



# ITU-R M.2164

Summarising the technical conditions recommended as guidance to allow operation of the amateur and amateur satellite services whilst minimising the potential for interference to RNSS in the 23cm band.

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# ITU-R M.2164 – Key elements

**Guidance on technical and operational measures for the use of the frequency band 1 240-1 300 MHz by the amateur and amateur-satellite service in order to protect the radionavigation-satellite service (space-to-Earth).**

- **Scope**

- This Recommendation provides guidance on technical and operational measures for administrations authorizing stations operating in the amateur and amateur-satellite services to protect the radionavigation-satellite service (space-to-Earth) in the frequency band 1 240-1 300 MHz.

- **Recommends**

- that administrations wishing to allow operations or continue the operation of the amateur and amateur-satellite services across their territory in all or part of the frequency band 1 240-1 300 MHz, should use as guidance the technical and operational measures described in the Annex in order to protect RNSS (space to Earth).

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# ITU-R M.2164 – Annex 1

- Identifies power restrictions in specific parts of the band for narrow band (<150kHz) and broadband (>150kHz) amateur and amateur satellite usage.
- In some cases the restrictions closely follow the sharing study results (ITU-R M.2513)
  - i.e. below 1255.76 MHz – driven by the Russian Federation
- In other cases they are also based on negotiation and compromise:
  - i.e. 1255.76 to 1258 MHz – negotiated with China and Russian Federation.
  - And 1260 – 1262 MHz for ASS – negotiated with China.
  - And 1296 – 1300 MHz negotiated with France and European Commission.
- In large parts of the band very low power levels effectively suppress amateur service operation.

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# Power levels for narrow band

- 1296 – 1298 MHz = 50W pep into antenna (IARU proposed 150W).
  - all narrow band modes
- 1298 – 1300 MHz = 150W pep into antenna (IARU proposed 200W).
  - all narrow band modes
- 1298 – 1300 MHz = 500w pep into antenna (IARU proposed 500W).
  - for eme at >15degree elevation + high gain >30dBi ant.
- 1255.76-1256.52 MHz (760 kHz) = 24 dBW eirp / 250W eirp
  - Amounts to 4W into typical beam antenna or 60W into 6dBi mobile ant.
- 1 256.52-1 258 MHz (1.48 MHz) = 21 dBW eirp / 125W eirp
  - Amounts to 2W into typical beam antenna or 30W into 6dBi mobile ant.

Typical beam antenna gain = 18dBi

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# Power levels for broadband

- 1255.76-1256.52 MHz (760 kHz) = 24 dBW eirp / 150 kHz eirp
  - Amounts to 26W into typical beam antenna for 1MHz DATV signal.
- 1 256.52-1 258 MHz (1.48 MHz) = 21 dBW eirp / 150 kHz eirp
  - Amounts to 13W into typical beam antenna for 1MHz DATV signal.
- The IARU had proposed a 4MHz wide block between 1256 and 1260 MHz at 100W.

Typical beam antenna gain = 18dBi

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# Power levels for narrow band satellite

- 1260 – 1262 MHz for all narrow band modes (<150 kHz):
  - Maximum value of e.i.r.p. =
    - -3 dBW for 0° to 15°
    - 17 dBW for 15° to 55°
    - 26.8 dBW for 55° to 90°
- 17 dBW eirp corresponds to 5W to a 10 dBi antenna



# Suppressing power levels

- 1 258-1 296 MHz: Maximum value of e.i.r.p.  $-17$  dBW = 20mW.
  - No viable narrow band or broadband operation.
- 1 240-1 255.76 MHz:  $-39.0$  dBW in (150 kHz) = 1.26mW/150 kHz.
  - 21dB more stringent at high elevation angles.
  - No viable narrow band or broadband operation.
- Other Measures:
- Out-of-band emissions below 1 255.76 MHz, should be as defined above; i.e.  $-39.0$  dBW in (150 kHz).
  - E.g. a 150kHz wide emission would seem to need to be 63dB down.
- Additional aeronautical considerations 1240-1256 MHz.



# ITU-R M.2164 Technical Annex

For Broadband:

1 255.76-1 256.52 MHz: e.i.r.p. = 24 dBW/150kHz\*

1 256.52-1 258 MHz: e.i.r.p. = 21 dBW/150 kHz\*

Low mW level power only.  
In effect Amateur operation  
suppressed

Maximum e.i.r.p = 17 dBW  
at 15 deg elevation up to  
26.8 dBW at 55 deg and  
above for Amateur Satellite.  
1260-1262 MHz

50W Tx power agreed.  
Narrow band.

150W Tx power agreed.  
Plus 500W for EME above 15  
deg elevation and >30dBi  
antenna. Narrow band.

1240 1 255.76 1 258 1296 1298 1300

1258.29 GALILEO 1299.21

GLONASS

1256.52 COMPASS 1280.52

\*24 dBW/150 kHz = 50W/2MHz

\*21 dBW/150 kHz = 25W/2MHz

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