

- Unofficial translation -

Notification of the National Telecommunications Commission

On Technical Standards for Telecommunication Equipment

Re: Radiocommunication Equipment in Amateur Radio Service

Whereas the National Telecommunications Commission has revised the regulations regarding amateur radio equipment to ensure greater benefit to the society and higher efficiency, thereby the radiocommunication equipment and accessories used for amateur radio service shall operate in radio frequency bands and conform with technical standards as prescribed by the National Telecommunications Commission;

Pursuant to Section 29 (4) of the Radiocommunications Act B.E. 2498 (1955) and Section 78 paragraph one of the Act on the Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunication Services B.E. 2543 (2000), the National Telecommunications Commission hereby issues the Notification on Technical Standards for Telecommunication Equipment regarding Radiocommunication Equipment in Amateur Radio Service, as detailed in the Standard No. NTC TS 1018-2550 appended hereto.

This Notification shall come into force as from the day following the date of its publication in the Government Gazette.

Announced on the 5th day of June B.E. 2550 (2007)

General Choochart Promphasid

Chairman of the National Telecommunications Commission

This English version is prepared by International Organizations Bureau with the sole purpose of facilitating the comprehension of foreign participants in the telecommunication rules and regulations and shall not in any event be construed or interpreted as having effect in substitution for or supplementary to the Thai version thereof.

Please note that the translation has not been subjected to an official review by the Office of the National Telecommunications Commission. The Office of NTC, accordingly, cannot undertake any responsibility for its accuracy, nor be held liable for any loss or damages arising out of or in connection with its use.



Technical Standards for Telecommunication Equipment

NTC TS 1018-2550

Radiocommunication Equipment in Amateur Radio Service

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Technical Standards for Telecommunication Equipment
NTC TS 1018-2550
Re: Radiocommunication Equipment in Amateur Radio Service

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1. Scope

This technical standard specifies the minimum technical characteristics for radiocommunication equipment for amateur radio service, which is used as base station (i.e. network control station, repeater, and fixed station), mobile station, and hand portable station, with the main purpose of voice communication.

1.1 Base station is a radiocommunication transmitter, receiver, or transceiver fitted with an antenna socket for use with an external antenna, and intended for use at a certain, fixed location.

1.2 Mobile station is a radiocommunication transmitter, receiver, or transceiver fitted with an antenna socket for use with an external antenna, and normally used in a vehicle or as a transportable station.

1.3 Hand portable station is a radiocommunication transmitter, receiver, or transceiver either fitted with an integral antenna or an antenna socket for use with an external antenna, or both, and intended for use as being carried on a person or held in the hand.

This technical standard shall also apply to radiocommunication equipment for amateur radio via satellite (earth station) only.

This technical standard shall apply to locally produced or imported radiocommunication equipment for the purpose of distribution or use by radio amateurs in general, but shall not be applicable to radiocommunication equipment created by radio amateurs for research and experiment as purposed by the amateur radio, which shall be in line with the good engineering practice.

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2. Requirements for Transmitter

2.1 Rated carrier power

Definition **Rated carrier power** is the carrier power of the equipment delivered to the artificial antenna as declared by the manufacturer in its technical documents. The measured carrier power shall be within ± 1.5 dB of the rated carrier power.

Limit The rated carrier power shall not exceed the values given in the table below:

Radio frequency band (MHz)	Type of station/radiocommunication equipment	Mean power (watt)	Peak envelope power (watt)
< 30	Network control station/ Base station/ Mobile station		200
> 30	Network control station	60	
	Repeater/ Base station/ Mobile station	10	
	Hand portable station	5	

Remarks (1) The National Telecommunications Commission (NTC) may authorize the rated carrier power beyond the limits shown in the table above on a case-by-case basis.

(2) The permissible radio frequency bands shall comply with the NTC regulations on amateur radio service. The Office of NTC may permit only to import the radiocommunication equipment in the operating frequency bands within those given in the Annex for the purpose of conformity assessment.

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2.2 Conducted spurious emissions

Definition **Conducted spurious emissions** are emissions at the antenna connector on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

Limit The power levels of conducted spurious emissions within the frequency range of 9 kHz - 1 GHz shall be as given in the table below:

Radio frequency band (MHz)	Power level of conducted spurious emissions
< 30	Below carrier power at least $43 + 10 \log \text{PEP (dB)}$ or 50 dB whichever is less stringent
> 30	Below carrier power in the absence of modulation at least $43 + 10 \log P \text{ (dB)}$ or 70 dBc whichever is less stringent

Remarks:

PEP is peak envelope power in watt (W)

[The average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle at the crest of the modulation envelope taken under normal operating conditions.]

P is mean power in watt (W).

[The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions.]

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2.3 Frequency tolerance

Definition **Frequency tolerance** is the tolerable deviation of a transmitter's radio frequency, by comparing the median frequency of emissions with the assigned frequency (in case of frequency modulation), or by comparing the easily measurable characteristic frequency, such as the carrier frequency in the absence of modulation, with the reference frequency which is correlated to the assigned frequency (in case of amplitude modulation).

Limit Frequency tolerance shall not exceed the values given in the table below:

Radio frequency band (MHz)	Frequency tolerance
< 30	± 100 Hz within any 15-minute interval (after the equipment has been switched on for 30 minutes)
> 30	± 0.001% (10 ppm)

2.4 Occupied bandwidth

Definition **Occupied bandwidth** is the difference between the highest frequency and the lowest frequency of the signal arising during the modulation, by measuring the frequency bandwidth at the level of 26 dB below the highest amplitude level of the signal.

Limit Occupied bandwidth shall not exceed the values given in the table below:

Radio frequency band (MHz)	Highest permissible bandwidth
< 30	6 kHz (AM DSB) 3 kHz (AM SSB full carrier)
> 30	11 kHz (12.5 kHz channel spacing)

Remark In case of the amplitude modulation, the radiocommunication equipment shall have supporting parts to prevent overmodulation.

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3. Requirements for Receiver

3.1 Sensitivity

Definition **Sensitivity** is the lowest level of a receiver's input signal at the specified frequency, with the specified modulation, that will result in the standard S/N at the output of the receiver.

Limit The maximum input signal level shall not exceed the values given in the table below:

Radio frequency band (MHz)	Value of sensitivity
< 30	0.25 microvolts (\square V) at 10 dB S/N (in case of amplitude modulation)
> 30	0.50 microvolts (\square V) at 12 dB SINAD (in case of frequency modulation)

4. Methods of Measurement

4.1 Transmitter

4.1.1 Rated carrier power

The method of measurement shall follow IEC 60489-2 [1], IEC 60489-4 [2], or any other equivalent method.

4.1.2 Conducted spurious emissions

The method of measurement shall follow IEC 60489-2, IEC 60489-4, ETSI EN 301 783-1 [3], ITU-R Rec. SM. 329-10 [4], or any other equivalent method.

4.1.3 Frequency tolerance

The method of measurement shall follow IEC 60489-2, IEC 60489-4, or any other equivalent method.

4.1.4 Occupied bandwidth

The method of measurement shall follow ITU-R Rec. SM. 328-10 [5], or any other equivalent method.

4.2 Receiver

4.2.1 Sensitivity

The method of measurement shall follow IEC 60489-3 [6], IEC 60489-5 [7], ANSI/TIA/EIA-603-B [8], or any other equivalent method.

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References for Methods of Measurement

- [1] IEC 60489-2: Methods of measurement for radio equipment used in the mobile services - Part 2: Transmitters employing A3E, F3E or G3E emissions
 - [2] IEC 60489-4: Methods of measurement for radio equipment used in the mobile services - Part 4: Transmitters employing single-sideband emissions (R3E, H3E or J3E)
 - [3] ETSI EN 300 783-1 V1.1.1: Electromagnetic compatibility and radio spectrum matters (ERM); Land Mobile Service; Commercially available amateur radio equipment; Part 1: Technical characteristics and methods of measurement
 - [4] ITU-R Recommendation SM. 329-10: Unwanted emissions in the spurious domain
 - [5] ITU-R Recommendation SM. 328-10: Spectra and bandwidth of emissions
 - [6] IEC 60489-3: Methods of measurement for radio equipment used in the mobile services - Part 3: Receivers for A3E or F3E emissions
 - [7] IEC 60489-5: Methods of measurement for radio equipment used in the mobile services - Part 5: Receivers employing single-sideband techniques (R3E, H3E or J3E)
 - [8] ANSI/TIA/EIA-603-B: Land mobile FM or PM communications equipment; Measurement and performance standards
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Annex

Frequency Bands for Radiocommunication Equipment

Transmitter

Frequency band for radiocommunication equipment (MHz)	Permissible operating frequency band (MHz)
1.000 - 3.000	1.800 - 1.825 (160 m)
3.000 - 5.000	3.500 - 3.540 (80 m)
6.000 - 8.000	7.000 - 7.100 (40 m)
9.000 - 11.000	10.100 - 10.150 (30 m)
13.000 - 15.000	14.000 - 14.350 (20 m)
17.000 - 19.000	18.068 - 18.168 (17 m)
20.000 - 22.000	21.000 - 21.450 (15 m)
24.000 - 26.000	24.890 - 24.990 (12 m)
27.000 - 30.000	28.000 - 29.700 (10 m)
144.000 - 146.000	144.000 - 146.000 (2 m)

Receiver

Frequency band for radiocommunication equipment (MHz)	Permissible operating frequency band (MHz)
1.000 - 3.000	1.800 - 1.825 (160 m)
3.000 - 5.000	3.500 - 3.540 (80 m)
6.000 - 8.000	7.000 - 7.100 (40 m)
9.000 - 11.000	10.100 - 10.150 (30 m)
13.000 - 15.000	14.000 - 14.350 (20 m)
17.000 - 19.000	18.068 - 18.168 (17 m)
20.000 - 22.000	21.000 - 21.450 (15 m)
24.000 - 26.000	24.890 - 24.990 (12 m)
27.000 - 30.000	28.000 - 29.700 (10 m)
144.000 - 146.000	144.000 - 146.000 (2 m)
430.000 - 450.000	435.000 - 438.000 (70 m) (For amateur satellite radio business)

Remark Receivers in the MF/HF frequency bands may be the synthesized receivers, which have frequency bands below 30 MHz.
