



## Hi-Lux Optics



## M40USMC39X40 / M40TACH39X40 RIFLESCOPE INSTRUCTIONS

### Contact Information:

Website: <http://www.hi-luxoptics.com>  
Technical Support: E-mail [info@hi-luxoptics.com](mailto:info@hi-luxoptics.com)

### Hi-Lux, Inc.

3135 Kashiwa Street  
Torrance, CA 90505, U.S.A.  
Tel: (310) 257-8142, Fax :( 310) 257-8096

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In 1965, the U.S. Marine Corps began its search for a new rifle and scope combo to serve as their official combat sniper rifle. The goal was to have USMC armorers customize and accurize a readily available production rifle. The Corps settled on the Remington Model 40x, a premium grade of the Model 700, chambered in .308 Winchester (a.k.a. 7.62 NATO) cartridge, and topped it with a commercially available 3-9x40mm variable power hunting scope that featured a simple and easy to learn ranging system. This rifle was designated the M40.

Hi-Lux Optics is now recreating this 1960's era USMC scope for all of those "old school" sharpshooters among us, those who take the time to know the trajectory of the loads they reload and shoot. However, we've made some major internal improvements. The optics are far superior to that of the original, with precision ground lenses that are fully multi-coated for maximum light transmission. We've also added positive 1/4" click adjustments to the windage and elevation turrets.

The Auto-Ranging™ system incorporated in this scope features two parallel horizontal crosshairs near the top of the reticle. There is a ranging scale calibrated in yards in the bottom right quadrant. The yardage ranging scale is a separate etched glass reticle in the first focal plane. The shooter simply zooms in on a known target of 18 inches, until it fits perfectly between the two upper crosshairs, and then reads the range at the bottom. The reticle accurately ranges from 200 to 600 yards.

The M40 Tactical Hunter model features the same ranging system. However, the reticle of the Tactical Hunter version of this scope features BDC hold-overs - for 200, 300, 400 and 500 yards. Then, where the crosshair and bottom post meet can be used for 600-yard shooting. These aiming points have been calibrated for the .308 Winchester, but work well with more than a dozen other popular calibers. By shooting to determine where these aiming points are "on", the drop compensating reticle and hold-over points

can be used with just about any rifle chambered for any sporting center-fire rifle cartridge.

Hi-Lux's M40 scopes are built with all of the ruggedness and reliability that has made this line well known for its quality and value. Other features include a tough, wear resistant **Perma-Coat** finish and **DiamondTuff** fully multi-coated lenses polished to photographic quality.

Here is a riflescope that's built to take on anything that Mother Nature can dish out. With every Leatherwood®/Hi-Lux™ riflescope, you get Quality, Precision and Ruggedness at a price that doesn't break your budget. The M40 scopes are built to meet the wants and needs of all shooters.

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# SECTION 1: SPECIFICATIONS AND BASIC DEFINITIONS

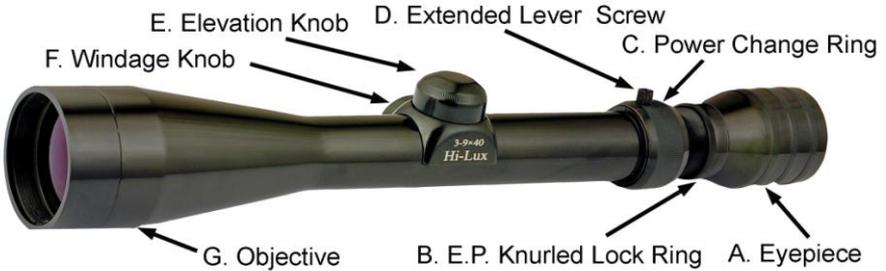
## (1) SPECIFICATIONS:

Model	Power	Obj. (mm)	F.O.V.@ 100 Yds (Ft)	Eye Relief (In)	Length (In)	Weight (O.Z.)	Exit Pupil Range In Variable (mm)	Tube (In)
M40USMC39X40	3X-9X	40	37.7-12.6	3.25	10.5	16.2	13.3 - 4.4	1
M40TACH39X40	3X-9X	40	37.7-12.6	3.25	10.5	16.2	13.3 - 4.4	1

All air-glass surfaces are fully multi-coated to maximize the light transmission. The **Elevation** and **Windage** click adjustment is 1/4 MOA at 100 yards  $\approx$  1/4 inch at 100 yards  $\approx$  7mm at 100 meters. A special ranging reticle is used in these two models. The details of the reticles are illustrated in the Section 8.

The M40 3-9X40 rifle scopes have a total of 90 MOA of internal adjustment.

## (2) BASIC DEFINITIONS:



**A.** Eyepiece; **B.** EP Knurled Lock Ring; **C.** Magnification Ring; **D.** Extended Lever Screw; **E.** Elevation Knob; **F.** Windage Knob; **G.** Objective.

## SECTION 2: EYEPIECE FOCUSING

Hold the scope about three inches from your eye and look through the eyepiece at a featureless flatly lit bright area such as a wall or open sky. If the reticle is not sharply defined instantly, you just need to turn the Eye Piece (1) in or out for adjustment until the

reticle appears in sharp focus. After you get a sharp reticle image, you can tighten the knurled E.P. Lock Ring by turning the knurled E.P. lock ring (2) counterclockwise to lock up the E.P. If you want to loosen E.P., you can either turn the E.P. (1) counterclockwise or turn the the E.P. knurled lock ring (2) clockwise.

### **SECTION 3: ELEVATION AND WINDAGE TURRETS**

Both the **Elevation** and **Windage** have click adjustments. The click value is  $\frac{1}{4}$  MOA. You can use a coin to turn the elevation or windage turret in the direction you want to move the point of impact on the target. For elevation adjustment, turning the turret counterclockwise moves the point of impact **UP** and turning the turret clockwise moves the point of impact **DOWN**. For the windage adjustment, turning the turret counterclockwise moves the point of impact to the **RIGHT** and turning the turret clockwise moves the point of impact to the **LEFT**. After you have the elevation or windage adjusted, you can reset the elevation or windage mark ring to the zero by moving the center of the open gap to the turret zero tickmark.

### **SECTION 4: MOUNTING**

To achieve the best accuracy from your rifle, the scope must be mounted properly. You should use a high-quality mount with bases designed to fit your particular rifle. To mount the scope:

- A. The scope should be mounted as low as possible without touching either the barrel or the receiver.
- B. Before tightening the mount rings, look through the scope using your normal shooting position. Adjust the scope (either forward or backward) until you find the farthest point forward (to ensure maximum eye relief) that allows you to see a full field of view.
- C. Rotate the scope in the rings until the reticle is plumb and the elevation turret is on top.
- D. Tighten the ring screws to 18-20 in lbs.

**WARNING:** AVOID OVER-TIGHTENING THE RINGS. THIS CAN DAMAGE THE SCOPE, AFFECTING PERFORMANCE OR RENDERING IT INOPERABLE. THERE SHOULD BE A SLIGHT EVEN GAP BETWEEN THE SHOULDERS OF THE RING HALVES. BE SURE THAT THE SCOPE IS MOUNTED FAR ENOUGH FORWARD. ITS REARWARD MOTION MAY INJURE THE SHOOTER WHEN THE RIFLE RECOILS.

## **SECTION 5: HOW TO RESET THE SCOPE TO OPTICAL OR MECHANICAL CENTER**

The **Elevation** and **Windage** adjustments on all new Hi-Lux scopes are preset to the optical center or mechanical center at the factory. For all the new scopes you do not need to reset the optical or physical center for the scope. However, if you are mounting a scope that was previously used on another rifle, you should recenter the scope first before you zero the scope again. Centering the **Elevation** and **Windage** adjustments to mechanical center will not only help you obtain optimum travel of the adjustments, but also saves you time when re-zeroing the scope.

If the erector unit inside the scope is off to one side, the **Elevation** and **Windage** adjustments cannot travel equally in all directions. In order for the **Elevation** and **Windage** adjustments to move the erector unit fully horizontally and vertically in a consistent and correct manner requires keeping the erector unit as centered as possible. This may require using a set of rings or a base mount that also offers some adjustment. The following details are how to regain full adjustment travel by re-centering your scope adjustments:

- (1) Turn the **Windage** adjustment all the way to the **Right** as the arrow indicates on the turret to the point that it stops moving.
- (2) Turn the **Elevation** adjustment all the way **UP** to the **TOP** as the arrow indicates on the turret to the point that it stops moving too.
- (3) Then turn the **Windage** adjustment all the way back in the other direction **Left** until it stops - counting the clicks or

hash marks while you are turning the adjustment back. Remember the total clicks or the hash marks.

- (4) Move the **Windage** adjustment back to **Right** half the amount of the clicks or hash marks. The **Windage** is then centered.
- (5) Repeat the above two procedures, (3) and (4), to reset the optical and physical center for **Elevation** adjustment as well.
- (6) The **Windage** and **Elevation** adjustment of the scope is now optically and physically centered. This will make zeroing the scope easier. By using rings or a base that offer external gross **Windage** adjustment to keep the scope internal **Windage** adjustment in the optical and physical center, the scope is capable of maximum **Elevation** adjustment.

## SECTION 6: PRE-ZEROING

Pre-zero sighting can be done either manually, or with a bore-sighting device. To bore sight manually:

- A. It is necessary to be able to see through the bore from the breech end. In the case of a bolt action, this usually means removing the bolt.
- B. Set the variable-power scope to low power.
- C. To eliminate as much human error as possible, we recommend using a gun vise or other mechanism to stabilize the firearm while boresighting.
- D. Look through the bore and center the target in the bore. Adjust the **Windage** and **Elevation** turrets to position the reticle on the center of the target.
- E. For the **Windage** adjustment, turn the **Windage** adjustment turret **Clockwise** to move the point of impact

**Left** and **Counterclockwise** to move the point of impact **Right** as the arrow on the turret indicates.

- F. In the same manner, adjust the **Elevation** by turning the **Elevation** adjustment turret **Clockwise** to **Lower** the point of impact and **Counterclockwise** to **Raise** the point of the impact. *\*\*If a large amount of adjustment is required to align the reticle, make approximately one-half of the **Windage** correction, then approximately one-half of the required **Elevation** correction.*
  
- G. Finish by applying the balance of **Windage** and **Elevation** correction.

If you can't see through the bore then it will be necessary to use some type of bore-sighting device. When using a bore-sighting device, follow the instructions provided with the device.

**NOTE:** If your mounting system allows for adjustment of the scope, the gross adjustments should be made in the mount and then the final adjustments will be made with the scope's internal adjustment system.

## **SECTION 7: ZEROING**

**DANGER: IF A BORE SIGHTING COLLIMATOR OR ANY OTHER BORE OBSTRUCTING DEVICE WAS USED; IT MUST BE REMOVED BEFORE PROCEEDING. AN OBSTRUCTION CAN CAUSE SERIOUS DAMAGE TO THE GUN AND POSSIBLE PERSONAL INJURY TO YOU AND OTHERS NEARBY.**

The zero range will depend on your shooting needs and range conditions.

- A. In general, if most of your shots will be at short range, we recommend that you zero at 100 yards. If you want to use the **M40TACH39X40** reticle BDC holdovers, you need to zero the Tactical Hunter scope at 100 yards.
  
- B. Set the power to 9X and remove both **Elevation** and **Windage** caps.

- C. From a rested position, fire three rounds at the target.
- D. Observe the center of the points of impact on the target and adjust the **Windage** and **Elevation** screws as needed to bring the point of aim to the desired relationship to the points of impact. The point of impact moves in the direction indicated on the adjustment turrets and by the amount indicated.
- E. Repeat as necessary.
- F. Once you have finished zeroing, you can re-index the mark ring by lining up the open gap on the mark ring with the tickmark corresponding to the zero on the turret. Put the turret covers on to prevent accidental adjustment.

Each click of the adjustment turret moves the bullet impact at 100 yards by 1/4 MOA. The adjustments are calibrated in Minutes of Angle (MOA). One minute of angle is very close to 1 inch at 100 yards.

To calculate the click value at distances other than 100 yards, use the following formula: divide the distance (yardage) by 100. Then multiply this number by the click value stated on the windage and elevation adjustments. This will tell you the actual click value of the scope at that distance.

For Example: Your range is 200 yards. Divide 200 by 100 and that equals 2. Multiply 1/4 - the "click value" indicated on the adjustment turrets by 2 and the adjustment at 200 yards is 1/2 inch per click.

For 400 yards, you would multiply 1/4 - the "click value" by 4 and that would give 1 inch per click at 400 yards and so forth. Once the zeroing of the scope is completed, you can reset the zero marking per the instruction.

**WARNING: ALL SHOOTING SHOULD BE DONE AT AN APPROVED RANGE, OR SAFE AREA. EYE AND EAR PROTECTION IS RECOMMENDED.**

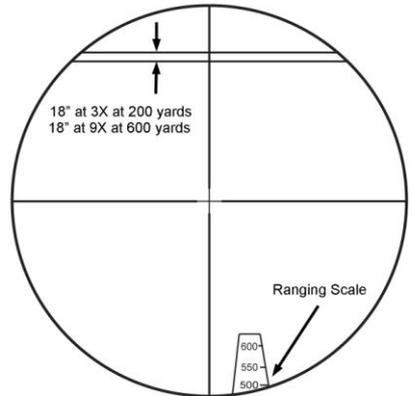
## SECTION 8: M40 SPECIAL RANGING RETICLES

### 1. M40USMC39x40 Reticle:

The Auto-Ranging™ system incorporated in either the M40 3-9X40 USMC model or the Tactical Hunter model M40 TACH 3-9X40 features two parallel horizontal crosshairs near the top of the reticle. At the bottom of the reticle there is a yardage ranging scale. The yardage ranging scale is a separate etched glass reticle in the first focal plane. The shooter simply zooms in on a known target of 18 inches, until it fits perfectly between the two crosshairs, and then reads the range at the bottom. The reticle accurately ranges from 200 to 600 yards.

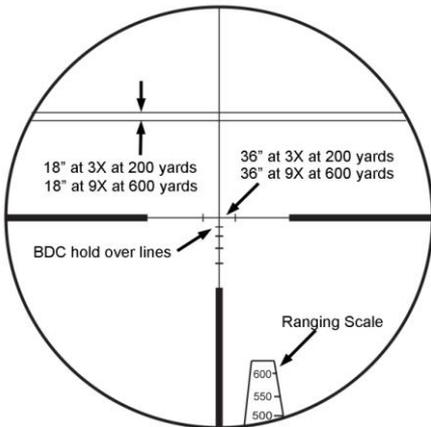
#### (1) USMC Reticle:

Frame a known sized 18" target between the two parallel horizontal lines. To determine the range to the target, simply read the range distance on the ranging scale. The approximate range is indicated by where the ranging scale meets the edge of the sight picture. The ranging capacity is from 200 yards to 600 yards.



#### (2) Tactical Hunter Reticle

The Tactical Hunter model has the same Auto-Ranging system as the USMC model. Additionally, the Tactical Hunter model has BDC holdover lines, which are calibrated for .308 Winchester. There are also two vertical tickmarks on the horizontal axis. You can frame a 36" target from the center to the bar or frame a 72" target between the two



horizontal short bars. The Tactical Hunter Reticle requires a 100 yard zero. The 2<sup>nd</sup> BDC is for 300 yards. The 3<sup>rd</sup> BDC line is for 400 yards. The 4<sup>th</sup> BDC line is for 500 yards and the top of the heavy post is for 600 yards. Simply frame an 18", 36" or 72" target to get the range - and use the appropriate BDC holdover line to compensate for the drop. The following chart gives the BDC holdover values, allowing individual shooters to determine a more precise point of aim based on the ballistics of their rifle, cartridge or load.

### **M40 Tactical Hunter BDC Holdover Values**

<b>Range ( Yards)</b>	<b>Holdover Value</b>		<b>BDC Holdovers to Use</b>
	<b>MOA</b>	<b>MIL</b>	
100	0	0	Zero the scope at 100 yards.
200	3.0	0.85	The 1 <sup>st</sup> BDC holdover line is the impact point at 200 yards.
300	6.0	1.8	The 2nd BDC holdover line is the impact point for 300 yards.
400	10.0	2.8	The 3 <sup>rd</sup> BDC holdover line is the impact point for 400 yards.
500	15.0	4.2	The 4th BDC holdover line is the impact point for 500 yards.
600	23.0	6.4	The top of the heavy post is the impact point for 600 yards

## **SECTION 9: MAINTAINING YOUR RIFLESCOPE**

Your scope, though amazingly tough, is a precision instrument that deserves reasonable and cautious care. For normal maintenance:

- A. Do not attempt to disassemble or clean the scope internally.
- B. The external optical surfaces should occasionally be wiped clear with the lens cloth provided or an optical quality lens paper.
- C. Keep the protective lens covers in place when the scope is not in use.
- D. Remove any external dirt or sand with a soft brush so as to avoid scratching the finish.

- E. Wipe the scope with a damp cloth, followed by a dry cloth.
- F. Then go over the metal portions of the scope with a silicon treaded cloth in order to protect the scope against corrosion.
- G. Store the scope in a moisture-free environment.
- H. Avoid storing the scope in a hot place, such as the passenger compartments of a vehicle on hot days. The high temperatures could adversely affect the lubricants and sealants. A vehicle's trunk, a gun cabinet or a closet is the preferred storage locations.
- I. Never leave the scope where direct sunlight can enter either the objective or the eyepiece lens. Damage may result from the concentration of the sun's rays (burning glass effect).

**WARNING: UNNECESSARY RUBBING OR USE OF A COARSE CLOTH MAY CAUSE PERMANENT DAMAGE TO LENS COATINGS.**

## **SECTION 10: DIAMONDTUFF LIFETIME WARRANTY**

**Hi-Lux, Inc.** warranties its products against defects arising from faulty workmanship, or materials, for the lifetime of the **original purchaser**. Any attempt to alter, dismantle or change the standard specifications of the products, will make this warranty null and void. This warranty is made to the original purchaser of the goods including all international sales, and applies only to the products purchased through our authorized distributors or dealers. The international warranty is subject to approval from our authorized distributor or us directly. The warranty is transferable.

Warranty obligation is limited to the repair or replacement of any product returned to **Hi-Lux, Inc.**, which is determined by the manufacturer to have defects arising from faulty workmanship, or materials that adversely affect the satisfactory operation of the product. It should be noted that on items containing an etched

glass reticle that the occasional appearance of some small particles is common and not a warrantable repair.

We have a two-year warranty for the electronic components that are contained on the products. **Hi-Lux, Inc.** reserves the right to request proof of purchase and purchase date.

We assume no liability for any incidental or consequential damages, or incidental expenses. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusion may not apply to you. No warranties are made, or are authorized to be made, other than those expressly contained herein.

To file a claim under this warranty, please contact the Customer Service Department of **Hi-Lux, Inc.** at (310) 257-8142 to obtain a Return Authorization number (RA number). After receiving your RA number, please mark the number on the outside of the package; enclose the defective item with a brief explanation of the problem. Please be sure to include your name, address and phone number.

Failure to obtain a RA number may result in either refusal upon delivery, or lengthy delays for warranty repairs and service required for the item returned to us. All returns are to be shipped prepaid direct to **Hi-Lux, Inc.** including a check or money order in the amount of \$21 to cover postage and handling regardless of purchase date. Additional fees will be applied to all returns from outside of the United States.

**Warranty & Service Dept.**

Hi-Lux, Inc.  
3135 Kashiwa Street  
Torrance, CA 90505

Tel: (310) 257-8142, Fax: (310) 257-8096

E-Mail: [info@hi-luxoptics.com](mailto:info@hi-luxoptics.com)

[www.hi-luxoptics.com](http://www.hi-luxoptics.com)

In the event of a non-warranty repair, you will receive an estimate prior to any work being done. This warranty gives you specific legal rights and you may have other rights, which vary from state to state. As defined by federal law, this is a limited warranty.