Lab Rats: 5 More Essentials For Your RF Hack Lab

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It’s time to check out the latest in cool tools that belong in your lab.

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In this previous article, we took a look at some of the tools you’ll need to kick off your RF hacking lab. It’s fair to say, though, that any lab you walk into should be well kitted out. So, today we’re back with more of what you need to unlock the secrets of the spectrum.

Remember, though, all the hardware in the world means little if you aren’t burning some electrons. So while all the cool kit is well…kinda cool, remember, it isn’t the be-all and end-all.

It’s far more important to get out there and put these skills into practice. Cyber should be fun, remember?!

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Oscilloscope

Displaying voltage and other metrics as a unit of time, the Oscilloscope or O-Scope is an extremely useful piece of kit if you’re looking to do some more in-depth testing on your factory hardware or self-built transmitters.

With this, we can see amplitude, frequency, distortion and even interval! It’s a great bit of kit for identifying issues and getting the full picture on what a piece of hardware might be doing.

And, unlike spectrum analysers, which are pretty pricey, mass production means that oscilloscopes can be pretty affordable for amateur labs.

Keep a good eye on your local amateur radio swap meet to potentially pick one up for peanuts.

Alfa Wi-Fi make great wireless adaptors for hacking. Source: Amazon.com

Promiscuous Mode Wi-Fi Card

It’s fair to say that when it comes to essential kit for hackers of all kinds, a promiscuous, capable Wi-Fi card is pretty high up the list. While it looks pretty similar to any other plug-in adaptor, Promiscuous (or monitor mode) cards are capable of being placed into monitor mode.

This means that rather than hearing packets just for your network, monitor mode cards are able to listen to everything as well as sending deauth packets and other Aireplay-ng commands.

They are particularly useful when paired with Sparrow W-Fi, Kismet and other wireless logging programs.

Use caution, though. Some cards are incompatible with monitor mode, so be sure you’re grabbing the right one.

The Flipper Zero

2025’s rockstar of the wireless hacking world, the Flipper Zero is actually a pretty useful tool for the lab, all things considered.

While it has everything you need to gamify learning about the RF spectrum and cybersecurity, it also has some other pretty useful functions tucked away in there as well.

The “Read Raw” function allows you to record and analyse a signal in intricate detail, and the array of GPIO pins on the flipper means that compiling your own extensions is merely a matter of time/experience.

There’s no denying that, in some instances, the flipper gets a bad rap. But, don’t let that put you off, as it’s still a VERY useful bit of kit to have in your lab.

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Coaxial Cable Adapters

Antennas are an essential part of radio, but actually building and experimenting with antennas can be pretty fun if you’re a nerd.

However, one thing that isn’t fun is trying to standardise your connectors. N type, BNC, F type, all vary, which means that more often than not, you’ll have every connector and patch cable you need EXCEPT for the one you actually want.

Get ahead of this problem by sorting yourself a coaxial adapter kit. Comprised of most standard 50/75 Ohm coaxial fittings, it’s a great way to ensure that you have the correct connectors on hand while saving yourself a whole bunch of frustration.

Check Amazon or Facebook Marketplace to nab one at a reasonable price.

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Low Noise Amplifier

Effectively an amplifier, a quality Low Noise Amplifier (LNA) can be a lifesaver when you’re dealing with distant satellites or other faraway signals. While they will introduce some additional noise into the system, they are designed to do so in the lowest possible fashion, meaning that you should be able to intercept your signal of choice without losing it to background noise.

LNA’s work particularly well with the cheap, off-the-shelf RTL-SDR units and can help make the difference between a clear intercept and hearing nothing at all.

To keep things in the early stages easy, stick with one that has an onboard battery to save yourself the drama of getting power to it and keep things nice and simple. The Nooelec Sawbird LNA works well for beginners and can be found at a reasonable price point with a bit of effort.

Over To You!

The best labs are designed with their owners in mind, so with that said, it’s worth pointing out that these are simply suggestions for getting you started quickly as opposed to any hard and fast rule.

You’ll also find that the best labs are well lit, well-resourced and comfortable, which are all things you’ll find pretty essential if you’re planning on spending any significant length of time in there.

Remember, though, not everything has to be new. It just has to work. So, some savvy shopping combined with a little bit of patience could mean you potentially walk away with a well-stocked lab for cents on the dollar.

Have you scored a bargain for your homelab recently? Leave a comment and share the details.

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