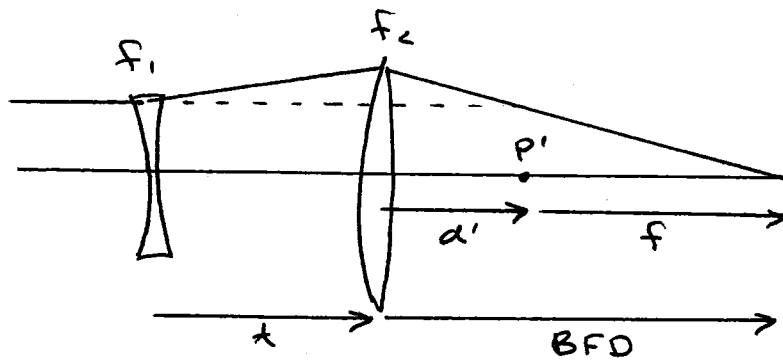


Reverse-Telephoto Zoom Lens



$$f_1 = -50 \text{ mm}$$

$$f_2 = 50 \text{ mm}$$

System: $f \ 30 \rightarrow 80 \text{ mm}$

$$\phi = \phi_1 + \phi_2 - \phi_1 \phi_2 t$$

$$\phi_1 = -\phi_2 = \frac{1}{f_1} = \frac{-1}{50 \text{ mm}}$$

$$\phi = \phi_1^2 t$$

$$f = \frac{1}{\phi_1^2 t} = 2500/t$$

$$t = \frac{2500 \text{ mm}^2}{f}$$

$$\text{BFD} = f + d'$$

$$d' = -\frac{\phi_1}{\phi} t = \frac{-\phi_1 t}{t \phi_1^2} = \frac{-1}{\phi_1} = -f_1$$

$$d' = 50 \text{ mm}$$

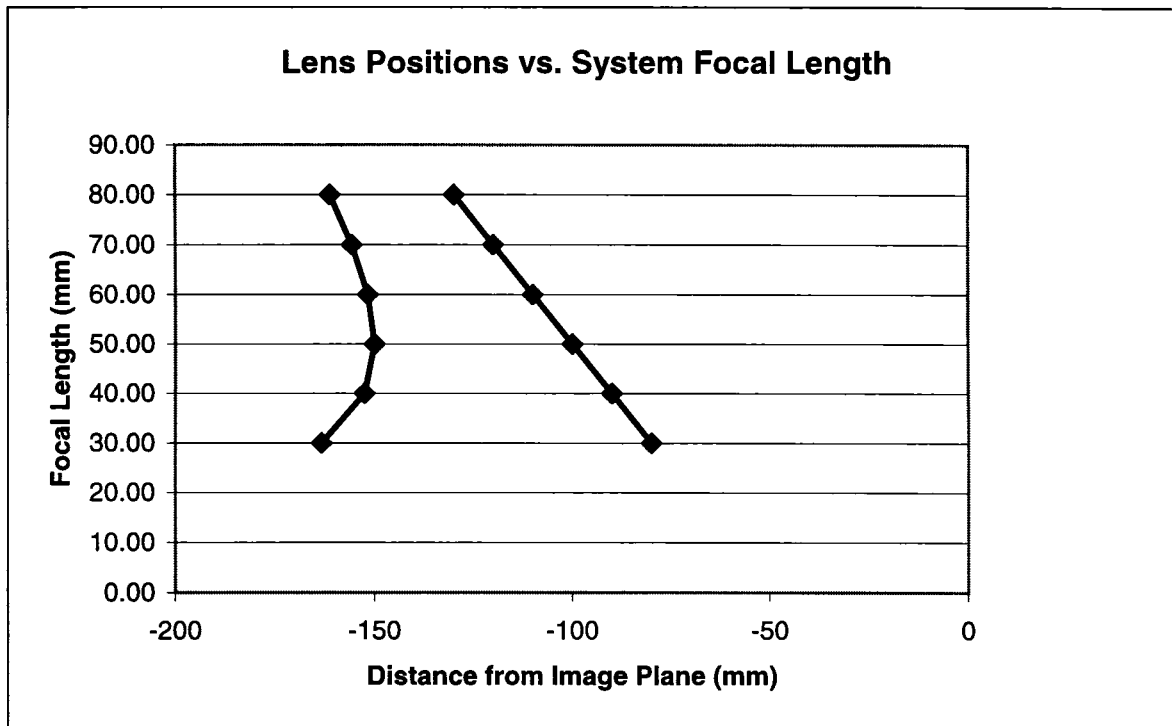
$$\text{BFD} = f + 50 \text{ mm}$$

System Length:

$$L = t + \text{BFD}$$

f	t	BFD	L
30.00	83.33	80.00	163.33
40.00	62.50	90.00	152.50
50.00	50.00	100.00	150.00
60.00	41.67	110.00	151.67
70.00	35.71	120.00	155.71
80.00	31.25	130.00	161.25

All Units in mm



Attached is some lens design output showing the element positions.

