Communication Protocols

Please do the following exercises individually.

UART Transmission

Please draw the signal sequence of a UART transmission and calculate the transmission time of one bit and of the complete frame. The character to transmit is *S* (53_{hex}), the parameters are 19200 7E2. Use the following grid to present your solution.

Description															
Name															
Signal															

UART Reception

The following signal of a UART transmission has been recorded. Please fill in the description and the name of the individual bits and determine which character has been sent. Please specify, too, which parameters have been used[1] and draw the state diagram of this reception.

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Name													
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[1] Assume that no parity bit has been used.

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Parameter 192000 7E2: 19200 bps, 7 data bits, even parity, two stop bits

Bit to transmit: S → 53_{hex} → 0101 0011 → 1100 101 (7 data bits in transmission order)

Parity bit: 1100 101 → already even parity → 0

Description	standby	sync	data bits							parity	sync		standby
Name		start	0	1	2	3	4	5	6	E	stop	stop	
Signal													

Transmission time of one bit: 19200 bps → 1s / 19200 per bit → 52 µs

Transmission time of one frame: 1 frame = 11 bits → 11 · 52 µs → 573 µs = 0.57 ms ≈ ½ ms

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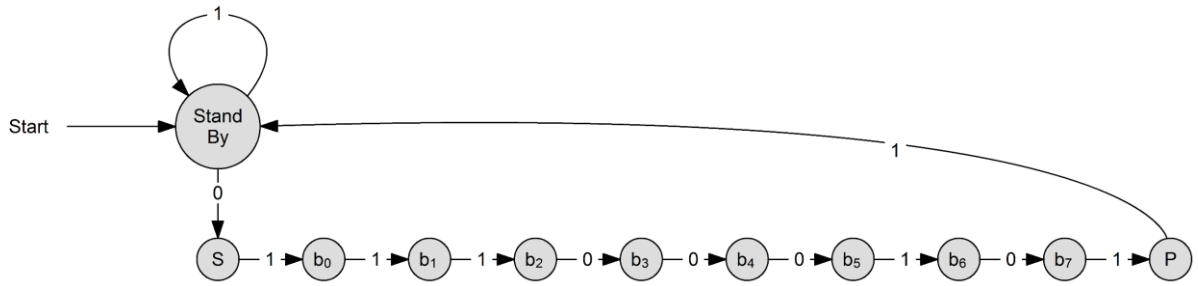
Description		sync	data bits								sync	
Name	standby	start	0	1	2	3	4	5	6	7	stop	standby
Signal												

Parameters used for this transmission: 8N1

Transmitted character: 0100 0111 → 47_{hex} → G

State diagram:



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