

FOVEAL SYSTEMS

The Center of Vision

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LNLW Option

Lock Nuts and Lock Washers Option for Foveal Mounts: Installation Manual



READ ME FIRST

This option adds steps to the installation procedures found in the

Foveal Camera Mount Installation Manual.

Reading through this manual first, and then the other manual should make the overall installation process clearer.

In any case, read both manuals before installing your first Foveal Camera Mount with the LNLW option.

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Contact Me If You Have Any Questions, Comments or Suggestions.

Overview

The **Foveal Rigid Camera Mounts** and **Foveal Fine-adjustment Camera Mounts** are finely adjustable camera mounts for small-to-medium sized "box" cameras, camera enclosures and other instruments (such as lasers). They allow each position of the pan, tilt and, in some models, roll axes to be locked down so they cannot be casually changed, either deliberately or accidentally. The **Rigid Mounts** are intended for environments where they will be subjected to extreme bumps or twisting forces. The **Fine-adjustment Mounts** are less expensive and less robust 2-axis mount designed for less demanding environments. See:

http://www.Foveal.com/rigid_mount.html
http://www.Foveal.com/fine_mount.html

However, we are not sure the adjustments would hold if they were subjected to frequent or constant vibration, so we optionally build the mounts with

- undersized lock nuts (also called small pattern nuts),
- lock washers and
- lock nuts with attached toothed washers

so the adjustments can be double locked.

This manual illustrates ways to use the additional parts to ensure the mount is double locked.

Figure 1-1 and **Figure 1-2** labels the various parts of the Rigid and Fine-adjustment Mounts before the option is added.

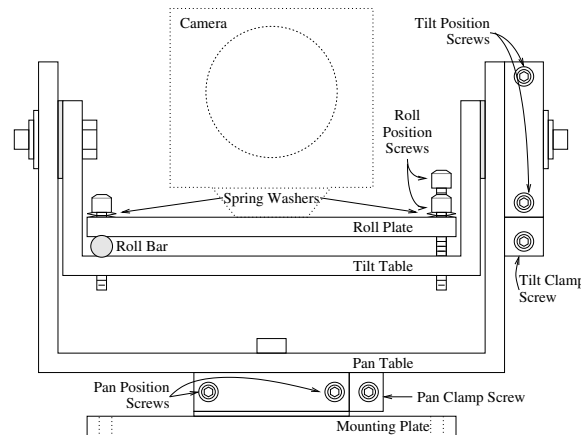


Figure 1-1. Front View of a Rigid 3-Axis Mount



Figure 1-2. Front View of FM1_2a and FM3_2a Fine-adjustment 2-Axis Mounts

Double Locking Pan and Tilt Adjustments with Lock Nuts and Lock Washers

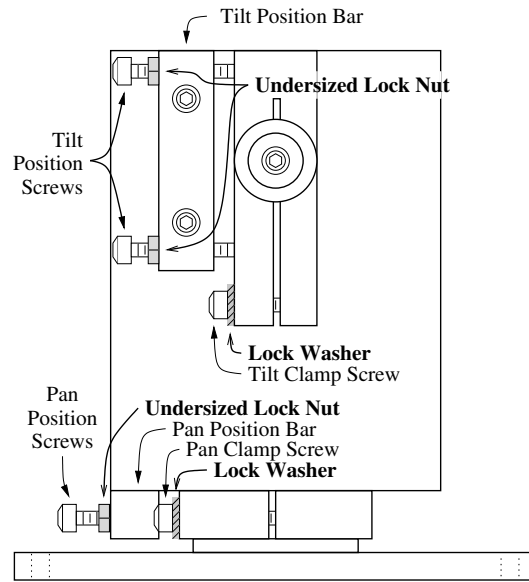


Figure 2-1. Side View of a Foveal Mount with undersized Lock Nuts and Lock Washers

A normal sized nut would not leave enough clearance to tighten it easily. An undersized Lock Nut is used to lock the Position Screws so a socket wrench will fit over the nut without interference from the mount.

- **Before installing the Foveal Camera Mount, install the undersized nuts on the Pan and Tilt Clamp Screw.**

This is usually much easier to do before the camera is mounted and before the Camera Mount is mounted.

Do not tighten the nuts!

- Run the Lock Nuts up to the heads of the Adjustment Screws.
- Adjust the Mount as described in the **Foveal Camera Mount Installation Manual**.
- After each pair of Position Screws is set, run the Lock Nuts down to the Position Bar.



Figure 2-2. Position Screws with undersized Lock Nuts; Clamp Screws with Lock Washers; installed and tightened.

- Tighten with an open-end wrench or socket wrench. A nut driver will not work. See **Figure 2-2**.

3-axis Mounts: Double Locking the Roll Adjustment with Lock Nuts

In the 3-Axis mounts¹, the Roll Plate is fastened to the underlying Tilt Table by 3 screws with a stack of 3 Belleville Spring Washers between the screw heads and the Roll Plate. The Spring Washers accommodate the fact that the Roll Plate may not be parallel to the underside of the screw heads.



Figure 3-1. Roll Position Screws Detail



Figure 3-2. Roll Plate Lock Nut and Lock Washer Detail

There are also two Roll Position Screws:

- one pushes the Roll Plate away from the Tilt Table,
- the other (with three Spring Washers under the head) holds the Roll Plate down, thus locking the Roll Plate position.

See **Figure 1-1** and **Figure 3-1**.

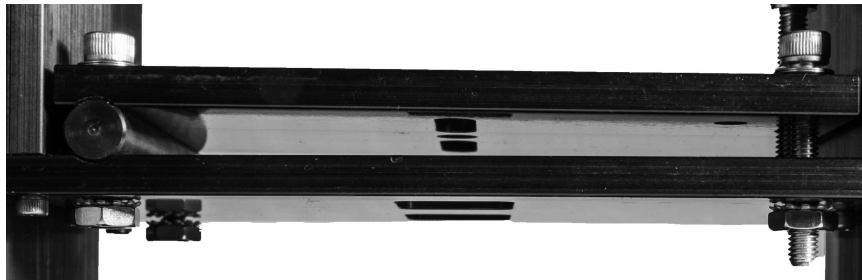


Figure 3-3. 3 Lock Nuts with Toothed Washers below the Inner-U Base.

To ensure these screws do not loosen, we add lock nuts with toothed washers to the 3 screws with Spring Washers that are threaded into the Tilt Table. See **Figure 3-2.** and **Figure 3-3.**

In the case of the Roll Position Screw, we install an undersized nut on the screw *before* the Screw is installed.

- Run the undersized nut all the way up to the head of the Roll Position Screw.
- Install the 3 lock nuts on the ends of the screws with Spring Washers that extend below the Tilt Table. **Do not tighten!**
- Adjust the Mount as described in the **Foveal Rigid Camera Mount Installation Manual**.
- After the Roll Position is set, be sure the 3 screws with Spring Washers are tightened firmly. Then tighten the lock nuts with toothed washers on those 3 screws, below the Tilt Table, against the Base.
- Run the nut on the Roll Position Screw down to the Roll Plate and tighten it.

1. The 3-axis mounts all have **_3a** in the model name. E.g. **RM2_3a-RMP** is a Rigid Mount, model 2, 3-axis, with Rectangular Mounting Plate