

3.4.2 FECKER COLLIMATOR

Modified version of write-up by D. I. Brown

The Fecker Collimator, a.k.a the Voyager Collimator, is an inherited piece of Voyager equipment used for WAC calibration testing in the following areas : Focus, ADC Uneven Bit-Weighting, Polarization, and Distortion.

The Fecker Collimator is a refractive system with an aperture of 4.5" and a focal length of 25 inches (f/5.6). Its designed spectral range is 486 to 656 nm, corresponding to the Voyager wavelength range. The collimator optical prescription has been retrieved from the manufacturer, formerly J.W. Fecker, now Contraves, of Pittsburgh, and resides in the files in the JPL optical tunnel. This includes the melt data on the various glasses used in its manufacture.

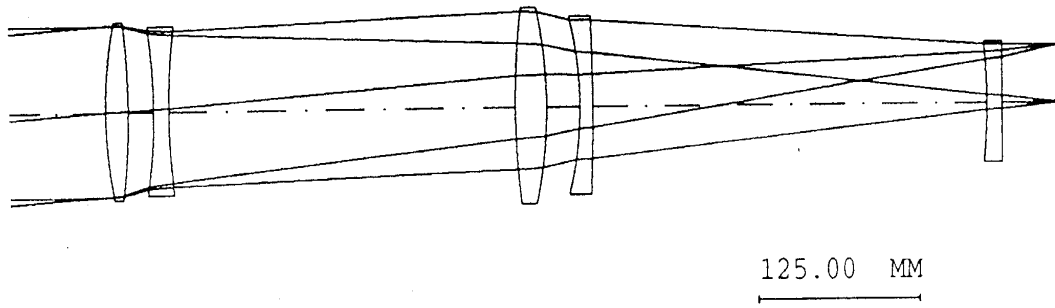
The target holder is on a 3-axis motorized stage with 1 micron or better accuracy. The targets are illuminated with the a visible/IR light source.

See Table 3.4.2-1 for the Fecker Collimator Summary and Figure 3.4.2-1 for the Fecker Collimator Layout.

As noted in Table 3.4.2-1, the Fecker Collimator focal length is dependent upon wavelength, and is shown in Figure 3.4.2-2.

Fecker Collimator Element	Value / Description
Focal Length	635 mm; substantial variation with wavelength, even over the design wavelength range
Aperture	114.3 mm (4.5 in)
F/#	5.6
Field of View	7 °
Airy Disk, 500 nm	7 microns
Depth of Field, 500 nm	31 microns
Wavelength Range (design)	486 to 656 nm
Coatings	Mg F ₂
Optical Model	Obtained from Contraves (formerly J. W. Fecker); implemented in Code V format
Light Source (350 - 1100 nm)	9 in white painted Al integrating sphere; 250 W Qtz lamp, stabilized, filtered

Table 3.4.2-1 - Fecker Collimator Summary



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Figure 3.4.2-1 - Fecker Collimator Layout

Voyager collimator
focus dependence on wavelength

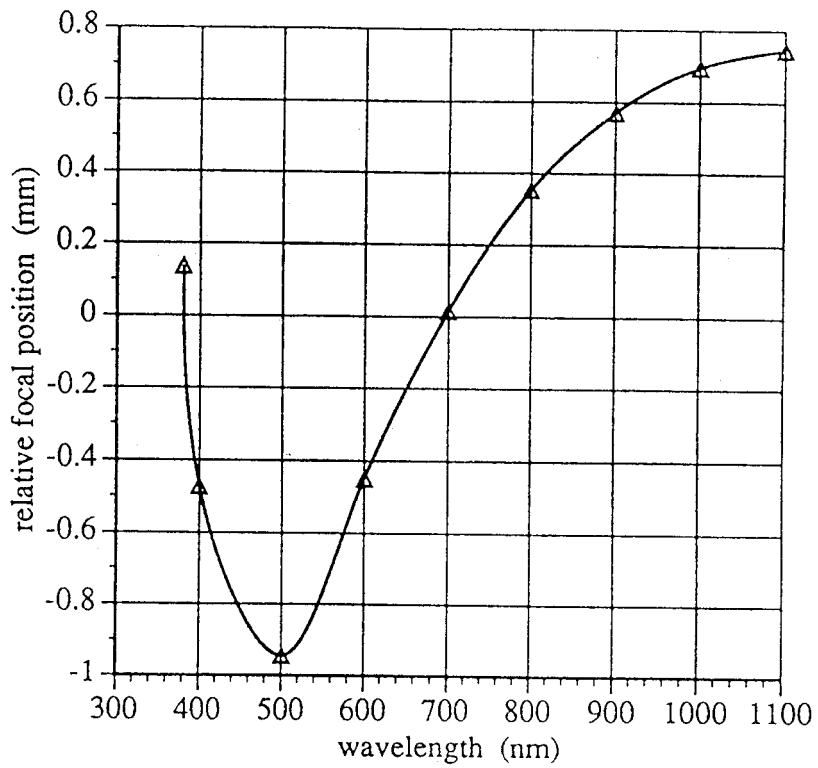


Figure 3.4.2-2 - Fecker Collimator Focus Dependence on Wavelength