

Fundamentals of Telecommunications

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- ❑ Time Division Multiplexing T1, T3, DS1, E1
- ❑ T1 Framing
- ❑ Echo Cancellation
- ❑ Signaling

Time Division Multiplexing

- ❑ Voice signal has a bandwidth of 4 kHz
- ❑ Nyquist sampling theorem:
Sample at twice the highest signal frequency
 - ⌚ Sample at 8 kHz
 - ⌚ Sample every 125 μ sec
- ❑ 256 levels \Rightarrow 8 bits per sample \diamond 8000 samples/sec
= 64 kbps
- ❑ In 1962, telephone carrier cable between Bell System offices could carry approx 1.5 Mbps over a mile
 - = Distance between manholes in large cities
 - = Distance between amplifiers