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# ***NIVISYS***<sup>™</sup><sub>LLC</sub>

## **OPERATOR MANUAL**

### **TAG<sup>™</sup> SERIES**

#### **Thermal Acquisition Goggle**



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# OPERATOR MANUAL

## for

# TAG™ SERIES

## Thermal Acquisition Goggle

PART NUMBER	MODEL DESCRIPTION (LENS, CORE)
7325-000	TAG-32cS (19mm, 25μ)
7327-000	TAG-327cS (19mm, 17μ)
7330-000	TAG-32iS (19mm, 25μ)
7329-000	TAG-327iS (19mm, 17μ)
7335-000	TAG-32cM (35mm, 25μ)
7337-000	TAG-327cM (35mm, 17μ)
7331-000	TAG-32iM (35mm, 25μ)
7340-000	TAG-327iM (35mm, 17μ)
7334-000	TAG-32cL (60mm, 25μ)
7338-000	TAG-327cL (60mm, 17μ)
7332-000	TAG-32iL (60mm, 25μ)
7339-000	TAG-327iL (60mm, 17μ)
7336-000	TAG-32cE (100mm, 25μ)
7328-000	TAG-327cE (100mm, 17μ)
7333-000	TAG-32iE (100mm, 25μ)
7326-000	TAG-327iE (100mm, 17μ)
7645-000	TAG-64cM (35mm, 17μ)
7651-000	TAG-64iM (35mm, 17μ)
7650-000	TAG-64cL (60mm, 17μ)
7652-000	TAG-64iL (60mm, 17μ)
7647-000	TAG-64cE (100mm, 17μ)
7653-000	TAG-64iE (100mm, 17μ)

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## **ADVISORY OVERVIEW**

The following description categorizes the level of risk associated with each cautionary statement displayed throughout the manual.

### **WARNING**

**HIGHLIGHTS AN OPERATION OR PROCEDURE WHICH, IF NOT STRICTLY OBSERVED, COULD RESULT IN INJURY TO OR DEATH OF PERSONNEL.**

### **CAUTION**

**HIGHLIGHTS AN OPERATION OR PROCEDURE WHICH, IF NOT STRICTLY OBSERVED, COULD RESULT IN DAMAGE TO OR DESTRUCTION OF EQUIPMENT OR LOSS OF MISSION EFFECTIVENESS.**

### **NOTE**

**HIGHLIGHTS AN ESSENTIAL OPERATION, PROCEDURE, CONDITION OR STATEMENT.**

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# CHAPTER 1:

## GENERAL INFORMATION

### 1.1 Introduction:

This manual provides operation and preventative maintenance instructions for the TAG. It also provides specifications and data on the performance of the goggle. To ensure the safety of the operator and the correct operation of the goggle it is recommended that this manual is read carefully in its entirety before any deployment or field application.

### 1.2 Equipment Description:

The TAG Series of products are reliable, high performance, and intuitive handheld thermal binoculars designed to increase combat effectiveness of forward observers by enhancing the ability to detect, recognize, and identify hostile threats. Boasting a variety of optical configurations, the TAG incorporates the latest uncooled VOx detector technology for optimal range performance.

The TAG is ideal for low visibility observation at a wide number of ranges and designed using currently fielded U.S. Military night vision components for improved reliability and ease of integrated logistic support.

The TAG Series is offered in a variety of resolutions and objective lenses, providing a variety of fields of view and target detection ranges. The TAG Series models include image capture to an internal memory and review of still images on the internal micro-display. Video and still images may be downloaded and captured to a SD card using our optional Audio Visual Kit.

### 1.3 Standard Kit Parts List:

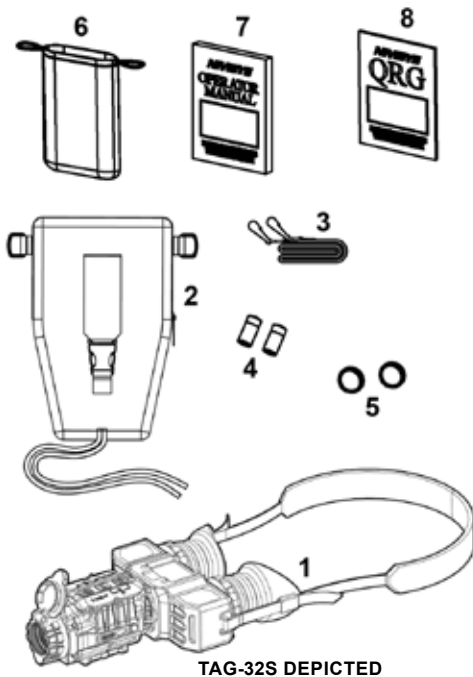
The standard TAG kit comes with the items listed in the following table.

<b>Item</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty.</b>
1	See page i for Part Numbers	Thermal Acquisition Goggle	1
2	A3187392	Soft Carrying Case	1
3	A3144267	Shoulder Strap	1
4	580-0002-0	Battery, CR123 Lithium	2
5	A3144263	Demist Shield	2
6	170-12	Cleaning Kit	1
7	830-0035-0	Operator Manual, TAG	1
8	830-0036-0	Quick Reference Guide, TAG	1
9	116-0001-0	Neck Strap	1

**Table 1-1 Standard Kit Parts List**

#### 1.4 Standard Kit Parts Illustration:

The illustration below is provided for quick identification of the standard parts of the TAG kit.



**Figure 1-1 Standard Kit Parts Illustration**

## 1.5 **Optional Items List:**

The TAG is compatible with the following optional items and accessories listed in the following table.

<b>Item</b>	<b>Part No.</b>	<b>Description</b>
1	7B257-2F	Shipping/Storage Case
2	A3144268	Headmount Assembly with Brow Pads
3	A3256368	Helmet Mount, PASGT. Flip-up
4	3250-000	Remote Switch
5	7320-900	Head Mount Interface

**Table 1-2 Optional Items List**



## 1.6 Optional Items Illustration:

The illustration is provided as a visual key to optional items that can be used with the standard TAG.

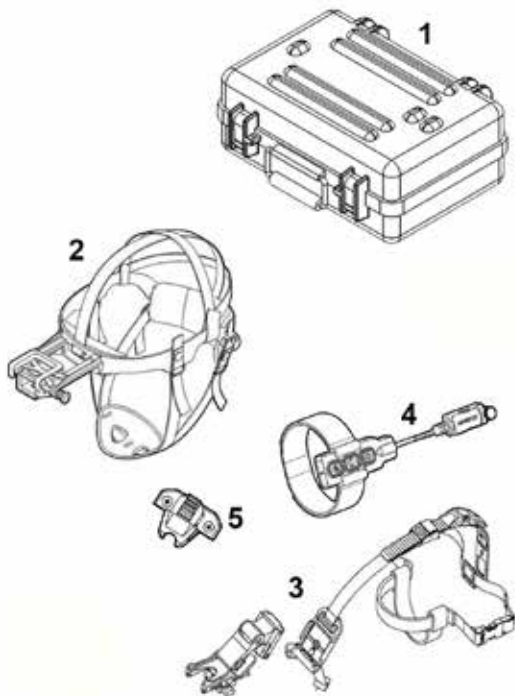


Figure 1-2 Optional Parts Illustration

## 1.7 System Performance and Data:

The table below lists the technical specifications and data of the TAG system. The data contained herein is subject to change without notice.

ITEM	LIMITS			
<b>Electrical</b>				
Power Source	Battery (3.0V DC max.)			
Battery Requirements	CR123 Lithium (2ea.)			
Battery Life	>4 hrs @ 21°C (70°F)			
<b>Physical</b>				
	<b>-S</b>	<b>-M</b>	<b>-L</b>	<b>-E</b>
Overall Dimensions, without eyecups (L x W x H)	18.8cm x 14.7cm x 6.5cm	20.1cm x 14.7cm x 7.1cm	22.1cm x 14.7cm x 7.9cm	27.1cm x 14.7cm x 8.3cm
Weight (with batteries)	625g	675g	801g	1098g
<b>Environmental</b>				
	<b>“c”</b>		<b>“i”</b>	
Operating Temperature	-10° to +45° C		-40° to +55° C	
Storage Temperature	-40°C to +70°C			

**Table 1-3 System Performance and Data**

<b>Thermal Core</b>				
	<b>-16 (25<math>\mu</math>)</b>	<b>-32 (25<math>\mu</math>)</b>	<b>-32 (17<math>\mu</math>)</b>	<b>-64 (17<math>\mu</math>)</b>
Sensor Resolution	160 x 120	324 x 256	336 x 256	640 x 480
Pixel Pitch	25 $\mu$ m	25 $\mu$ m	17 $\mu$ m	17 $\mu$ m
Sensor	Vanadium Oxide (VOx) Microbolometer Uncooled 30Hz frame rate			
Thermal Sensitivity	<50mK			
Spectral Response	7 – 14 $\mu$ m			
Video Output	Composite, NTSC			
<b>Optical</b>				
	<b>-S</b>	<b>-M</b>	<b>-L</b>	<b>-E</b>
Objective Lens Focal Length	19mm,	35mm,	60mm,	100mm
Objective Lens F Number	f/1.25	f/1.4	f/1.25	f/1.4
Diopter Range	+2 to -6 diopters			
Eye Relief	25mm			

**Table 1-3 System Performance and Data, (cont.)**

ITEM	LIMITS			
<b>Electrical</b>				
Power Source	Battery (3.0V DC max.)			
Battery Requirements	CR123 Lithium (2ea.)			
Battery Life	>4 hrs @ 21°C (70°F)			
<b>Physical</b>				
	<b>-M</b>	<b>-L</b>	<b>-E</b>	
Overall Dimensions (L x H x W)	15.2 x 6.8 x 6.8cm	18.0 x 6.7 x 7.4cm	24.9 x 8.6 x 8.6cm	
Weight (with batteries)	590g	724g	1167g	
<b>Environmental</b>				
	<b>“c”</b>		<b>“i”</b>	
Operating Temperature	-10° to +45° C		-40° to +55° C	
Storage Temperature	-40°C to +70°C			
<b>Thermal Core</b>				
	<b>-16 (25μ)</b>	<b>-32 (25μ)</b>	<b>-32 (17μ)</b>	<b>-64 (17μ)</b>
Sensor Resolution	160 x 120	324 x 256	336 x 256	640 x 480

**Table 1-3 System Performance and Data, (cont.)**

Pixel Pitch	25 $\mu$ m	25 $\mu$ m	17 $\mu$ m	17 $\mu$ m
Sensor	Vanadium Oxide (VOx) Microbolometer Uncooled 30Hz frame rate			
Thermal Sensitivity	<50mK			
Spectral Response	7 – 14 $\mu$ m			
Video Output	Composite, NTSC			
<b>Optical</b>				
	<b>-M</b>	<b>-L</b>	<b>-E</b>	
Objective Lens Focal Length	35mm,	60mm	100mm	
Objective Lens F Number	f/1.4	f/1.25	f/1.4	
Dioptr Range	+2 to -6 diopters			
Eye Relief	25mm			

**Table 1-3 System Performance and Data, (cont.)**

<b>Magnification and Field of View by Model</b>				
<b>Model</b>	<b>PN</b>	<b>Pixel Pitch</b>	<b>MAG</b>	<b>FOV (H x V)</b>
TAG-32cS	7325-000	25 $\mu$	1.0	24° x 19°
TAG-327cS	7327-000	17 $\mu$	1.5	16° x 13°
TAG-32iS	7330-000	25 $\mu$	1.0	24° x 19°
TAG-327iS	7329-000	17 $\mu$	1.5	16° x 13°
TAG-32cM	7335-000	25 $\mu$	1.8	13° x 10°
TAG-327cM	7337-000	17 $\mu$	2.8	9° x 7°
TAG-32iM	7331-000	25 $\mu$	1.8	13° x 10°
TAG-327iM	7340-000	17 $\mu$	2.8	9° x 7°
TAG-32cL	7334-000	25 $\mu$	3.1	8° x 6°
TAG-327cL	7338-000	17 $\mu$	4.8	5° x 4°
TAG-32iL	7332-000	25 $\mu$	3.1	8° x 6°
TAG-327iL	7339-000	17 $\mu$	4.8	5° x 4°
TAG-32cE	7336-000	25 $\mu$	5.4	5° x 4°
TAG-327cE	7328-000	17 $\mu$	8.0	3° x 2.5°
TAG-32iE	7333-000	25 $\mu$	5.4	5° x 4°
TAG-327iE	7326-000	17 $\mu$	8.0	3° x 2.5°
TAG-64cM	7645-000	17 $\mu$	1.4	18° x 13°
TAG-64iM	7651-000			
TAG-64cL	7650-000		2.3	10° x 8°
TAG-64iL	7652-000			
TAG-64cE	7647-000		4.0	6° x 5°
TAG-64iE	7653-000			

**Table 1-3 System Performance and Data, (cont.)**

## CHAPTER 2: PREPARATION FOR USE

### 2.1 Introduction:

This section contains instructions for installing and attaching various components and accessories to the TAG for operation under normal conditions.

### 2.2 Battery Precautions:

#### **WARNING**

**DO NOT MIX OLD AND NEW BATTERIES.  
DO NOT MIX BRANDS OF BATTERIES. DO  
NOT MIX DISPOSABLE AND RECHARGEABLE  
BATTERIES. FAILURE TO FOLLOW THESE  
INSTRUCTIONS COULD RESULT IN DEATH,  
INJURY OR IMPOSITION OF LONG-TERM  
HEALTH HAZARDS.**

#### **WARNING**

**INSPECT BATTERIES FOR BULGING PRIOR  
TO USE. IF THE BATTERY SHOWS SIGNS OF  
BULGING, DO NOT USE.**

#### **WARNING**

**DO NOT HEAT, PUNCTURE, SHORT CIRCUIT,  
ATTEMPT TO RECHARGE OR OTHERWISE  
TAMPER WITH THE BATTERIES. TURN OFF  
THE TAG IF THE BATTERY COMPARTMENT  
BECOMES UNDULY HOT. IF POSSIBLE, WAIT  
UNTIL THE BATTERIES HAVE COOLED  
BEFORE REMOVING THEM.**

**WARNING**

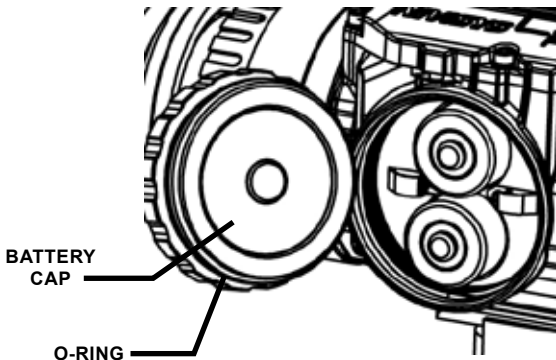
**DO NOT REPLACE BATTERIES IN A POTENTIALLY EXPLOSIVE ATMOSPHERE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN DEATH, INJURY OR IMPOSITION OF LONG-TERM HEALTH HAZARDS.**

**CAUTION**

**OBEY THE BATTERY MANUFACTURER'S DIRECTIONS FOR BATTERY DISPOSAL.**

**2.3 Battery Installation:**

The electronic circuit of the TAG is powered by two (2) Lithium CR123 cells. Install the batteries as follows.



**Figure 2-1 Battery Installation**

1. Remove the battery cap by turning it counter-clockwise.



2. Check to ensure the o-ring is present and undamaged. Replace o-ring if necessary.
3. Insert batteries into the battery compartment, negative (-) ends first, positive ends toward the battery cap.
4. Replace battery cap, turning it clockwise until a stop occurs.

#### 2.4 Installation of the Eyecups:

Perform the following procedure to install the eyecups onto the TAG:

1. Carefully press each eyecup over the diopter cell retainer.
2. Rotate each eyecup into proper viewing position.

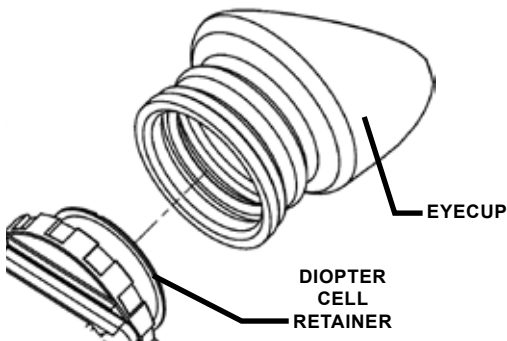


Figure 2-2 Eyecup Installation

#### 2.5 Installation of the Demist Shields:

Perform the following procedure to install the demist shields on the diopter lenses.

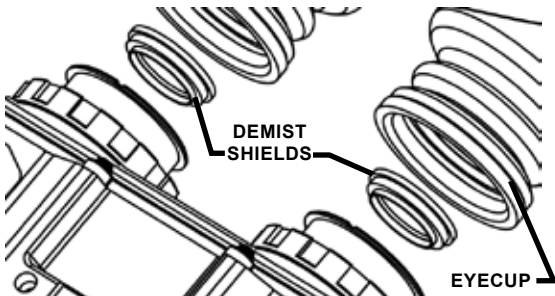
**CAUTION**

**IF THE DEMIST SHIELD IS WIPED WHILE WET OR WITH WET LENS TISSUE, THE COATING WILL BE DAMAGED.**

**NOTE**

**IF INCLEMENT OPERATING CONDITIONS ARE EXPECTED (E.G. SIGNIFICANT TEMPERATURE CHANGE AND HIGH HUMIDITY), INSTALL DEMIST SHIELD TO MINIMIZE EYEPiece LENS FOG PRIOR TO EXECUTION OF MISSION.**

1. Carefully remove the eyecups.
2. Carefully press a demist shield onto each eyepiece. Be careful not to smudge the eyepieces or demist shields.
3. Replace the eyecups



**Figure 2-3 Demist Shield Installation**

## 2.6 Camera Neck Strap Installation:

To install the camera neck strap to the TAG perform the following.

1. Remove one end of the camera neck strap from the plastic fastener it is installed in. Ensure the tri-glide fastener remains threaded on the strap about 6 inches away from the end.
2. Locate the neck strap eyelets on the rear housing.
3. Insert the free end of the strap through one of the eyelets and pull through about 3 inches.
4. Thread the end of the strap back through the fastener from which it was released.
5. Repeat the steps with the remaining end of the neck strap.
6. Ensure the camera neck cord is installed correctly by pulling the neck strap away from the TAG. No slipping should occur if installed correctly.

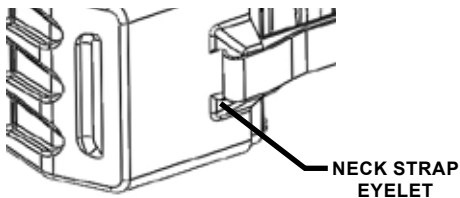


Figure 2-4 Neck Strap Eyelet Location

## 2.7 19mm Lens Cover Installation:

The -S models are issued with the lens cover pre-installed. In the event installation or re-installation is necessary, perform the following procedure.

1. Insert the hinge pin into one of the two hinge bosses so that it enters the boss completely but does not exit out of the other side. A small pair of slip-joint pliers is helpful.

- Align the spring so that the ends face outward and insert it into the lens cover. One end of the spring will remain outside of the lens cover.
- Press the lens cover in between the hinge bosses so that the spring and hinge pin are in line.

**NOTE**

**THE SPRING END THAT REMAINS OUTSIDE THE LENS COVER WILL BE TORQUED AGAINST THE HINGE BOSS AS THIS IS DONE.**

- Press the hinge pin through the spring, lens cover and through the other hinge boss.
- Check that the cover freely pivots around the hinge pin.

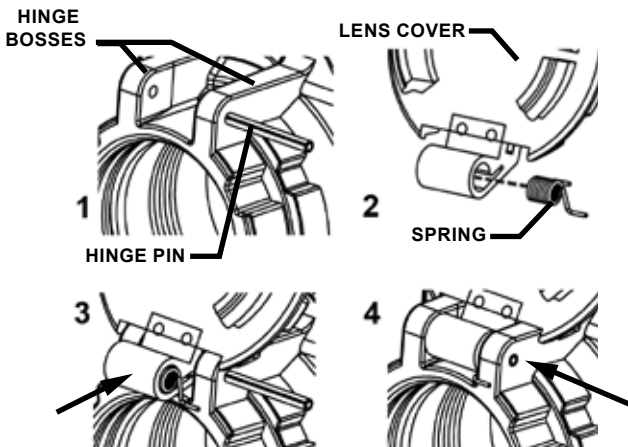


Figure 2-5 Lens Cover Installation (19mm Lens)

## 2.8 35mm Lens Cover Installation:

The -M models are issued with the lens covers pre-installed. In the event installation or re-installation is necessary, perform the following procedure.

1. Close the lens cover assembly.
2. Ensure the lens cover catch is facing up.
3. Press the lens cover assembly onto the objective lens.
4. Gently rock the lens cover assembly back and forth while continuing to press firmly onto the objective lens.
5. The lens cover is fully seated as the lens cover base and the TAG body meet.

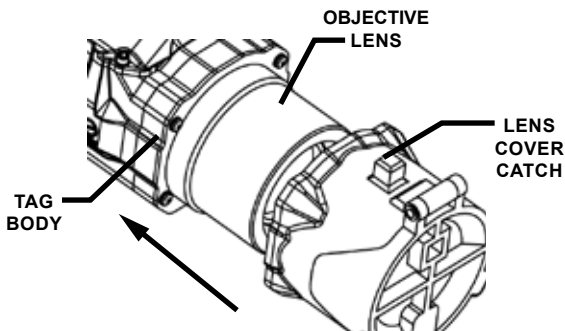


Figure 2-6 Lens Cover Installation (35mm Lens)

### NOTE

**PROPER INSTALLATION OF THE LENS COVER MATCHES THE PROFILE OF THE LENS COVER BASE TO THE PROFILE OF THE TAG BODY.**

## 2.9 60mm and 100mm Lens Cover Installation:

The TAG units are issued with the lens covers pre-installed. In the event installation or re-installation is necessary, perform the following procedure.

1. Stretch the lens cover base over the lens housing.
2. Push the lens cover base onto the lens housing until it is securely seated.
3. Ensure the lens cover operates properly before use.

### NOTE

**THE 60MM AND 100MM LENS COVERS CAN BE ROTATED FOR OPERATOR PREFERENCE.**

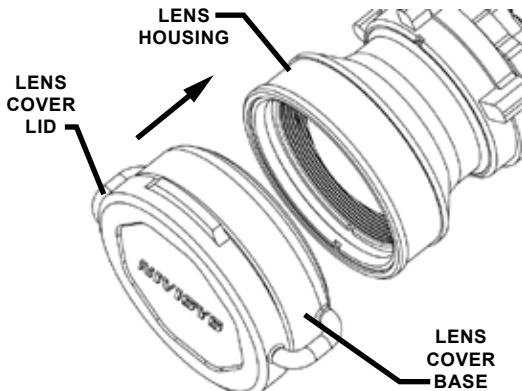


Figure 2-7 60mm and 100mm Lens Cover Installation

## 2.10 Head Mount Interface Installation (Optional):

The head mount interface is an optional component of the TAG system that allows the TAG to be head or helmet mounted. Perform the following to install the head mount interface to the TAG.

### NOTE

#### **TO PERFORM THIS OPERATION A PHILLIPS HEAD SCREW DRIVER IS REQUIRED (NOT PROVIDED)**

1. Locate the bag with the head mount adapter and two 6-32 x 5/16 flat head screws provided by manufacturer.
2. Align the holes in the mounting plate to those on the top of the rear housing of the TAG so that the pyramid connector points toward the eyepieces of the goggle.
3. Use the provided screws to fasten the head mount adapter to the rear housing.
4. Secure the head mount adapter by tightening the screws with a Phillips head screw driver.

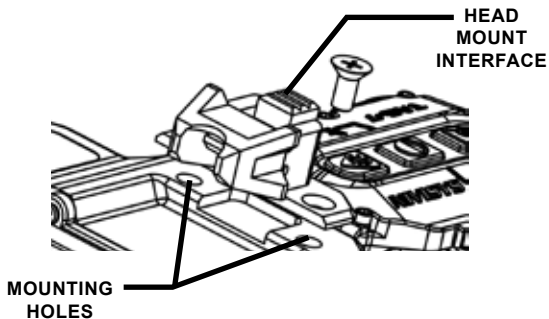


Figure 2-8 Head Mount Interface Installation

## **2.11 Installation of the Head Mount Assembly (Optional):**

The head mount assembly is an optional piece of equipment that may be used in conjunction with the 19mm lens when applicable. Perform the following procedures for putting on the head mount assembly mount.

### **WARNING**

**THE TAG FIELD OF VIEW IS NOT OPTIMIZED FOR USE DURING TRANSPORTATION OF ANY KIND. IT IS NOT RECOMMENDED TO USE THE TAG WHILE WALKING, RUNNING OR OPERATING OF MOVING VEHICLES.**

### **WARNING**

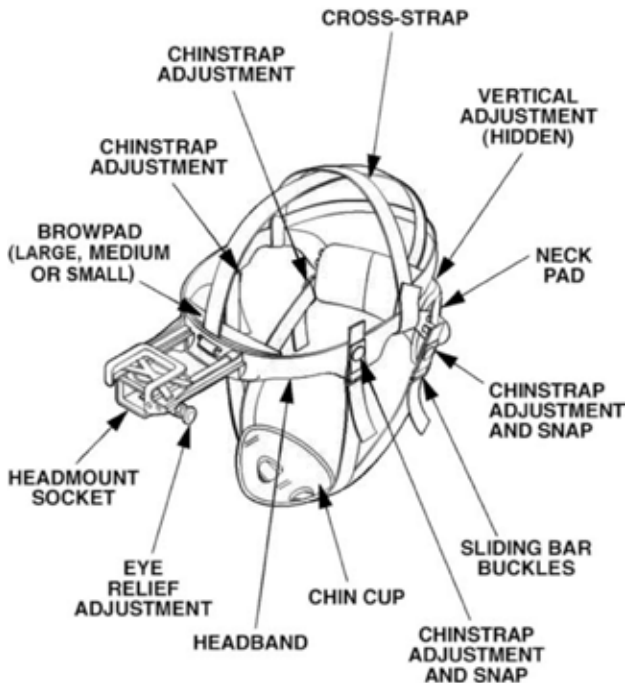
**DO NOT PUT ON THE HEAD MOUNT WHILE THE TAG IS ATTACHED.**

1. Prior to putting on the head mount, loosen the four chin straps so the ends of each strap are approximately two inches from the sliding bar buckles.
2. Snap the front and rear snaps in place.
3. With both hands, grasp the neck pad assembly and pull the harness over your head and the neck pad down to the back of your neck.
4. Holding the chin cup in position on chin, adjust both rear chin cup assembly straps until you feel light pressure against your chin. (DO NOT TIGHTEN.)

### **NOTE**

**IF THE HEAD MOUNT IS TOO LOOSE, REMOVE THE ATTACHED THIN BROW PAD AND REPLACE WITH THE MEDIUM OR LARGE BROW PAD, STORED IN THE CARRYING CASE.**





**Figure 2-9 Head Mount Illustration**

5. Maintain the position of the chin cup and remove any slack from the front and rear chin straps. (DO NOT TIGHTEN).
6. Ensure that the cross-strap assembly is not twisted and remove slack by adjusting the vertical adjustment strap at the neck pad.

7. Adjust chinstrap and vertical adjustment until the chin cup and headband assembly are in a comfortable but firm position.

### 2.12 Attaching the TAG to a Head/Helmet Mount (Optional):

1. Press and hold the latch lever of the mount interface.
2. Slide the pyramid connector into the receiving head or helmet mount socket.
3. Release the latch lever to lock the mount interface into the head/helmet mount.
4. Pull the TAG away from the head or helmet mount to verify that it is securely attached.

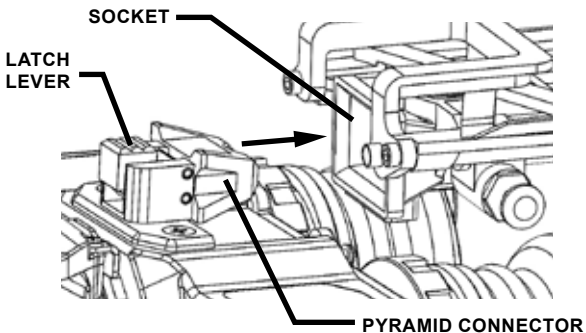


Figure 2-10 Attaching the TAG to a Head/Helmet Mount

### 2.13 Attaching the Tripod Mount (Optional):

The TAG may be fitted with an optional tripod mounting block to allow for hands free operation. To attach the TAG to a tripod mount perform the following procedure:

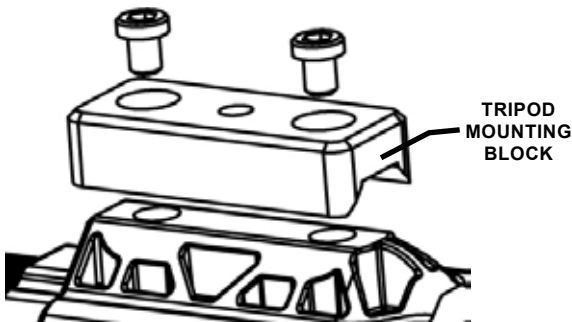
1. Align the tripod mount to the TAG body as shown below.
2. Use the provided 10-32 x .375in screws to attach the mount to the bottom of the TAG body.
3. Hand tighten the connection between the TAG and the tripod hardware.
4. Ensure that the connection is tight before use.

**CAUTION**

**THE TAG MOUNTING BLOCK IS EQUIPPED WITH A 1/4-20 THREADED HOLE FOR USE WITH STANDARD CAMERA TRIPOD MOUNTING CONNECTIONS ONLY.**

**NOTE**

**DAMAGE TO THE UNIT CAUSED BY FAULTY TRIPOD CONNECTION IS NOT COVERED UNDER WARRANTY**



**Figure 2-11 Tripod Mounting Block**

## 2.14 Hot Shoe Connector:

A hot shoe connector is built into the unit in order to facilitate various optional accessories of the TAG such as a remote switch, video out cable and external battery cable.

The hot shoe connector is covered by a hot shoe dust cover that should be in place at all times when not in use in order to protect the circuitry within the unit. To access the connector, lift and rotate the dust cover. To replace the dust cover, rotate the cover squarely over the hot shoe interface and gently push the cover into place.

### **CAUTION**

**HOT SHOE CONNECTOR CAN BE DAMAGED IF DUST COVER IS NOT REPLACED CORRECTLY. BE SURE NOT TO BEND PINS WHEN REPLACING HOT SHOE DUST COVER.**

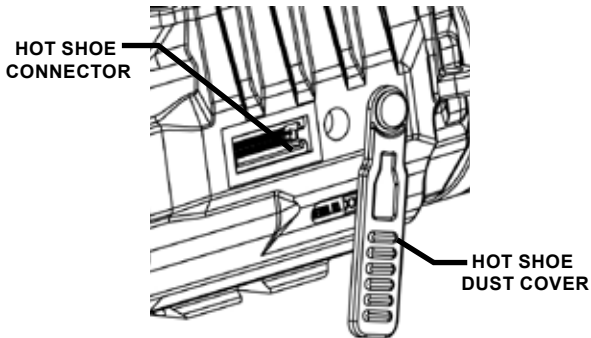


Figure 2-12 Hot Shoe Location

# CHAPTER 3:

## OPERATING INSTRUCTIONS

### 3.1 Introduction:

This chapter contains instructions for the safe operation of the TAG under normal circumstances and environments.

### 3.2 Operating Precautions:

#### **WARNING**

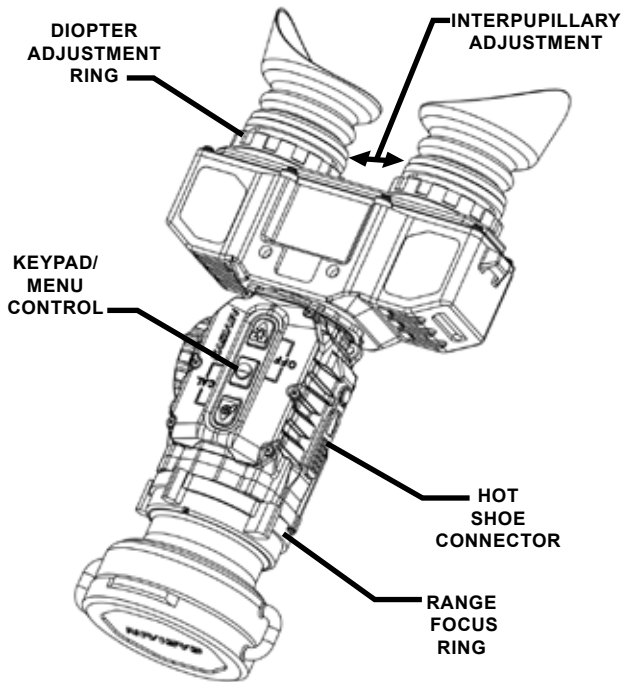
**THE THERMAL FOCAL-PLANE ARRAY UTILIZED WITHIN THE TAG IS SENSITIVE TO EXPOSURE TO EXTREMELY HIGH LEVELS OF RADIANT FLUX. NEVER EXPOSE THE TAG, EITHER POWERED OR UNPOWERED, DIRECTLY TO THE SUN OR ANY OTHER SOURCE OF RADIANT FLUX THAT THE HUMAN EYE CANNOT TOLERATE.**

#### **NOTE**

**INADVERTENT SUN DAMAGE IS NOT CONSIDERED A DEFECT IN MATERIAL OR WORKMANSHIP, AND IS NOT COVERED IN THE PRODUCT WARRANTY.**

### 3.3 Controls and Indicators:

The TAG is designed to adjust for different users and corrects for most differences in eyesight. The controls and indicators for the TAG are shown in Figure 3-1 and are described in Table 3-1.



**Figure 3-1 Controls and Indicators**

<b>Control and Indicators</b>	<b>Functions</b>
Keypad/ Menu Control	Switches unit ON or OFF. Activates Calibration, Polarity, Display Brightness and Digital Zoom. Controls Internal Menu System such as reticle selection, azimuth adjustment and elevation adjustment.
Battery Indicator (not shown)	Icon located in the eyepiece display that shows battery life of the system.
Diopter Adjustment Ring	Focuses eyepiece lens. Adjust for sharpest image of display screen.
Hot Shoe	Controls the interface between the TAG and accessories such as the RS-16 (remote switch) and external power and/or video.
Interpupillary Adjustment	Slide diopter rings to adjust for differences in the spacing between users eyes.
Range Focus Ring	Adjusts the focus of the viewed scene from 5m to infinity. Available in the -L and -E models only.

**Table 3-1 Controls and Indicators**

### **3.4 Powering ON the TAG:**

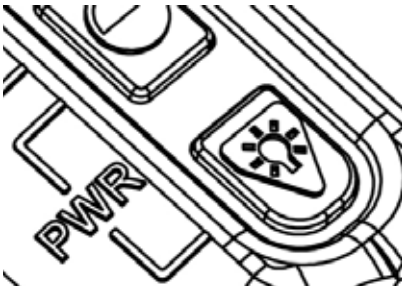
When the TAG is powered ON, the circuit will energize and the start up screen will appear for a few seconds in the display.

To power ON the TAG perform the following procedure.

1. Close the objective lens cover.
2. Press and hold (approx. 2 seconds) the center and rear buttons as indicated on the keypad bezel by “PWR.”

**NOTE**

**THE OBJECTIVE LENS COVER MUST BE CLOSED WHILE POWERING ON TO ALLOW THE CALIBRATION OF THE SYSTEM. CALIBRATION IS COMPLETE WITHIN TWO SECONDS OF ACTIVATION.**



**Figure 3-2 Keypad Buttons**

**NOTE**

**WHEN THE REMOTE SWITCH IS ATTACHED, THE TAG CAN ONLY BE POWERED ON THROUGH THE MAIN TAG KEYPAD. ALL OTHER FUNCTIONS CAN BE EXECUTED USING THE REMOTE SWITCH KEYPAD.**

**3.5 Battery Indicator:**

To monitor available battery power, press and hold the rear button until the battery icon appears. When battery life is low, a flashing low battery indicator will appear near the center of the eyepiece display.





**Figure 3-3 Battery Power Icons**

Two conditions determine the length of time the unit will operate on a set of batteries:

1. The brightness setting on the display.
2. The temperature at which the unit operates.

**NOTE**

**WHEN THE FLASHING LOW BATTERY INDICATOR APPEARS, THE UNIT HAS APPROXIMATELY 5 MINUTES OF BATTERY LIFE BEFORE AUTOMATIC SHUTDOWN.**

### **3.6 Thermal Calibration:**

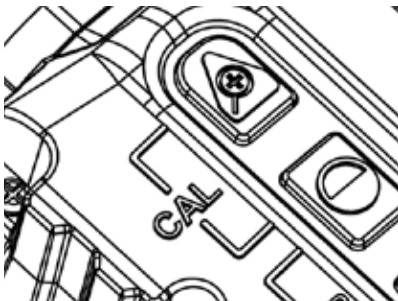
The TAG Series features shutterless core technology and the lens cover unit must be closed when calibrating the system. Calibration gives the user the clearest picture possible. To calibrate the system perform the following procedure.

1. Fully close the lens cover.
2. Simultaneously press the front and center buttons.

The TAG Series will automatically perform an initial calibration at power up. For this reason it is necessary to keep the lens

cover closed for a minimum of 2 seconds at power up.

A second calibration is suggested at 30 seconds after powering ON the unit. This allows the thermal sensor to adjust to the surrounding temperatures. Additional calibrations may be required as surrounding temperature changes or any time a fixed, non-uniform shading appears on the display screen.

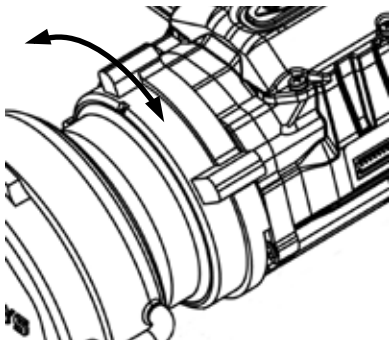


**Figure 3-4 Calibration**

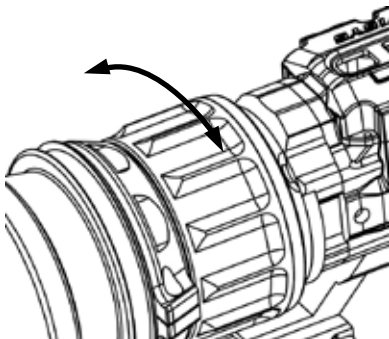
### **3.7 Range Focus Adjustment (60mm and 100mm Lenses):**

The range focus ring is used to focus the objective lens for objects viewed at varied distances. Rotate the range focus ring counter-clockwise for distant objects up to infinity. Rotate the range focus ring clockwise for close objects.

The 60mm lens is indicated by an “L” in the model name and can focus to 2 meters. The 100mm lens is indicated by an “E” in the model name and can focus to 10 meters.



**Figure 3-5 Range Focus Adjustment 60mm**



**Figure 3-6 Range Focus Adjustment 100mm**

### 3.8 Digital Zoom:

Press the Zoom button to cycle through the electronic zoom presets.



Figure 3-7 Zoom Button

### 3.9 Polarity (White-Hot/Black-Hot):

The TAG Polarity button determines one of two viewing modes to identify environmental temperature differences: HOT temperatures are seen as WHITE on the screen or HOT temperatures are seen as BLACK on the screen. Press the Polarity button to toggle between the viewing modes.

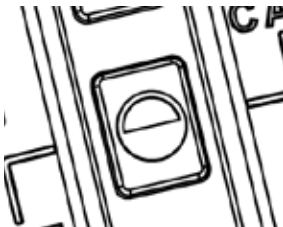


Figure 3-8 Polarity Button

### 3.10 Display Brightness:

When the system is first turned on, the unit activates white-hot with a midrange display brightness setting. The unit has 6 brightness settings. When adjusting the brightness, each time the Display Brightness button is pressed, the level of intensity will increase. A corresponding brightness level icon will appear in the field of view.

#### **NOTE**

**AFTER THE UNIT REACHES ITS MAXIMUM BRIGHTNESS SETTING IT WILL CYCLE BACK TO ITS LOWEST SETTING.**



**Figure 3-9 Display Brightness Button**

### 3.11 Menu Activation and Use:

To activate Menu Mode:

1. Press and hold the center button until the menu appears on the display (approximately 2 seconds).
2. Use the front and rear buttons to scroll through the menu items.
3. Use the center button to select an item.
4. The menu mode will time out after 7 seconds of non-use, except in the Adjust sub-menu.



Figure 3-10 Main Menu

### 3.12 Selecting Display Mode:

1. Push and hold the center button until the Main Menu is displayed.
2. Press the center button to select the DISPLAY sub-menu.



Figure 3-11 Display Sub-menu

The 6 display modes to choose from are:

- ALERT mode shows a Monochrome image with the hot

- spots in orange and red.
- MONO mode shows a Monochrome image.
  - COLOR 1 mode shows hot as orange and cold as purple.
  - COLOR 2 mode shows gradients of brown and green with hot temperatures shown in white.
  - COLOR 3 mode shows gradients of white, yellows and orange with hotter temperatures in white.
  - COLOR 4 is a full color spectrum with hotter temperatures in reds and orange and cooler temperatures in blue and purples.

**NOTE:**

**WHEN ANY ONE OF THE COLOR VIEWING MODES IS ACTIVE, THE PRESSING CENTER BUTTON WILL CYCLE TO THE NEXT COLOR MODE.**

### **3.13 Selecting a Reticle Pattern:**

When the TAG is used as a stand alone thermal weapon sight, an internal reticle is available. To choose a specific reticle perform the following:

**NOTE**

**UPON START UP, THE UNIT WILL DISPLAY THE LAST RETICLE SELECTED BY THE USER PRIOR TO SHUTDOWN OR BATTERY REMOVAL.**

1. Push and hold the center button until the Main Menu is displayed.
2. Scroll until RETICLE is highlighted.
3. Press the center button to select the RETICLE sub-menu.



Figure 3-12 Reticle Sub-menu

4. Scroll until desired reticle appears in display.
5. Press the center button to select the reticle desired.
6. Press the center button to exit menu.

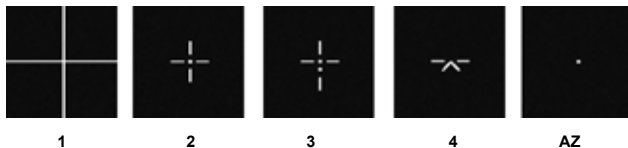


Figure 3-13 Reticle Types

**NOTE**

**RETICLE WILL AUTOMATICALLY CHANGE BLACK/WHITE TO GIVE BEST CONTRAST.**

**3.14 Removing Reticle:**

To remove the reticle from the display screen perform the following:

1. Select OFF under the Reticle sub-menu.



**NOTE**

**THE RETICLE TYPE AND POSITION WILL BE MAINTAINED THROUGH THE POWERING DOWN AND STARTING UP OF THE SYSTEM.**

**NOTE**

**WHEN AZ IS SELECTED, THE ACCU-ZOOM DOT RETICLE IS SHOWN. THIS RETICLE HAS INDEPENDENT AZIMUTH (H) AND ELEVATION (V) ADJUSTMENT MEMORY AND WILL BE DISPLAYED WHEREVER IT WAS LAST MOVED TO ON THE SCREEN. ADJUSTING THE POSITION OF THE AZ RETICLE WILL NOT AFFECT THE POSITION OF THE OTHER RETICLES.**

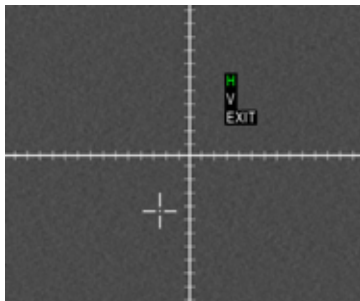
**3.15 Adjusting Reticle Position:**

1. Push and hold the center button until the Main Menu is displayed.
2. Scroll until ADJUST is highlighted.
3. Press the center button to select the ADJUST sub-menu.



**Figure 3-14 Adjust Sub-menu**

- Adjust the reticle horizontally when the H is highlighted by using the front and rear buttons.



**Figure 3-15 Reticle Adjustment**

- Press the center button when the desired position is reached.
- Adjust the reticle vertically when the V is highlighted by using the front and rear buttons.
- Select EXIT.

**NOTE**

**EACH BUTTON PUSH MOVES THE RETICLE ONE INCREMENT. PRESS AND HOLD FOR FASTER ADJUSTMENT.**

### **3.16 Determining Installed Firmware:**

Perform the following to determine the firmware installed on the unit:

- Push and hold the center button until the Main Menu is displayed.
- Scroll until UTILITY is highlighted.
- Press the center button to enter the UTILITY sub-menu.

4. Press the center button again to select INFO.
5. At this point the information about the system appears on the screen.
6. Press the center button again to EXIT.



Figure 3-16 Utility Sub-menu

### 3.17 Enabling the Video Output (for Optional VPDM):

In order to utilize the video export feature of the unit, the video output feature must be selected from the menu.

#### **NOTE**

**IT IS RECOMMENDED THAT THE VIDEO OUT SELECTION REMAINS IN THE OFF POSITION WHEN NOT IN USE IN ORDER TO MAXIMIZE BATTERY LIFE.**

1. Push and hold the center button until the Main Menu is displayed.
2. Scroll until UTILITY is highlighted
3. Press the center button to select the UTILITY sub-menu.
4. Scroll until VIDEO is highlighted, then press center button to select.

5. Scroll to choose ON or OFF.
6. Press the rear button to EXIT the video enable.
7. Press the center button twice to EXIT the menu system.

### 3.18 Camera Operation

1. Hold the center button until the menu appears.
2. Scroll and select CAMERA.
3. Select CAPTURE to enter the camera mode.
4. Press the center button to take a picture and advance the counter located in the upper left corner of the screen.
5. Exit the Camera mode by holding down the center button and selecting CAPTURE or powering down the unit.



Figure 3-17 Camera Sub-menu

#### NOTE

**THE INTERNAL MEMORY IS LIMITED TO  
APPROXIMATELY:  
250 IMAGES FOR THE -16 MODELS  
100 IMAGES FOR THE -32 MODELS  
50 IMAGES FOR THE -64 MODELS**

**NOTE**

**ONCE THE MAXIMUM CAPACITY OF IMAGES HAVE BEEN STORED, THE ERASE ALL FUNCTION MUST BE PERFORMED TO CAPTURE MORE IMAGES.**

**3.19 Image Review**

1. Hold the center button until the menu appears.
2. Scroll and select CAMERA.
3. Scroll and select REVIEW to review the stored images.
4. Use the front and rear buttons to advance through the stored images.



**Figure 3-18 Image Review Counter**

**NOTE**

**THE REVIEW COUNTER IN THE UPPER LEFT CORNER OF THE SCREEN SHOWS THE SPECIFIC NUMBER OF IMAGE YOU ARE VIEWING AS WELL AS THE TOTAL NUMBER OF IMAGES CAPTURED.**

5. Exit the Review mode by pressing the center button and selecting EXIT.

### **3.20 Downloading Images**

Still images stored on the TAG are currently exported via an analog video feed. In order to download images, the operator must have the Nivisys VPDM (Video Power and Download Module). This can be purchased as an accessory.

With a VPDM the operator can record the stored images using:

- an external DVR
- or computer equipped for analog video capture

### **3.21 Erasing Images**

1. Hold the center button until the menu appears.
2. Scroll and select CAMERA.
3. Scroll and select ERASE ALL to erase the stored images.

#### **NOTE**

**THERE IS NO WAY TO ERASE SELECTED IMAGES. ERASING IMAGES ERASES ALL STORED IMAGES AND CAN TAKE UP TO 30 SECONDS.**

#### **NOTE**

**THE UNIT CAN NOT BE POWERED DOWN USING THE KEYPAD WHILE ERASING IMAGES.**



Figure 3-19 Erase All Function

### 3.22 Powering OFF the TAG Series:

To power OFF the system, perform the following:

1. Simultaneously press the center and rear buttons. Visually check that the unit is OFF by looking through the eyepiece.

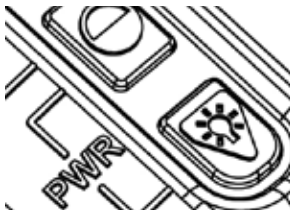
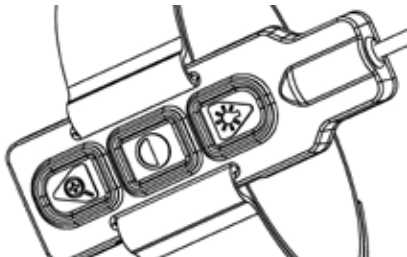


Figure 3-20 Powering OFF the TAG Series

### 3.23 Use with the RS-16 Remote Switch:

The TAG Series may be used with the supplied remote switch. When attached, all keypad functions of the TAG Series, except for powering ON, can be executed using the remote switch.



**Figure 3-21 Remote Switch**

### **3.24 Preparation for Storage:**

1. Remove batteries from the TAG Series.
2. Inspect the battery housing for corrosion or moisture. Clean and dry if necessary.
3. Replace the battery cap.
4. Remove the demist shield if installed.
5. Install objective lens cover.

#### **NOTE**

**PRIOR TO PLACING TAG SERIES INTO CARRYING CASE, ENSURE TAG SERIES AND CASE ARE FREE OF DIRT, DUST, AND MOISTURE.**

6. Place the TAG Series, accessories and cleaning supplies back into their storage/carrying cases. It is best to place the items in their original locations to prevent any possible damage to the unit and/or accessories.
7. Return to storage area.



# CHAPTER 4:

## MAINTENANCE INSTRUCTIONS

### 4.1 Introduction:

The TAG is designed to be used in diverse environments and rugged conditions. It is recommended that regular and simple maintenance is performed for optimal system performance.

### **CAUTION**

**THIS WEAPON SIGHT IS A PRECISION ELECTRO-OPTICAL INSTRUMENT AND MUST BE HANDLED CAREFULLY.**

**DO NOT SCRATCH THE EXTERNAL LENS SURFACES OR TOUCH THEM WITH YOUR FINGERS.**

**WIPING DEMIST SHIELD WITH LENS TISSUE WHILE WET OR WITH WET LENS TISSUE CAN DAMAGE THE COATING.**

### 4.2 Preparing for Maintenance:

Before performing any maintenance or cleaning of the system, remove all power sources from the TAG including batteries and/or external power supplies.

### 4.3 Cleaning the TAG:

When necessary, use a moistened clean cloth to wipe the outside of the unit, EXCEPT FOR THE OPTICAL SURFACES. Be sure to wipe away excess dirt and dust that may restrict the performance or damage moving and mating parts. If needed, the use of a very diluted detergent solution is permissible. Dry with a soft clean cloth, or allow unit to air-dry before storing it.

#### **4.4 Cleaning the Optics:**

When cleaning of the lens is required, first blow any loose dirt or grit away from the surface of the lens. EXCEPT FOR THE DEMIST SHIELD, use the supplied lens tissue lightly moistened with water or lens cleaning fluid to lightly wipe the optical surfaces, using a circular motion. Discard each lens tissue after one use to avoid transferring grit or foreign matter onto the lens surfaces. If the lens remains dirty, use a cotton swab lightly moistened with lens cleaning fluid to remove the foreign matter from the lens. Dry with a clean unused lens tissue.

#### **4.5 Checking for Damage and Corrosion:**

As a general guideline, conduct an inspection of the TAG, accessories, and the case after every use. Look for heavy wear and cracks in rubber or plastic. Inspect for moisture or corrosion in the battery compartment. Check for scratches, condensation and foreign matter on optical surfaces. Report missing or damaged items, for replacement.

# CHAPTER 5: TROUBLESHOOTING

## 5.1 Troubleshooting Procedures:

Table 5-1 lists common malfunctions that may occur with the equipment. Perform the tests, inspections and corrective actions in the order they appear in the table.

This table cannot list all the malfunctions that may occur, all the tests and inspections needed to find the fault, or all the corrective actions needed to correct the fault. If the equipment malfunction is not listed or actions listed do not correct the fault, notify your maintainer.

Malfunction	Test or Inspection	Corrective Action
Unit fails to power ON.	Visual.  Check for defective, missing or improperly installed batteries.	Power the system ON.  Replace battery or install correctly.  Tighten battery cap securely.  If TAG still fails to power ON, refer to higher level of maintenance.
No display in eyepiece.	Visual check to see if lens cover is still on.	Open lens cover.

**Table 5-1 Troubleshooting**

Poor image quality.	Check for fogging or dirt on objective lens or eyepiece lenses.  Visual.	Clean optics.  Adjust Range Focus. (On -64L and -32L only)
Diopter adjustment cannot be made.	Check to see if the diopter adjustment ring is bent or broken.	If damaged, refer to higher level of maintenance.
Interpupillary adjustment cannot be made (left & right eye).	Defective eyepiece assembly.	Refer to higher level of maintenance.

**Table 5-1 Troubleshooting, (cont.)**

# APPENDIX A: SPARE AND REPAIR PARTS LIST

## A.1 Introduction:

This section provides information needed to identify, contact and order spare and/or repair parts for the TAG.

## A.2 Contact Information:

To order spare or repair parts for the TAG or any night vision products contact:

Nivisys, LLC  
Corporate Headquarters, Sales and Engineering  
15475 N. Greenway Hayden Loop, Suite B-21  
Scottsdale, AZ 85260  
Tel: 480-970-3222  
Fax: 480-970-3555

## A.3 Spare Part List:

The following is a list of parts that may be ordered for spare parts for the TAG.

Part No.	Description	Qty.
830-0035-0	Operator Manual, TAG	1
830-0036-0	Quick Reference Guide, TAG	1
310-0098-0	Mount Adapter, Tripod	1
A3187392	Soft Carrying Case	1
A3144267	Shoulder Strap	1

**Table A-1 Spare and Repair Parts List**

580-0002-0	Battery, CR123 Lithium (2ea. required for operation)	1
A3144263	Demist Shield	1
170-12	Cleaning Kit	1
A3144422	Eyecup (Open)	1
116-0001-0	Camera Neck Strap	1
A3144315	Purge Screw	1
A3144316	Purge Screw O-Ring	1
7320-900	Head Mount Interface	1
710-0004-0	Tripod Mount Screw (requires 2)	1
3200-112	Hot Shoe Dust Cover	1
3200-114	Dust Cover Retaining Pin	1
830-0057-0	RS-16 Quick Reference Guide	1
4200-800	35mm Lens Cover Assembly	1
220-0013-0	60mm Lens Cover Assembly	1
A3144268	Head Mount Assembly	1
3255 -000	RS-16 (Remote Switch)	1
3200-900	Lens Cover Replacement Kit, 19mm	1
220-0041-0	100mm Lens Cover Assembly	

**Table A-1 Spare and Repair Parts List, (cont.)**

## **APPENDIX B: WARRANTY INFORMATION**

### **Equipment Warranties And Remedy:**

Seller warrants that each newly manufactured item sold hereunder and such portion of a repaired/refurbished item as has been repaired or replaced by Seller under this warranty, shall be free from defects in material or workmanship at the time of shipment and shall perform during the warranty period in accordance with the specifications incorporated herein. Should any failure to conform to these warranties be discovered and brought to Seller's attention during the warranty period and be substantiated by examination at Seller's factory or by authorized field personnel, then at its own cost, Seller shall correct such failure by, at Seller's option, repair or replacement of the non-conforming item or portion thereof, or return the unit purchase price of the non-conforming item or component. Buyer agrees that this remedy shall be its sole and exclusive remedy against Seller and that no other remedy shall be available or pursued by Buyer against Seller. In no event shall the Seller be liable for any cost or expense in excess of those described in this paragraph and expressly excluding any liability or damages for special, incidental or consequential damages.

The warranty period for newly-manufactured items shall extend 12 months from the date of shipment by Seller unless a different warranty period is agreed in writing to by Seller. The warranty period for repaired/refurbished electronic components shall extend for the unexpired warranty period or 90 days, whichever is longer, of the item repaired or replaced.

This warranty shall not extend to any item that upon examination by Seller is found to have been subject to:

- A. Mishandling, misuse, negligence or accident.

- B. Installation, operation or maintenance that either was not in accordance with Seller's specifications and instructions, or otherwise improper.
- C. Tampering, as evidenced, for example, by broken seals, damaged packaging containers, etc.
- D. Repair or alteration by anyone other than Seller without Seller's express advance written approval.

Failure to promptly notify Seller in writing upon discovery of any non-conforming item during the warranty period shall void the warranty as to such item. Buyer shall describe any such non-conformity in detail, expressing its position as to return of any article under the remedy provided herein. No returns shall be accepted without prior approval by Seller.

**Return Material Authorization Number (RMA#):**

Warranty and non-warranty items returned to Nivisys for repair or replacement require a RMA#. Email [support@nivisys.com](mailto:support@nivisys.com), call 1-480-970-3222 or fax 1-480-970-3555 with a serial number and detailed information to obtain a RMA#.

**THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY OTHER WARRANTY, EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**



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