Unofficial Translation

Notification of the National Telecommunications Commission

On Technical Standards for Telecommunication Equipment

Re: Radiocommunication Equipment Used in Aeronautical Mobile Services in the VHF Frequency Band B.E. 2553 (2010)

Whereas the National Telecommunications Commission has a policy to revise technical standards for the radiocommunication equipment and accessories widely in use to keep pace with the changing technologies and comply with the international requirements without causing undue burden on the operators as well as to eliminate problems of frequency interference and increase efficient use of radio frequencies;

Pursuant to Section 51 (6) and Section 78, paragraph one, of the Act on Organization to Assign Radio Frequency and to Regulate the Broadcasting and Telecommunication Services, B.E. 2543 (2000), which contains certain provisions regarding the restriction of the rights and freedom of an individual as permitted to be done under the law by Article 29, in conjunction with Article 35, Article 36, Article 43, Article 45, Article 46, Article 47, Article 61 and Article 64 of the Constitution of the Kingdom of Thailand; and pursuant to Section 32 of the Telecommunications Business Act, B.E. 2544 (2001), which contains certain provisions regarding the restriction of the rights and freedom of an individual as permitted to be done under the law by Article 29, in conjunction with Article 35, Article 36, Article 41, Article 43 and Article 45 of the Constitution of the Kingdom of Thailand; together with Section 29 (4) of the Radiocommunications Act, B.E. 2498 (1955), which contains certain provisions regarding the restriction of the rights and freedom of an individual as permitted to be done under the law by Article 29, in conjunction with Article 35, Article 36, Article 41, Article 43, Article 45, Article 46, Article 47 and Article 61 of the Constitution of the Kingdom of Thailand; the National Telecommunications Commission hereby repeals the Notification of the National Telecommunications Commission on Technical Standards for Telecommunication Equipment Re: Radiocommunication Equipment Used in Aeronautical Mobile Services in the VHF Frequency Band which was issued on 29 August B.E. 2548 (2005) and prescribes Technical Standards for Telecommunication Equipment Re: Radiocommunication Equipment Used in Aeronautical Mobile Services in the VHF Frequency Band, as detailed in the Technical Standards No. NTC TS 1003 – 2553 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 7th day of May B.E. 2553 (2010)

Professor Prasit Prapinmongkolkarn

Chairman of the National Telecommunications Commission

Technical Standards for Telecommunication Equipment

NTC TS 1003 - 2553

Radiocommunication Equipment Used in Aeronautical Mobile Services in the VHF Frequency Band

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Technical Standards for Telecommunication Equipment
NTC TS 1003 - 2553
Radiocommunication Equipment Used in Aeronautical Mobile Services in the VHF Frequency Band

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Technical Standards for Telecommunication Equipment
NTC TS 1003 - 2553
Radiocommunication Equipment Used in Aeronautical Mobile Services in the VHF Frequency Band

1. Scope

This technical standard specifies the minimum technical characteristics for radiocommunication equipment used in the aeronautical mobile services in the VHF frequency range of 117.975 – 137.000 MHz with channel spacing of 8.33 kHz or 25 kHz. Such equipment is used as fixed, mobile, and hand-held ground-based aeronautical stations, for analogue speech communication by the double sideband amplitude modulation only.

This technical standard does not apply to the VHF Air-Ground Digital Link (VDL) communication and the radiocommunication equipment using frequency-offset system.

2. Requirements for Transmitter

2.1 Rated carrier power

Definition **Rated carrier power** is the carrier power of the equipment as declared by the manufacturer in its technical documents. The carrier power is the average power delivered to the artificial antenna during a radio frequency cycle in the absence of modulation. 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:

Type of transmitter	Carrier power (watt) (mean power)	Carrier power (watt) (peak envelope power)
Fixed	200	800
Mobile	50	200
Hand-held	10	40

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. Conducted 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 - 3 GHz shall be attenuated below the carrier power in the absence of modulation at least 43 + 10 log P (dB) or 70 dBc, whichever is less stringent, where P is mean power in watt (W).

2.3 Frequency error

Definition **Frequency error** is the difference between the measured carrier frequency in the absence of modulation and the nominal frequency of the transmitter.

Limit The frequency error shall not exceed the values given in the table below:

Channel spacing (kHz)	Frequency error (Part per million: ppm)
8.33	± 1
25	± 20

2.4 Modulation depth: speech

Definition **Modulation depth: speech** is the fractional ratio, expressed as a percentage, of the difference and the sum of the numerical values of the largest and smallest amplitudes encountered in one cycle of the modulating waveform.

Limit The amplitude modulation depth shall be at least 85% at the normal 1 kHz test signal.

2.5 AM distortion

Definition **AM distortion** is the ratio, expressed as a percentage, of the total rms voltage of all the harmonics of the modulated waveform to the total rms voltage.

Limit The AM distortion shall not exceed 10%.

2.6 Adjacent channel power

Definition **Adjacent channel power** is that part of the total output power of a transmitter under defined conditions of modulation, which falls within a specified passband centered on the nominal frequency of either of the adjacent channels. This adjacent channel power is the sum of the mean power produced by the modulation, hum and noise of the transmitter.

Limit The adjacent channel power levels shall be at least 50 dB below the carrier power.

3. Requirements for Receiver

3.1 Sensitivity

Definition **Sensitivity** is the lowest level of receiver input signal at a nominal frequency with specified modulation that will result in the standard SINAD at the output signal of the receiver.

Limit The maximum input signal level shall not exceed 1 μV (microvolt) at 12 dB SINAD when measured at the normal 1 kHz test signal with the modulation depth of 30%.

3.2 Adjacent channel rejection

Definition **Adjacent channel rejection** is the capability of a receiver to receive a wanted modulated signal at a nominal frequency without exceeding a given degradation due to the presence of an unwanted modulated signal in the adjacent channel, which differs in frequency from the wanted signal by 8.33 kHz or 25 kHz, as the case may be.

Limit The adjacent channel rejection shall not be less than 60 dB.

4. Safety Requirements

4.1 Electrical safety requirements

The electrical safety requirements for radiocommunication equipment used in aeronautical mobile services in the VHF frequency band shall comply with any of the following standards:

4.1.1 IEC 60950 - 1 : Information Technology Equipment – Safety – Part 1: General Requirements

4.1.2 TIS 1561 - 2548 : Information Technology Equipment - Safety: General Requirements

4.2 Radiation exposure requirements

The installation of radiocommunication station and the use of radiocommunication equipment in aeronautical mobile services in the VHF frequency band shall comply with the safety standard for the use of radiocommunication equipment on human health, as well as safety criteria and measures for the use of radiocommunication equipment on human health prescribed by the National Telecommunications Commission.

5. Methods of Measurement

5.1 Transmitter

5.1.1 Rated carrier power

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

5.1.2 Conducted spurious emissions

The testing method shall follow IEC 60489-2, ITU-R Rec. SM. 329-10 [2], or any other equivalent method.

5.1.3 Frequency error

The testing method shall follow IEC 60489-2, or any other equivalent method.

5.1.4 Modulation depth: speech

The testing method shall follow IEC 60489-2, or any other equivalent method.

5.1.5 AM distortion

The testing method shall follow ETSI EN 300 676 [3], AZ/NZS 4583 [4], or any other equivalent method.

5.1.5 Adjacent channel power

The testing method shall follow IEC 60489-2, or any other equivalent method.

5.2 Receiver

5.2.1 Sensitivity

The testing method shall follow IEC 60489-3 [5], or any other equivalent method.

5.2.2 Adjacent channel rejection

The testing method shall follow IEC 60489-3, or any other equivalent method.

6. Conformity with the Standard

The radiocommunication equipment used in aeronautical mobile services in the VHF frequency band shall present its conformity with this Standard. It shall be regarded as telecommunication equipment Type B prescribed in the Notification of the National Telecommunications Commission Re: Conformity Assessment of Telecommunication Equipment.

Reference

[1] IEC 60489-2: Methods or measurement for radio equipment used in the mobile services - Part 2: Transmitters employing A3E, F3E or G3E emissions

[2] ITU-R Rec. SM. 329-10: Unwanted emissions in the spurious domain

[3] ETSI EN 300 676: Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers for the VHF aeronautical mobile service using amplitude modulation; Technical characteristics and methods of measurement

[4] AS/NZS 4583: Amplitude modulated equipment for use in the aeronautical radio service in the frequency range 118 MHz to 137 MHz

[5] IEC 60489-3: Methods of measurement for radio equipment used in the mobile services. Part 3: Receivers for A3E or F3E emissions