

# Transmission: Digital vs. Analog

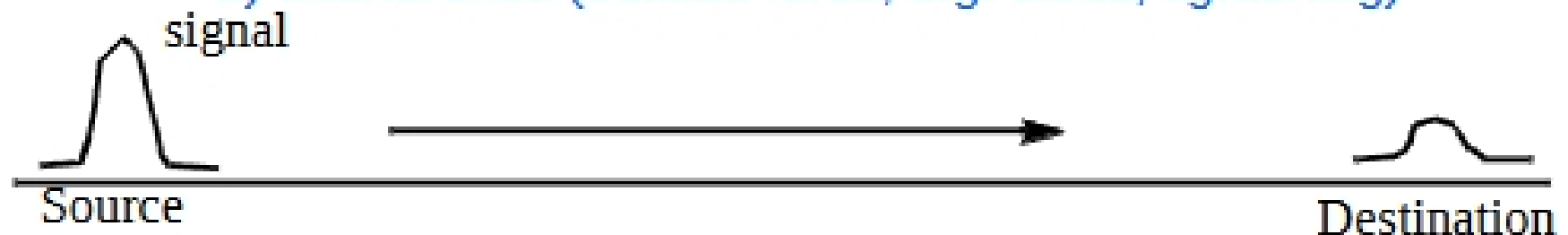
Problem 1: Transmit information “faithfully” (with little or no distortion) to the receiver

Reality: signal got distorted over distance

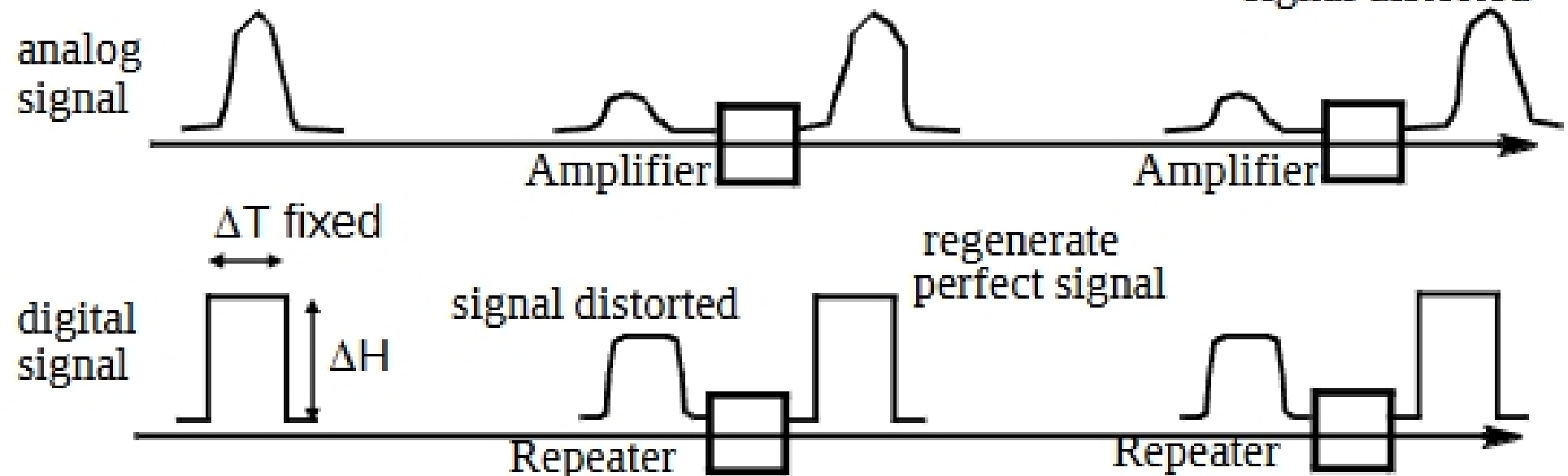
because

1) impedance (within transmission medium)

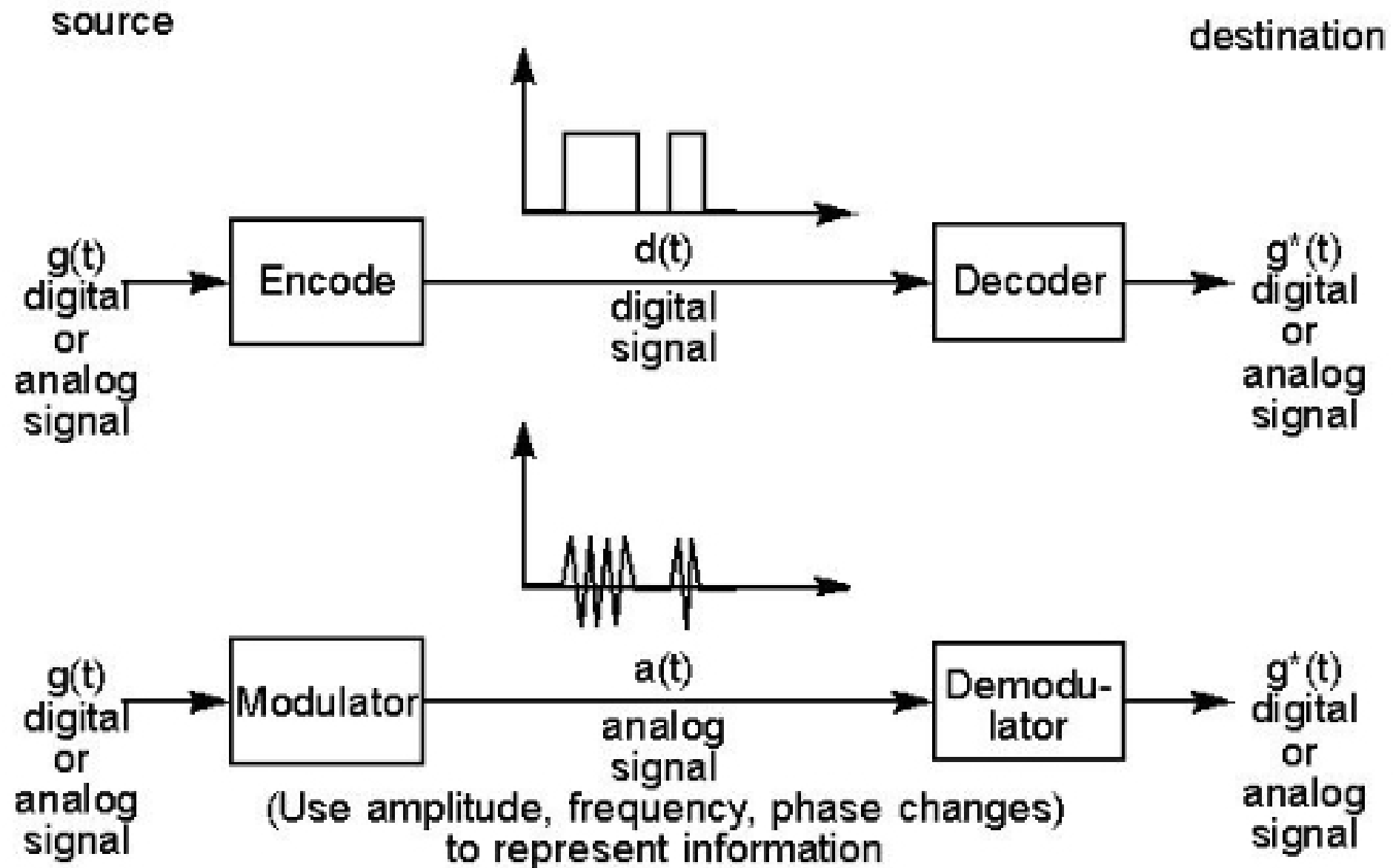
2) interference (outside force, e.g. cloud, lightening)



Solutions:



# Data Encoding and Modulation



# Amplitude, Frequency, and Phase of a Signal

$$s(t) = A \sin(2\pi ft + \theta) \quad \text{Amplitude}=A; \text{ Frequency}=f; \text{ Phase}=\theta$$

