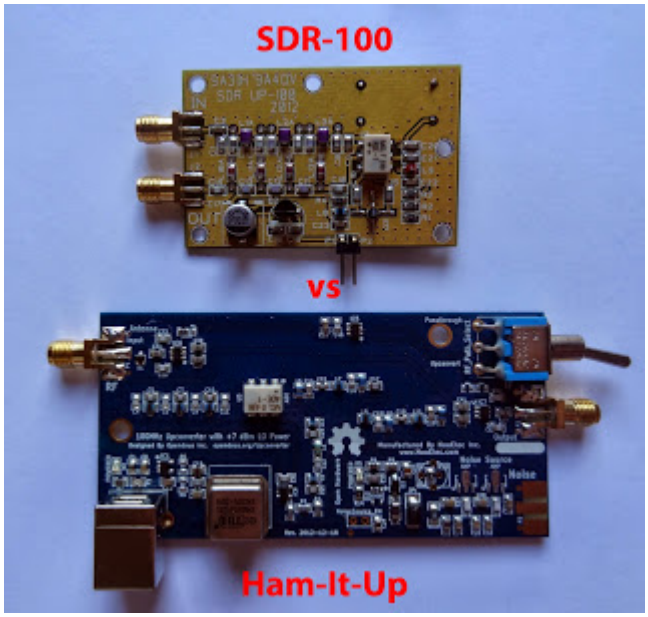
Sunday, 29 September 2013

Ham-It-Up vs SDR Up 100



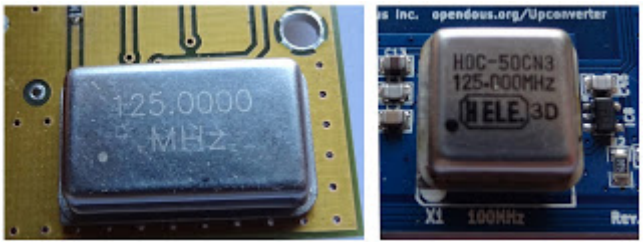
The **Ham-It-Up** and the **Up 100** are the two cheapest shortwave adapters available: direct competitors at 50 USD (including shipping).
For this review, I purchased the Ham-It-Up and received the Up-100 for free for testing.

Shipping and customer service

The Ham-It-Up comes from the States with tracked shipping; you get emails where it is, but when the package leaves the US no more tracking info available. You can buy on Ebay, Amazon or via the manufacturer's website.
The Up-100 ships from Croatia (that's a country in Europe next to Italy) with no tracking. You pay when the item arrives, so no shipping worries. Available by sending an email to Adam: adam9a4qvwashington@yahoo.com, remove the US capital to get his proper email.
Nooelec: Local postal service lost my first order, so after some Ebay hassle they sent a replacement one free of charge. Nooelec also included 3 adapters for free, to compensate for the inconvenience.
Adam: Upconverter arrived quickly, seller replies almost immediately, will help you with antennas, cables and power options. I requested a power lead to power the SDR-100 and received one free of charge.

Ham-It-Up First Impressions

Your 50 dollars from Nooelec arrives in an anti-static bag, protected by two bubble-wrap envelopes. **The Ham-It-Up** fits in your palm, looks and feels impressive; first thoughts were "This will get the job done, money well spent and just look at that beauty".
You get a piece of electronic component separately, the brain of the thing, which you have to push in; there are no written instructions in the envelope,



Brain Game: SDR-Up 100 on left, Ham-It-Up on right

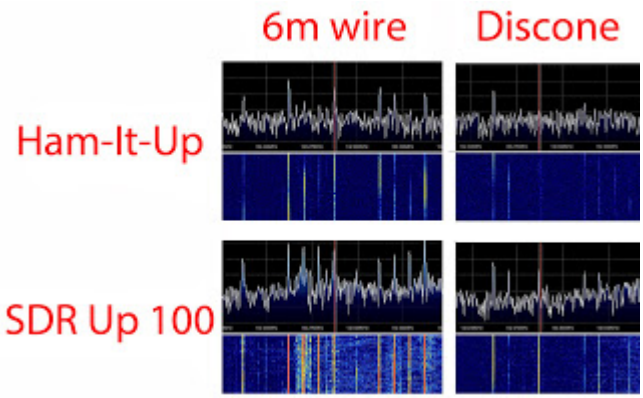
a YouTube video shows assembly.
A chunky switch enables pass through mode, so if you use an outdoor (preferably discone) antenna you can use the same antenna for shortwave with a flick of a switch.
In comparison, the Up-100 works out of the box, no fitting or manual assembly required.
I want equipment that works when I get it: Adam's upconverter is better here.
Both upconverters add 125 MHz to the received frequency, so the only major difference is power options, usability and, ultimately, performance.

Power and size

The Ham-It-Up needs power between 4-6 Volts: the square USB-B cable used for printers and some external hard drives powers it.
Works with any of the following options:
1. Directly from laptop, USB port supplies power. Distance from computer limited by USB cable length.
2. Mains USB adapter, then USB cable powering the upconverter. Plug-in USB chargers work fine for this purpose.
3. 12V from a car battery or similar supply, 12V to 5V adapter which is widely available (called 12V to USB adapter).
4. Four rechargeable or normal batteries supplying between 4.8 V and 6V, then power via USB-B cable.

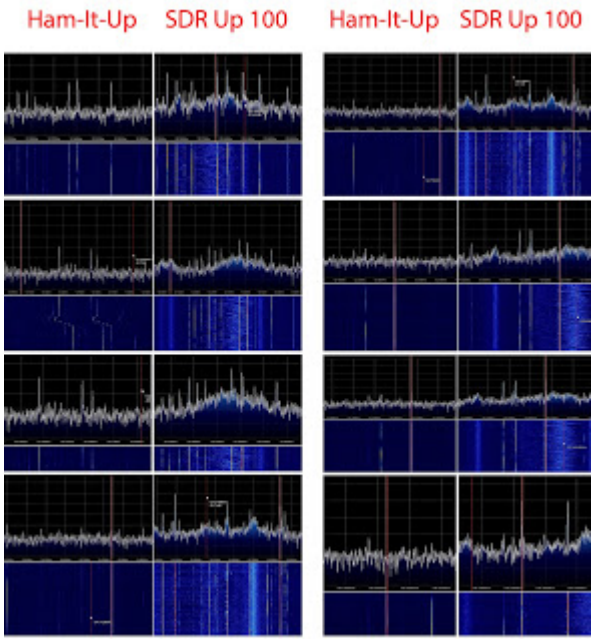
Unless you power the Ham-It-Up from your laptop, a USB-B cable must be cut apart for power.
Connect the USB-B square bit into the Ham It UP, Red and Black to battery terminals and you're in business: green light comes on when it has power.
This is better than the Up-100 which has no light to show it works.
The Up-100 will fit into an electrical junction box, the Ham-It-Up needs a bigger enclosure.
For marine use, without testing for performance, choose the Up-100, no power adapter nor special cable needed, smaller enclosure and works with boat or car-standard 12V.

Testing setup



You need as much wire outdoors as possible for the frequency you're interested in; the lower the frequency the more wire you need.
If you have a discone antenna you're better off with a short wire than your discone, see results on your right. Higher peaks = better signal, more fun.
City centre location, 20 foot wire as antenna for testing, coax with ferrites to upconverters.
Laptop with 8GB Ram, Core i3 Processor running Windows 7 64-bit if you want to know.
During setup same antenna, RTL-SDR dongle, Gain at 0dB, same SDRSharp settings used throughout.
The two upconverters were set up side-by-side, only swapped antenna and signal cables.
Tested both day and night, sunshine and rain, strong and weak signals.
Offset: I do NOT use offset in SDRSharp, simply enter 125 MHz plus the desired frequency. Tune to 125 MHz, you'll see a huge spike, your real tuned frequency starts from there. 129 MHz becomes 129-125 = 4 MHz and so on. SDRSharp crashes or fails to start for me with - 125 offset, plus some mental arithmetics won't hurt.

Performance



Update 2: *More pictures with different gain settings at the bottom of the post*

Update 4: *Due to Nooelec's response I feel compelled to insert their observation here (full reply at the end of article)*

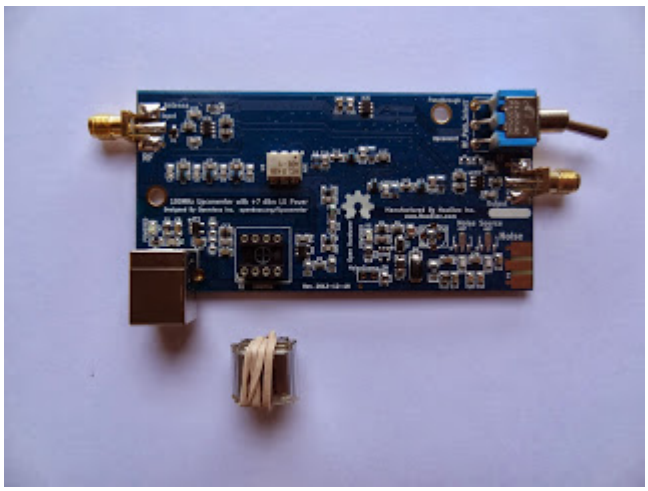
There is no chance that the 'Ham It Up' could possibly perform as well as it should without any gain in front of it. It's not a fair performance comparison. If anything, you should certainly specify as much in the performance section of the article.

Conclusion: the Up-100 is better. Much better.
Ham-It-Up: trying to understand speech, fading.
Up-100: the room is full of voice, more noise too, but Digital Noise Reduction takes care of that.
Weak signals are simply not there with the Ham-It-Up. I can hear them with the Up-100.
The difference is so huge that when changing upconverters I stopped double-checking which one is in use, as the Up-100 is so much louder.
The Ham-It-Up gave me the impression of a dusty, old shortwave handheld, which tunes the major stations with lots of noise and fading; and you're happy with it, 'cause at least you hear something.
With the SDR-100 the feel is more of a sensitive, cutting edge equipment, able to receive faraway stations.

Room for Improvement

- More power options. Thick Red and Black wires for 9-15 V power when I need them, standard USB extension cord connectors when I want Plug and Hear.
- LED for power. SDR-Up 100 needs an indicator to show all is fine; both need flashing LED to remind me to change batteries when the battery starts to die.
- Simple enclosure for an extra 5 euros.
- **Two antenna sockets** for HF and VHF work, big switch between the two. I don't want to change antennas.

Final thoughts



At least, you can receive shortwave.
The Ham-It-Up is an excellent product for listening to major broadcast stations with an outdoor discone; the pass-through switch enables simple and quick exploration of signals below 30 MHz without the need to change antennas. Powered with an USB cable, the package takes up little space and is easy to use: if you see a signal in SDRSharp chances are **you'll hear something.**

Apart from that novel fact there's no reason to buy one.
Compared to the SDR-100, the Ham-It-Up is so deaf it needs a hearing aid. To put this into perspective, the Ham-It-Up with a 6m wire is about equal to an ICOM IC-R5 (small communications receiver) with an outdoor discone, and comparatively worse than a Grundig G3 with a built-in telescopic antenna. Simply put, the SDR-100 is light years ahead for weak signals, at the cost of noise pickup. At half the size a suitable enclosure is easier to find, and 9 and 12V power options are just the cherry on the cake.
If you are new to shortwave radio spend your 50 dollars on a second-hand portable from eBay.
For everyone else, I recommend the SDR-100 over the Ham-It-Up.

Update 1: Shielding, Aerials, Settings and Images

Due to an interesting comment on RTL-SDR.com let me clear a few things... Regarding this post and in general my attitude to testing, usability and, ESPECIALLY, cost.

50 USD results in an upconverter from either manufacturers, so you can listen to shortwave signals. Both lets you do that, but due to the built-in amplifier the SDR-UP 100 lets you receive more signals.

Neither up-converters were placed in an metal box, so level field here. RTL stick in a metal box plus all the tricks I detailed in the noise suppression post.

The aerial question: the maximum I can or will put out is 20 foot wire. The results show a dramatic difference between the two.
Obviously, you can improve reception with more wire, as 20 foot wire is far from ideal. Or an UNUN. Or an antenna tuner. Or moving to the countryside, try 40m wire in an urban environment from a third-floor flat.

I am interested in utility and value for money out of the box, so a beginner can read understandable information on which one to choose to hear faraway radio stations - and the SDR Up 100 is better for this purpose.

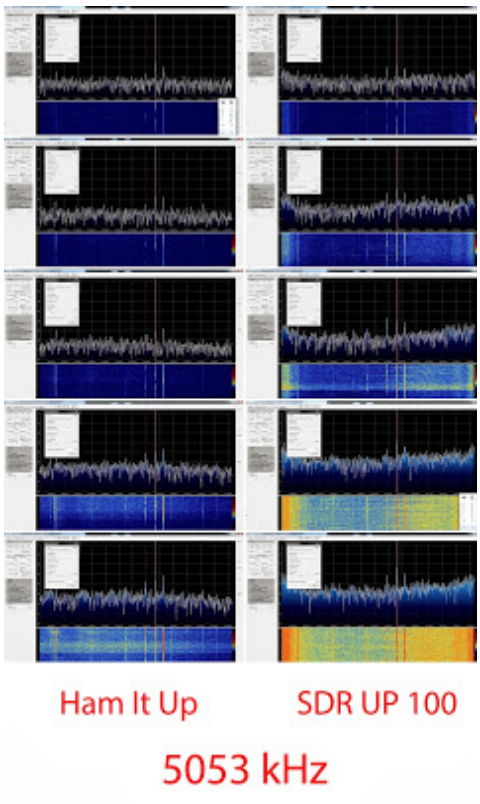
The number-crunching game is pointless for beginners: the primary target audience for this blog are yachties without AIS moaning that a receiver is expensive, people on a budget, non radio people exploring the world of RTL-SDR.

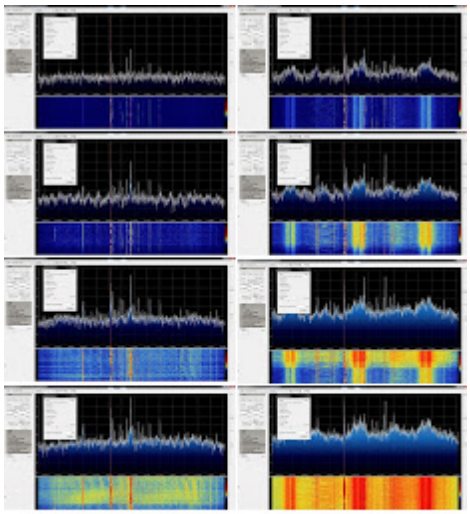
Leave comments here please

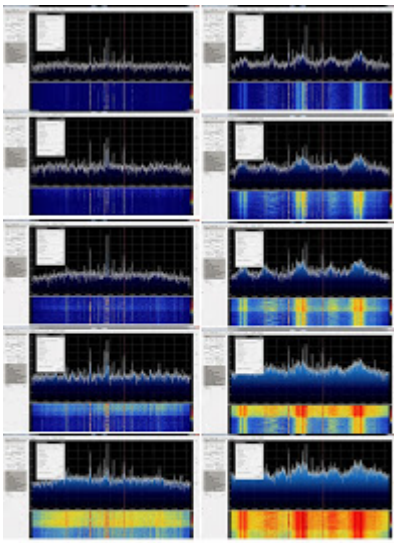
Comments are much appreciated, especially if you leave them on this blog, so I can reply them here. Unfortunately, you have to have an account for that, with a name, maybe even a face like some of us do.

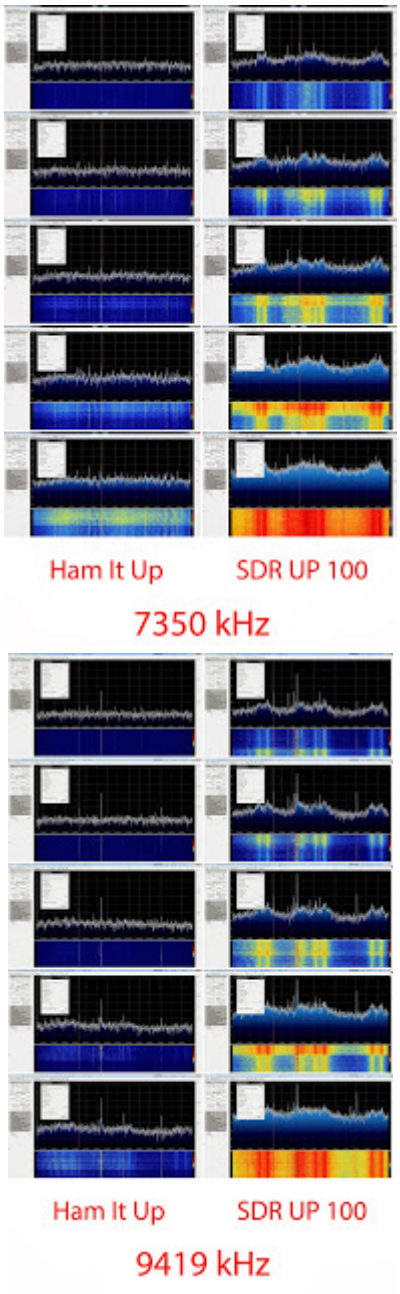
Update 2: Comparisons with different gain settings

Tested both upconverters on 5053, 5910, 6134, 7350 and 9419 kHz, with four and five different gain settings. Click on the frequency numbers to download printscreens below, one file is around 13-14 Mb.
I consistently found the SDR UP 100 better. An example is 5053 kHz: extremely faint Portuguese voice with the SDR Up with lots of noise, short-wave info tells me possibly R Jornal a Critica FM on 5055kHz. Still, playing with Noise reduction and Gain at the same time results in understandable speech. With the Ham It Up, no matter how I tried I could not get the same results, since I have to increase gain in SDRSharp up to a point where noise swamps the signal.




Ham It Up
SDR UP 100
5910 kHz


Ham It Up
SDR UP 100
6134 kHz



Update 3: Reply from Adam, the maker of SDR UP 100.

Adam has to say about my suggestions:

"Regarding your notes for the improvement, they are all in place.
The guide line when constructing the upconverter is to have the unit with costs up to 50 USD.
I have plenty addons and improvements that can be included in the design but then, it will not cost the 50 USD but 100 USD and then we are entering another price level.

I agree, with a small investment, the various power connector system can be added.

The cost of the led diode is minor and all gadgets are not so expensive.

My first idea was to have a descent reception using the peace of wire, because this is the unit built for those users who will use a peace of wire, and the unit shoul be able to receive the signals with that antenna.
If the unit require full size resonant antenna, than this is not the product for everyday user.

If you compare this upconverter together with the stick against the expensive 800USD sdr receivers the difference is only that they have the dedicated bandpass filters, attenuator and a better AD converter."

Many thanks for the above. Adam can be reached at adam9a4qvwashington@yahoo.com, remove the US capital to get his proper email.

Update 4: Reply from Nooelec, the maker of the Ham-It-Up.

Your review is thorough and well-written. I find it great that you covered aspects other than performance.

However, the performance review is not even close to apples to apples. As you are aware, there is no LNA on the 'Ham It Up' upconverter itself. There are quite a few reasons for that.

1. An LNA on-board limits options as it would be fixed-gain. Variable-gain would be exceedingly expensive.
2. An LNA should really be placed near the antenna if the antenna run is long. That cannot be done if it is built into the upconverter.
3. The appropriate gain should be dependent on the frequency or frequencies of interest and antenna being used.

There is no chance that the 'Ham It Up' could possibly perform as well as it should without any gain in front of it. It's not a fair performance comparison. If anything, you should certainly specify as much in the performance section of the article.

If you really wanted to do a better comparison, you would either insert the same amount of gain in front of the Ham It Up, or take the signal from after the LNA on the Up-100 and insert into the Ham It Up upconversion path. If you need assistance with this please contact us.

You also fail to note that there are advantages to a socketed oscillator, as on the Ham It Up, insomuch as it can be very easily replaced with an even

better clock-source for those who have one at their disposal. We ship the oscillators off-board so that it is more likely to survive international transit.

The Up-100 is a good upconverter, much better than other designs we've seen. We have one here at the lab that we have used to compare performance. The performance is very similar with the same amount of gain in front. This is not surprising, since the actual frequency mixing is done by the same ADE-1 and the Up-100 uses quality filtering components as does the Ham It Up. The only differences you should see when doing a legitimate comparison test is the differences between the filtering components used on the two upconverters.

Update 5: Thoughts after manufacturer's responses

Deep respect to both manufacturers for replying to this review; it shows that both truly care about their product. I added Nooelec's response to the performance section as suggested as it was a good idea.
The reason I did this review is to find out which upconverter is better for 50 USD; I define better as more enjoyable, easier to use, capable of providing a signal I can listen to, out of the box.
Some readers fail to grasp the fact that both upconverters cost 50 dollars, so they are competitors. LNA or no LNA. A friend asks me which one to buy: I point to the SDR Up 100. Ham It up for 30? Sure. Same price? SDR Up 100.
Out of the box, you hear more with the SDR UP 100. Even after playing with gain settings, I could not get the same performance out of the Ham It Up.
At the end of the day you pay your money and you take your chances: order both, enjoy both.

Ham-It-Up technical information and user Guide here:
https://code.google.com/p/opendous/wiki/Upconverter#SDR_Software_Tuning_Instructions

If you enjoyed this article, or wish to support this blog,

... go to Amazon and buy my book. Tips and tricks in the book will save time and money, reduce frustration with computer settings and help you build the best antenna system from shortwave to microwave. Detailed and illustrated step-by-step descriptions on easy-to-do antennas, from shortwave to microwave.
Basically all you need to know to enjoy radio.

Posted by Akos at 16:38

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2 comments:

1. *Wilson Costrino*25 October 2013 at 11:35

   looks like adam closed production of sdr up 100...:-(

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   Replies
   Reply

2. *Akos Czermann*12 February 2014 at 06:21

   SDR UP 100 is out of production, so that comparison would be pointless.

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  - ► December (1)
  - ► October (1)
  - ▼ September (3)
    - Ham-It-Up vs SDR Up 100
    - Review: SDR UP 100
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