OTAL-C

Technical Manual

OFFSET TACTICAL AIMING LASER

VISIBLE LASER POINTER

STEINER
Nothing Escapes You

TABLE OF CONTENTS

Page

SAFETY SUMMARY 2

HOW TO USE THIS MANUAL 6

GENERAL INFORMATION 7

EQUIPMENT DESCRIPTION 11

SECTION I OPERATING INSTRUCTIONS 17

SECTION II MOUNTING PROCEDURES 22

SECTION III BORESIGHTING/ZEROING PROCEDURES 24

SECTION I OPERATOR PREVENTIVE MAINTENANCE CHECKS 32

SECTION II OPERATOR TROUBLESHOOTING 36

SECTION III OPERATOR MAINTENANCE 38

SECTION I UNIT TROUBLESHOOTING 41

SECTION II UNIT MAINTENANCE 43

SECTION III SERVICE/PACKING AND UNPACKING 48

REPAIR PARTS 50

SAFETY SUMMARY

WARNING

VISIBLE OR INVISIBLE LASER RADIATION
AVOID DIRECT EXPOSURE TO THE BEAM

VISIBLE LASER POINTER / Class IIIa
WAVELENGTH: 635 nm

INFRARED LASER POINTER / Class I / EYE-SAFE
LASER WAVELENGTH: 850 nm
OUTPUT: <0.7mW

- DO NOT stare into the laser beam.
- DO NOT look into the laser beam through binoculars or telescopes.
- DO NOT point the laser beam at mirror-like surfaces.
- DO NOT shine the laser beam into other individual's eyes.

Safety Data

LASER	Power Output	SAFETY CLASS	NOHD (m) Unaided
Vis Red Pointer	<5 mW	IIIa	79.2
IR Pointer	<1 mW	I	56.8

DEFINITION OF THE FOLLOWING ALERTS THROUGHOUT THIS MANUAL:

WARNING
Identifies a clear danger to the person doing that procedure.

CAUTION
Identifies risk of damage to the equipment.

NOTE
Used to highlight essential procedures, conditions, statements, or convey important instructional data to the user.

WARNING

Be sure the weapon is CLEAR and on SAFE before proceeding.

WARNING

RISK OF DETECTION BY ENEMY–To reduce the risk of detection by an enemy using a Night Vision Device (NVD), avoid prolonged activation of the infrared laser model.

WARNING

The infrared laser beam is more detectable to an enemy using a NVD when used in smoke, fog and rain. Avoid prolonged activation of the infrared laser model in these conditions..

WARNING

DO NOT store the laser with the battery installed.

WARNING

If a laser borelight is used to boresight the device, **BE SURE TO REMOVE THE BORELIGHT FROM THE WEAPON PRIOR TO FIRING.**

WARNING

The laser is activated by depressing the remote cable switch. Remove batteries prior to storage in a rifle, or in any situation where the remote cable switch may be depressed accidentally.

WARNING

All directions, such as CW and CCW are given from the shooter's point of view as though the OTAL Classic were weapon mounted.

CAUTION

DO NOT over-adjust the laser adjusters by forcing them beyond their end of travel.

CAUTION

Use ONLY authorized cleaning supplies on the laser or permanent damage may occur.

CAUTION

DO NOT remove the Remote Cable Switch by pulling on the cable.

HOW TO USE THIS MANUAL

Usage

You must familiarize yourself with the entire manual before operating the equipment. Read the complete maintenance task before performing maintenance and follow all **WARNINGS, CAUTIONS** and **NOTES**.

Manual Overview

This manual contains sections for Operating and Maintaining the laser.

Appendix A Repair Parts

CHAPTER 1–GENERAL INFORMATION

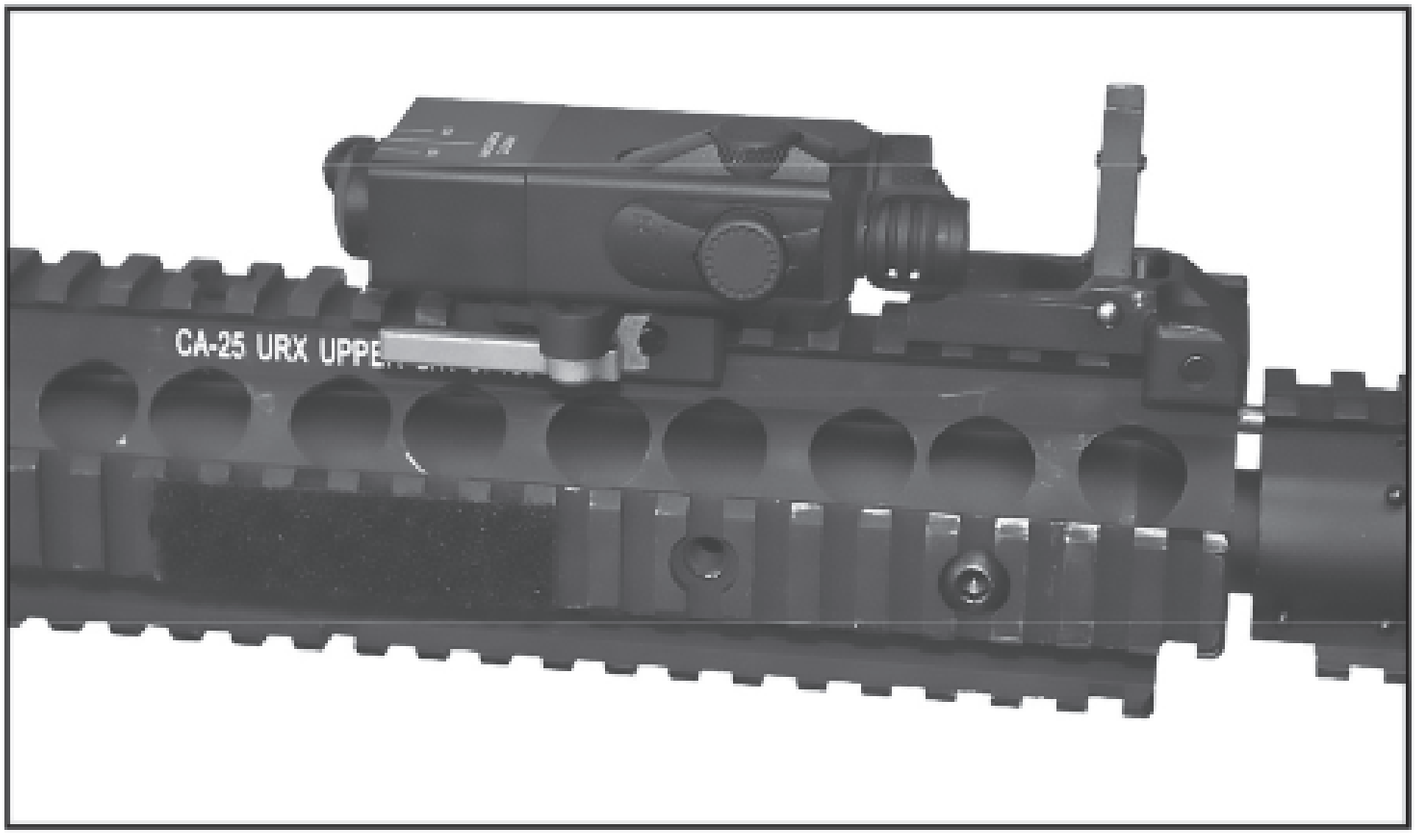

Figure 1-1 OTAL Classic in Use

1.1 GENERAL INFORMATION

1.1.a Type of Manual:
Operator and Field Maintenance Manual.

1.1.b Equipment Name:
OTAL-Classic

1.1.c Purpose of Equipment:
For aiming and pointing using the visible aiming laser (VIS POINTER) model, or for aiming and directing fire using an infrared laser pointer (IR POINTER) model with a Night Vision Device (NVD).

1.2 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS
If your equipment needs improvement, let us know. Mail your comments to Steiner Optik, 920 54th St., Greeley, CO 80634 or email: laserlightsinfo@steiner-optics.com

1.3 Steiner 3-Year Laser Device Warranty
On all laser devices, Steiner offers a 3-Year Limited Warranty from the date of purchase that covers all laser, optical and electronic components, materials and workmanship. All warranties are void if the serial number or manufacturer's labels affixed to the product have been removed, or if products have been abused, misused, modified, neglected or have been disassembled prior to return to the manufacturer.

1.4 CROSS REFERENCES

Common Name	Official Name
Allen Wrench	Socket Head Screw Key
Battery	1.5v AA
Battery Cap	Battery Box Cover
Gasket	O-Ring
Lens Cover	Exit Port Cover
Neoprene Jack Plug	Plug Assembly
Paddle Switch	Remote Cable Switch
Pattern Generator	Optical Instrument Reticle
Safety Screw	Electrical Dial-Knob Lock
Shipping Case	Textile Bag
Tape Fastener Hook	Fastener, Hook Tape
Tape Fastener Loop	Fastener, Loop Tape
Technical Manual	Operator and Field Maintenance Manual

1.5 LIST OF ABBREVATIONS

C	Celsius (Centigrade)
CCW	Counter-clockwise
cm	Centimeters
CTA	Common Table of Allowance
CW	Clockwise
EA	Each
F	Fahrenheit
HI	High
ILLUM	Illuminator
in	Inches
IR	Infrared
LBS	Laser Borelight System
LED	Light Emitting Diode
LO	Low
m	Meter
Max	Maximum
Mfr	Manufacturer
Min	Minimum
MOM	Momentary
mm	Millimeter
mrad	Milliradians
mW	Milliwatts
nm	Nanometers
No	Number
NOHD	Nominal Ocular Hazard Distance
NSN	National Stock Number
NVD	Night Vision Device
O.D.	Optical Density
OIR	Optical Instrument Reticle
Para	Paragraph
PWR	Power
QTY	Quantity
RAS	Rail Adapter System
RMA	Return Material Authorization
SR	Service Representative
TM	Technical Manual
VIS	Visible

CHAPTER 2–EQUIPMENT DESCRIPTION

2.1 SYSTEM DESCRIPTION

The OTAL-Classic may be equipped with either a Class IIIa VIS POINTER or a Class I – Eye Safe IR POINTER laser.

The VIS POINTER model is for daylight and low light operations. The IR POINTER model emits a highly collimated beam of infrared light for precise aiming of the weapon for users equipped with a NVD.

The OTAL-Classic laser is designed to attach to any weapon equipped with Picatinny/MIL-STD-1913 rails.

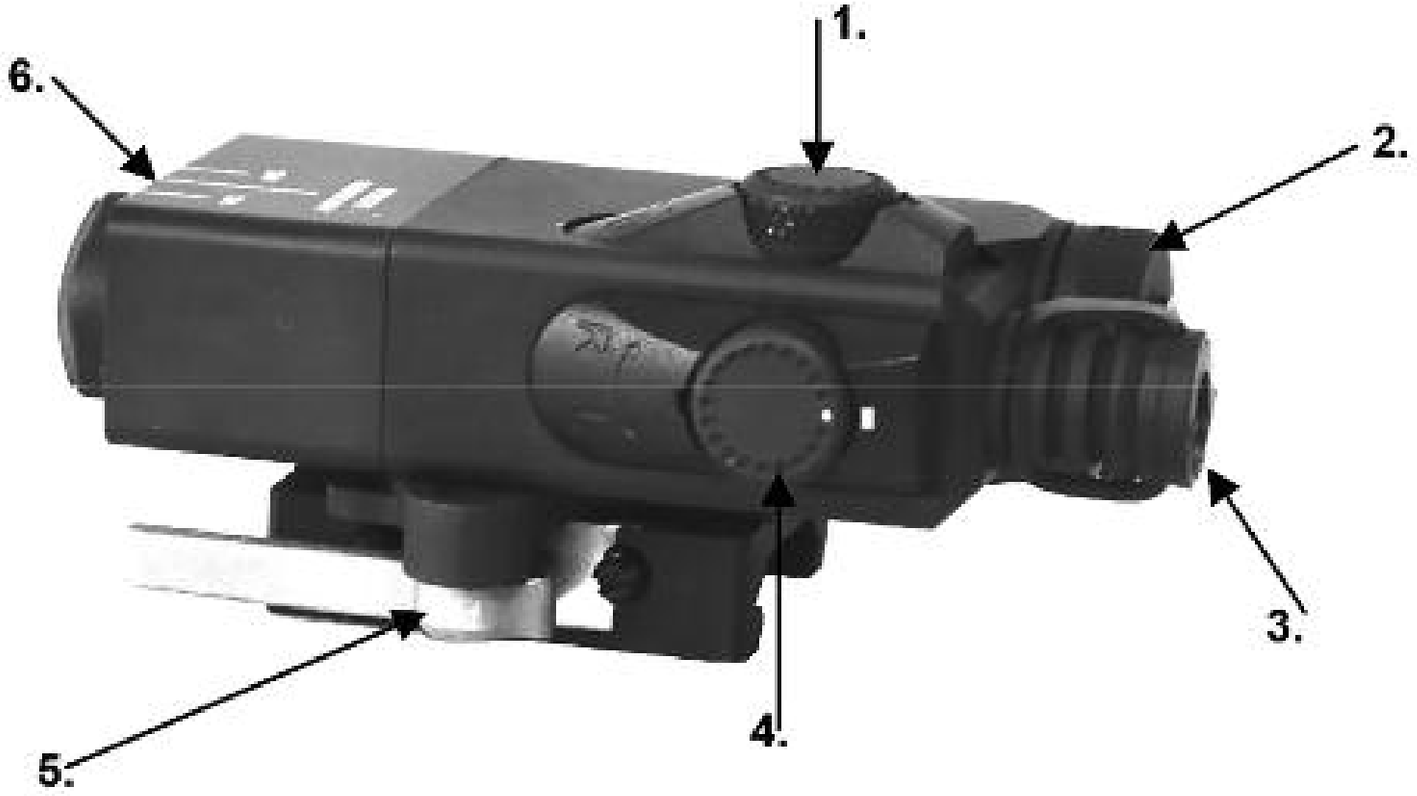

Figure 2-1 System Description

ITEM	DESCRIPTION
1	Elevation Adjustor
2	Battery Compartment
3	Laser Exit Port
4	Windage Adjustor
5	Mount
6	Remote Cable Port

2.2 GENERAL CHARACTERISTICS

Table 2.2 Weight, Dimensions, and Performance

WEIGHT	
(with one battery & Mount)	4.9 oz / 138.9 grams
DIMENSIONS	
Length	2.8 in. / 7.2 cm
Width	1.4 in. / 3.6 cm
Height	.73 in. / 1.9 cm
PERFORMANCE	
Laser Wavelength	
VIS POINTER RED	635 nm
IR POINTER	850 nm
Output Power (Hi Power)	
VIS POINTER	<5 mW
IR POINTER	<0.7 mW
Beam Divergence	
VIS POINTER	0.3 mrad
IR POINTER	0.3 mrad
Battery Life	Up to 5 hours continuous
IR POINTER and IR POINTER RANGE (NIGHT / DAY)	
VIS POINTER	250 m / 5 m
IR POINTER	250 m

2.3 DESCRIPTION OF MAJOR COMPONENTS

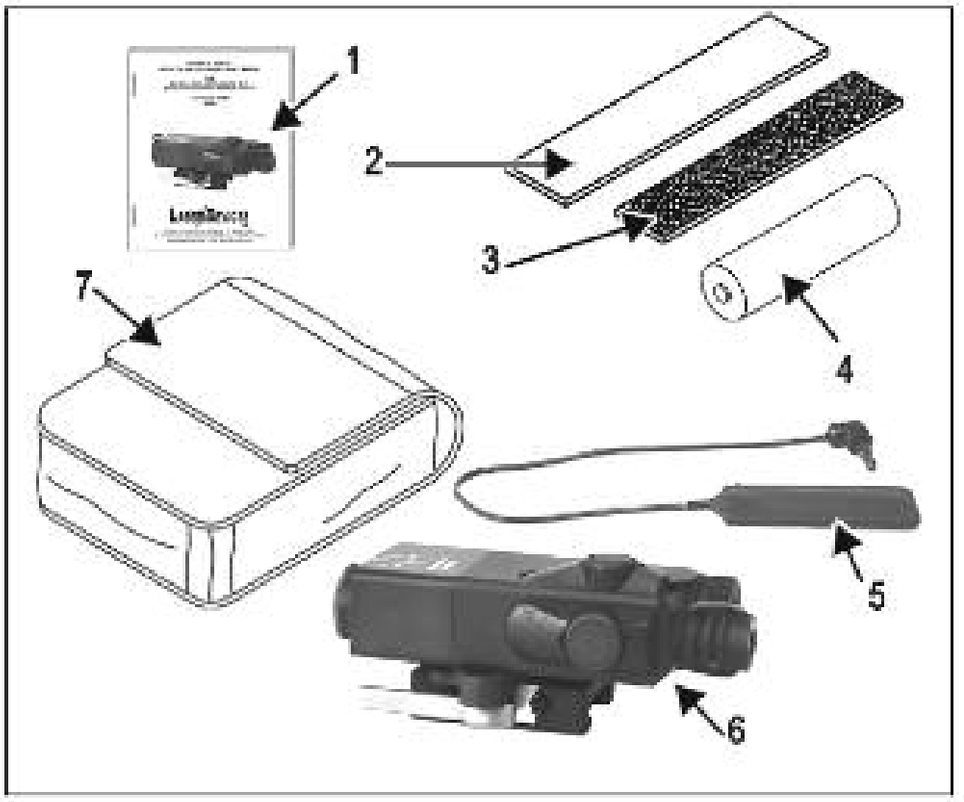

Fig. 2-2 Major Components

ITEM	DESCRIPTION
1	Operator and Field Maintenance Manual
2	Tape Fastener Loop 5/8" (Black)
3	Tape Fastener Hook 1/2" (Black)
4	Battery, 1.5-volt AA
5	Remote Cable Pressure Pad Switch
6	Laser Assembly
7	Shipping Pouch

NOTE

Before operating the laser, you must read the entire Operator and Field Maintenance Manual and follow all WARNINGS, CAUTIONS and NOTES.
The Operator and Field Maintenance Manual provides safety information, equipment information, operating instructions, mounting procedures, zeroing procedures and operator and unit maintenance procedures.

2.3.a Tape Fastener Loop

The Tape Fastener Loop is provided to secure the Remote Cable Switch to the weapon in a position convenient to the soldier.

2.3.b Tape Fastener Hook

The Tape Fastener Hook is pre-attached by the manufacturer to the pressure pad switch.

2.3.d Battery

One 1.5-volt AA battery. The use of high-quality battery is recommended.

2.3.e Remote Cable Switch

The Remote Cable Switch allows the user to activate the laser in a momentary (MOM) fashion by depressing the pressure pad. When the Remote Cable Switch is released, the unit turns off. The pressure pad provides a tactile (silent) click that indicates when the switch has been activated. The Remote Cable Switch has a hook strip fastener attached to the switch.

2.3.f Laser Assembly

The OTAL-Classic offers a VIS POINTER model or an IR POINTER model. The device is used for aiming, signaling, command and control.

2.3.g Shipping Pouch

The laser is provided with a Shipping Pouch that is used to protect the unit during transport or storage.

CHAPTER III – SECTION I OPERATING INSTRUCTIONS

3.1 CONTROLS AND INDICATORS

3.1.a Battery Installation

WARNING

DO NOT store the laser with the battery installed.

Unscrew the battery cap in a CCW direction. Remove and properly discard the spent battery. Inspect the battery compartment for dirt, moisture and corrosion. Clean the battery compartment as needed (refer to Paragraph 4.3.c). Inspect the O-ring seal on the battery cap to make sure it is free of sand and dirt particles and that it has not been damaged (see Paragraph 4.3.d). Install the battery as indicated by the marking on the laser housing. Reinstall the battery cap and hand tighten in a CW direction.

Figure 3-1 Battery Installation

3.1.b Laser Remote Cable Switch

WARNING
The laser is activated by depressing the remote cable switch. Remove batteries prior to storage or in any situation where the remote cable switch may be depressed accidentally.

DO NOT lay a rifle equipped with the laser on the ground or other hard surface in a way that will rest the weight of the rifle on the pressure pad switch.

The Remote Cable Switch plugs into the back side of the laser housing as shown in Figure 3-2. Pressing the Remote Cable Switch activates the laser. When the remote cable switch is released, the laser turns off.

Figure 3-2 Remote Cable Switch Location

3.1.c Laser Adjusters

CAUTION

DO NOT over adjust the adjusters by forcing them beyond their end of travel.

NOTE

The adjuster may offer increased resistance as you turn it in a CW direction from the factory neutral position. When the adjuster is harder to turn it has reached the maximum CW travel.

The laser is equipped with adjusters to adjust the laser for elevation and azimuth. Each adjuster click will move the laser point by approximately 1 cm at 25 meters.

The laser housing is engraved with arrows and the letters U (UP), D, (Down), R (Right) and L (Left). The arrows and letters show the direction that the shot group will move when the adjuster is turned.

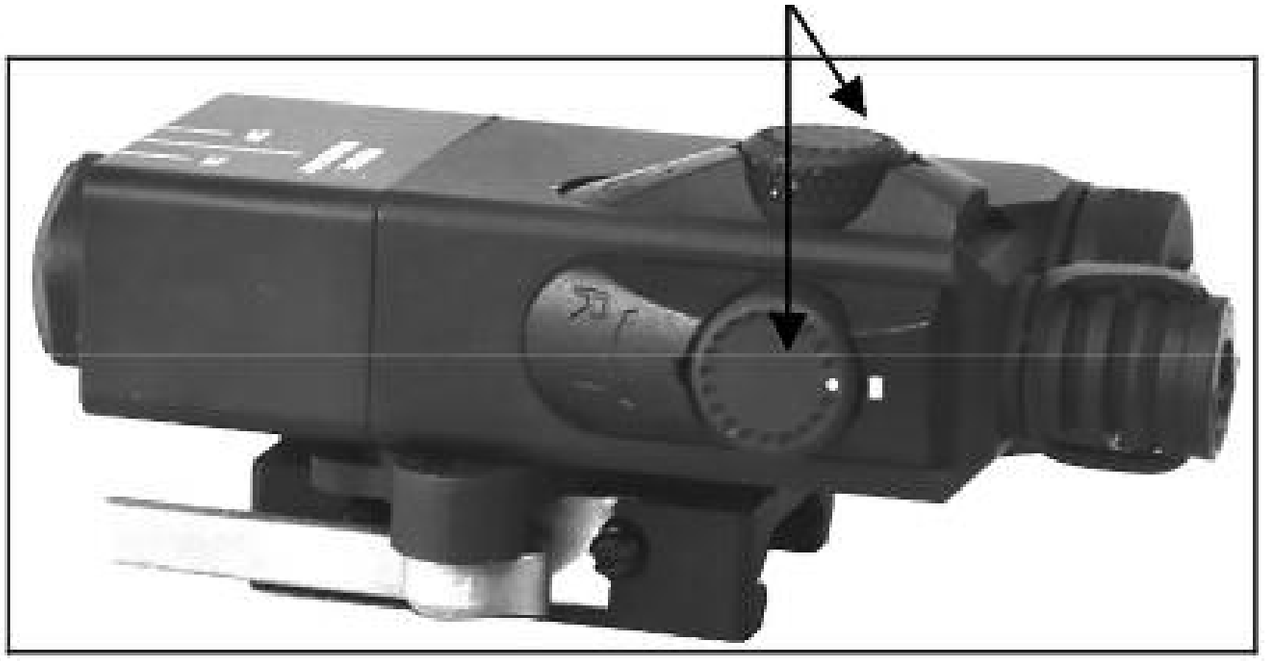

Figure 3-3 Laser Boresight Adjusters

Table 3-2 Adjuster Rotation and Shot Group Movement for the Aiming Laser

ZEROING THE LASER BEAM	Adjuster Movement	Shot Group Movement
Top Adjuster Elevation	CW	Up
(guard marked U/D)	CCW	Down
Side Adjuster Elevation	CW	Right
(guard marked R/L)	CCW	Left

CHAPTER III – SECTION II MOUNTING PROCEDURES

3.2 MOUNTING PROCEDURES

WARNING

Be sure the weapon is CLEAR and on SAFE before proceeding.

NOTE

The laser may be placed at any position (forward and aft) on the rail that is convenient for the operator. If the laser is removed from the rail, the operator must take note of the position at which it was zeroed, and return it to the same position in order to ensure that zero is retained.

Failure to fully tighten the Quick Release Mount will cause zero retention problems. Insure that the base of the Quick Release Mount is fully seated on the MIL-STD-1913 rail with NO front or rear overhang.

The OTAL-Classic is for use on weapons where the MILSTD- 1913 rail is parallel with the bore of the weapon. In the factory neutral position the VIS POINTER / IR POINT should project on the same side of the target as the laser is mounted and must fall within 10.2 cm of the bore at 25 meters. See Section 3.5.

An integrated Quick Release Mount is used to attach the laser to weapons equipped with a MIL-STD-1913 rail. Place the unit far enough back on the rail to allow for battery replacement without removal from the weapon. If removed, the laser must be returned to the same position on the rail to retain zero.

CHAPTER III – SECTION III BORESIGHTING/ZEROING PROCEDURES

This section provides boresighting/zeroing instructions for the laser using the AA Borelight, Item# 9090 on a 25-meter range.

3.3 PLACING A POSITIVE LOAD ON THE ADJUSTERS

CAUTION

DO NOT over-adjust the adjusters by forcing them beyond their end of travel.

NOTE

ALWAYS Boresight/Zero the laser starting with the Adjuster marked U/D.
When moving the adjusters, make sure that the adjustment mechanism has engaged a detent and has not stopped between detents. Failure to properly engage a detent may impact the accuracy of the laser.
Positive Load is required anytime an adjustment to the AIM POINT is made in a CCW direction. A Positive Load is not required when making a CW adjustment.

A Positive Load is the controlled compression of the spring within the adjuster mechanism to insure the highest level of accuracy is maintained after the weapon is boresighted or zeroed.

When adjusting in a CCW direction, apply a positive load to the adjuster by turning an additional 1/4 turn (8 clicks) CCW, then make the final boresight/zero adjustment by turning the adjuster CW. For example, to move the adjuster one (1) click CCW, turn the adjuster CCW 8 clicks and then turn it CW 7 clicks to the new position.

3.4 FACTORY NEUTRAL PRESET

CAUTION

DO NOT over-adjust the adjusters by forcing them beyond their end of travel.

NOTE

ALWAYS Boresight/Zero the laser starting with the Adjuster marked U/D.

When moving the adjusters, make sure that the adjustment mechanism has engaged a detent and has not stopped between detents. Failure to properly engage a detent may impact the accuracy of the laser.

The adjuster may offer some resistance as you turn it in a CW direction from the factory neutral position. When the adjuster is harder to turn it has reached the maximum CW travel.

The laser is preset at the factory to a neutral position. In the neutral position the laser beam is parallel to the bore of the weapon. To return the laser to the factory alignment (neutral position) using the following procedure:

- Turn the adjuster marked U/D CW to the natural stop.
- Turn it CCW one and one-quarter (1 1/4) turn.
- Turn it CW until the white dot on the adjuster aligns with the white dot on the adjuster guard.
- Turn the adjuster marked R/L CW to the natural stop.
- Turn it CCW one and one-quarter (1 1/4) turn.
- Turn it CW until the white dot on the adjuster aligns with the white dot on the adjuster guard.

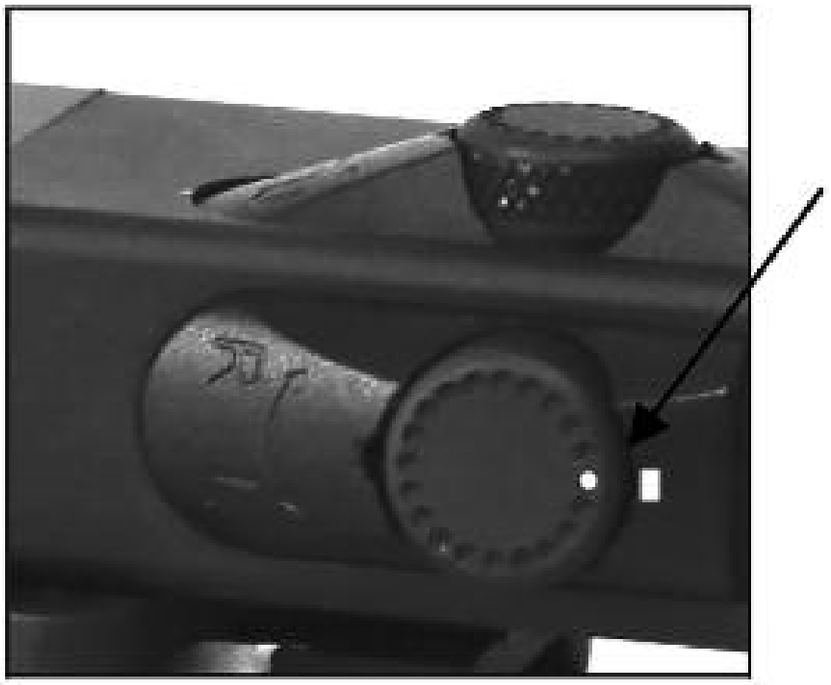

Figure 3-14 Neutral Preset

Table 3-4 Factory Neutral Preset

Adjuster	Instruction
Adjuster Guard marked U/D	First, turn CW to end of travel. DO NOT force past mechanical stop. Next, turn CCW 1 1/4 turns. Finally, turn CW to align the dot on the adjuster with the dot on the adjuster guard.
Adjuster Guard marked R/L	

3.5 Zeroing the Laser on a 25-Meter Range

The laser aim point is horizontally aligned with the weapon bore and offset 2.6" above the weapon bore.

CAUTION

DO NOT over-adjust the adjusters by forcing them beyond their end of travel.

NOTE

Always move the adjusters slowly, one click at a time, to prevent the adjuster from jumping detents.

In extreme cold temperatures the adjusters may offer more resistance. The adjuster may offer some resistance as you turn it in a CW direction from the factory neutral position. When the adjuster is harder to turn it has reached the maximum CW travel.

When the adjuster is at its maximum CW or CCW point of travel and is turned in the opposite direction the laser point may trace a small loop on the target. This is normal and does not indicate a failure condition.

A positive load is required on the adjustment mechanism when boresighting/zeroing the laser for purposes of retaining the set alignment. See paragraph 3.4.

The adjuster knobs on the laser may vary slightly in the force required to turn the adjusters. This is normal and does not indicate a failure condition.

At the maximum CW or CCW travel the laser may not move a full 1cm per click, or may jump squares on the target. If this happens the laser should be returned to its factory neutral preset as described in Section 3.5. Confirm that the mount was property tightened so that the laser is parallel with the barrel.

This procedure is used to zero the laser to its weapon. Refer to Tables 3-2 and 3-3 for adjuster rotation and direction of shot group movement. Each adjuster click moves the strike point by 1 cm on the 25-meter zeroing target.

1. On a 25-meter zeroing target, mark the designated strike point and designated 4 cm/6 cm strike zone based on the weapon you are using. See Table 3-6 and Figure 3-13.

2. Mount the target on an "E" silhouette or other suitable surface at 25 meters.

3. Set the laser adjusters to their factory neutral position as described in Paragraph 3.5.

4. Activate the laser aim point pressing the remote momentary switch. Aim center of the target.

5. Fire a 3-round shot group and note the center of the shot group relative to the designated strike zone.

6. Adjust the aiming beam adjusters to move the center of the shot group to the designated strike zone.

7. Repeat steps 5 and 6 until the shot group falls within the strike zone.

8. When firing the M16 or M4 series, when 5 out of 6 consecutive rounds are in the designated 6cm strike zone you are zeroed.

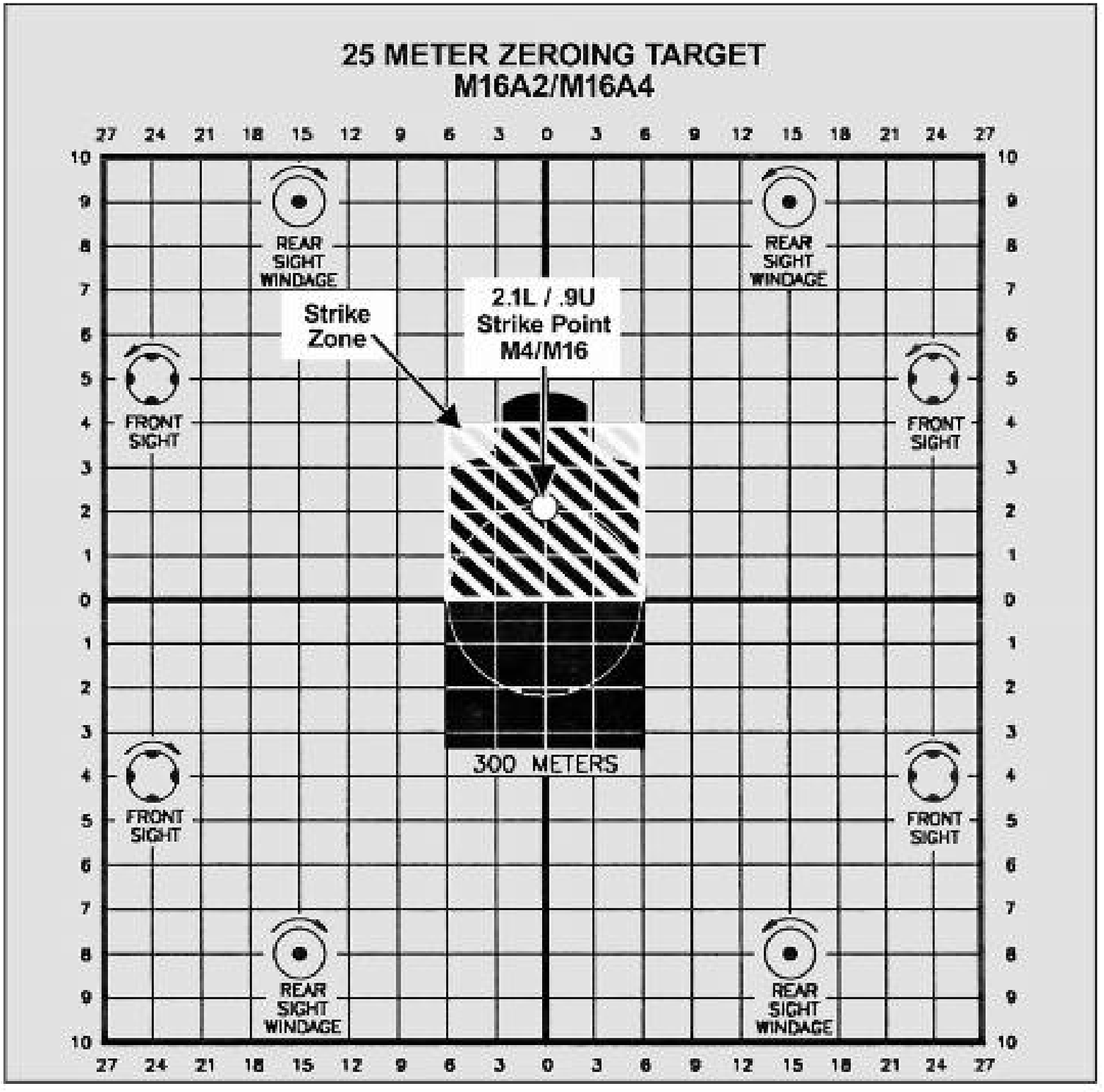

Figure 3-5 Sample 25-meter Zeroing Target

CHAPTER IV – SECTION I PREVENTIVE MAINTENANCE CHECKS

Table 4-1 Preventive Maintenance Checks, has been provided so that you can keep your equipment in good operating condition.

NOTE
Perform functional tests in the order listed in Table 4-1. Operating Procedures are detailed in Chapter III, Section I.

4.1.a Warnings and Cautions
Always observe the WARNINGS and CAUTIONS appearing in the table.

4.1.b Explanation of Table Entries
1. Item Number
Numbers in this column are for reference. Item numbers also appear in the order that you must perform the checks and services listed.

2. Interval
This column tells you when you must do the procedure in the procedure column. BEFORE (B) PROCEDURES must be done before you operate or use the equipment. DURING (D) PROCEDURES must be done during the time you are operating or using the equipment. AFTER (A) PROCEDURES must be done immediately after you have operated or used the equipment.

3. Item to Check/Service
This column provides the item to be checked or serviced.

4. Procedure
This column gives the procedure you must do to check the item.

5. Not Fully Mission Capable If
Information in this column tells you what faults will keep your equipment from being capable of performing its primary mission.
Be sure to observe all special information and notes that appear in your table.

Table 4-1 Preventive Maintenance Checks and Services

Item No.	Interval	Item to Check/Service	Procedure	Not Fully Mission Capable If:
1	B/D/A	Laser Exterior	-Check housing for separation between the front and the rear section of the housing, missing screws and missing switch knob, windage and elevation adjuster.	-A gap appears between the front and the rear section of the housing, missing switch knob, or adjuster cover.
WARNING: DO NOT STARE DIRECTLY INTO THE VISIBLE OR INFRARED LIGHT BEAM				
2	B/A	Exit Port Lens	-Check for cracked, dirty or broken lenses.	-If cracked or missing lens.
3	B/A	Adjusters	-Check for broken, missing or stripped Adjusters.	-Adjusters broken, missing or stripped or laser fails to move.
4	B/A	Battery Compartment	-Check for corrosion, presence of O-ring, spring, battery cap lanyard. Inspect threads for dirt or damage.	-Corroded or broken contacts.
5	B/A	Battery Compartment O-Ring	-Check O-ring for cuts, cracks. -Lubricate as needed.	

Table 4-1 Preventive Maintenance Checks and Services

Item No.	Interval	Item to Check/Service	Procedure	Not Fully Mission Capable If:
6	B/A	Install 1.5 volt AA Battery	-Install a known good battery.	
7	B	Boresight Alignment	-Confirm that the laser can be boresighted /zeroed on the weapon on which it will be mounted.	-Cannot be zeroed or boresighted to the weapon.
8	B/A	Remote Cable Switch	-Insert the remote cable switch and activate the laser.	-Fails to activate laser.
9	A	Textile Bag	-Check for torn fabric.	
10	A	Battery	-Remove battery.	

CHAPTER IV – SECTION II TROUBLESHOOTING

4.2 GENERAL

The purpose of troubleshooting is to identify the most frequent equipment malfunctions, probable causes, and corrective actions required. Table 4-2 lists the common malfunctions which may be found during the operation or maintenance of the laser and accessory equipment. Perform the tests, inspections and corrective actions in the order listed. This manual cannot list all malfunctions that may occur; or all tests, inspections and corrective actions.

Table 4-2 Operator Troubleshooting

Malfunction	Test / Inspection	Corrective Action	Ref. Para.
1. Laser beam fails to come on or stay on.	a. Verify battery installation.	-Tighten battery cap. -Install new battery.	3.1.a
	b. Inspect battery cap for damage or corrosion.	-Notify Unit Maintenance.	
	c. Inspect battery contact spring in the battery compartment for damage or corrosion.	-Notify Unit Maintenance.	
	d. Possible internal failure.	-Notify Unit Maintenance.	

Table 4-2 Preventive Maintenance Checks and Services

Malfunction	Test / Inspection	Corrective Action	Ref. Para.
2. Laser Beam has become weak (not as bright).	a. Verify that Exit Port Lens is not obscured by mud / dirt.	-CleanExit Port Lenses.	4.3.b
	b. Verify proper battery installation.	-Tighten battery cap. -Install new battery.	3.1.a
	c. Verify Exit Port Lens is not scratched or pitted.	-Notify Unit Maintenance.	
3. Laser beam DOES NOT move.	a. Verify adjuster function.	-Clean as required. -Notify Unit Maintenance.	4.3.a
4. Remote Cable Switch inoperable.	a. Verify Remote Cable Switch plug is fully seated.	-Reconnect plug. -Notify Unit Maintenance.	-
5. POINT beam cannot be zeroed to weapon.	a. Verify Mount is properly positioned/secured to front sight.	-Properly position and secure. Confirm that the laser is parallel with the barrel. Remount on weapon tightening the mounting screws in the correct order if necessary.	3.2
	b. If laser is loose: -Tighten hex screws on mounting bracket. -Tighten laser thumb screw	-Notify Unit Maintenance.	
	c. Inspect mount base for corrosion or dirt.	-Clean as required. -Notify Unit Maintenance.	4.3.a
	d. Check for beam movement.	-Notify Unit Maintenance.	

CHAPTER IV – SECTION III OPERATOR MAINTENANCE

4.3 GENERAL

WARNING

DO NOT store the laser with the battery installed.

CAUTION

The use of gun cleaning agents that contain perchloroethylene or methylene chloride may permanently damage the system.

The laser is a rugged, compact laser device that is designed to operate in severe military environments. The exterior housing is made of aircraft grade aluminum and the outer components are made of chemically resistant materials that will not be harmed by chemicals normally encountered during military operations. Operator maintenance is limited to the inspection and cleaning of the laser external surfaces, replacement of the battery before each mission and removal of the battery after each mission.

4.3.a External Cleaning

Clean the exterior of the laser by flushing with water and wiping with a clean, soft cloth. Cleaning should be done whenever the laser becomes dirty or after exposure to salt water.

4.3.b Exit Port Lens Cleaning

To clean the Exit Port Lenses, wipe clean using a soft cloth or disposable applicator dampened with water.

4.3.c Battery Compartment

Before each use, inspect the battery and battery compartment for dirt, dust, or corrosion. If dirty, clean using a soft cloth or disposable applicator.

4.3.d Battery Cap

Prior to water operations or immersion, inspect the O-ring seals in the battery cap to make sure they are free of sand or dirt particles. If the O-ring becomes cut, nicked or dried out, it should be replaced. If the battery cap is bent or scratched in the O-ring seating area, it should be replaced.

4.3.e Battery Removal and Replacement

Refer to Chapter III, Paragraph 3.2.a for Battery Installation procedures. No special tools or equipment are required to replace the battery.

4.3.F Battery Compartment O-ring

NOTE

Never use a sharp or metal object to remove O-rings, as they damage the O-ring or the O-ring groove contact surface.

Before each use, inspect the battery compartment O-ring for nicks, cuts or damage. Lubricate the O-ring as needed using silicone grease as follows:

1. Gently remove the O-ring. Be careful not to stretch the O-ring.

2. Check the O-ring for hair, sand, lint, or other debris and wipe clean as necessary. Be careful not to stretch the O-ring. If the O-ring is cut or cracked it must be removed and replaced with a new O-ring.

3. If possible, wash your hands prior to greasing the O-ring. Lubricate the O-ring using your fingertips and a small amount of silicone grease until there is a thin film covering the complete surface. DO NOT stretch the O-ring.

4. Before replacing the O-ring, visually inspect the groove in the battery compartment cap for hair, sand, lint, or other debris and wipe clean as necessary.

5. Install the O-ring in the groove at the base of the battery compartment cap, making sure that it is seated uniformly, with no twists or loose areas. Be careful not to stretch the O-ring.

CHAPTER V – SECTION I UNIT TROUBLESHOOTING

5.1 GENERAL

The purpose of troubleshooting is to identify the most frequent equipment malfunctions, probable causes and corrective actions required. Table 5-1 lists the most common malfunctions that may occur with the laser. Perform the tests, inspections and corrective actions in the order they are listed. This manual cannot list all malfunctions that may occur; or all tests, inspections and corrective actions.

Table 5-1 Unit Troubleshooting

Malfunction	Test / Inspection	Corrective Action	Ref. Para.
1. Laser fail to come on or stay on.	a. Inspect battery compartment for corrosion.	-Clean battery compartment.	5.2.c
	b. Inspect battery cap contact for corrosion.	-Clean battery cap contact.	5.2.d
	c. Inspect battery cap and housing threads for contamination.	-Clean battery cap and housing threads.	5.2.d
	d. Possible internal failure.	-Replace battery cap -Return for repair.	5.7
2. Laser beams have become weak (not as bright).	a. Verify Exit Port Lens is not obscured by dirt.	-Remove Exit Port Cover. -Clean Exit Port Lenses.	5.2.b
	b. Verify battery installation.	-Tighten battery cap. -Install new battery.	3.2.a
	c. Verify Exit Port Lens is not scratched or pitted.	-Replace battery cap. -Return for repair.	5.7
3. Laser beams do not move.	a. Verify adjuster function.	-Clean as required. -Return for repair.	5.2.a 5.7
4. Remote Cable Switch inoperable.	a. Possible remote cable failure.	-Return for repair.	5.2.g 5.7
5. Laser cannot be aligned, moves on rail.	a. Inspect weapon front sight.	-Refer to appropriate weapons TM.	

CHAPTER V – SECTION II UNIT MAINTENANCE

5.2 GENERAL

CAUTION
The use of gun cleaning agents that contain perchloroethylene or methylene chloride may permanently damage the system.

Unit Maintenance Procedures consist of operational tests, inspections, troubleshooting and the replacement of a limited number of parts (paragraphs 5.2.a through 5.2.g). All authorized repair parts can be installed at the unit level. A laser failing to meet the tests and inspections should be replaced.

5.2.a External Cleaning
Prior to flushing with water, make sure the battery cap is fully tightened. Clean the exterior of the laser by flushing with water and wiping with a clean, soft cloth. Cleaning should be done whenever the laser becomes dirty or after exposure to salt water.

5.2.b Exit Port Lens Cleaning
Use a lens cleaning kit to clean the Exit Port lenses.

5.2.c Battery Compartment

Before each use, inspect the battery and battery compartment for dirt, dust or corrosion. Clean the battery compartment by wiping with a soft, clean cloth. If a damp cloth is used to clean the battery compartment make sure to allow the compartment to air dry completely before reinstalling the battery cap.

5.2.d Battery Cap

Prior to water operations or immersion, inspect the O-ring and the battery cap to make sure they are free of dirt, moisture or corrosion. Thoroughly clean the O-rings, battery cap and back of the battery compartment that seals against the O-ring using Isopropyl Alcohol. After cleaning, or if the O-ring becomes dried out, lubricate the O-ring using silicone grease. If the O-ring becomes cut or nicked, it should be replaced.

5.2.e Battery Compartment and Housing Threads

Inspect threading on the battery cap and housing for contamination. If the threading appears to be oily or dirty, clean with Isopropyl Alcohol using a soft, clean cloth.

5.2.f Replace Remote Cable

See Chapter III, Paragraph 3.2.g for replacement of the Remote Cable Switch.

5.3 TESTS AND INSPECTIONS

See Preventive Maintenance Checks and Services Table 4-1.

5.4 REMOVAL AND REPLACEMENT OF PARTS

Unit Maintenance is authorized for the removal and replacement of a limited number of assemblies. All repair parts can be installed at the unit level. Special tools or equipment are not required for maintaining the laser.

The following items are authorized for repair or replacement by Unit Maintenance:

5.4.a Battery Removal and Installation

See Chapter III, Paragraph 3.2.a for procedures.

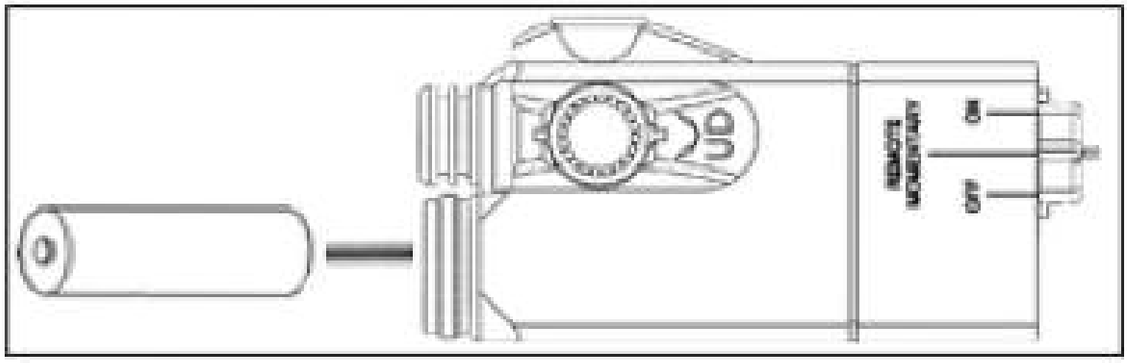

Figure 5-1 Battery Removal and Installation

5.4.b Remove and Replace Battery Cap

Unscrew battery cap. Stretch the end of the retaining strap over the battery compartment housing threads to remove.

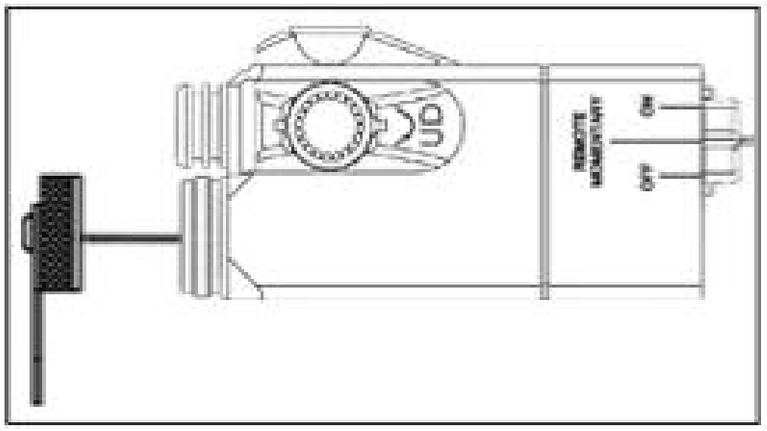

Figure 5-2 Remove and Replace Battery Cap

5.4.c Removal and Replacement of Battery Cap Retaining Strap

To install stretch the end of the retaining strap over the stud located on the battery cap. Stretch the other end of the retaining strap over the battery compartment threads.

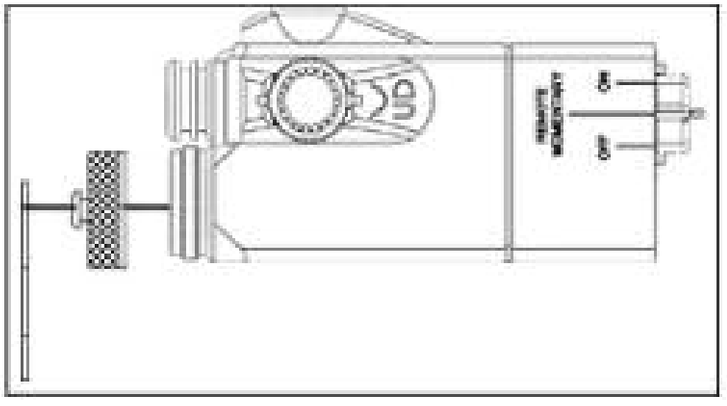

Figure 5-3 Remove and Replace Battery Cap Retaining Strap

5.4.d Remove and Replace Battery Cap O-ring

NOTE

NEVER use a sharp or metal object to remove O-rings as they may damage the O-ring or the O-ring groove contact surface.

Inspect the O-ring for nicks, cracks, cuts or abrasion. Also check to make sure that it feels soft. If damaged, replace the O-ring.

To remove pull the O-ring out of the groove at the base of the threaded portion of the battery cap and remove. Install the new O-ring by pulling it onto the battery cap so that it fits in the groove located at the base of the threaded portion of the battery cap.

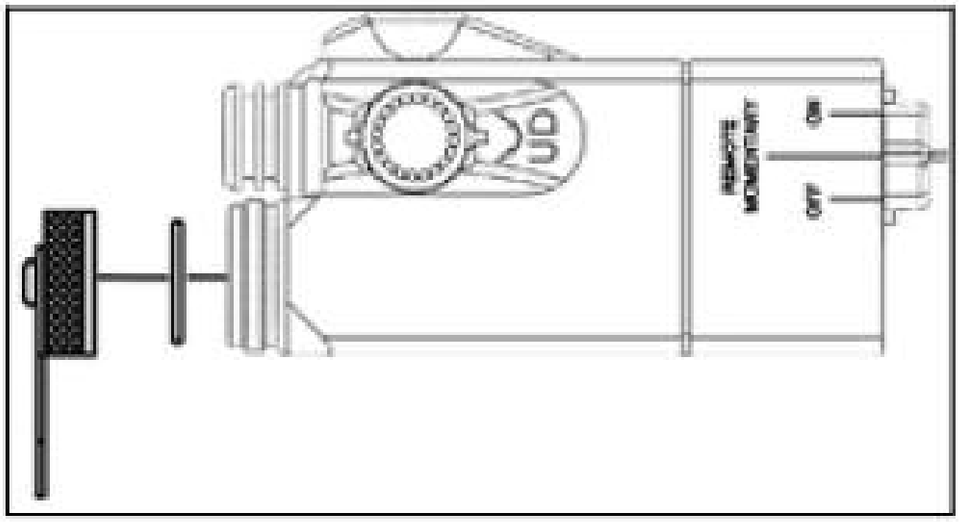

Figure 5-4 Remove and Replace Battery Cap O-ring

CHAPTER V – SERVICE/PACKING AND UNPACKING

5.1 Steiner 3-Year Laser Device Warranty

On all laser devices, Steiner offers a 3-Year Limited Warranty from the date of purchase that covers all laser, optical and electronic components, materials and workmanship. All warranties are void if the serial number or manufacturer's labels affixed to the product have been removed, or if products have been abused, misused, modified, neglected or have been disassembled prior to return to the manufacturer.

5.2 Warranty or Repair Service

5.2.a If you require warranty or repair service please contact Steiner Optik, and we will determine the best way to fix your device. For more information, email laserlightsinfo@steiner-optics.com or call 888-288-7747.

5.2.b To assist the Customer Service with determining if the item is repairable, please provide the following information:

1. Serial Number of the defective item
2. Thorough description of the malfunction, defect or damage
3. An explanation as to how the malfunction, defect or damage occurred, if known.

If Steiner determines that the item is under warranty or should be returned for repair, a Return Material Authorization (RMA) number will be provided.

5.2.c When returning the OTAL Classic for service or repair, the following procedures should be followed to prevent any additional damage:
1. Be sure that the OTAL Classic is free of all contaminants such as dirt or any other foreign material.
2. Remove the battery.
3. Place the OTAL Classic in the Shipping Case or Carrying Case if available. If the Shipping Case is not available, individually package each OTAL Classic unit being returned in a suitable container.

5.2.d Place the OTAL Classic and a copy of the test report or detailed description of the failure in a suitable packing/shipping container. Mark the package with the RMA number. Ship by the fastest, traceable, prepaid means to the address provided by Steiner Customer Service.

APPENDIX A
REPAIR PARTS

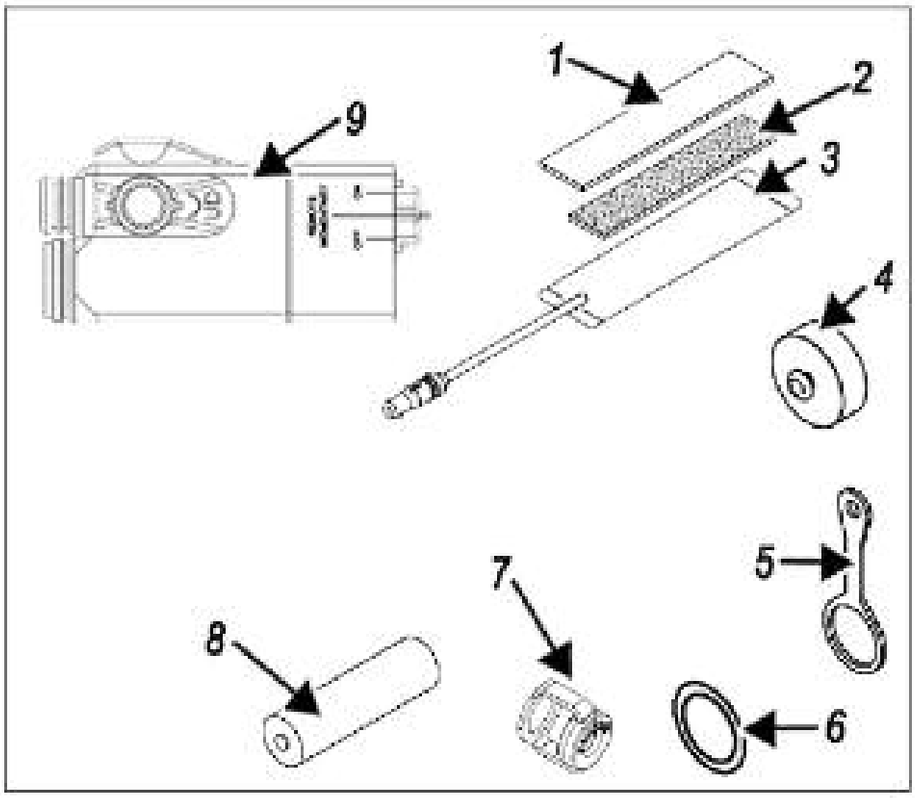

Table A-1 Repair Parts List

Item No.	Description	QTY
1	Tape Fastener Loop 5/8" (Black)	1
2	Tape Fastener Hook 1/2" (Black)	1
3	Remote Cable Switch, 7"	1
4	Battery Cap	1
5	Battery Cap Strap	1
6	O-Ring	1
7	Exit Port Cover	1
8	AA Battery	1
9	OTAL-Classic Housing	1

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