Two-Way Radios

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Devon Community Resilience Forum

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What is Two Way Radio?

- Traditionally, radios transmit and receive voice.
- Using a PTT (Push to Talk) button, a user can reach one, or many, instantly.
- Existence of electromagnetic waves was proved in 1800s.
- First transmission of speech and music occurred over radio waves in 1906.
- Marconi's wireless radio technology was used on the Titanic.
- In 1923, mobile two-way radios were first installed into Australian police patrol cars.
- Despite massive development in technology, the fundamental voice elements of two-way radio communication remain reassuringly familiar

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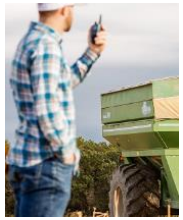
Who uses Two Way Radios?

- Emergency Services
- Construction
- Petrochemical, oil and gas
- Utilities
- Highways maintenance
- Transport and logistics
- Security
- Shop/pub watch schemes
- Supermarkets, stores and malls
- Agriculture
- Mining
- Hotels, restaurants and fish & chip shops
- Schools, colleges, universities, nurseries
- Hospitals and social care settings
- Events, carnivals and festivals
- Manufacturing
- Food processors
- Sporting and concert arenas
- Stately homes and country estates
- Prison services
- Etc, etc, etc...



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Key Considerations:

Operating environment and circumstances

Consider the circumstances under which ***you*** would be using two-way radios:

- High pressure situations → simplicity and accessibility
- High background noise → good audio processing
- High water presence → high IP rating and protection

- Range
- IP Rating
- Quality
- Storing and charging arrangements
- Test! (and be aware of limitations!)
- Users

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VHF or UHF?

VHF – Very High Frequency

Business users operate between the frequency range **136 MHz to 174 MHz**

Longer, slower waves are less well able to negotiate obstructions – think of them having less energy to push through solid matter. As such, VHF are often better in large, outdoor, open spaces.

UHF – Ultra High Frequency

Business users operate between the range of **400 MHz to 470 MHz**

Shorter, faster waves are better able to negotiate some obstructions – think of them as having more energy, allowing them to push through more solid matter. UHF is recommended for obstructed/built-up areas

Remember, antenna type and length can also improve or detract from a handportable's performance...

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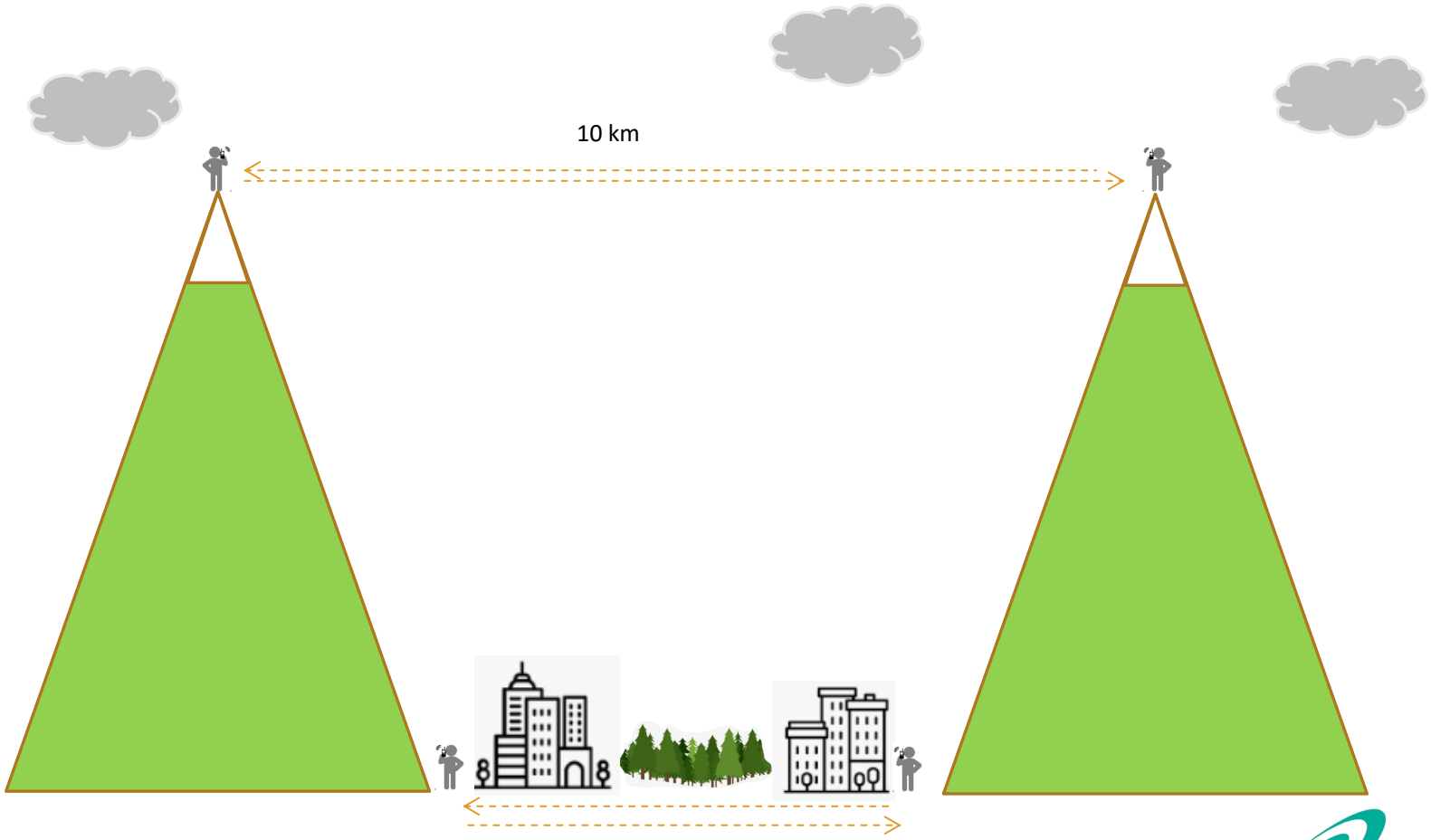
The box says a 10km range...



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Be aware….

Electromagnetic waves only travel in straight lines; degrade over distance by a set %; AND are affected by the materials they need to pass through...

Factors affecting range:

- Terrain, obstacles/obstructions – natural and man-made materials
- Interference, eg weather conditions or other radio signals from nearby devices
- The devices themselves:
  - Power output
  - Receive sensitivity
  - Antenna type
  - Component quality
  - Battery charge level and overall health
  - Servicing – power and frequency drift can occur

- A repeater may offer the solution...

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The challenge...

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Radio Licencing

Unlicenced (446) radios:

- No licence required; no restriction on who can use them, or where, in the UK; restricted to 0.5W, so short-range. Limited number of public frequencies, leading to congestion. Popular for consumer applications

Business Radio Simple Site licence:

- 5 year licence; unlimited number of radios; shared frequencies; use only within 1km of the licenced address; permits use of portables & mobile units and repeater. Limitations on antenna height and power output is restricted to 2W for UHF and 0.02w for VHF.

Business Radio Simple UK licence:

- 5 year licence; unlimited number of handportable and vehicle mounted radios (but no repeater), anywhere in the UK. Maximum power output of 5W.

Technically Assigned licence:

- Annual licence; Required when using a repeater. Ofcom allocate frequencies based on algorithms to reduce risk of congestion.

Area Defined licence:

- Annual licence; permits exclusive use of a frequency within an area defined in terms of 50 sq. km map squares. Cost is based on the number of squares required.

Accessories

For operational assistance and protection of equipment:

- Cases and harnesses
- Earpieces
- RSM
- Headsets

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Thank you for listening!

Any Questions?

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