

1. Please describe about Near-end crosstalk and Far-end crosstalk, and which is the main interference?

Sol:

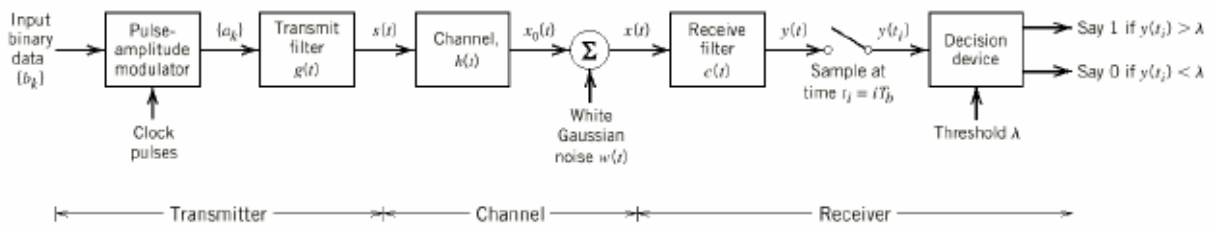
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2. Briefly describe about Time compression multiplexing and Echo-cancellation mode. What is the main difference between them?

Sol:

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- 3.



For this system, the mean-square error J_i (after sampling at receiver) is

$$J_i = \frac{1}{2} \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} c(\tau_1)c(\tau_2)R_q(\tau_1, \tau_2; i)d\tau_1d\tau_2 + \frac{N_0}{4} \int_{-\infty}^{\infty} c^2(\tau_1)d\tau_1 + \frac{1}{2} \int_{-\infty}^{\infty} c(\tau_1)q(-\tau_1)d\tau_1$$

$$\text{where } R_q(s, \tau; i) = \sum_k q(iT_b - kT_b - s)q(iT_b - kT_b - \tau) \text{ and } q(t) = g(t) * h(t)$$

Please find the frequency response $C(f)$ of the receive filter which could achieve the minimum-mean square error (MMSE equalizer).

Sol:

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