

Clint Gouveia has tested the SDRPlay RSP1A Software Defined Receiver and offers his review here, focusing on long- medium- and short wave reception, portability and comparisons with more expensive receivers.

Performance and Portability

As an old-school 'traditionalist', I customarily prefer to use a receiver in the traditional way. With controls on a front panel and a display. It was that rationale led me to purchase an Elad FDM DUO, at a cost of around £800. A significant outlay but one which I haven't ever regretted because – when coupled to a Wellbrook ALA1530 magnetic loop at home – it delivered hundreds of transatlantic medium wave signals.

More recently, I have also acquired a Microtelecom Perseus – widely regarded as one of the best SDRs of the past few years and in my experience, the equal of the Elad.

Therefore, I feel I know a little about how well a really good SDR ought to work.

How might it be possible then, that the SDRplay RSP1A (Fig. 1) – at a cost of around £85 (about one-tenth the cost of the Elad) – can come even close in performance? I was intrigued to find out.

First Impressions

The RSP1A arrived in a very simple plastic packaging, reminiscent of how a cheap pair of headphones would be hanging on a store retail fitting. Having removed the device from the packaging, I was immediately struck as to how light it was. Its case was just a simple moulded-plastic affair with four screws in the bottom and a single SMA connector for the antenna.

There was no USB cable supplied. Fortunately, I had one – a USB A-B type – the sort of thing used with wired printers. I also had an SMA-to-BNC adapter. This was necessary so I could connect the RSP1A to my Wellbrook ALA1530 magnetic loop antenna.

In all, I have to say the RSP1A looks 'cheap' but that's ok because it is cheap and it's only a 'black box' after all. What really matters with a pure SDR is how it performs.

The technical specifications are certainly quite impressive; coverage from 1kHz to 2GHz, 14-bit ADC, up to 10 MHz



Fig. 1: The SDRplay RSP1A.

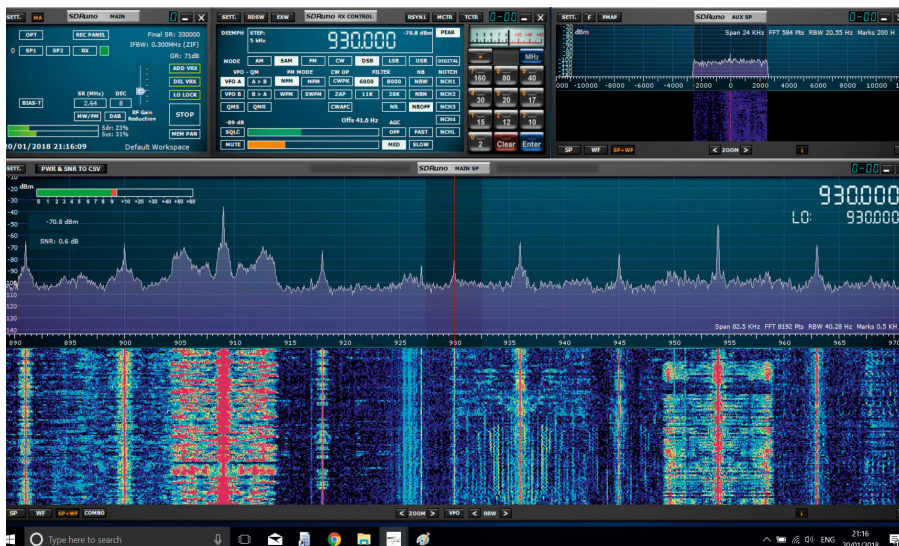


Fig. 2: The SDRRuno Software on Screen.

visible bandwidth, all the usual software bells and whistles and, interestingly, operating from 5V USB, which gives a level of portability that is not possible with the Elad or Perseus.

Setting up the Software

The first stop was the SDRplay website, to download SDRRuno V1.22 for my Windows

10 laptop. The download and installation went very smoothly. You receive an invite to plug in the hardware halfway through installation, which then completes, with drivers installed. Perfect.

I also downloaded CubicSDR for my MacBook Pro. Again, a faultless installation of a software package that is, however, somewhat lacking in features and rather

reminiscent of GQRX, which I used extensively with my NooElec RTL-SDR.

Initial Switch-on

Booting up the SDRuno software results in three windows opening on the computer screen (Fig. 2).

First, there is the *Main SP* window, displaying the waterfall and spectrum, along with signal strength, SNR, centre- and LO- frequencies.

Second, you will see the *Main* window. Here, you can access the IF spectrum, RF gain and so on.

Third, there is the *RX Control* window, which permits users to set the receive mode (Synchronous AM is included) standard audio bandwidth filters, VFOs A and B, AGC, notch filters, noise reduction, noise blanking, squelch, AF gain and other principal parameters.

The large *Play* button in the *Main SP* window fires up the receiver and immediately initiates a spectrum and waterfall. It is very straightforward to select a new frequency with the mouse and to adjust the viewable portion of the spectrum, by dragging it to the left or right.

After quite a lot of playing around, I managed to find the button in the *Main* window that allows you to view the IF spectrum and manually set the audio bandwidth filtering. This aspect of using the receiver seems a little fiddly in the first instance but other than that, the software is very ergonomic and, I have to say, aesthetically pleasing to the eye.

Being able to record entire spectra and bands is, naturally, one of the 'killer-features' of most SDRs. It is easily achieved with the RSP1A, by means of a separate recording panel, accessed from the *Main* window.

This feature is very comprehensive and a more detailed assessment of the software is beyond the scope of this particular article.

It is possible to get 'up-to-speed' with the standard Microtelecom software for the Perseus in minutes.

Getting up to speed with SDRuno will take much longer. However, this is well worth the effort, if users are to extract optimum performance from this brilliant receiver.

Performance on Long Wave

I am a big fan of long wave and this was the first band I tuned with the RSP1A. I immediately tuned to Iceland RÚV Rás 1/ Rás 2 on **189** and **207kHz**. Both signals were there, peaking at around S8, with very clear audio in USB to avoid the

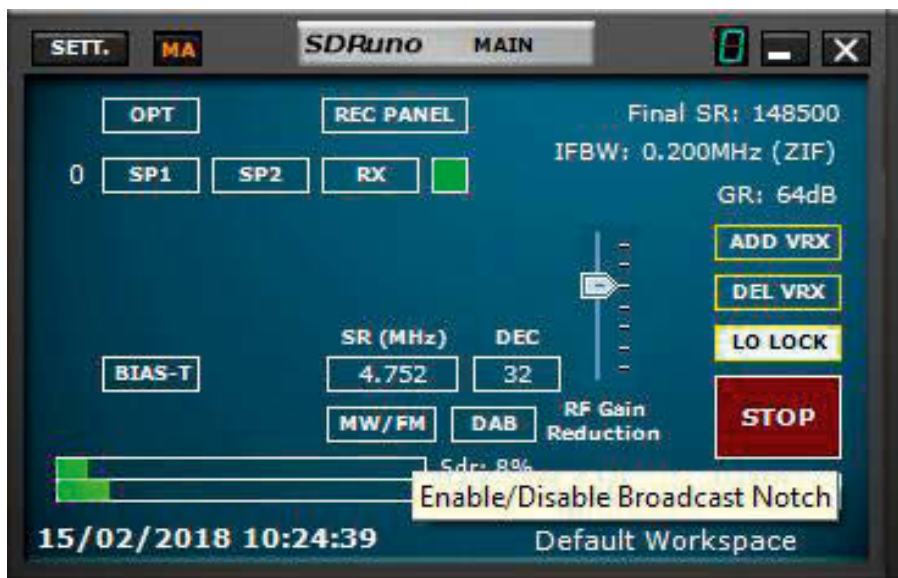


Fig. 3: The Notch Filter will remove unwanted images.

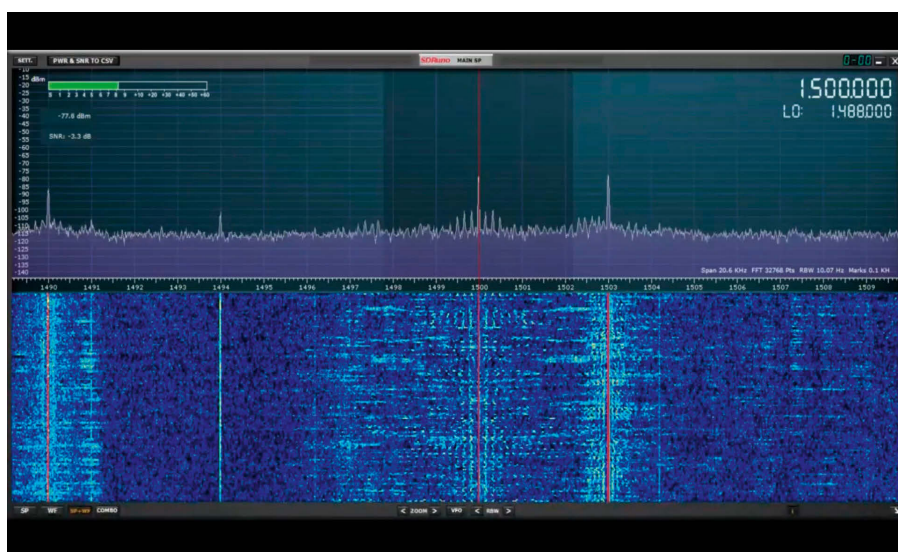


Fig. 4: The signal from CFRB News Talk 1010 Toronto.

powerhouses on **183** and **198kHz**. An excellent start.

The folk music I love, played by Radio Antena Satelor on **153kHz**, boomed in with a 12kHz audio bandwidth filter and all my other favourites were heard very clearly, particularly Polski Radio on **225kHz** and ČRo Radiožurnál on **279kHz**. There was also a signal from Turkmenistan on 279kHz with little modulation and poor audio. Overall, the performance of the RSP1A, in terms of sensitivity and selectivity, was indistinguishable from the Elad or Perseus. If you should find that there are any medium wave images on long wave, you can avail yourself of the notch filter functionality, named 'MW/FM' on the screen (Fig. 3) to suppress them.

Medium Wave Reception

This is the band where I really need an SDR to shine and the RSP1A did not let me down. Over several days of testing, coupled to my Wellbrook ALA1530, I copied

numerous transatlantic DX signals, starting with a booming one from CFRB News Talk 1010 Toronto (Fig. 4). It came across well in USB (to avoid adjacent-channel-QRM).

I quickly realised that the RSPA1 was a serious piece of kit, as it were.

This initial success was followed by the reception of WFED, on **1510kHz** from Washington D.C. – another signal that often suffers from adjacent-channel-QRM. This was an excellent example of the super-selectivity provided by the SDRuno software.

Further catches included WBBR Bloomberg Radio on **1130kHz** New York, WFAN on **660kHz** New York, CKNB on **950kHz**, Campbellton, New Brunswick (Fig. 5) and CJYQ on **930kHz**, St. John's, Newfoundland and Labrador, among several others.

The one catch that, more than any other, confirmed the 'DXing-credentials' of the RSP1A was YVKS RCR 750 Radio Caracas on **750kHz**, from Venezuela. This

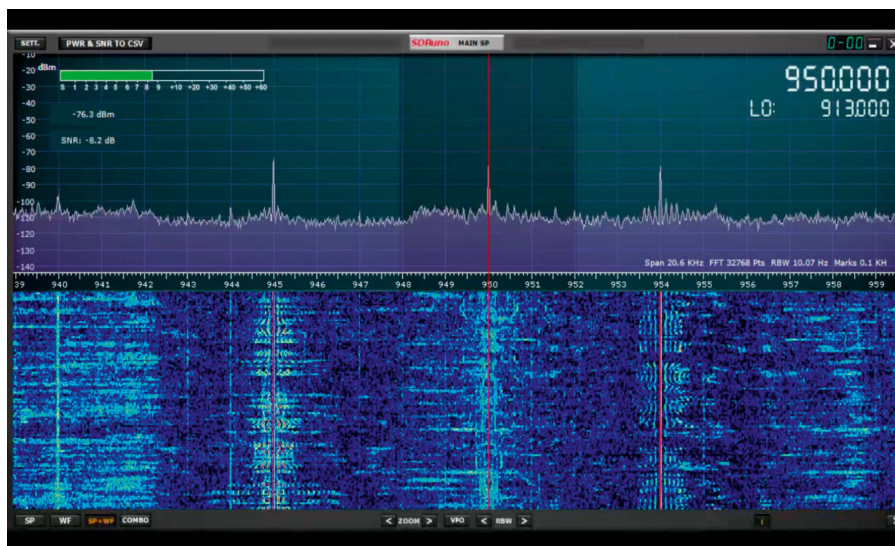


Fig. 5: The signal from CKNB 950kHz, Campbellton, New Brunswick.

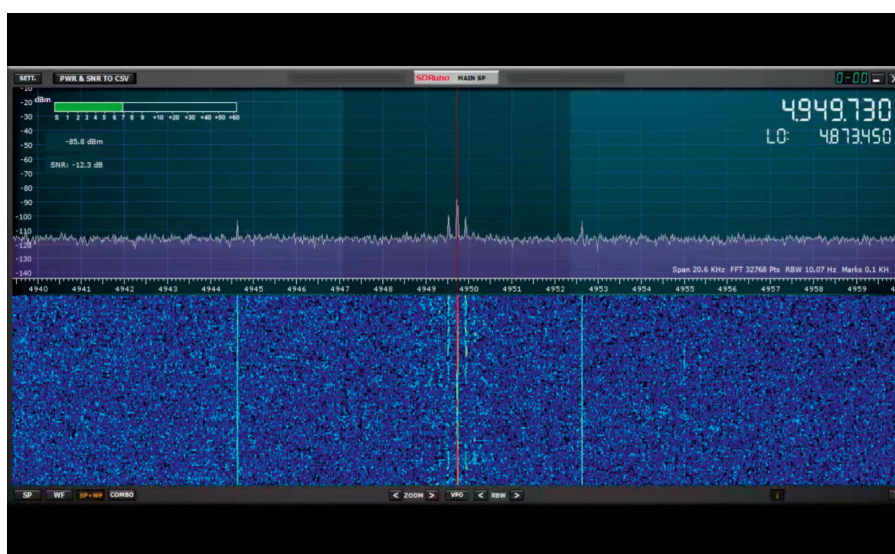


Fig. 6: The signal from Radio Nacional Angola on 4949.73kHz.

is a signal, which, particularly at this time of year, requires an excellent receiver and antenna. A superb job that firmly puts this modestly priced SDR 'on the map'.

As far as I can tell, the performance of the RSP1A on medium wave is almost indistinguishable from the Elad or Perseus SDR receivers.

On Short Wave

Once again, I thoroughly tested the RSP1A over a few days and made some direct comparisons with the Elad and Perseus. I purposely used what I consider to be 'difficult-to-receive' signals, on the basis that any shortcomings of the receiver, in the field of sensitivity, would become more obvious.

In direct comparison to the Perseus, I received Emisoras Pio XII, Bolivia, on **5952.42kHz**, Radio Nacional Angola, on **4949.73kHz** (Fig. 6), Rádio Clube do Pará, Belem, Brazil, on **4885kHz**, Radio Difusora Roraima on **4875.24kHz**, Boa Vista, Brazil, Myanmar Radio, on **5914.98kHz** and CHU,

on **3330kHz**, Ottawa, Canada.

In all of the above cases, the RSP1A matched the noise-floor of the Perseus (~110 dBs) as well as signal strength, modulation and recovered audio. In the case of Rádio Clube do Pará, the Perseus was out-performed for signal strength. An amazing result.

A similarly impressive result was obtained in comparison with the Elad. I copied signals from Radio Voz Missionaria, Camboriu, Brazil, on **5939.79kHz**. At last, I was also able to resolve Rádio Evangelizar, Curitiba, Brazil, on **6040.69kHz**, Radio Nacional Angola, on **4949.73kHz**, Rádio Clube do Pará, Belem, Brazil, on **4885kHz** and Radio Cultura Ondas, Manaus, Brazil, on **4845kHz**.

Signal strength, modulation and recovered audio of the RSP1A very nearly matched that of the Elad. The only slight let-down was a slightly higher noise-floor (~3 to 5 dBs), which, of course, led to a marginally inferior signal-to-noise ratio. However, it was very close indeed.

Portability

I am known for my 'DXpeditions' into the wilds of the Oxfordshire countryside and further afield, particularly in Continental Europe and South America. With the benefit of 5V USB operation, it is very straightforward to get out of the shack with the RSP1A. I do that quite frequently, in order to get away from the ubiquitous 'electro-smog', which plagues so many of us.

Therefore – with a couple of hours to spare one evening and with a fully-charged laptop – it was good to take advantage of the vastly superior SNR outdoors.

I received numerous signals on the tropical bands and further up the HF band, using just a 50-metre long-wire. I have always wanted to carry what I consider to be a 'top-end' SDR to South America. Here then was the perfect opportunity so to do – at a modest price, with no issues of how to power it in the jungles of Brazil.

I also carried the RSP1A into the office one day. It slips into your briefcase or laptop bag, plugs into your laptop and you're away. I copied various signals on short wave in the afternoon – with just a few metres of wire hanging out of the window.

When coupled to my equally-portable Bonito MegActive MA305 E-field antenna, within 15 minutes I had copied clear signals from the VOA Botswana relay, on **15580kHz**, WCCR Nashville, on **13800kHz**, Zanzibar BC, on **11735kHz**, KBS World Radio, on **9640kHz** and TWR Africa, Swaziland, on **7300kHz**.

Not a bad haul at 1530 UTC, in the middle of the afternoon.

Conclusion

In terms of performance as a function of price, I don't believe the RSP1A can be beaten. It delivers 98% of the performance of a 'high-end' SDR at about one-tenth of the cost. Truly remarkable. Whether it is transatlantic medium wave DX or shortwave you are interested in, the RSP1A delivers at a level that should satisfy any 'hard-core DXer'.

Another big advantage of this SDR is the fact that it is very portable; the unit itself is lightweight and, with 5V USB operation, you can easily power it from your laptop, literally anywhere.

The only downside is that it appears to be (slightly) noisier than the Elad.

There is competition, in the shape of the new Airspy HF+.

However, at £225, that receiver will need to be really special indeed to take the price/performance crown from SDRplay. ■