

9`Y_fca U[bYfbUnXfi y`fj cgh]b`nUXYj Yj`nj Yn]`nfUX]`g_`ja `gdY_fca `fØFAŁĚ
A YhYcfc`cý_]df]dca c_]fA Yh5]XgŁĚFUX]cgc bXY`nUi dcfUVc`j`ZY_j Yb bYa
cVa c`f`cX`(\$\$Z) `A<n`Xc`(\$* `A<n`ia c bcglb]a]`b]j c`f`Xc`bU`j Y`&\$`a J`Ě`%
XY.`HM b] bY`UfU`hf]gh`Y]b`dfYg_i gbY`a YfcXY

Electromagnetic compatibility and Radio spectrum Matters (ERM); Meteorological Aids (Met Aids); Radiosondes to be used in the 400,15 MHz to 406 MHz frequency range with power levels ranging up to 200 mW; Part 1: Technical characteristics and test methods

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European Standard (Telecommunications series)

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
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Contents

Intellectual Property Rights	6
Foreword.....	6
1 Scope	7
2 References	7
3 Definitions, symbols and abbreviations	8
3.1 Definitions	8
3.2 Symbols.....	8
3.3 Abbreviations	8
4 Technical requirement specifications	9
4.1 Presentation of equipment for testing purposes.....	9
4.1.1 Choice of model for testing	9
4.1.2 Definitions of Switching Range, Alignment Range and Operational Frequency Range	9
4.1.2.1 Definition of Switching Range (SR)	9
4.1.2.2 Definition of Alignment Range (AR).....	9
4.1.2.3 Definition of Operating Frequency Range (OFR).....	9
4.1.2.4 Alignment Range	10
4.1.2.5 Number of samples for testing	10
4.1.3 Testing of equipment with alternative power levels	10
4.1.4 Testing of equipment that does not have an external 50 Ω RF connector (integral antenna equipment)	10
4.1.4.1 Equipment with an internal permanent or temporary antenna connector.....	10
4.2 Mechanical and electrical design.....	10
4.2.1 General.....	10
4.2.2 Controls	10
4.2.3 Transmitter shut-off facility.....	10
4.2.4 Marking	10
4.2.4.1 Regulatory marking	11
4.2.4.2 Equipment identification, additional marking.....	11
4.3 Declarations by the manufacturer.....	11
4.4 Auxiliary test equipment	11
4.5 Interpretation of the measurement results	11
5 Test conditions, power sources and ambient conditions	11
5.1 Normal and extreme test conditions	11
5.2 Test power source.....	11
5.2.1 External test power source.....	12
5.2.2 Internal test power source	12
5.3 Normal test conditions.....	12
5.3.1 Normal temperature and humidity	12
5.3.2 Normal test power source	12
5.4 Extreme test conditions	12
5.4.1 General.....	12
5.4.2 Procedure for tests at extreme conditions	12
5.4.2.1 Procedure for equipment designed for continuous operation.....	13
5.4.2.2 Procedure for equipment designed for intermittent operation.....	13
5.4.3 High temperature test.....	13
5.4.4 Low temperature tests.....	13
5.4.5 Special Radiosondes	14
5.4.6 Extreme test source voltages.....	14
5.4.6.1 Power sources using batteries	14
5.4.6.2 Other power sources.....	14
6 General conditions.....	14
6.1 Normal test signals and test modulation.....	14
6.2 Artificial antenna.....	15

6.3	Test fixture	15
6.4	Test sites and general arrangements for radiated measurements	15
6.5	Modes of operation of the transmitter	15
6.6	Measuring receiver	16
7	Measurement uncertainty	16
8	Methods of measurement and limits for transmitter parameters	16
8.1	Frequency error	17
8.1.1	Definitions	17
8.1.1.1	Method of measurement	17
8.1.2	Limit	17
8.2	Carrier power (conducted)	17
8.2.1	Definition	17
8.2.2	Method of measurement	17
8.2.3	Limits	17
8.3	Effective radiated power	18
8.3.1	Definition	18
8.3.2	Methods of measurement	18
8.3.3	Limit	19
8.4	Transmission Spectrum	19
8.4.1	Definition	19
8.4.2	Method of measurement	19
8.4.2.1	Method of measurement using a spectrum analyser	19
8.4.3	Limits	19
8.5	Range of modulation bandwidth	20
8.5.1	Definition	20
8.5.2	Method of measurement	20
8.5.3	Limits	20
8.6	Spurious emissions	20
8.6.1	Definition	20
8.6.2	Method of measuring the power level in a specified load, clause 8.6.1 a) i)	21
8.6.3	Method of measuring the effective radiated power, clause 8.6.1 a) ii)	21
8.6.4	Method of measuring the effective radiated power, clause 8.6.1 b)	22
8.6.5	Limits	22
8.7	Frequency stability under low voltage conditions	22
8.7.1	Definition	22
8.7.2	Method of measurement	22
8.7.3	Limits	23
Annex A (normative):	Radiated measurement.....	24
A.1	Test sites and general arrangements for measurements involving the use of radiated fields	24
A.1.1	Anechoic Chamber	24
A.1.2	Anechoic Chamber with a conductive ground plane	25
A.1.3	Open Area Test Site (OATS)	26
A.1.4	Test antenna	27
A.1.5	Substitution antenna	27
A.1.6	Measuring antenna	28
A.1.7	Stripline arrangement	28
A.1.7.1	General	28
A.1.7.2	Description	28
A.1.7.3	Calibration	28
A.1.7.4	Mode of use	28
A.2	Guidance on the use of radiation test sites	28
A.2.1	Verification of the test site	28
A.2.2	Preparation of the EUT	29
A.2.3	Power supplies to the EUT	29
A.2.4	Volume control setting for analogue speech tests	29
A.2.5	Range length	29
A.2.6	Site preparation	30
A.3	Coupling of signals	30

A.3.1	General	30
A.3.2	Signals	30
A.4	Standard test position	31
A.5	Test fixture	31
A.5.1	Description	31
A.5.2	Calibration	32
A.5.3	Mode of use	33
Annex B (normative):	Technical performance of the spectrum analyser	34
Annex C (informative):	Bibliography	35
History		36

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[SIST EN 302 054-1 V1.1.1:2003](https://standards.iteh.ai/catalog/standards/sist/dcc704c8-1c1c-48ba-b62e-9930ab90348b/sist-en-302-054-1-v1-1-1-2003)

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

For non EU countries the present document may be used for regulatory (Type Approval) purposes.

The present document is part 1 of a multi part deliverable, covering digitally modulated Radiosonde transmitters in the Meteorological Aids frequency band from 400,15 MHz to 406 MHz, as identified below:

Part 1: "Technical characteristics and test methods";

Part 2: "Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive".

Clauses 1 and 3 provide a general description on the types of equipment covered by the present document and the definitions and abbreviations used.

Clause 4 provides a guide as to the number of samples required in order that type tests may be carried out, and any markings on the equipment which the manufacturer should provide.

Clauses 5 and 6 give guidance on the test and general conditions for testing of the device. Clause 7 gives the maximum measurement uncertainty values.

Clause 8 specifies the spectrum utilization parameters which are required to be measured. These are the maximum limits which have been chosen to minimize harmful interference to other equipment and services. The clause provides details on how the equipment should be tested and the conditions which should be applied.

Annex A provides specifications concerning radiated measurements.

Annex B provides information on the spectrum analyser specification.

Annex C provides related bibliography information.

National transposition dates

Date of adoption of this EN:	14 March 2003
Date of latest announcement of this EN (doa):	30 June 2003
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 December 2003
Date of withdrawal of any conflicting National Standard (dow):	31 December 2003

1 Scope

The present document applies to digitally modulated Radiosonde transmitters and whole units in the range from 400,15 MHz to 406 MHz and with power levels ranging up to 200 mW. The present document shall not be applied to the presently widely used analogue FM Radiosonde transmitter.

The present document contains the technical characteristics for radio equipment referencing CEPT/ERC/REC 70-03 [2].

The present document does not necessarily include all the characteristics which may be required by a user, nor does it necessarily represent the optimum performance achievable. It is a product family standard which may be completely or partially superseded by specific standards covering specific applications.

For non-harmonized parameters, national regulatory conditions can apply regarding the type of modulation, channel/frequency separations, maximum transmitter output power/effective radiated power, equipment marking and the inclusion of an automatic transmitter shut-off facility as a condition of the issue of an individual or general licence, or, as a condition of use under licence exemption.

The extreme atmospheric conditions are given in clause 5.4.4

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

- [1] Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).
- [2] CEPT/ERC/REC 70-03: "Relating to the use of Short Range Devices (SRD)".
- [3] ETSI ETR 028: "Radio Equipment and Systems (RES); Uncertainties in the measurement of mobile radio equipment characteristics".
- [4] CISPR 16-1: "Specification for radio disturbance and immunity measuring apparatus and methods; Part 1: Radio disturbance and immunity measuring apparatus".
- [5] ETSI ETR 273 (all parts): "ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties".
- [6] ANSI C63.5 (1988): "American National Standard for Calibration of Antennas Used for Radiated Emission Measurements in Electromagnetic Interference (EMI) Control".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

assigned frequency band: frequency band within which the device is authorized to operate

conducted measurements: measurements which are made using a direct 50 Ω connection to the equipment under test

dedicated antenna: removable antenna supplied and type tested with the radio equipment, designed as an indispensable part of the equipment

full tests: all tests specified in EN 302 054-1

integral antenna: permanent fixed antenna, which may be built-in, designed as an indispensable part of the equipment

manufacturer: means the manufacturer, or his authorized representative or the person responsible for placing on the market

radiated measurements: measurements which involve the absolute measurement of a radiated field

telemetry: use of radio communication for indicating or recording data at a distance

wideband: equipment to be used in a non-channelled continuous frequency band covering more than 25 kHz, or to be used in a channelled frequency band with a channel spacing greater than 25 kHz

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3.2 Symbols

For the purposes of the present document, the following symbols apply:

dB	decibels	https://standards.iteh.ai/catalog/standards/sist/dcc704c8-1c1c-48ba-b62e-9930ab90348b/sist-en-302-054-1-v1-1-1-2003
E	Field strength	
FR _L	Lower end of Frequency Range	
FR _C	Centre of Frequency Range	
FR _H	Higher end of Frequency Range	
SND/ND	Signal + Noise + Distortion / Noise + Distortion	
°C	Temperature in degrees Celsius	
hPa	Atmospheric pressure in hecto Pascal	
%RH	Air relative humidity in percentage	
λ	Wavelength	

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AR	Alignment Range
EUT	Equipment Under Test
ICAO	International Civil Aviation Organization
OATS	Open Area Test Site
OFR	Operating Frequency Range
R&TTE	Radio and Telecommunications Terminal Equipment
RF	Radio Frequency
SR	Switching Range
SRD	Short Range Device
VSWR	Voltage Standing Wave Ratio

4 Technical requirement specifications

4.1 Presentation of equipment for testing purposes

Each equipment submitted for testing shall fulfil the requirements of the present document on all frequencies over which it is intended to operate.

Where appropriate the nominal frequency 403 MHz should be used for testing.

If an equipment is designed to operate with different carrier powers, measurement of each transmitter parameter shall be performed at the highest power level at which the transmitter is intended to operate.

To simplify and harmonize the testing procedures between the different testing laboratories, measurements shall be performed, according to the present document, on samples of equipment defined in clauses 4.1.1 to 4.1.4.

These clauses are intended to give confidence that the requirements set out in the present document have been met without the necessity of performing measurements on all frequencies.

4.1.1 Choice of model for testing

The manufacturer shall provide one or more samples of the equipment, as appropriate, for testing.

If an equipment has several optional features, considered not to affect the RF parameters then tests need only be performed on the equipment configured with that combination of features considered to be the most complex, as proposed by the manufacturer and agreed by the test laboratory.

STANDARD PREVIEW

4.1.2 Definitions of Switching Range, Alignment Range and Operational Frequency Range

4.1.2.1 Definition of Switching Range (SR)

The manufacturer shall state the switching range of the transmitter.

The SR is the maximum frequency range, as specified by the manufacturer, over which the transmitter can be operated within the alignment range without reprogramming or realignment.

4.1.2.2 Definition of Alignment Range (AR)

The manufacturer shall also, when submitting equipment for testing, state the alignment ranges for the transmitter.

The alignment range is defined as the frequency range over which the transmitter can be programmed and/or aligned to operate, without any change to the circuit other than the substitution of programmable read only memories or crystals (for transmitter) and the trimming of discrete components.

Trimming is an act by which the value (in this case relating to frequency) of a component is changed within the circuit. This act may include the physical alteration, substitution (by components of similar size and type) or activation/de-activation (via the setting of soldered bridges) of components.

For the purpose of all measurements, the transmitter shall be considered separately.

4.1.2.3 Definition of Operating Frequency Range (OFR)

The Operating Frequency Range is the total range of frequencies covered either by one type, or by a family of equipment.

It is noted that a family of equipment may be capable of covering a wider frequency range than the alignment frequency range of one type of equipment.

4.1.2.4 Alignment Range

The allowed frequency range for Meteorological Aids is 5,85 MHz. Full tests (see clause 3.1) shall be carried out on 403 MHz, or on a frequency within 50 kHz of the centre frequency of the true alignment range of the equipment, if less than the full OFR of 5,85 MHz.

4.1.2.5 Number of samples for testing

The SR, 5,85 MHz, of the Meteorological Aids transmitter is close to SRD equipment category AR0, 5 MHz, consequently only one sample shall be tested.

4.1.3 Testing of equipment with alternative power levels

If a family of equipment has alternative output power levels provided by the use of separate power modules or add on stages, then each module or add on stage shall be tested in combination with the equipment. The necessary samples and tests can be proposed by the manufacturer and/or test laboratory and shall be agreed with the Administration(s), based on the requirements of clause 4.1.

4.1.4 Testing of equipment that does not have an external 50 Ω RF connector (integral antenna equipment)

4.1.4.1 Equipment with an internal permanent or temporary antenna connector

The means to access and/or implement the internal permanent or temporary antenna connector shall be stated by the manufacturer with the aid of a diagram. The fact that use has been made of the internal antenna connection, or of a temporary connection, to facilitate measurements shall be recorded in the test report.

No connection shall be made to any internal permanent or temporary antenna connector during the performance of radiated emissions measurements, unless such action forms an essential part of the normal intended operation of the equipment, as declared by the manufacturer.

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4.2 Mechanical and electrical design

4.2.1 General

The equipment submitted by the manufacturer, or his representative, shall be designed, constructed and manufactured in accordance with good engineering practice, and with the aim of minimizing harmful interference to other equipment and services.

Transmitters and receivers may be individual or combination units, but shall operate with the correct power source.

4.2.2 Controls

Those controls which, if maladjusted, may increase the interfering potential of the equipment, shall not be easily accessible to the user.

4.2.3 Transmitter shut-off facility

If the transmitter is equipped with an automatic transmitter shut-off facility, it should be made inoperative for the duration of the test.

4.2.4 Marking

The equipment shall be marked in a visible place. This marking shall be legible and durable.