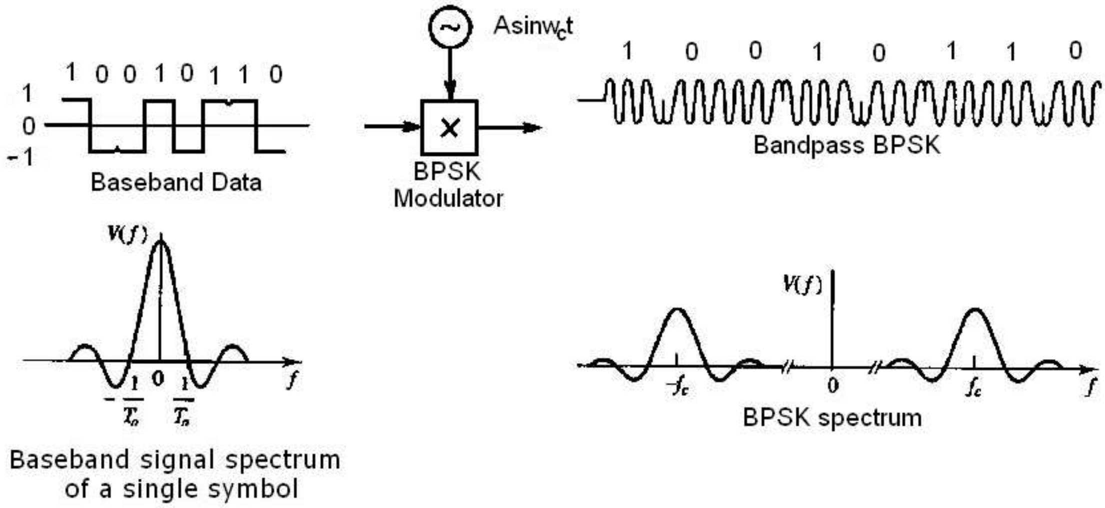
2.4 BINARY PHASE SHIFT KEYING (BPSK)

BPSK converts the baseband binary to passband by changing the carrier's phase in sympathy with the baseband digital data.

$$x(t) = \begin{cases} A\sin(\omega_c t) & \text{for logic 1} \\ A\sin(\omega_c t + \phi) & \text{for logic 0} \end{cases}$$

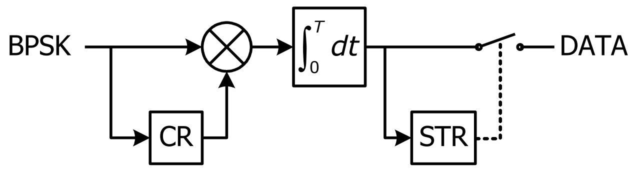
In BPSK, $\phi = 180°$.

2.4.1 Generation



2.4.2 Demodulation

Coherent Correlation Receiver



2.4.3 Probability of Error in BPSK

$$P_E = \text{Erfc}\left(\sqrt{\frac{2E_{\text{Avg}}}{\eta}}\right)$$

Since $E_{\text{Avg}} = E_1 = E_0$. So, the coherent detection at $T_0 B = 1$ is

$$P_E = \text{Erfc}\left(\sqrt{\frac{2E_1}{\eta}}\right) \quad \text{and} \quad P_E = \text{Erfc}\left(\sqrt{\frac{2S}{N}}\right)$$

This means BPSK is better than the former schemes. *Where is the incoherent detection?*