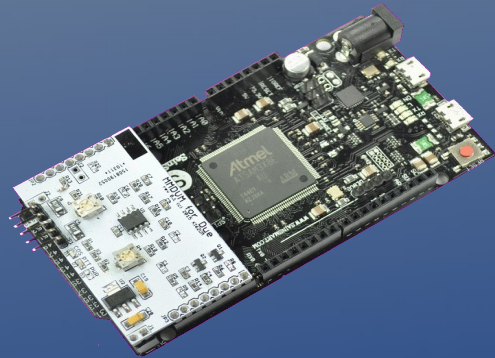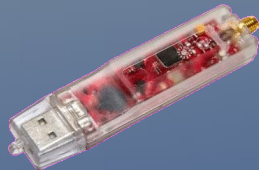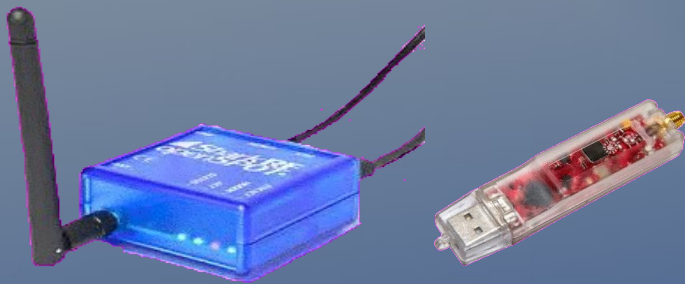# Yaesu Fusion / C4FM Update

David Ranch
KI6ZHD
BayCon 2017
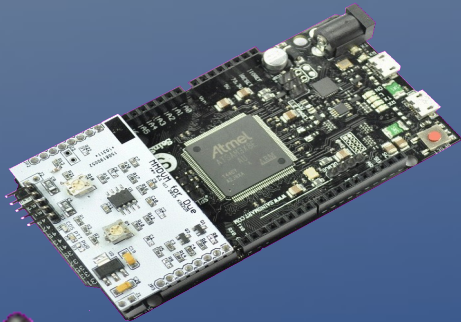1/28/2017 v3

A Quick Refresh:
What is YSF / C4FM?

- System Fusion is Yaesu's answer to the digital radio market vs. Dstar (Icom & Kenwood), DMR (Tera, Hytera, Motorola, etc)

- C4FM : Continuous Four Level Frequency Modulation – A type of 4FSK / FDMA

    - This is the *same* mode used in P25 Phase1 used by Emergency Responders but the higher layer data framing isn't compatible

- FM envelope uses 12.5Khz BW (narrow FM)

- Uses DVSI AMBE chip used in DMR & P25 but newer than D*star – patent encumbered

New Hardware since last BayCon

- FTM-3200 – inexpensive 2m-only mobile radio

(no APRS; limited Fusion support [DN])

- MMDVM – Arduino Mega board mated with Raspberry Pi solution for DMR, Dstar, and BMN conferences

- OpenSpot - Stand alone (no computer required) Multi-mode transceiver hotspot supporting DMR, Dstar, C4FM

  - Requires Wired Ethernet (?!)

WiresX functionality is Deployed!

- We have finally replaced the old standalone DR1 beta unit with a production DR1X repeater, HRI200 linking box, and WiresX Internet system up on Black Mountain!

- The system allows to connect to remote nodes, repeaters, and rooms around the world in an easy to use interface Repeaters:

    VIDEO Showing WiresX mode?

Fusion Evolution

- DR1X 1.10Q firmware looks to solve many previous repeater lockups – looks to be stable!

- Wires-X 1.12 Windows software – solves many HRI-200 soundcard driver issues

- New DR2X repeater has been announced. Initial details talks about site to site linking w/o needing a WiresX computer (few other details available at the moment)

Join Bay-Net's YSF Net

- Join Jason K6DGN's YSF net every <u>Sunday night at 7pm PST</u>

- A classic round-table that discusses what's new in YSF but also covers other HAM topics

- W6PW's San Francisco Sutro Tower YSF Repeater is now linking in for this net for a larger (but still Bay Area only) WiresX net
  - Check out the W6PW YSF net Mondays @ 8:30pm PST

Fusion Repeaters in the Bay Area

- **WW6BAY - Bay-Net – Black Mountain**

    - **444.425 "+" pl:127.3 – WiresX enabled**

- W6PW – San Francisco

    - Sutro tower: AMS 145.150 "+" DCS:664 - WiresX enabled and linked to BrandMeister reflector FCS002/64

    - SF VA near Golden Gate Park: AMS 444.225 pl:114.8 soon to be DCS:664 – Stand alone repeater

- 2x N6ZX – Skyline, Woodside – AMS: 145.370 "-" & 440.450 "+" : Stand alone repeaters

- W6RTF – Salinas - 440.700 "+" pl: 100.0

Helpful URLs and Links

- Yahoo email group:
  https://groups.yahoo.com/neo/groups/YaesuSystemFusion
  - 3503 subscribers as of 1/17/17 and growing!

- Yaesu's Digital Fusion Facebook page
  - https://www.facebook.com/pages/Yaesu-C4FM-FDMA-System-Fusion

- Live Wires-X / Fusion status
  - https://www.yaesu.com/jp/en/wires-x/id/id_active.php
  - http://jq1yda.org/i/db-x/x_activeroom.html
  - http://fusion.kf5way.com/country/USA
  - https://fusionlive.net/
  - https://register.ysfreflector.de/

Even More URLs

- Technical specs on the Fusion framing, etc for possible homebrewing (on Yaesu's Digital area)
    - http://www.systemfusioninfo.com/
- Technical details of C4FM, etc

http://www.cmsara.org/wp/wp-content/uploads/2015/10/Fusion-Presentation_N5WDG.pdf

Thank you!

Any Questions?