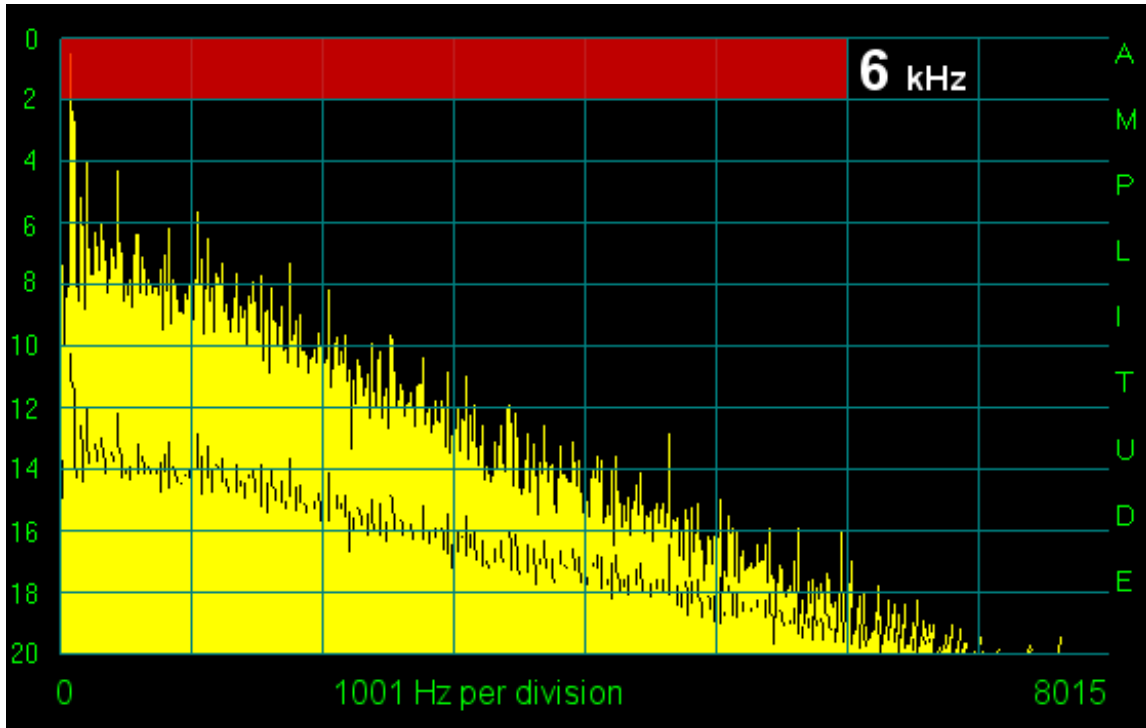


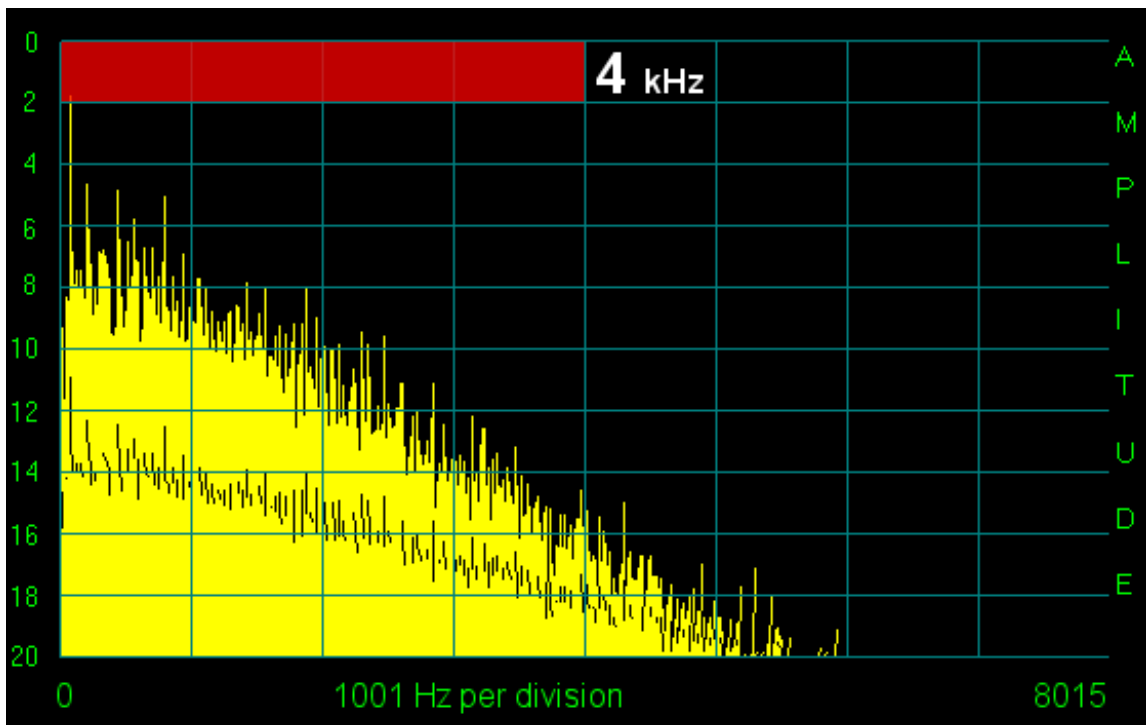
# Si4734 Digital Filters

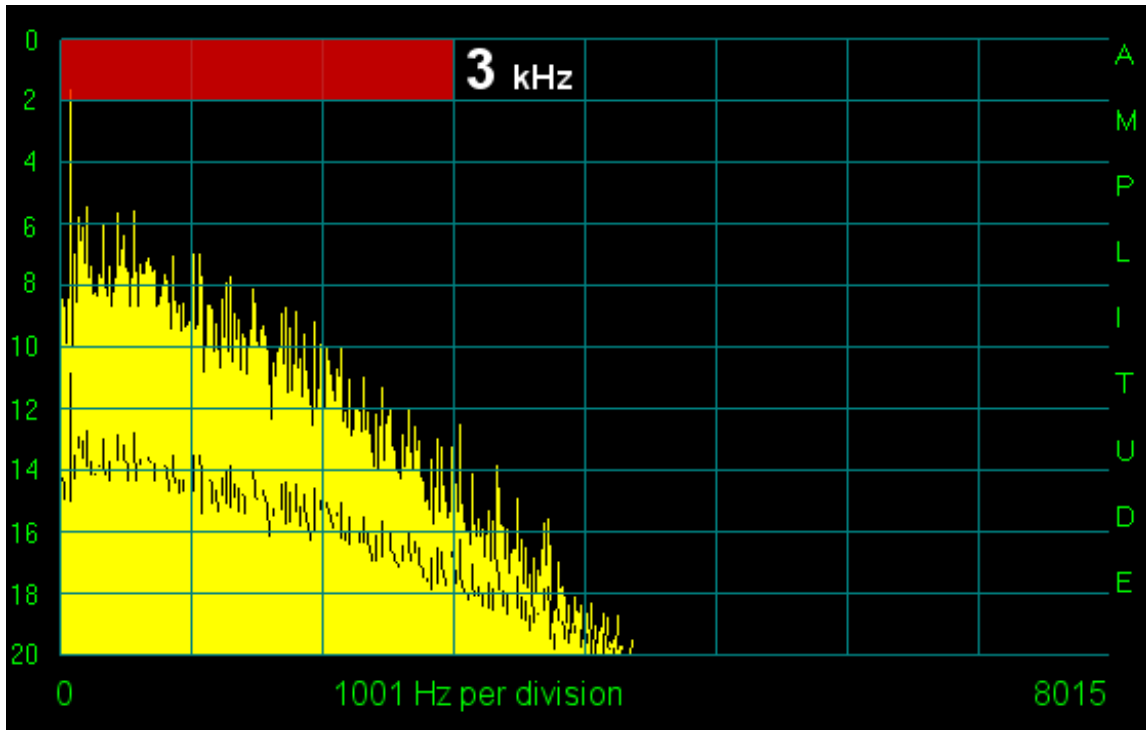
6, 4, 3, 2, and 1 kHz  
VERSION 1 ©2011

*The information below is **not** guaranteed to be free of errors.*



The graph above shows the attenuation of background noise via the 6-kHz filter of Silicon Lab's Si4734. The audio of a Tecsun PL-390 was fed into a PC sound card, at a 48,000 Hz sample rate. The horizontal axis is linear: 1001 Hz per division. The vertical axis has a log 10 scale: 2 dB per division. The yellow traces represent peaks over a timed period. By 7 kHz there is no output.

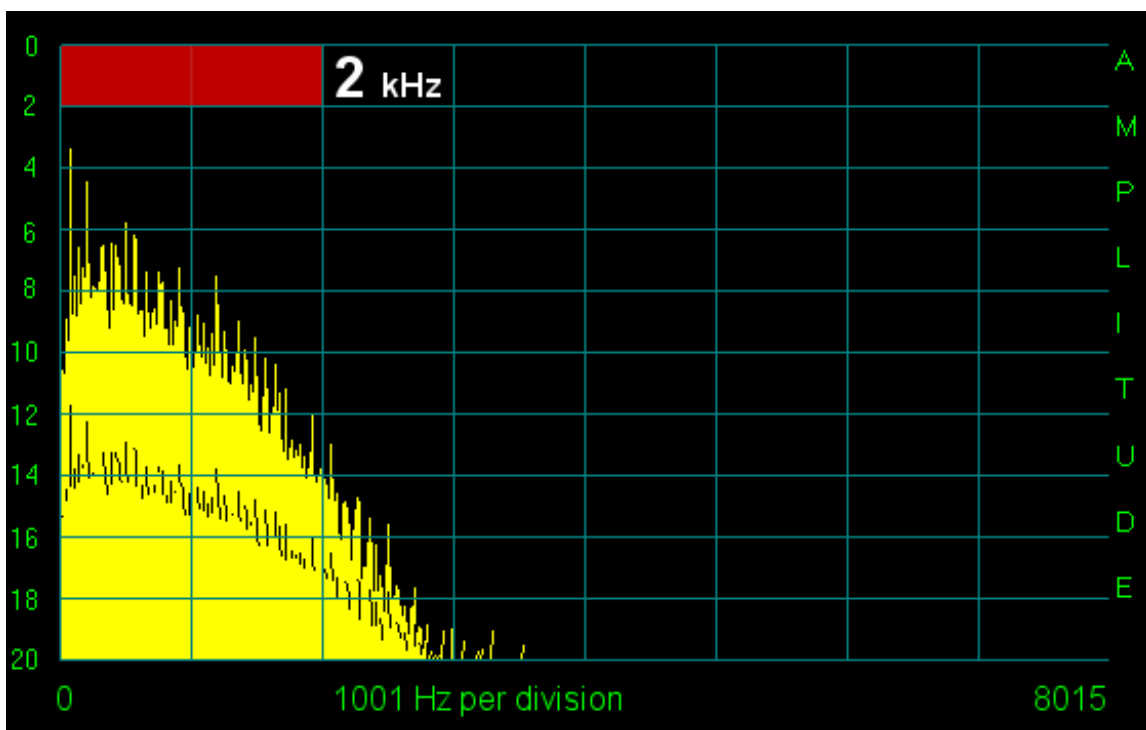


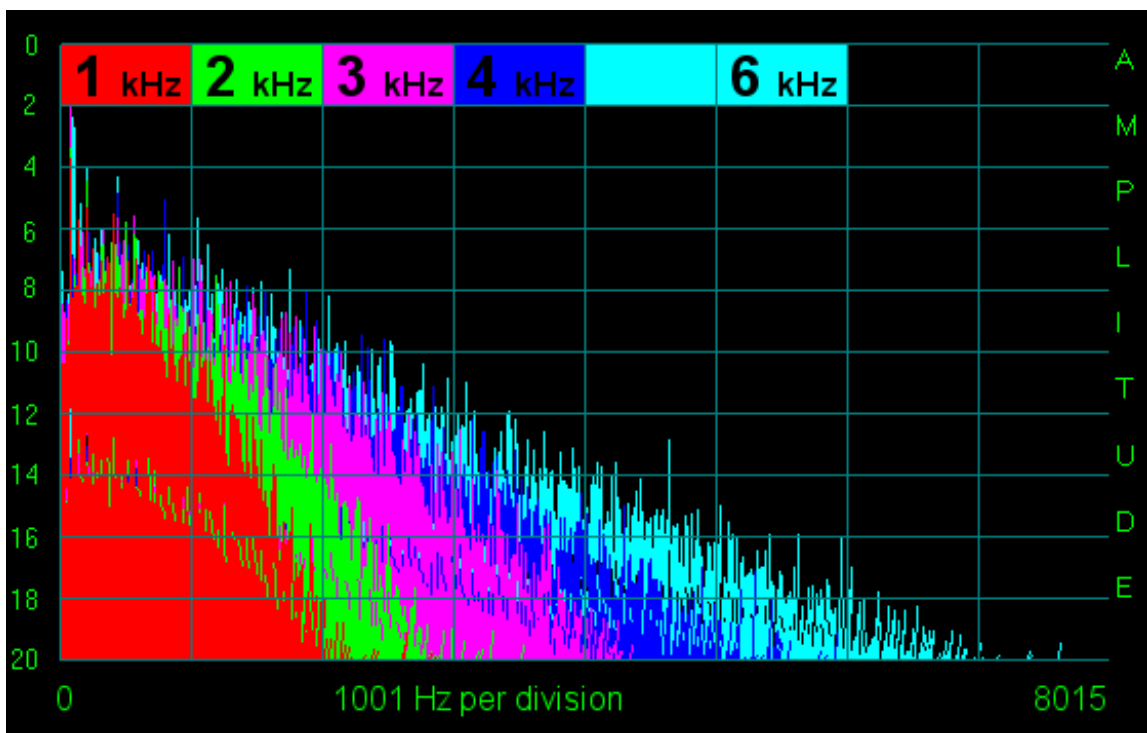
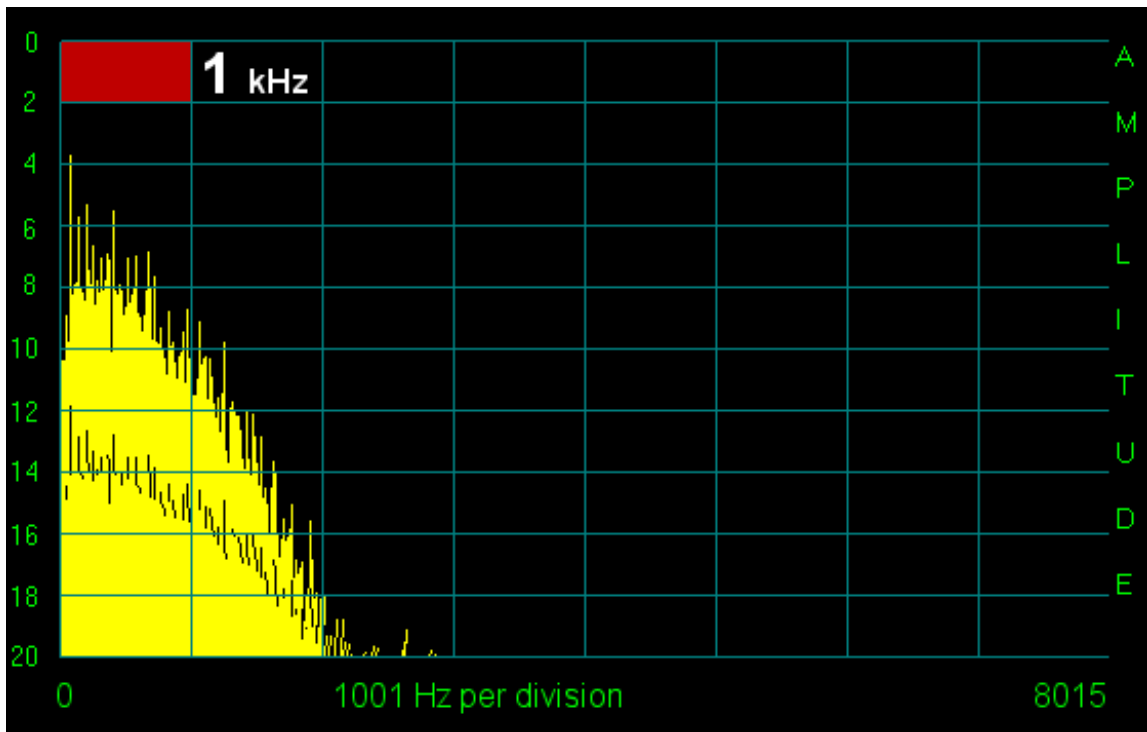


Above are the 4-kHz and 3-kHz filter plots. Again, within 1 kHz, the output is nearly zero. At these bandwidths this tight of a shape factor is beyond that of ceramic, mechanical, or crystal filters. Below are the 2-kHz and 1-kHz filter plots. Within  $\sim 1$  kHz all output has been attenuated. The last graph shows all 5 Si4734 digital filter bandwidths superimposed over top of one another.

The *Sony CXA1129N*, in the *SRF-59*, allowed consumers a taste of low-IF in an analog MW radio. And now, the *Silicon Labs Si4734*, in the *PL-390* and other radios, has given consumers a taste of low-IF DSP in a digital MW, FM, and SW radio. Silicon Labs, of Austin, Texas, is now the high technology leader in the shortwave radio industry. Their chips are a huge win for consumers.

*Speculating:* the Si4734 hardware is 24-bit: this represents 144 dB of theoretical dynamic range. Each bit gives 6 dB. If the audio is 8-bit (takes 48 dB) then 96 dB of dynamic range is left.





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