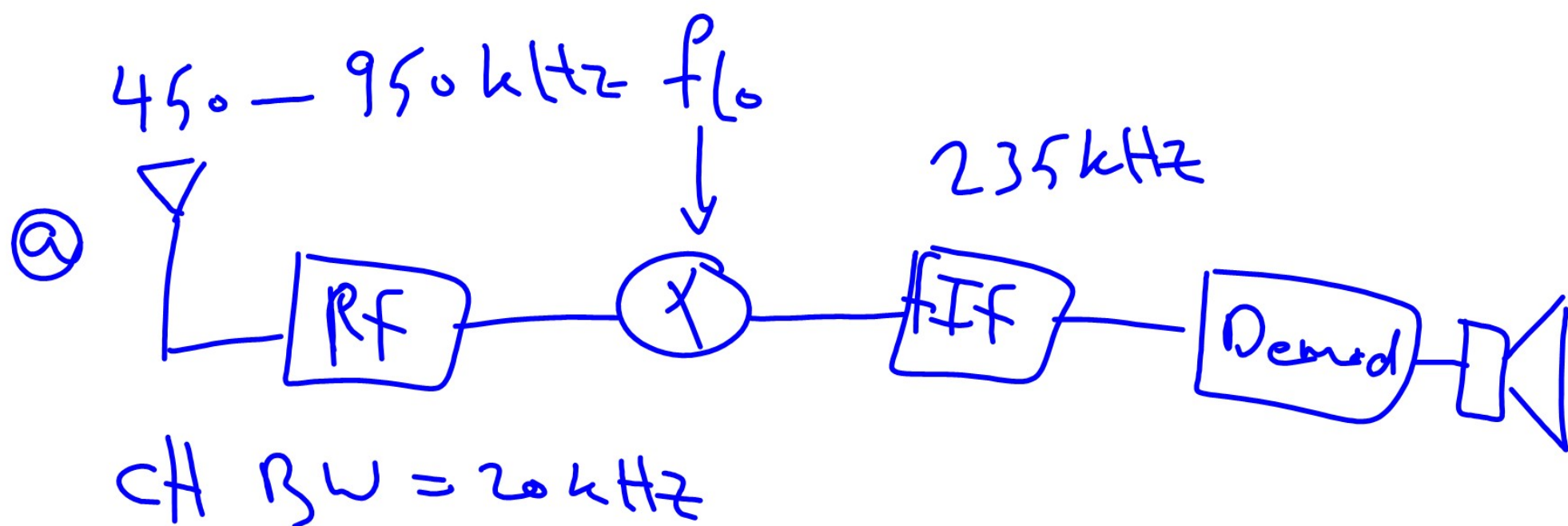




⑤

$$f_{L_{min}} = 450 + 235 = 685 \text{ kHz}$$

$$f_{L_{max}} = 950 + 235 = 1185 \text{ kHz}$$

⑥

$$f_{img1} = 450 + 2(235) = 920 \text{ kHz}$$

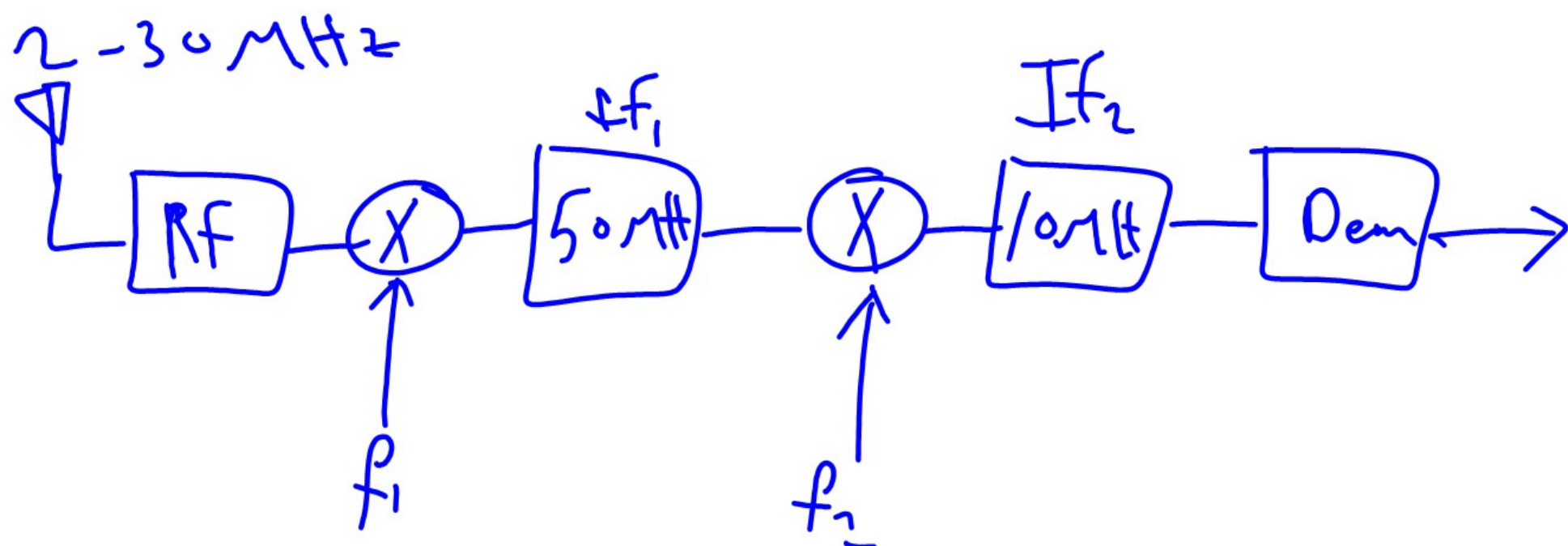
$$f_{img2} = 470 + 2(235) = 940 \text{ kHz}$$

$$f_{img3} = 950 - 2(235) = 480 \text{ kHz}$$

$$f_{img4} = 930 - 2(235) = 460 \text{ kHz}$$

⑦

$$f_{IF_{new}} \geq \frac{950 - 450}{2} \geq 250 \text{ kHz}$$



a) $f_1 > f_{IF}$

$$f_{1min} = 2 + 50 = 52 \text{ MHz}$$

$$f_{1max} = 30 + 50 = 80 \text{ MHz}$$

$$52 < f_1 < 80$$

b) $f_1 < f_{IF}$

$$f_{1max} = 50 - 2 = 48$$

$$f_{1min} = 50 - 30 = 20$$

$$20 < f_1 < 48$$

c) $f_2 = 50 + 10 = 60 \text{ MHz}$

$$f_2 = 50 - 10 = 40 \text{ MHz}$$

d) Is there any image problem?

No,

$$f_{IF} \gg \frac{f_{max} - f_{min}}{2} = \frac{30 - 2}{2} = 14 \text{ MHz}$$

$$f_{IF} = 50 \text{ MHz} > 14 \text{ MHz} \quad \checkmark$$