

Binary:

1 → frequency of 1khz

0 → frequency of 2 khz

There is a set amount of time between each bit something like 300ms (will have to be figured out)

To transmit a character the transmitter sends a frame.

A frame is made up of 12 bits: a start bit, a heading bit (to know if the next frame is a letter or number) 8 data bits using the ascii conversion, a parity bit, and a stop bit. One frame represents one character

Parity bit:

The point of a parity bit is incase the receiver miss receives one of the data bits it can compare the number of 1s in the received data bits with the parity bit to see if the numbers of 1s in the data bit match up to the parity bit and if they dont it will just throw away that frame.

Start Bit	Heading Bit	Data Bits (8)	Parity Bit	Stop Bit
1	1 = number 0 = letter	Ascii bits	0 if the number of 1s in the data bits is even 1 if odd	0

For example the frame for the character "A" would be:

100100000100

Start bit (1): indicates a new frame

Heading bit (0): indicates this frame is a letter

Data Bits(01000001): ASCII binary for character "A"

Parity bit(0): Number of 1s in data bits is even

Stop bit(0): indicates the end of a frame

There has to be a set amount of time between frames (Ex. 500ms)

This ensures the receiver knows if it dropped a bit.

For Example:

If the frame being transmitted is 110100000000 and it accidentally skips the start bit it will read each bit every 300ms but then it will get to the end of the frame it will expect another bit after 300ms but instead it will get the next bit (A start bit from the next frame) in 500ms indicating to the receiver that it dropped a bit.

Theoretically the heading bit is not needed because ASCII distinguishes between letters and numbers without the need for the heading bit but a heading bit would allow multi-digit numbers

to be transferred in one frame making it more efficient for example if you wanted to transfer the number 29 without the heading bit it would be [111001010] [111100100] ([] denotes a new frame). Where if you had the heading bit 29 could just be transferred as [110001110100] which is more efficient. The issue is when you have numbers greater than 255 (the maximum number represented by 8 bits) because you would need multiple frames. An idea is that if a number is greater than 255 it can be broken down into smaller chunks for example 256 could be broken into 25 and 6 which still is more efficient than without the heading bit because that only requires 2 frames where without the heading it requires 3.