

# Capture & Analyse Like a Bawss

`kitchen_sink` and `baz_fft`

# kitchen\_sink


 **balint256 / uhd**  
forked from [EttusResearch/uhd](#)


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History

This branch is 16 commits ahead, 1925 commits behind EttusResearch:master.

 Pull request  Compare

 **balint256** Always set RX loop size so RX param is set (even if 0)

Latest commit 453cdaa on 2 Apr

..

 [.gitignore](#)

tools: Added Balints kitchen sink debug util

4 years ago

 [CMakeLists.txt](#)

ks: wait one second with GPSDO for time to latch, checker thread for ...

3 years ago

 [kitchen\\_sink.cpp](#)

Always set RX loop size so RX param is set (even if 0)

4 months ago

# kitchen\_sink

- The ultimate USRP capture/feature exerciser tool
- Command-line utility
- Many options/args
- Install SoapySDR's UHD module to use other devices

# kitchen\_sink

## Soapy Devices in UHD

---

On the other hand, the UHD utilities and API can be used for Soapy SDR supported devices. This feature also allows USRP owners to use their devices remotely through the UHD API using [Soapy Remote](#).

In this example, lets find the RTL dongle using `uhd_find_devices`:

```
uhd_find_devices
linux; GNU C++ version 4.8.4; Boost_105400; UHD_003.009.001-0-unknown

Detached kernel driver
Found Rafael Micro R820T tuner
Reattached kernel driver
-----
-- UHD Device 0
-----

Device Address:
  available: Yes
  driver: rtl_sdr
  label: Generic RTL2832U OEM :: 00000001
  manufacturer: Realtek
  product: RTL2838UHIDIR
  rtl: 0
  serial: 00000001
  tuner: Rafael Micro R820T
  type: soapy
```

# kitchen\_sink

- Example:

```
./kitchen_sink --rx-channels 0 --rx-rate  
4e6 --progress-interval 1 --rx-freq 1000000  
--rx-ant RX2 --rx-cpu sc16 --rx-gain 55 --  
rx-file cap.sc16 --set-time next_pps --  
manual-time gpsdo --rx-timing-file --  
args="type=b200,num_recv_frames=256" --rx-  
start-time "2018-08-11 14:30:00"
```

# kitchen\_sink

```
./kitchen_sink  
--rx-channels 0  
--rx-rate 4e6  
--progress-interval 1  
--rx-freq 1000000  
--rx-ant RX2  
--rx-cpu sc16  
--rx-gain 55  
--rx-file cap.sc16  
--set-time next_pps  
--manual-time gpsdo  
--rx-timing-file  
--args="type=b200,num_recv_frames=256"  
--rx-start-time "2018-08-11 14:30:00"
```

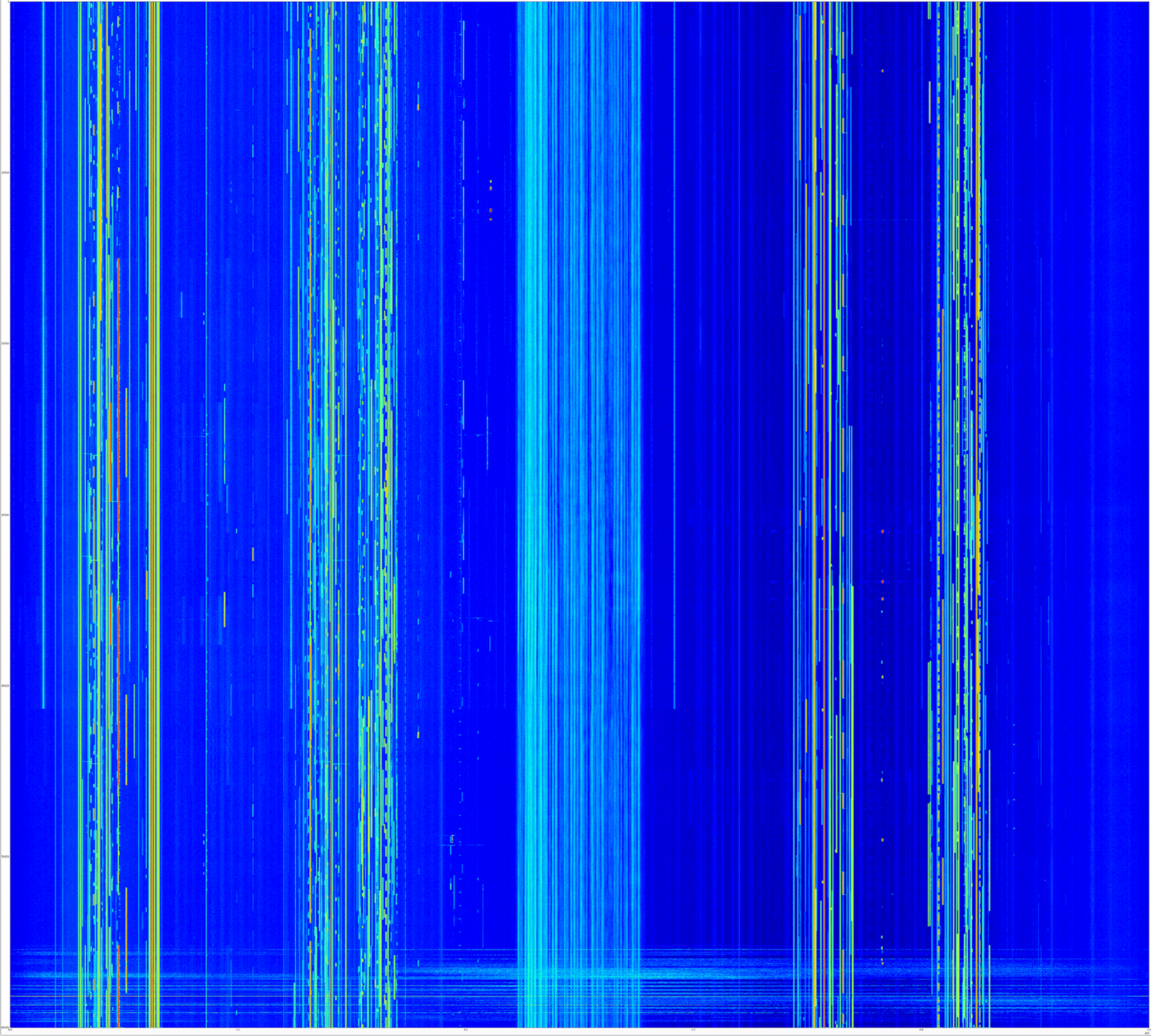
# Multichannel

- `--rx-channels 0,1`
- `--rx-freq "100e6,200e6"`
- `--rx-gain "10,15"`
- `--rx-file "cap_%d.sc16"`
  - **Output:** `cap_0.sc16` & `cap_1.sc16`
- `--interleave-rx-file-samples`

# Tips

- `B2x0: --num_recv_frames=256/512/1024`
- `--rx-subdev: A/B side`
- `--rx-cpu=sc16: Halve capture size (vs. fc32)`
- `--rx-file-loop-size <bytes>`
  - Also creates `‘.loop’` file that contains  
(file cursor, sample count) for each loop





CERS: 853.0875

CERS: 853.0875

CERS: 853.225

PERS: 853.25

CERS: 853.225

PERS: 853.25

Beep: 853.3625

Beep: 853.3625

CERS: 853.4125

CERS: 853.4125

CERS: 853.4375

CERS: 853.4375

CERS: 853.625

CERS: 853.625

CERS: 853.65

CERS: 853.65

CERS: 853.7875

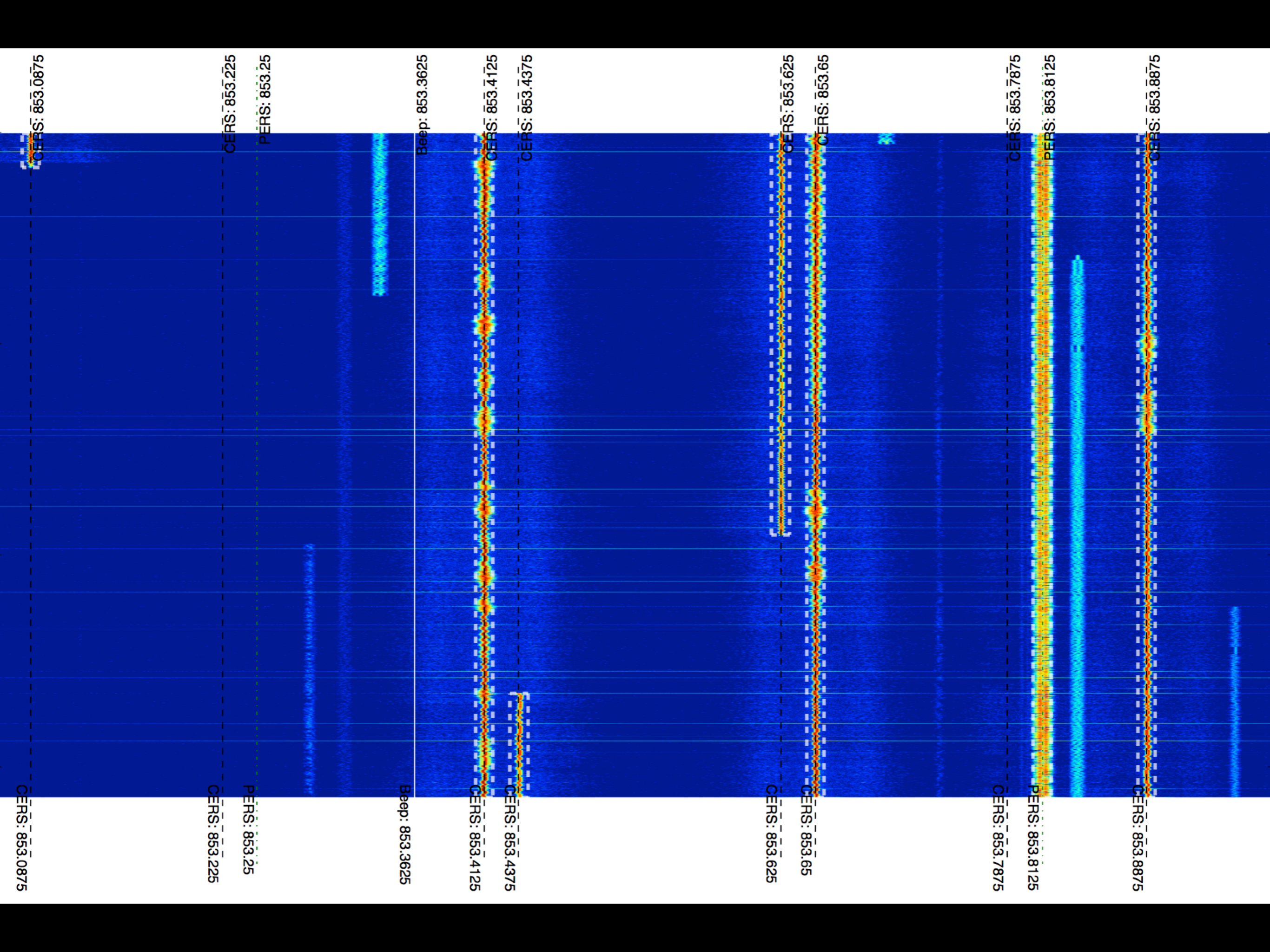
CERS: 853.7875

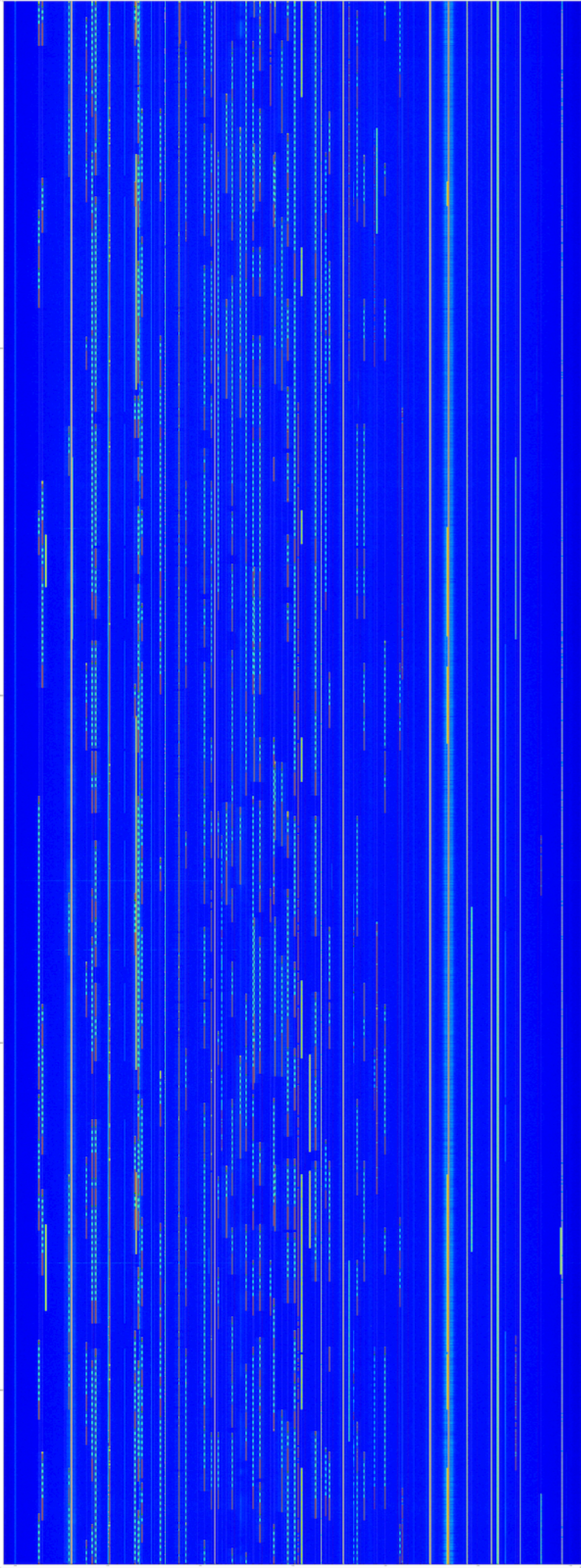
PERS: 853.8125

PERS: 853.8125

CERS: 853.8875

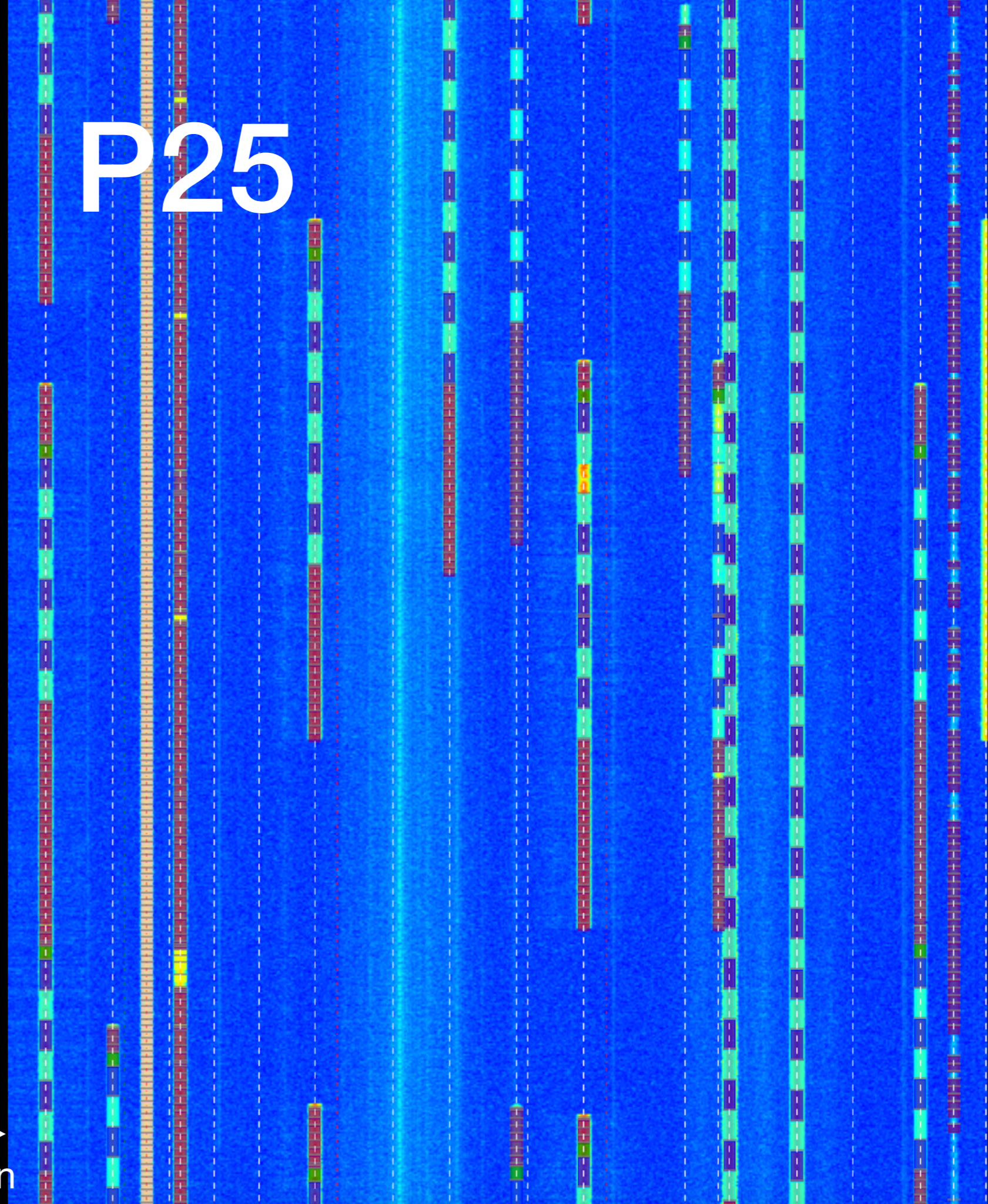
CERS: 853.8875





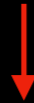
→  
Zoomed in

P25

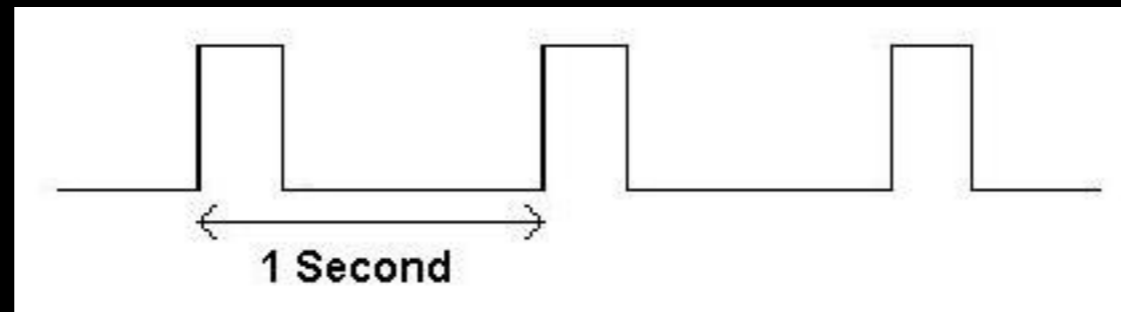


# Time Sync

Future time latched (once)

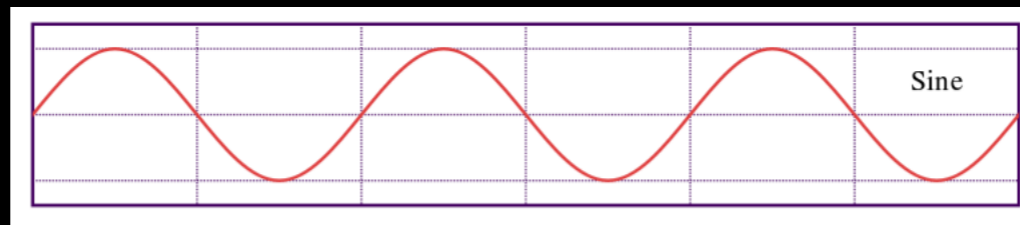


*Time ref*  
1 PPS



--time  
next\_pps

*Clock ref*  
10 MHz



--clock

[https://en.wikipedia.org/wiki/Sine\\_wave](https://en.wikipedia.org/wiki/Sine_wave)

<http://www.ni.com/white-paper/9882/en/>

# pps\_diff.py

balint256 / gr-baz

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balint256 Improved gpsdo script Latest commit 605dd39 on 5 Mar

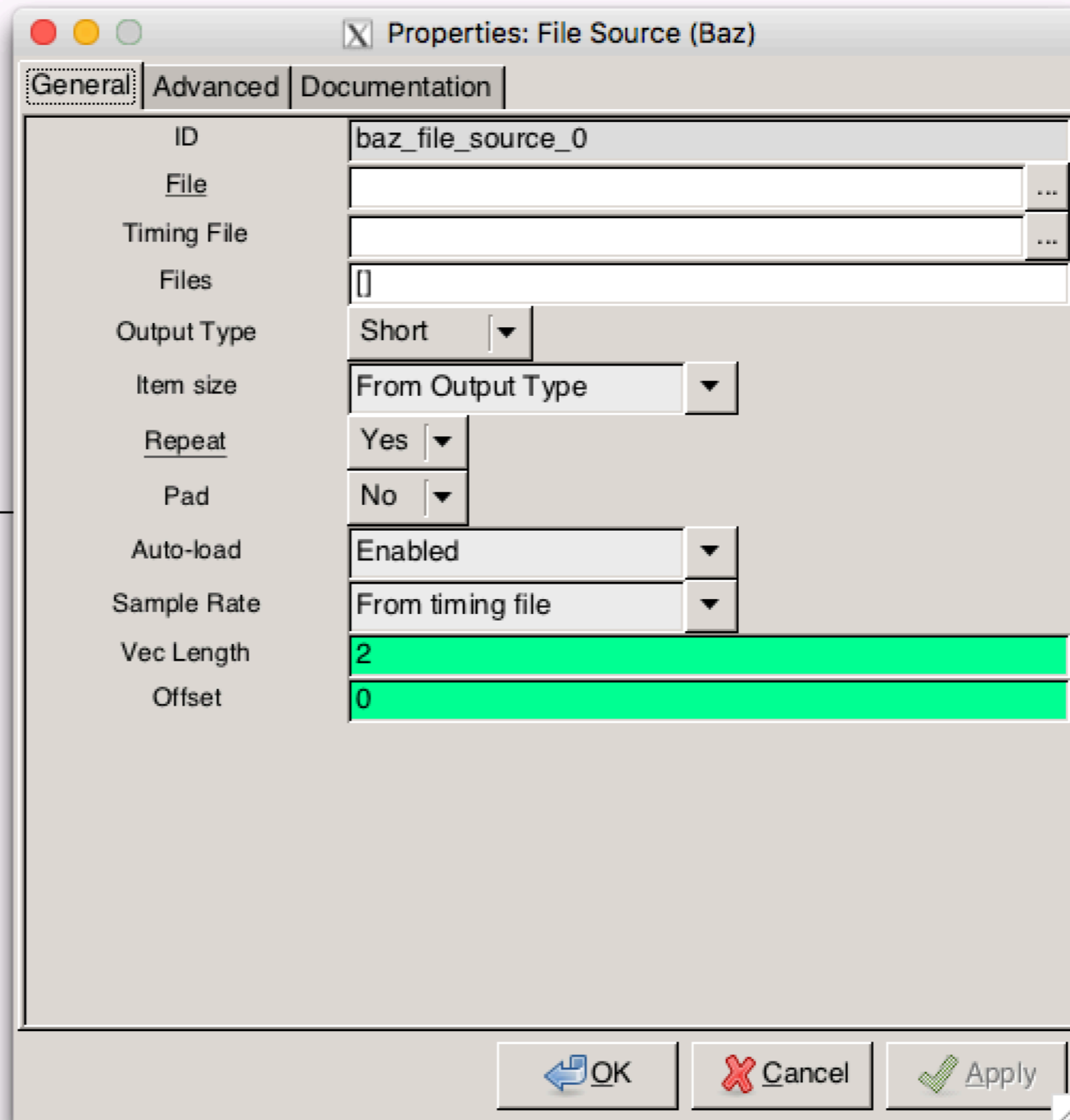
..

CMakeLists.txt	Transition to CMake - either cmake or configure will work.	6 years ago
am_fft.py	Fixed am_fft for GR 3.7	4 years ago
borip-RTL.grc	BorIP server & sample flowgraphs for RTL + Legacy USRP	6 years ago
borip-USRP-Legacy.grc	Check for 'set_status_msgq' in Legacy USRP interface	6 years ago
borip-USRP-UHD.grc	UHD module for BorIP	6 years ago
borip_RTL.py	Fix for new location of firdes filter in gnuradio 3.7	4 years ago
borip_RTL2.py	Fix for new location of firdes filter in gnuradio 3.7	4 years ago
borip_block-RTL.grc	BorIP server & sample flowgraphs for RTL + Legacy USRP	6 years ago
borip_server.py	Modified +x perms on scripts	5 years ago
borip_usrp_legacy.py	Fix for new location of firdes filter in gnuradio 3.7	4 years ago
borip_usrp_uhd.py	Fix for new location of firdes filter in gnuradio 3.7	4 years ago
control_loop_calc.py	Added DOA Compass & Missile Launcher	5 years ago
gpsdo.py	Improved gpsdo script	5 months ago
papr.py	New delay code	4 years ago
pps_diff.py	New delay code	4 years ago

# Timing File

- Record absolute time
- Record overflows (lost samples)
- Synchronise captures across frequencies / devices / locations

# gr-baz File Source



**File Source (Baz)**  
File:  
Timing File:  
Files:  
Item size: From Output Type  
Repeat: Yes  
Pad: No  
Auto-load: Enabled  
Sample Rate: From timing file  
Vec Length: 2  
Offset: 0

out

Multiple files  
(seamlessly)

Auto-load  
file  
sequence

Auto-pad  
overflows

Emits timing  
tags

# baz\_fft

- IQ waterfall/spectrum generator
- Event overlay (squelch, digital packets)
- Interactive playback
- Audio review
- And more...



# playback

- GR-based demodulator
- Controlled via RPC from baz\_fft