**A Cooperative Tale: Connecting a Quickfilter demo board to RadioSkyPipe data acquisition software**

In one of the numerous free magazines I get, a news bit appeared about a chip with programmable amplifiers, A/D conversion, and programmable FIR filter banks from a manufacturer called Quickfilter. So I got further info. A demo board is available. I'm kind of a sucker for demo boards, as they often enable me to try things without having to design a board or stick something together. (Dip packages aren't really available for too many new devices, either...)

The Quickfilter demo board looks good. Available for $199.95 from Mouser or Digikey, the board contains a Quickfilter data processing chip, glue and USB port hardware, and is accompanied by a development software suite.

The processing chip is the QFA512, (block diagram shown here with permission
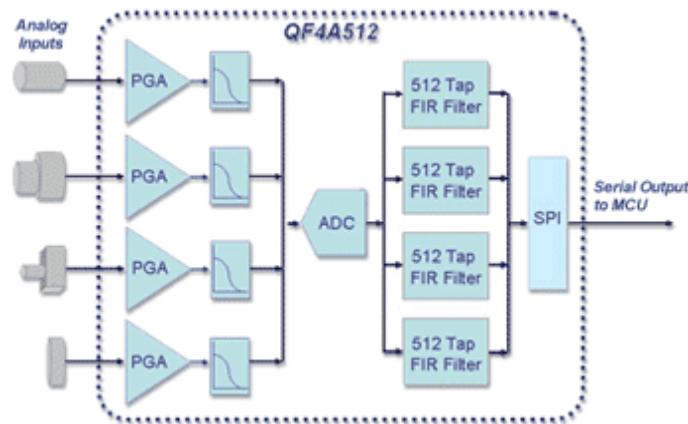
from Quickfilter Technologies at www.quickfiltertech.com). So, with the development kit, we have four programmable amplifiers, low pass filtered for anti-aliasing, a fast 16-bit A/D converter, and four software programmable FIR filters, all connected to a USB port.

Basically, the input amplifiers allow for either differential or single-ended, AC or DC coupled inputs. Some input resistors and capacitors must be added, but there is space on the demo board to mount what is needed. The input amplifiers can also be operated in chopper-stabilized mode or not, depending on the desired bandwidth.

Next is a multiplexed ADC that can operate on the outputs of any of the input amplifiers. The ADC-multiplexer combination on the demo board can, in single channel operation, sample at a maximum rate of 2.5 MHz, and more than 700 kHz (each) using all four channels, with a nominal resolution of 16 bits.

The filter channels can implement FIR (Finite Impulse Response) filters including lowpass, highpass, notch and bandpass. Two filters can be run per channel, for example

a lowpass filter with a notch at, say, 60 Hz.

The development kit comes with software to design the filters desired for application. In addition, there is a test system in the program that performs an FFT (Fast Fourier Transform) on the filter outputs and allows storage of the output of the FFT.

So, I thought this might be a really useful device for both SARA and SETI League members looking for a simple digital signal processing system. All that was missing was a good way to capture and store the data output from the development board. I had an aha: Jim Sky's Radio-Sky Pipe software. Here is a data acquisition software suite that can display, tag, and save data from many channels, and has a general interface to data acquisition (UDS) built in. Suppose the Quickfilter development kit software could be combined with Radio-Sky Pipe, using the QF dev kit software to specify the channel characteristics, and Radio-Sky Pipe to acquire, view, and store the data from the dev kit. A marriage of these two very powerful systems would cost about $250.00, and be extremely flexible.

The rest is now history. First, I had a copy of Radio-Sky Pipe Pro and was already planning to understand and use the UDS aspect of the program to acquire data from another A/D converter. So, I started by email to Charles Osborne (for SARA) and Dr Paul Shuch (for Seti League) to get permission to use the organizations' names in talks with the Quick Filter folks. My aim was to get a copy of the source code for the QF development kit software so it could be adapted to the UDS interface specs provided with R-S Pipe, and I thought that QF might be interested in using the organization names in their advertising or other places. Charles and Paul came through (thanks!). So, I started with the QF folks.
They were reluctant, rightly so, to part with the code for the dev kit software. But Mr. Ed Rocha, President of the company, very kindly volunteered to get his programmers to hook the programs together!! Then I got in touch with Jim Sky, who sent a complimentary copy of R-S Pipe to the QF programmers, and, after some correspondence between them, voila! I'm reasonably sure this kind of hookup would not work with, say, Analog Devices, or other large corporations, but with a small (for now, we hope) company such as Quickfilter Technologies, more personal contacts and cooperation is still possible. For example, I was able to talk directly to the programmer, Ms. Anne Ngo at QF.

So, thanks to the voluntary cooperation of the Quickfilter company and Jim Sky, I can now develop filters I want, implement them, check them with (storeable) FFT's and collect the data with an Internet-connected data acquisition program. That's truly remarkable, and I cannot possibly thank everyone concerned enough for their efforts.

Now, as soon as I can get my dish to point where I want it to (another story) and get a reliable front end on it, I can hook the I and Q outputs of my downconverter to the Quickfilter dev board, and wail on the data to my heart's content. Forget not that R-S Pipe can manipulate data on the fly (such as squaring it) and so on. While not as elegant as the full SDR stuff, for $250 that ain't bad!!!

If anyone wants to try this, I'd be happy to pass on what I know and be assured I am going to continue to work with this setup to see what can be done with it. I'll try to get results posted on a website Real Soon Now.

Again, many thanks to all concerned for the cooperation that made this project possible!

Don Latham