



# UTM TRAINING

This Brief is Classified UNCLASSIFIED//FOR OFFICIAL USE ONLY



# Universal Thermal Monocular (UTM)

C4ISR - SPAWAR - AUSGAR

- Enabling Learning Objectives
- Terminal Learning Objectives
- What is the UTM
- How to use the UTM
- How to employ the UTM
- Care and cleaning of the UTM





# Universal Thermal Monocular

C4ISR - SPAWAR - AUSGAR

## Enabling Learning Objectives:

Upon completion of this period of instruction the Warfighter will be familiar with the following:

- A. Specifications
- B. Basic functions
- C. Manipulation of the lasers
- D. Manipulation of the Menu Options
- E. Maintenance, Care and Cleaning

## Terminal Learning Objective:

Upon completion of this period of instruction, you the Warfighter will have a better understanding on how to operate UTM optic.





# UTM Specifications

C4ISR - SPAWAR - AUSGAR

**Weight** 12.8 oz (0.8lbs)

**Dimensions** 5.1"L x 2.1"H x 3.2"W

## Imaging Sensor

**Format** 640 x 480 Focal Plane Array  
Un-cooled VOx Micro-bolometer

**Refresh Rate** 60 Hz

**Spectral Response** 8–12  $\mu\text{m}$  Micron LWIR

**ZOOM** 1x True Unity Display / 2x Digital

**Minimum Focus Range** 18"

**Still Photo and Video Output Capable**

**Startup** <4 seconds

## Eyepiece

**Display** 640 x 480 Display, 307,200 pixels

**Diopter** -4 to +2

**Eye Relief** 1" (up to 8" standoff weapons mounted)

## Power usage

**Disposable Battery** 1 x CR123A / 2.5 Hours

2 x CR123A / 5.5 Hours

## External connections

**Helmet Mount, Weapons Mount**

**Still and Video Connection** RS-170 NTSC to USB

**Tripod** 1/4-20 thread mount

## Laser

**Dual band IR (pointing) and RED (aiming)**



## Environmentals

**Temperature Range** Operating -38°F to 140°F

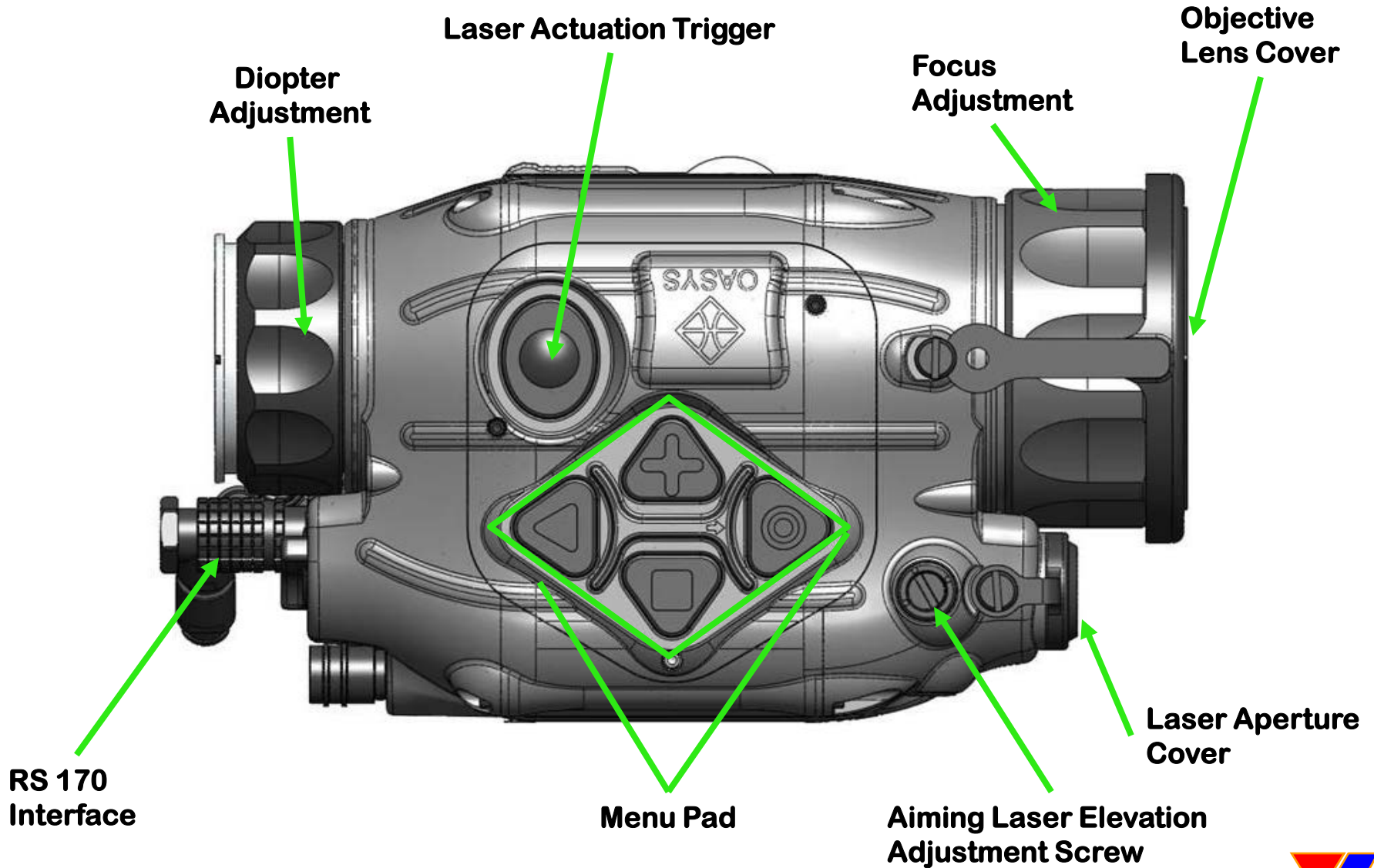
**Waterproof** 66" (Total Immersion, 30 mins)





# UTM Nomenclature (Top)

C4ISR - SPAWAR - AUSGAR





# UTM Nomenclature (Back)

C4ISR - SPAWAR - AUSGAR

Ocular Lens

3 Position Laser  
Selector Lever

Remote Laser  
Trigger Cable  
Interface

RS 170  
Interface

RS 170 Protective Plug

MILSTD 1913 Picatinny Rotating Mount



# UTM Nomenclature (Left/Front)

C4ISR - SPAWAR - AUSGAR

Visible Aiming  
Laser Windage

Visible Aiming  
Laser Windage

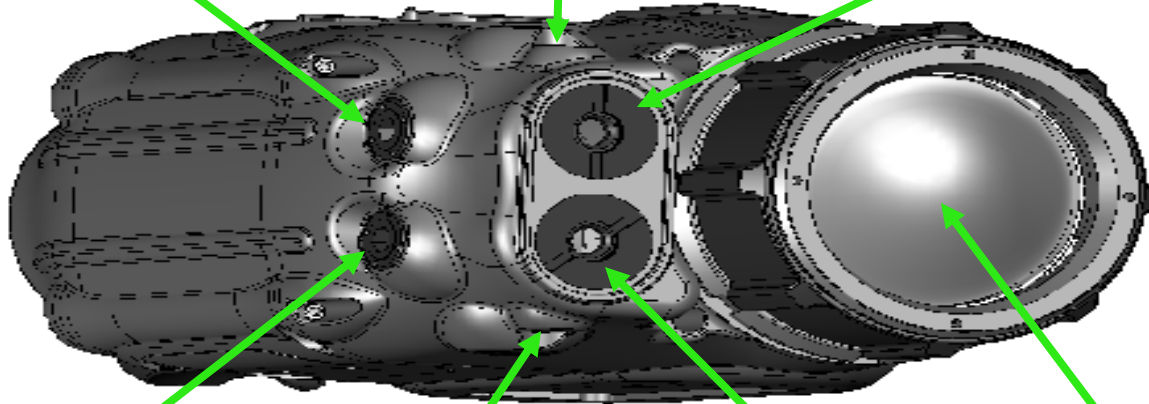
Visible RED Aiming  
Laser Aperture

IR Pointing  
Laser Windage

IR Pointing  
Laser Elevation

Invisible IR Pointing  
Laser Aperture

Objective Lens





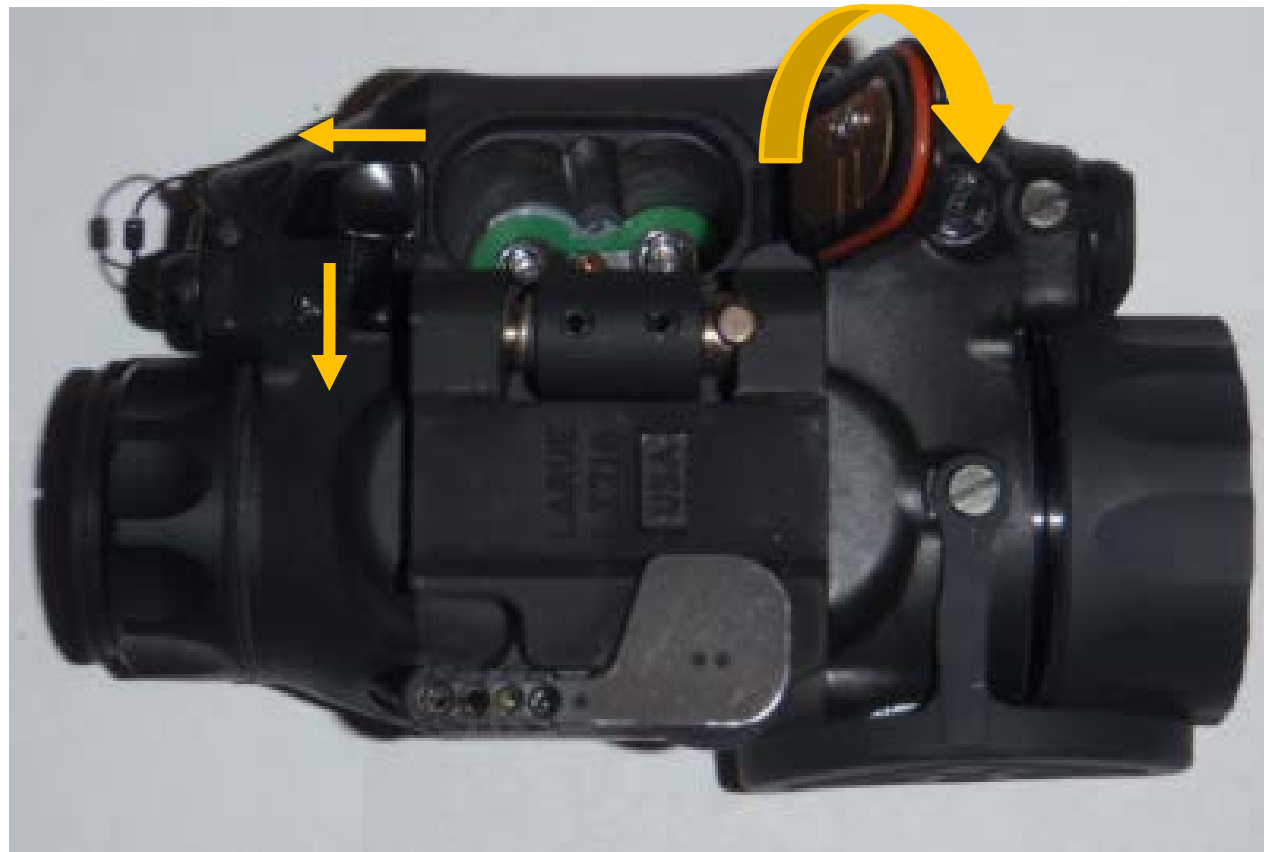
# UTM Battery Change

C4ISR - SPAWAR - AUSGAR

## **To OPEN:**

Unlock the battery door hatch by squeezing the battery door latch locking arms at the same time in the direction of the arrows and pull the battery door hatch.

Place 2 x CR123A batteries positive (+) side up in the battery box.



## **To CLOSE:**

Remove used batteries and insert new batteries into the battery box. Close battery door by pushing down the battery door hatch. Ensure the battery door latch locking arms are locked.



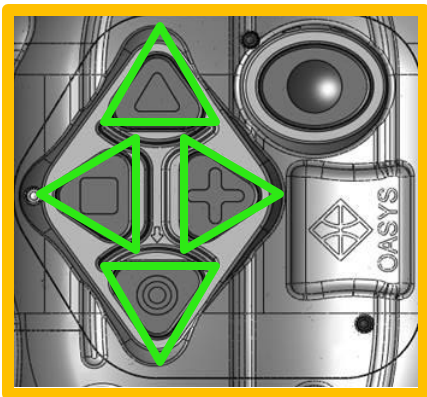




# Powering on the UTM

C4ISR - SPAWAR - AUSGAR

To power on the UTM, depress both the top and bottom buttons at the same time for approximately 4 seconds.



UTM MENU PAD





# UTM View Screen

C4ISR - SPAWAR - AUSGAR

**NORTH-SEEKING ARROW**

**IR OR VISIBLE LASER ON /OFF**

**HEADING  
PITCH  
ROLL**

H 360.0 ↑  
P -10.0  
R 0.0

IRLO



**BATTERY  
LIFE**

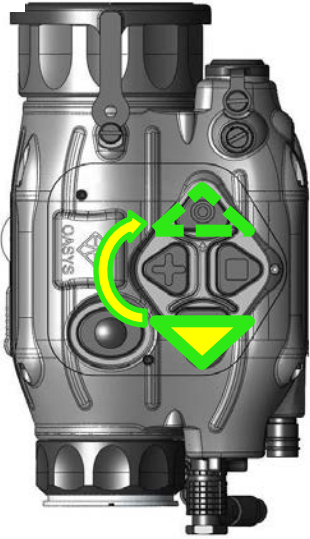


**RETICLE**



# UTM Brightness & Gain Settings

C4ISR - SPAWAR - AUSGAR

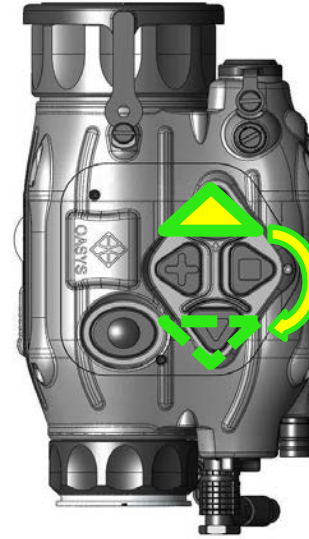


**BRIGHTNESS**  
 PRESS REAR  
 ARROW KEY ONCE  
 TO BRING UP  
 BRIGHTNESS  
 CONTROL. - PUSH  
 FRONT ARROW KEY  
 TO CHANGE  
 VALUES



▲ ▼ TO ADJ BRIGHT = 30

• BRIGHTNESS VALUES RANGE  
 FROM 1 TO 32



**GAIN**  
 PRESS FRONT  
 ARROW KEY ONCE  
 TO BRING UP  
 GAIN CONTROL. - PUSH  
 REAR ARROW KEY  
 TO CHANGE  
 VALUES



GAIN = AGC

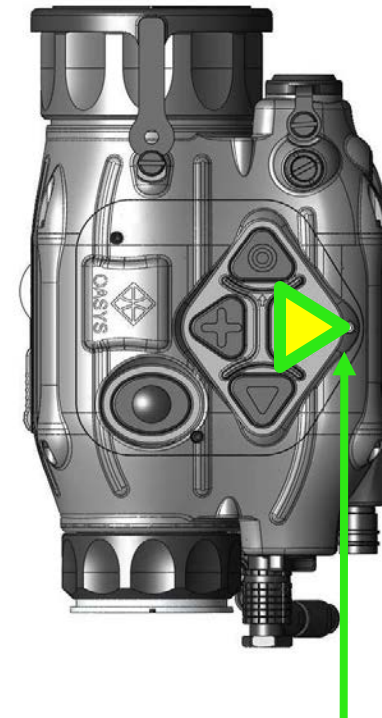
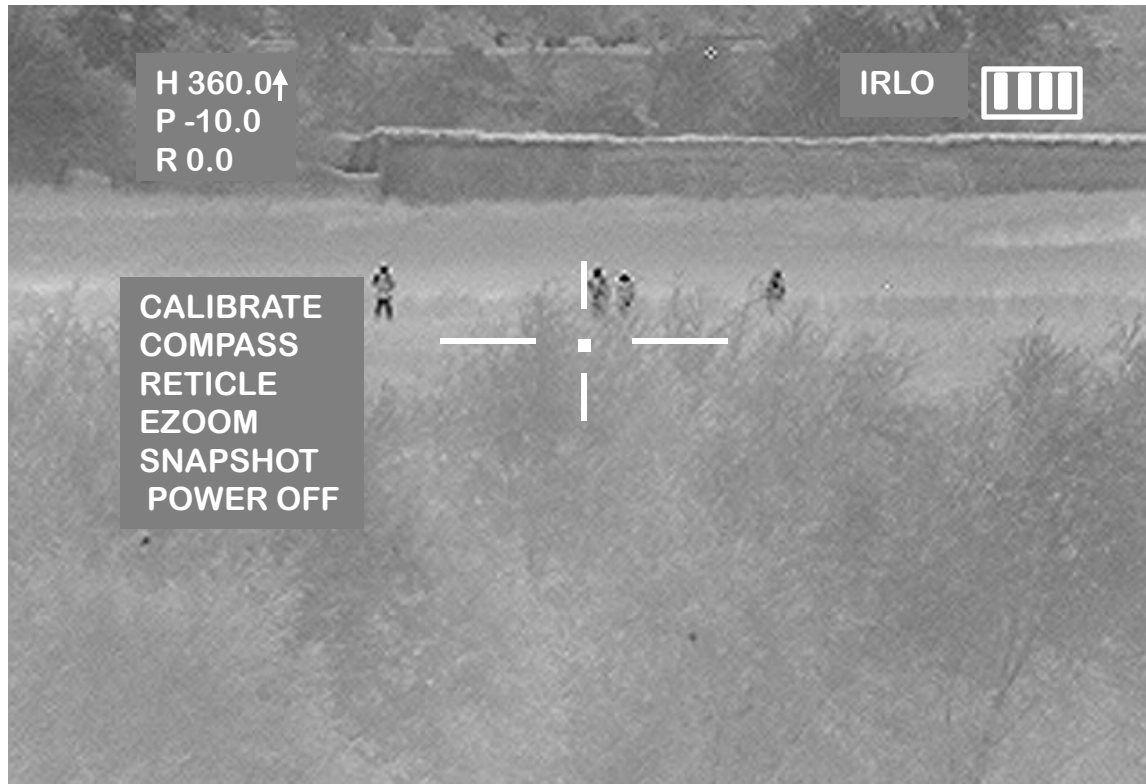
• GAIN VALUES RANGE FROM 1 TO  
 10, AND "AGC" (AUTOMATIC GAIN  
 CONTROL)





# UTM View Screen Menu

C4ISR - SPAWAR - AUSGAR



**PUSH ONCE TO ACTIVATE  
THE UTM MENU FUNCTION**

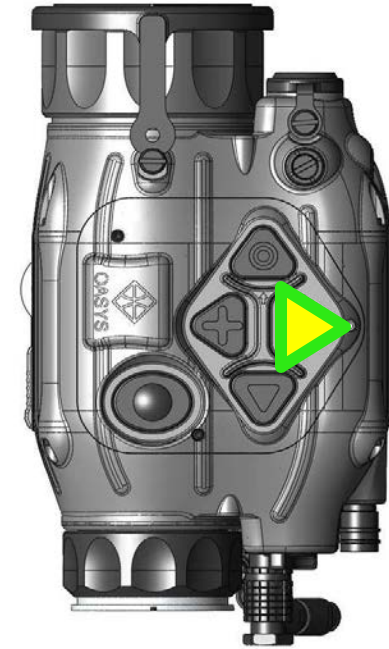
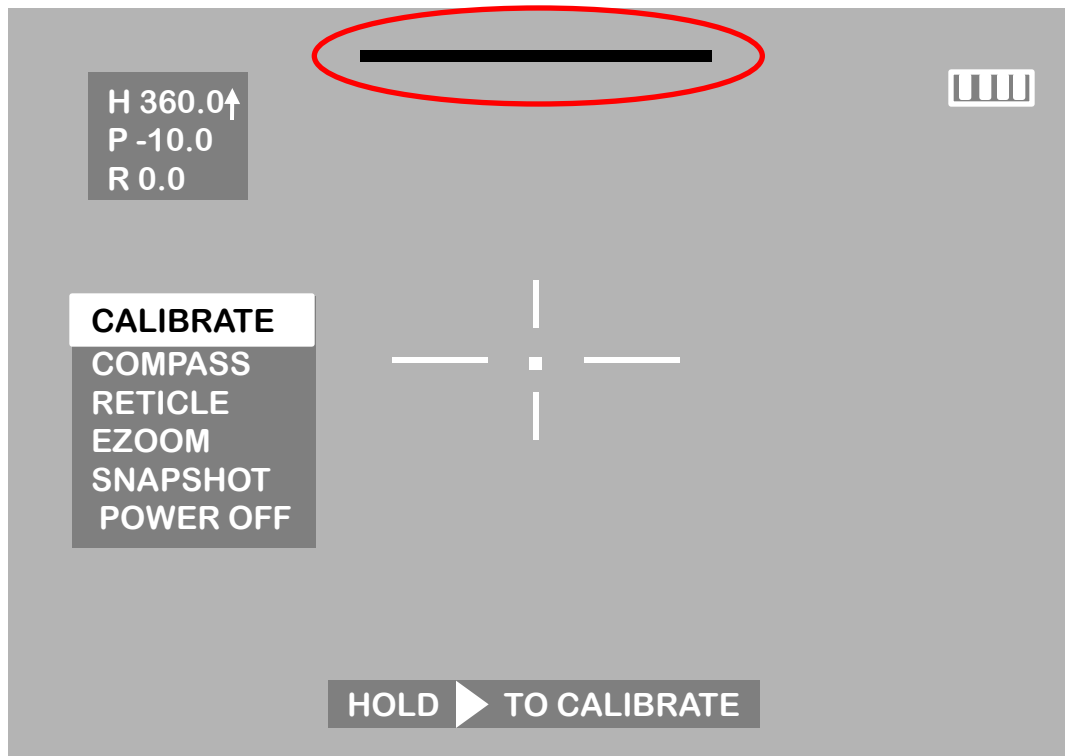
- **WHEN THE RIGHT BUTTON IS PUSHED, THE UTM VIEW SCREEN MENU WILL APPEAR ON THE LEFT SIDE OF THE VIEW SCREEN.**
- **THE BATTERY LIFE INDICATOR WILL APPEAR IN THE UPPER RIGHT HAND CORNER OF THE VIEW SCREEN ONLY WHEN THE MENU FUNCTION IS IN USE.**





# UTM IR Sensor Calibration

C4ISR - SPAWAR - AUSGAR



**NOTE:**  
**ALWAYS COVER THE LENS WITH THE LENS CAP OR WITH AN OPAQUE SURFACE WHEN CALIBRATING**

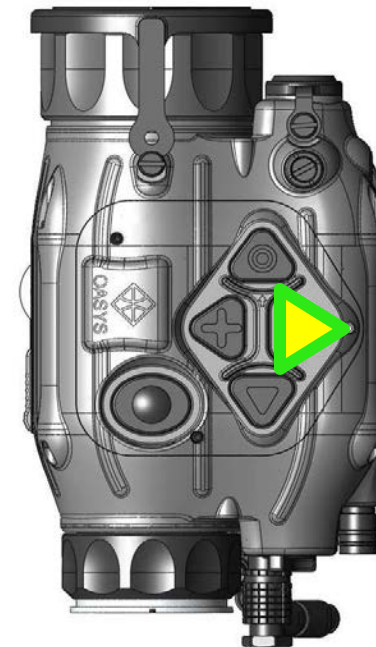
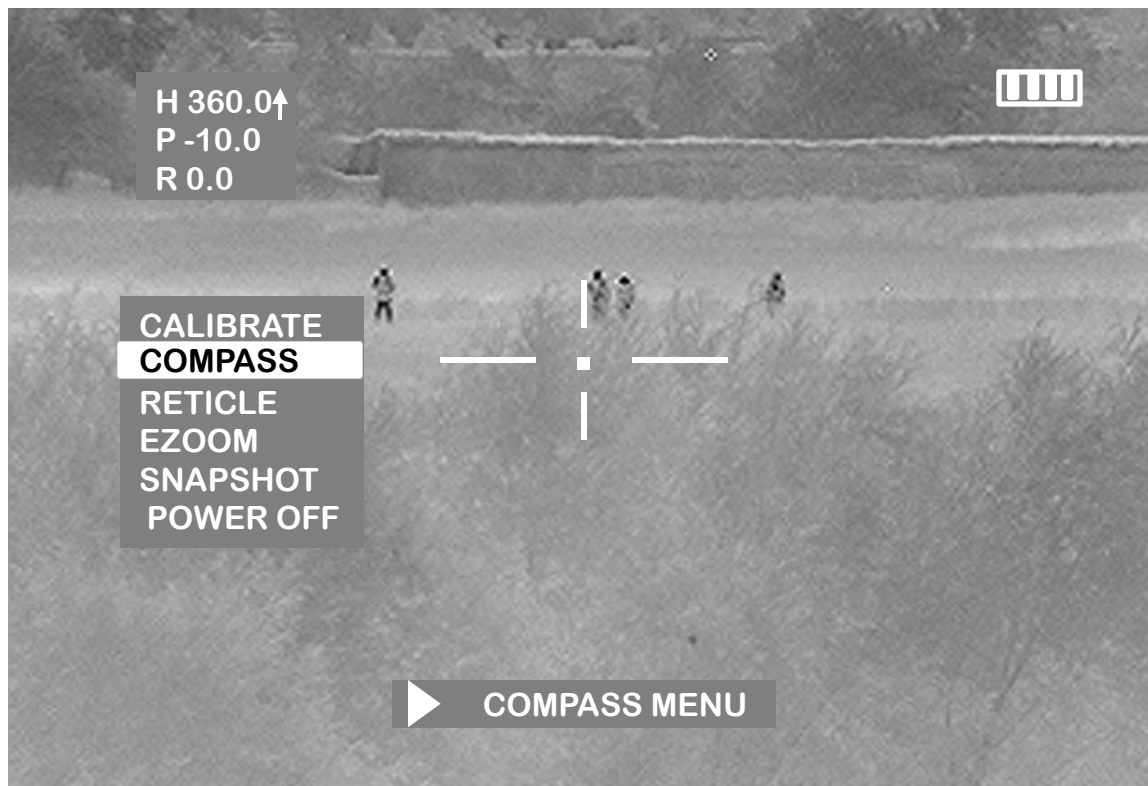
- ENSURE THAT THE LENS CAP IS ON BEFORE CALIBRATION
- PUSH THE RIGHT ARROW KEY ONE TIME AND HIGHLIGHT "CALIBRATE".
- PUSH AND HOLD THE RIGHT ARROW KEY TO CALIBRATE THE UTM.
- A BLACK LINE WILL APPEAR AT THE TOP OF THE UTM VIEWSCREEN MOVING FROM LEFT TO RIGHT.





# UTM Compass and Calibration

C4ISR - SPAWAR - AUSGAR



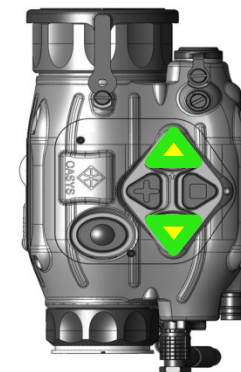
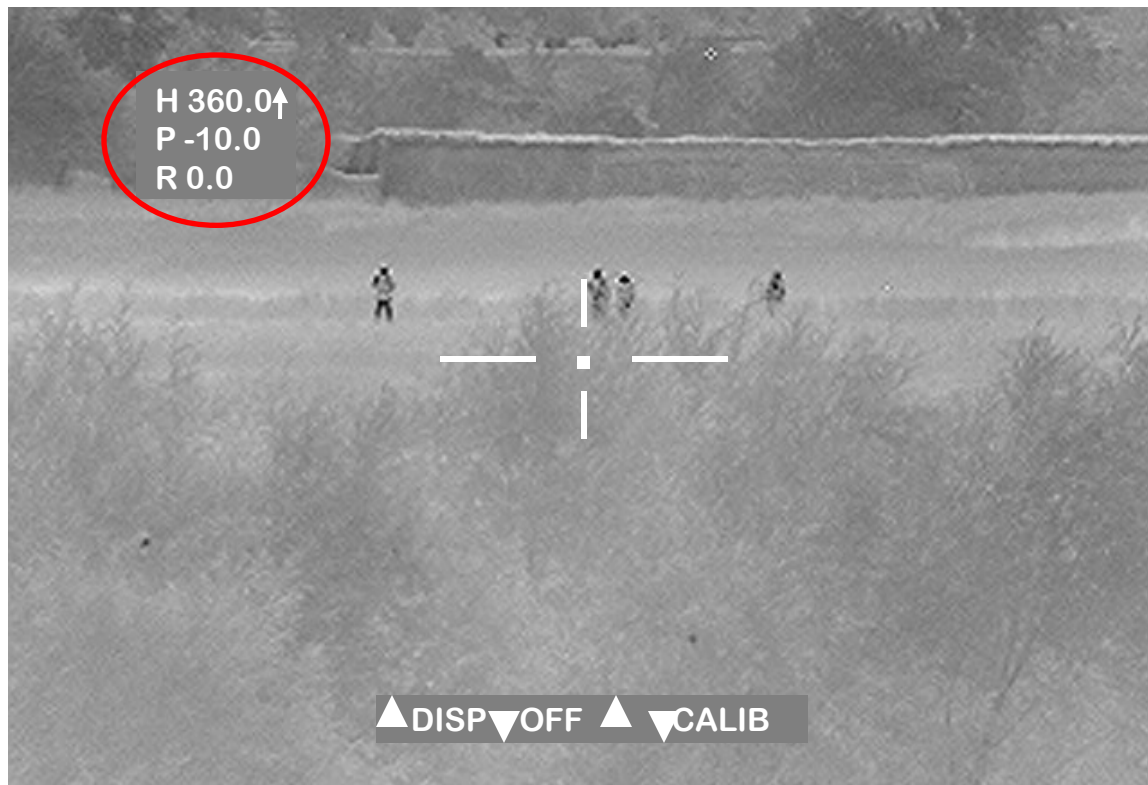
- PUSH THE RIGHT ARROW KEY ONE TIME TO BRING UP THE MENU FUNCTION.
- PUSH THE DOWN ARROW AND HIGHLIGHT "COMPASS".
- PUSH AND HOLD THE RIGHT ARROW TO BRING UP THE "COMPASS MENU".





# UTM Compass and Calibration (cont.)

C4ISR - SPAWAR - AUSGAR



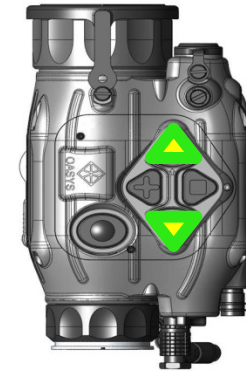
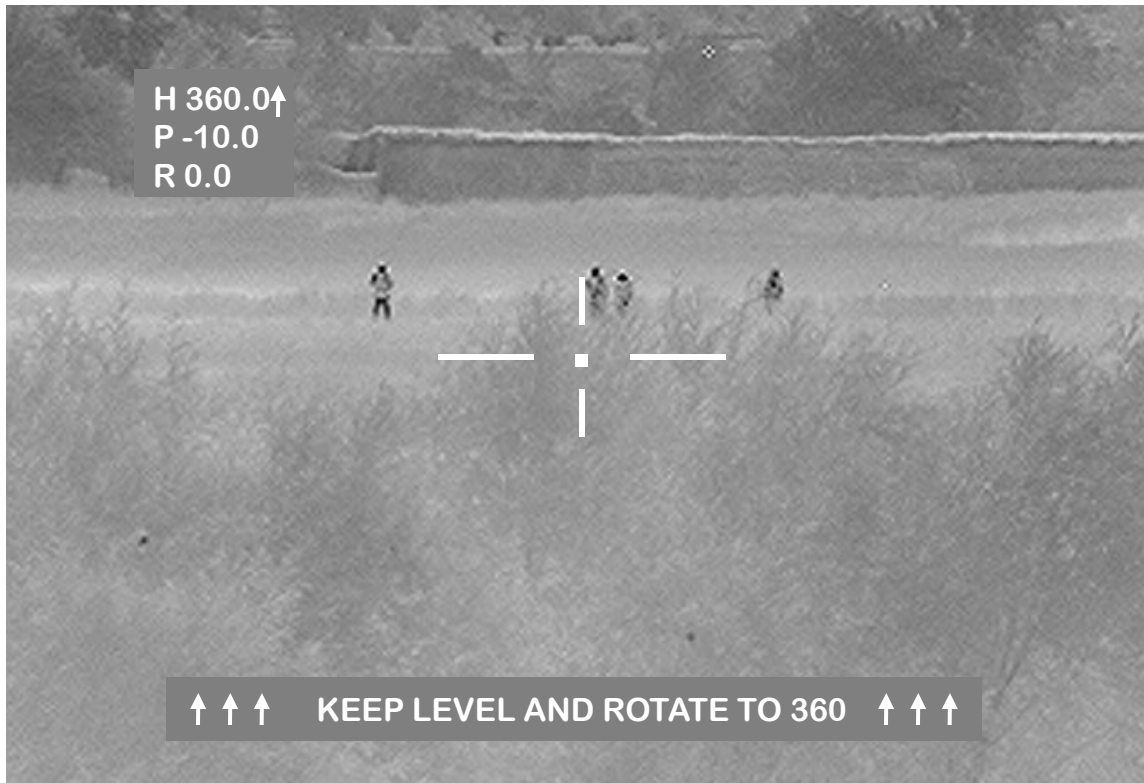
- PUSH THE UP ARROW TO CYCLE THROUGH THE HEADING, PITCH, AND ROLL; KEEPING HEADING ONLY OR ALL THREE ON THE VIEW SCREEN.
- PUSH THE DOWN ARROW TO TURN OFF THE HEADING, PITCH, AND ROLL.





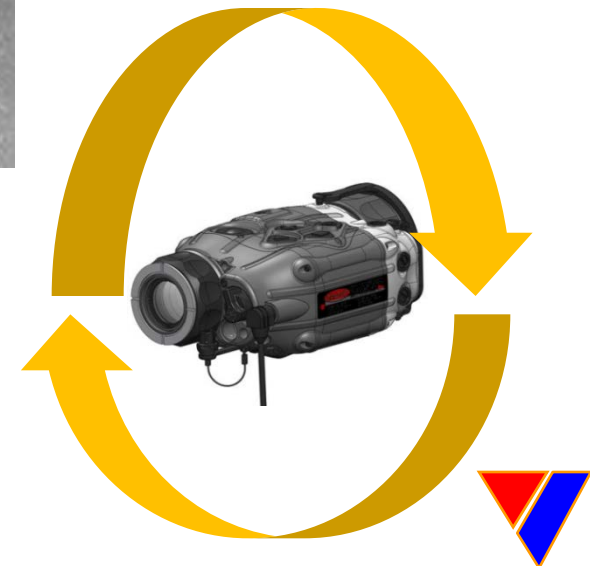
# UTM Compass Calibration

C4ISR - SPAWAR - AUSGAR



▲ DISP ▼ OFF ▲ CALIB ▼

- PUSH THE UP AND DOWN ARROW KEYS AT THE SAME TIME.
- HOLD THE UTM LEVEL AND ROTATE 360 DEGREES.
- THE 6 ARROWS WILL ROTATE GIVING A VISUAL CUE.

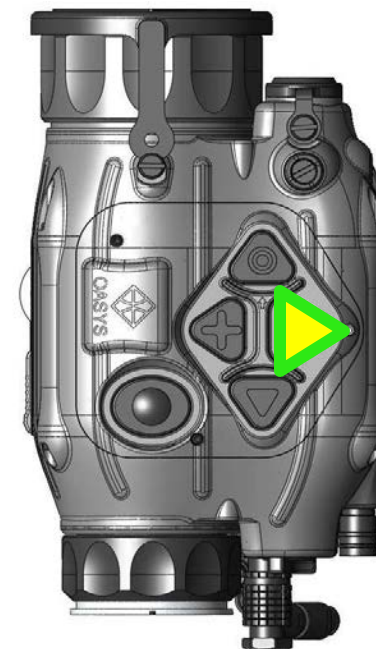
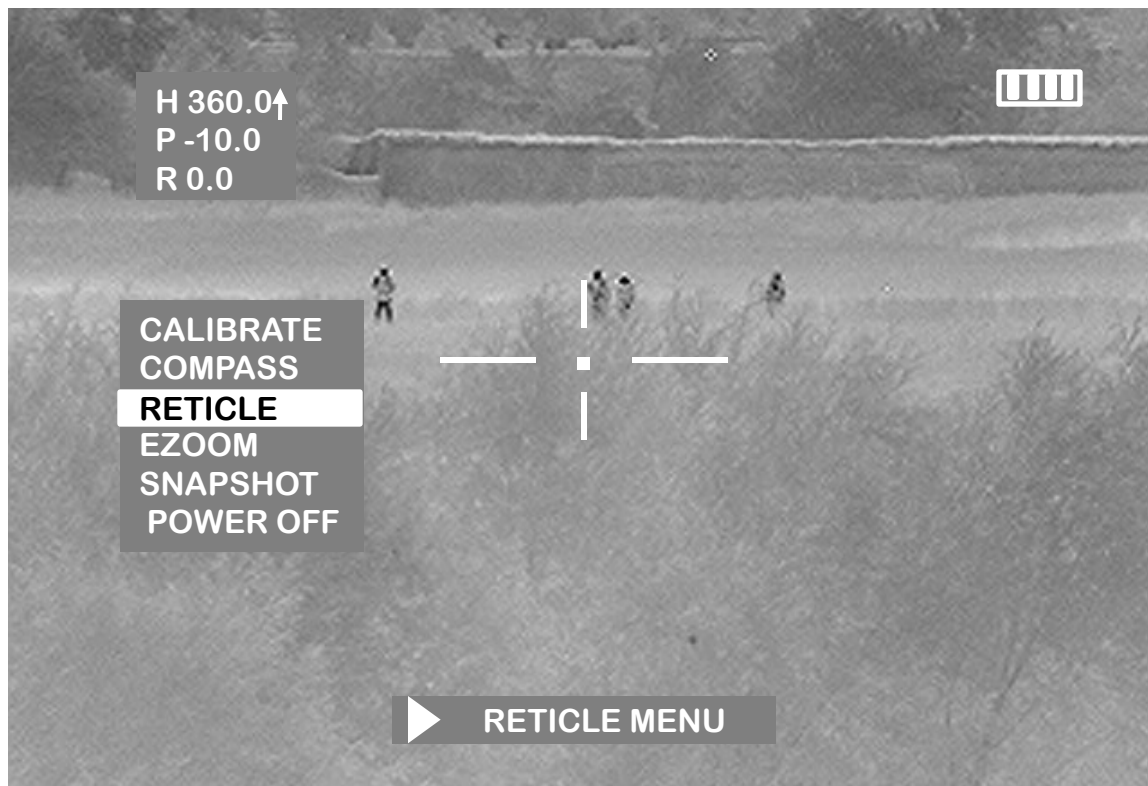






# UTM Reticle Menu

C4ISR - SPAWAR - AUSGAR



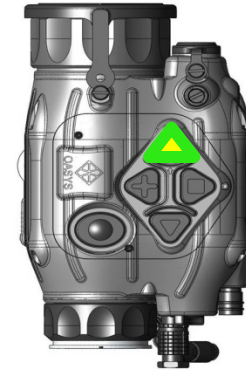
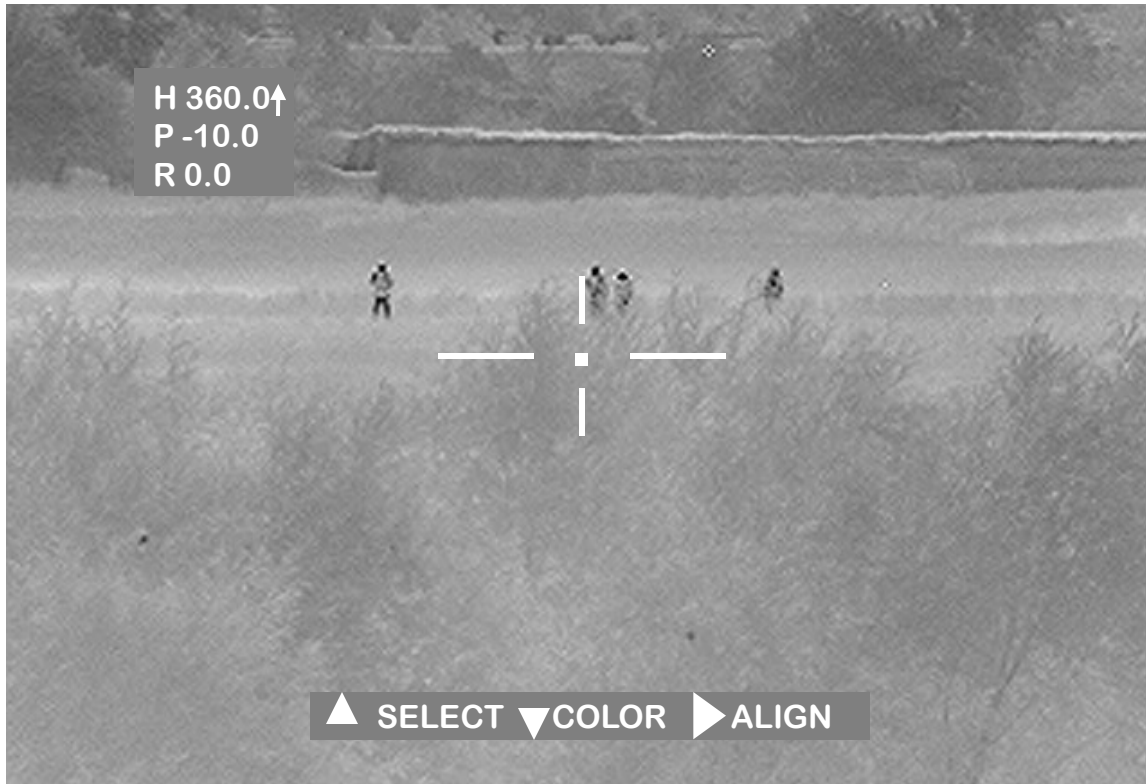
- PUSH THE RIGHT ARROW KEY ONE TIME TO BRING UP THE MENU FUNCTION.
- PUSH THE DOWN ARROW AND HIGHLIGHT "RETICLE".
- PUSH AND RIGHT ARROW TO BRING UP THE "RETICLE MENU".



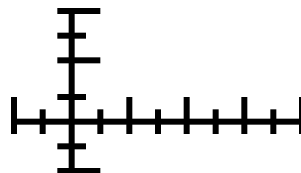
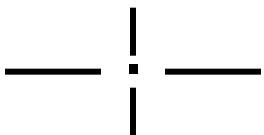


# UTM Reticle Select

C4ISR - SPAWAR - AUSGAR



- PUSH THE UP ARROW TO SELECT FROM THREE SETTINGS:
  - “CROSSHAIR”
  - “MIL SCALE”
  - “NONE”



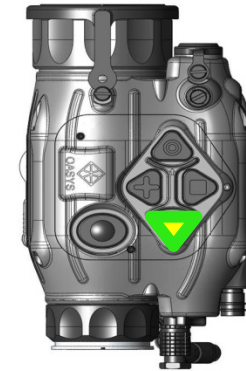
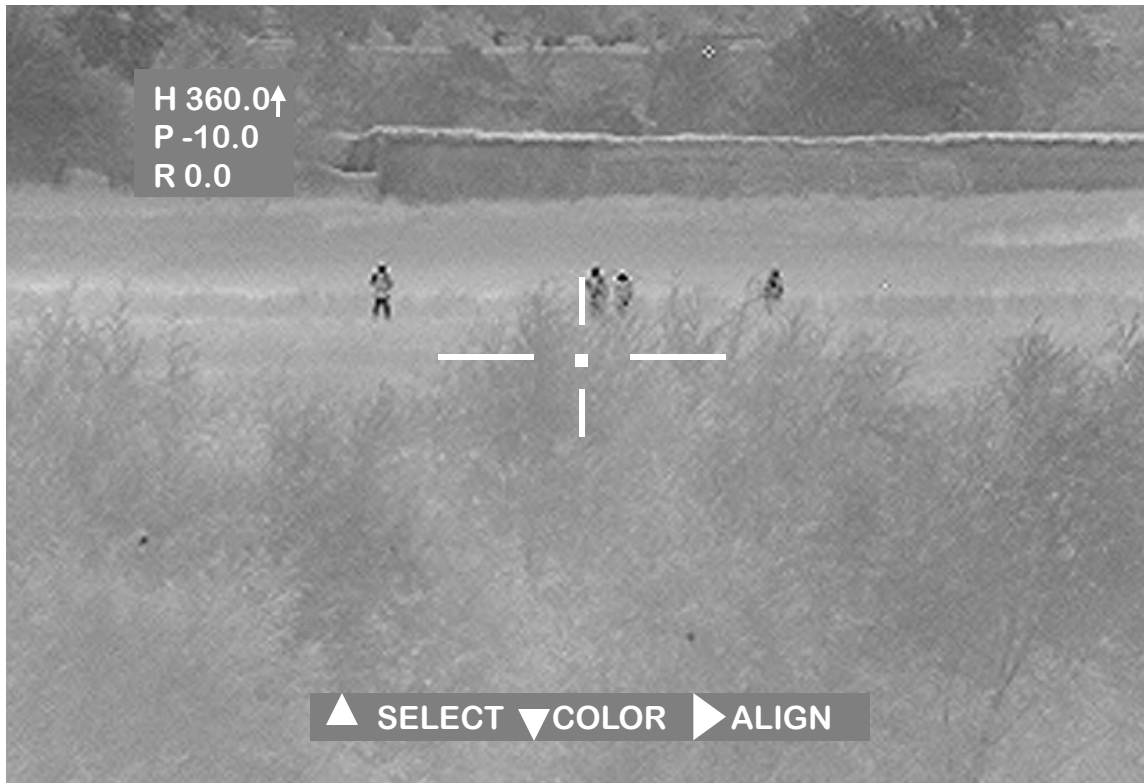
“NONE”





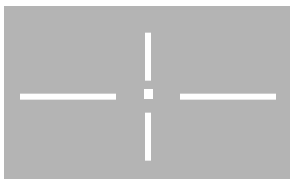
# UTM Reticle Select (cont.)

C4ISR - SPAWAR - AUSGAR

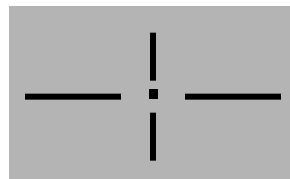


- PUSH THE DOWN ARROW FOR THREE DIFFERENT COLOR SETTINGS:

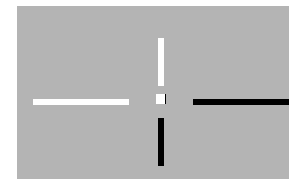
“WHITE”



“BLACK”



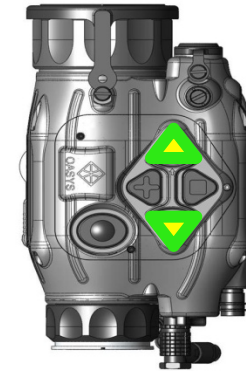
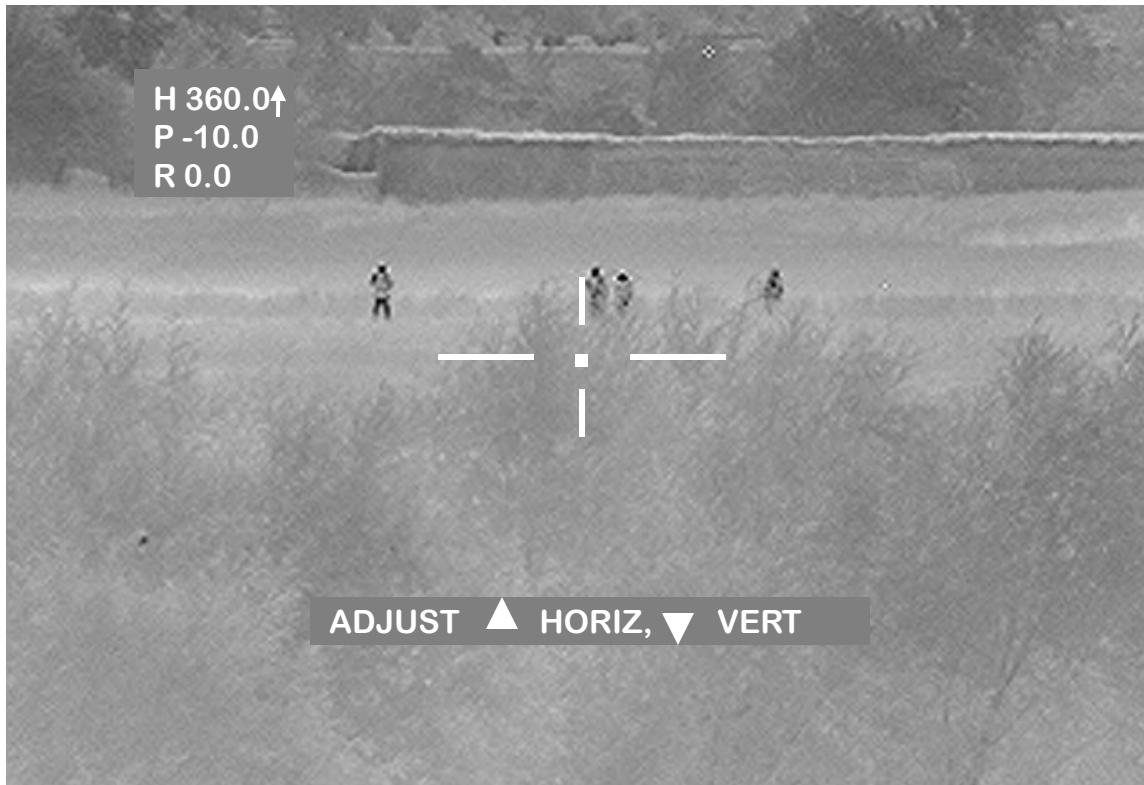
“ADAPTIVE”





# UTM Reticle Alignment

C4ISR - SPAWAR - AUSGAR



ADJUST ▲ HORIZ, ▼ VERT

ADJUST ▲ HORIZ, ▼ VERT

- FROM THE RETICLE MENU SELECT "ALIGN" BY PUSHING THE RIGHT ARROW KEY

▲ SELECT ▼ COLOR ► ALIGN

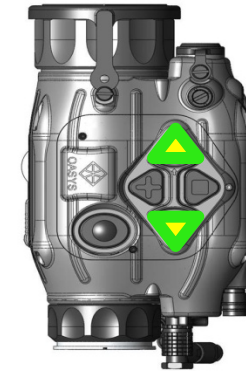
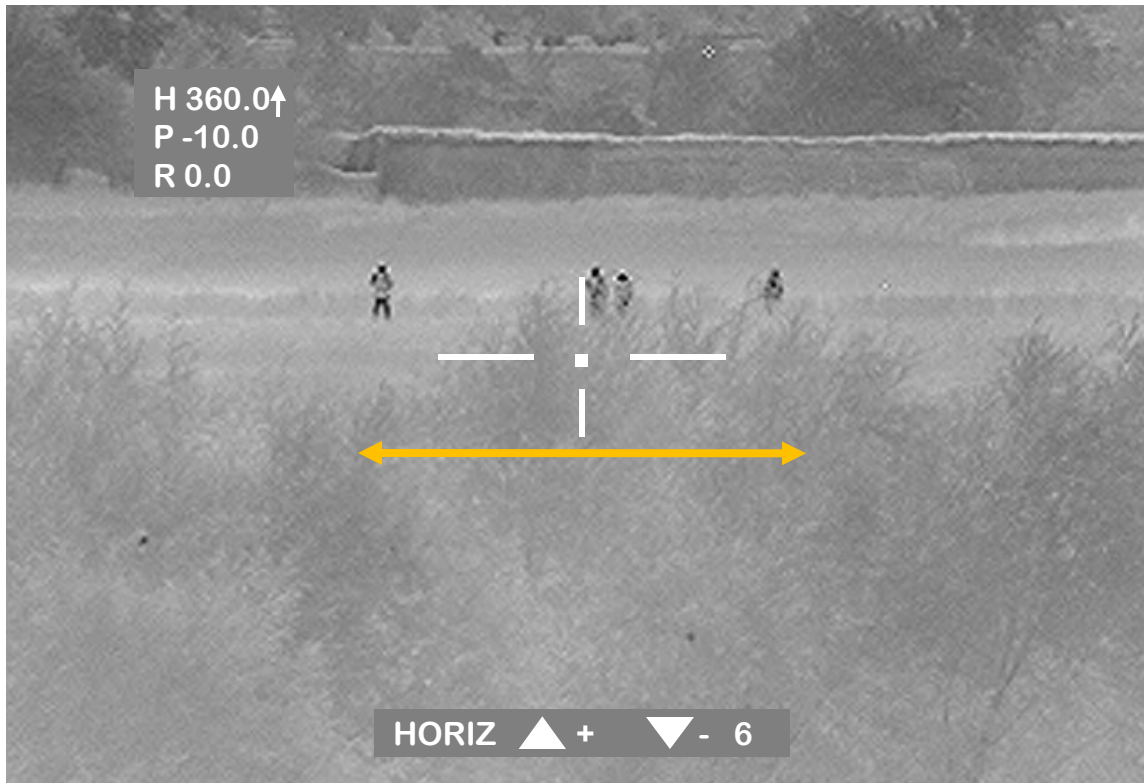
- SELECT EITHER THE HORIZONTAL OR VERTICAL RETICLE ADJUSTEMENT BY PRESSING THE UP OR DOWN ARROW KEYS





# UTM Horizontal Reticle Alignment

C4ISR - SPAWAR - AUSGAR



HORIZ ▲ + ▼ - 6

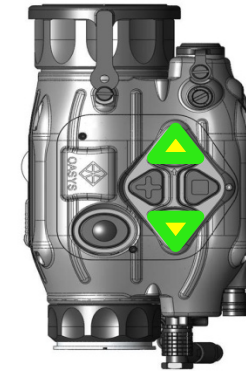
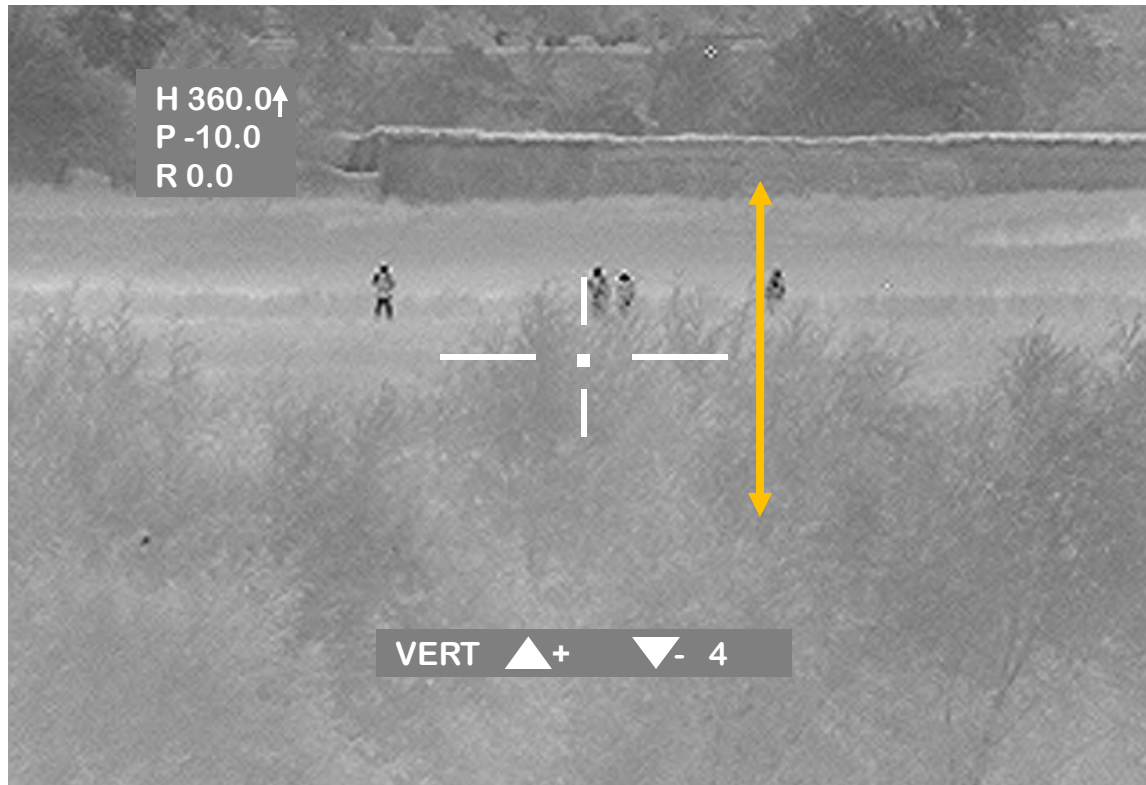
- WHEN HORIZONTAL ADJUSTMENT HAS BEEN SELECTED, CHANGE THE POSITION OF THE RETICLE USING THE UP AND DOWN ARROW KEYS. A NUMERIC VALUE WILL APPEAR THAT CORRESPONDS TO THE HORIZONTAL POSITION OF THE RETICLE.





# UTM Vertical Reticle Alignment

C4ISR - SPAWAR - AUSGAR



VERT ▲ + ▼ - 4

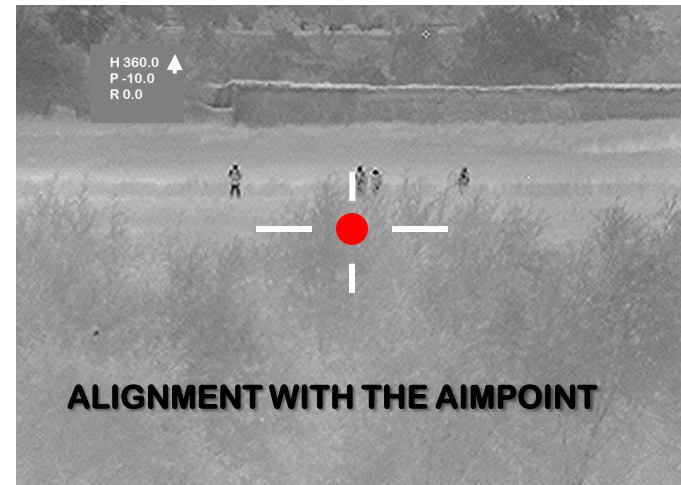
- WHEN VERTICAL ADJUSTMENT HAS BEEN SELECTED, CHANGE THE POSITION OF THE RETICLE USING THE UP AND DOWN ARROW KEYS. A NUMERIC VALUE WILL APPEAR THAT CORRESPONDS TO THE VERTICAL POSITION OF THE RETICLE.





# Reticle Alignment to Sights

C4ISR - SPAWAR - AUSGAR



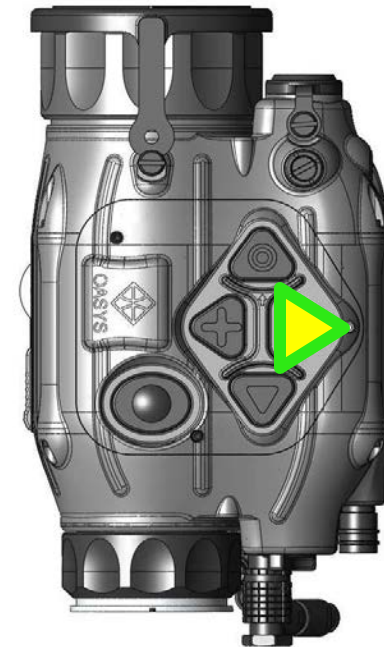
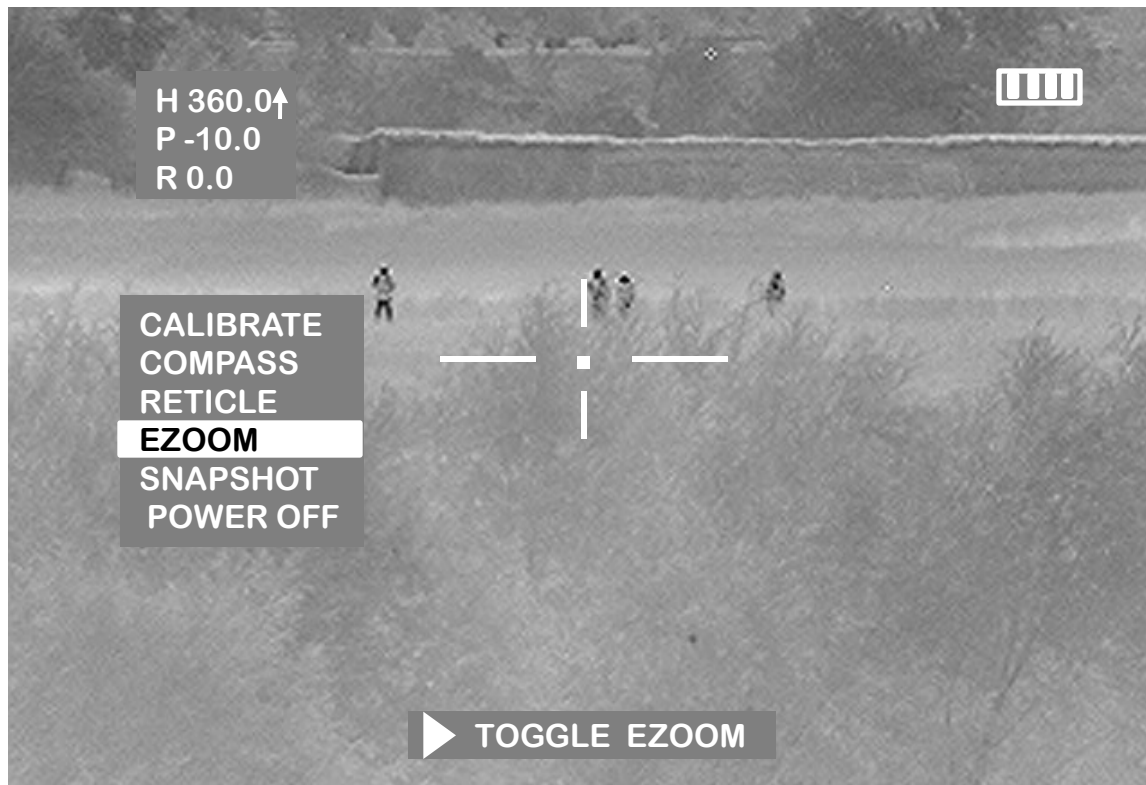
- **ALIGN THE UTM RETICLE TO CORRESPOND TO THE TIP OF YOUR ACOG CHEVRON, THE CENTER OF YOUR AIMPOINT OR EOTECH CENTER DOT.**
- **AFTER ALIGNING THE UTM RETICLE WITH YOUR SCOPES INTERNAL PATTERN, YOU CAN TURN THE UTM RETICLE OFF.**





# UTM EZoom Menu

C4ISR - SPAWAR - AUSGAR



- PUSH THE RIGHT ARROW KEY ONE TIME TO BRING UP THE MENU FUNCTION.
- PUSH THE DOWN ARROW KEY TO HIGHLIGHT “EZOOM”.

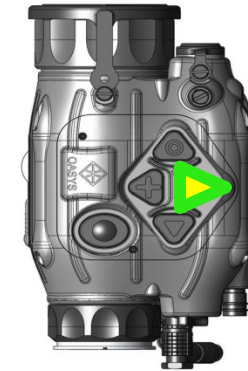
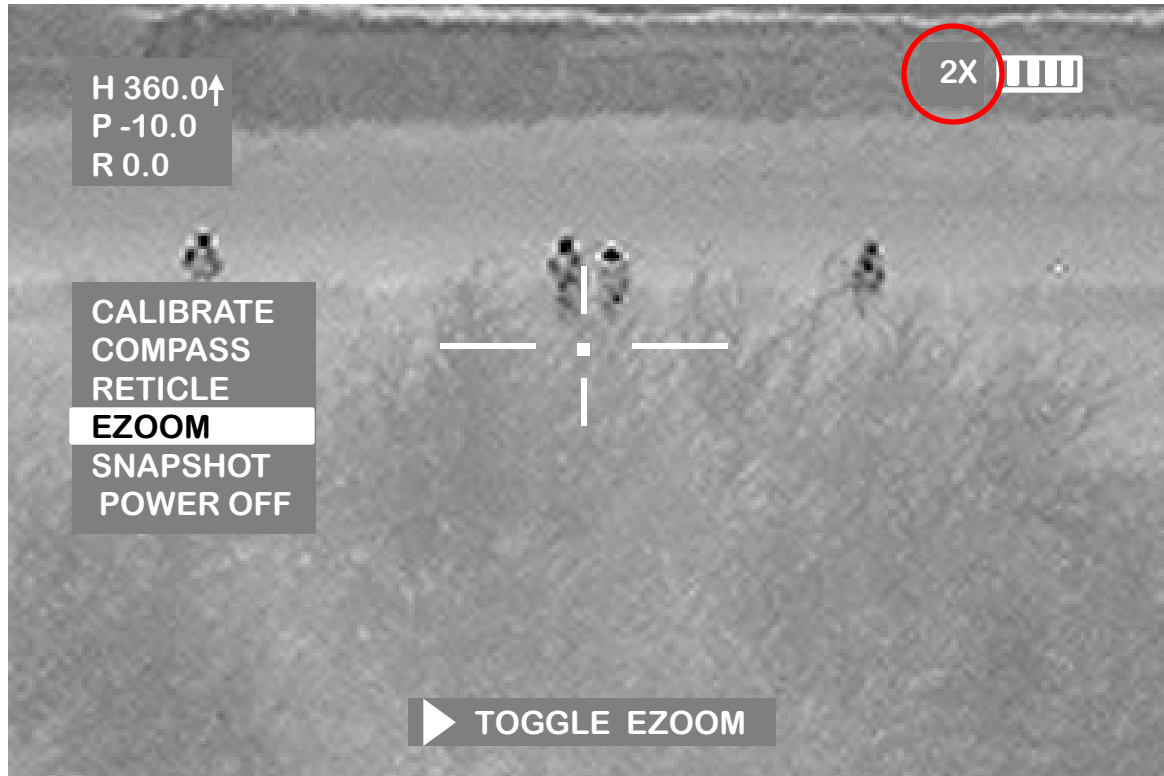






# UTM 1X / 2X Zoom Function

C4ISR - SPAWAR - AUSGAR



 TOGGLE EZOOM

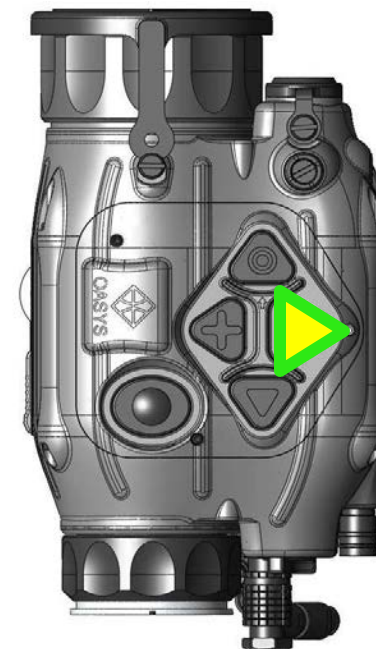
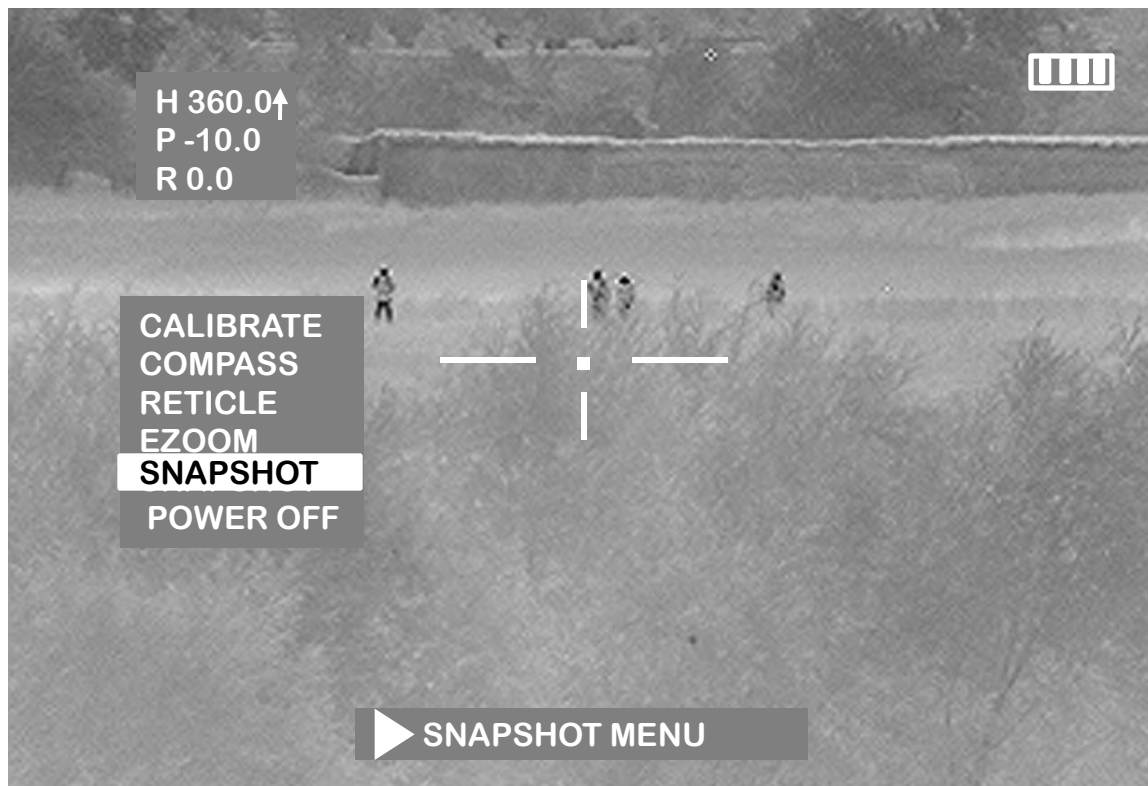
- PUSH RIGHT ARROW TO TOGGLE THE 2X FUNCTION.
- **2X** WILL APPEAR IN THE VIEW SCREEN IN THE UPPER RIGHT HAND CORNER NEXT TO THE LASER ICON.
- REPEAT THE PROCESS TO SWITCH BACK TO 1X EZOOM.





# UTM Snapshot Menu

C4ISR - SPAWAR - AUSGAR



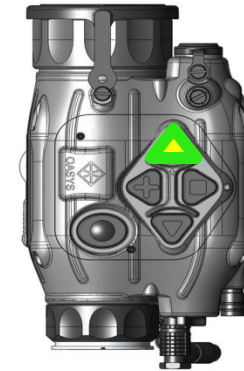
- PUSH THE RIGHT ARROW KEY ONE TIME TO BRING UP THE MENU FUNCTION.
- PUSH THE DOWN RROW KEY AND HIGHLIGHT "SNAPSHOT".
- PRESS THE RIGHT ARROW KEY TO BRING UP THE SNAPSHOT FUNCTIONS.





# UTM Snapshot Photos

C4ISR - SPAWAR - AUSGAR



▲ TAKE PHOTO ▼ REVIEW

- PUSH THE UP ARROW TO TAKE A SNAPSHOT PHOTO. THE NUMBER OF THE PHOTO WILL BE DISPLAYED.

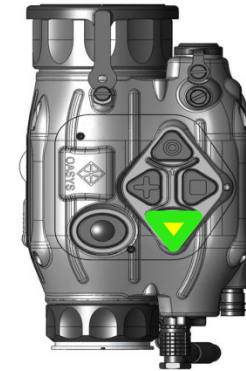
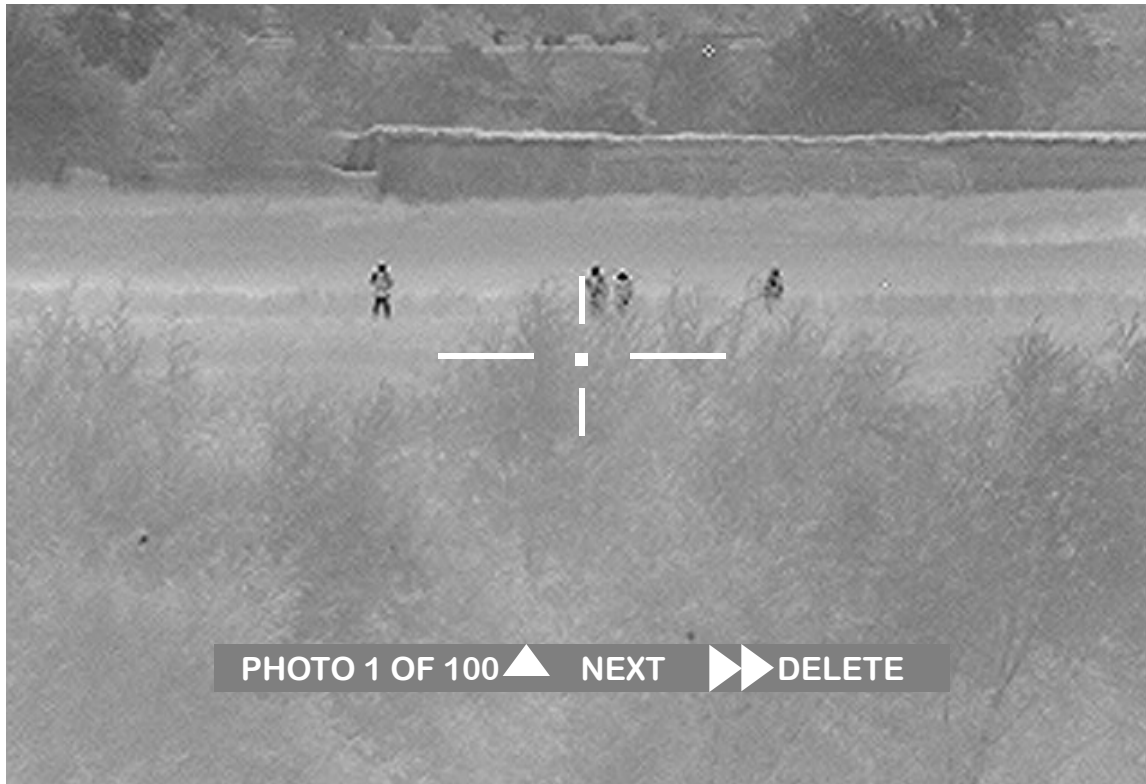
STORING IMAGE 4 OF 100





# UTM Snapshot Photos (cont.)

C4ISR - SPAWAR - AUSGAR



▲ TAKE PHOTO ▼ REVIEW

- PUSH THE DOWN ARROW TO REVIEW ALL SNAPSHOT PHOTOS RECORDED ON THE INTERNAL MEMORY.
- PUSH THE UP ARROW TO REVIEW ALL SUBSEQUENT PICTURES STORED ON THE INTERNAL MEMORY.

PHOTO 1 OF 100 ▲ NEXT ► DELETE

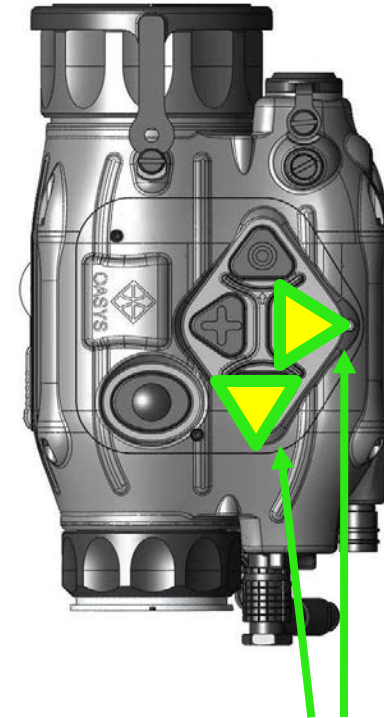
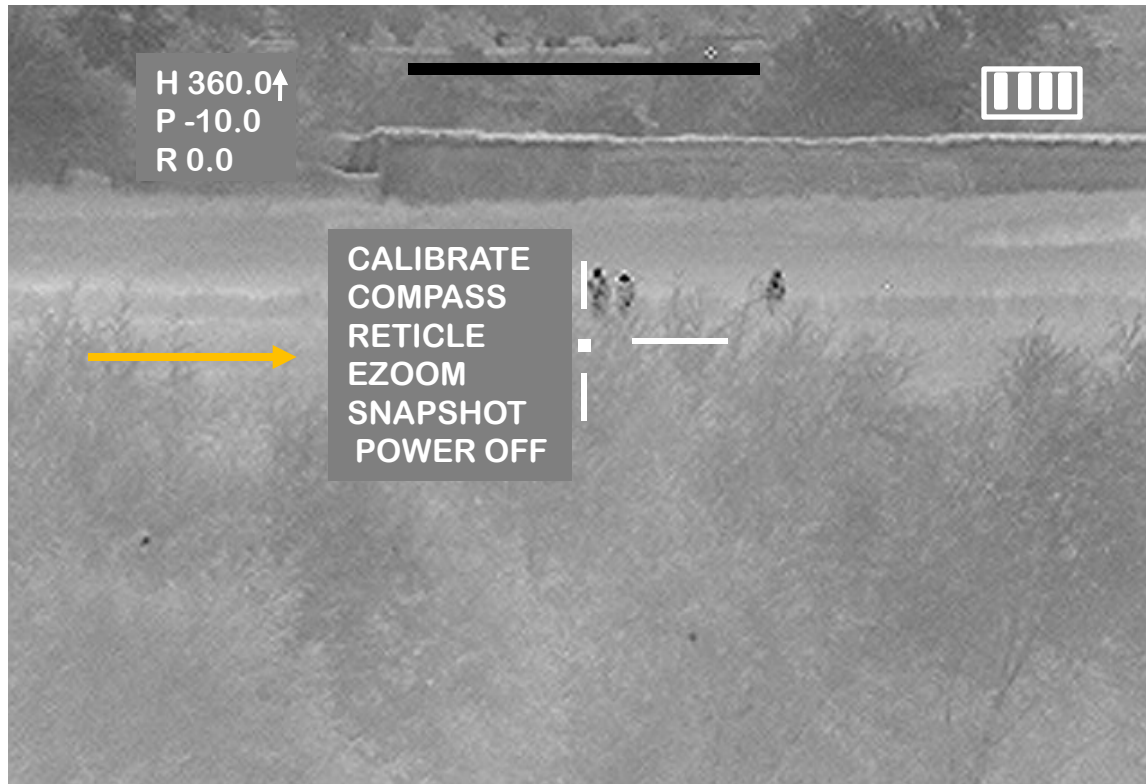
PHOTO 1 OF 100 ▲ NEXT ►► DELETE





# UTM Menu Position

C4ISR - SPAWAR - AUSGAR



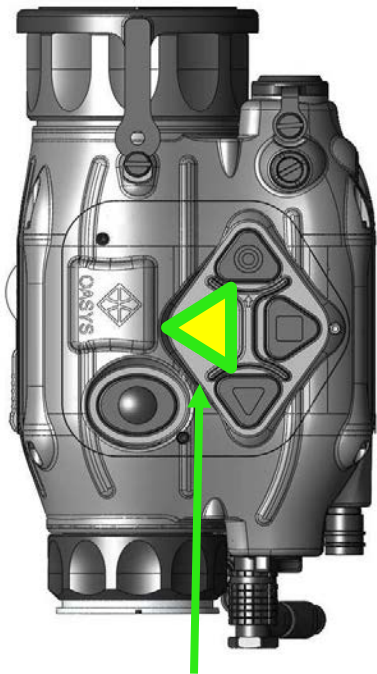
**PUSH AND HOLD BOTH  
BUTTONS TO MOVE MENU**

- **PUSH BOTH THE RIGHT AND REAR ARROW BUTTONS AT THE SAME TIME AND HOLD TO MOVE THE MENU TOWARDS THE CENTER OF THE DISPLAY. THE UTM WILL ALSO CALIBRATE WHEN THIS IS DONE.**
- **REPEAT TO MOVE THE MENU BACK TO THE LEFT OF THE DISPLAY.**



# UTM Polarity

C4ISR - SPAWAR - AUSGAR

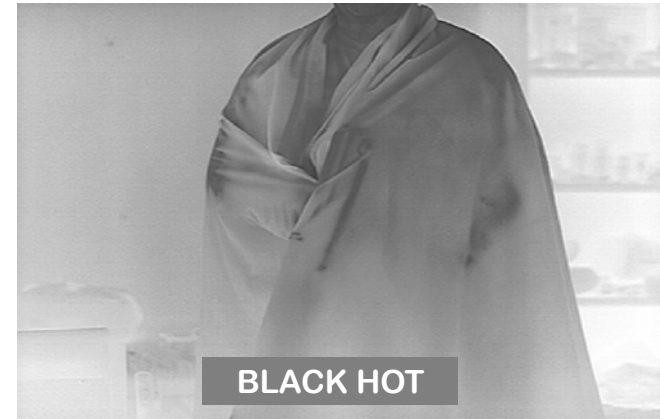


**PUSH TO CYCLE  
THROUGH WHITE HOT,  
BLACK HOT, AND EDGE  
DETECT**



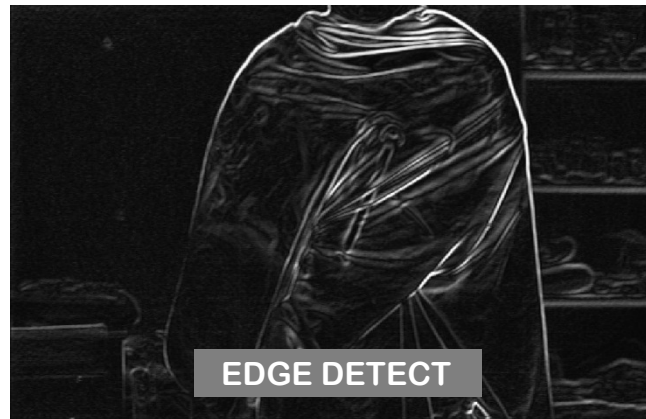
WHITE HOT

- **WARMER OBJECTS ARE WHITE**



BLACK HOT

- **WARMER OBJECTS ARE BLACK**



EDGE DETECT

- **SHOWS THE HEAT HORIZON OR  
"EDGE" WHERE TEMPERATURE  
DIFFERENCES OCCUR**

**NOTE: THE UTM CAN TAKE  
SNAPSHOTS IN EITHER WHITE HOT  
OR BLACK HOT MODES, BUT *NOT*  
WHILE IN EDGE DETECT MODE**

**ALL THREE MODES ARE VISIBLE  
WHEN USING VIDEO CAPTURE VIA  
THE RS-170 INTERFACE CABLE**

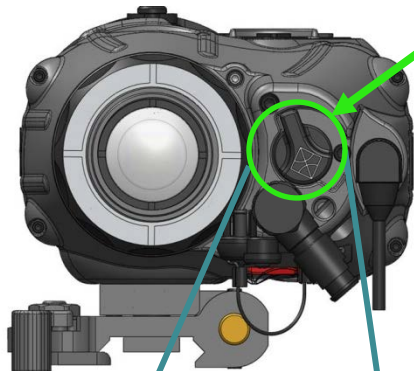
**Thermal pictures are of a male with a rifle concealed under a tunic.**



# UTM Laser Actuation

C4ISR - SPAWAR - AUSGAR

## 3 Position Laser Selector Lever



OFF RED IR



## LASER ACTUATION TRIGGER

PUSH ONCE TO  
ACTIVATE  
LASER MOMENTARILY.

PUSH TWICE TO TURN  
LASER ON CONTINUOUS

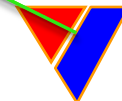
PUSH AND HOLD TO  
TURN LASER OFF



VISIBLE RED AIMING LASER

INVISIBLE IR LASER POINTER

- ONLY ONE LASER AT A TIME MAY BE SELECTED AND USED.
- THE RED AIMING AND IR POINTING LASERS ARE ADJUSTED THE SAME AS THE PEQ-15 LASER MODULE - BY ADJUSTING THE WINDAGE AND THE ELEVATION SCREW ON THE TOP, BOTTOM, AND RIGHT SIDE OF THE UTM.





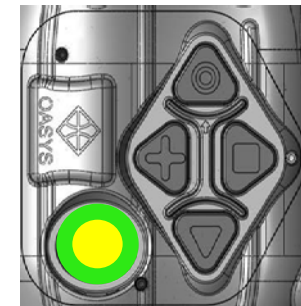
# UTM Laser Actuation (cont.)

C4ISR - SPAWAR - AUSGAR

RED IR



- SELECT VISIBLE RED OR IR.



- PUSH ACTUATION BUTTON.

•WHEN THE LASER SELECTOR LEVER IS ON “RED” OR “IR”, A CROSSHAIRS WILL APPEAR IN THE VIEWSCREEN NO MATTER WHICH RETICLE HAS BEEN SELECTED PREVIOUSLY.

•WHEN THE VISIBLE RED LASER IS SLECTED, **VIS** WILL APPEAR IN THE UPPER RIGHT OF THE DISPLAY. WHEN THE IR LASER IS SELECTED, **IRLO** WILL APPEAR.

•WHEN THE LASER ACTUATOR IS PUSHED, THE CROSS HAIRS IN THE UTM WILL BECOME SOLID, INDICATING WHERE THE LASER IS POINTING.





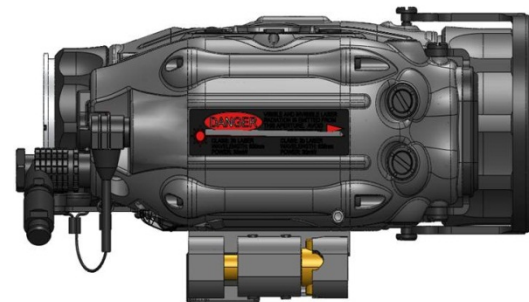


# UTM Laser Warning

C4ISR - SPAWAR - AUSGAR

- THE UTM INCORPORATES TWO CLASS 1 “EYE SAFE” LASERS, WITH A WARNING LABEL LOCATED ON THE RIGHT HAND SIDE OF THE UTM
- ALL LASERS SHOULD BE TREATED AS A WEAPON NO MATTER WHAT THEIR CLASSIFICATIONS ARE WHEN ACTUATING IR OR VISIBLE RED.
- THE LASERS THAT ARE MOUNTED INSIDE OF THE UTM ARE ACTUATED BY THE THREE POSITION LEVER LOCATED ON THE RIGHT SIDE WITH YOUR THUMB.
- AS YOU PUSH THE BUTTON, THE LASER WILL TURN ON UNTIL YOU LET GO OF THE BUTTON AND THE LASER WILL TURN OFF.
- THE LASER IS INDICATED IN THE EYE PIECE AS A “LIGHT GRAY CROSS HAIR”.
- REMEMBER WHEN YOU OPERATE THE IR OR THE VISIBLE RED LASER FOUND ON THE UTM AND POINT AT A TARGET, THE LASER WORKS BOTH WAYS.

**Think before you actuate!!!!**





# UTM Weapons Mounting

C4ISR - SPAWAR - AUSGAR

PLACE THE UTM SHOE MOUNT SO THE EYEPIECE IS AT LEAST 1 INCH AND NO MORE THAN 8 INCHES FROM THE RIFLE'S DAY SIGHT. TIGHTEN THE SHOE MOUNT.





# Using Day Optic Only

C4ISR - SPAWAR - AUSGAR



•PLACE THE UTM INTO THE SHOE MOUNT AND PULL IT BACK UNTIL IT LOCKS INTO PLACE



•PUSH IN ON THE LOCK RELEASE BUTON WHILE PULLING THE UTM TO THE RIGHT



•ROTATE THE UTM OUT FROM IN FRONT OF THE DAY OPTIC



•ROTATE THE UTM TO THE LEFT TO PUT IT BACK IN LINE WITH THE DAY OPTIC





# UTM Maintenance, Care and Cleaning

C4ISR - SPAWAR - AUSGAR

- **ENSURE WHEN YOU STORE THE UTM THAT YOU REMOVE THE CR-123A BATTERIES. REPLACE THE EYE COVER AND OBJECTIVE LENS COVERS WHEN YOU STORE THE UTM IN ITS CASE.**
- **AFTER EACH OPERATION, TAKE A SOFT PENCIL ERASER AND RUB THE BATTERY CONTACTS TO CLEAN THEM.**
- **WHEN STARTING A NEW OPERATION, ENSURE YOU USE NEW BATTERIES.**
- **YOUR UTM IS WEATHER-PROOFED BUT DO NOT SUBMERGE IT IN WATER OR ANY OTHER LIQUID.**
- **AFTER EACH OPERATION, TAKE A CLEAN DAMP CLOTH TO WIPE DOWN THE OUTER CASING.**
- **ALWAYS (NEVER USE ANYTHING ELSE BUT) USE LENS CLEANING PAPER TO CLEAN THE EYE PIECE AND OBJECTIVE LENS.**
- **RUB YOUR EYE CUP DOWN WITH SILICON OR VASELINE JELLY, WIPING IT CLEAN AFTER IT CONDITIONS.**





# UTM Equipment Repairs

C4ISR - SPAWAR - AUSGAR

- IF ANY ITEM IN YOUR KIT BECOMES INOPERABLE, PLEASE CONTACT THE FOLLOWING BY E-MAIL OR PHONE:
- ***SSC Pacific C4I Help Desk - 24/7/365***  
***ssc\_pac\_c4isrhd@navy.mil***  
***(619/DSN) 524-3888***
- IF ANY ITEM IN YOUR KIT BREAKS OR BECOMES DAMAGED (FOR ANY REASON), CONTACT THE ABOVE WEB ADDRESS TO CONFIRM SHIPPING INSTRUCTIONS. PLEASE BOX BROKEN OR DAMAGED GEAR AND SHIP TO:
- ***N69255 Receiving Officer***  
***Attn: Ron Brown Tel:(619) 524-3882***  
***SPAWAR Systems Center Pacific (41420)***  
***4297 Pacific Highway, Building 7***  
***San Diego, CA. 92110***
- ONCE CONFIRMATION OF SHIPPING OF DAMAGED EQUIPMENT TAKES PLACE, REPLACEMENT GEAR WILL BE SENT TO YOU. ENSURE YOU PUT YOUR UNIT'S RUC OR DODAAC NUMBERS AND UNIT'S ADDRESS AND A POINT OF CONTACT WITH EMAIL AND PHONE NUMBER.



# QUESTIONS?

