

Emergency Preparedness

Part 5: Communications Overview

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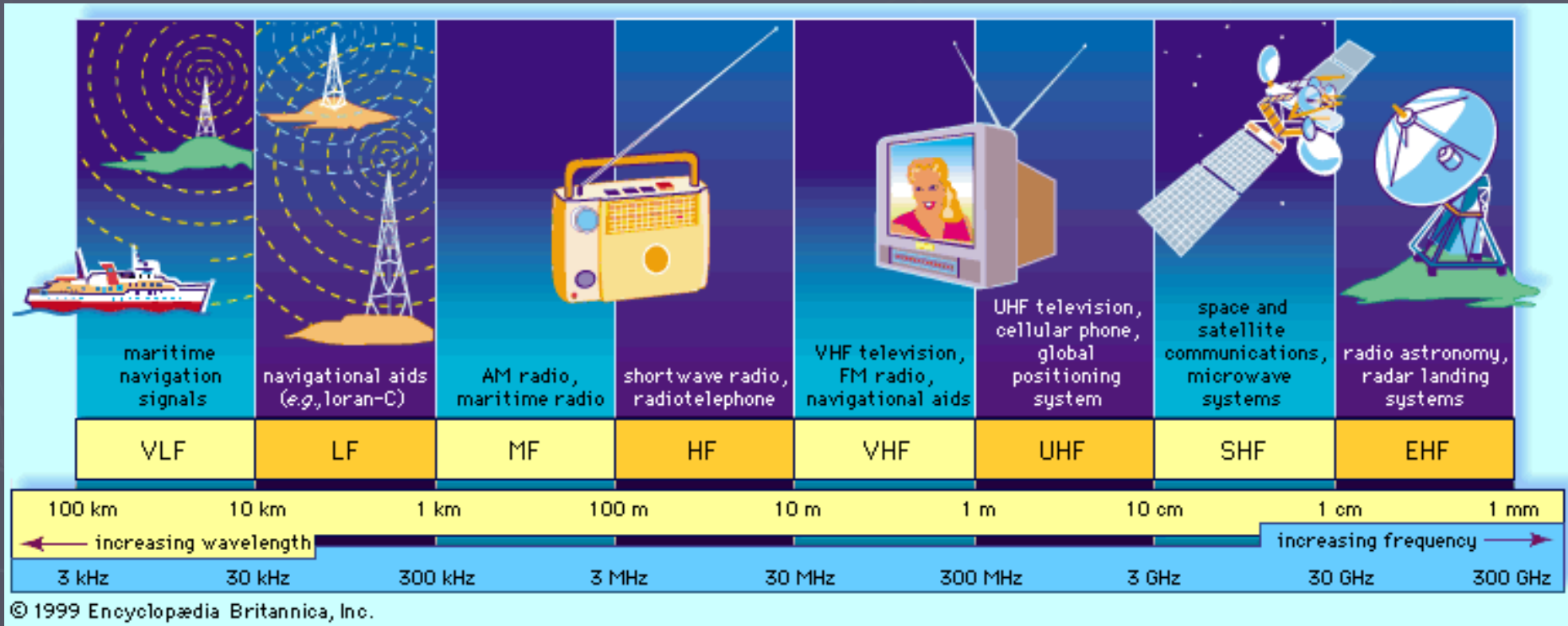
Communications Considerations

- ▶ Licensing Requirements
- ▶ Equipment availability and cost
- ▶ Equipment size, weight, and power requirements
- ▶ Availability of accessories (Headsets, Antennas, etc)
- ▶ What will you use it for?
- ▶ Communication distance considerations?
- ▶ What activities will allow you to practice?
- ▶ Other restrictions/regulations/considerations

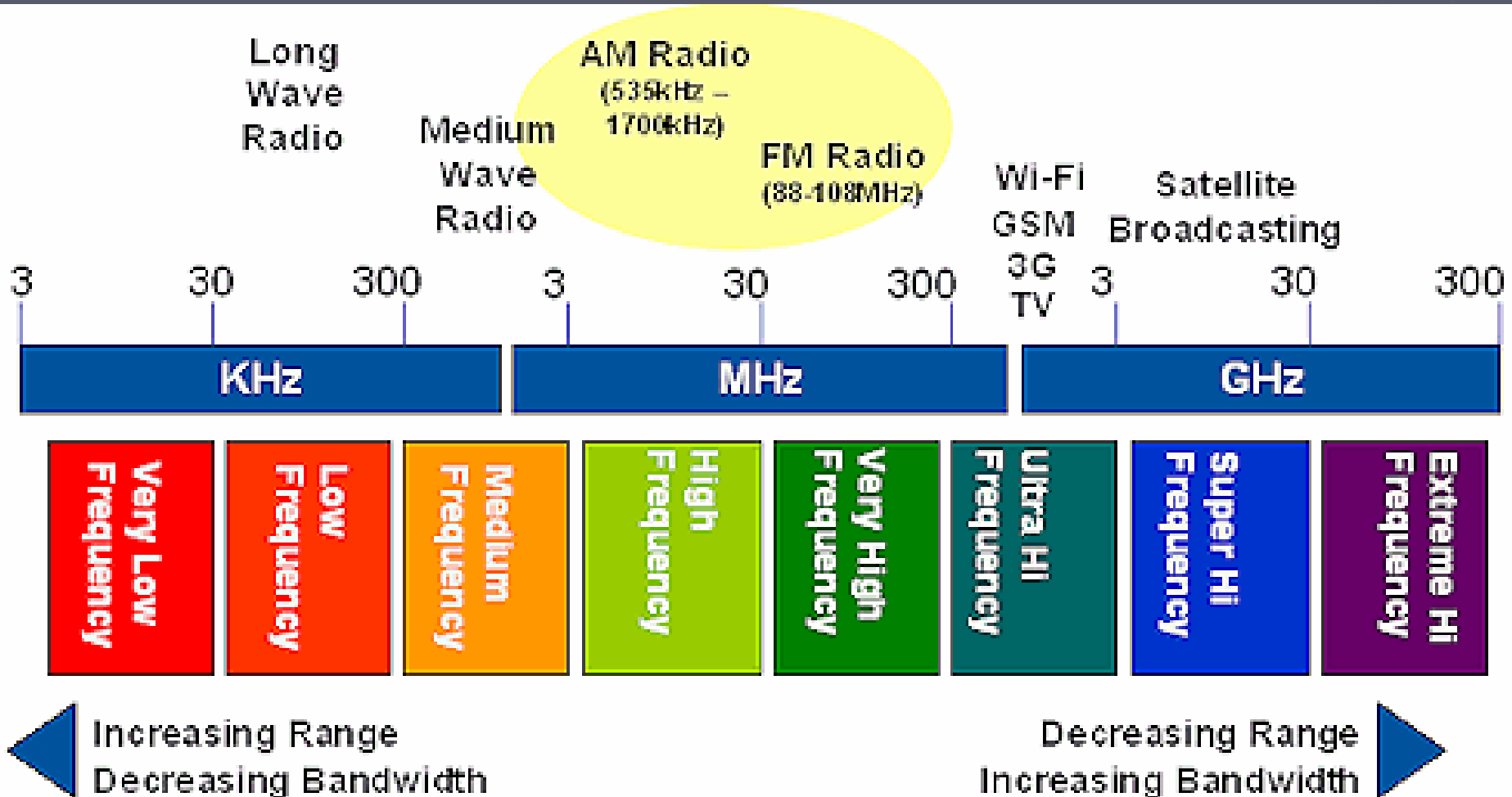
Communications Types

- ▶ Runners/Couriers/Messengers
- ▶ Cell Phone
- ▶ Two-Way Radio
 - CB
 - FRS/GMRS
 - MURS
 - Amateur (HAM)
- ▶ Receive Only
 - NOAA (Weather Radios)
 - AM/FM radios

Frequency Spectrum



Frequency Spectrum



Emergency Cell Phone Use

- ▶ During a crisis, voice circuits will be overloaded
 - But text messages may be able to get through
 - If data services up, your apps may still work
- ▶ Even a cell phone with no current service agreement can be used for an emergency call

Radio Communications Types

▶ Citizen Band (CB)

- No licensing requirements
- 26.965 MHz – 27.405 MHz (~10m HF band)
- Channels 1 – 40
- Maximum Power: 4 watts (12 watts SSB)
- Short range

▶ CB Radio Reference:

- <http://www.csgnetwork.com/cbradiofreq.html>
- http://support.radioshack.com/support_tutorials/communications/cfq-rdio03A.htm

Radio Communications Types

- ▶ Multi-Use Radio Service (MURS)
 - No licensing requirements
 - 151.82 MHz – 154.6 MHz (2m VHF band)
 - Channels 1 – 5
 - Maximum Power: 2 watts
 - Short range
- ▶ MURS Radio Reference:
 - https://en.wikipedia.org/wiki/Multi-Use_Radio_Service

Radio Communications Types

▶ Family Radio Service (FRS)

- No licensing requirements
- 462 MHz – 467 MHz (~1m UHF band)
- Simplex only
- Channels 1 – 7 (Shared with GMRS), 8 – 14 (FRS Only)
- Maximum Power: 500 milliwatts
- Short range
- Fixed antenna only

▶ FRS Radio Reference:

- https://en.wikipedia.org/wiki/Family_Radio_Service

Radio Communications Types

▶ General Radio Service (GMRS)

- **License required – No licensing exam**
- 462 MHz – 467 MHz (~1m UHF band)
- Simplex or Duplex (use with repeaters)
- Channels 1 – 7 (Shared with GMRS), 8 – 14 (FRS Only)
- Maximum Power: 5 watts typical/allowed up to 50 watts
- Short range
- Fixed or removable antennas allowed

▶ GMRS Radio Reference:

- https://en.wikipedia.org/wiki/General_Mobile_Radio_Service
- http://wiki.radioreference.com/index.php/FRS/GMRS_combined_channel_chart

Channels and Frequencies

Channel	Frequency	Description	Channel	Frequency	Description
1	462.5625 MHz	GMRS/FRS	12	467.6625 MHz	FRS
2	462.5875 MHz	GMRS/FRS	13	467.6875 MHz	FRS
3	462.6125 MHz	GMRS/FRS	14	467.7125 MHz	FRS
4	462.6375 MHz	GMRS/FRS	15	462.5500 MHz	GMRS
5	462.6625 MHz	GMRS/FRS	16	462.5750 MHz	GMRS
6	462.6875 MHz	GMRS/FRS	17	462.6000 MHz	GMRS
7	462.7125 MHz	GMRS/FRS	18	462.6250 MHz	GMRS
8	467.5625 MHz	FRS	19	462.6500 MHz	GMRS
9	467.5875 MHz	FRS	20	462.6750 MHz	GMRS
10	467.6125 MHz	FRS	21	462.7000 MHz	GMRS
11	467.6375 MHz	FRS	22	462.7250 MHz	GMRS

Radio Communications Types

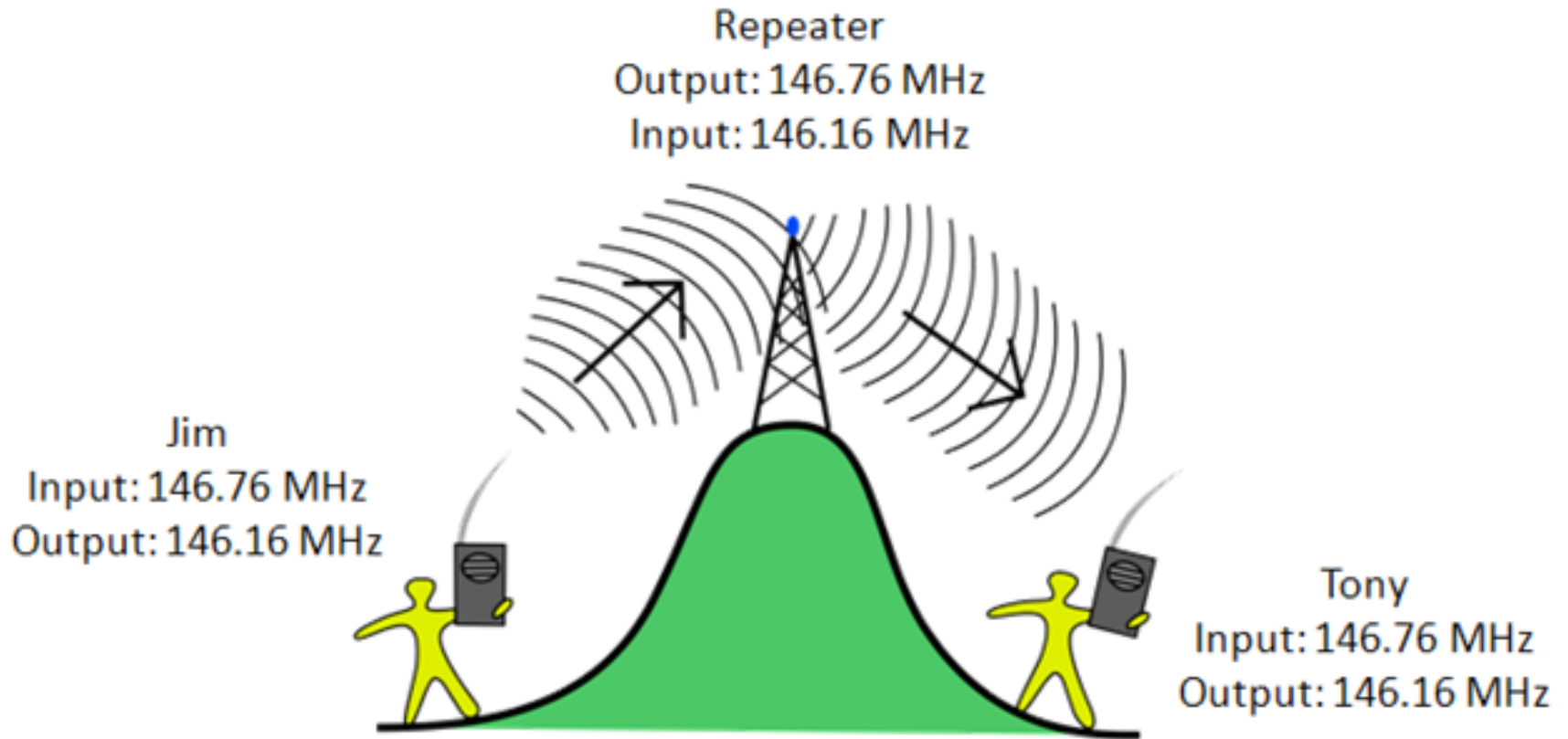
▶ Amateur Radio Service (HAM)

- **License required – Licensing Exam**
- Various (HF – UHF)
- No designated “channels,” but you can program radios with your presets
- Simplex or Duplex (use with repeaters)
- Maximum Power: varies by license type
- Capable of long range (depending on power and frequency)
- Wide variety of antennas and equipment

▶ HAM Radio References:

- https://en.wikipedia.org/wiki/Amateur_radio
- <http://www.qrz.com/>
- <http://www.arrl.org/>

HAM Radio Repeater Operation



Programmable Radio Presets Example

VX-7 Programmer - CFRM-6

File Edit Communications Settings Window Help

CFRM-6 x

	Receive Frequency	Transmit Frequency	Offset Frequency	Offset Direction	Operating Mode	Name	Tone Mode	CTCSS	DCS	Tx Power	Skip	Step
100	445.97500	445.97500		Simplex	FM	SIMPLEX	None	100.0 Hz	023	High	Off	25 kHz
101	446.00000	446.00000		Simplex	FM	NATIONAL	None	100.0 Hz	023	High	Off	25 kHz
102	446.02500	446.02500		Simplex	FM	SIMPLEX	None	100.0 Hz	023	High	Off	25 kHz
103	446.05000	446.05000		Simplex	FM	SIMPLEX	None	100.0 Hz	023	High	Off	25 kHz
104	446.07500	446.07500		Simplex	FM	SIMPLEX	None	100.0 Hz	023	High	Off	25 kHz
105	446.10000	446.10000		Simplex	FM	SIMPLEX	None	100.0 Hz	023	High	Off	25 kHz
106	446.12500	446.12500		Simplex	FM	SIMPLEX	None	100.0 Hz	023	High	Off	25 kHz
107	446.15000	446.15000		Simplex	FM	SIMPLEX	None	100.0 Hz	023	High	Off	25 kHz
108	446.17500	446.17500		Simplex	FM	SIMPLEX	None	100.0 Hz	023	High	Off	25 kHz
109	446.20000	446.20000		Simplex	FM	SIMPLEX	None	100.0 Hz	023	High	Off	25 kHz
110	446.22500	446.22500		Simplex	FM	SIMPLEX	None	100.0 Hz	023	High	Off	25 kHz
111	446.27500	446.27500		Simplex	FM	SIMPLEX	None	100.0 Hz	023	High	Off	25 kHz
112	447.15000	442.15000	5.00 MHz	Minus	FM	CRA DEN	Tone	107.2 Hz	023	High	Off	25 kHz
113	447.17500	442.17500	5.00 MHz	Minus	FM	GOLDEN	Tone	186.2 Hz	023	High	Off	25 kHz
114	447.22500	442.22500	5.00 MHz	Minus	FM	DENVER	Tone	141.3 Hz	023	High	Off	25 kHz
115	447.27500	442.27500	5.00 MHz	Minus	FM	GREELEY	Tone	100.0 Hz	023	High	Off	25 kHz
116	447.45000	442.45000	5.00 MHz	Minus	FM	FT COLL	Tone	123.0 Hz	023	High	Off	25 kHz
117	447.50000	442.50000	5.00 MHz	Minus	FM	CONIFER	Tone	88.5 Hz	023	High	Off	25 kHz
118	447.57500	442.57500	5.00 MHz	Minus	FM	CRA DEN	Tone	107.2 Hz	023	High	Off	25 kHz

Questions and Answers

► Contact me:

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http://www.gonzosgarage.net/prepper/emergency_prep.html