

Notes for PSWS ClementineSDR - 06-12-2023

Paths to pursue:

1. Platform revision

- Platform Requirements
- As much of functionality described in "**TangerineSDR - Architecture and System Requirements**" (Tom McDermott rev. 0.3, 30 May 2019) as possible.

2. Radio subsystem only

- Implement as much of the functionality described in "**TangerineSDR RF Receiver Module (RXM-5001D)**" (Document Number: TSDR-RXM-5001D-REQ, Tom McDermott rev. 0.4, November 22, 2019) as possible.
 - Use existing RX-888 devices for RF Data Collection.
 - How to integrate?
- Create adapter based on the **Cypress FX3 SuperSpeed USB 3.0 peripheral controller** to interface the existing TangerineSDR receiver module.
 - How much bandwidth support?
 - Coherent receiver support?
- Design customized receiver based on the **RX-888/BBRF103** design.
 - Which A/D chip?
 - ADC9648 [dual-channel 14-Bit, 125 MSPS/105 MSPS, 1.8 V Dual]
 - LTC2208-14/16 [14-Bit, 130MSPS ADC].
 - ???
 - Use For front end?
 - LTC6420-20 [dual-channel differential ADC driver with a fixed gain of 20 dB gain].

2. One Receiver or Two?

3. Features added:

- Front end conditioning,
- GPSDO discipline,
- Time-stamping, etc.

4. Features removed:

- RT820T2 VHF tuning?

3. Software integration

- Verify that software drivers for intended platforms support existing use cases.
- Understand organization and configuration of **KA9Q-radio** components relevant to project.
- Integration of data capture and collection into the HamSCI/PSWS storage architecture.

4. Immediate Actions:

- Make **certain** that all existing HamSCi PSWS documentation is archived and accessible for future reference.
- Investigate configuration of **KA9Q-radio** and understand its configuration.
- Collect/Write documentation of **KA9Q-radio** and define its use as relates to this project.
- Acquire and test **RX-888** devices to characterize their strengths/weaknesses to meet current needs.
- Document fitness to purpose of existing **RX-888** devices.
- Acquire development tools required for customized design based on **RX-888/BBRF103** designs.
- Create sharable working schematic using KiCad.
- Create sharable schematic and board designs for interface to existing **TangerineSDR RF Receiver Module (RXM-5001D)**.
- Create Github Repo for all documents and designs.

5. Development Tools:

- CYUSB3Kit-003 (USB3 Interface dev. board) [Newark.uk, AliExpress].
- CYUSB3Kit-007 (CPLD accessory board) [Newark.uk, AliExpress].
- EZ-USB FX3 Software Development Kit [Infineon].
- SuperSpeed Device Design by Example (book) [Amazon <https://www.amazon.com/dp/1500588059?psc=1>].
- USB Complete v5 (book) [Amazon <https://www.amazon.com/USB-Complete-Developers-Guide-Guides/dp/1931448280/134-6836790-4507607?psc=1>].
- AD/LTC Development board for ADC to be used. [Mouser, best bet].
- KiCad footprints, symbols, 3D models for chips to be used [Ultra Librarian, various sources].