Performace of SGTL500 in PJRC audioboard (with overclocking)
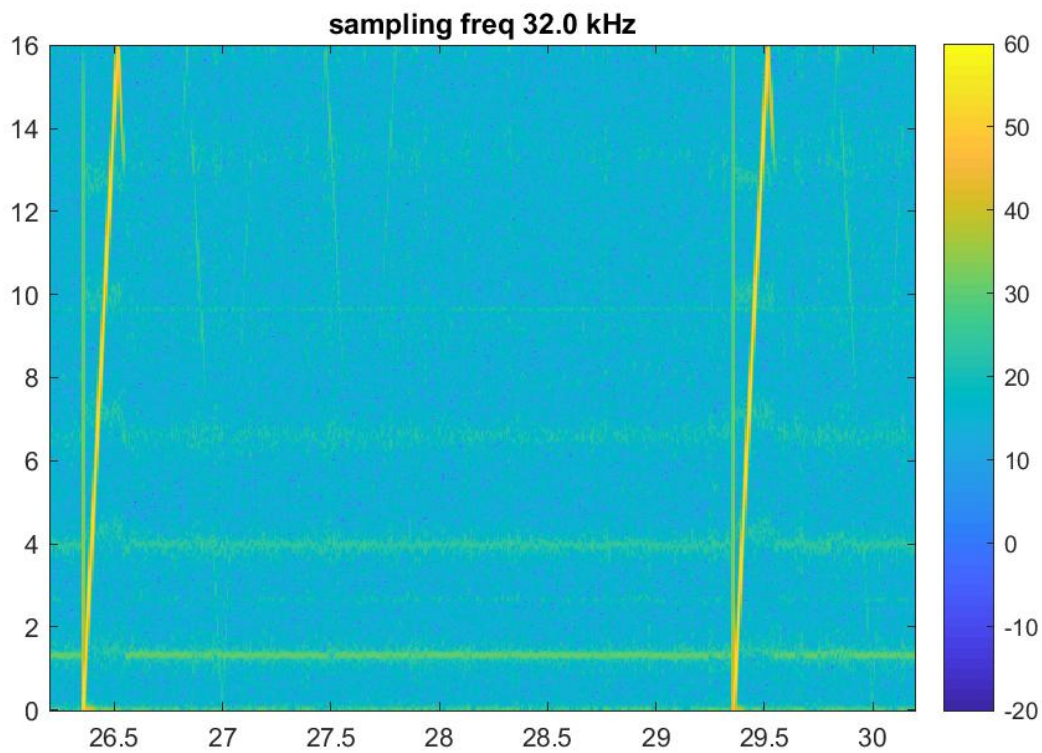WMXZ
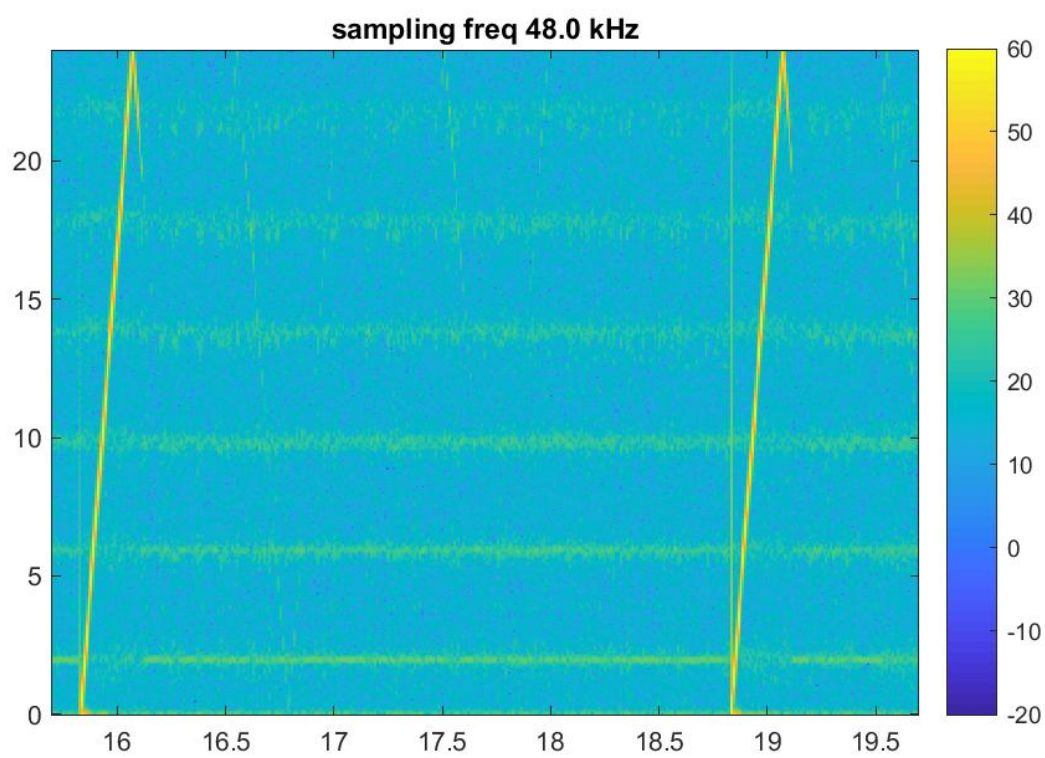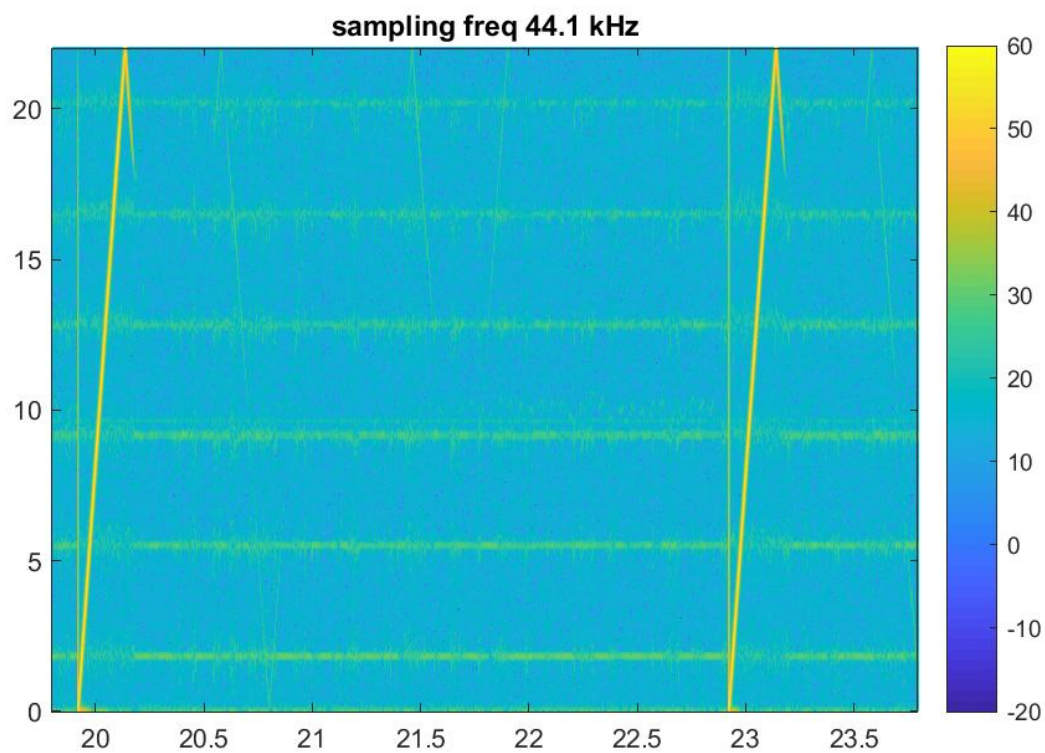
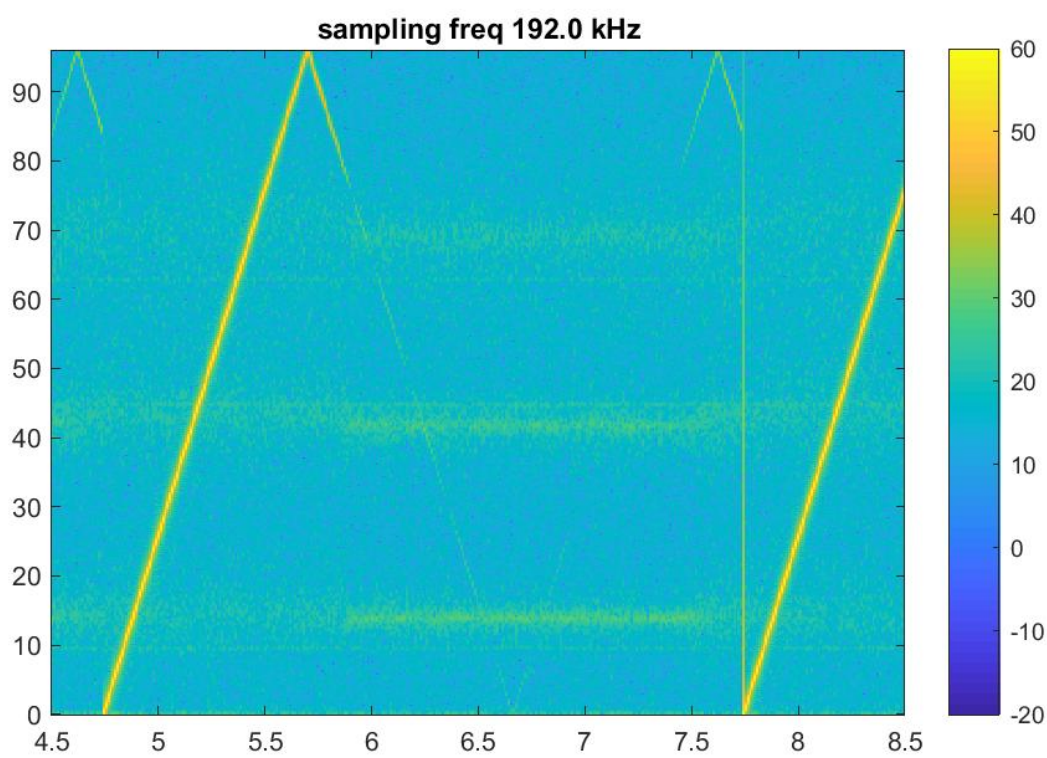Signal sweep 100Hz to 300 kHz in 3 seconds, 200 mVp, repeated continuously
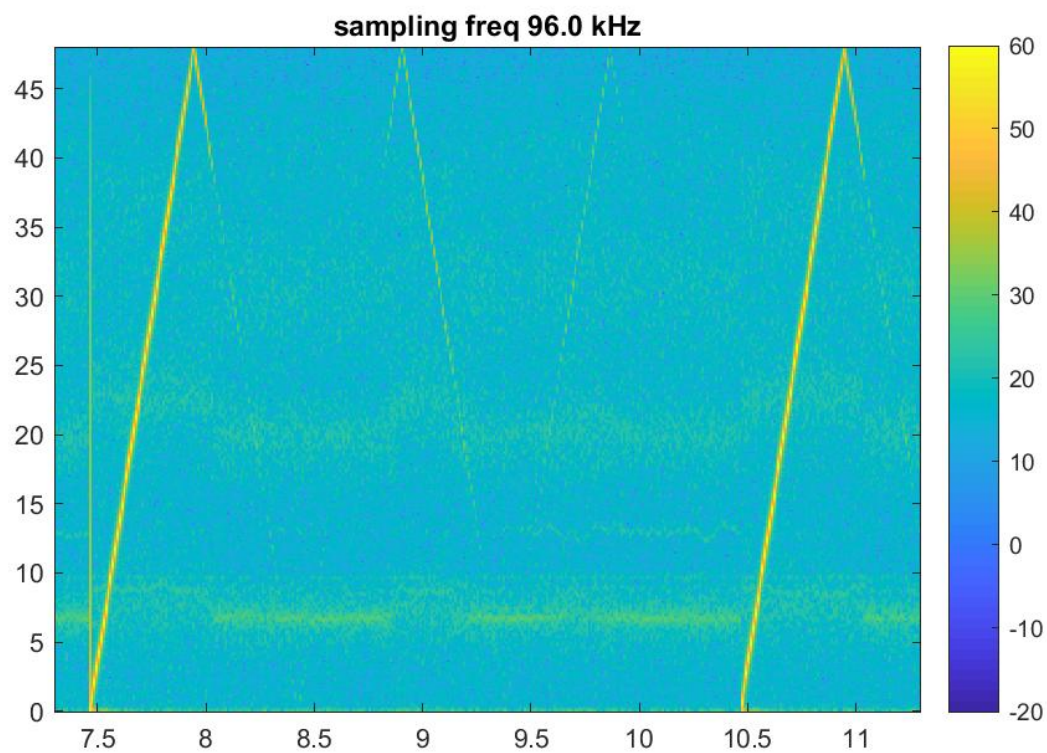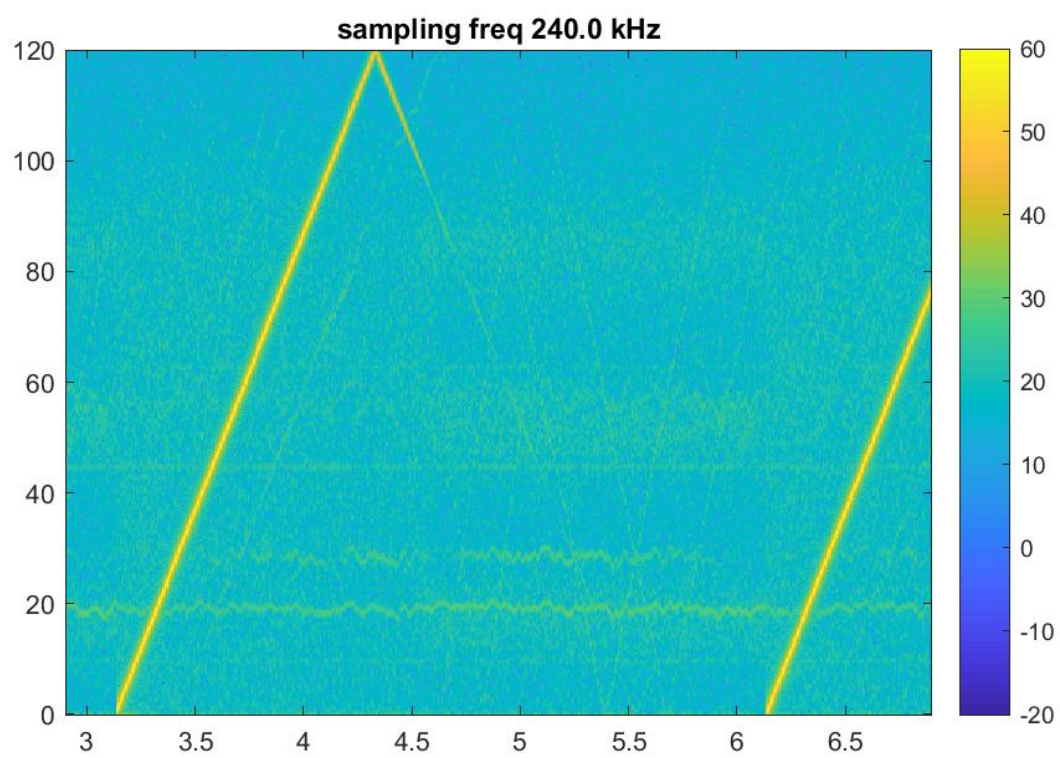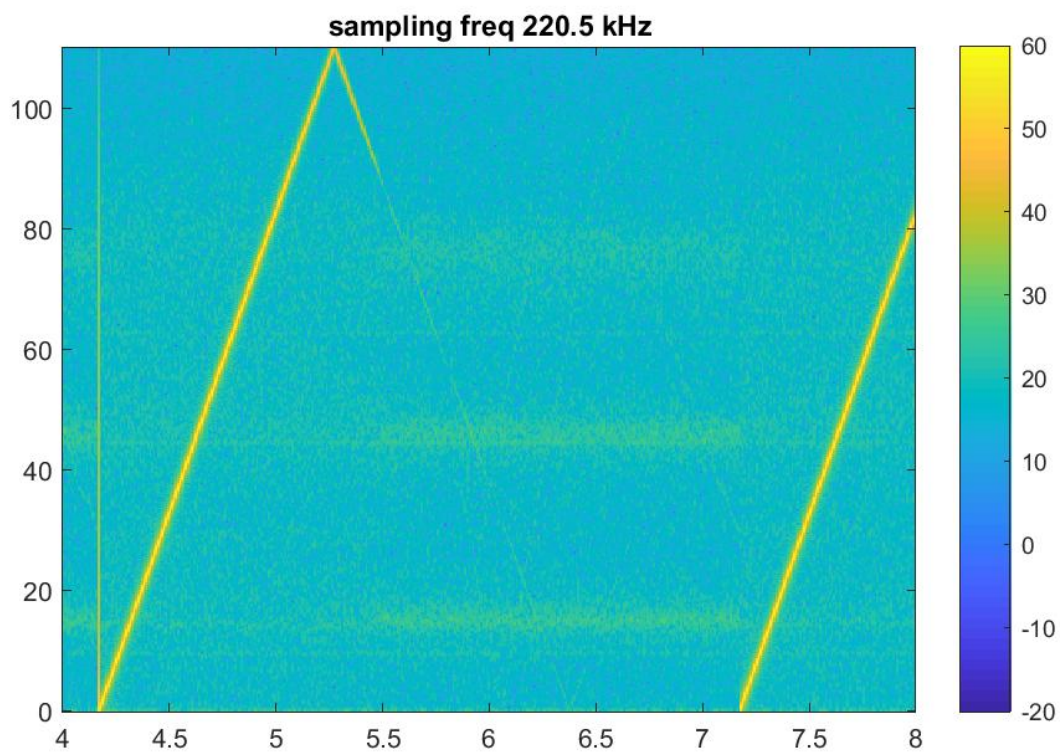
Setup

- Teensy3.6
- Audioboard
- Agilent 33220A (20 MHz Function Generator)
- Fluke 124 40 MHz Scopemeter to check waveform
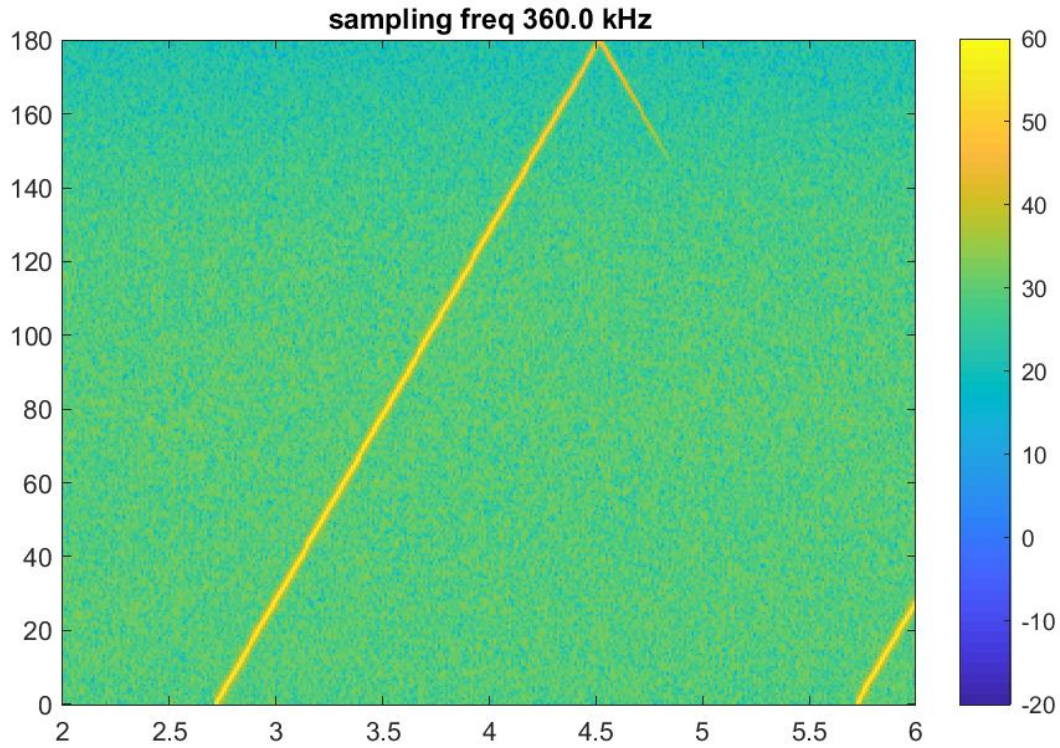- Data archived to T3.6 uSD

Spectrograms

sampling freq 44.1 kHz

sampling freq 48.0 kHz

sampling freq 96.0 kHz

sampling freq 192.0 kHz

sampling freq 220.5 kHz

sampling freq 240.0 kHz

sampling freq 360.0 kHz

Noise levels

Noise measured with same configuration, but with signal generator output switched off.

Total RMS Noise level relative to LSB

32.0 kHz	44.1 kHz	48 kHz	96 kHz	192 kHz	220.5 kHz	240 kHz	360 kHz
22.64 dB	22.59 dB	22.54 dB	22.32 dB	21.79 dB	22.00 dB	22.07 dB	33.45 dB

Noise levels are rather high due to electronic interferences in the testing environment of opportunity.
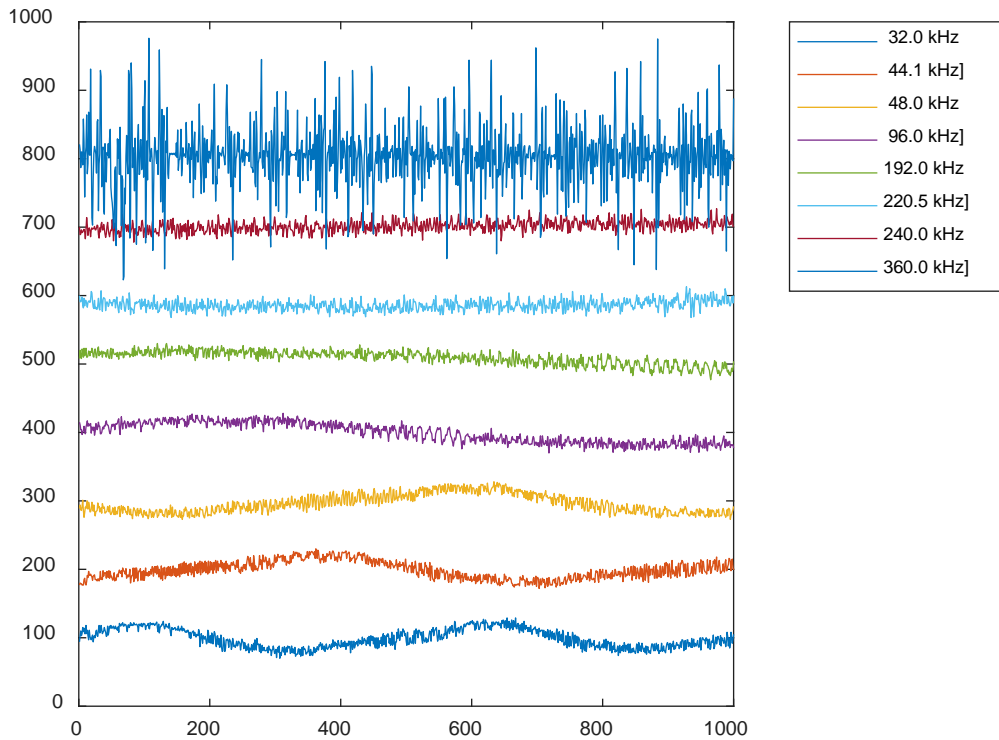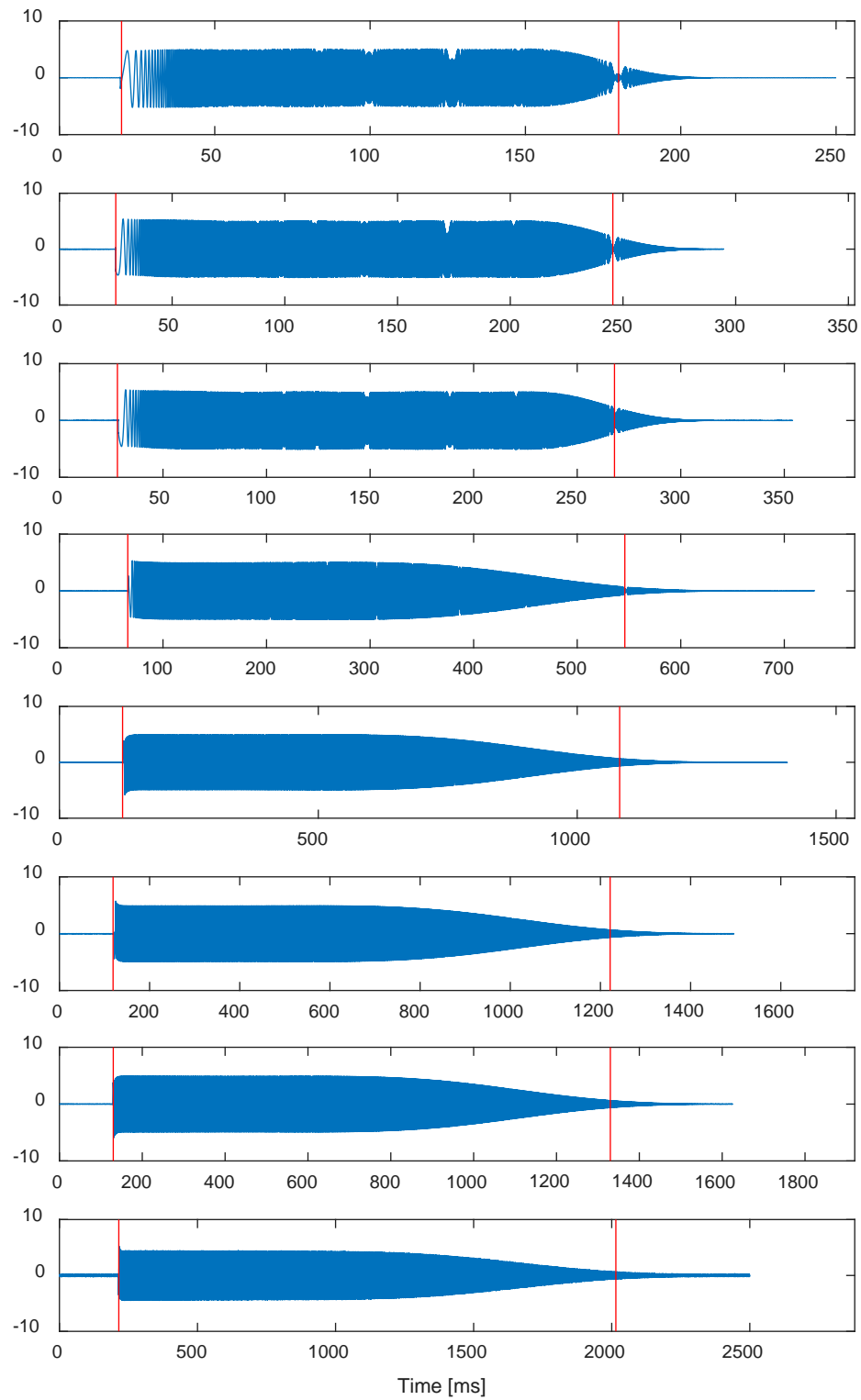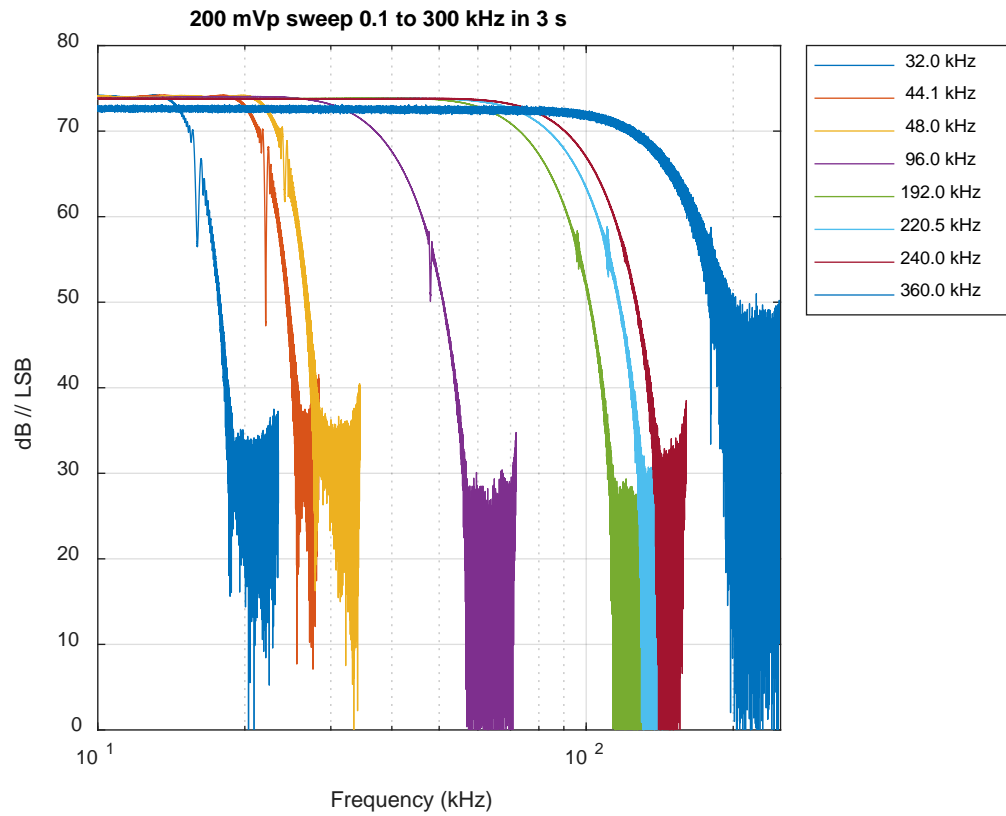
Frequency response

The following figure shows the rectangular Linear FM sweep in time domain. Top panel is 32 kHz and bottom panel is 360 kHz.

The red vertical lines show the start of the pulse and the nominal end of the pulse, where the pulse frequency equals the Nyquist frequency.

One realizes that while for sampling frequencies the transition band is relatively sharp, for sampling frequencies (96 kHz and higher) the transition band start very early.

Time [ms]

Resulting transfer function

200 mVp sweep 0.1 to 300 kHz in 3 s

Legend:
- 32.0 kHz
- 44.1 kHz
- 48.0 kHz
- 96.0 kHz
- 192.0 kHz
- 220.5 kHz
- 240.0 kHz
- 360.0 kHz

Axis labels: dB // LSB (y-axis), Frequency (kHz) (x-axis)

Note: signal of 200 mVp results to 74 dB or Saturation level of 1.3 Vp for MSB (2^15)