

The  
Pragmatic  
Programmers

Pragmatic  
exPress

# Build, Tune, Explore with OpenWebRX+

Web-Connected Software-Defined  
Radio Made Simple



Richard Murnane, VK2SKY

*edited by Kelly Lee*

This extract shows the online version of this title, and may contain features (such as hyperlinks and colors) that are not available in the print version.

For more information, or to purchase a paperback or ebook copy, please visit <https://www.pragprog.com>.

Copyright © The Pragmatic Programmers, LLC.

# Preface

---

Hi, I'm Richard! My radio friends know me as VK2SKY. I've been a radio enthusiast since I was a boy, when "Santa Claus" left my brother and me a pair of walkie-talkies one Christmas morning. Little did he know what he was starting. Or maybe he did... seven years later I found myself studying electronics in university, and spent many years in the electronics and software industry.

Fast forward to the present, and radio is almost unrecognisable, yet familiar. We still have walkie-talkies – HTs or "handy-talkies", we call them these days – and most everyone listens to voices and music on the radio. But applications of this magical technology have advanced far beyond that, and radio is now a part of everyone's lives, whether they realise it or not.

In this book, we'll be going to go on a little journey, into the realm of "web-connected Software-Defined Radios", or webSDRs for short. Using little more than a Raspberry Pi microcomputer, a USB radio receiver dongle, and a basic antenna, we can explore the far reaches of the radio spectrum and discover its secrets. And we can share those secrets with the world.

Only a few years ago, this kind of exploration required expensive dedicated hardware, and as a ham radio operators, I've gone through my fair share of radios over the years! But with a web-connected SDR, we can do it all (receiving, if not transmitting) with an inexpensive kit small enough to fit in a shoe box.

Today, you can choose your own Radio Adventure: listen to air traffic, track nearby flights, ships, and vehicles on a map, receive pictures from the International Space Station, discover digital signals of all kinds, and much more. And if the signals you want to chase are out of range of your webSDR, there are hundreds more around the world that are as close as your web browser.

## Who is this Book for?

You don't need to be an electronics or radio expert to play here, nor a computer whiz; if you know your way around a Linux terminal, that's great, but if not, just follow the examples and you'll do just fine. Along the way, we'll have short, simple projects to build understanding and skills, and have fun along the way.

My aim here is to get you up and running OpenWebRX+ with minimal fuss, so you can explore at your leisure, and expand your horizons as you go. We'll start with acquiring the basic hardware, installing the OpenWebRX+ software, and making it fit your particular needs. If or when those needs change, you'll have the basic tools to expand your receiver to suit.

## How to Use this Book

You can dip into chapters in any order you like (it's your book, after all) but each chapter builds on what has come before, so if you want to get working OpenWebRX+ going quickly, then going in sequence will serve you well. Along the way there are plenty of "mini projects" to build your skills in various aspects of the software:

- Chapter 1 - OpenWebRX+ Jump Start will guide you through buying the hardware needed to build the receiver and installing the software.
- Chapter 2 - Basic Configuration will show you the basics of setting up and using OpenWebRX+ so that you can listen to signals of interest to you.
- Chapter 3 - Operating OpenWebRX+ takes a deeper dive into the many on-screen controls available, bookmarking your favourite stations, and monitoring some of the many data signals out there.
- Chapter 4 - Customising OpenWebRX+ takes you under the hood with more advanced customisation, understanding regional band plans, modifying OpenWebRX+ configuration files, and more.
- Chapter 5 - Exploring with OpenWebRX+ delves deeper into the many available data decoders, reporting decoded data to online aggregators and using those services, and improving on the default reporting settings.
- Chapter 6 - Sharing Decoded Data goes beyond listening and explores the world of data transmissions, how to decode them, and sharing the decoded data with online aggregators.

- Chapter 7 - Take your WebSDR Public will show you how to be one of the hundreds of KiwSDR and OpenWebRX receivers already connected to the web, so you can share what your receiver hears with online visitors.
- Chapter 8 - Going Further takes you beyond the limitations of the RTL-SDR receiver to help you grab more spectrum and power up your receiving experience. If you're a ham radio operator, you'll see how to use OpenWebRX+ to control your radio remotely.

## Open Source is Always Under Construction...

OpenWebRX+ is an open source software project, which means you can look at the source code,<sup>1</sup> make copies of it, and modify it to your heart's content, to add new features or to improve the way it works. You can keep those changes to yourself, or offer them back to the developers so that others can benefit. Even a very simple change can be helpful; so far, I have made just one minor improvement, but I plan to do more.

This book covers OpenWebRX+ up to version 1.2.89.

## Online Resources

The companion web page for this book<sup>2</sup> can be found on the Pragmatic Bookshelf.

I also invite you to check out my GitHub page,<sup>3</sup> where you'll find all the resources I have linked in the text, so readers of the print edition can save themselves typing them out by hand. There is also a lot of free extra material: the things I wanted to include here that just would not fit into the Pragmatic Express book format.

## Up Next: Fasten Your Seat Belt

Most of us have used a "traditional" radio, with a tuning dial and some kind of frequency display. If you've never seen or used an SDR, you may be in for a bit of shock. But it will be a good one, I promise! Let's go...

---

1. <https://github.com/luarvique/openwebrx>
2. <https://pragprog.com/book/rmwebxr>
3. <https://vk2sky.github.io/>