



Protostar Flockboard installation

Flockboard is a good material choice for lining the upper cages of Dobsonian Newtonian telescopes and solid-tube telescopes. The surface is the same ultra-low reflective surface as our traditional Hi-tack light trap, but is applied to a thin sheet substrate. It's stiff enough to be self-supportive when rolled up, but still easy to cut with scissors or a utility knife.

The light absorbing side is specifically engineered as a light trap surface (unlike some flocked papers that are just for decorative texturing). It is designed to have almost zero reflectivity at all angles of viewing, and is not damaged by normal dew and moisture. It will not shed fibers onto your optical surfaces under normal use. Flockboard springs out against the tube wall, and does not require adhesives or tapes in most applications.

Always work on your telescope in a horizontal position to avoid accidentally dropping something onto the primary mirror.

Step 1. Strip the telescope tube of most components. Remove the focuser, spider, finderscope, primary cell assembly and altitude bearings from the tube.

Step 2. Roll up and insert the first sheet of Flockboard into the primary mirror end of the tube until it's about 3-inches from the end of the tube.

Step 3. Roll up and insert the second piece of Flockboard into the focuser end of the tube. Position it against the edge of the tube, and rotate the sheet to orient the overlap seam to be approximately aligned with the focuser hole.

Step 4. Working from outside the tube, mark the locations of the holes for the spider, finderscope, and focuser. Also trace the large cutout for the focuser. Remove the Flockboard and drill the marked holes with a 1/4" drill. The large focuser cutout can be cut with a utility knife or scissors.

Step 5. Re-insert the upper piece of Flockboard, and re-install the focuser, finderscope and spider.

Step 6. Re-assemble the telescope, and install the primary cell assembly last.

Maintenance: You may occasionally need to remove dust or other particles from the flocked surface. This is best done with a rolling tape lint remover typically used for clothing. Do not try to vacuum the inside, as this can scuff and damage the flocking.

(See the reverse side of this sheet for optional air-spacing instructions for metal tube telescopes.)

Optional Air-spaced Installation Method for Metal Tube Telescopes

Air-spacing Flockboard away from the tube's wall with foam strips creates a thermal insulation layer that prevents mixing currents inside the tube. The sky-facing portion of a metal tube will fall several degrees below ambient air temperature due to radiative heat loss to the clear night sky, and the inside wall of the tube "feels" this due to the high thermal conductivity of metals. This causes a churning of cool/warm air in the optical path that persists all night long. This inexpensive fix will solve the problem.

Installation

Cut approximately $\frac{3}{4}$ " wide foam strips from the supplied foam sheet material. Tape the strips to the outside of the Flockboard as shown to hold them in place as you insert the rolled sections into the tube. It's easier to do this with the Flockboard on a *clean* flat surface.

Note that only the lower rolled up section of Flockboard requires foam spacers at both ends.

The cutout holes for the focuser, spider, and other parts are not shown in this picture. If you plan to air-space your Flockboard, the layout and marking of these holes should be done with the foam strips in place to ensure the holes will line up properly.

Another potential advantage of air-spacing the Flockboard is that small nuts and screws for accessories like finderscopes can be smoothly covered and hidden in the air gap between the Flockboard and tube wall.

Insert the lower piece of Flockboard first until it reaches the primary mirror cell struts.

Insert the upper piece of Flockboard overlapping inside the lower piece.

