

FILES, DATA, AND SIGNALS

FILE

HAMLET.TXT

USER DATA

Yea, from the table of my memory
I'll wipe away all trivial fond records

INTERNAL

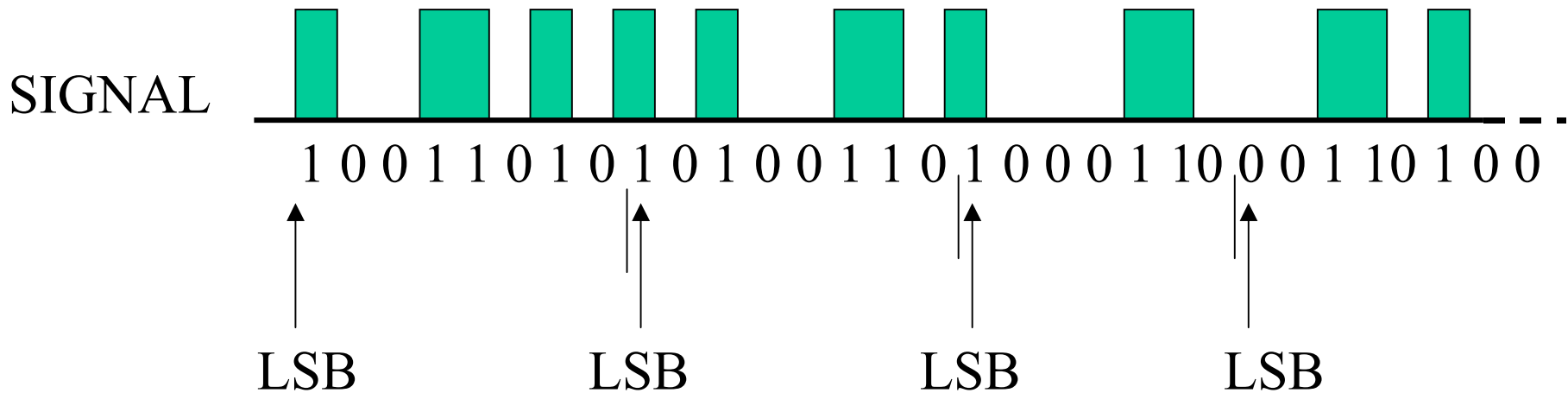
REPRESENTATION

OF USER DATA

y	e	a	,	b
01011001	01100101	01100001	00101100	00100000
f	r	o	m	b
01100110	01110010	01101111	01101101	00100000

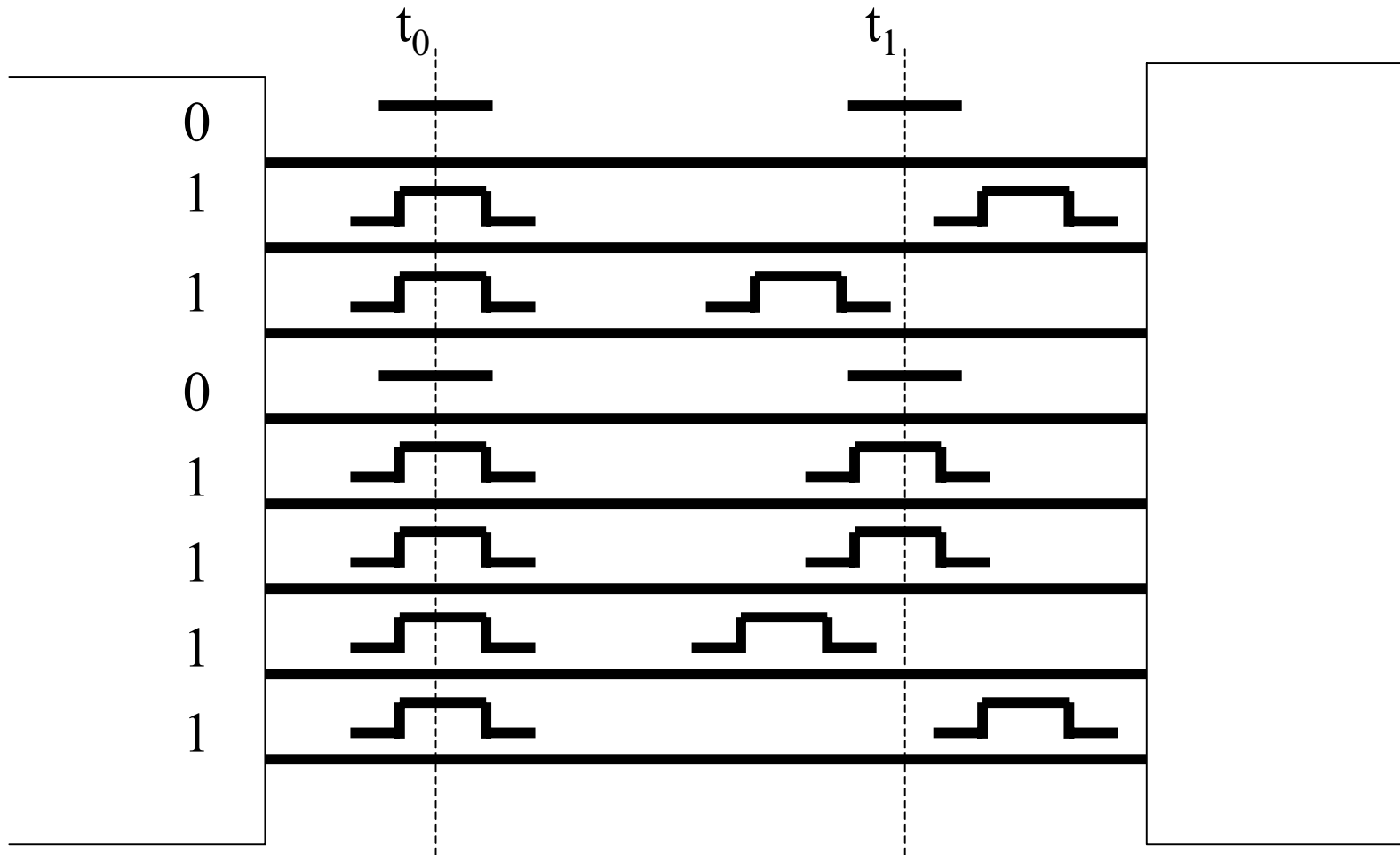
- Internal representation of information stored in n-bit entities corresponding to a particular character code (e.g., ASCII is shown here).

FILES, DATA, AND SIGNALS (cont.)



- SIGNAL – External representation of user data
 - Mapping of bits to a signal depends only on choice of implementer. NonReturn to Zero-Level (NRZ-L) shown, but other signaling types are possible.

SKEW

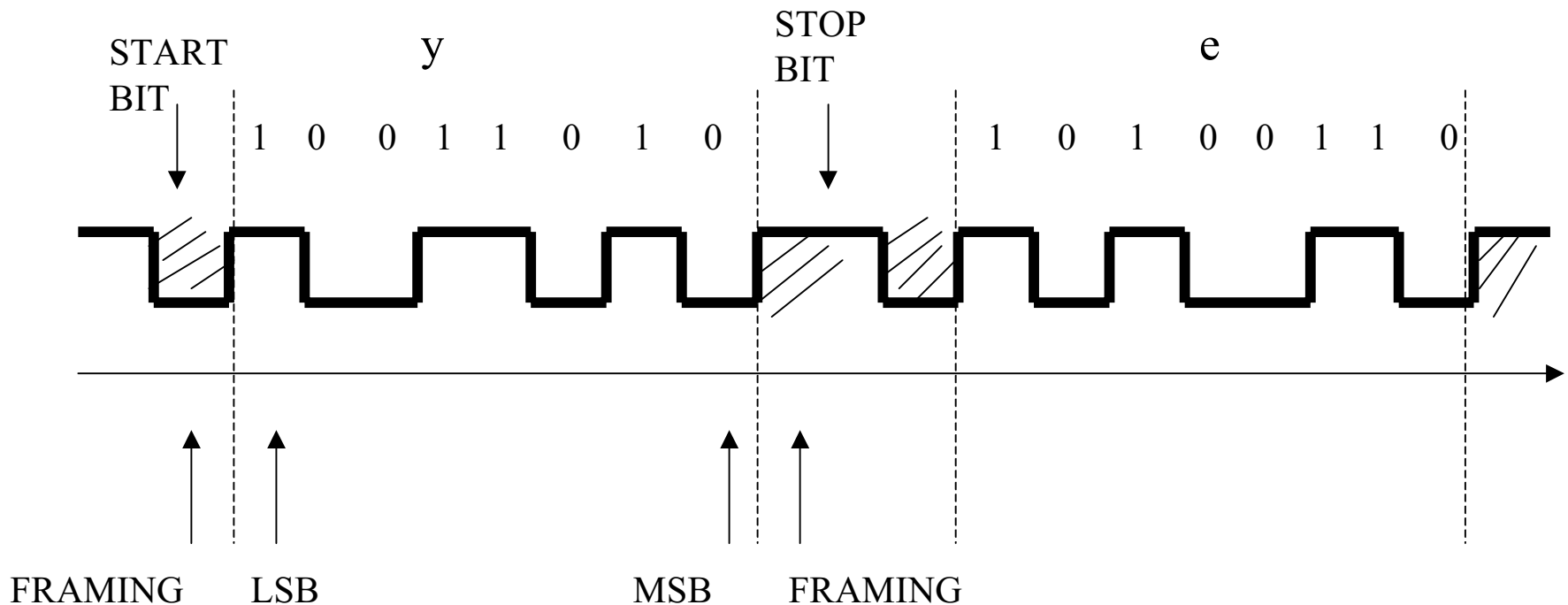


SKEW: The arrival of bits from the same character at different times may lead to erroneous reception.

SERIAL VS. PARALLEL TRANSMISSION

	SERIAL	PARALLEL
APPLICATIONS	DTE – DTE. Longer distances.	CPU-peripheral, internal to computer. Relative short distance
ADVANTAGES	Long distances possible. Easier to implement. Device-independent.	Very high throughput. Matches internal architecture.
DISADVANTAGE	Relatively low speeds. Parallel-to-Serial Conversion required.	Extra cable, connectors, Amplifiers, and Clock add expense. Skew limits distance.

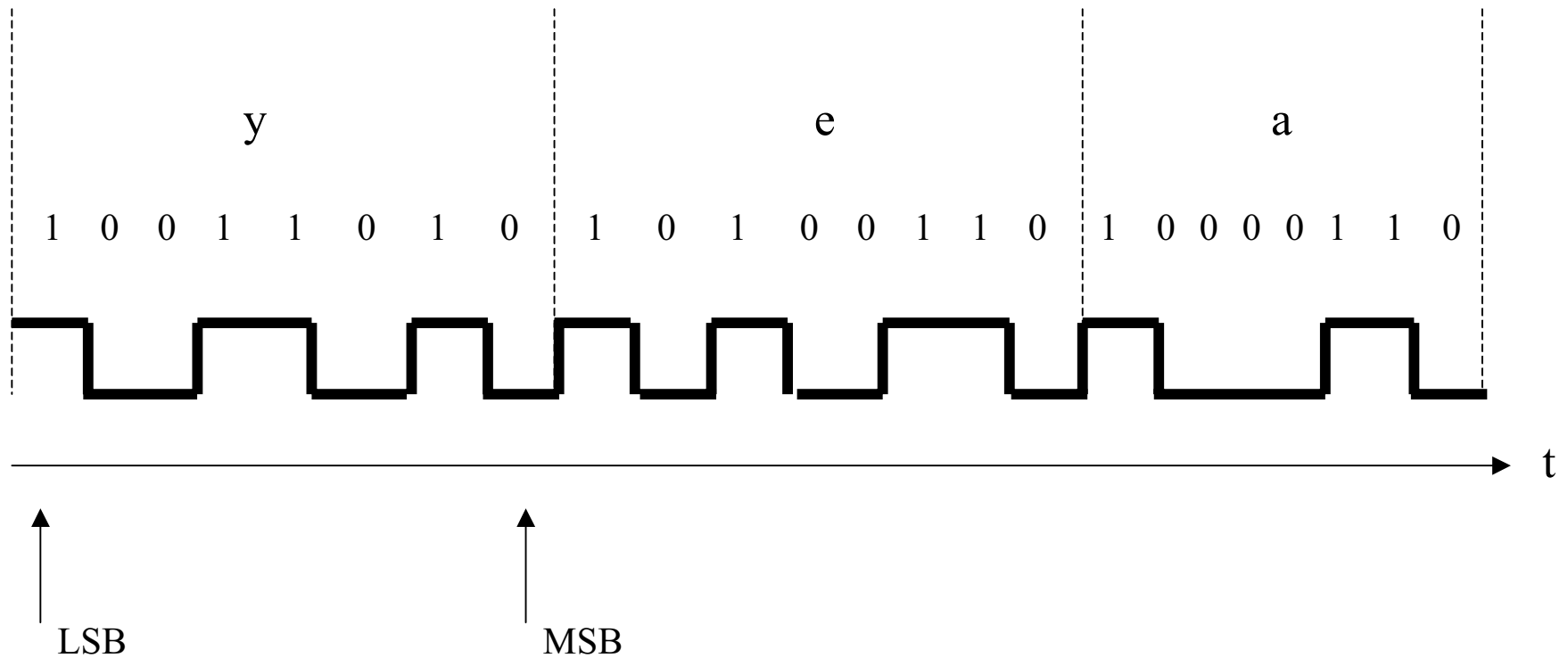
ASYNCHRONOUS TRANSMISSION



Asynchronous transmission:

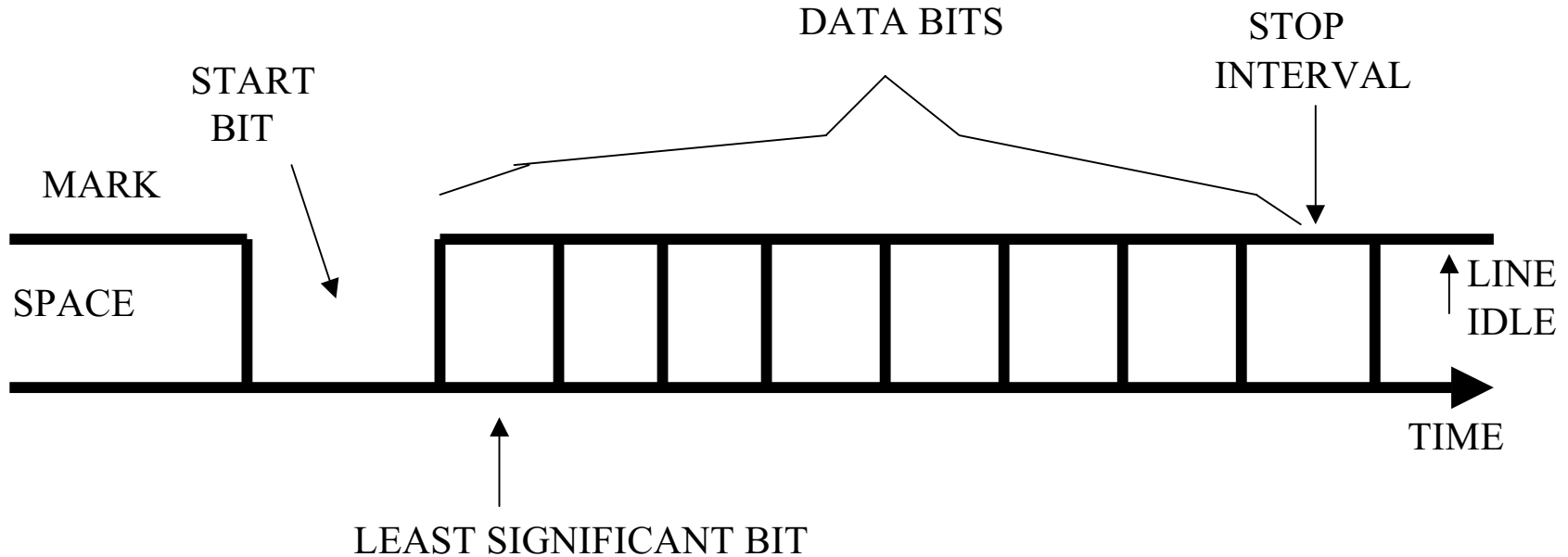
- Timing of each bit is specified within a character
- Inter-character time is non-uniform
- Each character must be framed

SYNCHRONOUS TRANSMISSION



- Characters, within a block, are sent contiguously
- Each block is framed

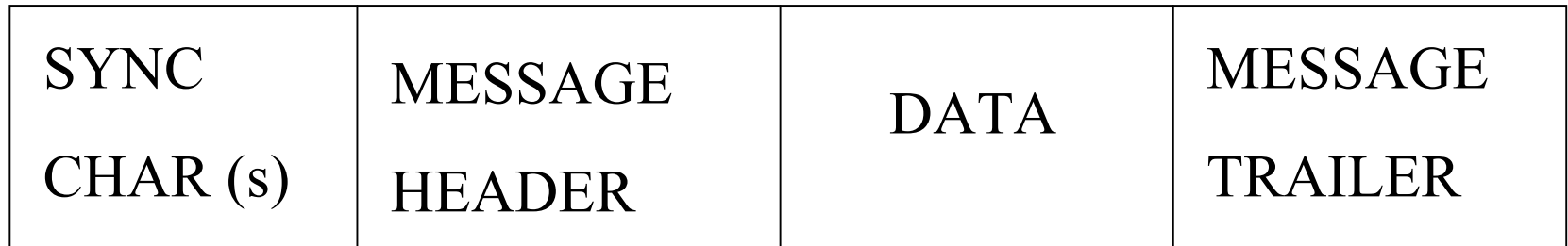
ASYNCHRONOUS CHARACTER FORMAT



Transmitter and receiver must agree on:

- Number of data bits per character
- Length of a bit time
- Length of the stop interval
- Signal level
- Order of bit transmission
- Character code

SYNCHRONOUS MESSAGE FORMAT

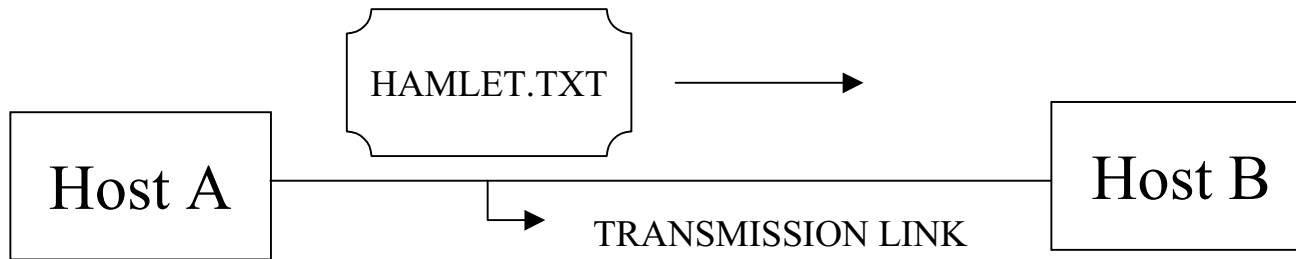


- All data characters sent as part of a continuous transmission block (frame)
- Transmitter and receiver must agree on:
 - Transmission format
 - Length of a bit time
 - Signal levels
 - SYNC characters
 - Size and content of header and trailer

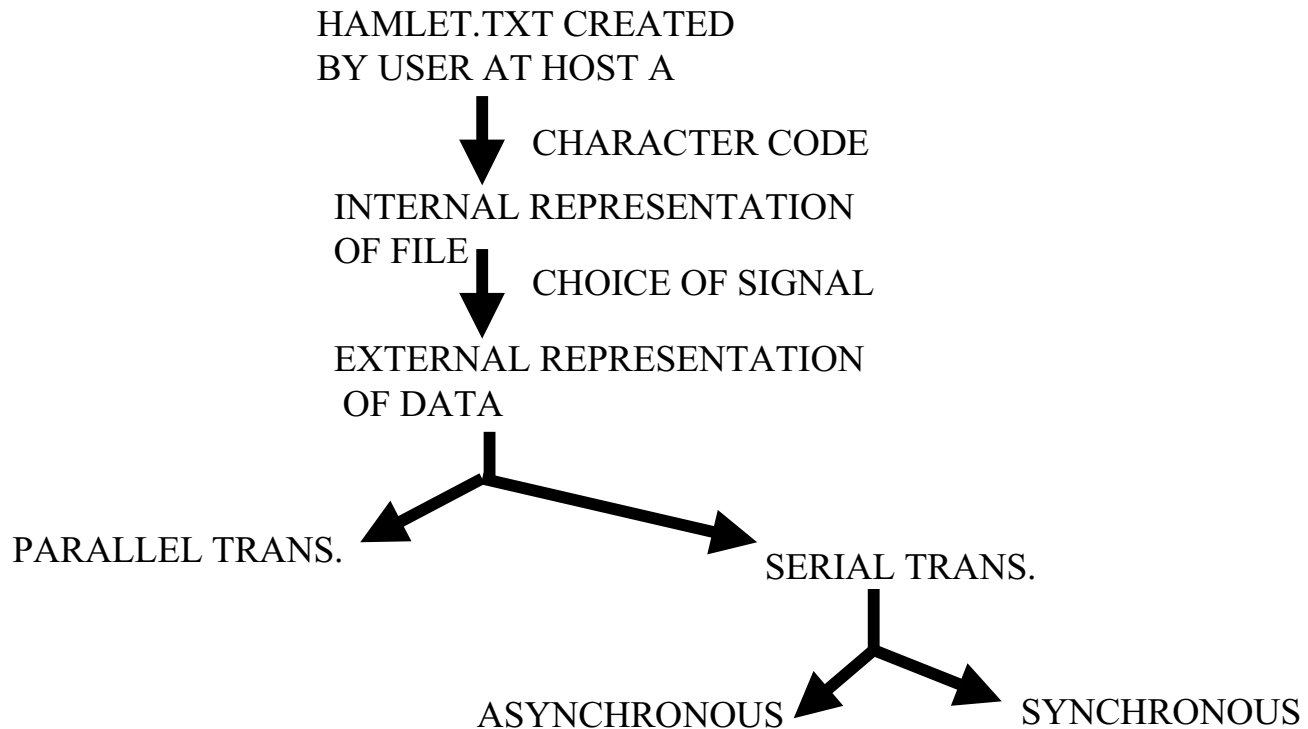
ASYNCHRONOUS VS. SYNCHRONOUS TRANSMISSION

	ASYNCHRONOUS	SYNCHRONOUS
APPLICATIONS	Between a terminal and computer or between low-cost computer – and - computer	High-speed Device interconnection.
ADVANTAGES	Simple to implement. Low cost. Clock resynchronizes with each character.	High throughput. High line efficiency
DISADVANTAGES	Low line efficiency Low speed (<20,000 bps)	Error detection protocol required. Self-clocking signaling Technique required. High cost.

A FILE TRANSFER



- **FILE TRANSFER: THE STEPS IDENTIFIED IN THIS UNIT**



- **ADDITIONAL AGREEMENTS STILL REQUIRED**