# Types of radio waves

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#### What is radio waves?

electromagnetic waves propagating through space at the speed of light transferred through space energy emitted from an electromagnetic oscillation generator born at the change of the electric field

 characterized by frequency, wavelength and power portable energy

### Radio waves range

• for aeronautical communications for ground connection Radio transmission For space communications For sea communications Transmission data and medicine For radiolocation and radionavigation

| Frequency<br>range | The name of the range       | the<br>wavelength<br>range | Wave<br>length |  |
|--------------------|-----------------------------|----------------------------|----------------|--|
| 3–30 кГц           | Very low frequency          | Myriametre                 | 100–10 км      |  |
| 30–300 кГц         | Low frequency               | Kilometer                  | 10–1 км        |  |
| 300–3000 кГц       | MIDs                        | Hectometre                 | 1–0.1 км       |  |
| 3–30 МГц           | High frequency              | Decameter                  | 100–10 м       |  |
| 30–300 МГц         | Very high frequency         | Meter                      | 10–1 м         |  |
| 300–3000 МГц       | Ultra high frequency        | UHF                        | 1—0.1 м        |  |
| 3–30 ГГц           | Over Ultrahigh<br>frequency | Cm                         | 10–1 см        |  |
| 30—300 ГГц         | Extremely high<br>frequency | Mm                         | 10—1 мм        |  |
| 300—3000 ГГц       | Hyper high frequency        | Decimillimeter             | 1—0.1 мм       |  |

## Range radio waves

| J.  | норская<br>насягация                   | ная игационное<br>оборудование<br>напр. Loran-C | Св/ДВ зещание.<br>морокая са въъ            | КВ сещание,<br>КВ се кањ | МВ ТВ<br>УКВ х ещание,<br>поденахная сказь | ДМВ ТВ,<br>сотовая сеязь,<br>GPS,<br>поденкная сеязь | во опинче оказа и<br>спутниковала селан<br>радиорелейные<br>ликии | радиоастрономия,<br>радарные<br>по садочные<br>системы |
|-----|--|---|---|--------------------------|--|--|---|--|
|     | OH4/(VLF)                              | H4/(LF)   | C4J(MF)                                     | 84/(HF)                  | OB4/(VHF)                                  | YB4/(UHF)  | CB4/(SHF)   | KB4/(EHF)  |
| 100 | Охм 10<br>– узеличение дл. в<br>«Гц 30 | им 1<br>олны<br>кГц 300                         | ห <mark>ท 1</mark> 00<br>ม <sub>ีน 31</sub> | 0 <b>m 1</b><br>MFu, 30  | 0 м 1<br>) МГц 300                         | <mark>и 1</mark> 0<br>МГц 3.1                        | ом 1<br>Уурали<br>ГГЦ 30  | см 1 мм<br>чение частоты — ><br>ГГц 300 ГГц            |

### How apply radio waves

radio waves are emitted via an antenna

 the transmission of long-wave broadcasting stations can be taken at a distance of several thousand kilometers

medium wave stations are audible within a thousand kilometers.

The energy of the short waves dramatically decreases as the distance from the transmitter.

 study of short and ultrashort waves showed that they quickly disappear when you go near the Ground. When the direction radiation upward short wave back with decreasing wavelength increases their damping and absorption in the atmosphere.
on the propagation of waves shorter than 1 cm are affected by fog, rain, clouds, strongly limiting the communication range.

Wave of the radio spectrum have different spreading properties, and every part of this range is used where it can best be used to his advantage.