CHAPTER 8-1

HEADSETS : MK 3 FLYING HELMET SERIES

CONTENTS

GENERAL DESCRIPTION

1 This series is a lightweight headset intended to be worn inside a Mk 3 series protective flying helmet. It is constructed so that no hard materials are allowed to touch the head, especially in the region of the ears. It utilizes soft plastic ear capsule assemblies connected by plastic tubes to earphone elements which transform the electrical energy from the aircraft communications system into sound waves. The capsule assemblies and tubes function in a similar manner to a medical stethoscope. All headsets in this series are similar in construction, the differences being either in cable assembly or the number of earphone elements fitted. In some applications two earphone elements are connected in parallel to provide the correct electrical interface with the aircraft communication system. Table 1 compares cable assemblies and earphone impedances for the four current versions of the headset. Table 2 Figs 1 & 2 compare the construction and availability of spare parts.

TABLE 1 LEADING PARTICULARS OF HEADSETS

Headset NSN	Impedance (1 kHz)	Nominal Cable Length	Total Weight
5965-99-954-3067	300 ohms	500 mm	385 grams
5965-99-970-8450	300 ohms	267 mm	340 grams
5965-99-658-4577	150 ohms	500 mm	407 grams
5965-99-659-3857	150 ohms	500 mm	407 grams

Ear capsules

2 The capsule assemblies (5) and (7) are formed from soft PVC mouldings and are matched to the earphone element to give the required frequency response and sensitivity. This is achieved by the internal volume of the capsule and the exponential horn shape of the interior. The exterior shape of the capsules is such that they follow the contours of the user's head and with the use of foam-filled ear cushions (9) make an effective acoustic seal round the ears. Formerly, liquid-filled ear cushions, 5935-99-135-5604 or 8415-99-130-2424, were fitted. Modification No A8032 (see Topic 2, Leaflet No 3) replaced them with the foam-filled type. Dimensional changes to the ear capsules, during production, have been made to improve the performance. Modified items are distinguished by either a blue background to the identification label or a blue disc affixed to the label. There is no Service retrospective application of this modification.

3 The capsule assemblies are permanently attached to wire frames by means of a soft PVC slide fitting which allows adjustment of the capsules inside the helmet. Anchor nuts fitted to the ends of the wire frames are used to attach the frames to the inside of the helmet. Two tape loops, also permanently attached to the capsules, are used by the wearer to position the capsules when donning the helmet. The acoustic tubes are PVC mouldings. The earphone element (11) is specifically designed for use with these tubes, and is mounted in a rubber housing (10) which is fitted inside the helmet.

4 Formerly, the passages inside the earphone element for ambient pressure equalization were liable to variation, resulting in loss of output under conditions of rapidly changing pressure. This condition was corrected in production. Items with improved pressure equalisation are distinguished by a change in case colour from black to dark blue; they are interchangeable and will show identical performance under ground test conditions.

5 Further information on the use of the headset in Mk 3 protective flying helmets is given in AP108F-0203-12.

Cable assemblies

6 All cable assemblies employ tinsel type conductors and follow the basic arrangement of a plug for external connection, a branch to the earphone element and a branch to a plug connection to a microphone. The latter is fitted with a bracket for attachment to the helmet.

Cable assembly 5965-99-970-8449 (1)

7 A 4-conductor cable with the following connectors: 4-pole plug Type 671, 5935-99-946-6652; 8BA tags for connection to earphone element; 2-pole plug Type 517, 5935-99-944-8103. Used on headsets, electrical 5965-99-954-3067, and 5965-99-659-3857.

Cable assembly 5965-99-970-8451 (2)

8 A 2-conductor cable with the following connectors: 8BA tags for connection to earphone element; 2-pole plug Type 517, 5935-99-944-8103. The latter is intended for external connection to an aircraft intercom system and is fitted with a guide plate to facilitate attaching a long, free cable.

Cable assembly, Racal Acoustics Ltd Part No A1/500640 (not codified) (3)

9 A 4-conductor cable with the following connectors: 7-pole plug LEMO Type 2B, 5935-99-727-9728, 8BA tags for connection to earphone element; 2-pole plug Type 517, 5935-99-944-8103. Used on Headset, Electrical 5965-99-658-4577.

Cable assembly (not codified) (4)

10 An 11 in. length of Cable, Electrical 6145-99-110-8621, terminated with 8BA tags at each end of each conductor. It serves to connect two earphone elements in parallel. Used on Headsets, Electrical 5965-99-658-4577 and 5965-99-659-3857.

Cable assembly 5995-99-794-4398 (Fig 2, lower diagram)

11 An assembly comprising one each of items (3), (4), (10) and (11), complete with the necessary assembly materials. It was introduced under Modification No B 0272 and is intended for the purpose of converting Headset, Electrical 5965-99-954-3067 to Headset, Electrical 5965-99-658-4577. It is not provisioned as a spare, since items (3), (4), (10) and (11) are available separately.

Cable assembly 5995-99-653-0469 (not illustrated)

12 An assembly generally similar to that described in Para 11 above, but differing with respect to the cable construction and the 7-pole plug, which was a LEMO Type 1B, 5935-99-744-9820. It was introduced under Modification No A8346 (see Topic 2 Leaflet No. 4). It is obsolete in all Service applications, since Modification No A8346 (see Topic 2) is superseded by Modification No B 0272 (see Topic 2 Leaflet No. 13) and is not to be used.

Cable assembly 5995-99-658-0679 (not illustrated)

13 An assembly functionally interchangeable with cable assembly 5965-99-970-8449. On the 4-pole plug, the standard rubber shield 5935-99-444-5310 is replaced by a rubber boot 5830-00-119-7642, which provides some splash protection when the plug is mated with a free socket. It is intended for use in areas subject to rain or spray, eg Helicopter winch operating. It does not render the cable or the plug waterproof. It is converted from cable assembly 5965-99-970-8449, by Mod No A8692 (see Topic 2, Leaflet No. 7).

SERVICING

14 The headset must be tested at appropriate intervals, and after servicing for correct electrical performance, using the Comprehensive Headset Test Set Type 21A/200/1, 6625-99-620-0369 or Type 21A/400/6, 6625-99-794-0189. For details of test methods, refer to AP117L-0402-1, Chapter 4 or AP117L-0404-1 Chapter 4 respectively. For details of test methods, refer to AP117L-0401-1.

NOTE

When testing the headset in an uninstalled state, ie without a helmet, care should be taken to follow the instructions in AP117L-0402-1 to obtain consistent test results.

15 Complete loss of output will be caused by failure of the earphone element. Loss of signal in one ear capsule may be caused by the acoustic tube being damaged or blocked by accumulated moisture. If intermittent loss of output occurs which cannot be detected on ground testing, and the earphone element is seen to have its case coloured black, the fault may be due to poor pressure equalization in the earphone element, which should be replaced. It is a sealed unit, and must be replaced if found faulty.

16 During visual examination, particular attention is to be given to the following:

16.1 Ear capsule interior. Separation of the capsule back from the moulded body at any point, including the central projection which forms the internal horn shape, will degrade the acoustic performance. If a slight separation is evident, repair may be carried out according to Para 21. If any other damage is present, the capsule assembly must be replaced.

16.2 The acoustic tubes must be free from kinks or fractures.

16.3 The cable assembly where it passes the edge of the helmet shell. Chafing of the cable may be alleviated by applying SI/Survival Equipment (Aircrew Clothing)/115. The sheathing on current cable assemblies is less prone to damage from this cause than earlier versions.

REPAIR

17 Repair of the headset is limited to the replacement of ear cushions, capsule assemblies, earphone elements, cable assemblies and attaching parts. Item numbers used in the following text refer to Figs 1 and 2 and Table 2; the latter shows the availability of spares for the different versions of headsets and the extent of interchangeability between headsets.

NOTE

Screws, etc, used to attach the headset to a helmet are provisioned as parts of the helmet.

Replacement of cushion earphone

18 Remove and retain screw securing the capsule assembly (5) or (7) to the helmet. Carefully remove the assembly from the helmet, avoiding detachment of the acoustic tubes. Carefully peel off adhesive tape (16) securing the ear cushion to the capsule interior assembly (6) or (8). Retain tape. It may be necessary to cut the tape to release it from the acoustic tube. Taking care not to disturb the acoustic tube, remove the cushion.

19 Replacement cushions earphones (9, 9a) are interchangeable, and replacement procedure is the same. Position replacement cushion on interior capsule assembly so that the cut-out in the cushion skirt is adjacent to the acoustic tube. Although the capsules are handed, the cushions are not. Ensure skirt is flat and free from wrinkles, trim edge to leave a 0.31 in overlap, and ensure that the cushion is fully in contact with the capsule body.

20 Using the tape retained in Para 18 above, prepare a replacement tape using Tape, self adhesive 7510-99-135-1671 (16). Fit the replacement tape around join of cushion and capsule interior assembly, ensuring that it is free from wrinkles and adhering all round. Refit capsule assembly to helmet using screw retained in Para 18.

Repair of capsule assembly

WARNING

ADHESIVES. REFER TO THE ADHESIVE WARNING IN THE PRELIMINARY PAGES OF THIS PUBLICATION.

21 Capsule assemblies, particularly those manufactured prior to the introduction of Modification No A9284 (see Topic 2), may show separation of the capsule back from the moulded capsule body. If the separation is slight, repair may be effected by applying a fillet of 'Evostik 528' adhesive, 8040-99-943-6957, along the joint. Allow the adhesive to dry for 8 hours, under light pressure just sufficient to close up the joint. However, if the glued joints have parted extensively, the capsule should be replaced.

Replacement of capsule assembly

WARNING

VARNISH. REFER TO THE VARNISH WARNING IN THE PRELIMINARY PAGES OF THIS PUBLICATION.

NOTE

The ear capsules are handed and must be fitted on the correct side of the helmet so that the acoustic tube emerges to the rear on each side. They are not matched and need not be replaced as a pair.

22 Remove screw to allow release of capsule assembly from helmet. The telephone housing (10) containing earphone element (11) should also be released from the helmet to allow ease of working. Retain all parts.

23 Remove and discard lacing cord (13) securing acoustic tube and earphone element to the telephone housing. Remove and discard whipping thread (12) securing the acoustic tube to the earphone element. Detach the acoustic tube and discard capsule assembly.

24 Fit the acoustic tube of the replacement capsule assembly to the earphone element and whip in position with thread (12). Tie off in an approved manner and varnish thread, using item (14). Fit the earphone element into the telephone housing and secure with lacing cord (13). Tie off in an approved manner and seal all knots with varnish (14). Refit the telephone housing to the helmet, taking care not to pull the acoustic tube from the capsule assembly. Refit the capsule assembly to the helmet using the screw retained in Para 22. Ensure that the acoustic tubes lie without being kinked or twisted.

Replacement of earphone element

WARNING

VARNISH. REFER TO THE VARNISH WARNING IN THE PRELIMINARY PAGES OF THIS PUBLICATION.

CAUTION

DAMAGE TO EARPHONE ELEMENT TERMINALS. The earphone element terminals are fitted with nuts encased in plastic material with a moulded screwdriver slot. They must be tightened with great care to avoid damage.

25 The earphone element is a sealed unit and must be replaced if found faulty. When two elements are used, the unused outlet on each one must always be fitted with a blanking cap (17). The elements are not handed or matched, and need not be replaced as a pair.

26 Remove and retain screws securing the capsule assemblies to the helmet. Remove and discard lacing securing the telephone housing (10). Carefully remove the capsule and housing from the helmet, avoiding detachment of the acoustic tube.

27 Remove and discard lacing cord (13) securing the element and cable to the telephone housing (10). Remove and discard thread (12) to release acoustic tubes and detach these from the earphone element. Disconnect cable from the element, retaining the terminal nuts and washers (15). Where a blanking cap (17) is fitted, it should be discarded with the faulty element.

28 Fit the acoustic tubes onto the replacement element. When two elements are used, fit one tube to each element and fit blanking caps on the unused outlets. Using thread (12), whip tubes and/or blanking caps to the element. Tie off with an approved knot and seal whipping with varnish (14). Refit cable electrical connections to element, keeping the same polarity as on the removed element, using nuts and washers (15) retained in Para 27. Seal terminals with varnish (14).

29 Position element into telephone housing and secure with lacing cord (13). Replace cable assembly into telephone housing. Tie off with approved knots and coat all knots with varnish item (14). Assemble telephone housing to helmet and lace into position with lacing cord (13), tie off and varnish knot. Position the capsule within the helmet and secure using the screws retained in Para 26. Ensure that the acoustic tubes lie without being kinked or twisted.

Replacement of cable assembly

WARNING

VARNISH. REFER TO THE VARNISH WARNING IN THE PRELIMINARY PAGES OF THIS PUBLICATION.

30 The plug 5935-99-944-8103, when fitted to the cable assemblies on this headset, cannot be dismantled owing to the riveted mounting plate, therefore the cable assembly should be replaced on failure of this plug. It should also be replaced if chafing, cracking or other signs of deterioration occur.

31 Remove and retain screws and washers securing the capsule assemblies and plug 5935-99-944-8103 to the helmet. Remove and discard the lacing securing the cable assembly, including, if fitted, the short cable assembly (4), and the telephone housing (10) to the helmet. Carefully remove the headset complete from the helmet.

32 Taking care not to damage the plastic nuts, remove and retain nuts and washers securing the electrical connections to the earphone element. Note wire colours to terminals and remove connections. Discard cable assembly but retain all other items.

33 Connect wires from replacement cable assembly to electrical connections on earphone elements using nuts and washers retained in Para 32 and varnish with item (14). Ensure correctness of connections using wire colours as noted in Para 32.

34 Position earphone element into telephone housing and using item (13), relace the element and cable assembly to the housing. Tie off, and varnish knot, using item (14). Refit headset assembly to helmet using items retained in Para 31, ensuring that there are no kinks in the acoustic tubes and that these are not pulled from the capsule assemblies. Replace cable assembly into helmet using item (13), tie off in an approved manner and varnish knot with item (14). Assemble microphone socket to helmet using fixing screws and washers retained in Para 31.

HEADSET, ELECTRICAL 5965-99-954-3067 (Fig 1)

DESCRIPTION

35 This equipment is the standard headset for general use on Mk 3 protective flying helmets. It comprises ear capsule assemblies (5) and (7), one earphone element (11) and cable assembly 5965-99-970-8449 (1).

HEADSET, ELECTRICAL 5965-99-970-8450 (Fig 1)

DESCRIPTION

36 This equipment is a headset intended for use in certain aircrew positions where a microphone facility is not required. It comprises ear capsule assemblies (5) and (7), one earphone element (11) and cable assembly 5965-99-970-8451 (2). In use, the signal output from the communication system must be connected directly to the helmet.

HEADSET, ELECTRICAL 5965-99-658-4577 (Fig 2)

DESCRIPTION

37 This equipment is a headset intended for use in Tornado aircraft, where an earphone impedance of 150 ohms is required. It comprises ear capsule assemblies (5) and (7), two earphone elements (11) cable assembly (4) and cable assembly 5995-99-794-4398 (1). It is converted from Headset, Electrical 5965-99-954-3067 by modification to Special Order Only (see Topic 2 Mod No. B0272). The earphone elements each feed one capsule. The unused outlet on each earphone element is closed by a blanking cap.

HEADSET, ELECTRICAL 5965-99-659-3857 (Fig 2)

DESCRIPTION

38 This equipment is a headset intended for use in Chinook aircraft, where an earphone impedance of 150 ohms is required. It comprises ear capsule assemblies (5) and (7), two earphone elements (11), cable assembly (4) and cable assembly 5965-99-970-8449 (1). It is converted from Headset, Electrical 5965-99-954-3067 by modification to Special Order Only (Mod No. A8658) (see Topic 2 Leaflet No. 6). The earphone elements each feed one ear capsule. The unused outlet on each earphone element is closed by a blanking cap.

TABLE 2 INTERCHANGEABILITY OF COMPONENTS

Item No	Component	Headset			
		5965-99-954-3067	5965-99-970-8450	5965-99-658-4577	5965-99-659-3857
1	Long cable assembly (standard) 5965-99-970-8449 or 10ZZ/353794	1	-	-	1
2	Short cable assembly 5965-99-970-8451	-	1	-	-
3	Special cable assembly Part No A1/500640	-	-	1	-
4	Special cable assembly TBA	-	-	1	1
5	Capsule assembly (LH) 5965-99-757-8397	1	1	1	1
6	Capsule interior assembly (LH) 5965-99-757-8399	1	1	1	1
7	Capsule assembly (RH) 5965-99-757-8396	1	1	1	1
8	Capsule interior assembly (RH) 5965-99-757-8400	1	1	1	1
9	Cushion earphone 5965-99-130-4923	1	1	1	1
9a	Cushion earphone (Alternative 5975-99-631-0657 to item 9)	1	1	1	1
10	Telephone housing 5965-99-664-3910	1	1	2	2
11	Earphone element 5965-99-748-5262	1	1	2	2
12	Whipping thread 8310-99-109-6640	A/R	A/R	A/R	A/R
13	Lacing cord 4020-99-011-9481	A/R	A/R	A/R	A/R
14	Varnish 5970-99-225-0808	A/R	A/R	A/R	A/R
15	Washer, flat, 8BA 5310-99-914-1863	2	2	4	4
16	Tape, self-adhesive 7510-99-135-1671	A/R	A/R	A/R	A/R
17	Blanking cap 5965-99-742-7075	-	-	2	2

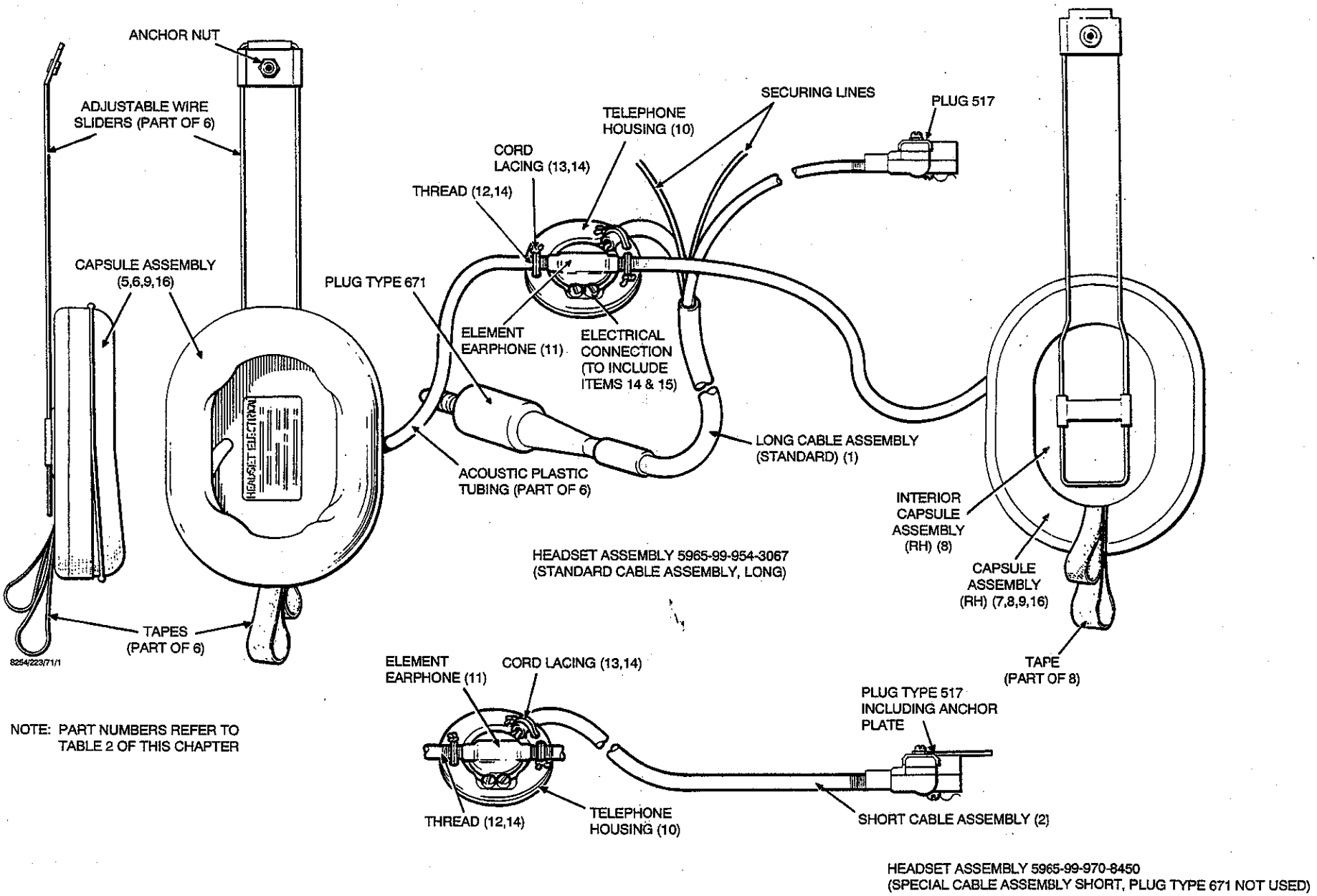

Fig 1 Headsets, electrical 5965-99-954-3067 & 970-8450

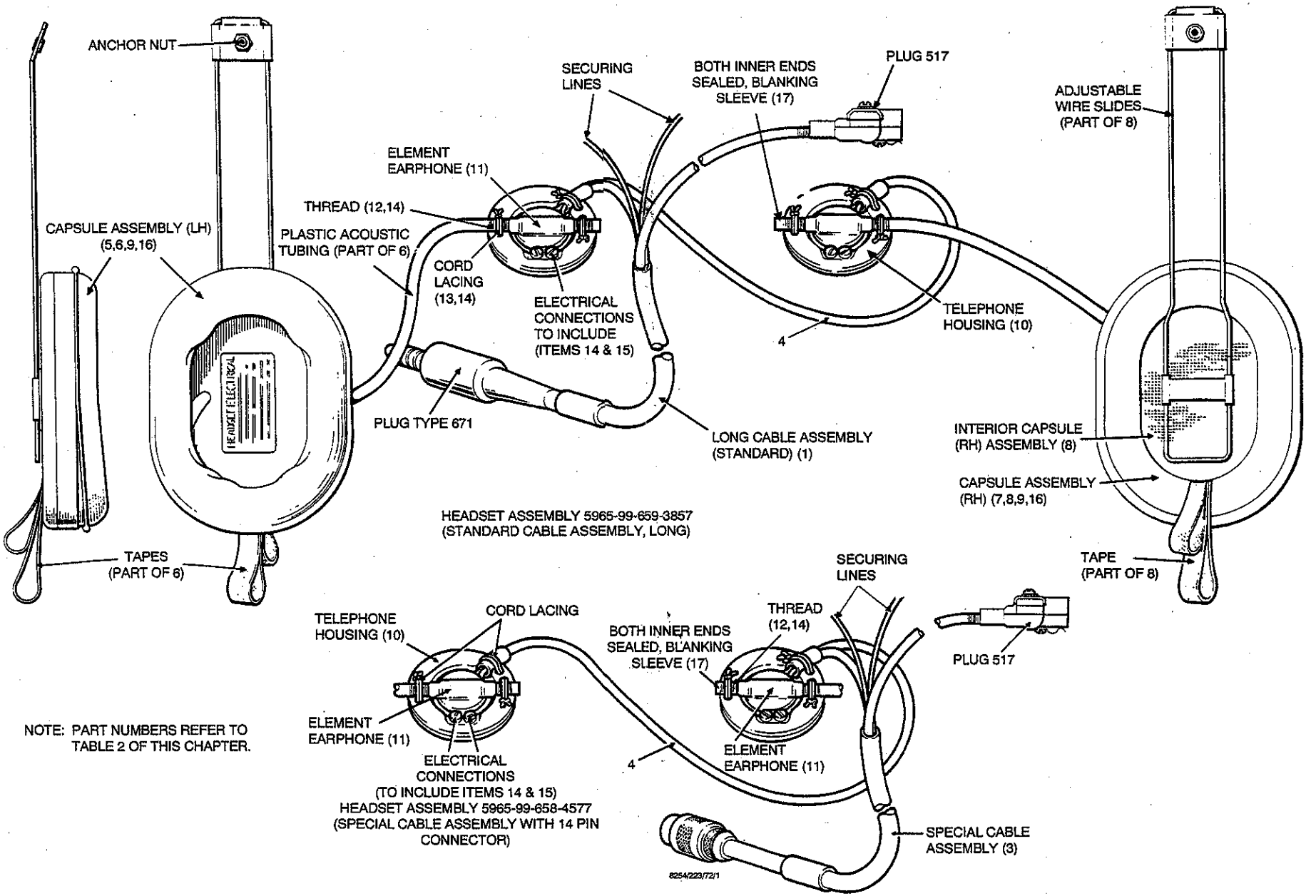

Fig 2 Headsets, electrical 5965-99-658-4577 & 659-3857