

CHAPTER 1: GENERAL DESCRIPTION AND SPECIFICATIONS

WARNING: Clear and safe the firearm prior to mounting sight!

1.1 Description

The SpecterTR™ 1-3-9x optical firearm sight is the world's first three field-of-view optical firearm sight; available in both 5.56 and 7.62 configurations. The unique three field-of-view design maximizes marksmanship capability by providing precision close range, mid-range, and long-range engagement capability. The SpecterTR™ firearm sight's durability, versatility, and extra-long eye relief provides the user with an unmatched advantage in the field.

The SpecterTR™ provides three ways of targeting for maximum flexibility:

- “Close-Range” – 1x magnification with 3 MOA illuminated red dot.
- “Mid-Range” – 3x magnification with an illuminated, ballistically-compensated reticle.
- “Long-Range” – 9x magnification with an illuminated, ballistically-compensated reticle.

Figure 1-1: Long Eye Relief Facilitates Quick Target Acquisition

An LED is used to illuminate the reticle. When turned in the counter-clockwise direction, the LED is used to illuminate the reticle. When turned in the clockwise direction while in 1x magnification, the reticle illumination switch provides five illumination levels for the “red dot” aiming mark. While in the 3x and 9x magnification modes, the reticle illumination switch provides 5 illumination levels for the entire ballistic reticle.

Two “castle” style nuts attached the sight to the MIL-STD 1319 rail. This system provides accurate zero retention when the sight is repeatedly removed and replaced on the rail.

Figure 1-2: Selected Overall Views

1.2 Technical Specifications – Nominal

Table 1-2: Technical Specifications - Nominal

Table 1-2: Technical Specifications - Nominal

1.3 SpecterTR™ Controls and Terminology

Figure 1-3: Left Side view and Selected and Controls

Figure 1-4: Right Side view and Selected and Controls

1.3.1 1x – 3x – 9x Field-of-View Switch

The 1x-3x-9x field-of-view switch allows the marksman to quickly transition from 1x to 3x to 9x magnification without affecting eye relief or firearm zero.

1.3.2 Firearm Mounting Nuts

The mounting nuts are used to secure the sight to the weapon's MIL-STD 1913 "Picatinny" rail.

1.3.3 Elevation Adjust and Lock

The elevation zero dial is located at the lower rear of the mount, and the zero lock (silver tab) is just above the dial. When the lock is in the UP position, the dial may be used to adjust the elevation of the Point of Impact (POI) 0.1 Mils per click. If the zero lock is DOWN, the zero dial is locked in place and the sight elevation is fixed.

<p>CAUTION: To prevent damage, be sure to that the lock is fully disengaged before attempting to turn the elevation dial!</p>
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1.3.4 1x – 3x – 9x Field-of-View Switch

The azimuth adjustment screw is located at the front right side of the mount. Rotating it adjusts the Point of Impact (POI) to the right or left. Each 'click' moves the Point of Impact (POI) 0.1 Mils.

1.3.5 Reticle Illumination Switch

When turned in the clockwise direction while in 1x, the reticle illumination switch provides 5 illumination levels for the “red dot” aiming dot. While in the 3x and 9x modes, the reticle illumination switch provides 5 illumination levels for the entire ballistic reticle.

1.3.6 Battery Cap

Located on the Reticle Illumination Switch, the battery cap may be removed with the use of coin or flat head screw driver by unscrewing it in the counter clockwise direction. The battery cap should only be tightened until snug.

1.4 Safety

- 1 Ensure the firearm is clear, on safe and pointed in a safe direction while mounting the sight.
- 2 Ensure sight is secured tightly to the firearm prior to conducting live fire.
- 3 To avoid injury, ensure that the eye relief has been adjusted to provide a safe distance between your eye and the ocular end of the sight.
- 4 Proper zeroing techniques must always be taken prior to using the sight.

CHAPTER 2: PREPARATION FOR USE & INSTALLATION

2.1 Mounting Sight to Firearm/Eye Relief

Installing the optical sight onto the firearm involves the following steps:

- Ensure that the sight is 9x magnification mode (See Section 2.3).
- Loosen the mounting nuts and place the sight on top of the MIL-STD 1913 rail.

Figure 2-1: Mounting Nuts Lock Sight to MIL-STD 1913 Rail

- ‘Cheek’ the firearm in normal firing position
- Slide the sight along the rail until the correct eye relief is achieved for the user’s natural head position and a full field-of-view is visible through the sight. Approximate eye relief is 74.3mm (2.93”). The field-of-view tunnel effect should be minimized when the eye relief is adjusted properly, producing a circular and sharp image (see Figure 2-2). Note the position of the sight on the rail.

Figure2-2: Proper Eye Relief

- a) Eye shown at proper 74.3mm (2.93”) eye relief distance for rear-most glass surface.
- b) Image through sight is sharp and circular when the eye is placed at or near the proper relief distance (no scope shadow).
- c) Image through sight when eye is too close or too far from optimal viewing distance.

- Mount the sight on the rail at the rail slot which is the closest match with the mount slot bar. Apply forward pressure to the sight to tighten the firearm mounting nuts.
- ‘Cheek’ the firearm at the normal firing position. Verify that the sight is approximately 74.3mm (2.93”) in front of the eye and that full target picture is observed through the sight.
- Mark the sight’s position on the weapon to be used as a further reference point.

2.2 Zeroing

Zeroing the SpecterTR™ aligns point of aim (center of the reticles' crosshairs) with the Point of Impact (POI) of the firearm.

Controls

- Azimuth/Windage zeroing uses the azimuth adjustment dial at the front of the mount. Rotate the azimuth zero dial in the direction of the arrow marked R to move the Point of Impact (POI) to the right; or in the direction of the arrow marked L to move the Point of Impact (POI) to the left. Each click of the azimuth dial moves the Point of Impact by 0.1 Mils [10mm (.39") at 100 meters (109 yards)]

Rotate the Azimuth/Windage adjust using a common item such as flat-head

- Elevation zeroing uses the elevation dial at the bottom rear of the mount. Unlock the zeroing lock (silver tab) by raising it up as it will go. Be sure that the lock pin at the bottom of the zeroing lock is fully disengaged from the elevation dial. Adjust the elevation dial as required. Each click of the elevation dial moves the point of impact by 0.1 Mils [approximately 10mm (.39") at 100 meters (109 yards)]. When the elevation adjustment is complete lower the zeroing lock (silver tab) fully to lock the elevation zero in place. Be sure that the lock pin at the bottom of the zeroing lock is fully engaged into the elevation dial.

A mechanical zero of the sight is recommended so that the optical axis is in the rough alignment with the bore axis of the firearm. This will make zeroing easier to accomplish.

- To achieve a mechanical zero of the sight, adjust the Azimuth Adjustment Dial until the gaps between the mount base and the front of the optical housing are equal. Adjust the elevation dial by raising the silver lock and turning the dial until the sight body is parallel to the rail (See Figure 2-3)

In addition to setting the sight to its mechanical zero, it is recommended that the firearm is bore sighted prior to going on the zeroing range. When done correctly this can save a lot of time and ammunition. Follow steps below to acquire a good bore sight.

- 1 Place the weapon on a stable platform that does not allow for any movement (bench rest, cradle, rucksack).
- 2 Get behind the firearm and along the barrel axis.
- 3 Choose an identifiable object down range (preferably about the same range that you will be zeroing at).
- 4 If possible, look through the barrel and center the object in the bore circle. Otherwise, look parallel to the bore axis and align the firearm with and identifiable object.
- 5 Look through the optic and locate the identifiable object.
- 6 Adjust the windage and elevation until the crosshairs are on the object.
- 7 As necessary, perform safety checks, assemble firearm, follow range procedures and then commence zeroing (first shot should be on paper).

Figures: 2-3: Azimuth / Windage Adjusts

Zeroing should be performed at the magnification that provides the best sight picture in the given conditions. The recommended distance at 100 meters! It is recommended that the marksman fires three to five round groups and make adjustments based upon the geometric center of those groups.

- 1 Look through the sight with proper eye relief and align the aiming point of the center dot onto the center of the target.
- 2 Fire three to five aimed individual rounds (Figure 2-4)
- 3 Determine the approximate center of the group (Figure 2-5)

Figure 2-4: Aimed Fire Shot Group

Figure 2-5: Determine Approximate Center of Group

- 4 Measure the amount of movement required left or right (Azimuth / Windage) to move the center of the Point of Impact (POI) group onto the aimpoint in mm or inches (Figure 2-6).
- 5 To adjust Azimuth/Windage, each click of the Azimuth/Windage dial move the Point of Impact (POI) by 0.1 Mils [approximately 10mm (.39") at 100 meters (109 yards)]. Direction of Point of Impact (POI) change is labeled on the housing next to the Azimuth Adjustment Dial. Table 2.1 is provided to convert mm or inches into 0.1 Mils click of movement for a given target range. Calculate the number of clicks to adjust the Point of Impact (POI) to the aimpoint for your target's range.

Figure 2.6: Adjust Azimuth/Windage or Elevation

Figure 2-7: Adjust Point of Impact (POI) – Azimuth / Windage

- 6 Measure the amount of movement required up or down (elevation) to move the center of the Point of Impact (POI) group onto the aimpoint in mm or inches (Figure 2-6).
- 7 Each click of the elevation dial moved the Point of Impact (POI) by 0.1 Mils [approximately 10mm (.39") at 100 meters (109 yards)]. Table 2-1 is provided below to convert mm or inches into at 0.1 Mils click of adjustment for a given target range.

To adjust elevation:

- Push the elevation zero lock (silver tab) up to disengage.
- When viewing the sight from the rear, rotate the elevation dial right to raise or left to lower the Point of Impact (POI). **Caution: To prevent damage, be sure the lock is fully disengaged before attempting to turn the elevation dial!!!**
- When elevation adjustment is completed, lower the zero lock fully to lock the elevation zero in place. Be sure that the lock pin at the bottom of the zero lock is fully engaged into the elevation dial. **It is important to ensure that the zero lock is pushed back down to lock the elevation zero dial when zeroing is completed.**

Figure 2-8: Adjust Point of Impact (POI) - Elevation

Table 2-1: Point of Impact (POI) Movement per Click Adjustment Azimuth or Elevation

CHAPTER 3: PRINCIPLES OF OPERATION

3.1 Mounting Sight to Firearm/Eye Relief

The SpecterTR™ Optical Sight is unique in provided the shooter with three fields-of-view:

- 1 The first is a 1x sight with 16" field-of-view. 1x magnification together with the red dot illuminated aiming point provides the shooter with an extremely fast, "both eyes open" target acquisition capability.
- 2 The second is a 3x magnified sight with a field-of-view of 5° and an illuminated range-compensating reticle. This magnification provides the shooter with long-range target identification and precision marksmanship capability.
- 3 The third is a 9x magnified sight with a field-of-view of 2° and an illuminated range-compensating reticle. This magnification provides the shooter with long-range target identification and precision marksmanship capability.

To change magnification, rotate the field-of-view switch counter clockwise. Sight 'zero' and eye relief are not affected.

3.2 Reticle and Ranging

The SpecterTR™ reticle provides the shooter with easy to locate aiming marks to designate the target both at short and long ranges. The following are sample illustrations of reticle pattern.

Figure 3-1: Sample Reticle Illustration (Not To Scale)

Describing the sample reticle pattern in Figure 3-1:

- The main horizontal line provides the aiming point for targets at 100 meters. The reticle pattern is designed to be zeroed at 100 meters.
- A 6 MOA red dot is placed at the reticle crosshair center and is designed for use at the 1x optical magnification setting.
- The ballistic drop reticle provides calibrated drop increments of 100 meters. The 400 meter, 600 meter, and 800 meter stadia lines are labelled (see Figure 3-1).
- The 200 meter and 300 meter horizontal stadia lines differ in size and represent a 19" (48.26 cm) wide target at that distance (see Figure 3-1).
- The 400 meter, 500 meter, 600 meter, 700 meter and 800 meter stadia contain a gap. The width of this gap is equal to 19" (48.26 cm) target at that distance (see Figure 3-1).

The calibre of firearm (5.56mm or 7.62mm) is indicated on the reticle as well as the sight.

Reticle Illumination

The SpecterTR™ provides two types of reticle illumination:

- A red dot at the center of the crosshairs
- A Range Estimating and Bullet Drop Compensation Reticle.

Each reticle has multiple brightness settings which can be set by the Reticle Illumination Switch (rotary) on the right side of the sight (see Figure 3-2):

- 1x: Clockwise rotation provides 5 levels of red dot illumination.
- 3x and 9x: Clockwise rotation provides 5 levels of reticle illumination.

The first two settings are night vision equipment compatible.

Figure 3-2: Reticle Illumination Switch Operation

CHAPTER 4: MAINTENANCE

The SpecterTR™ is designed for ruggedness and minimal maintenance. The following sections describe recommended maintenance procedures.

4.1 Preventative Maintenance

Prior to use in the field and every week of use, the following routine maintenance is recommended:

- Inspect the sight for missing or damaged parts.
- Inspect the sight for visual obstructions of target image, dust, dirt, pits or moisture on optical surfaces, and loose or broken optical elements. If these conditions cannot be corrected by cleaning (see Section 4.3), the sight is unsuitable for use.
- Check battery cap – Ensure that the cap is present. Inspect the threads on the battery housing and battery cap for damage, dirt or moisture. Ensure that the rubber washer is present, free of damage and sealed properly. An absent or improperly seated battery cap could lead to a loss of power or shorten battery life.
- Check the reticle – if the reticle does not illuminate, try replacing the battery.
- Verify proper positioning and mounting of the sight (see Section 2-1).

4.2 Changing the Battery

The battery cap is located on the Reticle Illumination Switch. To change the battery:

- Using a tool such as a coin or flat head screw driver, turn the battery cap in a counter-clockwise direction.
- Remove the old battery and dispose of it properly according to your regulations.
- Place a new CR2032 Lithium battery into the compartment with “-“ terminal facing in.
- Replace battery cover (hand tighten only). (see Figure 4-1).

Figure 4-1: Battery Replacement

4.3 Cleaning

Clean the surfaces of the optical sight lenses by using cotton lens paper, microfiber or freshly laundered cheesecloth saturated with alcohol and wipe in a circular motion. Dry the lens by wiping with a clean piece of the same material in the same circular motion from the center outward.

CAUTION

- **DO NOT** use fingers to clean lenses. Apply only a light downward pressure on the cleaning material.
- **DO NOT** immerse the SpecterTR™ sight in solvents.
- If mud or hardened dirt is on or near the lens, flush with cold or warm water and gently wipe with moistened tissue. Repeat the procedure above if necessary.
- **DO NOT** use compressed air to clean the sight.

4.4 Preparation for Shipment

Clean and dry the sight. It is highly recommended that the lens covers be installed to protect the optical elements during shipment.

- For shipment while attached to the firearm, make sure and properly stow the firearm.
- For shipment as an individual sight, reinsert the sight into its original packaging, or equivalent, to cushion against impact and prevent crushing.