

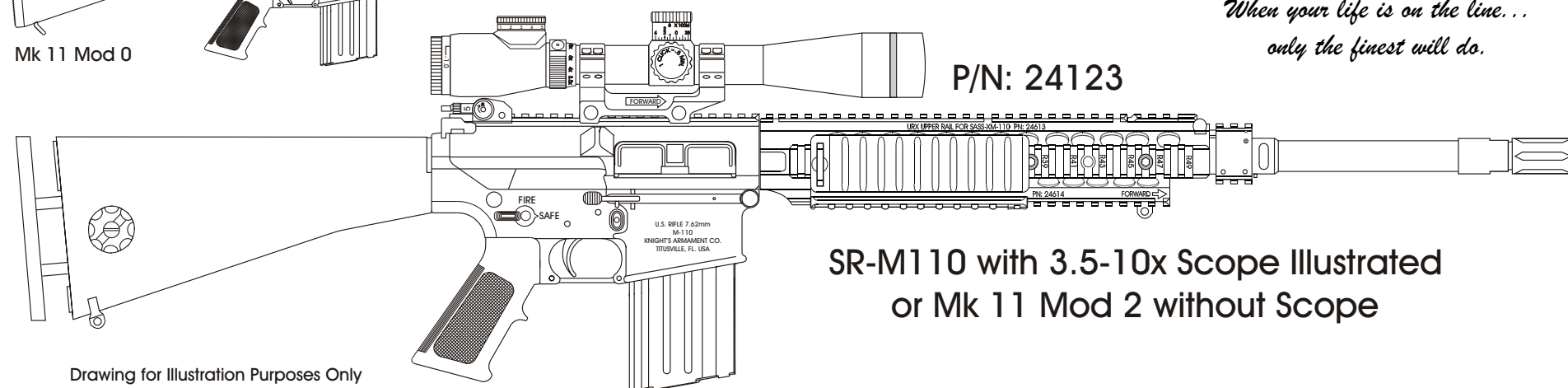
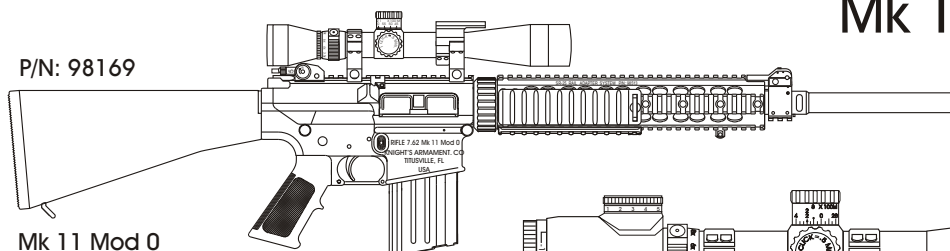
Military Operator's Manual

Stoner SR-25 7.62mm Mark 11 Mod 0 Type Rifle Systems

June 2000 (Revised Jan 07)

(KAC P/N: 98169 NSN: 1005-01-475-7980) and

Rifle 7.62mm U.S. Army Stoner Rifle (SR)-M110 (KAC P/N: 24123) and Mk 11 Mod 2



Drawing for Illustration Purposes Only

*When your life is on the line...
only the finest will do.*



Gov. Part Number SW370-BX-MMO-010



This Manual is Intended
for Official Government Use Only



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Drawings in this manual are for illustration purposes only.

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CHAPTER 1 INTRODUCTION

1-1 SCOPE

This Commercial Off-The-Shelf (COTS) manual is published for the purpose of providing a military style and format Operator's Manual for use by government authorized personnel issued the SR-25 Sniper Rifle Model Systems, to include the U. S. Navy's 7.62mm Mk 11 Mod 0 model **and U.S. Army M-110 Semi-Automatic Sniper System (SASS)**. This also **includes the Navy's & USSOCOM's new Mk 11 Mod 2 designated rifles** which are identical to the U.S. Army SR-M110 rifle component of their system.

Most maintenance for the SR-25 Sniper Rifle Systems (SR-25) and/or Mk11 Mod 0/**SR-M110 SASS**/Mk 11 Mod 2 is Operator Level. Any deficiencies that may occur which the operator cannot correct, require that the complete weapon system be returned to the appropriate service repair activity for maintenance support. The user will note however, that numerous parts and maintenance procedures are identical/interchangeable with many standardized U.S. Government supply and maintenance system components for the 5.56mm M16A1/A2 Service Rifles. The return of U. S. Navy weapons will be coordinated by the POC in paragraph 1-2 below.

1-2 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS

You can help improve this rifle system. If you find any mistakes or if you learn of any ways to improve this manual, please telephone/fax or mail a letter direct to: KNIGHT'S MANUFACTURING COMPANY, 701 Columbia Blvd. Titusville, Florida 32780, Telephone: (321) 607-9900, Fax: (321) 268-1498. **Note: U.S. Navy and USSOCOM personnel will use the following point of contact: Naval Surface Warfare Center (Code 4081), 300 Highway 361, Crane IN 47522-5001 (attn: Mr. Terry O'Brian, Commercial Telephone (812) 854-5831 or Fax (812) 854-1044.**

1-3 NOMENCLATURE CROSS REFERENCE LIST: The below listed nomenclatures are to be considered interchangeable wherever used throughout this manual:

Common (used most often in this manual)

Allen Wrench // Allen Screw
Buffer Tube
Round/Ammunition
Gas Key
Oil
Solvent, Hoppe's, or Shooter's Choice
Recoil Spring
Scope
Rifle/Weapon
Safety

Official

Key, Socket Head Screw // Socket Head Screw / Set Screw
Lower Receiver Extension
Cartridge
Carrier Key
Lubricant, CLP
Bore Cleaner
Action Spring
Day Optic/Primary Daytime Optic
Sniper Rifle/Sniper Rifle System (Mk 11 Mod 0 or **SR-M110 SASS**)
Safety Selector Lever

1-4 DESTRUCTION OF MATERIAL TO PREVENT ENEMY USE

Only your commanding officer can authorize the destruction of material to prevent enemy use. Refer to TM 750-244-7.

1-5 NUCLEAR, BIOLOGICAL AND CHEMICAL (NBC) DECONTAMINATION

General procedures can be found in FM 3-87, FM 21-40, and TM 3-220.

1-6 SR-25 PARTS COMMONALITY WITH STANDARD M16A2 RIFLE

Bolt Catch Plunger	Door Assy. Storage (4 parts)	Rear Sling Swivel
Bolt Catch Spring	Door Assy. Hinge	Rear Sling Swivel Screw
Buffer Detent	Door Assy. Pin	Receiver Extension
Buffer Detent Spring	Dust Cover Spring	Spring, Safety Lever Detent
Butt Cap	Gas Tube	Spring, Take Down & Pivot Detent (2)
Buttstock	Gas Tube Pin	Trigger Guard Assy. (4 parts)
Buttstock Screw	Hammer Pin	Trigger Guard Hinge Pin
Buttstock Spacer	Magazine Catch	Trigger Pin
Carrier Key	Magazine Catch Button	Windage Knob
Carrier Key Screws (2)	Magazine Catch Spring	Windage Knob Pin
Detent, Safety Lever	Rifle Grip	Windage Knob Detent
Detent, Rear Take Down & Front Pivot (2) each	Rifle Grip Screw	Windage Knob Spring
	Rifle Grip Screw Washer	

Note: some of the above listed parts are common to the M4/M4A1 Carbines as well

SECTION II-Navy: Mk 11 Mod 0 EQUIPMENT DESCRIPTION

1-7 TECHNICAL SPECIFICATIONS FOR RIFLE SYSTEM WITH RAS FOREND:

Ammunition: 7.62mm (.308 Win.), M118 LR (combat use) and M852 Match.

Barrel Rifling and Twist: 20" barrel with 5 grooves, right-hand twist with 1 turn in 11 inches (279 mm).

Muzzle Velocity: 2,571 fps (784 meters per second) M118LR Ammunition / Barrel Length: 20" (508 mm).

Maximum Effective Range: 1,000 meters (M118LR velocity at 1,000 meters is 1,099 fps).

Overall Length: 39.5" (1003 mm). Maximum Height w/20-Rd. Magazine and Day Optic: 10.25" (260 mm).

Rifle Weights unloaded: without sights, adapters, or mounts: 10.44 lbs. (4.74 kg.).

w/ Front & Rear Iron Sights, Bipod Adapter: 10.78 lbs. (4.89 kg.).

w/ Iron Sights, Bipod Adapter, Leupold 3.5 x 10 Scope & SIMRAD Mount: 12.83 lbs. (5.83 kg.).

Mk 11 Mod 0 Complete: w/Leupold 3.5 x 10 Scope & SIMRAD Adapter, Bipod Adapter with LM Type S Bipod: 13.7 lbs. (6.21 kg.).

Weight of 7.62mm KAC Sound Suppressor: 1.86 lbs. (.87 kg.). Length: 12.375".

Weight of unloaded 20-Round Magazine: .46 lbs. (.21 kg.).

Weight of Magazine loaded w/20-Rounds of M118 LR Ammunition: 1.62 lbs. (.73 kg.).

Bipod LM Type S Weight: .87 lbs. (.39 kg.). Weight of Bipod Adapter: .12 lbs. (.05 kg.).

Leupold 3.5 x 10 Scope and 30mm Ring Set: 1.66 lbs. (.75 kg.).

Leupold 3.5 x 10 Scope, 30mm Ring Set, Scope Covers, and SIMRAD Mount: 2.05 lbs. (.93 kg.).

Day Optic Magnification: Variable Power 3.5 to 10 Power w/M3 type (single revolution) Ballistic Cam with 1 MOA elevation adjustment clicks and ½ MOA windage adjustment clicks.

Rifle Deployment (Hard) Case, Reduced Length: 40" Long x 14" Wide x 10" Deep: Weight: 17 lbs. (7.71 kg.).

SECTION II-Army: SR-M110 (SASS) EQUIPMENT DESCRIPTION (Note: the rifle component of the Mk 11 Mod 2 is identical, except for the Mk 11 Mod 2 receiver markings, as the Army's SR-M110 rifle component.)

1-7 TECHNICAL SPECIFICATIONS FOR RIFLE SYSTEM WITH RAS FOREND:

Ammunition: 7.62mm (.308 Win.), M118 LR (combat use) and M852 Match.

Barrel Rifling and Twist: 20" barrel (not including flash suppressor) with 5 grooves, right-hand twist with 1 turn in 11 inches (279 mm).

Muzzle Velocity: 2,571 fps (784 meters per second) M118LR Ammunition / Barrel Length: 20" (508 mm).

Maximum Effective Range: 1,000 meters (M118LR velocity at 1,000 meters is 1,099 fps).

Overall Length: 40.5" at shortest buttstock adjustment (1028 mm). Maximum Height w/20-Rd. Magazine and Day Optic: 10.25" (260 mm).

Rifle Weights unloaded: without sights, adapters, or mounts: 10.81 lbs. (4.90 kg.).

w/ Front & Rear Iron Sights, Bipod Adapter: 11.06 lbs. (5.01 kg.).

w/ Iron Sights, Bipod Adapter, Leupold 3.5 x 10 SASS Scope: 12.82 lbs. (5.81 kg.).

M-110 Complete: w/Leupold 3.5 x 10 SASS Scope, Bipod Adapter with LM Type S Bipod: 13.7 lbs. (6.21 kg.).

Weight of 7.62mm (SASS) KAC Sound Suppressor: 1.96 lbs. (.89 kg.). Length with Sound Suppressor: 46.5" (1,181 mm).

Weight of unloaded 20-Round Magazine: .46 lbs. (.21 kg.).

Weight of Magazine loaded w/20-Rounds of M118 LR Ammunition: 1.62 lbs. (.73 kg.).

Bipod LM Type S Weight: .87 lbs. (.39 kg.). Weight of Bipod Adapter: .12 lbs. (.05 kg.).

Leupold 3.5 x 10 Illuminated Reticle SASS Scope w/.5 MOA Elevation Clicks and 30mm SASS Mount: 1.76 lbs. (.79 kg.).

Day Optic Magnification: Variable Power 3.5 to 10 Power w/M2 type (double revolution) Ballistic Cam (with .5 MOA Elevation & Windage Adjustment Clicks).

Rifle Deployment (Hard) System Case, Length: 51" Long x 17" Wide x 12" Deep: Weight: 78 lbs. loaded with Drag Bag. (35.38 kg.).

SR-M110 Semi-Automatic Sniper System Components

Note: this rifle is identical to the Mk 11 Mod 2 rifle except for receiver marking.

SR-M110 with LASER Filter Installed on Day Scope



SR-M110 with Sound Suppressor is
46.5" (1,181mm) Long



Suppressed Rifle in optional Drag Bag with
Crown & Scope Covers Installed



SR-M110 Semi-Automatic Sniper System Components (Continued...)



Crown & Scope
Cover Installed



Deployment Kit is Stored in System Case



System Case with Optional Drag Bag stored in Lid



System Case showing Upper & Lower Trays

Two olive green tactical medical bags are shown. The bag on the left is smaller, while the one on the right is larger. Both bags have a top flap with a strap and buckle, and MOLLE webbing on the front. They appear to be made of a durable, water-resistant material.

The image displays various mechanical components for a 12V battery-powered car. The parts include:

- A clear plastic tube with black caps at both ends, likely for the battery compartment.
- A blue plastic tube with blue caps, possibly for a different section of the car.
- A long metal shaft, likely for the axle.
- A metal bracket or frame component.
- A metal ring or washer.
- A metal cap or plug.
- A metal spring or coil.

A collection of dental instruments and materials arranged vertically. From top to bottom: a bundle of white cotton swabs, a clear plastic tube with a black cap, a black lens brush with 'LENS BRUSH' printed on it, another clear plastic tube with a black cap, and a small blue cap with a white ring and a black sponge.

7

Special Military Light Weight Match “Free-Floating” Barrel RAS Rifle
with KAC Sound Suppressor & Selected Optional Accessories (note Navy Mk 11 Mod 0 GFE SIMRAD Mount)



Figure 1-1 (Basic Mk 11 Mod 0 Rifle & Sound Suppressor)

Selected Navy Mk 11 Mod 0 System Component Nomenclature

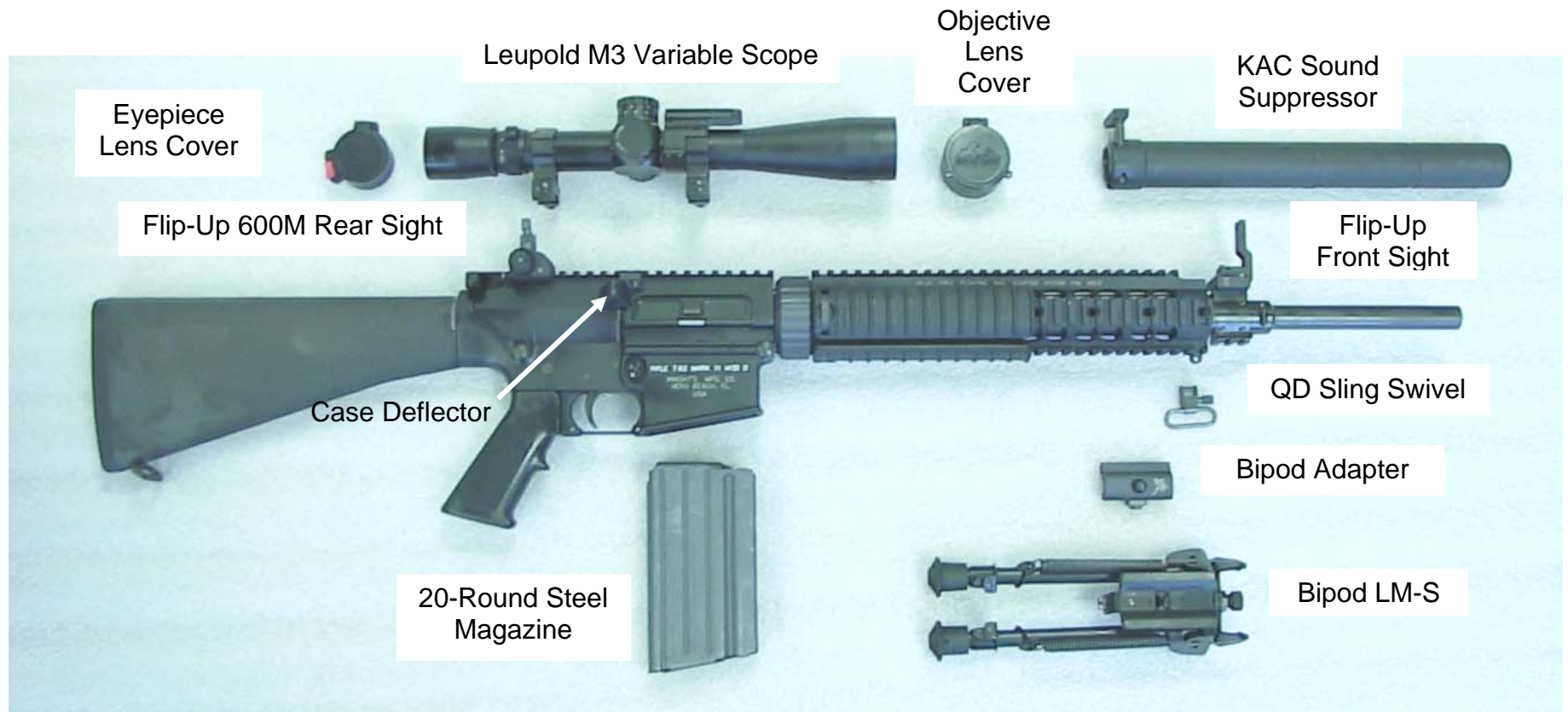


Figure 1-2

Mk 11/M-110 Common Detailed Nomenclature (Right / Starboard Side)

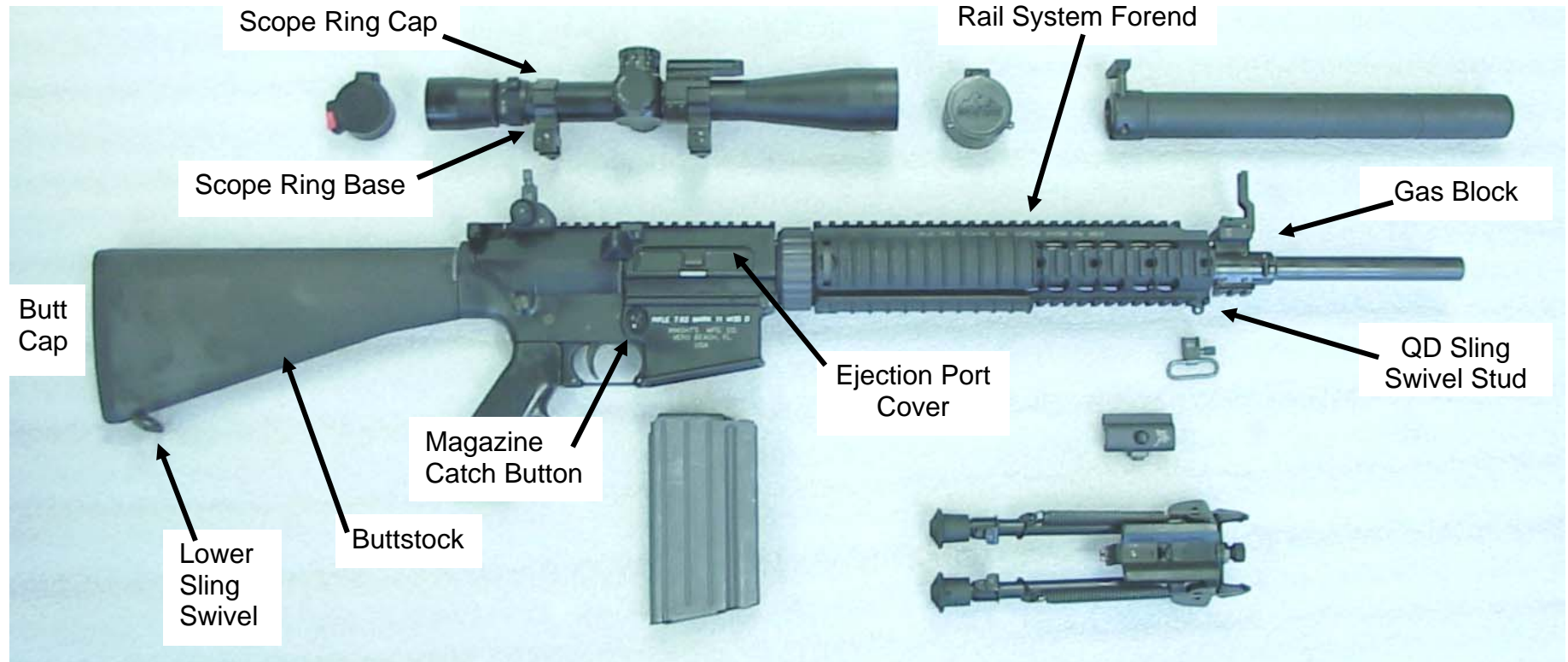


Figure 1-3

Mk 11/M-110 Detailed Nomenclature (Left / Port Side)

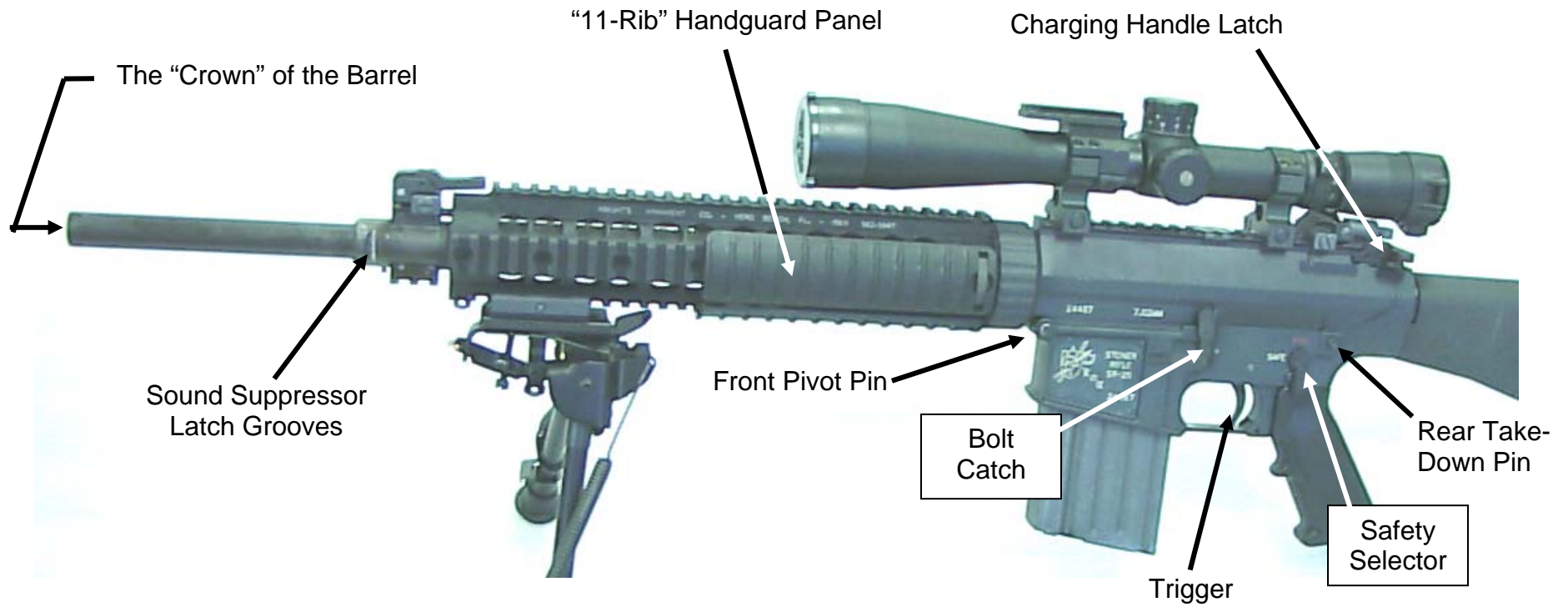
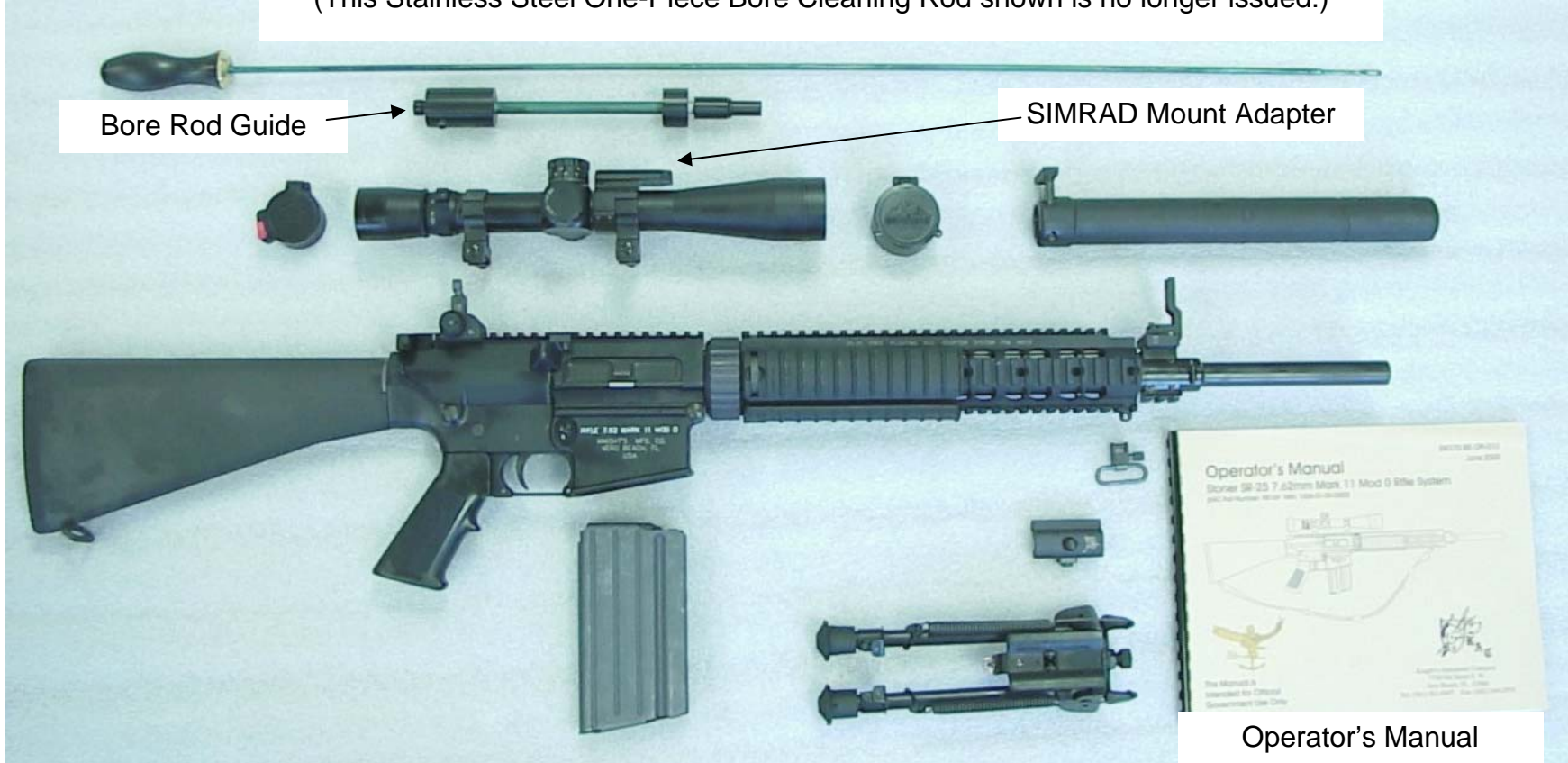


Figure 1-4

Typical Navy SR-25 System for “RIFLE 7.62 MK 11 MOD 0”

(This Stainless Steel One-Piece Bore Cleaning Rod shown is no longer issued.)



Note: Navy system also includes Form Fitted Case as Illustrated in Figure 1-7.
Latest One-Piece Bore Rod currently issued is a black colored coated Dewey Rod.

Figure 1-5

Mk 11 Mod 2 System Navy/USSOCOM (may be shipped without scope)



Figure 1-6

Mk 11 Mod 2 System US Marine Corps (as shipped without scope)



Figure 1-7

1-8 FACTS ABOUT YOUR SNIPER RIFLE

The SR-25 Sniper Rifle System (Mk 11 Mod 0 & **SR-M110 SASS**) consists of an air cooled, precision made semi-automatic rifle, scope rings, optical sight, back-up iron sights, magazines, bipod, a form fitted foam lined rifle deployment case, a detachable sound suppressor, and an Operator's Manual.

The rifle may also be provided with optional accessories that might include an adjustable sling, a deployment kit with spare parts, user cleaning and maintenance kit, drag bag, scope covers, scope lens covers, and/or night scopes.

The free-floating barrel system of these rifles is one of the key contributors to its system accuracy. This simple design does not require application of glass bedding compound or barrel replacement operations by specially trained and equipped Armorers.

1-9 TACTICAL FLEXIBILITY

The rifle will be used by expert class riflemen and trained snipers to engage and destroy enemy personnel at both long and short ranges. The trained sniper armed with the rifle system and proper ammunition can consistently hit personnel size targets at ranges of 1,000 meters. The effective range obtained from other users will be dependent on their training, motivation and skill level.

The rifle system design deliberately capitalizes on prior shooting and maintenance skills of individuals trained and proficient with M16 type rifles and M4 type carbines, but provides an inherently more robust and precision arm. The 7.62x51mm NATO caliber 175 gr. M118LR ammunition also provides very accurate firing capability at extended ranges (600-1,000 meters). The rifle's receiver and Mil-Std M1913 rail system forend design permits the subsequent attachment and detachment of other sighting systems/Universal Night Sights and accessories with approved mounting systems without loss of combat zero.

A complete kit of accessories can be provided for sustained deployment in remote areas. A variety of capabilities may be obtained by the combination of basic issue items and ancillary items like a scope/crown cover, drag bag, Universal Night Sight, illuminating laser, etc., can then be tailored for a variety of tactical applications. These applications range from counter sniper actions conducted by local and federal level law enforcement agencies, to the most severe operational environments, which Forward Deployed General Purpose/Expeditionary and Special Operations Forces may encounter.

A sound suppressor is also available for approved agencies. The combination of precision mounting points and the suppressor design provide yet another aspect to the rifle's unique flexibility and adaptability. This combination provides a level of accuracy, repeatability and precision formally unavailable in a weapon of this type.

7.62mm KAC Sound Suppressor mounted to the Special Military Light Weight Match
“Free-Floating” RAS Rifle (Mk 11 Mod 0 Type)



Figure 1-8

1-10 RATES OF FIRE

In training and peacetime, the rifle should never be fired with unnecessary rapidity or past the point where the barrel/sound suppressor cannot be held comfortably in a bare hand because it is too hot. Although the mechanism itself is capable of a very high and rapid rate of fire, abuse of this capability will lead to premature barrel wear, loss of match grade accuracy and premature suppressor failure.

MAXIMUM SUSTAINED RATE OF FIRE for Maximum Barrel Life: Five rounds per minute for four minutes, two minute cooling (bolt open). After 100 rounds, allow rifle to fully cool before repeating. Clean bore during cooling periods to increase barrel life and provide the best accuracy with subsequent shot groups.

Note

The Sustained Firing Rate is a Maximum Firing Rate, but not a recommended firing rate. In combat, you may be required to exceed the Maximum Sustained Rate to accomplish your mission.

In training, you should rarely—if ever—approach the Maximum Sustained Rate of Fire.

	Maximum Sustained Firing Rate: 4 Minute Firing Cycles				Total Rounds Fired	Cumulative Time in Minutes
Cooling Cycles:	Rounds per Minute	Rounds per Minute	Rounds per Minute	Rounds per Minute		
	5	5	5	5	20	4
2 Minute Cooling Cycle w/Bolt Open	5	5	5	5	40	10
2 Minute Cooling Cycle w/Bolt Open	5	5	5	5	60	16
2 Minute Cooling Cycle w/Bolt Open	5	5	5	5	80	22
2 Minute Cooling Cycle w/Bolt Open	5	5	5	5	100	28
After firing 100 Rounds in 28 Minutes Stop Firing. Allow barrel to cool to touch. Clean and completely de-foul copper from bore.						

Figure 1-9

CHAPTER 2 OPERATING INSTRUCTIONS

SECTION I: DESCRIPTION

2-1 DESCRIPTION: The SR-25 is a precision 7.62mm NATO, direct-gas operated, semi-automatic, air cooled rifle equipped with a 20 and 10-round magazines. Once loaded, it will continue to fire at each pull of the trigger as long as ammunition remains in magazine.

CAUTION

Although the SR-25 is provided with a manual safety lever system for positive firing sear control, do not load a round into the chamber until you are actually about to engage an authorized target.

2-2 SR-25 SYSTEM: The basic system consists of the rifle, magazines, sighting system(s), and optional items such as a sling, cleaning kit, minimum essential tools, system/component cases, bipod, drag bag (tactical soft case), spare parts kit for rifle and or scope, and other items.

NOTE

Approved scopes, sighting devices and mounting systems can be removed and replaced easily by the user without the loss of more than 1/2minute of angle (MOA) change in zero. It is recommended, however, that the primary optical sight be left on the rifle in order to protect their mating surfaces.

SECTION II: SERVICE UPON RECEIPT

WARNING

Before starting an inspection or performing any maintenance procedures, personally ensure the rifle is clear. Never squeeze the trigger until you have cleared the rifle. Always check the chamber and see that it is empty before pulling the trigger. Also check for obstructions in the bore before loading and chambering a round. Never keep or allow live ammunition near administrative, cleaning or maintenance areas. Never leave rifle or ammunition unattended.

2-3 SERVICE UPON RECEIPT

- a. Check system case for signs of damage. Conduct safety check and inspect the equipment for damage that may have occurred during shipment.
- b. Inspect contents of system case (s) against the Shipping Documents and/or the rifle system parts list provided in Appendix C. Note that not all applicable accessories may have been shipped with your particular rifle. Check with your supervisor to verify that the contents of your particular shipment are correct and complete.
- c. Clear and field strip rifle to ensure there are no missing parts (see paragraph 2-7 thru 2-10: Field Stripping).
- d. Clean the rifle. When finished, inspect bore for obstructions. Do not leave cleaning patches in the bore (see paragraph 2-11: Barrel and 3-5: Cleaning). Inspect and Lubricate rifle per paragraph 3-1 and 3-2.
- e. Perform safety and functional checks (see paragraph 2-23: Safety/Functional Check).
- f. If not attached, attach day optic to rifle and check eye relief with your stock weld (see paragraph 2-15: Day Optic Mounting). Remount scope or adjust scope's position between the scope mounting rings if necessary. In conjunction with this procedure, check for eyepiece focus (see paragraph 2-23). With the M-110 SASS type buttstock, eye relief may also be changed by adjusting the buttstock length.
- g. Move to a suitable firing range and check zero of rifle and scope combination (see paragraph 2-25: Day Optic Sight. Use this opportunity to adjust the sling for your requirements and to test fire all magazines included with the rifle. Magazines are best tested loaded with 18 rounds; you need not fire more than 5 rounds of the 18 for an adequate magazine test (9 rounds recommended for 10-round magazines). Manually unload unfired rounds carefully while not damaging the magazine feed lips. **Although the magazine will function loaded with 20 rounds, loading under a closed bolt is more reliable with only 18 rounds loaded due to the extra energy you need to apply to overcome the fully compressed magazine spring.**
- h. Clean and inspect rifle in accordance with paragraph 3-5: Cleaning and Inspection.
- i. The rifle and magazines are ready for service.
- j. If any deficiencies or discrepancies are found, you may contact: KNIGHT'S MANUFACTURING COMPANY, 701 Columbia Blvd. Titusville, Florida 32780, Telephone: (321) 607-9900, Fax: (321) 268-1498. **Note: U.S. Navy personnel will use the following point of contact: Naval Surface Warfare Center (Code 4081), 300 Highway 361, Crane IN 47522-5001 (attn: Mr. Terry O'Brian, Commercial Telephone (812) 854-5831 or Fax (812) 854-1044.**

SECTION III: OPERATION AND CHARACTERISTICS

2-4 SAFETY SELECTOR LEVER (the Safety)

a. The **safety** is located on the left rear side of the lower receiver. The safety has two positions: **SAFE** and **FIRE** are both clearly marked on the lower receiver. When the safety is rotated to the **SAFE** position, the rifle (hammer) is fully cocked, but the firing sear is blocked from movement providing protection from accidental discharge under normal usage when the safety is properly engaged and serviceable. **The M-110 may have an ambidextrous (second) lever on the opposite side of the receiver. That side is marked SAFE and Fire as well.**

b. To rotate the safety to the **SAFE** position, pull the charging handle fully to the rear (while visually checking that the chamber is clear by observing through the ejection port) as the bolt is retracted by the charging handle. The safety may be rotated to the **SAFE** position any time the bolt is held fully to the rear or when the bolt is forward and the hammer is cocked.

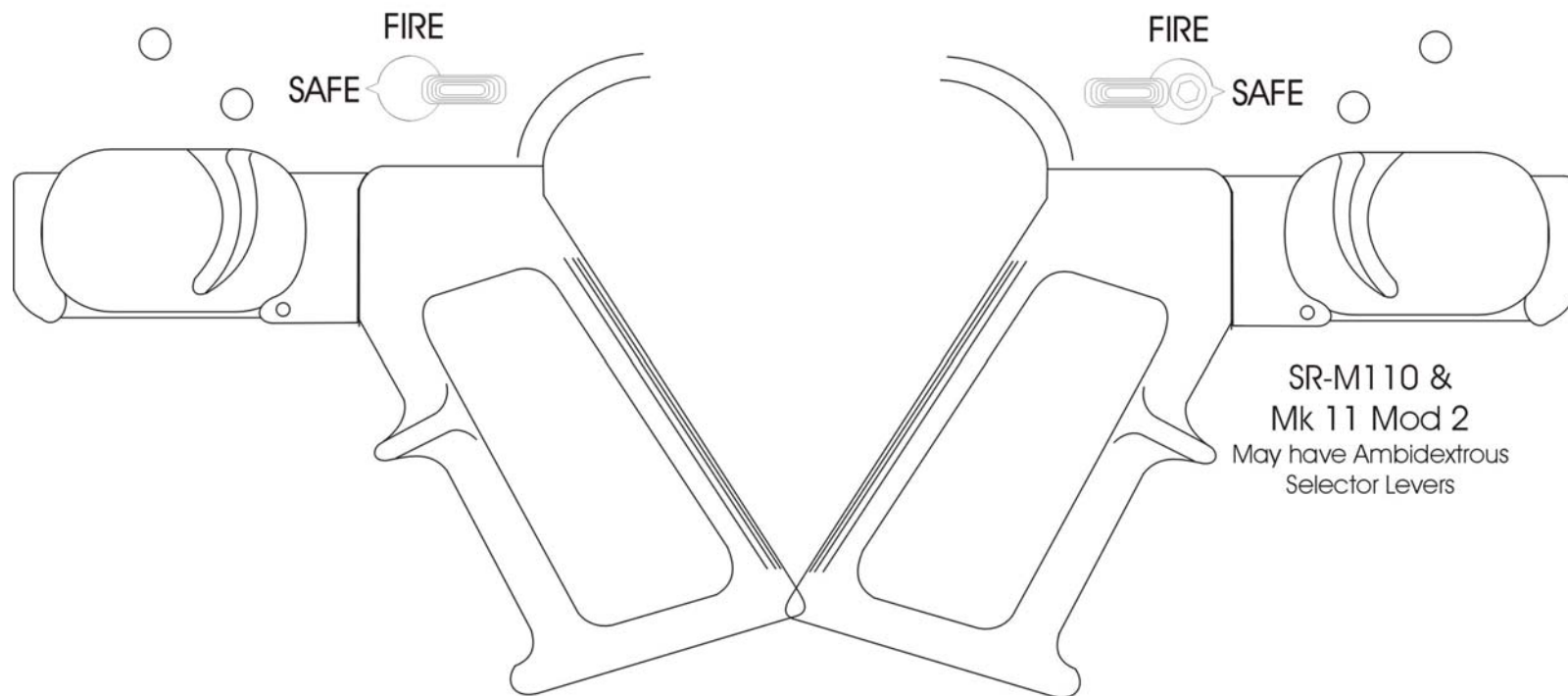


Figure 2-1

WARNING

**The rifle may fire any time the safety is in the FIRE position and the trigger is pulled.
When you are not actually firing your rifle, always rotate the safety to the SAFE position.**

REMEMBER:

Simply removing the magazine does not Safe or Clear a weapon.

- c. Keep the safety in the SAFE position while handling, loading, or unloading the rifle.
- d. When you are ready to fire, confirm your target, rotate the safety to the FIRE position, and squeeze the trigger.

NOTE

Before clearing the rifle, place safety on SAFE, and remove the magazine.

2-5 CHARGING HANDLE

- a. The charging handle is located at the rear of the upper receiver and is the primary means of cocking the bolt and either loading or unloading the chamber. It has a spring loaded catch which retains it in its forward position during firing. **The M-110 charging handle is interchangeable with that of the Mk 11, but the M-110's has integral channels that divert gasses bleeding back from the suppressor from the shooter's face.**
- b. To operate the charging handle, depress the catch while pulling the handle to the rear. When the bolt is fully to the rear, the handle will come to a stop. Note that the ejection port cover snaps open as the bolt passes. This allows the chamber to be inspected and the bolt locked to the rear (with the Bolt Catch) if desired.

2-6 CLEARING PROCEDURES (see photographs on follow-on pages)

- a. Point rifle in safe direction and rotate safety to SAFE position.

WARNING

If the safety will not go to SAFE position, perform the following steps with extreme care.

- b. Remove magazine by depressing catch button and pulling magazine down.
- c. Pull the charging handle fully to the rear while visually checking that the chamber is clear by observing through the ejection port as the bolt is retracted.
- d. To lock the bolt open, pull charging handle fully to the rear. Press bottom portion of bolt catch and hold. Allow bolt to move forward slightly by slowly releasing charging handle. The bolt should engage the catch lug (this can be observed through the ejection port). Then return the charging handle fully forward until it latches. Rotate safety to SAFE.
- e. Check interior of receiver area and chamber ensuring these areas are clear of ammo.
- f. With the safety pointing to SAFE, allow the bolt to go fully forward by pressing the upper (larger) portion of the bolt catch. The bolt should spring home (forward). Close the ejection port cover. The bolt may be closed without noise by retarding its spring forward with the charging handle.

NOTE

It is good operational practice to keep the ejection port dust cover closed at all times. It opens automatically each time the bolt is pulled to the rear or when a round is fired. However, it will remain in the open position unless you manually close it. This practice will help keep the rifle clean and functional, especially under adverse weather conditions.

2-7 FIELD STRIPPING -- UPPER RECEIVER (see photographs on follow-on pages)

WARNING

Rifle must be unloaded, magazine removed, rifle clear and on SAFE before Field Stripping and removing bolt.

- a. Depress the magazine release button and remove magazine if present. Pull charging handle to the rear and check that the receiver and chamber are clear. Ease the charging handle forward (bolt should move forward under tension from the action/recoil spring). Close dust cover.
- b. While squeezing the upper and lower receivers together, push left end of rear takedown pin into lower receiver. From the right side of the receiver, pull the pin until it stops against its internal detent. Pivot open receiver.
- c. Hold the upper receiver horizontal (lower receiver down) and pull charging handle about three inches to the rear.
- d. Withdraw bolt carrier to the rear and down out of the upper receiver. Note that the dust cover being closed helps prevent the bolt from falling out prematurely.
- e. Remove charging handle by pulling to the rear and allowing it to pass down through its disassembly slots in the upper receiver.
- f. While squeezing the upper and lower receivers together again, push left end of front pivot pin into lower receiver. From the right side of the receiver, pull the pin until it stops against its internal detent.
- g. Separate upper and lower receivers. No other field stripping of the upper receiver is required for normal cleaning. However, optical sight may be removed if desired. See paragraph 3-6 for handguard removal. **The SR-M110 lower rail is removable (if the outside of the barrel or rail forend interior requires cleaning) by the Operator removing its side rail screws.**

2-8 FIELD STRIPPING -- CARRIER AND BOLT (see photographs on follow-on pages)

- a. Hold carrier with bolt pointed downwards. Pull or push firing pin retaining pin from its recess, note it does not come free of the carrier like M16 rifles and M4 carbines. The SR-25's firing pin retainer is held captive by a pin so it won't be lost during cleaning.
- b. Cover open end of carrier with the palm of a hand and point bolt upwards. Allow firing pin to drop into palm. Avoid dropping firing pin onto a hard surface. Set firing pin aside in a safe place or in your pocket wrapped in a rag.
- c. Push bolt assembly into the carrier to its locked position. Withdraw cam pin clear of bolt carrier. Set cam pin aside with firing pin in a safe place or in your pocket wrapped in a rag.

CAUTION

Do not lose rifle parts that you set aside. Wrap them in a rag and put them in your pocket. They are essential for safe operation. Do not remove firing pin retaining pin from carrier assembly.

- d. Remove bolt by pulling it from the carrier.

2-9 DETAILED FIELD STRIPPING -- BOLT (see photographs on follow-on pages)

- a. Extractor may be removed from bolt by pressing the rear of the extractor against bolt and using the firing pin to slightly press out the pivot pin. Be especially careful not to lose this pivot pin. Wrap it in a rag and put it in your pocket.
- b. Using your fingers, withdraw extractor pivot pin. Set extractor and extractor pin aside with cam pin and firing pin.

CAUTION

With the extractor removed from the bolt, it is easy to lose the extractor pin, or the small silicone (rubber) buffer that fits inside the coils of the extractor spring during cleaning if you do not place them aside in a safe place. Be careful not to lose any parts, **wrap them in a rag and place them in your pocket.** Do not damage tip of firing pin if it is used to press out pins. Do not remove extractor spring from extractor body—if you do, have an Armorer re-assemble. The spring requires a clock-wise twist to lock it into its recess.

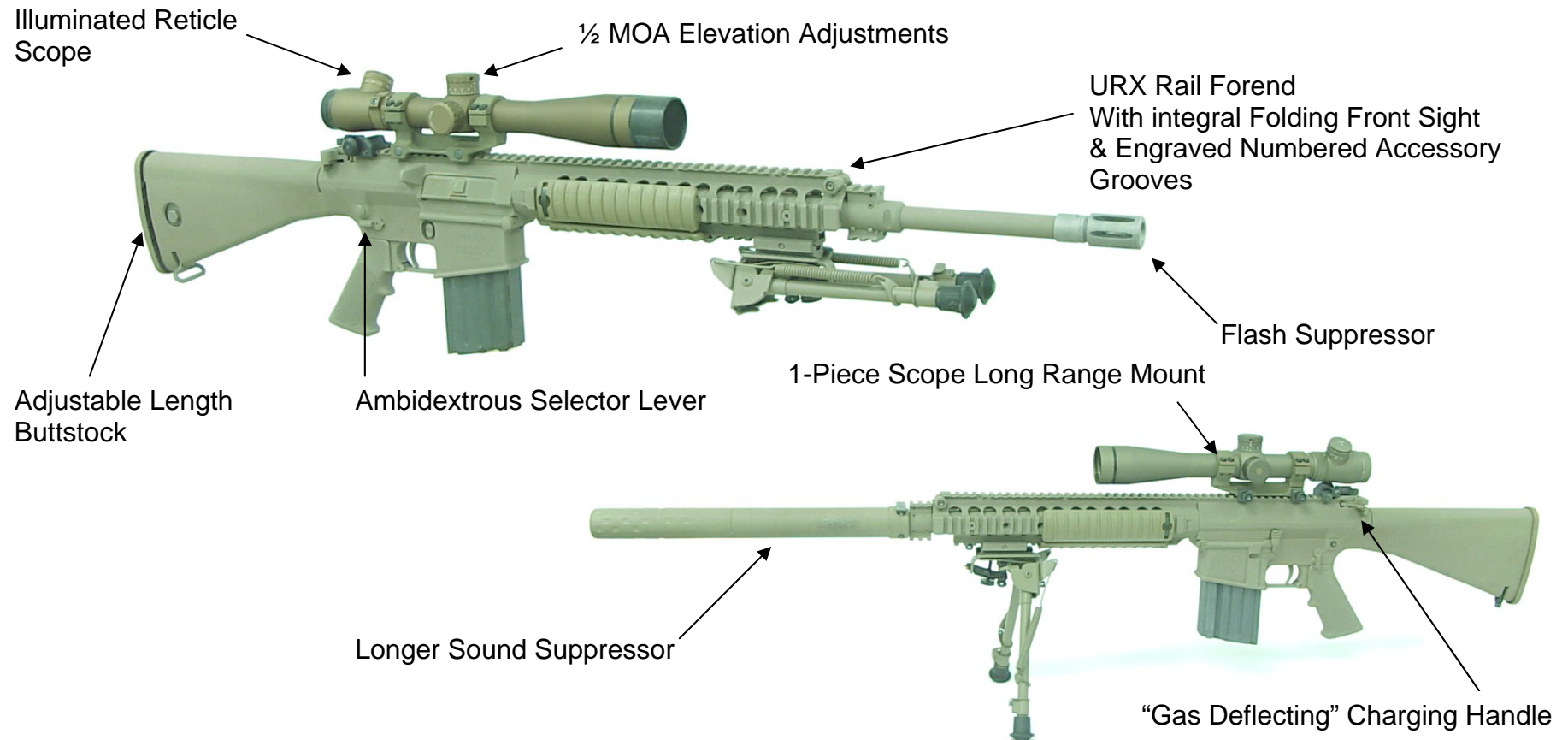
- C. No other field stripping of the bolt and carrier is required.

2-10 DETAILED FIELD STRIPPING -- LOWER RECEIVER (see photographs on follow-on pages)

- a. Cock hammer and press in buffer (note that it is strongly spring loaded), depress buffer retainer detent.
- b. Slowly ease buffer and action spring from lower receiver extension (buffer tube) while holding hammer out of the way. Separate the action/recoil spring from buffer.

No other field stripping of the rifle or rifle assemblies is required.

SR-M110 Rifle System Differences from Mk 11 Mod 0



Field Stripping Procedures common to all Models:



2-7 a.
Release Magazine and Clear Weapon



2-7 b.
Pull Rear Takedown Pin



2-7 c.
Slightly Retract Charging Handle



2-7 d.
Withdraw Bolt Carrier Assembly



2-7 e.
Remove Charging Handle



2-7 f. Pull Front Pivot Pin

Field Stripping Procedures (Continued)



2-8 a.
Separate Upper and Lower Receivers

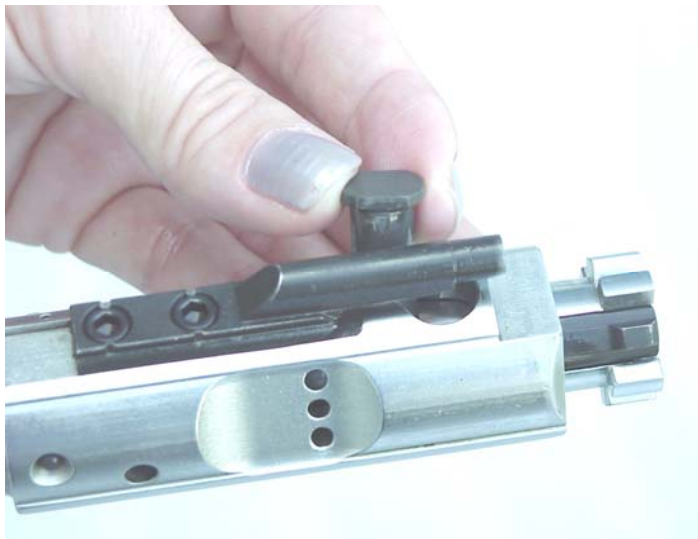


2-8 b.
Pull Firing Pin Retainer Pin



2-7 g.

Tilt Bolt Up and Catch Firing Pin in Hand



2-8 c.
Withdraw Cam Pin



2-8 d.
Remove Bolt Assembly

Detailed Field Stripping Procedures



2-9 a.

Push Out Extractor Pivot Pin Slightly with Firing Pin



2-9 b.

Withdraw Extractor Pivot Pin and Remove Extractor



Bolt & Extractor readied for detail cleaning.



2-10 a.

Depress Buffer Detent while preventing Buffer from flying-out under spring pressure with your Thumb



2-10 b.

Remove Buffer and Action Spring, and then carefully separate them for Cleaning, Inspection, and Lubrication

Weapon Completely Field Stripped for Cleaning, Inspection, or Lubrication

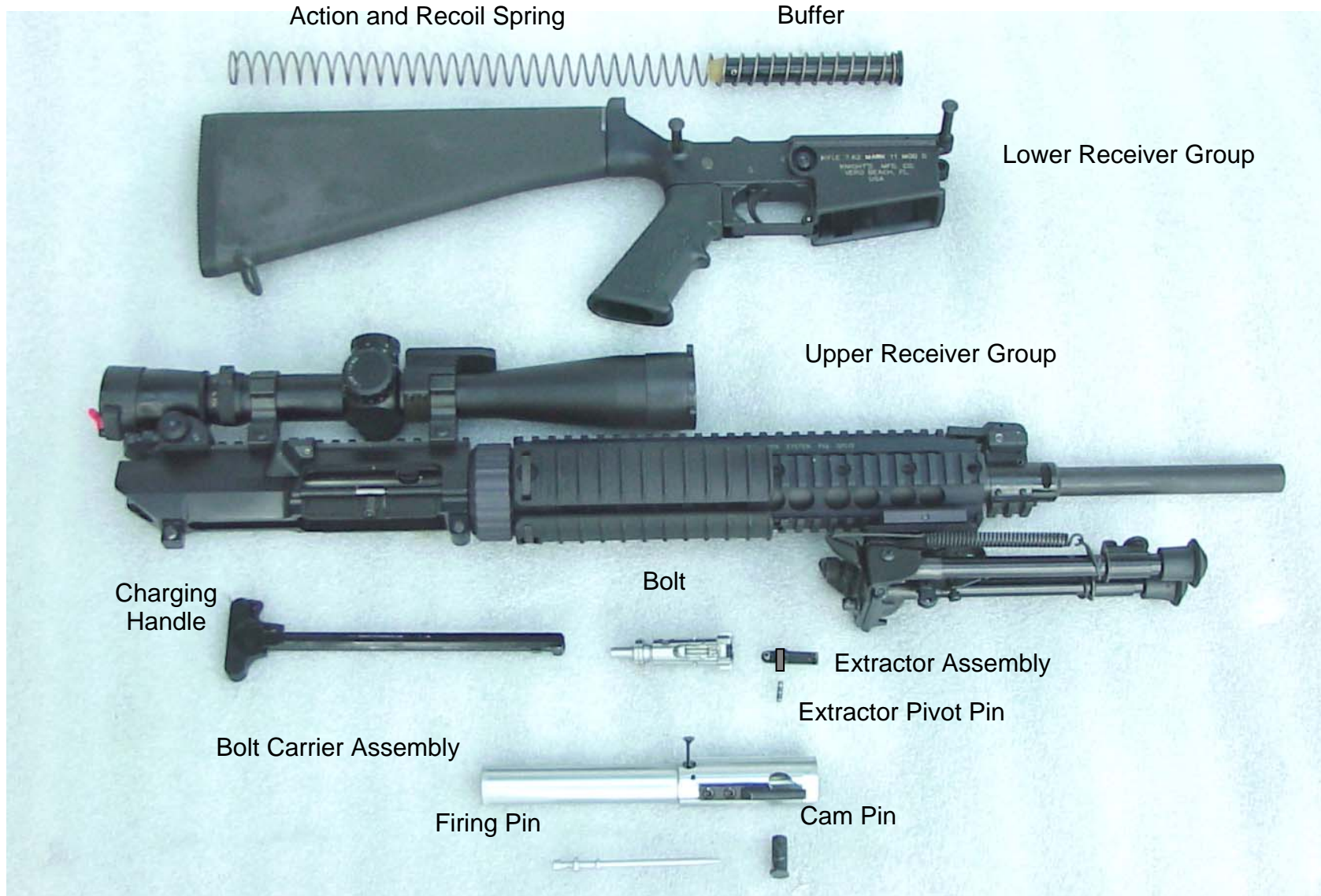
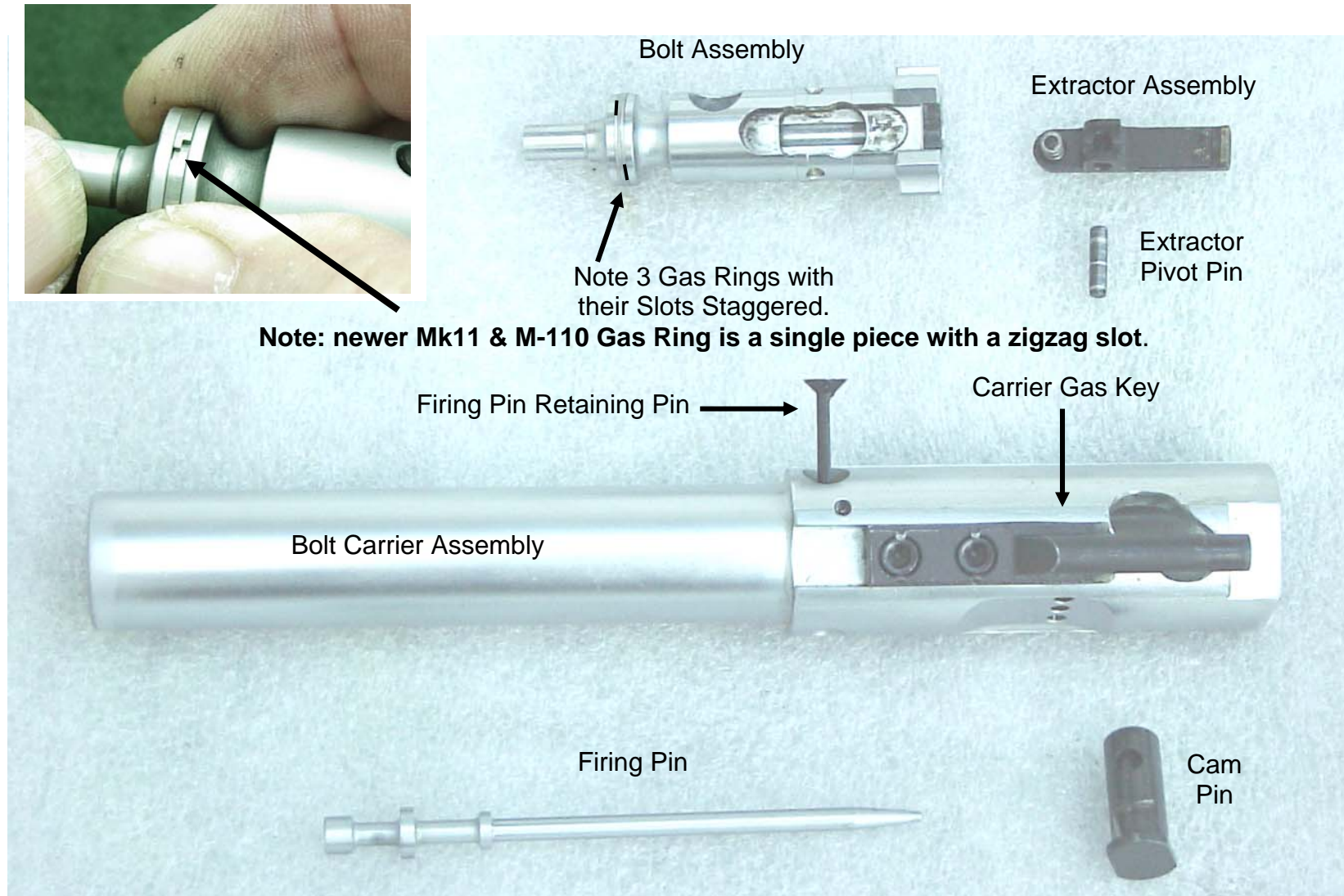


Figure 2-2

Bolt & Carrier Assembly Field Stripped for Cleaning, Inspection, or Lubrication



Note: All SR-M110's and most Mk 11 Mod 0's will have a single gas ring with a single (zigzag) slot. The Operator need not be concerned with its orientation.

Figure 2-3

Operator in the Field: 2-Piece Bolt Ring Replacement Instructions:



If bolt slides in and out of bolt carrier too easily, the 2-piece bolt ring set needs to be replaced. Worn out rings can lose gas and cause malfunctions like “short stroking” because the bolt carrier is not propelled far enough rearwards during recoil.



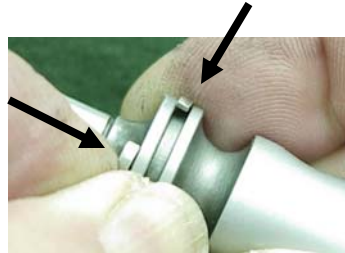
A pen knife is a field expedient tool to remove the old rings. Pry up one end and push ring rearwards of bolt.



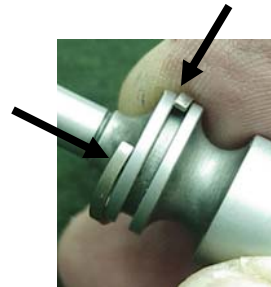
1. Inner ring install starting position. Using your fingers of the supporting hand, keep the top end ring as much in the groove as possible...



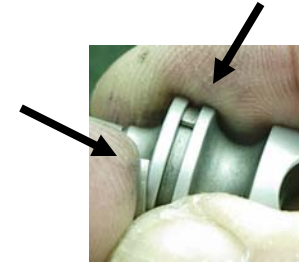
2...while sliding the other end up and over with the fingers of your other (stronger) hand...



3...as the top end snaps into the groove, lift the other end up and over...



4...continuing...



5...final finger push...



6...inner ring snaps into place.



7. Outer ring install is the same.



8. Holding and rotating until ring



9. Outer ring completed.



“GENTLY” insert bolt in carrier. You may need to compress the outer ring with your fingers to ease initial insertion. **DO NOT FORCE!**

2-11 THE BARREL

The barrel is the heart of your rifle's accuracy and precision. **It is steel, and will rust if not cared for properly.** Take very good care of the barrel and upper receiver group. Be especially careful when it is detached from the rifle after field stripping and during cleaning.

a. To inspect the inside of the barrel:

(1) Perform clearing procedures (see paragraph 2-6).

(2) Remove bolt assembly (see paragraph 2-7).

(3) Look through the bore from the chamber end to the muzzle. It should be clean and free of obstructions. This includes the chamber throat, chamber walls, and bolt locking recesses.

(4) To remove bore obstructions, debris, or excess lubricants, use the Bore Rod Guide and cleaning rod with a patch. Insert the rod through the Bore Rod Guide, into the chamber, and all the way through the bore until the rod tip/patch clears the muzzle.

(5) Clean the barrel and chamber (see para 3-5: Cleaning).

2-12 REASSEMBLY--LOWER RECEIVER

a. Assemble action spring and buffer.

b. Make sure hammer is cocked. Insert action spring and buffer into lower receiver extension. Buffer retainer may need to be depressed as buffer is fully inserted.

2-13 REASSEMBLY--BOLT AND CARRIER

a. Ensure extractor spring and silicone buffer are properly seated (see photo to the right) The point of a bullet may be used to re-seat extractor spring by giving it a slight clockwise twist. Press extractor assembly in place on bolt and insert extractor pivot pin. If the bolt has the older style 3-piece bolt ring set, check orientation of gas ring slots on bolt assembly. They should be staggered at 12, 4, and 8 o'clock positions.



b. Insert bolt in carrier. Rotate bolt to align cam pin hole at rear of cam slot of carrier. Ensure extractor is orientated to the right (ejection port side).

c. Insert cam pin with firing pin hole aligned front to rear.

WARNING

Cam Pin must be installed in bolt group; if not, rifle can still fire and will explode.



Remember to Install Cam Pin

d. **HOLD FIRING PIN RETAINING PIN TO ITS FULL OPEN STOP.**

Hold bolt downwards in palm of hand and drop firing pin into carrier.

With a section of cleaning rod, push firing pin to its full forward position (only about 1/8" of the firing pin head is visible when fully forward).

See illustration on this page. With firing pin fully forward, push in on retaining pin. Retaining pin should be flush or below the surface of the carrier body.

Proper Assembly of Firing Pin and insertion of Firing Pin Retaining Pin

Retaining Pin must pass between the Firing Pin's Head and large firing pin bearing

Firing Pin Tip should be visible in Bolt Face

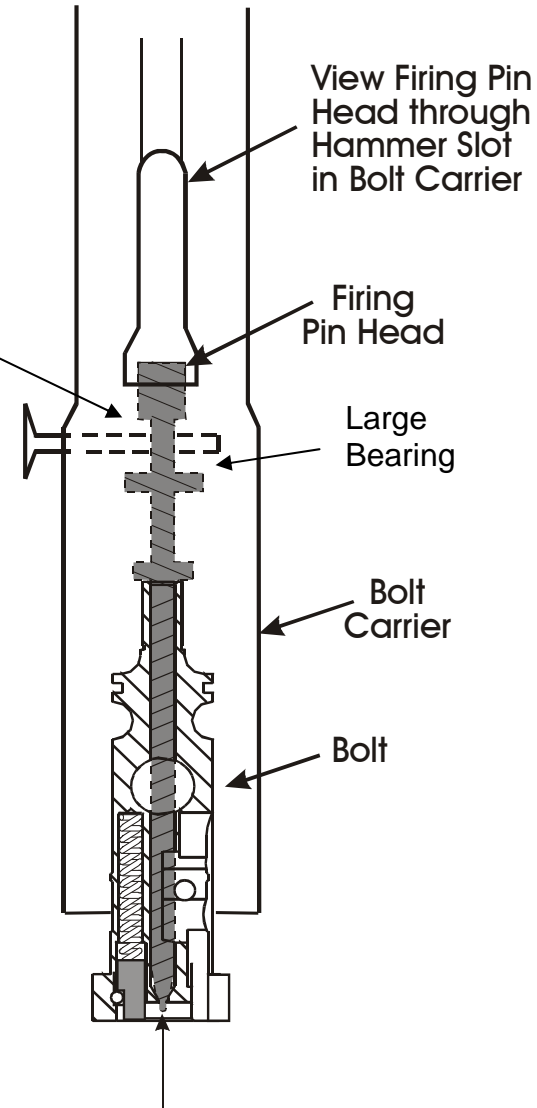


Figure 2-4

- e. Pull bolt to its extended (unlocked) position. Hold rear of carrier down against open palm and shake carrier. Firing pin should not fall out if retaining pin and firing pin are properly installed (you should also be able to hear firing pin moving back and forth).

2-14 REASSEMBLY--UPPER RECEIVER

- a. With sights down, insert charging handle into upper receiver. Ensure charging handle lugs enter their grooves in the rear of upper receiver through the clearance slots near the rear of the upper receiver. Position the charging handle three inches from its full forward position.
- b. Insert bolt and carrier group carefully into upper receiver. Push forward on carrier until bolt and charging handle are fully forward. Close dust cover.
- c. Make sure hammer is cocked and safety is on SAFE. Assemble upper and lower receivers so that the pivot pin holes are aligned. Push in pivot pin.
- d. Hold upper and lower receivers together push in rear takedown pin. **REASSEMBLY is now complete.**

2-15 DAY OPTIC MOUNTING -- (As required)

- a. Before mounting day optic, lubricate the threads of each mounting nut with one drop of oil. Rotate mounting nuts to evenly distribute lubricant. Wipe dry any excess oil. Leave nuts fully loosened (turned counter-clockwise) 2 or 3 turns on their shafts until the bases are seated on the receiver rail.
- b. Inspect each mounting ring nut and mount claw for burrs and debris. Remove any debris from surfaces before mounting sighting systems. Make sure receiver dovetail is also free of debris and burrs. See armorer to remove burrs with a fine stone if necessary.
- c. Mount day optic sight and scope rings to the upper receiver dovetail with rifle held horizontally and ejection port up. Hook fixed claws of sight mounts under right side of receiver dovetail and rotate scope ring bolt shafts down into the selected dovetail slots. **Continue holding optic against receiver dovetail during the following steps.**

NOTE

There are several pairs of mounting slots to accommodate eye relief and scope ring location. Once you select a pair, they should be re-used to retain zero if the sight is subsequently removed and then reattached again.

- d. Slide the rear mount claw under and against the receiver dovetail. Finger tighten the mounting ring nut. Tighten means to turn to the right/clockwise direction.
- e. Slide the front claw under/against the dovetail and finger tighten mounting nut as above.

CAUTION

Steps f. and g. should be performed only when the day optic is attached without benefit of the T-Handle Torque Wrench and re-zeroing of the system cannot be accomplished through live firing. Otherwise, use T-Handle Torque Wrench as described in steps h. through j.

- f. Use the 1/2" combination wrench (or plastic T-Wrench from Cleaning Kit) to tighten the rear mounting ring nut 1/4 turn (90°).
- g. Use the 1/2" combination wrench (or plastic T-Wrench from Cleaning Kit) to tighten the front mounting ring nut 1/4 turn (90°).
- h. With the T-Handle torque wrench pre-set to 65 in. lb., tighten the rear mounting ring nut until torque wrench clicks.
- i. With the T-Handle torque wrench pre-set to 65 in. lb., tighten the front mounting ring nut until torque wrench clicks.
- j. After an initial ten rounds have been fired, re-torque/check tightness of the mounting ring nuts. Do not over-tighten mounting ring nuts.



1/2" Wrenches for Scope Mount Nuts

2-16 DAY OPTIC REMOVAL

- a. Use the 1/2" combination wrench to loosen the front and then the rear mounting ring nuts while holding optic firmly against receiver dovetail. Never use torque wrench to loosen if possible. Loosening means to rotate to the left/counterclockwise direction.
- b. Holding left side of rifle downwards, rotate scope away from the nuts to disengage from receiver dovetail. Note that nuts may rotate completely off their shaft.

2-17 MAGAZINE DISASSEMBLY

- a. Unload magazine carefully. Do not bend, deform, or gouge feed lips while unloading (stripping rounds from magazine).
- b. Turn magazine base plate up. Push up on rear of base plate with one thumb while covering the bottom of the magazine with the other hand in order to catch the spring as you slide base to the rear and free of magazine body. Note that the base is under spring tension.



Figure 2-5b Removing Magazine Base

- c. Jiggle spring while pulling it gently from magazine body to spring and follower assembly. Note magazine follower and spring are attached. Do not separate the follower from the spring if at all possible.

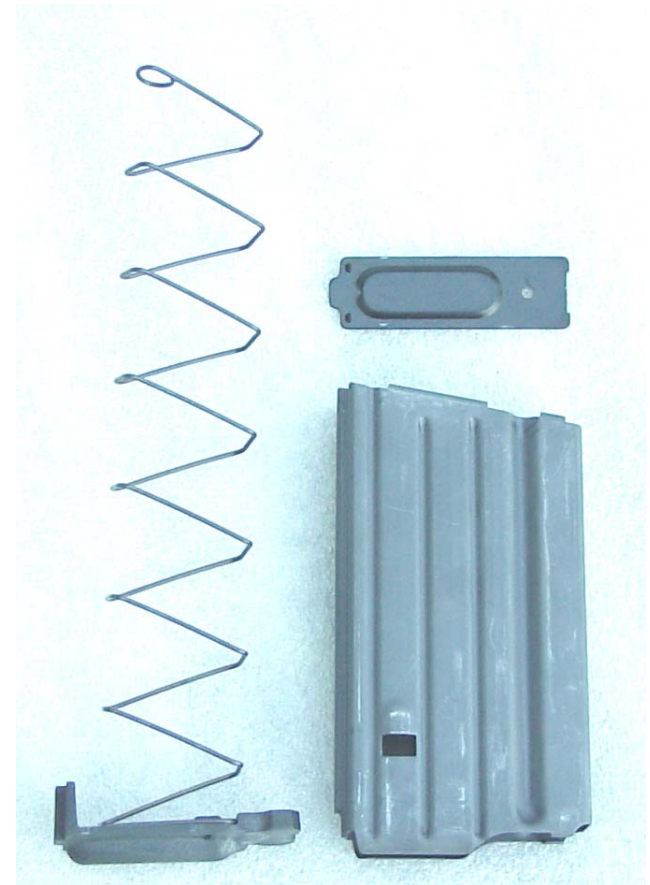


Figure 2-5 Magazine Disassembled

2-18 MAGAZINE REASSEMBLY

- a. Before reassembly, clean all foreign matter from magazine components. The magazine spring should be lightly lubricated with a cleaning patch wetted with only 2-3 drops of oil.

NOTE

The magazine follower must be orientated as illustrated in Figure 2-5.

- b. Orientate follower and spring to magazine body and carefully insert through bottom of magazine body. Jiggle spring while pushing gently until follower is seated under feed lips. Push the remainder of the spring into the magazine. Hold spring under tabs with thumb pressure.
- c. Orientate base so its raised central surface is on the outside. Slide base under rear tabs, and continue sliding base under front tabs until the rear of the base catches on magazine body.

2-19 BACK-UP IRON SIGHTS

- a. Loosen retention screw of back-up iron sights 4-5 turns (it is not necessary to remove them) and lift away from receiver rail or mounting surface. (See pictures on the next page.)
- b. (Note the rear iron sight's retention screw normally lays in the third rearward slot on the receiver rail.) With scope removed and mounting rails clean, mount back-up iron sights by engaging the right side of rail with right side claws of the bases. Then rotate iron sight base down against receiver rail.
- c. Hold assembly in place with thumb, and tighten retention screws against their clamps firmly. Do not over tighten retention screws with tools. Removal is the opposite of installation. A coin that fits either screw slot may be used if a screwdriver is not available.
- d. **The M-110 has an integral, self-locking folding front sight at the front of the forend's top rail.** Depress lock from the left side and raise the front sight. Lock should re-set to remain its up or down position. Front sight post is adjustable for zero elevation without tools .75" at 100 yards per click.

Figure 2-6d Deploying M-110 Front Sight





Figure 2-6 Installation of Mk 11 Back-Up Front Sight



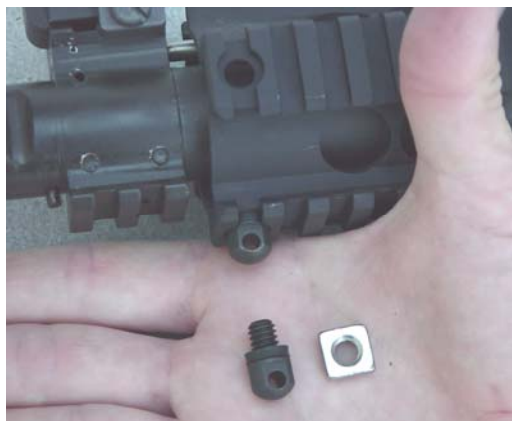
Figure 2-7 Installation of Back-Up Rear Sight



Use 5/64" Allen Wrench from Cleaning Kit to rotate and adjust Front Sight Post during Zeroing Procedures.

1/4 turn of the post moves the strike of the bullet 3/8" at 25 meters or 1.5" at 100 meters.

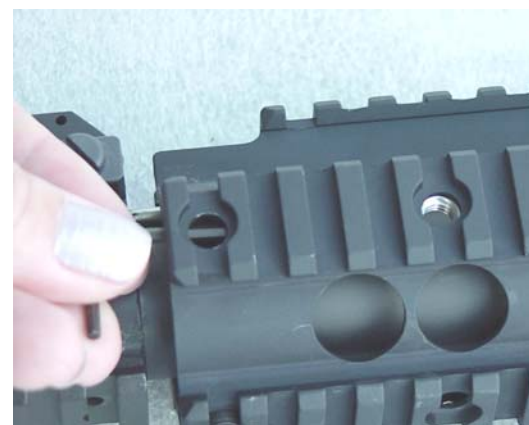
2-20 Installation or Re-Location of Sling Swivel Stud Assemblies to “Free-Floating” Rail Adapter System (RAS) & M-110 URX Foreends



Stud and Nut Assy.



a. Slide nut into channel.



b. Slide nut to desired hole.



c. Screw stud into nut.



d. Tighten with allen wrench.

Figure 2-9

2-21 Operator Disassembly of Lower URX “Free-Floating” SR-M110 Forend



1. Remove Handguard Panels.



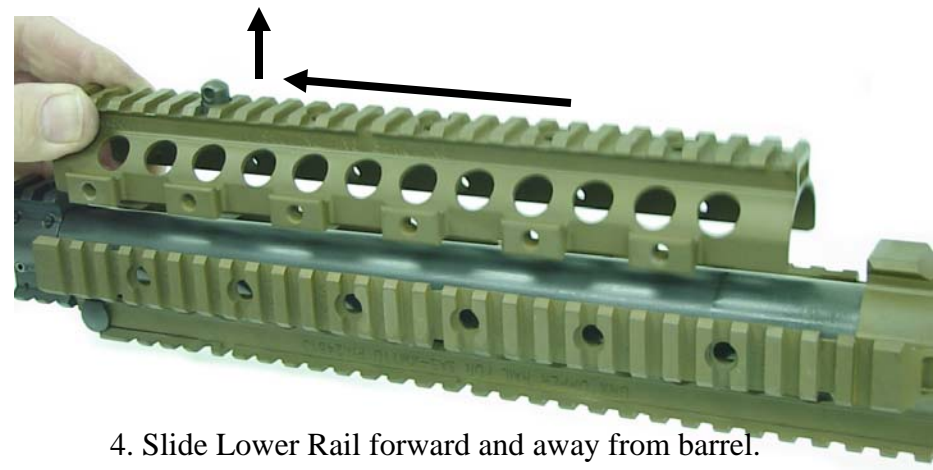
2. Locate Lower Rail Screws.



Note: Newer Screws are also slotted for turning with a coin.



3. Remove screws from both sides.
(Note: as many as 6 screws may be present.)



4. Slide Lower Rail forward and away from barrel.

5. Assembly is the reversal. Re-install at least two screws on either side at opposite ends of the rail.

2-20 SR-25/Mk 11/SR-M110 MODEL QD (QUICK-DETACH) SOUND SUPPRESSORS
(For SR-25 Sniper Rifles with Quick-Detach Suppressor Slots Machined in Gas Block)

a. INTRODUCTION.

The SR-25 Model QD Sound Suppressor interface are two vertical slots cut on both sides of the gas block/front sight base, at the three and nine o'clock positions. There is also an alignment pin on the underside of the gas block at the six o'clock position that prevents improper installation of the suppressor. The SR-25 Model QD is not compatible with SR-25 sniper rifles which are not equipped with the two slots and the alignment pin feature. **The M-110 model suppressor is slightly longer and heavier than the Mk 11 Mod 0 model.**

The Model QD sound suppressors weigh approximately one and a half pounds and significantly decreases the sound level, muzzle flash and recoil of the weapon on which it is installed. The QD suppressor is constructed of stainless steel and is coated with a black colored moly resin.

Before attempting to install or use QD suppressors, familiarize yourself with all instructions, WARNINGS, CAUTIONS, NOTES, and maintenance guidelines contained in this manual.

WARNING

The QD suppressor was designed to be as effective and lightweight as possible. The trade-off is that it gets hot very quickly. Except in emergencies, firing duration (number of rounds fired before cooling) should be limited to increase the lifespan of the suppressor. Never subject the Model QD suppressor to more than 20 rounds of sustained fire (five rounds per minute for four minutes). If this limit is reached, allow the unit to cool to ambient temperature before resuming fire if possible. To precisely maintain the point of impact, the suppressor should be allowed to cool to ambient temperature every 10 rounds.

SPECIFICATIONS:

Mk 11 Length: 12.25 inches.	M-110 Length: 14.125".
Diameter: 1 3/8 inches.	Same.
Mk 11 Weight: 1.86 lbs. (average).	M-110 Weight: 1.96 lbs. (average).
Construction: Stainless Steel.	Same.
Type: Baffle.	Same.
Sound Suppression: 30 dB drop (average and ammunition dependent).	

b. INSTALLATION / REMOVAL OF THE QD (QUICK DETACH) SOUND SUPPRESSOR.

INSTALLATION:

1. **CONFIRM THE SR-25 SNIPER RIFLE IS UNLOADED AND ON SAFE.** Remove the magazine. Draw the bolt/carrier assembly to the rear and visually inspect the chamber and receiver. Close the bolt/carrier assembly, confirm that the selector is set to "SAFE," and close the dust cover.

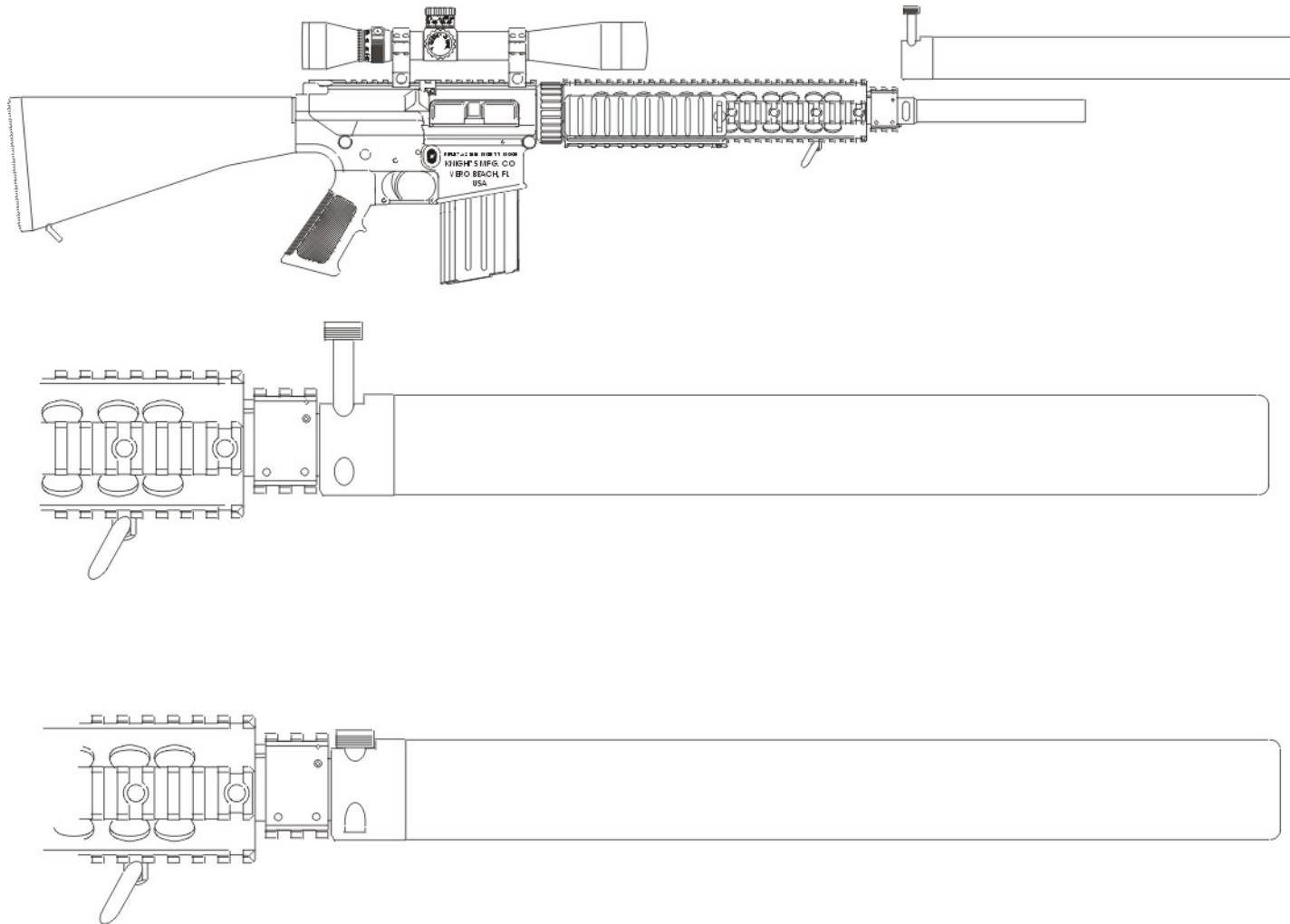


Figure 2-8

2. **FROM THE REAR OF THE RIFLE (muzzle pointed away from you)**, raise the quick-detach locking latch on the QD suppressor and slide the suppressor over the barrel. Rotate the QD suppressor counter-clockwise (looking from the rear) until it engages its rotational stop (alignment pin) in the barrel.
3. While holding the suppressor firmly to the rear and against its rotational stop in the barrel, lower the quick-detach locking latch on the QD suppressor until fully engaged (i.e., flush with the top of the suppressor).

WARNING

The model QD suppressor is not designed to be used "wet." Under no circumstances should it be filled with grease or any other "artificial environment" before use (as is often the procedure with suppressed weapons using low velocity pistol ammunition). The use of an "artificial environment" could alter the path of the projectile and/or foul the gas system and moving parts of the rifle.

REMOVAL:

CAUTION

After use, the suppressor will be extremely hot. Protect your hands with leather or heat resistant gloves when removing hot suppressors.

1. **CONFIRM THE RIFLE IS UNLOADED AND ON SAFE AND STAY BEHIND THE WEAPON (muzzle pointed away from you)**. After use, the suppressor will be extremely hot. To remove the suppressor while hot, use a bayonet or other available tool to disengage (raise) the locking latch.
2. With muzzle pointed away from you, rotate the suppressor clockwise and slide the suppressor straight off the barrel.

WARNING

Except in emergencies, firing duration (number of rounds fired before cooling) should be limited to increase the lifespan of the suppressor. Never subject the Model QD suppressor to more than 20 rounds of sustained fire (five rounds per minute for four minutes). If this limit is reached, allow the unit to cool to ambient temperature before resuming fire if possible. To precisely maintain the point of impact, the suppressor should be allowed to cool to ambient temperature every 10 rounds.

c. SR-25 MODEL QD (QUICK-DETACH) SOUND SUPPRESSOR MAINTENANCE.

IMPORTANT OPERATOR CLEANING NOTE

The SR-25 Model QD (Quick-Detach) sound suppressor should be removed from its host weapon as soon as possible after every use. The QD suppressor should be removed while it is still warm because carbon fouling solidifies as the unit cools, making it more difficult to remove if cold. If the weapon/suppressor combination is to be repeatedly used over a period of time, it is useful to remove the suppressor temporarily, thereby minimizing the buildup of metal and carbon fouling.

OPERATOR CLEANING. The SR-25 barrel and the Model QD (Quick-Detach) sound suppressor should be cleaned with the following procedure after every use:

1. Dismount the suppressor from the weapon.
2. Dry brush carbon fouled parts using the general purpose (GP) toothbrush from the weapon cleaning kit. Take care to orientate the parts so carbon does not fall into the weapon bore, the handguard tube, or down into the suppressor body.
3. CLP and a rag should be used to remove carbon fouling from the barrel surfaces normally covered by the suppressor or they will rust.
4. Do not use wire brushes. If carbon fouling remains, use the nylon bristles GP tooth brush and CLP to scrub parts clean. Re-mounting and dismounting the suppressor (with the muzzle pointed down) once wet with CLP may also help remove residue.

NOTE

Do not allow CLP or cleaning solvent to flow down into the QD suppressor body. Orientate the suppressor “muzzle up” when brushing with the GP toothbrush or if soaking the locking latch contact area at the rear of the suppressor body.

5. The user should final clean and dry the CLP from affected parts with an absorbent cloth.
6. When used with a suppressor, the SR-25 Rifle requires a thorough cleaning after every use, even after firing just a few rounds. **The rifle’s bolt carrier assembly and chamber, in particular, are heavily fouled by the addition of a suppressor to the system, and therefore requires more frequent cleaning than is necessary under normal firing conditions.**
7. If the SR-25 barrel and suppressor are exposed to salt water, mud, or corrosive chemicals, the QD suppressor should be removed from the host weapon and the assembly should be thoroughly rinsed with fresh water and completely dried internally using compressed air or an oven (at 250°F) if available.

d. LUBRICATION. Do not oil the QD suppressor body, wipe it dry with a clean cloth. Apply only a light coat of CLP to the latch contact area of the barrel to prevent corrosion each time the weapon is cleaned. A very light coat of CLP should be applied to the suppressor latch components to smooth their operation.

CAUTION

Do not allow CLP to flow down into the suppressor body and contaminate the internal baffle areas. CLP and other oily residues will cause excessive smoke when the suppressed rifle is fired.

If the user suspects that CLP or copper cleaner has entered the suppressor, the suppressor should be thoroughly soaked and agitated vigorously in warm soapy water, and then rinsed in clear fresh water and allowed to air dry for several hours or overnight.

CAUTION

The interior of the QD suppressor must be thoroughly dry before using. The use of compressed air, an electric fan, or even an oven set on low heat (250⁰ F) is recommended if available. Any solvent or other cleaning agent remaining in the suppressor could alter the path of the projectile and/or foul the gas system and moving parts of the rifle.

CATUTION

As soon after firing suppressor as possible, clean and lightly re-lubricate the rifle bore thoughly.

Also clean firing residue from flash suppressor, barrel exterior and gas block suppressor interface areas. This residue is very hydoscopic and will absorb moisture quickly.

This residue also conrtains a barium salt, that when combined with moisture in the air, will corrode and pit the barrel steel within a matter of days and possibly ruin your barrel's accuracy.



e. ARMORER CLEANING. The QD suppressor may occasionally (every 500-1,000 rounds) require an armorer to soak the suppressor body in oil-free cleaning solvent to remove powder residue or un-burned granules which are noted by the user as degrading sound or flash suppressing performance.

1. Oil-free cleaning solvent should be used to remove carbon fouling and un-burnt propellant granules from the QD suppressor by overnight soaking.

NOTE

If Dry Cleaning Solvent, (81348) A-A-711, 1 Gal. Can, NSN: 6850-00-281-1985 is used, follow normal precautions, insure adequate ventilation, wear rubber gloves, etc.

2. After soaking overnight in a closed solvent container, use hot, soapy, water to wash remaining chemicals from the internal voids of the suppressor. Use fresh hot water to thoroughly rinse and final clean the QD suppressor.
3. The QD suppressor must be thoroughly dried internally using compressed air, or an oven set on low heat.

CAUTION

Any solvent or other cleaning agent remaining in the suppressor could alter the path of the projectile and/or foul the gas system and moving parts of the rifle/carbine.

4. The armorer should perform operator maintenance on the QD suppressor and lightly lubricate the latch components before returning it to service and/or while it is stored in the armory.

SECTION IV: PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

GENERAL

WARNING

Before starting PMCS, clear the rifle. Inspect the chamber, receiver areas, and magazines to ensure they are empty. Do not allow live ammunition near work or maintenance areas.

If your equipment fails PMCS, refer to trouble shooting procedures in Chapter 3.

2-22 PMCS PROCEDURES

PMCS lists those required checks and services to be performed by operator personnel assigned the Sniper Rifle System before, during and after use.

- a. **Before Operation.** Perform your Before (B) PMCS as a brief service ensuring the rifle system is ready for operation.
- b. **During Operation.** As required/same as for Before Operation.
- c. **After Operation.** Perform your After (A) PMCS as a corrective service ensuring that all operational deficiencies are identified and corrected so the weapon system will be ready to operate when needed.
- d. ***Not Ready/Available If Column.*** *The PMCS table lists those deficiencies which cause the Sniper Rifle System **Not Ready/Available**. If these deficiencies are not correctable, such deficiencies will require an Armorer or evacuation to the next higher echelon of maintenance.*

2-22 PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) TABLE

B=Before Operation

D=During Operation

A=After Operation

Item #	Interval			ITEM TO BE INSPECTED. Procedure	<i>Equipment is NOT READY/AVAILABLE IF:</i>
	B	D	A		
1	*		*	EQUIPMENT. Check the Sniper Weapon System Parts (see Appendix C).	<i>Major parts or components are missing.</i>
2	*		*	RIFLE. Visually inspect the entire rifle for damaged or missing rifle components (see Figure 1-1).	<i>If components are damaged or missing.</i>
3			*	CLEAN the rifle and day optic sight per cleaning instructions (see para 3-5 and 3-7).	<i>If rifle or components are dirty.</i>
4	*		*	ACTUATE SAFETY. (Rifle must be cocked, see instructions in para 2-4) a. Rotate safety to SAFE position, squeeze trigger. b. Rotate safety to the FIRE position, squeeze trigger. Hammer should fall (you should hear the hammer fall).	<i>If hammer will not stay cocked.</i> <i>If hammer falls.</i> <i>If hammer does not fall forward.</i>
5	*		*	BOLT OPERATION. Grasp charging handle and pull bolt fully to the rear. Operation should be smooth.	<i>If operation is not smooth.</i>
6	*		*	BOLT CATCH. While holding bolt to the rear, depress lower end of bolt catch. Return charging handle fully forward. Bolt should be retained to the rear by the bolt catch.	<i>If bolt is not held to the rear by the bolt catch.</i>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) TABLE

B=Before Operation

D=During Operation

A=After Operation

Item #	Interval			ITEM TO BE INSPECTED. Procedure	Equipment is <i>NOT</i> READY/AVAILABLE IF:
	B	D	A		
7	*		*	MAGAZINES. Check spring action and free up and down movement of magazine follower. Movement should be smooth and strong.	<i>If magazine follower movement is not smooth and strong.</i>
8	*		*	DAY OPTIC SIGHT SYSTEM. Sight through the day optic sight. Inspect for visual obstruction of target image by dust, dirt, fungus or moisture on optical surfaces, and loose or broken optical elements.	<i>If these conditions resist correction after cleaning lenses.</i>
9	*		*	DAY OPTIC SIGHT AND MOUNTING. a. Check for damaged, loose or missing parts.	<i>If parts are loose or missing.</i>
10	*		*	b. Check to ensure that day optic is securely mounted to mating split on scope rings, receiver dovetail, and that the reticle is oriented correctly.	<i>If scope is loose or reticle is canted.</i>
				c. Ensure day optic sight dust covers are installed. Clean dust and other foreign matter from lenses (see para 3-7).	
11	*		*	SAFETY/TRIGGER FUNCTION CHECK. Perform safety/function check as shown in paragraph 2-23.	<i>If rifle fails safety/trigger function check.</i>

2-23 SAFETY / TRIGGER FUNCTIONAL CHECK

WARNING

Always clear rifle before checking function of safety and trigger. Refer to para. 2-6 for proper clearing procedures.

Checking SAFE Position:

- a. Remove magazine. Pull charging handle fully to the rear and lock bolt to the rear. Return charging handle to its forward position. Visually check receiver and chamber area for ammunition or foreign objects. Release bolt catch and allow bolt to lock into battery. Rotate safety to SAFE position.
- b. Squeeze trigger fully to the rear. You should not hear anything as the hammer should not fall. Release the trigger.

Checking SEMI Position and Disconnect:

- a. Rotate safety to FIRE position.
- b. Squeeze trigger fully to the rear while listening for the hammer to snap forward.
- c. You should hear hammer snap forward with a distinct click. Continue holding the trigger fully to the rear.
- d. While holding the trigger to the rear, pull the charging handle fully to the rear. Ride the charging handle forward slowly and listen for the hammer to fall. You should hear nothing as the hammer should be held to the rear by the disconnect.
- e. Slowly release the trigger. You should hear a light click as the hammer is released from the disconnect and engages the sear.
- f. Squeeze the trigger fully to the rear. You should hear the hammer fall forward with a distinct click.
- g. Close the ejection port cover.

SECTION V: OPERATING UNDER NORMAL CONDITIONS

WARNING

Keep finger away from trigger unless you observe a target and intend to fire. Make sure the rifle is not already loaded by inspecting the magazine and chamber.

2-24 LOADING AND UNLOADING THE RIFLE

WARNING

Use only serviceable and authorized ammunition. Inspect ammunition for defects prior to loading magazines.

LOADING THE MAGAZINE

- a. Load magazines one round at a time. Do not use charger clips.
- b. Place each round between magazine lips and push down until round rotates under feed lips. Never load more than 20 rounds.
- c. As rounds are pushed down, slide them to the rear of the magazine.

UNLOADING MAGAZINE

- a. Strip one round at a time out of the magazine by pushing on the cartridge rim. Do not bend or deform magazine lips when stripping rounds from magazines.
- b. An alternative method is to push top round slightly forward and depress the base of the second round under it. This relieves the pressure on the top round making it easier to remove.

LOADING RIFLE AND FIRING

- a. Point rifle in a safe direction and lock the bolt to the rear with bolt catch.
- b. Place safety in SAFE position and visually check chamber and receiver areas.
- c. Insert loaded magazine into receiver magazine well until the magazine catch engages and positively retains magazine. Slap bottom of magazine with palm of hand to be sure.
- d. Push on upper portion of bolt catch to release bolt. Bolt will spring forward into battery and load first round into chamber.

WARNING

**Rifle is now loaded. Keep it pointed in a safe direction. If you rotate the safety to the FIRE position....
THE RIFLE WILL FIRE WHEN YOU PULL THE TRIGGER.**

UNLOADING

- a. Point rifle in a safe direction.
- b. Rotate safety to the SAFE position if possible. (If hammer is not cocked, safety cannot be rotated to SAFE.)
- c. Remove magazine by pushing in magazine catch button while pulling magazine from receiver.
- d. Pull charging handle fully to the rear and lock bolt to the rear by pressing on the bottom portion of the bolt catch. If not done so already, place safety on SAFE.
- e. Inspect chamber and inside of receiver areas for cartridges or brass. Remove any rounds and other debris. Let the bolt go forward and close the dust cover.

WARNING

Ensure there are no cartridges in the chamber or receiver.

2-25 DAY OPTIC SIGHT (Note: different scopes may be used on these rifles. Always refer to specific instructions when available)

NOTE

*If you do not see the scope's full field of view when your cheek is in its normal shooting position on the stock (stock weld), reposition the scope forward or backwards before proceeding. Para 2-15 refers. **The M-110 buttstock may be adjusted as well.***

a. **EYEPiece/RETICLE FOCUSING.** With proper focus, both reticle and target will have maximum sharpness. To properly focus the reticle and scope, you should have an area where you can observe a target at about 300 meters. Focus the scope yourself--all human eyes see things differently.

NOTE

Eyepiece focusing is performed after mounting the day optic sight and supporting the rifle in a steady rest.

*Mk 11: when unscrewing the eyepiece, make sure it is not completely rotated off the scope body. If the eye piece is already too far back, rotate the lock ring and eyepiece forward until focused. **M-110 has a diopter focus ring and no lock ring.***

(1) Rotate scope's variable power ring to its highest magnification and the target/parallax focusing knob to its infinity setting. Mk 11: unscrew the eyepiece one turn counter-clockwise to back it away from its lock ring. Make sure lock ring is free by turning a quarter turn.

(2) Point the rifle at a clear area of the sky and turn the eyepiece, **or for M-110 diopter adjustment ring**, while observing the sharpness of the reticle as you turn the eyepiece. Turn the Mk 11 eyepiece several revolutions so as to move it at least 1/8 of an inch. It will take this much movement to change reticle sharpness. **The M-110 diopter adjustment ring is marked for your reference and requires little rotation to bring the reticle into sharp focus.**

(3) Once at the best focus point, turn the eyepiece back and forth through the focus point until the reticle is at its maximum sharpness.

(4) Now, look away from the scope at some distant object and let your eyes focus on that object. With your eyes focused for that distance, quickly look into the scope at the reticle. It should appear clear and sharp.



(5) Repeat Steps 2-4 until focus is set for your eyes. Mk 11: then screw the lock ring up against the eyepiece--hold the eyepiece in one hand and do not let it move as you rotate the lock ring. Turn the lock ring until finger tight against the eyepiece. **M-110 has no lock ring, it has an eyepiece diopter (focus) adjustment ring at the rear of the scope that is marked for your reference.**

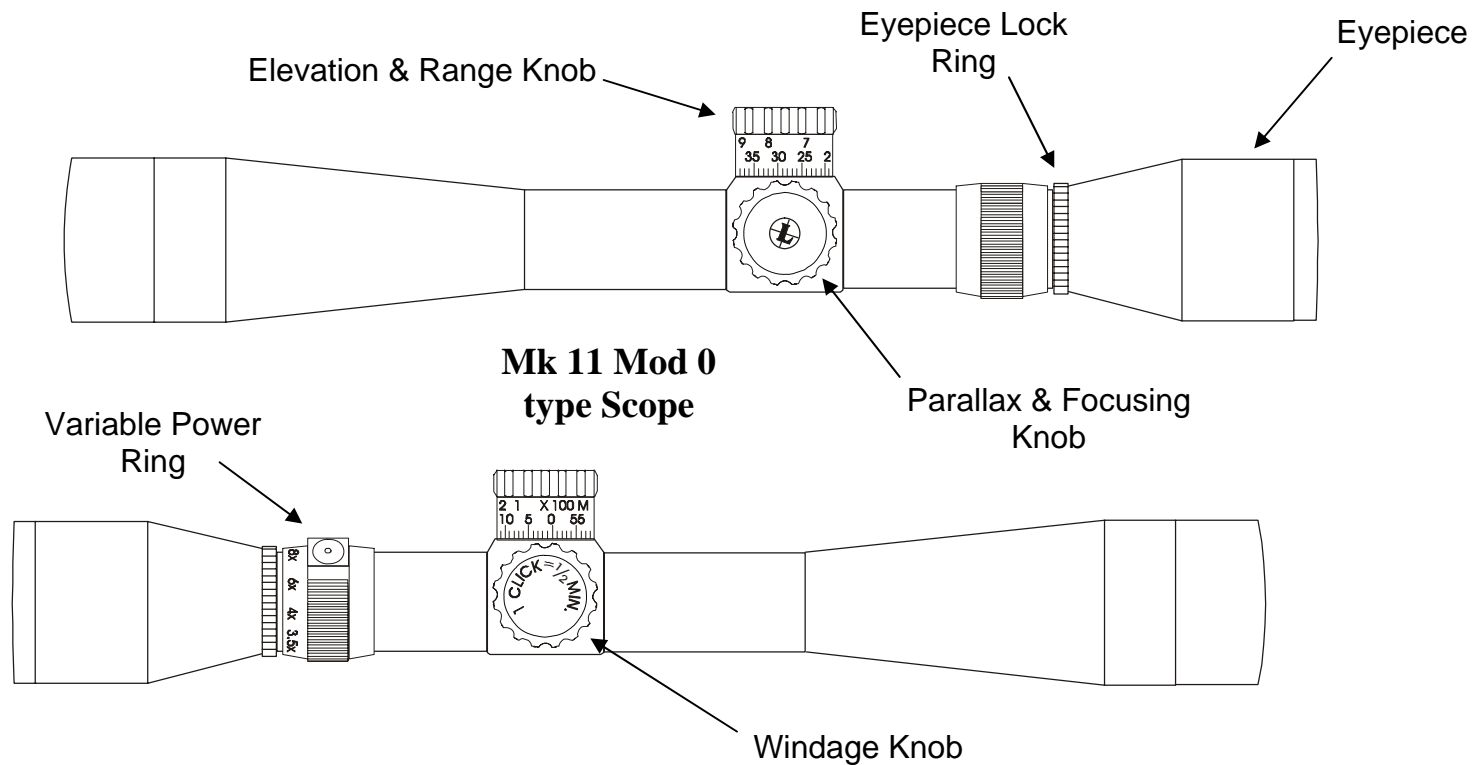
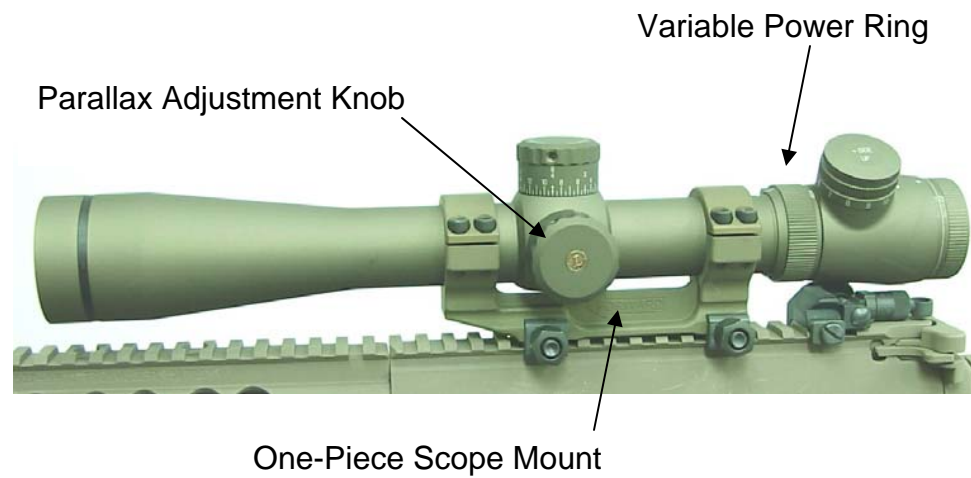
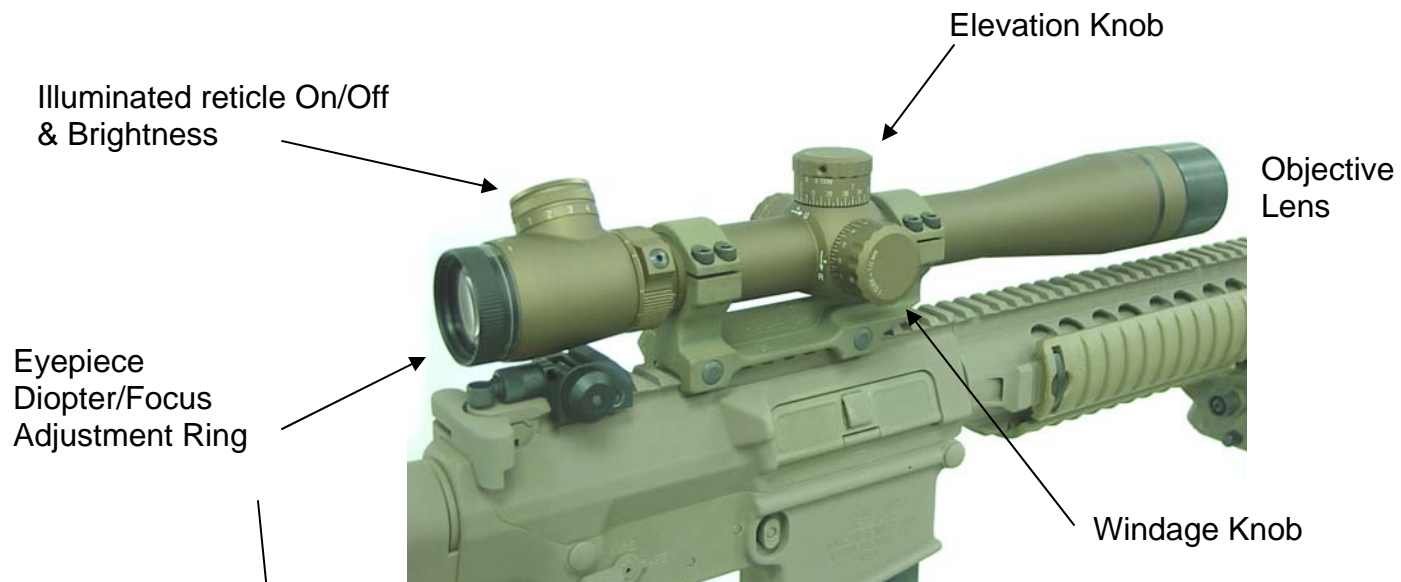


Figure 2-10 Day Scope Control Locations

SR-M110 3.5-10x 40mm Variable Power Scope



b. **TARGET/PARALLAX FOCUSING.** The day optic has a target focus and parallax adjustment knob on the left side of the scope. Once the reticle focus is set as described above, the scope is then focused on a target as follows:

- (1) Observe the markings on the dial. The larger dots are settings for closer ranges; the infinity mark is for the most distant targets. Note the dial stops at either the minimum or maximum setting.
- (2) Steady the rifle and observe a small target at from 100 to 300 meters through the scope.
- (3) Move your head slightly from left to right and note if the target appears to move away from the center of the crosshairs.
- (4) If target appears to move, parallax is present and you need to adjust the knob. Rotate the target focus/parallax knob slightly in one direction and then the other and observe the effect in the apparent target movement by moving your head as before in paragraph (3). Find the best knob position for both the elimination of parallax and target focus.
- (5) When shooting at closer or more distant targets, the dial may require minor re-adjustment.



c. **ZEROING THE DAY OPTIC.** Once the reticle and scope are properly focused and parallax minimized, zero it with the rifle's correct ammunition. The elevation knobs can be replaced and are calibrated to the trajectories and standard velocities (and barrel lengths) of specific rounds at sea level. The knob marked **7.62** is for M118 LR ammunition used in combat by snipers. The elevation zero and adjustment knob is on top of the scope. The windage zero and adjustment dial is located to the right side of the scope.

NOTE

Always zero, or re-zero, with the correct ammunition or the ammunition you will use while on a mission.

300 METER ZEROING METHOD

- (1) Set elevation dial to 300 meters (3 mark on the range scale) and windage dial to zero (0) settings. If measurable wind is blowing, make appropriate adjustment to windage dial.
- (2) Fire a 3-shot group at 300 meters. Use a large target to capture all rounds fired. Unload rifle and move down range to spot the 3-round group. (Take the rifle with you and your ammunition covered so the sun does not heat it up and change its ballistics.)
- (3) Calculate the clicks necessary to move the shot group (point of impact) to the point of aim. The following click adjustments apply:

Elevation Dial: 1 minute of angle (MOA) per click. **At 300 meters, one click equals approximately 3 inches.** At 200 meters, one click equals 2 inch, At 100 meters, one click equals 1 inch. **M-110 elevation dial is graduated in 1/2 MOA clicks, so it takes two clicks at 300 meters to equal 3 inches.**

Windage Dial: 1/2 MOA per click. **At 300 meters, one click equals 1.5 inches.** At 200 meters, one click equals 1 inch. At 100 meters, one click equals 1/2 inch.

NOTE

If your shot group does not appear on target, apply 25M zeroing procedures.

- (4) Ignoring the other markings on the dials for the moment, rotate the dials the estimated number of clicks to move the point of impact to the point of aim.
- (5) Re-fire a 3-shot group from 300 meters. Repeat Steps 3-4 until the point of impact is the same as the point of aim.
- (6) Carefully loosen the three small setscrews located around the edges of the elevation and windage knobs with a 1/16" Allen Wrench. Gently rotate (slip) dials to appropriate (for example the number 3 for 300 meters) numerical range/windage settings.

For example, if you were actually zeroing at 300 meters, rotate the range knob after loosening the three small set screws until the 3 on the upper scale lines-up with the scope's zero reference mark. Note the small set screws need only be loosened 1 or 2 turns to allow dials to rotate freely without actually changing internal zero adjustments. If wind is blowing, make appropriate compensation for zero (0) windage setting in the same manner.

- (7) Re-tighten the small setscrews. Do not over tighten. Use "short end" of the Allen Wrench for a handle when tightening, and the "long end" as a handle to loosen small setscrews.



Use 1/16" Allen Wrench from Cleaning Kit to check tightness or loosen.



SR-M110 Scope 300 Meter Setting

25 METER ZEROING METHOD. The 25 meter method establishes only a rough zero, never rely on it for tactical applications. Always confirm zero at longer ranges. 300 meters is recommended.

- (1) Adjust focus knob to the 25M target. The target need not be in perfect focus for the 25 meter procedure. Note that a black paper disk with a small aperture hole in the center, placed over the objective lens, may bring the 25M target into better focus.
- (2) With elevation set at 300M, fire a 3-shot group, unload rifle, and move to target.
- (3) The point of impact for the 3-shot group should be approximately 1 inch below the point of aim.
- (4) Make appropriate elevation and windage click adjustments as follows:

Mk 11 Elevation Dial: At 25 meters, one click equals approximately 1/4 inch. **M-110 clicks are 1/8" at 25 meters.**

Windage Dial: At 25 meters, one click equals 1/8 inch.

- (4) Repeat Steps 1-3 until point of impact is approximately 1 inch below point of aim.
- (5) **Perform 300 yard zeroing procedure to establish true zero.**

NOTE

Once rifle has been zeroed at 300 meters and elevation dial set to that range, all other range markings should be considered approximate. If a specific range is required for tactical success, confirm zero at actual mission range, if known ahead of time, when ever possible.



100 Meters



600 Meters



800 Meters



1000 Meters

d. **MIL DOT RETICLE.** The Mil Dot Reticle (see drawing on next page) is a modified duplex crosshair style with thick outer sections that thin as they approach the center and cross. A special feature of this reticle is the series of small dots equally spaced on the thin crosshair sections. There are four dots on each side of center. The first dot is 1 mil from the center, and each of the other dots 1 mil apart. The end dots are 1 mil from the ends of the thick outer section. **The SR-M110 scope reticle uses 1 mil “hash marks” instead of dots.**

For your reference in YARDS:

1 mil equals 1 yard (about 36 inches) at 1,000 yards.

1 mil equals 1/2 yard (about 18 inches) at 500 yards.

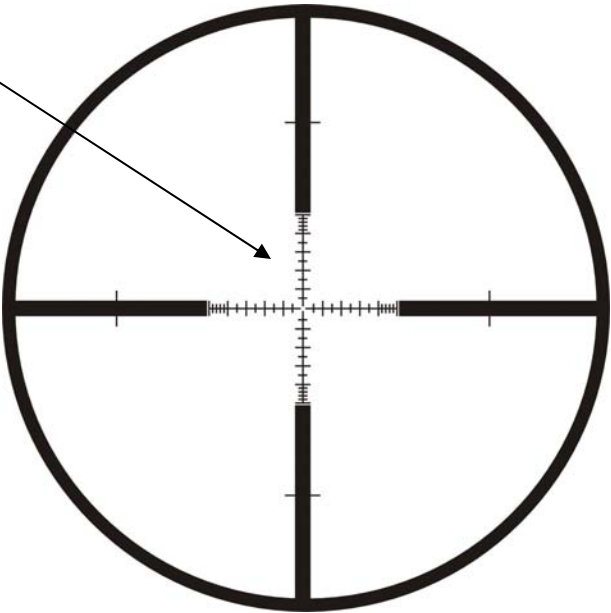
1 mil equals 1/4 yard (about 9 inches) at 250 yards.

For your reference in METERS:

1 mil equals 1 meter (about 39.37 inches) at 1,000 meters.

1 mil equals 1/2 meter (about 20 inches) at 500 meters.

1 mil equals 1/4 meter (about 10 inches) at 250 meters.



For Yards vs. Meters (yards x .9144 = meters).....Meters vs. Yards (meters ÷ .9144 = yards) comparisons:

Yards	Meters	Yards	Meters		Meters	Yards	Meters	Yards
100	91.44	600	548.64		100	109.36	600	656.17
200	182.88	700	640		200	218.72	700	765.53
300	274.32	800	731.52		300	328	800	874.89
400	365.76	900	823		400	437.45	900	984.25
500	457.20	1000	914.40		500	546.81	1000	1093.61

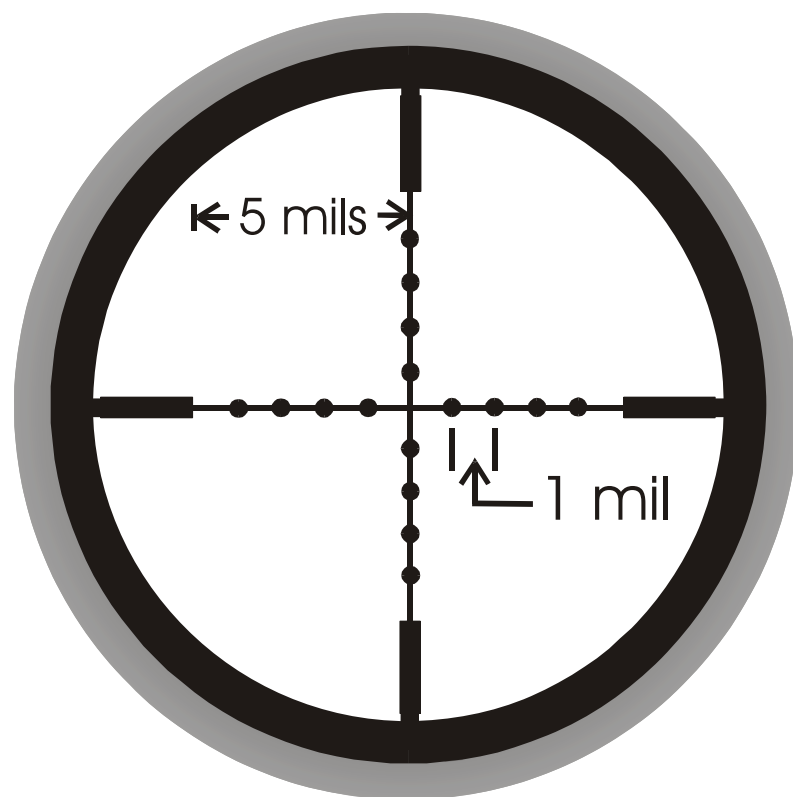
Note that 1,000 meters is nearly 1,094 yards. So if your scope’s elevation knob is in meters, do not assume they are the same for yards. If you wish to use yards, then one or two clicks down from the meter range setting may be correct for your yardage range estimates. Especially at 300 yards and more.

Mk 11: the spacing of the dots (or **M-110 1-mil hash-marks**) allows the shooter to accurately estimate range to objects of known size. For example, a distant target is estimated to be 6-feet tall, which equals 2 yards. When viewed through the scope, this human 6-foot size target would appear as:

2 mils tall at 1,000 yards...4 mils tall at 500 yards...6 mils tall at 250 yards.

You may also use the following formula to estimate range: (yards may be substituted for meters)

$$\frac{1,000 \times \text{Height of target in yards}}{\text{Height of target in mils}} = \text{Range}$$



At 100 Yards:
 $\frac{1}{4}$ mil = .900"
 $\frac{3}{4}$ mil = 2.700"
 1 mil = 3.600"
 5 mils = 18.00"

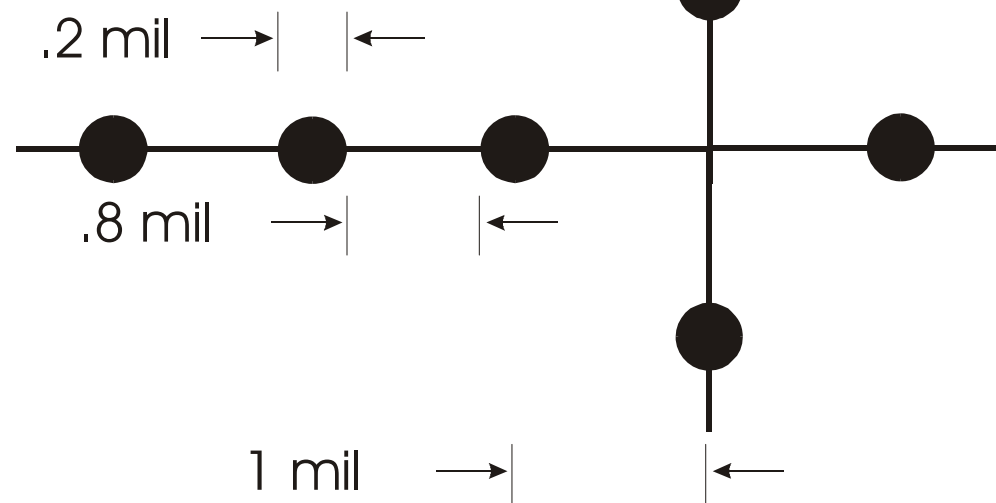
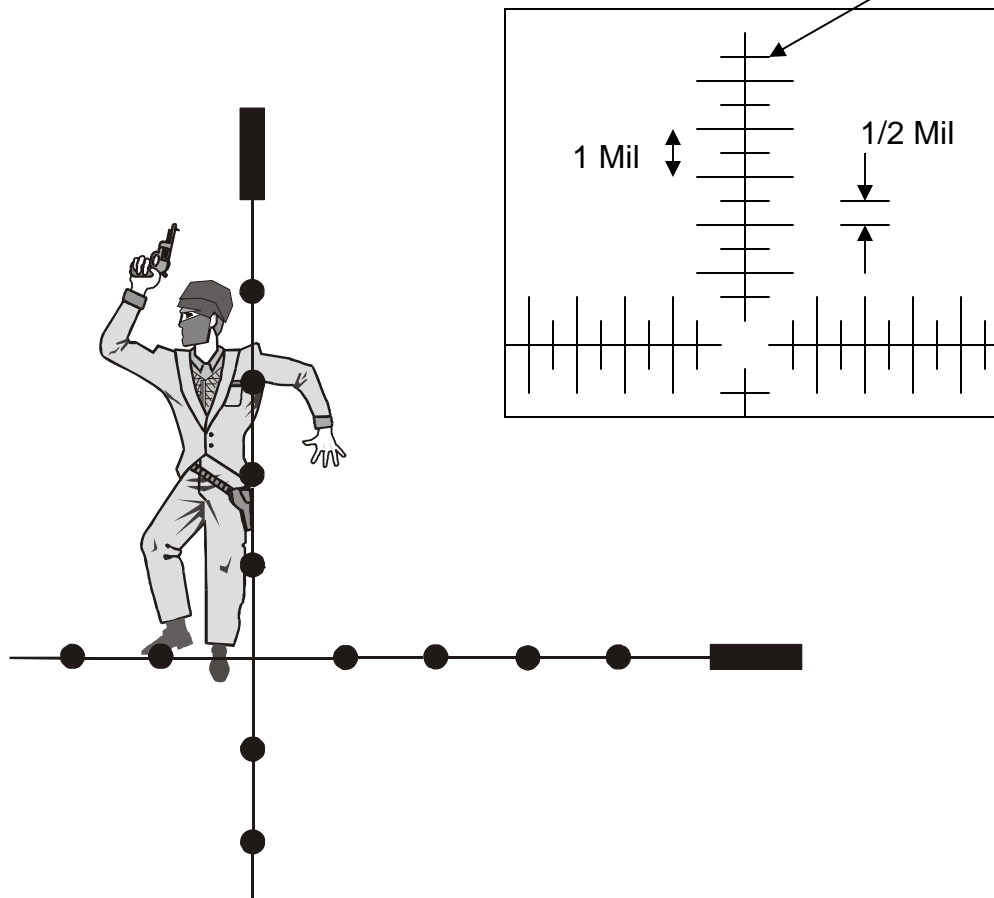


Figure 2-11 Mk 11 Mod 0 .8 Mil-Dot Reticle

Using this reticle's mil dot system (or the **M-110 hash-marks**) at 10x and the height or width of a known object, it is possible to determine range to that object. Always use the crosshairs or a mil dot for an aim point when shooting. **Note, the M-110 reticle also ½ mil values with the shorter hash-marks that appear in between the wider 1-mil marks.**

$$\frac{1,000 \times \text{Height of target in yards}}{\text{Height of target in mils}} = \text{Range}$$



Example of a terrorist target at 500 yards and sniper using reticle pattern as a range finder. (Target is estimated at 2 yards tall, and appears to measure 4 mils tall)

2-12 Mil-Dot or Hash-Mark Target Range Estimation
(Note: this Mil-Dot Reticle does not have .5 Mill indicators or Hash Marks)

e. **Advanced Scope Mounting Option for Eye Relief and Diopter Setting Fix.** The scope mount design allows the Operator to reposition the scope forward one set of rail notches at a time until optimal eye relief is attained. This should be done with the scope set to 10x, or the maximum magnification setting the sniper expects to use for the most accurate shots and proper use of the range finding reticle. For the 10x scope this will be approximately 3.5" from where the shooter's eye is located when a good cheek weld is attained on the buttstock in a particular firing position. In addition, the adjustable butt stock should be set beforehand to its shortest length as this allows (1), the scope to be positioned as far forward as possible and thus improving access to the charging handle, and (2), maximizes the length adjustable stock to be extended when at the lower scope power settings are used during observation when the eye relief is extended to 4.7".



Move scope forward for eye relief with stock at shortest position.



Moving scope forward may improve charging handle access.



Adjust stock length later for low magnification (requires longer eye relief) or other shooting positions.

Another advanced technique is using the eyepiece dust cover as a means to maintain your diopter adjustment. As you may have discovered, the diopter ring easily rotates and the dust cover covers the diopter setting reference marks when it is installed. However, the shape of the dust cover prevents it from a full rotation especially when its cover is open. So whether you prefer the dust cover opening at 12 o'clock, or 3 o'clock lets say, you can always return home by rotating the dust cover back to your preferred position if you ever see that it has rotated out of position because it can not rotate a full turn.



Determine your diopter adjustment number



Install Dust cover.



Note clockwise rotation limit.



Note counter-clockwise rotation limit.

2-26 BIPOD (OPTIONAL ACCESSORY)

WARNING

Always unload and clear rifle before attaching or detaching bipod.

a. BIPOD ATTACHMENT

- (1) Point bipod legs forward towards muzzle.
- (2) Loosen bipod set screw. While squeezing side plates together, engage lugs with bipod mounting adapter or stud beneath forend. Relax grip on side plates.
- (3) Position bipod mounting base against forend and turn setscrew finger tight.
- (4) Using a coin, or flat blade screw-driver, tighten set screw firmly, but no more that 1/4-1/3 of a turn past "finger tight".

b. BIPOD REMOVAL is the reverse of attachment procedure.

c. BIPOD LEG ADJUSTMENT--from folded (up) position:

- (1) Grasp bipod leg one at a time and rotate down away from barrel.
- (2) Depress leg release catch while grasping bipod leg foot and pull out (extend) to desired length.
- (3) Leg release catch is spring loaded and automatically locks leg in extended position.
- (4) Repeat for other leg. Bipod legs may be rotated up when they are extended if desired.
- (5) Retract legs by depressing the leg release catch and pushing bipod leg in.

d. BIPOD MAINTENANCE

Wipe steel parts with an oily rag to prevent rust. Do not apply oil to the leather pads on bipod saddle or the rubber ends of the bipod legs.



1. Present Bipod to Rail Adapter.



2. Tighten Bipod Nut.



3. Tighten Bipod Pivot Tension.



4. Ensure Adapter screw is tight.

Recommended Mounting Locations for Bipod Adapter and other Accessories:

Note that “T” designates the Top Rail, “L” the Portside Rail, “R” the Starboard Rail, and “B” the Bottom Rail.

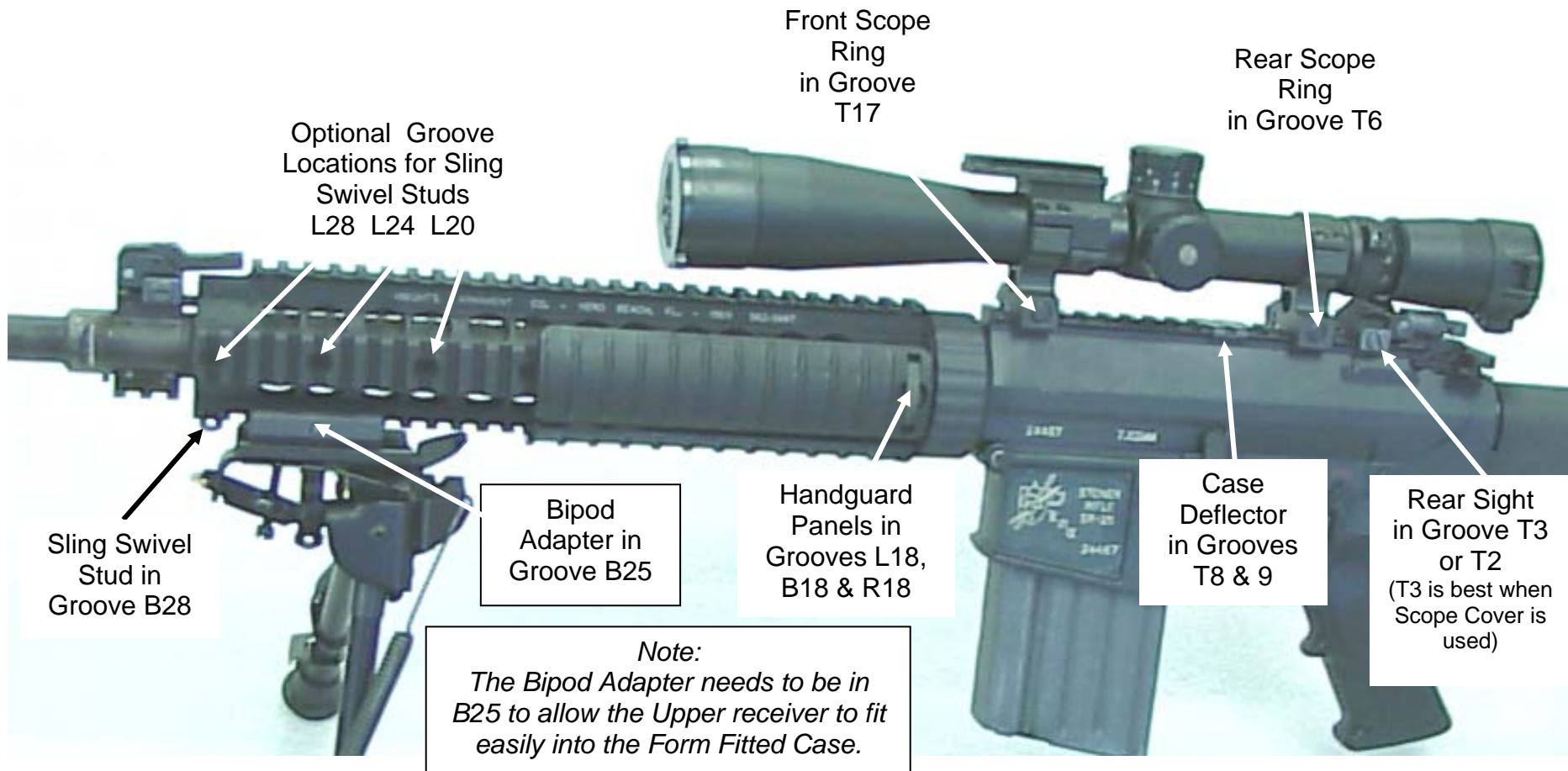


Figure 2-13 Recommended Accessory Groove Locations (Mk 11 Mod 0)

SECTION VI: OPERATION UNDER ADVERSE CONDITIONS

NOTES

Adverse or unusual condition are defined as any conditions requiring other than normal maintenance for continued operation and serviceability of the rifle.

*Perform the special maintenance procedures listed herein or take appropriate **Active Protective Measures** outlined for the climate and weather conditions that most apply to your operational area.*

Refer to paragraph 3-2 for normal lubrication instructions.

2-27 EXTREME COLD/ARCTIC

CAUTION

Be careful not to accidentally fire your rifle when inserting gloved finger into the trigger guard area.

NOTE

If gloves or mittens are to be worn, depress trigger guard plunger and open trigger guard for ease of trigger access with gloved fingers.

- a. Use Lubricant, Arctic Weapons (LAW) for lubrication and warm (body temperature) CLP for cleaning.

NOTE

Carry CLP in an inside shirt pocket to keep it fluid.

- b. To a weapon that has been thoroughly cleaned free of other type lubricants, apply a light coat of LAW to all functional parts.

- c. Avoid taking the rifle into warm places for short periods of time. However, clean and lubricate your rifle at room temperature if possible. When moving a cold rifle and ammunition into a warm place, condensation/moisture will form in and on the surfaces of the rifle and ammunition. If practical, leave your weapons and gear outside in a protected, but cold area. When the rifle is brought inside a warm place, it should be field stripped and wiped dry several times as it reaches room temperature.
- d. When returning to the cold, prevent condensation of moisture and freezing of parts by keeping the weapon completely covered when moving from a warm to a cold area, thereby allowing the metal parts to cool gradually.
- e. Keep the rifle and scope as dry as possible. **Active Protective Measure:** Keep dust cover closed.
- f. Keep ammunition and the insides of magazines dry. Moisture can cause malfunctions because it will freeze and turn to ice. Do not lubricate ammunition.
- g. Do not lay a warm weapon directly on snow or ice.
- h. **Active Protective Measure:** The use of a muzzle cap, protective magazine bags, and an overall rifle cover will help protect your rifle. Use them when the tactical situation permits.
- i. Always keep snow out of the bore. If snow should get in the bore, field strip the rifle and clean the bore from the chamber end as in the bore cleaning instructions.
- j. For extended operations in extreme cold, have an armorer remove trigger guard.
- k. **MOST IMPORTANT--Unload and hand function rifle every 30 minutes to prevent freezing of parts.**

2-28 HOT, WET, JUNGLE CLIMATES AND FORDING OPERATIONS

- a. Perform maintenance more frequently to prevent corrosion. Keep a light coat of lubricant on all metal surfaces. Wipe away moisture left by finger and handprints.
- b. Frequently inspect hidden areas of the bolt and carrier assemblies, locking lugs of barrel extension, chamber, lower receiver and receiver extension (buffer tube), and trigger assembly areas. Check and lube spring loaded detents for free spring action.
- c. **Active Protective Measure:** Unload and check magazines, springs, and ammunition daily if necessary. Wipe ammunition dry with a clean cloth before reloading. Do not lubricate ammunition.
- d. **Active Protective Measure:** The use of a muzzle cap, protective magazine bags, and an overall rifle cover will help protect your rifle when the tactical situation permits. Keep optical sights as dry as possible and out of the direct rays of the sun.

e. If rain or water gets in the bore, field strip the rifle and clean the bore from the chamber end as in the bore cleaning instructions. Check that the bore is clear if you fall, or drop the rifle at night or in the mud and after fording water obstacles. Detail clean, dry, and re-lubricate if the rifle becomes submerged. Perform **After Fording Procedures if you swim with the rifle**.

f. **MOST IMPORTANT--Keep the rifle well lubricated and as dry as possible.**

2-29 DESERT CLIMATES--HOT/COLD, DRY/WET, SANDY/DUSTY

a. Do not lubricate exterior of weapon unless corrosion becomes a problem in humid coastal areas. **Lubricate internal moving parts as directed in paragraph 3-2 for normal conditions.** Most importantly, however, follow the Active Protective Measures below:

(1) **Active Protective Measure:** Use a muzzle cap to keep sand out of the bore--especially during a stalk or when maneuvering through a trench line. Use the drag bag or overall rifle protective bag if the tactical situation permits. Use magazine bags to protect ammunition and magazines.

(2) **Active Protective Measure:** To seal airborne dust and blowing sand from the receiver interior while in administrative areas, keep the bolt closed on an empty chamber, the dust cover closed, and an empty magazine in the magazine well.

b. **Active Protective Measure:** Keep the optical scope and magazines/ammunition from the direct rays of the sun. Ammunition warmed by the hot sun may not shoot to the rifle's zero.

c. **Active Protective Measure:** Unload and wipe clean magazines/ammunition several times daily. Do not lubricate ammunition, but lube magazine spring lightly (as for normal operations).

d. **MOST IMPORTANT--Use normal amounts of lubricant on internal moving parts and follow the Active Protective Measures listed above. In fact, most testing by the Army in 2006 indicates that more internal lubrication performs better than less lubrication in M16/M4 design weapons.** However, keeping the breech area and bolt clear of sand and dust by keeping the bolt closed, a magazine inserted and the dust cover shut are very important as well.

2-30 AFTER FORDING PROCEDURES--if the tactical situation allows no time to properly clean bore.

- a. Keep muzzle pointed down and remove muzzle cap if present.
- b. Shake rifle vigorously.
- c. Pull charging handle only 2 to 3 inches to the rear (so as to only partially extract the round in the chamber) and allow water to drain out muzzle.
- d. Release charging handle to reload chamber. Close dust cover.
- e. When time and situation permits, unload and hand operate rifle and clear the drain hole in buttstock with pipe cleaner and drain buffer tube.

2-31 IMMEDIATE ACTION/EMERGENCY PROCEDURES

a. If your rifle stops firing unexpectedly and the tactical situation demands you must continue firing, point it in a safe direction and perform the following immediate actions:

- (1) **Slap upward on bottom of magazine** to make sure its properly seated.
 - (2) **Pull charging handle all the way to the rear.** Observe ejection of empty case or complete round (if any). **Visually check chamber for obstructions.**
 - (3) If the chamber is clear, **release charging handle to feed a new round into the chamber.** Do not ride the charging handle forward, let it spring forward under pressure from the compressed recoil spring.
 - (4) Aim the rifle and **attempt to fire again.** If rifle again fails to fire, remove magazine, lock bolt to rear and clear chamber, select a new magazine and reload, aim and attempt to fire again.
- b. **If rifle again does not fire, clear the rifle and apply the remedial actions** on the following pages.

2-32 REMEDIAL ACTION/EMERGENCY PROCEDURES

WARNING

If your rifle stops firing with a live round in the chamber of a hot barrel, point the rifle in a safe direction and remove the round as fast as you can. However, if you cannot remove it within 10 seconds, keep the rifle pointed in a safe direction, remove the magazine and wait 15 minutes for the chambered round to cool before initiating remedial action. These are precautions to prevent injury or death from a cook off. Regardless, keep your face away from the ejection port while clearing a hot chamber.

a. Remedial action assumes that faulty ammunition is the cause of the rifle's failure to fire. In other words, there is either a cartridge case stuck in the chamber or a bullet lodged in the rifling just in front of the chamber. Lock the bolt to the rear and clear these obstructions as follows:

(1) To clear a stuck cartridge case, tap it out with a cleaning rod inserted from the muzzle. Do not attach anything to the cleaning rod end for these procedures. If a complete cartridge is ejected, a faulty primer probably caused the malfunction. So check the primer:

If it has a normal firing pin indentation and the chamber and bore are clear of obstructions, reload with fresh ammunition and test fire rifle.

If primer is not indented sufficiently, check firing pin tip for a broken or flattened tip. Also see paragraph 3-4.1, Failure to Fire in the Trouble Shooting Table:

NOTE

A related malfunction to a stuck cartridge case is a "ruptured cartridge case". See Trouble Shooting Procedures "Fail to Chamber" in paragraph. 3-4.7.

WARNING

If an audible "pop" or reduced recoil is experienced during firing, immediately cease firing and clear the rifle. The "pop" could have been an incomplete powder burn which jams a bullet in the bore just in front of the chamber. If you chamber another round and fire it with this type bore obstruction, the rifle will blow up and possibly injure or kill you.

(2) **To clear a stuck bullet lodged in the rifling** just outside the chamber; tap it out gently using the cleaning rod as for a stuck cartridge case described previously. Be careful not to damage the crown end of the muzzle during these procedures. A bullet stuck in the bore is caused by a round without any, too little, or contaminated powder. Although a very rare circumstance, it can have disastrous effects. See **WARNING** above.

- (3) If gentle tapping on the cleaning rod will not dislodge the stuck bullet, seek an Armorer's assistance.

CAUTION

Be careful not to damage the crown of the muzzle (the area of the bore where the rifling ends).
Crown damage will significantly degrade accuracy.

2-33 DOUBLE FEED/BOLT CARRIER JAMMED

a. Bent magazine lips can create a feeding malfunction where more than one round is stripped from the magazine. This extra round can jam the carrier and bolt to the rear. It is near impossible to force the carrier forward under these conditions. It is also impossible to open the upper receiver because the carrier has partially entered the buffer tube. **The only direction the carrier and bolt can move with a double feed is to the rear, but the charging handle is usually jammed as well by the double feed.** If this malfunction occurs, follow these steps:

- (1) Immediately place safety on SAFE, drop to your knees if standing or roll to your side if in the prone position, and remove magazine.
- (2) Push in firmly on bottom portion of bolt catch so as to lock the bolt to the rear during the next step and point muzzle up.

WARNING

Keep face clear of muzzle during these procedures. The rifle could fire.

- (3) Slam rifle butt on the ground. Keep pressure on bottom of bolt catch. Bolt and carrier should move fully rearward and lock behind bolt catch lug. With bolt locked to the rear, shake, or otherwise clear loose rounds from interior of receiver.
- b. If attempts at slamming the buttstock on the ground fail to move bolt to rear, use a cleaning rod inserted from the ejection port to push the bolt rearward until it is held rearward by the bolt catch.

CHAPTER 3 MAINTENANCE INSTRUCTIONS

SECTION I: INSPECTION AND LUBRICATION

3-1 INSPECTION GUIDE. Clean and inspect parts before lubrication.

WARNING

Do not interchange bolts between rifles.

BOLT. Cracks or fractures, especially in the cam pin hole area and around the locking lugs. Bolts that have pits in the bolt face extending into the firing pin hole (hole out of round) need to be replaced.

FIRING PIN. Bent, cracked, flattened or sharply pointed tip. Firing pin tip should be rounded and smooth. Check firing pin protrusion by inserting firing pin through bolt and observing the tip protruding from the face of the bolt.

CAM PIN. Cracked, chipped, or pitted?

FIRING PIN RETAINING PIN. Bent or badly worn. Should withdraw to its stop freely, but not come lose from the carrier body.

EXTRACTOR AND EXTRACTOR SPRING. Chipped or broken edges in the area of the extraction lip that engages around the rim of the cartridge. Extractor spring not seated properly.

EXTRACTOR SPRING BUFFER. Broken edges, missing or not seated properly.

CHAMBER AND BORE. Excessively oiled, pitted, dirty, obstructed. Locking lugs of barrel extension fouled with excess lubricant.

NOTE

Several of the above parts may be carried as spares in the Deployment Kit. Periodically inspect these parts and lubricate them so they don't rust.

3-2 LUBRICATION GUIDE. Over lubrication should be avoided at all times. A light to medium coat of lubricant is all that is required to prevent rust. **The following lubricating instructions are for before operations and firing, not storage.**

WARNING

Before the rifle is fired, wipe any lubricant from the chamber and bore with one or two clean dry patches, each run through the bore twice. This leaves just a trace coating of oil to those areas for short term corrosion protection.

KEY DEFINITIONS.

LIGHTLY LUBED: A thin film of oil barely visible to the eye. Wetting a cleaning patch with 5-10 drops of oil and then wiping the area over several times with the same patch should produce this effect and spread the oil thinly and evenly.

GENEROUSLY LUBED: A medium thick film of oil that can be spread or dabbed-on with a finger. This can be applied with the fingers or a patch wetted with 20-30 drops of oil.

a. UPPER RECEIVER (These procedures assume the rifle has been Field Stripped).

(1) Lightly lube the inside of the upper receiver with oiled patch or angle-head, soft bristle, tooth brush. This includes the locking lugs and feed ramps of the barrel extension. A soft bristle tooth brush works best for locking lugs of barrel extension.

(2) Place one drop of oil on dust cover detent. Push detent in several times to work oil past detent into spring area. Brush/wipe off excess oil.

(3) Place one drop of oil on each end of the dust cover hinge. Work oil in by rotating dust cover open and closed. Brush/wipe off excess oil.

CAUTION

Be careful not to get solvents or oils on the scope lens when cleaning or lubricating rifle or to scratch them while cleaning.

(4) Install Bore Rod Guide into Upper receiver. Assemble clean patch to cleaning rod tip, or wrap the appropriate size patch around the Brass Jag from the Navy Mk 11 Cleaning Kit. Push the patch through the receiver, into the chamber, and through to clear the muzzle and remove patch before withdrawing rod. Repeat several times as necessary. Repeat this with another clean patch paying particular attention to wiping the chamber clear of old lubricant by rotating the rod clockwise. Then with a lightly lubed patch, push the rod through to the muzzle and back again, 2 or 3 times, leaving just a trace coating of oil.

(5) Lightly lube charging handle. Apply one drop of oil to catch and spring. Squeeze catch several times and then brush/wipe off excess. Assemble charging handle to upper receiver, but do not push it fully forward.

b. BOLT CARRIER GROUP.

(1) Lightly lube the firing pin. Apply only a trace of lubricant to the firing pin recess hole with a lightly lubed, doubled-over, pipe cleaner and then pushing the pipe cleaner back and forth through the firing pin recess hole. Also pass an end of the lightly lubed pipe cleaner through extractor pin hole once or twice.

(2) Using the same, lightly lubed/doubled-over pipe cleaner--push this into the straight section of the gas key two or three times.

(3) Lightly lube inner and outer surfaces of bolt carrier. Generously lube the four (4) carrier slide ribs. Two are located on either side of the gas key (10 & 2 o'clock) and two are at 5 & 7 o'clock. Also generously lube cam pin groove and lightly lube the carrier's hammer cocking surface.

(4) Lightly lube extractor and extractor pin. Assemble extractor to bolt.

(5) Generously lube the cam pin and the outside of the bolt's mid-point bearing, bolt ring and tail-piece. (If old 3-piece bolt rings are used, stagger bolt rings Note: newer bolt ring does not have grooves to stagger, only a zigzag cut). Insert bolt into carrier with extractor to the right.

(6) Insert cam pin with firing pin hole aligned front to rear. ENSURE FIRING PIN RETAINING PIN IS FULLY WITHDRAWN TO ITS STOP. Drop in firing pin and push it fully forward with cleaning rod section or small end of GP cleaning brush if necessary. Push retaining pin flush with carrier body to lock-in firing pin. Shake bolt and carrier assembly to ensure firing pin is retained. BE READY TO CATCH FIRING PIN IF IT FALLS OUT. Work bolt back and forth several times to spread lubricant.

(7) Pull bolt to unlocked position and assemble in upper receiver with charging handle installed. Push bolt carrier and charging handle fully forward. Close dust cover.

c. LOWER RECEIVER.

- (1) Wipe buffer and inside of receiver extension (buffer tube) dry. Lightly lube action (recoil) spring. Place one drop of oil to buffer detent and push detent in several times to work lube past detent to detent spring. Brush/wipe off excess oil. Assemble buffer and action spring in receiver extension.
- (2) Generously lube take down and pivot pins. Apply one drop of oil to their detent grooves. Work pins in and out several times to spread lubricant. Wipe dry all excess oil.
- (3) Apply one drop of oil to the bolt catch, trigger guard detent, and magazine catch button areas. Work these controls in and out several times. Brush/wipe off any excess oil.
- (4) Hold hammer down (to rear), apply one drop of oil to each end of the trigger pin. Pull trigger to rear several times to work oil between trigger pin and receiver. Wipe off excess oil.

CAUTION

When receivers are open or separated, never pull trigger and let hammer spring forward against receiver wall/bolt catch. Without the bolt installed and the receivers assembled, this can damage the receiver and bolt catch.

When it is necessary to lower the hammer, retard it springing forward with your non-shooting hand as you pull the trigger.

- (5) Apply one drop of oil to each end of the hammer pin. Rotate the hammer back about 1" several times while keeping the trigger pulled. Repeat this several times to work oil between hammer pin and receiver. Wipe off excess oil.
- (6) Rotate hammer back fully with trigger pulled and note action of disconnecter and rear hammer hook. Apply one small drop of oil each to contact surfaces of the hammer hook and disconnecter and in between the sear and the disconnecter.
- (7) Observe that when hammer is forward, the hammer's sear notch can be observed within the lower receiver. Apply one small drop of oil to the notch, AND WITH FINGER OFF TRIGGER--cock hammer. Hold hammer with thumb and release hammer by squeezing the trigger. Do this several times to spread oil down to the sear where you can not see. Remove any excess oil with a dry, bent pipe cleaner.

(8) From inside receiver, apply one drop of oil to both visible round ends of the safety selector lever (**Safety**) shaft (not the midsection/cut-out portion) and to the end of the safety selector lever shaft on the right side of the receiver. Rotate safety from FIRE to SAFE several times. Wipe off excess oil. **With M-110, check tightness of right-side ambidextrous selector with wrench from Cleaning Kit.**

(9) Generously lube the face of the hammer.

(10) Assemble lower and upper receivers. Check action of charging handle, bolt catch, and dust cover. Dry fire rifle once or twice and listen for hammer fall. Close dust cover.

(11) SAFE rifle. It is now ready for loading and firing.

EXTERNAL SURFACES. A light coating of oil or rust preventative should be applied to all external metal areas. Plastic, rubber, or glass surfaces should be kept dry. They may be dry brushed with a soft brush (a dry paint brush) and then wiped clean with a slightly water dampened absorbent cloth.

3-3 GENERAL

Perform Before and After Operations PMCS (paragraph 2-22) if you are the assigned operator and the weapon has been stored in an armory/arms room and not used for a period of 60 days, or if you have just been issued the rifle.

NOTE

Assigned operators should perform PMCS and clean or preserve their rifles as often as necessary to prevent corrosion, rust, or detect worn and damaged parts which may require replacement. The time interval for this activity will be determined by the Commanding Officer. This may be as often as once per week in garrison, or more often, if necessary.

This is particularly important for the barrel surface covered by the sound suppressor when it is fired.

SECTION II: TROUBLESHOOTING PROCEDURES

3-4 TROUBLESHOOTING

a. Troubleshooting procedures are easier to remember and use effectively if you first know and understand what normally occurs during the rifle's Eight Steps in the Cycle of Functioning.

EIGHT STEPS IN THE CYCLE OF FUNCTIONING.

-- How Your Rifle Works --

- (1) **FIRING.** (Conditions: round in chamber, bolt locked, hammer cocked) Safety is rotated to FIRE, trigger is pulled releasing hammer. Hammer springs forward under tension of hammer spring. Hammer strikes firing pin and firing pin strikes cartridge primer. Primer detonates from the firing pin impact and ignites propellant (gunpowder) inside cartridge case. Very high pressure (50,000 pounds per square inch) develops inside case as the powder burns. Bullet is pushed from case and accelerated (2,600 fps) down barrel and out muzzle.
- (2) **UNLOCKING.** Expanding gas pressure enters the gas tube through a port in the forward area of the barrel. This gas pressure travels through the gas tube into the gas key. Via the gas key, high pressure gas enters the carrier interior, but is trapped by the bolt rings at the front. Consequently, expanding gas pressure begins pushing the carrier to the rear--away from the bolt. As this gas continues to expand, (the bullet has already left the barrel) the bolt carrier continues to move rearward overcoming the tension of the action (recoil) spring. The cam groove of the bolt carrier acts on the bolt cam pin which in-turn causes the bolt to rotate and the bolt lugs to disengage from the barrel extension locking lugs.
- (3) **EXTRACTION.** As the bolt now begins movement to the rear, the lip of the extractor, which is hooked on the rim of the cartridge case, pulls the case out of the chamber. The lip maintains its grip on the rim of the case through tension of the extractor spring as the bolt passes by the ejection port.
- (4) **EJECTION.** As the case clears the barrel extension, the stored energy of the ejector spring is applied to the rim of the case by the ejector plunger. The plunger completes its action as the case clears the ejection port and is rotated free of the extractor lip and bolt. If working properly, this sequence throws the case through the ejection port and clear of the rifle .
- (5) **COCKING.** The thrust of the carrier assembly from the injection of expanding gases is so great, it continues to move the carrier and bolt assembly fully back into the receiver extension. As these parts move to the rear, the bottom surface of the carrier passes over the face of the hammer forcing it back and down against the tension of the hammer spring. With the trigger finger probably still to the rear at this moment, the hook of the disconnecter engages the rear hook of the hammer, holding the hammer to the rear and down until the trigger is released (subsequently, the hammer is then held back by the sear as the trigger is released). The action or recoil spring is now fully compressed and prepared to thrust the recoiling mass (carrier and bolt assembly) forward.
- (6) **FEEDING.** As the bolt and carrier begin moving forward under tension of the action spring, the lower feed lug of the bolt strikes the base of the top cartridge in the magazine. The force of the bolt strips a round from the magazine feed lips. As the round begins to move forward, the tip of the bullet hits one of the two feed ramps of the barrel extension. The angle of the feed ramp helps force the round up and into the chamber as the bolt continues to move it forward in the feeding cycle.
- (7) **CHAMBERING.** Chambering occurs when the cartridge is fully forward in the chamber. If there is an obstruction in the chamber, the cartridge case will not fit the chamber properly and the bolt will be prevented from locking.

(8) LOCKING. With a cartridge fully in the chamber, the bolt has fully entered the barrel extension and has stopped moving forward. Also at this time, the extractor lip has snapped over the rim into the extractor groove of the cartridge case and the ejector and its spring are fully compressed. The carrier, however, continues forward under continued force of the action spring and through action of its "dog leg" cam pin groove on the cam pin, causes the bolt to rotate. Rotation of the bolt moves its locking lugs into alignment with the barrel extension locking lugs. When this rotation of the bolt is complete, the bolt is locked. If the bolt is fully forward, but the carrier is back slightly out of battery (bolt not fully locked), the firing pin will be prevented from reaching the primer even with a blow of the hammer. See FIRING above. As the shooter releases the trigger for the next shot, the firing sear (trigger sear) enters the hammer sear notch through tension from the trigger spring. Simultaneously, the disconnecter releases the rear hammer hook. With the hammer fully cocked and the trigger sear engaged with the hammer sear notch, the rifle is ready to fire again or be placed on SAFE and unloaded.

b. This manual cannot list all possible malfunctions that may occur, nor all causes and corrective actions. If a malfunction is not correctable, contact Knight's Manufacturing. **Note: U.S. Navy personnel will use the following point of contact: Naval Surface Warfare Center (Code 2521), 300 Highway 361, Crane IN 47522-5001 (attn: Mr. Terry O'Brian, Commercial Telephone (812) 854-5831 or Fax (812) 854-1044.** However, by your understanding of the Eight Steps in the Cycle of Functioning described above, you should be able to pin point the source of the problem. As you review the following Troubleshooting Table, note the relationships between the CAUSE and that part's role during normal functioning.

CAUTION

Clear rifle and place on SAFE before following Troubleshooting procedures.

TROUBLESHOOTING TABLE

MALFUNCTION	CAUSE	CORRECTION/ACTION
1. FAILURE TO FIRE	a. Safety on SAFE. b. Defective ammunition. c. Improper assembly of firing pin.	a. Move safety to FIRE. b. Eject round. c. Retaining pin passes behind large diameter of firing pin.

TROUBLESHOOTING TABLE (Continued)

MALFUNCTION	CAUSE	CORRECTION/ACTION
FAILURE TO FIRE (continued)	d. Excess lube.	d. Wipe firing pin dry and use pipe cleaner in firing pin recess.
	e. Short firing pin protrusion.	e. Replace firing pin.
	f. Round not fully chambered.	f. Clear obstruction from chamber. Clean and lube bolt, cam pin and carrier.
	g. Hammer not cocking, or "hair trigger"	g. Check correct hammer spring reassembly. Check sear engagement screw for adjustment. Left screw may need to be tightened slightly. (See armorer for re-adjustment or new hammer and/or sear.)
	h. Trigger fails to release hammer.	Replace disconnecter (See Armorer). h. Disconnector screw may need to be tightened slightly. Check adjustment. Check correct trigger spring reassembly. (See armorer for re-adjustment.)
2. FAILURE TO UNLOCK	i. Rifle (pistol) grip screw is too long or washer is missing.	i. Loosen rifle grip screw and re-test hammer cocking & trigger pull.
3. FAILURE TO EXTRACT	a. Gas key clogged.	a. Use pipe cleaner to check/clear gas key.
	a. Chamber or ammo dirty.	a. Clean chamber and wipe ammo clean.
	b. Extractor spring weak.	b. Replace spring and silicone rubber insert.
	c. Extractor lip worn.	c. Replace extractor.
	d. Extractor stuck (frozen in place).	d. Remove, clean, lube extractor.

TROUBLESHOOTING TABLE (Continued)

MALFUNCTION	CAUSE	CORRECTION/ACTION
4. FAILURE TO EJECT	<ul style="list-style-type: none"> a. Frozen ejector. b. Not enough gas pressure. c. Restricted movement of bolt carrier group. d. Restricted buffer. 	<ul style="list-style-type: none"> a. Clean brass flakes from ejector and clean/lube ejector. b. Stagger gas rings or replace with new ones. Clean gas key. Replace ammunition. c. Remove, clean, lube. Check gas key fit and gas tube. d. Remove, clean, lube.
5. FAILURE TO COCK	<ul style="list-style-type: none"> a. Hammer spring in wrong. b. Disconnecter hook worn. c. Disconnecter spring weak. d. Hammer hook worn. e. Hammer spring broken. 	<ul style="list-style-type: none"> a. Check correct hammer spring reassembly. b. Replace disconnecter. c. Replace spring. d. Armorer replaces. e. Replace hammer spring.
6. FAILURE TO FEED	<ul style="list-style-type: none"> a. Dirty/corroded ammo. b. Magazine not fully seated. c. Double feed. d. Bolt overrides cartridge. e. Restricted movement of bolt carrier group. f. Restricted buffer. g. Too many rounds in magazine. h. Dirty magazine. 	<ul style="list-style-type: none"> a. Clean or replace. b. Adjust magazine catch. c. Replace magazine. d. Replace magazine. e. Remove, clean, lube. f. Remove, clean, lube. g. Remove excess. h. Disassemble, clean, lube magazine spring.

TROUBLESHOOTING TABLE (Continued)

MALFUNCTION	CAUSE	CORRECTION/ACTION
7. FAILURE TO CHAMBER	a. Obstruction in chamber. b. Dirty/corroded ammo. c. Bullet stuck in bore just past chamber.	a. Clear chamber. b. Replace ammo. c. Remove per instructions para. 2-30 (2).
8. FAILURE TO LOCK	a. Dirty bolt/locking lugs. b. Dry/dirty cam pin or cam pin groove. c. Burrs on bolt locking lugs.	a. Remove, clean, lube. b. Remove, clean, lube. c. Show to armorer.

SECTION III: MAINTENANCE INSTRUCTIONS

3-5 CLEANING (Refer to para. 2-8 for Field Stripping procedures). Cleaning is the removal of all old lubricant, firing residue, dirt, debris, foreign matter, and corrosion from the sniper rifle and its associated accessories. The following procedures refer to CLP. This is a combination bore and carbon **Cleaner**, gun oil **Lubricant**, and **Preservative** oil product. Refer to Lube Guide for other authorized cleaners and lubricants. However, the SR-25 requires no special CLP products for proper and reliable functioning under normal conditions. Any good grade of commercial bore cleaner like Shooter's Choice Bore Cleaner; or gun oil like Rem Oil, Hoppe's, etc., may be used. However, always avoid heavy greases or excessive use of oils with this rifle.

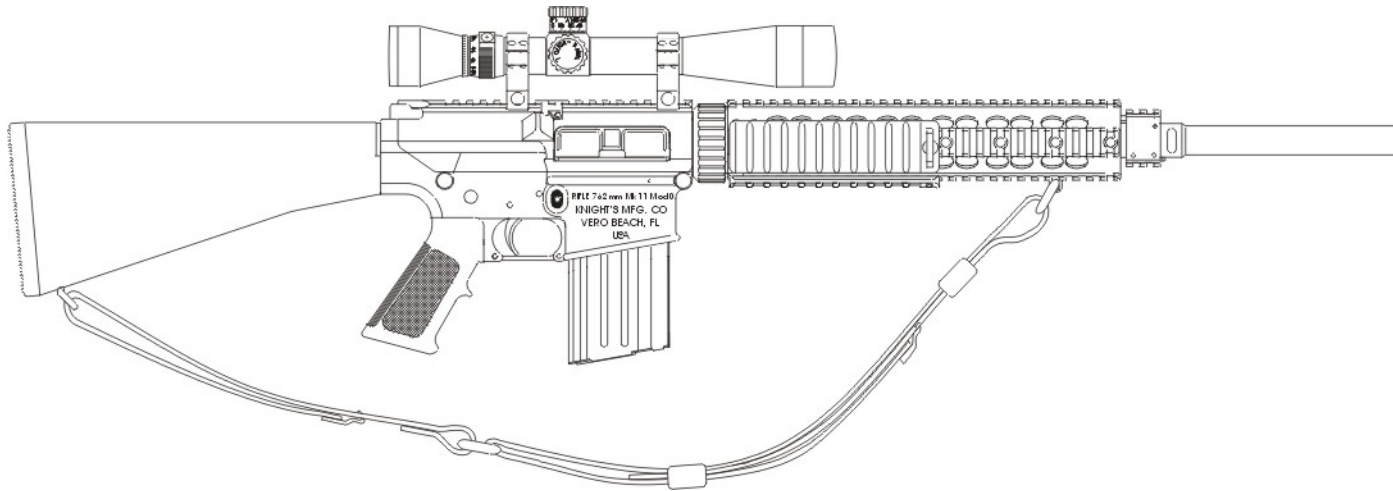
WARNING

Clear and SAFE rifle before performing any maintenance or cleaning action.

- a. Use the basic issue cleaning kit and expendable supplies provided through the supply system or one obtained from Knight's Manufacturing Company. Ensure a good supply of patches. Obtain several absorbent cotton rags. Always shake CLP prior to and during use to keep its Teflon flake lubricant in suspension.
- b. Field strip rifle as described in paragraph 2-8 through 2-10.
- c. Wipe the rifle and its parts as clean as possible with a clean rag wetted with CLP. Wipe the chamber and bore with a CLP wetted patch, then wipe dry.
- d. BARREL AND CHAMBER.

General. Always clean bore from chamber end through to muzzle end. Note that bore brush screws into an adapter and not the rod sections. Do not reverse direction of the bore rod until the tip has cleared the muzzle. Repeat wiping the bore and chamber with patches wetted with CLP. Frequently wipe bore rod dry with a clean rag.

Sniper Rifle Bore Cleaning Instructions



1-1. Bore Cleaning Instructions--Introduction. KMC recommends Shooter's Choice Bore Cleaning products. Shooter's Choice is a commercial product that may be available for sale in your local area or PX. If not, ask your CO to get it into the PX. Government issue Rifle Bore Cleaner (RBC) or CLP may also be used, but these are less effective in removing copper fouling.

There are 3 main steps in bore cleaning:

(Step One) Clean out the Carbon using a quality bore cleaner.

(Step Two) De-foul the bore of copper residue with copper removing compound.

(Step Three) Keep the bore from rusting by neutralizing Copper removing compound and wiping with preservative oil..

WARNING

Clear and SAFE rifle before cleaning bore.

Note:

*There are two levels of bore cleaning, one for armory or in the rear (garrison) area, and one for the field. These procedures are different because the tools and facilities available in garrison or in rear areas are not usually available in a forward deployed field environment. For example in garrison or when ever else possible, use only the one-piece bore rod because it is most likely to be straight and therefore be less likely to damage the bore from repeated use. When deployed in the field, you would most likely use the sectional bore rod that un-screws and can be stored in the SR-25 Rifle buttstock compartment if so equipped. However, the sectional rod may damage the bore in use if it is bent or crooked. **Always use the Knight's SR-25 Bore Rod Guide and Bore Rod Guide Pilot—especially with the sectional rod in the field.***

1-2. Bore Cleaning Procedures--General.

The Basics:

- a. If possible, use the one-piece cleaning rod and the **Knight's SR-25 Bore Rod Guide** provided with the Stoner Rifle System. The rod is stored in the rifle carrying case lid and/or the Knight's SR-25 Bore Rod Guide is in the box for the cleaning kit components that may also be stored in the rifle case lid.
- b. Field strip rifle as described in paragraphs 2-7 through 2-10, of the Operator's Manual.
- c. Brush and wipe the rifle and its parts as clean as possible with a clean rag.
- d. If so equipped, lock down the flip-up scope covers or otherwise cover both ends of the scope to protect the lens surfaces from bore cleaning solvents.

e. Always clean the bore—from the chamber end--through to the muzzle end—utilizing the Knight's SR-25 Bore Rod Guide and the Bore Rod Pilot Guide with the straightest one-piece rod available. **The Guide Pilot is inserted into the rear opening of the Bore Rod Guide as the rod is pushed into the bore to help keep the rod centered.** Do not reverse direction of the bore rod until the rod tip or bore brush has cleared the muzzle. The fingers of your free hand may need to keep the Guide Pilot in-place when the rod is pulled back out of the bore.

Note:

*When the bore is dirty, do not pull dirty patches back through the bore because it re-introduces fouling to the bore, chamber, and bore guide. Only push wet patches one-way. Remove each patch from the rod as it clears the muzzle if it appears dirty. **Frequently wipe the bore rod dry with a clean rag.***



Dirty patch—do not pull back through the bore

Once patches wet with bore cleaner clear the muzzle and are reasonably clean, then scrub the bore with the brass bore brush. After 5 full in-and-out strokes with the bore brush, change back to wet bore patches as described previously.

The one-way process with wet patches requires lots of patches, but it reduces cleaning time. It also helps the bore brush stay clean, last longer and perform better.



Sights Up

f. Any time the bore needs cleaning, so does the chamber. The chamber can be cleaned with either Shooter's Choice Bore cleaner or CLP.

g. When cleaning the bore, keep muzzle pointed downwards and the sights orientated up to prevent bore cleaner from collecting in bolt locking recesses of the chamber area or seeping into the gas port.

Muzzle Down & Scope Caps closed.

1-3. Clean the Chamber when cleaning the Bore.

First, swab out the chamber with Bore Cleaner or CLP applied to cleaning patches.

Close Scope Caps to
protect lenses from solvent

Second, using the SR-25 Chamber Brush assembled to the Chamber & Brass Brush Rod, scrub out the chamber in a clockwise direction with the brush fully inserted into the chamber. Turning the chamber brush clockwise will keep the brush from unscrewing from the rod.

Third, use a general purpose brush (or tooth brush), additional bore cleaner or CLP and a piece of rag to clean residue from barrel extension locking recesses. Pipe cleaners from the cleaning kit and/or Q-Tips may also be used for the locking recesses. Wipe the chamber and bore dry with clean/dry patches.

Note:

Since the chamber is much larger in diameter than the bore, you may need to double-up the patches when wiping the chamber. Two patches will usually fit the slotted bore rod tip when cleaning the chamber.

Fourth, dry the chamber with cleaning patches.

Note: Also see detailed Cleaning Kit Instructions packed with the Mk 11 Navy Cleaning Kit.

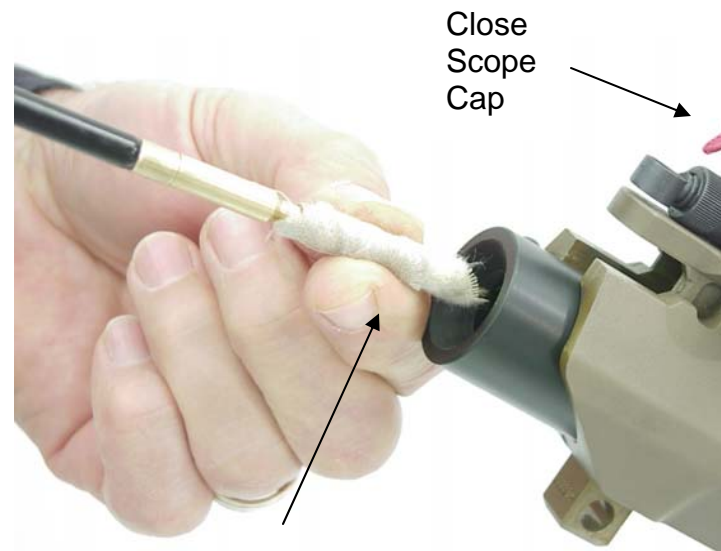


1-4. Cleaning the Bore—Detailed Procedures.

Step One—Clean out the Carbon

(1) Install **Knight's SR-25 Bore Rod Guide** in receiver and rotate to the left to lock in place. Slide the Bore Rod Guide Pilot over the rod. Screw the brass bore rod jag or the bore brush and adapter onto the end of the rod and then insert into the Bore Rod Guide.

(2) Wrap a patch wet with Shooter's Choice Firearms **Bore Cleaner** around the brass jag and insert at the rear opening of the Knight's SR-25 Bore Rod Guide as shown here. Push jag or bore brush completely through the bore with the rod. Remove the patch from the jag as it clears the muzzle and then pull the rod out from the rear. Repeat with a second wet patch. Wipe the bore rod dry with a dry patch wrapped around the jag. Repeat this process with clean wet patches through the bore at least four times or until the patches appear clean.



Wrap patch tightly around jag before insertion.

The Cleaning Kit may contain a Brass Jag. The best way to use this jag is to wrap it tightly with a bore patch that is 1 3/4" square.

Note: When this patch is pushed clear of the bore, it usually must be removed before withdrawing the rod.



NOTE:

As the patch or bore brush enters the bore rod guide, slide the Guide Pilot into the rear opening of the Bore Rod Guide and then hold it in place to provide additional "dead center" bore rod support as it is being pushed back and forth through the barrel.

Slide Bore Rod Guide Pilot Forward and hold in place.



NOTE:

In the field, use the rear edge of the Bore Rod Guide as a means to hold the receiver's apart for ease of using the bore rod as shown in these pictures:

Note the bipod is being used to support the front of the rifle as well.



Using the Bore Rod Guide in this manner helps keep the sights up, and if the buttstock is raised as shown above, then bore solvent drains away from the chamber, while keeping the rifle stable for bore cleaning.



Note: *If your cleaning patches are too large they may be too difficult to push through the bore, either cut down the patch to reduce its size, or remove the bore rod tip or jag from the rod and try just the rod end to push patches through.*

(3) Replace bore rod tip or jag with a bore brush/bore brush adapter from Mk 11 Cleaning Kit, and push this through the bore and back 8 or 10 times. Remove bore-brush and re-attach bore rod tip or jag.

Note:

Roll bore brush between the layers of a clean rag after each use to remove carbon & solvent residue from brush bristles.

(4) Wrap a patch wet with **Bore Cleaner** around the brass jag and insert at the rear opening of the Bore Rod Guide. Push the patch completely through the bore with the rod. Remove the patch as it clears the muzzle and then pull the rod out from the rear. Repeat this process with clean wet patches at least four times or until the patches appear clean.

(5) Replace bore rod jag with a bore brush, and push this through the bore and back 4 or 5 times. Remove bore-brush and re-attach brass bore rod jag.

(6) Wrap a patch wet with **Bore Cleaner** around the brass jag and insert at the rear opening of the Bore Rod Guide. Push the patch completely through the bore with the rod. Remove the patch as it clears the muzzle and then pull the rod out from the rear. Repeat this process with clean wet patches at least four times or until the patches appear clean.

(7) Dry patch bore thoroughly. This requires 3 or 4 clean/dry patches.

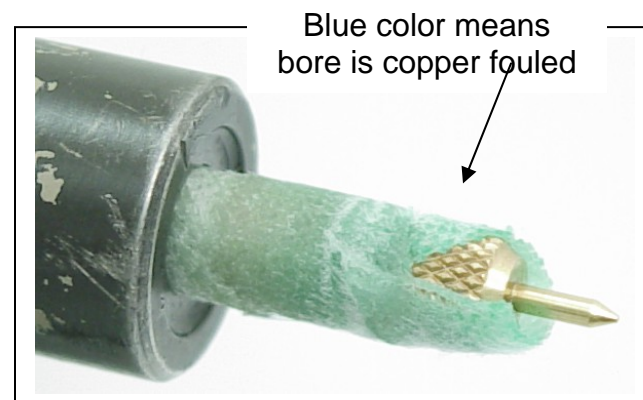
Step Two—De-Foul the Bore of Copper Residue.

(1) Wrap a patch wet with a **Copper Remover** (like that offered commercially by Shooter's Choice) around the brass jag and insert at the rear opening of the Bore Rod Guide. Push the patch completely through the bore with the rod using short, jerking motions until clear of the muzzle. Repeat and otherwise follow directions on the bottle.

Note the blue/green color caused by the chemical reaction of the Copper Remover against the copper fouling.

CAUTION:
Do not leave Copper remover in bore for more than 5 to 10 minutes.

Remove the patch as it clears the muzzle and then pull the rod out from the rear. **Wipe bore rod and jag dry with a clean rag.**



(2) **Wait 5 to 10 minutes for the de-fouling chemical to attack the copper.**

Caution

Do not allow Copper Remover to remain in bore for more than 10 minutes because it may attack the barrel steel.

(3) Wrap a patch wet with **Bore Cleaner** around the brass jag and insert at the rear opening of the Bore Rod Guide. Push the patch completely through the bore with the rod. **(Using Shooter's Choice Bore Cleaner after the Copper Remover waiting period helps to neutralize the stronger chemical.)** Remove the patch as it clears the muzzle and then pull the rod out from the rear. Repeat this process with clean patches wetted with Bore Cleaner two more times.

Note:

The blue/green color indicated on the patches caused by the chemical reaction of the Copper remover against the copper fouling.

If significant blue/green discoloration is shown on the patches, continue as follows:

(4) Dry patch bore thoroughly. This requires 3 or 4 clean/dry patches.

(5) Wrap a patch wet with a **Copper Remover** around the brass jag and insert at the rear opening of the Bore Rod Guide. Push the patch completely through the bore with the rod using short, jerking motions until clear of the muzzle. Repeat and otherwise follow directions on the bottle. Remove the patch as it clears the muzzle and then pull the rod out from the rear. **Wipe bore rod dry with a clean rag.**

(6) **Wait 5 to 10 minutes for the chemical to attack the copper.**

(7) Wrap a patch wet with **Bore Cleaner** around the brass jag and insert at the rear opening of the Bore Rod Guide. Push the patch completely through the bore with the rod. Remove the patch as it clears the muzzle and then pull the rod out from the rear. Repeat this process with clean wet patches twice.

The Cleaning Kit may contain a Brass Jag. The best way to use this jag is to wrap it tightly with a bore patch that is 1 $\frac{3}{4}$ " square.

Note: When this patch is pushed clear of the bore, it usually must be removed before withdrawing the rod.



When blue/green discoloration is not indicated on the patches, continue as follows:

Step Three—Keep the Bore from Rusting.

(1) Dry patch bore and chamber thoroughly. This requires 3 or 4 clean/dry patches. Remove and wipe **Bore Rod Guide** clean and dry to include its bore and pilot guide.

Note:

*Drying the chamber requires removal of the **Knight's SR-25 Bore Rod Guide** from the upper receiver. It also requires the slotted bore rod tip to be installed on the bore rod and smaller size cleaning patches doubled-up for a snug fit in wiping the chamber.*

(2) Double-up on patches in the slotted bore rod tip and apply a light coat of CLP or rust preventative oil to the chamber. Re-insert the **Knight's SR-25 Bore Rod Guide** in the upper receiver and the bore jag on the end of the bore rod.

(3) Wrap a patch wet with **CLP or rust preventative oil** around the brass jag and insert at the rear opening of the Bore Rod Guide. Push the patch completely through the bore with the rod. Remove the patch as it clears the muzzle and then pull the rod out from the rear. Repeat this process with clean oiled patches twice.

Caution

Remember, before firing, dry patch bore and chamber to remove CLP or oil.

Remove bore guide, and clean remainder of rifle system.

Note:

*After each use of any cleaning brush, wipe or blot the brush clean with a dry rag.
Do not dip bore or chamber brush into solvent or CLP bottle because the brush will contaminate the liquid.*

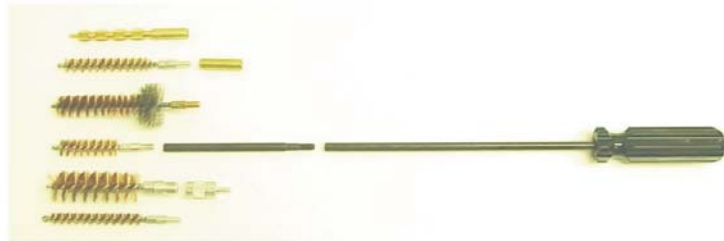
Note:

We do not recommend the use of a M16, or other types of sectional cleaning rods. However, if you include a M16 sectional cleaning rod that screws together with your Mk 11 Cleaning Kit, remember that the sectional rod requires a Bore Rod to Rod Tip Adapter from the Mk 11 Kit to allow the sectional M16 rod to accept standard patch holders and bore brushes. Do not use a M16 section rod for bore cleaning without the bore rod guide in place.

1-5. Cleaning Kit Component Instructions Knight's SR-25/Mk 11 Cleaning Kit contains a number of items intended to help you clean your rifle quickly and efficiently. This list and the photographs on the next pages can be used to help identify Kit parts.

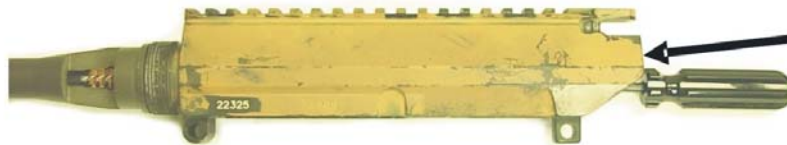
Item:		Description & Purpose	
GA1014	#1	Plastic Box	Provides storage for cleaning gear in rifle case
GA1000	#2	Bore Cleaner	Shooter's Choice MC#7 Bore Cleaner
GA1001	#3	Q-Tips	Cleaning aid for barrel extension
GA1002	#4	Pipe Cleaners	Cleaning aid for gas key and firing pin hole
GA1003	#5	Cotton Bore Patches 1.75" Square	Sized to fit bore snugly when used with rod tip jag
24383	#6	Handle & Rod Assembly	Used with Chamber Brush, Large Brass, Small Brass Bolt Carrier Brushes, and 9mm Neck Brush
GA1005	#7	Adapter for Large Brass Brush	Handle & Rod Assy. to the Large Brass Carrier Brush
GA1006	#8	Lg. Brass Brush	20 Ga. Shotgun Brush cleans carbon from the bolt recess in the bolt carrier.
GA1007	#9	Sm. Brass Brush	25. Cal. Bore Brush cleans carbon from the bolt tail piece's recess in the bolt carrier.
99319	#10	Chamber Brush, SR-25	Cleans chamber and barrel extension recess
GA1009	#11	Scope Mount Nut Wrench	½" Nut T-Wrench to check scope mount nut tightness
GA1008	#12	Metric to Standard Thread Adapter	Adapts standard threaded brushes & rod tips to the rod section of the Handle Assy.
GA1011	#13	Brass Bore Brush	7.62mm Brass Bore Brush—used with Dewey Rod Adapter & Dewey Bore Rod
T1000	#14	GP Nylon Bristle Tooth Brush	Double-ended Tooth Brush
T1001	#15	Screwdriver, Flat tip	To check tightness of front & rear sights
20206	# 16	T-15 Size Torx Screw L-Wrench	To check tightness of older model scope ring cap screws.
23228	#17	1/8" Allen Wrench	Used to check tightness of scope ring cap screws
T1004	#18	3/32" Allen Wrench	Used to check scope ring cap screw tightness
T1005	#19	5/64" Allen Wrench	Used to adjust elevation zero on front sight
T1006	#20	1/16" Allen Wrench	For Hex Head screws that secure range & windage cams on turrets on Mk 11 Mod 0 Scope.
GA1012	#21	Velcro Cinch Strap	Used to keep Cleaning Kit Box Lid secure
GA1013	#22	TW-25 High Tech Lubricant	Requested by the Navy for inclusion to kit
24386	#23	T-10 Size Torx Screw L-Wrench	To check tightness of newest model Mk 11 Mod 0 scope ring cap screws.
GA1019	#24	Instructions for TW-25 Lubricant	Requested by the Navy for inclusion to kit
GA1015	#25	Brass Bristle Carbon Cleaning Brush	Used to remove "burned-on" carbon from bolt
GA1016	#26	"Bore Snake"	Bore cleaning substitute for Dewey Rod
GA1017	#27	Chamber Neck Cleaning Brush	9mm Bore Brush used to clean the chamber neck area
21300	#28	Dewey Brass Jag	Used with Dewey Coated Rod to hold bore patches
21301	#29	Dewey Bore Brush Adapter	Used with Dewey Coated Rod to use .30 Cal. Bore Brush.
GA1018	#30	Brass Patch Holder	Used an alternative to Dewey brass Jag
GA1010	#31	Cleaning Kit Instructions	Explains use of these listed components

Rod Tip Assortment



Cleaning Kit Handle Assembly
P/N: 24383 & Metric to Std. Adapter
has many uses:

Chamber Cleaning Details

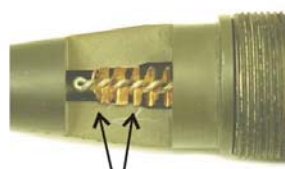


Using Cleaning Kit Handle Assy.,
Metric to Standard Rod Adapter,
& 9mm brush to clean chamber neck

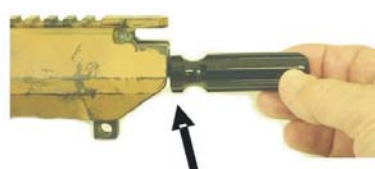
The end of the Cleaning Kit Handle shown above (with the 9mm chamber neck brush and metric to std. rod adapter assembled to it) is aligned with the rear of the upper receiver as a "penetration" guide.



Chamber Neck area
to be cleaned with
9mm brush

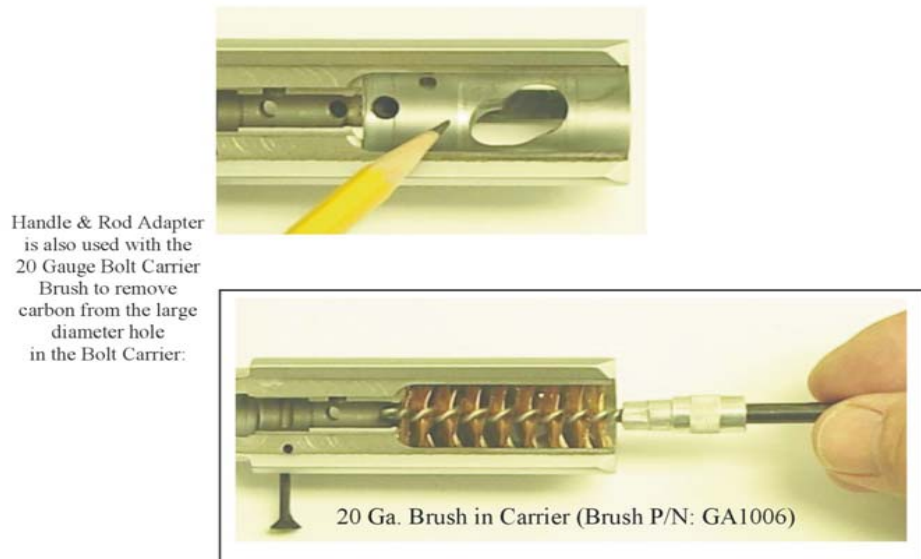
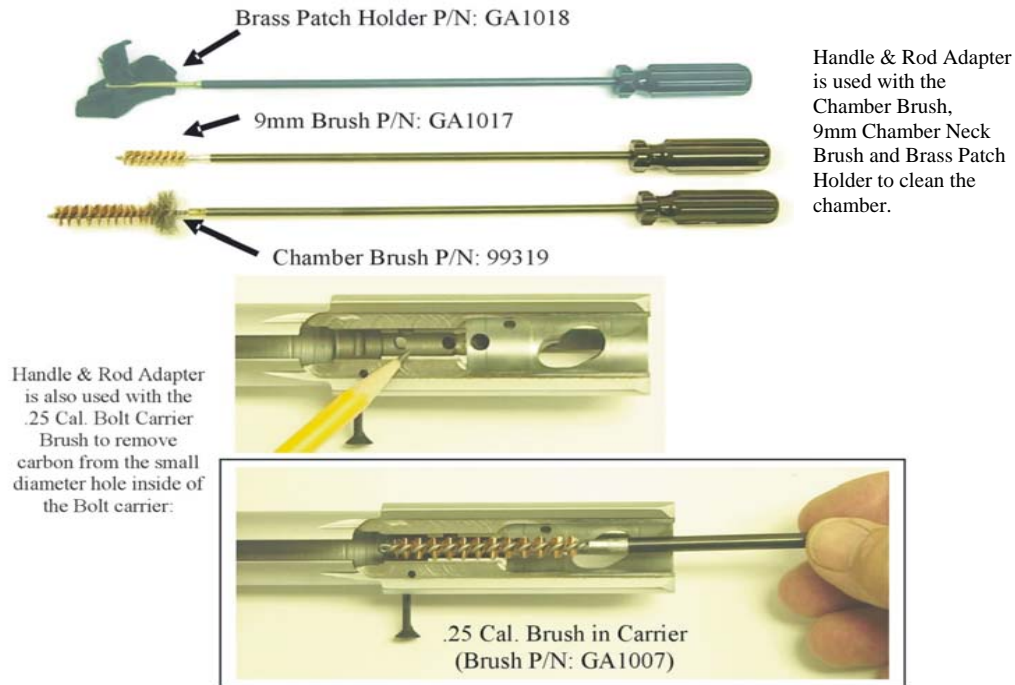


"Fit" of 9mm
Brush
in Chamber

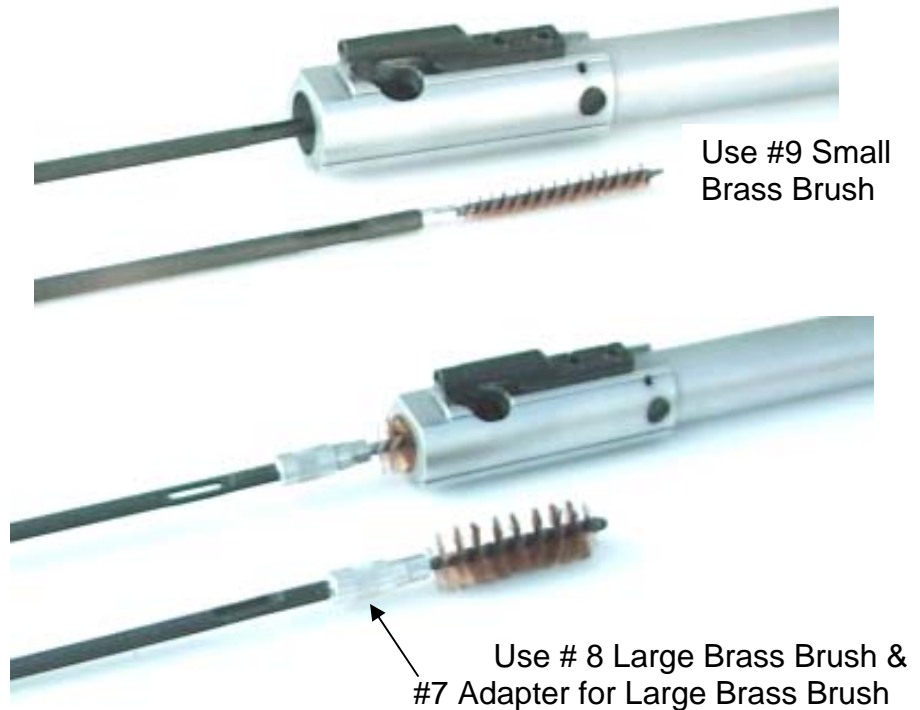


Handle Front Edge used as 9mm brush
penetration limit indicator—do not push it in
any further

1-6: Using the Cleaning Kit components to clean the Bolt Carrier.



(1) Assemble the #9 Small Brass Bolt Carrier Brush to the #6 Chamber & Brass Brush Rod and insert it through the small diameter hole inside the bolt carrier. One or two passes with the brush will generally clean carbon from the bolt's tail piece recess. Rotate rod handle clockwise to keep the brush from unscrewing.



(2) Assemble the #8 Large Brass Bolt Carrier Brush and its #7 Adapter to the #6 Chamber & Brass Brush Rod and insert it in the bolt carrier's bolt recess. Rotate rod handle clockwise 5 or 6 times to keep the brush from unscrewing and to clean carbon from the bolt recess.



Knight's Armament Company

7750 9th Street SW
Vero Beach, FL 32968
Phone (561) 562-5697 • Fax (561) 569-2955

**Mk 11 Mod 0 Sniper Lubrication
Instructions for TW-25 B**

1. Wipe Bolt Carrier and Bolt Components clean and Dry.
2. Shake TW-25 container to mix components.
3. Apply ONE DROP to the areas indicated in the following photos and spread evenly with a finger.



#24 TW-25 Lube
Instructions
Ga1019

#21 Velcro
Strap Ga1012

#1 Plastic
Box GA1014

#2 Bore Cleaner
GA1000

#22 TW-25 Lube
Ga1013

#25 Brass
Carbon Brush
GA1015

#26 Bore Snake
GA1016



#12 Metric to Standard Adapter: GA1008

#6 Handle & Rod Assy.: 24383

#8 20 Ga. Brush: GA1006

#7 Large Brush Adapter: GA1005

#10 Chamber Brush: 99319

#13 .30 Cal. Bore Brush: GA1011

#9 .25 Cal. Brush: GA1007

#27 9mm Neck Brush: GA1017

#28 Dewey Brass Jag: 21300

#29 Dewey Bore Brush Adapter: 21301

#14 Nylon Tooth Brush: T1000

#15 Screwdriver: T1001

#16 Size 15 Torx Wrench: T1002

#11 Scope Nut Wrench: GA1009

#23 Size 10 Torx Wrench: P/N: 24386

#4 Pipe Cleaners GA1002

#5 Bore Patches: GA1003

#17

#18

#19

#20

Allen Wrenches:
#17 = 1/8" P/N: T1003
#18 = 3/32" P/N: T1004
#19 = 5/64" P/N: T1005
#20 = 1/16" P/N: T1006

#3 Q-Tips: GA1001

#30 Brass Patch Holder: GA1018

e. UPPER RECEIVER

- (1) Wipe inside of upper receiver with a clean rag wetted with CLP. Remove CLP with a clean dry rag. Repeat as necessary.
- (2) Use both ends of general purpose (GP) brush to clean around area where gas tube enters receiver and the charging handle track. A piece of string wet with CLP can be looped around the gas tube and pulled back and forth for cleaning where the brush will not reach. Caution: DO NOT BEND GAS TUBE with small end of brush.

f. BOLT GROUP (note ejector cleaning procedure on next page)

- (1) Generously coat with CLP and scrub thoroughly with GP brush. Use small end of GP brush in cam pin hole and doubled-over pipe cleaner in firing pin recess. See pipe cleaner and q-tip use illustrations below for firing pin hole, gas key, etc.
- (2) Scrub extractor, cam pin, and firing pin in similar manner. Be careful brush does not dislodge extractor spring. If necessary to re-seat extractor spring, place larger diameter end-coil into recessed hole in extractor body and press in on opposite end with the point of a round of ammunition.
- (3) Wipe parts with clean/dry rag. Repeat cleaning with CLP and GP brush if carbon is present or as necessary to remove fouling, then wipe clean and dry.



GP Brush on Bolt Lugs
& Bolt Exterior



Pipe Cleaner for
Firing Pin Hole
& Gas Key



Q-Tips for
Extractor & Cam Pin
Recesses



1. Apply 1 drop of CLP to the area around the ejector.



2. Hook case under extractor lip and depress ejector with thumb pressure several times.

3. Wipe away any excess or dirty CLP. Repeat steps 1 and 2 until the CLP works past the ejector and spring action is strong. Wipe away any excess CLP.



FIGURE 3-1 Ejector Cleaning Procedures

g. CARRIER AND GAS KEY

- (1) Generously coat (inside and out) with CLP and scrub thoroughly with GP brush. Place two or three drops of CLP down the gas key. Use GP brush to clean the inside surfaces where the bolt rides.
- (2) A doubled-over pipe cleaner should be used to scrub the straight section of the gas key. A straight pipe cleaner wetted with CLP should be passed back and forth completely through the gas key into the inside area of the carrier.
- (3) Use small end of GP brush to scrub cam groove. Wipe all parts clean and dry with rags, patches, and pipe cleaners.
- (4) Clean small inside diameter of carrier with diagonal-half of a cleaning patch attached to bore rod tip. Pay particular attention to bolt recess in carrier and gas key. DO NOT USE Q-TIPS IN GAS KEY.

h. LOWER RECEIVER GROUP

- (1) Use GP brush wrapped with pieces of rag, pipe cleaners, or bore rod with cleaning patches to wipe interior of lower receiver (trigger area) clean.

CAUTION

Do not use wire brushes or any abrasive material to clean aluminum surfaces.

- (2) Use a pipe cleaner to clean drain hole at end of buffer tube.
- (3) Clean interior of the buffer tube with a large piece of rag slightly wet with CLP attached to the end of the bore rod. Wipe buffer tube dry with a clean rag in the same manner.
- (4) If absolutely necessary, have an armorer remove hammer and trigger when detailed cleaning is required.

i. OTHER AREAS

- (1) Other metal surfaces are cleaned with CLP and a rag or the general purpose brush, and then wiped dry with a clean rag.
 - (2) Plastic and rubber surfaces are cleaned with small amounts of water on a rag and then wiped dry. Do not let water enter the inside of the stock or lower receiver.
- j. When rifle parts are clean, lubricate for operational use as described in paragraph 3-2.
- k. If not yet assembled, follow reassembly procedures in paragraph 2-12 through 2-14.

3-6 SPECIAL OPERATOR MAINTENANCE PROCEDURES

NOTE

*Special disassembly procedures are those not normally required each time the rifle is cleaned. These parts should only be disassembled and cleaned when their proper functioning is in question or suspected of causing malfunctions. **They will usually require an Armorer's assistance or supervision.** They are not included in this Operator's Manual as an authorization, they are described here solely to prevent damage from improper disassembly.*

For SR-M110, the Operator may remove the Lower URX Rail to gain access for barrel cleaning (under handguard). Refer to Section 2-21 on Page 41 of this Manual for URX Lower Rail Instructions.

- a. Mk 11 Mod 0 HANDGUARD REMOVAL--requires a strap wrench...see armorer.
- (1) With muzzle pointed away from you, hold handguard with weak hand and with strong hand--turn handguard nut to the left (counter-clockwise) with strap wrench.
 - (2) Continue turning NUT with hand until handguard is free and lift handguard clear of barrel. Replace handguard as soon as possible to protect gas tube from being bent while handguard is removed.
 - (3) Assembly is the reverse of the above except ensure that the handguard index pins enter the barrel nut's 3, 6, and 9 o'clock position as you begin turning the handguard nut. Use Armorer's strap wrench to tighten firmly (**slightly more than hand tight**).

b. MAGAZINE CATCH REMOVAL

NOTE

An Armorer will be required to remove the Bolt Catch before removing Magazine Catch.

- (1) Perform disassembly of magazine catch with upper receiver removed. Observe the action on the magazine catch lug through the magazine well by pushing the magazine release button several times.
- (2) With a section of cleaning rod, push the release button as far in as possible.
- (3) The left side of the catch (magazine catch lug) now clears the left side of the receiver. Unscrew the lug to the left (counter-clockwise) 3 turns and relieve pressure on release button.
- (4) Depress the button again, but only with finger pressure. Continue to unscrew the lug.

WARNING

The magazine release button is spring loaded. Once the lug is fully unscrewed, the button could fly out of the receiver and hit you in the eye or be lost.

- (5) Slowly release pressure on release button as lug finally comes loose from the button. As pressure is relaxed on button, capture it and the spring in your hand or in a rag held over the receiver.
- (6) Assembly is the reverse of the above.

c. MAGAZINE CATCH ADJUSTMENT (Mk 11 Mod 0 only, newer M110/Mk 11 Mod 2 Ambidextrous Models are not adjustable)

(1) As the lug is screwed into the magazine catch button, more and more tension is applied to the catch assembly by the spring. Screw the lug into the button until the threaded end of the lug is just below flush with the surface of the button.

(2) Observe the range of motion the button now has on the lug by viewing through the magazine well and pushing on the button.

(3) If the lug is screwed in too far, the lug will not clear the inside lip of the receiver. This condition will fail to release the magazine properly.

(4) If the lug is screwed out too far, spring tension on the button will be weak and the lug may even drop out of its recess when the button is pressed. Both of these conditions will fail to secure the magazine in the magazine well.



New Model
Ambidextrous
Magazine
Release

d. Ambidextrous Bolt Latch (possible upgrade for future M110/Mk 11 type Rifles) is not User adjustable.



New Model
Ambidextrous Bolt Catch
(Possible Future Upgrade)



3-7 CLEANING THE DAY OPTIC SIGHT

- a. Use lens cleaning kit supplied with rifle or scope. **The M-110 has an Optics Cleaning Kit in its Deployment Kit.** Use only silicone-free lens cleaning paper/tissue to wipe lenses.
- b. Remove dust, lint, dirt, and large particles by first blowing across the lenses. **DO NOT BLOW ON LENSES IN COLD WEATHER.** Then use a soft bristle clean/oil free camel's hair brush to gently sweep any debris from the lens.
- c. To remove finger prints, oil smudges, and other grime from the lens, apply lens cleaning fluid or isopropyl (rubbing) alcohol to a folded piece of lens cleaning paper. Wipe lens clean with a circular motion starting at the center of the lens and working outward.
- d. Clean outside metal surface of sight with a clean cloth.

3-8 CLEANING SCOPE MOUNTING RINGS

- a. If so attached, install and close dust covers over lenses before cleaning scope.
- b. Keep Allen screw heads clear of debris and rust. Use long bristles of general purpose (GP) brush to keep clean and clear. If rust is, or may be a problem, put a drop of CLP on each screw head, brush in and wipe off excess.
- c. Clean other areas of mounting rings, mounting nuts, etc., with GP brush. Apply a light coat of CLP to exterior metal parts.
- d. Remove and clean dust covers with a damp cloth. Wipe control knobs clean with a soft dry cloth. **DO NOT OIL, USE SOLVENTS, OR CLP on control knobs or dust covers.**

3-9 STORAGE (Temporary storage in unit armory, arms room, etc.)

- a. Ensure rifle is unloaded, clear and the hammer is down. Rifle should be cleaned and lubricated as described in paragraph 3-5 and 3-2 respectively.
- b. If possible store rifle vertically with muzzle pointed down.
- c. **Never store ammunition or loaded magazines with the rifle !!!**

SECTION IV: PREPARATION FOR SHIPMENT

3-10 PACKAGING FOR SHIPMENT

WARNING

Never ship the rifle with a round in the chamber, or ammunition in magazines, or system case.

- a. Remove any ammunition from rifle, magazines, and cases. Ensure rifle, components, and accessories are clean. Use metal banding around System Case.
- b. System case should be packed in a fiberboard (heavy duty/double walled cardboard) shipping box of appropriate size. Fill any voids in shipping box with cushioning material (see Appendixes A and D).
- c. Enclose a Packing List (DD Form 1750 or equivalent) and a description of work required or nature of malfunction. Include your (operator's or technician's) name and phone number so maintenance personnel can contact you directly if necessary.
- d. Close fiberboard box and seal all seams and joints with approved tape (see Appendixes A and D). Ship only one rifle per shipping box.

3-11 MARKING FOR SHIPMENT

- a. Mark in accordance with MIL-STD-129.
- b. Ship via U.S. Registered Mail, Return Receipts Requested.

CHAPTER 4 AMMUNITION

4-1 AUTHORIZED AMMUNITION

WARNING

Use only 7.62mm M118LR, M118 Special Purpose Ball, M852 Match, or other authorized ammunition, e.g., M80 Ball, M993 Armor Piercing.

DO NOT FIRE corroded or dented cartridges, cartridges with loose bullets, cartridges with their bullets pushed in, cartridges longer than magazine or reloaded ammunition.

4-2 AMMUNITION WHICH FAILS TO FIRE

Dispose of any misfired rounds in accordance with authorized procedures.

4-3 CARE, HANDLING, AND PRESERVATION

- a. Protect ammunition from mud, sand, and moisture. If ammunition gets dirty or wet, wipe it dry with a clean/dry cloth. If corrosion will not wipe clean of ammunition, properly dispose of it.
- b. Do not let ammunition be heated by the direct rays of the sun. If the ammunition is warm or hot to the touch, excessive pressure may damage the rifle or hurt you. Let ammunition cool/store in the shade before use.
- c. Do not oil or grease cartridges. Oiled cartridges produce dangerously high levels of bolt thrust against the locking lugs and may damage them.

APPENDIX A REFERENCES

A-1 SCOPE

This Appendix lists forms, field manuals, technical manuals, tables, regulations, standards, and miscellaneous publications referenced in this manual.

A-2 TECHNICAL MANUALS

TM 3-220....Chemical, Biological and Radiological (CBR) Decontamination
TM 4700-15/1....Equipment Repair Procedures (USMC)
TM 740-90-1....Administrative Storage of Equipment
TM 750-244-7....Procedures for Destruction of Equipment to Prevent Enemy Use
TM 9-1300-200....Ammunition General
TM 9-1300-206....Care and Storage of Ammunition

A-3 COMMON TABLE OF ALLOWANCES (CTA)

CTA 8-100....Army Medical Department Expendable/Durable Items
CTA 50-970....Expendable/Durable Items

A-4 ARMY REGULATIONS AND PAMPHLETS

DA PAM 25-30....Consolidated Index of Army Publications and Blank Forms
DA PAM 738-750....The Army Maintenance Management System (TAMMS)

A-5 FIELD MANUALS

FM 3-87....Nuclear, Biological and Chemical (NBC) Recon and Decontamination Operations
FM 21-11....First Aid for Soldiers
FM 21-40....NBC (Nuclear, Biological and Chemical) Defense
FMFM 1-3B.....Sniping (U.S. Marine Corps Publication)

A-6 TRAINING CIRCULAR

TC 23-14.....Sniper Training and Employment

A-7 FORMS

DA Form 2028.....Recommended Changes to Publications and Blank Forms

DD Form 1750.....Packing List

SF 368.....Quality Deficiency Report

A-8 MISCELLANEOUS

MCO 8020.1....Handling, Transportation, Storage, Reclassification, and Disposal of Class V (W) Material (USMC)

NAVMC 10558A.....Weapon Record Book, Part II (USMC)

MIL-STD-129.....Military Standard-Masking for Shipment and Storage

PPP-B-636.....Federal Specifications - Boxes, Shipping, Fiberboard

PPP-C-843.....Federal Specification - Cushioning Material

PPP-C-1842.....Federal Specification - Cushioning Material

PPP-T-60.....Federal Specification - Tape, Packaging, Waterproof

A-A-1683.....Federal Specification - Tape, Packaging, Waterproof

TB 43-0196.....Inspection and Certification of Gages - Small Arms

APPENDIX B DESCRIPTION OF TOOL USAGE

B-1 TOOLS

- a. T-Handle Torque Wrench (when combined with 1/2" Socket).

(Optional Accessory used to torque day optic mounting nuts to 65 in. lbs.)

- b. Socket, Socket Wrench, 1/2".

(Optional Accessory used with T-Handle Wrench to torque day optic mounting nuts)

- c. Key, Socket Head Screw 1/16".

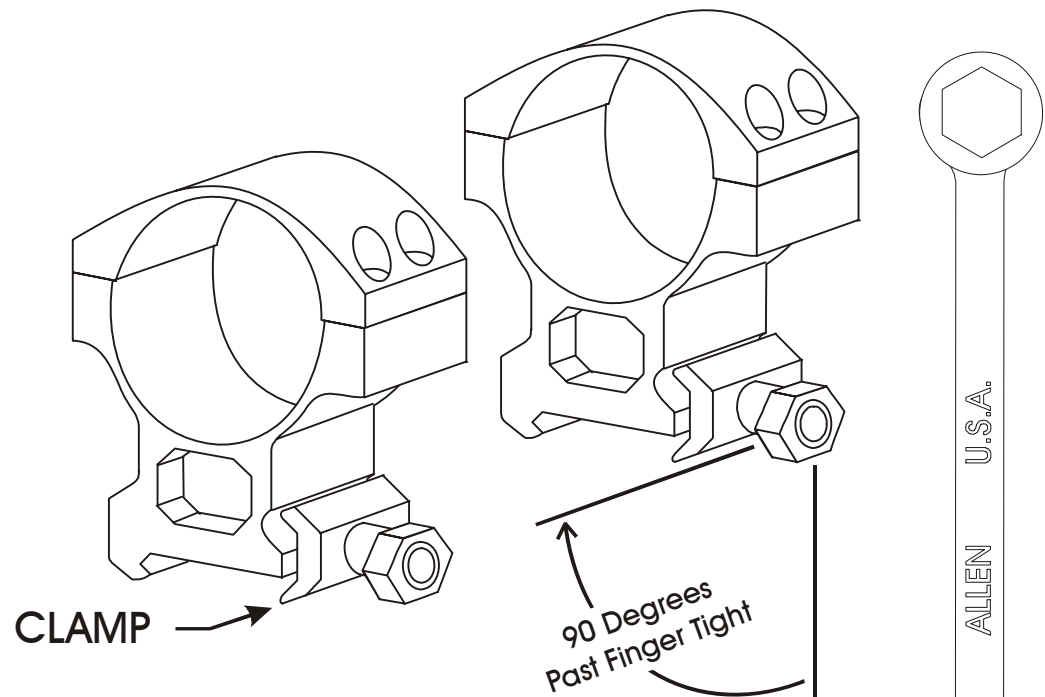
(Optional Accessory used for day optic sight elevation and windage dial set screws)

- d. Wrench, Combination, Box and Open, 1/2". See page 98.

(Optional Accessory, use box end to remove day optic sight and initial or field tightening of mounting nuts)

- e. Key, T-15 Torx Head or T-10, or; Key, Socket Head Screw 5/64", 1/8", 3/32", and 5.32". See Pages 99 and 100.

(Optional Accessories used for day optic sight ring cap screws, front sight post adjusting, etc., all wrenches included in Mk 11 Navy Cleaning Kit)



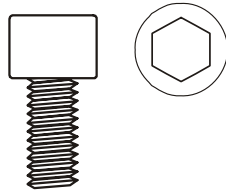
TO REMOUNT KMC SCOPE RINGS WHEN THE 65-INCH POUND T-HANDLE TORQUE WRENCH IS NOT AVAILABLE, USE THE 1/2-INCH COMBINATION WRENCH IN THE CLEANING KIT AS FOLLOWS:

1. MOUNT RINGS AND SCOPE ASSY. ON THE RAIL IN THE DESIRED POSITION, AND LOOSELY TIGHTEN THE HEX NUTS WITH YOUR FINGERS.
2. WITH THE NUTS SLIGHTLY LOOSE, POSITION CLAMPS AND PUSH THE SCOPE AS FAR FORWARD AS THE RECOIL GROOVES ALLOW.
3. WHILE HOLDING THE SCOPE FORWARD, FINGER TIGHTEN THE FRONT HEX NUT AS MUCH AS POSSIBLE. REPEAT FOR THE REAR HEX NUT.
4. WITH THE 1/2-INCH COMBO WRENCH IN THE CLEANING KIT, TIGHTEN THE FRONT HEX NUT AN ADDITIONAL 90 DEGREES. REPEAT FOR THE REAR HEX NUT.
5. THIS FIELD MOUNTING PROCEDURE WILL BE CLOSE TO THE DESIRED TORQUE VALUE, AND REPEAT A GOOD ZERO IF PERFORMED EXACTLY THE SAME EACH TIME.

Use for:
Scope Mount
Nuts

Figure B-1 Use of 1/2" Combination Wrench with Scope Ring Nuts (Same for SR-M110 1-Piece Mount)

3/32" Hex Screw



The SR-25 Cleaning Kit contains 3/32" Hex Head and T-15 Torx Head Screw wrenches.

On a weekly basis, check the tightness of the scope ring cap screws with the correct wrench.

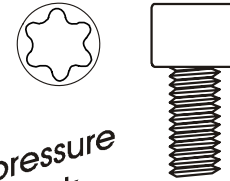
However, do not use the wrench's long arm to check the screw tightness.

Use the short arm to feel if the screw is loose. If you use the wrenches long arm, you will move the screw and change the torque setting from the factory.

**** CAUTION ****

Using the wrench's long arm may over-tighten and break the screws.

T-15 Torx Screw



**T-10 Torx
Size Screws
also used.**

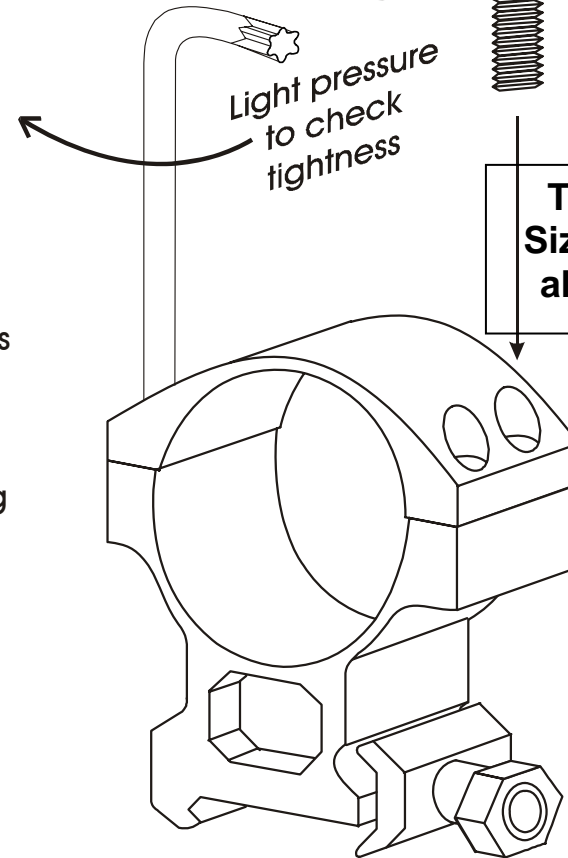
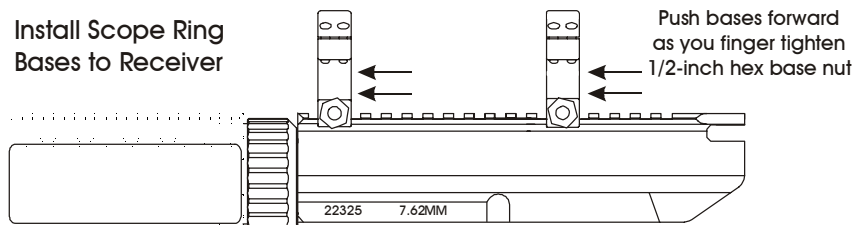


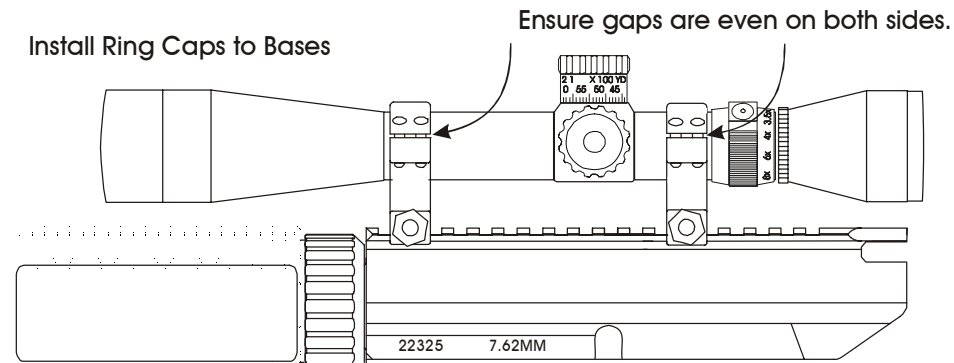
Figure B-2 Use of Hex or Torx Wrench with Mk 11 Mod 0 Scope Ring Caps

Install Scope Ring Bases to Receiver



1. Install Scope Ring Bases to Receiver Rail finger tight. The forward ring should be positioned in the second groove from the front, and the rear ring positioned in the thirteenth groove.

Install Ring Caps to Bases

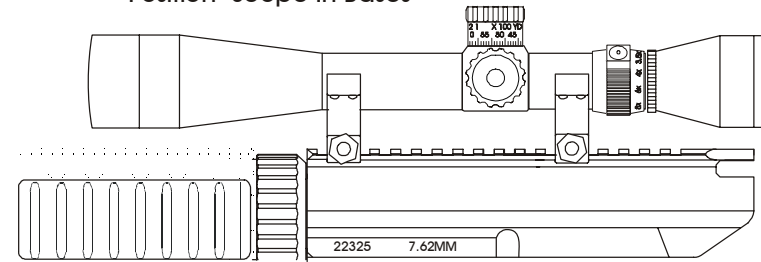


4. Install the ring caps to the bases with the screws provided with the rings. While only finger tightening the cap screws, ensure that the gap between each cap and its base is equal on both sides of the ring.

5. Torque the cap screws to 13-Inch/Pounds with a properly calibrated torque driver while following the numbered pattern shown to the right. Ensure the gaps are equal after tightening.

6. Torque 1/2-inch hex base nuts to 65-Inch/Pounds with a properly calibrated torque wrench.

Position Scope In Bases



2. Remove Ring Caps and clean away any oil or dirt from the scope and ring mating surfaces. Position scope in bases as shown.

3. The scope and ring positions shown above should allow for the appropriate eye relief. However, subsequent re-positioning may be required to accommodate different shooters or firing positions.

**3/32" Hex
or
T-15 Torx**

**T-10 Torx
Size also
used.**

Torque Cap Screws to
13-Inch/Lbs in the
numbered tightening
Sequence shown.

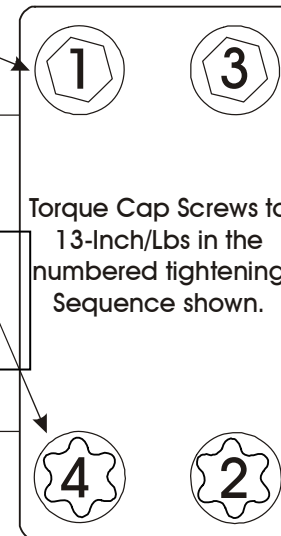


Figure B-3 Use of Tools for Mk 11 Mod 0 Scope Mounting (Use same basics for M-110 Scope Base)

APPENDIX C SYSTEM ITEMS THAT MAY APPLY TO YOUR RIFLE

C-1 GENERAL The operator is authorized to order the following optional Government Supply System accessories:

Note: P/N's listed are US Government, not KAC

NO.	FSCM/CAGE	PART NO.	NOMENCLATURE	NSN:
1	19240	7141245	Sling, Small Arms, Leather	1005-00-714-1245
2	19204	8448462	Brush, Cleaning, GP	1005-00-494-6602
3	19204	5564174	Brush, Bore (.30"/7.62mm)	1005-00-556-4174
4	19204	8436793	Oil Bottle	9150-00-889-3522
5	55719	AW2	1/16" Key, Socket Head Screw	5120-00-198-5398
6	92674	BA27077-4	3/32" Key, Socket Head Screw	5120-00-242-7410
7	64959	G243079-6	Wrench, Box and Open 1/2"	5120-00-228-9506
8	19204	5019316	Swabs, Cleaning Small Arms	1005-00-288-3565
9	3A703	96092	T-Handle Section	1005-01-271-3856
10	3A703	96093	Cleaning Rod Section, 4 ea.	1005-01-271-3861
11	19204	11686237	Swab Holder	1005-00-937-2250
12	3A703	96095	Adapter, Bore Brush to Rod Section (converts 8-36 to 8-32)	1005-01-271-3857
13		8448751	Case, Accessory, SA (Rod sections & T-Handle)	1005-00-403-5804
14	81348	GG-A-616	Applicator, (Q-Tips)	6515-00-303-8250
15	81348	NNN-P-40	Paper, Lens (Cleaning Tissue)	6640-00-663-0832
16	81348	L-B-56A	Bottle (for containing Isopropyl Alcohol)	8125-00-824-9058
17	81348	H-B-118	Brush, Artists (Cleaning Brush)	8020-00-224-8010
18	3A703	96401	Case, Lens Cleaning	1005-01-260-2661
19	58536	A-A-1404	Socket, Socket Wrench 1/2"	5120-00-227-6702
20	3A703	96059	T-Handle Torque Wrench	1005-01-260-2645
21	3A703	96083	Day Optic Sight Ring Screws	1005-01-260-2650

APPENDIX D

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

D-1 SCOPE

This appendix lists expendable and durable supplies and materials that the operator will need to operate and maintain the SR-25 Sniper Rifle System. This listing is for informational purposes so all personnel will be aware of the items available to support the user. It is not authorization to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

D-2 EXPLANATION

a. **LEVEL.** This column identifies the lowest level of maintenance that requires the listed items:

C - Operator/Crew

F - Intermediate Direct Support Maintenance

b. **U/M (Unit of Measure).** Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea., in., pr.). If the U/M differs from the unit of issue, requisition the lowest unit of issue that satisfies your requirements.

EXPENDABLE / DURABLE SUPPLIES AND MATERIALS LIST

ITEM NO.	LEVEL	NSN	DESCRIPTION	U/M
1	C	6810-00-983-8551	ALCOHOL, ISOPROPYL, (Cleaning Fluid) (81348) TT1735, 1 qt. can	QT
2	C	6515-00-303-8250	APPLICATOR (Q-TIPS) (81348) GG-A-616 100 per pk	EA

EXPENDABLE / DURABLE SUPPLIES AND MATERIALS LIST

ITEM NO.	LEVEL	NSN	DESCRIPTION	U/M
3	C	8125-00-824-9058	BOTTLE (FOR CONTAINING ISOPROPYL ALCOHOL), (81348) L-B-56A, 1 oz. bottle	EA
4	F	8115-01-015-2710	BOX, SHIPPING (81348) PPP-B-636, 12 in. x 12 in. x 48 in. 10 each	BL
5	C	8020-00-224-8010	BRUSH, ARTIST (Lens Cleaning), (81348) H-B-118	EA
6	C	1005-00-556-4174	BRUSH, BORE (.30"/7.62mm), (19204) 5564174	EA
7	C	TBD	BRUSH, CHAMBER (SR-25)	EA
8	C	1005-00-494-6602	BRUSH, CLEANING, SMALL ARMS (19204) 8448462 (Double End Tooth Brush)	EA
10	C	9150-01-102-1473	CLEANER, LUBRICANT, PRESERVATIVE (CLP) (81349) MIL-L-63460, 1/2 oz. bottle	OZ OZ
11	F	8135-01-087-3605	CUSHIONING MATERIAL (81348) PPP-C-1842, 325 in. x 12 in. x 1/4 in.	RO
12	F	8135-00-913-3514	CUSHIONING MATERIAL (81348) PPP-C-843, 100 ft. x 6 in. x 3/4 in.	RO

EXPENDABLE / DURABLE SUPPLIES AND MATERIALS LIST

ITEM NO.	LEVEL	NSN	DESCRIPTION	U/M
13	C	9150-00-292-9689	LUBRICATING OIL, ARCTIC WEAPONS (LAW) (81349), MIL-L-14107, 1 qt. can	QT
14	C	9150-00-935-6597 9150-00-889-3522	LUBRICATING OIL, WEAPONS (LSA), SEMI-FLUID (81349) MIL-L-46000 2 oz. plastic bottle 4 oz. plastic bottle	OZ OZ
15	C	6640-00-663-0832	PAPER, LENS (81348) NNN-P-40 (Cleaning Tissues), 50 sheet pk.	EA
16	C	7920-00-205-1171	RAG, WIPING, (58536) A-A-531, 50 lb. bl.	LB
17	C	1005-00-288-3565	SWAB, SMALL ARMS CLEANING (2.5" X 2.5") (19204) 5019316, 200 per bl. (.30"/7.62mm)	EA
18	F	7510-00-297-6655	TAPE, PRESSURE SENSITIVE, PAPERBACK, WATER-RESISTANT (58536) A-A-1683, 2 in. wide, 120 yd. roll	YD
19	F	7510-00-074-4952	TAPE, PRESSURE SENSITIVE, CLOTHBACK, WATER-RESISTANT (81348) PPP-T-60, 2 in. wide, 60 yd. roll	YD

APPENDIX E

CORROSION PREVENTION AND CONTROL (CPC)

The supplies and materials required for Corrosion Prevention Control (CPC) are listed within Appendix D, Expendable/Durable Supplies and Materials List.

Preventive Maintenance Checks and Services are in Chapter 2, Section IV (see Paragraph 2-20).

Rifle CPC is addressed in Chapter 2, Section VI: **Operation Under Adverse Conditions** (see Paragraphs 2-25 through 2-28), and the Lubrication Guide in Paragraph 3-2 as well as Paragraph 3-3: General.

Ammunition CPC is addressed in Chapter 4.

CPC of ordinance equipment and other material is a matter of continuing concern for all personnel. It is important that any corrosion problems with your Sniper Rifle System be reported so that the problem can be corrected and improvements can be made to prevent the problem in the future. Although corrosion or "rust" is commonly associated with the surface deterioration of metals, it can also include the deterioration of other materials such as rubber and plastic items. However, for the purposes of CPC, corrosion also includes unusual cracking, softening, swelling, or breaking of items made from these materials.

If corrosion or premature failure of components is identified, it should be reported using Standard Form 368, Quality Deficiency Report. Use "key words" such as "corrosion", "rust", "deterioration", or "cracking" to ensure your problem information is identified as a CPC problem.

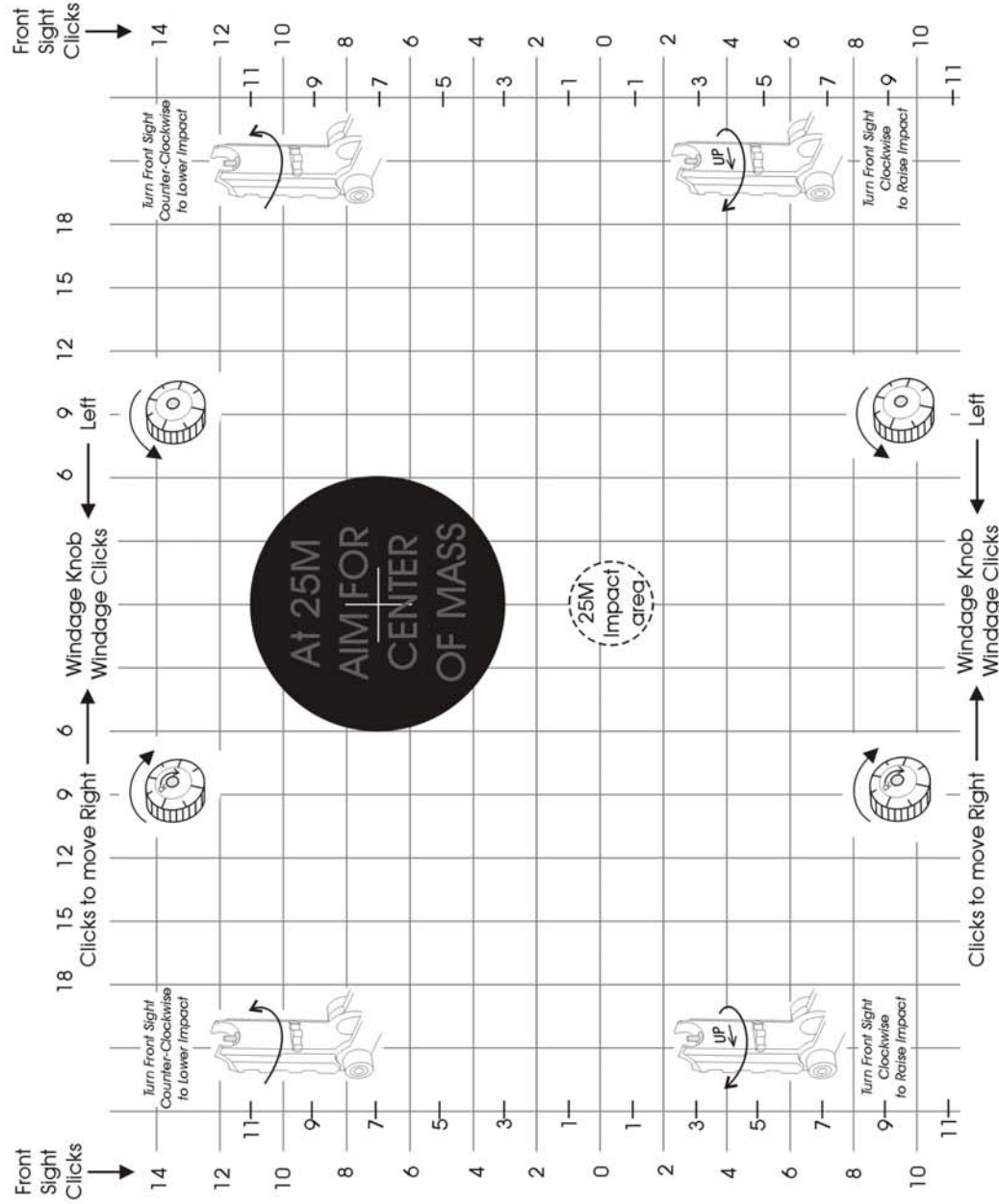
The form should be submitted to:

KNIGHT'S MANUFACTURING COMPANY
701 Columbia Blvd.
Titusville, Florida 32780
e-mail: militaryops@knightarmco.com

Note: U.S. Navy personnel will use the following point of contact: Naval Surface Warfare Center (Code 4081), 300 Highway 361, Crane IN 47522-5001 (attn: Mr. Terry O'Brian, Commercial Telephone (812) 854-5831 or Fax (812) 854-1044.

M110 (SASS) & MK 11 Mod 2 Front Sight 25 Meter Off-Set Zeroing Target (P/N: 10825-1)

Aim for Center of Bull's Eye. Adjust front sight elevation to off-set bullets to impact $1\frac{3}{8}$ " low at 25 Meters for a true "point of aim = point of impact" 200 Meter zero.



1. After securely mounting the sights as directed in the Operator's Manual, turn the rear sight's range adjuster so its 200 Meter marking is aligned with the range index mark on the left side of the sight (Like this $2\frac{1}{2}$).
2. Fire a 3-round group at the target bull's eye. The shot group should be centered $1\frac{3}{8}$ " below the aim point.

If the group is too low, rotate the front sight post adjusting wheel clockwise (while looking straight down on the post) the number of clicks indicated on the vertical scales above.

Or, if the group is too high, rotate the front sight post adjusting wheel counter-clockwise the number of clicks indicated on the vertical scales above.

Make zero windage adjustments with the rear sight windage knob as the horizontal scales above indicate.

3. One "click" on the front sight post moves the bullet strike $3/16$ " (or one-half of a vertical square above) at 25 meters.
4. Repeat firing a 3-round group. If the group is not centered in the $25M$ Impact area, repeat the preceding steps.
5. Once 25 meter zero is attained, the calibration of the front sight elevation zero should be checked at actual range. For example:
If checking zero at 100 meters, the rear sight's 200 meter setting (2) should group $2\frac{1}{2}$ " high.
Whereas:
If checking zero at 100 meters, the rear sight's 300 meter setting (3) should group $5\frac{1}{2}$ " high.

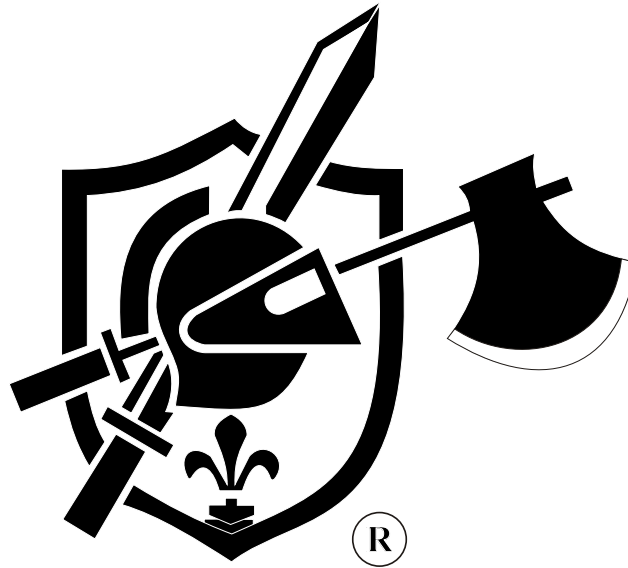
Note: one front sight "click" at 100 meters moves the strike .75".

Warranty Statement

Contact the Service Command Point of Contact for warranty service instructions. The weapon is fully guaranteed as outlined below.

“KAC has a high standard of quality for its product and stands behind them. KAC products will be serviced for a period of one-year from the date of purchase or delivery, at no charge to original purchaser, for defects in materials and workmanship. Damage deemed to be the result of abused and/or lack of owner/operator’s maintenance is not covered by this warranty. Be sure to retain your sales slip or other proof of purchase, delivery or original issue date, when making a claim.”

Knight's Armament Company



*When your life is on the line...
only the finest will do.*

**701 Columbia Blvd.
Titusville, Florida 32780**

Phone: (321) 607-9900 Fax: (321) 268-1498

e-mail address: militaryops@knightarmco.com