

Appendix 4

STATIC TRANSDUCER, TYPE B, Ref. No. 6A/6434

SERVICING

REMOVAL AND REPLACEMENT OF COMPONENTS

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Introduction

1. This appendix describes the removal and replacement of electrical components of the static transducer Type B to a depth consistent with the second line range of spares held up to and including modification ADS/141.

2. The transducer is illustrated in Chap. 11 and a circuit diagram is given at fig. 17 (pre-mod. ADS/75) and fig. 18 (post-mod. ADS/75) of that chapter.

3. Components permitted to be removed and replaced within the depth of servicing are shown in Table 1; faulty components will be disposed of in accordance with current servicing instructions.

4. The transducer is made up of three main sub-assemblies, viz.: a front panel and chassis, a gear plate and a motor plate; the assembly is complete with a dust cover.

5. The components carried on the sub-assemblies are shown in Table 1.

Tools and materials

6. The following tools and materials are required:—

(1) Tools. Plug/Socket. Plessey Mk. 4 special tool.

(2) Materials (in addition to those in para. 7):

(a) Solder, 18 SWG. 60/40 resin cord.

(b) Lubricating oil DTD 822.

(c) Sleeve HELLERMAN Type T to DEF20 Type A, size No. H15.

(d) P.V.C. filament: $\frac{3}{4}$ mm.

(e) Silicon rubber sleeving, 0.028 in. bore.

(f) 22 SWG copper wire.

(g) Compound silicone MS4.

7. All screws and nuts 8BA and smaller should

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be locked on assembly with LOCTITE sealant Type E. All other screws and nuts should be locked with LOCTITE sealant Type C.

REMOVAL AND REPLACEMENT OF COMPONENTS

8. Unless otherwise detailed the replacement procedure for all components is a reversal of the removal. Where split clamps have to be replaced attention is drawn to Appendix 2, Table 1.

Caution . . .

Damage may be caused to components by the transfer of excessive heat due to misuse of a soldering iron. This damage can largely be prevented by the use of a heat shield between the iron and the component. The soldering iron must be allowed to reach the required temperature before being applied to the component.

Sleeving PTFE will not suffer damage when in contact with the hot soldering iron.

Cover

9. Remove the two 6BA ch. hd. screws securing the cover to the rear faces of the right and left-hand side frames. Slide the cover clear of the chassis. When replacing the cover, ensure that the front edge is engaged tightly with the spring clips attached to the front panel.

Transistor amplifier TA1 (3C5161) (Chap. 11, fig. 2, 3, 7, 11 and 12)

10. Unsolder the nine connections to pins a to j. These pins are identified on the rear of the plinth supporting TA1 (Chap. 11, fig. 11 and 12). Remove the two 6BA ch. hd. screws securing the tie rail to the top of TA1, the tie rail remaining tied to the cable form. On transducers which have been modified to ADS/75 standard, remove the two 6BA ch. hd. screws which secure TB1 to TA1 (Chap. 11, fig. 3). Remove the four 6BA ch. hd. screws securing the base of TA plinth to the gear plate. Lift the transistor amplifier and plinth assembly off the gear plate and remove the four 6BA ch. hd. screws securing the transistor amplifier to the plinth and retain the screws. On replacement these screws should be substituted for those in the base of the replacement transistor.

11. Detailed servicing of the transistor amplifier is covered in Chap. 7, Appendix 4.

Plugs ST1 and ST2

12. Remove the four 6BA ch. hd. screws retaining the side frames to the locating pin pillars, the 8BA ch. hd. screw and nut securing the lower right-hand corner of the type label and the four 6BA screws securing the magnetic amplifier to the front panel. Withdraw the front panel and side frames from the transducer as far as the cable form will permit. With the special tool provided unscrew and remove the locking ring from the appropriate plug. Extract the plug from its socket and unsolder the connections to the base pins. (It is advisable to label each wire with a tag identifying the pin from which it is removed.) Remove the plug.

Magnetic amplifier MA1 (3C635 or 3C635/1) (Chap. 11, fig. 2, 3 and 7)

13. Unsolder the connections to pins ADJGHK and N on top of the magnetic amplifier (Chap. 11, fig. 2 and 3). Remove the two 6BA ch. hd. screws securing the magnetic amplifier to its rear mounting pillars, the 8BA ch. hd. screw and nut securing the lower right-hand corner of the type label, and the four 6BA screws securing the magnetic amplifier to the front panel. Lift out the magnetic amplifier, complete with flux shield, from the top of the transducer. The flux shield can be separated from the magnetic amplifier by removing the remaining 6BA ch. hd. screw.

Motor-tachogenerator

14. Remove the magnetic amplifier as described in para. 13. Unsolder the eight leads connecting the motor-tachogenerator to the tag strip mounted on the gear plate (Chap. 11, fig. 10). Remove the four 6BA screws from the mounting flange of the motor-tachogenerator and lift vertically; the gear head remains on the motor plate.

Note . . .

After replacement of the motor-tachogenerator, the velocity feedback may require adjustment as described in Appendix 3, para. 10 or 11.

Synchro CX1 (HT (10T) synchro) (Chap. 11, fig. 2 and fig. 10)

15. In units modified to ADS/75 standard TB1 must be removed first (para. 21), thereafter proceed as follows. Unsolder the five connections to the top of the synchro (Chap. 11, fig. 2). Release the split clamp securing the 135T and 56T gears (axis 4) to the synchro shaft (Chap. 11, fig. 7). Remove the three 6BA screws securing the fixing clamps to the gear plate and draw out the synchro vertically. It should be noted that on replacement the three fixing clamp screws must be fully tightened when the electrical zero setting-up routine as described in Appendix 3, para. 16, has been completed.

Synchro CX2 (HT (4T) synchro)

16. Remove the transistor amplifier (para. 10). Unsolder the five connections to the top of the synchro. Remove the three 6BA ch. hd. screws from the base of the motor plate securing the synchro clamps, remove the clamps and draw out the synchro vertically. Again it should be noted that on replacement the fixing clamp screws must be fully tightened when the electrical zero setting-up routine, as described in Appendix 3, para. 15, has been completed.

Potentiometer RV3

17. Remove the transistor amplifier (para. 10). Unsolder the three connections to the top of the potentiometer (pre-mod. ADS/75) or the six connections to the side of the potentiometer (post-mod. ADS/75). Release the split clamp securing the pinion to the potentiometer shaft. Remove the three 6BA ch. hd. screws and clamps from the gear plate and draw out the potentiometer

vertically. After replacement, setting up of RV3 must be carried out in accordance with the instructions in Appendix 3, para. 17 or 18.

RV1 (units pre-mod. ADS/75) (Chap. 11, fig. 2)

18. Unsolder the three leads to the component. Remove the single 6BA ch. hd. screw securing the resistor to the gear plate, access to which is gained via a hole in the motor plate provided for this purpose. Lift the resistor off the gear plate.

RV2 and RV4

19. (1) On units unmodified to ADS/75 standard (Chap. 11, fig. 2), unsolder the two leads to the component. Remove the single 6BA ch. hd. screw securing the resistor to the gear plate, access to which is gained via a hole in the motor plate provided for this purpose. Lift the resistor off the gear plate, together with the 390 ohm fixed resistor (R15 or R16) mounted across the top.

(2) On units modified to ADS/75 standard (Chap. 11, fig. 3 and 12), release tagboard TB1 (para. 21) without unsoldering the cable form and locate conveniently. Unsolder the two leads to the requisite resistor. Remove the 6BA ch. hd. screw securing the resistor to the gear plate, access to which is gained via a hole in the motor plate provided for this purpose. Lift the resistor off the gear plate.

RV5 (units pre-mod. ADS/75) (Chap. 11, fig. 2)

20. Unsolder the three leads to the component. Remove the single 6BA screw securing the resistor to the gear plate, access to which is gained via a hole in the motor plate provided for this purpose. Lift the resistor off the gear plate complete with the high stability carbon resistor (R10) mounted on it.

Component panel TB1 (units post-mod. ADS/75) (Chap. 11, fig. 3)

21. Unsolder connections from the cable-form to pins A, B (two), E, G, H, J and K on top of the component panel. Remove the 6BA ch. hd. screws securing the component panel to the transistor amplifier bracket (two in number), and to the stand-off pillars at the outside of the panel, near pin B and between VT2 and VT3. Lift up the panel until access can be made to unsolder the connections from the cable-form to terminals C and D on the underside of the panel. The component panel can now be removed. It is advisable to label each wire of the cable-form with the terminal letter from which it has been removed.

Component panel TB2 (Chap. 11, fig. 7 and 8)

22. Proceed as in para. 10 (removal of transistor amplifier TA1) without removing the transistor amplifier from the plinth. Remove the two 6BA screws securing the component panel to the plinth. Unsolder the connections from the cable-form to

terminals of the component panel, labelling each wire with a tag identifying the point from which it is removed. The panel can now be lifted clear.

Components on TB1 and TB2

23. It may be necessary to remove and replace individual components on either TB1 or TB2 without entirely removing the component panel. In such cases the relevant panel should be released only as far as is necessary to gain access to the particular component without disturbing the cable-form.

24. With snipe-nosed pliers grip one wire of the component to be removed, apply the soldering iron to the turret lug to which the wire is connected and gently pull the connection apart. The wire should unwind easily as it is only hooked round the turret lug and not wrapped fully round it. Repeat for all other wires from the component. When refitting it should be remembered to wind the wire only half-way round the turret lug in order to facilitate possible future removal.

R9 and R10

25. In units pre-mod. ADS/75, R9 and R10 constitute part of the capsule pick-off bridge and are associated with RV5.

R9

26. Proceed as in para. 24 exercising particular care to avoid burning the cable-form with the soldering iron.

R10

27. Remove RV5 (para. 20). Unsolder the fixed resistor mounted between a stand-off tag screwed to the top of the preset resistor, and one end of the preset resistor.

R15 and R16

28. In units unmodified to ADS/75 standard, these resistors are mounted on top of RV2 (R15) and RV4 (R16). Remove the preset resistor as detailed in para. 19 (1) and then proceed as in the latter half of para. 27.

29. In units post-mod. ADS/75 (Chap. 11, fig. 12), these resistors are mounted one above the other on a small bracket adjacent to RV2. To gain access to the bracket and attached resistors it is necessary first to release TB1. Remove the two 6BA ch. hd. screws securing the component panel to the transistor amplifier bracket and to the stand-off pillars, at the outside of the panel near pin B and between VT2 and VT3. Lift up the panel, taking care that the cable-form is not damaged, and unsolder the connections to both ends of R15 and R16 mounted on their bracket. Remove the two 8BA ch. hd. screws securing the bracket to the gear plate. The bracket with resistors attached can now be lifted clear.

R118 (units post-mod. ADS/75)

30. Invert the transducer and proceed as in para. 24, exercising particular care to avoid burning the cable-form with the soldering iron, as space is severely limited.

Capacitors C1 and C2 (Chap. 11, fig. 9)

C1

31. Invert the transducer and release the clip

holding C1 to the motor plate. Proceed as in para. 24.

C2

32. Units unmodified to ADS/75 standard only. Invert the transducer and proceed as in para. 24, exercising particular care to avoid burning the cable-form with the soldering iron.

TABLE 1

Sub-assemblies and components

Item (a)	Sub-assembly (b)	Component (c)	If to be serviced (d)	Remarks (e)
1	Front panel and chassis	Plug, Plessey 25-way orientation 0, ST1	Yes	
		Plug, Plessey 25-way orientation 1, ST2	Yes	
		Static pressure line adapter	No	
		Captive screw	No	
		Mounting pillars for Magnetic Amplifier MA1	No	
2	Gear plate	Capsule unit cover	No	Capsule unit is mounted between gear and motor plates
		Synchro CX1	Yes	
		Adjustable cam	No	Adjustment only, by fully trained personnel
		Magnetic amplifier MA1, flux shield and mounting pillars	Yes	MA1 may be 3C635 or 3C635/1
		Transistor amplifier TA1 (3C5161) and plinth	Yes	
		Preset potentiometers RV1, RV2, RV3, RV4, RV5	Yes	RV1 and RV5 only in units unmodified to ADS/75 standard
		Resistors R9 and R10	Yes	In units unmodified to ADS/75 standard only
		Component panel assembly Ref. No. 3B8097 carrying resistors R6, R7, R11, R12, R13, R14, silicon diodes MR1 and MR2, resistors R113 and R114	Yes	In units modified to ADS/75 standard, panel has Ref. No. 3B843 and is referred to as TB2 R113 and R114 in units modified to ADS/75 standard only
Component panel assembly Ref. No. 3B20228 (TB1) carrying R101, R102, R103, R104, R105, R106, R107, R108, R109, R110, R116, R117, RV102, RV103, RV104, C101, C103, C104, C106, C108, MR3, VT1, VT2, VT3	Yes	In units modified to ADS/75 standard only: referred to as TB1		
	R15 and R16	Yes	Location varies with modification state of unit	
3	Motor plate	Cam unit CU1A	No	
		Synchro CX2	Yes	
		Motor-tachogenerator and gear head	Yes	Motor-tachogenerator only
		Capsule unit body	No	See Item 2
		Capacitors C1 and C2	Yes	C2 in units unmodified to ADS/75 standard only
		R118	Yes	In units modified to ADS/75 standard only

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