

What is an SDR?

- A radio communication system where many components that have been traditionally implemented in hardware...

 (e.g. mixers, filters, amplifiers, modulators/ demodulators, detectors, etc.)
 ...are implemented by software on a PC or embedded system.
- The hardware portion consists of pre-selection filters, possibly some IF filtering and a Analog-to-digital converter



Why do I want one?

<u>Top Ten List</u>

- 1. True general coverage
- 2. Work one frequency and still monitor the band (or another band!)
 - Panadapter (suddenly your eyes can do 1000X what only your ears could do previously, one signal at a time!)
- 3. Filters! (brick-wall envelopes... improving all the time with s/w upgrades)
- 4. Audio and IF Digital Signal Processing (DSP)
- 5. Harness the power of your existing Computer
- 6. Multiple VFOs and/or virtual receivers
- 7. Record large bandwidths of the spectrum and tune later!
- 8. Record/playback of audio from a specific signal
- 9. Allows you to explore new applications:
 - Digital modes, WX satellites, radio astronomy, aircraft monitoring, digital stations, TV, DAB, Ionosondes! etc etc
- 10. Can you ever have too many receivers?

Application Examples



Digital Decoding

control

Fldigi NBEMS (Narrow Band Emergency Messaging System)



Credit: Erik Mikkel Wied



ADS-B decoding example using Dump1090 and VRS





Satellite working



SDRplau

NOAA Weather satellite (137 MHz) Wxtoimg (RSP1)



Credit: Jeff Broughton, WB8RJY

User pictures from the facebook group: www.facebook.com/groups/sdrplay/

Wxtoimg: http://www.wxtoimg.com



Credit: Sefi Merke



High Resolution satellite images (1.7GHz) RSP2



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..including latest GOES-16



ISA SATC+M

Processing a few images from GOES-16 testing received via RSP2 earlier in week. Looks great here. Himawari and GOES-16 Full Disks. @SDRPlay





SDRplay forum on Sat imaging

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How to get some very impressive GOES High Resolution Satellite images using the RSP2 and SDRuno

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NYTHER B, 167

"Generationary weather natellite image reception in more challenging than APT weather natellite image reception, but can be achieved well using an SDRying NDPT" as detectibed in this new post on our forum. The author writes "below petting started in putting together a receiving system for XRIT and LRIT images, it to a good idea to L.3



Tune in to Jupiter!

RECEIVING JUPITER NOISE BURSTS WITH AN SDRPLAY RSP1

Over to TruTable and <u>Manhot SML</u> has appeared a relate dynamic term memory party make banks have appeared by the SCHQue MDPs. The planet Jupite in layour to end bursts of users on tational radio been powered party by the planets interaction with the intercepty conductive games andred by to, one of the the planets where Appear and the step and the Earth parameters through one of these radios bursts are seen to reviewed on Earth pute same with an approximate amongs.

In the video MandoumAir, whose the 10 MPU of waterhal and audio from some Jupiter toxed burds received with the SCRaphy RSPH at 22118 kms. According to the YouTube description, It appears that for is using the <u>UTUL</u> cache betweep wheth is a large Dimension who intercept installator that connects of an area of 2240 dynamic According to the billioncept metablisher is not required to receive the Jupiter torsets or bartward dynamic to the UTUL will work, but the politimetrial resolutions and required there exists with Jupiter torsets or bartward dynamic to the UTUL will work, but the politimetrial resolutions are not required to receive the Jupiter torsets or bartward dynamic to the UTUL will work, but the politimetrial resolutions are not required torset and the state of the value.



Doubles as a new piece of RF lab kit: an RF Power meter – get one for work or play!





SDR hardware



SDR Variety



www.sdrplay.com

Price

Review of SDR receivers — what to consider:

- Frequency Range: The range of frequencies the SDR can tune.
- ADC Resolution: Higher is better. More resolution means more dynamic range, less signal imaging, a lower noise floor, more sensitivity when strong signals are present and better ability to discern weak signals.
- Instantaneous Bandwidth: The size of the real time RF chunk available.
- RX/TX: Can the radio receive and/or transmit?
- **Preselectors:** Analogue filters on the front end to help reduce out of band interference and imaging.
- Software: Is your favourite package supported? Does manufacturer provide?
- Price



SDRplay Receivers – RSP Family

- Continuous SDR receiver coverage from VLF to 2 GHz
- All the amateur radio bands from VLF to 23cm
- High performance ADC technology (not another compromise SDR!)
- Built-in high performance front-end filters
- Use as a stand-alone general coverage receiver, or as a high resolution panadapter
- Visualize all the signals in multiple bands simultaneously
- SDRuno Windows SDR software provided free-of-charge
- Also works with other platforms (Mac, Linus etc) and popular SDR Software (e.g. HDSDR, SDR-Console & Cubic SDR)
- Run on a Raspberry Pi3 download our SD Card image
- Ideal for portable operation (powered via USB)
- Can be used as a Spectrum Analyzer or an RF Power Meter
- Backed by the world's biggest and best SDR support community!



Instantaneous bandwidth illustration



10 MHz visibility







Introducing the RSPduo

...the biggest change to SDR since the RSP1!



RSPduo -Dual independent tuners!



Two independent "slices" anywhere in the coverage range



Monitor two widely spaced bands





Mix and match applications, simultaneously





ATC









Software

Popular 3rd Party free software includes:



 Manufacturer provided software, e.g. SDRuno for the RSP family



RSP Software availability/compatibility

- Multi-platform support for Windows, Mac, Linux, Android, Raspberry Pi 2/3
- SDRuno Windows SDR s/w (based on Studio1 which cost \$179) provided free of charge
- ExtIO compatibility
- Supports CubicSDR for MAC, Linux and Raspberry Pi3 users
- Software upgradeable for future standards
- API provided to allow demodulator or application development
- Works well with 3rd Party *free* software including:









SDRuno

SDRuno provides a rugged and flexible, high performance SDR receiver capability , featuring:

- Multiple 'Virtual Receivers' which allow for simultaneous reception and demodulation of different types of signals within the same receiver bandwidth
- A selectivity filter with an ultimate rejection greater than 140 dB
- A unique distortion-free double stage AGC with fully adjustable parameters
- Multiple notch filters with BW adjustable down to 1 Hz, Notch Lock feature
- A unique synchronous AM mode with selectable/adjustable sidebands, dedicated PLL input filter, and selectable PLL time constants
- Record and playback an entire amateur band!
- 29 pre-set amateur and broadcast bands



Multiple VFOs & different decode modes simultaneously!





Ham Band Framing + RF power level + SNR measurement & logging



SDRplau





What is a Panadapter?



"Go-to" choice for Kenwood, Yaesu, Icom, Elecraft etc!

- "Panadapter is short for Panoramic Adapter. The simple answer is that it allows us to see a panoramic display of the band our radio is tuned to. We can see every signal"*.
- Early implementations used a PC soundcard to achieve this function but were therefore limited to 200 kHz of bandwidth because they rely on the sound card.
- The advent of affordable SDR hardware such as the RSP1A has allowed implementations with much greater bandwidth, and hence much more usefulness.
- Combined with readily available, and capable, SDR software Panadapters are now an affordable and easy to implement reality!

* Definition courtesy KA9MOT http://mypanadapter.com/



Why panadapter?

- Add new capabilities / visibility to any rig
- Synchronize the the rig to the software if it has a CAT port
- Work one frequency while monitoring the whole band
- Monitor multiple bands in addition to the one you're working
- Arbitrarily large spectrum scope
- Less cost, more features than factory add-ons,



Monitoring 3 bands with SDRuno



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SDRplau

The perfect Panadapter companion for your rig

- Any of the SDR Software programs that support RSP can be used to provide a basic spectrum display.
- SDRuno, HDSDR and SDR Console have built-in capabilities for CAT and other add-on software, to allow for communication between the SDR software and the transceiver.
- Ham Radio Deluxe and OmniRig are commonly used for synchronization/control between the TRx and SDR Rx.
- App notes and videos available from sdrplay.com



Use a T/R switch if not using protected transceiver IF or RF out!



Support and further information



Software and documentation, app notes, how-to guides

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SOFTWARE Windows & Linux all6 & Mac	g Rappery Pl	DOCUMENTATION Software DiApp Notes @ Community Guides Have To Guides
Android & Alfattia		Voter guides & Mada Studio Datacherto
A SDRUNO - V1.22 (137)	H JAN 2018)	SDRUNO USER MANUAL
(RSP1/RSP1A/RSP2) includes herds	rans driver	Zversten 1.22.1 (3th January 2016)
A HDSDR - V2.76 (15TH /	NOV 2017)	SDRUNO RELEASE NOTES
(RSP1RSP1ARSP2, Includes for d	WHINPEXTO align	pverson 122 / 139 January 2018).
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How-to videos: SDRplay YouTube Channel

SDRuno Video Guides - Part 2 (V 1.2 onwards) PLAY ALL

This is Part 2 in our series of SDRuno Video guides for version 1.2 and later. The Video guides in Part 1 were created using earlier versions of SDRuno to you may see some slight differences in the



SORuno v1.2- What changed in Version 1.2 SDRoley Software Defined Rad ...

2H views + 1 roorth ago

Introducing RSP1A and SDRuho v1.21

766 views - 5 day ago

GDRolay Software Defined Red.

#1 SDRuno v1.2- Workspaces & Resolution bandwidth

#2 SDRuno v1.2- PWR & SNR measurement & ham band

> 104play Software Defined Red. 3.250 views - Disseks app

SDRuno Video guides- Part 1 (Click here for Part 1 in our series of over 20 video guides) PLAY ALL

These are 'How to' Video guides to setting up SDRuno for the RSP. Part 1 were made using earlier versions of SDRuno than was used

PowerMate



#1 SDRuno Basic layout and settings (version 1.2 and

SDRolay Software Defined Rad ... 14K views - 7 months ago



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SORuno EXT/10 Edition for a range of SDRs and dongles.

SDRolay Software Defined Red.

1 dX views - 2 weeks ago

SDRolay Software Defined Rad. 3.4K yieles + 2 memble age



#17 SDRuno with the TM-2 USB Controller

Oblain Doftware Defined Red. 1.3R views + 5 months ago.



#16 SDRuno & MultiPSX decoding ACARS

SDRplay Software Defined Rad ... 2.18 views - 5 months ago



www.youtube.com/c/SDRplayRS www.sdrplay.com

Facebook Group



Direct support from SDRplay



Hardware + Software + Community =

So many reasons to get one!



Recommended by authors of both HDSDR and SDR-Console Backed by the world's biggest & best SDR support community! www.SDRplay.com



For more information

- Company website: www.sdrplay.com
 - We have distributors located worldwide
 - US Distributor: Ham Radio Outlet
- Community Forums: <u>www.sdrplay.com/community/</u>
- Email:
 - North America: <u>support-usa@sdrpi</u>
 - Rest of World: <u>support@sdrplay.com</u>
- Facebook: <u>SDRplay</u> and <u>SDRuno</u> specifically
 - Independent groups run by enthusiastic users!
- Google / YouTube
 - Many videos covering how to use the various software packages, implementing panadapters and much more. Use the Google search function!
 - SDRplay channel: <u>www.youtube.com/c/SDRplayRSP</u>



See the RSP family at the HRO booth!