TTI-P-G166/98-30

Accredited Bluetooth™ Test Facility (BQTF)

Test report no.: 4_0602-01-03RX/02
FCC Part 15.109 / 95.1115
Avalon CTS Cordless Fetal Transducer System
M2720A Base station (receiver)

CETECOM – ICT Services GmbH
Untertürkheimerstr. 6-10
66117 Saarbrücken, Germany

Telephone: + 49 (0) 681 / 598-0
Fax: + 49 (0) 681 / 9075

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Table of Contents

1 General information

1.1 Notes

1.2 Testing laboratory

1.3 Details of applicant

1.4 Application details

1.5 Test item

1.6 Test standards

2 Technical test

2.1 Summary of test results

2.2 Test report

1 General information

1.1 Notes

The test results of this test report relate exclusively to the item tested as specified in 1.5.

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1.2 Testing laboratory

CETECOM ICT Services GmbH
Untertürkheimer Straße 6 - 10
66117 Saarbrücken
Deutschland
Telefone : + 49 681 598 - 9100
Telefax : + 49 681 598 - 9075
E-mail : info@ict.cetecom.de
Internet : www.cetecom.de

Accredited testing laboratory
DAR-registration number : TTI-P-G-166/98-30
Accredited Bluetooth™ Test Facility (BQTF)
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1.3 Details of applicant

Name : Philips Medizinsysteme Böblingen GmbH
Street : Hewlett-Packard-Str.2
City : D-71034 Böblingen
Country : Germany
Telephone : +49(0)7031 / 463-0
Telefax : +49(0)7031 / 463-2944
Contact : Mr. Hansjörg Geywitz
Telephone : +49(0)7031 / 463-0

1.4 Application details

Date of receipt of application : 2002-07-25
Date of receipt of test item : 2002-07-25
Date of test : 2002-07-25

1.5 Test item

Type of equipment : Wireless medical telemetry system
Type designation : **M2720A Base station (receiver)**
Manufacturer : - applicant -
Street :
City :
Country :
Serial number :
Additional informations: :
Frequency : 608.0125 – 613.9875 MHz Channel separation: 12.5 kHz

Number of channels : 478
Antenna : rod antenna with BNC connector
Power supply : Rx: 100 - 240V AC (110V tested)

1.6 Test standards

FCC Part §15.109 / §95.1115

2 Technical test

The radiated measurements were performed vertical and horizontal over the whole frequency range.We start at 1 m high with vertical receiving antenna and rotate the dish continuously. During rotation we use the antenna lift system to vary the high from 1 to 4 m. So we find maximum radiation output. At this points we do manual remeasurements. After this we do the same measurements in horizontal position of the receiving antenna. This (horizontal and vertical) is made for all the three planes of the test sample. We use the maximum received results. The radiated power was measured by substitution method according to FCC standard.

The detector function and selection of bandwidth are according ANSI C63.2-1996 / 8.2.1 and ANSI C63.4-1992 Item 4.2.

Antennas are conform with ANSI C63.2-1996 item 15.

150 kHz - 30 MHz: Quasi Peak measurement, 9kHz Bandwidth, passive loop antenna.

30 MHz - 200 MHz: Quasi Peak measurement, 120KHz Bandwidth, biconical antenna

200MHz - 1GHz: Quasi Peak measurement, 120KHz Bandwidth, log periodic antenna

>1GHz: Average, RBW 1MHz, VBW 10 MHz, waveguide horn

2.1 Summary of test results

The receiver is able to receive parallel on three different frequencies.
So we have got only one plot for receiving mode.

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

FINAL VERDICT : PASS

Technical responsibility for area of testing :

Date	Section	Name	Signature
2002-08-01	RSC8412	Hausknecht D.	D. Hausknecht
2002-08-01	RSC8414	Ames H.	H. Ames

2.2 Testreport

TEST REPORT

FCC Part 15.109 / 95.1115

Testreport no.: 4_0602-01-03RX/02

TEST REPORT REFERENCE

LIST OF MEASUREMENTS

The list of measurements called for in FCC Part 15.109 / 95.1115 is given below.

Paragraph	PARAMETER TO BE MEASURED	PAGE
	Receiver parameters	
§ 15.109	**Spurious radiations - Radiated**	**7**
	Test equipment listing	**12**
	Photographs of the equipment	**14**

Equipment under test : M2720A Base station (receiver)
Ambient temperature : 22.9°C
Relative humidity : 35 %

RECEIVER SPURIOUS RADIATION **§ 15.109**

All measured peaks were > 10 dB peak below limit.
We remeasured two frequencies, 122.7 MHz and 217.1 MHz with CISPR QP Detector.
Results:

122.7 MHz peak:12.3 dBµV/m QP:9.3 dBµV/m cor. 3 to 10m :10.5 dB =19.8 dBµV/m
217.1 MHz peak:9.2 dBµV/m QP:8.1 dBµV/m cor. 3 to 10m :10.5 dB =18.6 dBµV/m

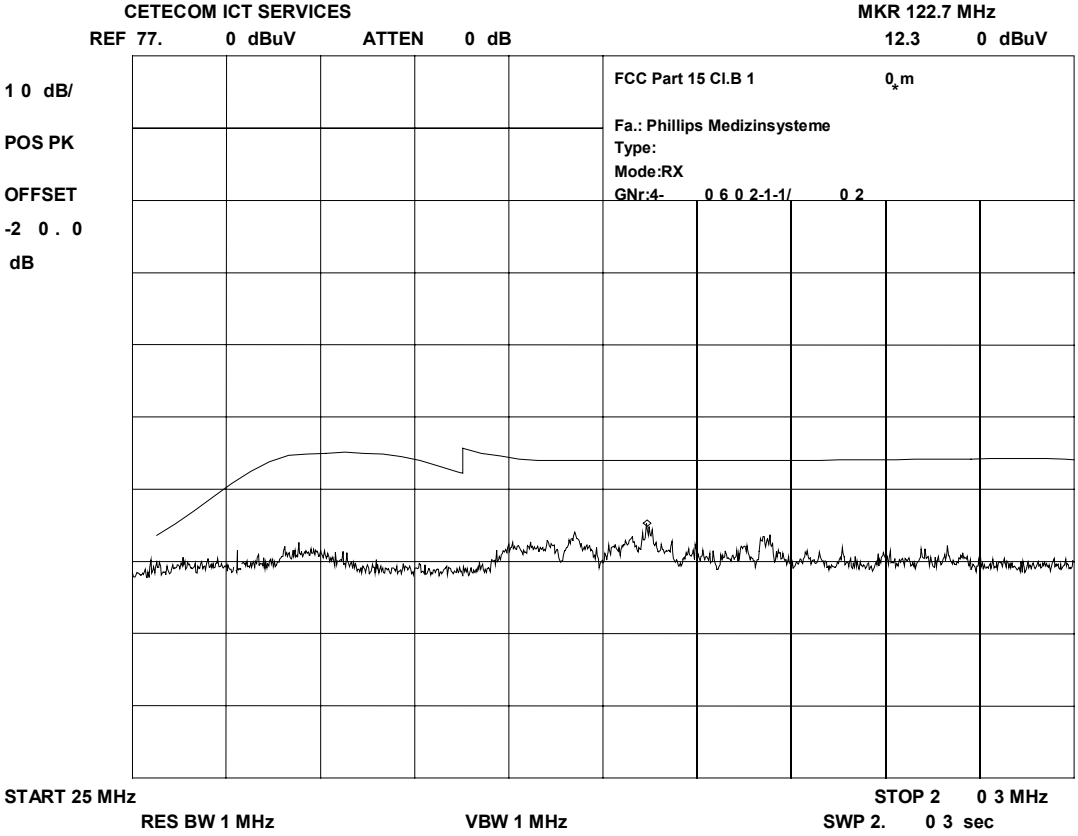
Both results are far below limit.

Plots see next pages.

Equipment under test : M2720A Base station (receiver)
Ambient temperature : 22.9°C
Relative humidity : 35 %

RECEIVER SPURIOUS RADIATION **§ 15.109**

RADIATED 30 – 200 MHz vertical



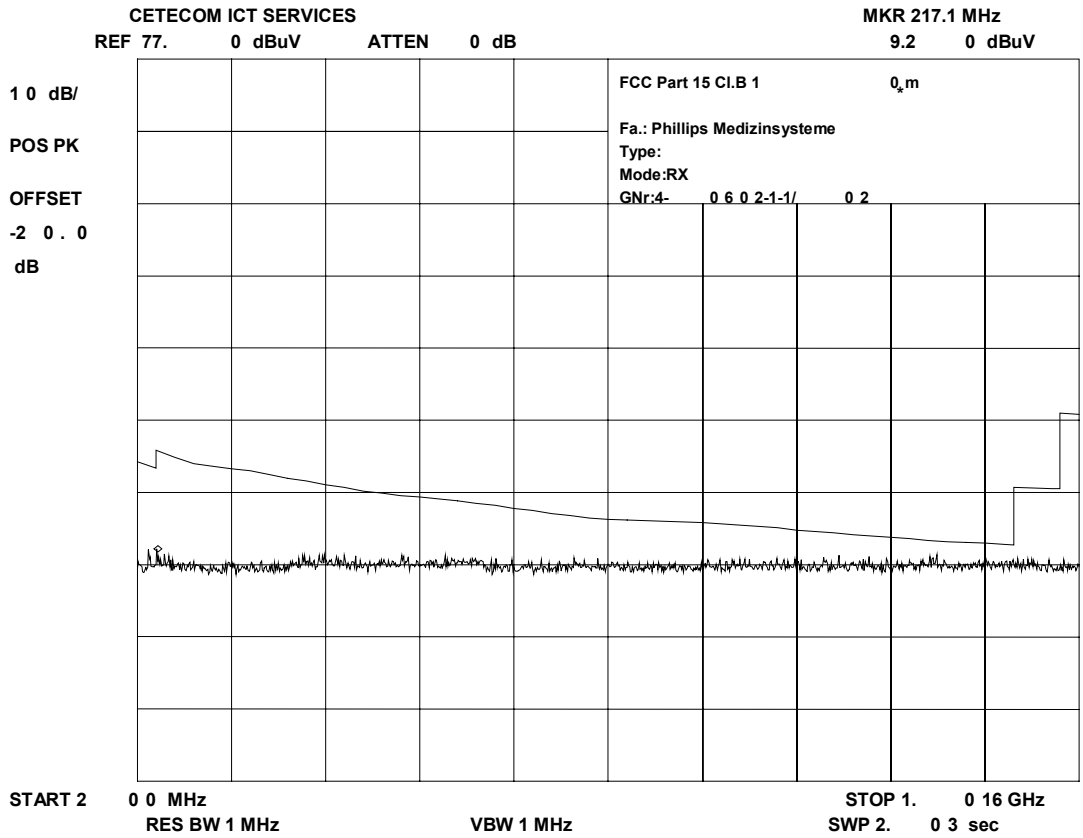
This plot shows peak values and the limit according to FCC15.109 at 10m distance. We made additional measurements with CISPR QP Detector and recalculated the results to 3m distance by adding 10.5 dB.
<u>All peaks were > 10 dB below limit.</u>

Limits **SUBCLAUSE § 15.109**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

Equipment under test : M2720A Base station (receiver)
Ambient temperature : 22.9°C
Relative humidity : 35 %
RECEIVER SPURIOUS RADIATION **§ 15.109**

RADIATED 200 - 1000 MHz vertical

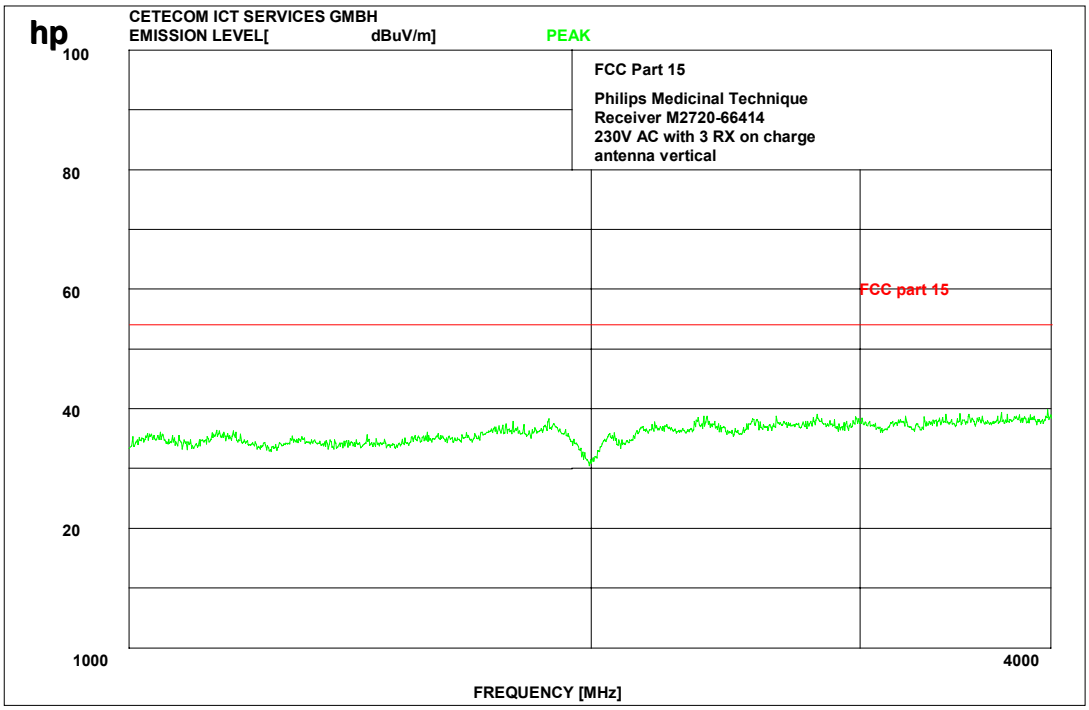


This plot shows peak values and the limit according to FCC15.109 at 10m distance. We made additional measurements with CISPR QP Detector and recalculated the results to 3m distance by adding 10.5 dB.
<u>All peaks were >10 dB below limit.</u>
Limits **SUBCLAUSE § 15.109**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

Equipment under test : M2720A Base station (receiver)
Ambient temperature : 22.9°C
Relative humidity : 35 %
RECEIVER SPURIOUS RADIATION **§ 15.109**

Radiated 1000 – 4000 MHz vertical



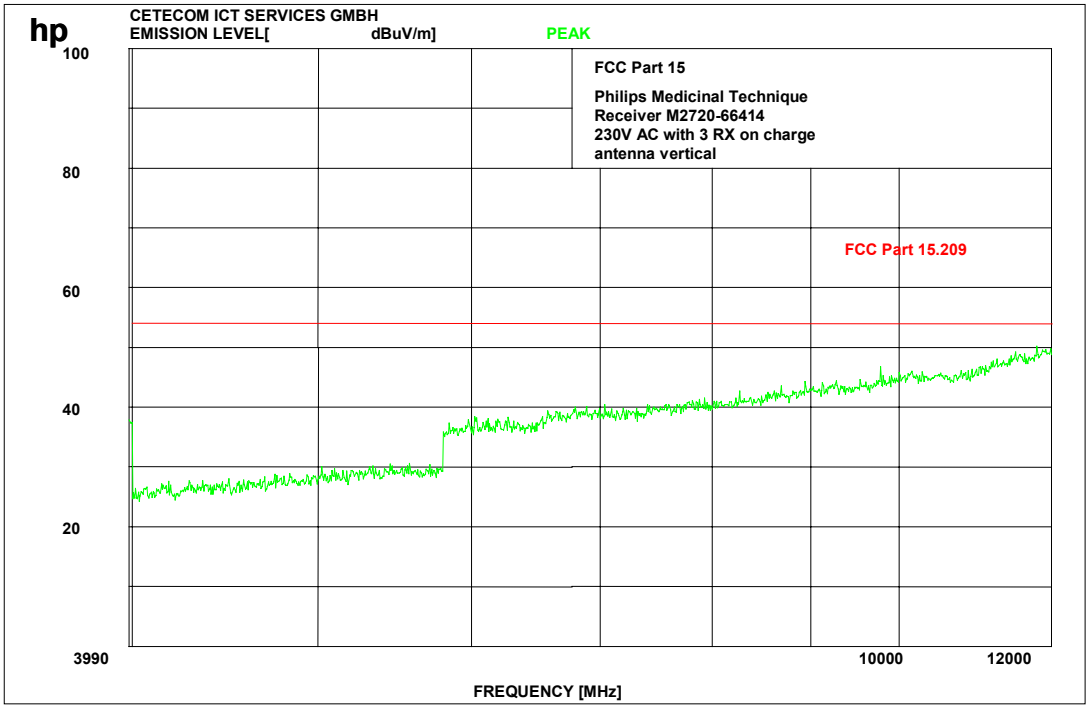
This plot shows peak values and the limit according to FCC15.109 at 3m distance. We made additional measurements with AV Detector.
<u>There were no peaks found.</u>

Limits **SUBCLAUSE § 15.109**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

RECEIVER SPURIOUS RADIATION **§ 15.109**

Radiated 4000 – 12000 MHz vertical



This plot shows peak values and the limit according to FCC15.109 at 3m distance. We made additional measurements with AV Detector.
<u>There were no peaks found.</u>

Limits **SUBCLAUSE § 15.109**

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

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	Control Computer	HD 100	Deisel	100/322/93
37	Relay Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relay Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spectrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Measuring Receiver	ESH 3	Rohde & Schwarz	890 174/002
43	Measuring Receiver	ESVP	Rohde & Schwarz	891 752/005
44	Bicon 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	Polarisation Network	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridged Horn Antenna 1-26.5 GHz	3115	EMCO	9107-3696
50	Microw. Sys. Amplifier 0.5- 26.5 GHz	8317A	Hewlett Packard	3123A00105
51	Audio Analyzer	UPD	Rohde & Schwarz	1030.7500.04
52	Controler	PSM 7	Rohde & Schwarz	883 086/026
53	DC V-Network	ESH3-Z6	Rohde & Schwarz	861 406/005
54	DC V-Network	ESH3-Z6	Rohde & Schwarz	893 689/012
55	AC 2 Phase V-Network	ESH3-Z5	Rohde & Schwarz	861 189/014
56	AC 2 Phase V-Network	ESH3-Z5	Rohde & Schwarz	894 981/019
57	AC-3 Phase V-Network	ESH2-Z5	Rohde & Schwarz	882 394/007
58	Power Supply	6032A	Rohde & Schwarz	2933A05441
59	RF-Test Receiver	ESVP.52	Rohde & Schwarz	881 487/021
60	Spectrum Monitor	EZM	Rohde & Schwarz	883 086/026
61	RF-Test Receiver	ESH3	Rohde & Schwarz	881 515/002
62	Relay Matrix	PSU	Rohde & Schwarz	882 943/029
63	Relay Matrix	PSU	Rohde & Schwarz	828 628/007
64	Spectrum Analyzer	FSIQ 26	Rohde & Schwarz	119.6001.27
65	Spectrum Analyzer	HP 8565E	Hewlett Packard	3473A00773
66				
67				
68				

PHOTOGRAPHS OF THE EQUIPMENT

Radiation test site

Photograph no.: 1

PHOTOGRAPHS OF THE EQUIPMENT

M2720A Base station

Photograph no.: 2

PHOTOGRAPHS OF THE EQUIPMENT

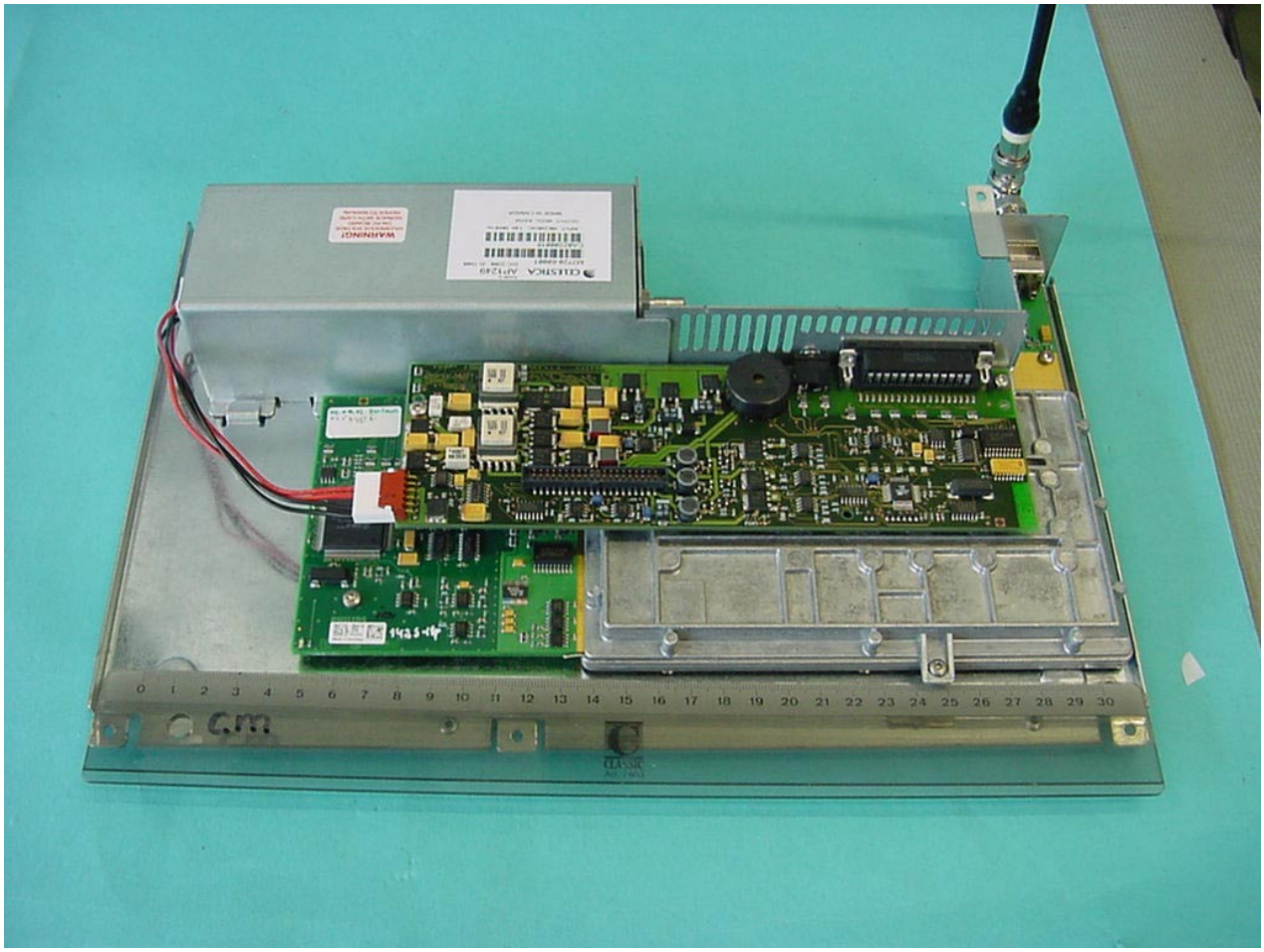
M2720A Base station

Photograph no.:3

PHOTOGRAPHS OF THE EQUIPMENT

M2720A Base station

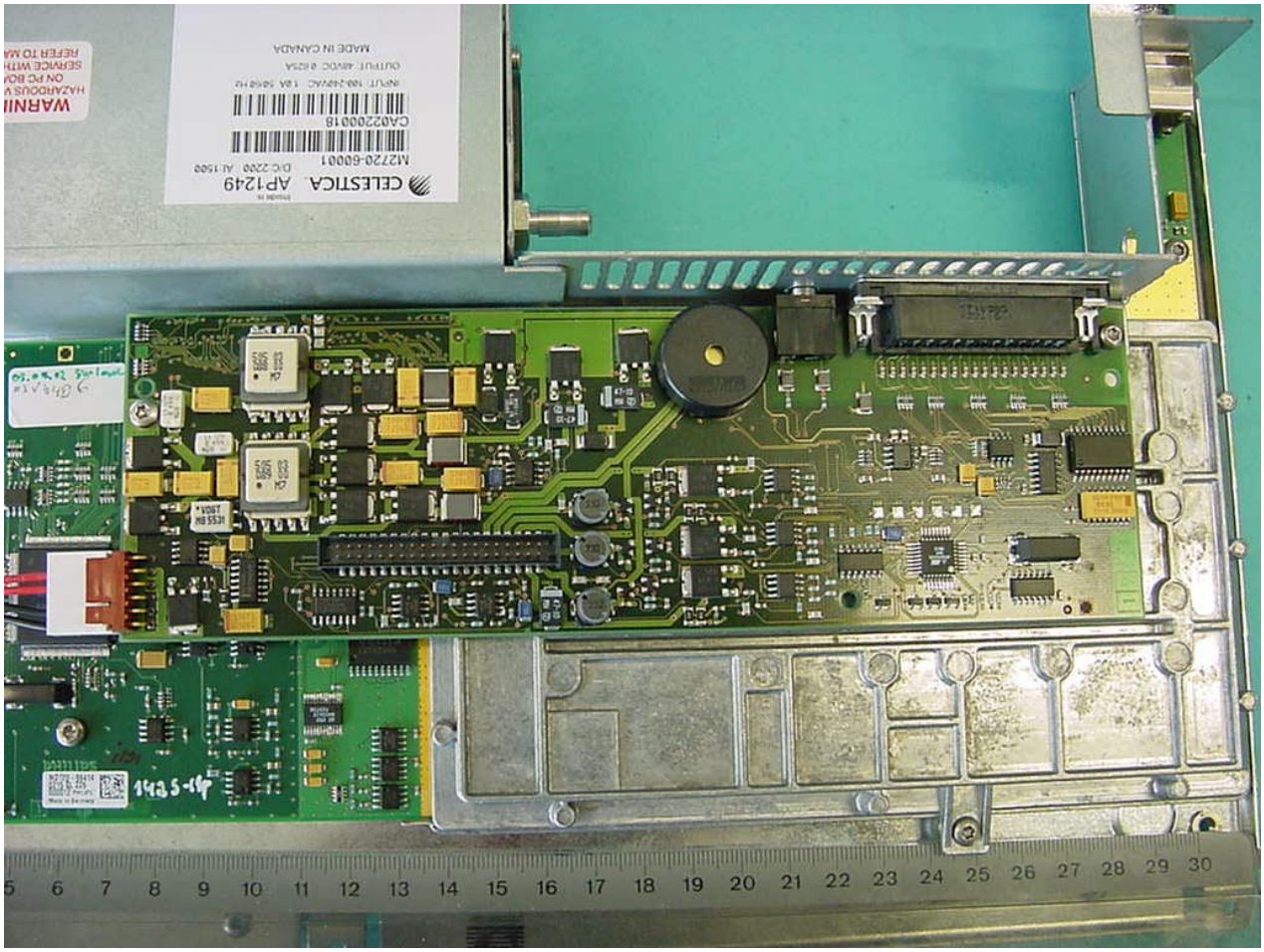
Photograph no.: 4



PHOTOGRAPHS OF THE EQUIPMENT

M2720A Base station

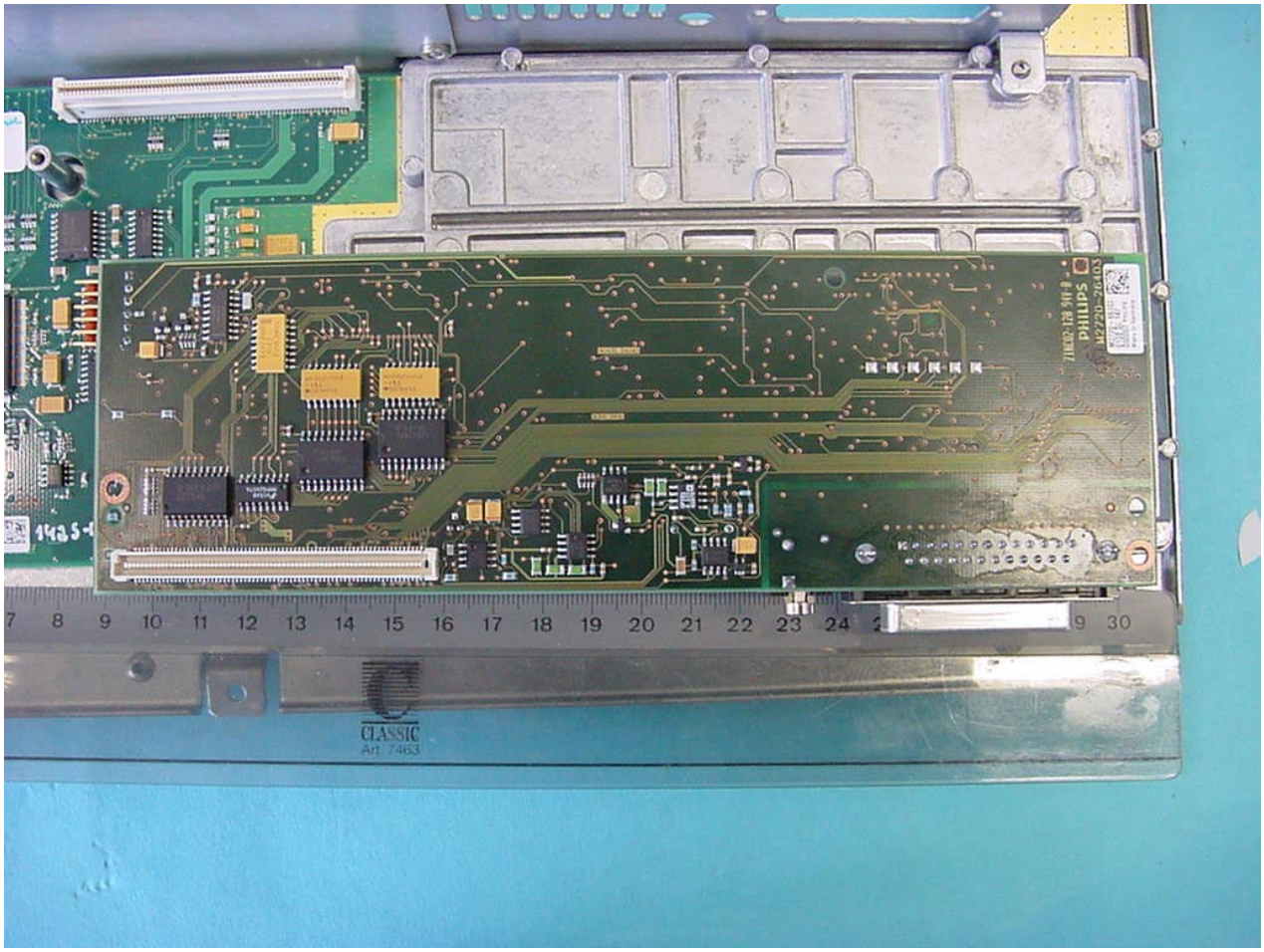
Photograph no.: 5



PHOTOGRAPHS OF THE EQUIPMENT

M2720A Base station

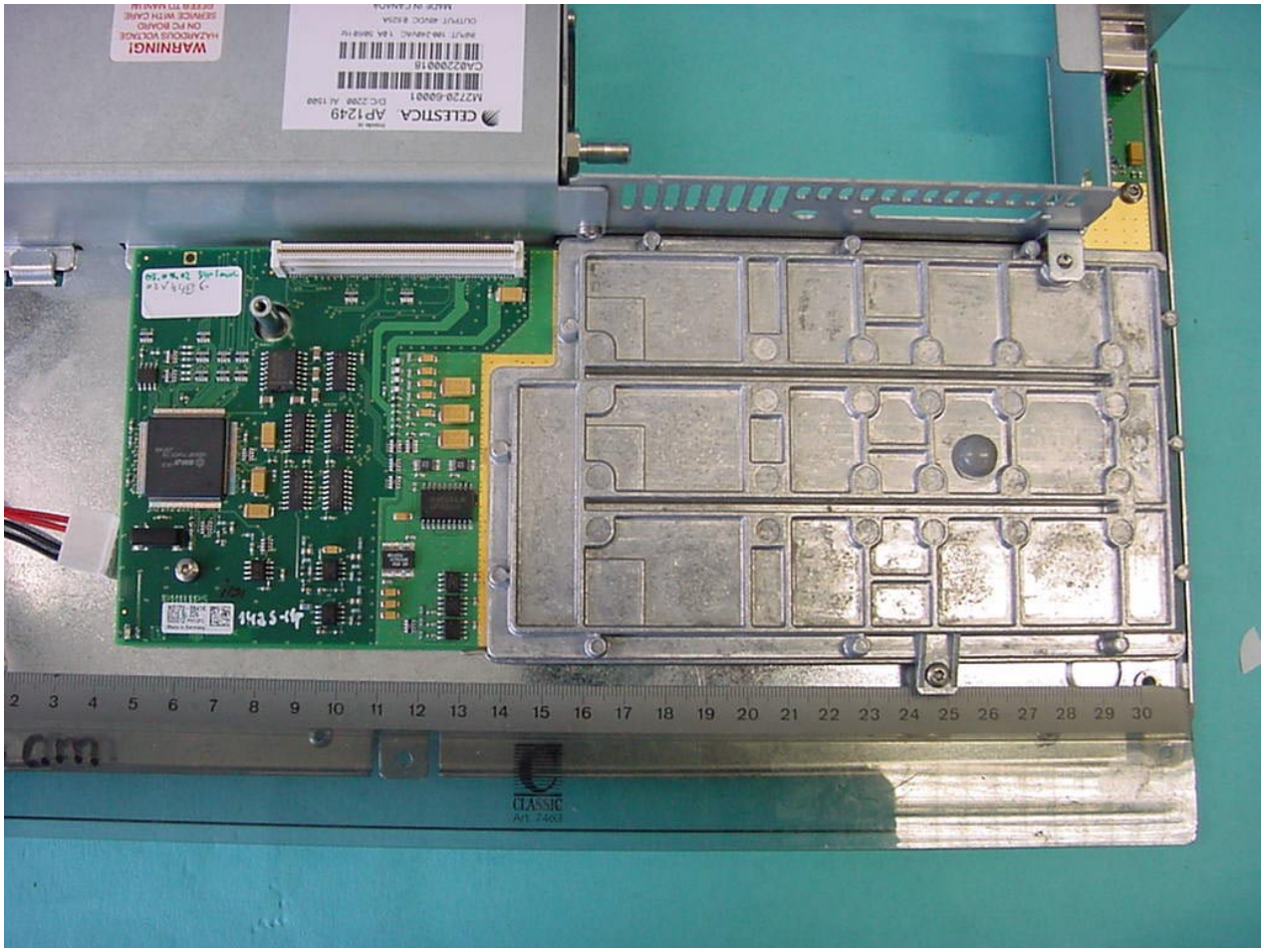
Photograph no.: 6



PHOTOGRAPHS OF THE EQUIPMENT

M2720A Base station

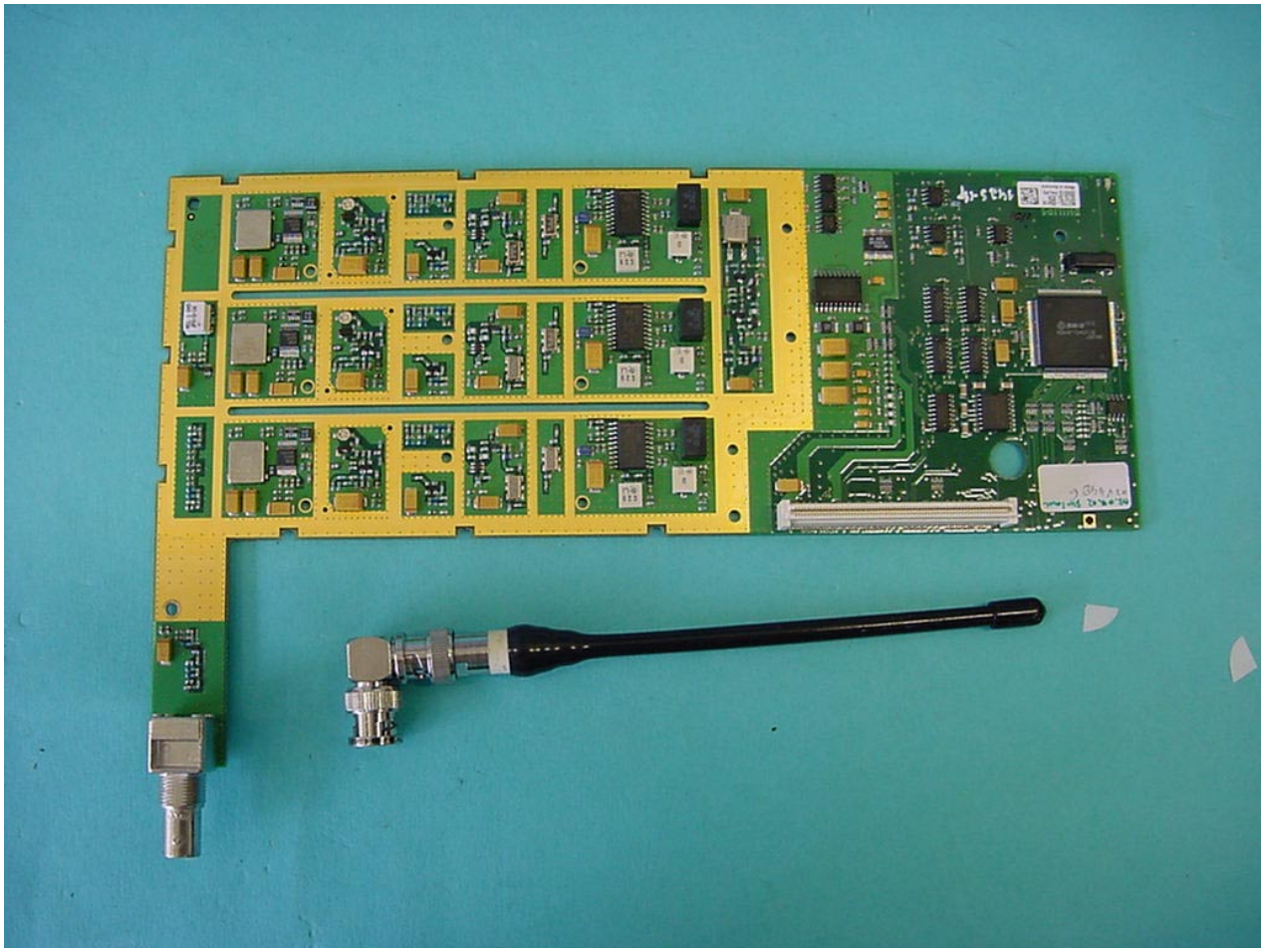
Photograph no.: 7



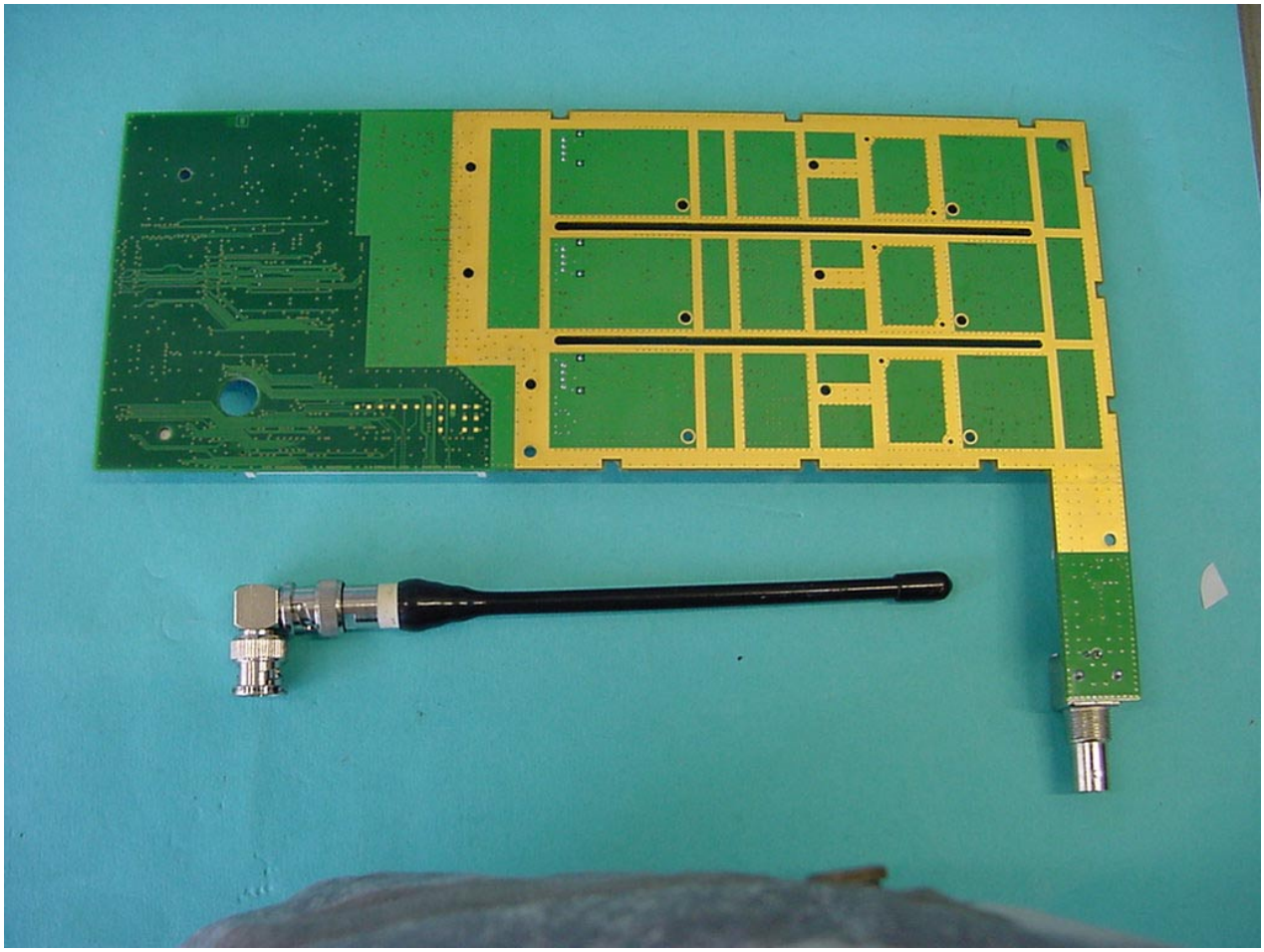
PHOTOGRAPHS OF THE EQUIPMENT

M2720A Base station

Photograph no.: 8



PHOTOGRAPHS OF THE EQUIPMENT

M2720A Base station

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