



Introduction to the FlexRadio

BARC Membership Meeting

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- Treasurer and Education Coordinator
- BARC Member since 2018
- Maintain the BARC, District 3, and GCARES repeaters
- Ph.D. in Electrical Engineering from Purdue University
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- Lori, Rachel, Jacob (LRJ)

- **Portions of this presentation are borrowed from Michael Walker, VA3MW, *Introduction to the FlexRadio.***

Introduction to FlexRadio

The FlexRadio is a *Software Defined Radio* or *SDR* designed to connect seamlessly over a network.

<http://www.flexradio.com>

- What is a Software Defined Radio (SDR)?
- FlexRadio Features
- FlexRadio New Terms Defined
- Setting up the FlexRadio in Your Shack
- Demonstration of the FlexRadio 6400
 - a) Slices, Panadapters, and MultiFlex
 - b) Wideband Noise Blanker (WNB)
 - c) Automatic Gain Control Threshold (AGC-T)
 - d) Digital modes (WSJT-X FT8)



What is a Software Defined Radio (SDR)?

- It works just like a Super-Heterodyne Radio, BUT...
- All the traditional analog parts (oscillators, mixers, RF filters, etc.) are replaced with digital hardware and software
- It is a quieter radio due to Direct Sampling (no extra mixers and IF stages to introduce noise)
- It can support many modulation schemes (flexible in software)
- An RTL-SDR or a cell phone are examples of SDR!



FlexRadio Features



- ***Future proof*** since it can accept software updates
- Uses ***Direct Sampling so much quieter*** since analog RF mixers introduce noise
- ***Multiple independent RF Receivers*** in each radio
- ***A full function Transmitter*** is shared among the receivers
- ***Unlimited*** number of RS232/CAT/Serial ports!
- ***Digital Audio eXchange (DAX)*** is included for easy digital audio setup (WSJT-X for FT-8, Fldigi, Winlink)
- Everything is over the network. ***No messing with USB or serial cables!***



Flex 6000 Series Block Diagram

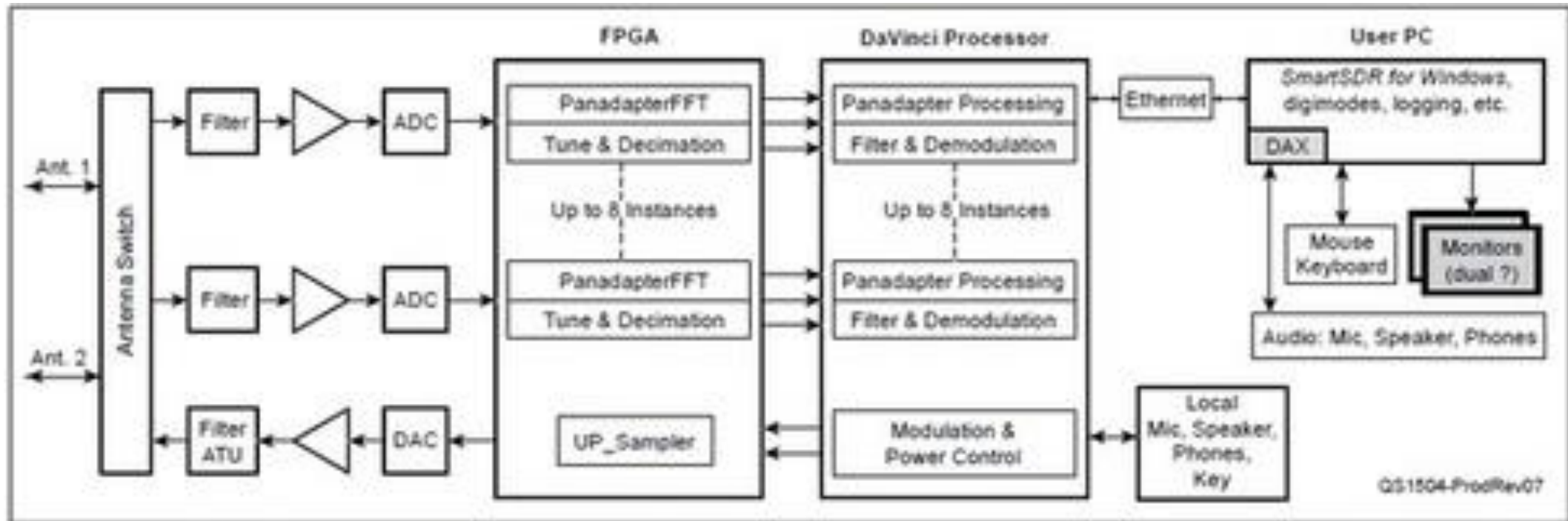
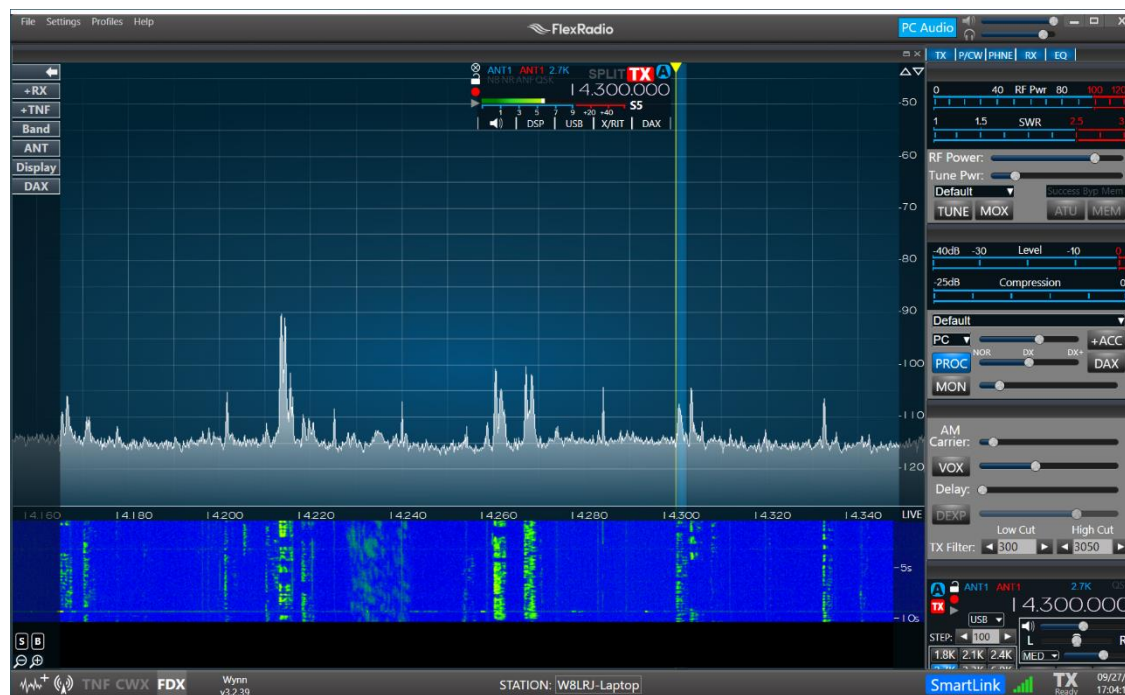


Figure 7 — FLEX-6000 signal flow diagram (adapted from FlexRadio Systems)

FlexRadio Terms

- **Slice** – a 160-6m receiver. FlexRadios have 2, 4, or 8 slices depending on model; allows for multiple slices on one radio or MultiFlex (multiple users on one radio)
- **Panadapter** – a separate display (useful for multiple slices)



FlexRadio Terms (con't)



- **SCU** – Spectral Capture Unit is what the antenna connects to. FlexRadios have 1 or 2 SCUs; each is a unique radio
- **FPGA** – Field Programmable Gate Array is the brains
- **Client** – the user interface software (*SmartSDR* or *SmartLink*)
- **CAT** – CAT radio control app used by loggers, WSJT-X, Fldigi, Winlink
- **DAX** – Digital Audio eXchange app used to send audio to and from the radio

FlexRadio 6000 Series



Flex-6400M



Flex-6400



FlexRadio 6400 (Rear View)



Network Setup

