



M17

KØNGA MIKE

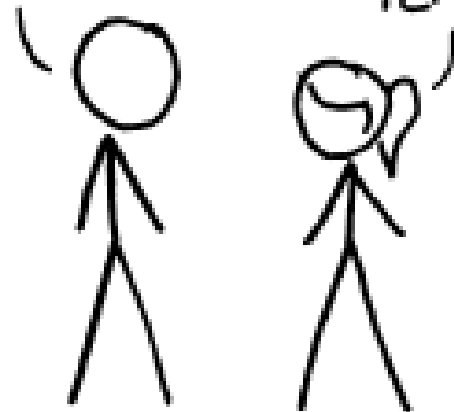
ROCKY MOUNTAIN HAM RADIO

OBLIGATORY – XKCD 927

HOW STANDARDS PROLIFERATE:
(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC)

SITUATION:
THERE ARE
14 COMPETING
STANDARDS.

14?! RIDICULOUS!
WE NEED TO DEVELOP
ONE UNIVERSAL STANDARD
THAT COVERS EVERYONE'S
USE CASES.



SOON:

SITUATION:
THERE ARE
15 COMPETING
STANDARDS.



WHAT IS M17

- Foundation
- Protocol



M17 FOUNDATION

- **Mission**
 - Our goal is to provide the amateur radio community with quality, open-source software and hardware solutions. As the name suggests, we are focused on supporting the M17 digital voice protocol, along with its open-source software and hardware implementations.
 - A vast majority of open-source projects relies on volunteer work. Some projects, especially the most sophisticated ones, can not rely on volunteers alone. We want to be able to pay developers for the work done.



M17 FOUNDATION

- Projects
 - M17 Protocol
 - M17 is a completely open-source digital voice protocol, designed for amateur radio use. Not a single part of it is patent encumbered. M17 uses **Codec 2 voice codec**.
 - WPSD Project
 - WPSD is a next-generation digital voice software suite & distribution for amateur radio use, enjoyed by many thousands of hams around the globe. It is used for personal hotspots and repeaters alike.
 - OpenRTX
 - OpenRTX is a free and open source alternative firmware for digital ham radios. The firmware is designed with a top-down approach with the objectives of modularity, flexibility and high performance. Currently, it is the only firmware with M17 support.

M17 – WHY?

- We did not need another digital voice mode, there is already plenty of them, wtf? (AKA: There is enough fragmentation to begin with!)
 - Yeah, and all of them (or most of them) are pain in the rear to experiment with. Can you demonstrate sending arbitrary data over *put your favorite mode here* with a GNU Radio block while playing with the protocol's error correction? I thought so. Even functionalities within one single mode often struggle to interoperate between devices from different manufacturers. Also, you seem to miss the whole point of amateur radio, which is experimentation, innovation and openness.

M17 PROTOCOL COMPARISON

Table 1: M17 compared with the other VHF/UHF digital voice standards used by radio amateurs in the UK.

	M17	System Fusion	DMR	D-STAR	NXDN	APCO P25	TETRA
Approx. number of Repeaters, UK	9	373	318	209	57	53	7
Developer/Vendors	Amateur radio community/multivendor	Yaesu/Yaesu	European Telecomms Standards Institute/multivendor	Japan Amateur Radio League/ Icom, Kenwood, and Flex	Icom and Kenwood/multivendor	Association of Public Safety Comms Officials/ multivendor	European Telecomms Standards Institute/multivendor
Type of standard	Free and open source	Proprietary	Partially open	Partially open	Partially open	Partially open	Partially open
Codec	Codec 2 (open source)	AMBE+2 (patent-protected)	AMBE+2 (patent-protected)	AMBE (copyright-protected)	AMBE+2 (patent-protected)	AMBE+2 (patent-protected)	ACELP (codebook-protected)
Modulation	4FSK	4FSK	4FSK	GMSK	4FSK	4FSK	DQPSK
Data features	Callsign, text messages, location, images	Callsign, text messages, location, images	Callsign, text messages, location	Callsign, text messages, location, images	Callsign, text messages, location	Callsign, text messages, location	Callsign, text messages, location
Advantages	Fully open source, created for amateur radio	Largest installed base of repeaters, WIRES-X	Well supported, talkgroups	Created for amateur radio, up to 128 kbps data	Can use 12.5 or 6.25 kHz channels	Designed for emergency communication	Supports four simultaneous conversations in 25 kHz
Disadvantages	Limited installed base (new entrant)	Single vendor	Designed for commercial use, difficult to set codeplug	Inferior codec, expensive	Designed for commercial & public safety, limited installed base	Mainly used gear for amateur use, not all models suitable for amateur radio	Equipment for amateur use limited to 430 MHz band



M17 – PERSONAL TAKE

- This is my own opinion
- Still very much in its infancy
- Most supported radios require physical modification to work
 - Exception: Connect Systems CS7000 radios
- Protocol already implemented on Pi-Star & WPSD, not yet on openSPOT
- Repeater setup is still a DIY project
 - Module 17 support for Analog FM radios
 - MMDVM Boards
 - RRU approach
- Bottom Line: On-ramp for Hams is still very steep



LINKS

- M17 Foundation - <https://m17foundation.org/>
- WPSD - <https://w0chp.radio/wpsd/>
- OpenRTX - <https://openrtx.org/>