Ham Friendly Digital Signal Processing (DSP) using GNU Radio Companion (GRC)

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Audience Survey

- Who has experience with Software Defined Radio (SDR) projects?
- How many are familiar with Digital Signal Processing (DSP)?
- How many are familiar with GNU Radio Companion (GRC)?
Digital Signal Processing and the Ham

Where does DSP fit into the world of SDR?

How can I develop my own DSP applications?
Where does DSP fit into the world of SDR?
Why Should I Learn More about DSP?

- The 'radio' in “SDR” is the DSP software
- DSP is that part of the SDR that the home experimenter can build
  - Contemporary SDR 'front ends' are almost impossible for the home experimenter to build – miniaturized surface mount technology and multilayer PCB's
How can I develop my own DSP applications?
'Ham Friendly' DSP

- Innovative and accessible graphical DSP software: GRC, MATLAB, LabView
- 'Beginner friendly' DSP text books, on-line tutorials and support
- DSP software authoring is within reach of any curious ham
GNU Radio is an Open Source DSP library written in C++ to maximize computation speed and efficiency, with a Python shell.
GNU Radio Companion (GRC)

GNU Radio Companion (GRC) is the graphical user overlay on top of GNU Radio. GRC permits visualization and manipulation of the DSP functions (aka. algorithms) without learning a programming language.
GNU Radio Companion (GRC)

- GRC is designed for hands on, trial and error experimentation with DSP
- Make a mistake? Change an algorithm or a parameter in real time
- Adjust parameters while operating the GRC DSP–enabled SDR
GRC Demonstration

- Main screen, work space, DSP library
- Move and link DSP graphical blocks, execute a DSP program
- Implementation of:
  - Filter
  - Mixer
  - Amplifier
- SDR flow graph and demonstration
www.w7fu.com

Installation and Maintenance of GRC 'Step by Step'

SDR flow graph applications available for download

DSP Bibliography and Tutorial links