

A simple mount for an optical scanner galvanometer

Many groups involved in the development of optical instrumentation rely on mechanical components available from a range of specialised suppliers. Our group generally makes use of opto-mechanics available from Thorlabs Ltd (<http://www.thorlabs.com/>). Although the range of items which can be purchased off the shelf is extensive, there are occasions when a customised component is required. We describe here a mount for an optical galvanometer scanner, and are indebted to one of our collaborators, Dr Simon Ameer-Beg, currently at King's College, London (<http://rg.kcl.ac.uk/staffprofiles/staffprofile.php?pid=5672>) for the idea behind this arrangement. The principle application is for deflecting laser beams, in particular for laser-scanning microscopy applications.

The mount shown in Figure 1 can be attached to the 'open' face of a Thorlabs C6W cage system cube and a galvanometer scanner can be clamped within the mount, as shown in Figure 2. In our case, the clamp was designed to hold a GSI-Lumonics VM1000 galvanometer scanner (www.gsig.com/scanners), although the same basic principle could be applied to other scanners. The mounting block provides heatsinking for the galvanometer and allows adjustment and clamping by tightening the split arrangement.

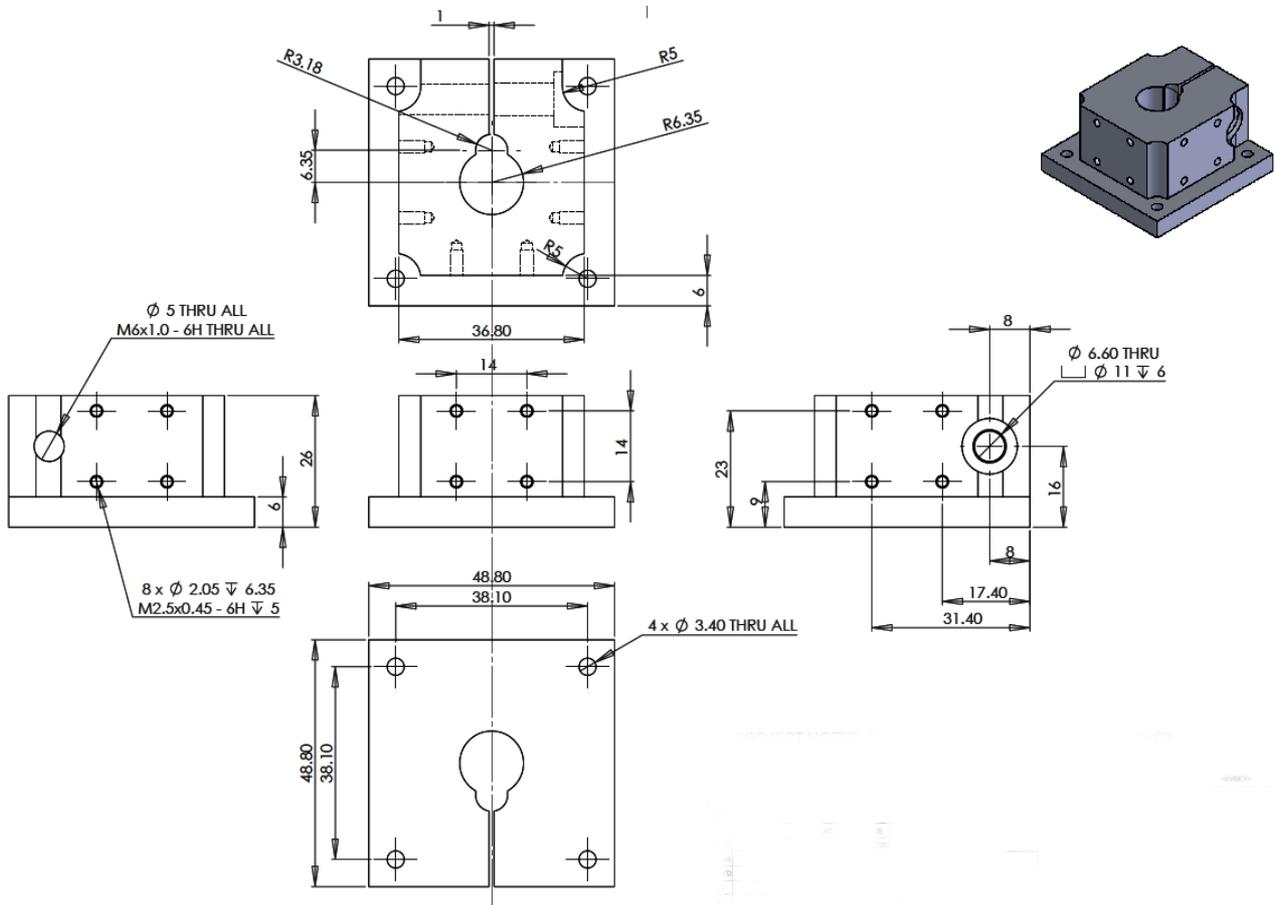


Figure 1: Drawing of the the galvanometer scanner mount.

This arrangement has been used for a number of years and duplicated countless times. Of course it is only useful when independent, rather than close-coupled galvos are needed. When close-coupled galvos are needed, proprietary mount are available commercially. It is noted that the rotation axis of the majority of galvos does not line up with the mirror reflective surface and this is the case for

VM1000 mirrors. Somewhat large than standard clearance holes to attach the mount to the C6W are used and alignment of the mirror surface with the centre of the 6CW cube can thus be performed. Four washers thus need to be placed below the C6W-coupling bolt-heads.

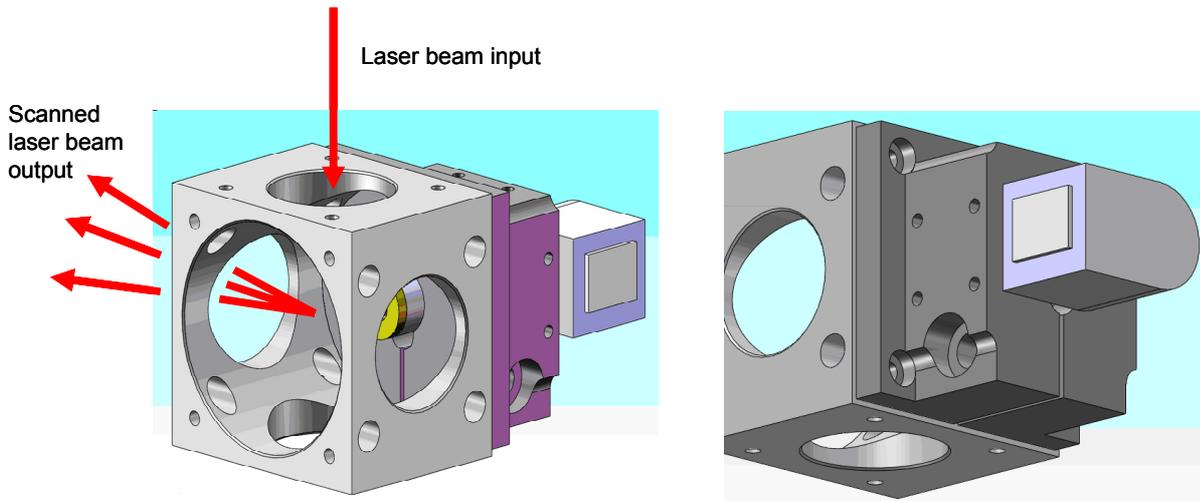


Figure 2: Model of the scanner mount attached to a Thorlabs C6W cage system cube.

Well, there's not much more that we can describe, apart from showing real-life images of the assembled unit. As can be seen in Figure 3, the cables from the galvanometer can be clamped on the side of the mount by sandwiching them below a small stainless steel plate. Tapped holes for this plate are provided on three sides of the mount to allow the galvanometer to be positioned in any direction.

If others wish to copy this design, here is a note of warning: the M6 side-clamping screw must be tightened as much as possible: the mechanical load on the galvo is significant and it is all too easy for it to work loose, particularly when operating at high scanning speeds. However, once set, the arrangement has been proved to be very stable indeed. How stable? – well we have had no need to adjust in our laser scanning instruments.

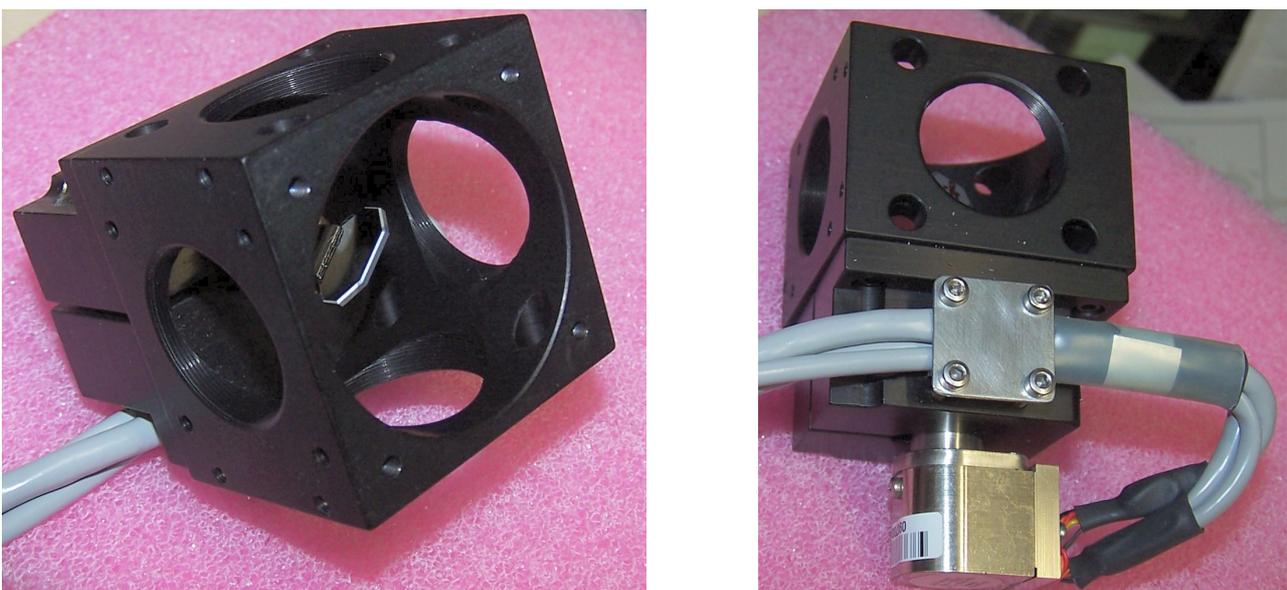


Figure 3: The completed galvanometer mount with a VM1000 galvanometer fitted.

This note was prepared in August 2011 by B. Vojnovic. Thanks go to IDC Tullis for thinking through the details and drawing, to John Prentice for machining the mount and to RG Newman for expert (!) clamping of cables.

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