



Test report No.:  
**2-2603-B/01**  
**FSG 2T**

## **Table of contents**

### **1. General information**

- 1.1 Notes
- 1.2 Testing laboratory
- 1.3 Details of applicant
- 1.4 Application details
- 1.5 Equipment under test (EUT)
  - 1.5.1 Operation conditions
  - 1.5.2 Test items
- 1.6 Test standards

### **2. Technical test**

- 2.1 Summary of test results
- 2.2 Test conditions
- 2.3 Measurements and test set-up
- 2.4 Test equipment
- 2.5 Test results
  - 2.5.1 Test results overview
  - 2.5.2 Test equipment and test set-up
  - 2.5.3 Test performance and test results with reference to each clause of the specification

<input checked="" type="checkbox"/>	Appendix 1	Photographs	9 pages
<input checked="" type="checkbox"/>	Appendix 2	Plots, graphs, data sheets	44 pages


## 1. General information

### 1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item .

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

#### ***Tester :***

Date	Name	Signature
30.09.01	Detlev Gillmann	

#### ***Technical responsibility for area of testing:***

Date	Name	Signature
30.09.01	Klaus Kammerinke	

**1.2 Testing laboratory**

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10,

D-66117 Saarbrücken

Deutschland

Telephone : + 49 681 5 98 - 84 34

Fax : + 49 681 5 98 - 90 75

Accredited testing laboratory

Accredited by : Regulierungsbehörde für Telekommunikation und Post (RegTP)

Listed by : Federal Communications Commission (FCC)

Authority	Identification/Registration No.
RegTP	TTI-P-G 166/98-30
FCC	90462

Testing location if different from CETECOM ICT Services GmbH:

Name :  
Street :  
Town :  
Country :  
Telephone :  
Fax :

**1.3 Details of applicant**

Name : Walter Dittel GmbH, Luftfahrt-Gerätebau  
Street : Erpfinger Strasse 36  
Town : D-86899 Landsberg / Lech  
Country : Germany  
Telephone : +49 (0) 8191 3351 - 0  
Fax : +49 (0) 8191 3351 - 49

Contact person : Mr. F Mössinger  
Telephone : +49 (0) 8191 3351 - 57  
Fax : +49 (0) 8191 3351 - 49

**1.4 Application details**

Date of receipt of application : 17.07.2001  
Date of receipt of EUT : 14.08.2001  
Date of tests : 22.08 – 03.09.2001  
File No. : 32 / 2001

## 1.5 Equipment under test (EUT)

Description of EUT : Mobile, portable or fixed VHF / AM-transceiver  
for voice communication  
Type designation : **FSG 2T**  
Manufacturer : Walter Dittel GmbH Luftfahrt-Gerätebau  
D 86899 Landsberg / Lech

### Technical data

Frequency range TX : 118.000 MHz - 136.975 MHz  
Frequency range RX : 118.000 MHz - 136.975 MHz  
Channel spacing : 25.000 kHz  
Number of channels : 760  
Type of modulation : 7K00A3EJN  
Modulation depth : 85.0 %  
RF – power (guaranteed) : 37.0 dBm (5.0 W)  
RF – power (measured) : 37.7 dBm (5.9 W)  
Power supply (DC) : 13.8 V (nominal)  
Power supply (extreme) : 10.8 V – 16.1 V

**Additional information** :

### 1.5.1 Operational conditions:

TX-/RX - operation for voice communication (double-sideband amplitude modulation) on 760 channels with 25 kHz spacing

Simplex TX-/RX – operation on 1 channel

## 1.5.2 Test items

Type designation : FSG 2T

P/N : F 10350 Prototype  
S/N : 351-05003  
S/N : 351-05004  
S/N : 351-05006

External test box (no part number) with two 6-pole DIN Sockets for the following functions/assessments:

Audio frequency (MOD) in  
Audio frequency (MOD) out  
PTT switch  
Microphone level isolator/transformer

## 1.6 Test standards

- ETSI / EN 300 676 (issue 05/2000)

**Electromagnetic compatibility and Radio spectrum matters (ERM);  
Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers  
of the VHF aeronautical mobile service using amplitude modulation;  
Technical characteristics and methods of measurement.**

- FCC Part 87 Aviation Services (issue 10/2000)
- FCC Part 15 Radio Frequency Devices (issue 10/2000)

## 2 Technical tests

### 2.1 Summary of test results

- ☒ **No deviations from the technical specifications were ascertained in course of the performed tests**  
☐  
☐ The deviations as specified in 2.5 were ascertained in course of the performed tests.

This test report:

- ☒ **describes the first test**  
☒ **describes an additional test according to FCC Part 87**  
☐ is a verification of documents  
☐ only is valid with test report No.:

Individual test results documented in section 2.5.

The equipment under test (EUT) is described in the following documents / manuals

1.		FSG 2T
----	--	--------

### 2.2 Test conditions

The environmental test conditions are declared especially in each test.

### 2.3 Measurements and test set-up

The measurement and test set-up is in accordance with the specification.

### 2.4 Test equipment

For details see pages 10 to 14

## 2.5 Test results

### 2.5.1 Test results overview

FCC Part 87 Subpart D		ETS 300 676	
Section		Clause	
87.131	Power and emissions	7.3	Carrier power
87.133	Frequency stability	7.2	Frequency error
87.135	Bandwidth of emission	7.4	Amplitude modulation characteristic
87.137	Types of emission	7.5	Adjacent channel power
87.139	Emission limitations	7.7	Conducted spurious emissions
87.141	Modulation requirements	7.5	Adjacent channel power
87.147	Authorisation of equipment		

FCC Part 15 Subparts B & C		ETS 300 676	
Section		Clause	
15.107	Conducted limits	8.10	Conducted spurious emissions (RX active)
15.109	Radiated emission limits		
15.207	Conducted limits	7.7	Conducted spurious emissions (TX active)
15.209	Radiated emission limits		

### Test results in details:

87.131	Power and emissions Test standards passed:
X	Yes, under normal and extreme test conditions
	No
	No measurement

87.133	Frequency stability Test standards passed:
X	Yes, under normal and extreme test conditions
	No
	No measurement

87.135	Bandwidth of emission Test standards passed:
X	Yes, under normal and extreme test conditions
	No
	No measurement

87.137	Types of emission Test standards passed:
X	Yes, under normal test conditions
	No
	Not applicable



87.139	Emission limitations Test standards passed:
X	Yes, under normal test conditions
	No
	No measurement

87.141	Modulation requirements Test standards passed:
X	Yes, under normal test conditions
	No
	No measurement

15.107	General requirements for unintentional radiators (Conducted limits) Test standards passed:
X	Yes, under normal test conditions
	No
	No measurement

15.109	General requirements for unintentional radiators (Radiated limits) Test standards passed:
X	Yes, under normal test conditions
	No
	No measurement

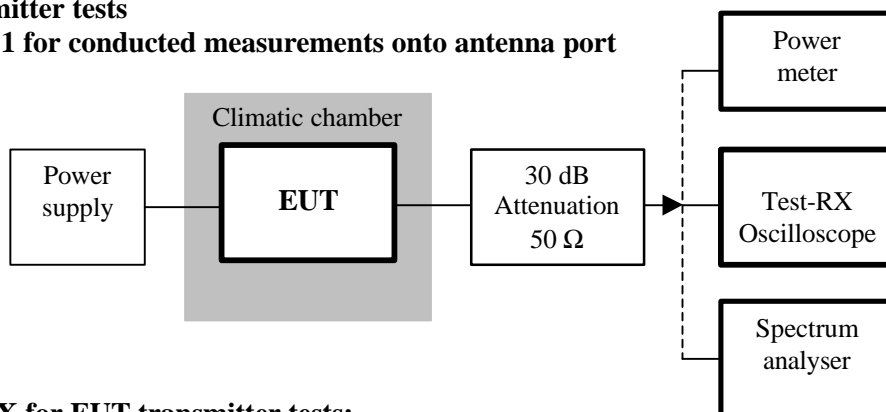
15.207	General requirements for intentional radiators (Conducted limits) Test standards passed:
X	Yes, under normal test conditions
	No
	No measurement

15.209	General requirements for intentional radiators (Radiated limits) Test standards passed:
X	Yes, under normal test conditions
	No
	No measurement

## 2.5.2 Test equipment and test set-up

### Transmitter tests

#### Set-up 1 for conducted measurements onto antenna port



#### Test-RX for EUT transmitter tests:

Test equipment	Manufacturer	Type	Serial No.
Spectrum analyser	HP	HP 8565E	3738A00773
Power meter	HP	HP E4419B	G839510924
Power sensor	HP	HP 8481A	2702A15657
Test-TX/RX	R&S	CMTA 84	158391007
Oscilloscope	Tektronix	TEK 2432	110270
30 dB attenuation	HP	HP 8498A	1801A02445
Power supply	HP	HP 6032A	2848A07227
Climatic chamber	Vötsch	VUK 04/500	522/32678
RF-cable	HP	5061-5359	P36303

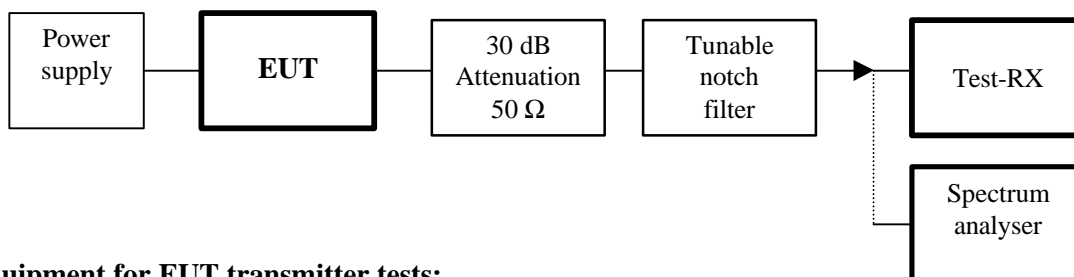
#### Measurement uncertainties

Performance	Uncertainty
Input power (DC)	$\pm 0.1$ V
Temperature	$\pm 0.2$ °C
Frequency	$\pm 0.01$ ppm
RF-power	$\pm 0.4$ dB

## 2.5.2 Test equipment and test set-up

### Transmitter tests

#### Set-up 2 for conducted spurious measurements onto antenna port



#### Test equipment for EUT transmitter tests:

Test equipment	Manufacturer	Type	Serial No.
Spectrum analyser	HP	HP 8565E	3738A00773
30 dB attenuation	HP	HP 8498A	1801A02445
Test-TX/RX	R&S	CMTA 84	158391007
Power supply	HP	HP 6032A	2848A07227
Notch filter	Telonic	TTR 95	20372-4
Notch filter	Telonic	TTR 190	30036-4
RF-cable	HP	5061-5359	P36303

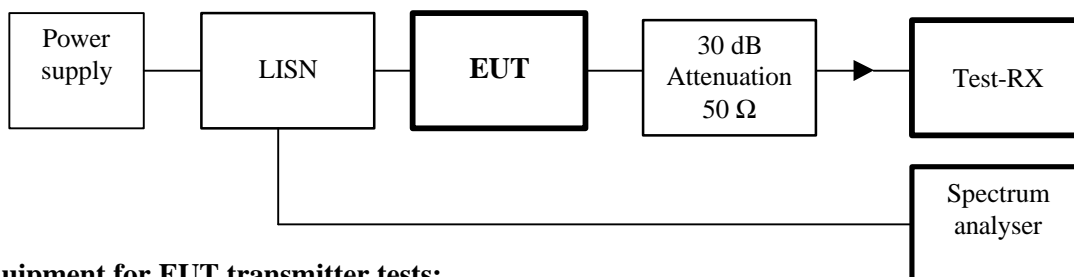
#### Measurement uncertainties

Performance	Uncertainty
Input power (DC)	$\pm 0.1$ V
Temperature	$\pm 0.2$ °C
Frequency	$\pm 0.01$ ppm
RF-power	$\pm 0.4$ dB

## 2.5.2 Test equipment and test set-up

### Transmitter tests and receiver tests

#### Set-up 3 for conducted spurious measurements at the antenna port and onto power line



#### Test equipment for EUT transmitter tests:

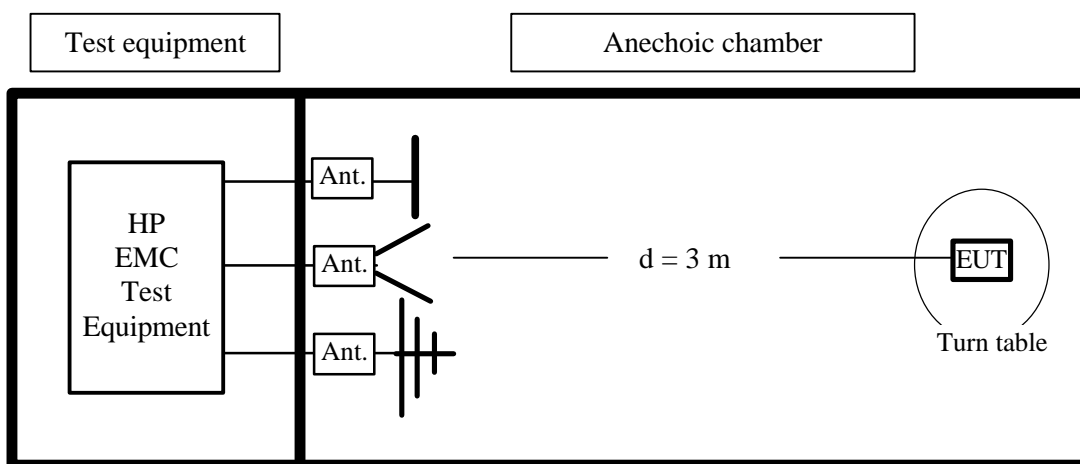
Test equipment	Manufacturer	Type	Serial No.
Spectrum analyser	HP	HP 8565E	3738A00773
30 dB attenuation	HP	HP 8498A	1801A02445
Test-TX/RX	R&S	CMTA 84	158391007
Power supply	HP	HP 6032A	2848A07227
LISN	R&S	ESH 3 Z 5	300001210
RF-cable	HP	5061-5359	P36303

#### Measurement uncertainties

Performance	Uncertainty
Input power (DC)	$\pm 0.1$ V
Temperature	$\pm 0.2$ °C
Frequency	$\pm 0.01$ ppm
RF-power	$\pm 0.4$ dB

## 2.5.2 Test equipment and test set-up

### Transmitter tests and receiver tests Set-up 4 for radiated measurements



#### Test equipment for EUT transmitter tests:

Test equipment	Manufacturer	Type	Serial No.
Spectrum analyser	HP	HP 85660B	2478A05306
Analyser display	HP	HP 85662A	2816A16541
Quasi peak adapter	HP	HP 85650A	2811A01131
RF-preselector	HP	HP 85685A	2833A00768
Biconical antenna	Emco	3104	3758
Log.-per.-antenna	Emco	3146	2304
Double ridge horn	Emco	3115	3007
Relay switch	R&S	RSU	375 339/002
High pass filter	FSY Microwave	HM 985955	001
Amplifier	Tron-Tech	P42-GA29	B2302
Power supply	HP	HP 6038A	2848A07027
RF-cable	HP	5061-5359	P36303

#### Measurement uncertainties

Performance	Uncertainty
Input power (DC)	$\pm 0.1$ V
Temperature	$\pm 0.2$ °C
Frequency	$\pm 0.01$ ppm
RF-power	$\pm 1.5$ dB