Grenadier's Manual for the

WILCOX RAAM™ GSS

Grenadier Sighting System

PN: 67800G01
CAGEC: 004F1

Primary Weapon

Both Options Configurable for Left– or Right-Handed Shooter

OSHA LASER OPERATOR SAFETY REQUIREMENTS

Inside the United States, State and Federal OSHA require the operation of Class 3B laser products to occur only under a formalized laser safety program as defined in ANSI Z136.1 Compliance with OSHA requirements are the sole responsibility of the purchaser / user.

Many countries have similar safety of use requirements. Reference the International IEC 60825 part 14, User's Guide for Laser Safety, outside the US."

FEDERAL RESTRICTIONS ON CLASS 3B WEAPON SIGHTS

[Restriction statement to be inserted following issuance of FDA variance.]

▲ WARNING ▲

You are required to thoroughly read all instructions and product safety information in the Wilcox RAAM GSS Grenadier's Manual before using this product. FAILURE TO COMPLY WITH PROPER INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, INJURY AND/OR DEATH. Wilcox is not responsible for damages resulting from improper use and/or maintenance. Customers may obtain a copy of the Manual by contacting Wilcox Customer Service at 603-431-1331.

This product contains technical data as defined in the International Traffic in Arms Regulations ITAR 22 CRF 120.10. Export of this material is restricted by the Arms Export Control Act 22 U.S.C. 2751 et seq. and may not be exported to foreign persons without prior written approval from the U.S. Department of State.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT'D)

TABLE OF CONTENTS (CONT'D)

TABLE OF TABLES

TABLE OF ILLUSTRATIONS

TABLE OF ILLUSTRATIONS

PREFACE

1. SCOPE. The purpose of this Grenadier's Manual is to assist the Grenadier in the operation of the *RAAM Grenadier Sighting System (Wilcox RAAM ™ GSS), hereby referred to as "RAAM GSS"*.

The information in this manual should not replace the experience of a trained operator. Keep this manual and all safety instructions for future use. The information must be provided to each product user.

2. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATION. Wilcox requests that all errors, omissions, and discrepancies be forwarded to the Program Management Department, Wilcox Industries, Corp., 25 Piscataqua Drive, Newington, NH 03801. To submit feedback by e-mail, visit *www.wilcoxind.com* and click on "Contact Us".

GRENADIER'S MANUAL TO SOFTWARE VERSION CROSS-REFERENCE

When utilizing an older version of the *RAAM GSS* software, it is critical to reference the correct version of the Grenadier's Manual for the software you are using. The following table provides a cross-reference for tracking Manual release revision numbers to software revision releases.

Manual Rev.	Software Rev.
A-1	4.07
A-2	4.07
A-3	4.07

SAFETY SUMMARY

WARNING and CAUTION statements have been strategically placed throughout the text to indicate operating or maintenance procedures, practices, or conditions considered essential to the protection of personnel (WARNING) or equipment and property (CAUTION). NOTES emphasize necessary and important data. CAUTIONS and NOTES appear in the text as applicable. Definitions for WARNINGS, CAUTIONS and NOTES are as follows:

▲ WARNING ▲

Highlights an essential operation or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury to or death of personnel.

■ CAUTION ■

Highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in damage to, or destruction of, equipment or loss of mission effectiveness.

NOTE

Highlights an essential operating or maintenance procedure, condition or statement.

▲ WARNING ▲

Laser Safety

- *The RAAM GSS features Class 3B laser products which emit visible and infrared laser radiation from the front end of the device. Both visible and infrared laser light can be dangerous if misused. Laser light reflected or refracted off mirrored surfaces may be equally harmful.*
  - *Never stare into a laser.*
  - *Never point lasers at someone's eyes.*
  - *Do not aim lasers at personnel or mirrored surfaces.*
  - *Never point the lasers at other persons as Class 3B lasers may cause skin irritation.*
  - *Do not look at a laser through telescopes, binoculars, scopes, image intensifiers, etc.*
  - *Direct eye exposure to a laser may cause permanent eye damage, including blindness. Special glasses for filtering laser light must be used if protection from laser radiation is required.*
- *Visible and infrared laser beams are enhanced by smoke, fog and rain, making them more easily detectable by onlookers or observers. When used in these environments, prolonged activation of the lasers should be avoided.*
- *When adjusting RAAM GSS range, use caution to ensure that lasers are not fired in an unsafe manner.*
- *Caution — Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.*
- *Range display may be compromised when a Low Battery error is displayed. Under such conditions, replace the battery before firing the RAAM GSS.*

▲ WARNING ▲

Usage Safety

- *Wilcox strongly recommends reviewing the operational and maintenance procedures outlined in this manual prior to operating the device.*
- *When mounting the RAAM GSS to a weapon, or to a new rail position, it is necessary to properly boresight the RAAM GSS to the weapon to ensure aiming accuracy.*
- *When handling a Grenade Launcher fitted with a RAAM GSS, ALWAYS keep the muzzle pointed down range and clear of all personnel.*
- *In the event of a detected built-in test failure, contact Wilcox Industries for repair.*
- *Ensure that the weapon is CLEAR and on SAFE before mounting or dismounting the RAAM GSS.*
- *Do not fire the weapon if the RAAM GSS displays a left or right cant indicator, as this is an indication that the RAAM GSS is canted left or right. Firing the weapon when the RAAM GSS is severely canted can cause unintended damage to surrounding targets and may result in injury or death.*
- *For guidance on the proper use of lasers, refer to ANSI Z136.1, "Standard for Safe Use of Lasers", American National Standards Institute.*
- *Do not operate the device if laser covers are missing, if the unit is defective, or if the laser port (aperture) cover or seal is damaged.*

▲ WARNING ▲

Battery Safety

- *Refer to battery manufacturer's instructions for safety warnings.*
- *If the battery compartment becomes hot to touch and you hear a hissing sound (i.e., battery venting) or smell irritating sulfur dioxide gas, IMMEDIATELY turn off the equipment. Wait until battery has cooled before removing it, then replace with a fresh battery.*
- *DO NOT use water to extinguish lithium battery fire.*

■ CAUTION ■

Battery Safety

- *Do not store the RAAM GSS with battery installed.*
- *When opening or closing the battery compartment, ensure that moisture is not allowed into the compartment.*
- *It is recommended that the battery be replaced and that activation procedures for the RAAM GSS be conducted prior to operation to ensure proper operation prior to use (see Section 4.2).*

Laser Safety

- *It is recommended that the Visible Laser be used for boresighting the RAAM GSS to the target. Always remember to remove the borelight after boresighting the RAAM GSS.*

NOTE

Usage Safety

- *This Grenadier's Manual should always accompany the product and be transferred with it upon change of ownership.*
- *Ensure that the Mode Selection Knob is set to the 'OFF" position when not in use to avoid inadvertent battery drain.*
- *Ammo storage temperature may affect round travel. For optimized accuracy, RAAM GSS and ammunition ambient temperature should be the same.*
- *A Laser Boresight Kit is required for optimal zeroing to the weapon.*
- *If the Lens Cover is not removed before the RAAM GSS is activated and the unit is configured for automatic display brightness, the display may be too dim to read. Refer to Section 3.3.1 for instructions on resetting display brightness.*
- *After 10 minutes of inactivity, the RAAM GSS will go into sleep mode. The lasers will be deactivated when sleeping and will stay off after waking. Pressing any button, rotating the sight or moving any switch will awaken the RAAM GSS.*
- *For guidance on the proper use of lasers, refer to ANSI Z136.1, "Standard for Safe Use of Lasers", American National Standards Institute.*

NOTE

- *To obtain the most accurate boresight, strike the buttstock of the M4 or M320 firmly against the ground to settle in the adjusters and rotate the RAAM GSS Sighting Module against the hard stop a couple of times, keeping the muzzle pointed away from yourself or others, prior to final boresight adjustments.*
- *When performing a Built-In Test, a failure of the accelerometer can occur if the unit is experiencing movement or vibration. If a failure is noted hold the RAAM GSS stable and reperform.*
- *When the Night Mode timer times out, the display is blanked of all information except the laser on/off state in laser switch positions.*

Maintenance Safety

- *Do not use harsh abrasives or chemicals such as acetone to clean the RAAM GSS. Any questions about appropriate chemicals should be directed to Wilcox Customer Service.*
- *The RAAM GSS contains no serviceable internal parts. Adjustments or attempted repairs to the RAAM GSS other than those expressly described in this Grenadier's Manual are to be performed by a Wilcox Factory Technician or will otherwise void the warranty.*

Battery Safety

- *Periodically inspect the Battery Compartment o-ring. If a Battery Compartment Cap o-ring becomes cut, nicked or torn, notify unit armorer.*

LASER RADIATION OUTPUT PARAMETERS

Table S1-1 *RAAM GSS Worst Case* Laser Safety Parameters

RAAM GSS WORST CASE LASER SAFETY CALCULATIONS					
Laser Safety Specifications*	**Vis Aiming**	**IR Aiming**		**IR Illuminator**	
	Low	**Low**	**High**	**Low**	**High**
Wavelength [nm]	640	840		840	
Divergence [1/e] (mrad)	0.28	0.28		21	
Maximum Output Power [mW] **	<0.7	<0.7	36	<0.7	36
NOHD [m]	0	0	173	0	2
OD	0	0	1.7	0	1.7
NOHDe*** [m]**	0	0	1018	0	14
ODe***	0	0	1.6	0	1.6

*This table is intended for laser safety guidance. Values in table exceed the set nominal values of the laser product.
** Maximum output power per laser. Total output will be higher in Dual High mode due to the additive maximum output of selected lasers.
***NOHDe and ODe are calculated using standard 7x50 Binoculars as the aided viewing optics.

Table S1-2 *RAAM GSS Product Performance Specifications*

RAAM GSS PRODUCT PERFORMANCE SPECIFICATIONS					
	Vis Aiming	**IR Aiming**		**IR Illuminator**	
	Low	**Low**	**High**	**Low**	**High**
Wavelength [nm]	640	840		840	
Divergence [1/e] (mrad)	0.28	0.28		21	
Nominal Output Power (mW)*	<0.7	<0.7	30	<0.7	30

*Nominal Output Power is subject to +/-10% tolerance

SYMBOLS

Table S1-3. *RAAM GSS* Product Symbols

	*WARNING – VISIBLE AND INVISIBLE LASER RADIATION AVOID EXPOSURE TO BEAM CLASS 3B LASER PRODUCT

SECTION 1

OVERVIEW

1.1 GENERAL SAFETY WARNINGS

The *RAAM GSS* should not be used by anyone unfamiliar with its operation.

This manual contains specific operating and maintenance instructions which the Grenadier should become familiar with before actual field usage.

The Safety Warnings in this Grenadier's Manual are intended to point out the dangers that are common in handling this type of equipment. **Failure to observe any of these warnings may result in serious physical injury, blindness, or death.** You must familiarize yourself with the entire contents of this Grenadier's Manual before using the *RAAM GSS.* All general text, WARNINGS, CAUTIONS and NOTES should be strictly followed.

This Grenadier's Manual is intended to provide you with information relevant to the operation of the *RAAM GSS* and is not a substitute for the information contained in the Grenadier's and Maintainer's Manual issued by the manufacturer of any Grenade Launcher to which it is attached. It is the responsibility of the Grenadier to read and thoroughly understand the handling and operating procedures for both the *RAAM GSS* and the weapon to which it is installed.

First Aid

Administer first aid in accordance with local procedures.

Laser Radiation Danger

When using the visible or infrared flood or laser of the *RAAM GSS*, or when ranging, the lasers and range finder built into the *RAAM GSS* emit visible and/or infrared laser radiation from the front end of the device (see Section 2.6 for technical data). Both visible and infrared laser light can be dangerous if misused. **Direct eye exposure may cause permanent eye damage, including blindness.** Laser light reflected or refracted off mirrored surfaces may be equally harmful.

- Never stare into a laser beam.
- Never point a laser beam at someone's eyes.
- Do not point a laser beam at personnel or mirrored surfaces.
- Do not look at a laser beam through telescopes, binoculars, scopes, image intensifiers, etc.

The *RAAM GSS* features a Laser Safety Label (see Figure S1-1) and Product Identification Label (see Figure S1-2). Note that the laser radiation warning as displayed on the Laser Safety Label reflects maximum additive laser output in dual high mode.

WARNING - VISIBLE AND INVISIBLE LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT

Figure S1–1. Laser Safety Label

Figure S1–2. *RAAM GSS* Product Identification Label

First Aid

Administer first aid in accordance with local procedures.

1.2 MODEL NUMBER AND EQUIPMENT NAME

67800G01 *RAAM GSS*

1.3 MANUFACTURER

Wilcox Industries Corp
25 Piscataqua Drive
Newington, NH 03801 USA

1.4 PURPOSE OF EQUIPMENT

The *RAAM GSS* is a lightweight fire control system for a grenade launcher that attaches to the 0300 or 0900 positions of the MIL-STD-1913 rail mounted to a primary weapon. It provides a daytime fighting capability utilizing an illuminated expanded reticle and a nighttime fighting capability through the use of an infrared aiming laser. It utilizes a number of sensors and inputs to calculate the range to target based on a selected firing table. This range is based on the operator set angle of the sight with the solution point of impact being the foot of the target.

SECTION 2

INTRODUCTION

2.1 PRODUCT DESCRIPTION

The Wilcox *RAAM GSS* is a lightweight fire control system (FCS) that features a built-in ballistic computer. It provides a shooting solution for the target distance selected by the grenadier. The user simply selects the grenade ammunition type from the stored ballistic solutions from the *RAAM GSS* menu or pre-programmed 2 position switch quick ammunition selector; this tailors the point of aim and point of impact for the selected ammunition.

Rotating the *RAAM GSS* sets the angle aiming references and corresponding target distance is displayed for the selected ammunition. The *RAAM GSS* features an environmentally stable optical bench with integral reflex sight (with back-up iron sight) for daytime use as well as near infrared (NIR) aiming laser and NIR illuminator for use in conjunction with night vision goggles.

The *RAAM GSS* features a daytime reticle and a red dot sight with illuminated expanded reticle. A lightweight mount easily attaches to the 0300 or 0900 positions of the MIL-STD-1913 rail mounted to a primary weapon. The *RAAM GSS* provides nighttime fighting capability through the use of an infrared aiming laser.

A Rail Mount Assembly is designed to attach to the left or right side of the *RAAM GSS* Sighting Module to accommodate left or right hand mounting to a weapon.

A standalone bracket may be purchased for mounting to a grenade launcher, subject to availability. For further information on standalone brackets, contact Wilcox Customer Service at 603-431-1331.

NOTE

Ammo storage temperature may affect round travel. To avoid discrepancies in accuracy, store ammo with the RAAM GSS.

2.2 LIST OF *RAAM GSS* MAJOR COMPONENTS

1. *RAAM GSS*
2. Lens Cover
3. Carrying Pouch

Figure 2.2–1 Major Component Identification

2.3 LIST OF *RAAM GSS* SUB-COMPONENTS AND FEATURES

R-1.	*RAAM GSS* Sighting Module
R-2.	Windage Adjustment Knob
R-3.	Mode Selection Knob
R-4.	Elevation Adjustment Knob
R-5.	Cant Indicators
R-6.	Lock-Out Screw
R-7.	Rail Mount Assembly
R-8.	Rail Clamp Screw
R-9.	Mode Indicator
R-10.	Battery Indicator
R-11.	Ammo Table Indicator
R-12.	Display
R-13.	Infrared Aiming Laser Port (Aperture)
R-14	Visible Aiming Laser Port (Aperture)
R-15.	Infrared Flood Port (Aperture)
R-16.	Battery Compartment & Cap
R-17.	Communication Port
R-18.	Left Button
R-19.	Center Button
R-20.	Right Button
R-21.	*RAAM GSS* Cradle
R-22.	Red Dot Sight
R-23.	Ammo Quick Select Switch
R-24.	Backup Range Indicator
R-25.	Laser Warning Labelling
R-26.	Battery Orientation Marking
R-27.	Lockout Screw Storage Port
R-28.	Iron Sights
R-29	Hardstop
R-30.	*RAAM GSS* Product Identification Label

S-1.	Boresight Chart
S-2.	*RAAM GSS* Grenadier's Manual
S-3.	*RAAM GSS* Quick Reference
S-4.	Cleaning Brush
S-5.	Cleaning Cloth
S-6.	Hex Keys (2)

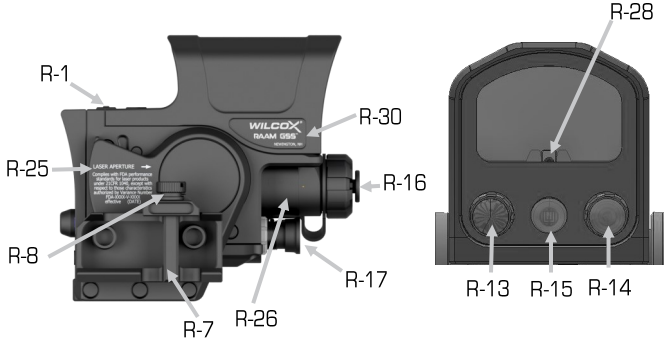


Figure 2.3–1 Sub-Component Identification - *RAAM GSS* (1 of 3)

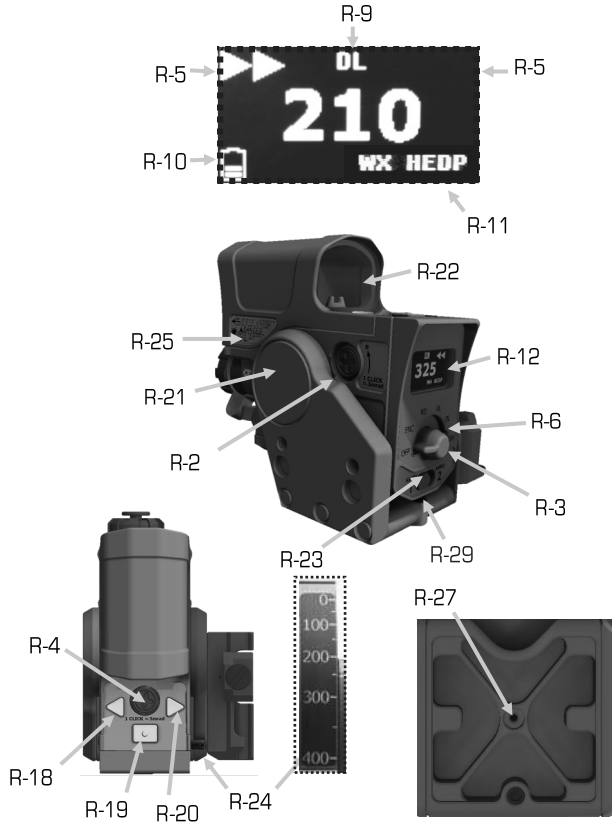
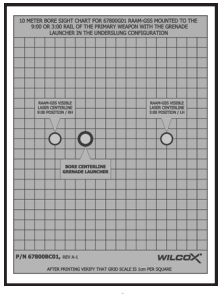


Figure 2.3–2 Sub-Component Identification - *RAAM GSS* (2 of 3)

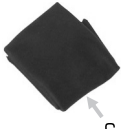


S-1

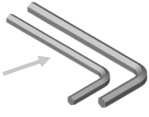
S-2

S-3

S-4



S-5



S-6

Figure 2.3–3 Sub-Component Identification - *RAAM GSS* (3 of 3)

2.4 DESCRIPTION OF *RAAM GSS* MAJOR COMPONENTS

1. *RAAM GSS* Module

The *RAAM GSS* features a pivoting Sighting Module that allows the grenadier to set the *RAAM GSS* to the approximate elevation angle for the acquired target distance. An Infrared Aiming Laser and IR Flood Illuminator provide invisible targeting at night when used with NVGs. A Red Dot Sight accommodates daytime target acquisition. One (1) commercial 1.5 Volt AA battery powers the *RAAM GSS* (Energizer Ultimate L91 AA recommended). The *RAAM GSS* mounts to the weapon by means of a removable rail grabber for ambidextrous mounting.

2. Lens Cover

When the *RAAM GSS* is not being used, the Lens Cover mounts over the sight windows to keep the optics clean and to prevent accidental laser emissions.

3. Carrying Pouch

A Carrying Pouch is provided for stowing the *RAAM GSS* when not in use.

2.5 DESCRIPTION OF *RAAM GSS* SUB-COMPONENTS

R-1. *RAAM GSS* Sighting Module

The *RAAM GSS* Sighting Module comprises the main pivoting body of the *RAAM GSS* sight. It allows the grenadier to approximate the elevation angle required for engaging targets at known distances by simply rotating the module until the displayed range matches the target range.

R-2. Windage Adjustment Knob

A Windage Adjustment Knob allows for windage adjustment when boresighting or Zeroing the *RAAM GSS* to the weapon and maintains its setting until reset by the grenadier. All Lasers and the Red Dot Sight move together when adjusting Windage. For information on adjusting Windage, refer to the Boresighting Procedure in Section 3.4.

R-3. Mode Selection Knob

A Mode Selection Knob allows the Grenadier to select up to five functional modes. The Display indicates the selected operational mode (see Table 2.5-1).

Table 2.5-1. Mode and Menu Function Options Tree

KNOB POSITION	SUBMENU OPTION	MODE / FUNCTION DESCRIPTION
OFF		*RAAM GSS* Power Off
FNC		Function Menu Options (Refer to Section 3.3)
	Display Bright	*Adjust Display Brightness - Automatic, Night Mode, or M 1 Manual, Dimmest) through M 8 (Manual, Brightest) (Dft = Automatic)*
	Ammo 1 Set	*Assign Firing Table to Ammo 1 Quick Select switch position: WX HEDP, WX Prac (Dft = First Table Stored on Unit)*
	Ammo 2 Set	*Assign Firing Table to Ammo 2 Quick Select switch position: WX HEDP, WX Prac (Dft = Second Table Stored on Unit)*
	Reticle Shape	*Select Reticle Shape: Dot and Circle, Dot and Sides, Dot Only, Circle Only (Dft = Dot and Circle)*
	Boresight	*Activates the Visible Red Laser for Boresighting: Enable (Activates Red Laser), Disable (Dft = Disable)*
	IR Laser Cant	*Enables or Disables Blink of the IR Aiming Laser When the Laser is Active and the Weapon is Canted: Enable/Disable (Dft = Enable)*
	Built In Test	*Run Built In Test*
	Atmos Comp	*Atmospheric Compensation Enable/Disable (Dft = Enable)*
	Set Defaults	*Reset Persistent Storage to Factory Default (Dft = Do Not Change)*
	Event Log	*Display RAAM GSS Log of System Events*
	About…	*Displays the Software Version, Hardware Version, Battery Percentage and the version and date stamp for each ammo table.*
RD		Red Dot Sight Operation: On, Off and Brightness Adjustment
AL		Aiming Low Power: IR Aiming Laser, Low Power On and Off
DL		Dual Low Power: IR Aiming Laser and Illuminator Low Power On and Off
DH		Dual High Power: IR Aiming Laser and Illuminator High Power On, Off and Power Adjustment (Can be Locked Out using Blue Lockout Screw)

R-4. Elevation Adjustment Knob

An Elevation Adjustment Knob allows for elevation adjustment when boresighting or Zeroing the *RAAM GSS* to the weapon and maintains its setting until reset by the grenadier. All Lasers and the Red Dot Sight move together when adjusting elevation. For information on adjusting Elevation, refer to the Boresighting Procedure in Section 3.4.

R-5. Cant Indicators

Two Cant indicators are located on either side of the Display to warn the grenadier that the *RAAM GSS* is canted left or right and should be brought back to level. One indicator appears on the left of the display ("►►"), informing the grenadier that the system is canted too far left. The other appears on the right of the display ("◄◄"), informing the grenadier that the system is canted too far right. The arrows point to the direction the system needs to be rotated to return the *RAAM GSS* to a level orientation.

Additional cant indication is provided using the left and right arc segments of the reticle when active, and by blinking the IR aiming laser when active.

R-6. Lock-Out Screw

A removable Lock-Out Screw prevents the Mode Selection Knob from rotating to the Dual High Power Laser (DH) mode when it is desired to prevent mode access. When the Lock-Out Screw is not installed, it can be stored in the Lock-Out Screw Storage Port.

R-7. Rail Mount Assembly
The fixed Rail Mount attaches to either side of the *RAAM GSS* and features a Rail Clamp Screw that mounts to the MIL-STD-1913 rail.

R-8. Rail Clamp Screw
When the Rail Mount Assembly is attached to the *RAAM GSS*, the Rail Clamp Screw allows for attachment of the rail mount to the MIL-STD-1913 rail of the weapon.

R-9. Mode Indicator
The Mode Indicator displays the laser operation mode, as selected on the Mode Selection Knob.

R-10. Battery Indicator
The Battery Indicator displays approximate battery life. For a more precise indication of battery life, use the "About" menu option, found in the "Function Menu".

R-11. Ammo Table Indicator
Indicates the active ammo table used for calculating the ballistic range. The table corresponds to the current Ammo Quick Select Switch position (see Sections 3.3.2 and 3.3.3).

R-12. Display
The Display provides feedback indicators, status and operational information based on the mode selected.

R-13. Infrared Aiming Laser Port (Aperture)

The *RAAM GSS* features an Infrared Aiming Laser that can be used as a covert target designator while wearing NVGs. Refer to Sections 1.1 and 2.6 for laser specifications.

Cant is indicated when the IR Aiming Laser blinks; when the Aiming Laser displays solid, the system is level. See Section 3.5 for a description of cant indication.

R-14. Visible Aiming Laser Port (Aperture)

The *RAAM GSS* features a red Visible Aiming Laser, that is used as a boresighting aid. Refer to Sections 1.1 and 2.6 for laser specifications.

R-15. Infrared Fixed Flood Laser Port (Aperture)

The *RAAM GSS* features an Infrared Fixed Flood Laser that can be used as a covert target illuminator while wearing NVGs. Refer to Sections 1.1 and 2.6 for laser specifications.

R-16. Battery Compartment & Cap

The battery compartment houses one (1) commercial AA battery. Refer to Section 4.2 for battery installation instructions.

R-17. Communication Port

In the Red Dot and Laser Modes, the Communication Port transmits range and environmental data for use by remote equipment.

R-18 / R-19 / R-20. Left / Center / Right Buttons

The Left, Right and Center Buttons are multi-purpose buttons that operate differently depending on the selected mode of operation (see Table 2.5-2 for individual mode operation).

R-21. *RAAM GSS* Cradle

The *RAAM GSS* Cradle holds the *RAAM GSS* Sighting Module and allows it to pivot to the required angle for targeting.

Table 2.5-2. Button Operations (by Mode)

Mode Selection Switch Positions	Left Button Operation	Center Button Operation	Right Button Operation
Laser Modes: **DH DL AL**	**Single Press:** Decreases laser power in DH mode when the laser is turned on. The selected power level persists through RAAM GSS power cycling.	**Single Press:** Active Laser On/Off.	**Single Press:** Increases laser power in DH mode when the laser is turned on. The selected power level persists through RAAM GSS power cycling.
Red Dot Mode: **RD**	**Single Press:** Dims the red dot.	**Single Press:** Turns the red dot On/Off.	**Single Press:** Brightens the red dot.
Function Menu: **FNC**	**Single Press:** Scroll up through available options.	**Single Press:** Select currently highlighted option.	**Single Press:** Scroll down through available options.

R-22. Red Dot Sight

The Red Dot Sight provides an expanded reticle which can be used for scaling objects to approximate target distances. The outer ring of the reticle is 34 MOA, which when filled corresponds to a man at 200 meters. The sight features eight (8) available brightness settings that can be manually adjusted by pressing the Left or Right Buttons while in Red Dot (RD) mode.

R-23. Ammo Quick Select Switch

The Ammo Quick Select Switch provides access to two preselected, Wilcox proprietary firing tables that are used in the ballistic calculations. This allows the grenadier to easily toggle between two preloaded ammunition types: Ammo 1 and Ammo 2. Refer to sections 3.3.2 and 3.3.3 to configure the switch settings from the loaded firing tables. To change the loaded firing tables, see your unit armorer.

R-24. Backup Range Indicator

A Backup Range Indicator provides the operator with a secondary sighting option when the *RAAM GSS* is powered off. The backup indicator ranges are based on the average of the low velocity firing tables and may not be as accurate as the ballistic range calculated by the *RAAM GSS*.

R-25. Laser Warning Labelling

A warning label identifies the laser specifications, exemptions and precautions for using the *RAAM GSS*.

R-26. Battery Orientation Marking

The Battery Orientation Marking indicates the proper direction for installing new batteries.

R-27. Lock-Out Screw Storage Port

A small threaded storage port prevents loss of the screw when not in use.

R-28. Iron Sights

The iron sights provide the grenadier with a backup aiming option.

R-29. Hardstop

The hardstop is the mechanical zero "0" position for the *RAAM GSS*. When the bottom of the *RAAM GSS Sighting Module* is rotated against the hardstop, this establishes the zero position for boresighting.

R-30. *RAAM GSS* Product Identification Label

The Product Identification Label Identifies the Manufacturer and the Product Name.

S-1. Boresight Chart

The *RAAM GSS* kit features a Boresight Chart for use in boresighting the *RAAM GSS* in the left-hand and right-hand configurations.

S-2. *RAAM GSS* Grenadier's Manual

A printed copy of the *RAAM GSS* Grenadier's Manual outlines the operation of the *RAAM GSS*.

S-3. *RAAM GSS* Quick Reference

A printed copy of the *RAAM GSS* Quick Reference summarizes *RAAM GSS* operation and is designed to be taken out into the field for quick reference. It is printed on water resistant paper to resist environmental degradation.

S-4. Cleaning Brush

A cleaning brush is provided for removing loose dirt and debris from the mechanical components of the *RAAM GSS*. DO NOT use the brush for cleaning the lenses as this may scratch the lens surface. For cleaning instructions, refer to Section 4.1.

S-5. Cleaning Cloth

A cleaning cloth is provided for removing any remaining residue from the lenses after they have been blown clean of dirt and dust. For cleaning instructions, refer to Section 4.1.

S-6. Hex Keys (2)

Two Hex Keys are provided: one 5/64 for attaching and detaching the blue Lockout Screw to the *RAAM GSS*, and one 5mm for attaching the Rail Mount Assembly to the *RAAM GSS*.

2.6 TECHNICAL DATA

Table 2.6-1. Technical Data

WEIGHT AND DIMENSIONS	
Operational Weight (with battery and Lens Cover)	< 312 gr, 11 oz
Operational Dimensions	2.60" W x 3.79" D x 3.63" H (6.61cm W x 9.63 cm D x 9.22 cm H)
LASER SPECIFICATIONS	
Visible Aiming Laser	Visible Red Laser, <0.7 mW Max Output 640nm Collimated to 0.3 mrad (1/e)
IR Aiming Laser LO	Infrared Laser, <0.7 mW Max Output 840 nm Collimated to 0.3 mrad (1/e)
IR Aiming Laser HI	Infrared Laser, 36mW Max Output 840 nm Collimated to 0.3 mrad (1/e)
IR Fixed Flood LO	Infrared Laser, < 0.7 mW Max Output 840 nm Collimated to 21 mrad (1/e)
IR Fixed Flood HI	Infrared Laser, 36 mW Max Output 840 nm Collimated to 21 mrad (1/e)
RANGE SPECIFICATIONS	
40mm Ballistic Range Capability	Minimum Range 50 Meters Maximum Range Specified by Firing Table
Operating Temperature Range	-40° F (-40° C) to 140° F (60° C)
Storage Temperature Range	-50° F (-45.6° C) to 160° F (71° C)
ADDITIONAL SPECIFICATIONS	
Power Source	One (1) AA Battery Powers the Full System (Energizer Ultimate L91 Lithium Preferred; Alkaline Acceptable but with Diminished Performance)
Display	128 x 64 Pixel OLED
Color	Black Matte Finish
Water Resistance	Waterproof to 1 Meter for 30 Minutes

SECTION 3

OPERATION

3.1 MOUNTING AND DISMOUNTING THE *RAAM GSS*

The *RAAM GSS* features a Rail Mount Assembly that allows the *RAAM GSS* to attach to the MIL-STD-1913 rail of the primary weapon.

Two (2) removable bolts allow for attachment of the Rail Mount Assembly to the *RAAM GSS*.

To Attach the Rail Mount Assembly to the *RAAM GSS:*

Step 1.) Position the flat of the Rail Mount Assembly against the *RAAM GSS* so that the bolt holes of the Rail Mount Assembly are aligned with the Cradle, as depicted in Figure 3.1-1.

Step 2.) Insert the two hex bolts provided with the Rail Mount Assembly and lightly thread the screws for retention.

Step 3.) Finish threading the bolts CW with the 5mm Hex Torque key. When the bolts no longer turn by hand, turn with the hex key one additional quarter turn.

Figure 3.1–1 Attaching the Rail Mount Assembly to the *RAAM GSS* *(Depicted for mounting to 0900 Rail Position for Right-Handed User)*

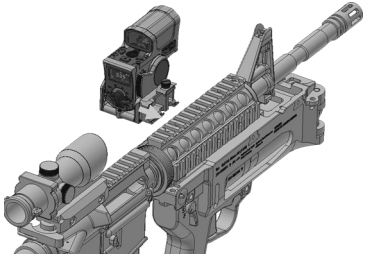
To Mount the *RAAM GSS* to the Primary Weapon using the Rail Mount Assembly:

▲ WARNING ▲

Ensure that the weapon is CLEAR and on SAFE before proceeding, in accordance with its Operator's Manual.

STEP 1:
Loosen the Rail Clamp Screw CCW on the Rail Mount Assembly.

STEP 2:
Attach the bottom Rail Grabber to the bottom edge of the side rail of the weapon and pivot inward to catch the top rail.



STEP 3:
Tighten the rail clamp screw by hand CW. Turn the screw another half of a turn CW.

Do not overtighten the Adjustment Screw.

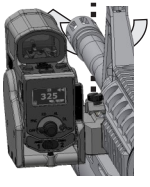


Figure 3.1–2 Mounting the *RAAM GSS* to the MIL-STD-1913 Rail (0900 Mounting Depicted)

To Dismount the *RAAM GSS* from the Primary Weapon:

Holding the *RAAM GSS* firmly in one hand, follow steps for mounting in reverse.

3.2 POWERING ON THE *RAAM GSS*

To Power On the *RAAM GSS* :

Step 1.) Rotate the Mode Selection Knob to select the desired mode of operation. When the power is on in any mode, the Display illuminates. The active mode of the laser is displayed on the top of the screen (see Figure 3.2-1).

If the *RAAM GSS* display indicates that a low battery condition exists when powered on, replace the battery as described in Section 4.2.

3.3 CONFIGURING USER FUNCTION SETTINGS

The *RAAM GSS* provides a Function Menu that allows the grenadier to display and/or configure a variety of *RAAM GSS* attributes (see Table 2.5-1). Left and Right Buttons scroll through menu options; the Center Button selects the highlighted menu option.

Figure 3.3–1 Function Menu

3.3.1 Setting Display Brightness

The "Display Bright" function allows the grenadier to set the display brightness to automatically dim and brighten in accordance with ambient light, or to a manually set value.

Automatic sets the display brightness based on light sensor input.

Night Mode sets display brightness to **M 1** (Dimmest), and starts a timer to blank most of the display after 10 seconds of inactivity. Additionally, **Night Mode** changes the **Reticle Shape** to **Dot Only**, changes reticle brightness to dimmest, and changes IR Aiming Laser and Illuminator to the dimmest power step. These other parameters, **Reticle Shape**, reticle brightness, and laser power step, can be changed by the operator in the normal way while still in **Night Mode**.

NOTE

When the Night Mode timer times out, the display is blanked of all information except the laser on/off state in laser switch positions. Press any button to awaken the display.

To Set Display Brightness:

Step 1.) Set the Mode Selection Knob to the FNC position. "Function Menu" appears on the display.

Step 2.) Press the Left or Right Button until "Display Bright" is highlighted, then press the Center Button to select.

Step 3.) Brightness settings are "Automatic". "Night Mode" and "M 1" (dimmest manual setting) to "M 8" (brightest manual setting). Press the Left or Right Button until the desired option is highlighted. The default setting is "Automatic" which covers brightness levels from "M 3" to "M 8".

Step 4.) Press the Center Button to save the highlighted setting and return to the Function Menu.

Step 5.) If the display brightness is manually set and too dim to read, turn the Mode Selection Knob to the FNC position and press both left and right buttons at the same time for 5 seconds to return to automatic brightness control.

3.3.2 Assigning Firing Tables 1 and 2

The "Ammo 1 Set" and "Ammo 2 Set" functions allow the grenadier to assign one of the installed firing tables to the Ammo 1 and 2 Quick Select Switch positions. See your unit armorer to install additional firing tables.

To Assign the Firing Table to a Switch Position:

Step 1.) Set Mode Selection Knob to the FNC position. "Function Menu" appears on the display.

Step 2.) Press the Left or Right Button until "Ammo 1 Set" or "Ammo 2 Set" is highlighted, then press the Center Button to select.

Step 3.) Press the Left or Right Button to scroll through the currently loaded tables until the desired ammo table is highlighted.

Step 4.) Press the Center Button to save this setting for the selected switch position, and return to the Function Menu.

3.3.3 Changing Reticle Shape

The "Reticle Shape" function allows the operator to choose from one of four reticle shape options for display within the Red Dot Sight.

To Change the Reticle Shape:

Step 1.) Set Mode Selection Knob to the FNC position. "Function Menu" appears on the display.

Step 2.) Press the Left or Right Button until "Reticle Shape" is highlighted, then press the Center Button to select.

Step 3.) Press the Left or Right Button to scroll through the currently loaded reticle shapes until you have illuminated the desired reticle option.

Step 4.) Press the Center Button to save this setting for the selected switch position, and return to the Function Menu.

Step 5.) Rotate the Mode Selection Knob to the "RD" position and verify that the reticle appears as desired.

Table 3.3-2. Reticle Options

Reticle Type	Description
Dot and Circle (Default)	Best used for daytime engagements. Dot and full circle illuminated.
Dot and Sides	Best used for daytime or low light conditions. Dot and two side arc segments illuminated.
Dot Only	Best used for low light or nighttime engagements to minimize signature. Dot illuminated with side arc segments flashing for cant indication purposes only.
Circle Only	Best used for daytime engagements. Only the outer arc segments are illuminated.

3.3.4 Activating Boresight Mode

The "Boresight" function allows the grenadier to activate the visible red laser for boresighting. This is the preferred method for boresighting.

To Activate Boresight Mode:

Step 1.) Set Mode Selection Knob to the FNC position. "Function Menu" appears on the display.

Step 2.) Press the Left or Right Button until "Boresight" is highlighted.

Step 3.) Press the Left or Right Button until "Enable" is highlighted, then press the Center Button to activate

the visible red laser. The Boresight screen displays (see Figure 3.3-2).

Step 4.) Rotate the sight to the zero position and perform boresighting as instructed in Section 3.4.

Step 5.) Press the Center Button to deactivate the visible red laser and return to the Function Menu.

Figure 3.3–2 Boresight Screen

3.3.5 Enabling or Disabling Cant Indication on the IR Laser

The "IR Laser Cant" option allows the operator to enable or disable the blink of the IR Aiming Laser when the system is canted and the IR Aiming Laser is active.

To Perform a Enable or Disable:

Step 1.) Set Mode Selection Knob to the FNC position. "Function Menu" appears on the display.

Step 2.) Press the Left or Right Button until "IR Laser Cant" is highlighted.

Step 3.) Press the Left or Right Button until the desired option ("Enable" or "Disable") is highlighted.

Step 4.) Press the Center Button to select the option and return to the Function Menu.

3.3.6 Performing a Built-In Test

The "Built In Test" function allows the grenadier to perform tests against the internal hardware to ensure proper operation. It consists of multiple test steps and a message is displayed at each step.

NOTE

While performing a Built-In Test, a failure of the accelerometer can occur if the unit is experiencing movement or vibration. If a failure is noted hold the RAAM GSS stable and repeat the test.

To Perform a Built-In Test:

Step 1.) Ensure that the *RAAM GSS* is fitted with fresh batteries.

Step 2.) Ensure the unit is upright and stationary during execution of these tests.

Step 3.) Set Mode Selection Knob to the FNC position. "Function Menu" appears on the display.

Step 4.) Press the Left or Right Button until "Built In Test" is highlighted, then press the Center Button to select.

Step 5.) Press the Left or Right Button to step through the tests until the final screen is displayed. The final

screen will display "Done Testing All Automatic Tests [Passed/Failed]". Note: if you continue to press the Left or Right button, testing will be repeated.

Step 6.) To exit the Built-In Test at any time, press the Center Button.

3.3.7 Setting Atmospheric Compensation On/Off

The "Atmos Comp" function allows the grenadier to enable or disable the use of temperature and pressure compensation when performing ballistic calculations.

To Set Atmospheric Compensation On/Off:

Step 1.) Set Mode Selection Knob to the FNC position. "Function Menu" appears on the display.

Step 2.) Press the Left or Right Button until "Atmos Comp" is highlighted, then press the Center Button to select.

Step 3.) Press the Left or Right Button until either "Enable" or "Disable" is highlighted as desired. "Enable" turns on usage of the temperature and pressure compensation, and "Disable" turns this off.

Step 4.) Press the Center Button to save this setting and return to the Function Menu.

3.3.8 Setting Factory Defaults

The "Set Defaults" function allows the grenadier to restore *RAAM GSS* settings to those set at the factory.

To Restore Factory Defaults:

Step 1.) Set the Mode Selection Knob to the FNC position. "Function Menu" appears on the display.

Step 2.) Press the Left or Right Button until "Set Defaults" is highlighted, then press the Center Button to select.

Step 3.) Select "Do NOT Change" to return to the Function menu without changing anything. Or, "Select Save Defaults" to restore all settings to the factory defaults.

Step 4.) If "Save Defaults" was selected, rotate the Mode Selection Switch to the "OFF" position. The *RAAM GSS* is now reset and restoration is now complete.

Figure 3.3–3 Factory Defaults Screens

3.3.9 Displaying the Event Log

The "Event Log" function displays up to three (3) events, categorized by their criticality from low to high as follows: "I" = Informational, "W" = Warning, and "E" = Error. Warning and error events will cause a highlighted "e" to display above the battery indicator. Refer to Section 4.6 for code definition.

To Display the Event Log:

Step 1.) Set the Mode Selection Knob to the FNC position. "Function Menu" appears on the display.

Step 2.) Press the Left or Right Button until "Event Log" is highlighted, then press the Center Button to display the Event Log:
Event 1: The first event since the last Power On.
Event 2: The next event, or the first higher level event.
Event 3: The most recent highest level event.

Step 3.) Press the Center Button to exit and return to the Function Menu.

3.3.10 Displaying the About Screen

The "About…" function allows the grenadier to display the software and hardware revisions, the percentage of remaining battery life, and the version and date stamp for each installed ammo table.

To Display the About Screen:

Step 1.) Set Mode Selection Knob to the FNC position. "Function Menu" appears on the display.

Step 2.) Press the Left or Right Button until "About…" is highlighted, then press the Center Button to select.

Step 3.) Press the Center Button to select and display the software and hardware revisions, and the remaining battery life.

Step 4.) Press the Left or Right Button to scroll through the installed ammo tables to display the version and date stamp of each.

Step 5.) Press the Center Button to exit and return to the Function Menu.

3.4 BORESIGHT PROCEDURE (ESTABLISHING THEORETICAL ZERO WITH A LASER BORESIGHT KIT)

The laser boresight procedure uses a borelight to determine the theoretical centerline of the Grenade Launcher bore. The lasers and the Red Dot Sight are co-aligned at the factory and are all adjusted simultaneously. Whenever possible, follow with live fire to verify aiming accuracy.

▲ WARNING ▲

When mounting the RAAM GSS to a weapon, or to a new rail position, it is necessary to properly boresight the RAAM GSS to the weapon to ensure aiming accuracy.

■ CAUTION ■

The illuminating beam of the laser emitting from the RAAM GSS indicates the area of round impact, provided the boresighting procedures have been properly followed. Be aware of the direction in which the Grenade Launcher is pointed, as well as the direction of the intended target, prior to firing a round.

NOTE

To obtain the most accurate boresight, hit the buttstock of the weapon or Grenade Launcher firmly against the ground to settle in the adjusters and rotate the RAAM GSS Sighting

Module against the hard stop, keeping the muzzle pointed away from yourself or others, a couple of times prior to final boresight adjustments.

NOTE

It is recommended that the Visible Laser be used for boresighting the RAAM GSS to the target. Always remember to remove the borelight after boresighting the RAAM GSS.

Laser Boresight Procedure:

Step 1.) Ensure the weapon is stable and square to the ground. If possible, use a steady rest.

Step 2.) Rotate the *RAAM GSS* Sighting Module to the "0" position against the backstop.

Step 3.) Set the boresight chart level with the weapon, 10 meters from the *RAAM GSS* front end (see Figure 3.4-1).

Step 4.) Install the Laser Boresight Kit for the GL as instructed in its operational instructions.

Step 5.) Zero the GL borelight in accordance with the instruction manual for the device.

Step 6.) Place the GL borelight laser on the Bore Centerline of the chart.

Step 7.) Enable Boresight Mode from the Function menu. This activates the visible boresight laser. Use right and left buttons to adjust the visible laser power up and down.

Step 8.) Adjust the *RAAM GSS* to the corresponding labeled position on the chart by rotating the Windage and

Elevation Control Knobs. Use the cant indicators on the display while boresighting to ensure that the *RAAM GSS* is level.

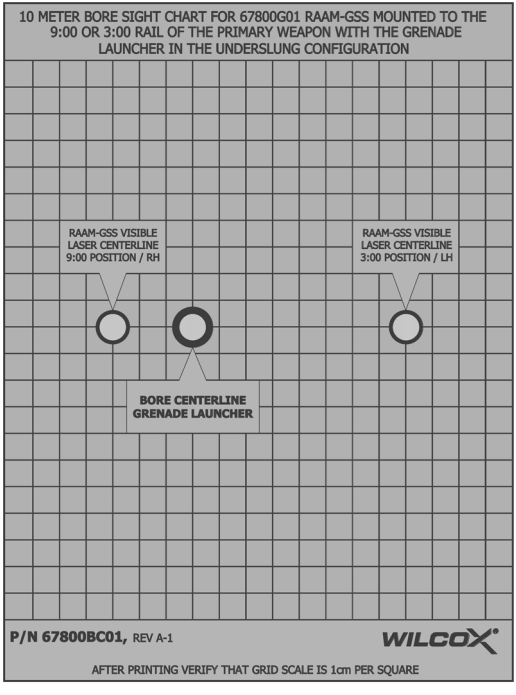


Figure 3.4–1 Universal Boresight Chart for *RAAM GSS* (Use for Left and Right Handed Mounting)

3.5 OPERATING THE *RAAM GSS*

To quickly fire a grenade, pivot the *RAAM GSS* Sighting Module to the range increment nearest the target range, align to the target using the *RAAM GSS* laser or the Red Dot Sight, verify that no cant indicators are displayed, and fire.

For minimal light signature and optimal night time operations, select "Night Mode" in the Display Bright menu. Night Mode sets the display brightness to minimum and starts a timer to blank the display of all information except laser state after 10 seconds of inactivity. Pressing any key will awaken the display. Additionally, the display brightness is set to minimum (M1), the reticle is changed to Dot Only and set to minimum brightness, and the IR Aiming Laser and Illuminator are set to minimum power settings.

▲ WARNING ▲

Do not fire the weapon if the RAAM GSS displays a left or right cant indicator. Firing the weapon when the RAAM GSS is canted can cause unintended damage to surrounding targets and may result in injury or death.

■ CAUTION ■

It is recommended that the battery be replaced and that activation procedures for the RAAM GSS be conducted prior to operation to

ensure proper operation prior to operational use (see Section 4.2).

Verify range setting after each shot as needed.

NOTE

If the Lens Cover is not removed before the RAAM GSS is activated and the unit is configured for automatic display brightness the display may be too dim to read.

Ammo storage temperature may affect round travel. To avoid discrepancies in accuracy, store ammo with the RAAM GSS.

After 10 minutes of inactivity, the RAAM GSS will go into sleep mode. The lasers will be deactivated when sleeping and will stay off after waking. Pressing any button, rotating the sight or moving any switch will awaken the RAAM GSS.

To Perform Daytime Engagement with the *RAAM GSS*:

Step 1.) Configure your display brightness and Red Dot Sight shape appropriately to match operational conditions (see Sections 3.3.1 and 3.3.3).

Step 2.) Rotate the Mode Selection Knob to the Red Dot (RD) mode position. Press the Left and Right Buttons on the *RAAM GSS* to adjust your Red Dot Sight brightness.

Step 3.) Select the desired firing table using the Ammo Quick Select Switch.

Step 4.) Rotate the *RAAM GSS* Sighting Module to the desired target distance and acquire the target using the Red Dot Sight.

Step 5.) Verify that the weapon is level to the horizon (not canted) by checking for cant indication. If the *RAAM GSS* is not level, cant indicators will appear as in Figure 3.5-1. Tilt the weapon in the direction the cant indicator arrows point to correct cant.

Additionally, the left and right arc segments of the Red Dot Sight provide cant awareness by flashing when canted as in Figure 3.5-1. The IR Aiming Laser will blink slowly when canted to the left, or quickly when canted to the right.

Step 6.) Acquire the target. To minimize time to acquire the Red Dot Sight reticle, align the iron sights inside the Red Dot Sight and the reticle will come into view.

Step 7.) Fire the weapon.

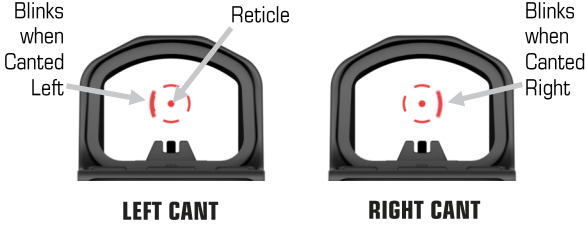


Figure 3.5-1 *RAAM GSS* Reticle Display

To Perform Nighttime Engagement with the *RAAM GSS*:

Step 1.) Configure your display brightness and Red Dot Sight shape appropriately to match operational conditions (see Sections 3.3.1 and 3.3.3). For optimal covert operation, set display brightness to Night Mode.

Step 2.) Rotate the Mode Selection Knob to the Red Dot (RD) mode position.

If Red Dot Sight use is desired for nighttime engagements, press the Left and Right Buttons on the *RAAM GSS* to adjust your Red Dot Sight brightness. Otherwise, press the Center button to disable the Red Dot Sight.

Step 3.) Rotate the Mode Selection Knob to the appropriate nighttime operational mode position (AL, DL, or DH).

Step 4.) Select the desired firing table using the Ammo Quick Select Switch.

Step 5.) Rotate the *RAAM GSS* Sighting Module to the desired target distance and acquire the target using laser(s).

Step 6.) Press the Center Button to activate the laser(s).

▲ WARNING ▲

When adjusting RAAM GSS range, use caution to ensure that lasers are not fired in an unsafe manner.

Step 7.) Verify that the weapon is level to the horizon (not canted) by checking for cant indication. If the *RAAM GSS* is not level, cant indicators will appear as in (see Figure 3.5-1). Tilt the weapon in the direction the cant indicator arrows point to correct cant.

Additionally, cant indication is provided via blinking of the IR Aiming Laser in all nighttime operational modes when cant indication is enable as described in Section 3.3.5. The aiming laser will blink slowly when canted to the left and will blink fast when canted to the right. A clever way to remember this is "**Slow/Left, Tight/ Right**".

Step 8.) Fire the weapon.

To Perform Engagements with the *RAAM GSS* Powered Off:

The *RAAM GSS* can still be used to accurately engage targets without being powered on through the use of the iron sights and the backup range indicator.

Step 1.) Rotate the *RAAM GSS* until the alignment marking aligns with the range on the backup range indicator, matching the range of your intended target (see Figure 3.5-2).

Step 2.) Look through the Red Dot Sight window and align the Iron Sights so that the front pin is centered between the two rear pins. Align all pins so that their heights match.

Step 3.) While maintaining the alignment of the Iron Sights, as described above, aim so that the top of the center pin is aimed at the target (see Figure 3.5-3).

Step 4.) Ensure that the weapon is level to the horizon.

Step 5.) Fire the weapon.

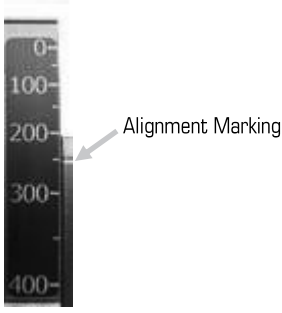


Figure 3.5-2 *RAAM GSS* Backup Range Indicator

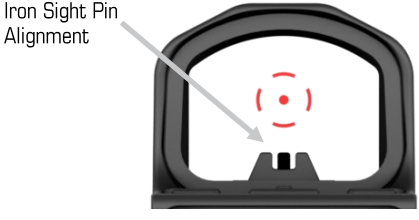


Figure 3.5-3 *RAAM GSS* Iron Sights (Rear View)

3.6 PERFORMING A SYSTEM TEST

The *RAAM GSS* is capable of operating in a diminished capacity in the event of a non-critical subsystem failure. The grenadier can command a test by accessing the Function Menu selection **"Built In Test"** and pressing the Center Button to enter the test.

▲ WARNING ▲

In the event of a detected built-in test failure, contact Wilcox Industries for repair.

When executing the system test, follow instructions on the screen to cycle through the tests. The grenadier needs to visually verify proper operation of the Display. Display patterns are provided to detect pixel errors. Pass or fail is subjective, based on the grenadier's observations.

Following these tests, internal components are tested and pass/fail indication is given based on the results of the internal testing.

SECTION 4

MAINTENANCE

4.1 CARE OF THE *RAAM GSS*

NOTE

Do not use harsh abrasives or chemicals such as acetone to clean the RAAM GSS. Any questions about appropriate chemicals should be directed to Wilcox Customer Service. Periodically inspect the Battery Compartment o-ring. If a Battery Compartment Cap o-ring becomes cut, nicked or torn, notify unit armorer.

Dismount the *RAAM GSS* from the primary weapon and inspect the unit for dirt, rust, and corrosion. If the display or lenses are broken or cloudy, notify unit armorer.

Ensure that the Battery Compartment Cap and o–ring are tightly sealed and that the area is free of sand and dirt particles. If a Battery Compartment Cap o–ring becomes cut, nicked or torn, notify unit armorer.

Dirt and other residue, like exposure to salt water, may impede the mechanical operation of the *RAAM GSS*. Flush with water while pivoting the *RAAM GSS* Sighting Module to remove any debris. Blow any residual dirt or dust free from the lenses, then wipe with a clean Lens Cloth, provided. Do not use the brush provided for cleaning optic glass and laser port (aperture) lenses. Using the brush, remove dirt and debris from the mounting rails and controls. This should be done on a regular basis.

Always keep the Communication Port plug fully installed to prevent ingress of foreign debris and to protect the port from corrosion.

4.2 BATTERY REPLACEMENT

The Battery Indicator on the *RAAM GSS* Display shows up to 4 bars, one bar for approximately each 20% of remaining battery life. If no bars appear in place of the indicator, the *RAAM GSS* has less than 20% of battery life remaining. The Dual High mode can more quickly drain battery when the lasers are operated.

Replace the battery when the Battery Indicator becomes low (see Figure 4.2-1). For best performance, always use Lithium batteries. Alkaline batteries are acceptable, but expect diminished operating time.

A low battery banner appears on the Display when the battery level has dropped to sufficiently low levels. When this occurs, performance of the *RAAM GSS* will be degraded and the battery should be replaced immediately.

Figure 4.2-1 Battery Indicator

To Replace the Battery in the *RAAM GSS* :

Step 1.) Remove the used battery and inspect O-Rings for damage as described in Section 4.3. Replace as needed.

Step 2.) Ensure that the Battery Compartment is clean and dry, then install the new battery, observing the battery direction indicated on the marking on either side of the compartment (see Figure 4.2-2).

Step 3.) Resecure the Battery Compartment Cap by turning the cap CW. Check the cap to ensure that it is secured.

Step 4.) Check that the battery indicator displays a full battery and perform a battery check from the Function Menu to ensure full capacity.

Figure 4.2-2 Replacing the Battery in the *RAAM GSS*

4.3 INSPECTING AND REPLACING O-RINGS

The Battery Compartment Cover of the *RAAM GSS* contains one (1) Buna O-Ring that prevents dirt and water intrusion to the Battery Compartment.

Age and temperature can wear Buna rubber, so O-Rings should be inspected periodically to maintain proper operation of the system. O-Rings are highly pliable and stretchable, and can be overstretched in the process of inspection. For this reason, it is strongly advised that they be replaced whenever they are removed, to ensure proper sealing of the compartment.

O-Ring replacements are available through Wilcox and should be purchased in advance of need to ensure continued service.

Step 1.) Gently brush any debris away from the o-rings with the cleaning brush provided.

Step 2.) Inspect the O-Rings for cracks, pinches, hardness, dryness, or tackiness of feel. If an O-Ring exhibits any of these characteristics, replace it.

Step 3a.) If the *RAAM GSS* O-Ring does not need replacement, but requires lubrication, lubricate the exterior surface of the O-Ring without removing it with a small amount of Silicone Grease.

Step 3b.) If replacement is required, gently remove the O-Ring using a pick tool. Gently lubricate the *RAAM GSS* O-Ring on both sides, with the thumb and index finger, using Silicone Grease. Using the pick tool, gently replace the lubricated O-Ring, using caution not to overstretch or damage.

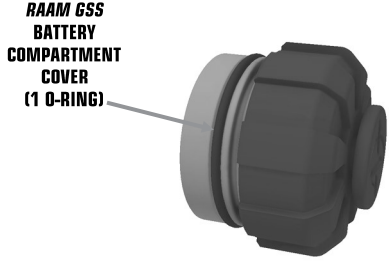


Figure 4.3-1 Inspecting and Replacing O-Rings

4.4 STORAGE

Ensure that cleaning instructions in Section 4.1 have been followed. When the *RAAM GSS* is dismounted for storage, place the Mode Selection Knob in the 'OFF' position. Reattach the laser cover to the *RAAM GSS* to prevent damage to the optics. Remove battery from the *RAAM GSS*.

■ CAUTION ■

Do not store the RAAM GSS with battery installed.

4.5 SHIPPING

Prior to shipping the *RAAM GSS*, follow cleaning and storage instructions as described in Sections 4.1 and 4.4. Package all components securely in a suitable shipping container, maintaining adequate separation between components.

4.6 TROUBLESHOOTING

Event Log

Use the Event Log function on the Function Menu to determine the cause of system events (see Section 3.3.9). The Event Log displays up to 3 events:

- **Event 1**: The first event since the last power up.
- **Event 2**: The next event, or the first highest level event.
- **Event 3**: The most recent event of the highest level.

Event Levels

Event levels are an indication of importance. Levels include:

- **Info (I)**
- **Warning (W)**
- **Error (E)**

Warning and Error level events are accompanied by an event flag above the battery icon, while Info events do not.

Table 4.6-1 identifies the codes, causes and solutions of these events. If an event code should display, and persists after attempting to perform the solutions listed in the table, please contact Wilcox Customer Service for assistance at 603-431-1331.

Table 4.6-1. System Events

EVENT LEVEL	EVENT CODE	DESCRIPTION	SOLUTION
W	20	The Firing Allocation Table was not found and rebuild was attempted.	No action required.
E		The Firing Allocation Table is empty. This means no Firing Tables were found installed on this unit.	Request Updated Firing Tables from Unit Armorer.
E	21	Bad Firing Table Index in Firing table Allocation Table.	1. Set factory defaults. 2. Request Updated Firing Tables from Unit Armorer.
E	22	Bad Firing Table Address in Firing table Allocation Table.	
E	23	Firing Table row offset past end of table. Installed Firing Table may contain an error.	
E	24	Firing Table row address past end of memory.	
E	51	Temperature sensor returning bad values. Atmospheric compensation is not functioning.	Power cycle unit to reinitialize sensor.
E	52	Pressure sensor returning bad values. Relative air density compensation is not functioning.	

E = Error, W = Warning, I = Information

Table 4.6-1. System Events (Cont'd)

EVENT LEVEL	EVENT CODE	DESCRIPTION	SOLUTION
W	53	Encoder measurement incomplete. Encoder angle dropped and last good encoder angle was used for ballistic solution.	Power cycle unit to reinitialize sensor.
E		Encoder returned error indication. Encoder angle dropped and last good encoder angle was used for ballistic solution.	
E	54	Encoder returned corrupted data.	
I	71	Update patch applied. This may occur on firmware updating to initialize changes to persistent storage.	No action required.
W	72	Low battery detected during storage of a configuration change. The change was NOT stored in persistent memory. However, the attempted change is in active memory and the unit can be operated using the changed value until the next power cycle. This event displays " LOW BATTERY " at the bottom of the display.	1. Use unit with changes not saved. 2. Replace battery and try again (see Section 4.2).
E	75	Setting defaults failed. This may occur after a 'LOW BATTERY' event.	Install a fresh battery and try again (see Section 4.2).

E = Error, W = Warning, I = Information

APPENDIX A

WARRANTY STATEMENT

A.1 STANDARD LIMITED WARRANTY

Wilcox Industries Corp. ("WX") offers a limited warranty ("Limited Warranty") that its products will be free from defects in material and workmanship under proper usage for one (1) year from the date of original shipment from WX ("Warranty Period") if purchased through an authorized sale, provided that, the product and purchasing documents are returned to WX (at user's expense) and WX will have the option (in its sole discretion) to exchange or recondition the product (subject to WX's examination and confirmation that the product is defective), and return the product via preapproved carrier at user's expense. This Limited Warranty is void if the date of manufacture which is laser engraved on the product is defaced, modified or altered. This Limited Warranty is only for products purchased directly from WX or an authorized reseller. Items purchased via ecommerce such as Ebay, Craigslist, Amazon or any other online marketplaces are not eligible for the Limited Warranty.

The Limited Warranty does not include damage or defects arising from improper use, maintenance, repairs, installation or storage, abuse, misapplication, vandalism, negligence, neglect, normal wear and tear or any other circumstances over which WX has no control.

WX MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED. WX SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR

IMPLIED, INCLUDING BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE.

THE LIMITED WARRANTY IS YOUR SOLE AND EXCLUSIVE REMEDY FOR WARRANTY COVERAGE, WX CONDUCT, OR FOR ANY OTHER CLAIM OR CAUSE OF ACTION AGAINST WX. WX SHALL NOT BE RESPONSIBLE FOR ANY DAMAGES WHETHER DIRECT, INCIDENTAL, CONSEQUENTIAL OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, LABOR CHARGES, REPAIRING OTHER PRODUCTS, REPLACEMENTS, OR ANY DELAYS.

IN ADDITION, TO THE FULLEST EXTENT PERMISSIBLE BY LAW, WX SHALL NOT BE LIABLE FOR ANY INJURY OR DAMAGE TO PERSONS OR PROPERTY OF ANY KIND. IN NO EVENT SHALL WX BE LIABLE FOR DIRECT, SPECIAL, INDIRECT, PUNITIVE, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, FUTURE REVENUE, DATA, OR ANY OTHER LOSS, REGARDLESS OF WHETHER A CLAIM OR ACTION IS ASSERTED IN CONTRACT OR TORT, WHETHER OR NOT THE POSSIBILITY OF SUCH DAMAGES HAS BEEN DISCLOSED IN ADVANCE OR COULD HAVE BEEN REASONABLY FORESEEN.

NOTHWITHSTANDING ANY OTHER AGREEMENT OR UNDERSTANDING BETWEEN THE PARTIES, THE PARTIES AGREE THAT ALL LIABILITY WITH RESPECT TO A CLAIM AGAINST WX IN CONNECTION WITH OR RELATED TO ANY PRODUCT PROVIDED BY WX SHALL BE LIMITED IN DURATION TO THE WARRANTY PERIOD AND SOLELY TO DIRECT DAMAGES, AND MAY BE SATISFIED BY REPAIR OR REPLACEMENT OF NONCONFORMING PRODUCT (AS DETERMINED BY WX IN ITS SOLE AND ABSOLUTE DISCRETION), AND IN NO EVENT SHALL THE AGGREGATE RECOVERY OF ANY KIND AGAINST WX EXCEED THE LESSER OF TWENTY THOUSAND DOLLARS ($20,000 USD) OR THE PURCHASE PRICE OF THE PRODUCT.

A.2 WARRANTY CLAIM AND SERVICE INFORMATION

For a warranty claim or service work, WX must be contacted in the United States at +1 603-431-1331 to assign a **Return Merchandise Authorization (RMA) / Service Call Number (SC)** prior to return shipment.

After an RMA/SC number is provided, WX will accept a package at the address below, clearly marked with the number assigned as follows:

Wilcox Industries Corp.
RMA # _____
25 Piscataqua Drive
Newington, NH 03801

The *RAAM GSS* must be securely packaged, accompanied by purchasing information, a letter including sender's name, address, daytime phone number, date of manufacture, lot number and a description of the problem or work to be performed.

APPENDIX B

ABBREVIATIONS

B.1 ABBREVIATIONS

CCW	Counter-Clockwise
CU IN	Cubic Inches
CW	Clockwise
GL	Grenade Launcher
GLM	Grenade Launcher Module
RAAM GSS	RAAM Grenadier Sighting System
ITAR	International Trafficking in Arms Regulations
lb	Pound
mm	Millimeter
mrad	Milliradian
nm	Nanometer
NVD	Night Vision Device
NVG	Night Vision Goggle
OLED	Organic Light Emitting Diode
oz	Ounce

APPENDIX C

SPARE PARTS

C.1 SPARE AND OPTIONAL PARTS LISTS

To order replacement and optional parts, contact the Wilcox marketing department at +1 603-431-1331. Please specify your product color when ordering.

NOTE

- **International** (High Power & Low Power) and Domestic (Low Power) orders for Combat Systems - Fire Control Systems and Laser Aiming Devices are packaged in a "Non-Berry" compliant tactical pouch unless specified prior to ordering,
- **Domestic** (High Power) orders for Combat System - Fire Control Systems and Laser Aiming Devices are packaged in a "Berry" compliant tactical pouch.

Note the repair type specified for the following replacement parts is identified as follows:

- **Field** – Can be changed out at the field level.
- **Armorer** – Can be changed out by the unit armorer.
- **Factory** – A change that occurs at the factory level only.

Table C-1. Spare Parts List

#	PART NO	DESCRIPTION	REPAIR TYPE	REFERENCE
C.1.1	TBD	LABEL KIT	Field	
C.1.2	66189P98	LENS COVER	Field	7
C.1.3	66189G45	BATTERY CAP FISHER COVER TETHER ASSY	Field	8
C.1.4	F2481	LOCKOUT SCREW	Field	8
C.1.5	66113P79	CAP TENSIONER	Armorer	8
C.1.6	66199P78	POST - TETHER	Field	8
C.1.7*	F2509 OR F2770	POUCH - 7 X 5 X 2.25 COYOTE NON-BERRY COMPLIANT POUCH - 7 X 5 X 2.25 COYOTE BERRY COMPLIANT	Field	7
C.1.8	66189P68	BRACKET - STANDALONE	Field	10
C.1.9	66189G23	RAIL GRABBER	Field	8
C.1.10	F1808	SOCKET HEAD SCREW KEY - 5/64 HEX	Field	
C.1.11	F2947	SOCKET HEAD SCREW KEY - 5 MM	Field	
C.1.12	66189P03	SOCKET HEAD SCREWS	Field	
C.1.13	F1302	O-RING	Field	
C.1.14	F2978	SPRING, HELICAL	Armorer	
C.1.15	66189G22	RAAM GSS – PACKOUT	Field	10

* For non-standard pouches, please specify when ordering.

NOTES:

NOTES:

"Our Customer's Life Depends on It"™

Manufactured by:

WILCOX®

Wilcox Industries, Corp.
25 Piscataqua Drive
Newington, NH 03801-7816

Phone: +1 888-8WILCOX
+1 603-431-1331
Fax: +1 603-431-1221

WWW.WILCOXIND.COM

For troubleshooting service questions, contact Wilcox between 8am and 5pm EST.