

CETECOM ICT Services GmbH

Radio Satellite Communication

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RSC14

issue test report consist of

31 Pages

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Akkreditiertes Prüflaboratorium

**DAR-Registriernummer:
TTI-P-G 166/98-00 vom 18.09.98**

**Test report no.: 2_2035-A/00
FCC Part 15.231
TC 100-200**

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1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations 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.

CETECOM ICT Services GmbH

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1.2 Testing laboratory

CETECOM ICT Services GmbH

66117 Saarbrücken

Untertürkheimer Straße 6 - 10

Deutschland

Telefone: + 49 681 598 - 9000

Telefax : + 49 681 598 - 9075

E-mail : Harro.Ames@ict.cetecom.de

Internet : www.cetecom.de

Accredited testing laboratory

DAR-registration number : TTI-P-G-166/98-00 vom 18.09.98

1.3 Details of applicant

Name : Theimeg Elektrogeräte GmbH

Street : Krefelder Str. 423 - 425

City : D-41066 Mönchengladbach

Country : Germany

Telephone : +49 2161 6363-0

Telefax : +49 2161 6363-100

Contact : Mr. Kraus

Telephone : +49 2161 6363-0

1.4 Application details

Date of receipt of application : 15.02.00

Date of receipt of test item : 03.03.00

Date of test : 03.03.00

1.5 Test item

Type of equipment : remote control transmitter

Type designation : **TC 100-200**

Manufacturer : applicant

Street :

City :

Country :

Additional informations: :

Frequency : 412 – 469 MHz
during test 445.0 MHz

Channel separation: 25 kHz
opt. 12.5 kHz

Number of channels : max 64

Antenna : build –in print antenna

Power supply : Tx: 12DC NiCd -Accu

Type of equipment : . - .

Unmodulated carrier : not possible

1.6 Test standards

FCC Part 15.231 and 15.209

The following tests were made to test that the reglementations of the FCC Part15.231 and FCC Part 15.209 are fulfilled .

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.

Technical responsibility for area of testing :

17.08.2000 RSC8414 Ames H.

Date

Section

Name

Signature

17.08.2000 RSC8411 Berg M.

Date

Section

Name

Signature

2.2 Testreport

TEST REPORT

FCC Part 15.231

FCC Part 15.209

Testreport no.: 2_2035-A/00

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TEST REPORT REFERENCE

LIST OF MEASUREMENTS

The list of measured parameters called for in FCC Part 15.231 and FCC Part15.209 is given below.

Paragraph	PARAMETER TO BE MEASURED	Page
	Transmitter parameters	
§15.231 (b)	Maximum field strenght of emission	7
§15.231 (a)	Automatic deactivation	8
§15.231 (c)	Bandwidth of emission	9
	Test equipment listing	10
	Photographs of the equipment	12

EMISSION LIMITATIONS

SUBCLAUSE § 15.231 (b) § 15.209

EMISSION LIMITATIONS					
all measurements are made up to the 10 th harmonic at 3m					
f (MHz)	polarization	amplitude of emission (µV/m)	limit max. allowed emission power (interpolation)	actual attenuation below frequency of operation (dB)	results
445.0	vertical	10945	11458 µV/m	-	Operating frequency
1335.0	vertical	54.8	1146 µV/m 500µV/m (209)	46	complies
2670.0	vertical	64.5	1146 µV/m 500µV/m (209)	45	complies
>2707	vertical	no peak found	1146 µV/m 500µV/m (209)		complies
412.675	vertical	10007	10111 µV/m	-	Operating frequency
2063.4	vertical	58.9	1011 µV/m 500µV/m (209)	45	complies
2476.1	vertical	66.1	1011 µV/m 500µV/m (209)	44	complies
>2476.1	vertical	no peak found	1011 µV/m 500µV/m (209)		complies
465.025	vertical	10351	12293 µV/m	-	Operating frequency
2325.1	vertical	58.2	1229 µV/m 500µV/m (209)	45	complies
2790.1	vertical	65.3	1229 µV/m 500µV/m (209)	44	complies
>2790.1	vertical	no peak found	1229 µV/m 500µV/m (209)		complies
Measurement uncertainty		± 3dB			

LIMITS

SUBCLAUSE § 15.231 (c)

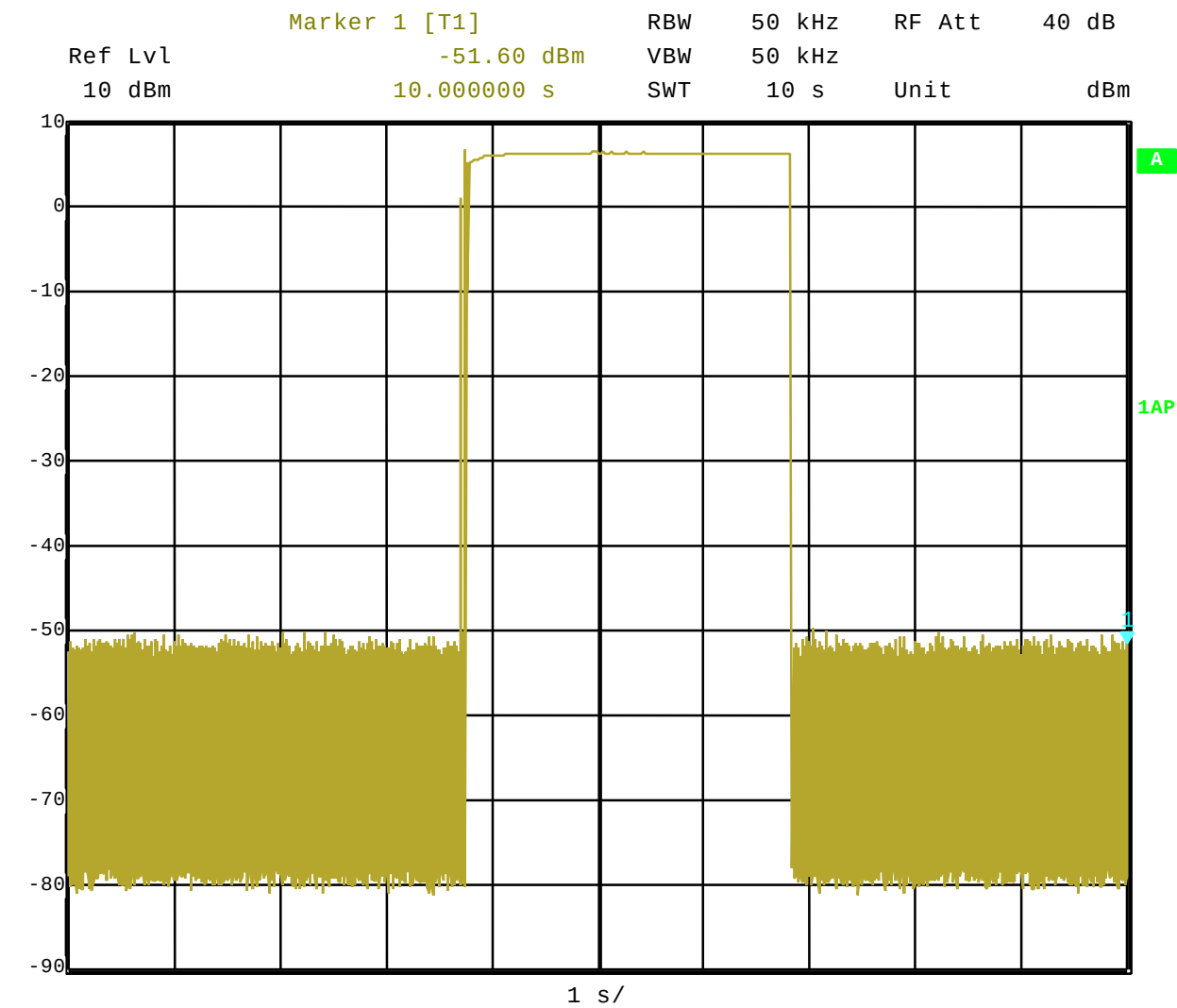
In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the permitted fundamental power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

All measurements are made with a CISPR quasi-peak equipment.

AUTOMATIC DEACTIVATION

SUBCLAUSE § 15.231 (a)

The pulse is activated at 4.7 seconds and deactivates at 6.8 seconds at release.



Date: 17.AUG.2000 13:05:47

Bandwidth of emissions

SUBCLAUSE § 15.231 (c)

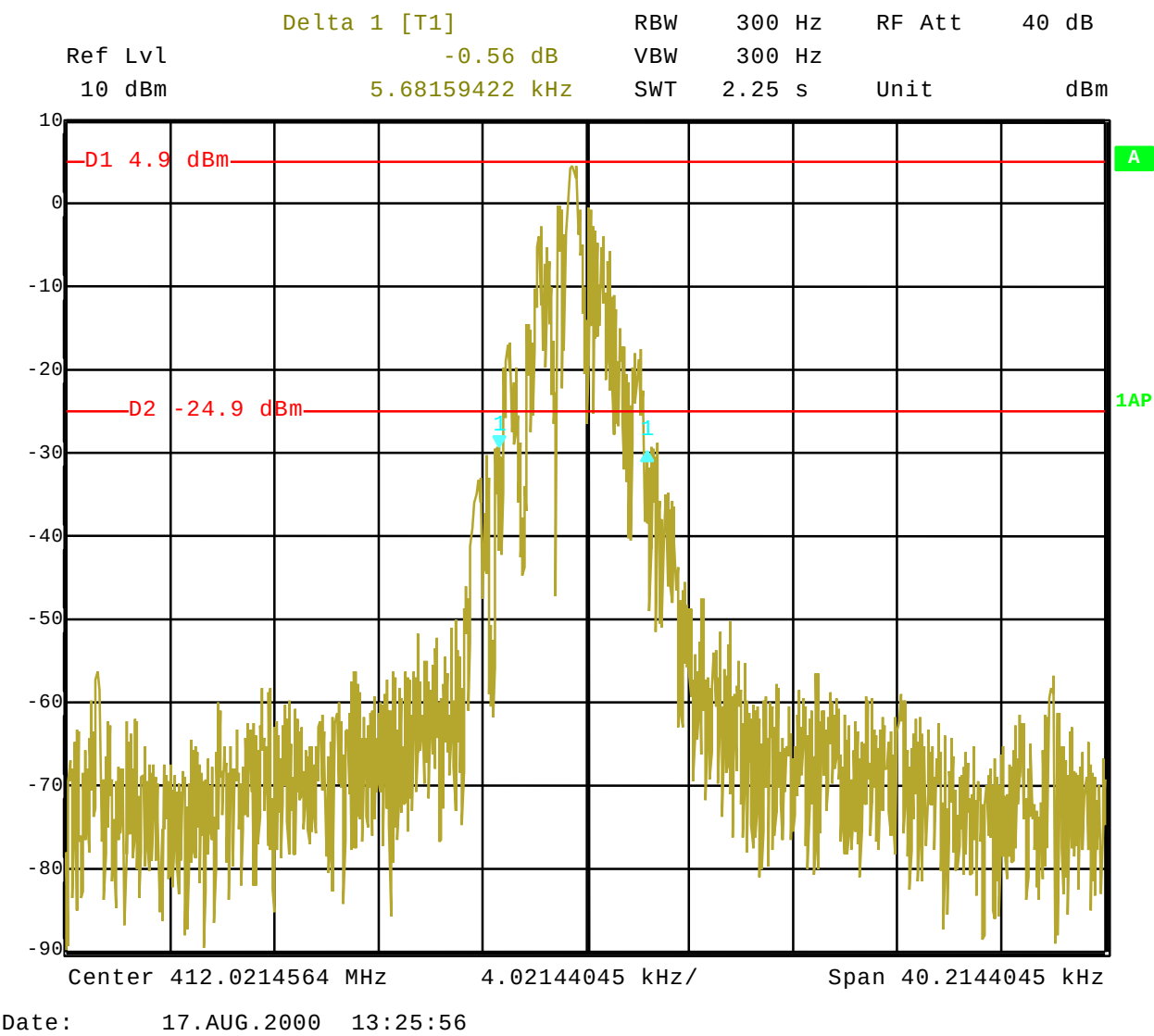
TEST CONDITIONS		FREQUENCY (MHz) at which –20 dBc occurs ±1.11125 MHz at 445 MHz	
445,0 MHz		low	high
$T_{nom}(20)^{\circ}C$	$V_{nom}(12,0)V$	444.989	445.011
Measured frequencies (lowest and highest)		$f_L = 444.989 \text{ MHz}$	$f_H = 445.011 \text{ MHz}$
412,675 MHz		low	high
max ±1.03 MHz at 412 MHz			
$T_{nom}(20)^{\circ}C$	$V_{nom}(12,0)V$	412.663	412.689
Measured frequencies (lowest and highest)		$f_L = 412.663 \text{ MHz}$	$f_H = 412.689 \text{ MHz}$
465.025 MHz		low	high
max ±1.163 MHz at 465 MHz			
$T_{nom}(20)^{\circ}C$	$V_{nom}(12,0)V$	465.014	465.037
Measured frequencies (lowest and highest)		$f_L = 465.014 \text{ MHz}$	$f_H = 465.037 \text{ MHz}$
Measurement uncertainty		$\pm 1 \times 10^{-5}$	

LIMITS:

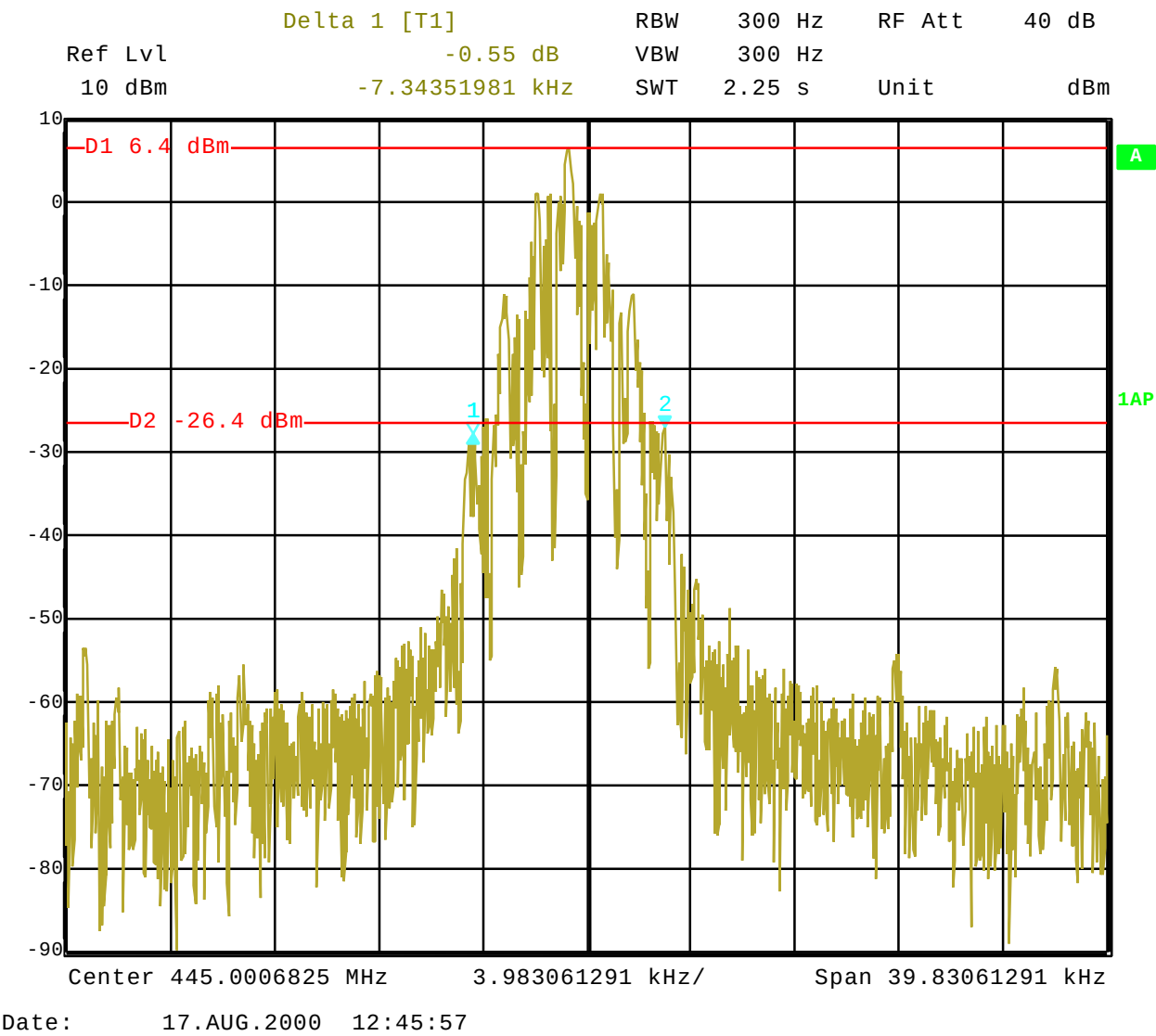
§15.231

Under all test conditions	no wider than 0.25% of the center frequency between 70 to 900 MHz, 0.5% above 900MHz. Bandwidth is determined at 20dB below modulated carrier.
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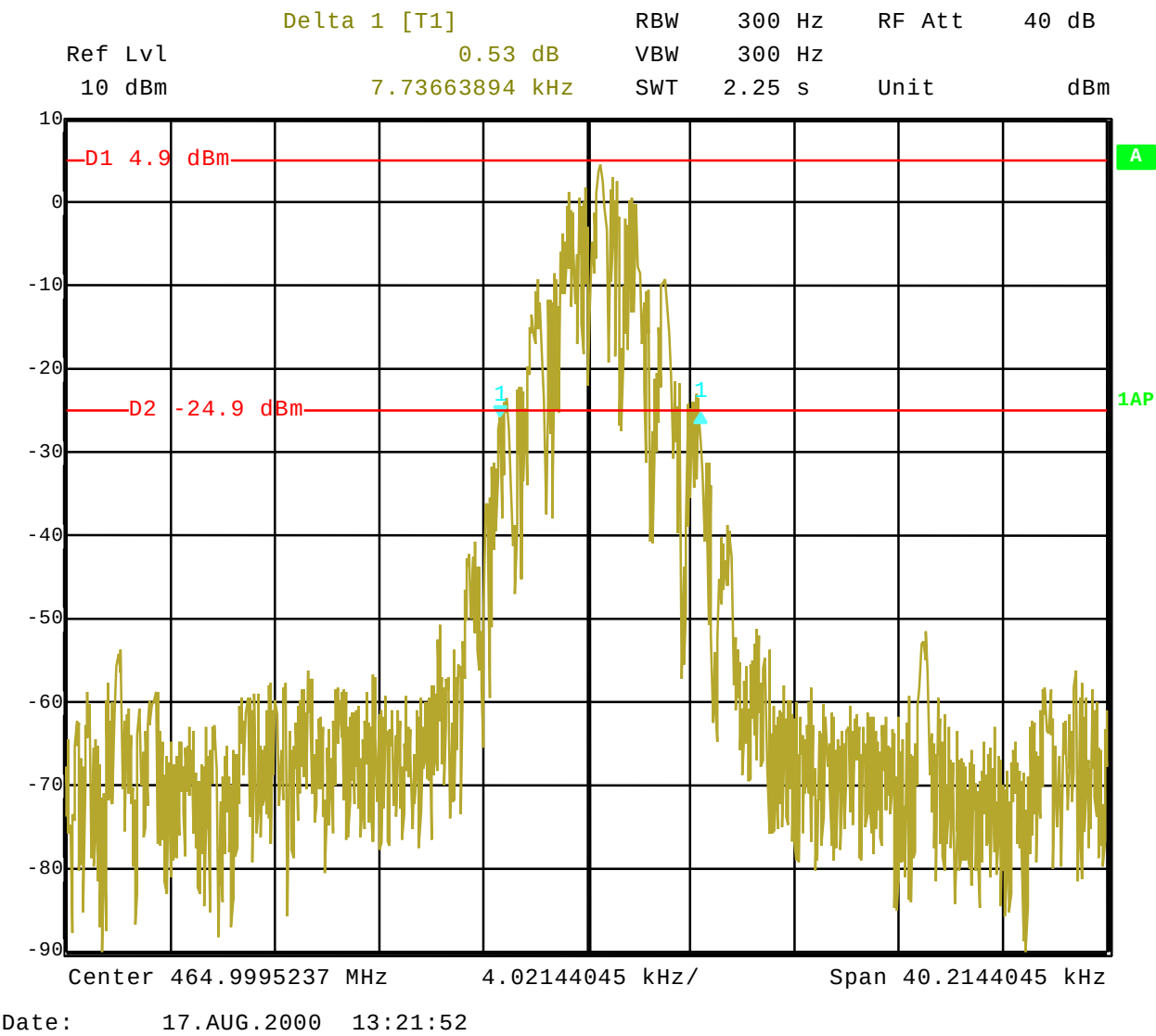
412,025 MHz



445,00 MHz



465,025 MHz



A

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TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	8566 A	Hewlett-Packard	1925A00257
02	Analyzer Display	8566 A	Hewlett-Packard	1925A00860
03	Oscilloscope	7633	Tektronix	230054
04	Radio Analyzer	CMTA 54	Rohde & Schwarz	894 043/010
05	System Power Supply	6038 A	Hewlett-Packard	2848A07027
06	Signal Generator	8111 A	Hewlett-Packard	2215G00867
07	Signal Generator	8662 A	Hewlett-Packard	2224A01012
08	Funktionsgenerator	AFGU	Rohde & Schwarz	862 480/032
09	Regeltrenntrafo	MPL	Erfi	91350
10	Netznachbildung	NNLA 8120	Schwarzbeck	8120331
11	Relais-Matrix	PSU	Rohde & Schwarz	893 285/020
12	Power-Meter	436 A	Hewlett-Packard	2101A12378
13	Power-Sensor	8484 A	Hewlett-Packard	2237A10156
14	Power-Sensor	8482 A	Hewlett-Packard	2237A00616
15	Modulationsmeter	9008	Racal-Dana	2647
16	Frequenzzähler	5340 A	Hewlett-Packard	1532A03899
17	Absorber Schirmkabine	---	MWB	87400/002
18	Spectrum Analyzer	85660 B	Hewlett-Packard	2747A05306
19	Analyzer Display	85662 A	Hewlett-Packard	2816A16541
20	Quasi Peak Adapter	85650 A	Hewlett-Packard	2811A01131
21	RF-Preselector	85685 A	Hewlett-Packard	2833A00768
22	Biconical Antenne	3104	Emco	3758
23	Log. Per. Antenne	3146	Emco	2130
24	Double Ridge Horn	3115	Emco	3088
25	EMI-Testreceiver	ESAI	Rohde & Schwarz	863 180/013
26	EMI-Analyzer-Display	ESAI-D	Rohde & Schwarz	862 771/008
27	Biconical Antenne	HK 116	Rohde & Schwarz	888 945/013
28	Log. Per. Antenne	HL 223	Rohde & Schwarz	825 584/002
29	Relais-Switch-Unit	RSU	Rohde & Schwarz	375 339/002
30	Highpass	HM985955	FSY Microwave	001
31	Amplifier	P42-GA29	Tron-Tech	B 23602
32	Absorber Schirmkabine		Frankonia	
33	Steuerrechner	PSM 7	Rohde & Schwarz	834 621/004
34	EMI Test Reciever	ESMI	Rohde & Schwarz	827 063/010
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
36	Controler	HD 100	Deisel	100/322/93
37	Relais Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relais Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spektrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Meßempfänger	ESH 3	Rohde & Schwarz	890 174/002
43	Meßempfänger	ESVP	Rohde & Schwarz	891 752/005
44	Biconi Ant. 20-300MHz	HK 116	Rohde & Schwarz	833 162/011
45	Logper Ant. 0.3-1 GHz	HL 223	Rohde & Schwarz	832 914/010
46	Amplifier 0.1-4 GHz	AFS4	Miteq Inc.	206461
47	Logper Ant. 1-18 GHz	HL 024 A2	Rohde & Schwarz	342 662/002
48	Polarisationsnetzwerk	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridge G Horn Antenne 1-26.5 GHz	3115	EMCO	9107-3696
50	Microw. Sys. Amplifier 0.5- 26.5 GHz	8317A	Hewlett Packard	3123A00105
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PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

Photograph no.: 1



PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

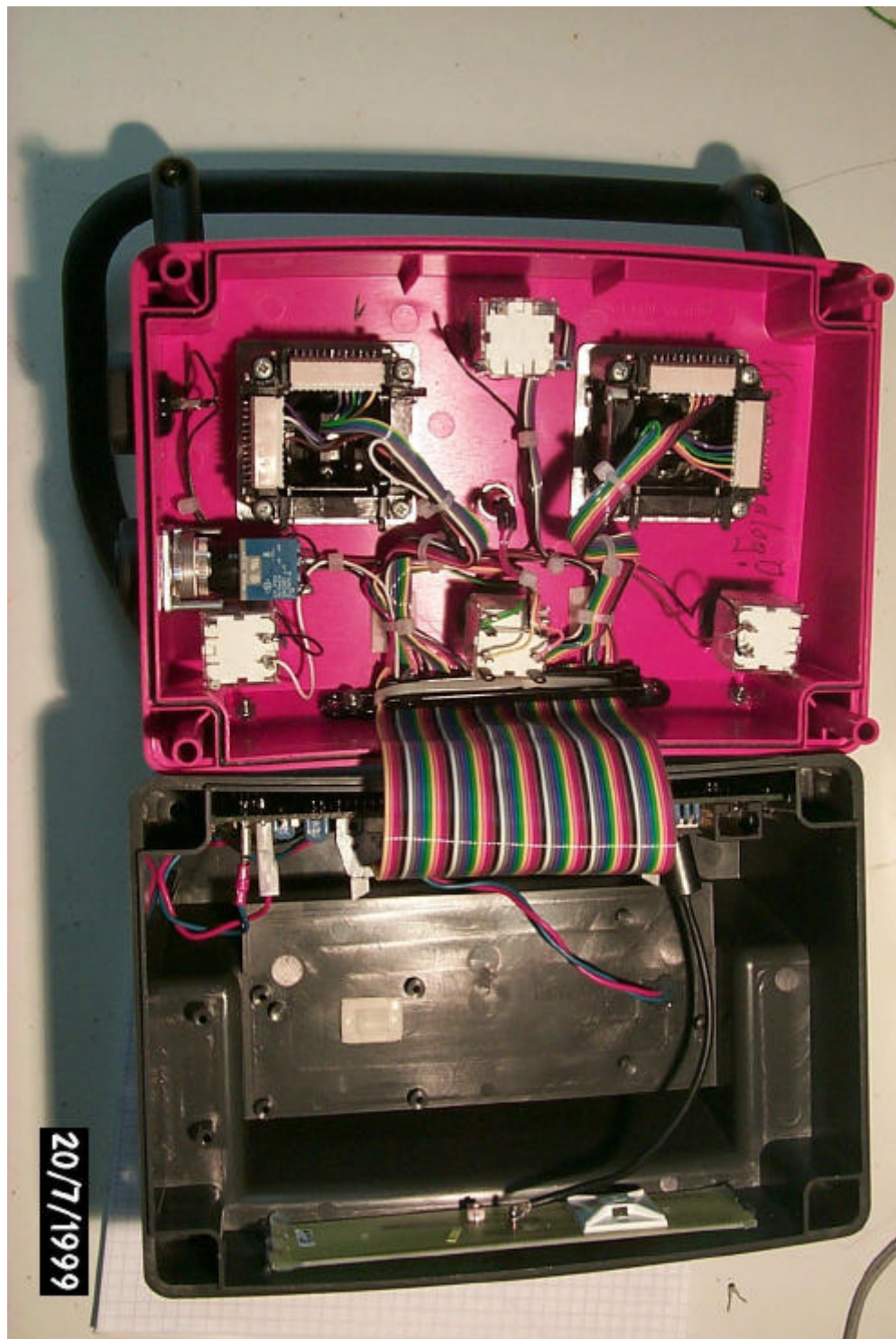
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PHOTOGRAPHS OF THE EQUIPMENT

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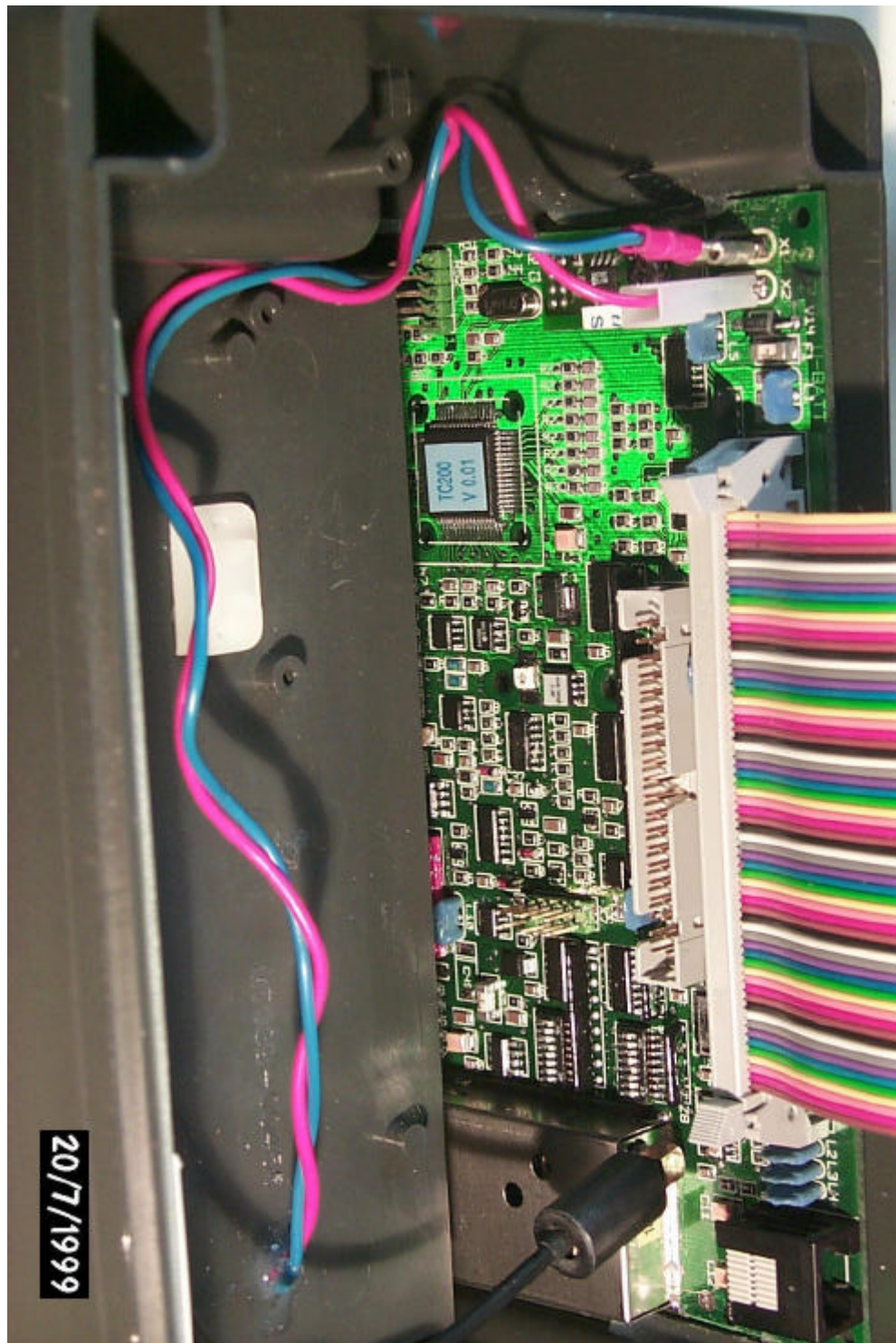
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PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

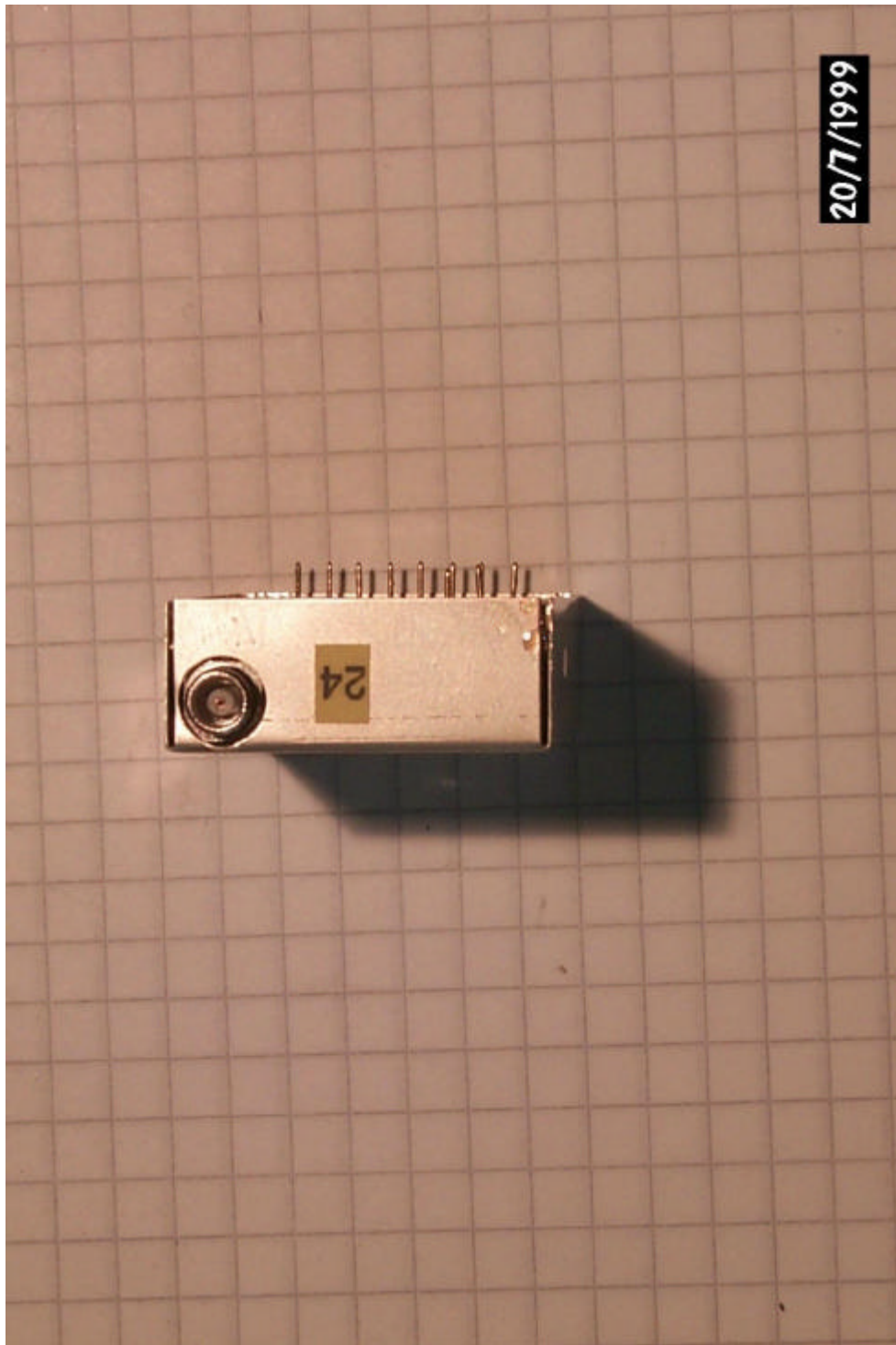
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PHOTOGRAPHS OF THE EQUIPMENT

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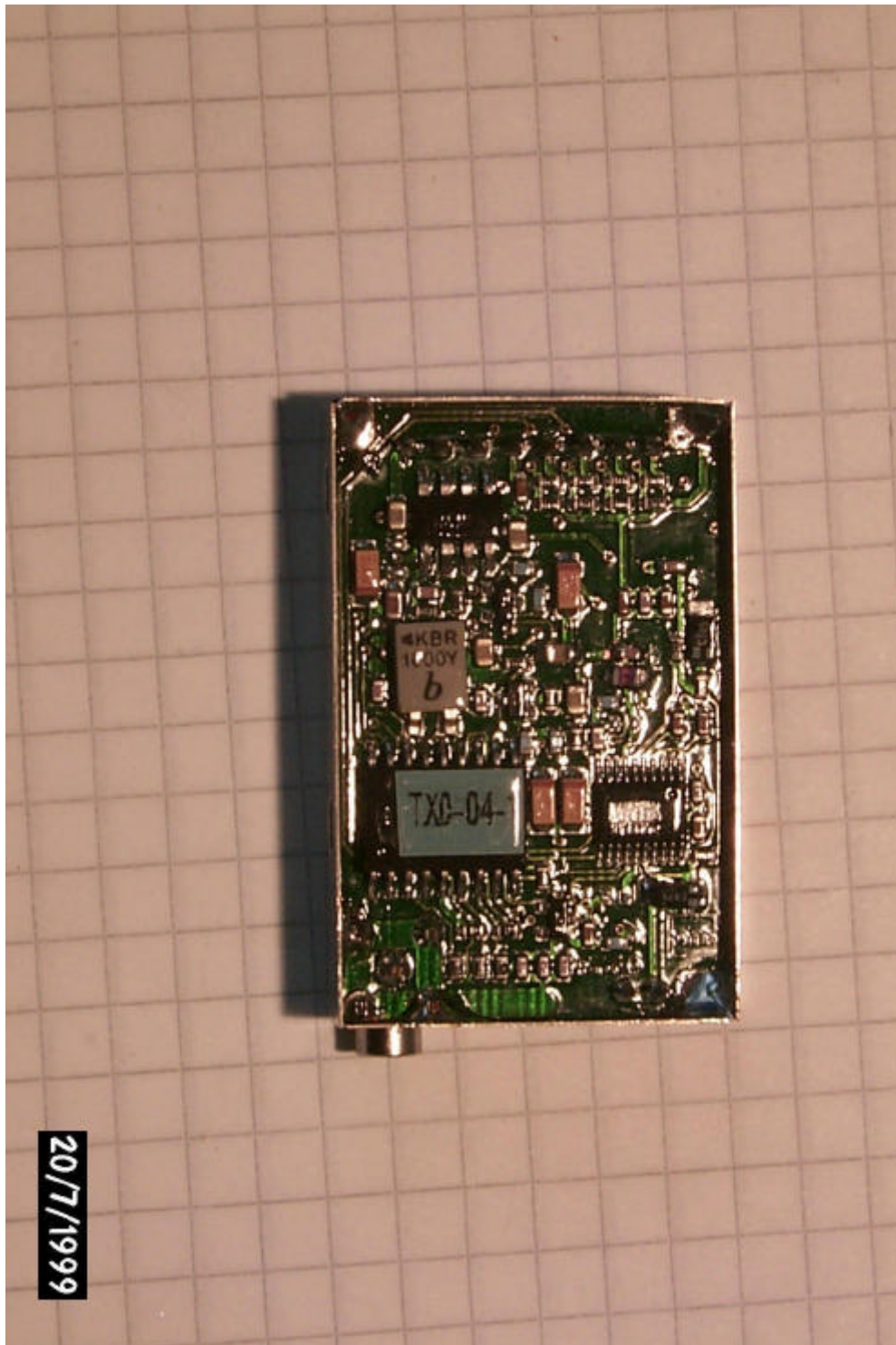
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PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

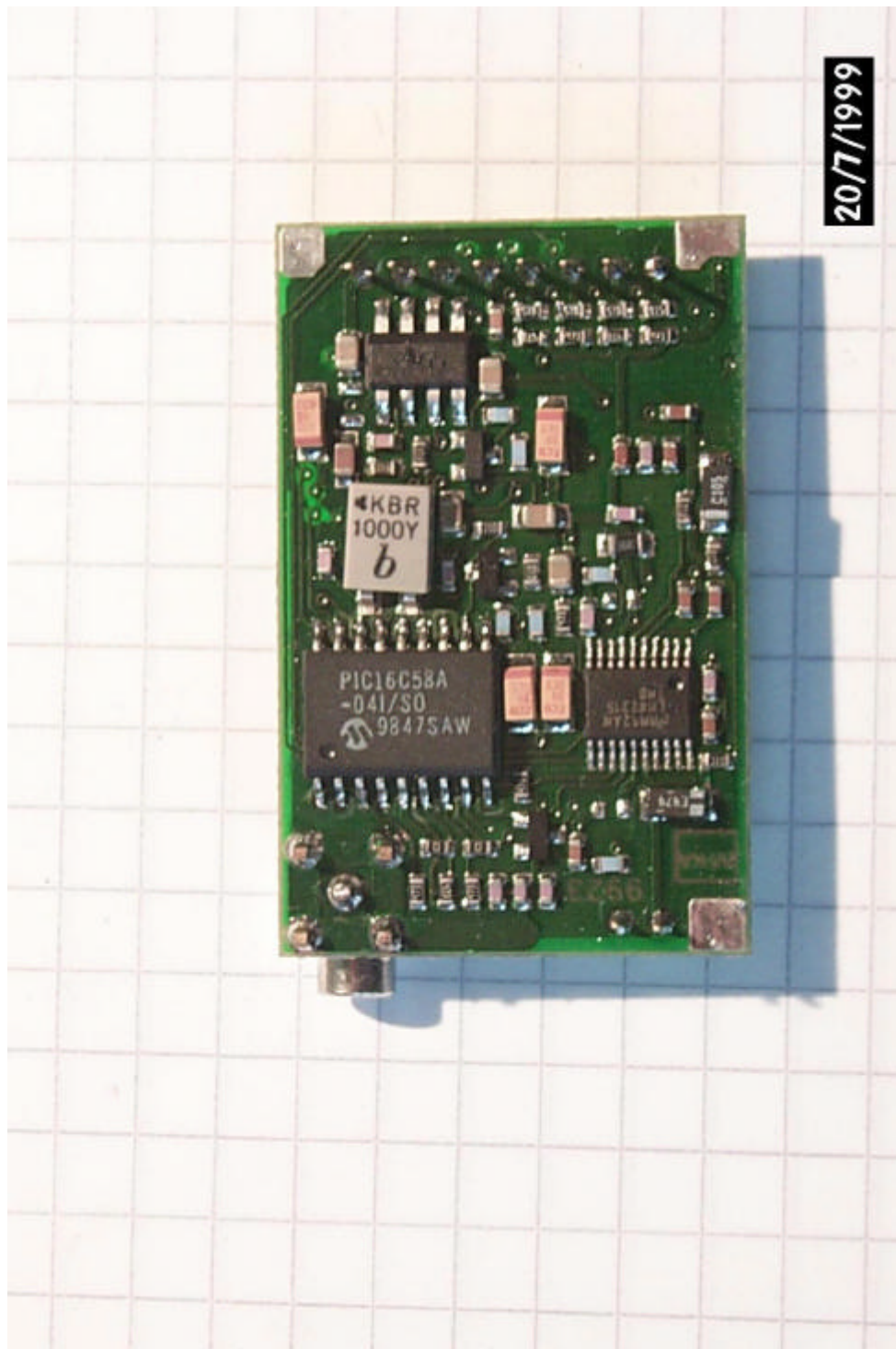
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PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

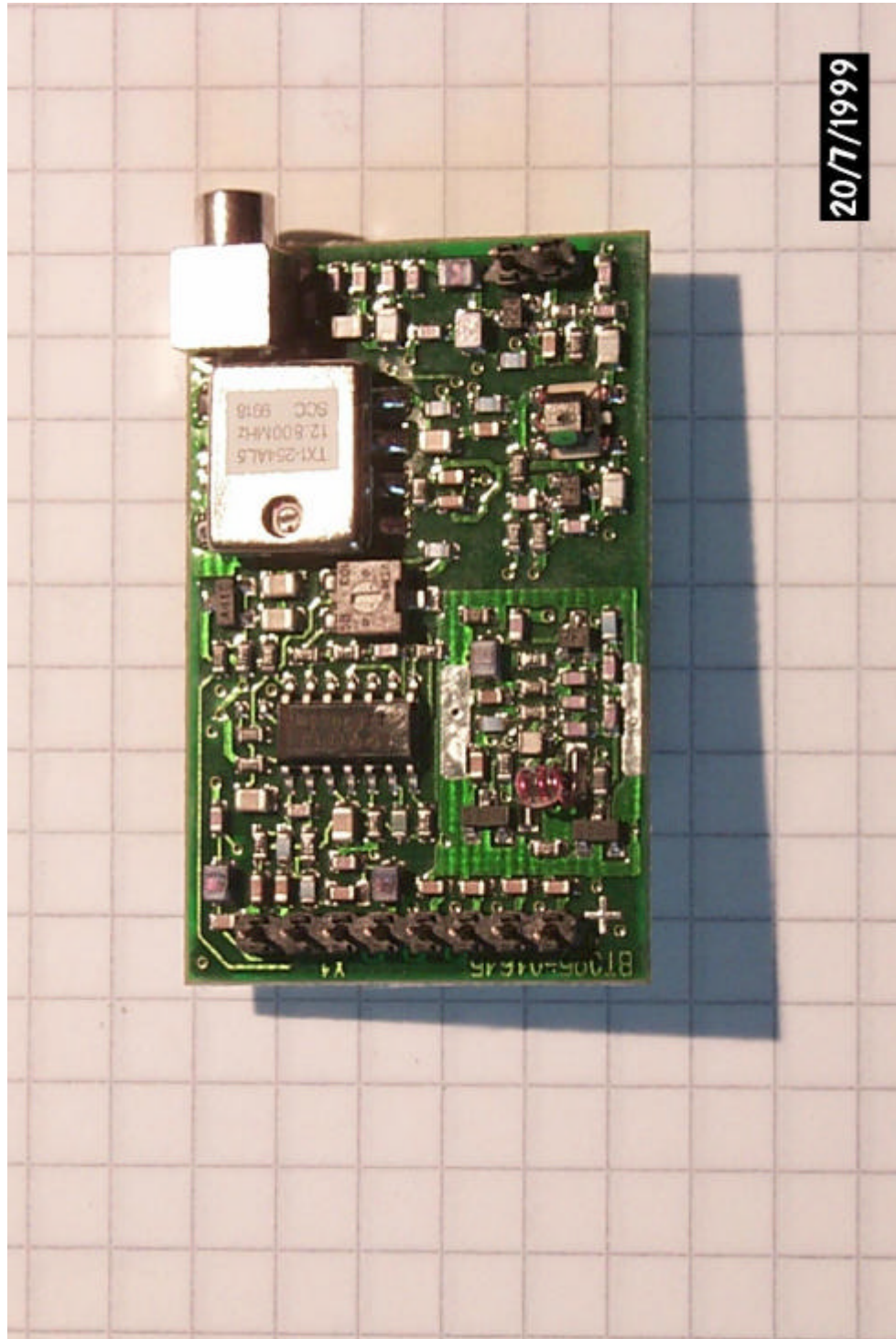
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PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

Photograph no.: 8



PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

Photograph no.: 9



PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

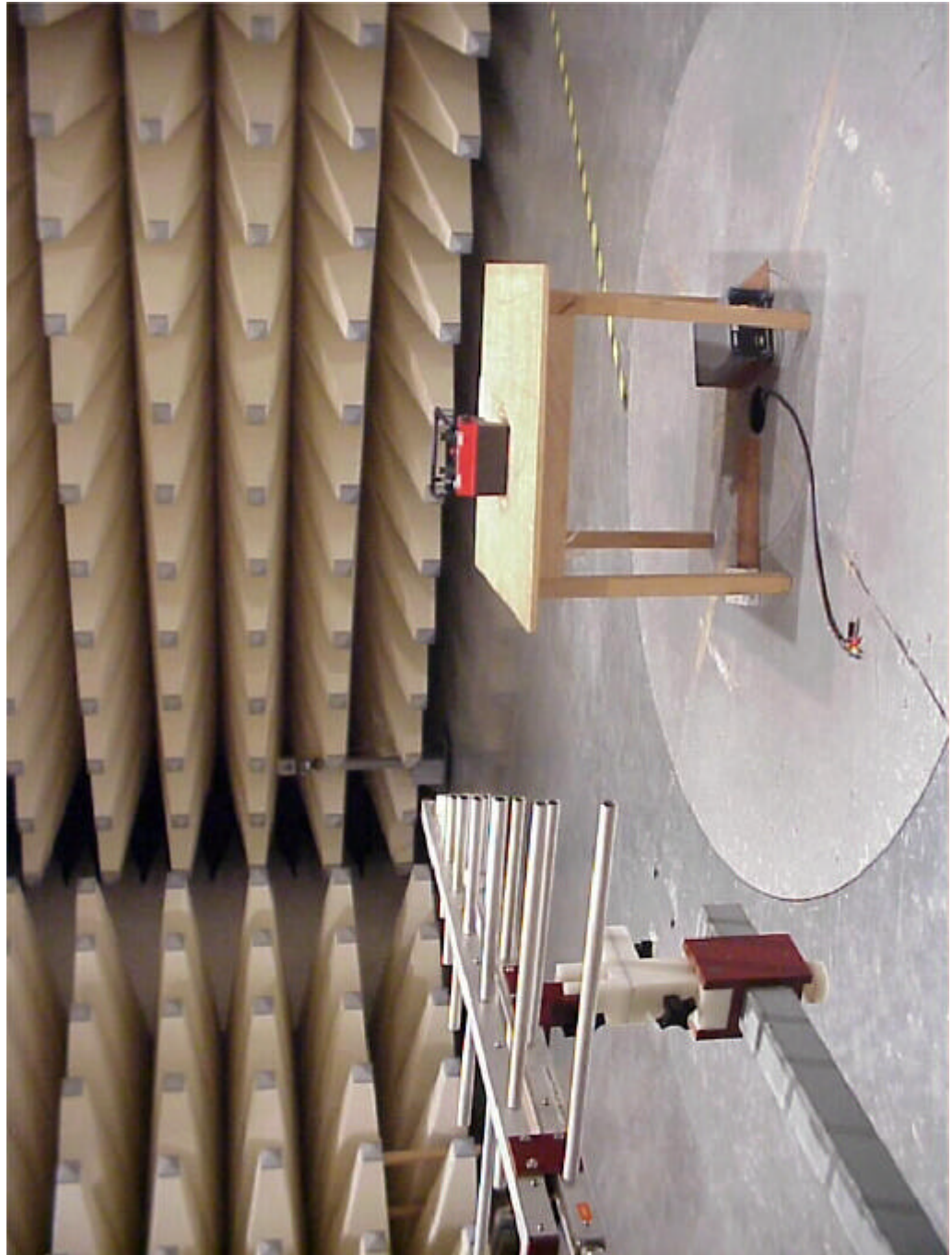
Photograph no.: 10



PHOTOGRAPHS OF THE EQUIPMENT DURING MEASUREMENT

TC 100-200

Photograph no.: 11



PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

Photograph no.: 12



PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

Photograph no.: 13



PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

Photograph no.: 14



PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

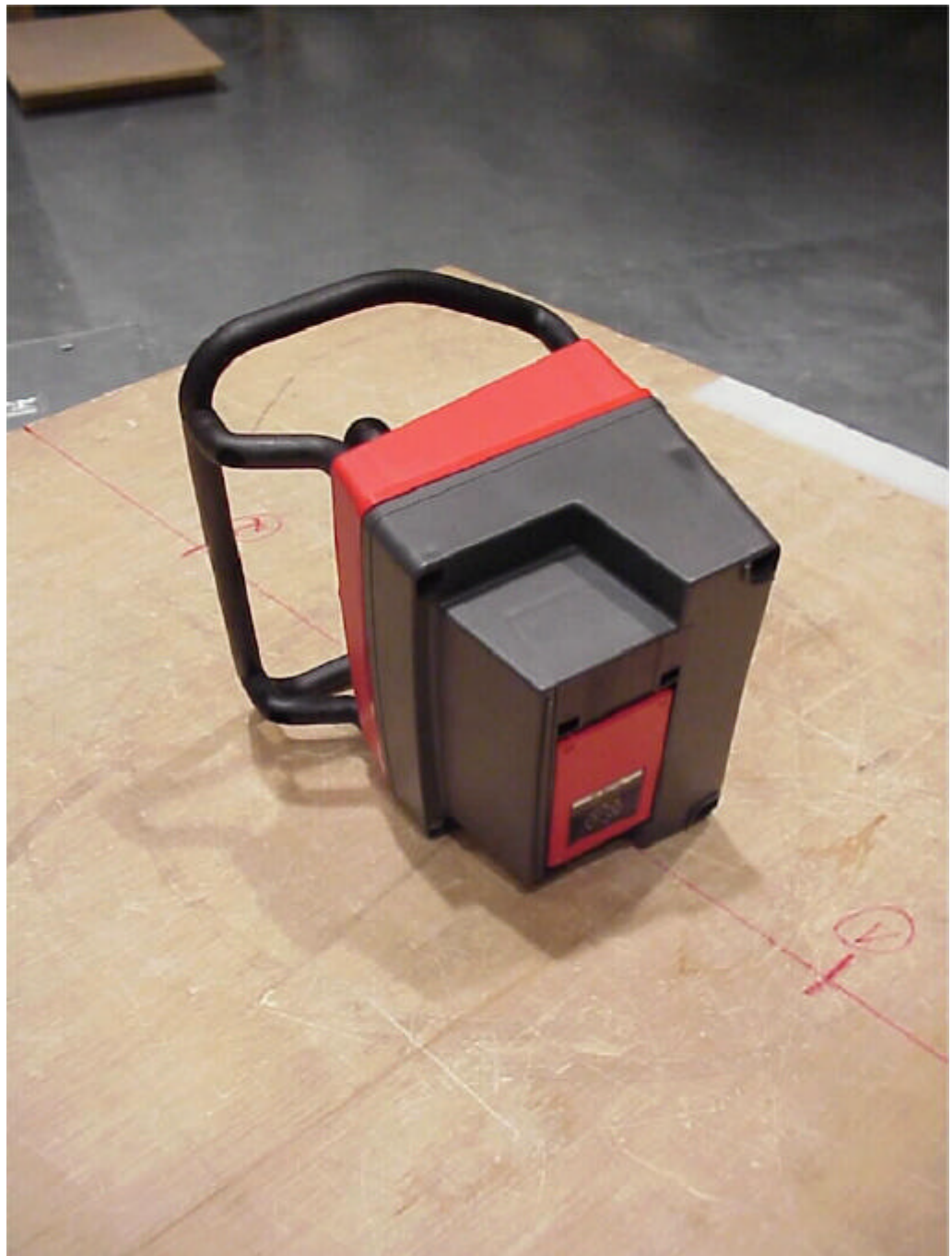
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PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

Photograph no.: 16



PHOTOGRAPHS OF THE EQUIPMENT

TC 100-200

Photograph no.: 17

