

## 10X Keplerian with Specified Eye Relief

Requirement: 10X  $\rightarrow$  MP = -10

$$ER = 11 \text{ mm}$$

$$m = \frac{1}{MP} = -\frac{f_2}{f_1} = -\frac{1}{10}$$

$$f_1 = 10 f_2$$

The XP is the image of the stop/objective through the eye lens ( $f_2$ )

$$z' = ER = 11 \text{ mm}$$

$$z = -\text{Separation} = -(f_1 + f_2)$$

$$z = -11 f_2$$

$$\frac{1}{z'} = \frac{1}{z} + \frac{1}{f_2}$$

$$\frac{1}{11} = \frac{1}{-11 f_2} + \frac{1}{f_2}$$

$$f_2 = 10 \text{ mm}$$

$$f_1 = 100 \text{ mm}$$

$$\text{Separation} = 110 \text{ mm}$$