# CHAPTER 4

# TACAIR HELMET ASSEMBLIES FOR FIXED WING AIRCRAFT

## Section 4-1. Description

### 4-1. GENERAL.

4-2. This chapter contains data pertaining to TACAIR helmet assemblies for fixed wing aircraft which includes the HGU-66(V)/P series, HGU-68(V)/P series, HGU-85(V)/P series, HGU-87(V)/P series, and HGU-89/P22P-16 helmet assemblies.

**NOTE**

Use of the HGU-33/P thru HGU-52/P series helmets and HGU-55/P helmet assemblies has been extended indefinitely. Refer to Section 4-7 (Maintenance of HGU-33/P thru HGU-52/P and HGU-55/P Helmet Assemblies) for the only authorized maintenance procedures applicable to these helmets.

4-3. The HGU-68(V)/P series aircrew protective helmet assemblies feature a lightweight helmet shell constructed of graphite and ballistic nylon trimmed for optimum peripheral vision. The helmets are available in three sizes (medium, large, and extra-large). They afford enhanced stability through the use of an integrated chin/nape strap assembly. The helmets are designed to provide face, eye, aural, and head protection when properly assembled and fitted to the aircrewmember. The helmet assemblies also house the communications components, allow for the use of the visor assembly or AN/AVS-9(V) Night Vision Image Intensifier Set (NVIIS), and integrate with the MBU-21/P CBR Mask.

### 4-4. CONFIGURATION.

4-5. The helmet assembly configuration is built from components. In order to obtain the desired configuration for certain aircrew or aircraft applications, refer to tables 4-1 and 4-2.

**NOTE**

The configuration area of this chapter is divided into two general categories: Major Helmet Assemblies and Major Helmet Components, plus a brief description following each.

**4-6. MAJOR HELMET ASSEMBLIES.** The following are the major helmet assemblies covered in this chapter as well as a brief description of each. See figures 4-2 through 4-5 for Illustrated Parts Breakdown (IPB) and tables 4-4 through 4-7 for order of assembly.

**4-7. HGU-66(V)1/P Helmet Assembly.** The HGU-66(V)/P series helmets are interim night attack helmet assemblies incorporating the Night Vision Image Intensifier Sets (NVIIS) and an oxygen mask. The M22442/37-4708 (CX-4708A/AIC) cable assembly is used for communications. This helmet was a limited quantity production of only 750 units. The HGU-66(V)/P series featured a chemically formed, custom fit, two piece inner liner covered with gray leather, foam filled gray leather covered helmet shell edge-roll and the integrated chin/nape strap. The HGU-66(V)1/P is an HGU-66(V)/P configured with the AN/AVS-9(V) mounting plate for NVIIS aided flights. Use the maintenance and repair/replacement procedures for the HGU-85(V)/P series helmets to maintain the HGU-66(V)/P series helmet assemblies. Use figure 4-3 as IPB.

**4-8. HGU-68(V)/P Series Helmet Assembly.** The HGU-68(V)/P series helmets are designed to replace the HGU-33/P series helmets in all Tactical fixed wing aircraft applications. The assembly is delivered configured with the M22442/37-4708 (CX-4708A/AIC) cable assembly for communications; a 600 knot ejection capable, low profile, single lens visor assembly with interchangeable clear and neutral lenses, an integrated chin/nape strap, an energy absorbing polystyrene impact liner and the PRU-52/P Thermoplastic Liner (TPL) Assembly. Included with the assembly, but not attached, are low profile oxygen mask jaw receivers. See tables 4-1 and 4-2 for helmet configuration and aircraft application. See figure 4-2 for IPB.

**Table 4-1. Helmet Configuration Matrix**

| Helmet Configuration | Liner | | | Shell | | NVIIS | Visors | | Ear Phone | Mike and Amp | | | | | Cable Clip | Communication Cables/ Cordsets | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Custom Fit Liner | PRU-52/P | Oregon Areo Zetaliner | PRU-55/P (Holes for Track Visor) | PRU-58/P (Bungy Visor) | AN/AVS-9(V) | EEU-7/P Tracked Visors (Note 1) | Lightweight (Bungy) Visors (Note 2) | MIL-E-18239 (H-87B/U) | MIL-E-26542/2-01, -02, -03 | MIL-E-26542/2 (M-87/AIC) | Boom Swivel | M23595/1-2 (AM-3597C/A) | Amp Mounting Bracket | MK-634/AIC | M22442/37-4708 (CX-4708A/AIC) | M22442/30-1 (CX-13155/A) | M22442/30-2 (CX-13164/A) | M22442/15-1 (CX-4832A/AR) | M22442/19-1 (CX-12972/AR) | KMU-561/P22P-16 (NCE Helmet Bladder) |
| HGU-66(V)1/P | X | – | – | – | – | X | – | X | X | O | O | O | O | O | O | X | O | O | O | O | – |
| HGU-68(V)/P | – | X | O | X | – | – | X | – | X | O | O | O | O | O | O | X | O | O | O | O | – |
| HGU-68(V)1/P | – | X | O | X | – | – | X | – | X | O | X | X | O | O | O | O | O | X | O | O | – |
| HGU-68(V)2/P | – | X | O | X | – | – | X | – | X | X | O | X | O | O | O | O | O | O | X | X | – |
| HGU-68(V)3/P | – | X | O | X | – | – | X | – | X | X | O | X | X | X | O | O | O | O | O | X | – |
| HGU-68(V)4/P | – | X | O | X | – | – | X | – | X | X | O | X | X | X | O | O | X | O | O | O | – |
| HGU-68(V)6/P | – | X | O | X | – | X | – | X | X | – | – | – | – | – | – | X | – | – | – | – | – |
| HGU-85(V)1/P | – | X | O | – | X | X | – | X | X | – | – | – | – | – | O | X | O | O | O | O | – |
| HGU-87(V)/P22P-16 | – | X | O | X | – | O | X | – | X | O | O | O | O | O | O | X | O | O | O | O | X |
| HGU-87(V)1/P22P-16 | – | X | O | X | – | X | – | X | X | O | O | O | O | O | O | X | O | O | O | O | X |
| HGU-89/P22P-16 | – | X | O | – | X | X | – | X | X | O | O | O | O | O | O | X | O | O | O | O | X |

Legend: X - Required
O - Optional
– - Not Applicable

Notes: 1. See Table 4-2A (MBU-12 Trim) or 4-2C (MBU-23/P-24/P Trim) for authorized optional visors.

2. See Table 4-2B (MBU-12 Trim) or 4-2D (MBU-23/P-24/P Trim) for authorized optional visors.

3. Special purpose visors with reference numbers beginning with GW, listed as open purchase, are commercially available from Gentex Western Operations, Rancho Cucamonga, CA., 91730 Telephone (909) 481-7667 (at menu prompt, choose USN MBU-23/P Order Desk). All other special purpose visors listed as open purchase are commercially available from Gentex Corporation, Carbondale PA, 18470 Telephone (570) 282-8505. See tables 4-2A thru 4-2D.

**Table 4-2. Helmet Application Matrix**

| Helmet Designation | Fighter | | | | Attack | | ASW | Electronic | | Patrol | Cargo | Trainers | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | F/A-18 Series | F-16 Series | F-14 Series | F-5 Series | AV-8B | All Other Attack | S-3 Series | E-2C, TE-2C | EA-6B | P-3 Series | C-2 Series | T-2 Series | TA-4F, J | T-6 | TA-7C | TAV-8B | T-34B/C (student) | T-34B/C (instructor) (Note 4) | T-45 Series |
| HGU-55A/P (Note 3) | X | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| HGU-66(V)1/P | X | – | O | O | O | - | O | O | O | O | O | O | – | – | – | O | O | O | O |
| HGU-68(V)/P | X | X | X | – | O | – | – | – | X | – | – | X | X | X | X | X | – | O | X |
| HGU-68(V)1/P | – | – | – | X | – | – | – | – | – | – | X | – | – | – | – | – | X | O | – |
| HGU-68(V)2/P | – | – | – | – | – | – | – | – | – | X | – | – | – | – | – | – | – | O | – |
| HGU-68(V)3/P | – | – | – | – | – | – | X | – | – | – | – | – | – | – | – | – | – | O | – |
| HGU-68(V)4/P | – | – | – | – | – | – | – | X | – | – | – | – | – | – | – | – | – | O | – |
| HGU-68(V)6/P | O | – | O | – | O | O | – | – | O | – | – | – | – | – | – | – | – | O | – |
| HGU-85(V)1/P | O | – | O | – | X | O | – | – | – | – | – | O | O | – | O | O | O | O | O |
| HGU-87(V)/P22P-16 | X | – | O | – | – | – | – | – | – | – | – | – | – | – | – | – | – | O | – |
| HGU-87(V)1/P22P-16 | O | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | O | – |
| HGU-89/P22P-16 | O | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | O | – |

Legend: X - Required
O - Optional
– - Not Applicable

Notes:

1. Refer to NATOPS for helmet requirement in aircraft not listed.
2. Helmets for special mission aircraft not listed will be configured the same as the base line aircraft. Communication is dependent upon airframe.
3. F/A-18 E/F JHMCS helmets are maintained in accordance with instructions contained in NA 13-1-6.7-5
4. Instructor Pilots in T-34 Series aircraft who have been issued HGU-84/P series helmets may continue to use those helmets during assignment as instructors in CNATRA T-34 series aircraft. See Chapter 3 for installation of T-Bayonet Microphone Mount authorized for use by T-34 instructor pilots.

**Table 4-2A. Helmet, Mask, and Visor Interface Chart, Tracked Visors - (MBU-12/P Trim for HGU-68(V)/P thru (V)4/P Helmets)**

| Part Number | NIIN | Lens Type |
|---|---|---|
| 88B7586-2 | 01-360-7285 | EEU-7/P Visor Assembly |
| 90D7972-1 | 01-360-9320 | Neutral Lens, EEU-7/P |
| 90D7972-2 | 01-362-0314 | Clear Lens, EEU-7/P |
| 97A10037-1 | — | Amber Lens (Open Purchase) (Note 1) |
| 97A10037-3 | — | Gradient Lens (Open Purchase) (Note 1) |
| GW9654-01 | — | Neodymium Laser Eye Protective (Open Purchase) (Note 2) |

Notes: 1. Special purpose visors listed as open purchase are commercially available from Gentex Corporation, Carbondale PA, 18470 Telephone (570) 282-8505.
2. Special purpose visors with reference numbers beginning with GW, listed as open purchase, are commercially available from Gentex Western Operations, Rancho Cucamonga, CA., 91730 Telephone (909) 481-7667 (at menu prompt, choose USN MBU-23/P Order Desk).

**Table 4-2B. Helmet, Mask, and Visor Interface Chart, Lightweight (Bungy) Visors - (MBU-12/P Trim for HGU-68(V)6/P and HGU-85(V)1/P Helmets)**

| Part Number | NIIN | Lens Type |
|---|---|---|
| 80D5189-11 | — | Gradient Lens (Open Purchase) (Note 1) |
| 81D5189-3 | 01-143-2088 | Clear Lens |
| 81D5189-4 | 01-141-5917 | Neutral Lens |
| 85D7139-6 | — | Amber Lens (Open Purchase) (Note 1) |
| 88C7538-1 | — | Safety Visor, Stepped-In, Medium |
| 88C7538-2 | — | Safety Visor, Stepped-Out, Medium |
| 88C7538-3 | — | Safety Visor, Stepped-In, Large |
| 88C7538-4 | — | Safety Visor, Stepped-Out, Large |
| 88C7538-5 | — | Safety Visor, Stepped-In, Extra-Large |
| 88C7538-6 | — | Safety Visor, Stepped-Out, Extra-Large |
| GW9651-01 | — | Safety Visor, Reduced Profile, Stepped-In, Medium (Open Purchase) (Note 2) |
| GW9651-03 | — | Safety Visor, Reduced Profile, Stepped-In, Large (Open Purchase) (Note 2) |
| GW9651-05 | — | Safety Visor, Reduced Profile, Stepped-In, Extra-Large (Open Purchase) (Note 2) |
| GW9651-09 | — | Visor, Neodymium, Reduced Profile, Stepped-In, Medium (Open Purchase) (Note 2) |
| GW9651-11 | — | Visor, Neodymium, Reduced Profile, Stepped-In, Large (Open Purchase) (Note 2) |
| GW9651-13 | — | Visor, Neodymium, Reduced Profile, Stepped-In, Extra-Large (Open Purchase) (Note 2) |
| GW9750 | — | Neodymium Laser Eye Protective (Open Purchase) (Note 2) |

Notes: 1. Special purpose visors listed as open purchase are commercially available from Gentex Corporation, Carbondale PA, 18470 Telephone (570) 282-8505.
2. Special purpose visors with reference numbers beginning with GW, listed as open purchase, are commercially available from Gentex Western Operations, Rancho Cucamonga, CA., 91730 Telephone (909) 481-7667 (at menu prompt, choose USN MBU-23/P Order Desk).

**Table 4-2C. Helmet, Mask, and Visor Interface Chart, Tracked Visors - (MBU-23/P-24/P22P-16 Trim for HGU-68(V)/P thru (V)4/P and HGU-87(V)/P22P-16 Helmets)**

| Part Number | NIIN | Lens Type |
|---|---|---|
| 90D7972-4 | 01-439-2339 | Neutral Lens, EEU-7/P |
| 90D7972-5 | 01-439-2347 | Clear Lens, EEU-7/P |
| 97A10037-2 | — | Amber Lens (Open Purchase) (Note 1) |
| 97A10037-4 | — | Gradient Lens (Open Purchase) (Note 1) |
| GW9654-02 | — | Neodymium Laser Eye Protective (Open Purchase) (Note 2) |

Notes: 1. Special purpose visors listed as open purchase are commercially available from Gentex Corporation, Carbondale PA, 18470 Telephone (570) 282-8505.
2. Special purpose visors with reference numbers beginning with GW, listed as open purchase, are commercially available from Gentex Western Operations, Rancho Cucamonga, CA., 91730 Telephone (909) 481-7667 (at menu prompt, choose USN MBU-23/P Order Desk).

**Table 4-2D. Helmet, Mask, and Visor Interface Chart, Lightweight (Bungy) Visors - (MBU-23/P-24/P22P-16 Trim for HGU-68(V)6/P, HGU-85(V)1/P, HGU-87(V)1/P22P-16 andHGU-89/P22P-16 Helmets)**

| Part Number | NIIN | Lens Type |
|---|---|---|
| 89D7697-1 | — | Clear Lens |
| 89D7697-2 | — | Neutral Lens |
| 92A8058-2 | — | Gradient Lens (Open Purchase) (Note 1) |
| 92A8058-5 | — | Amber Lens (Open Purchase) (Note 1) |
| GW9142-06 | — | Neodymium Laser Eye Protective (Open Purchase) (Note 2) |
| GW9652-01 | — | Safety Visor, Reduced Profile, Stepped-In, Clear, Medium (Open Purchase) (Note 2) |
| GW9652-03 | — | Safety Visor, Reduced Profile, Stepped-In, Clear, Large/Extra-Large (Open Purchase) (Note 2) |
| GW9652-05 | — | Neodymium, Reduced Profile, Stepped-In, Medium (Open Purchase) (Note 2) |
| GW9652-07 | — | Neodymium, Reduced Profile, Stepped-In, Large/Extra-Large (Open Purchase) (Note 2) |

Notes: 1. Special purpose visors listed as open purchase are commercially available from Gentex Corporation, Carbondale PA, 18470 Telephone (570) 282-8505.
2. Special purpose visors with reference numbers beginning with GW, listed as open purchase, are commercially available from Gentex Western Operations, Rancho Cucamonga, CA., 91730 Telephone (909) 481-7667 (at menu prompt, choose USN MBU-23/P Order Desk).

**4-9. HGU-85(V)/P Series Helmet Assemblies.** The HGU-85(V)/P series helmets are night attack helmets incorporating Night Vision Image Intensifier Sets (NVIIS) to enhance aircrew night mission performance. The HGU-85(V)/P helmet is delivered configured with the M22442/37-4708 (CX-4708A/AIC) cable assembly for communications, attachable lightweight visors clear and neutral, an integrated chin/nape strap, an energy absorbing polystyrene impact liner and the PRU-52/P Thermoplastic Liner (TPL) Assembly. Included with, but not attached, are low profile oxygen mask jaw receivers. The PRU-58/P helmet shell features three factory-fabricated slots in the brow area to permit attachment of the MXU-810/U NVIIS helmet plate, (no longer authorized for use). The HGU-85(V)1/P is an HGU-85(V)/P helmet configured with the AN/AVS-9(V) mounting plate for NVIIS aided flights. Install in accordance with paragraph 4-44. See Figure 4-3 for IPB.

**4-10. HGU-87(V)/P22P-16 Series Helmet Assemblies.** The HGU-87(V)/P22P-16 helmet is an HGU-68(V)/P helmet modified by Air Crew Systems Change (ACC) No. 642 incorporating the Navy Combat Edge KMU-561/P22P-16 inflatable helmet bladder assembly. See tables 4-1 and 4-2 for helmet configuration and application. The HGU-87(V)1/P22P-16 helmet is modified for use with the AN/AVS-9(V)NVIIS. Both the HGU-87(V)/P22P-16 and the HGU-87(V)1/P22P-16 helmet assembly shall remain in service until it can no longer be economically repaired at organizational level to meet performance requirements. See Figure 4-4 for IPB.

**4-11. HGU-89/P22P-16 Helmet Assembly.** The HGU-89/P22P-16 helmet is an HGU-85(V)/P helmet modified by ACC No. 631 incorporating the AN/AVS-9(V) NVIIS and ACC No. 642 incorporating the Navy Combat Edge (NCE) inflatable helmet bladder assembly. See Figure 4-5 for IPB.

**4-12. MAJOR HELMET COMPONENTS.** The following are the major helmet components, as well as a brief description of each. These components are added to the basic PRU-55/P or PRU-58/P helmet shell assembly in order to achieve a desired helmet assembly configuration. See Figures 4-6 through 4-10 for IPB and table 4-1 for component application.

**4-13. PRU-55/P Helmet Shell Assembly.** The PRU-55/P helmet shell assembly is intended to provide head protection during in-flight buffeting and emergency situations such as ejection, bailout, or crash landings. The helmet shell assembly has a styrofoam energy absorbing liner and a fitted leather edgeroll installed. It is designed to resist projectile penetration and to distribute impact forces over the entire head. The PRU-55/P helmet shell assembly is the platform for other components such as the single lens visor assembly, communication devices, and the oxygen mask. A chin/nape strap assembly, and a thermoplastic liner assembly are added to the helmet shell assembly to provide a better fit and increased stability. See Figure 4-6 for IPB.

**4-14. PRU-58/P Helmet Shell Assembly.** The PRU-58/P helmet shell assembly provides the same protection and allows for the same configuration buildup as the PRU-55/P, except that the PRU-58/P helmet shell assembly accommodates the MXU-810/U NVIIS (no longer authorized for use) and the 81D5189 series lightweight visor or the 88C7538 safety visor.

**4-15. PRU-52/P Thermoplastic Liner (TPL) Assembly.** The TPL assembly used in conjunction with the styrofoam liner installed in the helmet shell assembly, provides impact energy absorption, helmet stability, and comfort. The TPL assembly consists of a preformed TPL layer assembly and a TPL cover assembly. The TPL assembly comes in three sizes: medium, large, and extra-large. See Figure 4-10 for IPB.

**4-16. Single Lens Visor Assembly.** The single lens visor assembly provides face and eye protection from impact, projectile penetration, sun-glare, dust, ultraviolet rays, windblast and flash fire. Each assembly is delivered with interchangeable clear and neutral lenses. Three optional special use visors are authorized, the amber lens, P/N 97A10037-1, for use in hazy/overcast conditions during daytime flight operations only. The gradient lens, P/N 97A10037-3, which offers glare protection similar to the neutral lens, however the lower portion of the lens is clear, allowing for un-obscured quick scan of cockpit instruments. This lens is for daylight operations only. The neodymium laser eye protective visor, P/N GW9654-01, provides protection from laser targeting and range finding devices during both day and night flight operations. These lenses are compatible with the MBU-12/P series oxygen mask. If authorized to use the MBU-23/24P22P-16 oxygen mask use the following lenses; Laser Eye Protective visor, P/N GW9654-02, Amber visor, P/N 97A10037-2 or Gradient visor, P/N 97A10037-4. See Figure 4-9 for IPB.

**4-17. Lightweight Visor, P/N 81D5189 Series.** Lightweight visors provide face and eye protection from impact, projectile penetration, sunglare, ultraviolet rays, laser radiation and dust. P/N 81D5189-3 (NIIN 01-143-2088) is a clear lightweight visor and P/N 81D5189-4 (NIIN 01-141-5917) is a lightweight neutral visor. Additionally two optional special use visors, also compatible with the MBU-12/P Oxygen mask, are authorized. The lightweight amber visor, P/N 85D7139-6 provides enhanced visibility in hazy/overcast conditions. The gradient visor, P/N 80D5189-11 provides glare protection similar to the neutral visor, however the lower portion of the lens is clear allowing for unobscured quick scan of cockpit instruments. Both the amber and gradient visor are for use during daylight flight operations only. If authorized to use the MBU-23/24/P oxygen mask, use amber visor P/N 92A8058-5 or gradient visor P/N 92A8058-2 to provide proper visor/mask interface.

**4-18. Safety Visor, P/N 88C7538 Series.** The Safety Visors, Stepped In and Stepped Out, are clear components of the HGU-85(V)1/P helmet assembly. The Safety Visors are worn when utilizing the AN/AVS-9(V) NVIIS and provide eye and facial windblast protection.

**4-19. Communication Cable Assemblies.** Each of the helmet assemblies is outfitted with the appropriate communication components for operation with the aircraft. See tables 4-1 and 4-2.

**4-20. M26542/2-01 Boom Microphone Assembly.** The boom microphone assembly provides communication when the oxygen mask is not in use.

**4-21. Bayonet Receiver Assembly.** The bayonet receiver assembly allows for the use of an oxygen mask.

## 4-22. GROUND SUPPORT EQUIPMENT.

**4-23. TTU-489/E OXYGEN HOSE AND COMMUNICATIONS TEST SET.** The TTU-489/E Test Set, P/N 1827AS100-1 is required to test the communications components of the helmet and oxygen mask. Refer to NAVAIR 17-15BC-22.

**4-24. TTU-551/E NCE LEAKAGE TESTER.** The TTU-551/E leakage test set (figure 4-1) is required to perform leakage tests on the KMU-561/P22P-16 bladder assembly of the HGU-87(V)/P22P-16 and HGU-89/P22P-16 Helmet Assemblies. The Helmet Bladder Test Adapter is an item of special support equipment provided with the TTU-551/E test set. If the adapter should become lost or broken, refer to NAVAIR 17-15GB-505 for fabrication instructions.

**4-25. FLYER'S HELMET BAG (MIL-B-43290J).** The flyer's helmet bag is a nylon fabricated bag and is used for holding the aircrewmember's helmet and auxiliary equipment.

## 4-26. APPLICATION.

4-27. Refer to table 4-2 for application of helmet assemblies covered in this chapter.

## 4-28. REFERENCE NUMBERS, ITEMS, AND SUPPLY DATA.

4-29. Section 4-6, Illustrated Parts Breakdown, contains information on each assembly, subassembly, and component part of this series of helmet assemblies. It also contains figure and index numbers, reference or part numbers, description, and units per assembly. Source, Maintenance, and Recoverability (SM&R) codes are indicated in the Numerical Index.

# Section 4-2. Sizing

## 4-30. GENERAL.

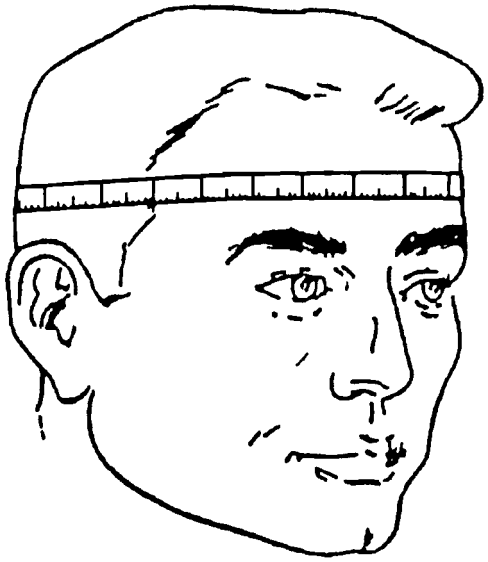
4-31. The concept of sizing as used in this chapter refers to the basic methods to be followed by the Aircrew Survival Equipmentman for requisitioning the proper size helmet shell from supply. Once the basic helmet shell assembly size has been determined and requisitioned, the helmet shell assembly is ready for buildup to the ultimate configuration desired (Section 4-3).

## 4-32. SIZING.

4-33. The helmet shell assembly required for each configuration is determined by the helmet shell size and the type of visor assembly needed for the helmet configuration buildup. The illustrated parts breakdowns (figures 4-2 through 4-5) indicate which helmet shell assembly (part number) is required for each configuration.

**4-34. SIZING THE BASIC PRU-55/P OR PRU-58/P HELMET SHELL ASSEMBLY.** To select the proper size helmet shell assembly for the aircrewmember, proceed as follows:

1. If TACAIR helmets are available, aircrewmember should trial fit to determine correct size to be ordered. If TACAIR helmets are not available, measure the circumference of the head, at the hatband line, with a tape measure. Refer to table 4-3 as a guide for sizing.



4p34s1

**Step 1 - Para 4-34**

**Table 4-3. PRU-55/P and PRU-58/P Helmet Shell Assembly Sizing Guide**

| Circumference (Inches) | Comparable Hat Size | Shell and Liner Size Required | Part Number |
|---|---|---|---|
| 21 - 22.5 | 7 or less | Medium | 90A8045-1, or -7 (Note 1) |
| 22.5 - 24 | 7 1/2 | Large | 90A8045-2, or -8 (Note 1) |
| 24 - 24.9 | 7 7/8 or more | Extra-Large | 90A8045-3, or -9 (Note 1) |

Notes: 1. Part numbers ending with -1, -2, or -3 are single visor, PRU-55/P helmet shell assemblies. Part numbers ending with -7, -8, or -9 are PRU-58/P helmet shell assemblies are no longer available through supply.

**NOTE**

Sizing instructions are provided only as general guidance. Because of the wide variation in head shapes likely to be encountered, it is not possible to present detailed guidance. The helmet is designed to provide lightweight head protection and should fit close to the head. Therefore, the Aircrew Survival Equipmentman (PR/MOS 6060), using sound professional judgement, should in conjunction with the aircrewmember, select the size helmet that provides the safest, most stable and comfortable fit acceptable to the aircrewmember.

2. Once the correct size has been determined, requisition the helmet assembly through normal supply channels.

# Section 4-3. Helmet Configuration Buildup

## 4-35. GENERAL.

4-36. The helmet shell assembly required for each helmet configuration varies according to aircraft mission and type visor assembly required. Table 4-3 along with the information in figures 4-2 and 4-3 will assist in indicating which part number for the required helmet shell assembly should be requisitioned from supply for the helmet assembly configuration buildup.

4-37. Once the basic helmet shell assembly and components are received, carefully inspect the shipping containers for evidence of damage or signs of abuse. Open each container and verify that all the required items have been included. If any parts are defective, damaged, or missing, replace all parts in the shipping container, prepare a Quality Deficiency Report (QDR), and notify the proper authority. Once the helmet shell assembly components have been accepted, it may be built up by adding or removing major components in order to obtain the desired helmet assembly configuration for the required application. This section, used in accordance with tables 4-1 and 4-2, provides enough information to build up the helmet assembly.

## 4-38. ASSEMBLY OF COMPONENTS.

**4-39. ORDER OF ASSEMBLY.** Refer to tables 4-4 through 4-7 for components and order of assembly required to build up the various helmet assembly configurations using either the PRU-55/P or the PRU-58/P helmet shell assembly. Fabricated components and parts shall be installed on the helmet shell assembly in accordance with and in the order shown in the appropriate tables.

**NOTE**

For clarification in determining the right and left side of the helmet assembly during buildup, assume the helmet to be donned by the aircrewmember and determine helmet sides relative to the aircrewmember's right and left sides.

**Table 4-4. HGU-68(V)/P Assembly of Components**

| Order of Assembly | Component/Assembly to be Installed | Paragraph Reference |
|---|---|---|
| 1 | Installation of Reflective Tape | 4-40 |
| 2 | Installation of Helmet Plate Assembly, AN/AVS-9 | 4-44 |
| 3 | Installation of Boom Microphone Assembly, Boom Swivel Assembly, M23595/1-2 (AM-3597C/A) Amplifier and Amp Mounting Bracket | 4-45 |
| 4 | Installation of Optional Cable Assemblies M22442/15-1 (CX-4832A/AR) or M22442/19-1 (CX-12972/AR) Cable Assembly | 4-47 |
| 5 | Installation of Thermoplastic Liner Assembly | 4-49 |
| 6 | Fitting of Helmet Components | 4-50 |
| 7 | Fitting of Thermoplastic Liner Assembly | 4-51 |
| 8 | Installation of Bayonet Receiver Assembly | 4-53 |
| 9 | Installation of CBR Receivers | 4-54 |
| 10 | Installation of Pile Tape | 4-57 |

**Table 4-5. HGU-85(V)1/P Assembly of Components**

| Order of Assembly | Component/Assembly to be Installed | Paragraph Reference |
|---|---|---|
| 1 | Installation of Reflective Tape | 4-40 |
| 3 | Installation of Thermoplastic Liner Assembly | 4-49 |
| 4 | Fitting of Helmet Components | 4-50 |
| 5 | Fitting of Thermoplastic Liner Assembly | 4-51 |
| 6 | Installation of Bayonet Receiver Assembly | 4-53 |
| 7 | Installation of CBR Receivers | 4-54 |
| 8 | Installation of Lightweight (Bungy) Visor | 4-55 |
| 9 | Installation of Single Visor Assembly (Optional) | 4-56 |
| 10 | Installation of Pile Tape | 4-57 |

**Table 4-6. HGU-87(V)/P22P-16 Assembly of Components**

| Order of Assembly | Component/Assembly to be Installed | Paragraph Reference |
|---|---|---|
| 1 | Installation of Reflective Tape | 4-40 |
| 2 | Installation of KMU-561/P22P-16 Helmet Bladder Assembly | 4-41 |
| 3 | Installation of Helmet Plate Assembly, AN/AVS-9 | 4-44 |
| 4 | Installation of Thermoplastic Liner Assembly | 4-49 |
| 5 | Fitting Helmet Components | 4-50 |
| 6 | Fitting of Thermoplastic Liner Assembly | 4-51 |
| 7 | Installation of Bayonet Receiver Assembly | 4-53 |
| 8 | Installation of CBR Receivers | 4-54 |
| 9 | Installation of Lightweight (Bungy) Visor | 4-55 |
| 10 | Installation of Pile Tape | 4-57 |

**Table 4-7. HGU-89(V)/P22P-16 Assembly of Components**

| Order of Assembly | Component/Assembly to be Installed | Paragraph Reference |
|---|---|---|
| 1 | Installation of Reflective Tape | 4-40 |
| 2 | Installation of KMU-561/P22P-16 Helmet Bladder Assembly | 4-41 |
| 3 | Installation of Helmet Plate Assembly, AN/AVS-9 | 4-44 |
| 4 | Installation of Thermoplastic Liner Assembly | 4-49 |
| 5 | Fitting of Helmet Components | 4-50 |
| 6 | Fitting of Thermoplastic Liner Assembly | 4-51 |
| 7 | Installation of Bayonet Receiver Assembly | 4-53 |
| 8 | Installation of CBR Receivers | 4-54 |
| 9 | Installation of Lightweight (Bungy) Visor | 4-55 |
| 10 | Installation of Single Visor Assembly (Optional) | 4-56 |
| 11 | Installation of Pile Tape | 4-57 |

**4-40. INSTALLATION OF REFLECTIVE TAPE ON HELMET SHELL ASSEMBLY.** To install reflective tape on the helmet shell assembly proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| As Required | Tape, Reflective, High Intensity, White, 3-Inch (Note 1) | NIIN 01-078-8660 3150-3X50YD |
| As Required | Tape, Reflective, White, CL 3 | L-S-300 NIIN 00-100-2153 |
| As Required | Tape, Reflective, Red, 1-Inch, CL 1 | L-S-300 NIIN 00-949-7552 |
| As Required | Tape, Reflective, Red, 3-Inch, CL 1 | L-S-300 NIIN 00-949-7598 |
| As Required | Tape, Reflective, Red, 6-Inch, CL 1 | L-S-300 NIIN 00-951-8833 |
| As Required | Tape, Reflective, Yellow, 1-Inch, CL 1 | L-S-300 NIIN 00-753-3208 |
| As Required | Tape, Reflective, Orange, 1-Inch, CL 1 | L-S-300 NIIN 00-656-1494 |
| As Required | Tape, Reflective, Orange, 2-Inch, CL 1 | L-S-300 NIIN 00-656-1186 |

Notes: 1. High intensity grade white tape provides greatest overall reflectivity and is most favorable for visual detection. Submit requisitions for high intensity grade tape to routing identifier code ZNC.

1. Clean outside of helmet shell assembly with damp cloth and a mild cleaning agent to remove all traces of grease, salt, or foreign substances.

2. Remove all traces of cleaning agent with a clean damp cloth. Dry with a clean, dry cloth.

3. Examine all surfaces of the helmet shell assembly for obvious signs of cracks, soft portions, splits or other defects which would be cause for replacement of the item. Chipped paint shall not be cause for replacement of helmet shell assembly. Defective helmet shell assemblies shall be disassembled and replaced and damaged parts shall be disposed of in accordance with the proper directives. Undamaged parts shall be retained for replacement on other helmet shell assemblies.

**CAUTION**

Refurbishment of helmet shell assembly by other than removal or replacement of reflective tape is unauthorized.

4. Aviator helmet assemblies shall be taped in accordance with the provisions of OPNAVINST 3710.7 Series (General NATOPS) and any Type Commander Directives.

5. Remove protective backing from reflective tape and place in desired position on helmet shell assembly surface. Avoid excessive stretching, air bubbles, and wrinkles. To obtain maximum adhesion, apply firm pressure to tape. Strip overlap should be minimized.

**NOTE**

Use of a heat gun increases adhesion of the reflective tape.

**CAUTION**

Application of any type of coating on top of reflective tape is not authorized.

6. Document in accordance with OPNAVINST 4790.2 Series.

**4-41. INSTALLATION OF THE KMU-561/P22P-16 HELMET BLADDER KIT.** The helmet bladder is a principle component of the Navy Combat Edge A/P22P-16 Aircrew Protective Assembly. It works in conjunction with the CSU-20/P22P-16 Anti-g Lower Ensemble and CSU-21/P22P-16 Counter Pressure Vest. It inflates during high-g situations to counter the positive pressure provided by the NCE system to the oxygen mask, keeping the mask tight against the face, aiding in the reduction of oxygen blow-by. The KMU-561/P22P-16 Helmet Bladder is installed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Bladder Assembly | 93C8611-1 |
| 3 | Strap, Tiedown | MS3367-4-0 |
| 1 | Bladder Inlet Connector Kit | 92B8414-1 |
| 1 | Cover, Bladder Inlet Connector | 89C7667-1 |
| As Required | Adhesive, RTV 102/732 | MIL-A-46106 NIIN 00-877-9872 |
| 2 | Screw, Panhead | MS1957-14B |
| 2 | Washer, Lock | MS35333-70 |

**NOTE**

The KMU-561/P22P-16 Bladder Kit Assembly is issued in one size only and contains all required material for installation.

1. Prepare helmet for bladder installation.

a. If installed, remove visor lens and TPL assembly.

b. Detach left hand earcup assembly from helmet shell earcup cavity pile fastener tape and position clear of work area.

2. Prepare KMU-561/P22P-16 helmet bladder for installation as follows:

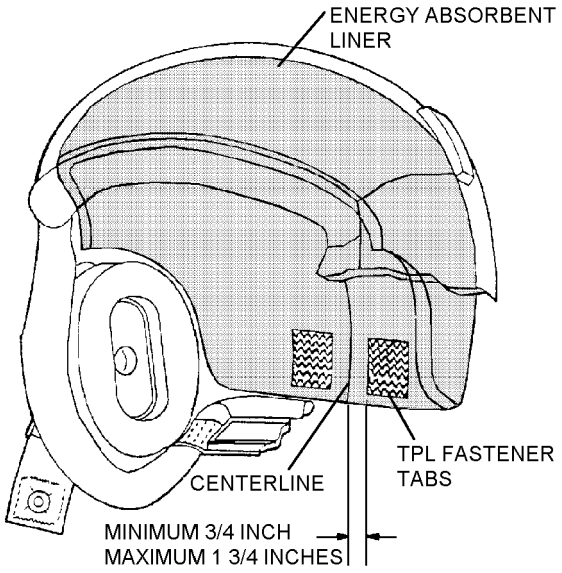
a. Remove KMU-561/P22P-16 bladder from kit package and lay out flat on workbench with identification label upward and bladder oxygen inlet supply tube on the lower left (as worn) side. Record KMU-561/P22P-16 bladder serial number in accordance with OPNAVINST 4790.2 series manual.

b. With helmet upright on work bench, position bladder assembly into helmet shell interior centered against rear inner surface of the energy absorbing liner with the identification label visible. Ensure bladder lays flat against the energy absorbing liner and lower edge of bladder is even with and parallel to the nape area edgeroll of the helmet shell with bladder inlet supply tube oriented toward left helmet shell earcup cavity.

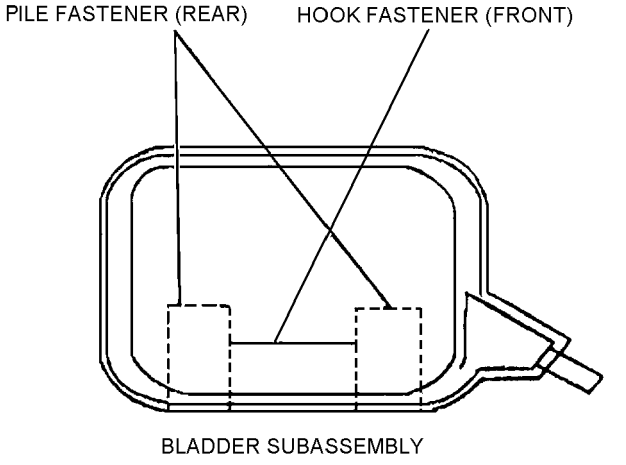
c. Maintaining centered position, lift lower edge of bladder upward to expose hook fastener tabs installed on energy absorbing liner. Using white chalk, lightly mark location for installation of mating pile fastener tabs on the underside of the bladder.

d. Remove bladder from helmet shell interior and place label side down on work bench. Remove backing from kit pressure sensitive pile fastener tabs and press firmly into place at marked locations on bladder.

e. Turn bladder over; determine center of bladder and mark using white chalk, on bottom edge bladder. Remove backing from kit pressure sensitive hook fastener tab, align center of tab with mark on bladder centerline, and install tab horizontally along bottom edge of bladder. Place bladder into helmet shell interior to verify proper fastener tab alignment and positioning.




**Step 2c - Para 4-41**




**Steps 2d and 2e - Para 4-41**

3. Install KMU-561/P22P-16 helmet bladder kit into the HGU-68(V)/P and HGU-85/P helmets as follows:

a. Detach visor cover attachment snap fastener stud from left side helmet shell earcup cavity exterior surface by loosening and removing the screw, lock washer and nut securing it in place and set aside for use during modification and subsequent reinstallation. From left interior earcup cavity, detach pile fastener material from inner surface of helmet shell and position clear of work area.

b. At the left rear integrated chin/nape strap attaching point on the helmet shell exterior, remove pan head screw, washer and underlying flanged nut and lock washer securing left nape strap and nape pad strap to helmet shell interior. Detach flanged nut and lock washer from grommets on end of left rear nape strap and nape pad strap, set aside, along with pan head screw and flat washer, for use during modification and subsequent reinstallation.

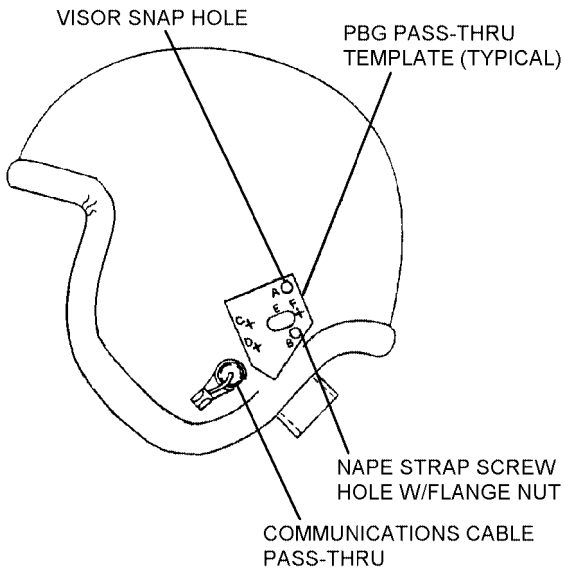
**NOTE**

To facilitate modification, template alignment holes A and B shall be cut out using the appropriate size cutter of a rotary (star) punch.

c. From kit package, select the template matching the size of the helmet being modified, cut out alignment holes A and B.

d. From interior of helmet, using flanged nut and lock washer removed in step b., pass the post of the flanged nut through left rear integrated chin/nape attachment hole, to helmet shell exterior. With the crosshatches for screw hole locators C and D oriented towards the front of the helmet, position hole B of the template over the post of the flanged nut, aligning hole A over visor cover snap fastener hole. Secure template in place by installing the visor cover screw and nut through hole A of the template and the nape strap pan head screw and flat washer through hole B into the post of the flanged nut.

e. Using a No. 2 medium lead pencil, draw outline of the bladder inlet supply tube pass through hole E onto helmet shell exterior surface. At screw locator holes C, D and installation tab locator hole F, mark the center of each crosshatch onto helmet using a center punch. Determine center of hole E outline and mark. With a center punch, mark the center of each half of hole E.




**Steps 3d and 3e - Para 4-41**

f. Loosen and remove hardware attaching template to helmet shell, remove template and set aside hardware for reinstallation.

**CAUTION**

Failure to ensure that nape strap, communications cord and earcup are clear of area to be drilled will result in damage to equipment.

Failure to ensure earcup cavity pile fastener is clear of area to be drilled will result in pile fabric becoming entangled in drill bit.

g. At marked locations C, D and F, using a No. 25 (0.149) drill bit, drill through helmet shell and deburr holes.

**NOTE**

Do not enlarge hole E any wider than necessary to permit passage through the helmet shell of the male portion of the inlet connector bladder quick disconnect and the bladder supply inlet hose.

h. At center mark of hole E outline, using a No. 1 (0.228) drill bit, drill a pilot hole. Enlarge and elongate hole E with a round file or a rotary tool kit (Dremel Tool), using the template hole E outline as a guide. Remove bladder inlet quick disconnect from kit package and use it to verify proper size and shape of the hole, using the male portion of the bladder inlet quick disconnect connector. Deburr all edges of the hole.

**NOTE**

Prior to assembly, apply a small amount of RTV to the first few threads of the screw.

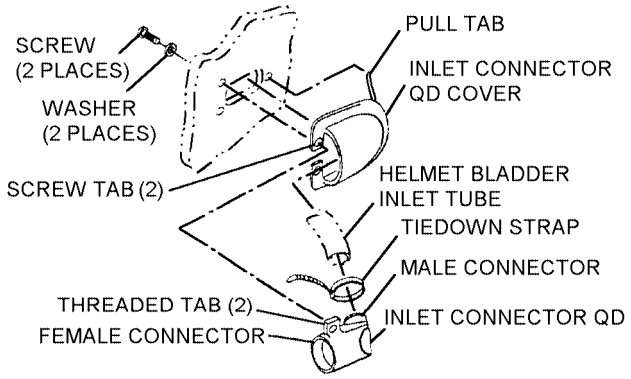
i. Reinstall visor cover snap fastener stud onto helmet shell exterior using screw, lock washer and nut removed during step 3.f.

j. Remove bladder inlet connector quick disconnect cover from kit package. Align the cover over hole E, with the two screw tabs of the cover oriented toward the forward edge of helmet shell earcup cavity. Attach rear portion of the cover to the helmet shell exterior by inserting the trailing end installation tab through hole F to the helmet shell interior. From inside the helmet, pull on trailing end of tab while pushing on the rear outside end of the cover to seat the groove of the installation tab between the interior and exterior surfaces of hole F. With installation tab fully seated, cut trailing end off tab and rotate cover toward rear of helmet to permit unrestricted access to hole E.

k. Insert bladder into helmet shell interior and attach it to the hook fastener tabs on the energy absorbing liner. Ensure the bladder lies smoothly across the surface of the liner and is correctly aligned with the nape edgeroll and that the bladder inlet supply tube is oriented toward the left helmet shell earcup cavity.

l. Remove plug from the bladder inlet supply tube and pull the supply tube out of the helmet shell interior through hole E. Fit inlet supply tube over the male portion of the inlet connector quick disconnect. Place the quick disconnect flush against the helmet shell exterior, with threaded inserts of disconnect over holes C and D, to ensure there is no twisting of bladder or bladder inlet supply tube when quick disconnect is properly positioned for installation.

m. Using tiedown strap supplied in kit and strap tensioning tool set at minimum tension (3), secure inlet supply tube to male portion of the bladder quick disconnect with the head of the tiedown strap positioned on the underside of the male portion of the quick disconnect.




4p41s3j

**Steps 3j thru 3m - Para 4-41**

**NOTE**

Prior to assembly, apply a small amount of RTV to the first few threads of each screw.

n. Rotate the bladder inlet connector forward over the bladder inlet connector. Arrange the screw tabs of the cover over holes C and D on helmet and under threaded inserts of the bladder inlet connector quick disconnect tabs. While maintaining alignment, from inside of helmet, attach connector and cover to helmet shell exterior by installing screws and lock washers through helmet shell; cover screw tabs into the threaded inserts of the inlet connector quick disconnect tabs. Securely tighten screws.

**NOTE**

Upon completion of bladder installation procedures, perform bladder leakage test in accordance with paragraphs 4-68 through 4-71.

o. Reattach left hand integrated chin/nape assembly to rear of helmet shell using screw, flat washer, lock washer and flanged nut removed in step 3.f. Using adhesive, reattach pile fastener material detached in step 3.a. Reinstall left hand earcup assembly removed in step 1.

p. Install visors Part Number P/N 90D7972-4 or 90D7972-5 in accordance with instructions contained in paragraph 4-83. Helmets intended for use with Night Vision Image Intensifier Sets will be configured with visors P/N 89D7697-1 or 89D7697-2, installed in accordance with instructions contained in, paragraph 4-55.

q. Contact aircrewmember to continue fitting of helmet in accordance with paragraph 4-48.

4. Document in accordance with OPNAVINST 4790.2 Series.

**4-42. Deleted**.

**4-43. Deleted.**

**4-44. INSTALLATION OF AN/AVS-9(V), DETACHABLE HELMET MOUNTING PLATE ASSEMBLY, P/N 264317-3.** The Detachable Helmet Mounting Plate Assembly provides the means to attach the AN/AVS-9(V) NVIIS to the aircrew protective helmet. Detachable mounting plate, P/N 264317-3, replaces currently installed helmet plate, P/N 00-067-01, on all TACAIR fixed wing helmet assemblies.

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Helmet Mounting Plate Assembly (extended travel) | 264317-3 |
| 1 | Bracket Kit, Helmet | 265030-3 |
| 1 | Hex Key Set | GGG-K-275 |
| As Required | Tape, Masking, 1-Inch | NIIN 00-283-0612 |
| As Required | Tape, Pressure Sensitive, 1-Inch | NIIN 00-074-5124 |
| As Required | Adhesive, RTV 102/732 | MIL-A-46106 NIIN 00-877-9872 |
| 1 | Lightweight Visor, Clear (MBU-23/P, -24/P trim) | 89D7697-1 NIIN 01-319-8962 |
| | -or- | |
| 1 | Lightweight Visor, Neutral (MBU-23/P, -24/P trim) | 89D7697-2 NIIN 01-319-8961 |
| | -or- | |
| 1 | Lightweight Visor, Clear (MBU-12/P trim) | 81D5189-3 NIIN 01-143-2088 |
| | -or- | |

Materials Required (Cont)

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Lightweight Visor, Neutral (MBU-12/P trim) | 81D5189-4 NIIN 01-141-5917 |
| | -or- | |
| 1 | Lens (MBU-23/P trim) (600 Knt) | 90D7972-4 NIIN 01-439-2339 |
| | -or- | |
| 1 | Lens (MBU-24/P trim) (600 Knt) | 90D7972-5 NIIN 01-439-2347 |

**NOTE**

The Bracket Kit P/N 265030-3 contains required hardware to attach the P/N 264317-3 helmet mounting plate to the selected helmet; four #6-32 hex head screws, four lock washers, left hand mounting bracket (thick concave bracket), right hand mounting bracket (thin concave bracket) and two interior backing plates.

Ensure aircrewmember has a properly fit helmet assembly prior to installing mounting plate.

1. Removal of installed MXU-810/U mounting plate.

a. For HGU-66/P, HGU-85(V)/P, and HGU-89(V)/P helmets:

(1) Unsnap and remove visor and position clear of work area for reinstallation.

(2) Detach existing MXU-810/U NVIIS helmet plate by removing the three screws and flat washers along with fabric cover from the underlying T-nuts. Proceed to step 1c.

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b. For HGU-68(V)/P helmets:

(1) Lower visor to expose visor locking guide locking plate.

(2) Lift locking plate tab and slide to open position to expose rounded hole in locking guide slot.

(3) Raise visor to full up position placing visor lock knob in the rounded hole of locking guide slot.

(4) Rotate visor lock knob 1/4 turn clockwise to disengage locking key from visor locking guide slot and remove lock knob.

(5) Remove visor by sliding aft until clear of tracks.

(6) Detach visor locking guide by removing six attaching screws.

(7) Detach left and right visor tracks and all external components by removing six attaching screws.

c. Detach earcup assemblies from pile fastener tape on helmet shell interior and position clear of work area.

d. Remove the screws and flat washers from the underlying lock washers and flanged nuts securing the chin/nape strap to the rear of the helmet. Reassemble removed components on grommeted ends of chin/nape strap to prevent twisting or position shift during maintenance.

e. For HGU-66/P helmets:

(1) Position helmet inverted on work bench with the helmet brow closest to technician.

(2) Grasp two fabric liner release loops on rear half of custom fit liner, apply inward and upward pressure on loops, maintain pressure and move liner up and out of rear of helmet shell.

(3) Slide front half of custom liner toward rear of helmet shell and remove, set both halves aside for reinstallation. Proceed to step 1g.

**CAUTION**

The energy absorbing liner is easily damaged, use extreme care during removal and handling procedures.

**NOTE**

Prior to removal of the energy absorbing liner, mark the centerline of the liner and the helmet shell edgeroll at the brow and nape to ensure correct re-positioning of the liner during replacement.

f. For HGU-68(V)/P, HGU-85(V)/P, and HGU-89(V)/P helmets:

(1) Position helmet inverted on work bench with brow of helmet closest to technician.

(2) Insert a thin flexible metal spatula (a 12-inch x 1-inch metal ruler may be used) between inner surface of helmet shell and energy absorbing liner at the center rear of the helmet, apply inward and upward pressure on liner, until there is enough clearance to grasp energy absorbing liner with free hand.

(3) Rotate liner approximately 90 degrees left or right to clear earcup cavity edgeroll and permit complete withdrawal from helmet shell.

(4) Maintain inward and upward pressure on liner and continue to move it up and out of helmet shell.

g. For HGU-66/P, HGU-85(V)/P, and HGU-89(V)/P helmets:

(1) Invert helmet and place 1 inch x 1 inch squares of pressure sensitive tape on the three T-nuts and underlying lock washers securing the MXU-810/U helmet plate on the helmet shell interior surface.

(2) Place helmet upright on work bench with front of helmet closest to technician.

(3) Detach MXU-810/U helmet plate from helmet shell exterior by removing the three screws and flat washers along with fabric cover from the underlying lock washers and T-nuts.

2. Installation of AN/AVS-9(V) helmet mounting plate.

a. Place helmet upright on work bench with the front of helmet closest to technician.

b. Adjust helmet mounting plate left hand latching screw counterclockwise until lower end of screw is flush with the inner end of the integral threaded cylindrical nut, with the locking nut loosened.

c. Position helmet mounting plate across brow of helmet, with helmet plate lower edge extension resting level across the upper edge of helmet shell brow edgeroll.

d. Align mounting plate centering arrow with center of upper MXU-810/U helmet plate attaching slot.

e. Visually verify alignment of helmet mounting plate centering arrow with upper attaching slot and that the lower edge extension is resting on the upper edge of the helmet shell edgeroll. Hold mounting plate firmly in place on helmet brow and tape in place with masking tape applied to the mounting plate and helmet shell on the left and right side of the goggle mount.

f. Position helmet with left hand side to technician.

g. Lift overcenter latch and insert head of latching screw into the center cut-out of the left hand mounting bracket (thick concave bracket). Close overcenter latch, ensuring head of latching screw remains centered in left hand bracket cut-out.

h. Position concave surface of left mounting bracket flush with surface of helmet shell, with head of latching screw centered in cut-out, inner edge of mounting bracket parallel to the left edge of the helmet mounting plate.

i. While holding bracket in place, outline mounting bracket position on exterior helmet shell surface. Place a mark at the center of the upper and lower slots to indicate location of drilling points for attaching screws.

**NOTE**

The right hand mounting bracket features two latching notches, one deep notch and one shallow notch, with four attaching screw slots. These features are incorporated to permit minor adjustments to the helmet mounting plate assembly's position on the helmet shell exterior surface to individualize goggle placement to optimize eye relief and interpupillary distance adjustments for the aircrewmember.

j. Position right hand side of helmet toward technician.

k. Position right hand mounting bracket with shallow latching notch down and away from front center of helmet under latching hook. Engage right hand helmet mounting plate latching hook into bracket notch.

l. With firm downward pressure on hook, position concave surface right hand mounting bracket flush with exterior surface of helmet shell.

m. With shallow locking notch down and away from center of helmet and inner edge of mounting bracket parallel with right edge of helmet mounting plate, hold bracket in place and outline bracket position on exterior helmet surface. Place a mark at the center of the upper and lower attaching slots, closest to the shallow locking notch, to indicate location of drilling points for attaching screws.

n. Remove masking tape from helmet shell and mounting plate, set mounting plate aside clear of work area.

o. At each of the two marked locations on each side of the helmet, using a No. 33 (0.113) drill bit, drill a small pilot hole. Using a No. 16 drill bit, enlarge each pilot hole to finished 0.177 dimension.

**NOTE**

Apply a small amount of RTV to the first few threads of attaching screws of the left hand mounting bracket prior to installation. Application of RTV to the right hand mounting bracket attaching screws will be accomplished after final goggle fit and alignment check.

p. Position backing plate, with flat surface of backing plate toward interior surface of left hand side of helmet align built in nuts with two drilled left hand bracket holes.

q. On the left side exterior, position left hand bracket, with center cut-out toward top of the helmet, over drilled holes. Secure in place using a 5/64-inch hex head key and two screws and lock washers.

r. Repeat procedure for installation on right hand bracket, ensuring the center notch is down and away from top of helmet.

s. Engage the right hand latching hook into the notch of the right hand mounting bracket.

t. Fit the left hand latching screw into the center cut-out of the left hand mounting bracket and close the overcenter latch. If helmet mounting plate assembly is loose, adjust left hand latching screw to provide the desired tension, ensuring the helmet mounting plate assembly is centered on helmet when the overcenter latch is closed. Once desired tension is achieved, tighten lock nut to maintain proper position of latching screw.

u. For HGU-66/P helmet:

(1) Invert helmet on work bench with brow positioned closest to technician.

(2) From rear of helmet, ensuring liner half remains centered within the helmet shell interior, insert front half of custom fit liner firmly against helmet shell brow edgeroll.

(3) Insert back half of custom fit liner, with fabric release loops positioned to the right and left side, ensuring the liner half remains centered within the helmet shell interior, into rear of helmet and push into place.

(4) Using screws, flat washers, locking washers and flanged nuts, install grometted ends of chin/nape strap to rear attaching points on helmet shell.

(5) Attach earcups to pile fastener fabric on interior of helmet shell earcup cavity.

v. For HGU-68(V)/P, HGU-85(V)/P, and HGU-89(V)/P helmets: Reinstall internal components in accordance with paragraph 4-86.

**NOTE**

During the crewmember goggle fit process, if difficulty is experienced in obtaining proper eye relief or interpupillary distance using installed goggle adjustments, minor adjustments to the position of the helmet mounting plate assembly may be accomplished by means of attaching slot selection. To adjust position of helmet mounting plate assembly slightly to the right (as worn), place screws in the inboard attaching slots. To adjust position of helmet mounting plate assembly slightly to the left (as worn), install the mounting bracket with the deep notch down and away from the center of the helmet, using the attaching slots closest to the deep notch.

w. Contact aircrewmember to schedule for a goggle fit, adjustment and alignment period.

**NOTE**

Aircrewmembers transferring to activities not involved in operational/training flights requiring the use of Night Vision Image Intensifier Sets (NVIIS) shall have their flight helmets returned to the HGU-68(V)/P configuration to preserve squadron NVIIS integration assets.

x. Document in accordance with OPNAVINST 4790.2 series.

**4-45. INSTALLATION OF BOOM MICROPHONE ASSEMBLY, BOOM SWIVEL ASSEMBLY, M23595/1-2 (AM-3597C/A) AMPLIFIER, AND AMP MOUNTING BRACKET.** To install the boom microphone assembly, boom swivel assembly, amplifier, and amp mounting bracket, select boom microphone assembly with correct length CX-4434/U extension cable for operational requirements and proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Boom Microphone Assembly (Note 1) | M-33A/AIC NIIN 00-755-4643 |
| 1 | Boom Microphone Assembly (Note 2) | M26542/2-01 NIIN 01-188-8529 |
| 1 | Boom Microphone Assembly (Note 3) | M26542/2-02 NIIN 01-188-8530 |
| 1 | Boom Microphone Assembly (Note 4) | M26542/2-03 NIIN 01-188-8528 |
| 1 | Swivel Assembly, Boom Microphone | 765AS300-1 NIIN 01-099-8634 |
| 1 | Amplifier, AM-3597C/A | M23595/1-2 NIIN 00-100-4932 |
| 1 | Amp Mounting Bracket | 80B4881 (CAGE 97427) NIIN 01-128-5334 |
| As Required | Adhesive, Polychloroprene, Class 3 | MIL-A-5540 NIIN 00-515-2246 |
| As Required | Adhesive, RTV 102/732 | MIL-A-46106 NIIN 00-877-9872 |

Materials Required (Cont)

Notes: 1. The M-33A/AIC Boom Microphone Assembly is an M-87/AIC microphone supplied with a 6-inch CX-4434/U extension cable.
2. The M26542/2-01 Boom Microphone Assembly is an M-87/AIC microphone supplied with a 13-inch CX-4434/U extension cable.
3. The M26542/2-02 Boom Microphone Assembly is an M-87/AIC microphone supplied with a 16-inch CX-4434/U extension cable.
4. The M26542/2-03 Boom Microphone Assembly is an M-87/AIC microphone supplied with a 23-inch CX-4434/U extension cable.

**NOTE**

Location for installation of the boom swivel assembly and boom microphone is on the left hand side of the PRU-55/P helmet shell assembly.

1. Install boom swivel assembly and boom microphone assembly as follows:

a. Detach left hand earcup assembly from pile fastener material on interior of left helmet shell earcup cavity and position clear of work area.

**NOTE**

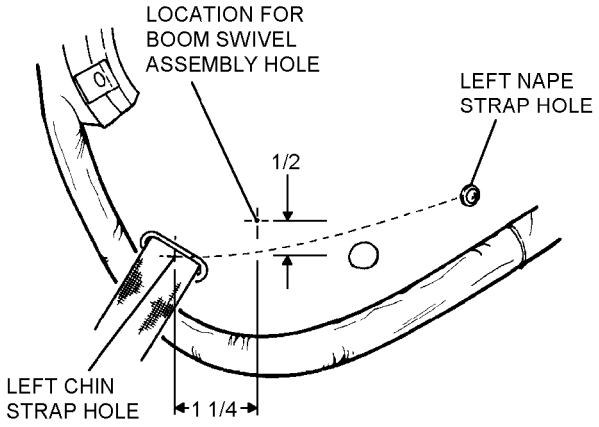
Line drawn in the following step is used as a reference by the installing technician to establish the location for the installation of the boom swivel assembly. It may also be used as an aid to locate the best position for the location of the amplifier mounting bracket hole.

b. Using a no. 2 medium lead pencil, draw a straight line across the exterior surface of the left helmet shell earcup cavity, from the center of the chin strap exit grommet to the center of the left nape strap attaching screw.

**NOTE**

Dimensions given are not critical. They are provided to the installing technician as an aid in selecting the location of the boom swivel mounting hole. Assure sufficient clearance for installation of the oxygen mask jaw receiver is provided during mounting site selection.

c. Locate position, using above stated criteria as a guideline, for boom swivel assembly installation and place a mark.

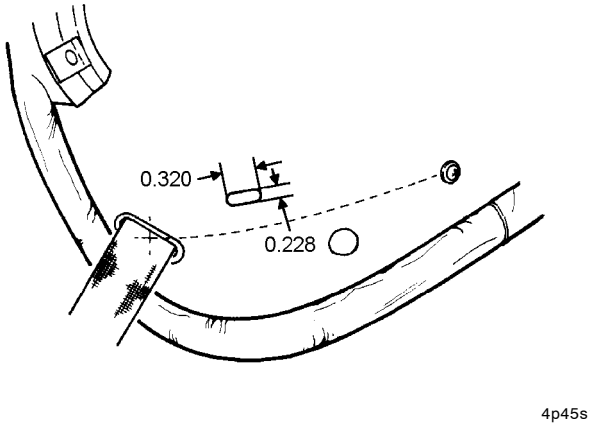



**Steps 1b and 1c - Para 4-45**

d. Detach pile fastener material from interior surface of helmet shell earcup cavity and position clear of work area.

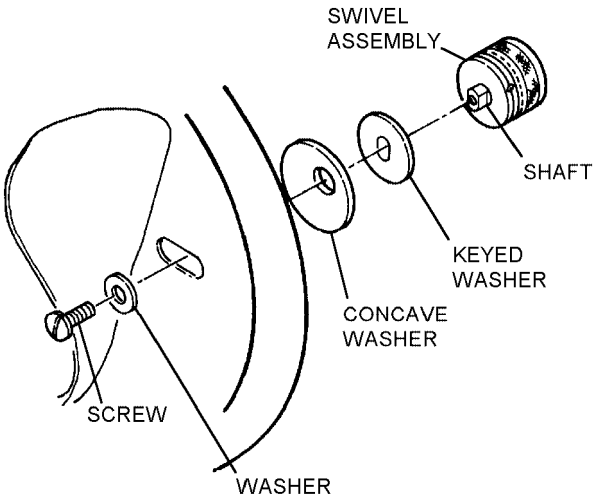
e. At marked location on helmet shell exterior, using a 0.228-inch bit, with drill bit perpendicular to helmet surface, drill the boom swivel mounting hole.

f. Elongate hole to 0.320-inch, using a rattail file. Deburr hole.




**Step 1f - Para 4-45**

g. Install boom microphone swivel assembly by securing swivel shaft (with attached parts) to helmet using pan head screw and washer.

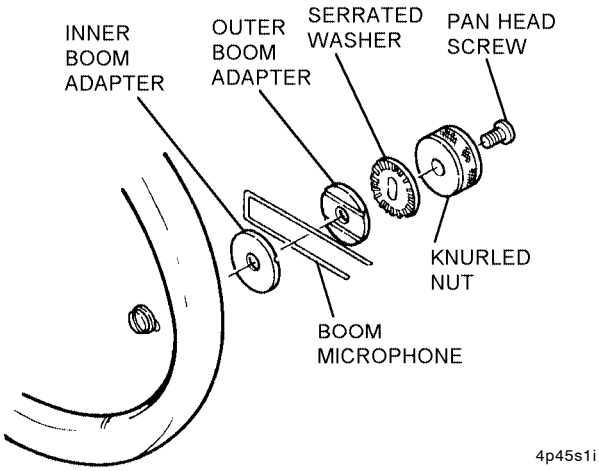



**Step 1g - Para 4-45**

h. Remove pan head screw, knurled nut, serrated washer, and outer half of boom adapter from shaft.

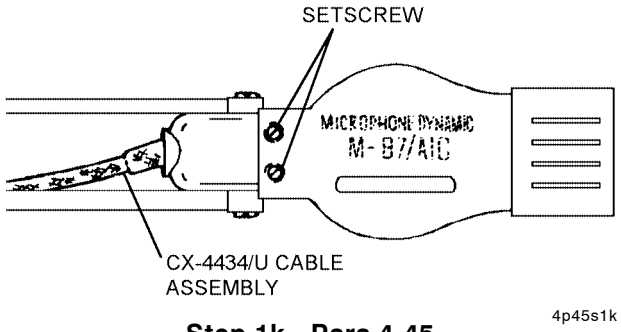
i. Align boom microphone support bracket legs into grooves of the inner boom swivel, boom adapter.

j. Position outer boom adapter over support bracket legs and install serrated washer, knurled nut and pan head screw then tighten.




**Step 1i and 1j - Para 4-45**

k. If the CX-4434/U cable assembly has been removed from boom microphone assembly, loosen setscrews on microphone, install plug of CX-4434/U cable assembly and tighten setscrews.



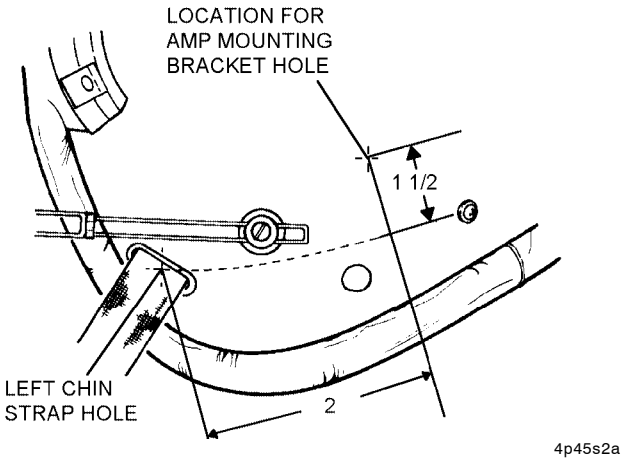

**Step 1k - Para 4-45**

2. For communications systems requiring the use of the M23595/1-2 (AM-3597C/A) amplifier, proceed as follows:

**NOTE**

Dimensions given are not critical. They are provided to the installing technician as an aid in selecting the location of the amplifier mounting bracket hole. Assure sufficient clearance for boom microphone operation and adjustment is provided during mounting site selection.

a. Locate position, using above stated criteria as a guideline, for amplifier mounting bracket installation and place a mark.




**Step 2a - Para 4-45**

b. At marked location on helmet shell exterior, using a 0.228-inch bit, with drill bit perpendicular to helmet surface, drill the amplifier mounting bracket hole.

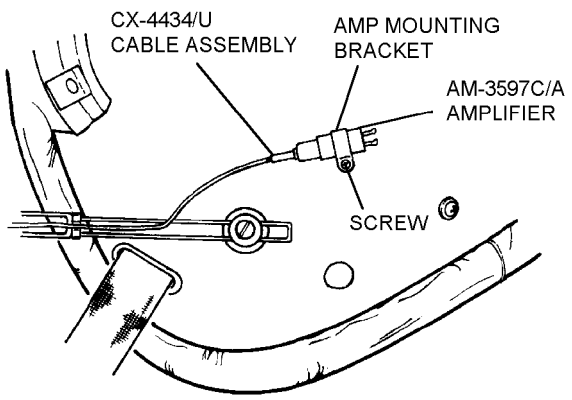
**NOTE**

A small amount of RTV may be applied to the first few threads of screws prior to installation.

c. Attach amplifier mounting bracket to helmet shell exterior with the 8-32 x 1/4-inch screw, flat washer and post. Do not tighten screw.

d. Connect amplifier to boom microphone CX-4434/U cable assembly U-173/U connector pins.

e. Insert MIL-A-23595/1 (AM-3597C/A) amplifier in mounting bracket, insert amplifier connector pins into junction block of M22442/15-1 or M22442/19-1 communication cable assembly and tighten mounting bracket screw.




**Step 2e - Para 4-45**

3. Re-cement pile fastener material to inner surface of helmet shell earcup cavity using adhesive and reattach left hand earcup assembly to pile fastener material.

**4-46. DELETED.**

**4-47. INSTALLATION OF M22442/15-1 (CX-4832A/AR) CABLE ASSEMBLY OR M22442/19-1 (CX-12972/AR) CABLE ASSEMBLY.** To install the M22442/15-1 (CX-4832A/AR) cable assembly or the M22442/19-1 (CX-12972/AR) cable assembly, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Cable Assembly, CX-4832A/AR | M22442/15-1 NIIN 00-961-8516 |
| | -or- | |
| 1 | Cable Assembly, CX-12972/AR | M22442/19-1 NIIN 01-016-4130 |
| 1 | Cable Assembly, CX-4831/AR (Note 1) | M22442/14-1 NIIN 00-631-8566 |
| 2 | Screw, 6-32 x 1/4 Inch | MS51957-25 NIIN 00-054-6649 |
| 2 | Washer | MS35338-138 NIIN 00-933-8120 |
| 1 | Earphones | H-87B/U NIIN 01-056-7225 |
| As Required | Adhesive, Polychloroprene, Class 3 | MIL-A-5540 NIIN 00-515-2246 |
| As Required | Adhesive, RTV 102/732 | MIL-A-46106 NIIN 00-877-9872 |

Notes: 1. Use Cable Assembly M22442/14-1 attached to the teardrop fitting of Cable Assembly M22442/15-1 to connect to aircraft audio system.

1. Remove factory installed communications cable as follows:

a. Disconnect cable from earphones in accordance with paragraph 4-81, steps 2.a. thru 2.g.

b. Remove MK-634/AIC cable clip from outside of helmet, if installed.

c. Pressing inward on rubber grommet encircling installed M22442/37-4708 cable to dislodge grommet from factory drilled hole and remove cable assembly.

**NOTE**

If the installing technician does not consider the factory drilled cable exit hole to be the best location for new cable installation, repair existing hole in accordance with paragraph 4-101 and redrill cable exit hole as indicated in the following instructions.

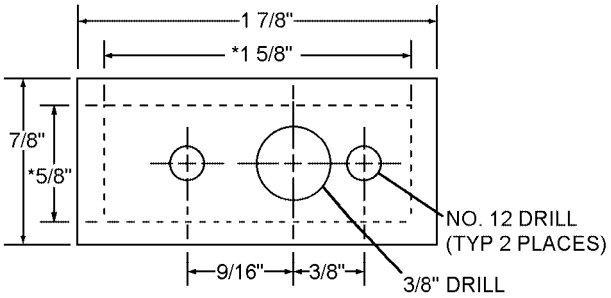
Dimensions are not critical. Adjust position to obtain optimum fit.

2. Drill mounting holes for cable assembly as follows:

a. Fabricate a template from the illustration below.

**NOTE**

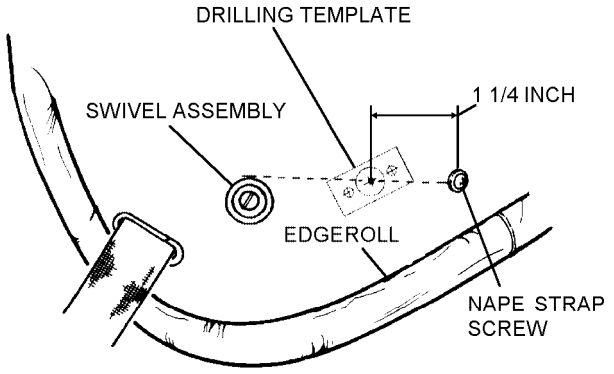
Illustration below is to scale. A copy may be used as the template.




4p47s2a

**Step 2a - Para 4-47**

b. Select a drilling location on the left side of the helmet. Selected location should not interfere with boom microphone installation or operation and should permit the junction block of the cable assembly to lie flush on helmet shell exterior. Orientation (horizontal, vertical, or angled) is at the discretion of the installing technician, based on above listed criteria. Using template, mark location of all holes to be drilled.




4p47s2b

**Step 2b - Para 4-47**

c. Pull pile fastener fabric from the inside of the helmet, away from the drilling position.

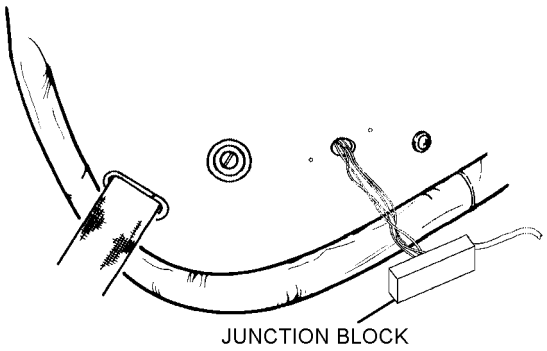
d. If not using the factory drilled hole, at marked location on helmet shell exterior, using a 3/8-inch bit, with drill bit perpendicular to helmet surface, drill center cable pass through hole.

e. At marked location on helmet shell exterior, using a No. 12 (0.189 inch) bit, with drill bit perpendicular to helmet surface, drill the two mounting screw holes.

f. After making an access slit for earphone leads and junction block mounting screw pass through, re-cement pile fastener material to the interior surface of the helmet shell earcup cavities.

3. Install cable assembly as follows:

a. Pass the four cable assembly earphone leads, with electrical contacts, through the 3/8-inch center hole drilled on the left side of the helmet shell assembly, to helmet shell interior.




4p47s3a

**Step 3a - Para 4-47**

**CAUTION**

Do not over torque 6-32 x 1/4-inch screws. Over torquing will cause damage to the cable assembly junction block.

**NOTE**

A small amount of RTV may be applied to the first few threads of screws prior to installation.

b. Secure cable assembly junction block to outside of helmet, using two 6-32 x 1/4-inch screws and two 0.032-inch thick flat washers. Apply no more than 4 in-lbs. of torque to 6-32 x 1/4-inch screws.

4. Install earphones and earcup assemblies in accordance with paragraph 4-81, steps 3.a thru 3.g.

**4-48. HELMET FITTING PROCEDURES.** The following text contains instructions for fitting the helmet to the aircrewmember. These procedures include earcup positioning, chin/nape strap adjustment and tensioning, visor assembly tension adjustment and tacking, TPL layer removal, and TPL custom-fitting (heat forming, if necessary). Proper fitting is essential for helmet stability and aircrew comfort, as well as ensuring that the NVIIS accessories can be properly positioned.

**NOTE**

As an additional aid in achieving safe, comfortable fit the use of the skull cap is authorized. The skull caps also absorb perspiration and when worn, assist in proper positioning of the helmet during donning by protecting the aircrewmember's ears. They are available through normal supply channels under P/N 765AS270-101 (size medium), NIIN 01-077-8909 or P/N 765AS271-101 (size large), NIIN 01-077-8910.

**4-49. Installation of TPL Assembly.** To install the TPL assembly to the helmet assembly, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| As Required | Tape, Pressure Sensitive Adhesive | A-A-1243 NIIN 00-782-6220 |

1. If four 1-inch x 2-inch pressure-sensitive hook fastener tabs are not present on the inside surface of the energy absorbing liner, installation is required.

a. Install two tabs on the inside front of the energy absorbing liner left and right of center over the eyes, 1/8 inch from front edge of the liner.

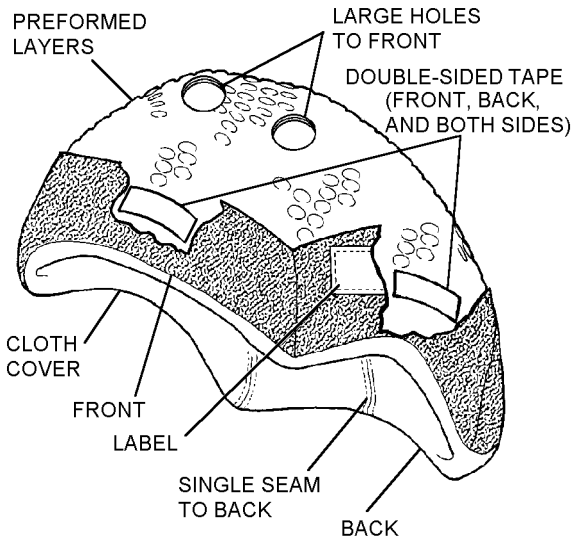
b. Install two tabs in the rear approximately 1 1/2 inch left and right of center and 1/2 inch from the bottom edge of the liner.

2. To prevent bunching of TPL cover fabric, secure the TPL cover to the preformed layer assembly using four 1-inch x 2-inch pieces of double-sided tape.

a. Position the cloth cover over the preformed layer assembly. The single seam is positioned to the rear.

b. Position tape strips with the 2-inch length horizontal at the front, rear, and both sides of the preformed layer assembly under the cover fabric overlap.

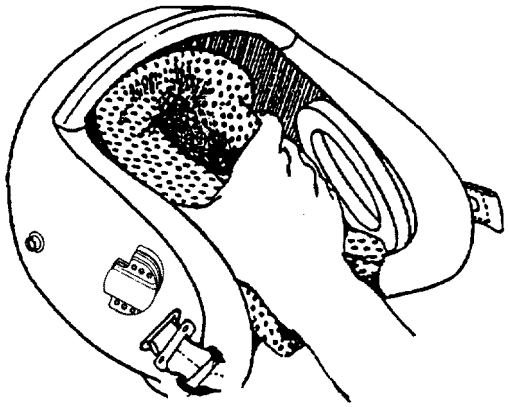
c. Press cover into place over the tape strips.




4p49s2a

**Step 2a thru 2c - Para 4-49**

3. Place the TPL inside the helmet shell by squeezing the TPL sides together to clear the earcups. Ensure that large holes on top of the TPL are facing forward. Release TPL and attach liner cover to hook fastener tabs.



4p49s3

**Step 3 - Para 4-49**

4. Ensure that the front edge of the TPL is aligned with the front edge of the energy-absorbing liner inside the helmet and that the TPL is centered in the helmet.

**4-50. Helmet Component Adjustments.**

1. Have the aircrewmember don the helmet as follows:

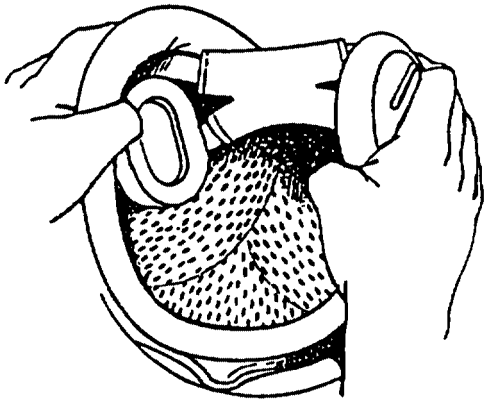
**CAUTION**

Spread helmet only enough to allow ease of donning and doffing. Excessive spreading may damage helmet.

a. Hook thumbs in earcups and spread helmet slightly.

b. Place edgeroll on helmet brow against forehead.

c. Rotate helmet toward the rear and down onto head.



4p50s1a

**Steps 1a thru 1c - Para 4-50**

**NOTE**

The edgeroll on the helmet brow should be positioned just out of the aircrewmember's line of sight as the aircrewmember looks upward.

2. Rotate the helmet toward the rear until the edge-roll on the brow is out of the field-of-view.

3. Check earcup assembly position, ensuring that the earpads completely cover the ears.

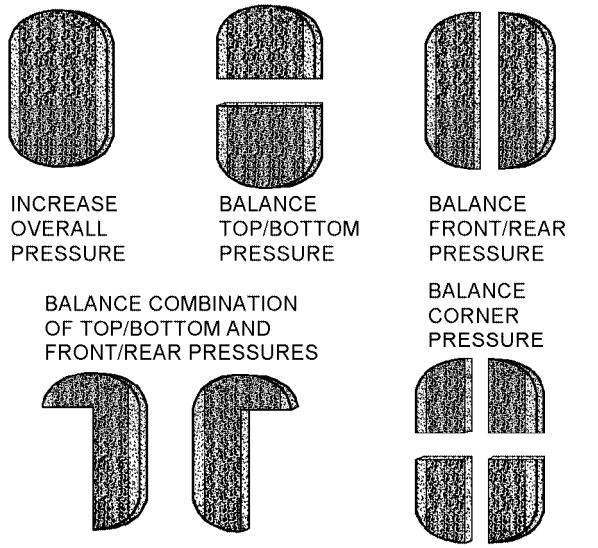
**NOTE**

For optimum sound attenuation and comfort, the earseals should be compressed to about half of their original thickness.

Earcup spacer pads can be used whole, cut into quarters, or cut in half lengthwise or crosswise.

If unable to achieve a proper fit after installation of spacer pads, the tapered crushable earcups may be inverted within the earpads and the earpad assemblies may be switched from right to left/left to right as additional aids in achieving a safe, comfortable fit. Other fitting options include: removal of the earpads and installation of the Oregon Aero Softseal earseals onto the tapered earcups, use of P/N 765AS230-102 earcup set, or installation of the Oregon Aero Hush Kit in place of the earcup assembly.

4. Check earpad compression. If necessary, adjust compression by adding spacer pads.




4p50s4

**Step 4 - Para 4-50**

**NOTE**

Use of clamps is optional.

Due to anatomical variations (e.g. unusual head breadth, thick/muscular neck) some aircrewmembers will be unable to don the helmet with the barrel clamps installed. In these instances removal of the clamps from the integrated chin/nape strap is authorized.

5. Loosen clamp screws, and slide clamps down as far as possible on the nape strap. Adjust the nape straps for a snug fit. Slide the clamps upward until they contact the shell, and tighten the screws. Clamps will now hold adjusted nape straps in place.

6. Tighten the chin strap to the desired tension. Once the desired tension is attained, the chin strap can be fastened and unfastened via the snap fastener and stud on opposite end of the chin strap.

7. After a trial wearing period of approximately 30 minutes, have the aircrewmember evaluate the helmet fit. If the aircrewmember is satisfied with the fit, proceed with helmet build-up. If the helmet does not fit properly, (i.e. pressure points exist, the helmet is too tight or sits high on aircrewmembers head, or aircrewmember complains of hot spots) have aircrewmember describe and point out areas where the problem is located. Take note of the location, size and shape of any exposed skin areas that appear irritated (red coloration or grooves in soft tissue of the scalp). To correct these fit problems, follow paragraph 4-51 procedures for fitting the TPL assembly.

**4-51. Fitting the TPL Assembly.** To fit the TPL assembly to the aircrewmembers, proceed as follows:

**NOTE**

Remove layers from the outside of the TPL assembly to lower the helmet onto the aircrewmember's head without changing the fit. Remove layers from the inside of the TPL assembly to relieve pressure and to optimize fit.

TPL layers can be modified, by cutting out areas in the layer/layers over the hot spots or pressure points. No cutting should be done on the layer that comes in contact with the aircrewmember's head (the inside layer). The size and shape of the removed area of TPL should match the shape and size of the irritated area on the aircrewmember's head. Circular shapes, (i.e. penny, nickel, quarter, etc.) work best for correction of hot spots, while half round shapes (i.e. half-moon, quarter-moon and crescent-moon) usually alleviate areas of pressure.

1. After preliminary adjustments to the TPL have been accomplished, have the aircrewmember don the helmet to check fit and comfort. If further adjustment/modification is required follow procedures below.

**WARNING**

The TPL assembly requires a maximum of five layers and a minimum of two layers to provide proper fit and impact attenuation protection.

2. Remove TPL layers one at a time from the liner. Pressure relief around the ears can be achieved by removing layers from the outside of the liner. Number each layer as it is removed (first layer No. 1, second layer No. 2, etc.) to aid in reassembly, if required. Remove up to, but no more than, three layers from the assembly. Check for proper fit after each layer is removed.

3. If a satisfactory fit has been achieved, have the aircrewmember doff the helmet.

4. If after the above steps have been performed, and a safe, stable fit cannot be obtained, then the TPL may be heated so that it conforms to the aircrewmember's head shape. Perform custom fitting in accordance with paragraph 4-52.

**CAUTION**

To prevent heat damage to the TPL plastic layers, do not store the helmet in a closed cockpit or automobile. Temperatures in these closed areas can exceed 200°F (93.3°C) on an 85°F (30°C) day.

**4-52. Custom Fitting of TPL Assembly and Installation Instructions for the Oregon Aero Zetaliner.** To custom fit the TPL assembly or to install the optional Oregon Aero Zetaliner, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Oregon Aero Zetaliner (Note 1) | 95132, 3, 4, 5 (medium); 95142, 3, 4, 5 (large); 95152, 3, 4, 5 (extra large); 95162, 3, 4, 5 (extra large wide) NIINs TBD |

Notes: 1. Oregon Aero Zetaliners are commercially available from Oregon Aero Corporation, Scappoose, OR 97056. Telephone (503) 543-7399.

**NOTE**

Refer to local Aeromedical Safety Officer (AMSO) for location of nearest suitable oven to conduct the heating and forming of the TPL assembly. If unable to achieve a satisfactory fit after heat forming the TPL or using the optional Oregon Aero Zetaliner, contact area FAILSAFE Tiger Team for helmet fitting assistance.

Oregon Aero Zetaliners are optional (commercially available) comfort liners that are approved for use in place of the supplied thermoplastic liner. The liners are provided in 4 sizes, with 4 different foam thicknesses available in each size. The last three digits of the part number indicate the liner size and thickness, for example in P/N 95162, the digits "16" denote the size extra large wide, the last digit "2" represents a 1/4-inch thick foam layer, the thinnest foam layer provided. Other layers available are "3" (3/8-inch), "4" (1/2-inch),

"5" (5/8-inch). When replacing the TPL with the Zetaliner, remove the TPL cover and count the number of plastic layers. Order the Zetaliner corresponding to the correct size for the helmet with the last digit of the part number matching the number of thermoplastic layers being replaced. To replace a 4 layer TPL in a size extra large helmet, order P/N 95154.

1. Reassemble the TPL by replacing the removed layers in the order in which they were removed. After the TPL is assembled, secure the layers by passing a heated soldering pencil through all five layers at the original attachment point.

2. Reinstall the TPL cover on the layers prior to heating.

3. Set the oven rack to the lowest position, and heat the oven to 200° ±5°F. Place a thermometer on the rack in a position where it may be observed throughout the entire heating process.

4. Thoroughly brief the aircrewmember on the fitting procedures, emphasizing those to be performed by the aircrewmember.

**CAUTION**

Do not attempt to heat the TPL in a microwave oven (which will not heat the layers) or a toaster oven (which will damage the liner).

Do not remove the cloth cover; the TPL is heated as a unit.

Monitor the oven temperature constantly to avoid overheating. Do not leave the TPL unattended while heating.

5. After 15 minutes, ensure the oven is stabilized at the pre-set temperature, and place the TPL with the fabric side down in the center of the oven rack. Set timer. See table 4-8.

**Table 4-8. Maximum Heating Time per Number of Layers**

| Number of Layers | Time (Minutes) |
|---|---|
| 5 | 8 |
| 4 | 7 |
| 3 | 6 |
| 2 | 5 |

**NOTE**

Heating characteristics of ovens vary. The time stated above is a guideline and may have to be adjusted to suit your oven.

6. To allow easy positioning of the heated liner into the helmet, place masking tape over the rear hook fastener tapes on the energy absorbing liner.

**CAUTION**

The TPL plastic layers will be hot. When removing the TPL from the oven, touch the fabric cover only.

**NOTE**

The following steps are to be performed by the aircrewmember assisted by the Aircrew Survival Equipmentman (PR), and should be accomplished within 30 seconds of removal of the heated liner from the oven.

7. Remove the TPL from the oven, touching only the fabric-covered portion. Squeeze the sides of the TPL to clear the earcups, and insert the heated TPL into the helmet with the wide end toward the front. The Aircrew Survival Equipmentman should hold the rear portion of the TPL tightly against the energy-absorbing liner during donning to ensure the TPL does not bunch up in the rear.

8. With the TPL symmetrically aligned in the helmet, have the aircrewmember hook thumbs over the edgeroll, spread the helmet slightly, place the brow of the helmet against the forehead, and rotate the helmet rearward and downward to don. Ensure that the edgeroll on the helmet brow is positioned just out of the line of sight as the aircrewmember looks upward.

9. Have the aircrewmember apply downward pressure on helmet with palms of hands until the ears are centered in the earcups. Maintain this pressure for five minutes.

10. Have the aircrewmember release downward pressure at the end of five minutes. Check helmet fit. If necessary, remove one layer from the inside of the TPL and repeat steps 2 through 8 until the fit is satisfactory.

11. Once a satisfactory fit is achieved, have the aircrewmember doff the helmet. Lift the rear portion of the TPL away from the energy-absorbing liner and remove masking tape from the hook fastener tapes. Secure TPL to the hook fastener tapes.

12. If unable to achieve a satisfactory fit with the TPL following procedures outlined in steps 4 through 10

above, order the appropriate size and thickness Oregon Aero Zetaliner.

13. Place the Zetaliner inside the helmet by centering the folded liner onto the energy absorbing liner, spread sides outward to mate with the installed hook fastener tabs. Ensure the widest end (with three sewn segments) is facing the front of the helmet.

**4-53. INSTALLATION OF BAYONET RECEIVER ASSEMBLY.** To install the bayonet receiver assembly to obtain correct visor mask interface, refer to the procedures outlined in Chapter 5 (for the MBU-12/P series oxygen masks) or Chapter 6 (for the MBU-23/P or MBU-24/P22P-16 oxygen masks).

**4-54. INSTALLATION OF CBR RECEIVERS.** CBR receivers are installed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| As Required | Adhesive, RTV 102/732 | MIL-A-46106 NIIN 00-877-9872 |
| 2 | Snap Stud | MS27983-2 |
| 2 | Washer | MS35335-58 |
| 2 | Nut | MS35649-264B |
| 2 | Screw | MS51959-33 |

**NOTE**

The latest TACAIR helmets for fixed wing aircraft must be builtup prior to installation of CBR receivers. Ensure that all helmets have had bayonet receivers installed prior to performing this installation.

1. Remove the earcups from the helmet. There is no need to disconnect the earphones or communications cables.

2. Carefully peal back the pile lining in the earcup region to expose the backplate of the oxygen mask receivers.

**NOTE**

If necessary to ensure a proper fit on the aircrewmember, the bottom screw hole on the bayonet receiver may be used instead of the top screw hole.

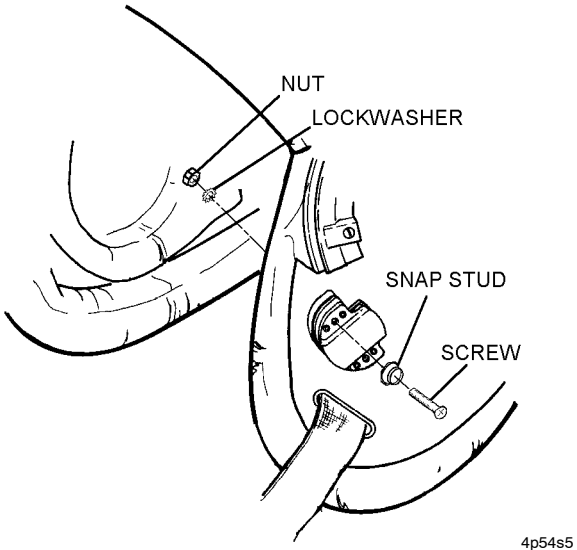
3. Remove the top screw from the bayonet receiver and discard; it will no longer be required.

4. Deleted.

**NOTE**

Do not over-tighten new upper screw attaching the snap stud to the jaw receiver as the brass snap stud can be easily deformed by application of excessive force.

5. Insert the screw through the snap fastener stud and install the screw into the top hole in the bayonet receiver. The screw will be threaded through the bayonet receiver and helmet shell and will exit through the backplate on the inside of the shell. If there is not enough screw length, use a razor knife to cut out and remove a portion of the leather visor retention buffer pad to ensure proper installation. Install a lock washer and nut on the screw inside the helmet shell and tighten.




**Step 5 - Para 4-54**

6. Cement pile fastener back onto the inside of the helmet shell and reinstall the earcups.

7. Install socket portion of the snap fastener as follows:

a. Have aircrewmember don the CBR respirator assembly and helmet.

b. Adjust toggle harness terminal to the midpoint range (to allow for further adjustment later).

c. Hold mask in proper position on aircrewmember's face.

d. Adjust straps and cables to proper position and tension for the aircrewmember.

**NOTE**

The toggle harness cables should lie over the hooks on the facepiece front, when the V-bow is down.

e. Flip the V-bow down into flight position. Mark the location on the adapter strap where the adapter strap is over the center of the stud portion of the snap fastener installed on the helmet.

**NOTE**

During installation of socket, orient the pull-the-dot socket so the adapter strap can be pulled directly forward to release the adapter strap socket from the snap that is mounted on the helmet.

f. Install the socket portion of the snap fastener at the position marked on the adapter strap.

g. Have aircrewmember snap the fasteners together. Ensure mask position and tension are acceptable.

**4-55. INSTALLATION OF LIGHTWEIGHT (BUNGY) VISOR.** Select visor from table 4-2B or 4-2D which meets helmet size and mission requirements and proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Lightweight Visor | See table 4-2B or 4-2D |
| As Required | Thread, Nylon, Size E | V-T-295 NIIN 00-244-0609 |

1. Install visor by positioning visor on front of helmet and securing it in place using snap fasteners.

2. Adjust strap tension.

3. If desired by the aircrewmember, tack the visor retention strap friction adapter in place with one turn of double E thread, once required tension is achieved.

**4-56. INSTALLATION OF SINGLE VISOR ASSEMBLY.** Install Single Visor Assembly as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Visor Assembly | 88B7586-2 NIIN 01-360-7285 |
| As Required | RTV 102/732 Adhesive | MIL-A-46106 NIIN 00-877-9872 |
| As Required | Tape, Pressure Sensitive Adhesive | A-A-1243 NIIN 00-782-6220 |

1. Remove helmet plate and cover assembly and place in VIDS/MAF bag, along with attaching screws and flat washers. The bag shall be clearly identified, using aircrewmember's identification number, and stowed for future reconfiguration, if necessary.

2. Remove internal components in accordance with paragraph 4-86 step 1.

3. Locate tooling dimples on exterior surface of helmet shell earcup cavities on right and left sides of helmet. Dimples are positioned 1 1/4 inch forward of visor snap fasteners and are 1 1/2 inches apart, aligned vertically.

4. Using draftman's compass, determine position for upper and lower visor track holes as follows:

**NOTE**

Compass settings are 3 5/8 inches for size medium helmet, 3 3/4 inches for size large, and 4 1/2 inches for size extra large.

a. For right side upper track hole, adjust compass setting, set compass point in center of lower dimple, and inscribe an arc on the helmet surface upward toward crown of helmet.

**NOTE**

Compass settings are 2 1/8 inches for size medium helmet, 2 3/8 inches for size large, and 2 3/4 inches for extra large.

b. Adjust compass setting, set compass point in center of upper dimple, and inscribe a second arc on helmet surface upward toward crown of helmet. Mark the place on the helmet where the inscribed arcs intersect. Repeat process to determine position of upper track hole for left side of helmet.

**NOTE**

Compass settings are 2 3/4 inches for size medium helmets, 2 7/8 inches for size large, and 3 1/2 inches for size extra large.

c. For right side lower track hole, adjust compass setting, set point of compass in center of lower dimple and inscribe an arc on helmet surface upward toward helmet brow.

**NOTE**

Compass settings are 2 3/8 inches for size medium helmets, 2 1/2 inches for size large, and 2 5/8 inches for extra large.

d. Adjust compass setting, set compass point in center of upper dimple and inscribe a second arc on helmet surface forward toward edgeroll. Mark the place on helmet where inscribed arcs intersect. Repeat procedure for left side of helmet.

5. With rounded end oriented toward top of helmet, position right side visor track with upper and lower track holes centered over marks made on helmet surface in step 4 above. Using pencil, mark position of center visor track hole on helmet surface through center track hole. Repeat procedure for installation of left side of helmet.

6. At each of the three marked locations on each side of the helmet, drill a small pilot hole. Using a 0.250 drill bit, enlarge each pilot hole to finished 1/4-inch dimension.

7. Position right side post retainer assembly on inside of helmet with posts aligned with and inserted in three right side visor track holes. On right side exterior, position spacer (size extra large helmets only), visor track, and visor retainer over track holes. Secure in place using three screws. Repeat procedure for installation of left side visor track.

8. Apply pressure sensitive tape to underside of visor track locking guide.

9. Install clear visor assembly in visor tracks with round visor cutout positioned left and aft. Raise and lower visor to check freedom of movement.

10. Unlock visor locking guide lock plate and move it to open position.

11. Slip visor locking guide aligning round visor cutout over round hole at top of visor locking guide. Ensure bottom edge of locking guide remains at top of locking guide. Ensure bottom edge of locking guide remains aligned with helmet brow edge-roll. With visor lock key aligned fore and aft, insert visor lock knob through visor cutout into slot of visor lock key in visor locking guide slot.

12. Lower visor and slide locking plate to closed and locked position.

13. Reposition visor locking guide as necessary to find optimum visor operating position. When optimum position is selected, press locking guide firmly into place on exterior helmet shell.

14. Lower visor to full down position. Using a pencil, through visor locking guide mark location of four upper mounting screws on helmet surface. Unlock visor locking guide lock plate and slide open to expose rounded hole in locking guide slot.

15. Raise visor to full up position. Rotate visor locking knob 1/4 turn clockwise to disengage locking key from visor locking guide slot and remove knob. Move visor aft until free of tracks and remove.

16. Using a pencil, through visor locking guide, mark location of remaining two mounting screw holes on helmet surface. Remove visor locking guide.

17. At each of the six marked locations (see steps 15 through 17), drill a small pilot hole. Using a 0.250 drill bit, enlarge each pilot hole to 1/4 inch finished dimension.

18. On inside of helmet, align post retainer with six visor locking guide holes. On helmet exterior, align visor locking guide, with locking plate closed, with six drilled holes and secure in place with six screws.

19. Open visor locking guide locking plate and insert selected visor in tracks. Position visor cutout over locking guide rounded out slot. With key positioned fore and aft, insert visor lock knob through cutout into slot. Rotate visor lock knob 1/4 turn counterclockwise to engage key in slot and lower visor. Slide visor locking guide plate closed.

20. Reinstall internal components in accordance with paragraph 4-86 step 2.

**4-57. INSTALLATION OF PILE FASTENER TAPE.** To install pile fastener tape to the helmet assembly for attachment of the SDU-5/E or the SDU-39/N distress signal light, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 2 Inches | Fastener Tape, Pile, Type I, 2-Inch Width | MIL-F-21840 NIIN 00-926-4930 |
| As Required | Adhesive, Polychloroprene, Class 3 | MIL-A-5540 NIIN 00-515-2246 |

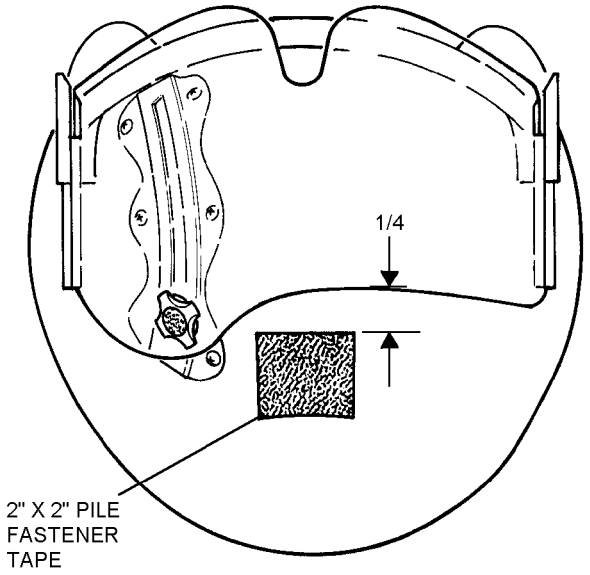
**NOTE**

Use of any size of type pile fastener tape available through local supply is authorized. Black or olive green are preferred colors.

Refer to Rescue and Survival Equipment, NAVAIR 13-1-6.5 for addition of hook tape to distress signal light.

1. Raise visor to full up position and lock in place with visor lock knob.

2. At a point 1/4 inch aft of raised visor, center a 2 x 2 piece of pile fastener tape on crown of helmet shell assembly. Hold in place and trace lightly around pile fastener tape with a lead pencil to make an outline on the surface of the reflective tape installed on the helmet shell assembly.




4p57s2

**Step 2 - Para 4-57**

3. Apply adhesive to outlined area and allow adhesive to become dry (approximately 30 minutes).

4. Apply adhesive to underside of pile fastener tape and a second coat of adhesive to helmet area. Allow adhesive to become tacky (approximately 15 minutes).

5. Press pile fastener tape firmly onto prepared area on helmet shell assembly.

# Section 4-4. Modifications

## 4-58. GENERAL.

4-59. There are no modifications for TACAIR Fixed Wing Helmet Assemblies.

# Section 4-5. Maintenance

## 4-60. GENERAL.

4-61. Proper care and use of the TACAIR fixed wing series helmet assemblies are essential to ensure optimum performance during emergencies and routine operations. The aircrewmember's responsibility for maintenance of the helmet assembly is limited to cleaning (see paragraph 4-75). Repairs or other maintenance action required shall be performed by organizational level or above upon issue and at least every 90 days thereafter. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

**NOTE**

The inspection interval for fixed wing helmet assemblies assigned selected air reserve aircrewmembers has been extended to 180 days vice 90 days, providing the helmets are stowed under controlled conditions.

## 4-62. INSPECTION.

**4-63. PREFLIGHT/POSTFLIGHT INSPECTIONS.** The Preflight and Postflight Inspection is a visual inspection performed by the aircrewmember to whom the helmet assembly is issued before/after each flight. To perform the inspection, visually inspect for the general overall condition of the helmet assembly. Refer to paragraph 4-65.

**NOTE**

Defects or questionable areas noted during this inspection shall be referred to the proper maintenance activity for required corrective action.

**4-64. SPECIAL INSPECTION.** The special inspection of the helmet shall be conducted upon issue and every 90 days thereafter at the organizational level. It shall consist of a visual inspection, a functional check of the helmet communication components and a thorough cleaning of the helmet assembly. The HGU-87/P22P-16 and HGU-89/P22P-16 helmets, in addition to the 90-day special inspection of the helmet, require a helmet bladder leakage test. This test is to be performed upon installation of the bladder and every 360 days thereafter by the organizational maintenance level.

**4-65. Visual Inspection.** Visually inspect the helmet assembly as follows:

1. Inspect chin/nape strap assembly for loose or broken stitching, snap fastener retention, and fraying. Repair broken stitching, reset loose snap fasteners, or replace chin/nape assembly.

2. Inspect helmet shell assembly for splits, cracks, chips, and delamination. Replace helmet shell assembly if damage is deemed extensive.

3. Inspect MK-634/AIC cable clip (if installed) for security of attachment to communications cable grommet.

**CAUTION**

A laser visor is considered damaged and shall not be used if a scratch is detected that exceeds one third of the thickness of the lens. A lens can continue to be used if a scratch of lesser depth is detected and is not in the critical visor areas or reported as bothersome by the aircrewmember.

**NOTE**

Refer to paragraph 4-67 for instructions for disposal of laser visor.

4. Inspect visor assembly for cracks, splits, chips, and delaminations and lenses for scratches and cracks. Replace visors deemed to have extensive damage.

5. Inspect edgeroll for rips, tears, splits, or loosening from helmet shell. Small (under 2-inch total length) tears, rips, or splits may be repaired in accordance with paragraph 4-102.

6. Inspect communication cables and cordsets for cut, split, or abraded insulation.

7. Inspect earcup assembly for proper retention to helmet shell assembly.

8. Inspect earpads for sound attenuation and pliability.

9. Inspect all hardware for damage and security of attachment. Tighten or replace as necessary.

10. Inspect oxygen mask receivers for proper function and retention to helmet shell assembly.

**4-66. Functional Check.** Functionally check the helmet assembly in accordance with the procedures in NAVAIR 17-15BC-22.

**NOTE**

Defects determined from these inspections shall be referred to the proper maintenance activity for required corrective action.

**4-67. DISPOSAL OF LASER VISOR.** The Laser Eye Protective Visor is a controlled item. The visor must be destroyed by the organizational level activity having custody using any of the following methods: incineration, crushing, or shattering.

## 4-68. HELMET BLADDER LEAKAGE TEST.

4-69. The helmet bladder assembly shall be leak tested as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| As Required | Oxygen, Aviator's Breathing Type I | MIL-O-27210 |

Support Equipment Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | NCE Leakage Tester, TTU-551/E | 3549AS100 |
| 1 | Stop Watch or Timing Device | — |
| 1 | Tensioning Tool | MS90387-1 |

**WARNING**

When working with oxygen, make certain that clothing, tubing, fittings, and equipment are free of oil, fuel, hydraulic fluid, and/or combustible material. Fire or explosion can result when even slight traces of combustible materials come in contact with oxygen under pressure.

**CAUTION**

Ensure hoses are not kinked when performing Leakage Test.

**NOTE**

Do not attempt to perform any maintenance without becoming thoroughly familiarized with Navy Combat Edge TTU- 551/E Leakage Tester.

Prior to performing leakage test, ensure that a pretest check has been performed on Test Set TTU-551/E in accordance with NAVAIR 17-15GB-505.

**NOTE**

For index letters referred to in this paragraph, refer to figure 4-1 unless otherwise noted.

**4-70. TEST SETUP.**

1. Ensure test set inlet pressure valve (F) is OFF and oxygen supply cylinder valve is fully closed.

2. Connect regulator (A) to oxygen supply cylinder. Ensure regulator (A) is not loaded by turning pressure adjustment handle counterclockwise until spring tension is released.

3. Ensure oxygen flow control valve (B) attached to regulator (A) is closed.

4. Slowly, fully open the oxygen supply cylinder. Relieve any excess pressure indicated on regulator gage (I) by opening and closing the oxygen flow control valve (B).

5. Connect oxygen hose (C) to fitting (B1) of regulator and connect the other end of oxygen hose (C) to the test set oxygen INLET (D).

6. Open oxygen flow control valve (B).

7. Adjust regulator (A) until 1.0 psig is indicated on regulator (A) outlet pressure gage (I).

8. Attach hose (O) to oxygen outlet port (H). Attach intermediate hose (S) to vest/helmet adapter (L) of hose (O). Connect helmet bladder hose (N) to intermediate hose (S) using quick disconnects.

## 4-71. SYSTEM TEST.

**CAUTION**

Inflating the bladder to pressures that exceed 2.5 psig will damage the bladder. Any helmet bladder subjected to pressure in excess of 2.5 psig must be removed from service.

**NOTE**

No adjustment to regulator (A) should be necessary during the filling process.

1. Prepare the helmet bladder by removing the thermoplastic liner (TPL) and loosen the helmet bladder from the polystyrene inner shell.

2. Turn test set inlet pressure valve (F) to the ON position.

3. Allow the pressure reading on pressure gage (G) to stabilize. Pressure in the bladder should indicate 1.0 ±0.1 psig. Adjust pressure reading on pressure gage (G) by turning pressure adjusting handle on regulator (A) as necessary to achieve 1.0 ±0.1 psig.

4. Turn test set inlet pressure valve (F) to the OFF position.

5. Time low pressure gage (G) reading. Leakage shall not exceed 0.1 psig in 30 seconds. If leakage exceeds allowable limit, proceed to paragraph 4-72.

6. Disconnect intermediate hose (S) from the helmet bladder hose (N).

7. Secure the helmet bladder to the polystyrene inner shell and reinstall TPL.

8. Provided there are no more tests to be conducted on equipment requiring the TTU-551/E, the test stand shall be secured in accordance with paragraph 4-74. Otherwise, attach the intermediate hose (S) to the helmet/vest bladder adapter (L) and return to step 1 to test additional helmet bladders.

## 4-72. LEAK ISOLATION.

1. Turn test set inlet pressure valve (F) to the ON position.

2. Using leak detection compound, check for leakage of helmet bladder quick disconnects and hose. If leakage is detected, proceed as follows:

a. Turn inlet pressure valve (F) to OFF.

b. Replace helmet bladder quick disconnects and/or hose as necessary. Attach replacement connector and/or hose using a cable tie with tension set to 3.

c. Retest helmet bladder assembly in accordance with paragraph 4-71.

3. If no leakage is indicated while using leak detection compound, perform a bladder decay test in accordance with paragraph 4-73.

## 4-73. BLADDER DECAY TEST.

1. Turn test set inlet pressure valve (F) to the OFF position.

2. Disconnect helmet bladder hose (N) from intermediate hose (S).

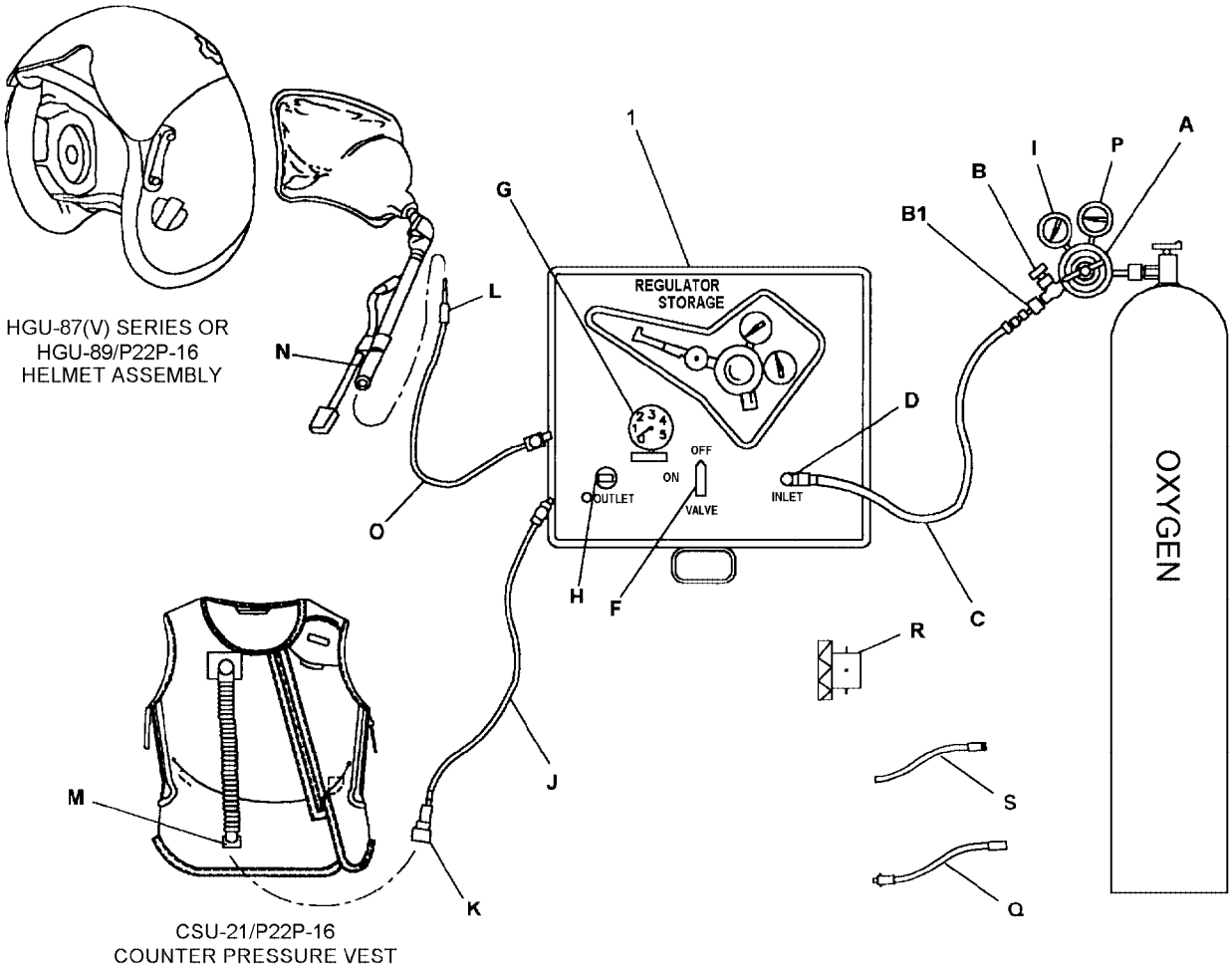
3. Remove intermediate hose (S) from helmet/vest adapter fitting (L).

**CAUTION**

Cut through head of cable tie using diagonal cut pliers. Do not attempt to cut strap underneath head.

4. Carefully cut the cable tie securing the male connector to the helmet bladder hose (N) and remove the connector.

5. Connect helmet/vest bladder adapter fitting (L) of hose assembly (O) to the helmet bladder hose (N).




1 LEAKAGE TESTER TEST SET
A REGULATOR
B VALVE (OXYGEN FLOW CONTROL)
B1 QUICK DISCONNECT (FITTING)
C HOSE, OXYGEN
D OXYGEN INLET (QUICK DISCONNECT)
E RELIEF VALVE (NOT SHOWN)
F INLET PRESSURE VALVE
G LOWER PRESSURE (0 - 5 PSIG)
H OXYGEN OUTLET (QUICK CONNECT)
I REGULATOR OUTLET GAGE
J HOSE ASSEMBLY (VEST)
K VEST ADAPTER (FITTING)
L HELMET/VEST BLADDER ADAPTER (FITTING)
M VEST ASSEMBLY FILL/DUMP VALVE
N HELMET BLADDER HOSE
O HOSE ASSEMBLY (HELMET BLADDER/VEST)
P REGULATOR INLET GAGE
Q ADAPTER CAP ASSEMBLY
R VEST ADAPTER CAP
S HOSE ASSEMBLY (HELMET BLADDER, INTERMEDIATE)

4-1

**Figure 4-1. Leakage Tester, TTU-551/E**

**CAUTION**

Inflating the bladder to pressures that exceed 2.5 psig will damage the bladder. Any helmet bladder subjected to pressure in excess of 2.5 psig must be removed from service.

**NOTE**

No adjustment to regulator (A) should be necessary during the filling process.

6. Turn test set inlet pressure valve (F) to the ON position. Small areas of abrasion can be covered with suitable electrical tape, cut or split insulation may require cable replacement.

7. Allow the pressure reading on pressure gage (G) to stabilize. Pressure in the bladder should indicate 1.0 ±0.1 psig. Adjust pressure reading on pressure gage (G) by turning pressure adjusting handle on regulator (A) as necessary to achieve 1.0 ±0.1 psig.

8. Turn test set inlet pressure valve (F) to the OFF position.

9. Time low pressure gage (G) reading. Leakage shall not exceed 0.1 psig in 30 seconds. If helmet bladder leakage exceeds allowable leakage limits, disconnect helmet bladder hose (N) from helmet/vest adapter (L), replace helmet bladder in accordance with paragraph 4-99, and retest assembly in accordance with paragraph 4-71.

10. Provided there are no more tests to be conducted on equipment requiring the TTU-551/E, the test stand shall be secured in accordance with paragraph 4-74. Otherwise, attach the intermediate hose (S) to the helmet/vest bladder adapter (L) and return to step 9 to test additional helmet bladders.

### 4-74. SECURING THE TEST SET.

1. Disconnect intermediate hose (S) from hose assembly (O).

2. Disconnect hose assembly (O) from test set oxygen OUTLET (H).

3. Close oxygen supply cylinder.

4. Turn test set inlet pressure valve (F) to the ON position, to bleed pressure from test set.

5. Turn regulator (A) counterclockwise until spring tension is released.

6. Close oxygen flow control valve (B) and turn test set inlet pressure valve (F) to the OFF position.

7. Disconnect all hoses from test set and regulator (A) and stow in lid of test set.

8. Disconnect regulator (A) from oxygen supply cylinder and stow in space provided in test set.

9. Stow all hoses and fittings/caps in space provided in test set.

## 4-75. CLEANING.

4-76. Clean the various parts of this series of helmet assemblies as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| As Required | Detergent, Laundry | Commercial |
| As Required | Cloth, Lint-Free | MIL-C-85043 NIIN 00-165-7195 |
| As Required | Plastic Polish | P-P-560 TY1 NIIN 00-935-3794 |
| As Required | Saddle Soap, or equivalent | — |

1. PRU-55/P and PRU-58/P Helmet Shell Assemblies.

a. Clean helmet shell assembly using a mild detergent and a lint-free cloth dampened with water. Mild abrasive scouring powder may be used to remove stains or scuff marks.

b. Wipe helmet shell assembly clean using a water-dampened cloth to remove detergents.

2. Clean leather edgeroll and chin/nape pad assembly as follows:

a. Apply a small amount of saddle soap or equivalent with a damp sponge to leather surfaces.

b. Rub vigorously to create a thin soap film.

c. Wipe with a damp lint-free cloth and let dry overnight.

3. Chin/Nape Strap Assembly and Fitting Pads.

a. Clean by lightly sponging with a mild solution of detergent and water.

b. Wipe with a damp, lint-free cloth.

4. TPL Assembly.

a. Remove cover assembly from TPL assembly.

b. Clean cover assembly by hand washing with a mild solution of detergent and water.

c. Thoroughly rinse in clear water and air dry.

5. Skull Cap. Laundering of skull cap is responsibility of aircrewmember.

6. Visor Assemblies.

**CAUTION**

Ensure that no abrasive particles are lodged in the polish application cloth or paper or in the cloth or paper used to polish the outside of the visor lenses.

Do not use solvent or abrasive type cleaners. Do not use polish on Laser Visors to remove scratches.

a. Clean each visor lens with mild soap and water using soft paper tissues, soft flannel cloth, soft cotton pads, or a water-dampened chamois and allow to dry.

b. If visor lenses are still soiled or slightly scratched, clean outside of visor only with liquid polish canopy cleaner. Clean the inside of visor lenses with a soft, lint-free cloth.

c. Dry visor lenses with a clean lint-free cloth.

## 4-77. REPLACEMENT/REPAIR OF HELMET COMPONENTS.

4-78. The following procedures list the steps necessary to replace/repair individual components of the helmet assembly. Disassembly shall be only to the extent necessary to perform required replacement/repair. Refer to table 4-9 for listing of repairs, fabrication, and replacement instructions.

**4-79. REPLACEMENT OF REFLECTIVE TAPE.** If reflective tape must be removed from helmet assembly, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| As Required | Denatured Alcohol | TT-I-735 NIIN 00-286-5435 |

1. Remove old tape.

**NOTE**

Removal of reflective tape requires considerable care and effort.

a. To minimize damage to the surface, carefully work a beveled (not sharp) short blade putty knife under the edge of the tape, stripping the sheeting from the adhesive.

b. Remove adhesive with a cloth dampened with denatured alcohol.

2. Refer to paragraph 4-40 for the installing of reflective tape on the helmet shell assembly.

**4-80. REPLACEMENT OF PILE TAPE.** To replace pile tape on the helmet assembly for attachment of the SDU-5/E or SDU-39/N distress signal lights, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 2 Inches | Fastener Tape, Pile, Type I, 2-Inch Width | MIL-F-21840 |
| As Required | Adhesive, Polychloroprene, Class 3 | MIL-A-5540 NIIN 00-515-2246 |

**NOTE**

Use of any size or type pile tape available through local supply is authorized. Black or olive green are preferred colors.

1. Remove damaged pile tape and clean area.

2. Apply adhesive to outer helmet shell or visor housing where damaged pile tape was removed. Allow adhesive to dry (approximately 30 minutes).

3. Apply adhesive to underside of pile fastener tape and a second coat of adhesive to the helmet area. Allow to become tacky (approximately 15 minutes).

4. Press pile fastener tape firmly onto prepared area of helmet or visor housing.

5. Document in accordance with OPNAVINST 4790.2 Series.

**Table 4-9. Repairs/Fabrications/Replacements**

| Description of Repair/Fabrication/ Replacements | Application | Paragraph |
|---|---|---|
| Replacement of Reflective Tape | All helmet assemblies (when applicable) with the exception of those worn in combat areas, which may have the reflective tape removed at the discretion of the local commander. | 4-79 |
| Replacement of Pile Tape | All helmet assemblies (when applicable) | 4-80 |
| Replacement of Earphones, Earcup Assemblies, Installation of the Oregon Aero Hush Kit Combo and Installation of the Oregon Aero Softseal Ear Cushions | All helmet assemblies (when applicable) | 4-81 |
| Replacement of Single Visor Assembly | HGU-68(V)/P and HGU-87(V)/P helmet assemblies | 4-82 |
| Replacement of Single Visor Lens | HGU-68(V)/P and HGU-87(V)/P helmet assemblies | 4-83 |
| Replacement of Thermoplastic Liner (TPL) Assembly, PRU-52/P or Oregon Aero Zetaliner | All helmet assemblies (when applicable) | 4-84 |
| Replacement of Thermoplastic Liner (TPL) Assembly, PRU-52/P Components | All helmet assemblies (when applicable) | 4-85 |
| Replacement of Energy Absorbing Liner | All helmet assemblies (when applicable) | 4-86 |
| Replacement of M22442/37-4708 (CX-4708A/AIC) Cable Assembly and MK-634/AIC Cable Clip | All helmet assemblies (when applicable) | 4-87 |
| Replacement of M22442/15-1 (CX-4832A/AR) Cable Assembly or M22442/19-1 (CX-12972/AR) Cable Assembly | All helmet assemblies (when applicable) | 4-89 |
| Replacement of M26542/2-01 Boom Microphone Assembly | All helmet assemblies (when applicable) | 4-90 |
| Replacement of M23595/1-2 (AM-3597C/A) Amplifier | All helmet assemblies (when applicable) | 4-91 |
| Replacement of Amp Mounting Bracket | All helmet assemblies (when applicable) | 4-92 |
| Replacement of the CX-4434/U Cable Assembly | All helmet assemblies (when applicable) | 4-93 |
| Replacement of the PRU-55/P or PRU-58/P Helmet Shell Assembly | All helmet assemblies (when applicable) | 4-94 |
| Replacement of Chin/Nape Strap Assembly and Nape Strap or Nape Strap Pad | All helmet assemblies (when applicable) | 4-95 |
| Replacement of Chin Strap and Chin Strap Pad | All helmet assemblies (when applicable) | 4-96 |
| Replacement of Bayonet Receiver Assembly | All helmet assemblies (when applicable) | 4-97 |
| Replacement of Helmet Plate Assembly (NVIIS) | HGU-68(V)/P and HGU-85(V)/P helmet assemblies | 4-98 |
| Replacement of KMU-561/P22P-16 Helmet Bladder Assembly | HGU-87(V)/P and HGU-89/P helmet assemblies | 4-99 |
| Fabrication of Camouflage Cover | HGU-68(V)/P and HGU-85(V)/P helmet assemblies | 4-100 |
| Repair of Helmet Shell | All helmet assemblies (when applicable) | 4-101 |
| Repair of Edgeroll | All helmet assemblies (when applicable) | 4-101A |

**4-81. REPLACEMENT OF EARPHONES, EARCUP ASSEMBLIES, INSTALLATION OF THE OREGON AERO HUSH KIT COMBO AND INSTALLATION OF THE OREGON AERO SOFTSEAL EAR CUSHIONS.** To replace the earphone, earcup assembly or to install the Oregon Aero Hush Kit Combo or Softseal Ear Cushions, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Earcup Assembly | 89C7735-1 (CAGE 97427) |
| 1 | Earphone | H-87B/U |
| 1 | Oregon Aero Softseal Ear Cushions, 3/4-inch (Note 1) | 20050 |
| 1 | Oregon Aero Softseal Ear Cushions, 1 1/8-inch (Note 1) | 20025 |
| 1 | Oregon Aero Hush Kit Combo, 3/4-inch (Note 1) | 28034 |
| 1 | Oregon Aero Hush Kit Combo, 1 1/8-inch (Note 1) | 28118 |

Notes: 1. Oregon Aero Softseal Ear Cushions are authorized optional replacements for P/N 88D7554-1 earpad sets. The Oregon Aero Hush Kit Combo is an authorized optional replacement for P/N 89C7735-1 earcup assembly. Both items are commercially available from Oregon Aero Corporation, Scappoose, OR 97056. Telephone (503) 543-7399.

1. Place helmet upright on padded work surface.

2. Remove earcup assembly.

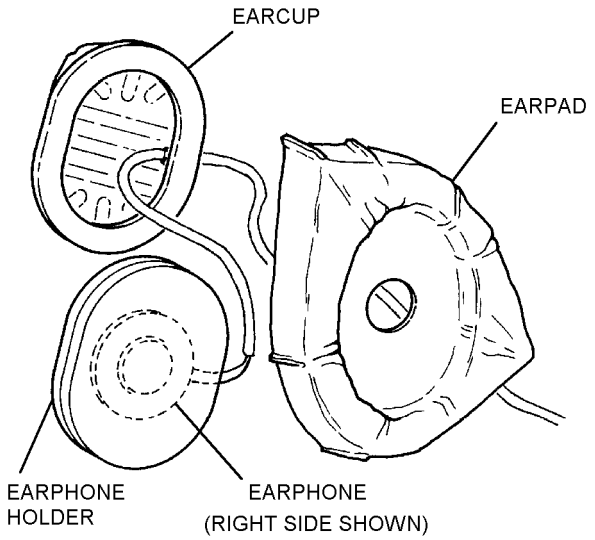
a. Remove earcup assembly from pile of interior helmet shell assembly.

b. Remove earpad backers from LH and RH earpads.

c. Remove earcups with enclosed earphone holders from LH and RH earpads.

d. Remove earphone holders and enclosed earphones from LH and RH earcups.

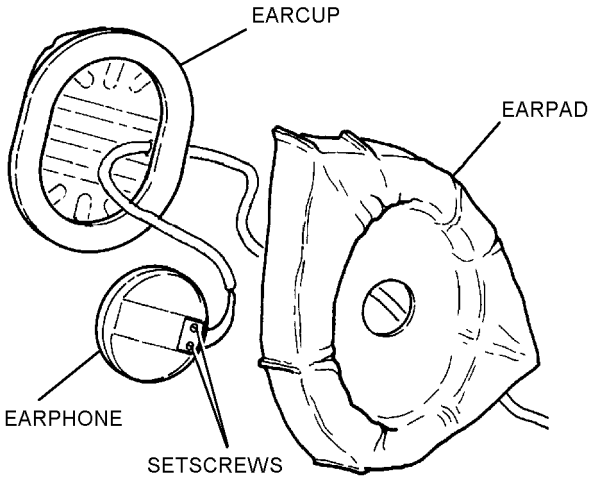
e. Remove earphones from earphone holders.




4p81s2c

**Steps 2c thru 2e - Para 4-81**

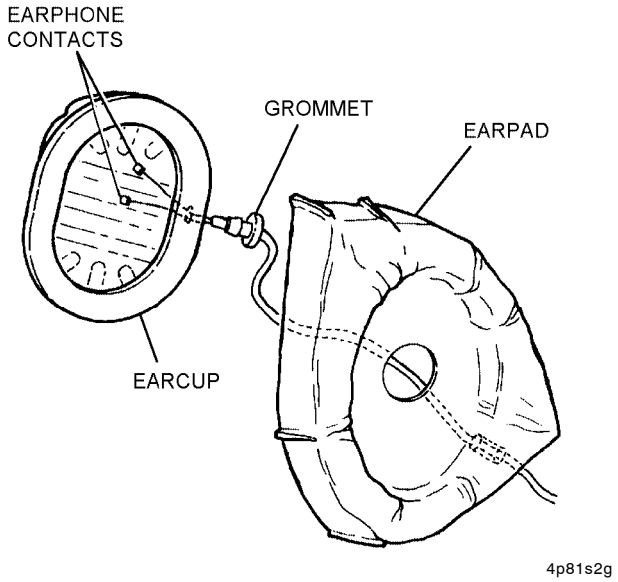
f. Loosen two setscrews and remove earphone contacts from earphones. Discard earphones if defective.




4p81s2f

**Step 2f - Para 4-81**

g. Remove cable assembly leads and grommets from LH and RH earcup shells and LH and RH earpads.




**Step 2g - Para 4-81**

h. Discard defective earcups, earpads, earpad backers, earphone holders, or fitting pads.

i. Keep any serviceable earcup assembly parts for reuse.

3. Install earcup/earphone assembly.

**NOTE**

The longer earphone leads must be positioned to lead to the right earphone.

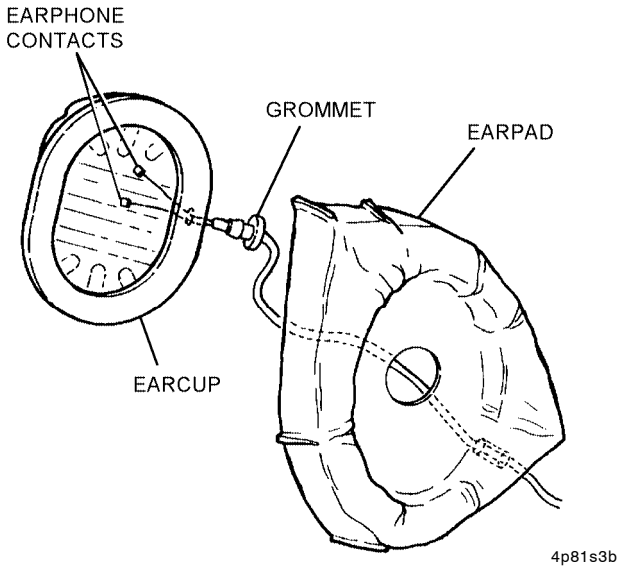
The LH earpad can be distinguished from the RH earpad by ensuring that the communication cord holes face the rear of the helmet shell assembly when placed inside the helmet shell assembly.

a. Install the LH and RH earphone leads through the holes in the LH and RH earpads.

**NOTE**

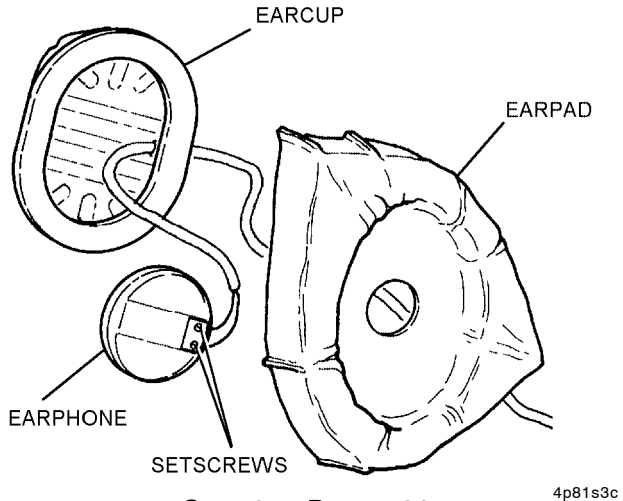
The LH earcup can be distinguished from the RH earcup by their positioning inside the helmet shell assembly. The tapered ends of the earcups should face down and the communication cord holes should face the rear of the helmet shell assembly.

b. Install the earphone contacts and small grommets into the holes of the LH and RH earcups. Secure the grommets.



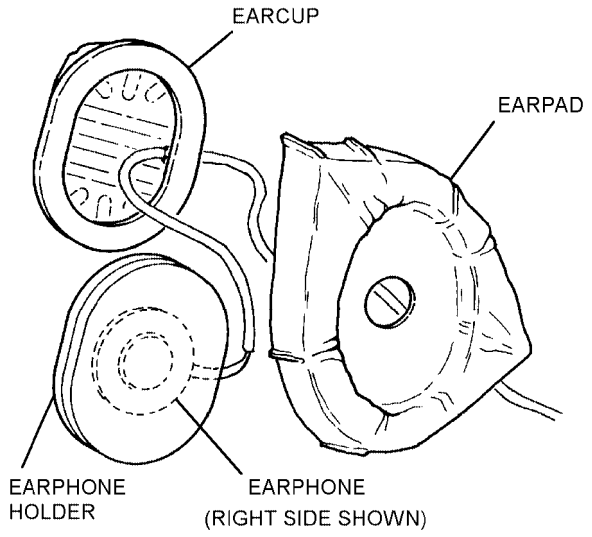

**Step 3b - Para 4-81**

c. Insert earphone contacts into earphones and tighten setscrews.




**Step 3c - Para 4-81**

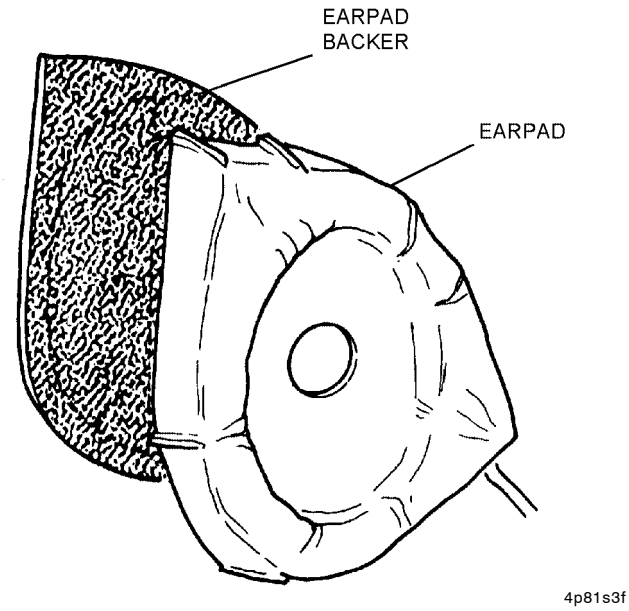
d. Insert earphones into cavity of earphone holders.




**Step 3d - Para 4-81**

e. Position earphone holders with enclosed earphones into LH and RH earcups. Smooth earphone holders inside LH and RH earcups to eliminate bunching.

f. Position LH and RH earcups into earpads and cover with earpad backers.




**Step 3f - Para 4-81**

g. Install earcup assembly onto the pile section of the LH and RH sides of the interior helmet shell assembly.

4. Install Oregon Aero Softseal earseal or the Oregon Aero Hush Kit as follows:

a. For earseal installation.

(1) Insert the communication cable leads with the earphone contacts through the holes at the rear of each earcup. Secure the small grommets encircling the leads into the holes in the LH and RH earcups.

(2) Insert earphone contacts into earphones and tighten setscrews.

(3) Insert earphones into the cavity of the earphone holder.

(4) Position earphone holders with enclosed earphones into the RH and LH earcups. Smooth earphone holders inside earcups to eliminate bunching.

(5) Install earseals onto earcups by hooking them over one end of the earcup and carefully stretching them over the lip of the earcup.

(6) Route RH earcup and cable lead around inside nape of helmet to the RH helmet earcup cavity.

(7) Install RH and LH earcup assemblies onto the pile fastener material on the interior of the helmet shell.

b. For hush kit installation.

(1) Insert communications cable leads with the earphone contacts through the holes at the bottom of the RH and LH hush kit. Secure the small grommet encircling the leads into the holes in each hush kit.

(2) Insert earphone contacts into earphones and tighten setscrews.

(3) Insert earphones into the cavity of the hush kit earphone holders.

(4) Position earphone holders with enclosed earphones into the RH and LH hush kit. Smooth earphone holders to eliminate bunching.

(5) Route RH hush kit and cable lead around inside nape of helmet to the RH helmet earcup cavity.

(6) Install RH and LH hush kits onto pile fastener material on interior of helmet shell.

5. Document in accordance with OPNAVINST 4790.2 Series.

**4-82. REPLACEMENT OF SINGLE VISOR ASSEMBLY.** Replace single visor assembly as follows:

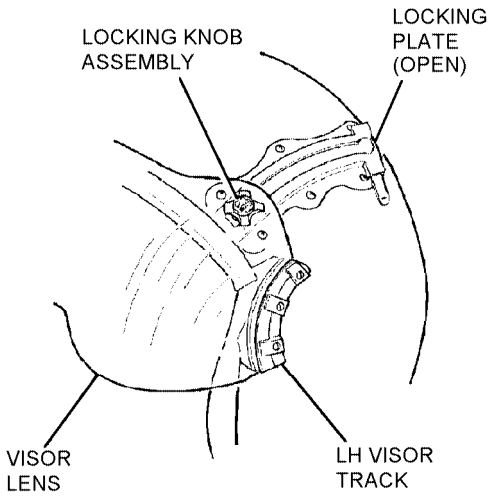
Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Visor Assembly | 88B7586-2<br>NIIN 01-360-7285 |
| 1 | Post Retainer | T94A8675 |
| 2 | Post Retainer | T94A8676-1 |
| 1 | Visor Lock Assembly | 96B9367 |
| As Required | Adhesive, RTV 102/732 | MIL-A-46106<br>NIIN 00-877-9872 |

1. Remove damaged single visor assembly.

a. Loosen visor lock knob and lower visor to expose visor locking guide locking plate.

b. Lift upward on locking guide locking plate release tab and slide locking plate to open position.



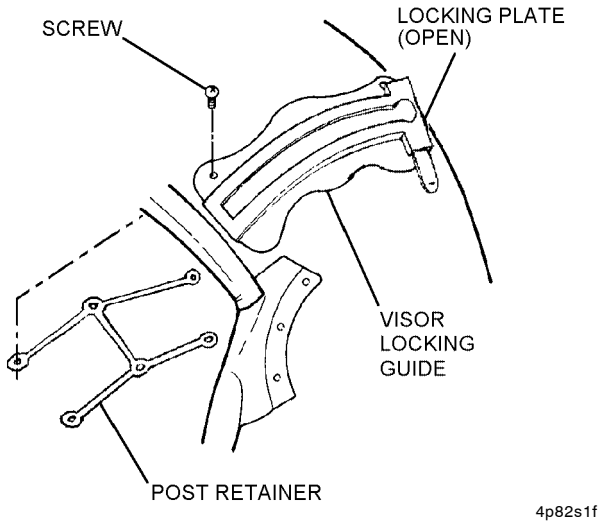

**Step 1b - Para 4-82**

c. Using lock knob, raise visor to full up position. Rotate visor lock knob 90 degrees counterclockwise in visor locking guide to release visor lock key sub-assembly; lift and remove lock knob assembly from helmet.

d. Slide visor rearward until free from right and left visor tracks and set visor aside.

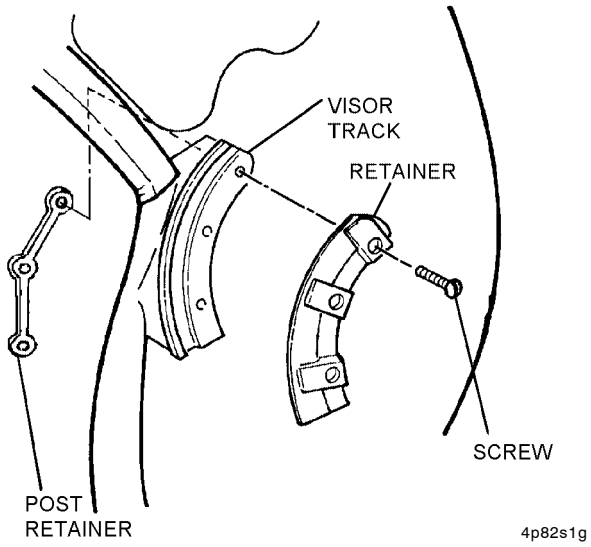
e. Remove internal components in accordance with paragraph 4-86, step 1.

f. Remove six attaching screws from locking guide. Remove locking guide assembly from helmet shell exterior, set aside, and retain attaching screws and post retainer.




**Step 1f - Para 4-82**

g. Remove three attaching screws from right and left visor tracks and remove tracks and interior retainers from helmet shell assembly.

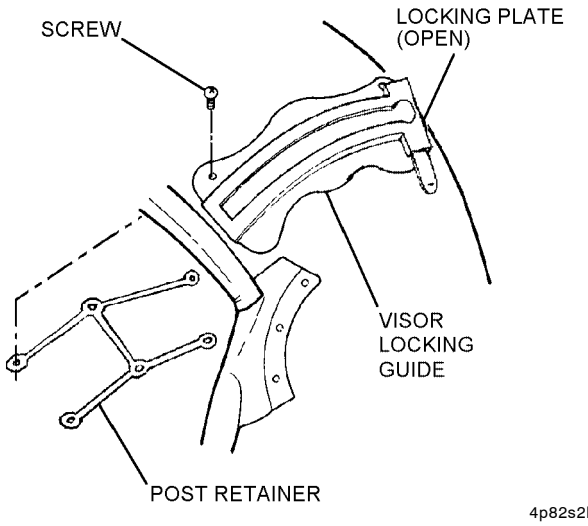



**Step 1g - Para 4-82**

2. Install replacement single visor assembly.

a. Align visor locking guide with six predrilled holes on top left side of helmet shell exterior and visor locking guide retainer positioned on interior of helmet shell.

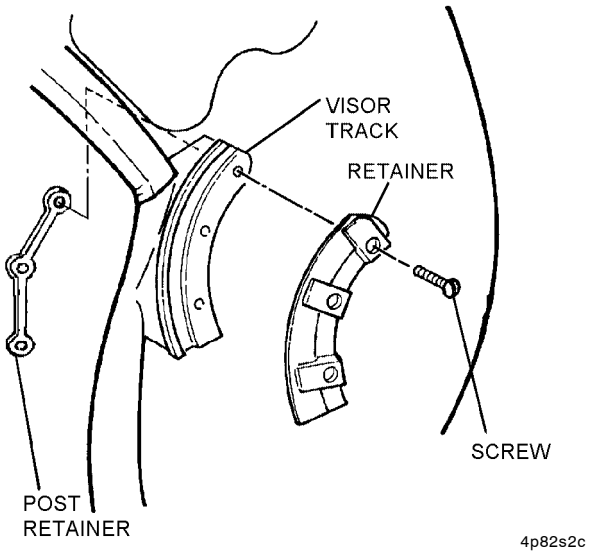
b. Apply small amount of RTV to first few threads of each attaching screw and secure visor locking guide to helmet shell with six attaching screws.




**Step 2b - Para 4-82**

c. Align holes of left tapered spacer (XL helmets only), lower visor track (on exterior), and retainer (on interior) with three predrilled holes in helmet shell and insert three posts.

d. Apply small amount of RTV to first few threads of three attaching screws, insert screws, align post retainers, and secure left visor track to helmet shell.




**Steps 2c and 2d - Para 4-82**

e. Repeat procedures in steps 2c and 2d for right visor track assembly.

f. Reinstall internal components in accaordance with paragraph 4-86 step 2.

3. Insert Visor lens (neutral or clear).

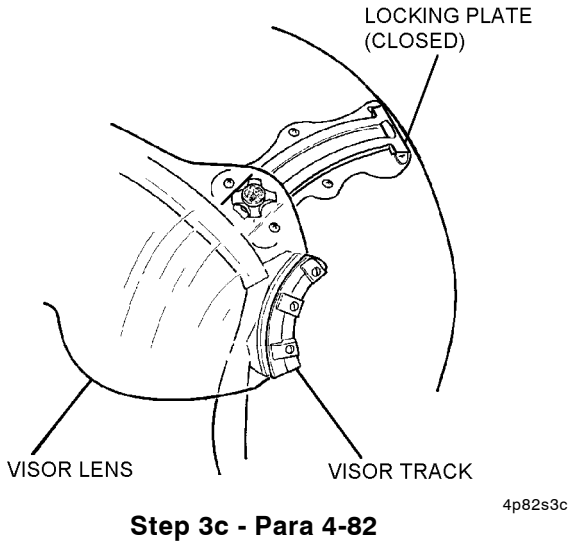
a. Lift and slide visor guide locking plate to open position.

b. Place visor lens track guides into grooves of left and right visor tracks and position visor lock knob over cut-out in upper end of visor locking guide.

**NOTE**

Ensure visor lock knob is fully unlocked.

c. Place visor lock key into slot of visor locking guide. Rotate visor lock knob 90 degrees clockwise with key within slot of visor locking guide. Using visor lock knob, lower visor to full down position. Slide visor locking guide locking plate to closed and locked position.




**Step 3c - Para 4-82**

d. Raise visor to full up position and lock in place.

4. Document in accordance with OPNAVINST 4790.2 Series.

## 4-83. REPLACEMENT OF SINGLE VISOR LENS.

Select visor from table 4-2A or 4-2C which meets helmet size and mission requirements and proceed as follows:

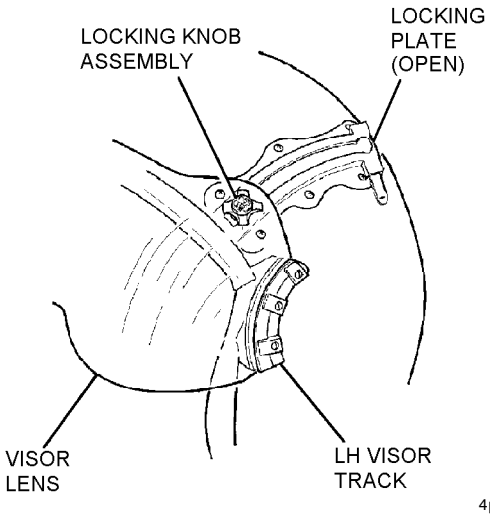
Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Single Visor Lens | See table 4-2A or 4-2C |

1. Remove installed single visor lens.

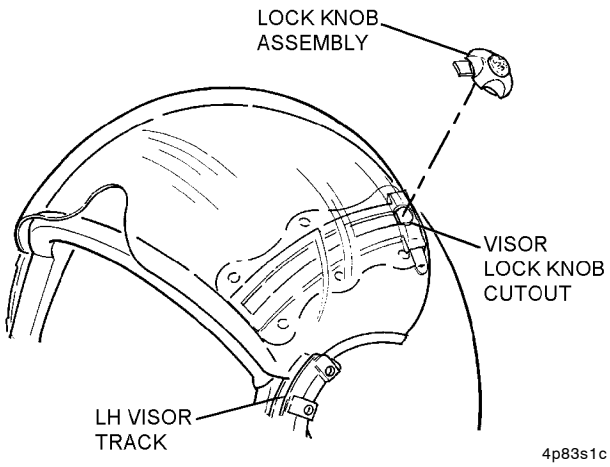
a. Loosen visor lock knob and lower visor to expose visor guide locking plate.

b. Gently lift upward on locking plate release tab and slide locking plate to open position.




**Step 1b - Para 4-83**

c. Using locking knob, raise visor to full up position. Rotate visor lock knob 90 degrees counterclockwise in visor locking guide track to release the visor lock key subassembly from the track of the visor locking guide, lift upward, and remove lock knob assembly from helmet.




**Step 1c - Para 4-83**

d. Slide visor toward rear of helmet until free of RH and LH visor tracks and set aside.

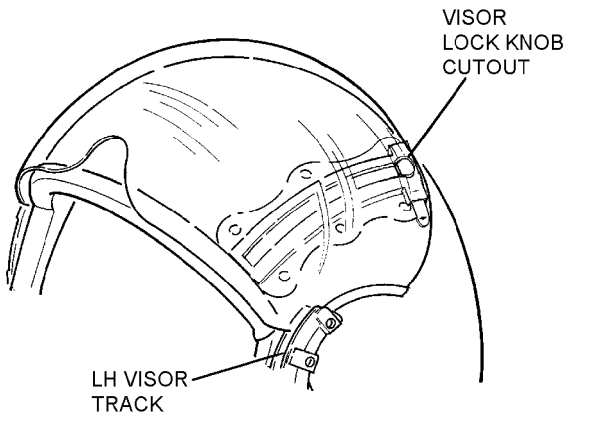
2. Dispose of laser protective visor lenses in accordance with paragraph 4-67.

3. Install replacement single visor lens.

**NOTE**

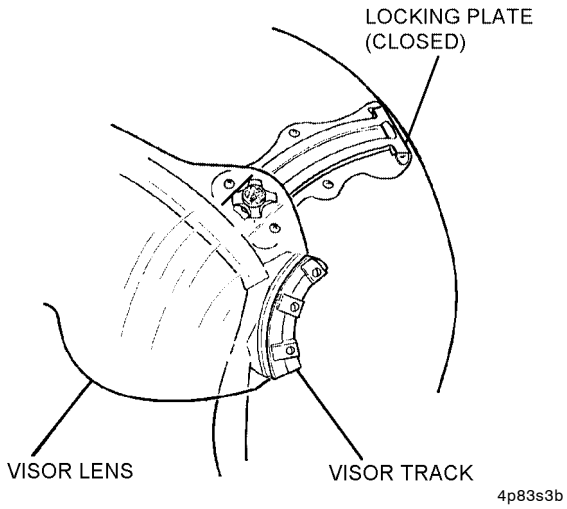
To better understand the mechanical process involved in visor installation procedures, use the clear visor to observe visor lock knob key subassembly counterclockwise rotation.

a. Place visor lens track guides into grooves of RH and LH visor tracks and position visor lock knob cut-out over upper end of visor locking guide.




**Step 3a - Para 4-83**

b. Verify visor lock knob is fully unlocked. Place visor lock knob key subassembly into slot of visor locking guide track. Rotate the visor lock knob key subassembly 90 degrees counterclockwise within the slot of the visor locking guide. Lower visor using visor lock knob and visually verify 90 degree rotation of key subassembly. Slide visor locking guide locking plate to the closed and locked position. Raise visor to full up position and secure in place using visor lock knob.




**Step 3b - Para 4-83**

4. Document in accordance with OPNAVINST 4790.2 Series.

**4-84. REPLACEMENT OF THERMOPLASTIC LINER (TPL) ASSEMBLY, PRU-52/P, OR OREGON AERO ZETALINER.** To replace the TPL assembly or the Oregon Aero Zetaliner, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | TPL Assembly, Medium | 85D7087-1P (CAGE 97427) |
| | -or- | |
| 1 | TPL Assembly, Large | 85D7087-2P (CAGE 97427) |
| | -or- | |
| 1 | TPL Assembly, Extra-Large | 85D7087-3P (CAGE 97427) |
| | -or- | |

Materials Required(Cont)

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Oregon Aero Zetaliner (Note 1) | 95132, 3, 4, 5 (medium); 95142, 3, 4, 5 (large); 95152, 3, 4, 5 (extra large); 95162, 3, 4, 5 (extra large wide) NIIN TBD |

Notes: 1. Oregon Aero Zetaliners are commercially available from Oregon Aero Corporation, Scappoose, OR 97056. Telephone (503) 543-7399

**NOTE**

Oregon Aero Zetaliners are optional (commercially available) comfort liners that are approved for use in place of the supplied thermoplastic liner. The liners are provided in 4 sizes, with 4 different foam thicknesses available in each size. The last three digits of the part number indicate the liner size and thickness, for example in P/N 95162, the digits "16" denote the size extra large wide, the last digit "2" represents a 1/4-inch thick foam layer, the thinnest foam layer provided. Other layers available are "3" (3/8-inch), "4" (1/2-inch), "5" (5/8-inch). When replacing the TPL with the Zetaliner, remove the TPL cover and count the number of plastic layers. Order the Zetaliner corresponding to the correct size for the helmet with the last digit of the part number matching the number of thermoplastic layers being replaced. To replace a 4 layer TPL in a size extra large helmet, order P/N 95154.

1. With helmet inverted, squeeze the sides of the TPL or Zetaliner inward to clear earcups. Detach from the hook fastener tabs and remove from inside the helmet.

2. Discard defective TPL or Zetaliner.

3. To install replacement TPL or Zetaliner into the helmet, center the folded liner on the energy absorbing liner and spread to mate with the installed hook fastener tabs. Ensure the widest end of the liner is attached to the helmet brow hook fastener tabs.

4. Contact aircrewmember to schedule a post replacement fit check.

5. Document in accordance with OPNAVINST 4790.2 Series.

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**4-85. REPLACEMENT OF PRU-52/P THERMOPLASTIC LINER (TPL) ASSEMBLY COMPONENTS.** If components of the TPL must be replaced, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Cover Assembly, Medium | 85D7088-1 |
| | -or- | |
| 1 | Cover Assembly, Large | 85D7088-2 |
| | -or- | |
| 1 | Cover Assembly, Extra-Large | 85D7088-3 |
| 1 | Layer Assembly, Medium | 88D7518-1 |
| | -or- | |
| 1 | Layer Assembly, Large | 88D7518-2 |
| | -or- | |
| 1 | Layer Assembly, Extra-Large | 88D7518-3 |
| As Required | Tape, Double-Coated, Vinyl, 1/2-Inch Width | No. 419 (3M) |

1. Remove TPL from helmet shell assembly.
2. Separate TPL cover assembly from layer assembly.
3. Discard defective assembly.
4. Remove any double faced tape from serviceable component.
5. Install new TPL components in accordance with paragraph 4-49.
6. Fit new TPL assembly in accordance with paragraph 4-51.
7. Document in accordance with OPNAVINST 4790.2 Series.

**4-86. REPLACEMENT OF ENERGY ABSORBING LINER.** If the energy absorbing liner must be replaced, proceed as follows:

Support Equipment Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Spatula, Metal | GGG-C-74G TY18GRD NIIN 00-680-2634 |

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Energy Absorbing Liner, Medium | 90C8006-1 NIIN 01-360-3746 |
| | -or- | |
| 1 | Energy Absorbing Liner, Large | 90C8006-2 NIIN 01-360-9316 |
| | -or- | |
| 1 | Energy Absorbing Liner, Extra-Large | 90C8006-3 NIIN 01-360-9317 |

1. Remove the energy absorbing liner.

**NOTE**

Removal of the energy absorbing liner requires considerable care and effort to avoid damage to the liner.

a. Invert helmet and remove TPL to expose the energy absorbing liner.

b. Detach the right and left earcup assemblies from the pile fastener tape in helmet shell earcup cavity and position clear of work area.

c. Remove the pan-head screws, flat washers, lock washers and flanged nuts securing the chin/nape strap to the rear of the helmet shell.

**CAUTION**

Use of liner removal aids other than the approved metal spatula or a 1 inch x 12 inch flexible metal machinists rule to remove the energy absorbing liner is not authorized. Use of unauthorized removal aids will damage the liner, which will result in reduced impact protection.

**NOTE**

Prior to the removal of the energy absorbing liner, measure across the helmet shell brow and nape edgeroll to determine the centerline and mark. Determine centerline of the liner brow and nape area and mark. The alignment of these marks during installation will aid in eliminating incorrect positioning of the liner.

d. With the helmet inverted on the work surface, position helmet brow area closest to the technician and insert a thin, flexible metal spatula (a 12 inch x 1 inch metal rule can be used) between the inner surface of the helmet shell and the energy absorbing liner.

e. With the spatula at the center of the liner, gently pry inward and upward on the energy absorbing liner to obtain sufficient clearance to permit grasping the liner with the free hand.

f. Maintain upward pressure and continue to withdraw the liner from the interior of the helmet shell. Rotate the liner 90 degrees to the right or left to clear the helmet earcup cavities.

2. Install the replacement liner.

**NOTE**

Prior to installing liner, ensure all attaching hardware for visor configuration which will be covered by liner is in place.

a. Rotate the liner 90 degrees and place into helmet shell.

b. Reverse rotation and place the front edge of the energy absorbing liner firmly against the inside surface of the front helmet shell edgeroll. Ensure the liner is centered within the helmet by aligning the centerline marks made during liner removal.

c. Press the rear portion of the liner into place ensuring that the rear edgeroll is not pinched or curled under the liner.

d. On inside surface of the energy absorbing liner, install front and rear hook fastener tapes. All four fasteners should be installed approximately 1 1/2 inches to the left and right of the liner centerline to avoid pressure points.

3. Ensure that the chin/nape straps have remained routed through the nape pad and no twists are present.

4. Reconnect the nape pad and chin/nape strap grommets to the rear attachment points by installing the pan head screws, flat washers, lock washers and flanged nuts.

5. Attach the earcup assemblies to the pile fastener tape in the helmet shell earcup cavities and route the communications cord for the right earcup between the energy absorbing liner and the rear edgeroll as required.

6. Reinstall TPL onto energy absorbing liner.

**4-87. REPLACEMENT OF THE M22442/37-4708 (CX-4708A/AIC) CABLE ASSEMBLY AND MK-634/AIC CABLE CLIP.** Replace the M22442/37-4708 (CX-4708A/AIC) cable assembly and MK-634/AIC cable clip (if installed), proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Cable Assembly, CX-4708A/AIC (Use until exhausted) | M22442/37-4708 NIIN 00-816-3657 |
| 1 | Cable Assembly, CX-4708A/AIC (MOD) (Alt. for CX-4708A/AIC) | CX-4708A/AIC (MOD) 89B7742 (CAGE 97427) |
| 1 | Cable Clip (optional) | MK-634/AIC NIIN 00-864-8047 |

**NOTE**

The use of the MK-634/AIC cable clip is optional.

1. If only the MK-634/AIC cable clip is defective:

a. Remove U-179A/U connector from cable clip.

b. Remove cable clip by rotating it clockwise and pulling away from large grommet.

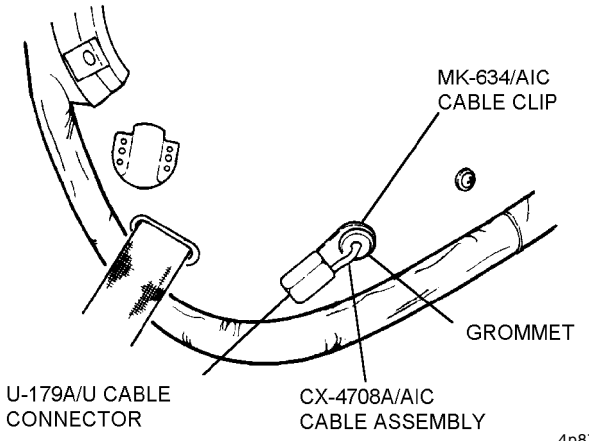
c. Install new MK-634/AIC cable clip by pressing it against large grommet and rotating counterclockwise.

d. Reinstall U-179A connector into cable clip.

2. If only the M22442/37-4708 (CX-4708A/AIC) cable assembly is defective, remove M22442/37-4708 (CX-4708A/AIC) cable assembly and MK-634/AIC cable clip (if installed).

a. Remove earphones in accordance with paragraph 4-81.

b. Remove U-179A/U cable connector from MK-634/AIC cable clip (if installed).




**Step 2b - Para 4-87**

c. Remove large grommet encircling cable from helmet shell assembly.

d. Discard defective M22442/37-4708 (CX-4708A/AIC) cable assembly.

3. Install new M22442/37-4708 (CX-4708A/AIC) cable assembly, MK-634/AIC cable clip.

**NOTE**

The use of the MK-634/AIC cable clip is optional.

a. Pass two M22442/37-4708 (CX-4708A/AIC) cable leads with earphone contacts through large hole in bottom rear of helmet shell assembly. Press large grommet encircling cable assembly into large hole and secure.

b. Secure M22442/37-4708 (CX-4708A/AIC) cable assembly connector (U-179A/U) to helmet shell assembly, using MK-634/AIC cable clip (if desired).

**NOTE**

The longer earphone leads must be positioned leading to the right earphone.

The LH earpad can be distinguished from the RH earpad by ensuring that the communication cord holes face the rear of the helmet shell assembly when placed inside the helmet shell assembly.

c. Install earphones and earcup assemblies in accordance with paragraph 4-81.

**4-88. DELETED.**

**4-89. REPLACEMENT OF M22442/15-1 (CX-4832A/AR) CABLE ASSEMBLY OR M22442/19-1 (CX-12972/AR) CABLE ASSEMBLY.** To replace the M22442/15-1 (CX-4832A/AR) cable assembly or M22442/19-1 (CX-12972/AR) cable assembly, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Cable Assembly, CX-4832A/AR | M22442/15-1 NIIN 00-961-8516 |
| | -or- | |
| 1 | Cable Assembly, CX-12972/AR | M22442/19-1 NIIN 01-016-4130 |
| 1 | Cable Assembly, CX-4831/AR (Note 1) | M22442/14-1 NIIN 00-631-8566 |
| 2 | Screws, 6-32 x 1/4-Inch | NIIN 00-638-5517 |
| 2 | Flat Washer, 0.032-Inch Thick 0.382-Inch O.D. 0.166-Inch I.D. | NAS1197-8 NIIN 00-722-6091 |
| As Required | Adhesive, RTV 102/732 | MIL-A-46106 NIIN 00-877-9872 |

Notes: 1. Use Cable Assembly M22442/14-1 attached to the teardrop fitting of Cable Assembly M22442/15-1 to connect to aircraft audio system.

1. Remove defective cable assembly.

a. Remove earcup assemblies in accordance with paragraph 4-81.

b. Remove screws and flat washers, securing the cable assembly junction block to helmet shell assembly.

c. Remove and discard defective cable assembly.

2. Install replacement cable assembly.

a. Pass four cable assembly earphone leads with the earphone contacts through large hole on left side of helmet shell assembly.

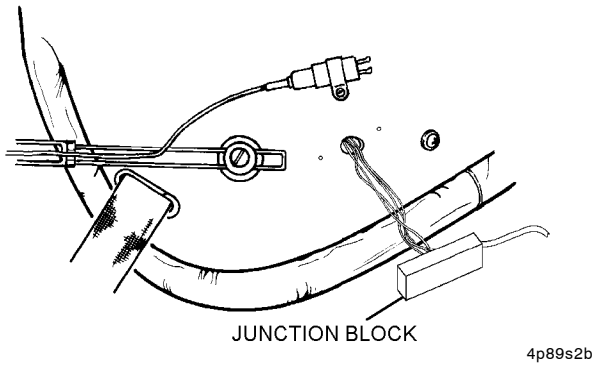
**CAUTION**

Do not over torque 6-32 x 1/4-inch screws. Over torquing will cause damage to cable assembly junction block.

**NOTE**

A small amount of RTV may be applied to the first few threads of screws prior to installation.

b. Secure cable assembly junction block to outside of helmet shell assembly using two 6-32 x 1/4-inch screws and two 0.032-inch thick flat washers. Apply no more than 4 in-lbs. of torque to 6-32 x 1/4-inch screws.




**Step 2b - Para 4-89**

c. Install earcup assemblies in accordance with paragraphs 4-81.

3. Document in accordance with OPNAVINST 4790.2 Series.

**4-90. REPLACEMENT OF BOOM MICROPHONE ASSEMBLY.** To replace the boom microphone assembly, select boom microphone assembly with the correct length extension cable and proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Boom Microphone Assembly (Note 1) | M-33A/AIC NIIN 00-755-4643 |

Materials Required (Cont)

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Boom Microphone Assembly (Note 2) | M26542/2-01 NIIN 01-188-8529 |
| 1 | Boom Microphone Assembly (Note 3) | M26542/2-02 NIIN 01-188-8530 |
| 1 | Boom Microphone Assembly (Note 4) | M26542/2-03 NIIN 01-188-8528 |

Notes: 1. The M-33A/AIC Boom Microphone Assembly is an M-87/AIC microphone supplied with a 6-inch CX-4434/U extension cable.

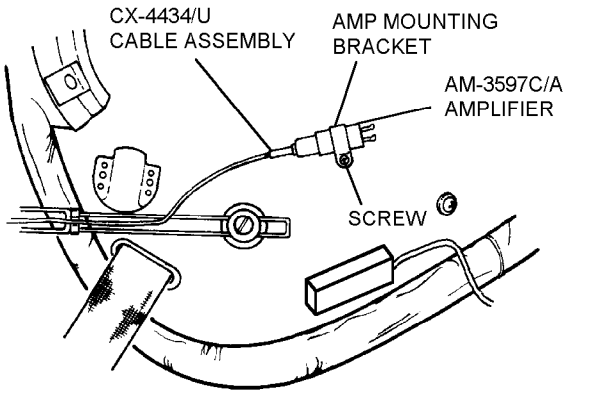
2. The M26542/2-01 Boom Microphone Assembly is an M-87/AIC microphone supplied with a 13-inch CX-4434/U extension cable.

3. The M26542/2-02 Boom Microphone Assembly is an M-87/AIC microphone supplied with a 16-inch CX-4434/U extension cable.

4. The M26542/2-03 Boom Microphone Assembly is an M-87/AIC microphone supplied with a 23-inch CX-4434/U extension cable.

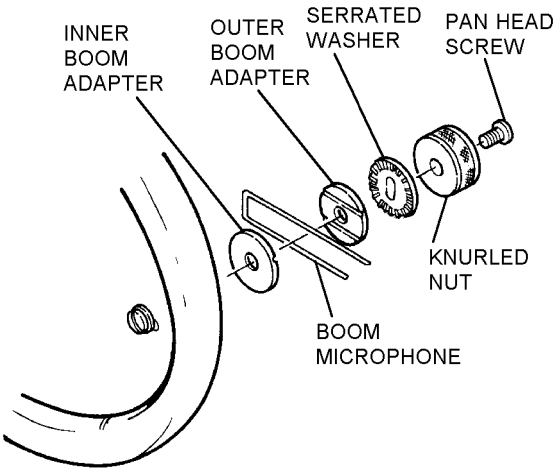
1. Remove boom microphone assembly.

a. Disconnect CX-4434/U cable assembly from AM-3597C/A amplifier or cable assembly (as required).




**Step 1a - Para 4-90**

b. Remove 8-32 x 1/4-inch long pan head screw, knurled nut, serrated washer, outer half of boom adapter, and boom microphone assembly.




4p90s1b

**Step 1b - Para 4-90**

c. Discard defective boom microphone assembly.

2. Replace boom microphone assembly.

a. Position replacement boom microphone assembly, and install the outer half of boom adapter, serrated washer, knurled nut, and pan head screw and tighten.

b. Connect CX-4434/U cable assembly to AM-3597C/A amplifier or cable assembly (as required).

3. Document in accordance with OPNAVINST 4790.2 Series.

**4-91. REPLACEMENT OF M23595/1-2 (AM-3597C/A) AMPLIFIER.** To replace the M23595/1-2 (AM-3597C/A) amplifier, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Amplifier, AM-3597C/A | M23595/1-2 NIIN 00-100-4932 |

1. Remove amplifier.

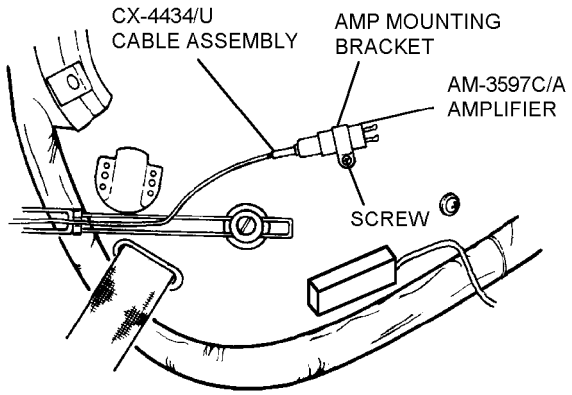
a. Disconnect all applicable cables from amplifier.

b. Loosen screw attaching amp mounting bracket to helmet shell assembly.

c. Remove and discard defective amplifier.

2. Replace amplifier.

a. Install replacement amplifier into amp mounting bracket and tighten screw.




4p91s2a

**Step 2a - Para 4-91**

b. Connect applicable cable assembly to amplifier.

c. Document in accordance with OPNAVINST 4790.2 Series.

**4-92. REPLACEMENT OF AMP MOUNTING BRACKET.** To replace the amp mounting bracket, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Amp Mounting Bracket | 80B4881 (CAGE 97427) NIIN 01-128-5334 |
| As Required | Adhesive, Polychloroprene, Class 3 | MIL-A-5540 NIIN 00-515-2246 |
| As Required | Adhesive, RTV 102/732 | MIL-A-46106 NIIN 00-877-9872 |

1. Remove amp mounting bracket.

a. Disconnect all applicable cables from AM-3597C/A amplifier.

b. Loosen screw attaching amp mounting bracket to helmet shell assembly.

c. Remove M23595/1-2 (AM-3597C/A) amplifier from amp mounting bracket.

d. Remove earpad assembly and loosen pile fastener tape.

e. Remove screw, washer, and post securing amp mounting bracket to helmet shell assembly.

f. Discard defective amp mounting bracket.

2. Replace amp mounting bracket.

**NOTE**

A small amount of RTV may be applied to the first few threads of screws prior to installation.

a. Insert replacement amp mounting bracket onto helmet shell assembly and secure with 8-32 x 1/4-inch screw, flat washer, and post. Do not tighten screw.

b. Install M23595/1-2 (AM-3597C/A) amplifier into amp mounting bracket and tighten screw.

c. Connect applicable cable assemblies to amplifier.

d. Recement pile fastener tape to helmet shell using polychloroprene adhesive.

e. Reinstall earpad assembly.

3. Document in accordance with OPNAVINST 4790.2 Series.

**4-93. REPLACEMENT OF THE CX-4434/U CABLE ASSEMBLY.** To replace the CX-4434/U cable assembly, select desired length cable and proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Cable Assembly, CX-4434/U, 6-Inch | M22442/36-1 NIIN 00-848-7662 |
| 1 | Cable Assembly, CX-4434/U, 13-Inch | M22442/36-3 |
| 1 | Cable Assembly, CX-4434/U, 16-Inch | M22442/36-4 |
| 1 | Cable Assembly, CX-4434/U, 23-Inch | M22442/36-6 |

1. Remove CX-4434/U cable assembly.

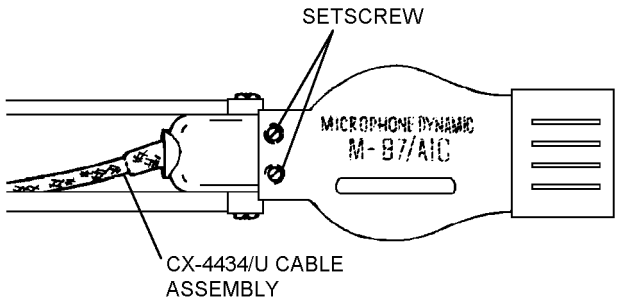
a. Disconnect CX-4434/U cable assembly from AM-3597C/A amplifier or cable assembly (as required).

b. Loosen two setscrews securing CX-4434/U cable assembly to boom microphone.

c. Remove and discard defective CX-4434/U cable assembly.

2. Replace CX-4434/U cable assembly.

a. Install U-179/U plug of new CX-4434/U cable assembly into boom microphone assembly and secure by tightening two setscrews.




**Step 2a - Para 4-93**

b. Connect other U-179/U plug of new CX- 4434/U cable assembly to AM-3597C/A amplifier or cable assembly (as required).

3. Document in accordance with OPNAVINST 4790.2 Series.

**4-94. REPLACEMENT OF THE PRU-55/P OR PRU-58/P HELMET SHELL ASSEMBLY.** To replace the PRU-55/P or PRU-58/P helmet shell assembly, select proper assembly from list below based on size and mission requirements and proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Helmet Shell Assembly, PRU-55/P, Medium | 90A8045-1 (CAGE 97427) |
| 1 | Helmet Shell Assembly, PRU-55/P, Large | 90A8045-2 (CAGE 97427) |
| 1 | Helmet Shell Assembly, PRU-55/P, Extra-Large | 90A8045-3 (CAGE 97427) |

**NOTE**

Helmet Shell Assembly PRU-58/P is no longer available from supply system.

1. Remove all serviceable components from condemned helmet assembly for reuse.

2. Once basic helmet shell assembly has been obtained and reusable components established, refer to Section 4-3 for buildup to desired configuration for required aircrew or aircraft applications.

3. Document in accordance with OPNAVINST 4790.2 Series.

**4-95. REPLACEMENT OF PRU-53/P CHIN/NAPE STRAP ASSEMBLY, NAPE STRAP OR NAPE STRAP PAD.** To replace the chin/nape strap assembly proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | PRU-53/P Chin/ Nape Strap Assembly, Medium | 90D7916-4 (CAGE 97427) NIIN 01-360-9308 |
| | -or- | |
| 1 | PRU-53/P Chin/ Nape Strap Assembly, Large | 90D7916-5 (CAGE 97427) NIIN 01-362-0113 |
| | -or- | |
| 1 | PRU-53/P Chin/ Nape Strap Assembly, Extra-Large | 90D7916-6 (CAGE 97427) NIIN 01-361-2972 |
| As Required | Adhesive, RTV 102/732 | MIL-A-46106 NIIN 00-877-9872 |

1. Remove chin/nape strap assembly.

a. Remove earcup assembly from interior of LH and RH helmet shell assembly.

b. Remove screws, flat washers, lock washers and flanged nuts from backside of helmet shell assembly securing nape strap to helmet shell assembly.

c. Pull nape straps out from nape strap pad and helmet shell assembly.

d. Remove chin strap and chin strap pad from nape strap.

e. Discard defective chin/nape strap assembly component(s). Retain serviceable components for re-assembly.

2. Install chin/nape strap assembly.

**NOTE**

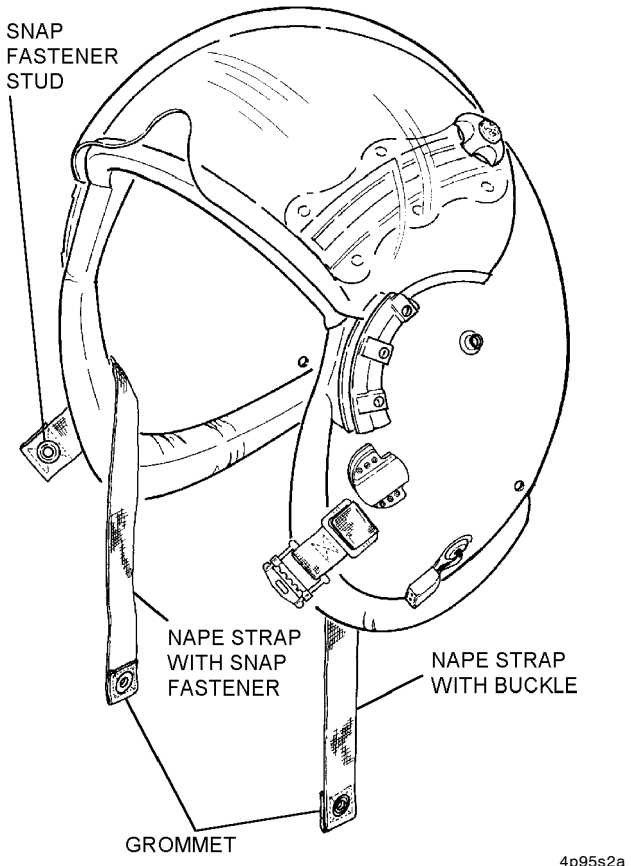
The top of chin/nape strap pad is the side from which the straps with grommets protrude.

a. Insert grommeted end of nape strap (with snap fastener at opposite end), from the outside, through slot located on the bottom right of the helmet shell assembly. Ensure that the snap fastener is facing outward.

**NOTE**

The nape strap with buckle can be installed on right or left of helmet to satisfy aircrewmember.

b. Insert grommeted end of nape strap (with buckle at opposite end) through the slot located on the bottom left outside of the helmet shell assembly.




**Steps 2a and 2b - Para 4-95**

c. Orient the nape strap pad so that its padded side faces toward the inside of the helmet shell and feed each nape strap, (grommeted ends) now located within helmet shell assembly, through the bottom openings of the nape strap pad.

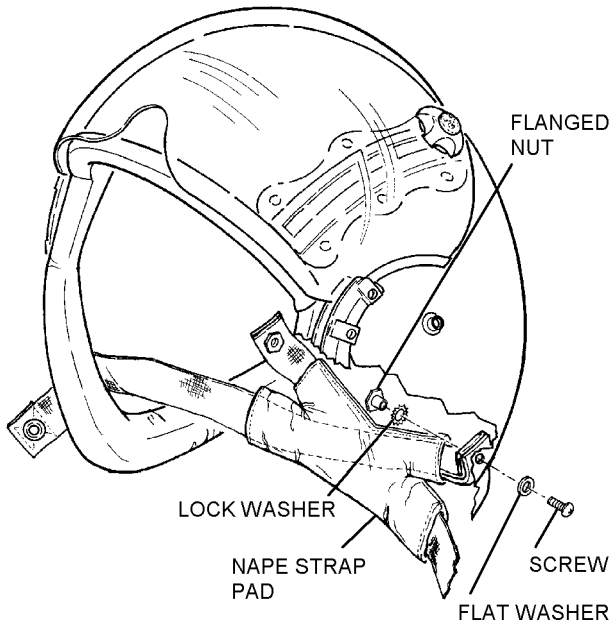
d. Cross the nape straps through the inside of nape strap pad.

**NOTE**

A small amount of RTV may be applied to the first few threads of screws prior to installation.

e. Attach one nape strap and associated strap from nape strap pad to helmet shell with screw and flat washer (outside) through helmet into lock washer and flanged nut (inside). Repeat for other nape strap.

Ensure that any cable assembly required to be secured to the left nape strap screw is attached with cable clip between washer and helmet shell.




**Steps 2c thru 2e - Para 4-95**

f. Snap chin strap to snap fastener on right nape strap. Feed opposite end of chin strap through buckle on left nape strap. Secure with hook and pile fastener.

3. Document in accordance with OPNAVINST 4790.2 Series.

**4-96. REPLACEMENT OF CHIN STRAP AND CHIN STRAP PAD.** To replace the chin strap or chin strap pad, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Chin Strap Assembly | 84C6708 |
| 1 | Chin Pad, Black | 89C7764-1<br>NIIN 01-362-8470 |

1. Remove chin strap assembly and chin pad.

a. Unsnap chin strap snap fastener from nape strap, if required.

b. Remove chin strap assembly by separating assembly's hook and pile tape fastener and unthreading chin strap from nape strap buckle.

c. Slide chin pad off of chin strap.

d. Discard unserviceable components.

2. Install chin strap assembly and chin pad.

a. Snap chin strap to snap fastener on right side nape strap.

b. Slide chin pad onto chin strap with hook tape on chin pad facing downward.

c. Feed chin strap through buckle on left side nape strap.

d. Secure chin strap with hook and pile fastener.

**4-97. REPLACEMENT OF BAYONET RECEIVER ASSEMBLY.** To replace the bayonet receiver assembly, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| 1 | Bayonet Receiver Assembly | 93A8514<br>(CAGE 97427) |
| As Required | Adhesive, Polychloroprene, Class 3 | MIL-A-5540<br>NIIN 00-515-2246 |
| As Required | Adhesive, RTV 102/732 | MIL-A-46106<br>NIIN 00-877-9872 |

1. Remove bayonet receiver assembly.

a. Remove earcup assembly from LH and RH side of interior helmet shell assembly.

b. Pull pile fastener fabric inside helmet shell assembly away from areas where earcup assembly was removed.

c. Remove four screws located inside helmet shell assembly that attach bayonet receiver assembly to LH and RH sides of exterior helmet shell assembly.

d. Discard defective bayonet receiver assembly.

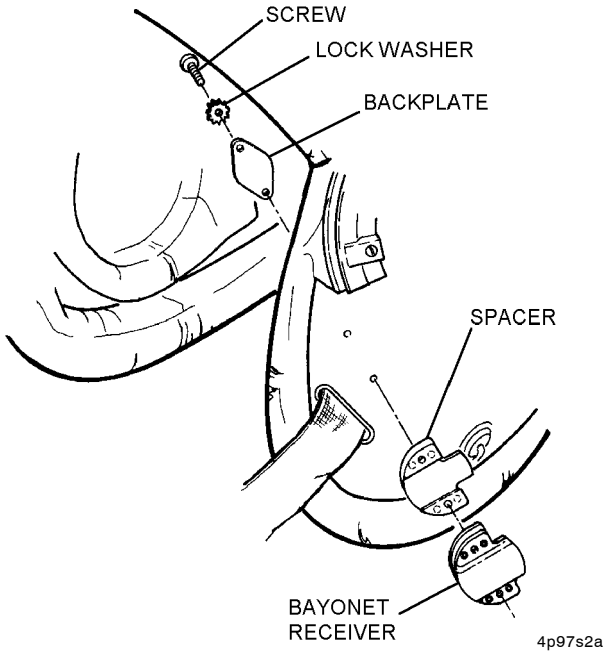
2. Replace bayonet receiver assembly.

**NOTE**

Each spacer should be fitted against riveted side of bayonet receiver.

A small amount of RTV may be applied to each screw prior to adding lock washer and backplate.

a. While holding pile fabric fastener away from the interior helmet shell assembly, insert screws with lock washers through the backplate from the inside of the helmet shell assembly. Attach bayonet receivers and spacers to outside of the helmet shell assembly. Ensure that projections on bayonet receivers are pointing to the rear of helmet shell assembly.




**Step 2a - Para 4-97**

b. Tighten all screws so that bayonet receivers and spacers are firmly attached to helmet shell assembly.

c. Cement pile fastener fabric to interior of helmet shell assembly. Cut an X pattern in pile fastener fabric, across the screwheads, to facilitate inspection/tightening.

3. Document in accordance with OPNAVINST 4790.2 Series.

**4-98. Deleted.**

**4-99. REPLACEMENT OF KMU-561/P22P-16 HELMET BLADDER ASSEMBLY.** Replace the KMU-561/P22P-16 Helmet Bladder Assembly as follows:

1. Remove the helmet bladder assembly.

a. Remove thermoplastic liner.

b. Pull left earcup assembly free from hook and pile fastener.

c. Remove attaching screws from bladder inlet connector cover.

**NOTE**

It is not necessary to remove inlet connector cover from helmet to replace helmet bladder. Remove cover only if replacement of cover is desired.

d. Rotate inlet cover toward rear of helmet until it is clear of pass-thru hole.

e. Pull bladder free from hook and pile fasteners attached to energy absorbing liner.

**CAUTION**

Carefully cut laterally through tiedown strap head using diagonal cut pliers. Do not attempt to cut under strap head.

f. Remove tiedown strap securing bladder inlet tube to male inlet connector and remove bladder from helmet.

**NOTE**

If bladder inlet tube is damaged in attempting removal, cut through tube to facilitate completion of bladder removal.

2. Install hook and pile fasteners to prepare bladder for installation as follows:

a. Lay the bladder out flat with the bladder supply tube on the lower RH side. The side of the bladder which rests against the back of the head should be facing up.

b. Insert bladder in helmet and center it. The bladder should be flat against energy absorbing liner, with the lower edge parallel with and as close to the edge roll as possible.

c. With the bladder inserted, roll the bottom of the bladder upward so that the fastener tabs on the energy-absorbing liner are partly exposed. Using white chalk, mark the bladder lightly to identify correct location of mating fastener tabs.

d. Remove the bladder and install the pile fastener tabs to the bladder at chalk marks by removing pressure sensitive backing and pressing tabs firmly onto bladder.

e. Turn the bladder over and install the TPL hook fastener tab so it is positioned parallel to and along bottom edge of bladder. Install bladder and verify proper alignment. Remove bladder from helmet.

3. Install replacement helmet bladder assembly.

a. If new bladder inlet connector cover is being installed, attach the bladder inlet connector quick disconnect cover to the outside of the helmet by inserting the installation tab into appropriate hole from the outside of the helmet. Pull on the tab from the inside while pushing on the outside of the cover. Once the tab is fully engaged in hole, remove the tail and rotate the cover toward the rear of the helmet and out of the way of the pass-thru hole.

b. Install and attach the bladder in helmet using fastener tabs. Ensure that bladder lays smooth and flat against styrofoam liner and aligns with the edgeroll.

c. Pull the bladder inlet tube through bladder inlet tube pass-thru hole.

d. Remove plug from bladder inlet tube.

e. Attach inlet tube to bladder inlet connector. Ensure that connector and bladder inlet tube are properly positioned to eliminate twisting of the bladder or inlet tube when the connector is placed flush against outside of helmet.

f. Arrange the head of the tiedown strap so that the head rests on the underside of the bladder inlet connection, allowing the head to lie in the front portion of the pass-thru hole.

g. Secure the inlet tube to the bladder inlet connection using the tiedown strap provided and tensioning tool (MS90387-1) set at (3). File down sharp edges of tiedown strap as necessary.

h. Position the bladder inlet connection cover over the bladder inlet connection, and arrange the screw tabs of the cover under the threaded tabs of the connector.

i. Install bladder inlet connector cover using attaching screws and washers. Apply light coat of thread sealing compound to screw threads and install screws and washers from inside of helmet.

j. Attach the nape strap, and reinstall visor snap screw. Insert the TPL, and reinstall left earcup.

k. Install and modify, as necessary, new visor assembly in accordance with paragraph 4-82.

**4-100. FABRICATION OF REMOVABLE CAMOUFLAGE HELMET COVER - HGU-68(V)/P OR HGU-85(V)/P.** Fabricate camouflage helmet cover from suitable durable material using patterns provided in Chapter 3 as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| As Required | Cloth, Aramid, Fire Resistant, Sage Green (Note 1) | MIL-C-83429 NIIN 01-147-2064 |
| As Required | Cloth, Camouflage, Woodland (Note 1) | NIIN 01-167-8403 |
| As Required | Fastener Tape, Pile, 2-Inch | MIL-F-21840 NIIN 00-926-4930 |
| As Required | Fastener, Tape, Hook, 1-Inch | MIL-F-21840 NIIN 00-106-5973 |
| As Required | Fastener, Tape, Pile, 1-Inch | MIL-F-21840 NIIN 00-106-5974 |
| As Required | Thread, Nylon, Size E | V-T-295 NIIN 00-204-3884 |
| As Required | Adhesive, Polychloroprene, Class 3 | MIL-A-5540 NIIN 00-515-2246 |

Notes: 1. Use of any type of camouflage material readily available is authorized for the fabrication of the removable camoflage cover.

**NOTE**

Ensure correct pattern size for helmet being covered.

1. Layout fabric, trace template onto material, and cut pattern.

**NOTE**

Placement of hook and pile tape securing tabs will vary depending on helmet configuration.

2. Assemble left and right cover center panel sections by machine stitching forming a 3/8-inch seam from forward edge to aft edge of cover.

3. Reverse fabric and top stitch the seam 1/4 inch from folded edge.

4. (HGU-85/P Only) Prepare 5 x 3 1/2-inch template from suitable durable material. Using top stitching as centerline for template placement, orient 5-inch template with length fore and aft and trace helmet plate cutout template on forward portion of assembled center section.

5. At helmet plate cutout, cut and fold excess fabric under and stitch 1/4 inch from edge around entire opening forming neat clean edge.

6. Using 3/8-inch seam, sew together darts marked AA and BB on right and left side panels of helmet cover. Top stitch outer surface of side panels over the 3/8-inch seam 1/4 inch from folded edge of side panel darts.

7. Attach right and left side panels to helmet cover center section using 3/8-inch seam. Top stitch 1/4 inch from folded edge of seam on outer fabric surface of each panel.

8. With visor lock knob and visor removed (on HGU-68/P only), position cover over helmet, mark location of visor locking guide front and rear centerline on outer surface of cover fabric, and mark portion of outer fabric to be modified to accommodate right and left upper visor tracks.

9. (HGU-68/P Only) Prepare a 6 1/4 x 2-inch template from suitably durable material and mark a front and rear centerline. On outer surface of cover, align visor locking guide cutout centerlines with centerlines marked in step 8 above and trace outline of visor locking guide cutout on forward portion of cover.

10. At visor locking guide cutout, cut and fold under excess fabric and stitch 1/4 inch from edge around entire opening forming neat clean edge.

11. Fold under 3/8-inch hem and stitch 1/4 inch from seam edge around entire helmet cover. Attach 1 x 1-inch hook fastener tape to inner surface of helmet cover at selected locations to ensure snug fit.

11A. On exterior of completed cover, sew a strobe light securing patch into place using dimensions from paragraph 4-57 as a guideline for positioning patch.

12. Refer to paragraph 4-57 and install 1 x 1-inch pile fastener tape on helmet shell exterior surface at locations corresponding to hook fastener locations on helmet cover.

**4-101. REPAIR OF HELMET SHELL.** To repair holes in helmet shell due to bayonet receiver repositioning, change or relocation of communications cables or removal of the boom microphone swivel assembly, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| As Required | Tape, Pressure Sensitive, Adhesive | PPP-T-60TY4CL1 NIIN 00-890-9874 |
| As Required | Adhesive, Epoxy, Two-part | MMM-A-1754 NIIN 00-738-6429 or equivalent |

1. Remove earcup assemblies from pile fastener on helmet shell interior and position clear of work area. Detach pile fastener material from interior surface of helmet shell assembly and fold clear of work area.

2. Prepare helmet shell exterior surface by removing reflective tape from area surrounding hole(s) to be filled. Lightly sand area around holes.

3. On the helmet shell interior surface, firmly apply pressure sensitive tape over hole(s) to be filled. Ensure tape adheres to inner surface of helmet shell, if required, use a second layer of tape to provide adequate backing during the filling procedure.

3A. Mix equal amounts of epoxy part A (resin) and part B (hardener), ensuring parts A and B blend into a smooth, uniform light gray color.

4. Using a putty knife or tongue depressor, fill holes completely with the epoxy mixture. Overfilling the holes slightly will compensate for settling as the mixture dries.

5. Allow mixture to dry for approximately four hours.

6. Sand away excess mixture from the helmet shell surface.

7. Remove masking tape from helmet shell interior.

**NOTE**

This procedure may also be used to fill in the boom microphone swivel mount hole on the helmet shell.

8. Reinstall bayonet receivers in accordance with paragraph 4-53.

9. Install reflective tape in accordance with paragraph 4-40.

10. Document in accordance with OPNAVINST 4790.2 Series.

**4-101A. REPAIR OF EDGEROLL.** To repair small (under 3-inch total length) tears, splits and rips to the edgeroll leather, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| As Required | Moleskin, Adhesive | NIIN 01-456-2000 |
| As Required | Thread, Nylon, Size “E” | V-T-295 NIIN 00-244-0609 |

**NOTE**

Tears, splits, and rips larger than the 3-inch limit shall be evaluated by the technician for determination of reparability. If leather is too brittle or otherwise deteriorated for repair procedures to be effective, replace the helmet shell.

1. Using size “E” nylon thread single, whip stitch or baseball stitch the raw edges of the torn, split or ripped edgeroll leather together. Secure stitching ends with a surgeon’s knot followed by a square knot.

2. Using pinking shears, cut a patch from the Moleskin material large enough to cover the damaged edgeroll area plus a 1/4-inch clearance.

3. Darken the upper surface of the Moleskin material with a black magic marker or equivalent to match the color of the edgeroll and allow to dry.

4. Remove covering over adhesive on Moleskin material and firmly press into position over the repaired area of the edgeroll.

5. Document repair in accordance with OPNAVINST 4790.2 Series.

# Section 4-6. Illustrated Parts Breakdown

## 4-102. GENERAL.

4-103. This section lists and illustrates the procurable parts of the Fixed Wing Aircraft Helmets.

4-104. The IPB is intended for use in the identification, procurement, storing, and issuing of replacement parts. Installation, operation, and maintenance of these helmets shall only be performed by authorized personnel utilizing the instructions set forth in the preceding sections.

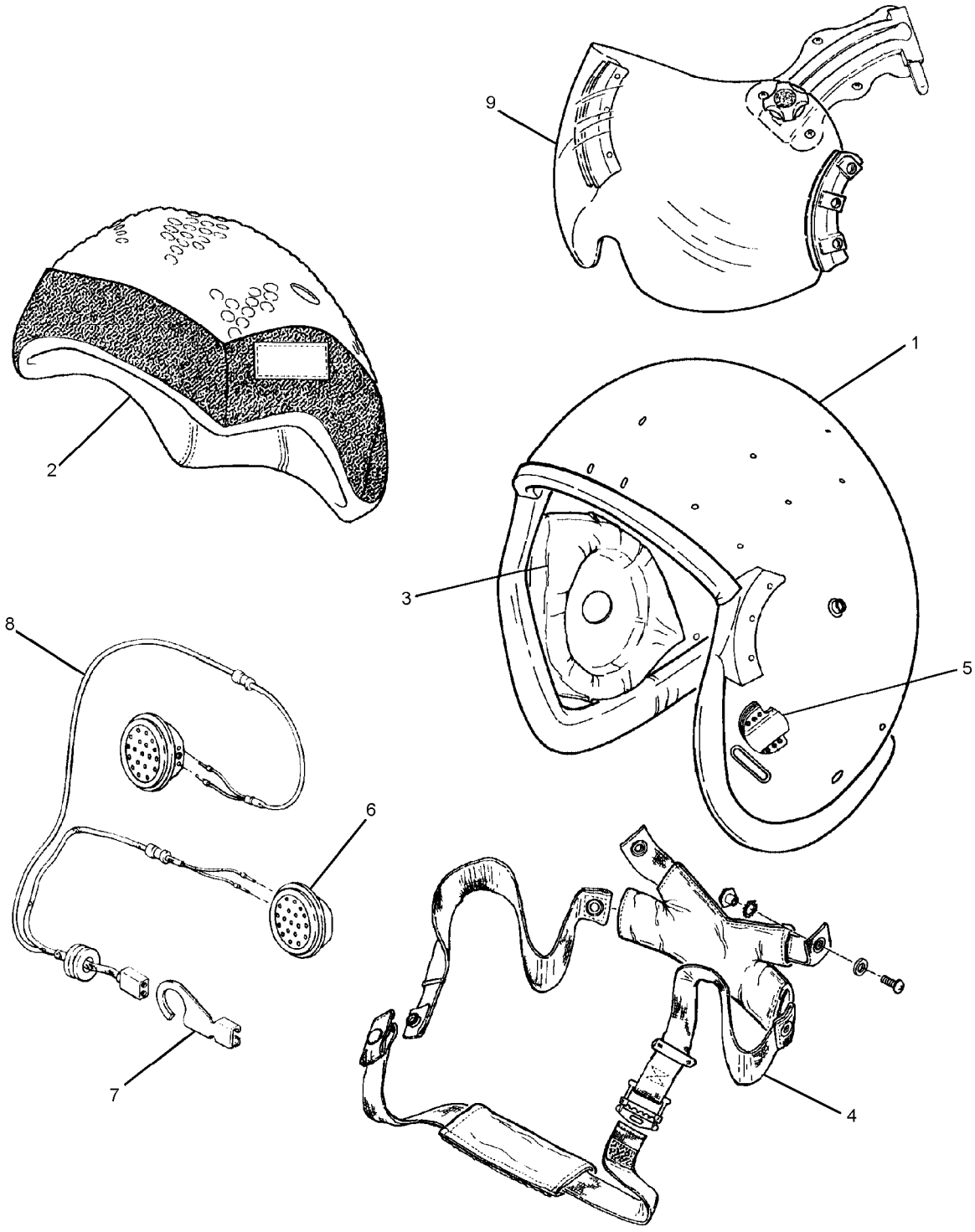
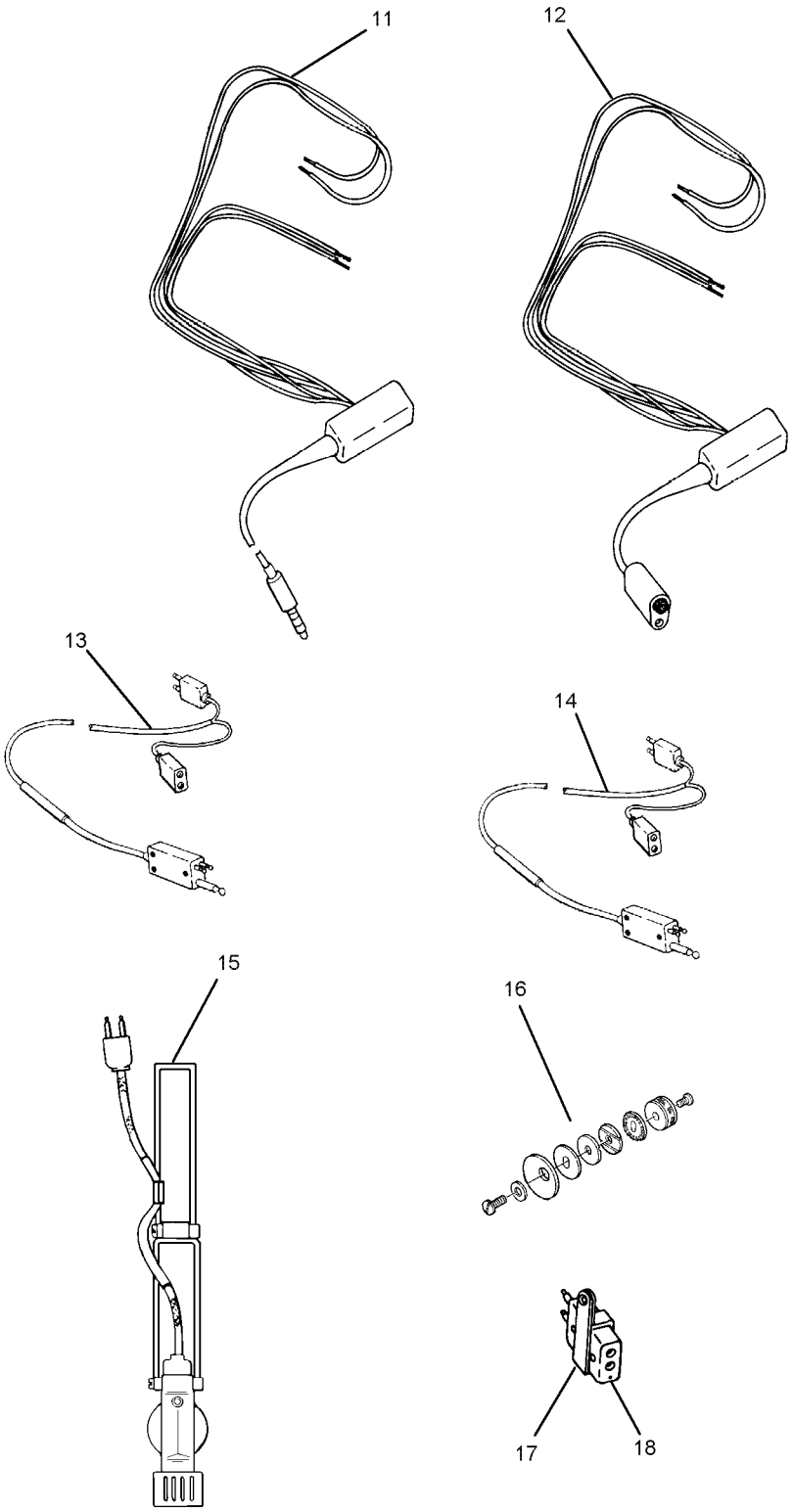



**Figure 4-2. HGU-68(V)/P Helmet Assembly (Sheet 1 of 2)**




4-2-2

**Figure 4-2. HGU-68(V)/P Helmet Assembly (Sheet 2 of 2)**

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-2 | 89D7981-1 | HGU-68(V)/P HELMET ASSEMBLY, Medium . . . . . | 1 | A |
| | 89D7981-2 | HGU-68(V)/P HELMET ASSEMBLY, Large . . . . . | 1 | B |
| | 89D7981-3 | HGU-68(V)/P HELMET ASSEMBLY, Extra-Large . . . | 1 | C |
| -1 | 90A8045-1 | . PRU-55/P HELMET SHELL ASSEMBLY, . . . . . Medium (97427) (See figure 4-6 for breakdown) | 1 | A |
| | 90A8045-2 | . PRU-55/P HELMET SHELL ASSEMBLY, . . . . . Large (97427) (See figure 4-6 for breakdown) | 1 | B |
| | 90A8045-3 | . PRU-55/P HELMET SHELL ASSEMBLY, . . . . . Extra-Large (97427) (See figure 4-6 for breakdown) | 1 | C |
| -2 | 85D7087-1P | . PRU-52/P THERMOPLASTIC LINER . . . . . (TPL) ASSEMBLY, Medium (97427) (See figure 4-10 for breakdown) | 1 | A |
| | 85D7087-2P | . PRU-52/P THERMOPLASTIC LINER . . . . . (TPL) ASSEMBLY, Large (97427) (See figure 4-10 for breakdown) | 1 | B |
| | 85D7087-3P | . PRU-52/P THERMOPLASTIC LINER . . . . . (TPL) ASSEMBLY, Extra-Large (97427) (See figure 4-10 for breakdown) | 1 | C |
| -3 | 89C7735-1 | . EARCUP ASSEMBLY (97427) (See . . . . . figure 4-7 for breakdown) | 1 | |
| -4 | 90D7916-4 | . PRU-53/P CHIN/NAPE STRAP ASSEMBLY, . . . . . Medium (97427) (See figure 4-8 for breakdown) | 1 | A |
| | 90D7916-5 | . PRU-53/P CHIN/NAPE STRAP ASSEMBLY, . . . . . Large (97427) (See figure 4-8 for breakdown) | 1 | B |
| | 90D7916-6 | . PRU-53/P CHIN/NAPE STRAP ASSEMBLY, . . . . . Extra-Large (97427) (See figure 4-8 for breakdown) | 1 | C |
| -5 | 93A8514 | . BAYONET RECEIVER ASSEMBLY (97427) . . . . | 1 | |
| -6 | H-87B/U | . EARPHONE . . . . . | 2 | |
| -7 | 7136032 | . MK-634/AIC CABLE CLIP . . . . . | 1 | |
| -8 | M22442/37-4708 | . COMMUNICATION CABLE, . . . . . CX-4708A/AIC (80063) (USE UNTIL EXHAUSTED) | 1 | |
| | 89B7742 | . COMMUNICATION CABLE, . . . . . CX-4708A/AIC (MOD) (97427) (Alt for CX-4708A/AIC) | 1 | |
| -9 | 88B7586-2 | . EEU-7/P HELMET VISOR ASSEMBLY, . . . . . Clear and neutral (97427) (See figure 4-9 for breakdown) | 1 | |

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-2-10 | Deleted | | | |
| -11 | M22442/19-1 | COMMUNICATION CABLE ASSEMBLY, . . . . . CX-12972/AR (Note 1) | 1 | |
| -12 | M22442/15-1 | COMMUNICATION CABLE ASSEMBLY, . . . . . CX-4832A/AR (Note 1) | 1 | |
| -13 | M22442/30-1 | COMMUNICATION CORDSET, . . . . . CX-13155/A (Note 1) | 1 | |
| -14 | M22442/30-2 | COMMUNICATION CORDSET, . . . . . CX-13164/A (Note 1) | 1 | |
| -15 | M26542/2 | BOOM MICROPHONE ASSEMBLY, M-87/AIC . . . . (Note 1) | 1 | |
| | M26542/2-01 | BOOM MICROPHONE ASSEMBLY, M-87/AIC . . . . (supplied with 13 inch CX-4434/U cord) (Note 1) | 1 | |
| | M26542/2-02 | BOOM MICROPHONE ASSEMBLY, M-87/AIC . . . . (supplied with 16 inch CX-4434/U cord) (Note 1) | 1 | |
| | M26542/2-03 | BOOM MICROPHONE ASSEMBLY, M-87/AIC . . . . (supplied with 23 inch CX-4434/U cord) (Note 1) | 1 | |
| -16 | 765AS300-1 | SWIVEL ASSEMBLY, Boom Microphone (Note 1) . | 1 | |
| -17 | 80B4881 | AMPLIFIER MOUNTING BRACKET (Note 1) . . . . . | 1 | |
| -18 | 765AS284-1 | AMPLIFIER, M23595/1-2 (AM-3597C/A) (Note 1) . . | 1 | |
| | Notes: 1. Must be procured separately if required for helmet configuration. | | | |

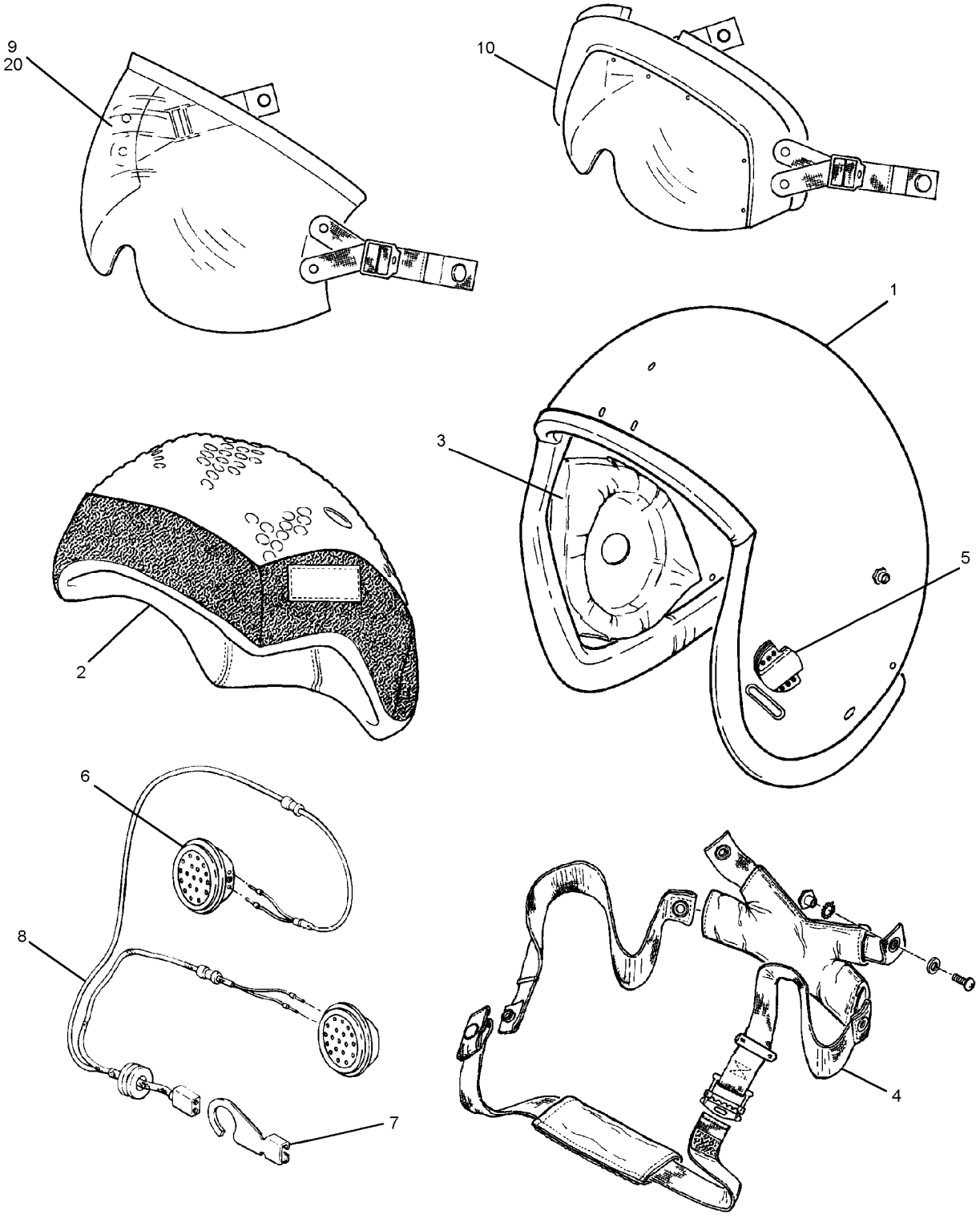
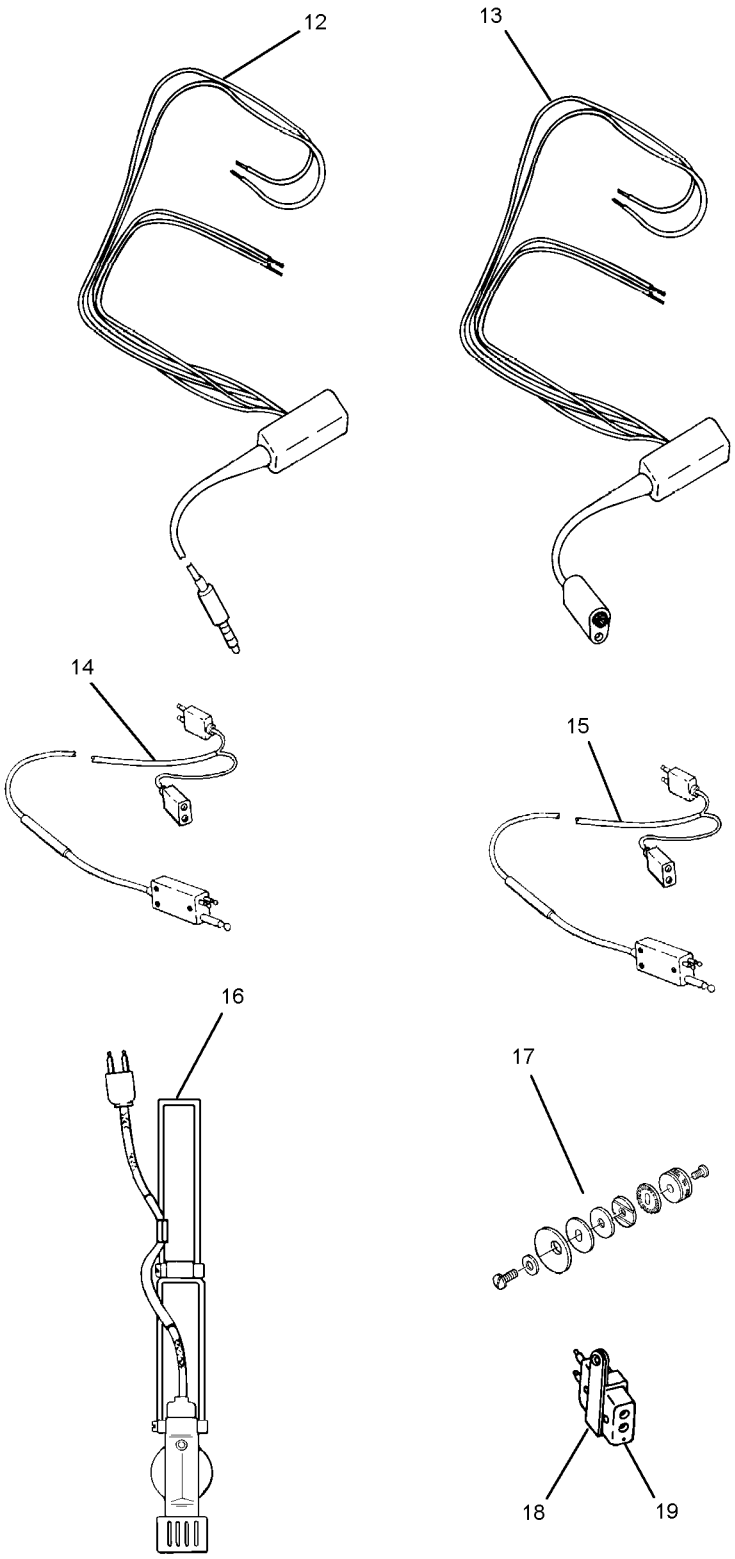



**Figure 4-3. HGU-85(V)/P Helmet Assembly (Sheet 1 of 2)**




4-3-2

**Figure 4-3. HGU-85(V)/P Helmet Assembly (Sheet 2 of 2)**

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-3 | 89D7981-7 | HGU-85(V)/P HELMET ASSY, Medium | 1 | A |
| | 89D7981-8 | HGU-85(V)/P HELMET ASSY, Large | 1 | B |
| | 89D7981-9 | HGU-85(V)/P HELMET ASSY, Extra-Large | 1 | C |
| -1 | 90A8045-7 | . PRU-58/P HELMET SHELL ASSY, Medium (97427) | 1 | A |
| | 90A8045-8 | . PRU-58/P HELMET SHELL ASSY, Large (97427) | 1 | B |
| | 90A8045-9 | . PRU-58/P HELMET SHELL ASSY, Extra-Large (97427) | 1 | C |
| -2 | 85D7087-1P | . PRU-52/P THERMOPLASTIC LINER (TPL) ASSY, Medium (97427) (See figure 4-10 for breakdown) | 1 | A |
| | 85D7087-2P | . PRU-52/P THERMOPLASTIC LINER (TPL) ASSY, Large (97427) (See figure 4-10 for breakdown) | 1 | B |
| | 85D7087-3P | . PRU-52/P THERMOPLASTIC LINER (TPL) ASSY, Extra-Large (97427) (See figure 4-10 for breakdown) | 1 | C |
| -3 | 89C7735-1 | . EARCUP ASSY (97427) (See figure 4-7 for breakdown) | 1 | |
| -4 | 90D7916-4 | . PRU-53/P CHIN/NAPE STRAP ASSY, Medium (97427) (See figure 4-8 for breakdown) | 1 | A |
| | 90D7916-5 | . PRU-53/P CHIN/NAPE STRAP ASSY, Large (97427) (See figure 4-8 for breakdown) | 1 | B |
| | 90D7916-6 | . PRU-53/P CHIN/NAPE STRAP ASSY, Extra-Large (97427) (See figure 4-8 for breakdown) | 1 | C |
| -5 | 93A8514 | . BAYONET RECEIVER ASSEMBLY (97427) | 1 | |
| -6 | H-87B/U | . EARPHONE | 2 | |
| -7 | 7136032 | . MK-634/AIC CABLE CLIP | 1 | |
| -8 | M22442/37-4708 | . COMMUNICATION CABLE, CX-4708A/AIC (80063) (USE UNTIL EXHAUSTED) | 1 | |
| | 89B7742 | . COMMUNICATION CABLE, CX-4708A/AIC (MOD) (97427) (Alt for CX-4708A/AIC) | 1 | |
| -9 | 81D5189-3 | . VISOR, Clear (97427) (MBU-12/P Trim) | 1 | |
| | 81D5189-4 | . VISOR, Neutral (97427) (MBU-12/P Trim) | 1 | |
| -10 | 88C7538-1 | . SAFETY VISOR, Stepped in, medium (Note 1) | 1 | A |
| | 88C7538-2 | . SAFETY VISOR, Stepped out, medium (Note 1) | 1 | A |
| | 88C7538-3 | . SAFETY VISOR, Stepped in, large (Note 1) | 1 | B |
| | 88C7538-4 | . SAFETY VISOR, Stepped out, large (Note 1) | 1 | B |
| | 88C7538-5 | . SAFETY VISOR, Stepped in, extra-large (Note 1) | 1 | C |
| | 88C7538-6 | . SAFETY VISOR, Stepped out, extra-large (Note 1) | 1 | C |

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-3-11 | Deleted | | | |
| -12 | M22442/19-1 | COMMUNICATION CABLE ASSEMBLY, . . . . . CX-12972/AR (Note 2) | 1 | |
| -13 | M22442/15-1 | COMMUNICATION CABLE ASSEMBLY, . . . . . CX-4832A/AR (Note 2) | 1 | |
| -14 | M22442/30-1 | COMMUNICATION CORDSET, . . . . . CX-13155/A (Note 2) | 1 | |
| -15 | M22442/30-2 | COMMUNICATION CORDSET, . . . . . CX-13164/A (Note 2) | 1 | |
| -16 | M26542/2 | BOOM MICROPHONE ASSEMBLY, M-87/AIC . . . . (Note 2) | 1 | |
| | M26542/2-01 | BOOM MICROPHONE ASSEMBLY, M-87/AIC . . . . (supplied with 13 inch CX-4434/U cord) (Note 2) | 1 | |
| | M26542/2-02 | BOOM MICROPHONE ASSEMBLY, M-87/AIC . . . . (supplied with 16 inch CX-4434/U cord) (Note 2) | 1 | |
| | M26542/2-03 | BOOM MICROPHONE ASSEMBLY, M-87/AIC . . . . (supplied with 23 inch CX-4434/U cord) (Note 2) | 1 | |
| -17 | 765AS300-1 | SWIVEL ASSEMBLY, Boom Microphone . . . . . (Note 2) | 1 | |
| -18 | 80B4881 | AMPLIFIER MOUNTING BRACKET (Note 2) . . . . . | 1 | |
| -19 | 765AS284-1 | AMPLIFIER, M23595/1-2 (AM-3597C/A) . . . . . (Note 2) | 1 | |
| -20 | 80D5189-11 | VISOR, Gradient Lens (MBU-12/P Trim) . . . . . (Note 3) | 1 | |
| | GW9750 | VISOR, Neodymium Laser Eye Protective . . . . . (MBU-12/P Trim) (Note 3) | 1 | |
| | 85D7139-6 | VISOR, Amber Lens (MBU-12/P Trim) . . . . . (Note 3) | 1 | |
| | 89D7697-1 | VISOR, Clear Lens (MBU-23/P-24/P Trim) . . . . . | 1 | |
| | 89D7697-2 | VISOR, Neutral Lens (MBU-23/P-24/P Trim) . . . . . | 1 | |
| | GW9142-06 | VISOR, Neodymium Laser Eye Protective . . . . . (MBU-23/P-24/P Trim) (Note 3) | 1 | |
| | 92A8058-2 | VISOR, Gradient Lens (MBU-23/P-24/P Trim) . . . . . (Note 3) | 1 | |
| | 92A8058-5 | VISOR, Amber Lens (MBU-23/P-24/P Trim) . . . . . (Note 3) | 1 | |
| | GW9652-01 | SAFETY VISOR, Reduced Profile, Stepped-In, . . . . . Clear, Medium (MBU-23/P-24/P Trim) (Note 3) | 1 | |
| | GW9652-03 | SAFETY VISOR, Reduced Profile, Stepped-In, . . . . . Clear, Large/Extra-Large (MBU-23/P-24/P Trim) (Note 3) | 1 | |
| | GW9652-05 | VISOR, Neodymium, Reduced Profile, Stepped-In, . . . Medium (MBU-23/P-24/P Trim) (Note 3) | 1 | |
| | GW9652-07 | VISOR, Neodymium, Reduced Profile, Stepped-In, . . . Large/Extra-Large (MBU-23/P-24/P Trim) (Note 3) | 1 | |

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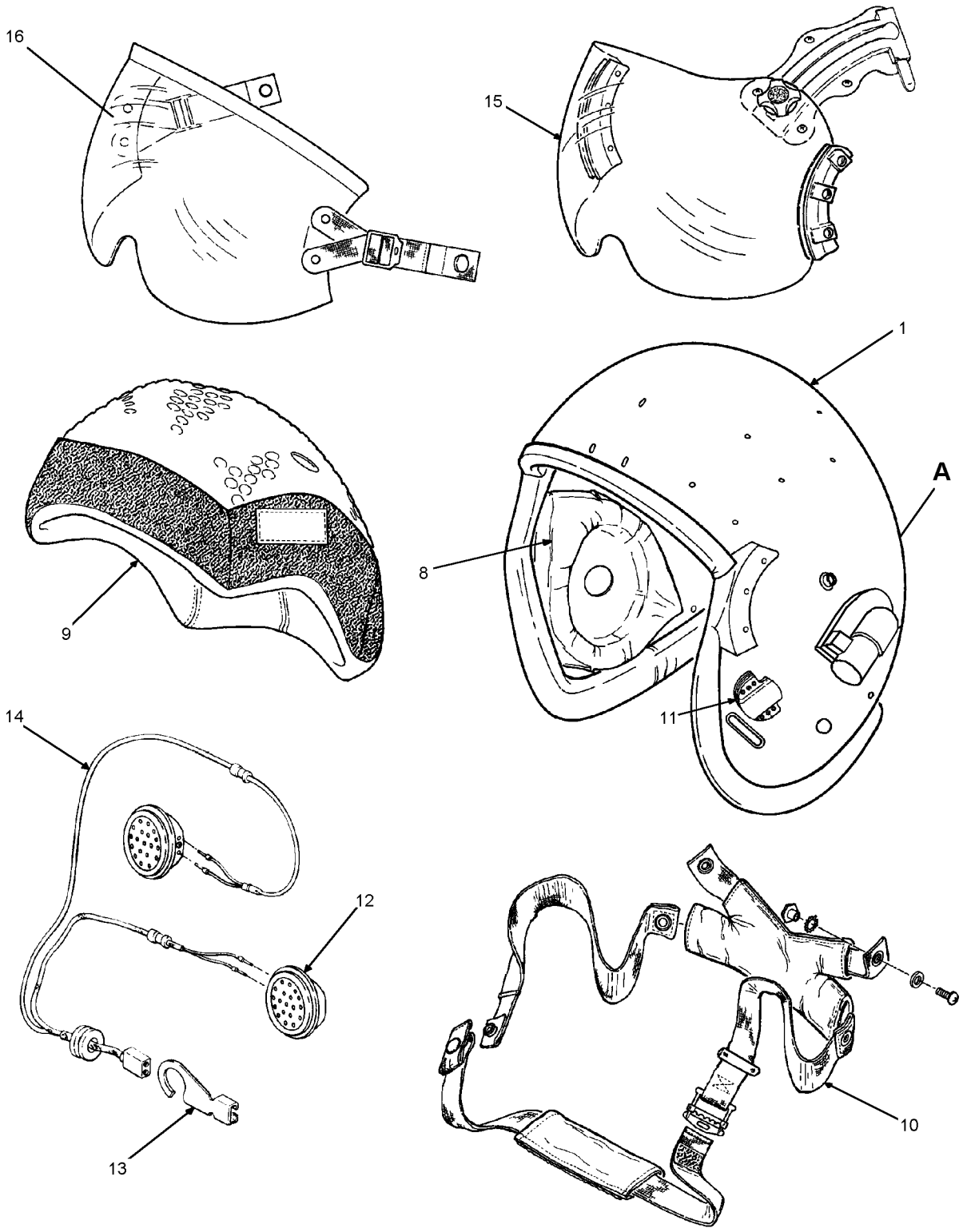
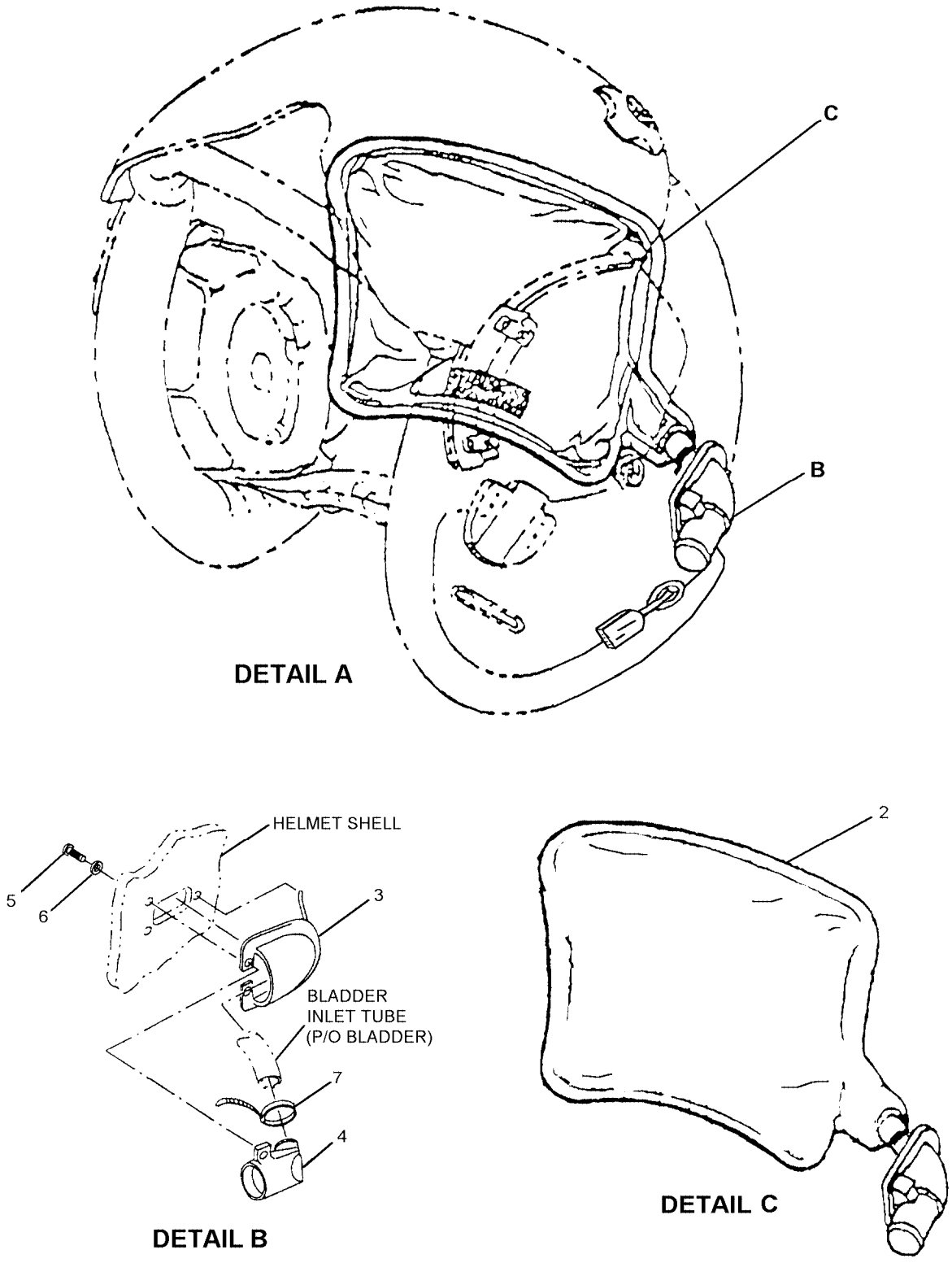
| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-3-20 (cont) | GW9651-01 | SAFETY VISOR, Reduced Profile, Stepped-In, . . . . . Medium (MBU-12/P Trim) (Note 3) | 1 | |
| | GW9651-03 | SAFETY VISOR, Reduced Profile, Stepped-In, . . . . . Large (MBU-12/P Trim) (Note 3) | 1 | |
| | GW9651-05 | SAFETY VISOR, Reduced Profile, Stepped-In, . . . . . Extra-Large (MBU-12/P Trim) (Note 3) | 1 | |
| | GW9651-09 | VISOR, Neodymium, Reduced Profile, Stepped-In, . . . Medium (MBU-12/P Trim) (Note 3) | 1 | |
| | GW9651-11 | VISOR, Neodymium, Reduced Profile, Stepped-In, . . . Large (MBU-12/P Trim) (Note 3) | 1 | |
| | GW9651-13 | VISOR, Neodymium, Reduced Profile, Stepped-In, . . . Extra-Large (MBU-12/P Trim) (Note 3) | 1 | |
| | Notes: 1. Part Numbers 88C7538-1 through 88C7538-6 are authorized for use with the AN/AVS-9 NVIIS.<br>2. Must be procured separately if required for helmet configuration.<br>3. Special purpose visors with reference numbers beginning with GW, are commercially available from Gentex Western Operations, Rancho Cucamonga, CA., 91730 Telephone (909) 481-7667 (at menu prompt, choose USN MBU-23/P Order Desk). All other special purpose visors are commercially available from Gentex Corporation, Carbondale PA, 18470 Telephone (570) 282-8505. | | |




4-4-1

**Figure 4-4. HGU-87(V)/P22P-16 Aircrew Protective Helmet (Sheet 1 of 2)**




4-4-2

**Figure 4-4. HGU-87(V)/P22P-16 Aircrew Protective Helmet (Sheet 2 of 2)**

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-4 | 95B9088-1 | HGU-87(V)/P22P-16 PROTECTIVE HELMET ASSEMBLY, Medium | REF | A |
| | 95B9088-2 | HGU-87(V)/P22P-16 PROTECTIVE HELMET ASSEMBLY, Large | REF | B |
| | 95B9088-3 | HGU-87(V)/P22P-16 PROTECTIVE HELMET ASSEMBLY, Extra-Large | REF | C |
| -1 | 90A8045-1 | . PRU-55/P HELMET SHELL ASSEMBLY Medium (97427) | 1 | A |
| | 90A8045-2 | . PRU-55/P HELMET SHELL ASSEMBLY Large (97427) | 1 | B |
| | 90A8045-3 | . PRU-55/P HELMET SHELL ASSEMBLY Extra-Large (97427) (See figure 4-6 for breakdown) | 1 | C |
| -2 | 93C8611-1 | . KMU-561/P22P-16 BLADDER ASSEMBLY | 1 | |
| -3 | 89C7667-1 | . COVER, Connector, Bladder inlet | 1 | |
| -4 | 92B8414-1 | . CONNECTOR, Bladder inlet<br>(ATTACHING PARTS) | 1<br>1 | |
| -5 | MS51957-14B | . SCREW, Panhead | 2 | |
| -6 | MS35333-70 | . WASHER, Lock<br>---*--- | 2<br>1 | |
| -7 | MS3367-4-0 | . STRAP, Tiedown | 1 | |
| -8 | 89C7735-1 | . EARCUP ASSEMBLY (See figure 4-7 for breakdown) | 1 | |
| -9 | 85D7087-1P | . PRU-52/P THERMOPLASTIC LINER (TPL) ASSEMBLY, Medium (97427) | 1 | A |
| | 85D7087-2P | . PRU-52/P THERMOPLASTIC LINER (TPL) ASSEMBLY, Large (97427) | 1 | B |
| | 85D7087-3P | . PRU-52/P THERMOPLASTIC LINER (TPL) ASSEMBLY, Extra-Large (97427) (See figure 4-10 for breakdown) | 1 | C |
| -10 | 90D7916-4 | . PRU-53/P CHIN/NAPE STRAP ASSEMBLY, Medium (97427) | 1 | A |
| | 90D7916-5 | . PRU-53/P CHIN/NAPE STRAP ASSEMBLY, Large (97427) | 1 | B |
| | 90D7916-6 | . PRU-53/P CHIN/NAPE STRAP ASSEMBLY, Extra-Large (97427) (See figure 4-8 for breakdown) | 1 | C |
| -11 | 93A8514 | . BAYONET RECEIVER ASSEMBLY (97427) | 1 | |
| -12 | H-87B/U | . EARPHONE | 2 | |
| -13 | 7136032 | . MK-634/AIC CABLE CLIP | 1 | |
| -14 | M22442/37-4708 | . COMMUNICATIONS CABLE, CX-4708A/AIC (Mod) (97427) | 1 | |
| -15 | 88B7586-2 | . EEU-7/P HELMET VISOR ASSEMBLY, Clear and Neutral (97427) (See figure 4-9 for breakdown) | 1 | |

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-4-16 | 89D7697-1 | VISOR, Clear Lens (MBU-23/P-24/P Trim) . . . . . (Note 1) | 1 | |
| | 89D7697-2 | VISOR, Neutral Lens (MBU-23/P-24/P Trim) . . . . . (Note 1) | 1 | |
| | GW9142-06 | VISOR, Neodymium Laser Eye Protective . . . . . (MBU-23/P-24/P Trim) (Note 2) | 1 | |
| | 92A8058-2 | VISOR, Gradient Lens (MBU-23/P-24/P Trim) . . . . . (Note 2) | 1 | |
| | 92A8058-5 | VISOR, Amber Lens (MBU-23/P-24/P Trim) . . . . . (Note 2) | 1 | |
| | GW9652-01 | SAFETY VISOR, Reduced Profile, Stepped-In, . . . . . Clear, Medium (MBU-23/P-24/P Trim) (Note 2) | 1 | |
| | GW9652-03 | SAFETY VISOR, Reduced Profile, Stepped-In, . . . . . Clear, Large/Extra-Large (MBU-23/P-24/P Trim) (Note 2) | 1 | |
| | GW9652-05 | VISOR, Neodymium, Reduced Profile, Stepped-In, . . . . Medium (MBU-23/P-24/P Trim) (Note 2) | 1 | |
| | GW9652-07 | VISOR, Neodymium, Reduced Profile, Stepped-In, . . . . Large/Extra-Large (MBU-23/P-24/P Trim) (Note 2) | 1 | |
| | Notes: 1. Visors 89D7697-1 and -2 are available through the supply system.<br>2. Special purpose visors with reference numbers beginning with GW, are commercially available from Gentex Western Operations, Rancho Cucamonga, CA., 91730 Telephone (909) 481-7667 (at menu prompt, choose USN MBU-23/P Order Desk). All other special purpose visors are commercially available from Gentex Corporation, Carbondale PA, 18470 Telephone (570) 282-8505. | | | |

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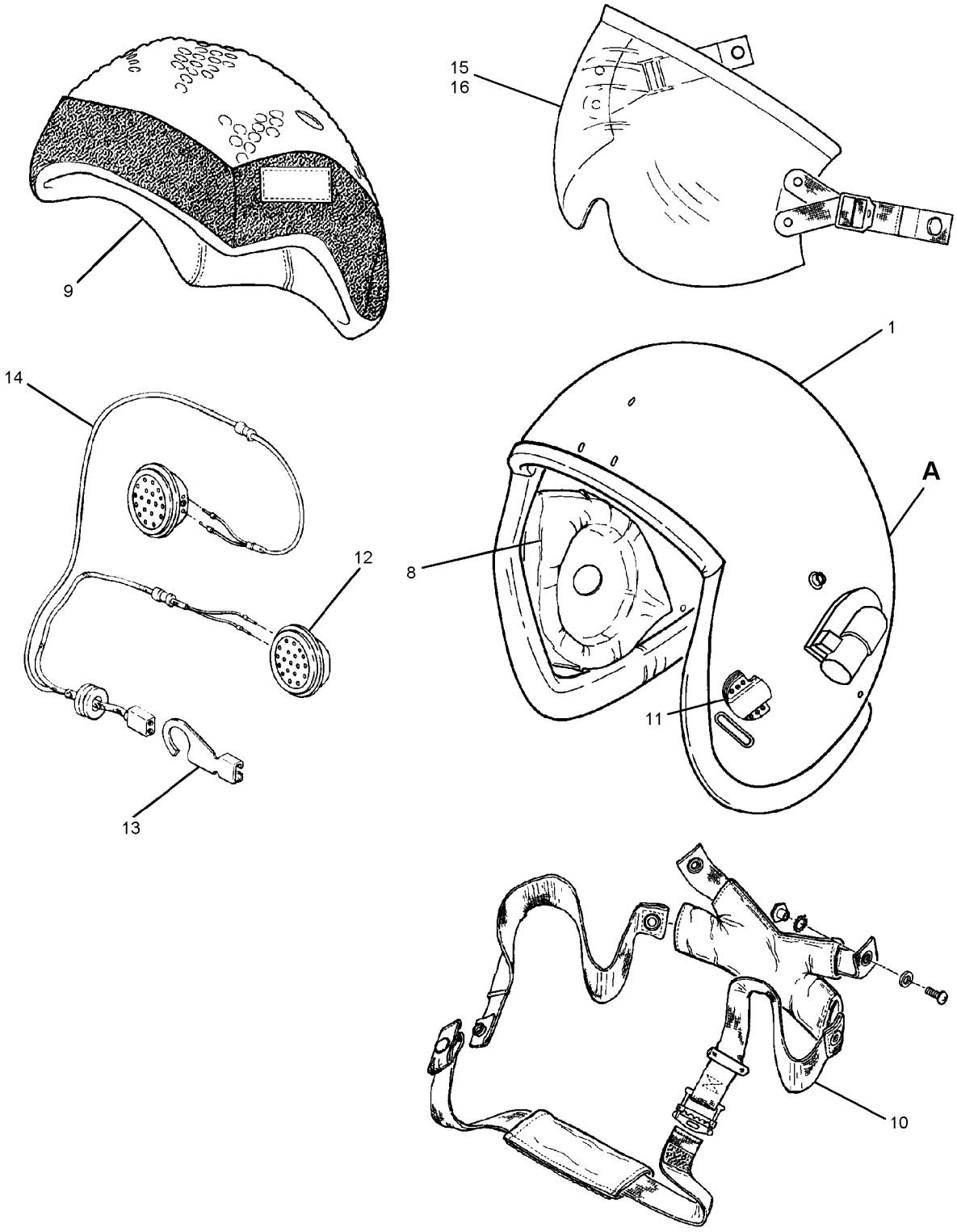
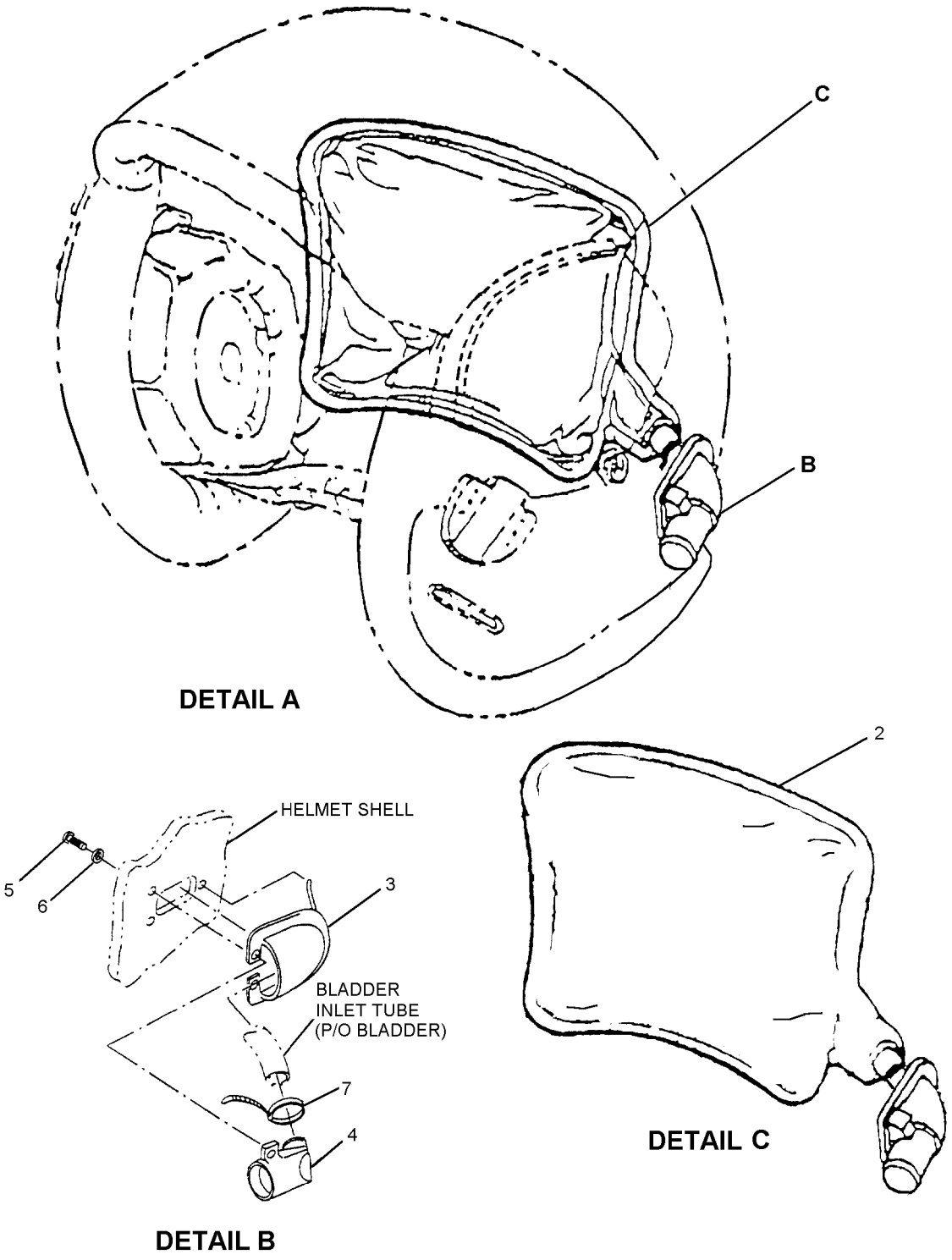



4-5-1

**Figure 4-5. HGU-89/P22P-16 Aircrew Protective Helmet (Sheet 1 of 2)**




4-5-2

**Figure 4-5. HGU-89/P22P-16 Aircrew Protective Helmet (Sheet 2 of 2)**

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-5 | 95B9088-7 | HGU-89/P22P-16 PROTECTIVE HELMET . . . . . ASSEMBLY, Medium | REF | A |
| | 95B9088-8 | HGU-89/P22P-16 PROTECTIVE HELMET . . . . . ASSEMBLY, Large | REF | B |
| | 95B9088-9 | HGU-89/P22P-16 PROTECTIVE HELMET . . . . . ASSEMBLY, Extra-Large | REF | C |
| -1 | 90A8045-7 | . PRU-58/P HELMET SHELL ASSEMBLY . . . . . Medium (97427) | 1 | A |
| | 90A8045-8 | . PRU-58/P HELMET SHELL ASSEMBLY . . . . . Large (97427) | 1 | B |
| | 90A8045-9 | . PRU-58/P HELMET SHELL ASSEMBLY . . . . . Extra-Large (97427) | 1 | C |

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| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-5-2 | 93C8611-1 | . KMU-561/P22P-16 BLADDER ASSEMBLY . . . . . | 1 | |
| -3 | 89C7667-1 | . COVER, Connector, Bladder inlet . . . . . | 1 | |
| -4 | 92B8414-1 | . CONNECTOR, Bladder inlet . . . . . | 1 | |
| | | (ATTACHING PARTS) | 1 | |
| -5 | MS51957-14B | . SCREW, Panhead . . . . . | 2 | |
| -6 | MS35333-70 | . WASHER, Lock . . . . . | 2 | |
| | | ---*--- | 1 | |
| -7 | MS3367-4-0 | . STRAP, Tiedown . . . . . | 1 | |
| -8 | 89C7735-1 | . EARCUP ASSEMBLY (See figure 4-7 . . . . . for breakdown) | 1 | |
| -9 | 85D7087-1P | . PRU-52/P THERMOPLASTIC LINER (TPL) . . . . . ASSEMBLY, Medium (97427) | 1 | A |
| | 85D7087-2P | . PRU-52/P THERMOPLASTIC LINER (TPL) . . . . . ASSEMBLY, Large (97427) | 1 | B |
| | 85D7087-3P | . PRU-52/P THERMOPLASTIC LINER (TPL) . . . . . ASSEMBLY, Extra-Large (97427) (See figure 4-10 for breakdown) | 1 | C |
| -10 | 90D7916-4 | . PRU-53/P CHIN/NAPE STRAP ASSEMBLY, . . . . . Medium (97427) | 1 | A |
| | 90D7916-5 | . PRU-53/P CHIN/NAPE STRAP ASSEMBLY, . . . . . Large (97427) | 1 | B |
| | 90D7916-6 | . PRU-53/P CHIN/NAPE STRAP ASSEMBLY, . . . . . Extra-Large (97427) (See figure 4-8 for breakdown) | 1 | C |
| -11 | 93A8514 | . BAYONET RECEIVER ASSEMBLY (97427) . . . . . | 1 | |
| -12 | H-87B/U | . EARPHONE . . . . . | 2 | |
| -13 | 7136032 | . MK-634/AIC CABLE CLIP . . . . . | 1 | |
| -14 | M22442/37-4708 | . COMMUNICATIONS CABLE, . . . . . CX-4708A/AIC (Mod) (97427) | 1 | |
| -15 | 89D7697-1 | . VISOR, Clear Lens (MBU-23/P-24/P Trim) . . . . . | 1 | |
| | 89D7697-2 | . VISOR, Neutral Lens (MBU-23/P-24/P Trim) . . . . . | 1 | |
| -16 | GW9142-06 | VISOR, Neodymium Laser Eye Protective . . . . . (MBU-23/P-24/P Trim) (Note 1) | 1 | |
| | 92A8058-2 | VISOR, Gradient Lens (MBU-23/P-24/P Trim) (Note 1) . . | 1 | |
| | 92A8058-5 | VISOR, Amber Lens (MBU-23/P-24/P Trim) (Note 1) . . | 1 | |
| | GW9652-01 | SAFETY VISOR, Reduced Profile, Stepped-In, . . . . . Clear, Medium (MBU-23/P-24/P Trim) (Note 1) | 1 | |
| | GW9652-03 | SAFETY VISOR, Reduced Profile, Stepped-In, . . . . . Clear, Large/Extra-Large (MBU-23/P-24/P Trim) (Note 1) | 1 | |
| | GW9652-05 | VISOR, Neodymium, Reduced Profile, Stepped-In, . . . . Medium (MBU-23/P-24/P Trim) (Note 1) | 1 | |
| | GW9652-07 | VISOR, Neodymium, Reduced Profile, Stepped-In, . . . . Large/Extra-Large (MBU-23/P-24/P Trim) (Note 1) | 1 | |
| | | Notes: 1. Special purpose visors with reference numbers beginning with GW, are commercially available from Gentex Western Operations, Rancho Cucamonga, CA., 91730 Telephone (909) 481-7667 (at menu prompt, choose USN MBU-23/P Order Desk). All other special purpose visors are commercially available from Gentex Corporation, Carbondale PA, 18470 Telephone (570) 282-8505. | | |

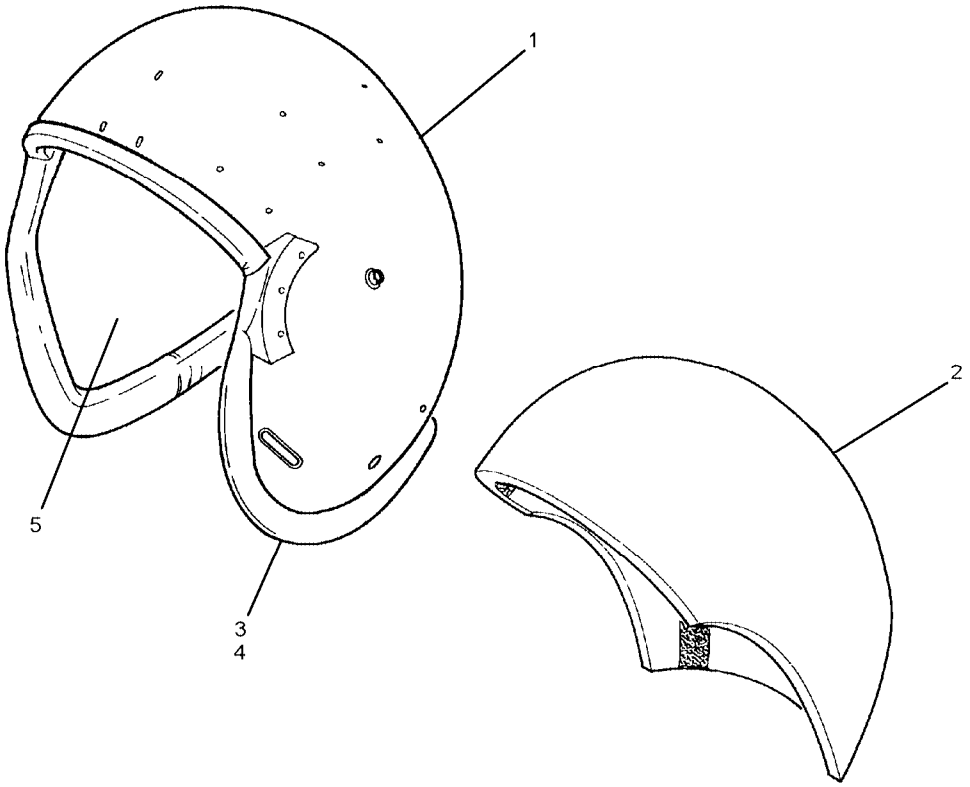



**Figure 4-6. PRU-55/P Helmet Shell Assembly**

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-6 | 90A8045-1 | PRU-55/P HELMET SHELL ASSEMBLY, . . . . . Medium (97427) | 1 | A |
| | 90A8045-2 | PRU-55/P HELMET SHELL ASSEMBLY, . . . . . Large (97427) | 1 | B |
| | 90A8045-3 | PRU-55/P HELMET SHELL ASSEMBLY, . . . . . Extra-Large (97427) | 1 | C |
| -1 | 90D7997-1 | . HELMET SHELL, Medium, Single Visor . . . . . | 1 | A |
| | 90D7998-1 | . HELMET SHELL, Large, Single Visor . . . . . | 1 | B |
| | 90D7999-1 | . HELMET SHELL, Extra-Large, Single Visor . . . . . | 1 | C |
| -2 | 90C8006-1 | . ENERGY ABSORBING LINER, Medium . . . . . | 1 | A |
| | 90C8006-2 | . ENERGY ABSORBING LINER, Large . . . . . | 1 | B |
| | 90C8006-3 | . ENERGY ABSORBING LINER, Extra-Large . . . . . | 1 | C |
| -3 | 83C6628-1 | . EDGEROLL CORE . . . . . | 1 | |
| -4 | 90D7967M | . EDGEROLL LEATHER SET, Medium, Black . . . . . | 1 | A |
| | 90D7967L | . EDGEROLL LEATHER SET, Large, Black . . . . . | 1 | B |
| | 90D7967XL | . EDGEROLL LEATHER SET, Extra-Large, Black . . | 1 | C |
| -5 | 90C7968M | . EARSHELL PILE FASTENER SET, Medium . . . . . | 1 | A |
| | 90C7968L | . EARSHELL PILE FASTENER SET, Large . . . . . | 1 | B |
| | 90C7968XL | . EARSHELL PILE FASTENER SET, Extra-Large . . . | 1 | C |

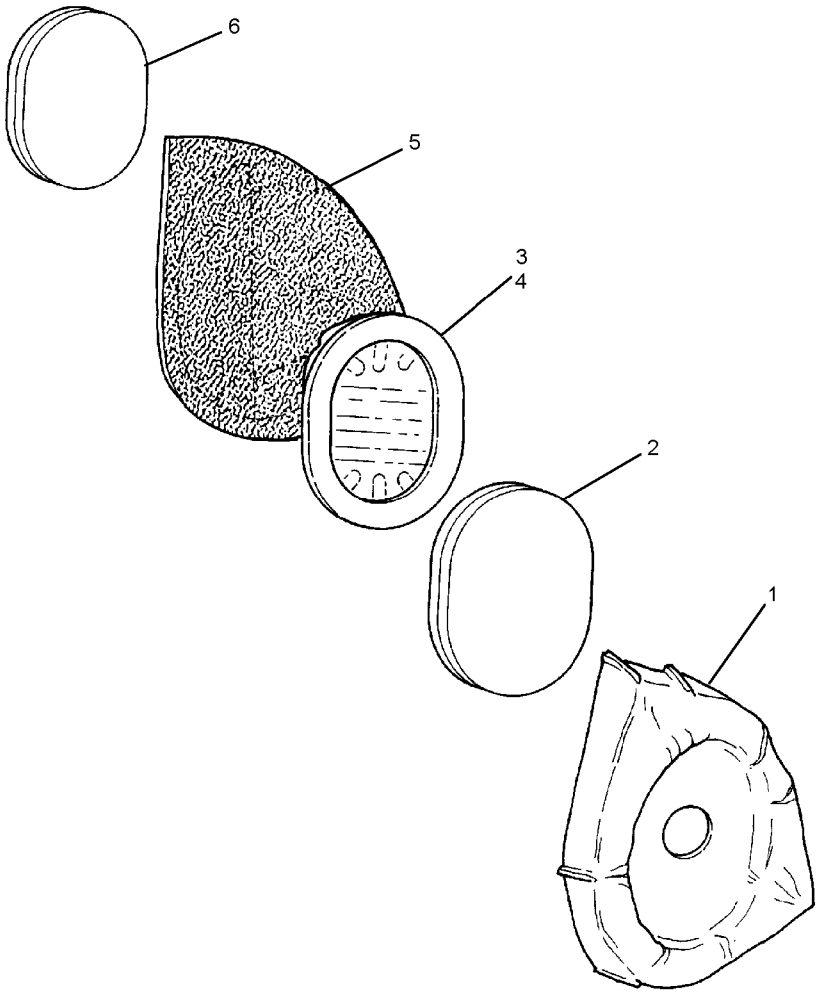
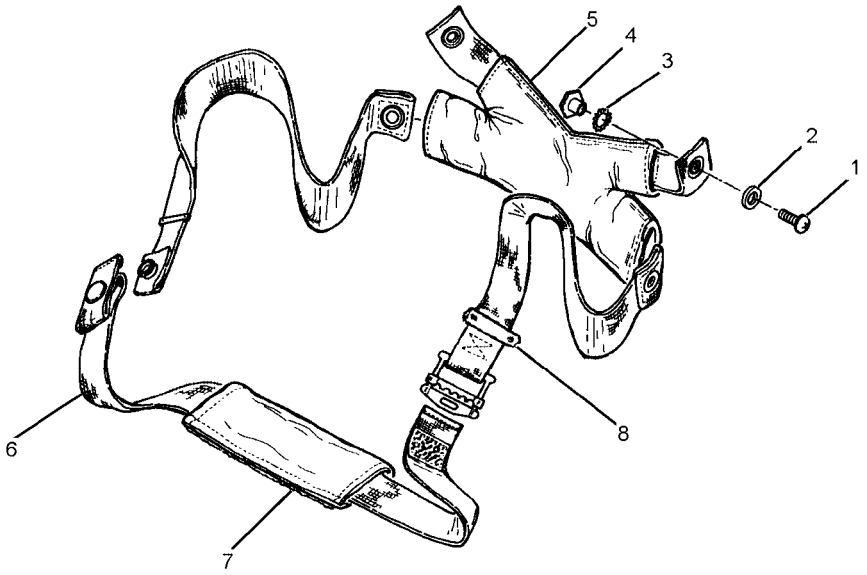



**Figure 4-7. Earcup Assembly**

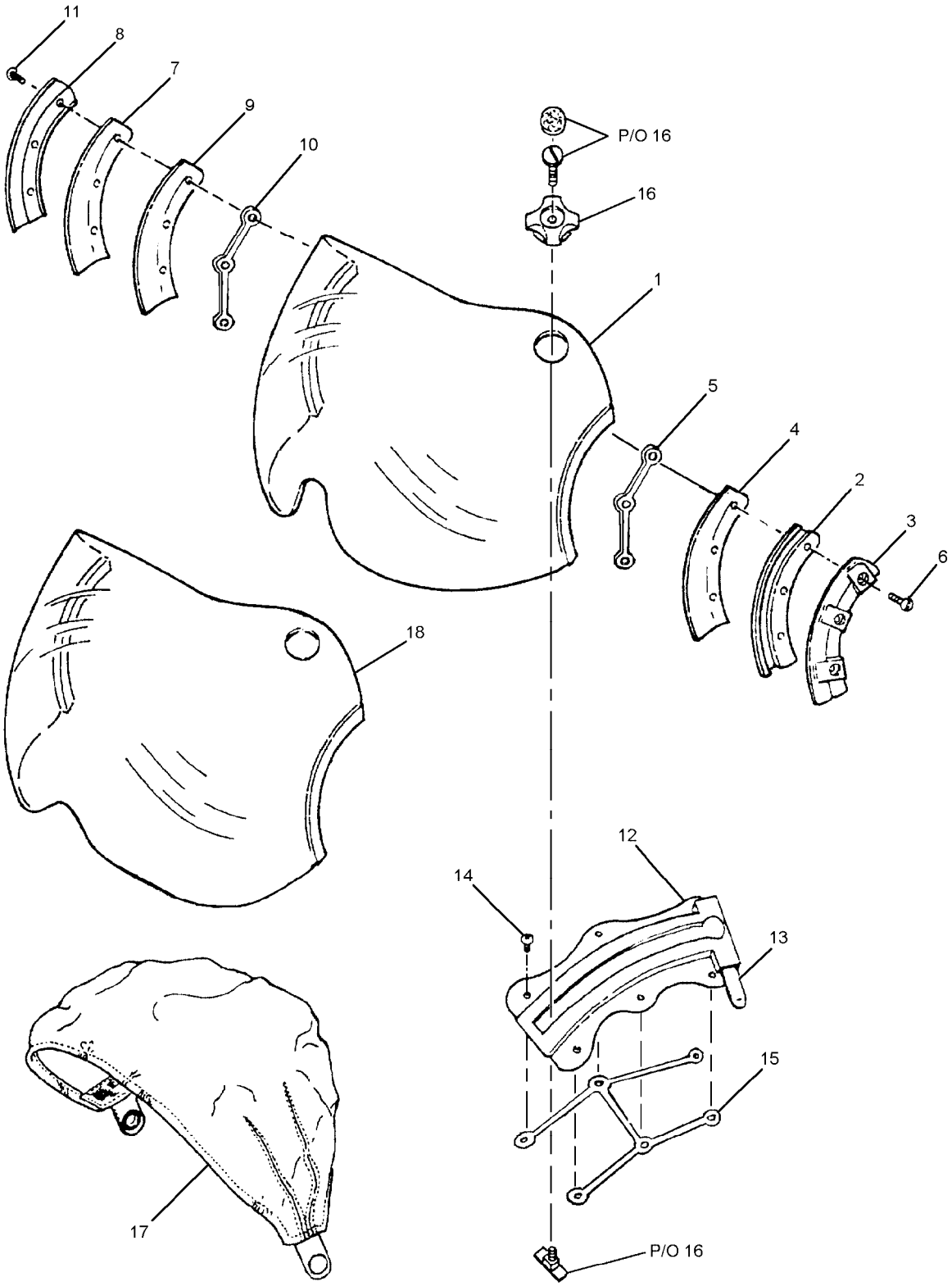
| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-7 | 89C7735-1 | EARCUP ASSEMBLY (97427) (Note 1) . . . . . | 1 | |
| -1 | 88D7554-1 | . EARPAD SET, LH and RH (Note 2) . . . . . | 1 | |
| -2 | 79C4401 | . EARPHONE HOLDER . . . . . | 2 | |
| -3 | 88C7540-1 | . EARCUP, LH . . . . . | 1 | |
| -4 | 88C7540-2 | . EARCUP, RH . . . . . | 1 | |
| -5 | 90C8015 | . EARPAD BACKER (Note 2) . . . . . | 2 | |
| -6 | 67B1721-10 | . FITTING PAD SET . . . . . | 1 | |
| | Notes: 1. The Oregon Aero Hush Kit Combo is an authorized optional replacement item for use in place of the earcup assembly. To order, use Oregon Areo P/N 28034, Hush Kit Combo, 3/4 inch, or P/N 28118, Hush Kit Combo, 1 1/8 inch.<br>2. The Oregon Aero Softseal Ear Cushions are authorized optional replacement items for use in place of the earpad set and earpad backer. To order, use P/N 20050, 3/4 inch, or P/N 20025, 1 1/8 inch. | | | |




4-8

**Figure 4-8. PRU-53/P Chin/Nape Strap Assembly**

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-8 | 90D7916-4 | PRU-53/P CHIN/NAPE STRAP ASSEMBLY, ..... Medium (97427) | 1 | A |
| | 90D7916-5 | PRU-53/P CHIN/NAPE STRAP ASSEMBLY, ..... Large (97427) | 1 | B |
| | 90D7916-6 | PRU-53/P CHIN/NAPE STRAP ASSEMBLY, ..... Extra-Large (97427) | 1 | C |
| -1 | MS51958-61B | . PAN HEAD, Screw, 10-32 x 3/8 ..... | 2 | |
| -2 | 77A3612-4 | . FLAT WASHER, #10, Black ..... | 2 | |
| -3 | MS35335-34 | . LOCK WASHER, Ext. tooth, 5/16 ..... | 2 | |
| -4 | 79A4436 | . FLANGED NUT, 10-32 ..... | 2 | |
| -5 | 84D6899-1 | . NAPE PAD, Medium ..... | 1 | A |
| | 84D6899-2 | . NAPE PAD, Large ..... | 1 | B |
| | 84D6899-3 | . NAPE PAD, Extra-Large ..... | 1 | C |
| -6 | 84C6708 | . CHIN STRAP ASSEMBLY ..... | 1 | |
| -7 | 89C7764-1 | . CHIN PAD, Black ..... | 1 | |
| -8 | 93B8471 | . CLAMP ..... | 2 | |




4-9

**Figure 4-9. EEU-7/P Helmet Visor Assembly**

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-9 | 88B7586-2 | EEU-7/P VISOR ASSEMBLY, Neutral/Clear . . . . . (97427) | REF | |
| -1 | 90D7972-1 | . LENS, Visor, Neutral (MBU-12/P Trim) . . . . . | 1 | |
| | 90D7972-2 | . LENS, Visor, Clear (MBU-12/P Trim) . . . . . | 1 | |
| -2 | 61C846-2L | . TRACK, Visor, LH . . . . . | 1 | |
| -3 | 90C7974-1 | . RETAINER, Track, LH . . . . . | 1 | |
| -4 | 93D8532-1 | . SPACER . . . . . (ATTACHING PARTS FOR ITEMS 2 THRU 4) | 1 | |
| -5 | 94A8676-1L | . POST RETAINER ASSEMBLY, LH . . . . . | 1 | |
| | 94A8676-2L | . POST RETAINER ASSEMBLY, LH . . . . . | 1 | |
| -6 | MS51957-31B | . SCREW, Pan head . . . . . | 3 | |
| | 93A8479 | . SCREW, Pan head, Mid and bottom . . . . . positions | 2 | |
| | MS51957-32B | . SCREW, Pan head, Top position . . . . . ---*--- | 1 | |
| -7 | 61C846-2R | . TRACK, Visor, RH . . . . . | 1 | |
| -8 | 90C7974-2 | . RETAINER, Track, RH . . . . . | 1 | |
| -9 | 93D8532-2 | . SPACER . . . . . (ATTACHING PARTS FOR ITEMS 7 THRU 9) | 1 | |
| -10 | 94A8676-1R | . POST RETAINER ASSEMBLY, RH . . . . . | 1 | |
| | 94A8676-2R | . POST RETAINER ASSEMBLY, RH . . . . . | 1 | |
| -11 | MS51957-31B | . SCREW, Pan head . . . . . | 3 | |
| | 93A8479 | . SCREW, Pan head, Mid and bottom . . . . . positions | 2 | |
| | MS51957-32B | . SCREW, Pan head, Top position . . . . . ---*--- | 1 | |
| -12 | 90C7985 | . LOCKING GUIDE, Visor . . . . . | 1 | |
| -13 | 91B8152 | . LOCKING PLATE . . . . . (ATTACHING PARTS) | 1 | |
| -14 | 92A8241-1 | . SCREW, Blind head . . . . . | 6 | |
| -15 | 94A8675 | . RETAINER ASSEMBLY . . . . . ---*--- | 1 | |
| -16 | 96B9367 | . LOCK ASSEMBLY (Note 2) . . . . . | 1 | |
| -17 | 90D7985 | . LENS COVER, Leather . . . . . | 1 | |
| -18 | 90D7972-5 | LENS, Visor, Clear, EEU-7/P (MBU-23/P-24/P . . . . . Trim) | 1 | |
| | 90D7972-4 | LENS, Visor, Neutral, EEU-7/P (MBU-23/P-24/P . . . . . Trim) | 1 | |
| | GW9654-01 | LENS, Visor, Neodymium Laser Eye Protective . . . . . (MBU-12/P Trim) (Note 1) | 1 | |
| | GW9654-02 | LENS, Visor, Neodymium Laser Eye Protective . . . . . (MBU-23/P-24/P Trim) (Note 1) | 1 | |
| | 97A10037-1 | LENS, Visor, Amber (MBU-12/P Trim) (Note 1) . . . . . | 1 | |
| | 97A10037-2 | LENS, Visor, Amber (MBU-23/P-24/P Trim) . . . . . (Note 1) | 1 | |
| | 97A10037-3 | LENS, Visor, Gradient (MBU-12/P Trim) (Note 1) . . . | 1 | |

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-9-18 (cont) | 97A10037-4 | LENS, Visor, Gradient (MBU-23/P-24/P Trim) . . . . . (Note 1) | 1 | |
| | Notes: 1. Special purpose visors with reference numbers beginning with GW, are commercially available from Gentex Western Operations, Rancho Cucamonga, CA., 91730 Telephone (909) 481-7667 (at menu prompt, choose USN MBU-23/P Order Desk). All other special purpose visors are commercially available from Gentex Corporation, Carbondale PA, 18470 Telephone (570) 282-8505.<br>2. Lock Assembly, part number 96B9367 is commercially procurable from GENTEX Corp., Carbondale, PA 18470. Telephone (570) 282-8505. | | | |

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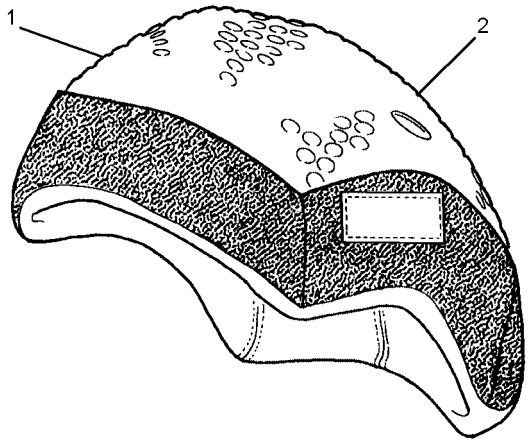


4-10

**Figure 4-10. PRU-52/P Thermoplastic Liner (TPL) Assembly**

| Figure and Index Number | Part Number | Description<br>1 2 3 4 5 6 7 | Units Per Assembly | Usable On Code |
|---|---|---|---|---|
| 4-10 | 85D7087-1P | PRU-52/P THERMOPLASTIC LINER (TPL) . . . . . ASSEMBLY, Medium (97427) (Note 1) | 1 | A |
| | 85D7087-2P | PRU-52/P THERMOPLASTIC LINER (TPL) . . . . . ASSEMBLY, Large (97427) (Note 1) | 1 | B |
| | 85D7087-3P | PRU-52/P THERMOPLASTIC LINER (TPL) . . . . . ASSEMBLY, Extra-Large (97427) (Note 1) | 1 | C |
| -1 | 85D7088-1 | . COVER ASSEMBLY, Medium . . . . . | 1 | A |
| | 85D7088-2 | . COVER ASSEMBLY, Large . . . . . | 1 | B |
| | 85D7088-3 | . COVER ASSEMBLY, Extra-Large . . . . . | 1 | C |
| -2 | 88D7518-1 | . LAYER ASSEMBLY, Medium . . . . . | 1 | A |
| | 88D7518-2 | . LAYER ASSEMBLY, Large . . . . . | 1 | B |
| | 88D7518-3 | . LAYER ASSEMBLY, Extra-Large . . . . . | 1 | C |
| -3 | 85D7027 | . FASTENER TAPE, Hook (Not illustrated) . . . . . | 1 | |
| | Notes: 1. Oregon Aero Zetaliners are authorized optional replacements for the TPL assembly. To order use Oregon Aero P/N 95132, 3, 4, 5 (medium); 95142, 3, 4, 5 (large); 95152, 3, 4, 5 (extra large); 95162, 3, 4, 5 (extra large wide) NIINs TBD | | | |

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| 95B9088-7 | 4-5 | AOOOO |
| 95B9088-8 | 4-5 | AOOOO |
| 95B9088-9 | 4-5 | |
| 96B9367 | 4-9-16 | XAOZZ |
| 97A10037-1 | 4-9-18 | |
| 97A10037-2 | 4-9-18 | |
| 97A10037-3 | 4-9-18 | |
| 97A10037-4 | 4-9-18 | |

# Section 4-7. Maintenance (HGU-33/P thru HGU-52/P and HGU-55/P Helmets Only)

## 4-105. GENERAL.

4-106. Proper care and use of the fixed wing series helmet assemblies are essential to ensure optimum performance during emergencies and routine operations. The aircrewmember's responsibility for maintenance of the helmet assembly is limited to cleaning (see paragraph 4-114). Repairs or other maintenance actions required shall be performed by organizational level or above upon issue and at least every 90 days thereafter. All maintenance actions shall be documented in accordance with OPNAVINST 4790.2 Series.

**NOTE**

The inspection interval for fixed wing helmet assemblies assigned to selected air reserve aircrewmembers has been extended to 180 days vice 90 days, providing the helmets are stowed under controlled conditions.

## 4-107. INSPECTION.

**4-108. PREFLIGHT/POSTFLIGHT INSPECTION.** The Preflight/Postflight Inspection is a visual inspection performed by the aircrewmember to whom the helmet is issued before/after each flight. To perform the inspection, visually inspect for the general overall condition of the helmet assembly. See paragraph 4-110.

**NOTE**

Defects or questionable areas noted during this inspection shall be referred to the proper maintenance activity for required corrective action.

**4-109. SPECIAL INSPECTION.** The Special Inspection shall be performed every 90 days by the organizational level and shall consist of a visual inspection, a functional check, and a thorough cleaning of the helmet assembly.

**NOTE**

Supply support of the HGU-33/P thru HGU-52/P and HGU-55/P helmets no longer exists. Helmets failing Special Inspection for defective parts must be replaced with the HGU-68/P series helmet.

**4-110. Visual Inspection.** To visually inspect the helmet assembly, proceed as follows:

1. Inspect chin strap and nape strap for loose or broken stitching and snap fastener retention.

2. Inspect shell for splits, cracks, chips, and delaminations.

3. Inspect MK-634/AIC installation clip for security to helmet.

**CAUTION**

A laser visor is considered damaged and not to be used if a scratch is detected that exceeds one third the thickness of the lens. A lens can continue to be used if a scratch of lesser depth is detected and is not in the critical vision area or reported as bothersome by the aircrewmember. Damaged lens should be disposed of in accordance with paragraph 4-112.

4. Inspect visor housing for cracks, splits, chips, and delaminations and lenses for scratches and cracks.

5. Check laser visor for scratches or damage.

6. Inspect liner and pads for proper retention. Ensure the liner is not cracked, dented, or excessively loose.

7. Inspect edgeroll for rips, tears, splits, loosening or tearing from the shell.

8. Inspect communications cord for cut, split, or abraded insulation.

9. Inspect earcup for proper retention to shell.

10. Inspect earseals for sound attenuation and pliability.

11. Inspect all hardware for damage and security of attachment. Tighten or replace as necessary.

12. Inspect oxygen mask receivers for proper locking in place and retention to shell.

**NOTE**

Defects determined from this inspection shall be referred to the proper maintenance activity for required corrective action.

**4-111. Functional Check.** Functionally check the helmet assembly in accordance with the procedures in NAVAIR 17-15BC-22.

**NOTE**

The TTU-489/E test set is the only test set available to perform the functional test. If this unit is not available, standard shop procedures should be used.

## 4-112. DISPOSAL OF LASER VISOR.

4-113. The Laser Eye Protection Visor is a controlled item. The visor must be destroyed, by the organizational level activity having custody, using any of the following methods: incineration, crushing, or shattering.

## 4-114. CLEANING.

4-115. To clean the various parts of this series of helmet assemblies, proceed as follows:

Materials Required

| Quantity | Description | Reference Number |
|---|---|---|
| As Required | Detergent, Laundry | Commercial |
| As Required | Cloth, Lint-Free | — |
| As Required | Anti-Fogging Compound | NIIN 00-754-2672 |
| As Required | Tissue, Facial | — |

1. PRK-37/P Shell.

a. Clean shell and edgeroll using a mild detergent and a lint-free cloth dampened with water. Mild abrasive scouring powder may be used to remove stains or scuff marks.

b. Wipe shell clean using water-dampened cloth to remove detergents.

2. Chin Strap, Nape Strap, and Fitting Pads.

a. Clean by lightly sponging with mild solution of detergent and water.

b. Wipe with a damp, lint-free cloth.

3. Liner.

a. Clean liner by hand washing with mild solution of detergent and water.

b. Thoroughly rinse in clear water and air dry.

4. Skull Cap. Laundering of skull cap is responsibility of aircrewmember.

5. Visor Assemblies.

**CAUTION**

Ensure that no abrasive particles are lodged in the polish application cloth or paper or in the paper or cloth used to clean or polish the outside of the visor.

Do not use solvent or abrasive type cleaners to clean the laser visor. Do not use polish on laser visors to remove scratches.

a. Clean the clear or neutral lens with mild soap and water using soft paper tissues, soft flannel cloth, soft cotton pads, or a water-dampened chamois and allow to dry.

b. If the clear or neutral lenses are still soiled or slightly scratched, clean outside of visor only with liquid polish canopy cleaner. Clean the inside of visor with soft, lint-free cloth.

**WARNING**

Alcohol and naphtha are toxic and flammable. Use these agents in a well ventilated area. Do not inhale the vapors or allow prolonged contact with the skin. Keep away from open flame.

c. Use alcohol or naphtha to remove adhesive residue.

(1) To clean the visor, lightly wipe all dust and dirt from the lens using a clean, soft, lint-free cloth.

(2) Clean the laser lens with a moistened cloth or apply moisture directly to lens by breathing on it and then wipe dry with a clean, soft, lint-free cloth or facial tissue.

d. (Optional) Apply anti-fogging compound.

4-116. Document all maintenance actions in accordance with OPNAVINST 4790.2 Series.