

## Esim. 5.7

**Jos**  $\mathcal{F}\{f(t)\} = F(j\omega)$  **niin**

$$\mathcal{F}\{f(t)\cos(\omega_c t)\} = \frac{1}{2}F(j(\omega - \omega_c)) + \frac{1}{2}F(j(\omega + \omega_c))$$

sillä

$$f(t)\cos(\omega_c t) = \frac{1}{2}\left(e^{j\omega_c t} + e^{-j\omega_c t}\right)f(t)$$

"The effect of multiplying the signal  $f(t)$  by the **carrier signal**  $\cos \omega_c t$  is thus to produce a signal whose spectrum consists of two (scaled) versions of  $F(j\omega)$ , the spectrum of  $f(t)$ ; one centred on  $\omega = \omega_c$  and the other on  $\omega = -\omega_c$ . The carrier signal  $\cos \omega_c t$  is said to be modulated by the signal  $f(t)$ ."