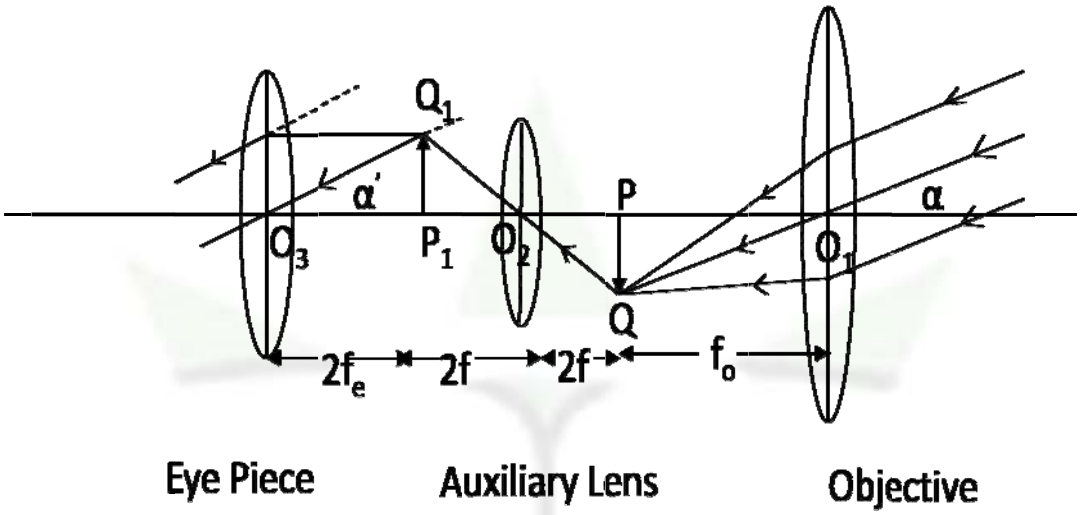
Terrestrial Telescope

Terrestrial telescope: In astronomical telescope the final image is inverted with respect to the object. In terrestrial telescope the final image is made erect with respect to the object by using a third lens known as auxiliary lens between the objective and the eye piece which simply inverts the image but not produce any modification.



$$L = f_o + 2f + 2f + f_e = f_o + 4f + f_e$$

$$M_n = \frac{\alpha'}{\alpha} = \frac{\tan\alpha'}{\tan\alpha} = \frac{P_1Q_1 / PQ}{O_3P_1 / O_1P} = \frac{O_1P}{O_3P} = \frac{f_o}{f_e}$$

Distinct vision:

$O_1P = f_o \quad PO_2 = 2f \qquad O_2P_1 = 2f \quad P_1O_3 = u < f_e$

$O_3P_2 = D = \text{Negative}$

$$\therefore \frac{1}{u} + \frac{1}{-D} = \frac{1}{f_e}$$

$$\frac{1}{u} = \frac{1}{f_e} + \frac{1}{D}$$

$$M_d = \frac{\alpha'}{\alpha} = \frac{\tan\alpha'}{\tan\alpha} = \frac{P_1Q_1 / O_3P_1}{PQ / O_1P} = \frac{O_1P}{O_3P} = \frac{f_o}{u} = f_o\left[\frac{1}{f_e} + \frac{1}{D}\right] = \frac{f_o}{f_e}\left[1 + \frac{f_e}{D}\right]$$