



## M1 GARAND CASM®

### **Removing the M1 REAR APERTURE SIGHT**

**Tools Required** A thick [ but not too wide ] flat blade screw driver.

1. Turn the elevation knob on the left side of the rear sight clockwise to raise the aperture all the way up.
2. On the right side of the rear sight, loosen the split screw in the center of the windage knob by turning counter clockwise. The small windage knob split screw will loosen, but it will stay connected to the body of the windage knob.
3. Unscrew the windage knob from the internal threads holding it to the elevation knob through screw.
4. Remove the elevation knob through-screw.
5. Push up and forward FIRMLY on the aperture to free the aperture spring cover from the slot in the rear of the rear sight pocket, and remove the remaining rear sight components
6. Clean the rear sight pocket of any dirt or hardened grease. Automotive brake cleaner and a tooth brush work well for cleaning the rear sight pocket.

### **M1 CASM® Installation**

**Tools Required** 5/32” Allen Wrench and a 3/32” Allen Wrench

**Note 1:** The mount is shipped with the half-dog flat tipped vertical tensioning screws installed but not protruding from the mount. Before installing the mount, ensure that these vertical tensioning screws are not turned out and not protruding from the mount. The smaller set screws are also installed, but not tightened. Ensure these smaller set screws do not intrude into the threads of the tapped side mount screw holes in the mount.

**Note 2:** While some vertical adjustment is designed into the mount, these vertical tensioning screws are not to be used against each other for major elevation adjustments at the mount. If you want to raise the front of the mount to significantly adjust vertical zero, then ensure that you loosen the rear elevation screw first, creating sufficient clearance for rotation without over stressing the mount.

**Note 3:** Do not turn the front vertical adjustment screw in any tighter than 1/8th of one turn after initial contact. These massive 5/16” screws have tremendous power and can flex the mount until it actually bends and takes a set, or even fractures. A small amount of pre-stress is designed in to the system to keep the front of the mount surface in contact with the top of the receiver during the vibration of recoil. By keeping the mount “unitized” to the receiver under spring tension, the mount and receiver act as one mass.

**Note 4:** Blue Loctite® is provided for extreme/heavy duty use, for very large/heavy scopes, for the ultimate in security, and for semi permanent installations,. Screws installed with blue Loctite® are still removable with normal hand tools: no heat is required.

## Installation:

After carefully cleaning any grease or dirt from the M1 receiver rear sight pocket, try the scope mount for fit inside the ears. The mount is CNC machined to close tolerances to fit genuine US GI M1 receivers, however, some M1 receivers may have variations. The mount should fit easily between the rear sight ears, with a few thousandth of an inch as clearance. In the unlikely event that the mount is too wide to fit easily between your receiver rear sight ears, carefully remove a small amount of material from the right side of the mount only.

**1.]** Apply blue Loctite® to the **left** side mounting screw and install through the **left** rear sight ear and into the scope mount. With the front of the scope mount held tight against the top of the receiver ring, torque the left side mounting screw as tight as you can get it comfortably with a hand held allen wrench . The fit of the left side of the scope mount to the inside of the rear sight pocket is critical to proper horizontal alignment of the mount with the bore. The side mounting screws are tapered, and sized to be self centering and self aligning within the rear sight ear holes. To prevent loosening under recoil and to lock this screw for maximum security, and a semi-permanent installation, we provide a locking set screw (add a small amount of blue Loctite® to it and tighten).

**2.]** Apply blue Loctite® to the **right** side mounting screw and install through the **right** rear sight ear and into the scope mount. With the front of the scope mount held tight against the top of the receiver ring, torque this as tight as you can get it comfortably with a hand held allen wrench . The right sight ear will compress inwards slightly to fit snugly against the right side of the mount. To prevent loosening under recoil and to lock this screw for maximum security, and a semi-permanent installation, we provide a locking set screw (add a small amount of blue Loctite® to it and fasten).

**3.]** Apply blue Loctite® and tighten the **rear** vertical adjustment screw as tight as you can get it comfortably with a hand held allen wrench. The **rear** elevation screw will raise the rear of the mount slightly and pre-load the front of the mount downwards against the receiver ring.

**4.]** Apply blue Loctite® and tighten the front vertical adjustment screw until it just contacts the top of the receiver. **Add no more than 1/16 - 1/8turn extra rotation to pre-load the spring tension of the mount.**

1/16 of one turn is represented here graphically.



**5.]** Apply blue Loctite® to the two vertical adjustment screws and the two side mounting screws by tightening the corresponding set screws.



## M1 GARAND CASM® Product Data Sheet

### Specifications:

<b><u>Product Name:</u></b>	M1 GARAND CASM®
<b><u>Type:</u></b>	Mil-spec, Picatinny Rail M14/M1A Scope Mount
<b><u>Material:</u></b>	7075 Alloy, Type II Hard Anodized
<b><u>Color:</u></b>	Bronze
<b><u>OAL:</u></b>	6.5"
<b><u>Compatibility:</u></b>	Fits all M1 Garand family of rifles
<b><u>Company:</u></b>	The Upgrade Path Inc. for M14.ca
<b><u>Contact:</u></b>	Sales
<b><u>Web Info.:</u></b>	<a href="http://www.m14.ca">http://www.m14.ca</a>
<b><u>Email:</u></b>	<a href="mailto:info@m14.ca">info@m14.ca</a>

### Shipping Components:

- 1 x 7075 alloy with Type II anodising M1 scope mount
- 2 x 3/4" tapered, self centering allen head sight ear mounting screws
- 2 x 3/8" sight ear set screws (rear of mount)
- 2 x 3/4" half-dog flat tipped vertical tensioning screws
- 2 x 3/8" half-dog flat tipped vertical tensioning screws
- 2 x 3/16" receiver standoff set screws (sides of mount)
- 1 x "M1 Garand CASM Scope Mount Instruction" sheet
- 1 x "Engineering and Design Considerations of the M1 Garand CASM Scope Mount," a treatise
- 1 x Blue Loctite® 243 package
- 1 x complete replacement set of scope mount replacement machine screws and set screws

### Description:

The M1 Garand CASM® mount replaces the original M1 rear sight, and uses the much larger, sturdier and more reliably consistent mounting area inside the rear sight pocket, and the solid rear sight ears, rather than using the more common, much smaller stripper clip guide. There is no left side mounting leg required on the scope mount.

The scope mount rail extends from the front of the receiver all the way back behind the rear sight location, resulting in a longer than usual (approx. 6.5") length of Mil-spec Picatinny rail for mounting longer, heavier scopes with greater eye relief adjustability. The bolt is easily removed for cleaning without removing the mount. The mount is designed with a slight angle down at the front, for optimum scope adjustment at long ranges. The mount attaches securely using a four point mounting system, with larger than usual 1/4" and 5/16" metal allen head screws for the attachment and adjustments, and more allen head set screws to hold these adjustments secure and solid.

At the sight ears, the main mounting system features *self-centering, tapered* 1/4" screws with Loctite® provided. These tapered screws locate the mount consistently in the center of the rear sight ear holes, and do not mark or damage the windage and elevation serrations on the receiver.

For maximum strength to weight ratio, this mount is CNC milled from a solid piece of 7075 alloy, and finished with Type II hard anodizing. This is a solid and secure mount for your M1 rifle that will give solid, durable, long term reliability when mounting optics to your rifle.



## Engineering and Design Considerations of the Original M14/M1A CASM® Scope Mount

This mount is one of those design concepts that translates eventually, after months of research and development, into a finished product that is “simply elegant”. Most *good* designs are like that ... simply elegant and elegantly simple.

However, as many engineers have discovered, “simply elegant” and “elegantly simple” are not always simple to achieve. Some very complicated engineering considerations, compromises and choices were made to end up with this “*simple*” M14/M1A scope mount.

This new “*Four-Point*” design may appear similar to many of the previous generation of other so-called “*three point*” M14/M1A mounts available, but this new generation mount has some important differences:

- 1.] The M14/M1A rear sight pocket is used as *a large, solid and consistently dimensioned mounting surface area* for the back end of the mount. Previous generations of M14/M1A scope mounts most commonly use the M14/M1A receiver side screw hole and the *much smaller* stripper clip guide dove tail slot, *both of which are often out of specification*. By using the rear sight pocket, a larger, more reliable and more secure rear mounting interface between the scope mount and the receiver is achieved.
- 2.] Given the much larger mounting surfaces inside the receiver rear sight pocket, the large screws used to connect the mount, and the close fit between the sight pocket and the CNC controlled scope mount mounting surfaces, the usual left side mounting leg can be left out entirely. This way, the mount construction can be simplified, and all those problems that can occur with the left side scope mount hole as a mounting point have all been eliminated. For example; no more loose side mount screws, no more rotation under recoil around that side screw (which leads to loss of vertical zero) and no more shimming to set the proper tension and windage for horizontal zero on out of specification receivers. Also, no more having to use Epoxy® or welding, and no more worrying about over-torqued side screws shearing off.
- 3.] This new M14/M1A CASM scope mount design *connects securely with the M14/M1A receiver at four different contact points*. Also an important consideration is that, while the contact point at the front of the scope mount may actually be redundant for security, that front screw is there to pre-load and pre-tension the mount to minimize mount flex during firing. To secure the front of the scope to the receiver so that they act, in effect, like one large mass instead of two separate legs of a tuning fork. Think of “Thud” instead of “Ping.” This proprietary spring loaded, pre-tensioned design is intended to minimize vibrations that can occur if the front were left free floating or “cantilevered”.
- 4.] The M14/M1A has a well deserved reputation as a scope destroyer. On the firing and reload cycle of an M14, there are lots of vibrations that can potentially be focused into a scope. The op rod and the bolt slam into the receiver both at the front and rear parts of the recoil cycle, which can cause the M14 rifle to ring like a bell. Poor mount design can focus or even amplify these vibrations into the scope. This back and forth “whiplash” vibration cycle is one of the reasons the semi-auto action of the M14 may quickly break a scope that might survive for years on a heavier caliber, heavier recoiling single shot or bolt action rifle. This new scope mount design minimizes vibration forces with a proprietary 4-point retention setup that effectively “unitizes” the M14/M1A CASM® to your M14/M1A receiver.
- 5.] That 4-point retention system begins with the back of this mount tensioned up with an over-sized 5/16" *half dog tipped* set screw, which rotates the mount around the two *tapered head 1/4" self centering* screws in the rear sight ears. This upwards tension at the rear forces the front of the mount tight to the front of the receiver. By design, the mount is installed with the front end a few degrees down from true to the bore horizontal. Then, the front of the mount is pre-tensioned up a tiny bit by another 5/16" *half dog tipped* set screw.
- 6.] For greater security, both of the 5/16" vertical adjusting/ tension screws and the tapered 1/4" side screws are locked *immovably* in place by smaller locking set screws. Also included is a small tube of Blue Loctite®. This “belt and suspenders” approach to keeping all the screws effectively double-locked, and in securing proper retention of any settings, is designed to achieve absolute “bullet proof” security. All of these locking features ensure your mount won’t come loose...EVER. (*Unless you use the proper tools to make it come loose!*).
- 7.] This “*pre-stressed for vertical adjustment*” design, *with the front and back of the mount held tightly against rotation*, eliminates all variations in elevation due to mount shifting under recoil, which is a common problem with many of the previous generation “three point” mounts.
- 8.] *The sides of the mount are held securely in horizontal alignment with the bore* by tight fit in the rear sight pocket, and two large 1/4" self-centering screws through the holes in the rear sight “ears”. These side screws are locked in place by smaller locking set screws. The large amount of high-strength 7075 alloy material in perfect contact with the left side of the rear sight pocket, plus the tight clearances between the mount and the inside of the receiver rear sight pocket, plus the thickness of the material purposely left in the mount under the picatinny rail, holds the mount securely against any *horizontal* flexing or movement. Beating on the scope mount with a hammer might move the zero, or break something loose, but short of that kind of abuse, *this mount is built to stay in place without any horizontal flex*.
- 9.] By using a large, solid rail with four large receiver to mount contact surfaces, and by using high quality, high strength 7075 material and Type III hard anodizing, this design eliminated the need for a side leg. That troublesome, and often out of specification left side scope mount hole, that too often loose left side scope mounting screw and that all too common discovery that no matter how much you adjust your scope sideways, you still can’t center/zero your scope with your rifle, is a thing of the past.

So there you have it .... some of the engineering details and years of experience behind the “*simple*” M14/M1A CASM mount.

Detailed installation instructions, spare screws, and a tube of Blue/removable Loctite are provided.



## ***M1 GARAND CASM® Notes***

- 1. Removing the M1 rear iron sights which weigh approx. 2.8oz and adding an approx. 4.2oz. weighted CASM scope mount to your M1 adds approx. 1.4oz. of weight to your rifle. In this regard, the CASM is the lightest M1 scope mount solution ever made.*
- 2. The CASM scope mount sets up in the rear sight pocket of your M1. This mounting location offers the following advantages: A. It allows you to mount a scope or short eye relief scope further rearward. B. For heavier scopes, the rearward position affords a slightly better tipping point balance than 3 point designs forward of the iron sights (i.e., rearward optics weight shift). The effect is that optics "feel" lighter as they are positioned closer to your body. And, in this regard, the optimal swing weight at the muzzle is maintained for fast handling and the best stability.*
- 3. The CASM scope mount will never require "gunsmithing" installation.*

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