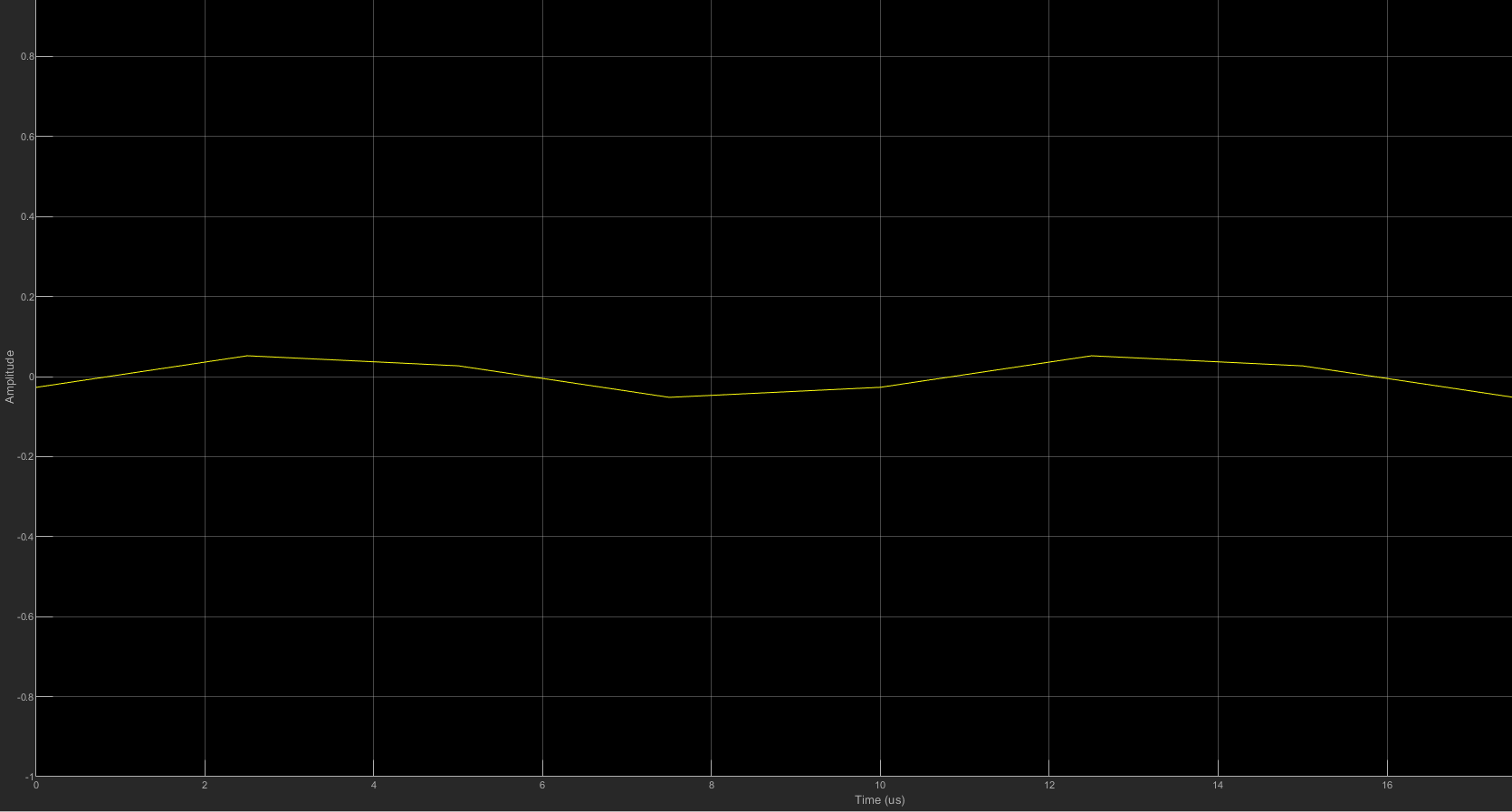
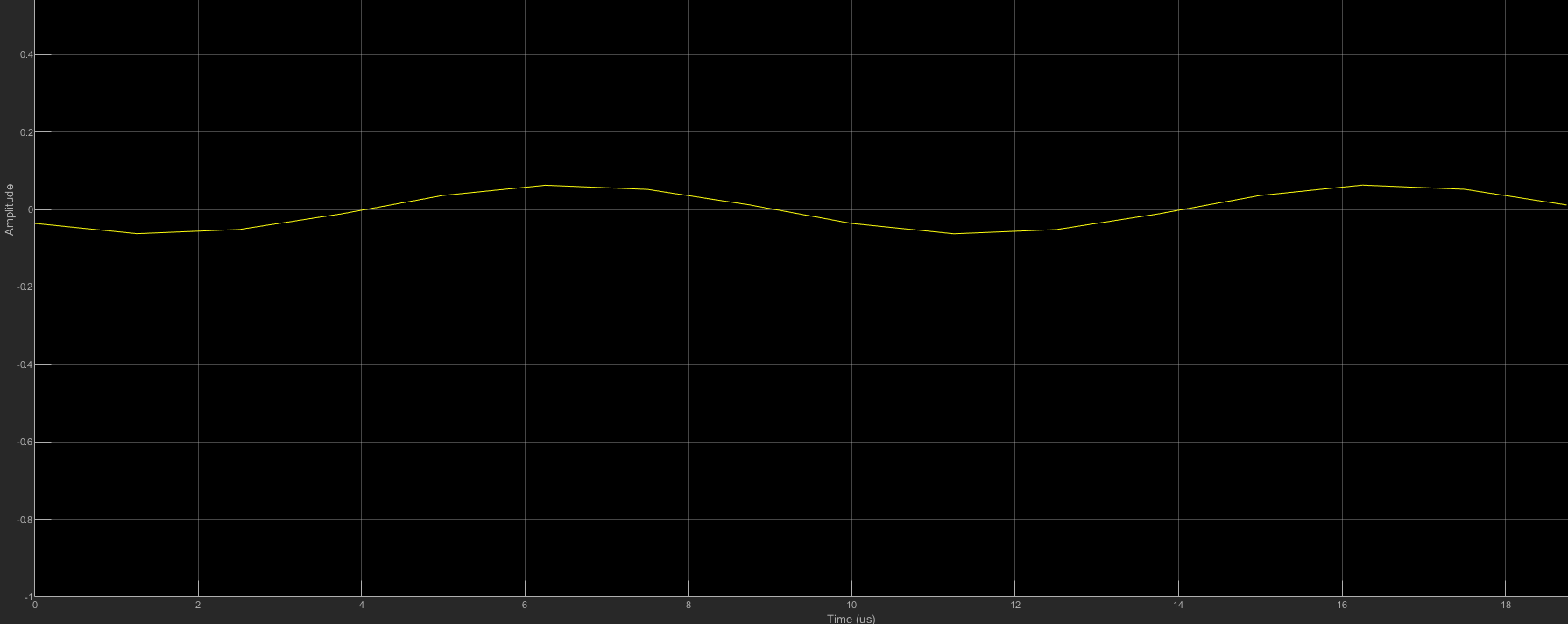
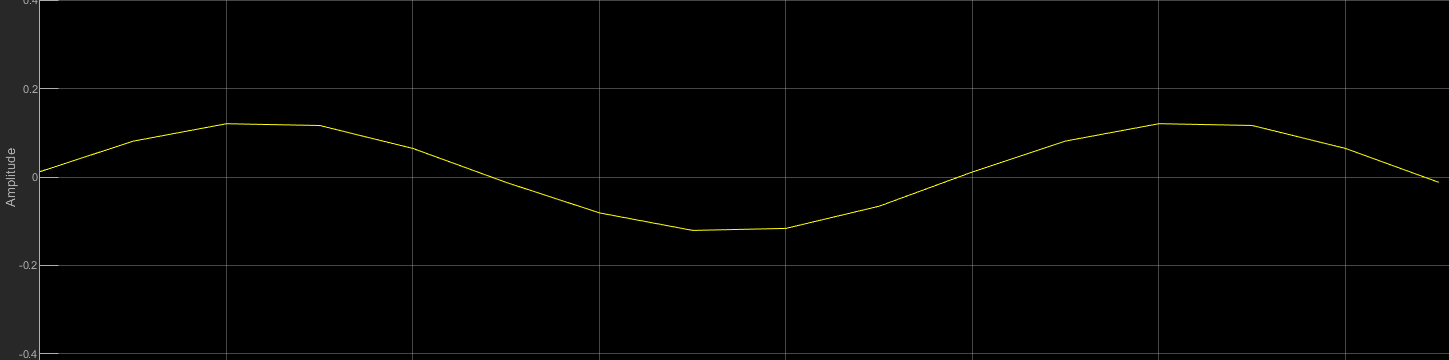
* Sine Wave – 100Khz f1
  + At 400KHz Sampling Rate
    - t1 = 2.5us



* At 800KHz Sampling rate
  + t1 = 1.25us



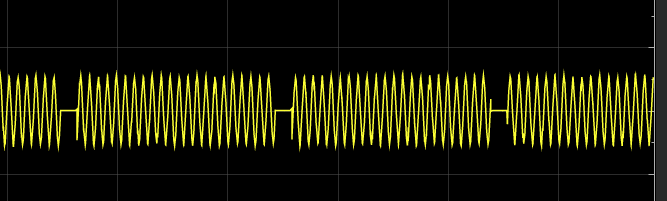
* At 1MHz Sampling Rate
  + t1 = 1 us

****

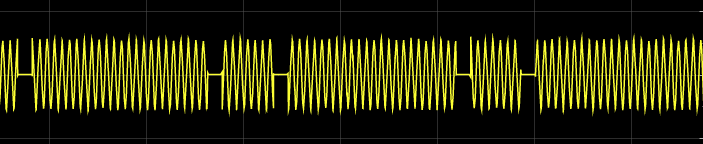
* Frequency Offset Calibration
  + [**https://www.mathworks.com/help/supportpkg/usrpradio/ug/frequency-offset-calibration-with-usrp-tm-hardware.html**](https://www.mathworks.com/help/supportpkg/usrpradio/ug/frequency-offset-calibration-with-usrp-tm-hardware.html)
  + Subtract 2.344 from receiver center frequency

**Reader Waveforms**

* Found out you need to have the antenna plugged into the reader for it to send out a signal (thought before the antenna was used to receive the signal)
* when the reader first gets turned on it is not sending out any signals
  + after sending out a command, the reader will continue to send out the RF field even if it not sending a command.
  + this RF field can be disabled by
    - unplugging and replugging in the reader
    - using the system reset command in ISOStart
    - or simply using the RF OnOff command in ISOStart
* For the inventory command under host commands in ISOStart.
  + the reader will continuously send out the inventory command by pressing start
  + this waveform will look like this:



* If the RF-reset option is checked, then it will reset the RF field after every inventory command, the waveform looks like this



* Judging from these two waveforms, it leads me to believe that the parts with a lot of pulses are the inventory command and the small pulses are either the RF field either starting up or turning off (will look more into this Thursday)
* The reader uses 1 out of 4 coding method
* Example of decoding waveform

A yellow lines on a black background

Description automatically generated with low confidence This kinds of waveform depicts a request



This is what it looks like zoomed in

You can see the first two dips indicate the Start of Frame. Which we know depicts the 1 of out 4 coding method

A picture containing line, diagram, screenshot, text

Description automatically generated

As you can see it starts with a low signal for 9.44 us. On the waveform the low signals start at the bottom (top) of the dip (peak).

A picture containing screenshot, line, text, design

Description automatically generated

Then the signal returns to normal for 37.76 us. then dips again

A picture containing screenshot, line

Description automatically generated

It is shown the timings are not always perfect, but they are pretty close

The signal then dips for another 9.44 us

A picture containing screenshot, line, parallel, text

Description automatically generated

Then is will be normal for 18.88 us

A screen shot of a graph

Description automatically generated with medium confidence

This is the whole start of frame from beginning to end

A picture containing screenshot, text, line, plot

Description automatically generated

After this the same method can be applied to the get the binary values according to the 1 out of 4 coding

Test Card UID: E0040100876A3E5C