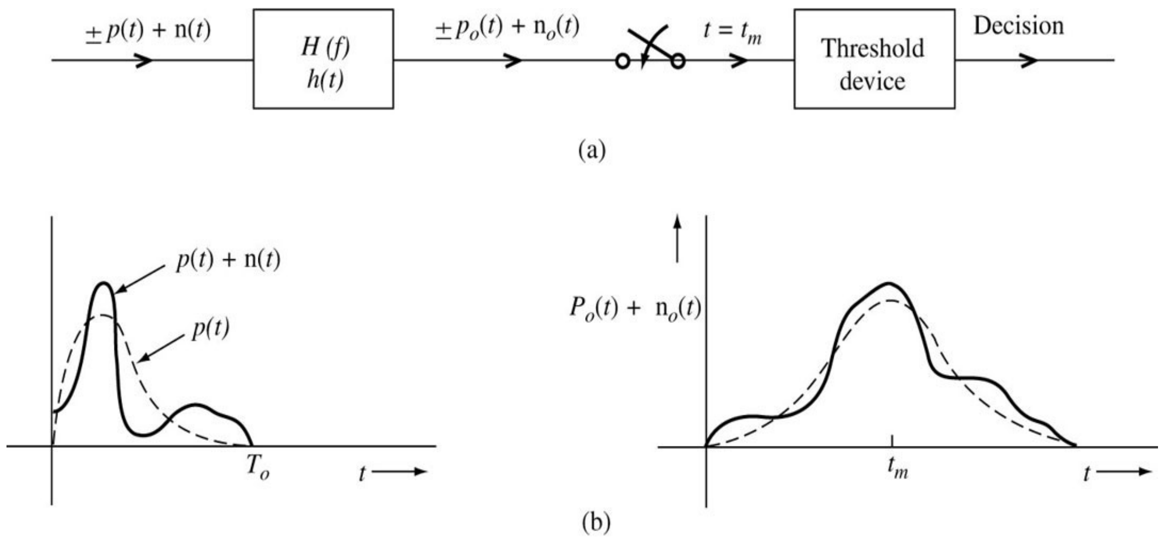
OPTIMUM LINEAR DETECTION FOR BINARY POLAR SIGNSLIMG



Noisy channel, the received signal waveform
$Y(t)=+p(t)+n(t)$, $Y(t)=-p(t)+n(t)$, $0 \le t \le T$
Where n(t) is a Gaussian channel noise. And p(t) is Binary data

Figure a and b Typical binary polar signaling and linear receiver.

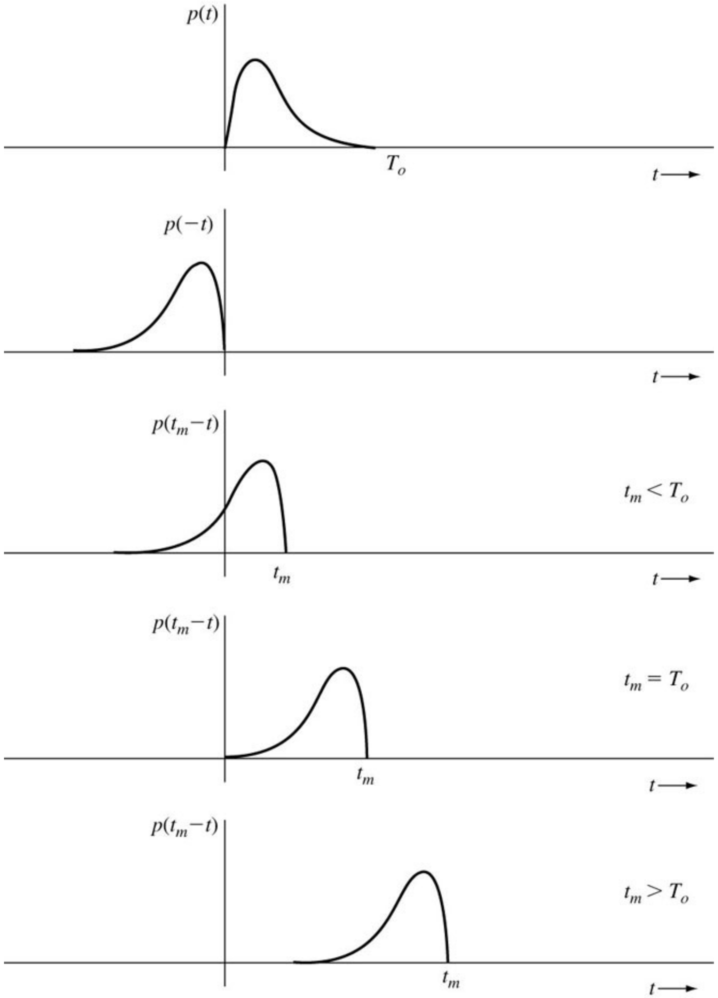


Figure Optimum choice for sampling instant.

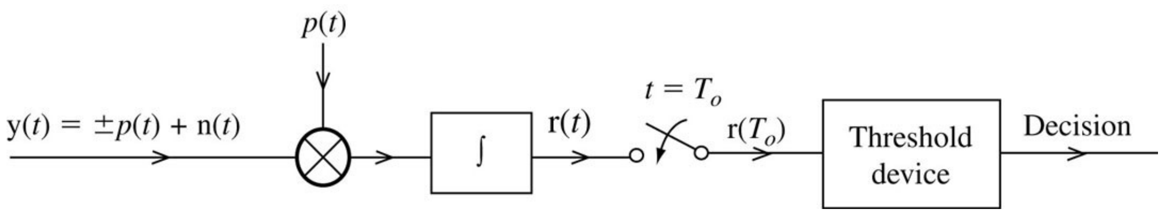


Figure Correlation detector.

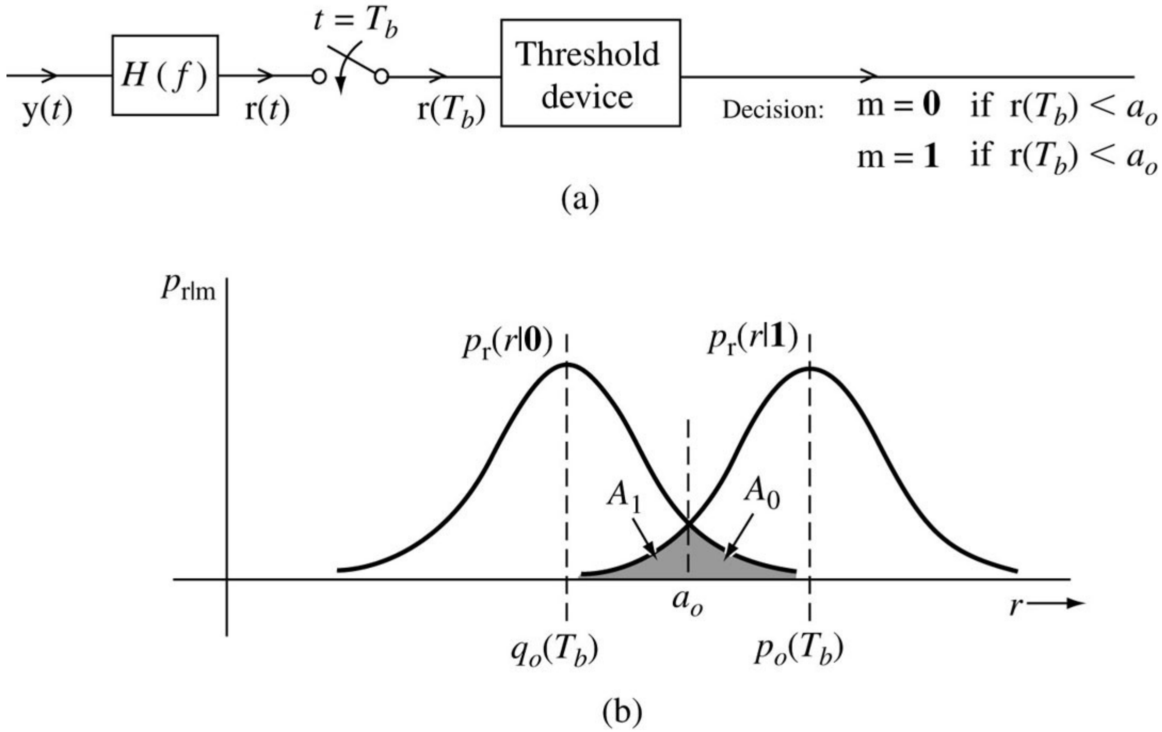


Figure Optimum binary threshold detection.

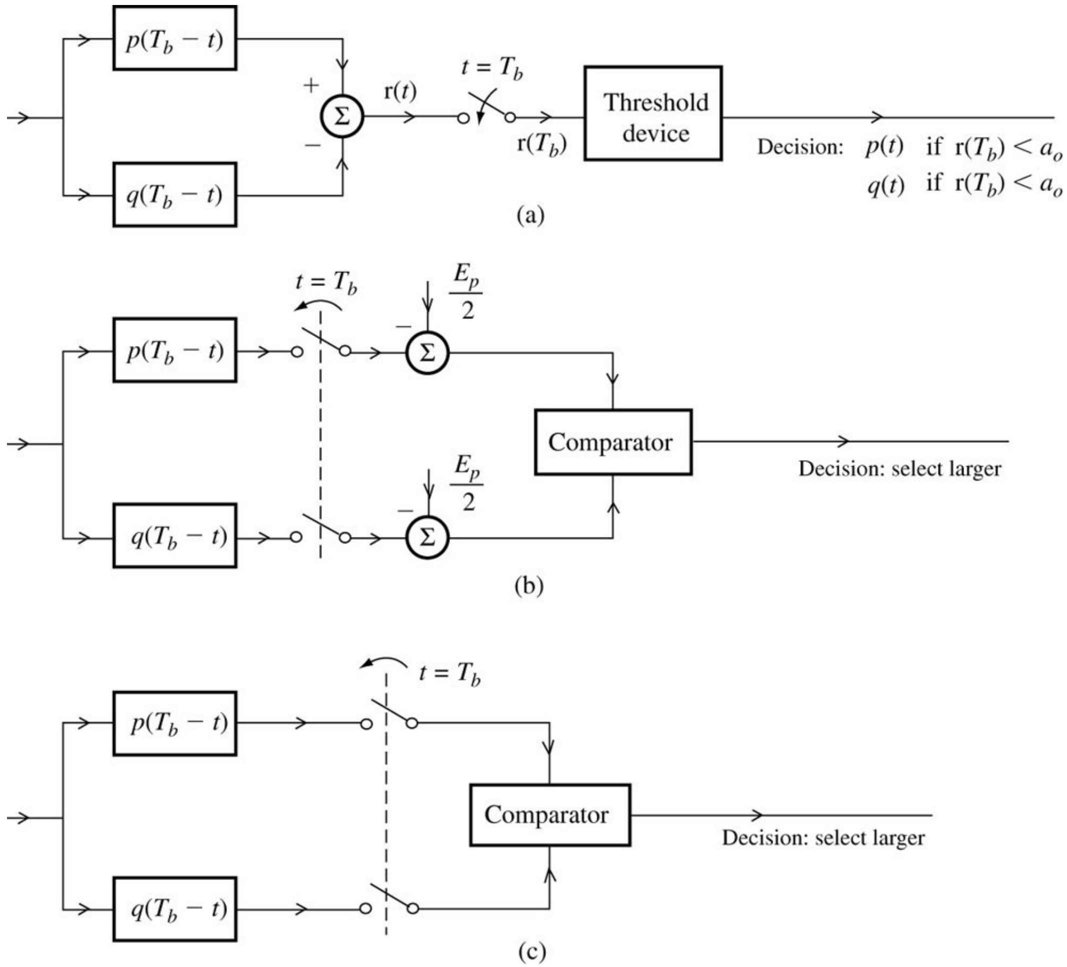


Figure Realization of the optimum binary threshold detector.

For polar signaling , q(t)=-p(t) hence, Ep=Eq and , Epq= - $\int_{-\infty}^{\infty} P^2(t)d(t)$
h(t)=2p(Tb-t) , Threshold a0 =0, Eb =Energy per bit

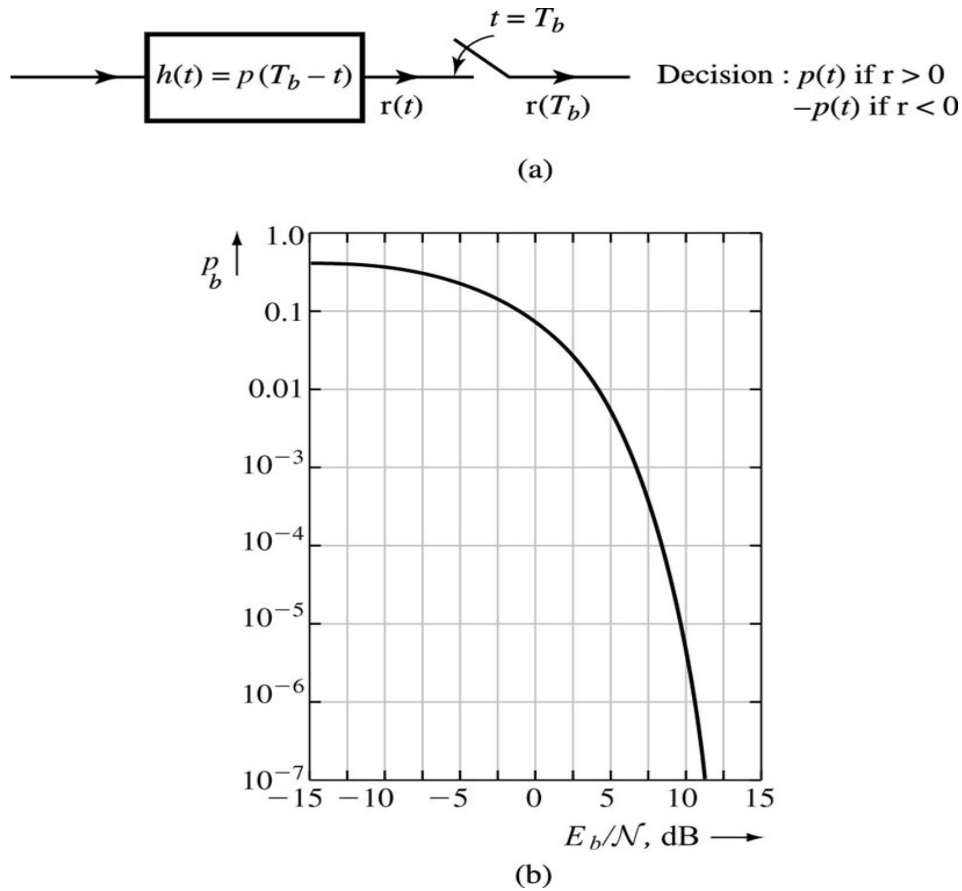


Figure (a) Optimum threshold detector and (b) its error probability for polar signaling.

polar case Ep=Eq and $E_b = E_p\, P(m=1) + E_q P(m=0)$

$E_b = E_p\, P(m=1) + E_p\,(1 - P(m=1))$, = Ep

$$P_b = Q\sqrt{(2E_b)/N}$$

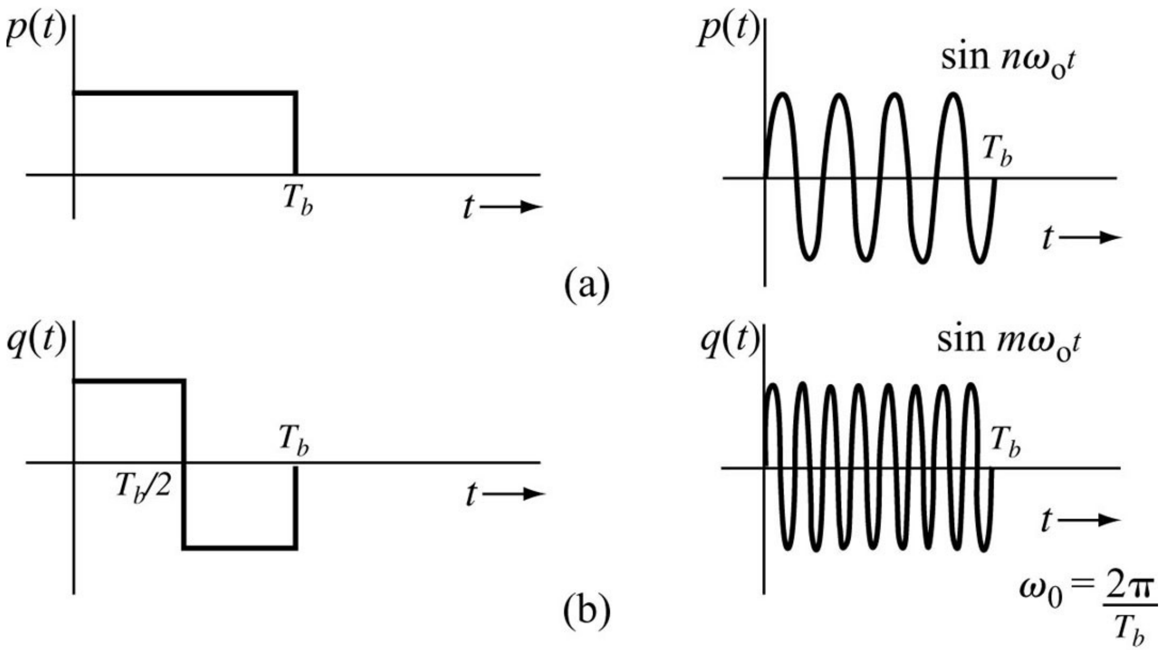


Figure Examples of orthogonal signals.

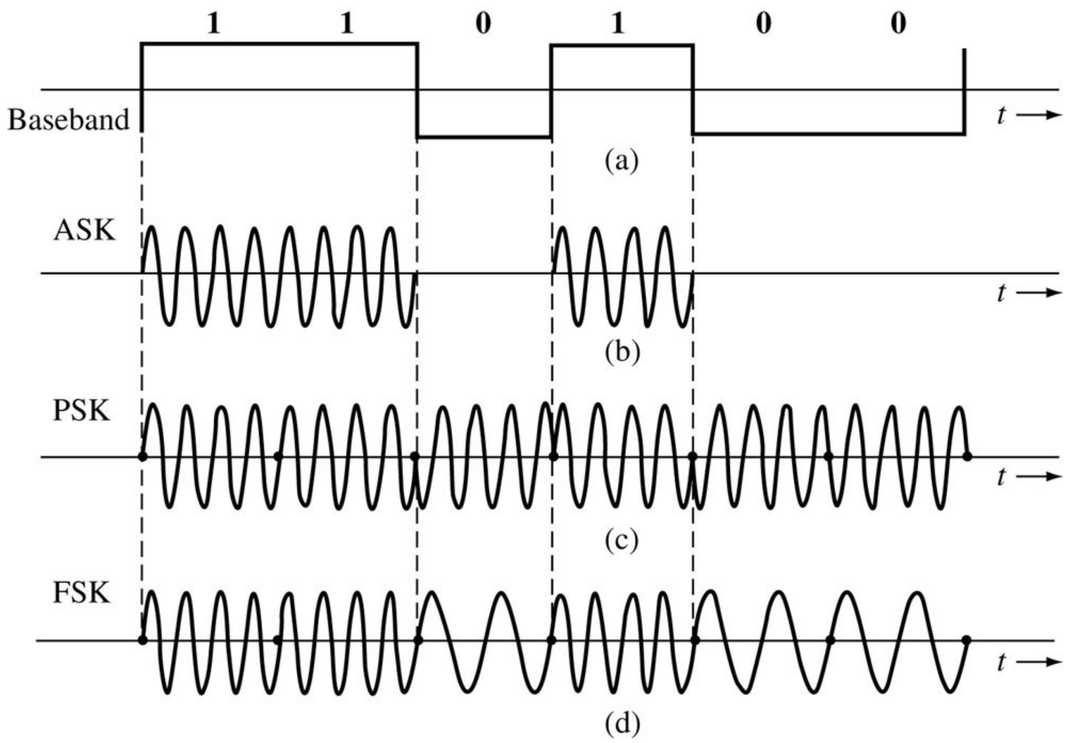


Figure Digital modulated waveforms.

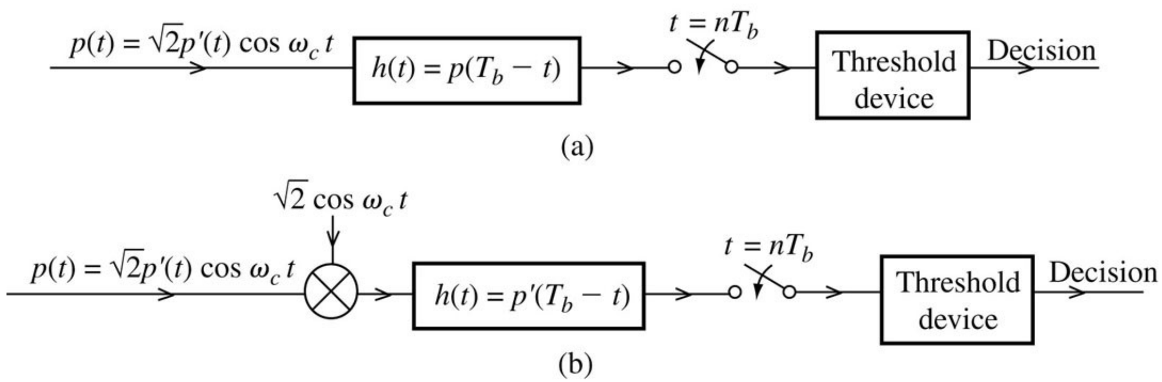


Figure Coherent detection of digital modulated signals.

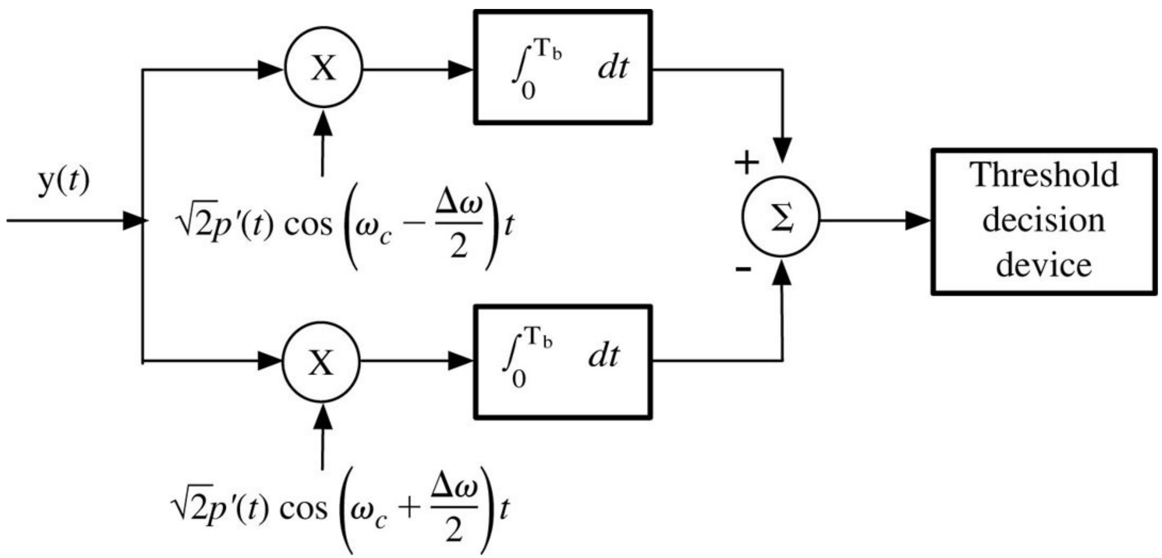


Figure Optimum coherent detection of binary FSK signals.

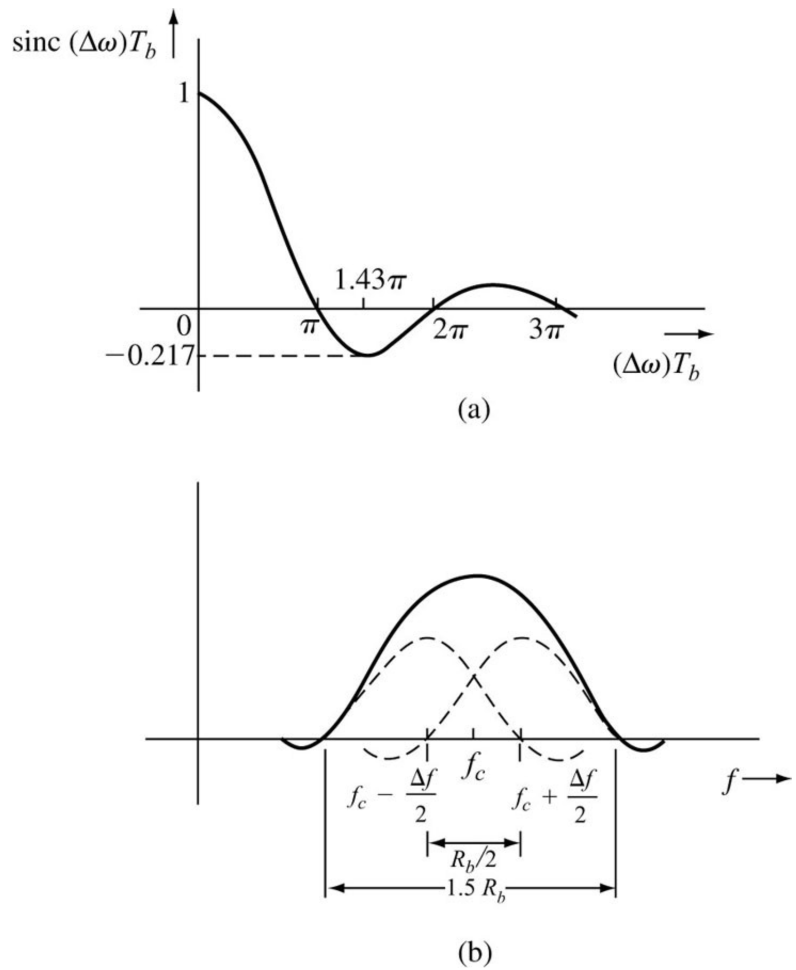


Figure (a) The minimum of the sinc function and (b) the MSK spectrum.

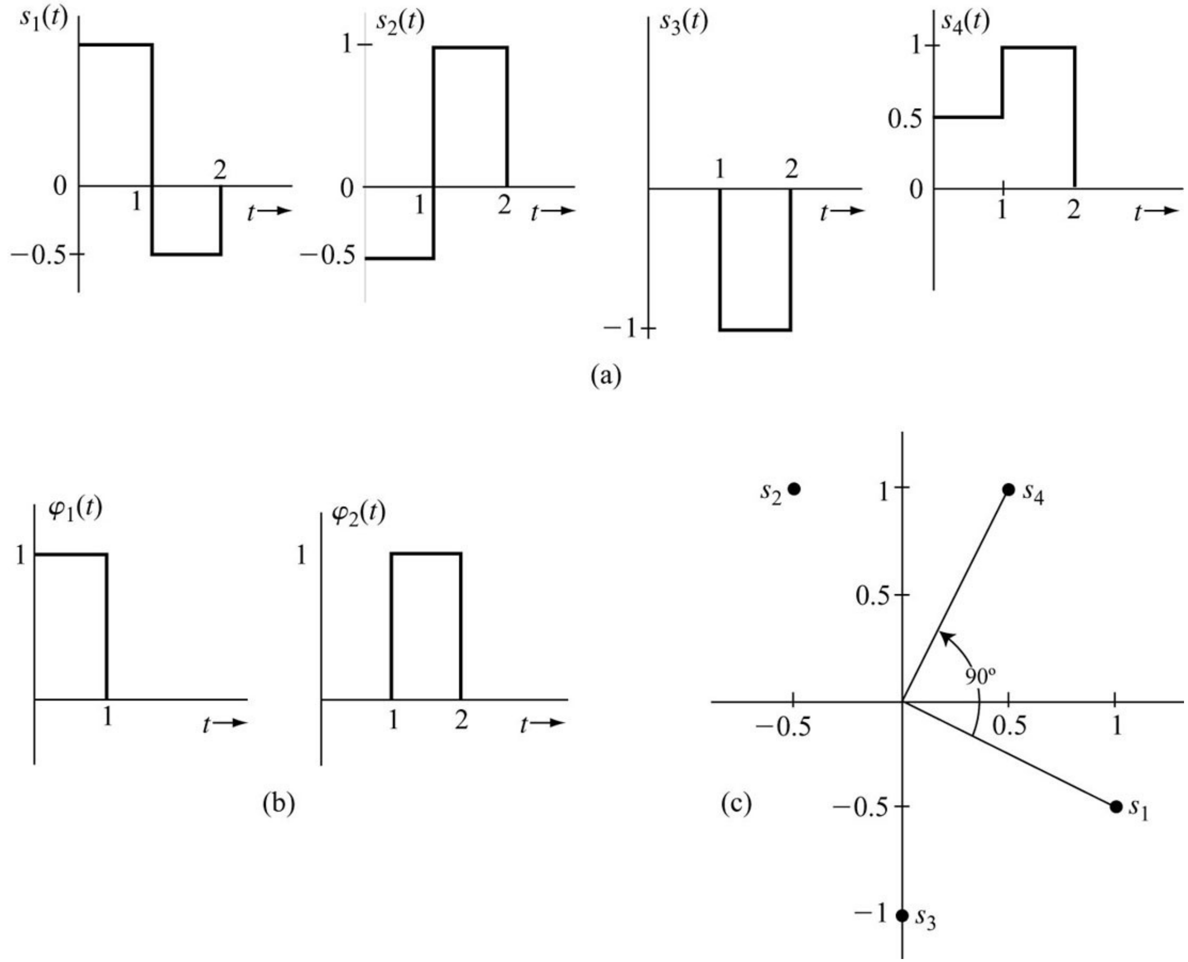


Figure Signals and their representation in signal space.

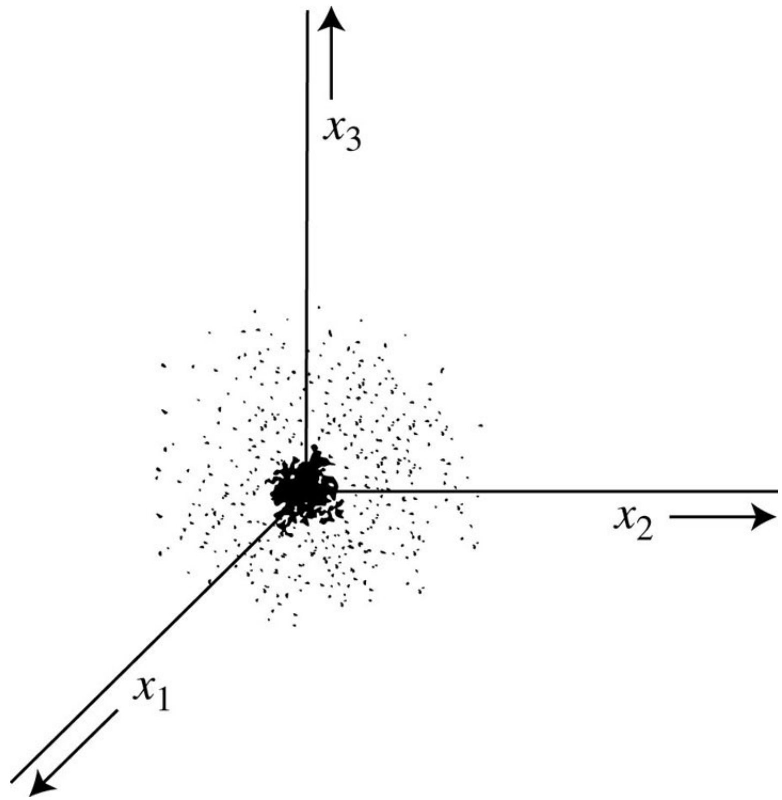


Figure Geometrical representation of a Gaussian random process.

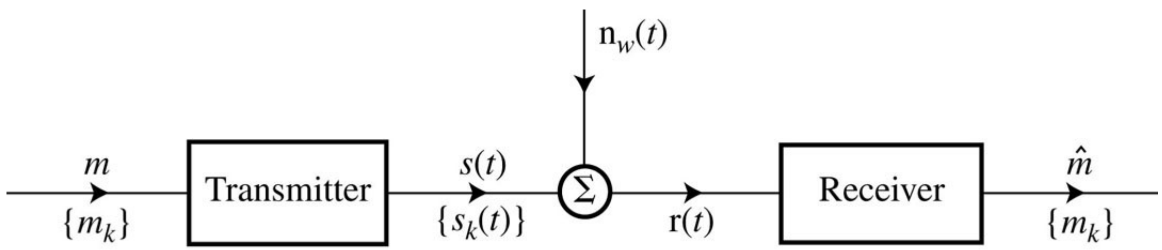


Figure *M*-ary communication system.

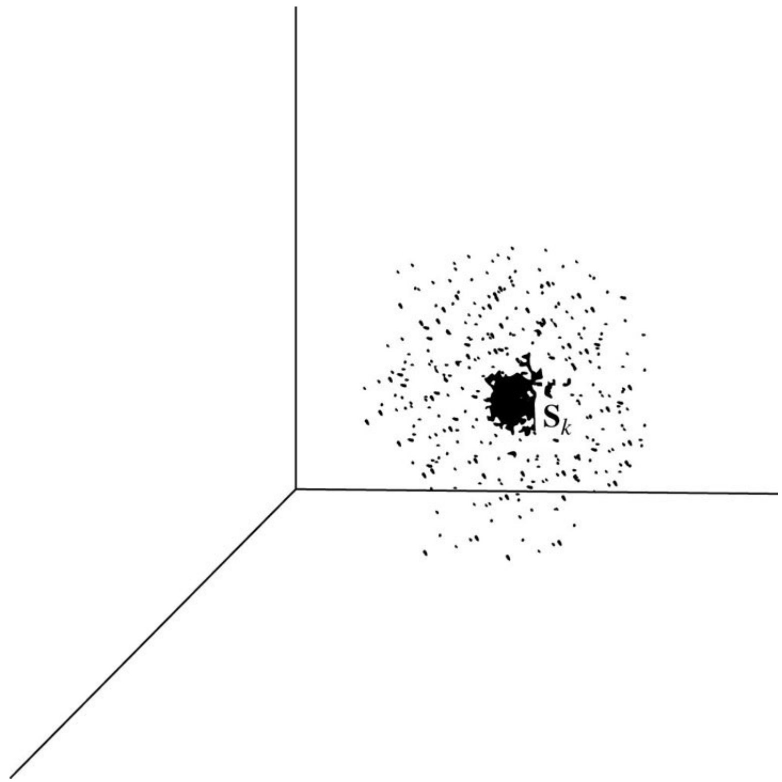


Figure Effect of Gaussian channel noise on the received signal.