DMR
Digital Mobile Radio

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What is DMR

- An ETSI published world-wide standard

- TDMA: Time Division Multiple Access

- AMBE+2 codec

- Supports data applications (txt, email, gps)

Why DMR?

- Commercial radio industry standard

- Open standard

- Spectrally efficient

- Improved codec / high tolerance of bit errors

- Wide support by many radio vendors
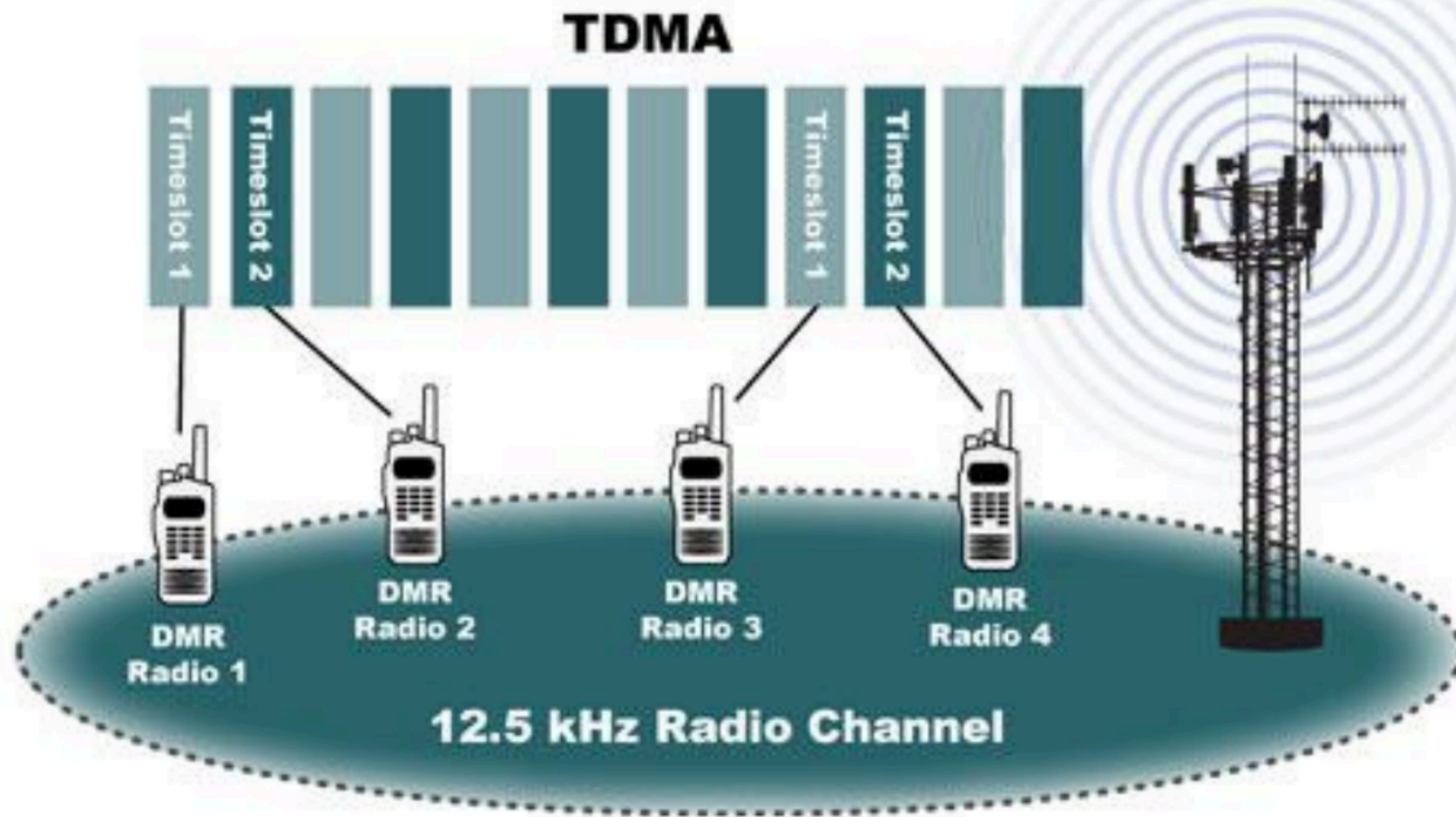
- Two repeaters in one!

DMR Tiers

- **Tier 1**
  - 1-slot TDMA
  - Simplex radio to radio only
- **Tier 2**
  - 2-slot TDMA
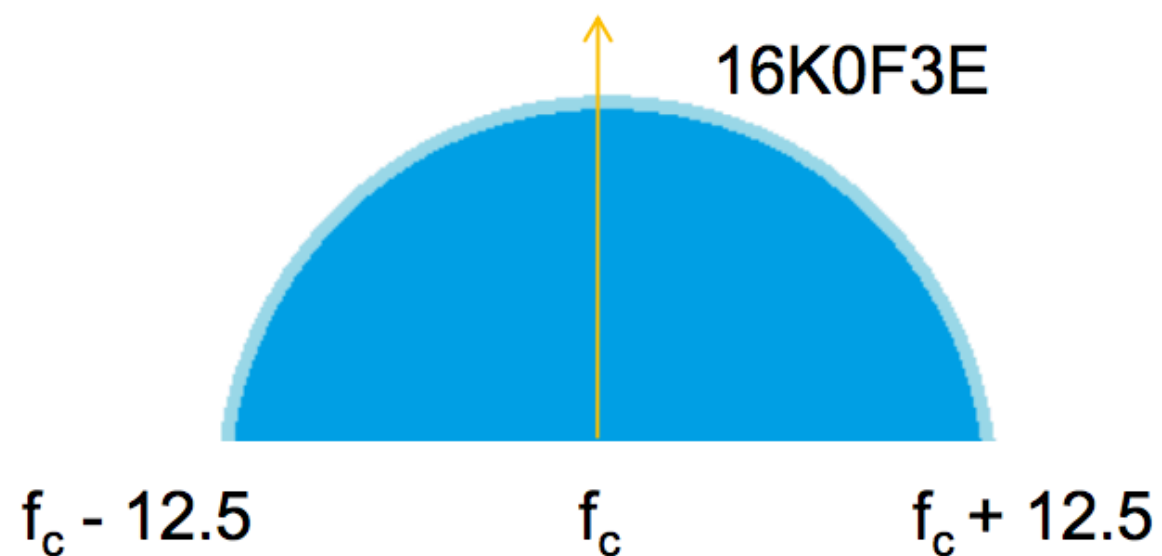 - Repeater or simplex
  - IP site Connect
- **Tier 3**
  - 2 - Slot TDMA
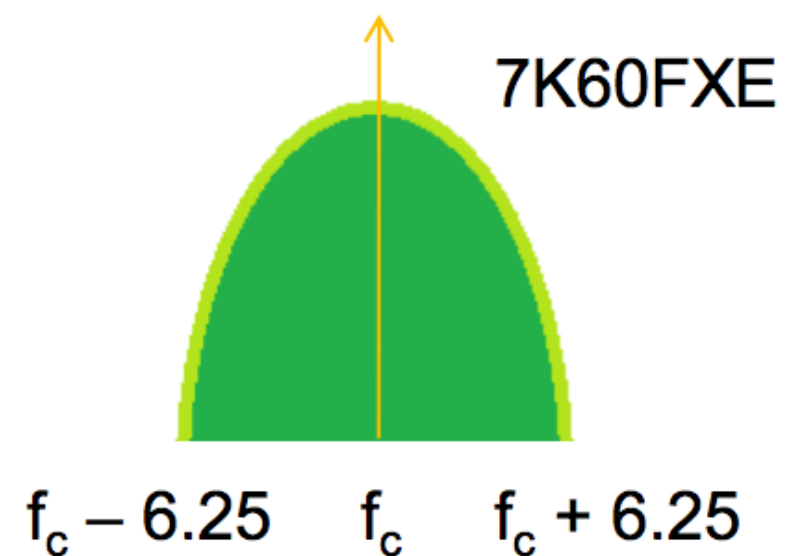 - Multi-Channel, Multi-Site
  - Trunking

Two Channels - One Frequency
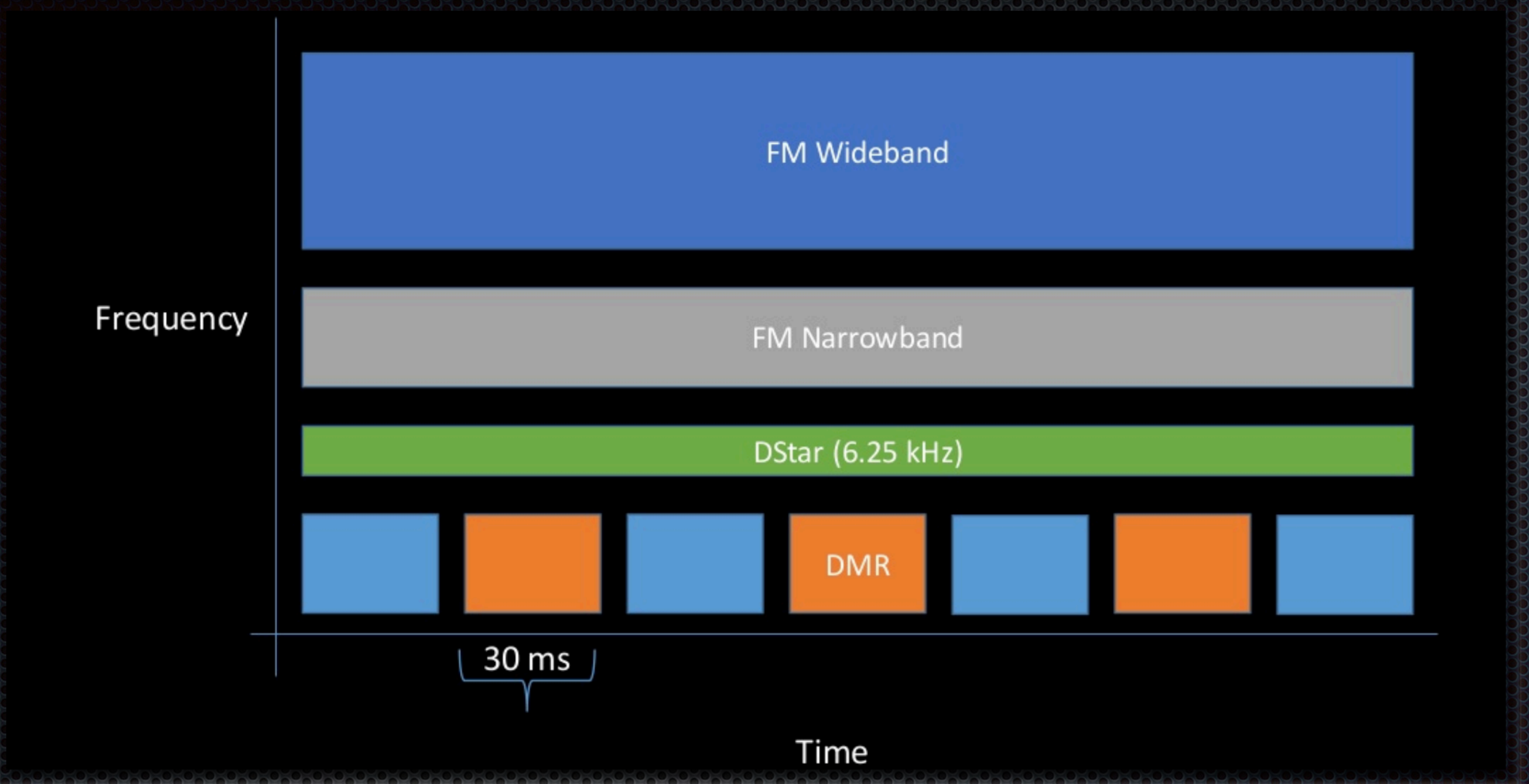Each TMDA cycle is 60ms long, containing two 30ms time slots

Half the Channel Bandwidth

DMR Bandwidth
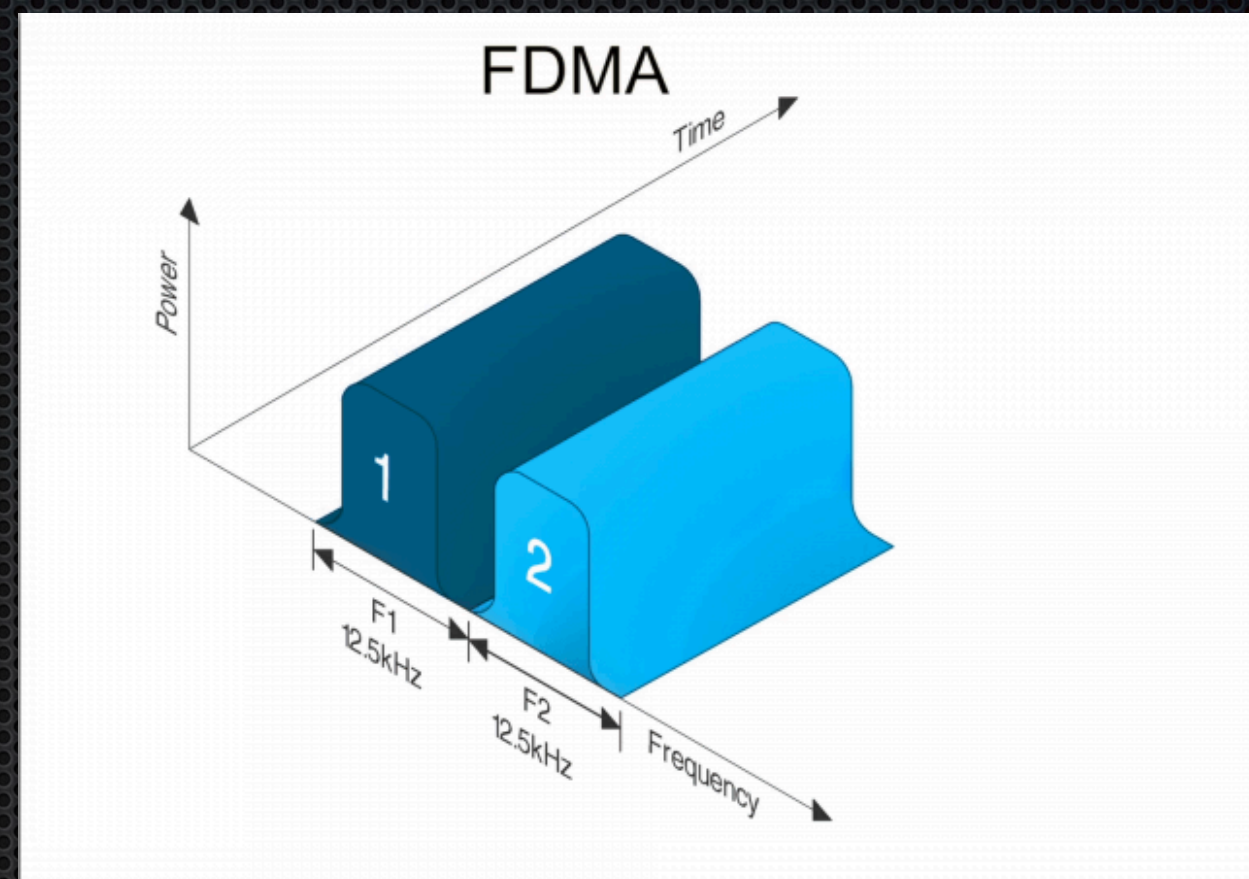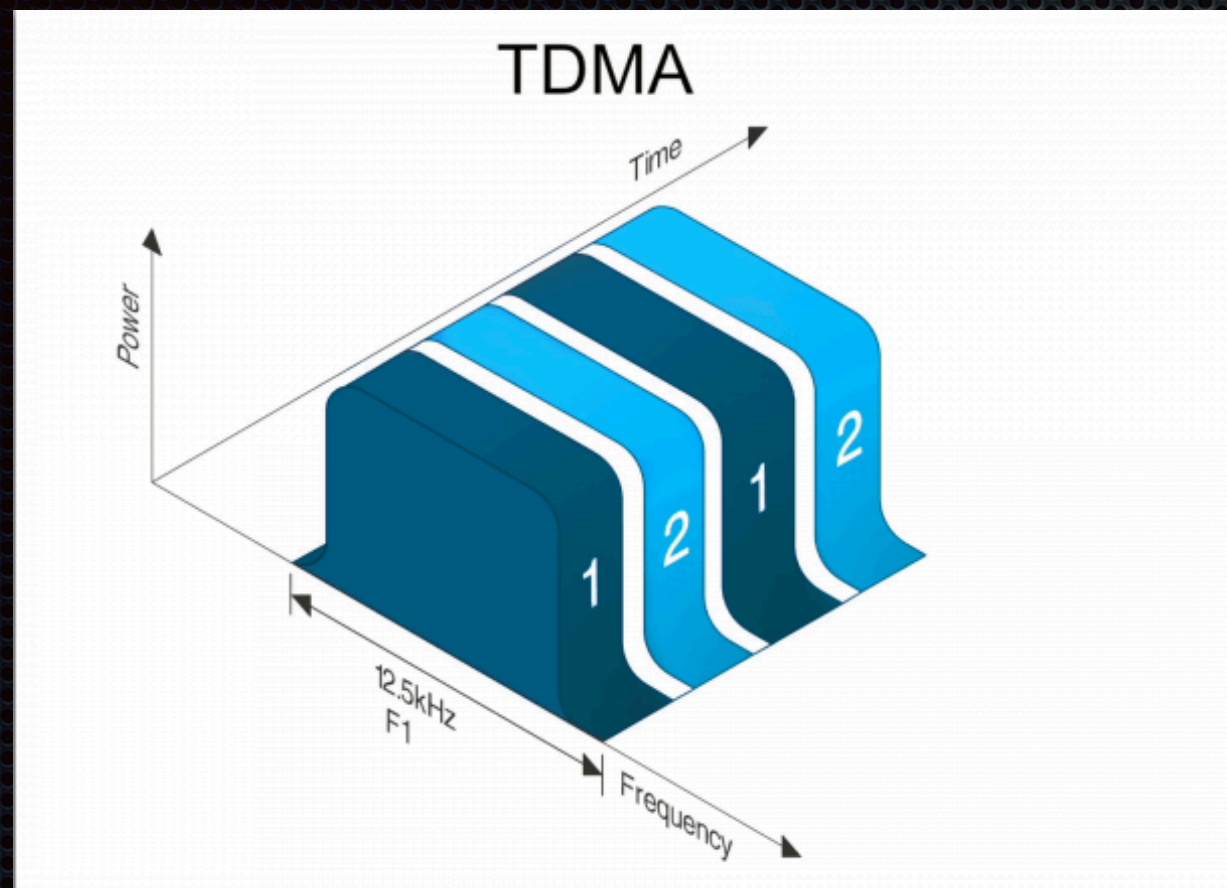
TDMA vs FDMA

DMR Terminology

* DMR ID

* Talk Group

* Time Slot

* Color Code

* Code Plug

DMR ID

- An number that identifies you as a unique user on a DMR network.

- In most cases a person needs only one ID, two radios can share the same ID

- www.radioid.net

Talk Group

- A method of organizing radio traffic on a DMR network

- Talkgroups exist for countries, states, regions, cities, or special interests.

- The equivalent to a System Fusion Room or DStar Reflecter.

Timeslot

- One of the two voice channels in the 12.5 kHz data stream

- A DMR repeater can handle two simultaneous conversations, one on Time Slot 1 and one on Time Slot 2.

- Repeater owners will assign certain talk groups to each time slot to best manage utilization.

Color Code

- DMR repeaters use color codes much like analog repeaters use CTCSS to minimize interference.

- Total of 15 different color codes.

- Color code 0 is the equivalent to open carrier.

Codeplug

* Program file loaded into a radio with frequencies, channel identifiers, talkgroups, etc.

* Antiquated term that's commonly used in commercial radio circles.

* The application used to program your radio is called the CPS or Customer Programming Software.

DMR Networks

- Brandmeister

  - Largest DMR Network

  - Bridged to Motorola and non-Motorola DMR repeaters

  - Wide MMDVM support

- DMR-MARC

  - Bridged Motorola repeaters

  - Limited MMDVM support

- DMR-Plus

  - Bridged Motorola and Hytera repeaters

  - Partners with DMR-MARC

DMR Handhelds

- $75 and up, average cost $150 - $225
- TYT, Anytone, Retevis, Connect Systems, Hytera, Motorola
- Most models dual band with analog support.

DMR Mobiles

- $300 and up
- Connect Systems, Retevis, Motorola
- Most models dual band with analog support.

DMR Hotspots

- Cost: variable
- Multi-Mode Digital Voice Modem (MMDVM)
- DVMega, SharkRF, etc
- DMR, DStar, Fusion, P25, NXDN support

Disadvantages of DMR

* More complex than amateur centric digital modes

* Difficult to dynamically join or monitor talk-groups

* Radio build quality all over the spectrum

* Another digital mode to choose from (Balkanization)

Questions

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