Notes for PSWS Zoom - 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 detefine its use as relates to this project.
    - Acquire and test **RX-888** devices to characterize their strengths/weaknesses to meet current needs.
    - Document fittness 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].