Installing Baffles and Aperture Stops in Borg Telescopes

Borg 100 Photographic Aperture Stop -- F4 to F4.8 [4048]

For very wide field medium or large format photography, an optional photographic aperture stop [4048] is available to optimize for an evenly illuminated wide field. The 4048 stop has an OD of 109mm and ID of 80mm and friction fits in the main tube body. This changes the f-ratio from F4 to F4.8 by reducing the effective aperture slightly (focal length is not affected) and improves illumination from 75% to 87% at the 88mm diameter point, and from 66% to 80% at the 100mm diameter point. The effect on exposure is a 1.5x increase in required time.

Note that this stop position is suggested as the optimal position, considering the tradeoffs of evenness of illumination, stray light, and aberration, but experimentation with the best position for your application may be necessary. For example, locating the stop 5mm from the front edge, makes the system go to F5.5 and illumination increases to 100% at the 88mm diameter position, but the exposure factor is 2 times that of F4.

To install the 4048 stop, turn it 90 degrees relative to the long axis of the tube and insert it to the nominal position 75mm from the front edge (objective side) of the 149mm long main tube section. When it is at the proper position, rotate the baffle into position with the cupped (concave) side toward the objective. It is easiest to rotate the stop into place with both hands (one in each end of the tube). Friction will hold it in place. To remove the stop, rotate it 90 degrees relative to the long axis of the tube and then slide it out.

Note that the 4048 baffle should not be used for solar viewing without a full aperture energy rejection filter (e.g. no solar projection) as the baffle is made of a resin that may melt.

Borg 100F6.4 Visual Baffles

For the Borg 100F6.4 visual system, an optional baffle set is available which enhances visual contrast by minimizing stray light in the system. These parts in the baffle set are:

- 4052 – 86mm ID, 109mm OD, 1mm thick
- 4053 – 45mm ID, 57mm OD, 1mm thick
- 4054 – 36mm ID, 52mm OD, 2mm thick

Measuring from the objective side of the Borg 100 scope's tube body section (which is 335mm in length), the 4052 baffle is placed with the cupped (concave) side toward the objective with the following effects:

Baffle Location (mm)	Focal plane FOV (mm)	Longest Eyepiece (mm)
85	6	high power only
120	20	25
150	30	32
335	48	51

As a general (compromise) position, setting the baffle at a position of 175mm is recommended. To install the baffle, turn it 90 degrees relative to the long axis of the tube and insert it to the desired position as measured from the front edge (objective side) of the long main tube section. When it is at the proper position, rotate the baffle into position with the cupped (concave) side toward the objective. It is easiest to rotate the stop into place with both hands (one in each end of the tube). Friction will hold it in place. To remove the stop, rotate it 90 degrees relative to the long axis of the tube and then slide it out.

Normally the baffle (4052) is used in conjunction with the focuser baffle (4053) and 2" eyepiece holder baffle (4054). However, for the widest field indicated above (355mm position), the 4054 baffle should be removed or vignetting will occur.

Note that the 4052 baffle should not be used for solar viewing without a full aperture energy rejection filter (e.g. no solar projection) as the baffle is made of a resin that may melt.

Borg 125 Photographic Aperture Stop -- F4 to F5 [4049]

For very wide field medium or large format photography, an optional photographic aperture stop [4049] is available to optimize for an evenly illuminated wide field. The 4049 stop has an OD of 109mm and ID of 63mm and friction fits in the main tube body. This changes the f-ratio from F4 to F5 by reducing the effective aperture slightly (focal length is not affected) and improves illumination from 54% to 68% at the 88mm diameter point, and from 42% to 53% at the 100mm diameter point. The effect on exposure is a 1.6x increase in required time.

Note that this position for the aperture stop is suggested as the optimal position, considering the tradeoffs of evenness of illumination, stray light, and aberration, but experimentation with the best position for your application may be necessary. For example, locating the stop 97mm from the front edge, makes the system go to F5.6 and illumination increases to 78% at the 88mm diameter position, but the exposure factor is 2 times that of F4.

To install the 4049 stop, turn it 90 degrees relative to the tube length and insert it to the nominal position 160mm from the front edge (objective side) of the 208mm long main tube section. When it is at the proper position, rotate the baffle into position with the cupped (concave) side toward the objective. Friction will hold it in place.

Note that the 4049 baffle should not be used for solar viewing without a full aperture energy rejection filter (e.g. no solar projection) as the baffle is made of a resin that may melt.

Borg 125F6.4 Visual Baffles

For the Borg 125F6.4 visual system, an optional baffle set is available which enhances visual contrast by minimizing stray light in the system. These parts in the baffle set are:

- 4052 – 86mm ID, 109mm OD, 1mm thick
- 4053 – 45mm ID, 57mm OD, 1mm thick
- 4054 – 36mm ID, 52mm OD, 2mm thick

Measuring from the objective side of the Borg 125 scope's tube body section (which is 380mm in length), the 4052 baffle is placed with the cupped (concave) side toward the objective with the following effects:

Baffle Location (mm)	Focal plane FOV (mm)	Longest Eyepiece (mm)
130	6	high power only
165	20	25
195	30	32
355	48	51

As a general (compromise) position, setting the baffle at a position of 220mm is recommended. To install the baffle, turn it 90 degrees relative to the long axis of the tube and insert it to the desired position as measured from the front edge (objective side) of the long main tube section. When it is at the proper position, rotate the baffle into position with the cupped (concave) side toward the objective. It is easiest to rotate the stop into place with both hands (one in each end of the tube). Friction will hold it in place. To remove the stop, rotate it 90 degrees relative to the long axis of the tube and then slide it out.

Normally the baffle (4052) is used in conjunction with the focuser baffle (4053) and 2" eyepiece holder baffle (4054). However, for the widest field indicated above (355mm position), the 4054 baffle should be removed or vignetting will occur.

Note that the 4052 baffle should not be used for solar viewing without a full aperture energy rejection filter (e.g. no solar projection) as the baffle is made of a resin that may melt.