



APOLLO

Thermal Imaging Clip-on System



OPERATION AND MAINTENANCE MANUAL

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SAFETY SUMMARY

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

The Armasight Apollo Thermal Imaging Clip-on System is a precision electro-optical instrument and requires careful handling. To avoid physical danger to the user and damage to the equipment, follow all WARNINGS, CAUTIONS and NOTES.

Below are definitions of the alerts that will appear throughout this Manual:

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

CAUTION – Identifies risk of damage to the equipment.

NOTE – Highlights essential procedures, conditions, statements, or conveys important instructional data to the user.

The information provided in this manual is for familiarization purposes only; the contents may undergo further changes with no commitment by Armasight® to notify customers of any updates.

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WARNING:

When installing the equipment on a weapon, verify that the weapon is clear and that the safety is on before proceeding.

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.

WARNING:

It is recommended that you use an eyecup on the eyepiece of the day scope, allowing for the eyepiece diameter and eye relief and having side paddle preferably in order to escape detection.

CAUTION:

To prevent thermal damage to the equipment, never point it, either on or off, directly at the sun or any other source of high intensity light that the unprotected human eye cannot tolerate (such as a welding arc). To prevent inadvertent exposure to these types of sources, never leave the equipment with the objective lens cap off.

CAUTION:

- Do not dismantle the equipment.
- Keep the equipment clean. Protect it from moisture, dramatic temperature drops, and electrical shocks.
- DO NOT drop or hit the equipment.
- DO NOT force the equipment controls past their stopping points.
- DO NOT leave the equipment activated during breaks in operation.
- Verify that the equipment is off before installing a battery.
- To avoid losing unsaved data, DO NOT remove the batteries or disconnect an external power source while the Apollo is on.
- Do not store the equipment with the batteries still in it.
- Dry thoroughly each item before replacing into the carrying case.
- To avoid deformation or damage, remove the light suppressor from the Apollo before placing the equipment in storage.
- Scope Mounting Systems are not recommended for installing the Apollo on firearms having vigorous recoil (0.308 Win or stronger).

NOTES:

- Optical axes of the Apollo and day scope should align. It is not recommended for the distance between the axes to exceed 3 mm. If the difference in the axis heights of the Apollo and day scope above the weapon rail exceeds 3 mm, you will need to replace the day scope mounting rings or monoblock.
- Inadvertent sun damage is not considered a defect in material or workmanship, and is therefore not covered in the product warranty.
- For the purpose of returning defective components, retain all packaging materials.

LIST OF CONTENTS

TITLE	PAGE
Safety Summary	2
List of Contents	4
List of Figures	5
List of Tables	6
How to Use This Manual	6
1. INTRODUCTION	7
1.1 General Information	7
1.1.1 Type of Manual	7
1.1.2 Model Number and Equipment Name	7
1.1.3 Purpose of Equipment	7
1.1.4 Reporting Equipment Improvement Recommendations	8
1.2 Warranty Information and Registration	8
1.2.1 Warranty Information	8
1.2.2 Limitation of Liability	9
1.2.3 Product Warranty Registration	9
1.2.4 Obtaining Warranty Service	9
1.3 List of Abbreviations	10
2. DESCRIPTION AND DATA	11
2.1 System Description	11
2.2 Apollo Specifications	12
2.3 Standard Components	14
2.4 Optional Equipment	16
2.5 Key Features	17
3. OPERATING INSTRUCTIONS	18
3.1 Installation and Mounting	18
3.1.1 Battery Installation	18
3.1.2 Installing the Apollo on a Picatinny/Weaver Rail	18
3.1.3 Clamping Device Adjustment	20
3.1.4 Installing the Apollo on a Weapon Using the Optional FSRS System	20
3.1.5 Installing the Apollo on the Lens of a Day Scope	22
3.1.6 Installing the Light Suppressor for a Day Scope	24
3.1.7 Fastening an Advanced Wireless Remote Control to a Weapon	24
3.1.8 Mounting a Platform Ring to the Apollo	25
3.1.9 Installing Additional Equipment on the Apollo	26
3.1.10 Connecting an External Video Recorder/Display to the Apollo	26
3.1.11 Connecting an External Power Source to the Apollo	26
3.1.12 Installing the 3X Magnifier	26
3.2 Controls and Display Indications	27
3.2.1 Apollo Controls	27
3.2.2 Main Menu	29
3.3 Operating Procedures	33
3.3.1 Operating the Apollo	33
3.3.2 Boresighting the Apollo	36
3.3.3 Apollo Shut-Down`	36

4. PREVENTIVE MAINTENANCE AND TROUBLESHOOTING	37
4.1 Preventive Maintenance Checks and Services	37
4.1.1 Preventive Maintenance Checks and Services (PMCS)	37
4.2 Operator Troubleshooting	39
4.3 Maintenance	39
4.3.1 General	39
4.3.2 Cleaning Procedures	40
4.3.3 Bore sighting	40
4.3.4 Battery Removal and Replacement	40
4.4 Return Instructions	41
APPENDIX	42
A Product Warranty Registration Card	42
B List of Spare Parts	43

LIST OF FIGURES

FIGURE	TITLE	PAGE
2-1	Apollo Thermal Imaging Clip-on system	12
2-2	Apollo Standard Components	14
2-3	Optional Equipment	16
3-1	Battery Installation	18
3-2	The Apollo Fully Assembled with the Mount	19
3-3	Day Scope Mounted in FSRS System	19
3-4	Mount. Top View	20
3-5	Mount. Underside View	20
3-6	Optional FSRS System. Component Parts	21
3-7	Day Scope Mounted In FSRS System	21
3-8	Apollo and Day Scope Mounted In FSRS System	22
3-9	The Apollo Installed on the Lens of a Day Scope	23
3-10	Scope Mounting System	23
3-11	Estimation of the SMS Turning Angle	24
3-12	Light Suppressor for a Day Scope	24
3-13	Advanced Wireless Remote Control	25
3-14	The Apollo Fully Assembled with the Platform Ring	25
3-15	Platform Ring	25
3-16	The Apollo with a 3x Magnifier	26
3-17	Apollo Controls	27
3-18	Button Control Panel	28
3-19	Apollo Main Menu	29
3-20	Palette Menu	30
3-21	Palette Menu	30
3-22	Temperature Menu	31
3-23	Reticle Menu	31
3-24	Boresight Menu	32
3-25	Scenarios Menu	32

3-26	Corrections Menu	32
3-27	Settings Menu	33
3-28	Store Image Menu	33
3-29	Setting Buttons	34
3-30	Reticle Patterns	35
4-1	Remote Control, Battery Installation	40
B-1	Apollo Spare Part List	43

LIST OF TABLES

TABLE	TITLE	PAGE
2-1	Apollo System Description	12
2-2	System Data	12
2-3	Mechanical Data	13
2-4	Optical Data	13
2-5	Electrical Data	13
2-6	Environmental Data	13
2-7	Scope Mounting Systems Data	14
2-8	Apollo Standard Components	15
2-9	Optional Equipment	16
3-1	Controls and Indicators	27
3-2	Button Controls	28
4-1	Preventive Maintenance Checks and Services	37
4-2	Operator Troubleshooting	39
B-1	Apollo Spare Parts List	43

HOW TO USE THIS MANUAL

USAGE

You must familiarize yourself with the entire manual before operating the equipment. Read the entire maintenance checklist before performing maintenance. Follow all WARNINGS, CAUTIONS, and NOTES.

MANUAL OVERVIEW

The Manual contains sections on operating and maintaining the Apollo Thermal Imaging Clip-on System.

Throughout this Manual, the Apollo Thermal Imaging Clip-on System will be referred to as the Apollo or the equipment.

The Product Warranty Registration Card is in Appendix A.

A List of Spare Parts is in Appendix B.

INTRODUCTION

1.1 GENERAL INFORMATION

1.1.1 TYPE OF MANUAL

Operation and Maintenance (including List of Spare Parts).

1.1.2 MODEL NUMBER AND EQUIPMENT NAME

The equipment is available in the following versions that are structurally different in thermal imaging cameras:

- Apollo 160-9 Thermal Imaging Clip-on System (FLIR Tau 2 – 160x120 Core (25µm) 9Hz)
- Apollo 160-30 Thermal Imaging Clip-on System (FLIR Tau 2 – 160x120 Core (25µm) 30Hz)
- Apollo 324-30 Thermal Imaging Clip-on System (FLIR Tau 2 – 324x256 Core (25µm) 30Hz)
- Apollo 324-60 Thermal Imaging Clip-on System (FLIR Tau 2 – 324x256 Core (25µm) 60Hz)
- Apollo 640-30 Thermal Imaging Clip-on System (FLIR Tau 2 – 640x512 Core (17µm) 30Hz)
- Apollo 640-60 Thermal Imaging Clip-on System (FLIR Tau 2 – 640x512 Core (17µm) 60Hz)

1.1.3 PURPOSE OF EQUIPMENT

The Apollo is a thermal imaging system intended to be used in conjunction with a daytime sight, or riflescope (hereafter referred to as a “day scope”). When mounted on a weapon in front of an existing day scope, the Apollo adds to the scope’s capabilities a thermal vision function, without affecting the boresight.

Displaying the thermal differences in the scene, the high performance thermal imaging system of the Apollo provides round-the-clock, all-weather detection and discrimination of heat-generating objects (such as animals), including those that are hidden. The Apollo is effective at close and long ranges irrespective of light and weather conditions, that is, in total darkness, through smoke, haze, fog, and light rain.

The Apollo is compatible with most commercial and military specification day scopes or binoculars and fits any Picatinny MIL STD 1913 or Weaver rail via the quick release mount.

Optional adapters make it possible to mount the Apollo directly to the objective lens of a variety of day scopes and binoculars.

The Apollo is powered by two CR 123A (2×3V) batteries. An external 6 VDC/1 A power source can also be used to power the Apollo.

The Apollo can be controlled by a wireless remote control that fastens to the weapon.

The Apollo is equipped with a standard NTSC/PAL video input/output function that make it possible to

connect it to an external video display to monitor or record the thermal imaging for in field documentation or training purposes, as well as to transmit information from remote display to the Apollo' one. The Apollo can be used in conjunction with other Armasight equipment, such as DT Digital Video Recorder and MCS Miniature Collimating Sight, that is mounted onto the Apollo' Picatinny/Weaver type side rail or detachable platform ring.

Really reliable and versatile, the Apollo is a useful multifunctional addition to any security or hunting equipment.

NOTE:

The Apollo can also be installed in front of the viewfinders of various instruments to widen the operational illumination range.

1.1.4 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS

Recommendations 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. This warranty does not cover battery. Nor does it protect against damage due to loss, misuse or mishandling.

In the event a defect that is covered by the foregoing warranty occurs during the applicable period stated above, Armasight, at its option, will either repair or replace the product, and such action on the part of Armasight shall be the full extent of Armasight's liability, and the Customer's sole and exclusive remedy. This warranty does not cover a product (a) used in other than its normal and customary manner; (b) subjected to misuse; (c) subjected to alterations, modifications or repairs by the Customer or 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 opinion is a result from the mishandling, abuse, misuse, improper storage or improper operation, including use in conjunction with equipment which 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.

This warranty is extended only to the original purchaser. Any breach of this warranty shall be waived 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.armsight.com. Please complete the included form (Appendix B) and immediately mail it to our Service Center:

Armasight Inc.
815 Dubuque Avenue
South San Francisco, CA 94080
USA

1.2.4 OBTAINING WARRANTY SERVICE

To obtain warranty service on your unit, End-user must notify Armasight service department via e-mail service@armsight.com to receive a Return Merchandise Authorization number (RMA#).

When returning please take or send the product, postage paid, with a copy of your sales receipt to our service center, Armasight Inc. at the address noted above. All merchandise must be fully insured with the correct postage; Armasight will not be responsible for improper postage or, missing or damaged merchandise during shipment.

When sending product back, please clearly mark the RMA# on the outside of the shipping box. Please include a letter that indicates your RMA#, Name, Return Address, reason for service return, Contact information such as valid telephone numbers and/or e-mail address and proof of purchases 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. End-user/customer is responsible for postage to Armasight for warranty service. Armasight will cover return postage/shipping to continental USA end-users/customers after warranty repair only if product is covered by aforementioned warranty. Armasight will return product after warranty service by domestic ground service and/or domestic mail. Any other requested, required or international shipping method the postage/shipping fee will be the responsibility of the end-user/customer.

1.3 LIST OF ABBREVIATIONS

µm	micrometer
AWREC	Advanced Wireless Remote Control
C	Celsius (Centigrade)
CCW	counterclockwise
CW	clockwise
F	Fahrenheit
FFC	Flat Field Correction
FL	Focal Length
g	gram
H	Height
hr	hour
in	inch
kg	kilogram
L	Length
lbs	pounds
m	meter
mA	milliampere
mils	milliradians
min	minute
mm	millimeter
MOA	Minute Of Angle
NO.	Number
NTSC	National Television Standards Committee
OEM	Original Equipment Manufacturer
oz	ounce
PAL	Phase Alternation Line
PMCS	Preventive Maintenance Checks and Services
RMA#	Return Merchandise Authorization number
sec	second
SEQ	sequence
SOA	Second Of Angle
SR	Service Representative
V	Volt
W	Width

DESCRIPTION AND DATA

2.1 SYSTEM DESCRIPTION

The Apollo consists of two primary parts: a thermal imaging device and a mount. The equipment comes as shown in Figure 2-1: with the mount secured to the device body.

Basically, the Apollo is a thermosensitive device. The Apollo senses the differences in heat emitted by objects in its field of view and converts the received temperature pattern into a viewable image that represents the scene as contrast black and white or color pattern, depending on user's selected image palette.

NOTE:

It is important that the Apollo sensor should receive sufficient thermal contrast between the target and background area or between the different parts of a target. Thus the large temperature contrast between the snow and any heat target (such as animals) makes it very easy to distinguish the target.

The main optical-electronic components of the Apollo are: an objective thermal lens, an output lens, a thermal-imaging camera, a display, a control card, and a button control panel. The image is projected by the output lens from the display to infinity, and the resulting image is magnified when viewed through the day scope. As such, when the Apollo mounted in front of the day scope, it converts the latter into a night vision sight.

The Apollo is equipped with a manual objective lens focusing.

To suit situational user needs, the Apollo has a variety of digitally controlled options, such as display brightness, temperature imaging mode (image palette), hunting scenarios function, field environment corrections, and temperature measurement.

Displaying information on the current operating state (battery status, active function, etc.) makes the Apollo field operation simple and convenient.

Manufactured to high tolerances, the Apollo has a lightweight and robust aluminium body.

A side Picatinny/Weaver rail allows an optional Armasight DT Digital Video Recorder or other equipment to be installed on the Apollo.

A detachable Platform Ring makes it possible to mount on the top of the Apollo an additional equipment such as Armasight MCS Miniature Collimating Sight.

A standard NTSC/PAL video input/output connector enables an external video display (a monitor, TV) or video recorder to be connected to the Apollo. An external 6 VDC/1 A power source can also be connected to the Apollo.

The quick release mount of the Apollo fits any Picatinny MIL STD 1913 or Weaver weapon rail. The lever-cam clamping device of the mount ensures easy, quick and reliable mounting and removal.

The Apollo is powered by two CR 123A (2x3V) batteries.

The Apollo is shown in Figure 2-1. ITEM NO. column of Table 2-1 indicates the number used to identify items in Figure 2-1.

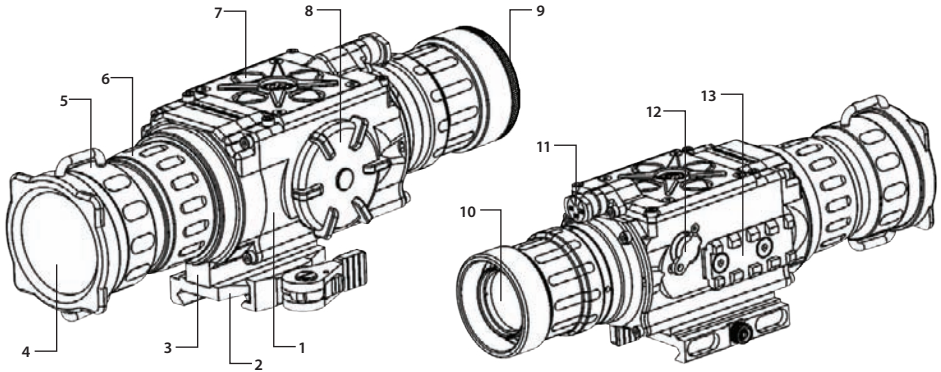


FIGURE 2-1. APOLLO THERMAL IMAGING CLIP-ON SYSTEM

TABLE 2-1. APOLLO SYSTEM DESCRIPTION

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Body	8	Battery Cap
2	Mount	9	Output Lens Cap
3	Raiser	10	Output Lens
4	Objective Lens Cap	11	Turn-pull Switch
5	Objective Lens	12	Connector (closed with a Cap)
6	Focus Ring	13	Side Picatinny/Weaver Rail
7	Button Control Panel		

2.2 APOLLO SPECIFICATIONS

TABLE 2-2. SYSTEM DATA

ITEM	APOLLO 160-9	APOLLO 160-30	APOLLO 324-30	APOLLO 324-60	APOLLO 640-30	APOLLO 640-60
Magnification	1x					
Type of Focal Plane Array	FLIR Tau 2					
Refresh Rate	9 Hz	30 Hz	30 Hz	60 Hz	30 Hz	60 Hz
Objective Lens Type	Germanium					
Pixel Array Format	160x120		324x256		640x512	
Pixel Size	25 μ m				17 μ m	
Resolution, mrad	0.60	0.33	0.40	0.23	0.40	0.23
Display Type	AMOLED SVGA 060					
Pixel Display Format	800x600					
Display Brightness	Discretely Adjustable to 8 Levels					
Turn-on Time, max	3 sec					
Digital Zoom	1x, 2x, and 4x				1x, 2x, 4x, and 8x	
Temperature Imaging Modes (Image Palettes)	White Hot, Black Hot, Fusion, Rainbow, Globow, Ironbow 1, Ironbow 2, Sepia, Color 1, Color 2, Ice-Fire, Rain, and OEM Custom					

TABLE 2-2. CONTINUED

ITEM	APOLLO 160-9	APOLLO 160-30	APOLLO 324-30	APOLLO 324-60	APOLLO 640-30	APOLLO 640-60
Reticle Type	6-Pattern Digitally Controlled: "Dot 4 MOA", "Line Dot", "Cross Center Dot", "Cross", "Crosshair", and "No Reticle"					
Reticle Color	Black, White, Red, Cyan					
Windage/Elevation Boresight Adjustment Type	Digitally Controlled					
Windage/Elevation Boresight Increment	2.3 MOA 0.7 mils 7cm/100m	2.3 MOA 0.7 mils 7cm/100m	1.7 MOA 0.5 mils 5cm/100m	1.7 MOA 0.5 mils 5cm/100m	1.7 MOA 0.5 mils 5cm/100m	1.7 MOA 0.5 mils 5cm/100m
Analog Input Format	PAL*/ NTSC					
Output	PAL		768x574 pixels			
Resolution	NTSC		640x480 pixels			

* Default setting (may be altered at the customer's request).

TABLE 2-3. MECHANICAL DATA

ITEM	DATA
Weapon Mount Type	Picatinny MIL STD 1913 and Weaver Rails
Overall Dimensions	217x70x80 mm (8.5"x2.8"x3.2")
Height of the Apollo Axis above Rail	40 mm (1.57 in)
Weight (w/o Batteries)	0.7 kg (1.5 lbs)

TABLE 2-4. OPTICAL DATA

ITEM	APOLLO 160-9	APOLLO 160-30	APOLLO 324-30	APOLLO 324-60	APOLLO 640-30	APOLLO 640-60
Field of View (horizontal x vertical)	12° x 9°	12° x 9°	11° x 8°	11° x 8°	15° x 12°	15° x 12°
Objective Focal Length	18 mm	18 mm	42 mm	42 mm	42 mm	42 mm
Objective F-number	1:1.2	1:1.2	1:1	1:1	1:1	1:1
Eyepiece Focal Length	45 mm		50 mm		45 mm	
Entrance Pupil Diameter	25 mm					
Exit Pupil Diameter	60 mm					
Focus Method	Manual					
Focusing Range	2.5m to ∞	2.5m to ∞	5m to ∞	5m to ∞	5m to ∞	5m to ∞

TABLE 2-5. ELECTRICAL DATA

ITEM	DATA
Battery	Two CR 123A (2x3V)
Current Consumption, maximum	350 mA
Battery Life at 20 °C (68 °F)	4 hr
External Power Supply	6 VDC / 1 A

TABLE 2-6. ENVIRONMENTAL DATA

ITEM	DATA
Operating Temperature	-40 to +50 °C (-40 to +122 °F)
Storage Temperature	-50 to +70 °C (-58 to +158 °F)
Recoil Resistance	700g
Immersion	10 m for 30 min

TABLE 2-7. SCOPE MOUNTING SYSTEMS DATA

SCOPE MOUNTING SYSTEM	WEIGHT, G	OVERALL DIMENSIONS, MM	DIAMETER OF THE INSERTS, MM	CLEAR APERTURE OF DAY SCOPE LENS, MM	EXAMPLE OF THE SCOPES
Scope Mounting System 1	53	39.5x43x52.4	25,4	20; 24	Leupold 1,5-5x20 PR
			30,0		Leupold 1,5-5x20 MR/T M2; Zeiss 1,1-4x24T
Scope Mounting System 2	61	44x49x62	38,0	32; 36	Meopta Artemis 2000 4x32
			42,0		Leupold Mark 4 3-9x36; Leupold Mark 4 2,5-8x36; Kahles 4x36
Scope Mounting System 3	71	44x57.5x71	46,7	40; 42	Leupold 3,5-10x40; Leupold VX-II 3-9x40
			48,0		Zeiss 1,5-6x42; Swarovski PV-N 2,5-10x42
			48,7-49,0		Meopta Artemis 3000 3-9x42;
			49,5		Meopta Artemis 3000 4-12x40
			50,0		Schmidt&Bender 10x42
Scope Mounting System 4	82	44x65.5x79	56,0	50	Zeiss 2,5 10x50
			57,0		Schmidt&Bender 3-12x50
			58,7		Leupold 4.4-14x50; Leupold VX-III 3,5-10x50
Scope Mounting System 6	93	44x70.5x84	62,0	56	Zeiss 3-12x56; Swarovski 2,5-10x56; Kahles CSX 3-12x56

2.3 STANDARD COMPONENTS

The Apollo standard components are shown in Figure 2-2 and listed in Table 2-8. ITEM NO. column indicates the number used to identify items in Figure 2-2.

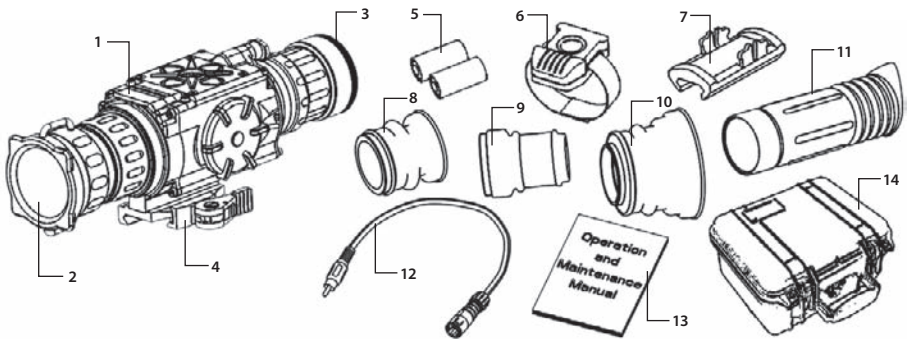


FIGURE 2-2. APOLLO STANDARD COMPONENTS

TABLE 2-8. APOLLO STANDARD COMPONENTS

ITEM NO.	DESCRIPTION	QUANTITY
1	Armasight Apollo Thermal Imaging Clip-on system A thermal imaging device. Comes fully assembled with a quick release Picatinny/Weaver mount.	1
2	Objective Lens Cap Securely protects the objective lens from dirt and mechanical damage and provides thermal protection of the Apollo. Comes attached to the objective lens.	1
3	Output Lens Cap Securely protects the output lens from dirt and mechanical damage.	1
4	Mount A quick release mount used to install the Apollo on a Picatinny/Weaver rail. Comes attached to the Apollo.	1
5	CR 123A Lithium Battery A battery used to power the Apollo.	2
6	Advanced Wireless Remote Control (AWREC) Allows to operate the Apollo in short-time activation mode. Ensures quick and silent activation/deactivation of the equipment. Comes with two CR2016 (3V) batteries installed.	1
7	Picatinny Adapter for Advanced Wireless Remote Control Allows the advanced wireless remote control to be installed on a weapon's Picatinny/Weaver rail.	1
8	Light Suppressor 1 A rubber cup mounted to the Apollo output lens to reduce light scattering. Used when installing the Apollo in front of day scopes with lens housing outer diameter over the range 25.4 to 42 mm.	1
9	Light Suppressor 2 A rubber cup mounted to the Apollo output lens to reduce light scattering. Used when installing the Apollo in front of ACOG 4x32 scope.	1
10	Light Suppressor 3 A rubber cup mounted to the Apollo output lens to reduce light scattering. Used when installing the Apollo in front of day scopes with lens housing outer diameter over the range 47 to 50 mm.	1
11	Light Suppressor for Day Scope A rubber cup mounted to the day scope output lens to reduce light scattering when Apollo is used and prevent surrounding light from interfering with image on eyepiece.	1
12	Video Cable A cable used to connect the analog video input/output of the Apollo to external display devices (a monitor, TV) or power sources. Supported input and output video formats are PAL and NTSC.	1
13	Operation and Maintenance Manual Provides safety information, equipment description, mounting procedures, operating instructions, and preventive maintenance checks and services (including List of Spare Parts).	1
14	Hard Shipping/Storage Case A protective case used for the shipping/storage of the Apollo and its accessories.	1

2.4 OPTIONAL EQUIPMENT

Optional items are shown in Figure 2-3 and listed in Table 2-9.

ITEM NO. column indicates the number used to identify items in Figure 2-3.

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

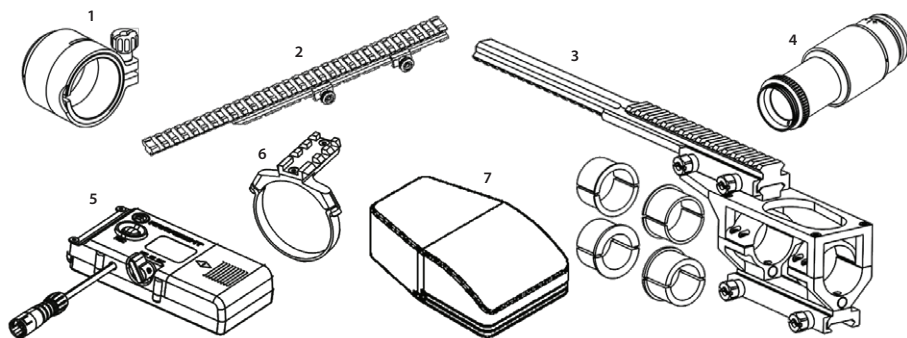


FIGURE 2-3. OPTIONAL EQUIPMENT

TABLE 2-9. OPTIONAL EQUIPMENT

ITEM NO.	DESCRIPTION	PART NO.
1	Scope Mounting System 1 #40 A mounting system used to install the Apollo on the lenses of specified day scopes. Includes a clamp with inserts that will fit 25.4 and 30mm diameters.	ANAM000009
-	Scope Mounting System 2 #41 A mounting system used to install the Apollo on the lenses of specified day scopes. Includes a clamp with inserts that will fit 38 and 42mm diameters.	ANAM000010
-	Scope Mounting System 3 #42 A mounting system used to install the Apollo on the lenses of specified day scopes. Includes a clamp with inserts for 46.7, 48, 48.7-49, 49.5 and 50mm fitting diameters.	ANAM000011
-	Scope Mounting System 4 #43 A mounting system used to install the Apollo on the lenses of specified day scopes. Includes a clamp with inserts for 56, 57 and 58.7mm fitting diameters.	ANAM000012
-	Scope Mounting System 6 #44 A mounting system used to install the Apollo on the lenses of specified day scopes. Includes a clamp with inserts for 62mm fitting diameter.	ANAM000013
2	Extended Rail Adapter #85 A mounting system used to install a day scope behind the Apollo on a weapon, using a short-mounting Picatinny/ Weaver rail.	ANAM000045
3	FSRS Front Scope Rail System #38 A mounting system used to install a day scope behind the Apollo on a weapon, using a short-mounting Picatinny/ Weaver rail.	ANAM000021
4	3x Magnifier Converts the Apollo into 3x thermal imaging device for long-range observation.	ANLE3X0008

TABLE 2-9. CONTINUED

ITEM NO.	DESCRIPTION	PART NO.
5	DT Digital Video Recorder A compact digital system used for video recording, storage and playback. Can also serve as an external power source. Equipped with a remote control.	ATAM000004
6	Platform Ring A dedicated mount with a Picatinny/Weaver type rail used to install on the top of the Apollo an additional equipment, such as Armasight MCS Miniature Collimating Sight.	ATAM000003
7	Soft Carrying Case A textile bag with a shoulder strap. Is used for the carrying/storage of the Apollo and its accessories.	AGHC000003

2.5 KEY FEATURES

- Converts your day scope, sight, or binoculars into night vision device
- Mounts in front of any day scope with no re-zeroing required
- High-performance thermal imaging camera
- Lightweight and robust design
- Easy to operate
- Manually adjustable objective lens
- Real-time display
- Digitally controlled features:
 - Adjustable display brightness
 - Selectable image palette
 - Temperature measurement
 - Hunting scenarios function
 - Field environment corrections
- Displaying information on the current operating state (battery status, active function etc.)
- Wireless remote control
- Analog video input and output
- Powered by two standard CR123A batteries.
- Power input capability
- Digital video recorder (optional)
- Fits any Picatinny MIL STD 1913 and Weaver rail with an adjustable quick-release mount
- Serviceability under severe conditions
- Filled with dry nitrogen to prevent internal fogging
- Waterproof
- Limited two-year warranty

OPERATING INSTRUCTIONS

3.1 INSTALLATION AND MOUNTING

3.1.1 BATTERY INSTALLATION

CAUTION:

Ensure that the equipment is off before installing a battery.

Install two CR 123A batteries as follows (refer to Figure 3-1):

1. Unscrew the battery cap (not shown) by hand.
2. Open the hinged contact clamping plate (C).
3. Install the batteries (D) into the battery compartment. Align the plus and minus contacts of the batteries with the plus (A) and minus (B) signs on the Apollo body.
4. Replace the contact clamping plate (C).
5. Replace the battery cap.

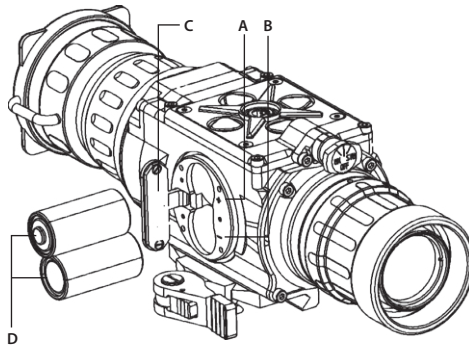


FIGURE 3-1. BATTERY INSTALLATION

3.1.2 INSTALLING THE APOLLO ON A PICATINNY/WEAVER RAIL

WARNING:

When installing the equipment on a weapon, verify that the weapon is clear and that the safety is on before proceeding.

WARNING:

It is recommended that you use an eyecup on the eyepiece of the day scope, allowing for the eyepiece diameter and eye relief and having side paddle preferably in order to escape detection.

NOTE:

Optical axes of the Apollo and day scope should align. It is not recommended for the distance between the axes to exceed 3 mm. If the difference in the axis heights of the Apollo and day scope above the weapon rail exceeds 3 mm, you will need to replace the day scope mounting rings or monoblock.

The Apollo comes fully assembled with a Picatinny/Weaver mount (Figure 3-2).

The mount (C) coupled with the raiser (D) is attached to the Apollo seating rail (E) with two M4×20 flat head socket cap screws (A).

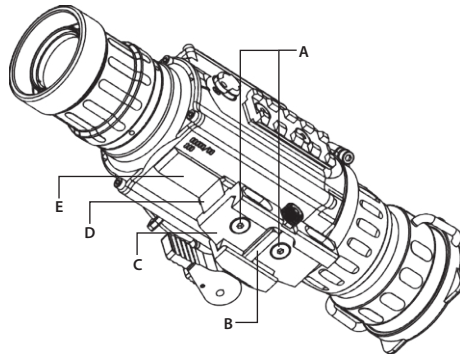


FIGURE 3-2. THE APOLLO FULLY ASSEMBLED WITH THE MOUNT

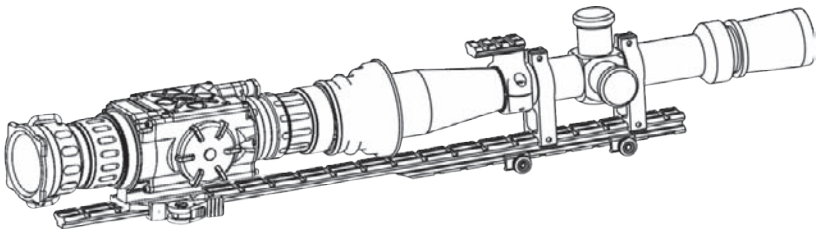


FIGURE 3-3. DAY SCOPE MOUNTED IN FSR SYSTEM

The Apollo mounted on a Extended rail Adapter in front of a day scope is shown in Figure 3-3.

Install the Apollo on a Picatinny/Weaver rail as follows:

1. Unscrew the output lens cap and place it in the storage case.
2. Remove the light suppressor from the storage case. Screw it into the output lens' thread in place of the cap.
3. Unlock the clamping device (A) of the Apollo mount by pushing down on the dog (B, see Figure 3-4) and unlocking the cam lever (C).

4. Install the Apollo on the Picatinny/ Weaver rail in front of the day scope so that the stop (B, see Figure 3-2) slides into one of the rail's transverse slots. The light suppressor should cover the day scope's objective lens.
5. Affix the Apollo to the rail by locking the cam lever (C, see Figure 3-4).

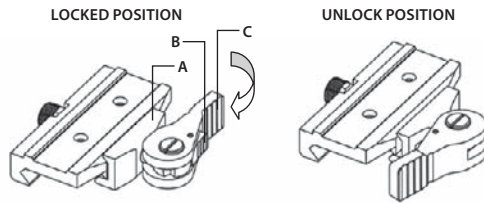


FIGURE 3-4. MOUNT. TOP VIEW

6. Verify that the clamping device is firmly holding the Apollo. If necessary, adjust the clamping device as detailed in Part 3.1.3 (Clamping Device Adjustment).

3.1.3 CLAMPING DEVICE ADJUSTMENT

Adjust the mount clamping device as follows (refer to Figure 3-5):

1. Unlock the clamping device and remove the Apollo from the weapon.
2. To tighten/loosen the clamping device (B), push the cam (C) towards the arrow (which will cause the nut (A) to slide out of its hollow) and turn the nut (A) CW/CCW respectively, in one-two increments (see note below). Much like when the cam (C) is released, backward-moving springs will cause the nut (A) to slide back into its hollow.

NOTE:

The eight-sided nut of the clamping device will only fit into its hollow if turned in one of the discrete positions using increment equal to $360^\circ/8$.

3. Verify that the adjusted clamping device is firmly holding the Apollo.

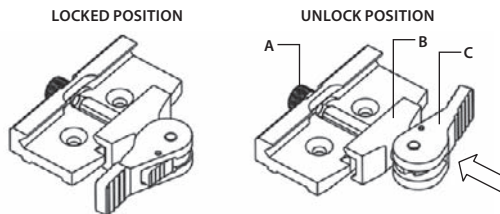


FIGURE 3-5. MOUNT. UNDERSIDE VIEW

3.1.4 INSTALLING THE APOLLO ON A WEAPON USING THE OPTIONAL FSRS SYSTEM

The FSRS system is delivered ready-assembled. The components of the FSRS system are shown in Figure 3-6.

A. Dismantling the FSRS System

Dismantle the FSRS system as follows (see Figure 3-6):

1. Loosen the nuts (D); remove the extension mount (E) from the bridge (B).
2. Unscrew the screws (C) and remove the bridge (B) from the mount (H).
3. Unscrew the screws (F) and remove the clamps (G).

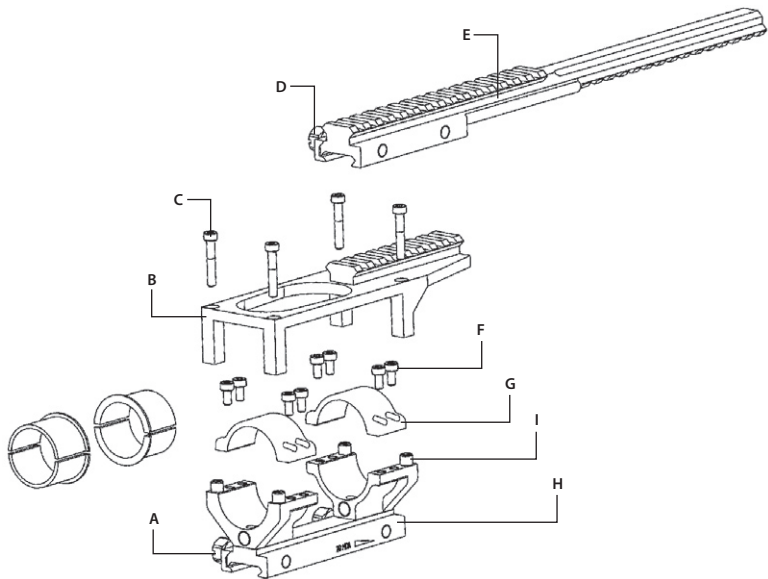


FIGURE 3-6. OPTIONAL FSRs SYSTEM. COMPONENT PARTS

B. Mounting the Day Scope

Figure 3-7 shows the day scope mounted to the FSRs system.

Mount the day scope to the FSRs system as follows:

1. Loosen the nuts (A, Figure 3-6). Install the mount (H) on the weapon's Picatinny/ Weaver rail; the two pins of the mount's clamping device should be secured in the transverse slots of the rail. Manually retighten the nuts (A).

NOTE:

Pay attention to the arrow engraved on the right side of the mount (H). The arrow must be pointed towards the end of the weapon muzzle.

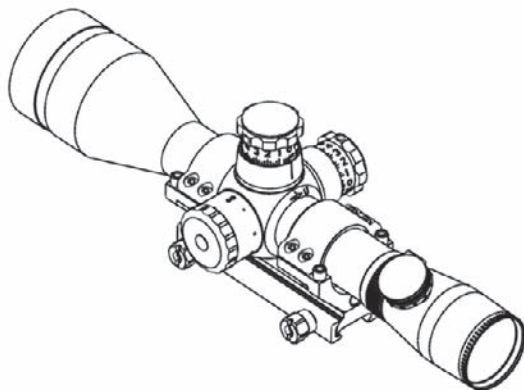


FIGURE 3-7. DAY SCOPE MOUNTED IN FSRs SYSTEM

- Without tightening the screws (F), use the clamps (G) to fasten the scope into the mount (H) with a 34mm fitting diameter, as seen in the preassembled equipment. To mount day scopes with fitting diameters of 30mm or 25.4mm, use the corresponding inserts.
- Adjust or reposition the mount (H) along the weapon rail until you find the most comfortable position over your eye. Readjust until the cross-hairs are level, and are not tilted. After positioning the scope in the mount (H), apply a small amount of thread lock to the threads and tighten the screws (F) using a 3mm hex key.
- Tighten the nuts (A) with a screwdriver to secure the mount (H) to the weapon rail.

C. Mounting the Apollo and Additional Equipment

Figure 3-8 shows the Apollo and day scope mounted to the FSRS system.

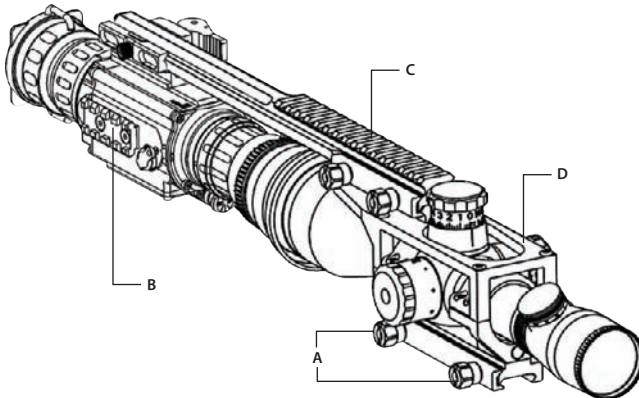


FIGURE 3-8. APOLLO AND DAY SCOPE MOUNTED IN FSRS SYSTEM

Mount the Apollo and additional equipment to the FSRS system as follows:

- Install the bridge (B, Figure 3-8) on the bushes (I, Figure 3-8). After applying a small amount of thread lock to the threads, install and tighten the screws (C, Figure 3-8) using 3mm hex key.
- Loosen the nuts (A, Figure 3-10); install the extension mount (C) onto the Weaver rail of the bridge (D). Retighten the nuts (A) with a screwdriver.
- Install the Apollo (B) onto the Weaver rail, underneath the extension mount, as shown in Part 3.1.3.
- Affix additional equipment to the top Weaver rail of the mount.

After you have completed these steps, remounting the equipment without reinstalling the mount only requires that you remove the extension mount (with the equipment installed) from the bridge.

3.1.5 INSTALLING THE APOLLO ON THE LENS OF A DAY SCOPE

Use the optional Scope Mounting System (SMS) to install the Apollo on the lenses of day scopes.

NOTE:

The adapters differ in attaching diameters and must fit with the day scope parameters specified in Table 2-7 (Scope Mounting Systems Data).

NOTE:

The Apollo cannot be attached to the scope having a focus ring on the objective lens' housing.

CAUTION:

The Scope Mounting Systems are not recommended for installing the Apollo on firearms having vigorous recoil (0.308 Win or stronger).

The Apollo installed on the lens of a day scope is shown in Figure 3-9.

Install the Apollo on the lens of a day scope as follows (refer to Figure 3-10):

1. Using a 2.5 mm Allen key, unscrew the both M4×8 screws fixing the Apollo mount. Remove the mount from its seating rail and put it with the screws into the storage case.
2. Take off the output lens cap and put it into the storage case.
3. With the nut (B) loosened, place the insert (C) into the SMS's clamp (A).

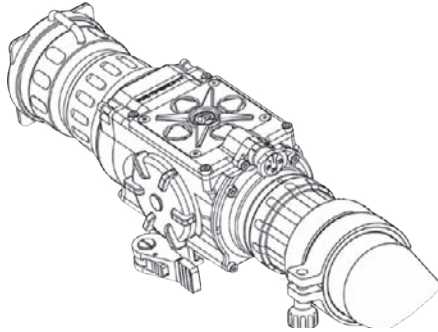


FIGURE 3-9. THE APOLLO INSTALLED ON THE LENS OF A DAY SCOPE

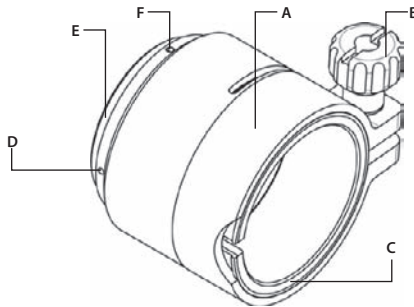


FIGURE 3-10. SCOPE MOUNTING SYSTEM

4. Screw the SMS into the Apollo's output lens thread.
 5. With the nut (B) loosened, slide the Apollo with the SMS onto the lens of the day scope as far as it goes.
 6. Tighten the nut (B) using a screwdriver.
- If the position of the SMS's clamping nut is unhandy, it is possible to change it as follows:
1. Decide on desirable position of the nut and estimate the angle through which the SMS should be turned CW (see Figure 3-11).
 2. Remove the SMS from the Apollo.
 3. Using a screwdriver, remove the both M2×2.5 screws (F, see Figure 3-10) and then unscrew the ring (E).

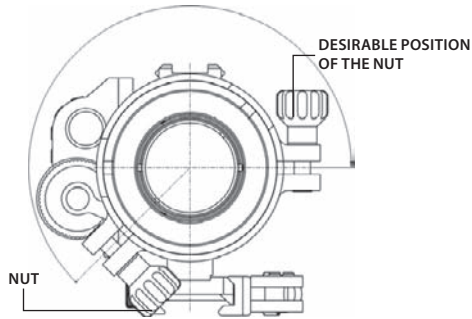


FIGURE 3-11. ESTIMATION OF THE SMS TURNING ANGLE

CAUTION:

To loosen the ring (E, Figure 3-10), only use its two auxiliary non-threaded holes (D), avoiding the use of the threaded ones.

4. Using a turning machine, cut the inside face of the ring (E, Figure 3-10). The value of cutting (in millimeters) is equal to the value of turning angle (in angular degrees) divided by 360°.
5. Screw the ring (E) into the SMS's body with its cut end directed inwards and tighten it.
6. After applying a small amount of thread lock to the threads, affix the ring (E) with the two M2×2.5 screws (F).

3.1.6 INSTALLING THE LIGHT SUPPRESSOR FOR A DAY SCOPE

The Light Suppressor for a Day Scope (A, Figure 3-12) slides over the eyepiece of your daytime scope (B). The suppressor can be used with scopes that have 40...43mm eyepiece diameter and 100...120 mm eye relief.

The suppressor can be adjusted for the eye relief of your scope by cutting the rubber at the desired distance (C).

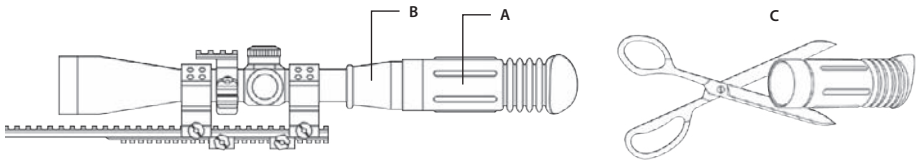


FIGURE 3-12. LIGHT SUPPRESSOR FOR A DAY SCOPE

3.1.7 FASTENING AN ADVANCED WIRELESS REMOTE CONTROL TO A WEAPON

Using Velcro tape (A), fasten the remote control (B) to your weapon in an easily accessible place (e.g., on the front of the rifle stock).

If there is a Picatinny/Weaver rail on the forend of your weapon, you can use a Picatinny adapter for Advanced Wireless Remote Control (C). Install the adapter on the weapon's rail (D) and then insert the remote control (B) in the adapter (C).

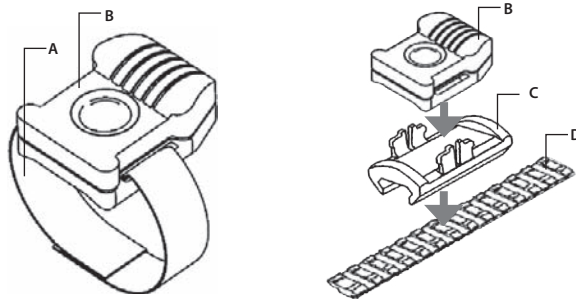


FIGURE 3-13. ADVANCED WIRELESS REMOTE CONTROL

3.1.8 MOUNTING A PLATFORM RING TO THE APOLLO

Figure 3-14 shows the Apollo with the Platform Ring adapter (A) installed.

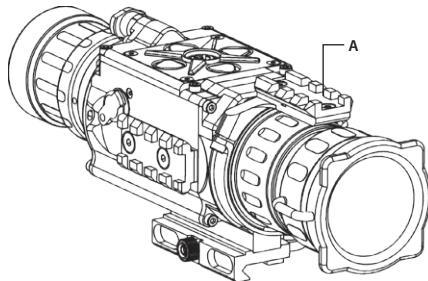


FIGURE 3-14. THE APOLLO FULLY ASSEMBLED WITH THE PLATFORM RING

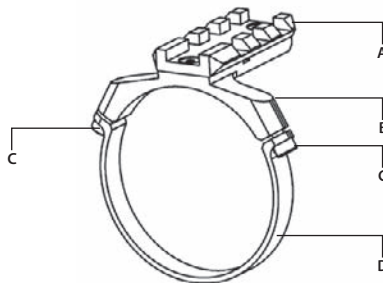


FIGURE 3-15. PLATFORM RING

Mount the Platform Ring (optional) on the Apollo as follows (refer to Figure 3-15):

1. Using a 1.5 hex key, unscrew the both clamp screws (C).
2. Place the clamps (B, D) onto the Apollo mounting tube (as in Figure 3-14). Screw the clamps together without tightening the screws (C).
3. Adjust position of the Platform Ring until its rail (A) is level. Apply a small amount of thread lock to the threads and tighten the screws (C).

3.1.9 INSTALLING ADDITIONAL EQUIPMENT ON THE APOLLO

Use a Platform Ring (optional) to install on the top of the Apollo an additional equipment such as Armasight MCS Miniature Collimating Sight. For the Platform Ring mounting procedure see Part 3.1.8.

Use the Apollo side Picatinny/Weaver rail to install an additional equipment such as Armasight DT Digital Video Recorder, a rangefinder, an external power source.

3.1.10 CONNECTING AN EXTERNAL VIDEO RECORDER/DISPLAY TO THE APOLLO

Connect an external video recorder/monitor/TV to the Apollo input/output connector (12, Figure 2-1). Use a video cable (included).

CAUTION:

Turn off the Apollo before you begin connecting/disconnecting an external equipment.
After removing the cable, replace the protective cap on the Apollo connector.

3.1.11 CONNECTING AN EXTERNAL POWER SOURCE TO THE APOLLO

Connect an external 6 VDC/1 A power source to the Apollo input/output connector (12, Figure 2-1). Use a video cable (included).

CAUTION:

Remove the batteries before you begin connecting an external power source.
To avoid a sudden removal of power, turn off the Apollo before removing the batteries or disconnecting the external power source.

CAUTION:

After removing the cable, replace the protective cap on the Apollo connector.

3.1.12 INSTALLING THE 3X MAGNIFIER

Figure 3-16 shows the Apollo with installed 3x magnifier.

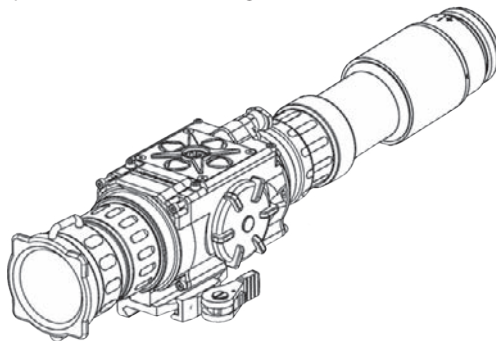


FIGURE 3-16. THE APOLLO WITH A 3X MAGNIFIER

To install the 3x magnifier on the Apollo, do the following:

1. Take off the output lens cap and place it into the storage case.
2. Screw the 3x magnifier into the Apollo's output lens thread.

3.2 CONTROLS AND DISPLAY INDICATIONS

3.2.1 APOLLO CONTROLS

CAUTION:

DO NOT force the equipment controls past their stopping points.

The Apollo controls are shown in Figures 3-17, 3-18 and defined in Tables 3-1, 3-2. ITEM NO. columns of the tables indicate the number used to identify items in the figures.

NOTE:

Various display symbols indicating the current operating state of the Apollo are displayed permanently or appear momentarily, or only when certain function is activated.

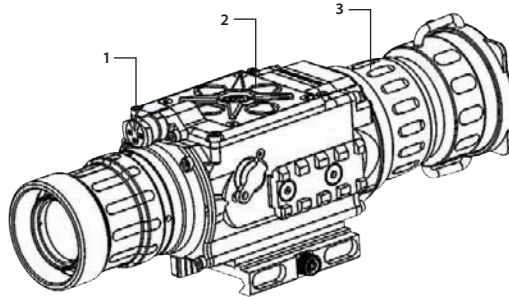


FIGURE 3-17. APOLLO CONTROLS

TABLE 3-1. CONTROLS AND INDICATORS

ITEM NO.	CONTROL/INDICATOR	FUNCTION
1	Turn-pull Switch	<p>Activates the Apollo, when turned to ON position.</p> <p>NOTE: Both ON and STB end positions of the switch can only be entered if the spindle is pulled before turning.</p> <hr/> <p>Actuates standby mode, when turned to STB (see note above).</p> <hr/> <p>Deactivates the Apollo, when turned to OFF.</p>
2	Control Panel Buttons	Configure operational settings. See Table 3-2 for button functions.
3	Focus Ring	Focuses the objective lens. Adjusts for sharpest view of the scene. The total focus range is covered with 3/4 turn of the lens.
—	Remote Control Button	Activates/deactivates the Apollo in standby when held down/released.
—	Battery Status Indicator (a battery icon in the lower right hand part of the display)	<p>The light gray bar in the battery icon indicates the current power level of the internal battery, or remaining battery life.</p> <hr/> <p>The completely shaded battery icon indicates the fully charged battery.</p> <hr/> <p>The flashing transparent battery icon indicates a low battery.</p>

The Apollo button control panel is shown in Figures 3-18.

Table 3-2 contains direct access functions of the buttons and their brief descriptions. ITEM NO. column of the table indicates the number used to identify buttons in Figure 3-18.

NOTE:

Each button is responsible for some functions selected by short pushing or holding down the button, or using the button in combination with other one, as described in Table 3-2.

If the button pushing time exceeds 3 sec, this will be taken as holding down the button.

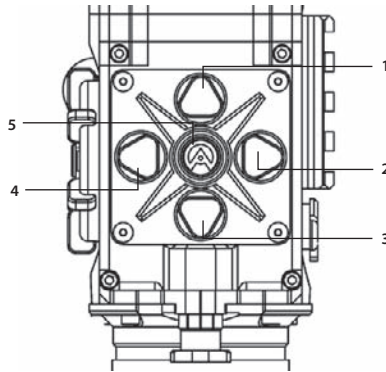


FIGURE 3-18. BUTTON CONTROL PANEL

TABLE 3-2. BUTTON CONTROLS

ITEM NO.	FUNCTION	DESCRIPTION
	Display Brightness Control	Press the button (1) to increase the screen brightness or press the button (3) to decrease the screen brightness.
1, 3	Image Palette Control	Push and hold down the button (1) or button (3) to switch between available palettes available image palettes: White Hot, Black Hot, Fusion, Rainbow, Globow, Ironbow1, Ironbow2, Sepia, Color1, Color2, Ice-Fire, Rain and OEM.
	Flat Field Correction (FFC)	Push the buttons (1) and (3) at the same time to induce a manual Flat Field Correction.
	Up, Down	Use the UP and DOWN buttons to navigate through the items on the menu.
2	Digital Zoom Control	Shortly push the button (2) to zoom progressively the central area of the displayed scene.
4	Reticle Color Control	Shortly push the button (4) to switch between four available colours of the reticle: black, white, red, and cyan.
	Reticle Patterns Control	Push and hold down the button (4) or button (2) to switch between available reticle patterns: "Dot 4 MOA", "Line Dot", "Cross Center Dot", "Cross", "Crosshair", and "No Reticle".
2, 4	Reticle Position Zeroing	Push and hold down the buttons (2) and (4) at the same time to zero the reticle position on the display.
	Left, Right	Use the LEFT and RIGHT buttons to navigate through the items on the menu.

TABLE 4-1. CONTINUED

ITEM NO.	FUNCTION	DESCRIPTION
	FFC Process Interruption	Shortly push the button (5) to interrupt FFC process when the count-down is still ongoing on the display.
5	Main Menu Access	Push and hold down the button (5) to access the MAIN MENU. See the Part 3.2.2 for how to use the MAIN MENU.
	Select	Push the SELECT button to view the settings available for the item selected with an arrow pointer.

3.2.2 MAIN MENU

Most of setup options can only be accessed from the Apollo MAIN MENU.

To display the MAIN MENU, push and hold down the MENU button (5) on the control panel (Figure 3-18).

Once the MAIN MENU is displayed (Figure 3-19), use the UP and DOWN buttons to navigate through the items on the menu.

Push the MENU button to view the settings available for the item selected with an arrow pointer.

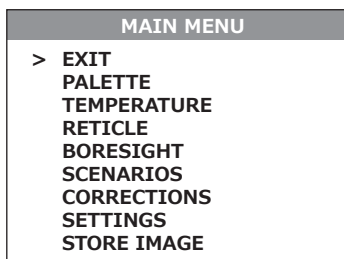


FIGURE 3-19. APOLLO MAIN MENU

NOTES:

Navigate through submenu items by pushing the UP and DOWN button except where otherwise expressly indicated. The LEFT and RIGHT buttons are available only when specified on the menu screen with < > symbols.

After a menu item is selected with an arrow pointer, push the MENU button to make the selected setting/ activate the selected function.

Select the EXIT item and then push the MENU button to turn to the MAIN MENU.

Palette Menu

The PALETTE menu (Figures 3-20, 3-21) allows to select from a choice of temperature imaging modes: White Hot, Black Hot, Fusion, Rainbow, Globow, Ironbow 1, Ironbow 2, Sepia, Color 1, Color 2, Ice-Fire, Rain, and OEM Custom.

NOTE:

To navigate through the items on the double-page PALETTE menu, push and hold down the UP/DOWN button.

The palettes act as color templates for visualization of temperature changes in the scene.

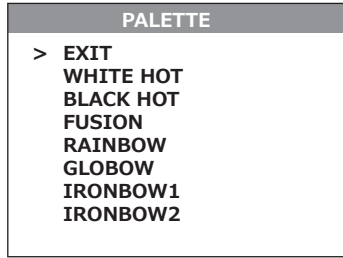


FIGURE 3-20. PALETTE MENU. PAGE 1

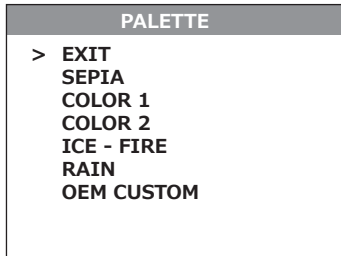


FIGURE 3-21. PALETTE MENU. PAGE 2

NOTE:

The most popular are White Hot and Black Hot palettes usually known as inversion. White hot mode is good for spotting targets and black hot mode is most useful for situational reading.

NOTE:

Training and experience are required to quickly and properly interpret the thermal image being displayed.

Temperature Menu

The TEMPERATURE menu (Figure 3-22) allows of temperature measurement and displaying.

Select Display Off item to remove all temperature data from the display.

Select Numeric Only item for a numerical representation of the temperature data on the display. The current temperature in the measurement spot (the center of the field of view) will be printed on the display.

Select Thermometer Only item for a graphical representation of the temperature data on the display. The current temperature in the measurement spot will be indicated by a graphical thermometer.

Select Numeric-Thermometer item for both numerical and graphical representation of the temperature data on the display.

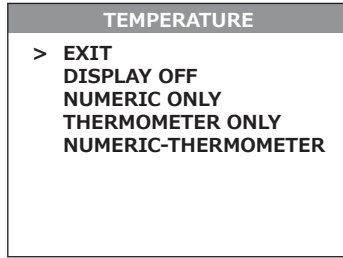


FIGURE 3-22. TEMPERATURE MENU

Reticle Menu

The RETICLE menu (Figure 3-23) allows to select from a choice of reticle patterns: "Dot 4 MOA", "Line Dot", "Cross Center Dot", "Cross", "Crosshair", or "No Reticle".

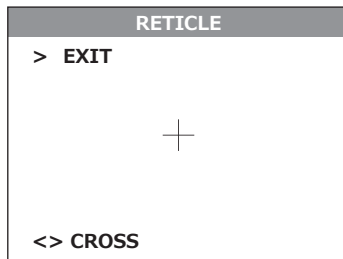


FIGURE 3-23. RETICLE MENU

NOTE:

To navigate through the items on the RETICLE menu, push and hold down the LEFT/RIGHT button.

Boresight Menu

The BORESIGHT function allows to change the reticle position on the display.

Figure 3-24 shows the boresight screen.

Push the buttons UP/DOWN and RIGHT/LEFT to shift the reticle on the display up/down and to the right/left, respectively.

Every time one of these button is pushed, the reticle shifts a single increment corresponding to the minimum boresight correction value, and **the center of impact** on the target moves specified windage/elevation boresight increment in the direction opposed to the direction of the reticle shift.

NOTE:

Remember that **the centre of impact on the target shifts in direction opposed to the direction of the reticle shift**. So, to bring the centre of impact to the right/left and up/down, you must shift the reticle to the left/right and down/up, respectively.

To control the reticle shifting, see the running coordinate of the reticle centre that is printed in the lower left hand corner of the display.

NOTE:

For display coordinates, the origin is the centre of the display. The running coordinate of the reticle is the number of incremental shifts of the reticle from the display centre. The minus sign appears before the displayed number when the reticle shifts left or down (**the centre of impact on the target shifts right or up, respectively**).

Push and hold down the combination of buttons (LEFT+RIGHT) to reset to zero azimuth and elevation. The reticle will shift in the display centre.

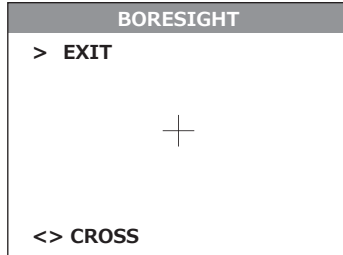


FIGURE 3-24. BORESIGHT MENU

Scenarios Menu

The SCENARIOS menu (Figure 3-25) allows to select from a choice of hunting scenarios or else turn the scenarios off. When a scenario is selected, the display image of the object with the correct temperature will be colored for easy detection.



FIGURE 3-25. SCENARIOS MENU

Corrections Menu

The CORRECTIONS menu (Figure 3-26) allows to select from a choice of filter patterns. The all different field environments are pre-set with the correction filters valued for the best field performance.

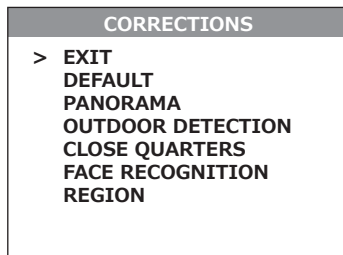


FIGURE 3-26. CORRECTIONS MENU

Settings Menu

The SETTINGS menu (Figure 3-27) allows of direct changes of the contrast, brightness, video standard, and temperature scale settings, as well as to restore the settings to their factory defaults.

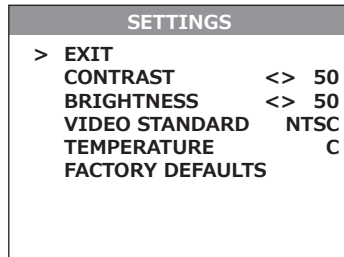


FIGURE 3-27. SETTINGS MENU

Store Image Menu

The STORE IMAGE menu (Figure 3-28) allows the images to be stored, viewed and deleted from the memory.



FIGURE 3-28. STORE IMAGE MENU

NOTE:

After configuration is complete, select the EXIT item of the MAIN MENU and push the MENU button to leave the MAIN MENU.

3.3 OPERATING PROCEDURES

3.3.1 OPERATING THE APOLLO

CAUTION:

DO NOT force the equipment controls past their stopping points.

CAUTION:

To prevent thermal damage to the equipment, never point it, either powered or un-powered, directly at the sun or any other source of high intensity light that the unprotected human eye cannot tolerate (such as welding arc). Never leave the equipment with the objective lens cap off to prevent inadvertent exposure to the sources above.

Apollo operating procedure is as follows:

1. Remove the Apollo from the carrying case.
2. Install the Apollo on the weapon's Picatinny/Weaver rail.
3. Verify the Apollo is firmly mounted to the weapon.
4. Remove the objective lens cap and place it over the lens' housing.
5. Point the equipment on an object.
6. Activate the Apollo by turning the turn-pull switch to ON position. After a turn-on time of approximately 3 sec, video of the thermal scene appears.
7. If the day scope includes a focusing ring (i.e., parallax adjustment knob), adjust the focus for a parallax-free image.
8. Turn on the day scope's reticle illumination and adjust the reticle brightness.
9. Adjust the focus of Apollo by turning the focus ring (CW for far focus, CCW for near focus).

NOTE:

The total focus range is covered with 3/4 turn of the focus ring.

10. Using the buttons on the control panel, configure the Apollo to adapt it to your situation.

For more information on operational setting procedures, see Part 3.2 (Controls and Display Indications).

A. Adjust the brightness of the display for your comfort.

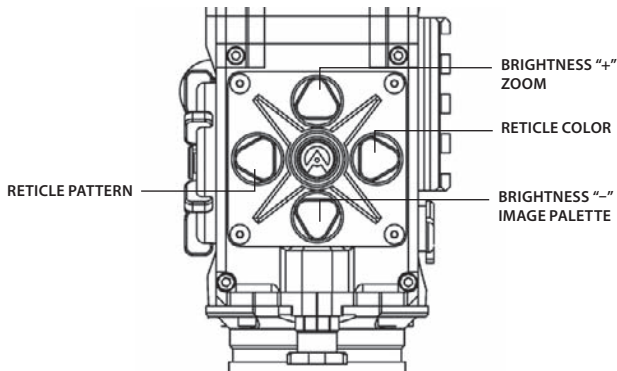


FIGURE 3-29. SETTING BUTTONS

Shortly push the brightness adjusting buttons to increase/reduce the display brightness by one level at a time until you reach your desired brightness level.

B. Use FFC (Flat Field Correction) to improve image quality.

Push the two brightness control buttons at the same time to induce a manual Flat Field Correction.

If necessary, interrupt the FFC process by pushing the central button on the control panel.

C. Make the necessary settings using the MAIN MENU. See Part 3.2.2 (Using the MAIN MENU).

NOTE:

After configuration is complete, select the EXIT item of the MAIN MENU and push the MENU button to leave the MAIN MENU. The all settings will be saved.

D. Select the color of the reticle.

Shortly push the reticle color control button to select between black, white, red, and cyan colors of the reticle.

E. Select a reticle pattern.

Push and hold button (2) or button (4) to select from a choice of reticle patterns: "Dot 4 MOA", "Line Dot", "Cross Center Dot", "Cross", "Crosshair", or "No Reticle" (Figure 3-30).

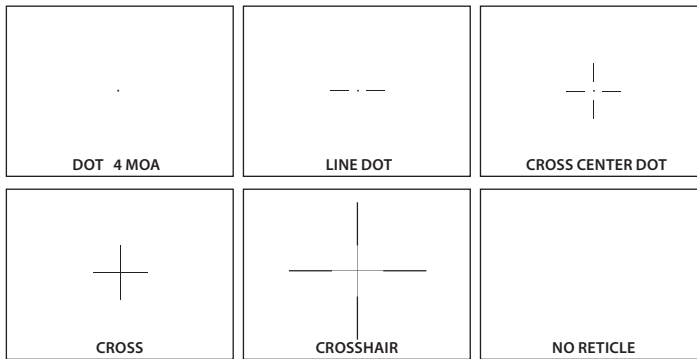


FIGURE 3-30. RETICLE PATTERNS

NOTE:

The reticles appear in the last saved position in the display.

11. Use a digital zoom to see the central area of the displayed scene magnified.

Shortly push the zoom control button to zoom progressively the displayed scene. The X1, X2, X4, X8 symbols will cyclically appear in the lower part of the display.

NOTE:

Digital zoom allows distant objects to appear larger, however the resolution will be compromised.

NOTE:

Zooming does not affect to boresight.

NOTE:

Digital zoom and reticle color control help in target detection and discrimination.

12. To align the barrel of the weapon, place the reticle on the desired target. To allow for the bullet travel (i.e. bullet drop, windage, and the target mobility), use the BORESIGHT function of the MAIN MENU.

13. To operate the Apollo in short-time activation mode, turn the standby on. To activate the Apollo, hold down the remote control button. Release the button to deactivate the Apollo.

CAUTION:

DO NOT leave the equipment activated during breaks in operation.

3.3.2 BORESIGHTING THE APOLLO

NOTE:

Zero the weapon prior to installing and boresighting the Apollo.

Boresight the Apollo as follows:

1. Locate a target at the fire adjustment range (100 m).
2. Turn the Apollo on.
3. Adjust the eyepiece and focus the objective lens to achieve a sharp image of the target.
4. Adjust the brightness of the display.
5. Select a reticle pattern.
6. Fire series of shots (3-4 shots) taking aim by centering the reticle on the target.
7. Find the centre of impact and measure (in centimetres) its vertical and horizontal deviations from the target centre.
8. Work out the values of the boresight corrections required to compensate for the measured deviation of the centre of impact from the target centre.
9. Use the BORESIGHT function of the MAIN MENU to apply corrections required to bring the centre of impact as close as possible to the target centre. See Part 3.2.2 (Using the MAIN MENU).

NOTE:

Remember that **the centre of impact on the target shifts in direction opposed to the direction of the reticle shift**. So, to bring the centre of impact to the right/left and up/down, you must shift the reticle to the left/right and down/up, respectively.

10. Fire a series of shots to check the Apollo boresight.
11. After completing the boresight adjustment procedure, turn off the Apollo and replace the cap on the objective lens.
12. After completing the boresight adjustment procedure, turn off the Apollo and replace the cap on the objective lens.

3.3.3 APOLLO SHUT-DOWN

NOTE:

Shut down the Apollo properly to avoid losing unsaved settings and data.

Shut-down the Apollo as follows:

1. Be sure to save your settings and data.
2. Turn off the Apollo.
3. Replace the cap on the objective lens.
4. Disconnect the cable.
5. Replace the cap on the Apollo connector.
6. Dismount the Apollo from the weapon.
7. Remove the batteries.

CAUTION:

Do not store the Apollo with the battery still in it.

8. Store the Apollo and all accessories in the carrying case.

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 (PMCS), has been provided so that you can keep your equipment in good operating conditions.

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

Operating procedures are detailed in Chapter 3.

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 storage/carrying case, inventory items by means of comparing with the data specified in this manual.	Missing items.
2	Hard Case	Inspect for cracks or damage.	Cracked or damaged.
3	Body	Inspect for cracks or damage. Scratches and gouges are OK if operation is not affected. Inspect for missing parts. Clean as required.	Cracked or damaged. Missing parts.
4	Objective Lens Cap	Inspect for cuts, tears and dirt. Clean as required.	Cap is torn or cut. Cap is not secured to the housing of the lens.
5	Output Lens Cap	Inspect for dirt. Check ease of installation and removal. Clean as required.	Cap is difficult to remove.

TABLE 4-1. CONTINUED

SEQ NO.	LOCATION ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF ...
6	Battery Compartment and Cap	Inspect for corrosion, moisture, corroded or defective contacts. Inspect for cap damaged or retainer breaks. Inspect for rubber gasket damaged.	Contacts are damaged or corroded. Retainer is broken. Cap or rubber gasket are damaged.
7	Lenses	Inspect for cleanliness, scratches, chips or cracks. Clean as required.	Chipped or cracked. Scratches hinder vision through the equipment.
8	Focus Ring	Rotate focus ring to ensure it is not too tight or too loose. Range is approximately 3/4 turn.	Ring gets stuck, is too loose, or adversely affects the user's ability to properly focus the objective lens.
10	Turn-pull Switch	Check for operation (without batteries).	Switch is inoperative.
11	Connector	Inspect for corrosion, moisture, corroded or defective contacts. Inspect for cap damaged or retainer breaks.	Contacts are damaged or corroded. Cap is damaged. Retainer is broken.
12	Mount and Raiser	Inspect for damage or corrosion, for missing parts. Check for proper operation and attachment security.	Damaged. Missing parts. Clamping device is inoperative.
13	Remote Control Unit	Check for damage and missing parts. Check Velcro tape for wear.	Damaged. Missing parts.
14	Light Suppressors	Inspect for cuts, tears. Check ease of installation and removal.	Light suppressor is torn or cut.
15	Video Cable	Inspect for damage. Inspect the cable connector for corrosion, moisture, corroded or defective contacts. Clean as required.	Damaged.
16	Platform Ring (optional)	Inspect for damage, corrosion, or missing parts. Check for proper operation. Clean as required.	Damaged. Missing parts.
17	Scope Mounting System (optional)	Inspect for damage and missing parts.	Damaged. Missing parts.
18	Extended Rail Adapter	Inspect for damage and missing parts. Check clamping devices for proper operation.	Damaged. Missing of some parts. Clamping devices are inoperative.
19	FSRS System (optional)	Inspect for damage and missing parts. Check clamping devices for proper operation.	Damaged. Missing of some parts. Clamping devices are inoperative.

OPERATIONAL CHECKS

NOTE:

For a complete operational checking, it is necessary to connect a video monitor to the Apollo.

16	Turn-pull Switch	Install the batteries. Remove the objective lens cap. Point the equipment on an object. Turn the equipment on. Look for a thermal image on the display. Look for a flashing battery icon in the eyepiece viewing area.	No thermal image. Battery icon is flashing (indicates a low battery).
17	Control Board	Ensure the Apollo is responsive to control buttons.	Irresponsive buttons.
18	Remote Control	Turn the equipment on standby. Point the equipment on an object. Press and hold the remote control button. Look for a thermal image on the display. Release the button. Turn off the equipment.	No image.
19	Video Cable	Connect an external monitor to the Apollo. Point the equipment on an object. Turn the equipment on. Look for an image on the monitor. Turn off the Apollo. Disconnect the monitor.	No image.

POST-CHECK PROCEDURES

20	<p>Turn off the equipment.</p> <hr/> <p>Replace the objective lens cap.</p> <hr/> <p>Remove the batteries.</p> <hr/> <p>Return the equipment and all accessories to the carrying case.</p>
----	--

4.2 OPERATOR TROUBLESHOOTING

The purpose of troubleshooting is to identify the most frequent equipment malfunctions, probable causes and corrective actions required.

Table 4-2 lists the common malfunctions which may be found during the operation or maintenance of the Apollo. Perform the tests/inspections and corrective actions in the order listed.

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
The Apollo fails to activate.	Batteries are missing or improperly installed.	Insert batteries or install correctly.
	Batteries are dead.	Replace the batteries.
	Batteries surfaces or contacts are dirty or corroded.	Clean the contact surfaces with a pencil eraser and/or alcohol and cotton swabs.
	Remote control unit is damaged.	Please contact Customer Support.
	Remote control batteries are dead.	Replace the batteries as per Part 4.3.4.
	The equipment is damaged.	Please contact Customer Support.
The Apollo is not responsive to control buttons.	The equipment is damaged.	Please contact Customer Support.
Remote control does not work.	Batteries are missing or improperly installed.	Insert batteries or install correctly.
	Batteries are dead.	Replace the batteries.
	Batteries surfaces or contacts are dirty or corroded.	Clean the contact surfaces with a pencil eraser and/or alcohol and cotton swabs.
	Remote control unit is damaged.	Please contact Customer Support.
Poor image quality.	Check objective lens focus.	Refocus.
	Check for fogging or dirt on objective lens and eyepiece.	Clean the lenses as detailed in Part 4.3.2.
	The equipment is damaged.	Please contact Customer Support.
No image on an external monitor.	Video cable is damaged.	Replace the video cable with a new one. Please contact Customer Support.
	The equipment is damaged.	Please contact Customer Support.
Hindered rotation of the battery cap.	Dirty cap thread.	Clean the thread.
	Damaged cap thread.	Replace the cap with a new one. Please contact Customer Support.
Light is visible around light suppressor.	Check suppressor resilience.	If the suppressor is defective, please contact Customer Support.

4.3 MAINTENANCE

4.3.1 GENERAL

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

CAUTION:

The Apollo is a precision electro-optical instrument and must be handled carefully at all times to prevent damage.

CAUTION:

DO NOT dismantle the equipment.

4.3.2 CLEANING PROCEDURES

Clean the Apollo and optional items as follows:

1. Gently brush off any dirt from the equipment using only a clean soft cloth.
2. Moisten the cloth with fresh water and gently wipe the external surfaces (except for optical surfaces).
3. Dry any wet surfaces (except for optical surfaces) with another dry and clean soft cloth.
4. Using lens brush, carefully remove all loose dirt from optical surfaces (objective lens and eyepiece).
5. Slightly dampen a cotton swab with ethanol and lightly and slowly wipe optical surface. Clean the optical surface by circular movements from the centre to the edge, not touching the lens holder and changing cotton swab after each circular stroke. Repeat until the optical surface is clean.
6. Clean the battery contact surfaces and contact springs with a pencil eraser and/or alcohol and cotton swabs.

CAUTION:

Dry thoroughly each item before replacing into the storage/carrying case.

4.3.3 BORESIGHTING

When mounted on a weapon in front of an existing day scope, the Apollo adds to the scope's capabilities a thermal vision function, without affecting the boresight.

4.3.4 BATTERY REMOVAL AND REPLACEMENT

Refer to Part 3.1.1 for the Apollo battery installation procedure.

Replace the remote control batteries as follows:

1. Using a screwdriver, unscrew the four screws (A, Figure 4-1) that affix the cover to the bottom of the unit. Remove the cover.
2. Replace the batteries with two new ones (CR2016, 3V). Stack the batteries in its place under the leaf contact spring with the minus contacts directed towards the electric board, as the minus sign etched on the board indicates.
3. Replace the cover and retighten the screws (A).

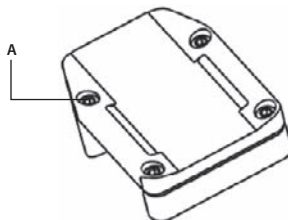


FIGURE 4-1. ADVANCED WIRELESS REMOTE CONTROL. BATTERY INSTALLATION

4.4 RETURN INSTRUCTIONS

For service, repair or replacement 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 (engraved on the underside of the Apollo' body).
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.

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

1. Make sure the Apollo is free of all contaminants such as dirt or any other foreign material.
2. Remove the batteries.
3. Place the cap over the objective lens.
4. Place the Apollo and accessories in the carrying case.

Place the Apollo 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 fastest, traceable, prepaid means 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.armsight.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. LIST OF SPARE PARTS

The parts authorized by this list of spare parts are required for the equipment operator maintenance. The list includes parts that must be removed for replacing authorized parts.

PART NO. column indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirement, to identify an item.

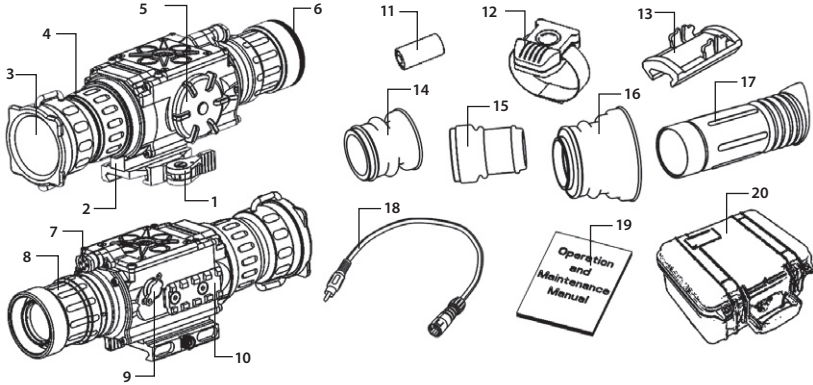


FIGURE B-1. APOLLO SPARE PARTS LIST

TABLE B-1. APOLLO SPARE PARTS LIST

ITEM NO.	DESCRIPTION	PART NO.
1	Mount	AAPLQRM
2	Raiser	AAPLRSR
3	Objective Lens Cap	AAPLOLC
4	Objective Lens Assembly	AAPLOLA
5	Battery Cap	AAPLBC
6	Output Lens Cap	AAPLOPLC
7	Turn-pull Switch	AAPLSWT
8	Output Lens Assembly	AAPLEPA
9	Connector Cap	AAPLCC
10	Side Picatinny/Weaver Rail	AAPLRRL
11	CR 123A Lithium Battery	ALT
12	Advanced Wireless Remote Control	ANVR000001
13	Picatinny Adapter for Advanced Wireless Remote Control	ANRA000002
14	Light Suppressor 1	AAPLLS1
15	Light Suppressor 2	AAPLLS2
16	Light Suppressor 3	AAPLLS3
17	Light Suppressor for Day Scope	AAPLDSL
18	Video Cable	AAPLVC
19	Operation and Maintenance Manual	AZSOMM
20	Hard Shipping/Storage Case	ANHC000004
21	M4×20 Flat Head Socket Cap Screw	ALT



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 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.

www.armasight.com