

FUX]’g\_UcdfYa U]b’g]ghYa ]’f9GLÈFUX]’g\_]’cXXU’b\_]’]b’gdfY’Ya b\_]’j  
 UYfcbUj h] b]’dcgHUU’UYfcbUj h] bY’a cV]’bY’ghcf]h] Yž\_]’XYi ^Y’c’j’dUgi ’J<: ’f!%  
 A<nÈ% +’A<nÈni dcfUVc’Ua d’]i XbY’a cXi`UM]’Y]b’g’\_UbUg\_]a ’fUna\_]ca’, ž’  
 A<nÈ’HM b] bY’\_UfU\_Hf]gh\_]Y]b’a Yf]’bY’a YrcXY

Radio Equipment and Systems (RES); Radio transmitters and receivers at aeronautical stations of the aeronautical mobile service operating in the VHF band (118 MHz -137 MHz) using amplitude modulation and 8,33 kHz channel spacing; Technical characteristics and methods of measurement

**Ta slovenski standard je istoveten z: ETS 300 676 E1.% - +!\$’**

**ICS:**

33.060.20	Sprejemna in oddajna oprema	Receiving and transmitting equipment
33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general
49.090	U]  ^{ aš /š • d~ { ^ } cāç :  æ } āōš /š • [  b\ āōš    çāā@	On-board equipment and instruments

**DSIST ETS 300 676.% - - en**





**E**UROPEAN  
**T**ELECOMMUNICATION  
**S**TANDARD

**ETS 300 676**

March 1997

---

Source: ETSI TC-RES

Reference: DE/RES-00007

ICS: 33.020

**Key words:** Aeronautical, AM, DSB, radio, testing

**Radio Equipment and Systems (RES);  
Radio transmitters and receivers at aeronautical stations  
of the aeronautical mobile service  
operating in the VHF band (118 MHz - 137 MHz)  
using amplitude modulation and 8,33 kHz channel spacing;  
Technical characteristics and methods of measurement**

**ETSI**

European Telecommunications Standards Institute

**ETSI Secretariat**

**Postal address:** F-06921 Sophia Antipolis CEDEX - FRANCE

**Office address:** 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

**X.400:** c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

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

---

**Copyright Notification:** No part may be reproduced except as authorized by written permission. The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 1997. All rights reserved.



## Contents

Foreword .....	7
Introduction .....	7
1 Scope .....	9
2 Normative references .....	9
3 Definitions, abbreviations and symbols .....	9
3.1 Definitions .....	9
3.2 Abbreviations .....	10
4 General requirements .....	10
4.1 Construction .....	10
4.2 Controls and indicators .....	10
4.3 Safety precautions .....	11
4.4 Class of emission and modulation characteristics .....	11
4.5 Warm up .....	11
5 Test conditions, power sources and ambient temperatures .....	11
5.1 Normal and extreme test conditions .....	11
5.2 Test power source .....	11
5.3 Normal test conditions .....	11
5.3.1 Normal temperature and humidity .....	11
5.3.2 Normal power sources .....	12
5.3.2.1 Mains voltage and frequency .....	12
5.3.2.2 Battery power sources .....	12
5.3.2.3 Other power sources .....	12
5.4 Extreme test conditions .....	12
5.4.1 Extreme temperatures .....	12
5.4.2 Extreme values of test power sources .....	12
5.4.2.1 Mains voltage .....	12
5.4.2.2 Battery power sources .....	12
5.4.2.3 Other power sources .....	12
5.5 Procedure for tests at extreme temperatures .....	12
5.6 Environmental tests .....	12
5.6.1 General .....	12
5.6.2 Performance check .....	13
5.6.3 Temperature tests .....	13
5.6.3.1 Dry heat .....	13
5.6.3.2 Damp heat .....	13
5.6.3.3 Low temperature .....	14
6 General conditions of measurement .....	14
6.1 Receiver test signal arrangement .....	14
6.1.1 Test signal sources .....	14
6.1.2 Level .....	14
6.1.3 Nominal frequency .....	14
6.1.4 Normal test signal .....	14
6.1.5 Squelch .....	14
6.1.6 Normal audio output power .....	14
6.2 Transmitter test signal arrangement .....	14
6.2.1 Artificial antenna .....	14
6.2.2 Signal sources .....	15
6.2.3 Normal test signal .....	15
6.3 Test channels .....	15

7	Transmitter .....	15
7.1	Frequency error.....	15
7.1.1	Definition.....	15
7.1.2	Method of measurement.....	15
7.1.3	Limits .....	15
7.2	Carrier power.....	15
7.2.1	Definitions.....	15
7.2.2	Method of measurement.....	16
7.2.3	Limits .....	16
	7.2.3.1 Normal test conditions .....	16
	7.2.3.2 Extreme test conditions.....	16
7.3	Amplitude modulation characteristic .....	16
7.3.1	Modulation depth .....	16
	7.3.1.1 Definitions .....	16
	7.3.1.2 Method of measurement.....	17
	7.3.1.3 Limits.....	17
7.3.2	Modulation compression.....	17
	7.3.2.1 Definition .....	17
	7.3.2.2 Method of measurement.....	17
	7.3.2.3 Limits.....	17
7.3.3	Amplitude modulation distortion.....	18
	7.3.3.1 Definition .....	18
	7.3.3.2 Method of measurement.....	18
	7.3.3.3 Limits.....	18
7.3.4	Audio frequency response .....	18
	7.3.4.1 Definition .....	18
	7.3.4.2 Method of measurement.....	18
	7.3.4.3 Limits.....	18
7.3.5	Unwanted frequency modulation .....	18
	7.3.5.1 Definition .....	18
	7.3.5.2 Method of measurement.....	18
	7.3.5.3 Limits.....	18
7.4	Adjacent channel power .....	19
7.4.1	Definition.....	19
7.4.2	Measurement.....	19
7.4.3	Limits .....	19
7.5	Conducted spurious emissions .....	19
7.5.1	Definition.....	19
7.5.2	Method of measurement.....	20
7.5.3	Limits .....	20
7.6	Cabinet radiation .....	20
7.6.1	Definition.....	20
7.6.2	Method of measurement.....	20
7.6.3	Limits .....	21
7.7	Intermodulation attenuation.....	21
7.7.1	Definition.....	21
7.7.2	Method of measurement.....	22
7.7.3	Limits .....	22
7.8	RF power attack time and release time.....	23
7.8.1	Definitions.....	23
7.8.2	Method of measurement.....	23
	7.8.2.1 Attack time .....	23
	7.8.2.2 Release time .....	23
7.8.3	Limits .....	24
7.9	Transient frequency behaviour of the transmitter.....	24
7.9.1	Definitions .....	24
7.9.2	Method of measurement.....	24
7.9.3	Limits .....	28
7.10	Protection of the transmitter .....	28
7.10.1	Definition.....	28
7.10.2	Method of measurement.....	28
7.10.3	Requirement .....	28

8	Receiver .....	28
8.1	Maximum usable sensitivity .....	28
	8.1.1 Definition .....	28
	8.1.2 Method of measurement .....	28
	8.1.3 Limits .....	29
8.2	Harmonic distortion .....	29
	8.2.1 Definition .....	29
	8.2.2 Method of measurement .....	29
	8.2.3 Limits .....	29
8.3	Audio frequency response .....	29
	8.3.1 Definition .....	29
	8.3.2 Method of measurement .....	29
	8.3.3 Limits .....	29
8.4	Audio noise .....	30
	8.4.1 Definition .....	30
	8.4.2 Method of measurement .....	30
	8.4.3 Limits .....	30
8.5	Adjacent channel selectivity .....	30
	8.5.1 Definition .....	30
	8.5.2 Method of measurement .....	30
	8.5.3 Limits .....	31
8.6	Spurious response rejection .....	31
	8.6.1 Definition .....	31
	8.6.2 Introduction to the method of measurement .....	31
	8.6.3 Method of search of the limited frequency range .....	32
	8.6.4 Method of measurement .....	32
	8.6.5 Limit .....	32
8.7	Intermodulation response rejection .....	32
	8.7.1 Definition .....	32
	8.7.2 Method of measurement .....	32
	8.7.3 Limit .....	33
8.8	Blocking or desensitisation .....	33
	8.8.1 Definition .....	33
	8.8.2 Method of measurement .....	33
	8.8.3 Limit .....	33
8.9	Conducted spurious emissions .....	34
	8.9.1 Definition .....	34
	8.9.2 Method of measuring the power level .....	34
	8.9.3 Limits .....	34
8.10	Radiated spurious emissions .....	34
	8.10.1 Definition .....	34
	8.10.2 Method of measuring the effective radiated power .....	34
	8.10.3 Limits .....	35
8.11	Squelch operation .....	35
	8.11.1 Definition .....	35
	8.11.2 Method of measurement .....	35
	8.11.3 Limits .....	36
8.12	Cross modulation rejection .....	36
	8.12.1 Definition .....	36
	8.12.2 Method of measurement .....	36
	8.12.3 Limits .....	36
8.13	RF automatic gain control .....	36
	8.13.1 Definition .....	36
	8.13.2 Method of measurement .....	37
	8.13.3 Limit .....	37
9	Measurement uncertainty and interpretation of the measured results .....	37
	9.1 Maximum measurement uncertainties .....	37
	9.2 Interpretation of the measurement results .....	38
	Annex A (normative): Radiated measurements .....	39
	A.1 Test sites and general arrangements for measurements involving the use of radiated fields .....	39

A.1.1	Outdoor test site .....	39
A.1.2	Test antenna .....	39
A.1.3	Substitution antenna.....	40
A.1.4	Optional additional indoor site .....	40
A.2	Guidance on the use of radiation test sites .....	41
A.2.1	Measuring distance .....	41
A.2.2	Test antenna .....	41
A.2.3	Substitution antenna.....	41
A.2.4	Artificial antenna.....	41
A.2.5	Auxiliary cables .....	42
A.2.6	Acoustic measuring arrangement .....	42
A.3	Further optional alternative indoor test site using an anechoic chamber .....	42
A.3.1	Example of the construction of a shielded anechoic chamber .....	42
A.3.2	Influence of parasitic reflections in anechoic chambers.....	43
A.3.3	Calibration of the shielded anechoic chamber .....	44
Annex B (normative):	Specification for adjacent channel power measurement arrangements.....	46
B.1	Power measuring receiver specification .....	46
B.1.1	IF filter .....	46
B.1.2	Attenuation indicator.....	47
B.1.3	RMS value indicator .....	47
B.1.4	Oscillator and amplifier.....	47
History	.....	48