



UTB TRAINING

This Brief is Classified UNCLASSIFIED//FOR OFFICIAL USE ONLY



Universal Thermal Binocular

C4ISR - SPAWAR - AUSGAR

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





Universal Thermal Binocular

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 UTB optic.





UTB Specifications

C4ISR - SPAWAR - AUSGAR

Weight 32 oz (1.9lbs)

Dimensions 6.5"L x 2.1"H x 5.2"W

Imaging Sensor

Format 640 x 480 Focal Plane Array

Range 2m – 2km

Refresh Rate 60 Hz

Spectral Response 8–15 μm 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)

Power Usage

Disposable Battery 3 x CR123A / 5.5 Hours,

2x CR123A / 3.5 Hours, 1 x CR123A / 1.5 Hours,

2 x AA (LITHIUM) / 2.5 Hours, 2 x AA (Alkaline) / 20 minutes

External Connections

Video RS-170 NTSC, USB video and still image capture

Tripod 1/4-20 thread mount

Laser

Dual band IR (pointing) and RED (aiming)



Environmentals

Temperature Range -38°F to 140°F

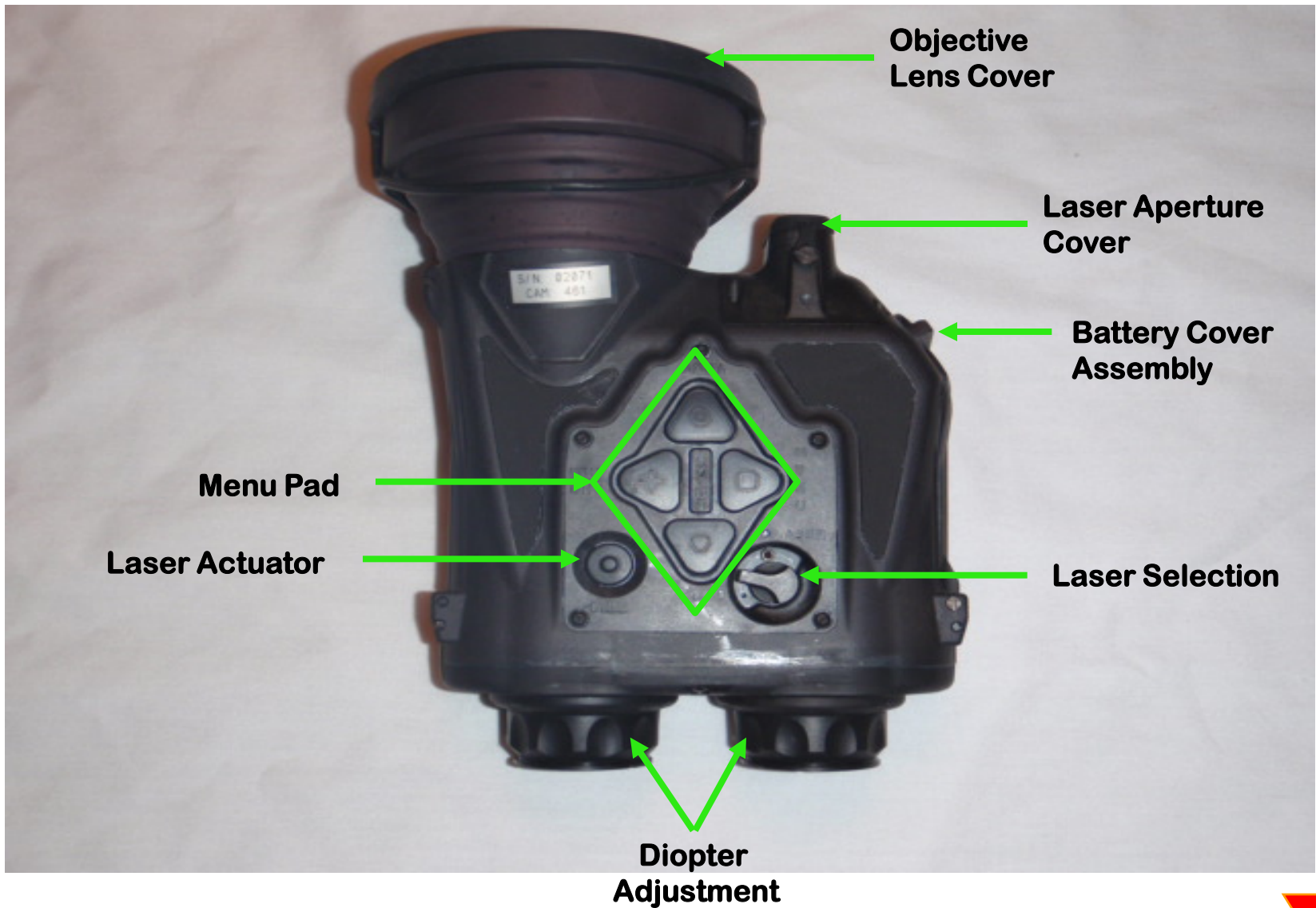
Waterproof 33' (Total Immersion, 120 min)





UTB Nomenclature (Top)

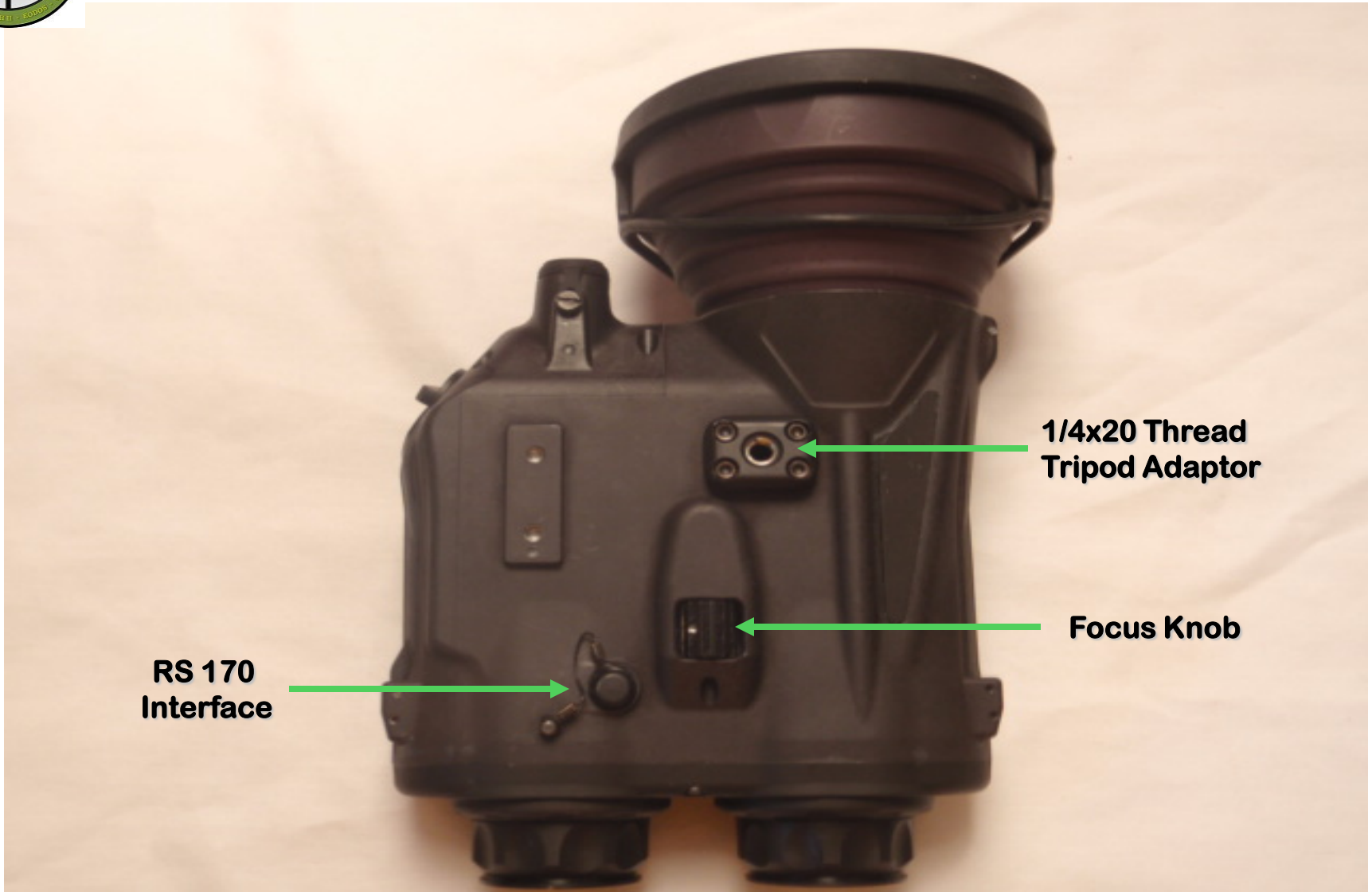
C4ISR - SPAWAR - AUSGAR





UTB Nomenclature (Bottom)

C4ISR - SPAWAR - AUSGAR



RS 170
Interface

1/4x20 Thread
Tripod Adaptor

Focus Knob





UTB Battery Change

C4ISR - SPAWAR - AUSGAR

To OPEN:

Unscrew the battery door hatch by rotating the battery door knob counter-clockwise.

Place 1, 2, or 3 x CR123A or 2 x AA 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 swinging the battery door back to the original position. Rotate the battery door knob clockwise until finger tight.



The UTB will function on less than 3x CR123A batteries but degraded operational time will occur. The UTB will not function on less than 2x AA batteries (lithium or alkaline).

Never mix lithium and alkaline batteries.





Changing the UTB Lens

C4ISR - SPAWAR - AUSGAR

The UTB kit comes with a 75mm and a 120mm lens. The lenses can be switched out by hand:



Unscrew the lens by rotating it towards the laser apertures



Remove the lens by pulling it out of the lens housing

Insert new lens in the reverse order. *Never screw the lens into the housing more than hand tight.*





UTB Focusing

C4ISR - SPAWAR - AUSGAR



- ROTATE THE FOCUS KNOB CLOCKWISE OR COUNTER-CLOCKWISE UNTIL THE PICTURE IN THE VIEW SCREEN BECOMES CLEAR.



- ROTATE THE DIOPTRER RINGS TO FOCUS THE PICTURE TO EACH INDIVIDUAL EYE UNTIL THE PICTURE APPEARS THE SAME THROUGH BOTH EYEPIECES.





UTB Menu Pad

C4ISR - SPAWAR - AUSGAR

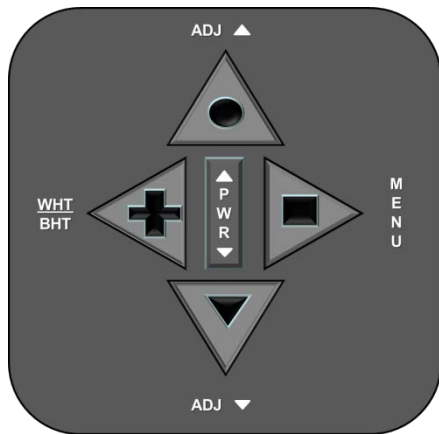




Powering on the UTB

C4ISR - SPAWAR - AUSGAR

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



UTB MENU PAD





UTB 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





UTB Brightness & Gain Settings

C4ISR - SPAWAR - AUSGAR



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



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



• **BRIGHTNESS VALUES RANGE**
FROM 1 TO 32



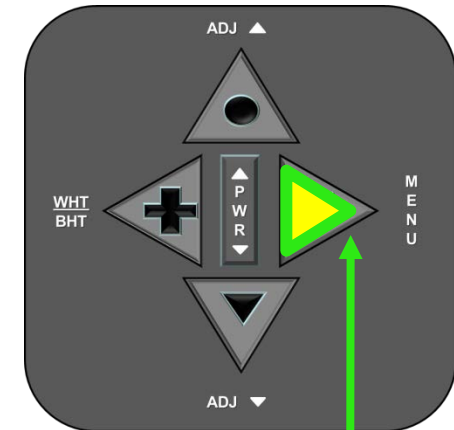
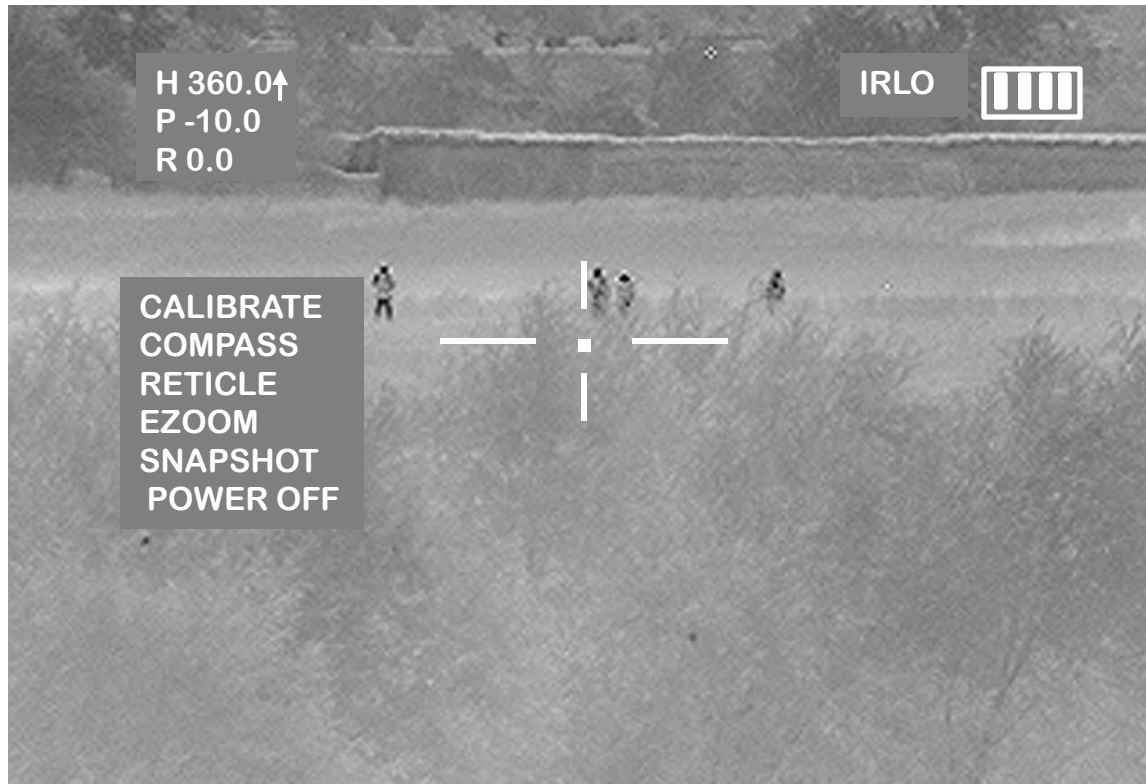
• **GAIN VALUES RANGE FROM 1 TO**
10, AND "AGC" (AUTOMATIC GAIN
CONTROL)





UTB View Screen Menu

C4ISR - SPAWAR - AUSGAR



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

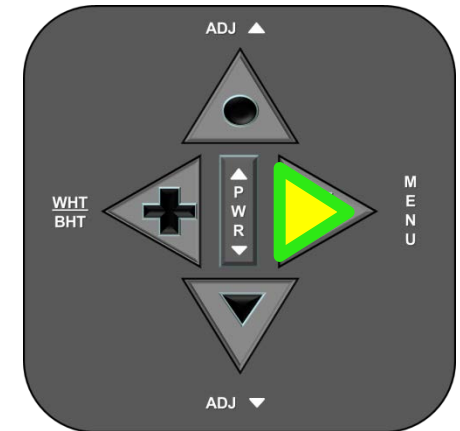
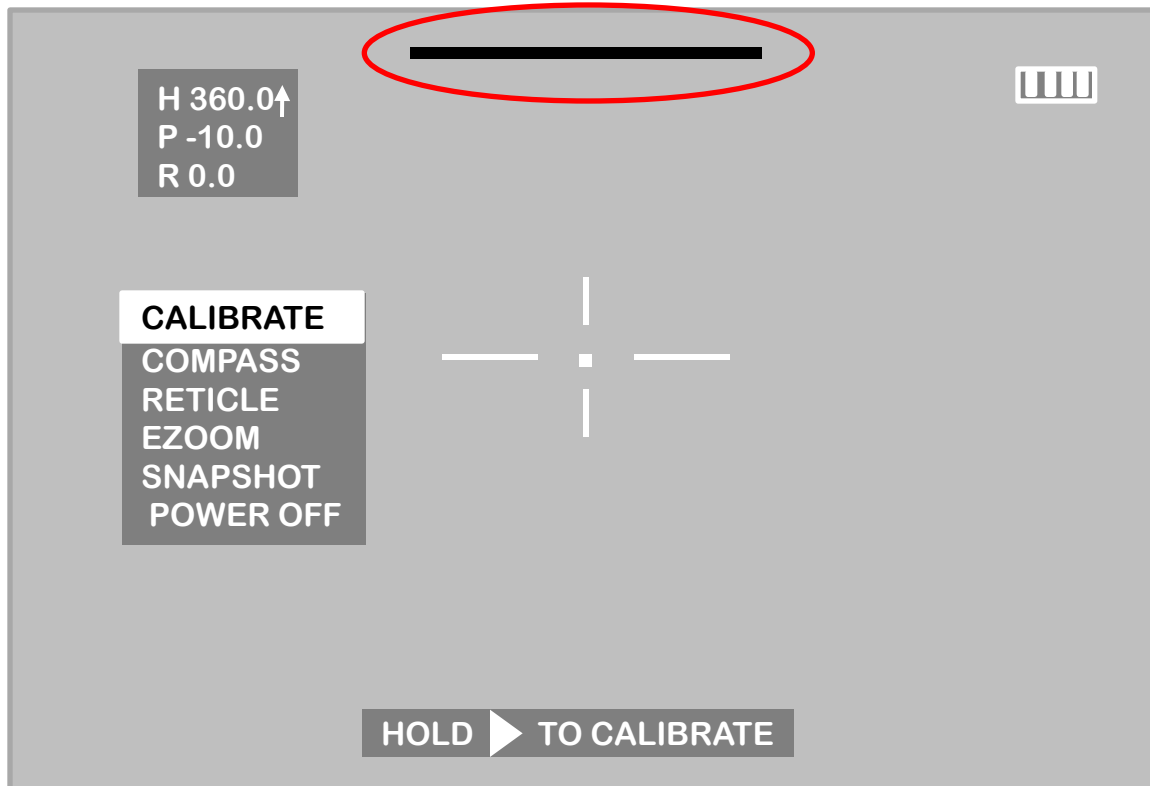
- **WHEN THE RIGHT BUTTON IS PUSHED, THE UTB VIEW SCREEN MENU WILL APPEAR ON THE LEFT SIDE OF THE VIEW SCREEN.**
- **THE BATTERY LIFE INDICATOR WILL APPEAR IN THE UPPER RIGHT HAND CORNER OF THE VIEW SCREEN ONLY WHEN THE MENU FUNCTION IS IN USE.**





UTB IR Sensor Calibration

C4ISR - SPAWAR - AUSGAR



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

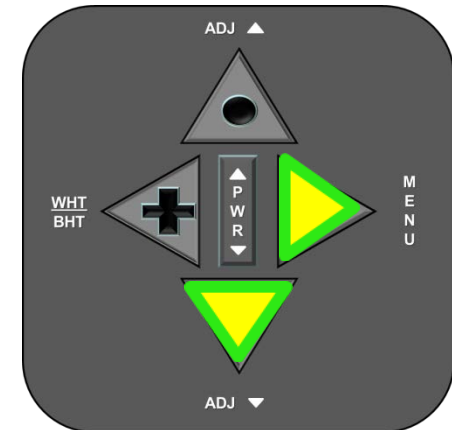
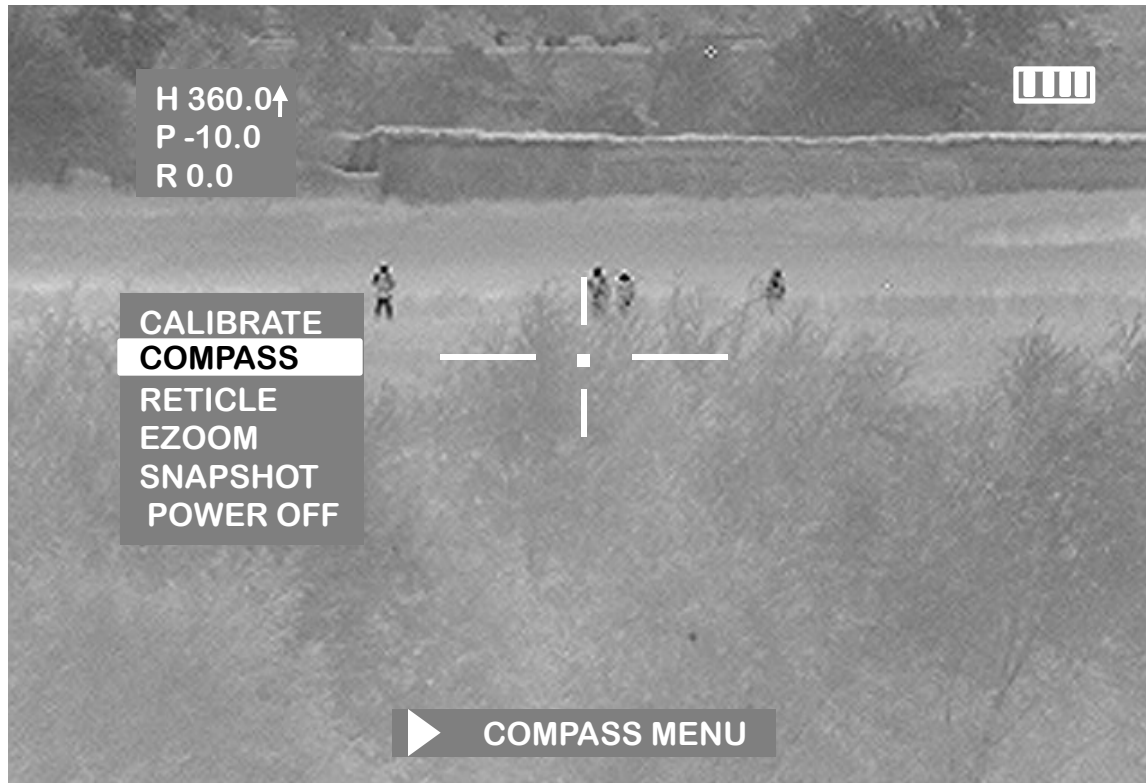
- PUSH THE RIGHT ARROW KEY ONE TIME AND HIGHLIGHT THE “CALIBRATE” MENU ITEM.
- PUSH AND HOLD THE RIGHT ARROW KEY TO CALIBRATE THE UTB.
- A BLACK LINE WILL APPEAR AT THE TOP OF THE UTB VIEWSCREEN MOVING FROM LEFT TO RIGHT.





UTB Compass and Calibration

C4ISR - SPAWAR - AUSGAR



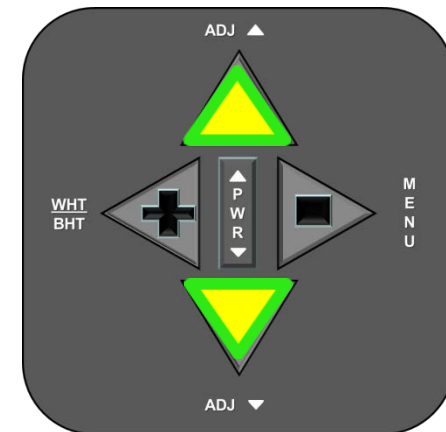
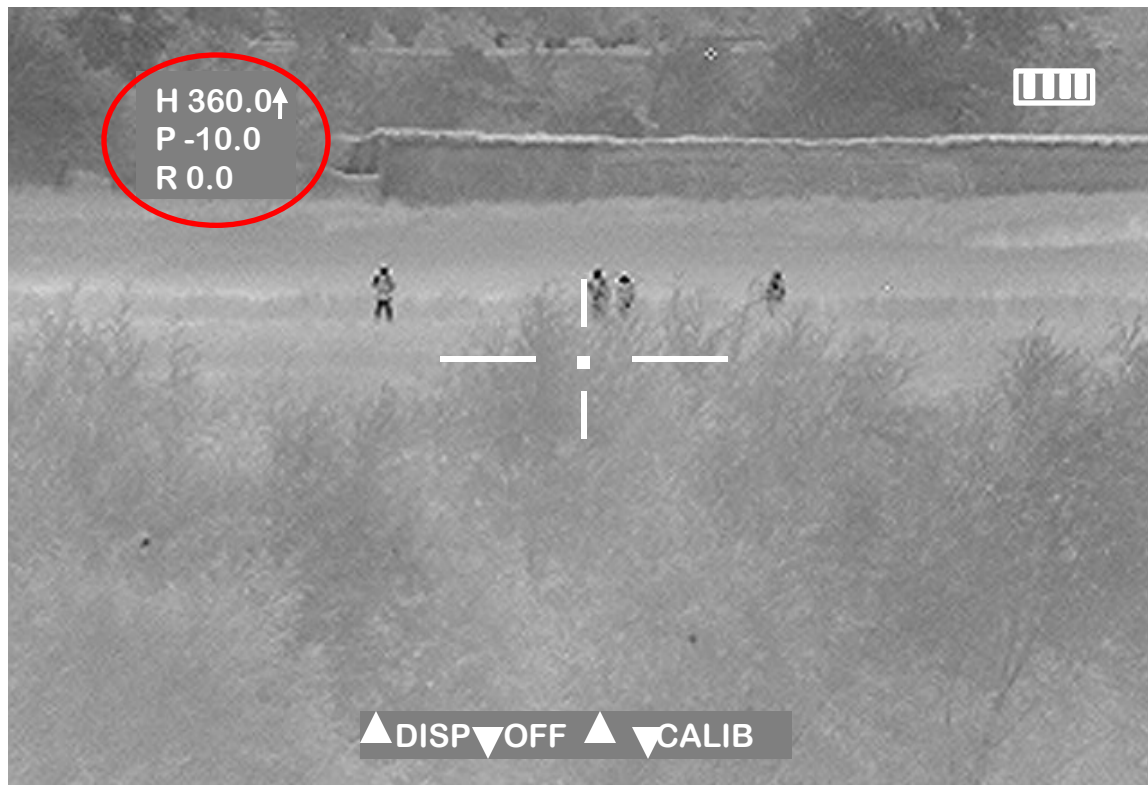
- **PUSH THE RIGHT ARROW KEY ONE TIME TO BRING UP THE MENU FUNCTION.**
- **PUSH THE DOWN ARROW AND HIGHLIGHT “COMPASS”.**
- **PUSH AND HOLD THE RIGHT ARROW TO BRING UP THE “COMPASS MENU”.**





UTB Compass and Calibration (cont.)

C4ISR - SPAWAR - AUSGAR

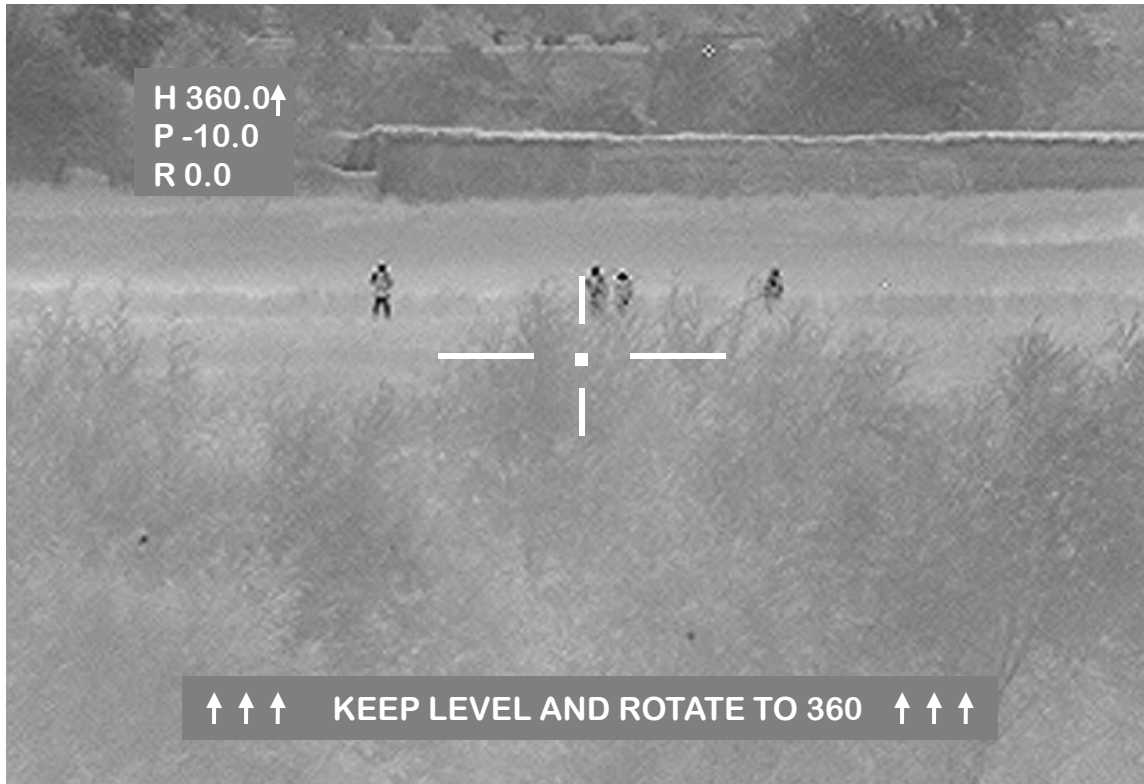


- PUSH UP ARROW TO CYCLE THROUGH THE HEADING, PITCH, AND ROLL, KEEPING HEADING ONLY OR ALL THREE ON THE VIEW SCREEN.
- PUSH THE DOWN ARROW TO TURN OFF THE HEADING PITCH, AND ROLL.

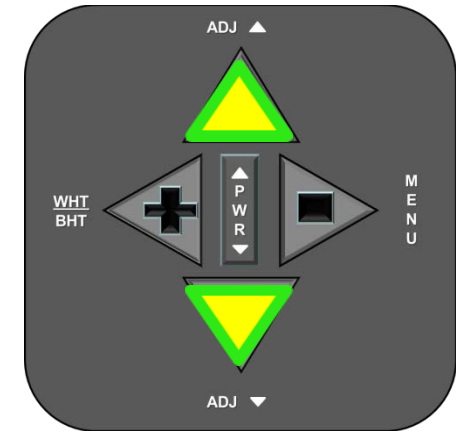


UTB Compass and Calibration (cont.)

C4ISR - SPAWAR - AUSGAR



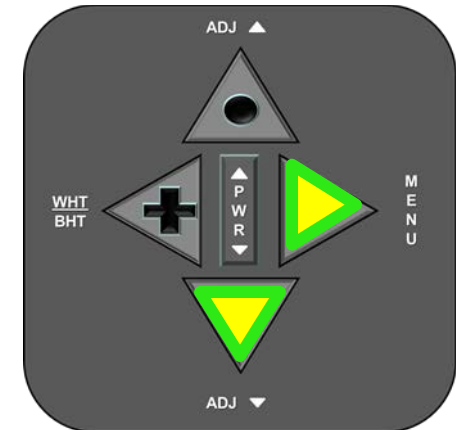
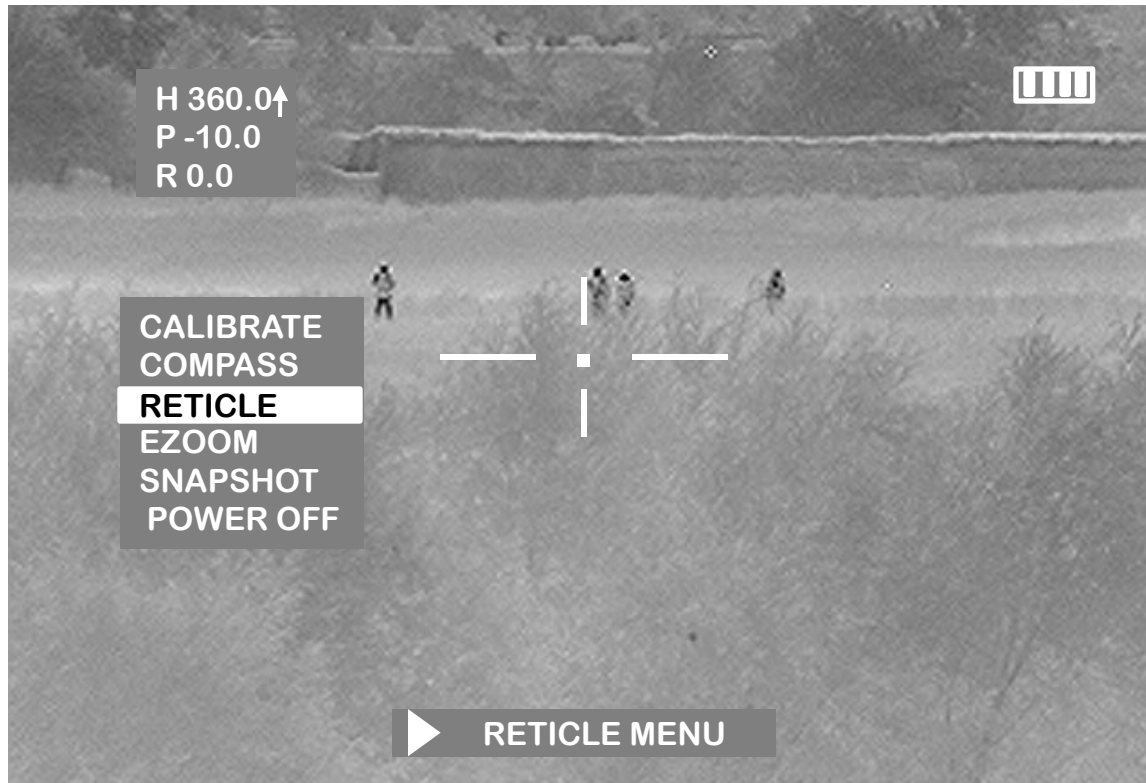
- PUSH THE UP AND DOWN ARROW KEYS AT THE SAME TIME.
- HOLD THE UTB LEVEL AND ROTATE 360 DEGREES.
- THE 6 ARROWS WILL ROTATE GIVING A VISUAL CUE.





UTB Reticle Menu

C4ISR - SPAWAR - AUSGAR



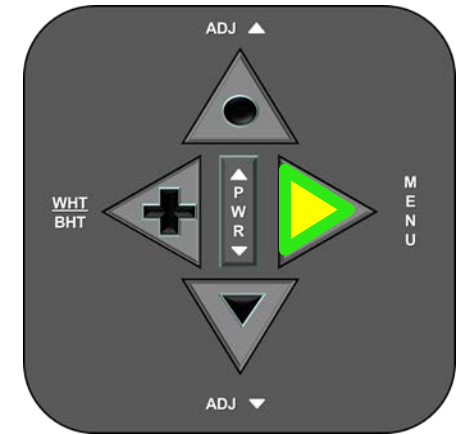
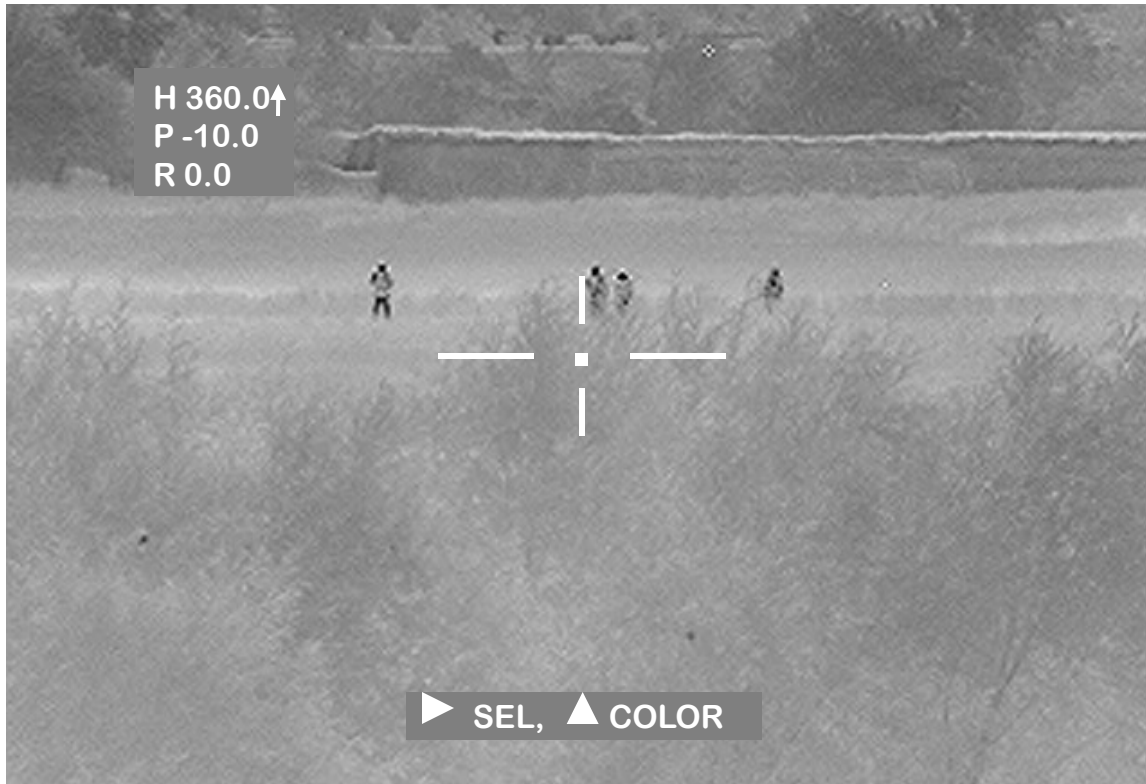
- **PUSH THE RIGHT ARROW KEY ONE TIME TO BRING UP THE MENU FUNCTION.**
- **PUSH THE DOWN ARROW AND HIGHLIGHT “RETICLE”.**
- **PUSH AND HOLD THE RIGHT ARROW TO BRING UP THE “RETICLE MENU”.**





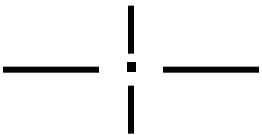
UTB Reticle Select

C4ISR - SPAWAR - AUSGAR

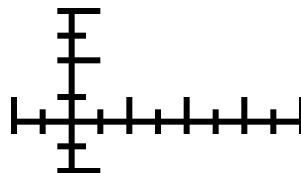


- PUSH THE RIGHT ARROW TO SELECT FROM THREE SETTINGS:

“CROSSHAIR”



“MIL SCALE”



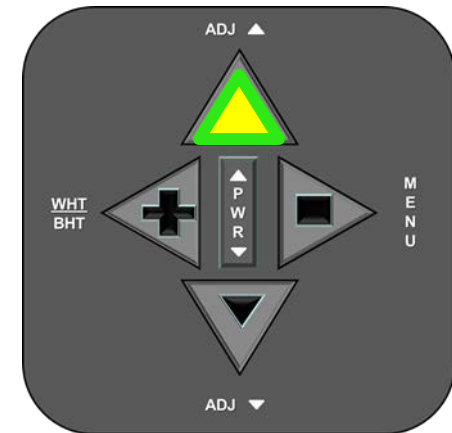
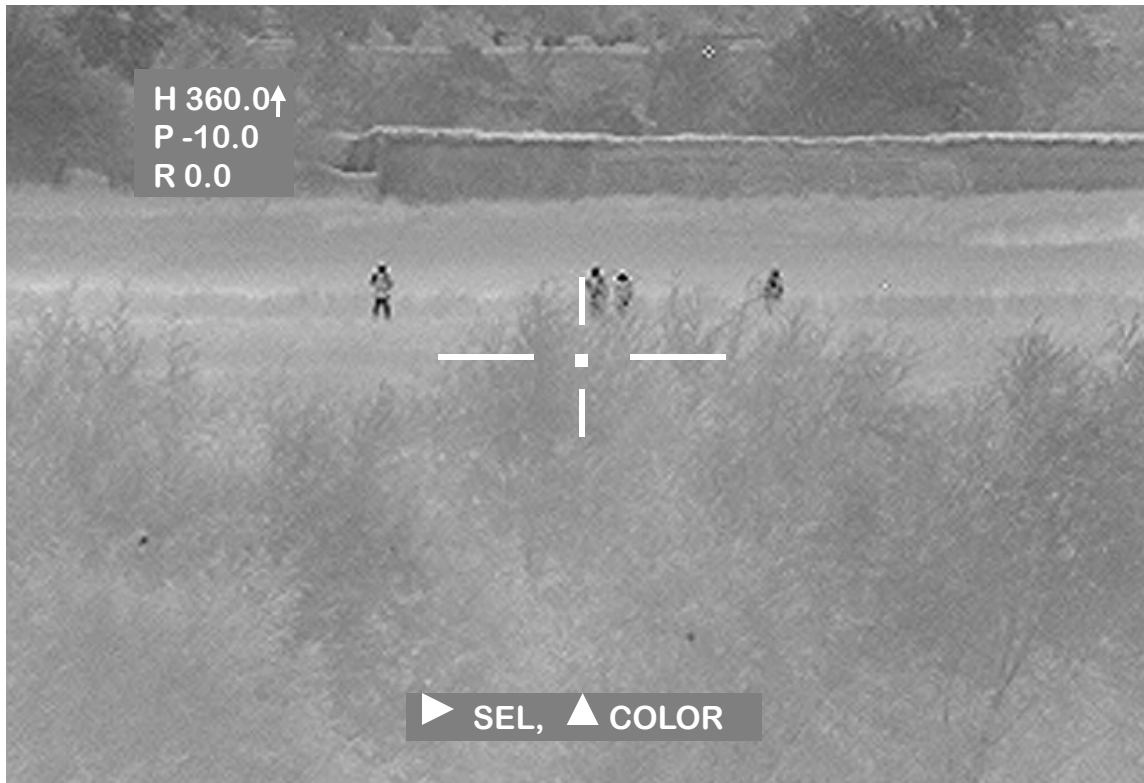
“NONE”





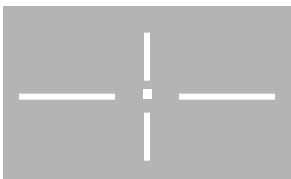
UTB Reticle Select (cont.)

C4ISR - SPAWAR - AUSGAR

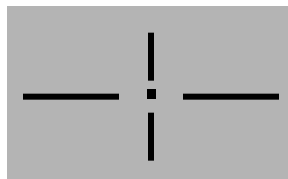


- PUSH THE UP ARROW KEY FOR THREE DIFFERENT COLOR SETTINGS:

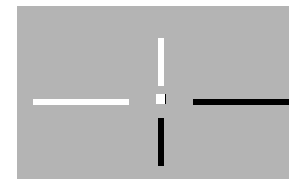
“WHITE”



“BLACK”



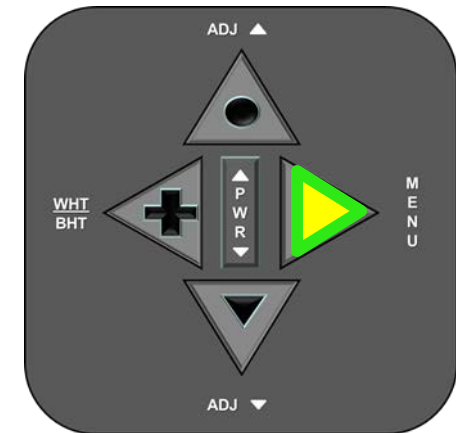
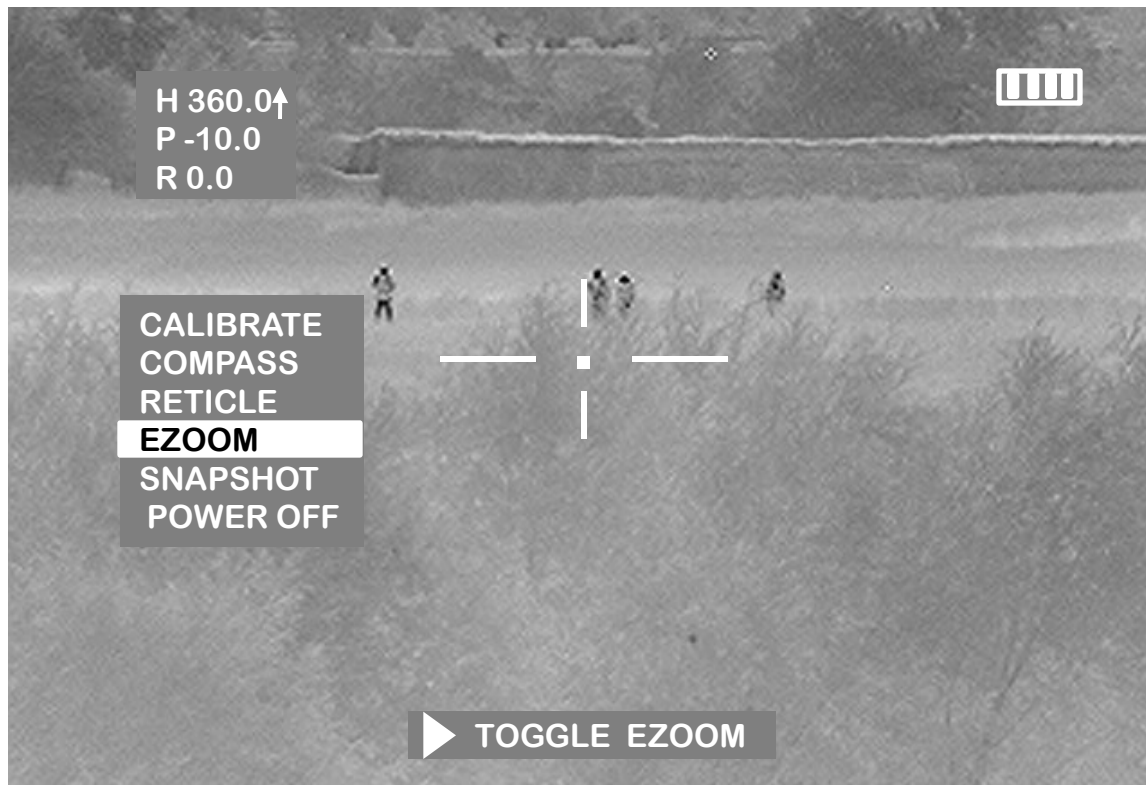
“ADAPTIVE”





UTB EZoom Menu

C4ISR - SPAWAR - AUSGAR



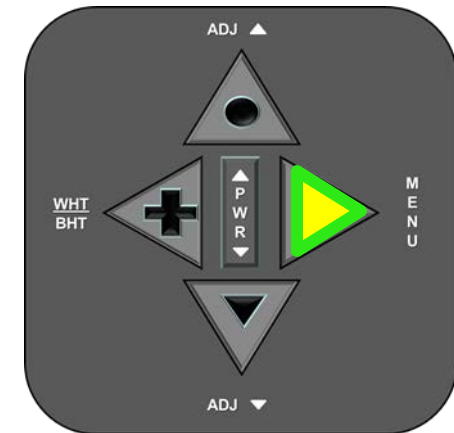
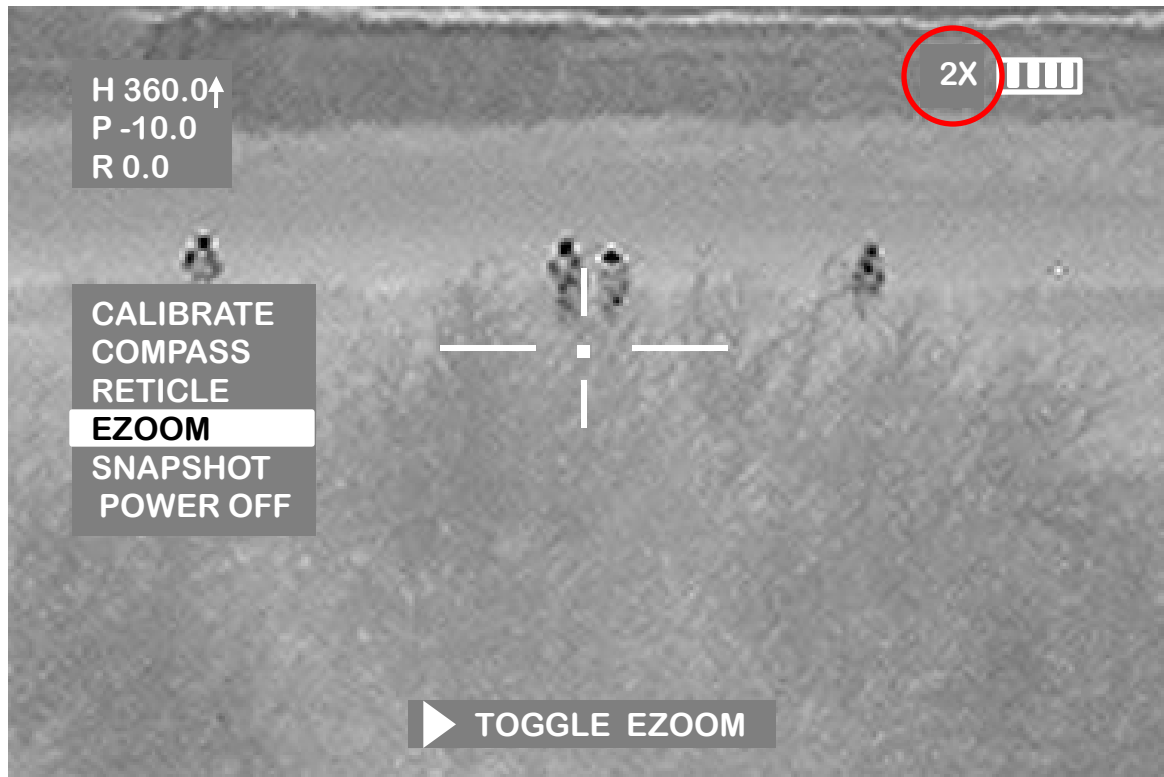
- PUSH THE RIGHT ARROW KEY ONE TIME TO BRING UP THE MENU FUNCTION.
- PUSH THE DOWN ARROW KEY TO HIGHLIGHT "EZOOM".





UTB 1X / 2X Zoom Function

C4ISR - SPAWAR - AUSGAR



 TOGGLE EZOOM

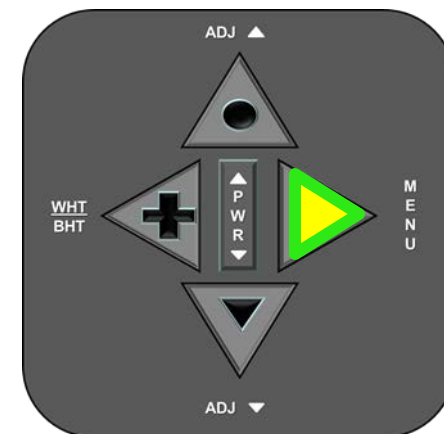
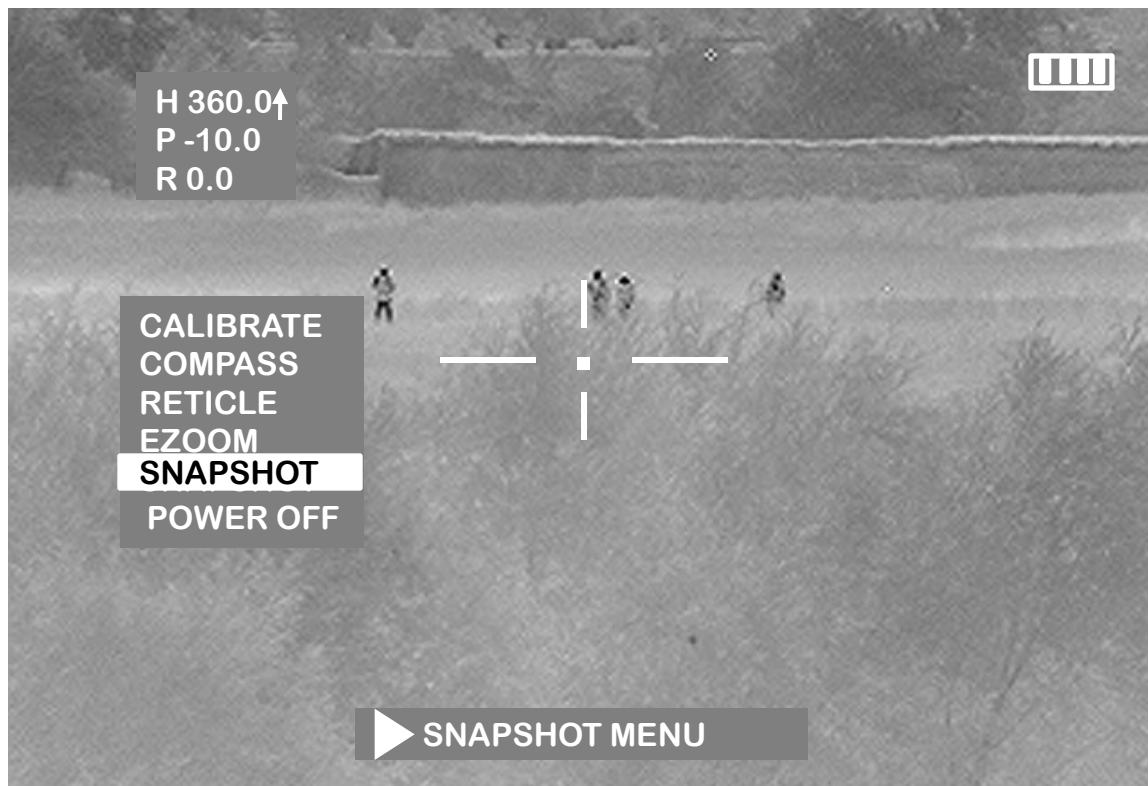
- PUSH RIGHT ARROW TO TOGGLE THE 2X FUNCTION.
- **2X** WILL APPEAR IN THE VIEW SCREEN IN THE UPPER RIGHT HAND CORNER NEXT TO THE LASER ICON.
- REPEAT THE PROCESS TO SWITCH BACK TO 1X EZOOM.





UTB Snapshot Menu

C4ISR - SPAWAR - AUSGAR



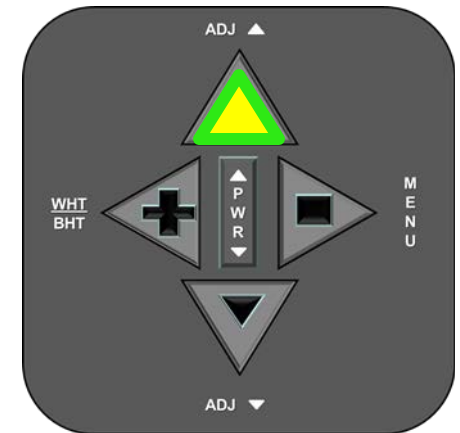
- PUSH THE RIGHT ARROW KEY ONE TIME TO BRING UP THE MENU FUNCTION.
- PUSH THE DOWN RROW KEY AND HIGHLIGHT "SNAPSHOT".
- PRESS THE RIGHT ARROW KEY TO BRING UP THE SNAPSHOT FUNCTIONS.





UTB 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.

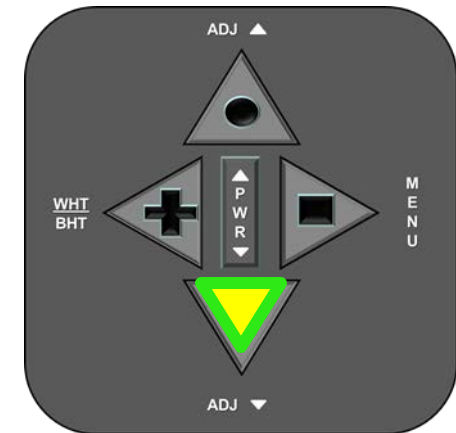
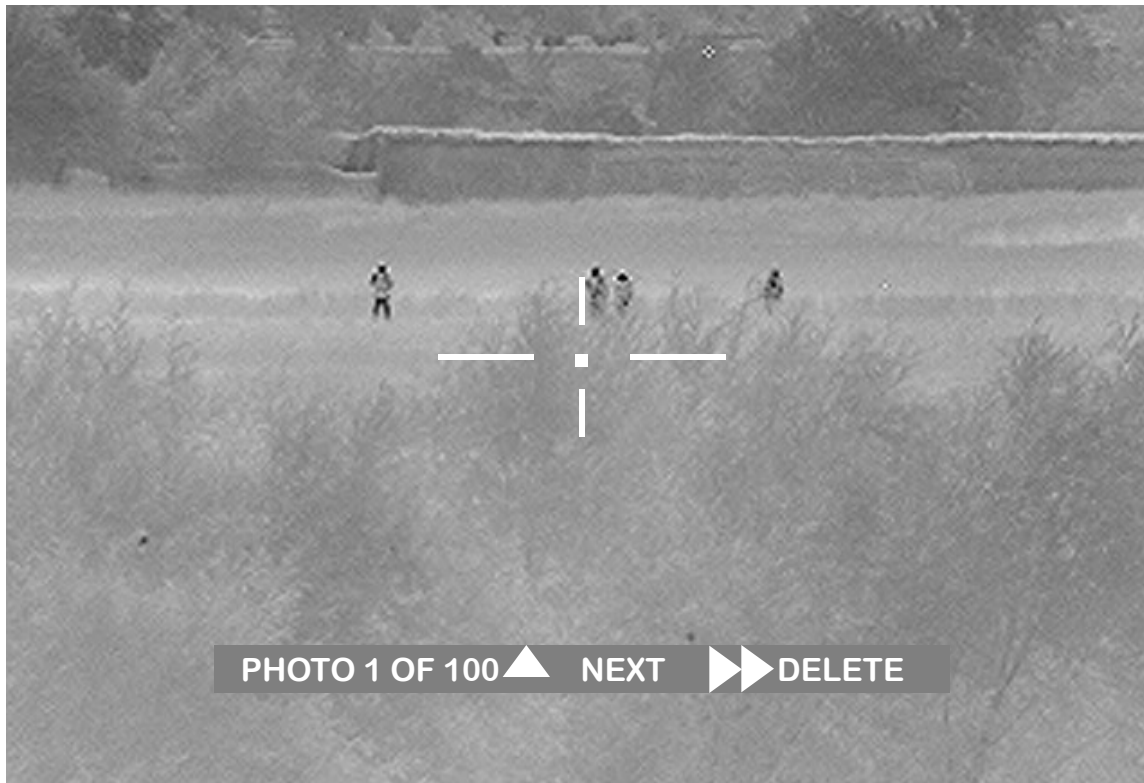
STORING IMAGE 4 OF 100





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 OIN THE INTERNAL MEMORY.

PHOTO 1 OF 100 ▲ NEXT ► DELETE

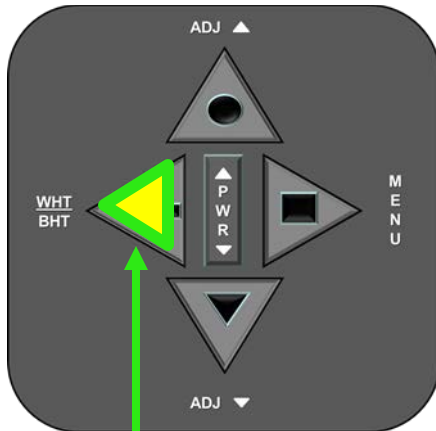
PHOTO 1 OF 100 ▲ NEXT ►► DELETE





UTB Polarity

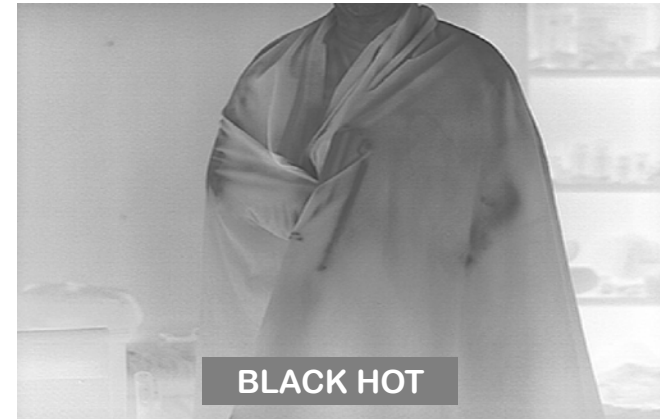
C4ISR - SPAWAR - AUSGAR



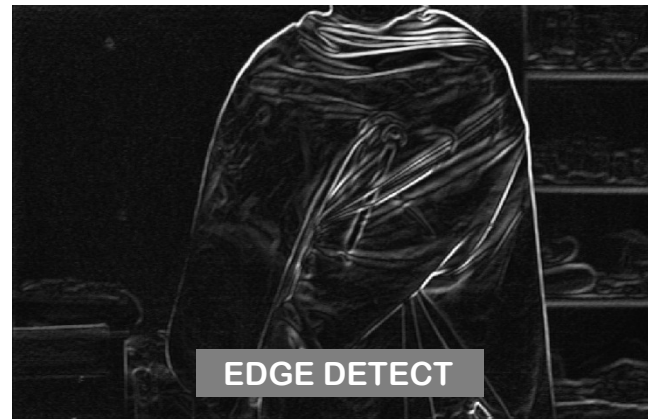
**PUSH TO CYCLE
THROUGH WHITE HOT,
BLACK HOT, AND EDGE
DETECT**



- **WARMER OBJECTS ARE WHITE**



- **WARMER OBJECTS ARE BLACK**



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

**NOTE: THE UTB 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.



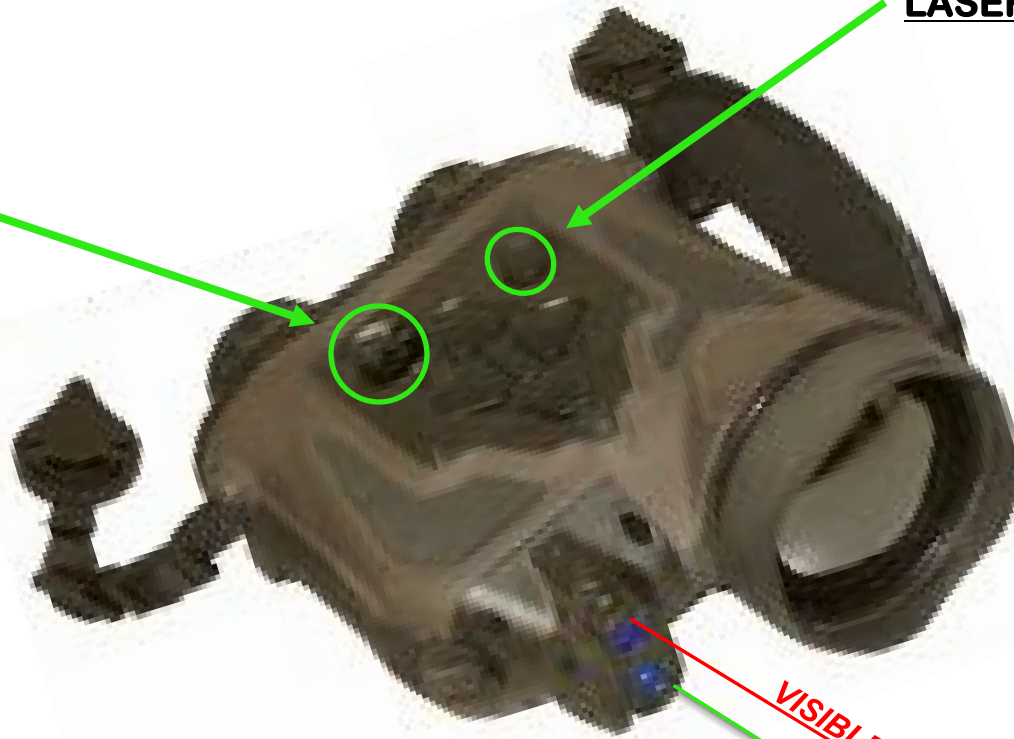


UTB Laser Actuation

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 CONTINUOS

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.





UTB 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.





UTB Laser Warning

C4ISR - SPAWAR - AUSGAR

- UTB HAS TWO INCORPORATED CLASS 1 “EYE SAFE” LASERS.
- **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 UTB 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. THEN 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 UTB AND POINT AT A TARGET, **THE LASER WORKS BOTH WAYS.**

Think before you actuate!!!!





UTB Maintenance , Care and Cleaning

C4ISR - SPAWAR - AUSGAR

- ENSURE WHEN YOU STORE THE UTB, YOU REMOVE THE CR-123A or AA BATTERIES. REPLACE THE EYE COVERS AND OBJECTIVE LENS COVERS WHEN YOU STORE THE UTB IN ITS CASE.
- AFTER EACH OPERATION, TAKE A SOFT PENCIL ERASER AND RUB ON TO THE BATTERY CONTACTS TO CLEAN THE CONTACTS.
- WHEN STARTING A NEW OPERATION, ENSURE YOU USE NEW BATTERIES.
- YOUR UTB IS WEATHER-PROOFED. 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.





UTB 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?

