EAGLE
Night Vision Binoculars

OPERATION AND
MAINTENANCE MANUAL

SAFETY SUMMARY

Before operating this product, carefully read and study this Operation and Maintenance Manual.

The Eagle is a precision electron-optical instrument, and requires careful handling. To avoid damage to the equipment or physical harm to the user when operating the Eagle, follow all WARNINGS, CAUTIONS and NOTES.

Below you will find definitions of the following alerts that appear throughout this Manual:

WARNING — Identifies a clear danger to the person operating the equipment.

CAUTION – Identifies risk of damage to the equipment.

NOTE – Serves to highlight essential procedures, conditions, and statements, or convey important instructional data to the user.

WARNING:

This product contains natural rubber latex which may cause allergic reactions! The FDA has reported an increase in the number of deaths that are associated with an apparent sensitivity to natural latex proteins. If you are allergic to latex, it is a good idea to learn which products contain it and strictly avoid exposure to those products.

WARNINGS:

- When installing the unit on a weapon, be sure the weapon is CLEAR and that the SAFETY is on before proceeding.
- When used in total darkness, the light from the unit infrared (IR) illuminator is invisible to the naked eye. **However, the light can be detected by other Night Vision Devices (NVD).**
- To reduce the risk of detection by another NVD, avoid prolonged activation of the IR illuminator.
- The IR light is more easily detectable by an NVD when used in smoke, fog and rain. Avoid prolonged activation of the unit IR illuminator in these conditions.
- This product contains natural rubber latex, which may cause allergic reactions.
- The intensifier's phosphor screen contains toxic materials. Please note the following:

— If the intensifier tube breaks, be **extremely careful** to avoid inhaling the phosphor screen material. DO NOT allow the material to come in contact with your mouth, eyes, or any open wounds on the skin.

— If the phosphor screen material comes in contact with your skin, wash it off immediately with soap and water.

— If you inhale or swallow any phosphor screen material, drink a lot of water, induce vomiting, and **seek medical attention as soon as possible.**

CAUTION:

- The Eagle is a precision electron-optical instrument, and must be handled carefully at all times to prevent damage to the device and danger to the user.
- To protect the intensifier tube, **do not remove** the lens caps of the Eagle when the binoculars are being operated in daylight conditions, or when the device is not in use.
- Use of the Eagle in brightly lit conditions may damage the unit's intensifier tube.
- Bright light sources such as firelight, headlights, searchlights, etc. can damage the Eagle. Avoid exposing the unit to these types of light sources.
- Before removing the lens caps, verify that the photoreceiver is open.
- DO NOT forget to open the photoreceiver after completing your mission.
- DO NOT attempt to force the controls past their stopping points, as this may cause damage to the mechanisms.
- Before replacing the intensifier tube, confirm that it is no longer covered by warranty.
- Thoroughly clean and dry each component of the Eagle before placing them in the storage case.

NOTES:

- The equipment requires some ambient light (moonlight, starlight, etc.) to operate.
- Performance of the device in nighttime conditions depends on the level of ambient light in the environment. Please remember the following:

— The level of ambient light is reduced by the presence of clouds, shade, or objects that block natural light (trees, buildings, etc.).

— The equipment is less effective when operated in shadows and other darkened areas.

— The equipment is less effective when operated in rain, fog, sleet, snow, dust or smoke.

— The equipment will not "see" through dense smoke.

- At operating temperatures below -20°C (-4°F), the use of an alkaline battery is not recommended, as the battery life will be severely reduced. Under said conditions, lithium-iron disulfide 1.5V AA batteries or their equivalent should be used.
- For the purpose of returning defective components, retain all packaging materials.

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HOW TO USE THIS MANUAL

USAGE

You must familiarize yourself with the entire manual before operating the equipment. Before performing any kind of maintenance on your device, read the section on maintenance in its entirety. Follow all WARNINGS, CAUTIONS, and NOTES.

MANUAL OVERVIEW

This manual contains sections on Operating and Maintaining the Eagle Night Vision Binoculars.

The Product Warranty Registration Card can be found in Appendix A.

The list of Spare Parts can be found in Appendix B.

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INTRODUCTION

1.1 GENERAL INFORMATION

1.1.1 TYPE OF MANUAL

Operation and Maintenance (including a List of Spare Parts).

1.1.2 MODEL NUMBER AND EQUIPMENT NAME

Eagle Night Vision Binoculars

1.1.3 PURPOSE OF EQUIPMENT

To provide the operator with the ability to observe at night under moonlight and starlight conditions.

The Armasight Eagle is a high-tech, tough and durable set of binoculars that delivers great

performance at the lowest possible cost. Packed with features, the Eagle is a unit that is equally at home with the hunter as it is with the professional security officer or law enforcement professional.

The Eagle is equipped with an infrared light-emitting source (IR illuminator).

1.1.4 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS

User recommendations from for improvements to the device are encouraged.
Mail your comments to:
Armasight Inc.
815 Dubuque Avenue
South San Francisco, CA 94080, USA.
Or, send an email to info@armasight.com.

1.2 WARRANTY INFORMATION AND REGISTRATION

1.2.1 WARRANTY INFORMATION

This product is guaranteed to be free from manufacturing defects in material and workmanship under normal use for a period of two (2) years from the date of purchase. In the event that a defect covered by the below warranty occurs during the applicable period stated above, Armasight, at its discretion, will either repair or replace the product; such action on the part of Armasight shall be the full extent of Armasight's liability, and the Customer's sole and exclusive reparation. This warranty does not cover a product if it has (a) been used in ways other than its normal and customary manner; (b) subjected to misuse; (c) subjected to alterations, modifications or repairs by the Customer of by any party other than Armasight without prior written consent of Armasight; (d) special order or "close-out" merchandise or merchandise sold "as-is" by either Armasight or the Armasight dealer; or (e) merchandise that has been discontinued by the manufacturer and either parts or replacement units are not available due to reasons beyond the control of Armasight. Armasight shall not be responsible for any defects or damage that in Armasight's view are a result from the mishandling, abuse, misuse, improper storage or improper operation of the device, including use in conjunction with equipment that is electrically or mechanically incompatible with, or of inferior quality to, the product, as well as failure to maintain the environmental conditions specified by the manufacturer. CUSTOMER IS HEREBY NOTIFIED THAT OPERATION OF THE EQUIPMENT DURING DAYLIGHT HOURS OR UNDER ANY EXCESSIVE LIGHT CONDITIONS MAY PERMANENTLY DAMAGE THE INTERNAL COMPONENTS OF THE UNIT AND SAID DAMAGE WILL NOT BE COVERED UNDER THIS WARRANTY. This warranty is extended only to the original purchaser. Any breach of this warranty shall be enforced unless the customer notifies Armasight at the address noted below within the applicable warranty period.

The customer understands and agrees that except for the foregoing warranty, no other warranties written or oral, statutory, expressed or implied, including any implied warranty of merchantability or fitness for a particular purpose, shall apply to the product. All such implied warranties are hereby and expressly disclaimed.

1.2.2 LIMITATION OF LIABILITY

Armasight will not be liable for any claims, actions, suits, proceedings, costs, expenses, damages or liabilities arising out of the use of this product. Operation and use of the product are the sole responsibility of the Customer. Armasight's sole undertaking is limited to providing the products and services outlined herein in accordance with the terms and conditions of this Agreement. The provision of products sold and services performed by Armasight to the Customer shall not be interpreted, construed, or regarded, either expressly or implied, as being for the benefit of or creating any obligation toward any third party of legal entity outside Armasight and the Customer; Armasight's obligations under this Agreement extend solely to the Customer. Armasight's liability hereunder for damages, regardless of the form or action, shall not exceed the fees or other charges paid to Armasight by the customer or customer's dealer. Armasight shall not, in any event, be liable for special, indirect, incidental, or consequential damages, including, but not limited to, lost income, lost revenue, or lost profit, whether such damages were foreseeable or not at the time of purchase, and whether or not such damages arise out of a breach of warranty, a breach of agreement, negligence, strict liability or any other theory of liability.

1.2.3 PRODUCT WARRANTY REGISTRATION

In order to validate the warranty on your product, Armasight must receive a completed Product Warranty Registration Card for each unit, or the Customer can complete a warranty registration on our website, at www.armasight.com. Please complete the included form (Appendix A) and immediately mail it to our Service Center:

Armasight Inc.
815 Dubuque Avenue
South San Francisco, CA 94080
United States of America

1.2.4 OBTAINING WARRANTY SERVICE

To obtain warranty service on your unit, the End-user (Customer) must notify the Armasight service department via email. Send any requests to service@armasight.com to receive a Return Merchandise Authorization number (RMA). When returning any device, please take in the product to your retailer, or send the product, postage paid and with a copy of your sales receipt, to Armasight Corporation's service center at the address listed above. All merchandise must be fully insured with the correct postage; Armasight will not be responsible for improper postage or merchandise that becomes lost or damaged during shipment. When sending product back, please clearly write the RMA# on the outside of the shipping box. Please include a letter that indicates your RMA#, the Customer's Name, a Return Address, reason for the return, Contact information (valid telephone numbers and/or an e-mail address), and proof of purchase that will help us to establish the valid start date of the warranty. Product merchandise returns that do not have an RMA# listed may be refused, or a significant delay in processing may occur. Estimated Warranty service time is 10-20 business days. The End-user/ Customer is responsible for postage to Armasight for warranty service. Armasight will cover return postage/ shipping after warranty repair to the End-user/ Customer only if the product is covered by the aforementioned warranty. Armasight will return the product after warranty service by domestic UPS Ground service and/ or domestic mail. Should any other requested, required or international shipping methods be necessary, the postage/ shipping fee will be the responsibility of the End-user/ Customer.

1.3 LIST OF ABBREVIATIONS

C   Celsius (Centigrade)
CCW   counterclockwise
Cont'd   Continued
CW   clockwise
Dia   diameter
F   Fahrenheit
FOV   Field of View
g   gram
Gen   Generation
H   Height
hr   hour
IR   infrared
IIT   Image Intensifier Tube
L   Length
LED   Light Emitting Diode
lx   lux
m   meter
mA   milliampere
min   minute
mm   millimeter
mW   milliwatt
nm   nanometer
No   Number
NV   Night Vision
NVD   Night Vision Device
Para   Paragraph
PMCS   Preventive Maintenance Checks and Services
QRM   Quick Release Mount
QTY   Quantity
RMA#   Return Merchandise Authorization number
s   second
seq   sequence
SR   Service Representative
VDC   Volts Direct Current
V   Volt
W   Width

2

DESCRIPTION AND DATA

2.1   SYSTEM DESCRIPTION

The Armasight Eagle is a high-tech, tough and durable set of binoculars that delivers great

performance. Packed with features, the Eagle is equally at home with the hunter as it is with the professional security officer or law enforcement professional.

The Armasight Eagle can be equipped with high-performance Gen 2+ and Gen 3 IITs including Green phosphor or Armasight's "Quick Silver" and "Ghost" IITs, which provide users with natural B&W night vision displays.

The Eagle utilizes the principle of intensification of the residual light that is reflected from the surrounding objects. The optical system of the unit consists of the two objective lenses, the two intensifier tubes (IT), and the two eyepieces.

The Eagle's automatic brightness adjustment system retains the same gain (image brightness), even under unsteady light conditions.

The Eagle's automatic protective system controls illumination through a photoreceiver. If the illumination level surpasses 100-300 lx for more than 10 s, the unit will shut off automatically.

The Eagle features bright light shut-off circuitry and a spot/flood built-in IR illuminator. A built-in IR illuminator makes it possible to use the unit in low light conditions or total darkness.

The Eagle uses LED lights to indicate illumination level, low battery, and to show the user that the IR illuminator is on.

> **NOTE:**
> The equipment requires some light (moonlight, starlight, etc.) to operate. Performance of the device depends upon the level of ambient light in the environment. Please remember the following:
> —   The level of ambient light in the environment is reduced by the presence of clouds, shade, or objects that block natural light (trees, buildings, etc.).
> —   The equipment is less effective when operated in shadows and other darkened areas.
> —   The equipment is less effective when operated in rain, fog, sleet, snow, or smoke.
> —   Under starlight conditions, particularly in low-contrast environments such as snow-covered territory, sandy deserts, large bodies of water or grassy hills, the visibility may degrade, thereby disguising or masking changes in terrain.
> —   The equipment will not "see" through dense smoke.
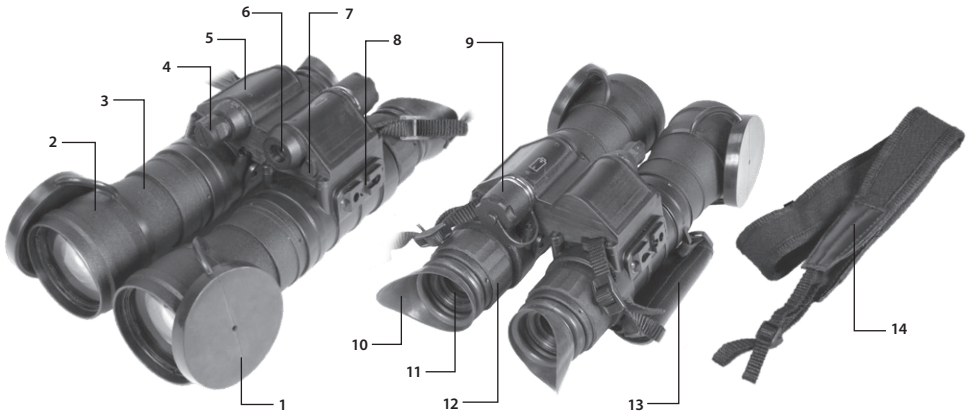
FIGURE 2-1. EAGLE NIGHT VISION BINOCULARS

TABLE 2-1. EAGLE SYSTEM DESCRIPTION

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Lens Cap	8	Rail
2	Focus Ring	9	Battery Cap with Battery Adapter
3	Lens	10	Eye-cup
4	Turn-pull Function Switch	11	Eyepiece
5	Body	12	Eyepiece Ring
6	IR Illuminator	13	Hand Strap
7	Photo Receiver with Pivotal Cap	14	Neck Strap

2.2 SPECIFICATIONS

TABLE 2-2. MECHANICAL DATA

ITEM	DATA
Dimensions	$235 \times 120 \times 75$mm / $9.2 \times 4.7 \times 2.9$ in
Weight	1.52 kg / 3.35 lbs

TABLE 2-3. ELECTRICAL DATA

ITEM	DATA
Battery*	One AA (1.5 V) or 123A (3 V)
Continuous Operation** at 20°C (68°F): - AA Alkaline Battery - 123A Lithium Battery	 30 (IIT Gen. 2+) / 25 (IIT Gen. 3) 60 (IIT Gen. 2+) / 50 (IIT Gen. 3)

Any AA or CR123 type rechargeable batteries with voltage from 1.2V to 3.7V can be used.
*** With IR illuminator off.*

TABLE 2-4. OPTICAL DATA

ITEM	DATA
Magnification	3.5X
Lens Focal Length	80mm
Lens F/number	1:1.6
Focus Range:	5m to infinity
FOV	12°
Exit Pupil Diameter	10mm
Eyepiece Focal Length	24mm
Eye Relief	21.5mm
Eyepiece Diopter Adjustment	-5 to +5 diopters
Built-in IR Illuminator: — Power — Illumination Range — Illumination Wavelength	 50mW up to 50m 850nm

TABLE 2-5. ENVIRONMENTAL DATA

ITEM	DATA
Operating Temperature	-40 to +50°C (-40 to 122°F)
Storage Temperature	-50 to +70°C (-58 to 158°F)
Humidity	95%, 25°C to 40°C for 48 hr
Illumination Required	Natural night illumination (overcast starlight to moonlight)
Environmental Rating	Waterproof

TABLE 2-6. IR850 DATA

ITEM	DATA
IR Emitter Type	LED
Peak Wavelength	850 nm
Power	500 mW
Illumination Range	Up to 500m
Divergence	8° to 12°
Battery	Single CR123A (3V)
Operational Time at 20°C (68 °F)	From 1.5 hr (Full Power) to 10 hr (1/4 Power)
Overall Dimensions with Mount	117 × 41 × 37 mm (4.6 × 1.6 × 1.5 in)
Weight (with Mount, without Battery)	102 g (3.6 oz)
Operating Temperature	-30 to +50°C (-22 to 122°F)
Storage Temperature	-50 to +70°C (-58 to 158°F)
Environmental Rating	Water Resistant

2.3 STANDARD COMPONENTS

The standard components of the Eagle are shown in Figure 2-2 and listed in Table 2-7. The ITEM NO. column indicates the number used to identify items in Figure 2-2.
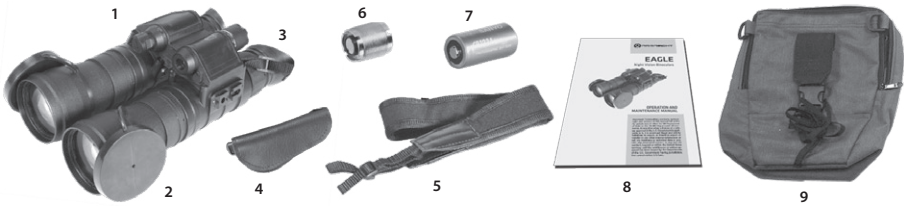
FIGURE 2-2. EAGLE STANDARD COMPONENTS

TABLE 2-7. EAGLE STANDARD COMPONENTS

ITEM NO.	DESCRIPTION	QUANTITY
1	**Night Vision Binoculars** Night vision binoculars with 3.5x magnification.	1
2	**Lens Cap** A protective cap for the lens and for use when testing the unit in daylight.	2
3	**Eye-cup** A protective rubber cup for the eyepiece that also provides comfort for the operator.	2
4	**Neck Strap** A strap that allows the user to hang the Eagle comfortably around the neck during breaks in observation sessions.	1
5	**Hand Strap** A strap that helps the user securely hold the Eagle without having to grip the unit too tightly. This provides greater comfort and security for the user during operation.	1
6	**Battery Adapter** To allow the use of a single 3V CR123 or 1.5V AA batteries.	1
7	**Battery 123A Lithium** A single, 123A lithium battery used to power the unit.	1
8	**Operation and Maintenance Manual** Provides safety information, equipment description, mounting procedures, operating instructions, and preventive maintenance checks and services (including a List of Spare Parts).	1
9	**Carrying Case** A protective case used for storage and transportation of the Eagle and its accessories.	1

2.4 OPTIONAL EQUIPMENT

Optional items are shown and listed in Table 2-8.

The PART NO. column indicates the primary number used by the manufacturer to identify an item.

TABLE 2-8. EAGLE OPTIONAL EQUIPMENT

IMAGE	DESCRIPTION	PART NO.
	IR810 Detachable Long Range Infrared Illuminator w/Dovetail to Weaver Transfer Piece #21 Extra long-range infrared illuminator. Provides greater viewing capabilities when the environment has little or no ambient light.	ANKI000016
	IR850 Detachable Long Range Infrared Illuminator w/Dovetail to Weaver Transfer Piece #21 Extra long-range infrared illuminator. Provides greater viewing capabilities when the environment has little or no ambient light.	ANKI000017
	Camera Adapter #47 An adapter with a step-down ring that allows the Eagle to be attached to any 35mm SLR camera or 8mm camcorder.	ANAM000016
	Time Tracker System #83 The system/IIT service life recorder allows the user to track, within one minute, how many hours the system has been in operation.	ANCA000001
	Hard Shipping/Storage Case #101 A protective case used for the shipping, storage, and transportation of the Eagle and its accessories.	ANHC000001

2.5 KEY FEATURES

- **Gen 2+ or Gen 3 image intensifier tube**
- **Automatic bright light cut-off system to protect the intensifier tube**
- **LED lights visible in the eyepiece viewing area, which indicate that the bright light cut-off system and IR illuminator are operating, as well as alert the user of a low battery**
- **Built-in IR illuminator**
- **Compact and robust design**
- **Easy to operate**
- **Serviceability under severe conditions**
- **High-performance**
- **Highly reliable**
- **Powered by single CR123A or AA battery**
- **Adaptable for use with cameras**
- **Waterproof**
- **Limited two-year warranty**

OPERATING INSTRUCTIONS

3.1 INSTALLATION AND MOUNTING

CAUTION:

To protect the intensifier tubes when the unit is not in use or when operating in daylight, keep the protective lens caps securely fitted over the lenses.

3.1.1 BATTERY INSTALLATION

The Eagle operates on a single CR123A or AA battery.

Depending on the size of the battery used, it may be necessary to reposition the battery adapter within the battery cap.

NOTE:

If operating the device at temperatures below -20°C (-4°F), the use of an alkaline battery is not recommended, as the severe cold will adversely affect the life of the battery. In these conditions, it is recommended that you use a lithium-iron disulfide 1.5V AA battery, or its equivalent.

Install the CR123A battery as follows:
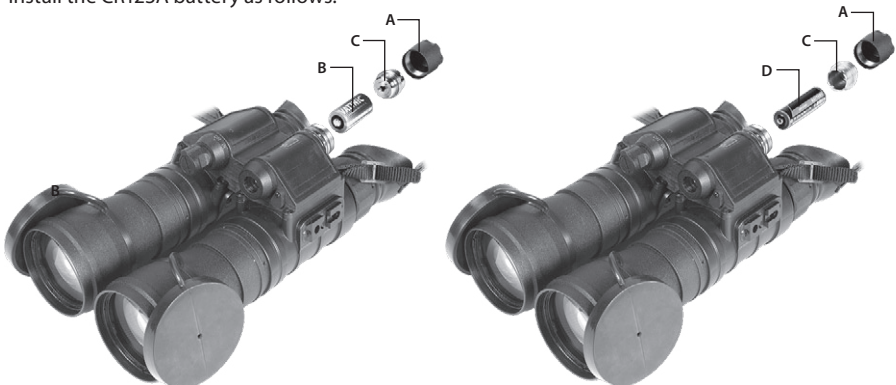
FIGURE 3-1. BATTERY INSTALLATION

1. Unscrew the battery cap (A) and insert the CR123A battery (B), observing polarity markings on the body of the device.
2. With the battery adapter (C) installed, screw the battery cap (A) back on securely.

Install the AA battery as follows:

1. Unscrew the battery cap (A).
2. Unscrew the battery adapter (C) from the cap, turn it around, and screw in the other end.
3. Insert the AA battery (D), observing polarity markings on the body of the device.
4. Screw the battery cap (A) back into place.

3.1.2 MOUNTING A LONG-RANGE IR ILLUMINATOR TO THE EAGLE

To mount an IR illuminator to the Eagle, use the Dovetail to Weaver Transfer Piece. Perform the following steps:

1. Install the transfer piece (A) onto one of the Eagle rails.
2. Tighten the two fixing screws (B) on the transfer piece.
3. Loosen the IR illuminator fixing screw (C).
4. Mount the IR illuminator on the Weaver rail of transfer piece and tighten the fixing screw (C).
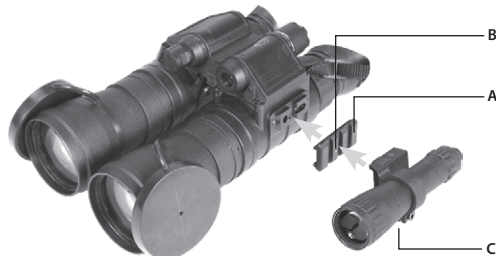
FIGURE 3-2. MOUNTING AN IR ILLUMINATOR TO THE EAGLE

3.1.3 MOUNTING A CAMERA/ CAMCORDER TO THE EAGLE

To mount any 35mm SLR photographic camera or 8mm camcorder to the Eagle, use the optional camera adapter and perform the following:

1. Using the (M37x0.75 threaded) adapter ring (B), screw the (M52x0.75 threaded) adapter (A) into the front lens of the photographic camera or video camera.
2. Remove the eyecup from the Eagle eyepiece.
3. Connect the adapter with the eyepiece and tighten the three fixing screws (C) located on the adapter.

FIGURE 3-3. MOUNTING A CAMERA/ CAMCORDER TO THE EAGLE

3.2 CONTROLS AND INDICATORS

3.2.1 CONTROLS AND INDICATORS

The Eagle controls and indicators are defined in Table 3-1.

The Eagle controls are shown in Figure 3-4.

> **CAUTION:**
> DO NOT force the controls past their stopping points.
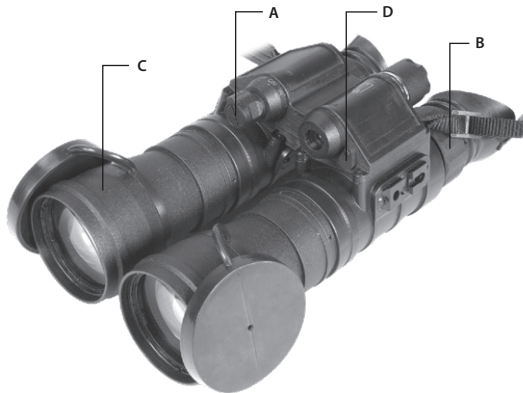
FIGURE 3-4. EAGLE CONTROLS

TABLE 3-1. EAGLE CONTROLS AND INDICATORS

CONTROL/INDICATOR	FUNCTION
Turn-pull Function Switch (Figure 3-4, A)	OFF position — the unit is off.
	ON position — the unit is on (IIT powered). Turn the unit on by turning the switch CCW from OFF to ON.
	IR position — the unit is on, and the IR illuminator is activated. Activate the IR illuminator by pulling it out and turning the switch CW from ON to the IR position.
Eyepiece Ring (Figure 3-4, B)	Adjusts the unit diopter. The total dioptric range is covered in a 1/2 ring revolution.
Focusing Ring (Figure 3-4, C)	Focuses the lens. Adjusts for sharpest view of the scene. The total focus range is covered in a 1/3 ring revolution.
Photo Receiver Cap (Figure 3-4, D)	Putting the cap on the photoreceiver disables the sensor and allows the user to operate or test the unit under bright light conditions. As a protective measure, normal positioning should leave the sensor exposed and operational.

TABLE 3-1. CONTINUED

CONTROL/INDICATOR	FUNCTION
Built-in LED Indicators	A GREEN GLOW in the eyepiece viewing area indicates excessive light conditions. After 10 s of exposure to bright light, the intensifier will shut off automatically. The unit will turn back on again when moved away from the excessive light.
	A PERMANENT RED GLOW in the eyepiece viewing area indicates that the IR illuminator is operating.
	A FLASHING RED LIGHT in the eyepiece viewing area indicates that the battery is low.

3.3   OPERATING PROCEDURES

3.3.1   OPERATING PROCEDURES

These procedures should be performed under nighttime conditions only.

> **CAUTION:**
> Use of the Eagle in brightly lit conditions may damage the unit's intensifier tube.

1. Verify that the battery is installed as indicated on the body of the device.
2. Make a visual estimation of the illumination level in the viewing area. The required level of illumination is less than 1 lx (late twilight sky conditions).
3. Remove the lens caps and place them over the lens casing.

> **CAUTION:**
> Before removing the objective lens caps, verify that the photoreceiver is open.

4. Turn the function switch ON. A green glow will appear in the eyepieces of the binoculars after a momentary delay.
5. Adjust the unit diopter by rotating the rings of the eyepieces.
6. Observe the scene. Rotate the focus rings until the image is clear and sharp.

> **CAUTION:**
> Bright light sources such as firelight, headlights, searchlights, etc. can damage the Eagle. Avoid exposing the unit to these types of light sources.

3.3.2   IR ILLUMINATOR OPERATIONS

> **CAUTION:**
> When operating the device in extremely dark conditions, the light from the unit's IR illuminator will be invisible to the naked eye. However, the light can be detected by other NVDs.

NOTE:

The IR illuminator is designed to provide additional illumination (when needed) while viewing scenes from a distance up to 50m.

To activate the IR illuminator, turn the binoculars on. Pull the IR illuminator out and flip the turn-pull function switch CW from ON to the IR position. A red light will appear in the eyepiece to indicate that the IR illuminator is operating.

3.3.3   OPERATING UNDER CHANGING LIGHT CONDITIONS

If the ambient light level exceeds the limit of 100-300 lx for more than 10 s, the Eagle automatic protective system will shut off the image intensifier tube. If a mission must be carried out in changing light conditions, the user can shut down the protective system manually by closing the photoreceiver with the pivotal cap. Putting the cap on the photoreceiver disables the sensor and gives the user an option of operating or testing the unit under brighter light conditions.

CAUTION:

DO NOT forget to open the photoreceiver after completing your mission.

3.3.4   OPTIONAL LONG-RANGE IR ILLUMINATOR OPERATIONS

CAUTION:

Do not forget that light emitted from the IR illuminator is invisible to the naked eye; however, it can be easily detected by other night vision devices.

Infrared illuminators are used in areas where the level of light level is not sufficient for surveillance. An IR illuminator provides infrared light which, although invisible to the naked eye, can greatly enhance the performance of night vision devices. Turn on the IR850 when working in total darkness. Please remember that the beam emitted by your IR illuminator will lose its brightness over long distances.

The Armasight IR850 runs on one CR123A battery. To install the battery, unscrew the battery compartment cap and insert the battery in accordance with polarity markings. Screw the battery compartment cap back into place.

Install the IR illuminator on your binoculars as described in Part 3.1.2 of this Manual.

To switch the IR850 ON, rotate the knob from the OFF position.

The power of the beam emitted by the IR850 can be changed. To change the brightness of IR light, rotate the illuminator knob.

You can change the field of coverage by adjusting the IR beam. To focus the beam, rotate the IR illuminator lens until the desired field of coverage is reached. Adjust the IR spot position in the field of view of the NVD as follows:

1. Loosen the screw of the clamp on the IR illuminator mount.

2. Turn on the sight and the IR illuminator.

3. Carefully move the lens of the IR850 up and down and side to side. While looking through the eyepieces of your device, observe the IR spot position.

4. Once the IR spot is centered in the field of view, tighten the fixing screw on the clamp.

BEAM DIRECTION ADJUSTMENT
OPERATION SWITCH
BATTERY COMPARTMENT
FOCUS ADJUSTMENT
SCREW OF CLAMP
FIXING SCREW
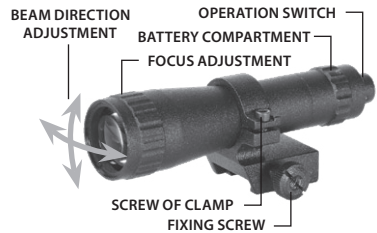
FIGURE 3-5. IR850 ILLUMINATOR

3.3.5 EAGLE SHUT-DOWN

1. Turn the function switch to OFF. The green glow of the viewing area will fade to black.

2. Secure the lens caps over the objective lenses.

3. Unscrew the battery cap and take out the battery. Replace the battery cap. Do not store the unit with the battery still in it.

4. Store the unit and all accessories in the case.

3.4 STORAGE

3.4.1 PREPARATIONS FOR STORAGE

Prepare the Eagle for storage as follows:

1. Verify that the Eagle and all accessories are clean and dry before returning them to the storage case.

2. Secure the caps over the objective lenses.

3. Remove the battery.

4. Place the Eagle and accessories in the appropriate locations in the case, and close the cover.

4

PREVENTIVE MAINTENANCE AND TROUBLESHOOTING

4.1 PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4.1.1 PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

Table 4-1: Preventive Maintenance Checks and Services has been provided so that you can keep your equipment operable and in good condition.

Perform all functional tests in the order listed in Table 4-1.

Operating Procedures are detailed in Chapter 3.

A. Cautions

Always observe any CAUTIONS that appear in the table.

B. Explanation of Table Entries

SEQ NO. column. Sequence numbers are for reference and appear in the order required to perform checks and services.

LOCATION/ITEM TO CHECK/SERVICE column. Indicates the location and the item to be checked or serviced.

PROCEDURE column. Details the checking/ servicing procedure.

NOT FULLY MISSION CAPABLE IF... column. Indicates what faults will prevent your equipment from operating successfully.

TABLE 4-1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

SEQ NO.	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF...
		BEFORE OPERATION CHECKS	
1	Completeness	Open the carrying case and inventory items by means of comparing with the data specified in this manual.	Items are missing.
2	Soft Carrying Case	Shake out loose dirt or foreign material. Inspect for tears, cuts, excess wear or damage to the mounting clips.	
3	External Surfaces	Inspect for cracks or damage. Scratches and gouges are allowable if operation is not affected.	Cracked or damaged.

TABLE 4-1. CONTINUED

SEQ NO.	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF...
4	Lens Caps	Inspect for cracked, torn, or missing lens caps.	Cap is torn or cut. Cap is not secured to the housing of the lens.
5	Eyecups	Inspect for dirt or dust. Inspect for cracked or torn, bent, broken or improperly fitting eyecup. If necessary, clean as per Part 4.4.2.	Cup torn or cut.
6	Battery Adapter/ Compartment/ Cap	Verify that the battery adapter is present. Inspect for corrosion, moisture, and corroded or defective contacts. Verify that the o-ring is present.	Adapter is missing, contacts damaged or corroded, or o-ring is missing.
7	Function Switch	Check the switch for operation (without a battery).	Switch has no definite stopping points. Switch knob is broken or missing.
8	Pivotal Photo-receiver Cap	Check to make sure pivotal cap is present.	Pivotal photoreceiver cap is missing.
9	Lenses	Inspect optical surfaces for dirt, fingerprint residue, scratches, chips, or cracks.	Scratches or chips hinder vision with the Eagle turned on. Cracks are present. Photoreceiver damaged.
10	Focusing Rings	Rotate the focusing ring to ensure free movement (range is approximately 1/3 turn).	Ring gets stuck or adversely affects the user's ability to properly focus the unit.
11	Eyepiece Rings	Rotate the eyepiece rings to make sure the eyepieces are not too tight or too loose. Range is approximately ½ turn.	Ring gets stuck, is too loose, or adversely affects the user's ability to properly adjust the diopter.
12	Optional Equipment	Inspect optional items for dirt, or corrosion, damage, and missing parts. Check for proper operation. If necessary, clean as detailed in Part 4.4.2.	Equipment is damaged or parts are missing.

OPERATIONAL CHECKS

CAUTION:
Do not activate the Eagle in daylight unless the lens caps are on, or you are operating in darkness.
CAUTION:
Do not forget to open the photoreceiver after finishing operational checks.
NOTE:
Daylight checks are described below.

SEQ NO.	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF...
13	Function Switch	Install the battery. Verify that the photoreceiver is open. Turn the switch from OFF to ON. Look for the green glow in eyepieces (it should appear after a slight delay), and wait about 10 s for image to disappear. Look for a flashing red light in eyepiece viewing area.	Image is present. Red light is flashing.
		Close the photoreceiver by placing the pivotal cap on the photoreceiver window. Pull out the IR and turn the switch from ON to the IR position. Look for a permanent red glow in the eyepiece viewing area. Turn the switch from IR to ON position.	Permanent red glow is absent
14	Viewed Image	Inspect for any operational defects (refer to Part 4.3.1: Identification of Operational Defects).	Shading, edge glow, flashing, flickering, and intermittent operation, or excessive cosmetic defects are found.

AFTER CHECKING PROCEDURES

SEQ NO.	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF...
15		Turn the unit OFF. Verify that the green glow fades from the eyepieces.	
		Remove the battery.	
		Return the unit and all accessories to the soft carrying case.	

4.2 TROUBLESHOOTING

4.2.1 OPERATOR TROUBLESHOOTING

The purpose of troubleshooting is to identify the most frequently occurring equipment malfunctions, their probable causes, and the corrective actions required to fix them.

Table 4-2 lists common malfunctions that may occur during the operation or maintenance of the Eagle. Perform the tests, inspections, and corrective actions in the order listed in the table.

This table does not list all of the malfunctions that may occur with your device, or all of the tests and corrective actions that may be necessary. If you experience an equipment malfunction that is not listed, or is not fixed by the corrective actions listed in the table, please contact Armasight's Customer Service center.

TABLE 4-2. OPERATOR TROUBLESHOOTING

MALFUNCTION	PROBABLE CAUSE/ TEST/INSPECTION	CORRECTIVE ACTION
Binoculars fail to activate.	Battery is dead, missing or improperly installed.	Replace the battery or install it correctly.
	Battery contact surfaces or contact springs are dirty or corroded.	Clean the contact surfaces with a pencil eraser and/ or alcohol and cotton swabs.
	Defective image intensifier.	Please contact Customer Support.
Battery adapter difficult to remove.	Check for damaged battery adapter and battery cap.	If damaged please contact Customer Support.
IR illuminator fails to activate.	Turn the IR illuminator on in a dark area. Visually estimate whether or not the observed scene is illuminated.	If the IR illuminator fails to activate, please contact Customer Support.
LED indicators fail to activate.	Visual inspection.	Please contact Customer Support.
Poor image quality.	Check objective lenses or eyepieces focus.	Refocus the lenses.
	Check for fogging or dirt on the lenses.	Clean the lenses as detailed in Part 4.4.2. If image quality is still poor, please contact Customer Support.
	Damaged optical components.	Please contact Customer Support
Light is visible around the eyecup.	Check the exit pupil distance value.	Readjust for proper eye-relief distance.
	Check the eyecup resilience.	If the eyecup is defective, please contact Customer Support.
Focusing ring cannot be moved.	Check to see if the focusing ring is bent or broken.	If damaged, please contact Customer Support.
Eyepiece ring cannot be moved.	Check to see if the eyepiece ring is bent or broken.	If damaged, please contact Customer Support.

4.3 IDENTIFICATION OF OPERATIONAL DEFECTS

4.3.1 OPERATIONAL DEFECTS

Operational defects relate to the reliability of the intensifier, and are an indication of instability. If identified, the user will need to return the Eagle immediately. Operational defects include shading, edge glow, flashing, flickering, and intermittent operation.

A. Shading

If shading is persistent, you will not be able to see a fully circular image (Figure 4-1). Shading is a very dark, high-contrast area with a distinct line of demarcation present, and you cannot see an image through it. Shading always begins on the edge, and will eventually migrate inward until it spans across the entire image area. If you notice shading with your device, please contact Customer Support.
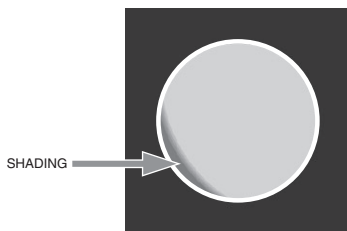
FIGURE 4-1. SHADING

> **NOTE:**
> Verify that any shading is not the result of improper eye-relief adjustment.

B. Edge Glow

Edge glow is a bright area (it sometimes appears to be sparkling) in the outer portion of the viewing area (see Figure 4-2). To check for edge glow, block out all light from the device by cupping a hand over the lens. If the image tube is displaying edge glow, the bright area will still show up; if edge glow occurs, please contact Customer Support.
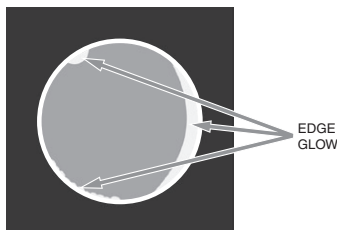

FIGURE 4-2. EDGE GLOW

C. Flashing, Flickering, or Intermittent Operation

The image may appear to flicker or flash. If there is more than a single flicker, check for a loose battery adapter or a weak battery. If flickering continues, please contact Customer Support.

4.3.2 COSMETIC BLEMISHES

Cosmetic blemishes are usually the result of manufacturing imperfections. They do not affect the reliability of the image intensifier, and are not normally a cause for returning the Eagle. However, some types of cosmetic blemishes can worsen over time and interfere with the user's ability to properly operate the device during missions. If you believe a cosmetic blemish is cause for returning the device, record the specific nature of the problem on the maintenance forms and use the clock method to identify the position of the blemish and its approximate distance from the center (e.g., 5:00 toward the outside, 2:30 near the center, or 1:00 midway).

The following are examples of cosmetic blemishes:

A. Bright Spots

A bright spot is a small, non-uniform bright area that may flicker or appear constant (Figure 4-3).

Not all bright spots make the Eagle returnable. Cup your hand over the lens to block out all light. If the bright spot remains please contact Customer Support.

Bright spots usually go away when all light is blocked out. Verify that any bright spots are not simply the result of bright light in the area you are observing. Bright spots are acceptable if they do not interfere with the user's ability to view the scene or perform missions.

B. Emission points

Emission points are steady or fluctuating pinpoints of bright light in the image area that do not go away when all external light is blocked from the objective lens (Figure 4-3). The position of an emission point within the image area does not move. Not all emission points are cause to return the Eagle. Verify that emission points are not simply light sources present in the scene you are observing. Emission points are acceptable if they do not interfere with the user's ability to perform missions.
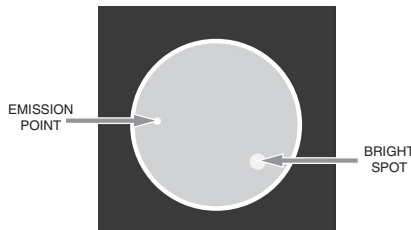

FIGURE 4-3. EMISSION POINTS AND BRIGHT SPOTS

C. Black Spots

Black spots are cosmetic blemishes in the image intensifier or debris between the lenses. Black spots are acceptable as long as they do not interfere with the user's ability to observe the scene. No action is required if this condition is present, unless the spots interfere with the operator's ability to perform missions.

D. Fixed-pattern Noise

Fixed-pattern noise is usually a cosmetic blemish characterized by a faint hexagonal (honeycomb) pattern that appears throughout the viewing area. This typically occurs in excessively lit environments or when viewing very bright lights (See Figure 4-4). This pattern can be seen in every image intensifier if the level of light is high enough. This condition is acceptable as long as the pattern does not interfere with the user's ability to view an image or perform missions.
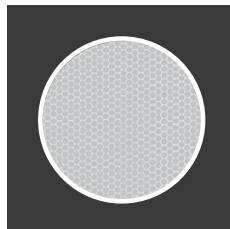

FIGURE 4-4. FIXED-PATTERN NOISE

E. Chicken Wire

Chicken wire is an irregular pattern of dark thin lines that can appear in the field of view, either throughout the image area or in sections of the image area (See Figure 4-5). In the worst-case scenario, these lines will form hexagonal or square, wave-shaped lines. No action is required if this condition is present, unless it interferes with the user's ability to view the image or perform missions.
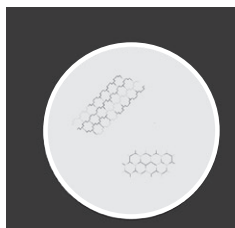

FIGURE 4-5. CHICKEN WIRE

4.4 MAINTENANCE

4.4.1 GENERAL

The section regarding Eagle operator maintenance consists of operational tests, inspections for the unit serviceability, cleaning and mounting procedures, troubleshooting, and replacement instructions for a limited number of parts. Maintenance instructions covered elsewhere in this manual (PMCS, troubleshooting, etc.) are **not** repeated in this section.

> **CAUTION:**
> The Eagle is a precision electron-optical instrument, and must be handled carefully at all times to prevent damage to the device's body or mechanisms.

4.4.2 CLEANING PROCEDURES

> **CAUTION:**
> Thoroughly clean and dry each item before placing them into the storage case.

Clean the Eagle as follows:

1. Gently brush off any dirt from the unit's body using a clean, soft cloth.
2. Moisten the cloth with fresh water and gently wipe external surfaces (**except** for glass surfaces).
3. Dry any wet surfaces (**except** for glass surfaces) with another clean, soft, dry cloth.
4. Using a lens brush, carefully remove all loose dirt from the glass surfaces.
5. Slightly dampen a cotton swab with ethanol. Gently and slowly wipe the lenses (including the photoreceiver and the pivotal focusing lens). Without touching the lens holders, clean the glass surfaces in circular movements, beginning in the center and moving out towards the edge. Change the cotton swab after each circular stroke. Repeat until the glass surfaces are clean.
6. Clean the battery contact surfaces and contact springs with a pencil eraser and/ or alcohol-dampened cotton swabs.

Clean optional mounting devices with a soft brush (cloth), soap, and water as required.

Clean optional lenses as detailed in items 4 and 5 above.

4.4.3 BATTERY REMOVAL AND REPLACEMENT

Refer to Part 3.1.1 for battery installation procedures. No special tools are required to replace the battery.

4.5 SERVICE/PACKING AND UNPACKING

4.5.1 RETURN INSTRUCTIONS

For service, repair or replacements, please email service@armasight.com.

To assist the Service Representative (SR) with determining if the item is repairable, please provide the following information:

1. Serial Number of the defective item.
2. Thorough description of the malfunction, defect or damage.
3. An explanation of how the malfunction, defect or damage occurred, if known.

If the SR determines that the item is under warranty or should be returned for repair, a Return Material Authorization number (RMA#) will be provided. The RMA can be obtained via e-mail to service@armasight.com or via phone by calling Armasight Customer Service at (888)959-2259 Ext. 2 or via fax (888)959-2260.

When returning the Eagle for service or repair, the following procedures should be followed to prevent any additional damage:

1. Verify that the Eagle is free of all contaminants such as dirt or any other foreign material.

2. Remove the battery.

3. Place the caps over the lens.

4. Place the Eagle in the hard shipping/ storage case or soft carrying case (if available). If the hard shipping/ storage case is not available, individually pack each Eagle unit being returned in a suitable container.

Place the Eagle and a copy of the test report or detailed description of the failure in a suitable packing/ shipping container. Mark the package with the RMA#. Ship the items using the fastest, most easily traceable, prepaid method to:

Armasight Inc.

815 Dubuque Avenue

South San Francisco, CA 94080, USA.

A. PRODUCT WARRANTY REGISTRATION CARD

In order to validate the warranty on your product, Armasight must receive a completed Product Warranty Registration Card for each unit, or the user must complete warranty registration on our website (www.armasight.com). Please complete the included form and immediately mail it to our Service Center:

Armasight Inc.

815 Dubuque Avenue

South San Francisco, CA 94080, USA.

ARMASIGHT PRODUCT WARRANTY REGISTRATION CARD

PRODUCT INFORMATION

Product Name _____   Purchased From _____

Purchase Date _____   Product Serial # _____

CUSTOMER INFORMATION

Name _____

Address _____

City _____   Country _____   Zip _____

Day Phone # _____   Home Phone # _____

E-mail address _____

....
Customer Signature Required

B. EAGLE LIST OF SPARE PARTS

The parts authorized in this list of spare parts are required for operator maintenance. This list includes parts that must be removed in order to replace authorized parts.

ITEM NO. Column indicates the number used to identify items in Figure B-1.

PART NO. Column indicates the primary number used by the manufacturer to identify an item; this number controls the design and characteristics of the item by means of its engineering, specifications, standards, and inspection requirements.
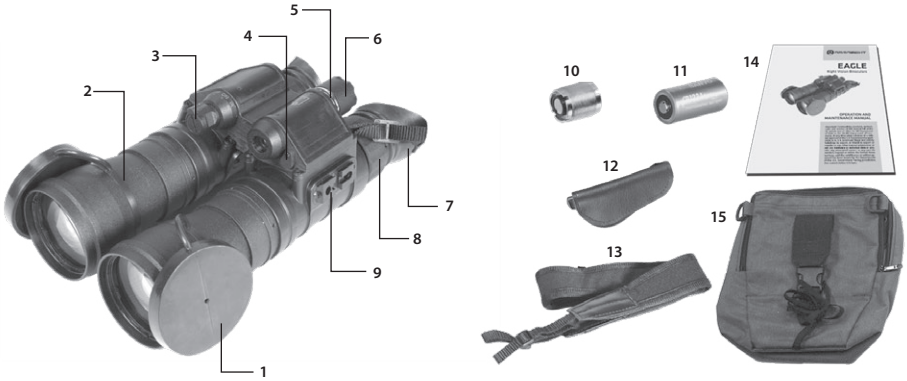

FIGURE B-1. EAGLE SPARE PARTS

TABLE B-1. EAGLE LIST OF SPARE PARTS

ITEM	DESCRIPTION	PART NO.	ITEM	DESCRIPTION	PART NO.
1	Lens Cap	EGLLC	9	Rail	EGLPR
2	Objective Lens Assembly	EGLOLA	10	Battery Adapter	EGLBA
3	Turn-pull Function Switch	EGLFS	11	CR123A Lithium Battery	CR123A
4	Photo Receiver Cap	EGLFRC	12	Hand Strap	EGLHS
5	Battery Cap Retainer	EGLBCR	13	Neck Strap	EGLNS
6	Battery Cap	EGLBC	14	Operation and Maintenance Manual	EGLOUMM
7	Eyecup Assembly	EGLECA			
8	Eyepiece Assembly	EGLEPA	15	Soft Carrying Case	EGLSCC

ARMASIGHT

Armasight Inc.

815 Dubuque Avenue
South San Francisco
CA 94080, USA

Phone: (888)959-2259
Fax: (888)959-2260
Intl Phone/Fax: (650)492-7755

info@armasight.com

CAUTION:

This product contains natural rubber latex which may cause allergic reactions! The FDA has noted an increase in the number of reported deaths that are associated with an apparent sensitivity to natural latex proteins. If you are allergic to latex, it is a good idea to learn which products contain it and strictly avoid exposure to those products.

www.armasight.com