

A FIELD GUIDE · EDITION ONE



The Quiet Multitool

*How a Flipper Zero and a little Wi-Fi board earn
their place in your carry — by reading the invisible
weather of modern life.*



SUB-GHZ · INFRARED · NFC & RFID · WI-FI · GPIO

FOR YOUR OWN DEVICES, ON YOUR OWN FREQUENCIES.

BEFORE YOU BEGIN

A pocket-sized sense of the invisible

YOU ARE SURROUNDED by signals you cannot see. The garage door answers a chirp at 433 megahertz. The television obeys a stutter of infrared light. Your office badge whispers a number over a centimetre of air. Your home is bathed in overlapping clouds of Wi-Fi, each on its own crowded channel. Most of us live inside this weather without ever once reading it.

This little guide is about a device that reads it for you — the Flipper Zero, a cheerful plastic slab with a dolphin living inside it, and the small Wi-Fi board that clips onto its back. Treat it not as a weapon but as a **barometer**: a way to notice, measure, consolidate, and tidy the radio life you already own.

THE ONE RULE

Everything in this guide points at **your** devices, **your** cards, **your** network — or someone's with their clear say-so. The Flipper can listen almost anywhere; where it may **transmit** is limited by your region and firmware, and by law. Read your own fob, clone your own remote, map your own house. That boundary is not a nuisance. It is the whole reason the thing is a tool and not a problem.



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The last page is a tear-out cheat card. Keep it in the wallet, not the drawer.

HOW TO READ IT

Nine short chapters, one per “sense.” Skim the sidebars if you’re in a hurry: **Field Notes** explain, **Carry Tips** are the one-liners worth remembering, and **The One Rule** keeps you honest.

WHAT YOU NEED

A Flipper Zero, a microSD card, the Wi-Fi dev board (ESP32), and a USB-C cable. A phone with the companion app is a lovely extra. No soldering, no command line required to start.

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CHAPTER I

Meet the Familiar

A dolphin, three radios, a light, and a patch of copper.

Any sufficiently advanced technology is indistinguishable from a pet that judges you.

— A PARAPHRASE, WITH APOLOGIES TO CLARKE

THERE IS A DOLPHIN in your pocket, and it is slightly disappointed in you. Neglect the Flipper and its on-screen cyber-dolphin grows sulky; feed it a steady diet of scans and reads and saved remotes and it perks up and levels. This is a toy's conceit wrapped around a serious instrument, and the wrapping is the point: a tool you **enjoy** carrying is a tool you actually carry.

Underneath the cartoon, the Flipper is five senses bundled into one orange shell. Learn the senses and the rest of this guide is just field craft.

The five senses

SUB-GHZ RADIO

The low, patient radio — garage doors, fan remotes, doorbells, weather stations. Hears 300–348, 387–464 and 779–928 MHz; the familiar 315 / 433 / 868 / 915 bands live here.

INFRARED

The wand. A blaster and a receiver for the stutter of light every TV, projector and air-conditioner speaks.

NFC & RFID

The tap. 13.56 MHz contactless cards and 125 kHz fobs — read, save, catalogue, and write your own tags.

GPIO & I-WIRE

The honest pins. A serial console, a logic probe, an iButton reader, and the socket the Wi-Fi board rides on.

THE SIXTH SENSE — WI-FI (CLIP-ON)

The small ESP32 dev board that snaps onto the GPIO header adds a radio the Flipper lacks on its own: 2.4 GHz Wi-Fi and Bluetooth. In this guide we use it the quiet way — to **see** networks and devices and measure their strength, never to shove them around.

THE DOLPHIN'S MOOD

The dolphin's happiness is a usage streak in a costume. Don't chase it — but do notice that the makers built a device whose personality rewards curiosity. Most gadgets reward **purchase**. This one rewards **practice**.

**CARRY TIP**

Put a fast microSD card in on day one. Every read, save, and recording lands there; an empty slot is a notebook with no pages.

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CHAPTER 2

The First Twenty Minutes

From unboxing to your first genuinely useful trick.

The best time to learn an instrument is the hour you are still delighted by it.

— FIELD WISDOM

Resist the urge to point it at the world immediately. Twenty calm minutes now turns the Flipper from a novelty into something you reach for on reflex.

- 1 **Feed it a card.** Insert a microSD (formatted on the Flipper itself: Settings → Storage → Format). This is where everything you capture lives.
- 2 **Update the firmware.** Use the official qFlipper desktop app or the phone app. Decide later about custom firmware — Chapter 9 — but start official and current.
- 3 **Set your region.** Settings → System → Region. This governs where you're **allowed to transmit** on Sub-GHz. Honour it.
- 4 **Learn the two buttons that matter.** The round **OK** button is “do the thing”; **Back** held down is “home.” Everything else is a menu.
- 5 **Do one real thing.** Open **Infrared** → **Universal Remotes** → **TV**, point it at your own television, and press power. When it clicks off, the dolphin just earned its keep — and so did you.

FIELD NOTE

The Flipper is almost entirely **passive** until you deliberately transmit. Reading signal strength, scanning networks, cataloguing your cards, receiving infrared — none of that broadcasts anything. The rare, deliberate “send” is where region and consent apply, and the menus make that moment obvious.

“A tool you enjoy carrying is a tool you actually carry.”

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CHAPTER 3

Reading the Radio Weather

Sub-GHz: find the frequency, tame the remotes, hunt the hum.

Everything with a button and a battery is shouting a number. The Flipper tells you which one.

— ON THE LOW BANDS

The world below one gigahertz is where the dull, dependable machines talk: roller doors, ceiling-fan remotes, cheap doorbells, LED-strip controllers, tyre-pressure sensors, the weather station on the fence. The Flipper's Sub-GHz radio is a patient ear on all of it.

Which frequency is it, anyway?

The single most useful Sub-GHz trick isn't cloning — it's **identification**. The Frequency Analyzer sweeps the bands and tells you which frequency carries the strongest signal right now.

- 1 Open Sub-GHz → Frequency Analyzer.
- 2 Hold your remote (fan, doorbell, cheap gate) a few centimetres from the Flipper's top edge and press and **hold** its button.
- 3 Read the frequency it locks onto — anything stronger than about **-90 dBm** registers. Most of the planet's gadgets land on 433.92 MHz; North America leans on 315.

FIELD NOTE

Now you **know** a device's frequency before you ever try to save it — and you know whether a “dead” remote is actually transmitting at all. That single reading has diagnosed more “broken” remotes than any battery swap.

Consolidate your own remotes

Here is the trick that justifies the carry. Count the single-purpose remotes in your life — the ceiling fan, the projector screen, the LED lights, the old gate, the garage. Most speak simple, fixed-code Sub-GHz. The Flipper can learn them and keep them all in one place.

- 1 Sub-GHz → Read (or **Read RAW** for stubborn signals). Press your remote's button; the Flipper captures it.
- 2 **Save** it with a human name — “Bedroom fan — OFF”, “Screen — DOWN”.
- 3 Repeat per button. Soon one orange slab replaces a drawer of plastic.
- 4 To use: open the saved signal and press **OK** to re-send it — where your region permits transmission.

CARRY TIP

Static, fixed-code remotes (many fans, screens, string lights, older gates) clone cleanly. Modern **rolling-code** car keys and newer garage openers deliberately change their code every press — by design they won't clone, and that's the security working as intended. Read them to learn; don't expect a copy.

Hunt the hum

A device chattering on a busy frequency can jam your own remotes or trip your doorbell at random. Walk the house with the Frequency Analyzer open and watch where a signal spikes — a failing sensor, a stuck transmitter, a neighbour's gadget bleeding onto your band. You can't always fix it, but **naming** it is half the cure.

THE DOLPHIN'S MOOD

A tidy stack of saved, well-named signals is the most satisfying thing on the SD card. It is your home's radio life, written down.

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CHAPTER 4

The Universal Wand

Infrared: one blaster for every screen, speaker, and cold room.

A television is just a very large, very obedient dog that only understands flashing light.

— ON THE INFRARED PORT

Infrared is the friendliest band to start transmitting on — it's line-of-sight, short-range, and entirely mundane. The Flipper ships with a database of the protocols behind thousands of consumer devices, and a receiver to learn the ones it doesn't know.

The built-in universal remotes

- 1 Infrared → Universal Remotes offers **TV, Audio, Projector** and **Air Conditioner**.
- 2 Pick one, point at the device, and press through the common commands. The Flipper cycles its dictionary until a protocol matches — power, volume, channel, mute.
- 3 Because it's cycling, a match can take a few seconds. When the screen reacts, you've found the protocol.

Learn a remote you own

- 1 Infrared → Learn New Remote.
- 2 Point your real remote at the Flipper's **top edge** and press one button; the Flipper records it. Name that button.

- 3 Repeat for each button you care about. Even oddball protocols are stored as raw signals and played back faithfully.
- 4 Save the set under the device's name. You've just backed up a remote that the manufacturer stopped selling years ago.

THE TRAVELLER'S REMOTE

20 MIN · ONCE

Before a trip, learn the handful of commands you always need and save them as named remotes: **Hotel TV** — **power / input / volume**, **Conference projector** — **power / source**, **Bedroom AC** — **cooler / warmer**. The companion phone app's Remotes Library can pre-fill many of these from a database (TV, projector, fan, AV receiver). Now your “remote” is the thing already in your pocket, and you never again hunt behind a hotel headboard for a lost clicker.

CARRY TIP

The IR **receiver** is a quiet diagnostic: point any suspect remote at the Flipper in **Learn** mode. If the Flipper sees a signal, the remote and its battery are fine and the fault is in the device. If it sees nothing, replace the remote — not the TV.

FIELD NOTE

Infrared can't travel through walls or around corners, which is exactly why it's the polite band to practise transmitting on. You can only ever command what you can **see** — and typically, what you own.

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CHAPTER 5

The Tap

NFC & RFID: catalogue your cards and turn stickers into switches.

A hotel key, a bus pass, and a cat flap walk into a bar. They are all the same number.

— ON 13.56 MHZ AND 125 KHZ

Two short-range worlds live here: **NFC** at 13.56 MHz (the contactless cards and the tags you can write) and **low-frequency RFID** at 125 kHz (older building fobs and animal-style tags). The Flipper reads both, and — the genuinely delightful part — writes the cheap NFC tags you can buy by the roll.

Know what you carry

Lay your cards and fobs on the Flipper, one at a time, via NFC → Read or 125 kHz RFID → Read. Save each with a name. You'll quickly learn which of your cards are simple read-only numbers and which are properly secured — a small, useful literacy about the keys to your own life.

THE ONE RULE

Read and emulate **your own** credentials, and only where you're allowed to use them. A gym fob you own, cloned to save a pocket, is housekeeping. Someone else's badge is not yours to copy — the chip doesn't know the difference, so you have to.

Turn a sticker into a switch

This is NFC's best everyday magic and it involves no cloning at all. Blank **NTAG** stickers cost pennies. Write one with the Flipper (or your phone), stick it somewhere, and a tap makes something happen.

GUEST WI-FI TAG

Write your guest network's name and password to a tag by the door. Visitors tap their phone and they're on — no password read aloud, no photo of a sticky note.

DOORWAY ROUTINE

A tag by the bed that your phone reads to trigger "good-night" — lights off, alarm set, do-not-disturb on. The Flipper writes it; your phone's automations do the rest.

TAP-TO-CALL CARD

A tag in your wallet holding a contact or a "where I parked" note. Cheap, rewritable, and faintly magical to hand to someone.

TOYS & FIGURES

Many collectible figures are just NTAG215 chips. Read and back up **your own** so a chewed one isn't a lost one.

FIELD NOTE

A quick honesty note on animal microchips: they live at 134.2 kHz (FDX-B), just off the Flipper's native 125 kHz reader. Community apps sometimes manage a read, but treat it as a party trick, not a vet tool. For the stickers-and-switches use above, though, NFC is rock solid.

CARRY TIP

Buy NTAG213 or NTAG215 stickers. 213 is plenty for a Wi-Fi handoff or a short note; 215 holds more and matches most toy figures.

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CHAPTER 6

Mapping the Invisible Weather

The Wi-Fi board: find dead zones, pick clear channels, spot lost trackers.

You pay for a hundred megabits and then let your router sit in the one cupboard that hates you.

— ON 2.4 GHZ

The clip-on ESP32 board is where most people's imaginations jump straight to mischief. We're going the other way entirely: using it as a **survey instrument** for the networks and devices you already live with. Everything below is passive — the board **listens** and **measures**. It never has to push a single packet to be useful.

Walk your dead zones

- 1 Flash the board's Wi-Fi tool and open its scan/sniffer from the Flipper's GPIO menu.
- 2 Let it list the access points around you — each with its **channel** and a **signal strength** (RSSI) reading.
- 3 Now walk. Watch your own network's RSSI climb and fall room to room. The spots where it collapses are your dead zones — mapped, not guessed.

- 4 Move the router, or place a mesh node, where the measurement says to. Re-walk to confirm.

“Signal strength is a number you can walk toward.”

Pick a channel nobody else wants

The 2.4 GHz band has only a few non-overlapping channels, and every router nearby is elbowing for them. The scan shows you **which channels are crowded**. Set your own router to the quietest one (usually 1, 6, or 11) and watch congestion-related slowdowns ease — a five-minute fix that feels like new hardware.

FIELD NOTE

This is ordinary network planning — the same thing a pricey Wi-Fi analyser app does, but from a device already on your belt. You’re reading beacons every router broadcasts to the whole room by design. Listening is not meddling.

Find what's beaconing

Switch the board to a Bluetooth/BLE scan and you’ll see the little advertisers around you: earbuds, a watch, a tile-style tracker, a fitness band. Two honest uses:

- I **Find a lost tracker or earbud** — watch the signal strength rise as you near it, a hot-and-cold game with real physics behind it.

- 2 Audit your own airspace** — notice what's quietly broadcasting in your home, and that the device you forgot about is still chirping every second.

THE ESP'S SECOND LIFE

AN AFTERNOON

The Wi-Fi board is a bog-standard ESP32 on a Flipper-shaped carrier. When the novelty of scanning fades, reflash it with **ESPHome** or **MicroPython** and it becomes a tiny sensor node — a temperature-and-humidity reporter, a doorbell watcher, a desk-side air monitor — feeding your home dashboard. Few gadgets have this good a retirement.

THE ONE RULE

The same board can be told to disrupt networks. This guide doesn't cover that, and not only for legal reasons: a survey instrument you trust is more useful, day to day, than a toy you have to feel sketchy about. Keep it passive and keep it yours.

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CHAPTER 7

The Swiss Bits

GPIO and the useful oddments: clicker, console, logger, keyboard.

The most underused feature of any multitool is the small blade you forgot was there.

— ON THE HONEST PINS

Past the four big senses sits a scatter of genuinely handy functions. None of them will make a headline; all of them earn pocket space.

THE PRESENTATION CLICKER

Over Bluetooth, the Flipper can act as a remote for your own laptop — next slide, previous slide — so you're not tethered to the keyboard mid-talk.

THE KEYBOARD MACRO

Plugged in as a USB keyboard (BadUSB), it can type a long, tedious string on **your own** machine on command — a setup incantation, a boilerplate block. A convenience, used honestly.

THE SERIAL CONSOLE

The GPIO pins are a USB-to-UART bridge. Talk to a Raspberry Pi, a router, or a dev board over serial without carrying a laptop and an adapter.

THE LOGIC PROBE

The GPIO app reads pin states — a quick “is this wire high or low?” for the hobby-electronics bench.

The small human tools

It also keeps time, runs a stopwatch, plays tones through its speaker, rolls dice, and hides a few games for a dull queue. Trivial — but they’re the features that keep the thing in your hand, which is how the useful features stay close too.

THE DOLPHIN'S MOOD

Every function you actually use nudges the dolphin’s mood up a notch. The design quietly bribes you into competence. Let it.

CARRY TIP

A short USB-C cable and the Wi-Fi board, taped into the same tiny pouch as the Flipper, turn “I have a Flipper somewhere” into “I have the whole kit, now.” Carry the **kit**, not the gadget.

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CHAPTER 8

Care & Compass

Firmware, updates, and the one boundary that keeps this fun.

The difference between a tool and a weapon is entirely in the hand that holds it.

— THE LAST WORD

Which firmware?

The Flipper runs **official** firmware out of the box, and a small world of community forks adds features. The honest trade-off is features versus stability versus staying inside the lines.

Official — the stable, well-mannered baseline. Honours regional transmit limits. Start here; many people happily stay.

Unleashed — a fork that unlocks the Sub-GHz region limits and adds frequencies. More reach, more responsibility, and the main reason these forks are legally contested.

Momentum — a continuation of the old Xtreme firmware; most of Unleashed's features with a polished settings app. A common “daily driver” among the forks.

RogueMaster — Unleashed plus heavy theming and animations; the most features, and historically the least stable. Fun, if you don't mind the occasional crash.

FIELD NOTE

Custom firmware mostly removes **region** locks on transmitting, not the **laws** behind them. Unlocking a frequency doesn't make it legal to use where you are. Keep the official build if you're unsure — nothing in this entire guide requires a custom one.

Keeping it healthy

- 1 Update through qFlipper or the phone app every month or so — the ecosystem moves fast.
- 2 Back up your SD card occasionally; your saved remotes and tags are the real value, not the hardware.
- 3 If it acts strange after a new app, the culprit is usually that app. Remove it before blaming the Flipper.

The compass

Everything here has pointed one way on purpose. Read your own signals. Consolidate your own remotes. Map your own house. Catalogue your own cards. The Flipper's gift is **literacy** — the ability to perceive and tidy the invisible systems you already live inside. That gift stays a gift exactly as long as you keep it aimed at what's yours.

“Aimed at your own life, it is a barometer. Aimed at someone else's, it is a problem. Same device; different hand.”

So feed the dolphin. Learn the five senses. Carry the small kit. And walk through your own house a little more aware of the



weather moving through it — the chirps and taps and quiet fields that were always there, finally legible.



The Quiet Multitool

FIELD CHEAT CARD



SUB-GHZ

Identify: Freq Analyzer → hold remote, read MHz (>-90 dBm). **Save:** Read → Save → OK re-sends. Fixed-code clones; rolling-code won't.

INFRARED

Universal Remotes → TV / Audio / Projector / AC. Learn New Remote → point at **top edge** → name → save. Receiver tests a remote.

NFC / RFID

NFC = 13.56 MHz, RFID = 125 kHz. Read → Save to catalogue. Write NTAG213/215 stickers: guest Wi-Fi, phone routines, notes.

WI-FI BOARD

Passive scan: APs with channel + RSSI → walk dead zones, pick a clear channel (1 / 6 / 11). BLE scan → find lost trackers by rising signal.

ODDS

BLE slide clicker · USB keyboard macro (own PC) · UART serial console · GPIO logic probe.

BUTTONS

OK = do it · hold **Back** = home · **Region** (Settings) governs transmit.

THE ONE RULE

Your devices, your cards, your network — or clear consent. Listen anywhere; transmit only where your region and the law allow.



VERIFY FREQUENCIES, FIRMWARE BEHAVIOUR, AND LOCAL LAW FOR YOUR OWN REGION BEFORE TRANSMITTING.