E and T carrier

E AND T CARRIER:

T CARRIER:

In telecommunications, **T-carrier** is the generic designator for any of several digitally multiplexed telecommunications carrier systems originally developed by Bell Labs and used in North America, Japan, and South Korea.The basic unit of the T-carrier system is the DS0, which has a transmission rate of 64 kbit/s, and is commonly used for one voice circuit."**T1**" now means any data circuit that runs at the original 1.544 Mbit/s line rate. Originally the T1 format carried 24 pulse-code modulated, time-division multiplexed speech signals each encoded in 64 kbit/s streams, leaving 8 kbit/s of framing information which facilitates the synchronization and de-multiplexing at the receiver. T2 and T3 circuit channels carry multiple T1 channels multiplexed, resulting in transmission rates of 6.312 and 44.736 Mbit/s, respectively.

T-Carrier Designation	DS Designation	Speed
	DS-0	64 Kbps
T-1	DS-1 (24 DS-0)	1.544 Mbps
T-2	DS-2 (96 DS-0)	6.312 Mbps
T-3	DS-3 (672 DS-0)	44.375 Mbps
T-4	DS-4 (178 T-1)	274.176 Mbps

E CARRIER:

In digital telecommunications, where a single physical wire pair can be used to carry many simultaneous voice conversations by time-division multiplexing, worldwide standards have been created and deployed. The European Conference of Postal and Telecommunications Administrations (CEPT) originally standardized the**E-carrier** system, which revised and improved the earlier American T-carrier technology,

In practice, only E1 and E3 versions are used. Physically E1 is transmitted as 32 timeslots and E3 512 timeslots, but one is used for framing and typically one allocated for signalling call setup and tear down.E1 circuits are very common in most telephone exchanges and are used to connect to medium and large companies, to remote exchanges and in many cases between exchanges. E3 lines are used between exchanges, operators and/or countries, and have a transmission speed of 34.368 Mbit/s.

An E1 link operates over two separate sets of wires, usually twisted pair cableThe line data rate is 2.048 Mbit/swhich is split into 32 timeslots, each being allocated 8 bits in

turn.Thus each timeslot sends and receives an 8-bit PCM sample, usually encoded according to A-law algorithm, 8000 times per second (8 x 8000 x 32 = 2,048,000). This is ideal for voice telephone calls where the voice is sampled into an 8 bit number at that data rate and reconstructed at the other end. The timeslots are numbered from 0 to 31.

SIGNAL	DATA RATE
E0	64kbps
E1 - (32 DS-0)	2.048 Mbps
E2 – 128 E0	8.448 Mbps
E3 – 16 E1	34.368 Mbps
E4 – 4 E3	139.264 Mbps
E5 - 4 E4	565.148 Mbps

Properties:

	Common Characteristics	**E1 and T1**
a	Sampling Frequency	8KHz
b	Number of samples per telephone signal	8000 per second
c	Length of PCM Frame	1/8000 sec=125 micro-sec
d	Number of bits in each code word	8
e	Telephone Channel Bit Rate	8000 per sec*8 bits=64Kbps

	Differing Characteristics	**E1**	**T1**
a	Encoding/Decoding	A-law	U-law
	Number of segments in characteristics	13	15

b	Number of Timeslots per PCM frame	32	24
c	Number of bits per PCM frame	8*32=256 bits	8*24+1=193 bits
d	Length of an 8-bit timeslot	(125 micro-sec*8)/256= approx 3.9micro-sec	(125 micro-sec*8)/193=approx 5.2 micro-sec
e	Bit-rate of a TDM signal	8000*256 bits=204k8bps	8000* 193 bits=1544kbps

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