SDRplay RSPdx-R2 Review
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The SDRplay RSPdx-R2 receiver

The RSPdx-R2 is the latest software-defined 14-bit receiver from SDRplay, an updated version of the RSPdx, and it features continuous spectrum coverage from 1kHz-2GHz. That's a massive range, meaning it is of interest to a wide range of radio enthusiasts, from VLF to microwave.

In the box

On opening the box, you are confronted with the tiny receiver measuring 113mm x 94mm x 35mm and weighing just 315g (**Figure 1**). On the outside are three antenna ports, which are selectable in software. Antenna A and antenna B feature female SMA connections, and are for 1kHz to 2GHz operation with 50Ω input impedance. Antenna B also has a selectable 4.7V DC out ('bias T') for driving externally-powered antennas. Finally, antenna C features a female BNC input for 1kHz to 200MHz operation. There are other connections for an MCX connector (a small push-in plug) external clock input for synchronisation purposes, or connection to a GPS reference clock for extra frequency accuracy, and a USB socket to enable you to connect it to your computer.

The manufacturer says that this updated version offers superior performance, namely improved noise performance below 1MHz (ie for some MF, LF and below) and improved dynamic range below 2MHz, both in 'tuner mode' and 'HDR mode'. In a press release, Jon Hudson, SDRplay Sales and Marketing Director, said: "Global supply-chain support issues have prompted some redesign of existing products to ensure continued supply for our UK manufacturing partners. With each new member of the RSP family, SDRplay tries to include improvements. This has given us the opportunity to offer performance enhancements at the same time as assuring supply. The RSPdx-R2 provides up to 10MHz spectrum visibility anywhere from 1kHz to 2GHz with no gaps."

One quick feature to point out is that the receiver is in a metal box; some of the earlier SDRplay models featured plastic boxes. The metal box's screening effect means noise and interference issues should

FIGURE 1: The tiny RSPdx-R2 measures 113mm x 94mm x 35mm and weighs just 315g.

be kept to a minimum. It also makes the RSPdx-R2 a 'chunkier' device, especially when compared with my existing RSP1A with its all-plastic construction.

The RSPdx-R2 also features three user-switchable notch filters for FM (>30dB 77MHz to 115MHz, >50dB 85MHz to 107MHz); medium wave (>15dB 400kHz to 1650kHz, >30dB 500kHz to 1530kHz, and >40dB 540kHz to 1490kHz); and DAB (>20dB 155MHz to 235MHz and >30dB 160MHz to 230MHz). These enable you to attenuate local interference sources if you live close to a MW, FM or DAB transmitter. It also has built-in low-, high-, and band-pass front-end filters for 500kHz and 2MHz (low-pass), and 2MHz to 12MHz, 12MHz to 30MHz, 30MHz to 60MHz, 60MHz to 120MHz, 120MHz to 250MHz, 250MHz to 300MHz, 300MHz to 380MHz, 380MHz to 420MHz, 420MHz to 1,000MHz (band pass), and 1,000MHz (high pass). So it looks as if they have thought of everything, and these filters should go a considerable way in terms of getting rid of unwanted signals; often the mark of a good receiver is its ability to reject what you don't want in favour of what you do.

In use

So how do you use it? The RSPdx-R2 is used in conjunction with SDRplay's SDRuno (**Figure 2**) or its newer SDRconnect software (**Figure 3**). Both are free to download and use, and they differ in their design and operation.

SDRplay recently launched their free multi-platform SDRconnect software which, as well as running on Windows, will also run on MacOS and Linux/Raspberry Pi. As with their SDRuno Windows software, the emphasis is on 'plug and play' making the use of SDRplay receivers an easy-to-use and low-cost way to discover (or rediscover) the radio hobby for anyone who already uses a computer.

The SDRconnect software is now on preview three and was fully released for the Dayton Hamvention show in the USA in May this year. Preview three offers RSPdx-R2 support, a tabulated frequency module to store and manage frequencies, audio recording pre-roll buffering with up to 10s of history, MPX view for WFM signals, a spectrum peak hold with decay added to the audio SP view, and recording settings are now saved.

The layout of SDRconnect has been adjusted to make it look better on smaller screen resolutions, and there have been

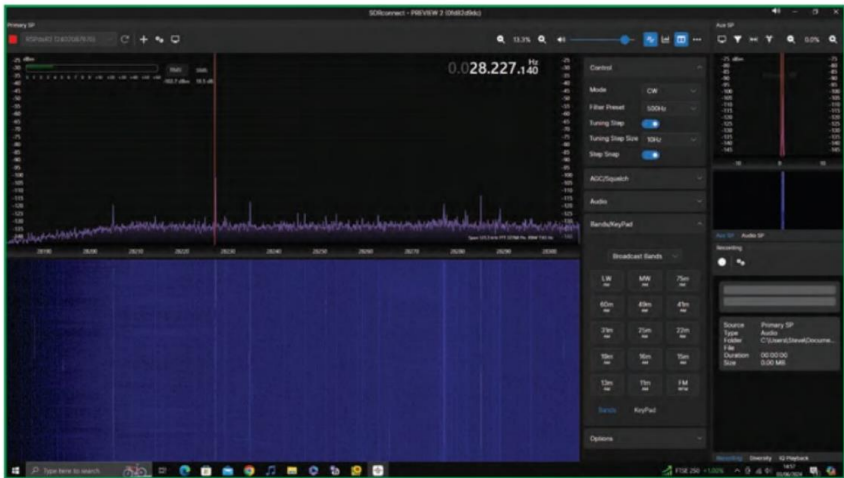FIGURE 2: A screen grab of SDRuno monitoring the 10m beacon band.

FIGURE 3: A screen grab of the newer SDRconnect monitoring the 10m beacon band.

several updates to both the spectrum and waterfall displays to improve the overall look and feel. If you are an existing SDRplay user and have been using SDRuno, you might like to see some of SDRconnect's functionality. To this end, there are a number of videos available at [1] or on YouTube. The SDRconnect software will run on Windows, Mac OS and Linux, but please note it will *not* run on systems older than 64-bit Windows 10 and 11. As always, refer to the videos on the SDRplay website for details of how to install it on your particular platform.

One thing to note, SDRconnect doesn't support Omnirig, which is what I use to drive my RSP1A as a panadapter with my Yaesu FTDX-3000. Jon Hudson of SDRplay said that rig control will come in a later version.

Once I had installed the latest version of SDRuno (V1.42-1710), which was released on 10 May 2024, and reconnected the USB lead, the RSPdx-R2 was instantly recognised as the software was loaded. Anyone familiar with SDRuno will be at home with the software; the only changes visible are the ability to select one of the three antenna ports (compared with my RSP1A).

I first used the RSPdx-R2 as a panadapter with my Yaesu FTDX-3000. I set it up to monitor the 10m beacon band and soon 'saw' OY6BEC on the Faroe Islands on 28.235MHz, DB0UM in Schwedt on 28.279MHz, ED4YIA in Cuneca on 28.263MHz, OE3XAC in Kaiserkogel on 28.188MHz, DB0TEN in Bomlitz on 28.245MHz, IW3FZQ in Monselice on 28.2277MHz, F1VJT on the Cote d'Azur on 28.3226MHz, DL0IGI in Hohenpeissenberg on 28.205MHz, and LA5TEN near Oslo on 28.2376MHz. Many of these beacons only run one or two Watts of power. All were received via Sporadic-E in June, and I think the SDRplay is a great way to monitor beacons visually.

Moving to SDRconnect, I repeated the monitoring (see Figure 3). The software is simple to use, and I soon got used to it. If anything, it is easier to use than SDRuno, but

I think it is a case of getting familiar with the software.

Performance

So what of the claim by SDRplay that the RSPdx-R2 offers: "Superior performance, namely improved noise performance below 1MHz (ie for some MF, LF and below) and improved dynamic range below 2MHz."? Given the time of year (summer) I thought that it might be hard to test that. But nevertheless, I mounted my Wellbrook ALA-1530N active loop antenna outside to see what I could hear.

Tuning into a distant Talksport transmitter on 1107kHz AM, I could receive it at about -80dBm to -81dBm (about S7) on the RSPdx-R2. Moving to my older RSP1A it was also about -80dBm, but just a little noisier. It was subtle, but the reception on the RSPdx-R2 was slightly better. I think the trick is to play with the RF gain to reduce overloading, and the synchronous AM controls to get the best reception you can.

The RSPdx-R2 is so versatile that you can do all sorts of things with it. As well as HF and medium wave, I played with it on VHF (2m band), UHF (70cm band) and also decoded DAB on around 200MHz with the supplied DAB decoder; it worked perfectly. A quick tip: selecting 'Pure Data Band Pass Filter (PDBPF)' in 'Ex Control' will remove CTCSS tones and make repeaters much easier to listen to.

Then there was the whole of HF to listen to, including VOLMET (weather transmissions) on 5505kHz and 5450kHz, Radio China International on 13710kHz, and Voice of Korea on 13760kHz to name just a few. It will cover everything from SAQ's CW VLF transmissions from the Alexanderson transmitter in Sweden on 19.2kHz up to satellite broadcasts near 2GHz.

If you already own an RSPdx, I would not necessarily upgrade to the R2 model, unless you really want the best you can get. But if you have an earlier all-plastic model, it may be worthwhile upgrading to reduce interference. The SDRplay RSPdx-R2 costs £238.67 including VAT and P&P when ordered direct from SDRplay. It is also available from suppliers, including SDR Kits, Martin Lynch & Sons, Nevada, Radioworld UK, Moonraker and Waters and Stanton. Our thanks go to SDRplay for the loan of the review model.

Reference
[1] www.sdrplay.com

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