

SDR 3-Aug-2016

Part 1 – Overview

GORVM

What is SDR?



- Software Defined Radio
- A/D conversion of RF spectrum
- One or more parts of RF spectrum simultaneously converted
- Some analogue RF & IF stages still necessary / best done 'traditionally'
- 'Heavy-lifting' done in fast FPGAs
- Filters, modulation etc performed in software / programmable DSPs



What is SDR?



- Modern SDR places ADC/DAC as far to the left as possible
- Avoids VFO, LO IF conversion, bandpass filters
- Needs fast ADC/DAC
- High data rates



- With black box radio's capacity for change is very limited
 - buttons, knobs fixed
 - scope for filtering restricted e.g. new multi-notch and noise reduction
 - new modulation schemes not possible. E.g. Adding SSB to FM only radio
- Software can easily be changed
 - its flexible
 - reduced obsolescence
 - greater scope for experimentation
 - convergence of analogue and digital domains
 - greater sensitivity and selectivity



- Interfacing simplicity:
 - sound card interfaces gone
 - CAT cables gone
 - multiple ground-loops gone
 - different pin-outs, connectors and levels gone
- Virtual cabling rules! 🙂
 - interfaces can span geographies
- Virtual receivers
 - listen/watch multiple bands simultaneously



- Filters:
 - brick-walls
 - wide, narrow
 - user-definable
 - multi-notch etc
 - new software can improve filters, add new filters...
- Potential to operate remotely
- See signals not just hear them!
 - monitor a band visually for activity
 - panadapters, waterfalls, audio spectrum
 - new displays added easily by developers

GX4 ABC

Why SDR?



GX4 ABC

Why SDR?





- Simpler to use:
 - TS-990 vs SDR comparison (next slide)
 - why have all those buttons?
 - just show the ones relevant for what you are doing!













• Small and light!



- Several manufacturers
 - ANAN Productised TAPR boards Hermes, Angelina...
 - Flex Radio
 - Airspy, RTL-SDR, Funcube etc (Receivers)
- Kits readily available
 - TAPR
 - SDR-Kits
 - etc, etc lots of them...
- Can be cheap or expensive
 - But always significantly cheaper than 'traditional' radios



- But you:
 - want knobs and not to use a computer
 - well that's ok too ☺





IQ Signals



- IQ tutorial (19 mins)
 - https://www.youtube.com/watch?v=h_7d-m1ehoY



The End

Thank you

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