

## LANforge CLI CT712 DFS / RF Generation, Japan W56 Functionality (similar to FCC)

Goal: Show usage of lf\_hackrf\_dfs.py and lf\_pulse\_detect3.py for FCC DFS testing.

This document describes the command line interface to generate Japan W56 pulses for DFS (Dynamic Frequency Selection) Testing. The pulses / chirps implemented will be described first then how to execute using the CLI. Japan W56 pulses may be generated with the W53 fixed pulse commands. Japan W56 chirp may be generated by FCC5 and FCC5B commands. Japan W56 hop may be generated by FCC6 hop.

### Known issues

Japan W56 Frequency Hopping Radar Test Waveform does not meet timing

### Pulse Detect

Pulse detect may be used with a second hackrf to monitor the signals produced by the first hackrf.

- command line
  - `./lf_pulse__detect3_pw.py --freq <"center frequency" in Mhz> --lf_hackrf <'hackrf serial'>`
  - example
  - `./lf_pulse_detect3_pw.py --freq 5320 --lf_hackrf c2b4aa75f`

### W56 - Pulse Description

#### Fixed Pulse Radar Test Waveform

Test Signal Fixed Pulses	Pulse Width (us)	Pulse Repetition Frequency (Hz)	Number of Continuous Pulses	Repetition Cycle (s)
Pulse 1	.5	720	18	15.0
Pulse 2	1.0	700	18	15.0
Pulse 3	2.0	250	18	5.0

#### Variable Pulse Radar Test Wave form

Test Signal Variable Pulses	Pulse Width (us)	Pulse Repetition Frequency (Hz)	Number of Continuous Pulses	Repetition Cycle (s)
Pulse 4	1-5	4347-6667	23-29	15.0
Pulse 5	6-10	2000-5000	16-18	15.0
Pulse 6	11-20	2000-5000	12-16	15.0

## Chirp Radar Test Waveform

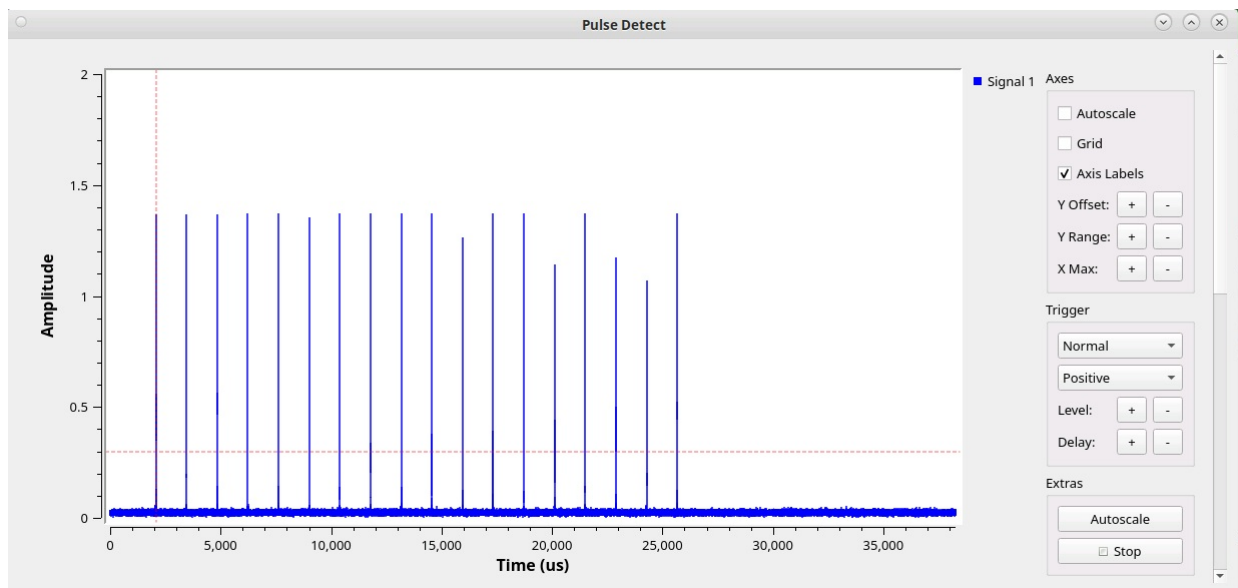
Test Signal	Pulse Width (us)	Chirp Width (MHz)	Pulse Repetition Frequency (Hz)	Number of Continuous Pulses	Repetition Cycle (s)	Number of Bursts
Chirp	50-100	5-20	500-1000	1-3	12.0	8-20

## Frequency Hopping Radar Test Waveform

Test Signal	Pulse Width (us)	Pulse Repetition Frequency (Hz)	Number of Continuous Pulses	Burst Interval (ms)	Repetition Cycle (s)	Hopping Sequence Length (ms)
Hopping	1.0	3000	9	3	10.0	300

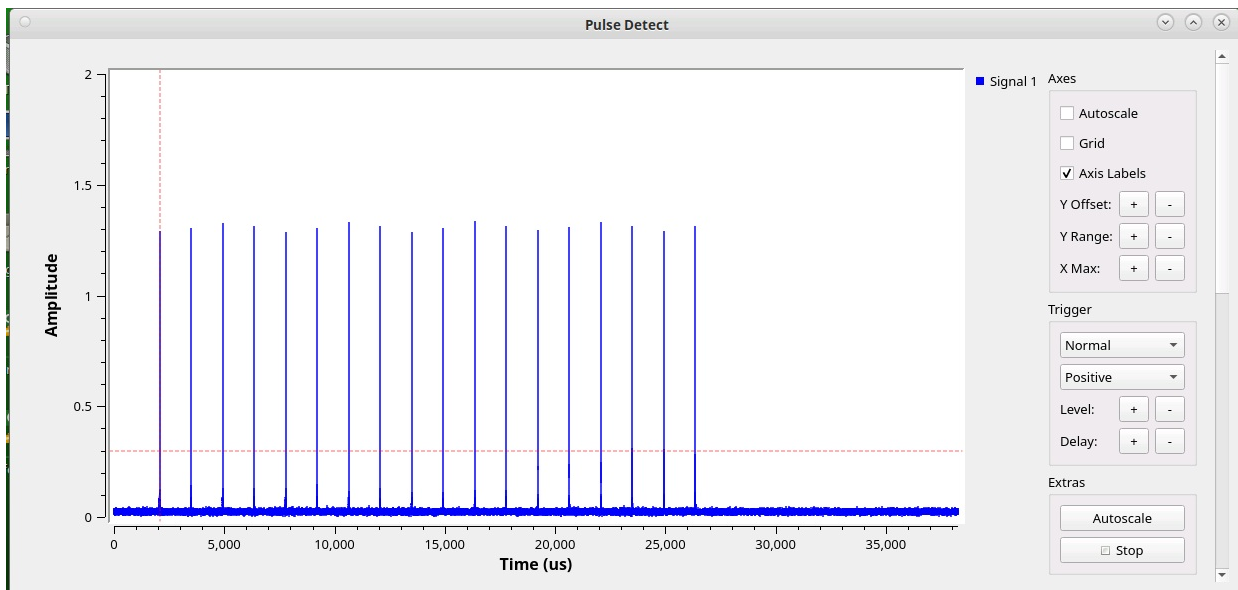
## Japan W56 - Fixed Pulse 1

- command line
  - `./lf_hackrf_dfs.py --freq <'center frequency'> --rf_type GENERIC,,, <tx_sample_rate Mhz> --lf_hackrf`
  - example:
  - `./lf_hackrf_dfs.py --freq 5320000 --rf_type W53PULSE,.5,720,18,20 --lf_hackrf 22276763`



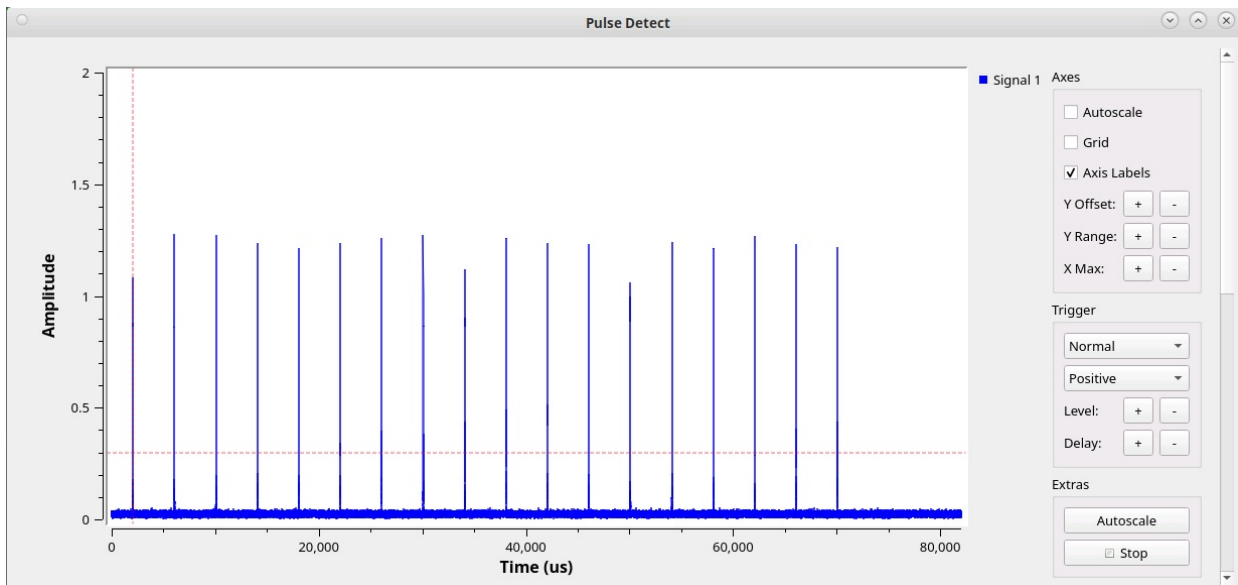
## Japan W56 - Fixed Pulse 2

- command line
  - `./lf_hackrf_dfs.py --freq <'center frequency'> --rf_type GENERIC,,, <tx_sample_rate Mhz> --lf_hackrf`
  - example:
  - `./lf_hackrf_dfs.py --freq 5320000 --rf_type W53PULSE,1.0,700,18,20 --lf_hackrf 22276763`



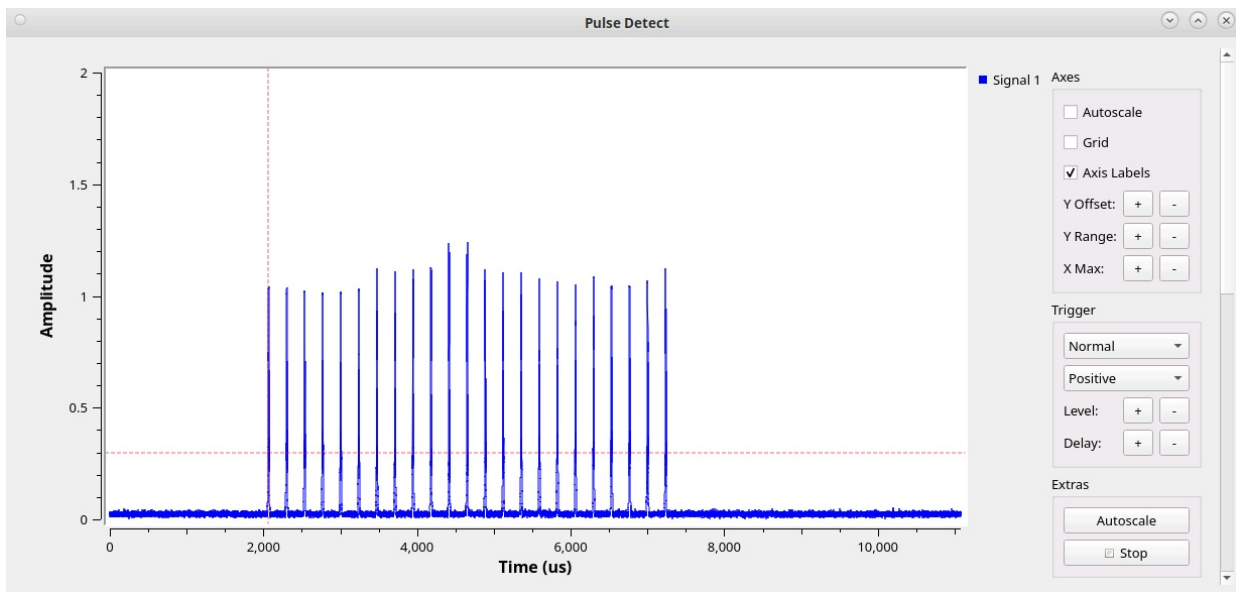
### Japan W56 - Fixed Pulse 3

- command line
  - `./lf_hackrf_dfs.py --freq <center frequency> --rf_type GENERIC,,, <tx_sample_rate Mhz> --lf_hackrf`
  - example:
  - `./lf_hackrf_dfs.py --freq 5320000 --rf_type W53PULSE,2.0,250,18,20 --lf_hackrf 22276763`



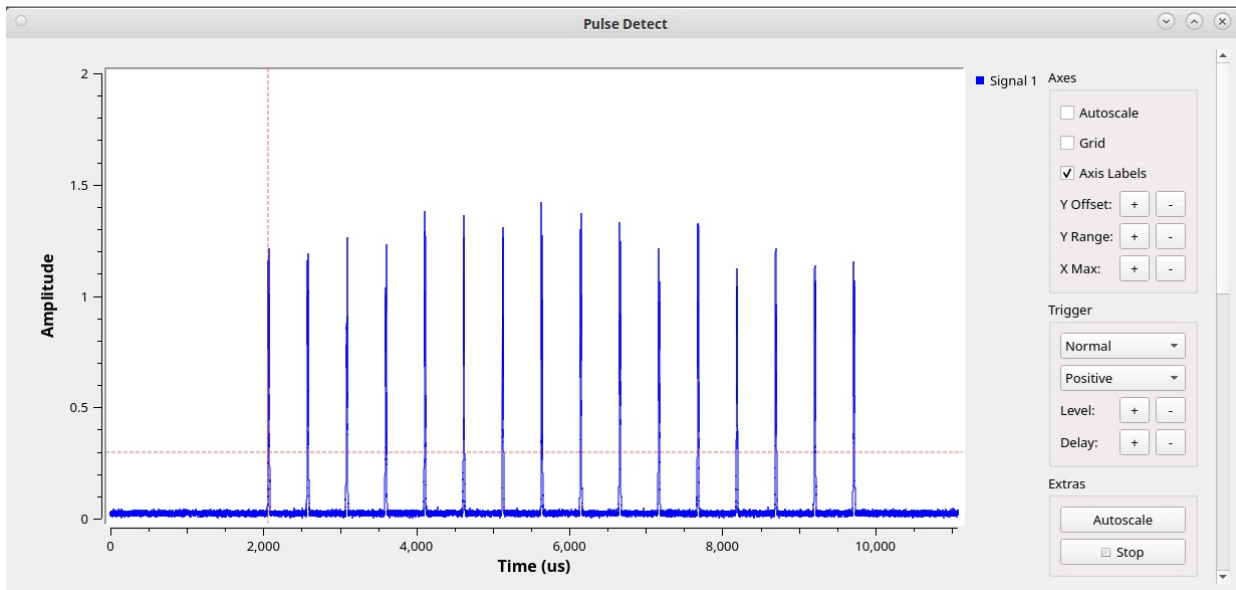
### Japan W56 - Variable Pulse 4

- command line
  - `./lf_hackrf_dfs.py --freq <center frequency> --rf_type GENERIC,,, <tx_sample_rate Mhz> --lf_hackrf`
  - example:
  - `./lf_hackrf_dfs.py --freq 5320000 --rf_type W53PULSE,5,4347,23,20 --lf_hackrf 22276763`



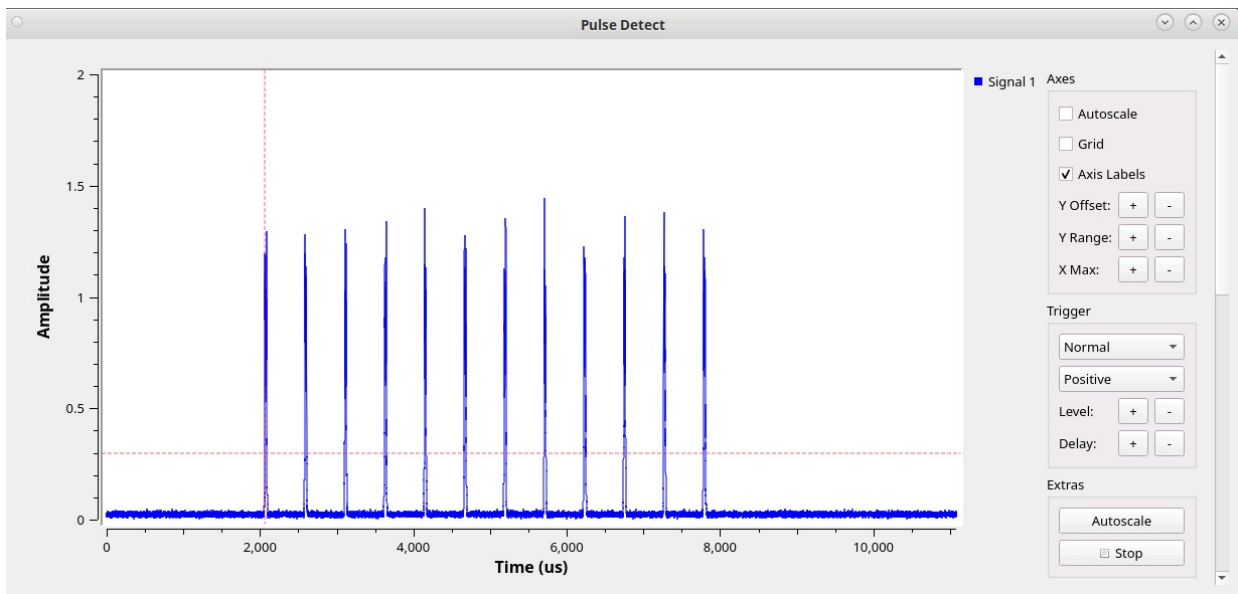
## Japan W56 - Variable Pulse 5

- command line
  - `./lf_hackrf_dfs.py --freq <'center frequency'> --rf_type GENERIC,,, <tx_sample_rate Mhz> --lf_hackrf`
  - example:
  - `./lf_hackrf_dfs.py --freq 5320000 --rf_type W53PULSE,10,2000,16,20 --lf_hackrf 22276763`



## Japan W56 - Variable Pulse 6

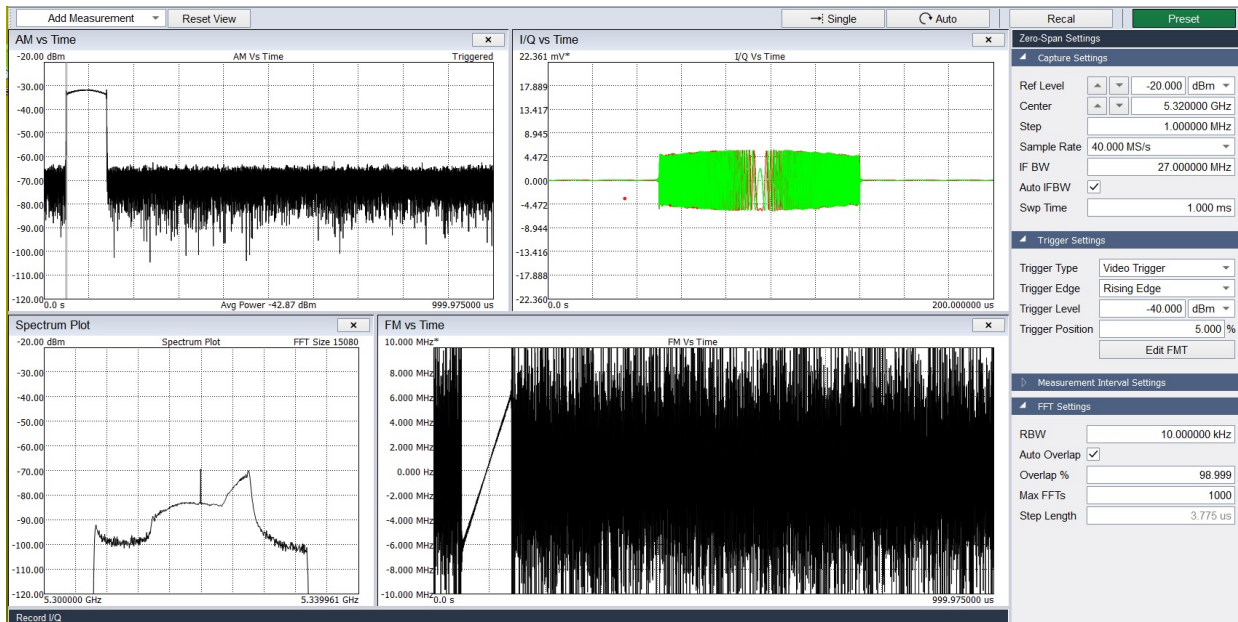
- command line
  - `./lf_hackrf_dfs.py --freq <'center frequency'> --rf_type GENERIC,,, <tx_sample_rate Mhz> --lf_hackrf`
  - example:
  - `./lf_hackrf_dfs.py --freq 5320000 --rf_type W53PULSE,20,2000,12,20 --lf_hackrf 22276763`



## Japan W56 - Chirp (FCC5)

- pulses per burst are randomly chosen between 1 - 3
- prf - randomly chosen by script
- command line
  - `./lf_hackrf_dfs.py --freq <'center frequency'> --rf_type FCC5,<number_bursts in trial>,<trials_center>,<trials_low>,<trials_high>,<uut_channel>,<tx_sample_rate Mhz>`
  - example

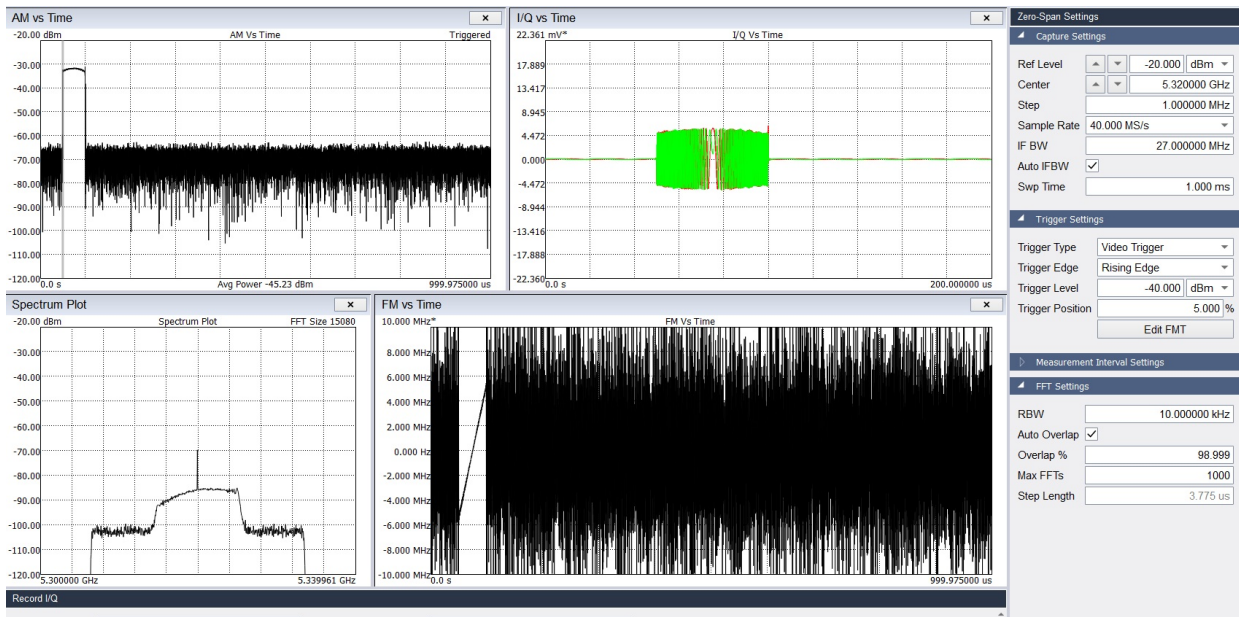
■ `./lf_hackrf_dfs.py --freq 5320000 --rf_type FCC5,10,1,0,0,20,15,20 --lf_hackrf 22276763`



## Japan W56 - Single Chirp (FCC5B)

- command line
  - `./lf_hackrf_dfs.py --freq <'center frequency'> --rf_type FCC5B,,,,<pulse rate frequency 2>,<pulse rate frequency 3>,,,<tx_sample_rate Mhz>`
  - example

■ `./lf_hackrf_dfs.py --rf_type FCC5B,0,50,12,500,600,700,3,20,5320,20 --lf_hackrf 22276763`



## Japan W56 (FCC6)

- command line
  - `./lf_hackrf_dfs.py --freq <center frequency> --rf_type FCC6,<fcc6_bursts>`
  - example
    - `./lf_hackrf_dfs.py --freq 5320000 --rf_type FCC6,100 --lf_hackrf 22276763`

