



OPERATOR'S MANUAL
FOR THE
SU-237 PVS SIGHT UNIT
TA31M4A1ECOS/TA01M4A1ECOS
Trijicon® ACOG®

US Patent No. 4,806,007

5 March 2007

WARNING:

Before installing the SU-237/PVS on a weapon, inspect the weapon to ensure it is **UNLOADED**. Visually and physically inspect the chamber to ensure it is empty.

WARNING:

**RADIOACTIVE MATERIALS
RADIATION HAZARD
SAFETY PRECAUTIONS**



The SU-237/PVS contains radioactive material for nighttime illumination. The radiation source is Hydrogen-3, commonly known as Tritium. Tritium is an odorless, tasteless, colorless gas that reacts to the human body in the same manner as natural hydrogen. The human body does not easily retain hydrogen or Tritium as a gas. However, the oxide, HTO, which is formed by the burning of Tritium, is 10,000 times more hazardous. For this reason great care should be taken to avoid flame in the presence of the SU-237/PVS/PVS with a Tritium lamp which is broken or is suspected of leaking. If the Tritium lamp in the SU-237/PVS breaks follow the procedures on the following page. The SU-237/PVS is regulated under an EXEMPT LICENSE from the United States Nuclear Regulatory Commission (NRC) held by Trijicon, Inc. Disassembly of the scope is prohibited except by Trijicon, Inc.

WARNING

HANDLING A DAMAGED SU-237/PVS (exposed internals, fire, or crushed)

DO NOT handle a defective unit if you have open skin cuts or abrasions (use gloves). If the Tritium lamp in a SU-237/PVS is broken or suspected of being broken, work in a well ventilated area and avoid inhaling air near the unit. Place the unit in a sealed plastic bag and contact your unit maintainer for return and proper disposal. Immediately following contact with the unit wash your hands in soap and water. Follow any other unit specific protocol.

DO NOT eat, drink, smoke, or apply cosmetics in the presence of a damaged SU-237/PVS.

TRITIUM FAILURE INSPECTION

Refer to **Inspection** on page 9 for the procedure to follow to determine if the tritium lamp in the SU-237/PVS is working correctly.

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INTRODUCTION

The SU-237/PVS is a dual role sighting system designed for M4 and M249 weapon systems. It provides the operator with quick target acquisition at close combat ranges utilizing the DOCTER® red dot sight and enhanced target identification and hit probability out to 1000 meters utilizing the 4x magnification and **Bullet Drop Compensator (BDC)** of the Advanced Combat Optical Gunsight (ACOG). The SU-237/PVS is available in several variations to include the dual illuminated reticle version. For further information refer to page 24 MODELS.

CHARACTERISTICS Advanced Combat Optical Gunsight (ACOG)

Objective Lens	32 mm
Magnification	4 power
Eye Relief	1.5 in
Exit Pupil	8mm
Field of View	7 degrees (36.8 ft @ 100 meters)
Length	5.8 in
Weight	15.6 oz. (including mount)
Waterproof	66 ft
Tritium	0.1 curies
Parallax	Set to be parallax free at 100m

CHARACTERISTICS (DOCTER® Red Dot Sight)

Sight Window	21mm x 15mm
Magnification	1.07x
Aiming Dot	3.5 MOA (10cm) or 7.0 MOA (20cm)
Power Supply	(1) 3V CR2032 Lithium battery
Battery life	6 months (Continuous use) (Up to 4 years storage)
Parallax	Set to parallax free at 40m
Operating temperature range	-10F to 130F (-25C to +55C)
Storage temperature range	-40F to 160F (-40C to +70C)
Water resistance	Resistant to moisture and limited exposure to water but not waterproof.

CONTROLS AND INDICATORS

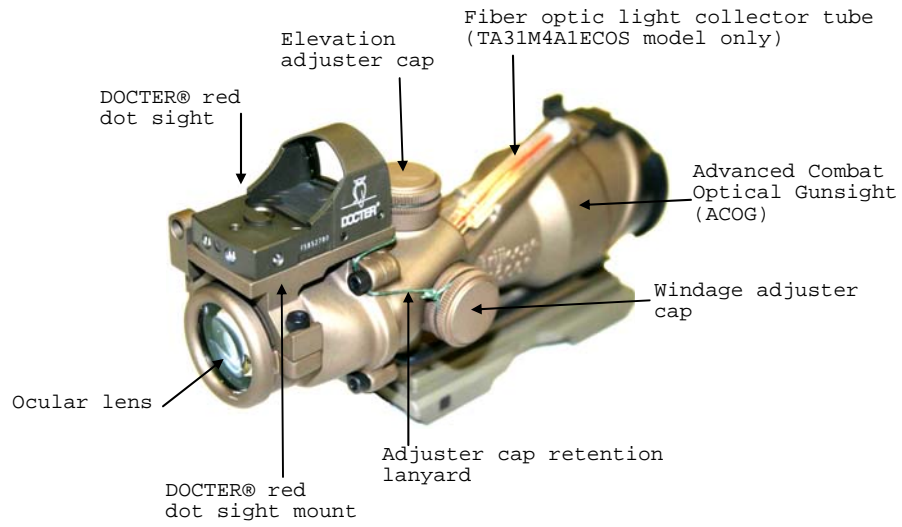


Figure 1

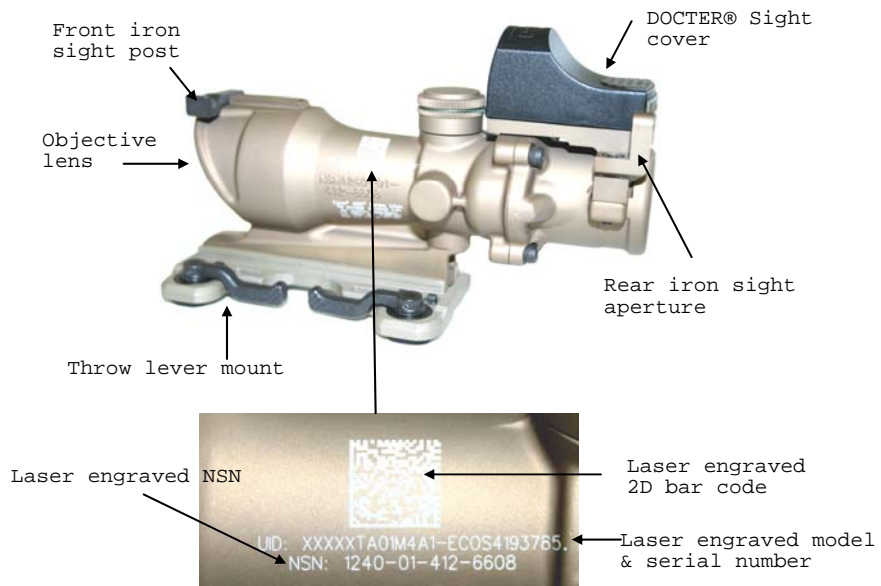


Figure 2
CONTROLS AND INDICATORS continued

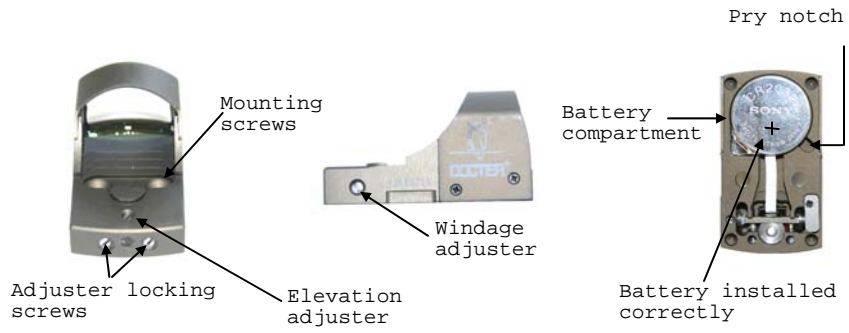


Figure 3

Figure 4

Figure 5

REPARATION FOR USE

SU-237/PVS ACOG Inspection

It is recommended that the tritium lamps be checked in the ACOG prior to deployment of the optic and every six months or immediately following any incident which might lead to lamp failure such as the dropping of the SU-237/PVS onto a hard surface.

To determine that the tritium lamp is functioning in the SU-237/PVS ACOG, enter a dark room and look through the optic. The center of the crosshair should be illuminated as shown in Figure 14 on page 18. The illumination provided by the tritium lamp is very faint and will be 10

hard to see without a dark-adapted eye. Remain in the dark room for approximately ten minutes to adapt your eyes to the dark.

The reticle is illuminated by Tritium in low light or complete darkness. If the reticle does not appear to illuminate under these conditions, contact your unit maintainer for confirmation and disposal.

SU-237/PVS DOCTER® Red Dot Sight Inspection

Remove the DOCTER® red dot sight cover from the sight by using your thumb to press down and forward on the rear of the cover, then lift.

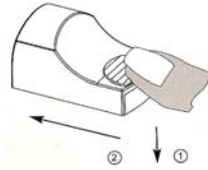


Figure 6

To inspect the sight, ensure that the red aiming point (dot) is illuminated. If it is not, check to ensure the battery was installed correctly. If the battery is installed correctly and there is still no red dot, change the battery by following the instructions on page 21.

The integrated electronics of the sight will adjust aiming point brightness automatically based on ambient light conditions so once the cover is removed, the sight is ready for use.

INSTALLATION PROCEDURES

WARNING:

Before installing SU-237/PVS on a weapon, inspect the weapon to ensure it is **UNLOADED**. Visually and physically inspect the chamber to ensure it is empty.

The SU-237/PVS is attached to the weapon's MIL-STD-1913 rail using a locking throw lever mount. Prior to placing the SU-237/PVS on the M1913 rail, ensure that the two locking levers are in the unlocked position.

The throw lever mount is unlocked when the front and rear throw levers are opened to 90° angle. Ensure the cam/rail interface bars (2), identified by the arrow, are back against the cam prior to seating the sight on the rail.

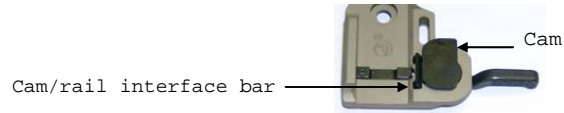


Figure 7

Place the SU-237/PVS in the slots on top of the receiver that

provide for proper eye relief. Once the ideal position has been determined, lock the SU-237/PVS to the M1913 rail by manipulating the locking levers to the locked position.

The throw lever mount is locked when both locking levers are facing inward.

ADJUSTMENT PROCEDURES: SU-237/PVS Optical Sight (ACOG)

The SU-237/PVS ACOG is internally adjustable. The adjusters need only position the internal roof prism.

The SU-237/PVS ACOG is shipped optically centered. Normally this means that only small adjustments are necessary for proper zeroing.

Elevation Adjustment

Remove the **top** adjuster cap to expose the elevation adjuster (Figure 8). Moving the adjuster in the direction of the arrow (clockwise) will move the strike of the bullet **UP** as indicated on the adjuster. **Adjustment increments are 1/2 inch per click at 100 meters. This means that 2 clicks are required to move the bullet impact one inch on a target at 100 meters.** The amount of clicks can be detected through audible and tactile feedback.



Figure 8

Windage Adjustment

Remove the **side** adjuster cap to expose the windage adjuster (Figure 9). Moving the adjuster in the direction of the arrow (clockwise) will move the strike of the bullet **RIGHT** as indicated on the adjuster. **Adjustment increments are 1/2 inch per click at 100 meters. This means that 2 clicks are required to move the bullet impact one inch on a target at 100 meters.** The amount of clicks can be detected through audible and tactile feedback.



Figure 9

CAUTION: The SU-237/PVS is waterproof only when adjuster caps are installed properly.

NOTE: The adjuster caps become water-tight when screwed onto the adjuster housing until they make contact with the body of the optic as illustrated in figure 10. Tighten with finger pressure only.

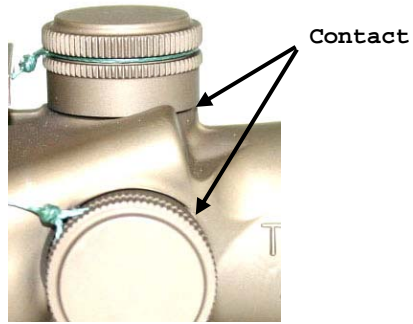


Figure 10

ZEROING THE SU-237 ACOG AT 100 METERS (Preferred Method)

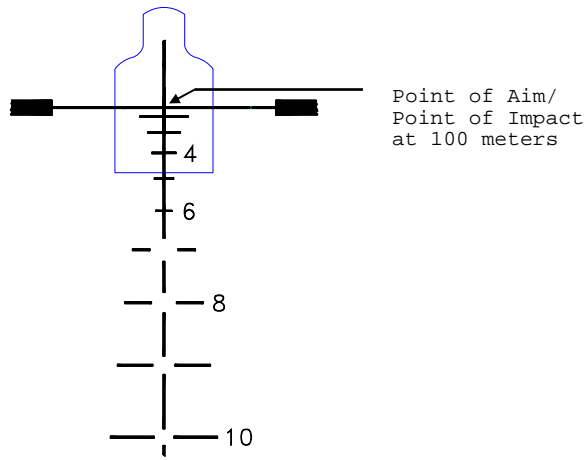


Figure 11

When zeroing the SU-237/PVS ACOG at 100 Meters, the center crosshair is used to obtain Point of Aim (POA), Point of Impact (POI).

BATTLE SIGHT ZEROING (BZO) THE SU-237 ACOG at 25 METERS

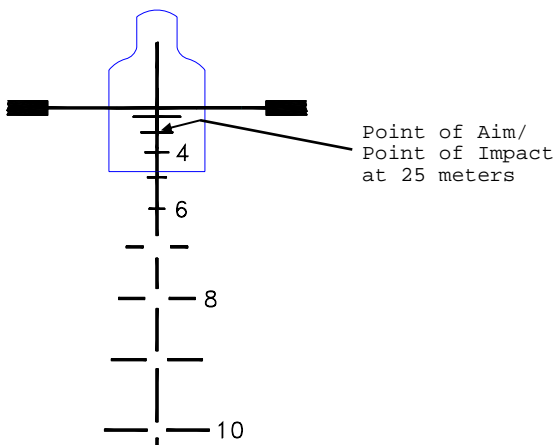


Figure 12

To acquire a Battle Sight Zero for the SU-237 ACOG at 25 meters, use the 300 meter aiming point to acquire Point of Aim/Point of Impact.

NOTE: This is a BZO only. Confirm zero at 100m using the 100m method as soon as possible. Failure to do so will result in inaccuracy at longer distances.

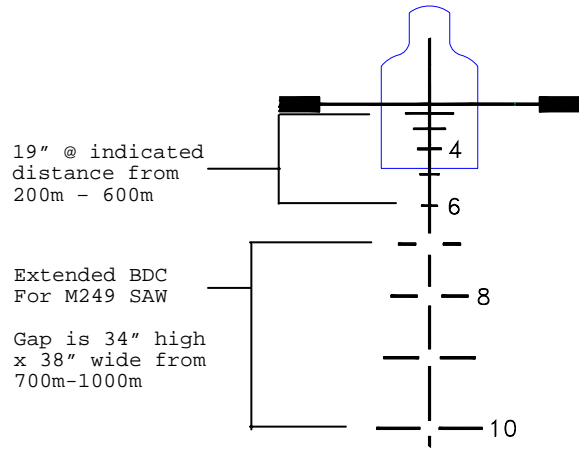


Figure 13

Once the SU-237 ACOG is properly zeroed, the Bullet Drop Compensator (BDC) and ranging feature will allow the operator to engage targets out to 600m with the M4 and 1000m with the M249 without having to mechanically adjust for elevation.

For targets 100m or less, place the center crosshair on the desired POI. To determine the range of a human target beyond 18

100m, raise the reticle until one of the horizontal stadia lines fits the target's torso. When a stadia line fits the torso, the operator uses that crosshair to engage the target.

RETICLE ILLUMINATION:

The TA01M4A1ECOS models have a black reticle during daylight conditions. Under low light/night conditions the reticle is illuminated by the use of Tritium. Figure 14 illustrates the illumination area and color of the illumination for the TA01M4A1ECOS models. For the TA31M4A1ECOS model the illumination is red in color and visible under all light conditions as illustrated in figure 15.

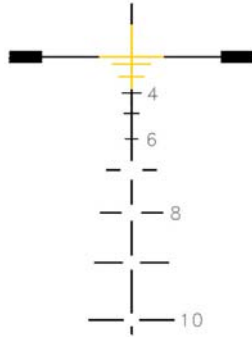


Figure 14

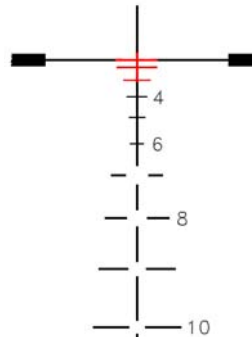


Figure 15

ADJUSTMENT PROCEDURES: DOCTER® RED DOT SIGHT

This sighting device has separate controls for elevation and windage adjustment. These are located on the top and right side of the sight. See figures 3 and 4.

Caution: To prevent damage to the sight, loosen the two adjuster locking screws identified in figure 3, 1/4 turn counter-clockwise before attempting to adjust the windage or elevation. Failure to do so will damage the sight and prevent zero retention.

Put the scale disk onto the screwdriver as illustrated in figure 16. This is used to calculate proper adjustment of elevation and windage.



Figure 16

To adjust **elevation**, place the screwdriver with disk attached onto the elevation adjuster screw located on the top of the sight (Figure 3). Using the edge of the sight as a reference point, turn the disk (1) increment on the scale to change POI 1 MOA (1" at 100m). The direction of bullet strike is indicated by the arrows on the disk.

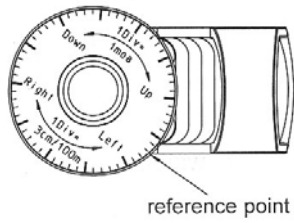


Figure 17

To adjust windage, place the screwdriver with the disk attached onto the windage adjuster screw located on the right side of the sight (Figure 4) Using the edge of the sight as a reference point turn the disk(1) increment on the scale to change POI 1 MOA (1" at 100m). The direction of bullet strike is indicated by the arrows on the disk.

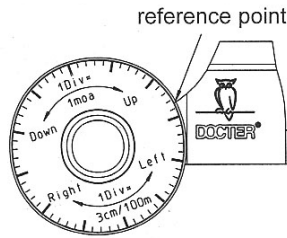


Figure 18

After all final adjustments are made, turn the two Adjuster Locking Screws located in the rear of sight $\frac{1}{4}$ turn clockwise to lock adjusters in place. DO NOT over tighten.

ZEROING THE DOCTER® RED DOT SIGHT

The DOCTER® red dot sight is designed to be parallax free at approximately 40 meters. For this reason, it is recommended that the DOCTER® red dot sight is zeroed POA/POI at 40m to minimize parallax related aiming errors over a large distance range.

CHANGING THE DOCTER® RED DOT SIGHT BATTERY

To replace the battery remove the sight from the mount by removing the two Allen head screws located on top of the sight (Figure 3). Remove the sight from its mount by lifting gently until it separates. Turn the sight upside down and insert a screwdriver or Allen wrench into the pry notch (Figure 5) located on the right side and pry the dead battery out. Replace with new battery with the positive pole being visible and reassemble.

DOCTER® RED DOT SIGHT POWER SAVING MODE

This sight does not contain a separate on/off switch. To operate the electronic circuit power saving mode, attach the cover or store in a dark area. These options will preserve battery life when not in use.

CHANGING THE RAIN SIGHTS TO THE OPPOSITE SIDE

Rear Sight: Using a 7/64 hex wrench, remove both DOCTER® red dot sight mount screws (figure 19) and rear iron sight. Keeping the longer screw with the rear iron sight place the rear sight on the opposite side and re-install both mount screws. DO NOT over tighten.

Front Sight: Secure the scope in a vise. Use a hammer and a plastic dowel pin to apply force along the horizontal direction (Figure 20). This will drive the front sight out. Place on the same side as the rear sight and re-install by tapping the sight into the dovetail. To zero, tap the sight left or right to obtain desired POA/POI.

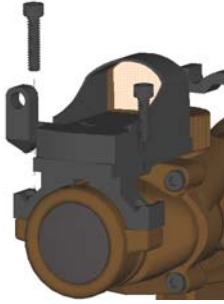


Figure 19

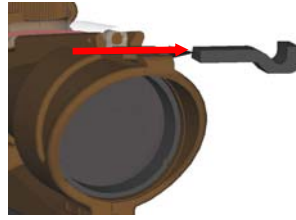


Figure 20

PREVENTATIVE MAINTENANCE & CLEANING

CAUTION: DO NOT allow the light collector tube (Figure 1) come into contact with harsh organic chemicals such as Acetone, Trichloroethane, or other cleaning solvents. They will affect the appearance of the light collector tube though they will not affect its performance.

The SU-237/PVS requires very little maintenance. If the lenses become dirty, wash using fresh water and a soft clean cloth. Be sure to wash the lenses fully before wiping them with a soft cloth, the lenses can be scratched if dirt is pulled along the lens by the cloth. In cold weather, if the outside lens surfaces fog over, clean using a clean, soft cloth to wipe them clear.

Repair or maintenance other than replacing the DOCTER® red dot sight battery, lost or damaged ACOG adjuster caps, mounts, or iron sights is prohibited by anyone other than the manufacturer because of the radioactive material contained in the SU-237/PVS. If further maintenance is required, contact your unit maintainer for guidance.

MODELS:

TA01M4A1-ECOS1:

4x ACOG in Sand Matte (Brown)
Black dual purpose 5.56mm reticle
3.5 MOA DOCTER® MRD Sight mounted on ACOG
Ambidextrous rain sight system
Throw lever mount



TA01M4A1-ECOS2:

4x ACOG in Sand Matte (Brown)
Black dual purpose 5.56mm reticle
7.0 MOA DOCTER® MRD Sight mounted on ACOG
Ambidextrous rain sight system
Throw lever mount



TA01M4A1-ECOS3:

4x ACOG in Sand Matte (Brown)
Black dual purpose 5.56mm reticle
Trijicon MRD interface mount only
Ambidextrous rain sight system
Throw lever mount



TA01M4A1-ECOS4:

4x ACOG in Sand Matte (Brown)
Black dual purpose 5.56mm reticle
Standard back-up iron sights
Throw lever mount



MODELS- continued:

TA31M4A1-ECOS1:

Dual-illuminated 4x ACOG in Sand Matte (Brown)
Red center dual purpose 5.56mm reticle
3.5 MOA DOCTER® MRD Sight mounted on ACOG
Ambidextrous rain sight system
Throw lever mount



TA31M4A1-ECOS2:

Dual Illuminated 4x ACOG in Sand Matte (Brown)
Red center dual purpose 5.56mm reticle
7.0 MOA DOCTER® MRD Sight mounted on ACOG
Ambidextrous rain sight system
Throw lever mount



TA31M4A1-ECOS3:

Dual Illuminated 4x ACOG in Sand Matte (Brown)
Red center dual purpose 5.56mm reticle
Trijicon MRD interface mount only
Ambidextrous rain sight system
Throw lever mount



TA31M4A1-ECOS4:

Dual Illuminated 4x ACOG in Sand Matte (Brown)
Red center dual purpose 5.56mm reticle
Standard back-up iron sights
Throw lever mount



TA01M4A1ECOS EXPLODED VIEWS:

Note: All parts and part numbers in this exploded view are also applicable to the TA31M4A1ECOS.

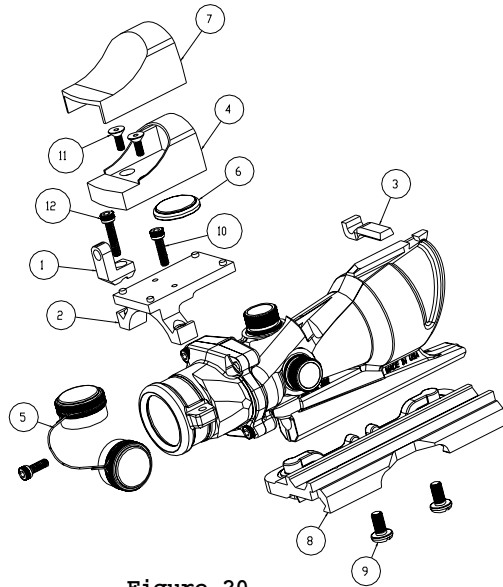


Figure 20

TA01M4A1ECOS EXPLODED VIEWS- continued:

Note: All parts and part numbers in this exploded view are also applicable to the TA31M4A1ECOS.

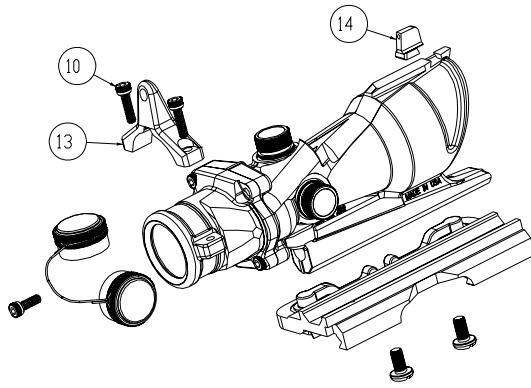


Figure 21

Item	Part number	Description	Qty
1	SUB-ACA3107-1	ECOS BUIS SOCOM-Rear Side	1
2	SUB-ACA3108-2	DOCTER Sight Mount- ECOS	1
3	SUB-ACA3109-1	ECOS BUIS SOCOM-Front Sight	1
4	ACA-3142-1B	DOCTER Sight 7.0 MOA dot Brown finish	1
4	ACA-3142-2B	DOCTER Sight 3.5 MOA dot Brown finish	1
5	ACA-3187-1	Adjuster Cap Assembly- ECOS	1
6	ACA3188-1	CR2032 3V Lithium Battery (DOCTER)	1
7	ACA3190-1B	DOCTER Sight Cover	1
8	TA75	Brown Anodized Throw Lever Mount	1
9	SUB-HSC2070-1	#10-32 X 3/8" Pan Head	2
10	SUB-HSC2077-1	#6-32 X 1/2" SHCS	1
11	HSC3070-1	M3X.5 X 10 FHCS	2
12	SUB-HSC3111-1	#6-32 X 5/8" SHCS	1
13	SUB-ACA2463-1	Standard Back-up Iron Sight- Rear	1
14	AC-SIGHT-1	Standard Back-up Iron Sight-Front	1
15	Manual-ECOSC	SU-237/PVS Manual	1

Table 1