Espectros de cada etapa:

1) $A_{\perp}m(t)\cos(2\pi f_0 t + \theta_0)$

$$A_1 m(t)\left(\frac{e^{j2\pi f_0 t} + e^{-j2\pi f_0 t}}{2}\right) = A\left(\frac{m(t)\,e^{j2\pi f_0 t}}{2}\right) + \left(\frac{m(t)\,e^{-j2\pi f_0 t}}{2}\right)$$

con $\quad F\{x(t)\,e^{j\omega_0 t}\} = X(\omega \mp \omega_0)$

$$\frac{A}{2} M\big((\omega - 2\pi f_0) + (\omega + 2\pi f_0)\big)$$

2) $\cos(2\pi f_0 t + \theta_0) \qquad$ con $\quad \theta_0 = 0$

$$\cos(2\pi f_0 t) = \left\{\frac{e^{j2\pi f_0 t} + e^{-j2\pi f_0 t}}{2}\right\} = F\left\{\frac{e^{j2\pi f_0 t}}{2}\right\} + F\left\{\frac{e^{-j2\pi f_0 t}}{2}\right\}$$

con $\quad F\{e^{\pm j\omega_0 t}\} = 2\pi\delta(\omega \mp \omega_0)$

$$F(\omega) = \pi\delta(\omega - 2\pi f_0) + \pi\delta(\omega + 2\pi f_0) \quad \longrightarrow \text{ Mixer}$$

$$A_1 m(t)\cos^2(2\pi f_0 t + \theta_0) = \frac{A_1 m(t)}{2} + \frac{A m(t)}{2}\cos(4\pi f_0 t + 2\theta_0)$$

$$F(\omega) = \frac{AM(\omega)}{2} + \frac{A\,m(t)}{2} \times \left(\frac{e^{j4\pi f_0 t} + e^{-j4\pi f_0 t}}{2}\right)$$

$$F(\omega) = \frac{AM(\omega)}{2} + \frac{A}{2}\left(\frac{m(t)\,e^{j4\pi f_0 t}}{2}\right) + \left(m(t)\,e^{-j4\pi f_0 t}\right)$$

con $\quad F\{x(t)\,e^{\pm j\omega_0 t}\} = X(\omega \mp \omega_0)$

$$F(\omega) = \frac{AM(\omega)}{2} + \frac{A}{4} M\big((\omega - 4\pi f_0) + (\omega + 4\pi f_0)\big) \quad \longrightarrow \text{ low pass}$$

$$\frac{A_1}{2}m(t)$$

$$F(\omega) = \frac{AM(\omega)}{2} \quad \longrightarrow \text{ scale amplitude by } \frac{2}{A_1}$$

$$\frac{A_1}{2}m(t) \cdot \frac{2}{A_1} = m(t)$$

$$F(m(t)) = M(\omega)$$