder the relay leads to the appropriate contacts of the new relay, using some form of heat shunt to avoid overheating the relay terminals and possibly causing an internal disconnection, (see Tels A522, para 5, 6 and Fig 1).

(h) Place the set the right way up, close up the chassis and secure with the screws previously removed. Replace the wander plugs in the ventilator unit.

(j) Strike through the figure 5 on the equipment modification record plate with a diagonal line.

(k) Carry out a functional check of the equipment. Ensure in particular that the transmitter keys correctly when operated on c.w.

(l) Replace the set in its case.

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END