SDR Transceivers
Disclaimer

Will not cover all transceivers

Why didn't he mention my Kickstarter receiver?

Not endorsing anything

Not endorsing anything
GNURadio without Transceivers

What would GR today be without accessible transceivers?
When a lot of us got our hands on one

Approx. release of USRP

Approx. release of support for RTL dongle
Evolution of moving samples

USB 2.0 – 8 MHz

1 Gig Ethernet – 25 MHz

PCle (v2) – 100 Mhz per lane *

USB 3.0 – 125 MHz *

10 Gig Ethernet – 250 MHz *

Thunderbolt – 500 MHz *
Transceivers w/ GNURadio Source/Sink Support

Ettus UHD Devices

- **B2XX**
  - Frequency: 70 MHz – 6 GHz
  - Resolution: 12-bit
  - 2 Channels
  - USB 3.0

- **E3XX**
  - Frequency: 70 MHz – 6 GHz
  - Resolution: 12-bit
  - 2 Channels
  - Embedded Xilinx Zynq

- **X3XX**
  - Frequency: Daughtercard
  - Resolution: 14-bit ADC, 16-bit DAC
  - Bandwidth: 120 MHz
  - 2 Channels
  - PCIe4, ExpressCard, or 10 GigE

- **N2XX**
  - Frequency: Daughtercard
  - Resolution: 14-bit ADC, 16-bit DAC
  - Bandwidth: 25 MHz
  - Gigabit Ethernet
Transceivers w/ GNURadio Source/Sink Support

**Ettus UHD Daughtercards**

- **UBX**
  - Freq: 10 MHz – 6 GHz
  - RF shielding
- **CBX**
  - Freq: 1.2 GHz – 6 GHz
- **SBX**
  - Freq: 400 MHz – 4.4 GHz
- **WBX**
  - Freq: 50 MHz – 2.2 GHz
  - Granddaughter card

All have 120 MHz X-series options
Transceivers w/ GNURadio Source/Sink Support

**DRS PicoFlexor**

- **Freq range:**
  - 2 MHz – 3 GHz
  - 2 MHz – 12.4 GHz with option
- **Resolution:** 8 bits
- **Dynamic Range:** not provided
- **Instantaneous bandwidth:** 6 or 25 MHz
- **Receive only**
- **2 Channels**
- **OMAP DM3730 onboard**
- **USB 2.0**

- **gr-dsp – OMAP DSP blocks for GNU Radio provided**
Transceivers w/ GNURadio Source/Sink Support

Epiq Sidekiq
• Freq range: 70 MHz – 6 GHz
• Resolution: 12-bit
• Instantaneous bandwidth: 50 MHz
• TX/RX full duplex
• 2 Channels – phase coherent
• MiniPCle x1 or USB 2.0
Transceivers w/ GNURadio Source/Sink Support

**RTL-SDR**
- Parameters vary depending on the part
- Freq range: ~25 MHz – 2100 MHz
- Resolution: 8 bits
- Dynamic Range: not provided
- Instantaneous bandwidth: 2.56 MHz
- Receive only
- USB 2.0
Transceivers w/ GNURadio Source/Sink Support

UmTRX

- Freq range: 300 MHz – 3.8 GHz
- Resolution: 12-bit
- Instantaneous bandwidth: 13 MHz
- TX/RX full duplex
- 2 Channels
- Gigabit Ethernet
Kickstarted Transceivers

HackRF

• Freq range: 10 MHz – 6 GHz
• Resolution: 8-bit
• Instantaneous bandwidth: 8-20 MHz
• TX/RX half duplex
• 2 Channels
• USB 2.0
Kickstarted Transceivers

BladeRF

• Freq range: 300 MHz – 3.8 GHz
• Resolution: 12-bit
• Instantaneous bandwidth: 28 MHz
• TX/RX full duplex
• 2 Channels
• USB 3.0

$191,422
Kickstarted Transceivers

PortableSDR – HF/Shortwave

• Freq range: 0 MHz – 35 MHz
• Instantaneous bandwidth: ? Hz
• ARM Processor - ARM Cortex-M4
• TX/RX full duplex
• GPS onboard
• Sweet color LCD screen
• USB 2.0

$66,197
Four Channels!!

**Ettus QuadRadio**
- Freq range: 700 MHz – 4 GHz
- Resolution: 16-bit
- Instantaneous bandwidth: 60MHz
- **1,2,3 or 4 RX Channels – Phase coherent**
  - “Stackable” up to 32-channels
- 2 x 10 GigE
Four Channels!!

SilverPalm SP-830X

- Freq range: 300 MHz – 4 GHz
- Resolution: 16-bit
- Instantaneous bandwidth: 20MHz
- TX/RX full duplex
- 1, 2, 3 or 4 RX Channels and 1 TX
- USB 3.0, PCIe x2, 10GE, or Thunderbolt
Four Channels!!

Nutaq PicoSDR

• Freq range: 300 MHz – 3.8 GHz
• Resolution: 12-bit
• Instantaneous bandwidth: 1.5 – 28 MHz
• TX/RX full duplex
• 2 or 4 Channels
• 1 GigE and/or PCIe x4
Interfacing with GNURadio

gr-dubri → DRS
gr-baz → RTL, bladeRF, hackRF, UmTRX
gr-osmocom → Funcube, USRPs, sidekiq
gr-uhd
gr-sidekiq
Questions?