

CHAPTER 8

AUXILIARY PERSONAL EQUIPMENT

Section 8-1. Deleted

Paragraphs 8-1 thru 8-38 Deleted.
Figures 8-1 thru 8-7 Deleted.
Tables 8-1 and 8-2 Deleted.

Section 8-2. Deleted

**Paragraphs 8-39 thru 8-59 Deleted.
Figure 8-8 Deleted.**

Pages 8-3 thru 8-24 Deleted.

Section 8-3. Wrist Watch

8-60. GENERAL.

8-61. The wrist watch (GG-W-113) consists of a dull metal case housing a watch movement with a minimum of 15 jewels. The crystal is made of plastic and the band is black nylon. The watch is waterproof, shock and vibration resistant and anti-magnetic. A black dial has dividers marked in phosphorescent paint. The hands, including the sweep second hand are also painted with phosphorescent material. See [figure 8-9](#).

8-62. APPLICATION.

8-63. The wrist watch is used by aircrewmembers in combat zones and issued by direction of the cognizant Type Commander.

8-64. FUNCTION.

8-65. The watch has a stem-wound, spring-driven movement which will operate for approximately 36 hours on one full winding. For greatest accuracy, the watch should be fully wound near the same time each day. The hands are set by pulling the stem outward

to a detent position and turning the stem forward or backward to adjust for the correct time. When the stem is outward position, the movement is locked and the second hand is stopped. When the stem is pressed in, the lock is released and the movement resumes operation.

8-66. MODIFICATIONS.

8-67. There are no modifications to the wrist watch required/authorized at this time.

8-68. MAINTENANCE.

WARNING

Phosphorescent material used in the dial is radioactive. If crystal is broken, avoid all contact with dial.

8-69. There are no formalized repair or servicing procedures for the wrist watch. The wrist watch may be serviced and regulated by a qualified watch repairman.



Figure 8-9. Aviator's Wrist Watch

8-9

Section 8-4. HGU-4/P Sun Glasses

8-70. GENERAL.

8-71. The HGU-4/P Sun Glasses (MIL-S-25948) consist of a metal frame, clear acetate nose pads and temple tips and high-quality ophthalmic crown glass lenses of neutral density. They are carried in a crush-resistant carrying case. See [figure 8-10](#).

WARNING

Aviator's sun glasses, are not shatterproof or breakproof, and do not provide an unbreakable shield against eye injury.

NOTE

Prescription sun glasses are available through local medical officer.

8-72. APPLICATION.

8-73. These glasses provide general purpose protection against sun glare. Sun glasses are issued to individual aircrewmembers.

8-74. FITTING.

8-75. The sun glasses are fitted to the individual by adjusting the nose pads and temples to the individual's comfort.

8-76. MODIFICATIONS.

8-77. There are no modifications to the sun glasses required/authorized at this time.

8-78. MAINTENANCE.

8-79. CLEANING. The sun glasses are cleaned by steaming with breath and drying with a high quality lens tissue. The lenses may be washed with warm water if extremely dirty.

8-80. Protect the lenses from scratches and dirt by carrying in case when not in use.

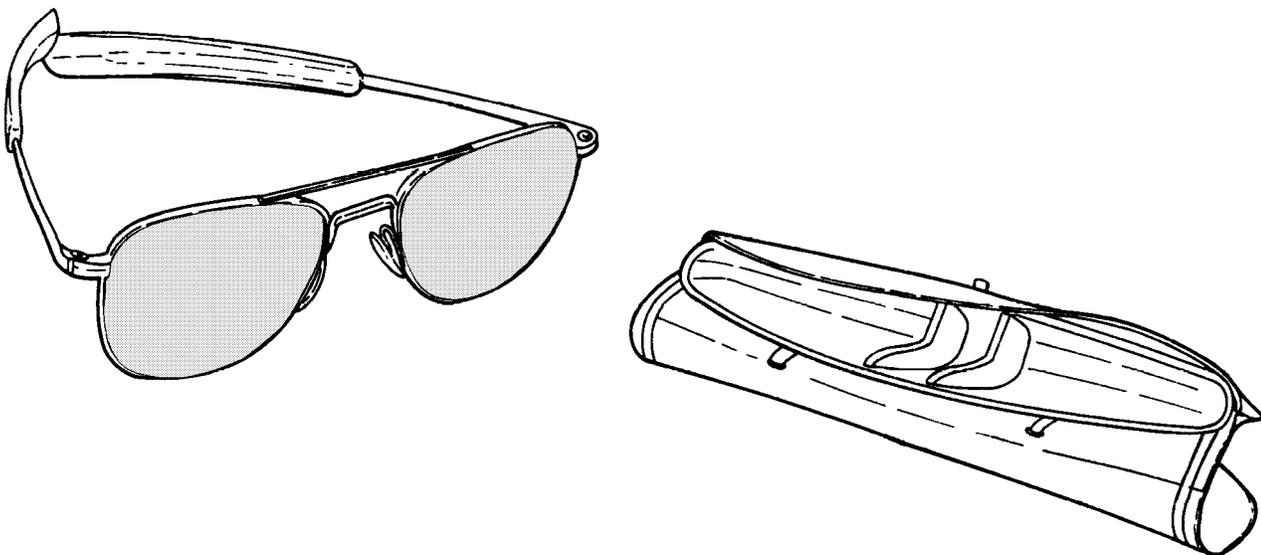


Figure 8-10. HGU-4/P Sun Glasses

8-10

Section 8-5. Darkness Adaptation Spectacles

8-81. GENERAL.

8-82. The Darkness Adaptation Spectacles (MIL-G-22112) consist of a plastic frame and shatter-resistant plastic lenses. The lens material is a slow burning cellulose acetate sheet having a dominant red hue. See [figure 8-11](#).

8-83. APPLICATION.

8-84. These spectacles provide dark adaptation for the aircrewmember prior to night operations. Darkness Adaptation Spectacles are issued to the aircrewmember.

8-85. FITTING.

8-86. The Darkness Adaptation Spectacles shall be worn a minimum time of 30 minutes prior to night

flights. The flexible earpieces may be adjusted by gently forming with the fingers to provide a proper fit.

8-87. MODIFICATIONS.

8-88. There are no modifications to the Darkness Adaptation Spectacles required/authorized at this time.

8-89. MAINTENANCE.

8-90. **CLEANING.** Remove any dust and finger prints by washing with warm water or steaming with breath. Dry with clean, soft cloth or soft tissue. Do not use solvents or hot water.

8-91. Protect the lens from scratches and dirt by carrying in case when not in use.

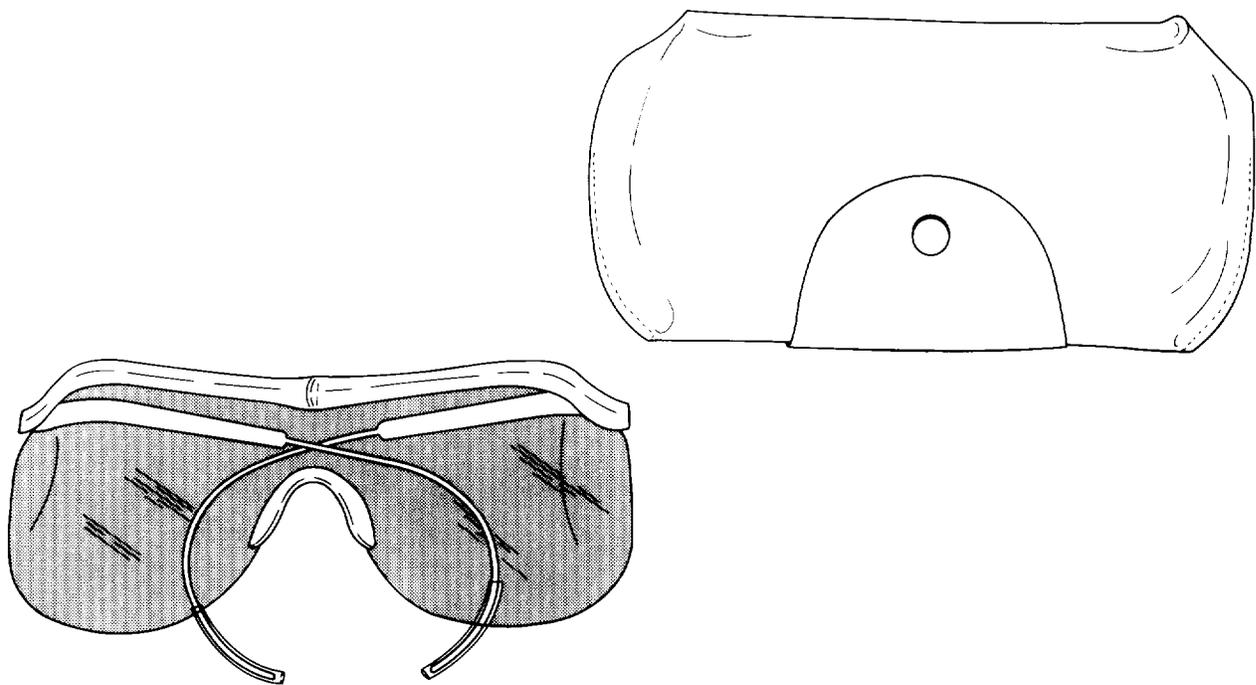


Figure 8-11. Darkness Adaptation Spectacles

Section 8-6. EDU-1/P Neodymium Laser Protective Spectacles

8-92. GENERAL.

WARNING

Neodymium Laser Protective Spectacles are not shatterproof or breakproof, and do not provide an unbreakable shield against eye injury.

NOTE

Prescription spectacles are available through local medical officer.

8-93. The EDU-1/P Neodymium Laser Protective Spectacles (MIL-S-85508(AS)) consist of a metal frame, clear acetate nose pads and temple tips, and lenses made from SCHOTT KG-3 optical glass or equivalent with a minimum optical density of 3.1. These spectacles protect against neodymium lasers

and are not to be used as sunglasses. They are carried in a crush-resistant carrying case. See [figure 8-12](#).

8-94. APPLICATION.

WARNING

The EDU-1/P Neodymium Laser Protective Spectacles are not intended for maintenance personnel or personnel using optical devices such as binoculars or telescopes.

8-95. These spectacles are designed to protect aircrew members against possible harmful effects of neodymium laser energy at a wavelength of 1064 nanometers. They are to be used by aircrewmembers operating in the vicinity of any neodymium laser detection, ranging, or designating systems.

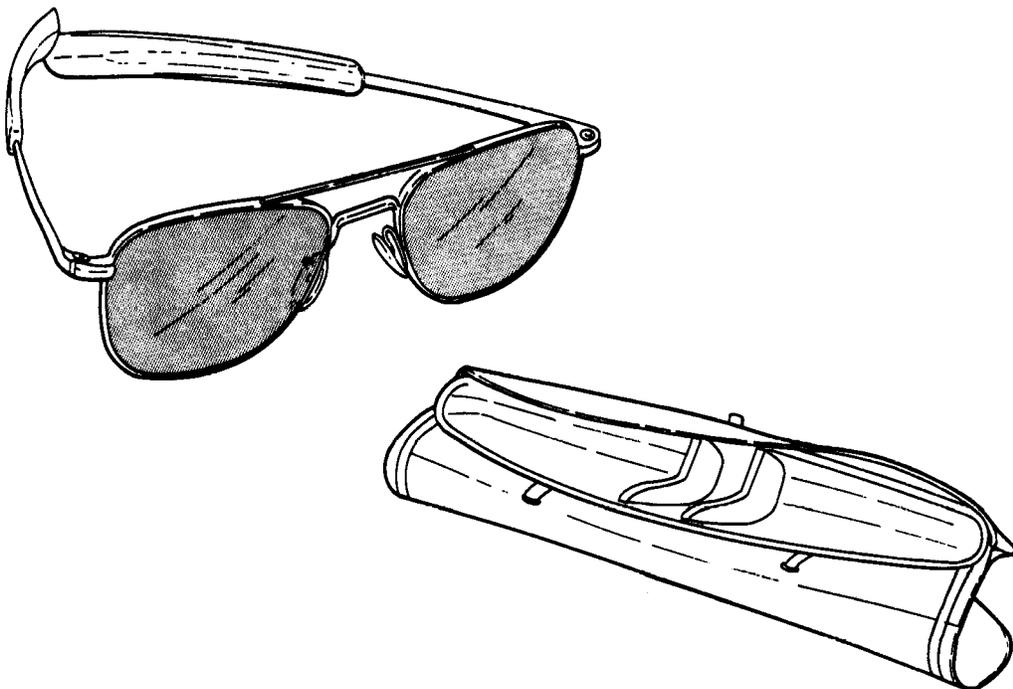


Figure 8-12. EDU-1/P Neodymium Laser Protective Spectacles

8-12

8-96. FITTING.

8-97. The spectacles are fitted to the individual by adjusting the nose pads and temples to the individual's comfort.

8-98. MODIFICATIONS.

8-99. There are no modifications to the spectacles required/authorized at this time.

8-100. MAINTENANCE.

8-101. INSPECTION. To inspect the EDU-1/P Neodymium Laser Protective Spectacles, proceed as follows:



If the spectacles are damaged do not use them. If scratched, lenses should not be reground as protection depends upon the thickness of the lens.

NOTE

The life expectancy of chrome electroplating of the frame is dependent on the type and duration of use. Wearers are advised that these frames should be replaced when the chrome electroplating erodes to the point when the underplating is exposed.

1. Check for scratches or damage to lenses.
2. Check frame for signs of erosion of chrome plating.

8-102. CLEANING. To clean the EDU-1/P Neodymium Laser Protective Spectacles, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Cloth, Lint-Free	MIL-C-85043 NIIN 00-044-9281



Spectacles are fragile and can damage easily. Care should be used in handling to prevent scratching and breakage. Do not use abrasive cleaners or polish on lenses to remove scratches.

NOTE

In order to provide the desired protection, the spectacles must be cared for and used properly. When not being used, always keep the spectacles in their case.

1. Wash off all dust and dirt with warm water or steaming with breath.
2. Dry with a soft tissue or lint-free cloth.

Section 8-7. FV2 Laser Eye Protection Spectacles (LEPS)

8-103. GENERAL.



FV2 Laser Eye Protection Spectacles are not shatterproof or breakproof and do not provide an unbreakable shield against eye injury.

8-104. The FV2 Laser Eye Protection Spectacles consist of a metal frame, clear acetate nose pads and

temple tips, and lenses made from an absorptive broadband dye doped polycarbonate. They are not currently available in prescription lenses. They are carried in a crush-resistant carrying case. See figure 8-13.

8-105. The FV2 spectacles are designed to protect the eye from the harmful effects of exposure to five discrete laser wavelengths. These include three common threat wave-lengths (lambda 1, 2, and 3), the Air Force's lambda 4A, and the Navy's 4N. The threat wavelengths and optical densities are classified SECRET, except for the lambda 3, Neodymium laser. The optical density for lambda 3 is a minimum of

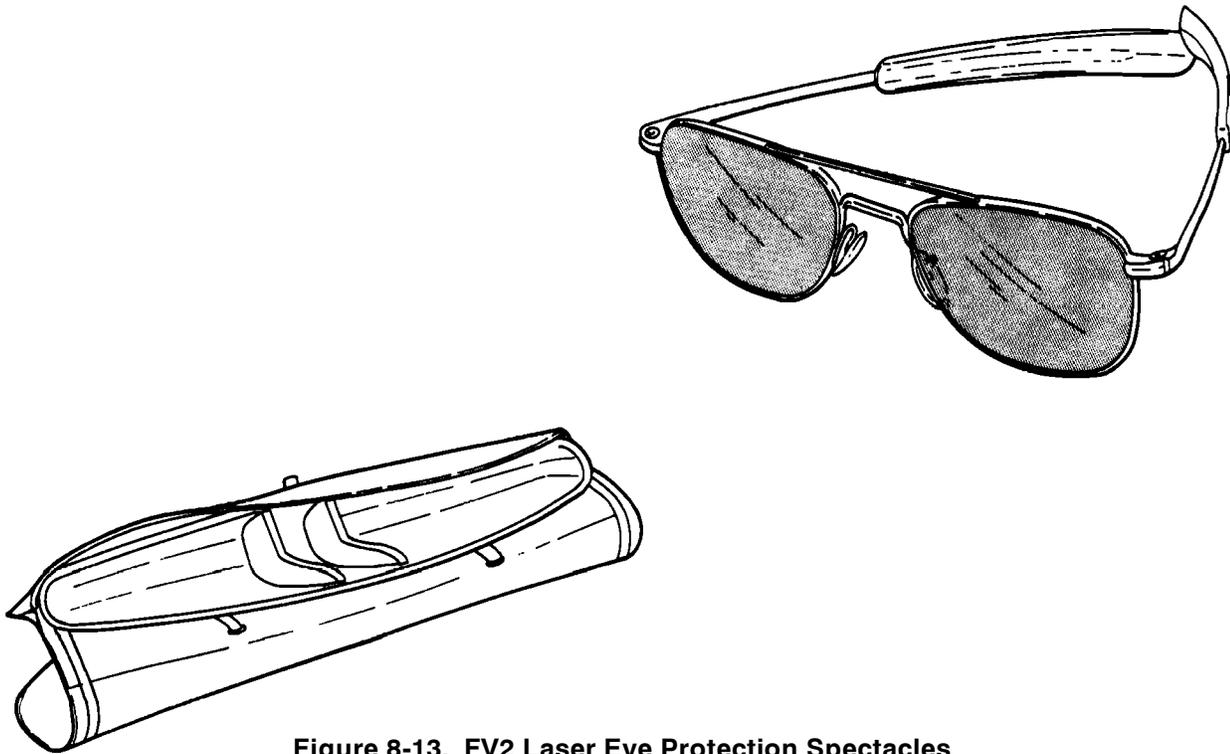


Figure 8-13. FV2 Laser Eye Protection Spectacles

8-13

four. Classified wavelength and optical density information can be obtained from:

Commanding Officer
Naval Air Systems Command
PMA-202E, 47123 Buse Road, Unit IPT
Patuxent River, MD 20670-1547

The FV2 Laser Eye Protection Spectacles should be a controlled item requiring special handling.

8-106. The spectacles reduce the available light to approximately 12% during the day (comparable to sun glasses), and allow only 2.5% of available light to reach the eye during the night. The reduction of available light and color distortion is significant. Items viewed through the spectacles will appear to be brownish-orange; there is no perception of blue or red and only minimal perception of green and yellow.

8-107. APPLICATION.

WARNING

The FV2 Laser Eye Protection Spectacles are not intended for maintenance personnel or personnel using optical devices such as binoculars or telescopes. The Spectacles shall be worn only during full daylight hours, as they do not transmit enough light during the hours of dawn, dusk, or at night.

WARNING

The FV2 spectacles are physically compatible with night vision goggles, however they can degrade the intensified scene by as much as 89%, depending on the ambient light level and scene contrast. They are also physically compatible with heads up and heads down displays, but may degrade the visibility of the displays under certain conditions.

CAUTION

The FV2 spectacles are not compatible with the helicopter CBR Protective Assembly (A/P22P-9(V)). The spectacle frames may scratch the mask faceplate due to the tight fit.

8-108. These spectacles are intended for use by all fixed- and rotary-wing aircrewmembers subject to potential laser exposure while operating in the vicinity of laser detection, ranging, or designating systems.

8-109. FITTING.

8-110. The spectacles are available in standard sizes of 52 mm and 58 mm and are fitted to the individual by adjusting the nose pads and temples to the individual's comfort.

8-111. MODIFICATIONS.

8-112. There are no modifications to the spectacles required or authorized at this time.

8-113. MAINTENANCE.



Spectacles are fragile and can be damaged easily. Care should be used in handling to prevent scratching and breakage. When not being used, always keep the spectacles in their case.

A lens 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 lenses should be disposed of in accordance with paragraph 8-116.

NOTE

If the frames are damaged, there is no authorization to procure frames from supply. Retain maintenance significant spare parts for repair.

8-114. INSPECTION. To inspect the FV2 Laser Eye Protection Spectacles, proceed as follows:

1. Check for scratches or damage to lenses.

2. Check frame for signs of damage.

8-115. CLEANING. To clean the FV2 Laser Eye Protection Spectacles, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Cloth, Lint-Free	MIL-C-85043 NIIN 00-044-9281
As Required	Tissue, Facial	Commercial
As Required	Compound, Anti-fogging	OA549 NIIN 00-754-2672



Do not use abrasive cleaners or polish on lenses to remove scratches.

1. Lightly wipe all dust and dirt from the lenses using a clean, soft, lint-free cloth.
2. Clean lenses with a moistened cloth or apply moisture by breathing on the lenses and wiping with a clean, soft, lint-free cloth.
3. Dry spectacles with a fresh, soft, facial tissue or clean, soft, lint-free cloth.
4. (Optional) Apply Anti-fogging compound to spectacle lenses.

8-116. DISPOSAL.

8-117. The FV2 lenses are controlled items and should be sent to the cognizant TYCOMS for disposal. The lenses shall be crushed for final disposal and discarded.

Section 8-8. EDU-5/P Laser Eye Protection Spectacles

8-118. GENERAL.

WARNING

EDU-5/P spectacles are not shatterproof or breakproof and do not provide an unbreakable shield against eye injury.

NOTE

Upon issue, the EDU-5/P spectacles shall be installed in the aircrewmember's survival vest and remain in place until the aircrewmember detaches/transfers from the command.

8-119. The EDU-5/P spectacles, Figure 8-14, are designed to protect the eyes of the wearer from the harmful effects of multiple, discrete, laser-threat wavelengths. Protection is provided by lenses comprised of holographic and dielectric filters laminated between a polycarbonate cap and dye base. Prescription lenses are not available. Attachable sun inserts are provided for use in bright sun conditions when desired. The spectacles are physically compatible with night vision goggles, heads-up displays, and cockpit lighting. The spectacles reduce the amount of light reaching the eye, but are designed to be used during day and night missions. The EDU-5/P spectacles replace the FV-2 laser eye protection spectacles. To protect the spectacles and sun inserts from damage, they should be kept in the protective case when not in use. To prevent scratching, do not lay spectacles, lens down, on any hard surface.

WARNING

The EDU-5/P is not authorized for use during take-off or landing.

CAUTION

The EDU-5/P provides protection against visible and invisible laser threats. As such, they will degrade visibility more than infrared-only protection devices. During daylight operations, under particular glare conditions, portions of the cockpit displays

may be difficult to read or may require greater head movement or dwell time. During night aided operations with the spectacles, increasing the brightness on cockpit displays may be required for readability.

NOTE

Operations with the EDU-5/P shall be conducted during daylight flight prior to night (aided) flight and shall be conducted at high altitude prior to any low altitude maneuvers. First time users of these specified LEP devices shall accomplish a crew station visibility assessment, in day and night NVG aided modes, prior to flight.

8-120. CONFIGURATION.

8-121. The EDU-5/P spectacles consist of a frame assembly and left and right lenses. Included with the EDU-5/P spectacles assembly are the sun insert and a two-compartment crush-resistant protective carrying case. The EDU-5/P spectacles come in ten sizes with the lens diameter standardized at 52 mm. There are five EDU-5/P frame sizes. Sun insert sizes match the five EDU-5/P frame sizes. There are three lens types (A, B, and C), each with an optically different direct look point. The direct look points are not visibly identifiable. Lens types are etched in the upper edge of each lens with the serial number. The location of the direct look points can be found by using the EDU-5/P fitting template set.

8-122. SUPPORT EQUIPMENT.

8-123. The EDU-5/P fitting template set is required to properly fit all aircrew members. The fitting template set consists of a box containing three pairs of color-coded template lenses which attach to the spectacles for fitting. Type A is red; type B is orange; and type C is yellow. These three types correspond to the A, B, and C type markings on each EDU-5/P lens. The EDU-5/P fitting spectacles set may be used with the fitting template set to determine the correct size spectacles for each aircrewmember. The fitting spectacles set consists of a box with five frame sizes, each with clear lenses. Fitting spectacles allow fitting and sizing to be determined when actual EDU-5/P spectacles are not available. Use of fitting templates either with actual EDU-5/P spectacles or the fitting spectacles allow the correct size to be determined prior to ordering EDU-5/P spectacles.

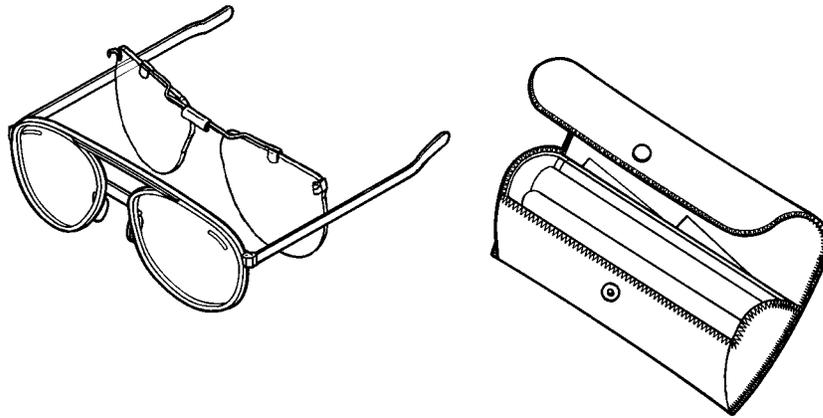


Figure 8-14. EDU-5/P Laser Eye Protection Spectacles

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8-124. APPLICATION.

NOTE

EDU-5/P spectacles are not intended for use by maintenance personnel. The spectacles are not compatible with the Chemical, Biological, Radiological (CBR) hood assembly.

8-125. The EDU-5/P spectacles are intended for use, day and night, by all fixed-wing and rotarywing aircrewmembers while operating in a laser threat environment. Sun inserts, which clip behind the spectacles, are only for use in very bright sun conditions, in addition to the clear visor. The neutral gray helmet visor is not recommended because the combination is very dark, but may be used if desired. The EDU-5/P frame design allows compatibility with night vision goggles. The spectacles are not compatible with the CBR hood assembly due to comfort issues.

8-126. FITTING.

NOTE

Proper fit of the EDU-5/P Spectacles is critical to achieve the designed level of laser protection. An inter-pupillary distance (IPD) measurement shall be performed by a qualified Flight Surgeon, Optometrist, or other qualified medical personnel. For accurate measurement, a Pupilometer shall be used.

Materials Required

Quantity	Description	Reference Number
1	EDU-5/P Spectacles, (size IAW Table 8-3)	(See IPB Para 8-144)
1	EDU-5/P Fitting Template Set	NIIN 01-466-4507
1	EDU-5/P Fitting Spectacles Set	2006997 (CAGE 4W129)
1	Projector, Overhead	—
1	Screen, Projection	—
1	Pliers, Needle Nose	—

1. Determine the EDU-5/P size required using the EDU-5/P size chart, table 8-3.

NOTE

Where there is an overlap of IPD size, aircrewmembers with wider head sizes will, generally fit better in the larger frame

size. Use of frames with clear lenses from the EDU-5/P fitting spectacles set for step 3 will verify the correct size prior to ordering EDU-5/P spectacles.

NOTE

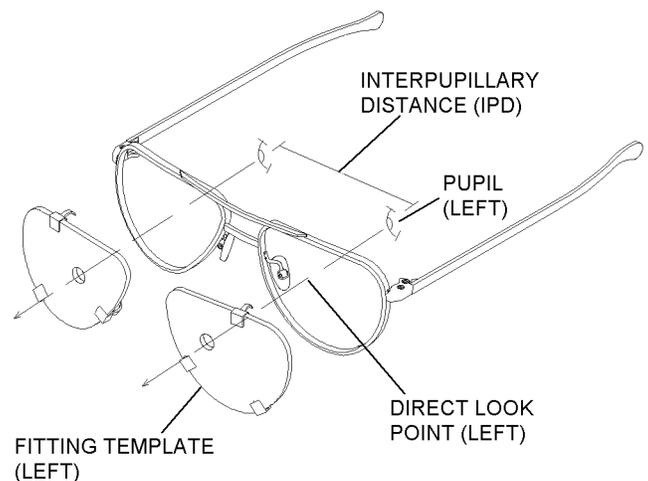
Fitting of EDU-5/P spectacles is only authorized to be performed by trained and designated Aircrew Survival Equipmentmen (PR). Training shall be provided by Fleet Air Introduction Liaison Survival Aircrew Flight Equipment (FAILSAFE), Aeromedical Safety Officer (AMSO), or Aeromedical Safety Corpsman (AMSC).

2. Using the aviator's NATOPS Training Jacket, record the interpupillary distance (IPD) measurement and the EDU-5/P size into the aviator's Aircrew Systems Record, OPNAV 4790/138 (figure 8-16).



If proper fit is not assured, refer to a qualified AMSO, Flight Surgeon, Optometrist, or other qualified medical personnel. Proper fit is required to locate the direct look point of each lens over the pupils of the individual in order to achieve the designed laser protection.

3. Verify that spacing of the direct look points matches the aircrewmember's IPD.



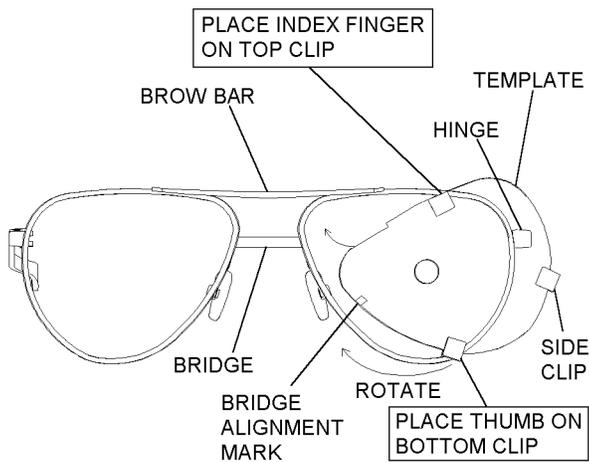
Step 3 - Para 8-126

8p126s3

Table 8-3. EDU-5/P Size Chart

IPD Size Range	EDU-5/P Size	Frame Size	Fitting Template Type	Template Tint
53-55 mm	52-14A	52-14	A	Red
56-58 mm	52-14B	52-14	B	Orange
58-60 mm	52-16B	52-16	B	Orange
60-62 mm	52-18B	52-18	B	Orange
62-64 mm	52-20B	52-20	B	Orange
63-65 mm	52-14C	52-14	C	Yellow
64-66 mm	52-22B	52-22	B	Orange
65-67 mm	52-16C	52-16	C	Yellow
67-69 mm	52-18C	52-18	C	Yellow
69-71 mm	52-20C	52-20	C	Yellow

a. Using the index finger and thumb, hold the top and bottom clips on the fitting template. Slide the template into place over the corresponding lens as shown, with the top and side clips above and below the hinge. Rotate the template to align the bridge alignment mark with the bridge. Proper attachment occurs when all three clips are seated firmly, the template's bridge mark lines up with the bridge, and the top of the template sits firmly against the brow bar.



Step 3a - Para 8-126

8p126s3a

b. Aim an overhead projector or other light source at a bulkhead approximately six feet away.

c. Stand the aircrewmember approximately 1 to 2 feet from the light source, facing perpendicular (90°) to the light source.

d. Turn the light source on and direct the light at the aircrewmember's head.

e. Place the spectacles on the aircrewmember.

f. Turn off all other light sources in the room.

g. Stand approximately two feet in front of the aircrewmember in a position to see the pupil closest to the light source.

h. Turn the aircrewmember slightly so that you can see the pupil closest to the light source through the hole in the template.

i. Instruct the aircrewmember to look straight ahead and level at a distant object (i.e. infinity).



Pupils must be centered in the holes on the fitting template without any adjustment to the front section of the frames. Nose pad and temple arms may be adjusted as necessary for correct position of the fitting template and for comfort.

j. Observe that the pupil closest to the light source is centered side-to-side on the hole in the fitting template.

k. If the fitting template does not line up correctly, use another size spectacles or refer to an AMSO.

l. Turn the aircrewmember to face the opposite direction and repeat [steps g through k](#).

4. Complete the fitting adjustment with flight equipment.

a. Instruct aircrewmember to don helmet and oxygen mask as normally worn during an operational flight, with the visor raised.

b. Stand the aircrewmember approximately 1 to 2 feet from the light source, facing perpendicular (90°) to the light source.

c. Place the spectacles on the aircrewmember.

d. Stand approximately two feet in front of the aircrewmember in a position to see the pupil closest to the light source.

e. Turn the aircrewmember slightly so that you can see the pupil closest to the projector through the hole in the template.

f. Instruct the aircrewmember to look straight ahead and level at a distant object.

g. If the fitting template does not line up, remove the spectacles from the aircrewmember. Raise or lower the spectacles to center the hole in the fitting template directly over the individual's pupil.

h. Use needle-nose pliers to carefully adjust the nose pads in (up) or out (down) to adjust the height of the spectacles. Remove and replace spectacles on aircrewmember as required during adjustment.

i. Instruct aircrewmember to turn from side to side as necessary to adjust the height of the entire EDU-5/P.

j. Height adjustment is complete when the holes in the fitting template are centered directly over the aircrewmember's pupils.

5. Verify compatibility with the visor.

a. Adjust room lighting to normal.

b. Without removing the spectacles, remove the fitting template from the spectacles by rotating and sliding the template off to the side.

c. Lower the visor and attach the oxygen mask if normally worn. Ensure spectacles are not in contact with the visor.



The frame assembly is designed to fit very closely to the face. Do not bend the frame or some laser protection will be lost.

d. Raise the visor. Remove the spectacles. As required, use needle-nose pliers, to carefully adjust the temple arms for best fit. Best fit will result in the spectacles being secure in the proper position on the head without excessive looseness, excessive tightness, or "hot spots."

e. Remove spectacles and re-attach the matching fitting template.

f. Use the light source and "fitting adjustment with flight equipment" procedures above ([steps 4a thru 4j](#)) to double-check that the holes in the fitting template are centered directly over each pupil. Re-adjust if necessary.

6. Verify sun insert fit.

a. Remove spectacles and remove the fitting template from the spectacles.

b. Attach the sun insert to the spectacles, ensuring a secure fit.

c. Place the spectacles with sun insert on the aircrewmember.

d. Ensure that the sun insert does not press on the aircrewmember's face or oxygen mask. If pressure is felt, readjust the nose pads slightly.

e. Remove spectacles and sun insert.

7. Clean lenses and sun insert in accordance with [paragraph 8-140](#).

8. Place spectacles and sun insert in protective case and secure in the aircrewmember's survival vest in accordance with [paragraph 8-139](#).

9. Record spectacles information on Aircrew Systems Record, OPNAV 4790/138, ([figure 8-16](#)) and in accordance with OPNAVINST 4790.2 Series.

NOTE

The EDU-5/P spectacles are controlled items. The spectacles shall be secured and maintained in a carrying case for storage. Aircrewmembers shall return spectacles to the O-level Aviator's Equipment Branch upon detachment from a squadron/unit requiring EDU-5/P spectacles.

8-127. REFERENCE NUMBERS, ITEMS, AND SUPPLY DATA.

8-128. Refer to the EDU-5/P Illustrated Parts Breakdown for reference numbers, items, and supply data.

8-129. MODIFICATIONS.

8-130. There are no modifications authorized on the EDU-5/P spectacles.

8-131. MAINTENANCE.

8-132. All EDU-5/P maintenance actions shall be performed by a qualified PR. The following two sub-components of the EDU-5/P spectacles assembly are supported for replacement: EDU-5/P Frame Assembly; EDU-5/P Sun Insert Assembly.



The EDU-5/P spectacles shall be stored in their protective carrying case when not in use. All necessary precautions shall be taken to avoid scratching the lenses and/or bending the frames. If frames are bent, fitting must be verified to ensure optimum laser protection.

NOTE

Unserviceable lens(es) require replacement of the complete EDU-5/P spectacles assembly. If one or both lenses are unserviceable, return the complete EDU-5/P spectacles in their protective case in accordance with [paragraph 8-142](#).

8-133. INSPECTION.

8-134. The EDU-5/P spectacles assembly shall be inspected upon issue and at intervals to coincide with the survival vest in which the spectacles are stored.



If aircraft instrument readability appears to deteriorate in flight, a fitting check is recommended after flight. A shift in fit may result in dimming of the gages and less than optimum laser protection.

8-135. EDU-5/P Inspection procedures are as follows:

1. Check lenses for scratches, delamination, or other damage, security, and cleanliness. Scratches do

not reduce laser protection. Severe scratches or other damage in the pupil area may be distracting to the point that the wearer may determine that the lens is unserviceable.

2. Check lenses for stress fractures internal to each lens. Fractures are most likely to occur near the hinges. Stress fractures extending 1/4 inch in from the edge are not considered a defect.

3. Check frame for signs of damage and loose or missing screws.

4. Check sun insert for scratches, signs of damage, and security of clips.

5. Check spectacles and sun insert for fit to ensure all frame components have retained proper position.

6. Check protective case for condition.

7. If discrepancies are found, clean or refer to a qualified PR to adjust, repair, or replace spectacles, components, sun insert, or protective case prior to flight.

8. Clean spectacles and sun insert, if required, in accordance with [paragraph 8-140](#).

9. Document in accordance with OPNAVINST 4790.2 series.

8-136. FRAME REPLACEMENT. EDU-5/P frame replacement consists of removing the lenses from the old frame and placing the lenses in the new frame assembly.

8-137. Lens Removal ([Figure 8-15](#)).

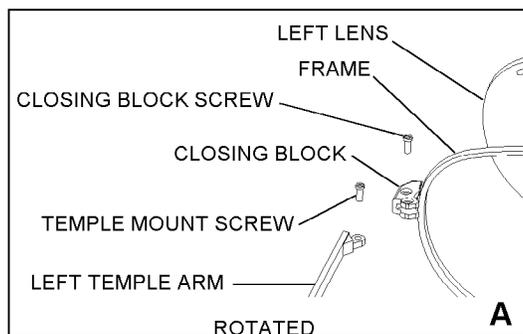
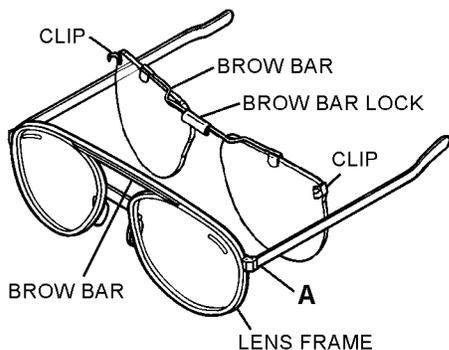


Figure 8-15. EDU-5/P Parts Identification

NAVAIR 13-1-6.7-2

Materials Required

Quantity	Description	Reference Number
1	Screwdriver Set, Jeweler's, Swivel	NIIN 00-288-8739
1	Cloth, Lint-Free, Type II	MIL-C-85043

WARNING

Place the hinge area of the spectacles on a table edge for support when using the jeweler's screwdriver to loosen or tighten screws.

1. Place the hinge area of the spectacles on a table edge.

2. Using a straight-slot jeweler's screwdriver, size 1.8mm (0.070 in.), loosen the closing block screw slightly (figure 8-15). Use firm pressure to avoid stripping screw head.

3. Hold the spectacles over a soft "catch cloth" and continue unscrewing the closing block screw until the side of the frame springs apart. The screw may be left in the closing block.

4. Remove the lens from the frame.

8-138. Lens Installation.

CAUTION

When installing lenses, ensure that the correct lens type is used. Do not mix A, B, or C lens types in a single frame. The diameters of all lenses are the same, and are physically able to fit in all frames. However, the direct look points of lenses are very different. Using the wrong lenses will significantly reduce laser protection.

Materials Required

Quantity	Description	Reference Number
As Required	Alcohol, Isopropyl	TT-I-735 NIIN 00-655-8366
As Required	Coating, RTV	MIL-A-46146 NIIN 01-157-9469
1	Screwdriver Set, Jeweler's, Swivel	5120-00-288-8739
2	Cloth, Lint-Free, Type II	MIL-C-85043

WARNING

Place the hinge area of the frame on a table edge for support when using the jeweler's screwdriver to loosen or tighten screws. Do not mix A, B, or C lens types in a single frame.

1. Peel residual RTV coating from outside edges of the lenses.

2. Place one of the hinge areas of the frame on a table edge.

3. Using a straight-slot jeweler's screwdriver, size 1.8mm (0.070 in.), loosen the closing block screw (figure 8-15). Use firm pressure to avoid stripping the screw head. The screw may be left in the closing block.

4. Repeat steps 2 and 3 for the other side of the frame.

NOTE

If a cured plug has formed in the RTV applicator tip remove the plug with a paperclip.

5. Using the applicator tip supplied with the RTV coating, carefully apply a very thin bead of RTV coating to the inside grooves of the frame where the lenses will be seated.

6. Allow the RTV to cure for one hour.

7. Using care not to scratch the lens, place one lens in the frame, nasal side first, and carefully squeeze the frame around the lens. Ensure that the free section of the frame is positioned in the closing block.

8. While holding the frame and lens in position, use a straight-slot jeweler's screwdriver, size 1.8mm (0.070 in.) to tighten the closing block screw a few turns to stabilize the screw.

9. Place hinge area of the spectacles on a table edge for final tightening.

10. Tighten the screw snugly. Do not over-tighten or threads may strip. The screw head should be flush or slightly recessed. The opposite end of the screw should protrude slightly through the closing block.

11. Repeat steps 7 through 10 for the second lens.

12. Using isopropyl alcohol and a clean, lint-free cloth, clean the frame and lenses to remove excess RTV coating.

13. Fit spectacles to aircrewmember in accordance with paragraph 8-126 steps 3 through 5.

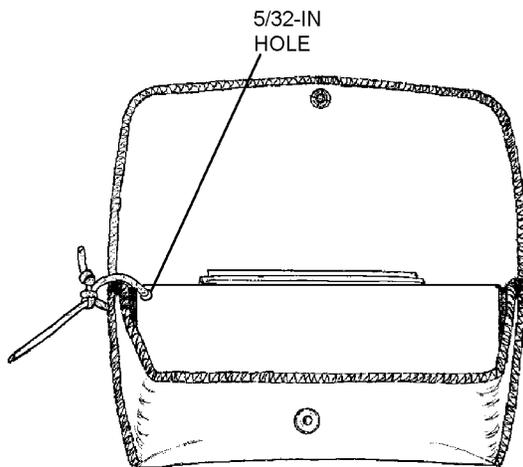
14. Clean lenses in accordance with paragraph 8-140.

15. Record spectacles information on Aircrew Systems Record, OPNAV 4790/138, (figure 8-16) and in accordance with OPNAVINST 4790.2 Series.

8-139. INSTALLATION OF RETENTION LANYARD. To install the EDU-5/P retention lanyard, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
1	Drill	—
1	Bit, Drill, 5/32-inch	—
As Required	Cord, Fibrous, Type IA	MIL-C-5040 NIIN 00-240-2154

1. Remove spectacles from their protective case.
2. Drill a 5/32-inch hole in the back left corner of the protective case in the location shown.
3. Using a 48-inch length of Type IA nylon cord (MIL-C-5040) seared at both ends, thread cord through the 5/32-inch hole in the case and secure to case with a bowline knot followed by an overhand knot.



Steps 2 and 3 - Para 8-139

8p139s2

4. Secure the opposite end by tying a bowline knot followed by an overhand knot in the applicable survival vest.

8-140. CLEANING. To clean the EDU-5/P Laser Eye Protection Spectacles, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Solution, Optical Cleaning	MIL-C-43454 NIIN 00-188-9875
	-or-	
As Required	Alcohol, Isopropyl	TT-I-735 NIIN 00-655-8366
As Required	Solution, Anti-fogging	NIIN 00-754-2672
As Required	Cloth, Lint-Free, Type II	MIL-C-85043 NIIN 00-044-9281
	-or-	
As Required	Tissue, Facial	—



Do not use abrasive cleaners, ammonia-based cleaners, polish or solvents to clean lenses or frame.

1. Lightly wipe all dust and dirt from the lenses and frame using a clean, soft, lint-free cloth or a fresh, soft, facial tissue.

NOTE

Isopropyl alcohol shall only be used for removing RTV, not for standard cleaning.

2. Apply optical cleaning compound, water, or isopropyl alcohol to the lenses with a spray or lint-free cloth.
3. Wipe lenses with a clean, soft, lint-free cloth.
4. Dry lenses with a dry, clean, soft, lint-free cloth or a fresh, soft, facial tissue. Avoid excess wiping of dry lenses.
5. (Optional) Apply anti-fogging solution to lenses.
6. Place spectacles with sun insert in protective case and store in a secure area.

8-141. DISPOSAL.

8-142. To dispose of unserviceable EDU-5/P lenses, proceed as follows:

1. If one or both lenses in a pair of spectacles is unserviceable, the complete EDU-5/P spectacles shall be disposed of in accordance with these procedures.

2. If unserviceable lens is in multiple pieces, place recoverable pieces in a plastic bag in the protective case with the frame and serviceable lens.

3. If the frame associated with a damaged lens is damaged to the point that it will not fit in the protective case, box the lenses, frame, and case.

4. Damaged lenses shall be returned via traceable means with their frame, protective case and Aircrew Systems Record (OPNAV 4790/138) to Commander, Naval Air Warfare Center, Aircraft Division, Vision Laboratory, Code 4.6.3.1, Bldg. 2187, Room 1A50, Unit 5, 48110 Shaw Road, Patuxent River, MD 20670-1906.

8-143. To dispose of an unserviceable frame or sun insert, proceed as follows:

1. Remove serviceable lenses from the damaged frame in accordance with [paragraph 8-137](#).

2. Discard unserviceable frame.

3. Return unserviceable sun insert to the Naval Air Warfare Center Vision Laboratory in the same manner as [paragraph 8-142](#).

4. Document in accordance with OPNAVINST 4790.2 Series.

8-144. ILLUSTRATED PARTS BREAK-DOWN.

8-145. This section lists and illustrates the assemblies and detailed parts of the EDU-5/P Laser Eye Protection Spectacles. The Illustrated Parts Breakdown ([figure 8-17](#)) should be used during maintenance when requisitioning and identifying parts.

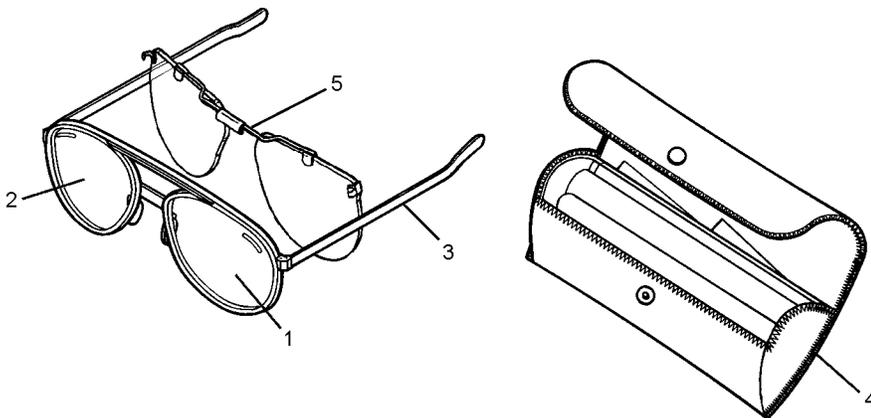


Figure 8-17. EDU-5/P Laser Eye Protection Spectacles

Figure and Index Number	Part Number	Description							Units Per Assembly	Usable On Code
		1	2	3	4	5	6	7		
8-17	2006572-501	EDU-5/P Laser Eye Protection Spectacles, 52-14A							1	A
	2006572-502	EDU-5/P Laser Eye Protection Spectacles, 52-14B							1	B
	2006572-503	EDU-5/P Laser Eye Protection Spectacles, 52-16B							1	C
	2006572-504	EDU-5/P Laser Eye Protection Spectacles, 52-18B							1	D
	2006572-505	EDU-5/P Laser Eye Protection Spectacles, 52-20B							1	E
	2006572-506	EDU-5/P Laser Eye Protection Spectacles, 52-22B							1	F
	2006572-507	EDU-5/P Laser Eye Protection Spectacles, 52-14C							1	G
	2006572-508	EDU-5/P Laser Eye Protection Spectacles, 52-16C							1	H
	2006572-509	EDU-5/P Laser Eye Protection Spectacles, 52-18C							1	I
	2006572-510	EDU-5/P Laser Eye Protection Spectacles, 52-20C							1	J
	-1	2005206-2	. EDU-5/P Lens, Left, Type A							1
2005207-2		. EDU-5/P Lens, Left, Type B							1	B,C,D,E,F
2005208-2		. EDU-5/P Lens, Left, Type C							1	G,H,I,J
-2	2005206-1	. EDU-5/P Lens, Right, Type A							1	A
	2005207-1	. EDU-5/P Lens, Right, Type B							1	B,C,D,E,F
	2005208-1	. EDU-5/P Lens, Right, Type C							1	G,H,I,J
-3	2003968-1	. EDU-5/P Frame, 52-14							1	A,B,G
	2003968-2	. EDU-5/P Frame, 52-16							1	C,H
	2003968-3	. EDU-5/P Frame, 52-18							1	D,I
	2003968-4	. EDU-5/P Frame, 52-20							1	E,J
	2003968-5	. EDU-5/P Frame, 52-22							1	F
-4	2005270-501	. EDU-5/P Case, Protective (Note 2)							1	
-5	2005732-101	. EDU-5/P Sun Insert, 52-14							1	A,B,G
	2005732-102	. EDU-5/P Sun Insert, 52-16							1	C,H
	2005732-103	. EDU-5/P Sun Insert, 52-18							1	D,I
	2005732-104	. EDU-5/P Sun Insert, 52-20							1	E,J
	2005732-105	. EDU-5/P Sun Insert, 52-22							1	G
Notes:		1. CAGE code is 4W129. 2. Protective case includes an instruction sheet and a lint-free cleaning cloth.								

NUMERICAL INDEX

Part Number	Figure and Index Number	SM&R Code
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Part Number	Figure and Index Number	SM&R Code
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2003968-1	8-17-3	PAOZZ	2005732-103	8-17-5	PAOZZ
2003968-2	8-17-3	PAOZZ	2005732-104	8-17-5	PAOZZ
2003968-3	8-17-3	PAOZZ	2005732-105	8-17-5	PAOZZ
2003968-4	8-17-3	PAOZZ	2006572-501	8-17	PAOZZ
2003968-5	8-17-3	PAOZZ	2006572-502	8-17	PAOZZ
2005206-1	8-17-2	XAOZA	2006572-503	8-17	PAOZZ
2005206-2	8-17-1	XAOZA	2006572-504	8-17	PAOZZ
2005207-1	8-17-2	XAOZA	2006572-505	8-17	PAOZZ
2005207-2	8-17-1	XAOZA	2006572-506	8-17	PAOZZ
2005208-1	8-17-2	XAOZA	2006572-507	8-17	PAOZZ
2005208-2	8-17-1	XAOZA	2006572-508	8-17	PAOZZ
2005270-501	8-17-4	XAOZA	2006572-509	8-17	PAOZZ
2005732-101	8-17-5	PAOZZ	2006572-510	8-17	PAOZZ
2005732-102	8-17-5	PAOZZ			

Section 8-9. Self-Contained Finger Light

8-151. GENERAL.

8-152. The Self-Contained Finger Light is optional equipment for use by aircrewmembers to provide quick, accurate, NVG compatible cockpit lighting during night flights. The Finger Light (NIIN 01-358-2175) and Lithium batteries (NIIN 01-138-8157) are available through normal supply channels. Commercially the Finger Light, FL-5, and Batteries, FL5-B1, are available through open purchase from:

Seitz Scientific Industries, Inc.
201 Hickory Bend Road
Enterprise, AL 36330-1007
Tel: (334) 348-9713

8-153. CONFIGURATION.

8-154. The Finger Light may be attached to any finger on either hand by a stretch velcro band. The self-contained light is powered by two lithium batteries.

8-155. APPLICATION.

8-156. The Self-Contained Finger Light is available to all aircrewmembers as optional equipment.

8-157. OPERATION.

8-158. The finger light, attached to any finger on either hand, is operated by a push ON/OFF switch on the front of the light to turn light ON/OFF as desired.

8-159. MAINTENANCE.

8-160. Maintenance of the finger light is limited to inspection and replacement of batteries. Required re-

cords shall be maintained and submitted in accordance with OPNAVINST 4790.2 Series.

8-161. INSPECTION. Inspection of the finger light shall be visual inspections consisting of Preflight/Postflight and Special Inspections.

8-162. Preflight/Postflight Inspection. Preflight/Postflight inspections shall be performed by the aircrewmember to whom the light was issued before and after each flight as applicable.

8-163. Special Inspection. The Special Inspection shall be performed every 90 days at organizational maintenance level or above.

8-164. Visual Inspection. The visual inspection is performed as follows:

1. Check function of light.
2. Inspect stretch velcro band for cuts, tears, abrasions, and security of attachment.
3. Inspect batteries and battery compartment for corrosion.

8-165. BATTERY REPLACEMENT. Replace batteries as follows:

1. Pull end-cap off of body tube of the light.
2. Pull cloth tab extending from inside body tube to remove batteries.
3. Insert fresh battery, positive (+) end of battery to positive (+) contact and negative (-) end of battery to negative (-) contact.
4. Reinstall end-cap on body tube.

Section 8-10. FV-9 Laser Eye Protective Spectacles (LEPS)

8-166. GENERAL.

WARNING

FV-9 Laser Eye Protection Spectacles are not shatterproof, or breakproof, and do not provide an unbreakable shield against eye injury.

8-167. The FV-9 Laser Eye Protection Spectacles NSN: 4240-01-458-5567 consists of a monolithic polycarbonate lens, mounted on a lightweight wrap-around sports frame. The FV-9 is designed for universal fit with adjustable temples, full front and lateral laser protection and they can be worn over some prescription eyewear. They are carried in a crush-resistant carrying case.

8-168. The FV-9 spectacles are designed to protect the eyes from the harmful effects of exposure to two discreet laser wavelengths. The polycarbonate lens is formed through an injection molding process, incorporating an absorptive dye designed to absorb laser emissions ranging from about 800 nanometers (nm) through at least 1064 nm. The FV-9 spectacles provide over 4 OD of attenuation for the two lasers against which they were designed to protect. This level of protection is somewhat higher than EDU-1/P spectacles and neodymium visors but the added protection comes at the expense of transmissivity of visible wavelengths. This higher level of protection is sufficient for all hand held IZLID devices, LAN-TIRN, and ATFLIR tactical mode. FV-9 provides no protection against wavelengths above 1100 nanometers (therefore no protection against ATFLIR training mode at 1540 nanometers or airborne laser at 1310 nanometers).

8-169. APPLICATION.

WARNING

The FV-9 spectacles are physically compatible with Night Vision Image Intensifier Sets (NVIIS). There is a potential for reduction in aircrew acuity due to reduced transmittance when wearing the FV-9 and NVIIS. Low light and poor weather conditions can further degrade the performance of the NVIIS and FV-9 combination. First time users of the FV-9 spectacles shall ac-

complish a crew station visibility assessment in night unaided and aided modes prior to flight.

CAUTION

FV-9 spectacles are not compatible with the Helicopter CBR Protective Assembly (A/P22P-9(V)). The spectacle frames may scratch the mask faceplate due to the tight fit.

8-170. These spectacles are intended for use by all fixed- and rotary-wing aircrewmembers subject to potential laser exposure while operating in the vicinity of laser detection, ranging, or designating systems.

8-171. FITTING.

8-172. The spectacles are designed for a universal fit, adjust the temples to the individual crewmember's comfort.

8-173. MODIFICATIONS.

8-174. There are no modifications to the spectacles authorized at this time.

8-175. MAINTENANCE.

CAUTION

Spectacles are fragile and can be damaged easily. Care should be used in handling to prevent scratching and breakage. When not in use, always keep the spectacles in their case. A lens 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 lenses should be disposed of in accordance with [paragraph 8-180](#).

8-176. The aircrewmember's responsibility for maintenance of the FV-9 spectacles is limited to pre/post-flight inspection and cleaning. Repairs or other maintenance actions required shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

8-177. PLACE-IN-SERVICE AND SPECIAL INSPECTIONS. The Place-In-Service and Special Inspections are visual inspections to be performed at organizational level or above in accordance with paragraph 8-178. The Place-In-Service Inspection shall be performed prior to issue upon placing the FV-9 Spectacles in service. The Special Inspection shall be performed when the aircrewmember returns the FV-9 Spectacles for repairs.

8-178. VISUAL INSPECTION. The visual inspection shall be performed as follows:

1. Check lenses for scratches, abrasions or other damage.
2. Check wraparound frames for signs of damage.

8-179. CLEANING. To clean the FV-9 Laser Eye Protection Spectacles, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Cloth, Lint-Free	NIIN 00-165-7195
As Required	Tissue, Facial	—
As Required	Compound, Anti-Fogging	NIIN 00-754-2672



Do not use abrasive cleaners or polish on lenses to remove scratches.

1. Lightly wipe all dust and dirt from lenses using a clean, soft, lint-free cloth.
2. Clean lenses with a moistened cloth or apply moisture by breathing on the lenses and wiping with a clean, soft, lint-free cloth.
3. Dry spectacles with a fresh, soft, facial tissue or clean, soft, lint-free cloth.
4. (Optional) Apply anti-fogging compound to spectacle lenses.

8-180. DISPOSAL.

8-181. If the FV-9 spectacles are damaged beyond use, they shall be destroyed by the organizational maintenance level by any means available (incinerated, crushed, shattered) prior to final disposal.

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