

[rtl-sdr.com](http://rtl-sdr.com)

RTL-SDR (RTL2832U) and software defined radio news and projects. Also featuring Airspy, HackRF, FCD, SDRplay and more.

- [Home](#)
- [About RTL-SDR](#)
- [Quick Start Guide](#)
- [Featured Articles](#)
  - [Tutorials](#)
    - [Air and Marine](#)
      - [ADS-B Aircraft Radar](#)
      - [ACARS Decoding](#)
      - [AIS Ship Tracking](#)
      - [Decoding Weather Balloons](#)
    - [Satellite](#)
      - [NOAA Weather Satellites](#)
      - [Meteor-M Weather Satellites](#)
      - [GOES 16/17 and GK-2A Weather Satellite Tutorial](#)
      - [Inmarsat STD-C NCS EGC Decoding](#)
      - [Decoding and Plotting GPS](#)
      - [Decoding HRPT Weather Satellite Images](#)
    - [Terrestrial](#)
      - [P25 P1 Digital Voice Decoding](#)
      - [P25 P2 Decoding with OP25](#)
      - [Trunked Radio Following](#)
      - [POCSAG Pager Decoding](#)
      - [TETRA Voice Decoding](#)
      - [Analyzing GSM Signals](#)
      - [DRM Radio Decoding](#)
      - [Decoding 433 MHz ISM Band Weather Stations](#)
    - [Single Board Computer](#)
      - [QRP \(FT8, JT9, WSPR etc\) Monitoring Station](#)
      - [Performing Replay Attacks with RTL-SDR and RpiTX](#)
    - [Radio Astronomy](#)
      - [Radio Astronomy Overview](#)
      - [Hydrogen Line Galactic Radio Astronomy](#)
    - [Other](#)
      - [Measuring Filter Characteristics & VSWR](#)
      - [SpyServer Tutorial](#)
      - [Using the V3 Bias Tee on PiAware](#)
      - [Properly Positioning a Preamp/LNA](#)
  - [Product Reviews](#)
    - [SDRs](#)
      - [Airspy HF+ Review](#)
      - [Airspy vs. SDRplay vs. HackRF](#)
      - [SDRplay RSP1A](#)
      - [SDRplay RSP2](#)
      - [FlightAware ADS-B RTL-SDR](#)
      - [Outernet Dreamcatcher](#)
      - [LimeSDR Review](#)
      - [LimeSDR Mini](#)
      - [ThumbNet N3](#)
      - [Airspy Mini](#)
      - [PlutoSDR Unboxing](#)
      - [PlutoSDR Tests](#)
      - [KiwiSDR Review](#)
      - [FlightAware Prostick vs Prostick Plus](#)
      - [HackRF PortaPack Review](#)
    - [SpyVerter Upconverter](#)
    - [9A4QV Folded Monopole ADS-B Antenna](#)
    - [FlightAware ADS-B Antenna and Filter](#)
    - [Outernet LNA and Patch Antenna](#)
    - [moRFeus Review](#)
  - [Interesting](#)
    - [TEMPEST with SDR](#)
    - [Listening to HD Radio](#)
    - [Receiving Dead Satellites](#)
    - [Listening to SCA Broadcasts](#)
    - [Live ADS-B Aircraft Cockpit](#)
    - [Transmitting with a Raspberry Pi](#)
  - [Quick Start Guides](#)
    - [RTL-SDR QSG](#)
    - [V3 Features Users Guide](#)
    - [SDRSharp Users Guide](#)
    - [PlutoSDR QSG](#)
  - [Direct Sampling Mod](#)
  - [Roundup of Software Defined Radios](#)
  - [KerberosSDR](#)
    - [KerberosSDR Quickstart Guide](#)
    - [Direction Finding Android Demo](#)
    - [Direction Finding Android Tutorial](#)
    - [SignalsEverywhere Direction Finding Tutorial](#)
    - [Networked Direction Finding](#)
    - [Measuring Traffic Volumes with Passive Radar](#)
- [Software](#)
  - [RTL-SDR Supported Software](#)
  - [List of SDRSharp Plugins](#)

- Experimental Drivers
  - [Experimental HF Driver](#)
  - [Manual gain controls and decimation driver](#)
  - [ExtIO with Decimation & Tuner Bandwidth Controls](#)
  - [Keenerds Driver](#)
  - [L-Band Heat Issue Driver](#)
- [Signal ID Wiki](#)
- [Forum](#)
- [RTL-SDR Store](#)
- [Guide Book](#)
- [Contact](#)

- Navigation - ▼

March 17, 2022

## Detecting Interstellar High-Velocity Clouds with a Radio Telescope and an RTL-SDR

Over on Facebook Job Gehenau has recently described his success in detecting interstellar high-velocity clouds with his telescope consisting of a 1.8 meter dish, amplifiers, band pass filters, and an RTL-SDR.

High-velocity clouds or HVC's are areas of interstellar gas that are moving at very high velocities relative to that of the galactic rotation.

Job has been ticking off some amazing amateur radio astronomy milestone results recently with his radio telescope and RTL-SDR. So far he has managed to [image the Cygnus star forming region](#), complete a [Hydrogen line survey of the northern sky](#), [measure the galactic rotational curve](#), and [create a radio image of the milky way](#).

His latest post about detecting high velocity clouds reads:

### **CIII High Velocity Cloud detected with 1.8 meter JRT.**

The receiver was a RTLSDR connected to some amplifiers, band pass filter and a 1.8 meter dish.

HIGH VELOCITY CLOUD CIII with JRT (Job's Radio Telescope)

#### **Wikipedia:**

“High-velocity clouds (HVCs) are large collections of gas found throughout the galactic halo of the Milky Way. These clouds of gas can be massive in size, some on the order of millions of times the mass of the Sun and cover large portions of the sky. They have been observed in the Milky Way's halo and within other nearby galaxies.

HVCs are important to the understanding of galactic evolution because they account for a large amount of baryonic matter in the galactic halo. In addition, as these clouds fall into the disk of the galaxy, they add material that can form stars in addition to the dilute star forming material already present in the disk. This new material aids in maintaining the star formation rate (SFR) of the galaxy.

The origins of the HVCs are still in question. No one theory explains all of the HVCs in the galaxy. However, it is known that some HVCs are probably spawned by interactions between the Milky Way and satellite galaxies, such as the Large and Small Magellanic Clouds (LMC and SMC, respectively) which produce a well-known complex of HVCs called the Magellanic Stream. Because of the various possible mechanisms that could potentially produce HVCs, there are still many questions surrounding HVCs for researchers to study.”

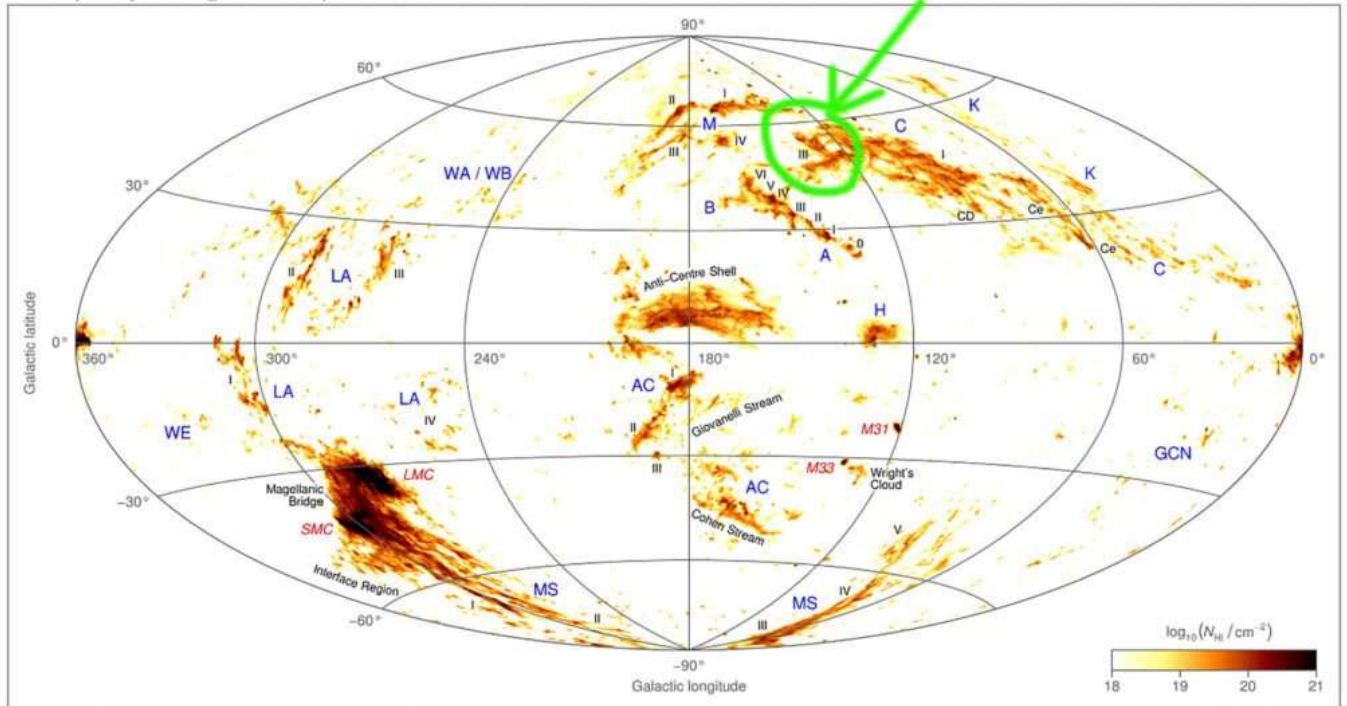
#### **My detection:**

For JRT the High Velocity Clouds are pretty hard to detect.

The Anti Center Complex is the easiest which I detected earlier last year.

This week I tried C III. It's at Galactic Coordinates 120 50 and has a Vlsr of -140 km/s. You can find it on the chart:

All-sky Map of High-velocity Clouds



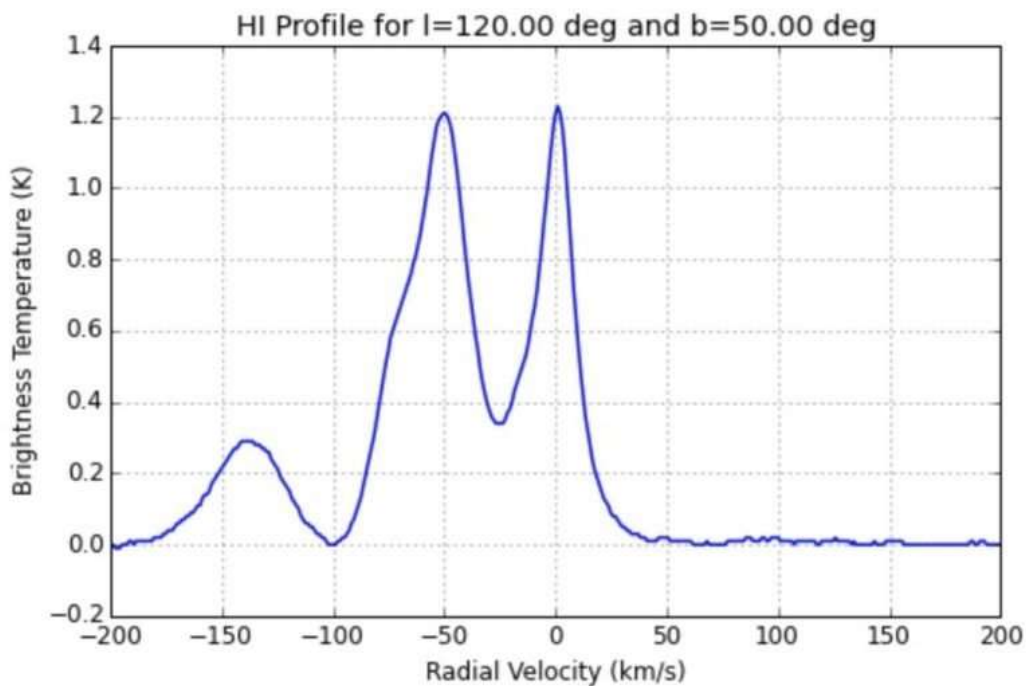
Westmeier, T., 2018, MNRAS, 474, 289; based on the HI4PI survey (A&A, 594, A116)

Tobias Westmeier

In the simulation it looks like this:

Position	RA [h m s]/ l [°]	120
	DEC [±° ' "]/ b [°]	50
Effective beamsize FWHM [°]		8.00
Velocity Window for display	Minimum [km/s]	-200.00
	Maximum [km/s]	200.00
Search data		

### Result



23.06.2022, 22:30

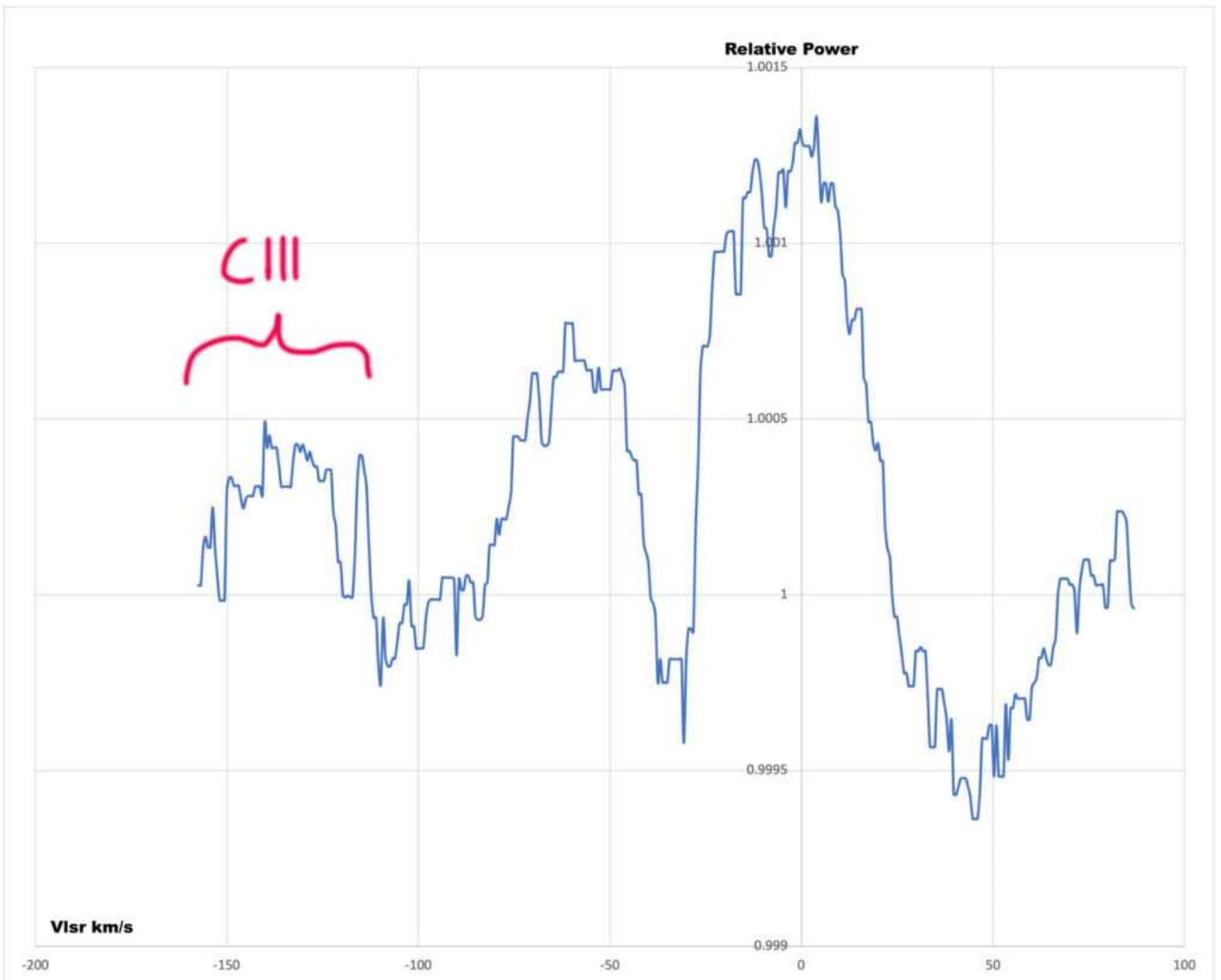
## Detecting Interstellar High-Velocity Clouds with a Radio Telescope and an RTL-SDR

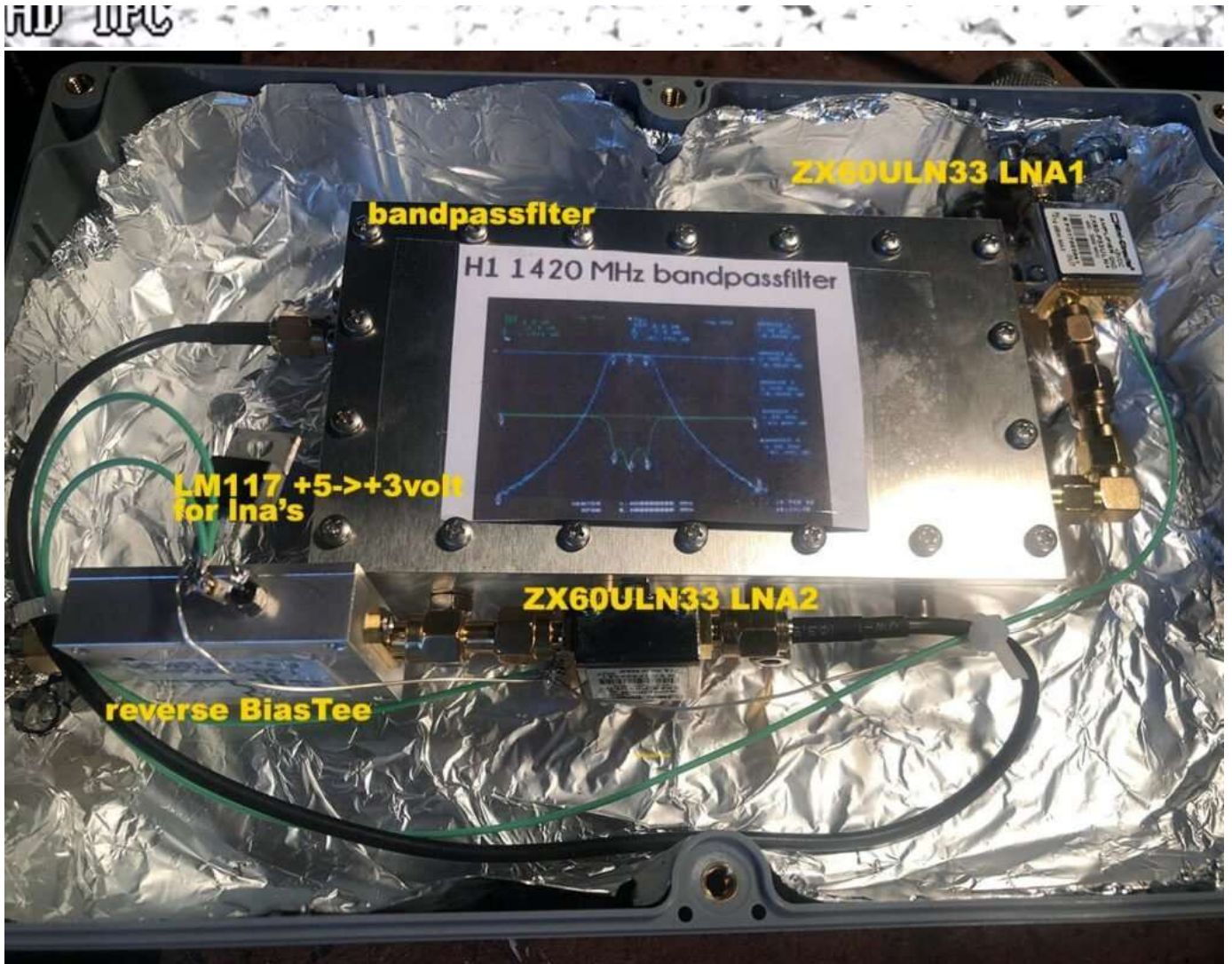
Pay attention the low Brightness Temperature (0.3 Kelvin) compared for instance with Deneb (80 Kelvin)! Pretty hard to detect with my dish.

With JRT I did a 4 hour exposure (also 4 hours of Darks in the neighborhood) at 1420.405 MHz.

The new Feed I built is very good and has a perfect 'pitch' at gain 25 dB.

The final result for High Velocity Cloud CIII with my 1.8 meter dish:





**Related Posts:**

- 1. [Job's Radio Telescope: Hydrogen Line Northern Sky Survey with RTL-SDR](#)
- 2. [PICTOR: An Open Source Low Cost Radio Telescope based on RTL-SDR](#)
- 3. [Conference Talk on PICTOR A Free-to-Use Open Source Radio Telescope based on RTL-SDR](#)
- 4. [Imaging the Cygnus Star Forming Region with an RTL-SDR and Amateur Radio Telescope](#)
- 5. [Imaging the Cassiopeia A Supernova Remnant with an RTL-SDR and Amateur Radio Telescope](#)

Written by [admin](#) Posted in [Applications](#), [Radio Astronomy](#), [RTL-SDR](#) Tagged with [high velocity clouds](#), [hydrogen line](#), [radio astronomy](#), [rtl-sdr](#), [rtl2832](#), [rtl2832u](#)

**Post a comment**

Comment

You may use the following HTML:

```

<a href="" title=""> <abbr title=""> <acronym title=""> <b> <blockquote cite=""> <cite> <code> <del datetime=""> <em> <i> <q cite=""> <s>
<strike> <strong>

```

Name  Email  Website

Save my name, email, and website in this browser for the next time I comment.

ANTISPAM: What does the 'R' in SDR stand for? (Required)

Notify me of followup comments via e-mail. You can also [subscribe](#) without commenting.

[SignalsEverywhere: Setting up and using SDR++ Server](#)  
[New York Times Story on Intercepted Russian Forces Radio Communications](#)



**Follow Us**



**Weekly Newsletter + Product Updates**

**Search**

**Recent Posts**

- [RTL-SDR Blog V3 Dongle and SDR# Spotted on The Secret of Skinwalker Ranch TV Show](#)
- [Airsby 2022 Summer Sale + SDR# Noise Reduction Improvements](#)
- [Low Cost Shielding Idea for Plastic RTL-SDRs](#)
- [The South Indian SDR User Group](#)
- [Metal Case Upgrade for the SDRplay RSP1A Back in Stock!](#)

**Recent Comments**

serial Killer hertz on [Radio Related News Occurring in the Russia-Ukraine Conflict](#): "I hope my QSL card from the Russian time station RWM doesn't get intercepted by our government or something. Been..."  
Jun 23, 04:06

Arib on [RTL-SDR Blog V.3. Dongles User Guide](#): "Hi I have the V3 version of rtl sdr and I want to power a LNA specifically a nooelec sawbird+..."  
Jun 20, 21:46

Jay Bree on [Photos of the MSi.SDR Dongle: A New SDRplay RSP1 Clone](#): "I can't see how anyone can make anything with 30% fallout. That's beyond terrible since about 1981."  
Jun 20, 12:53

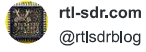
[Wong Lee](#) on [Photos of the MSi.SDR Dongle: A New SDRplay RSP1 Clone](#): "Sometimes the hard work and self-innovation in an exiting domain acts like acid on the skin. 😊"  
Jun 20, 05:27

[Jeff Burris](#) on [RTL-SDR Tutorial: Receiving NOAA Weather Satellite Images](#): "Thanks so much. Everything is updating now, between pouring through settings once again and also a server appeared to be..."  
Jun 18, 20:20

Anonymous on [RTL-SDR Tutorial: Receiving NOAA Weather Satellite Images](#): "You may have trouble when updating the keplers since some of the satellites have stopped operating. As of 2022 turning..."  
Jun 18, 03:40

Lester Hinton on [RTL-SDR Tutorial: Cheap ADS-B Aircraft RADAR](#): "Can you also hear the airplanes I hear nothing. It is not muted."  
Jun 17, 18:18

Tweets by @rtl-sdrblog



RTL-SDR Blog V3 Dongle and SDR# Spotted on The Secret of Skinwalker Ranch TV Show [rtl-sdr.com/rtl-sdr-blog-v...](https://rtl-sdr.com/rtl-sdr-blog-v...)



[Embed](#)

[View on Twitter](#)

Categories

Select Category ▾

Archives

Select Month ▾

[Full Archives List](#)

Tags

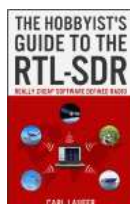
[ads-b](#) [airspy](#) [AIS](#) [amateur radio](#) [android](#) [antenna](#) [APT](#) [Automatic dependent surveillance broadcast](#) [bladerf](#) [DAB](#) [direction finding](#) [dsd](#) [E4000](#) [gnu radio](#) [GOES](#) [GPS](#) [hackrf](#) [HF](#) [hydrogen](#) [line](#) [inmarsat](#) [kerberosdr](#) [l-band](#) [limesdr](#) [LNA](#) [NOAA](#) [outernet](#) [P25](#) [passive radar](#) [plutosdr](#) [R820T](#) [radio astronomy](#) [raspberrypi](#) [reverse engineering](#) [rtl-sdr](#) [rtl2832](#) [rtl2832u](#) [satellite](#) [sdr#](#) [sdrplay](#) [sdrsharp](#) [security](#) [Software-defined radio](#) [upconverter](#) [usrp](#) [weather satellite](#)

[Latest Forum Posts](#)

- [RTL-SDR Discussion • What Is The Net Worth Of Mike Lindell?](#)
- [Troubleshooting Help • Re: ON OFF Boolean Value from RTL-SDR](#)
- [Troubleshooting Help • ON OFF Boolean Value from RTL-SDR](#)
- [RTL-SDR Discussion • RTL SDR and Windows ARM64 driver?](#)
- [KerberosSDR • To admins](#)

Submit a Story/Contact

[Submit a Story/Contact](#)





**Meta**

- [Log in](#)
- [Entries feed](#)
- [Comments feed](#)
- [WordPress.org](#)

**What is RTL-SDR**

The RTL-SDR is an ultra cheap software defined radio based on DVB-T TV tuners with RTL2832U chips. The RTL-SDR can be used as a wide band radio scanner. It may interest ham radio enthusiasts, hardware hackers, tinkerers and anyone interested in RF.

- [Privacy Policy](#)