My Paragliding Gadgets Setup

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Preface

This is book has the details for my gadgets that I use for paragliding.

Part I

Overview

1 My Paragliding Setup

Last updated: 2023-07-09

I've got the following devices on my paragliding cockpit since May 2022:

- Display: ONYX BOOX Poke 3 Android 6-inch e-reader running the XCTrack app.

  UPDATE May 2023: The 'ONYX BOOX Poke 3' (Android 10; 1072×1448 pixels = 300 ppi) is discontinued and has been replaced by the ONYX BOOX Poke 4 Lite (Android 11; 758×1024 pixels = 221 ppi). Two pilots have confirmed that the below instructions work also for the 'Poke 4 Lite' - they're happy with it.

- Vario: BlueFlyVario w/ Bluetooth & GPS v22

- Keyboard: Recoil Waterproof Bluetooth Media Button

Everything is attached using industrial-strength velcro. In addition to this, I carry an Android phone in my pocket that shares internet with the Poke 3 e-reader for XCTrack live location sharing and viewing.

I'm fairly happy with this setup. The readability of the e-reader is excellent - the brighter the sun is, then better it is, and it's already awesome on cloudy days. The e-reader has a touchscreen, but since that works so and so with gloves, I use the five-button media button as an external keyboard. The bluetooth connection between the Poke 3 e-reader and the BlueFlyVario is 100% reliable and always automatically. Same with the media button.

The only complaint I have is that one of the two BlueFlyVario has twice refused to boot up. Unfortunately, when this happens, the *only* way to get it working again is to reflash the firmware, but that requires an MS Windows computer, which you probably don't bring on your flying trip. This has happend twice to me (August 2022, and December 2022) - both times during flying trips ¯_( )_/¯. I hope that it won't happen again with the newer firmware I now got. OTH, since it's only out of two identical varios that's been acting up, there is a slight risk that one is a lemon.

1.1 Procedure on launch

1. Power on the Poke 3

2. On Android phone, start WiFi hotspot

3. Confirm that the Poke 3 is connected to the phone's WiFi

4. Power on the BlueFlyVario vario

5. Start XCTrack

6. Confirm that Bluetooth, GPS and live tracking work

Figure 1.1: XCTrack status bar with GPS, Bluetooth, live tracking and battery are all good

7. Power on the Media Button and confirm pressing left-right shifts XCTrack displays

The only little bit of friction in this set up is the hotspot setup and making sure the Poke 3 has a wifi connection before launching XCTrack. Without that, it's just power on the devices and starting the XCTrack app.

1.2 Gadget details

1.2.1 Vario: BlueFlyVario with Bluetooth & GPS v22

I've got the BlueFlyVario with Bluetooth & GPS v22. We ordered two on 2022-05-12 for 348 AUD (~240 USD) and received them 2022-05-29.

- Weight: 48 g

- Dimensions: 58 x 36 x 16 mm

- Battery: ~8 hours (w/ Bluetooth & electromagnetic transducer running). 2-3 hours to fully charge. Observation: A five-hour (sic!) flight took it from 100% down to 46% (3.828V; 3 beeps)

- Power button: click to turn ON, long press to turn OFF

- Power button when already ON: short press toggles audio ON, BUZZER, and OFF. This is easy to press during a flight.

- Battery status (during startup):

  1. First beep is a 1.0s beep at 4000 Hz
  2. Followed by 1-6 "battery" beeps (indicating 3.6-4.2 V)
  3. Followed by a short 0.2s beep at 4000 Hz

- LED lights:

  - BLUE (Bluetooth):

    * Flash every second => Bluetooth scanning

    * Double flash every second => connected

    * Solid => Bluetooth module is disabled (settings `SecondsBluetoothWait`). Fix by restarting vario

  - ORANGE (GPS):

    * 1.0s flashing => GPS 3D fix

    * off => no GPS fix

  - GREEN:

    * During startup

    * When pressing button

    * When lift beep sounds (setting `GreenLED`)

  - RED:

    * Charging (turns off if full charged, but may stays on for trickle charging)

- Track logs:

  - Capacity: ~60 hours at one-second intervals
  - Always on: when GPS has 3D fix (ORANGE flash)

1.2.2 Display: ONYX BOOX Poke 3 Android 10 e-reader

I ordered the ONYX BOOX Poke 3 e-reader from BestBuy USA on 2022-05-13 for 190 USD and received it on 2022-05-19.

- Weight: 150 g

- Dimensions: 153 x 107 x 6.8 mm

- Screen: 6.0 inch (90 x 120 mm), 1072 x 1448 px (300 ppi), 16 gray scales

- Android: 10

- Google Play Store: yes (requires manual one-time activation)

- Speaker: no

- XCTrack: Install and update via APK (changelog)

- Battery: 8-10 hours(?). Observation: A five-hour (sic!) flight took it from from 97% to 50% (running XCTrack in the background and an auto-reloading website with live wind data in the foreground)

1.3 Configuration

1.3.1 Poke 3 and XCTrack

The Poke graphical user interface (GUI) can be a bit peculiar at first. For example, it uses it's own on-screen keyboard and it also has a, so called, 'Navigation Ball'. It's a small round blob that sits in front on any app you open. You'll need it. If you click it, you'll get access to more action buttons, and one commonly used one is the "back" button.

In order for XCTrack to go into landscape, which you can set inside XCTrack by going to 'Preferences' and then 'Orientation', you must configure the app such that it can override the 'Rotation' settings that the Poke GUI uses, which is 'Portrait' by default. To do this:

1. Long press 'XCTrack' app icon
2. Select 'Optimize'
3. Go to the 'Others' tab
4. Disable 'Force to use system orientation' (i.e. set it to OFF)

1.3.2 Poke 3, BlueFlyVario, and XCTrack

Use BlueFlyVario as an external GPS in XTrack:

1. **Pairing**: In Poke 3 Bluetooth settings, pair BlueFlyVario device (e.g. BlueFly-7D0D). No PIN required.

2. **Enable location**: In Poke 3, open the 'Control Center' in the Poke 3/Android pulldown menu. There you should see WiFi and Bluetooth buttons at the very top. Below are two panels, both showing a set of icons that can be used to toggle settings on and off. The top panel, of these two, has a volume bar and the bottom one a brightness bar and a contrast bar. In the top panel, enable 'Location' by clicking on the map icon. This icon might be in the second "subscreen", which you can get to by swiping left inside the panel. **IMPORTANT**: if this is not done, then you cannot connect the BlyFlyVario device in XCTrack (at least not on Poke 3).

3. **External GPS and External Barometer in XCTrack**: In XCTrack, go to 'Preferences', then 'Connections & Sensors'.

   a. Under 'Connection', click 'External sensors', select 'Bluetooth sensor' and click 'OK'. It will scan for paired Bluetooh devices. Select the BlueFlyVario device (e.g. BlueFly-7D0D).

   b. Under 'GPS', enable 'Use external GPS'. **IMPORTANT**: If you forget this, XCTrack will never recieve GPS data therefore only report on the lift and sink (from the barometer in BlueFlyVario). When it works, XCTrack will give the 'GPS signal OK' notification and it will show GPS altitute, the speed, flight arrow, and more even when on the group.

   c. Under 'Atmospheric pressure sensor', enable 'Use external barometer'. **IMPORTANT**: If you forget this, I think XCTrack will use the GPS data, which is much less sensitive, to report on lift and sink.

1.3.3 BlueFlyVario setting

Options to change hardware settings:

- Android: BlueFlyVario Android App (installable on Poke 3) Download: https://bluefl yvario.com/files/BlueFlyVario.apk

- Any operating system: BFV Desktop Java Application Download: https://blueflyvario .com/files/BFVDesktop0.85.zip

For Poke 3, which does not have a speaker, change:

- `UseAudioWhenConnected`: `true` (default `false`)

1.3.4 Recoil Media Button settings

This device broadcasts itself on Bluetooth as 'PCR-1'. To pair to the Poke 3, go to the Bluetooth settings and locate 'PCR-1' under 'Available devices'. Then click on 'PCR-1' to pair it. When paired it will appear under 'CONNECTED DEVICES'. When powered off, it will be listed under 'PAIRED DEVICES', which are the devices that the Poke 3 remembers.

When powered on, the Poke 3 will immediately connect to the Recoil Media Button device.

The device goes automatically into a sleep mode after 20 minutes. This is to preserve battery. Pressing any button (Previous track, Next track, Volumn Down, Volume Up, PAUSE/PLAY) will wake it up with very little delay.

To configure what the buttons should do, open XCTrack, go to 'Preferences', andthen 'Key bindings'. I use the following settings:

- Switch to page left: Previous track
- Switch to page right: Next track
- Zoom map in: None
- Zoom map out: None
- Toggle map panning: Long press: 85
- Pan map LEFT in panning mode: Long press: Previous track
- Pan map RIGHT in panning mode: Long press: Next track
- Pan map UP in panning mode: Volumn Up
- Pan map DOWN in panning mode: Volumn Down
- Show menu: None
- Revert to previous waypoint in task: None
- Advance to previous waypoint in task: None
- Increase display brightness: None
- Decrease display brightness: None

Part II

Bluefly Vario

2 Bluefly Vario

The Bluefly is a vario that connects via Bluetooth. I've got the BlueFlyVario with Bluetooth & GPS v22. We ordered two on 2022-05-12 for 348 AUD (~240 USD) and received them 2022-05-29.

2.1 Overview

- Weight: 48 g

- Dimensions: 58 x 36 x 16 mm

- Battery: ~8 hours (w/ Bluetooth & electromagnetic transducer running). 2-3 hours to fully charge. Observation: A five-hour (sic!) flight took it from 100% down to 46% (3.828V; 3 beeps)

- Power button: click to turn ON, long press to turn OFF

- Power button when already ON: short press toggles audio ON, BUZZER, and OFF. This is easy to press during a flight.

- Battery status (during startup):

  1. First beep is a 1.0s beep at 4000 Hz
  2. Followed by 1-6 "battery" beeps (indicating 3.6-4.2 V)
  3. Followed by a short 0.2s beep at 4000 Hz

- LED lights:

  - BLUE (Bluetooth):
    * Flash every second => Bluetooth scanning
    * Double flash every second => connected
    * Solid => Bluetooth module is disabled (settings `SecondsBluetoothWait`). Fix by restarting vario
  - ORANGE (GPS):
    * 1.0s flashing => GPS 3D fix
    * off => no GPS fix
  - GREEN:

* During startup
* When pressing button
* When lift beep sounds (setting `GreenLED`)

- RED:

* Charging (turns off if full charged, but may stays on for trickle charging)

- Track logs:

  - Capacity: ~60 hours at one-second intervals
  - Always on: when GPS has 3D fix (ORANGE flash)

3 Settings

You can *view* the Bluefly settings via the BlueFlyVario Android app (download APK, source code). The app can be installed on Poke 3 (Android 10). Unfortunately, you *cannot* update the settings using this app. If you try, the app (v1.0) will crash when it tries to send the settings to Bluefly, and if you restart the app you will find that your changes were never applied.

To also *change* settings, use the BFV Desktop Java Application (download ZIP), which runs on any computer and operating system with Java installed. The downside is that you need a computer and you need to connect the Bluefly device via an USB-B micro cable (same that you charge it with). Unless you bring a computer with you on your flying trips, this means you cannot change the settings during trips.

The Poke 3 does not have a speaker. To make sure that the Bluefly outputs vario sounds during your flight, make sure to change settings to:

- `UseAudioWhenConnected`: `true` (default `false`)

4 Software

To install and run the BFV Desktop Java Application on Ubuntu Linux, do:

```
$ wget https://blueflyvario.com/files/BFVDesktop0.87.zip
$ unzip BFVDesktop0.87.zip
$ cd BFVDesktop0.87/
```

Then you have to run it as admin;

```
$ sudo java -jar BFVDesktop.jar
```

If you forget `sudo`, then you will run it as a non-priviliged user, which will not work. There will be no obvious errors, but the software will not send or receive any data to and from the device.

In the 'Recieve from Vario' panel at the top right of the BFVDesktop window, you'll see a 'Serial Port' section. It allows you to connect to your Bluefly via a USB cable. To connect:

1. Connect your computer with the Bluefly device using a USB cable.

2. Turn on the Bluefly device.

3. You should now be able to select 'ttyUSB0' [1] and click 'Connect'.

---

[1]It still unknown exactly what standard the 5-pin connectors are, if a standard at all. As far as I know, it is *not* a 5-pin DIN connector, because they have symmetrically located pins, whereas this headset has three pins on one side and two on the other (as if it missed the upper pin). It also has a thin rectangular guiding pin/hole in the center.

5 How to use BFV Desktop

5.1 Linux

5.1.1 Requirements

- Java Run-Time
- Sudo permissions (required for using the serial connection)
- USB cable

5.1.2 Installation

```
$ wget https://blueflyvario.com/files/BFVDesktop0.87.zip
$ unzip BFVDesktop0.87.zip
$ cd BFVDesktop0.87
```

5.1.3 Usage

1. Connect the BlueFlyVario to computer via USB cable

2. Launch the BFVDesktop software as administrator (see below)

3. Select serial port `ttyUSB0` (with default 115,000 baud rate)

4. Click 'Connect'

When connecting, the software sends command `$BST*` to the vario, which responds with a never-ending stream of data. The 'Raw Rx' panel will show something like:

```
$BST*
PRS 18738
PRS 18737
PRS 18738
$GNGGA,200729.000,3752.105089,N,12214.799547,W,1,4,1.90,176.023,M,-24.904,M,,*76
PRS 1873A
```

```
PRS 1873B
PRS 1873A
...
```

5.1.4 Launching BFVDesktop

To launch BFVDesktop, call the following while `distr/` being the current directory:

```
$ sudo java -classpath "BFVDesktop.jar:jSerialComm.jar" bfv.desktop.BFVDesktop
```

Alternatively, you can use the equivalent:

```
$ sudo CLASSPATH="BFVDesktop.jar:jSerialComm.jar" java bfv.desktop.BFVDesktop
```
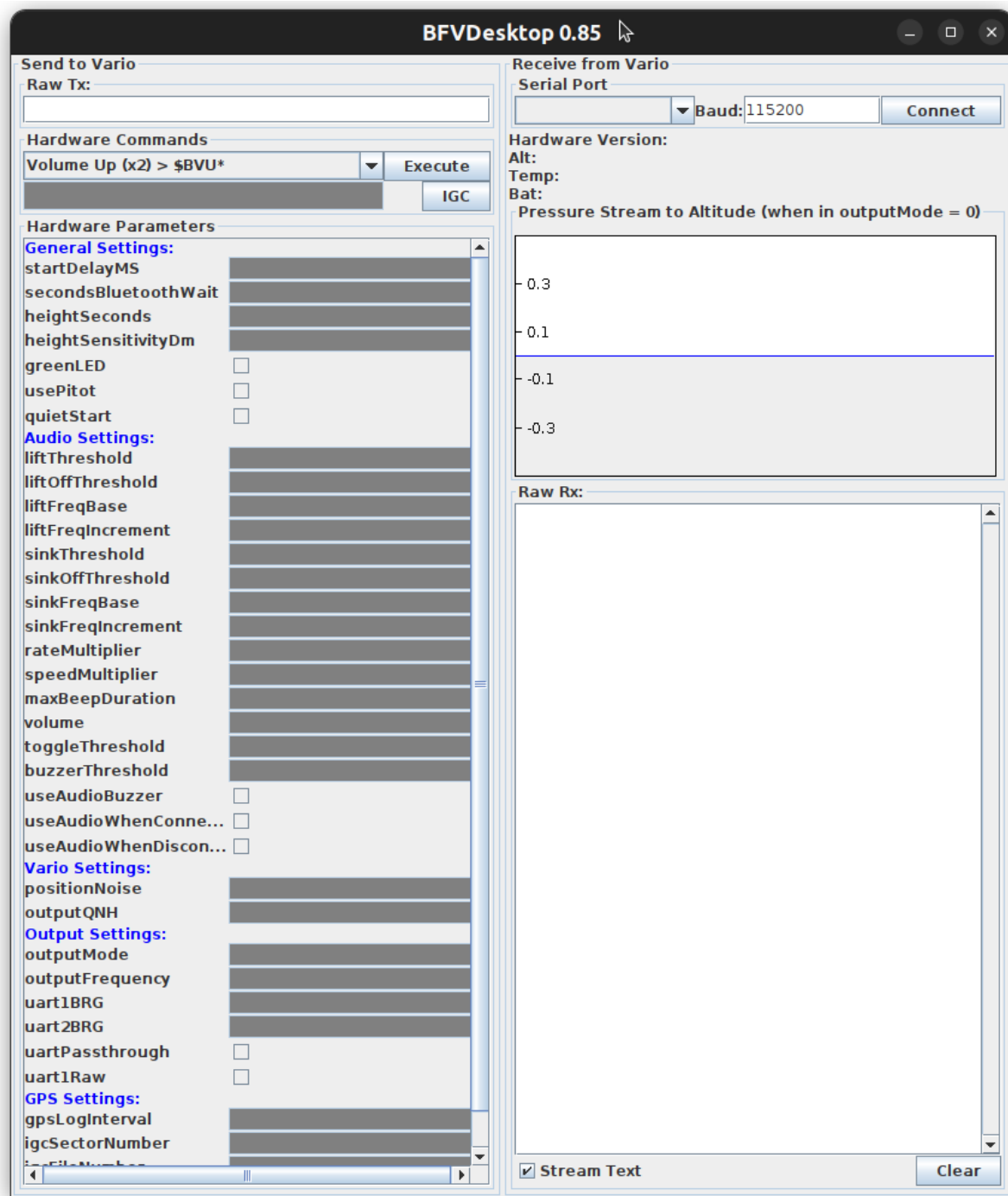
This opens the BFVDesktop window:

Figure 5.1: Screenshot of the BFVDesktop v0.85 window

5.1.5 Troubleshooting

If you run Java 1.8 and get:

```
Exception in thread "main" java.awt.AWTError: Assistive Technology not found: org.GNOME.Acces
    at java.awt.Toolkit.loadAssistiveTechnologies(Toolkit.java:807)
    at java.awt.Toolkit.getDefaultToolkit(Toolkit.java:886)
    at sun.swing.SwingUtilities2.getSystemMnemonicKeyMask(SwingUtilities2.java:2041)
    at javax.swing.plaf.basic.BasicLookAndFeel.initComponentDefaults(BasicLookAndFeel.java:1
    at javax.swing.plaf.metal.MetalLookAndFeel.initComponentDefaults(MetalLookAndFeel.java:43
    at javax.swing.plaf.basic.BasicLookAndFeel.getDefaults(BasicLookAndFeel.java:148)
    at javax.swing.plaf.metal.MetalLookAndFeel.getDefaults(MetalLookAndFeel.java:1577)
    at javax.swing.UIManager.setLookAndFeel(UIManager.java:539)
    at javax.swing.UIManager.setLookAndFeel(UIManager.java:579)
    at javax.swing.UIManager.initializeDefaultLAF(UIManager.java:1349)
    at javax.swing.UIManager.initialize(UIManager.java:1459)
    at javax.swing.UIManager.maybeInitialize(UIManager.java:1426)
    at javax.swing.UIManager.getUI(UIManager.java:1006)
    at javax.swing.JPanel.updateUI(JPanel.java:126)
    at javax.swing.JPanel.<init>(JPanel.java:86)
    at javax.swing.JPanel.<init>(JPanel.java:109)
    at javax.swing.JPanel.<init>(JPanel.java:117)
    at bfv.desktop.BFVDesktop.<init>(Unknown Source)
    at bfv.desktop.BFVDesktop.main(Unknown Source)
```

then comment out the `assistive_technologies` setting in /etc/java-8-openjdk/accessibility.properties
[1]:

```
$ cat /etc/java-8-openjdk/accessibility.properties
#
# The following line specifies the assistive technology classes
# that should be loaded into the Java VM when the AWT is initailized.
# Specify multiple classes by separating them with commas.
# Note: the line below cannot end the file (there must be at
# a minimum a blank line following it).
#
assistive_technologies=org.GNOME.Accessibility.AtkWrapper
```

You need sudo rights to do this. You can comment this out using:

```
$ sudo sed -i -E "s/^(assistive_technologies=)/## [Disabled by $USER on $(date --rfc-3339=se
```

I've verified that this is sufficient on my Ubuntu 22.04 machine with Java 1.8.0;

```
$ java -version
openjdk version "1.8.0_362"
OpenJDK Runtime Environment (build 1.8.0_362-8u362-ga-0ubuntu1~22.04-b09)
OpenJDK 64-Bit Server VM (build 25.362-b09, mixed mode)
```

5.2 How to

5.2.1 Identify firmware version

With vario physically connected via USB cable but not connected in BFVDesktop:

1. Turn off vario
2. Connect to vario (`ttyUSB0`)
3. Turn vario back on

You should now see something like:

- Hardware Version: 22.2.566
- Alt:
- Temp:
- BAT: 4.27 V

which tells us that we're running firmware v22.2 release 566. From https://www.blueflyvario.com/files/v22/, we can see that it was released on 2022-10-08.

Note that the vario will only send the firmware version when it is turned on, which is BFVDekstop has to be connected to it via cable when the vario is turned on.

We can also find the firmware version from the raw data stream:

```
$BST*
\0
Bluefly Power On
BFV 22.2 566
BlueFlyVario_BLUETOOTH_GPS_IGC_22.2.566
BST BFK BFL BFP BAC BAD BTH BFQ BFI BSQ BSI BFS BOL BOS BRM BVL BOM BOF BQH BRB BPT BUR BLD
...
```

5.3 References

- [1] https://stackoverflow.com/questions/15260989

6 How to update the BlueFlyVario firmware

6.1 Gist

Follow the instructions on https://www.blueflyvario.com/firmware/.

For the BlueFlyVario_Bluetooth_GPS_IGC_v22 device, all firmware versions are available at: https://www.blueflyvario.com/files/v22/

7 Parsing the Raw Data Stream

7.1 Capture startup stream

First, turn *off* the Bluefly device. Second, launch:

```
sudo minicom --baudrate=115200 --device=/dev/ttyUSB0 --capturefile=bluefly.out
```

Third, turn on Bluefly. After it started, turn it off again. Finally, press Ctrl-A and 'X' to exit minicom. To see the startup stream, call:

```
$ head bluefly.out

Bluefly Power On
BFV 22.2 566
BlueFlyVario_BLUETOOTH_GPS_IGC_22.2.566
BST BFK BFL BFP BAC BAD BTH BFQ BFI BSQ BSI BFS BOL BOS BRM BVL BOM BOF BQH BRB BPT BUR BLD
SET 13622 100 20 1 1 1 180 1000 100 400 100 200 5 190 100 1000 0 1 21325 51 1 0 0 624 20 3600
SPI_Flash JDEC:BF 26 43
$PGACK,SW_INI_ANT_INPUT_OK*31
$PMTK011,MTKGPS*08
$PMTK010,001*2E
```

This tells us we're running firmware v22.2 release 566. From https://www.blueflyvario.com/f iles/v22/, we can see that `BTH_GPS_IGC_22.2.566.hex` was released on 2022-10-08.

From FlyingAl (2021), we learn that pressure data is reported as `PRS <hexint>`, e.g.

```
PRS 18276
PRS 18278
PRS 1827B
PRS 18279
```

The entries starting with a dollar sign (`$`) are National Marine Electronics Association (NMEA) sentences[1]. Those can be parsed using tools such as Python package **pynmea2** (https://github.com/Knio/pynmea2) and R package **nmea** (https://github.com/paleolimbot/nmea).

---

[1]It still unknown exactly what standard the 5-pin connectors are, if a standard at all. As far as I know, it is

not a 5-pin DIN connector, because they have symmetrically located pins, whereas this headset has three pins on one side and two on the other (as if it missed the upper pin). It also has a thin rectangular guiding pin/hole in the center.

Part III

BOOK Onyx Poke

8 ONYX Poke Device

8.1 Activate Google Play Store

The Google Play Store app is not working out of the box, which is because the ONYX Poke 3 is *not* a certified Android device. The workaround is to override this and manual register your device. To do this,

1. Go to Apps
2. Click on the "hamburger" menu and select 'App Management'
3. Enable Google Play: ON
4. Click 'GSF ID' (showing a unique ID for your personal device) to get to Google's Device registration page.
5. Log into your Google Account.
6. Click 'Register' (after validating the reCAPTCHA)

The above registration didn't work for me when I first tried it back in May/June 2022. Then I have up. I then revisited August 2023, and the registration worked.

WARNING: It is up to you to decide whether you trust the Poke device and Boox to do the following. If not, you can always create a separate Google Account.

Source: YouTube video How to activate google play (Firmware V3.2)

8.2 Transfer files

There are several options to transfer files back and forth between a computer or a smartphone and the Poke device. I found that the 'BOOXDrop' alternative is quite convenient since it requires no login or account setup.

I don't think one can transfer these files via the ONYX Cloud Storage; it looks like you can only store notes and books via the cloud storage. See the Appendix for my notes on this.

8.2.1 BOOXDrop

Each BOOX device runs a built-in web server that can be access by other devices on the same local network (e.g. on the same WiFi network). [Comment: I need to figure out how to disable this /Henrik 2023-04-30]. To find the website address for your device,

1. Go to 'Apps'
2. Click 'BOOXDrop' (might be grouped under 'Onyx apps')

That will should you a URL that looks something like `http://192.168.1.8:8085`, where `192.168.1.8` is the IP number of the device (yours will be different) on your local network (e.g. WiFi). The `8085` number at the end is a port number, and we all have the same one. If you're lazy to type this in on your phone, you can scan the QR code.

3. Open your Poke's BOOXDrop URL in your computer's web browser. Your Poke and your computer must be connected to the same local network (e.g. WiFi). This will open up a webpage title 'BOOX Drop' where you can browser the files on your Poke, and upload ('Send to BOOX') and download ('Save to Computer') files.

8.3 Update firmware

I'm running firmware 2023-04-20_11-32_3.3.2_6c3976585 (last checked 2023-08-15).

8.4 Install apps by APK files

I failed to set up Google App Store on the ONYX Poke 3. The only way I found to install apps is by download their APK file.

8.5 Appendix

8.5.1 Create ONYX Account (optional/not useful)

On Poke 3,

1. Go to 'Settings'.
2. At the very top, click on the icon for 'ONYX Account' ("Get 10GB Cloud Storage for Notes Sync and Other Cloud Services").
3. Select 'Servers' (I picked 'EUR(eur.boox.com)' because of EU's stricter privacy rules).

4. Scroll down to 'Login Methods' and select the 'Email' icon (so you can register without having to give out your phone number).

5. Under 'Email', enter your email address.

6. Click 'Get verification code'

7. Check your email for the six-digit verification code.

8. Enter verification code.

9. Check that you agree on the terms and conditions.

10. Click 'Login'.

You should now be logged into the ONYX account, which you can confirm by going to the 'Settings' screen. There it should now say '' ("Cloud Storage: 0/10 GB") at the very top.

8.5.2 Connect to ONYX Cloud Storage from web browser

Each ONYX device gets 10 GB of free cloud storage. This requires your to sign up for an account (see Appendix for instructions).

On your computer, or smart phone,

1. Go to your ONYX account server (e.g. https://eur.boox.com) in the web browser.

2. Enter your login information (e.g. email address).

3. Click 'Obtain Verification Code'.

4. Check your emails for the one-time verification code.

5. Check 'Agree …'.

6. Click 'Sign in'.

You should now see a website titled 'BOOX' with menu items 'Notes', 'BooxDrop', 'Library' and 'Import Reading'.

Comments: It looks like 'BooxDrop' page here also requires your computer and Poke to be on the same local network. In other words, I don't think you can transfer files via 'BooxDrop' over the cloud or via the cloud storage.

Part IV

Recoil

Part V

XC Track

9 XCTrack

9.1 Sharing Pages layout with others

These instructions assumes you run XCTrack 0.9.8.7 (2023-04-26) or newer.

9.1.1 Export "Pages" layouts

1. Go to 'Preferences' -> 'Export & Import config'.

2. Click 'Export configuration'.

3. Select 'PAGES ONLY'.

You will get a pop-up window titled 'Export finished' that says something like "Current XCTrack configuration saved to file /storage/emulated/0/Android/data/org.xcontest.XCTrack/files/Config/202 04-30_pages_00.xcfg'.

If you have Sharing apps configured on your device, click 'SHARE' and select method for sharing this file. Otherwise click 'CLOSE' and use other ways to transfer the file under `/storage/emulated/0/Android/data/org.xcontest.XCTrack/files/Config/` on the Android device to another device or storage. If you're using a ONYX Poke device, you can use 'BOOXDrop'.

9.1.2 Import "Pages" layouts

If you received a XCTrack configuration file from some one else, either one that contains their full configuration, or just their pages configuration, you can import their "pages" settings to your XCTrack app.

After having downloaded the `*.xcfg` file to the Android device where your run XCTrack, open XCTrack and:

1. Go to 'Preferences' -> 'Export & Import config'.

2. Click 'Import configuration'.

3. Click 'OTHER …' (you might see an error message too)

4. You will now see an Android file-navigator window. Navigate to the `*.xcfg` file you wish to import, and click on it.

5. If you're importing a full XCTrack configuration, you will get three options:

   - Replace all (all your config and pages will be overwritten)

   - Replace pages only (overwrite your pages and widgets only)

   - Add pages only (nothing will be overwritten, new pages will be added after yours)

   Choose either 'Replace pages only' or 'Add pages only'.

6. Click 'CONTINUE'.

7. If you choose anything else than 'Add pages only', you need to confirm too. Click 'YES'.

8. You should see 'Configuration successfully imported'. Click 'OK'.

Done.

You can now go back to 'Preferences' -> 'Pages layout' to confirm that the new pages have been imported correctly.

Also, make sure 'Preferences' -> 'Display' -> 'Orientation' is set to either portrait or landscape of the pages you want to use. This is important, because pages designed in landscape mode will only work when the XCTrack display is set to be in landscape mode, and vice versa for portrait mode.

9.2 Backing up and Restoring XCTrack configuration

It's always good to backup your XCTrack settings once in a while. This is also the easiest way to get started again if you get a new Android device.

9.2.1 Backing up all your XCTrack settings

To back up your XCTrack settings to a `<date>_<index>.xcfg` file under `/storage/emulated/0/Android/data/` on the Poke,

1. Go to 'Preferences',

2. then 'Export & import config' (or 'Testing & Debug' on XCTrack <= 0.9.8.6), and

3. click 'Export configuration'.

You will get a pop-up window titled 'Export finished' that says something like "Current XCTrack configuration saved to file /storage/emulated/0/Android/data/org.xcontest.XCTrack/files/Config/2023-04-30_backup00.xcfg'.

This will export your airspaces, portrait and landscape page layouts, pilot and glider names, connected Bluetooth varios, and other types of preferences set.

Importantly, downloaded terrain maps and road maps will *not* be part of the exported `*.xcfg`. Your xcontest.org username and password will also *not* exported.

If you have configured your sharing on your Poke, you could click 'SHARE' to share via, say, Bluetooth or Email. I don't have sharing configured, so I click 'CLOSE' at this point. I use the 'Destiny' app (https://f-droid.org/en/packages/com.leastauthority.destiny/) to send my settings to my computer.

9.2.2 Restoring XCTrack configuration

To restore previously backed up XCTrack settings,

1. Go to 'Preferences',

2. then 'Export & import config' (or 'Testing & Debug' on XCTrack <= 0.9.8.6), and

3. click 'Import configuration'.

4. Choose an `*.xcfg` file to import (either among the listed ones or under 'OTHER…')

5. Confirm 'Really import configuration?' by pressing YES.

6. Confirm 'Shut down XCTrack?' by pressing YES.

7. In the XCTrack 'App info' display, click 'FORCE STOP', and then confirm by pressing 'OK'.

8. Reopen XCTrack.

Part VI

Radio

10 Ham Radio

10.1 Baofeng UV-5R

I use a Baofeng UV-5R since several years back. The reason for this is that they are easy to get in the US, the cost is only 40-50 USD, so it's not a biggie to get a replacement, keep a backup, and buy spare batteries. The Baofeng UV-5R handset uses the a Kenwood compatible two-pin plug; one plug is 2.5mm and the other is 3.5mm and are 12mm apart. Because of this, I have a fair bit of head sets with push-to-talk (PTT) buttons to choose from. I place the PTT button on my left riser near my break handle, because that way I can easily transmit also in active air and while thermalling. I have the headset and the mic mounted permanently on my helmet.

On launch, I put on my helmet, let the cable hang down before I close my jacket, then I connect it together with the PTT cable that I run down the riser thought the carabiner, and at the end I plug it to the radio that is on my flight deck. I then turn on the radio to confirm that I can hear "Frequency mode" or "Channel mode" that the radio says when turned on. After this, I do a formal radio check.

Accessory jack

The accessory jack on the Baofeng UV-5R is a Kenwood compatible two(2)-pin design.

Figure 2.4. Typical 2 pin Kenwood headset configuration.
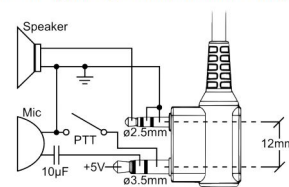
The Kenwood 2-pin connector has one 3.5mm TRS plug, and one 2.5mm TS plug, spaced 12mm apart.

Comment: According to Wikipedia, "the model variant Boafeng UV5R HT" is no longer sold in Germany and Switzerland and may not be used there.

Our radio units:

- 2 UV-5R MK4 with 'MIRKIT' on the front. Label on the back: Model: UV-5R MK4 Mirkit Edition, Voltage: 7.4V, Power: 8W, Frequency: 136-174 MHz/400-520 MHz, S/N: UV-5R MK4 A00163, S/N: UV-5R MK4 A00163. Purchased 2019-03-30 and 2019-06-14.

- 4 UV-5R MK4 with 'UV-5R MK4' on the front. Label on the back: Model: UV-5R MK4 Max Power Mirkit Edition, Voltage: 7.4V, Power: 8W, Frequency: 136-174 MHz/400-520 MHz, S/N: UV-5R MK4 A21895. FCCID: 2AJGM-UV5R. Purchased 2021-12-20.

Batteries:

- Model: BL-5. Li-ion battery 7.4V 1800mAh.

10.1.1 PTT Headset

The PTT headset I use is 15-20 USD on Amazon.

It has two flat ear pieces with speakers and a microphone on a three-way splitted cable with a male threaded ~13mm 5-pin circular connector[1] at the end. You mount the ear pieces inside your helmet and let the cable, which reaches your chest, hang down. The Push-to-Talk (PTT) button sits on another cable that also terminates with a male 5-pin connector. The third part of this kit is a Y-split connector where one end is a standard male 2-pin type K headset connector that plugs into the radio, and the other two ends are female 5-pin connectors that connects to your headset and PTT, respectively.

10.1.2 Alternative antennas

The Baofeng UV-5R handset uses a SMA (SubMiniature version A) connector for the antenna. The handset has a male connector (inside threads) and the antenna a female connector (outside threads).

In addition to the antenna that comes with the radio, I have a Nagoya NA-771 40cm Whip VHF/UHF (144/430Mhz) Antenna (SMA-Female) (~20 USD on Amazon) (left), which I never really used, because I mount my radio on my flight deck and then this long antenna sticks too far out.

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[1]It still unknown exactly what standard the 5-pin connectors are, if a standard at all. As far as I know, it is *not* a 5-pin DIN connector, because they have symmetrically located pins, whereas this headset has three pins on one side and two on the other (as if it missed the upper pin). It also has a thin rectangular guiding pin/hole in the center.

I've recently started to experiment with a 72cm foldable tactical antenna with a coax extension cord ((~17 USD on Amazon](https://www.amazon.com/dp/B094R6GW8Y/)) (right). I place the antenna upside-down in my harness and pull the extension cord over my sholder and down to the radio unit. This adds an extra step of having to screw on the antenna before each launch. To avoid that, I keep it connected and let the radio hang from it while I connect my harness and put on the flightdeck. I use a 100cm extension cord (~11 USD on Amazon) in order to reach over my shoulder and down inside of my jacket to my flight deck.

Another alternative that I've considered would be a wire antenna, which is basically a wire (e.g. H07V-K 4) on an female SMA connector. See https://ham.stackexchange.com/question s/140/good-wire-for-wire-antenna#181 for how to build one.

10.2 CRT France FP 00 (temporary)

I got a CRT France FP 00 radio in France 2023 when I was on the Saint Hilare launch realizing my the battery in my Baofeng radio was dead. I got it for 47 EUR from the Prevol shop at launch. I was lucky because it had the same headset connection as my Baofeng, so it worked with my PTT headset. It a Baofeng clone with the same configuration and menu items[2]. The battery and the charger, including the plug to the charging dock is different though. I haven't tried, but it also looks like CHIRP (programming via cable) is not support (yet), e.g. https://chirp.danplanet.com/issues/9894.

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[2]I walked through the menu on the CRT-FP00 and the Baofeng UV-5R step by step and the menu entries were identical.

10.3 Yaesu FT-270R (legacy)

In the past, I used my Yaesu FT-270R radio with a custom-build push-to-talk (PTT) headset. It worked great, but once in a while, and always during flying trips, the headset connection to the radio broke. The problem with the Yaseu FT-270R is that it has a screw-in plug (see picture). The purpose of that is so that the plug does not fall out, but the problem was that slowly you end up twisting the cable too much so that the cables inside break. It happened twice to me at launch during flying trips. I loved the custom-made Glidecom Cloudbase Headset, but it was custom built by a guy in Oregon and delivery was flaky at best, so this solution became unreliable in the long run. I never managed to find another nicec headset, so I switched to a cheaper, lower-quality Baofeng radio.

Glidercom Cloudbase Headset
(threaded radio-to-headset cable, mono headset with standard microphone, finger push-to-talk (PTT))

Yaesu FT-270R
(radio, antenna, battery, backup 6xAA-battery pack, 120V-only wall charger)

11 Mirkit Baofeng HAM radio UV-5R MK4 8W

- https://chirp.danplanet.com/projects/chirp/wiki/Home
- https://wayneoutthere.com/2013/08/31/how-to-program-your-baofeng-uv-5r-with-ubuntu/
- http://marcusjenkins.com/baofeng-uv-5r-programming-under-ubuntu-12-04/

11.1 Program radio via USB cable

11.2 Setup CHIRP

```
$ wget https://trac.chirp.danplanet.com/chirp_daily/LATEST/chirp-daily-20211221.flatpak
$ sudo flatpak install chirp-daily-20211221.flatpak
Required runtime for com.danplanet.chirp/x86_64/master (runtime/org.freedesktop.Platform/x86_
Do you want to install it? [y/n]: y
Installing in system:
org.freedesktop.Platform/x86_64/19.08              flathub              a85bd015f173
org.freedesktop.Platform.GL.default/x86_64/19.08   flathub              54eadc8792db
org.freedesktop.Platform.Locale/x86_64/19.08       flathub              82c2332b3e80
org.gtk.Gtk3theme.Ambiance/x86_64/3.22             flathub              73fed99df212
org.freedesktop.Platform.VAAPI.Intel/x86_64/19.08  flathub              86a7fe067ae4
org.freedesktop.Platform.openh264/x86_64/2.0       flathub              73f998362a6f
com.danplanet.chirp/x86_64/master                  com.danplanet.chirp-3-origin 168fd65053cc
  permissions: ipc, network, wayland, x11, devices
  file access: home
Is this ok [y/n]: y
Installing: org.freedesktop.Platform/x86_64/19.08 from flathub
```

11.3 First test

Identify /dev/tty? for radio:

1. Turn off radio
2. Unplug the red MERKIT USB programming cable
3. `before=$(ls /dev/tty*)`
4. Plug in the red MERKIT USB programming cable
5. `after=$(ls /dev/tty*)`
6. `diff <(echo "$before") <(echo "$after")` => e.g. `/dev/ttyUSB0`

Run CHIRP:

1. Turn on radio on max volume
2. `chirpw`
3. Menu 'Radio' -> 'Download from radio'
4. Port: `/dev/ttyUSB0`, Vendor: `Baofeng`, Model: 'UV-5R'

References

FlyingAl. 2021. *BlueFlyVario Hardware Settings Manual V1.8.* https://www.blueflyvario.c
om/files/BFV_HardwareSettings_Manual_v1.8.pdf.