N3K

EQUIPMENT: DATAPAQ TEST REPORT NUMBER: CTMS 98/573

Cambridge
Test and Measurement Services Limited

PO Box 465, St Andrews Road,
Cambridge CB4 1ZJ, England.
Tel: (Int+44) (0)1223 876676
Fax: (Int+44) (0)1223 876851
website: www.ctms.co.uk

TEST REPORT ON

DATAPAQ
Transmitter Module
Operating between 433.075 and 472.100 MHz
25 KHz Channel Spacing
to
EN 300 220-1(1997)

TEST REPORT NUMBER
CTMS 98/573
November 1998

Prepared for:-

Datapaq Limited
Deanuand House
160 Cowley Road
Cambridge
CB4 4GU

The test results are valid for the tested unit only.

EQUIPMENT: DATAPAQ TEST REPORT NUMBER: CTMS 98/573

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website: www.ctms.co.uk

Certificate of Conformity

Details

Manufacturer	:	Datapaq Limited
Supplier (if different from above)	:	N/A
Product 'Family' name	:	Datapaq
Product Type (Specific)	:	TX1001,TX1002,TX1003.
Serial Number	:	N/A

The product(s) and variant(s) listed were tested to the following standards:

EN 300 220-1(1997)

Cambridge Test and Measurement Services Ltd., certifies that the product tested was fully compliant with the requirements of the standard listed, the results of which are contained in test report No: CTMS 98/573.

Signed on behalf of the Company:

Signature: A. R. Parrish

Date: 11/12/98

A. R. Parrish
Head of Laboratory

SECTION 2

Transmitter Tests < 5 mWatt to EN 300 220-1

Clause No		Page No
8.2	Transmitter Output Power	20
8.3	Adjacent Channel Power	21
8.4	Spurious Emissions (Cabinet Radiated)	22

EQUIPMENT: DATAPAQ TEST REPORT NUMBER: CTMS 98/573

Ambient Temp 22 °C Relative Humidity 41 %

R.F. Power level < 5 mWatts Channel spacing 25 KHz

TRANSMITTER OUTPUT POWER (RADIATED) EN 300 220-1 CLAUSE 8.2
MODULATED/UNMODULATED

TEST CONDITIONS		TRANSMITTER POWER (mWatts)		
		433.075 MHz	458.650 MHz	472.075 MHz
T_{norm} 22 °C	V_{nom} 12.0 V	0.131	0.591	2.19
Measurement uncertainty (dB)		±0.26 dB		

LIMITS CLAUSE 8.2.3

Under normal and Extreme test conditions	Power level mWatt
7a	5
8	10
9	25
11	100
12	500

TEST EQUIPMENT USED :- 20,4,58,59,36,106

Ambient Temp. 21°C Relative Humidity 38%

R.F. Power level < 5 mWatts Channel spacing 25 KHz

RANGE OF MODULATION BANDWIDTH FOR WIDEBAND EQUIPMENT 25kHz

CLAUSE 7.6

TEST CONDITIONS		LIMIT	
		FREQUENCY MHz	
T_{NOM}(21)°C	V_{NOM}(12.0)V	Fl	433.0640
		Fh	433.0843
T_{MIN}(-20)°C	V_{MIN}(10.8)V	Fl	433.0658
		Fh	433.0864
	V_{MAX}(13.2)V	Fl	433.0658
		Fh	433.0864
T_{MIN}(+55)°C	V_{MIN}(10.8)V	Fl	433.0611
		Fh	433.0814
	V_{MAX}(13.2)V	Fl	433.0611
		Fh	433.0814
Measurement uncertainty (dB)	1.75 dB		

Where Fl Lowest frequency at appropriate spurious emission level
Fh Highest frequency at appropriate spurious emission level

Band edge limits Flm = Lowest Fl (measured) 433.0611 MHz
and
Fhm = Highest Fh (measured) 433.0864 MHz

SPURIOUS EMISSION LIMITS (TRANSMITTER OPERATING)

CLAUSE 7.7.5
Table 10

47 MHz to 74 MHz 87.5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies ≤1000 MHz	frequencies ≥1000 MHz
4.0 nW	250 nW	1.00 µW

TEST EQUIPMENT USED 4,10,20,6,39,112

EQUIPMENT: DATAPAQ TEST REPORT NUMBER: CTMS 98/573

Ambient Temp. 21°C Relative Humidity 38%

R.F. Power level < 5 mWatts Channel spacing 25 KHz

RANGE OF MODULATION BANDWIDTH FOR WIDEBAND EQUIPMENT 25kHz

CLAUSE 7.6

TEST CONDITIONS		LIMIT	
		FREQUENCY MHz	
T_{NOM}(21)°C	V_{NOM}(12.0)V	Fl	458.6487
		Fh	458.6515
T_{MIN}(-20)°C	V_{MIN}(10.8)V	Fl	458.6344
		Fh	458.6656
	V_{MAX}(13.2)V	Fl	458.6344
		Fh	458.6656
T_{MIN}(+55)°C	V_{MIN}(10.8)V	Fl	458.6389
		Fh	458.6649
	V_{MAX}(13.2)V	Fl	458.6389
		Fh	458.6649
Measurement uncertainty (dB)	1.75 dB		

Where Fl Lowest frequency at appropriate spurious emission level
Fh Highest frequency at appropriate spurious emission level

Band edge limits Flm = Lowest Fl (measured) 458.6344 MHz
and
Fhm = Highest Fh (measured) 458.6656 MHz

SPURIOUS EMISSION LIMITS (TRANSMITTER OPERATING)

CLAUSE 7.7.5
Table 10

47 MHz to 74 MHz 87.5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies ≤1000 MHz	frequencies ≥1000 MHz
4.0 nW	250 nW	1.00 µW

TEST EQUIPMENT USED 4,10,20,6,39,112

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Ambient Temp. 21°C Relative Humidity 38%

R.F. Power level < 5 mWatts Channel spacing 25 KHz

RANGE OF MODULATION BANDWIDTH FOR WIDEBAND EQUIPMENT 25kHz

CLAUSE 7.6

TEST CONDITIONS		LIMIT	
		FREQUENCY MHz	
T_{NOM}(21)°C	V_{NOM}(12.0)V	Fl	472.0647
		Fh	472.0847
T_{MIN}(-20)°C	V_{MIN}(10.8)V	Fl	472.0587
		Fh	472.0895
	V_{MAX}(13.2)V	Fl	472.0587
		Fh	472.0895
T_{MIN}(+55)°C	V_{MIN}(10.8)V	Fl	472.0667
		Fh	472.0821
	V_{MAX}(13.2)V	Fl	472.0667
		Fh	472.0821
Measurement uncertainty (dB)	1.75 dB		

Where Fl Lowest frequency at appropriate spurious emission level
Fh Highest frequency at appropriate spurious emission level

Band edge limits Flm = Lowest Fl (measured) 472.0587 MHz
and
Fhm = Highest Fh (measured) 472.0895 MHz

SPURIOUS EMISSION LIMITS (TRANSMITTER OPERATING)

CLAUSE 7.7.5
Table 10

47 MHz to 74 MHz 87.5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies ≤1000 MHz	frequencies ≥1000 MHz
4.0 nW	250 nW	1.00 µW

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EQUIPMENT: DATAPAQ TEST REPORT NUMBER: CTMS 98/573

Ambient Temp. 22 °C Relative Humidity 41 %

R.F. Power level < 5 mWatts Channel spacing 25 KHz

TRANSMITTER SPURIOUS EMISSIONS EN 300 220-1 CLAUSE 3.4.3
RADIATED
Transmitter operating.
MODULATED/UNMODULATED

SPURIOUS FREQUENCY (MHz)	EMISSION LEVEL (µW)		
	433.075 MHz	458.650 MHz	472.075 MHz
866.150	0.112		
917.300		0.194	
944.150			0.168
	All the rest >10dB below specification limit.		
Measurement uncertainty (dB)	+1.8/-1.9 dB		

LIMITS CLAUSE 8.7.5

State	47MHz to 74MHz 87.5MHz to 118MHz 174MHz to 230MHz 470MHz to 862MHz	Other frequencies below 1000 MHz	Frequencies above 1000 MHz
Operating	4 nW	250 nW	1 µW
Standby	2 nW	2 nW	20 nW

TEST EQUIPMENT USED:- 4,20,6,35,813,814,904,119

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Certificate of Conformity

Details

Manufacturer	:	Datapaq Limited
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Product 'Family' name	:	Datapaq
Product Type (Specific)	:	TX1001,TX1002,TX1003.
Serial Number	:	N/A

The product(s) and variant(s) listed were tested to the following standards:

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Cambridge Test and Measurement Services Ltd., certifies that the product tested was fully compliant with the requirements of the standard listed, the results of which are contained in test report No: CTMS 98/573.

Signed on behalf of the Company:

Signature:

Date: 11/12/98

A. R. Parrish
Head of Laboratory

DATE TEST SAMPLES RECEIVED:	23/9/98
DATE TESTING STARTED:	24/9/98
DATE TESTING FINISHED:	29/10/98
EQUIPMENT SERIAL NUMBERS:	N/A
PROJECT NUMBER:	98/573
TEST ENGINEER:	D.Fisher
TECHNICAL MANAGER:	D.Fisher

APPROVED BY: A. R. Parrish DATE 11/12/98

A. R. Parrish.
Head of Laboratory

Report Copy No 1

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SECTION 1	Client Application Forms	5
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SECTION 3	Photographs of Equipment	25
SECTION 4	List of Test Instruments	30

SECTION 1

CLIENT APPLICATION FORMS

	Page No
Application Forms	6

APPLICANT'S DETAILS		
CATEGORY OF APPLICANT (Please tick relevant box opposite)	[√]	MANUFACTURER
If box (b), (c) or (d) is ticked complete details in box below with respect to the manufacturer	[ ]	IMPORTER (b)
	[ ]	DISTRIBUTOR (c)
	[ ]	AGENT (d)
COMPANY NAME ADDRESS	Datapaq Limited Deanuand House, 160 Cowley Road, Cambridge CB4 4GU	
NAME FOR CONTACT PURPOSES	Rob Hornsblow	
TELEPHONE No. 01 223 423141	FAXS No 01 223 423306	

If box (a) is ticked and the equipment is manufactured at a different address to that of the applicant,
or if box (b),(c) or (d) is ticked, complete details in the box below with respect to the manufacturer.

MANUFACTURE'S DETAILS	
COMPANY NAME	As Above
ADDRESS	
NAME FOR CONTACT PURPOSES	
TELEPHONE NO	FAXS No

INTENDED USE (For Information only)		
Details: Oven Data Logger Radio Link		
Product Brochures Included	[ ] Yes	[√] No

APPLICANT'S DESIGNATION (1)

The type designation may be either a single alphanumeric code or an alphanumeric code divided into two parts.

Please fill in,

EITHER :-
TYPE DESIGNATION AS A SINGLE ALPHANUMERIC CODE. DATAPAQ

OR :-

TYPE DESIGNATION IN TWO PARTS:-

1). EQUIPMENT SERIES No (2)
("MODEL NUMBER")

2). EQUIPMENT SPECIFIC No (3)
("IDENTIFICATION No") TX1001,TX1002,TX1003

(1) This is the manufacturer's numeric or alphanumeric code or name that is specific to a particular equipment. It may contain information in coded form on the characteristics of the equipment e.g. frequency, power etc. The manufacturer is free to choose the form of the type designation.

(2) This is the number, code or trade name used by the manufacturer to describe a series or 'family' of equipment's of substantially the same mechanical and electric construction which include a number of related equipment's. This number is often referred to as the "Model No.".

(3) This is the manufacturer's identification number given to a specific equipment in the series or 'family' of equipment's. It is often referred to as the "Identification No.".

TYPE APPROVAL TO OTHER E.T.S SPECIFICATIONS

Has the equipment been previously type approved to any other MPTs,ETS or I-ETS

[ ] Yes [√] No

If Yes please provide details of the previous type approval.

EXTREME TEMPERATURE RANGE	
[√] Category 1 (General)	-20°C to +55°C
[ ] Category 2 (Portable equipment)	-10°C to +55°C
[ ] Category 3 (Equipment for normal indoor use)	0°C to +55°C

Note :- The term "equipment for normal indoor use" is taken to mean that the room temperature is controlled and the minimum indoor temperature is equal to or greater than 5°C

CONSTRUCTION OF EQUIPMENT

[√] SINGLE UNIT (See Note 4)

[ ] MULTIPLE UNITS

If multiple units describe each one clearly

Note 4 "UNIT" means a physically separate item of the equipment. The equipment under test may consist of two separate units. For example a car alarm with automatic paging consists of two units; the portable transceiver and associated mobile transceiver.

In this particular case additional sheets covering the transmitter and receiver characteristics for both units would be required, if unit 1 and unit 2 are covered by the same TYPE DESIGNATION.

TYPE OF EQUIPMENT		
FIXED STATION		
[ ] TRANSMITTER	[ ] SIMPLEX	[ ] INTEGRAL ANTENNA
[ ] RECEIVER	[ ] DUPLEX	[ ] SINGLE ANTENNA CONNECTOR
[ ] TRANSCEIVER		[ ] TWO ANTENNA CONNECTOR
MOBILE STATION		
[ ] TRANSMITTER	[ ] SIMPLEX	[ ] INTEGRAL ANTENNA
[ ] RECEIVER		[ ] SINGLE ANTENNA CONNECTOR
[ ] TRANSCEIVER	[ ] DUPLEX	
[ ] REMOTE CONTROL HEAD		[ ] TWO ANTENNA CONNECTOR
PORTABLE STATION		
[√] TRANSMITTER	[ ] SIMPLEX	[√] INTEGRAL ANTENNA
[ ] RECEIVER		[ ] SINGLE ANTENNA CONNECTOR
[ ] TRANSCEIVER	[ ] DUPLEX	
		[ ] TWO ANTENNA CONNECTOR
[ ] BATTERY CHARGER	[ ] VEHICLE BATTERY ADAPTOR	

TRANSMITTER TECHNICAL CHARACTERISTICS
FREQUENCY CHARACTERISTICS
Method of frequency generation :- [ ] CRYSTAL [√] SYNTHESISER [ ] OTHER:-_____
Transmitter channel alignment frequency range (See clause 4.1.2 of standard) 433.075 MHz-472.100 MHz Transmitter frequency switching range 5 MHz
CHANNEL SEPARATION 25 KHz

TRANSMITTER R.F. POWER CHARACTERISTICS			
MAXIMUM RATED TRANSMITTER OUTPUT POWER (as stated by Manufacturer)			
Watts	AT TRANSMITTER RF OUTPUT CONNECTOR (As defined by manufacturer)		
< 5 mWatts	EFFECTIVE RADIATED POWER (For equipment with integral antenna)		
Is transmitter intended for :-			
Continuous Duty	[√]		
Intermittent Duty	[ ]		
If intermittent state Duty Cycle			
TRANSMITTER ON	MIN.	TRANSMITTER OFF	MINS.
IS TRANSMITTER OUTPUT POWER VARIABLE?			
Yes [ ]		NO [√]	
[ ] Continuously Variable		< 5 mW Maximum R.F. power(Watts)	
[ ] Stepped			
dB per step			
W Maximum R.F. power (Watts)			
W Minimum R.F. power (Watts)			

TRANSMITTER - MODULATION			
[ ] AMPLITUDE		[ ] OTHER Details	
[√] FREQUENCY			
[ ] PHASE			
Can the transmitter be operated without modulation (see Note 5)			
[ ] YES		[√] NO	

CLASS OF EMISSION		
ITU DESIGNATION	1	16K0F1D
(If applicable)	2	
(If applicable)	3	
If more than three classes of emissions, list separately		

TRANSMITTER MODULATION INPUT CHARACTERISTICS ANALOGUE

Frequency or Phase Modulation;
[ ] for = 12% of channel separation at 1 KHz
Amplitude Modulation;
[ ] for 60% Modulation depth
or in the case that 60% modulation can not be achieved due to audio limiting,
Declare the maximum modulation depth. %

Modulation input signal level at

Microphone socket	mV	Impedance	Ohms
Accessory socket	mV	Impedance	Ohms
Other (See Note 6)	mV	Impedance	Ohms

Lowest audio modulation frequency transmitted by the equipment: Hz

Note 5 If No, frequency error (subclause 7.1 from standard) is not measured, however, the adjacent channel power under normal and extreme conditions shall be measured.

Note 6 For use where direct connection is provided for test purposes.

TRANSMITTER MODULATION INPUT CHARACTERISTICS DIGITAL

MODULATION BIT RATE. 4.K bit/s

TYPE OF MODULATION

SUBCARRIER:

MSK [ ]

FFSK [ ]

DIRECT

Direct FSK [√]

GMSK [ ]

Generalised Tamed FM [ ]

Multilevel State FM [ ]

PLL-4PSK [ ]

8 PSK [ ]

Other [ ] _____

INTERFACE FOR DATA TRANSMISSION

SIGNAL LEVEL

[ ] V28

[ ] OTHER Details_____

DEFINITION OF SIGNAL

[ ] V24

[ ] OTHER Details_____

NORMAL TEST SIGNAL

Can the equipment transmit continuous bit streams

[√] YES [ ] NO

If no, give details of the format and information agreed with the National Regulatory Authority (Subclause 6.1 of EN 300 220-1 refers).
Note: It is recommended that details of the agreed format are stated on the page of the type test report titled "Additional information supplementary to the test report"

TYPE OF CONNECTOR

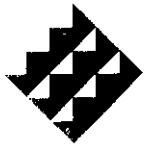
[ ] 25 PIN (RS232)

[ ] 9 PIN (RS232)

[ ] MALE

[ ] FEMALE

[√] OTHER Details: 6 Way PCB Connector



POWER SOURCE

[ ] **AC SUPPLY.**

STATE VOLTAGE _____ V SINGLE PHASE [ ]

AC MAINS FREQUENCY. _____ Hz THREE PHASE [ ]

[√] **DC SUPPLY.**

VOLTAGE 12 Volts

MAX DC CURRENT 40 mA

OTHER

BATTERY TYPE

[√] Nickel Cadmium

[ ] Lead Acid

[ ] Leclanche

[ ] Lithium

[ ] OTHER Details: _____

Extreme test voltages

Nominal DC voltage V

DC Maximum Current (A)

AUTOMATIC EQUIPMENT SWITCH OFF

If the equipment is designed to automatically switch off at a predetermined voltage level which is higher or lower in value than the battery minimum voltage calculated values this shall be clearly stated.

[√] Applies Cut-off voltage 7.5 V

[ ] Does not apply

PRESENTATION OF EQUIPMENT FOR TYPE TESTING							
The definition of the switching range (SR), alignment range and operating frequency range given in Sub clauses 4.1.2 of the Standard. The applicant should ensure that the sample equipment (s) submitted are operational on the appropriate frequency (s) as given in the Sub clauses 4.1.4 to 4.1.7 and the appropriate box is ticked.							
Clause	**Alignment Range**	**Number of Samples**	**Full Tests Sample 1**	**Full Tests Sample 2**	**Limited Tests Sample 3**	**Limited Tests Sample 4+**	**Tick**
4.1.4	**AR0**	**1**	√				
4.1.5	**AR1**	**2**	√	√			
4.1.6	**AR2**	**3**	√	√	√		√
4.1.7	**AR3**	**4 +**	√	√	√	√	

CHANNEL IDENTIFICATION			
Each equipment, whether one or more submitted for tests shall carry clear identification (such as a serial number) , together with the frequencies associated with the channel identification displayed on the equipment.			
Equipment identification e.g. serial No.	CHANNEL No.	NOMINAL TRANSMIT FREQUENCY MHz	NOMINAL RECEIVER FREQUENCY MHz
TX1002		433.075	
TX1001		458.650	
TX1003		472.075	

OTHER ITEMS SUPPLIED		
Spare Batteries for portable equipment.	[ ] YES	[√] NO
Battery charging device.	[ ] YES	[√] NO
Special tools for dismantling equipment.	[ ] YES	[√] NO
Encoder / Decoder.	[√] YES	[ ] NO
Test interface box or appropriate RF test fixture.	[√] YES	[ ] NO
Full documentation on equipment.	[ ] YES	[√] NO
(Handbook and circuit diagrams)		
Others NO		
If yes , please specify		

DECLARATION

Are the equipment's submitted representative production models [√] YES [ ] NO

If no are the equipment's pre-production models. [ ] YES [ ] NO

If pre-production equipment's are submitted will the final production equipment's be identical in all respects with the equipment tested. [ ] YES [ ] NO

If no , please specify

Is this Test report to be used as part of a DTI Radiocommunications Agency Type Approval application.

[√] YES [ ] NO

If yes, has the product, any direct engineering predecessor, or variant ever been granted Type Approval in any EEC member country ?

[ ] YES [√] NO

If yes , please specify

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature _____

Name **Brian Back**

Position held **Consultant**

Company **Radio Tech Limited**

Date _____

SECTION 2

Transmitter Tests < 5 mWatt to EN 300 220-1

Clause No		Page No
8.2	Transmitter Output Power	20
8.3	Adjacent Channel Power	21
8.4	Spurious Emissions (Cabinet Radiated)	22

Ambient Temp 22 °C

Relative Humidity 41 %

R.F. Power level < 5 mWatts

Channel spacing 25 KHz

TRANSMITTER OUTPUT POWER (RADIATED) EN 300 220-1 CLAUSE 8.2

MODULATED/UNMODULATED

TEST CONDITIONS		TRANSMITTER POWER (mWatts)		
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LIMITS CLAUSE 8.2.3

Under normal and Extreme test conditions	**Power level mWatt**
7a	5
8	10
9	25
11	100
12	500

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Ambient Temp. 21°C Relative Humidity 38%

R.F. Power level < 5 mWatts Channel spacing 25 KHz

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CLAUSE 7.6

TEST CONDITIONS		LIMIT	
		FREQUENCY MHz	
T_{NOM}(21)°C	V_{NOM}(12.0)V	Fl	433.0640
		Fh	433.0843
T_{MIN}(-20)°C	V_{MIN}(10.8)V	Fl	433.0658
		Fh	433.0864
	V_{MAX}(13.2)V	Fl	433.0658
		Fh	433.0864
T_{MIN}(+55)°C	V_{MIN}(10.8)V	Fl	433.0611
		Fh	433.0814
	V_{MAX}(13.2)V	Fl	433.0611
		Fh	433.0814
Measurement uncertainty (dB)	1.75 dB		

Where Fl Lowest frequency at appropriate spurious emission level
Fh Highest frequency at appropriate spurious emission level

Band edge limits Flm = Lowest Fl (measured) 433.0611 MHz
and
Fhm = Highest Fh (measured) 433.0864 MHz

SPURIOUS EMISSION LIMITS (TRANSMITTER OPERATING)

CLAUSE 7.7.5
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47 MHz to 74 MHz 87.5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies ≤1000 MHz	frequencies ≥1000 MHz
4.0 nW	250 nW	1.00 µW

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CLAUSE 7.6

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		Fh	458.6515
T_{MIN}(-20)°C	V_{MIN}(10.8)V	Fl	458.6344
		Fh	458.6656
	V_{MAX}(13.2)V	Fl	458.6344
		Fh	458.6656
T_{MIN}(+55)°C	V_{MIN}(10.8)V	Fl	458.6389
		Fh	458.6649
	V_{MAX}(13.2)V	Fl	458.6389
		Fh	458.6649
Measurement uncertainty (dB)	1.75 dB		

Where Fl Lowest frequency at appropriate spurious emission level
Fh Highest frequency at appropriate spurious emission level

Band edge limits Flm = Lowest Fl (measured) 458.6344 MHz
and
Fhm = Highest Fh (measured) 458.6656 MHz

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		Fh	472.0847
T_{MIN}(-20)°C	V_{MIN}(10.8)V	Fl	472.0587
		Fh	472.0895
	V_{MAX}(13.2)V	Fl	472.0587
		Fh	472.0895
T_{MIN}(+55)°C	V_{MIN}(10.8)V	Fl	472.0667
		Fh	472.0821
	V_{MAX}(13.2)V	Fl	472.0667
		Fh	472.0821
Measurement uncertainty (dB)	1.75 dB		

Where Fl Lowest frequency at appropriate spurious emission level
Fh Highest frequency at appropriate spurious emission level

Band edge limits Flm = Lowest Fl (measured) 472.0587 MHz
and
Fhm = Highest Fh (measured) 472.0895 MHz

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4.0 nW	250 nW	1.00 µW

TEST EQUIPMENT USED 4,10,20,6,39,112

Ambient Temp. 22 °C

Relative Humidity 41 %

R.F. Power level < 5 mWatts

Channel spacing 25 KHz

TRANSMITTER SPURIOUS EMISSIONS EN 300 220-1 CLAUSE 3.4.3
RADIATED
Transmitter operating.
MODULATED/UNMODULATED

SPURIOUS FREQUENCY (MHz)	EMISSION LEVEL (µW)		
	433.075 MHz	458.650 MHz	472.075 MHz
866.150	0.112		
917.300		0.194	
944.150			0.168
	All the rest >10dB below specification limit.		
Measurement uncertainty (dB)	+1.8/-1.9 dB		

LIMITS CLAUSE 8.7.5

State	47MHz to 74MHz 87.5MHz to 118MHz 174MHz to 230MHz 470MHz to 862MHz	Other frequencies below 1000 MHz	Frequencies above 1000 MHz
Operating	4 nW	250 nW	1 µW
Standby	2 nW	2 nW	20 nW

TEST EQUIPMENT USED:- 4,20,6,35,813,814,904,119

SECTION 3

PHOTOGRAPHS OF EQUIPMENT

	Page No
Front View	26
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PCB Top View	28
PCB Rear View	29

SECTION 4

TEST INSTRUMENTS and ANCILLARIES USED FOR RADIO & EMC TESTING

Each item of test equipment has a unique number allocated by Cambridge Test and Measurement Services Ltd. This number is listed on each page of the test report where this instrument was used in the test specified on that page.

TEST LAB No.	DESCRIPTION	MANUFACTURER	TYPE	SERIAL No
1	Audio Analyser	Hewlett Packard	HP 8903 B	3011A09130
2	Oscilloscope	Philips	PM 3375	DM546029
3	R.F. Generator	Rhode & Schwarz	SMPD	880627/003
4	Digital Multimeter	Philips	PM 2534	DY002910
5	R.F. Generator	Hewlett Packard	HP 8642A	2748A01501
6	Spectrum Analyser	Anritsu	MS 2602A	MT88057
7	RF Power Meter	Hewlett Packard	435B	2449U01762
8	RF Power Sensor	Hewlett Packard	8481B	2350A03194
9	R.F. Generator	Hewlett Packard	HP 8640B	1415U00184
10	ThermoHygrometer	Radio Spares	TH200	0896/253
11	10dB Attenuator	Bird	8343-100	633
12	High Pass Filter	Anritsu	MP526D	M12524
13	High Pass Filter	Anritsu	MP526B	M15624
14	High Pass Filter	Anritsu	MP526A	M09521
15	Notch Filter	Telonic Altair	TTR 95-3EE	70063-1
16	Notch Filter	Telonic Altair	TTR 375-3EE	0004-1
17	Notch Filter	Telonic Altair	TTR 190-3EE	60435-5
18	Modulation Analyser	Hewlett Packard	8901B	2642A01009
19	Audio Power Meter	Marconi	TF 893A	190134/050
20	Power Supply	Kingshill	18V10C	562
21	Power Supply	Kingshill	18V10C	561
22	Audio Power Meter	Marconi	TF 893A	58507/017
23	Receiver	Chase	UHR4000	6081
24	Attenuator 30 dB	Bird	8321	1058
25	Attenuator 10 dB	Bird	8343/100	623
26	Variable Attenuator	Telonic	8120A 50ohm	90789-4
27	50 Ohm Load 10W	Termaline	8053	7456
28	Attenuator 20 dB	Marconi	6535/4	625
29	50 Ohm Load 50W			
31	Adjacent Channel Power Meter	Rhode & Schwarz	NKS	879169/011
32	Mains Variac			
33	R.F. Generator	Rhode & Schwarz	SMH	894091-012
34	Modulation Analyser	Hewlett Packard	8901B	3011A09131
35	Signal Generator	Marconi	2032	119855-057
36	Environmental Oven	Heraeus Votsch	VMT 04/30	24558
37	Environmental Oven	Heraeus Votsch	VMT 04/240	27730
38	Environmental Oven	Heraeus Votsch	VMT 04/140	28785
39	Environmental Oven	Heraeus Votsch	VMT 04/16	24682

TEST LAB No.	DESCRIPTION	MANUFACTURE	TYPE	SERIAL No
40	R.F. Generator	Hewlett Packard	8657A	2929A00908
41	Signal Generator	Marconi	2018	118421/001
42	RF Power Sensor	Hewlett Packard	8481A	2702A77623
43	Signal Generator	Hewlett Packard	8657A	2849U01043
44	Dual Directional Coupler	Hewlett Packard	777D	07041
45	Attenuator	Weinschel	Model 1	AX4024
46	Attenuator	Weinschel	Model 1	AX2978
47	50Ω Termination	Wiltron	28N50-3	600051
48	Modulation Analyser	Hewlett Packard	8901B	2806A01910
49	Modulation Analyser	Hewlett Packard	8901B	3028A03136
50	Modulation Analyser	Hewlett Packard	8901B	2920A02137
51	Attenuator	Narda	766-3	
52	Signal Generator	Hewlett Packard	8656B	2838UO5964
53	Audio Analyser	Hewlett Packard	HP 8903 B	2836A05550
54	Signal Generator	Hewlett Packard	8656B	2838U05943
55	Audio Analyser	Hewlett Packard	HP 8903 B	2836A05420
101	R.F. Coax Cable 0.5M	LOCAL		TMS RF 101
102	R.F. Coax Cable 0.75M	LOCAL		TMS RF 102
103	R.F. Coax Cable 0.5M	LOCAL		TMS RF 103
104	R.F. Coax Cable 1.0M	LOCAL		TMS RF 104
105	R.F. Coax Cable 1.0M	LOCAL		TMS RF 105
106	R.F. Coax Cable 0.75M	LOCAL		TMS RF 106
107	R.F. Coax Cable 1.0M	LOCAL		TMS RF 107
108	R.F. Coax Cable 0.75M	LOCAL		TMS RF 108
109	R.F. Coax Cable 0.75M	LOCAL		TMS RF 109
110	R.F. Coax Cable 0.5M	LOCAL		TMS RF 110
111	R.F. Coax Cable 0.75M	LOCAL		TMS RF 111
112	R.F. Coax Cable 1.0M	LOCAL		TMS RF 112
113	R.F. Coax Cable 1.0M	LOCAL		TMS RF 113
114	R.F. Coax Cable 1.0M	LOCAL		TMS RF 114
115	R.F. Coax Cable	LOCAL		TMS RF 115
116	R.F. Coax Cable	LOCAL		TMS RF 116
117	R.F. Coax Cable	LOCAL		TMS RF 117
118	R.F. Coax Cable	LOCAL		TMS RF 118
119	R.F. Coax Cable 4.0M	LOCAL		TMS RF 119
201	4 WAY COMBINER	ANZAC	DS 312	TMS COMB 201
202	4 WAY COMBINER	ANZAC	DS -4-4	TMS COMB 202
203	4 WAY COMBINER	ANZAC	DS -4-4	TMS COMB 203
204	4 WAY COMBINER	ANZAC	DS 312	TMS COMB 204
205	2 WAY COMBINER	SUHNER	4901.01B	TMS COMB 205
206	2 WAY COMBINER	SUHNER	4901.01B	TMS COMB 206
301	MIXER/FILTER 12.5 KHz	LOCAL		TMS FILT 301
302	MIXER/FILTER 25.0 KHz	LOCAL		TMS FILT 302

TEST LAB No.	DESCRIPTION	MANUFACTURER	TYPE	SERIAL No
801	100 Watt Amplifier	Amplifier Research	100W1000M1	14195
802	Field Strength Meter	Holaday	HI-4400	60825
803	25 Watt Amplifier	Amplifier Research	25A250	14605
804	Power Supply	Kingshill	18V10C	686
805	Modulation Meter	Marconi	2305	169810-046
806	A.F. Oscillator	Marconi	TF2000	351220-02
807	Coupling Clamp	Schaffner	CDN 125	62436
808	Current Probe	Chase		10500792
809	Screened Chamber	Rayproof		6366
810	Screened Chamber	Belling Lee		74152
812	Dipoles	Anritsu	MP534A, 34E3610, EP-0169	M08533,M22021, M22021
813	Dipoles	Anritsu	MP534A, 34E3610, EP-0169	M21921,M21921, M53022
814	Dipoles	Anritsu	MP534A, 34E3610, EP-0169	M11112,M11112, X0002
901	Spectrum Analyser	Advantest	R3261C	51720046
902	Isotropic Probe	Holaday	HI-4421G	84838
903	Antenna	Chase	Bi Log	1668
904	Antenna	Rhode & Schwarz	Log Periodic	321312-30
905	Transient Limiter	Chase	CFL 9206	1067
906	ESD Gun	Keytek	MZ-15	9107193
907	Thermo-Hygrometer	Radio spares	TH200	0896-256
908	Manometer	Digitron	P200 AH	663
909	Signal Generator	Marconi	2030	119628-013
910	Interference test System	Schaffner	NSG600	3008
911	Double AC Supply Variator	Schaffner	NSG642	104
912	Line Impedance Stabilising Network	Chase	MN2053	5309
913	Isotropic Probe	Amplifier Research	FP2000	16294
914	Antenna Biconical	Schwarzbeck	VHBA9123	7440
915	Log Periodic	Chase	UPA6108	1065
916	EMI Test Receiver	Rhode & Schwarz	ESHS10	835499/0016
917	EMI Test Receiver	Rhode & Schwarz	ESVS10	843207/0015
918	RF Power Meter	Bird	4421	3220
919	RF Power Sensor	Bird	4022	6840

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TEST REPORT FROM RADIO FREQUENCY INVESTIGATION LTD.

Test Of: Radio-Tech Limited.
Datapaq TX1000A

To: FCC Part 90: 1996
Clause 90.217

Test Report Serial No:
RFI/EMCB1/RP36716A

This Test Report Is Issued Under The Authority Of Brian Watson, Technical Director:	
Tested By:	**Checked By:**
Report Copy No: OZ	
Issue Date: 2 June 1998	**Test Date: 18 May 1998**

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1. Client Information

Company Name:	Radio-Tech Limited
Address:	Overbridge House 41 Weald Hall Lane Thornwood Common Epping Essex CM16 6NB
Contact Name:	Mr B M Back

2. Equipment Under Test (EUT)

The following information (with the exception of the Date of Receipt) has been supplied by the client:

2.1. Identification Of Equipment Under Test (EUT)

Brand Name:	Datapaq
Model Name or Number:	TX1000A
Unique Type Identification:	US Version 464.075 to 464.875 MHz
Serial Number:	982203
Country of Manufacture:	United Kingdom
FCC ID Number:	None stated
Date of Receipt:	18 May 1998

2.2. Description Of EUT

The TX1000A is a dedicated radio interface that takes data from an attached data logger and transmits it to a host receiver. The data loggers are manufactured by Datapaq, and are used for industrial process monitoring, for example in the I.R. oven monitoring for PCB manufacturing.

The TX1000A actually takes the data from the logger and converts it into an encrypted data packet, which is frequency modulated onto a UHF carrier generated by a frequency synthesiser based transmitter covering 464.075 MHz to 464.875 MHz in 25 kHz steps.

2.3. Modifications Incorporated In EUT

None stated by client.

2.4. Additional Information Related To Testing

Power Supply Requirement:	+ 7.5 V nominal DC supply, obtained from the data logger and in the case of the sample tested the test box provided
Intended Operating Environment:	I.R. reflow oven for PCB manufacture/Brick Kilns and Paint Ovens
Dimensions:	130mm x 15mm x 100mm
Interface Ports:	TTL + 5 V logic dedicated to meet the Datapaq internal logger standard

2.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Test Box
Brand Name:	None, custom made test box
Model Name or Number:	Not stated by client
Serial Number:	Not stated by client
FCC ID Number:	Not stated by client
Cable Length And Type:	None
Connected to Port:	Direct by plug to data port

3. Test Specification, Methods And Procedures

3.1. Test Specification

Reference:	FCC Part 90: 1996 Clause 90.217
Title:	Code of Federal Regulations, Part 90 (47CFR80 to end) Private Land Mobile Radio Services.
Comments:	A description of the test facility used for this test is on file with, and has been accepted by, the Federal Communications Commission as required by Section 2.948 of Federal Rules.
Purpose of Test:	To determine whether the equipment complied with the requested part of the specification for the purposes of Type Acceptance.

3.2. Methods And Procedures

The methods and procedures used were as detailed in:

ANSI C63.2 (1987)
Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (1992)
Title: American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1988)
Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)
Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16 (1987)
Title: Specification for Radio Interference measuring apparatus and measurement methods.

3.3. Definition Of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the Methods & Procedures section above. Appendix 1 contains a list of the test equipment used.

4. Deviations From The Test Specification

None.

5. Operation Of The EUT During Testing

5.1. Operating Conditions

The EUT was tested in a normal laboratory environment.

During testing, the EUT was powered by a + 7.5V nominal DC supply, obtained from the data logger. In the case of the sample tested, the test box provided the DC supply.

5.2. Operating Modes

The EUT was tested in the following operating mode: Continuous transmit mode.

The reason for choosing this mode was that it was defined by the client as being likely to be the worst case with regards to EMC.

5.3. Configuration And Peripherals

The EUT was tested in the following configuration: The EUT was connected directly to the test box, which generated a typical data scenario for the EUT to transmit.

The reason for choosing this configuration was that it was defined by the client as being likely to be the worst case with regards EMC and the most representative configuration.

NB Section 2 of this report contains a full list of support equipment used and Appendix 3 contains a schematic diagram of the test configuration.

6. Summary Of Test Results

6.1. Radiated Emissions

Range Of Measurements	Specification Reference	Compliancy Status
Electric Field Strength, 30 MHz to 5000 MHz	Section 90 Clause 90.217 of C.F.R. 47: 1996	Complied

6.2. Location Of Tests

All the measurements described in this report were performed at the premises of Radio Frequency Investigation Ltd, Ewhurst Park, Ramsdell, Basingstoke, Hampshire, RG26 5RQ, England.

7. Measurements, Examinations And Derived Results

7.1. General Comments

7.1.1. This section contains test results only. Details of the test methods and procedures can be found in Appendix 2 of this report.

7.1.2. The measurement uncertainties stated were calculated in accordance with the requirements of NAMAS Document NIS 81 with a confidence level of 95%. Please refer to Section 8 for details of measurement uncertainties.

7.1.3. As the EUT is powered from a + 7.5 volt dc supply, conducted emission measurements were not performed.

7.2. Test Results For Radiated Emissions

7.2.1. Electric Field Strength Measurements

7.2.1.1. The client has stated that the highest transmit frequency for the EUT is 464.875MHz. Therefore tests were performed up to 5 GHz.

7.2.1.2. Plots of the initial scans can be found in Appendix 5.

7.2.1.3. The following table lists frequencies at which emissions were measured using a Quasi-Peak detector (results incorporate antenna factors and cable losses):

Frequency (MHz)	Ant. Pol.	Q-P Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
171.520	Horiz.	15.4	71.1	55.7	Complied
172.950	Horiz.	18.6	71.1	52.5	Complied
292.602	Horiz.	21.6	71.1	49.5	Complied
464.227	Horiz.	101.1	N/A	N/A	N/A (Note 1)
928.454	Horiz.	65.3	71.1	5.8	Complied

Note 1: According to section 90.217a) of the FCC regulations, the amplitude of the fundamental transmitted signal is measured to determine the limit for spurious emissions. For a product of this type, the spurious emissions shall not exceed a level 30dB lower than the fundamental signal.

7.2.2. Electric Field Strength Measurements

7.2.2.1. The client has stated that the highest transmitted frequency for the EUT was 464.875 MHz. Therefore tests were performed up to 5GHz.

7.2.2.2. Plots of the initial scans can be found in Appendix 5.

7.2.2.3. The following tables list frequencies at which emissions were measured using Peak and Average detector functions:

Highest Average Level:

Frequency (GHz)	Antenna Polarity (H/V)	Average Detector level (dBμV)	Antenna factor (dB)	Cable loss (dB)	Actual Average Level (dBμV/m)	Average Limit (dBμV/m)	Average Margin (dB)	Result
1.3927	Vert.	26.8	21.7	1.2	49.7	71.1	21.4	Complied
1.8569	Vert.	25.1	21.7	1.2	48.0	71.1	23.1	Complied

Highest Peak Level:

Frequency (GHz)	Antenna Polarity (H/V)	Peak Detector level (dBμV)	Antenna factor (dB)	Cable loss (dB)	Actual Peak Level (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	Result
1.3927	Vert.	32.7	21.7	1.2	55.6	71.1	15.5	Complied
1.8569	Vert.	31.9	21.7	1.2	54.8	71.1	16.3	Complied

8. Measurement Uncertainty

8.1. Company Policy, as based on the NAMAS Accreditation Standard, M10, paragraph 12.11 (o), states that Test Reports shall include estimated uncertainty of the calibration or test result (this information need only appear in test reports and test certificates where it is relevant to the validity or application of the test result, where a client's instructions so require or where uncertainty affects compliance to a specification or limit).

8.2. The global uncertainties have been calculated in accordance with NAMAS NIS 81 (Edition 1, May 1994) as follows:

Measurement Type	Range	Confidence Level	Calculated Uncertainty
Radiated Emissions	30 MHz to 1000 MHz	95%	+/- 4.9 dB
Radiated Emissions	1 GHz to 5 GHz	95%	+/- 4.3 dB

8.3. Measurement uncertainties have been applied in accordance with NAMAS document NIS 81 (edition 1, May 1994), and in the absence of any specification criteria, guidance, or code of practice, compliance has been judged on the basis of shared risk.

8.4. In the case of emissions tests, the measured value of the disturbance from the product sample shall be compared directly with the limits. If the measured value is equal to or less than the limit the product is deemed to pass the test.

8.5. In the case of immunity tests, the equipment is deemed to pass the test if it fulfils the stated performance criteria at the required or a higher severity level. The measurement uncertainty has been taken into account in the calibration procedures stated in the relevant basic standard.

8.6. The methods used to calculate the above uncertainties are in line with those used for calibration laboratories contained in NAMAS document NIS 3003 Edition 8 "The Expression of Uncertainty and Confidence in Measurement" May 1995, which align with international recommendations "Guide to the Expression of Uncertainty in Measurement" ISO/IEC/OIML/BIPM (Prepared by ISO/TAG 4: January 1993).

Appendix 1. Test Equipment Used

Instrument	Manufacturer	Model	RFI No.
Radiated Electric Field, OATS:			
UHF Receiver	R & S	ESVP	M002
Controller	R & S	EZM	M004
Receiver	R & S	ESBI	M090
Bilog antenna	Chase	CBL6111A	A259
Horn antenna, 1GHz to 2GHz	Eaton	9188-2	A028
Radiated Electric Field, Initial Scans:			
Receiver	R & S	ESBI	M090
Bilog antenna	Chase	CBL6111A	A490
Horn antenna, 1GHz to 2GHz	Eaton	9188-2	A028
Horn antenna, 2GHz to 4GHz	Eaton	91889-2	A031
Horn antenna, 4GHz to 5GHz	FMI	2094-NF10	None

NB In accordance with NAMAS requirements, all the measurement equipment is on a calibration schedule.

Appendix 2. FCC Part 90.217 Limit Calculations

A2.1. To obtain the limit as specified in section 90.217, the carrier level (Fundamental) was measured and found to be at a level of 101.1dBμV/m. A limit was then set 30dB below this level (71.1dBμV/m) and any spurious emissions found to be within 10 dB of this limit were measured on the open area test site.

Appendix 3. Measurement Methods

A3.1. Initial measurements covering the entire measurement band in the form of swept scans in a shielded enclosure were performed in order to identify frequencies on which the EUT was generating interference. This determined the frequencies of emissions on which the EUT should be re-measured in full on the open area test site. In order to minimise the time taken for the swept measurements, a Peak detector was used in conjunction with the appropriate detector IF measuring bandwidth (see table below). Repetitive scans were performed to allow for emissions with low repetition rates, and for the duty cycle of the EUT. The test configuration was the same for the initial scans as for the final measurements.

A3.2. The initial scans were performed using an antenna height of 1.5 metres and a measurement distance of 3m.

A 3.3. Following the initial scans, graphs were produced giving an overview of emissions from the EUT plotted against the appropriate specification limit. A tolerance line was set 10dB below the specification limit and levels above the tolerance line were re-tested on the open area test site. A Quasi-Peak detector was used for measurements below 1000MHz. For measurements above 1000MHz, average and peak detectors were used.

A3.4 For the main (final) measurements the EUT was arranged on a non-conducting table on an open area test site, as detailed in ANSI C 63.4:1992.

A3.5 All measurements on the open area test site were performed using broadband antennas.

A3.6 On the open area test site, at each frequency where a signal was found the levels were maximised by initially rotating the turntable through 360° and then varying the antenna height between 1 m and 4 m (for signals below 1000MHz).
For emissions above 1000MHz, the antenna height was fixed at 1.5m and only the turntable and polarisation of the antenna were used to maximise the level of the emission.

A3.7 The test equipment settings for radiated emissions measurements were as follows:

Receiver Function	Initial Scan	Final Measurements Below 1GHz	Final Measurements Above 1 GHz
Detector Type:	Peak	Quasi-Peak (CISPR)	Peak/Average
Mode:	Max Hold	Not applicable	Not applicable
Bandwidth:	100 kHz < 1 GHz 1.0 MHz > 1 GHz	120 kHz	1 MHz
Amplitude Range:	60 dB	20 dB	20 dB (typical)
Measurement Time:	Not applicable	> 1 s	> 1 s
Observation Time:	Not applicable	> 15 s	> 15 s
Step Size:	Continuous sweep	Not applicable	Not applicable
Sweep Time:	Coupled	Not applicable	Not applicable

Appendix 4. Test Configuration Drawings

This appendix contains the following drawings:

Drawing Reference Number	Title
DRG\36716JD02ETF02\EMIRAD	Test configuration for measurement of radiated emissions
DRG\36716JD02ETF02\001	Schematic diagram of the EUT, support equipment and interconnecting cables used for the test

Test Of: Radio-Tech Limited. Datapaq TX1000A
To: FCC Part 90: 1996 Clause 90.217

DRG\36716JD02ETF02\EMIRAD

Non-metallic remote controlled antenna tower, vertical range 1m to 4m with remote polarisation control.

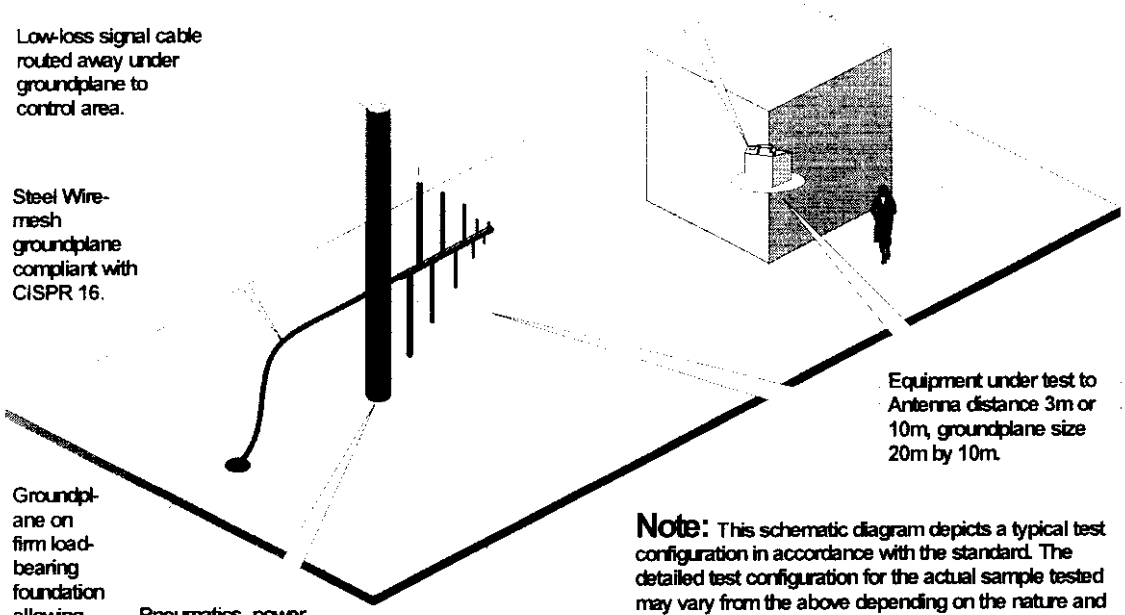
Test antenna, plane-polarised. Antenna factors taken into account in measurement.

Electrical supply to EUT, control lines for turntable and remote monitoring cables all routed underground to control area outside CISPR ellipse.

Non-metallic shelter housing remote controlled turntable, equipment under test and support equipment.
Table top equipment mounted on 0.8m wooden spacer table.

Low-loss signal cable routed away under groundplane to control area.

Steel Wire-mesh groundplane compliant with CISPR 16.



Equipment under test to Antenna distance 3m or 10m, groundplane size 20m by 10m.

Groundplane on firm load-bearing foundation allowing fast drainage and durability.

Pneumatics, power and control wires for mast routed under the groundplane from control area.

Groundplane mesh hole size 12mm. Flat to 5mm per metre in length and width.

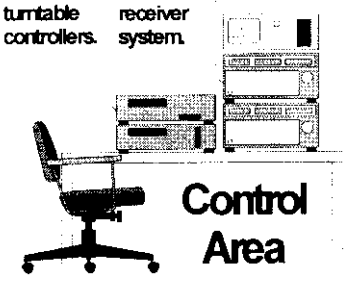
Note: This schematic diagram depicts a typical test configuration in accordance with the standard. The detailed test configuration for the actual sample tested may vary from the above depending on the nature and operation of the EUT.
The test site used by RFI is nominally at ground level.
All electrical cables run underground.
All other dimensions in accordance with the standard.

Test Configuration For Radiated Emissions Measurements

Reflection-free area: >60m by 52m
(CISPR ellipse)
Groundplane Earthed
Control room outside CISPR ellipse

Mast and turntable controllers.

Test receiver system.

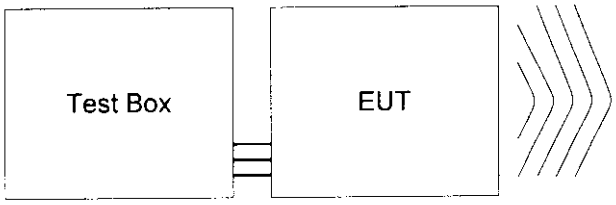


Control Area

Test Of: Radio-Tech Limited. Datapaq TX1000A
To: FCC Part 90: 1996 Clause 90.217

DRG\36716JD02ETF02\001

Configuration of EUT and Local Support Equipment



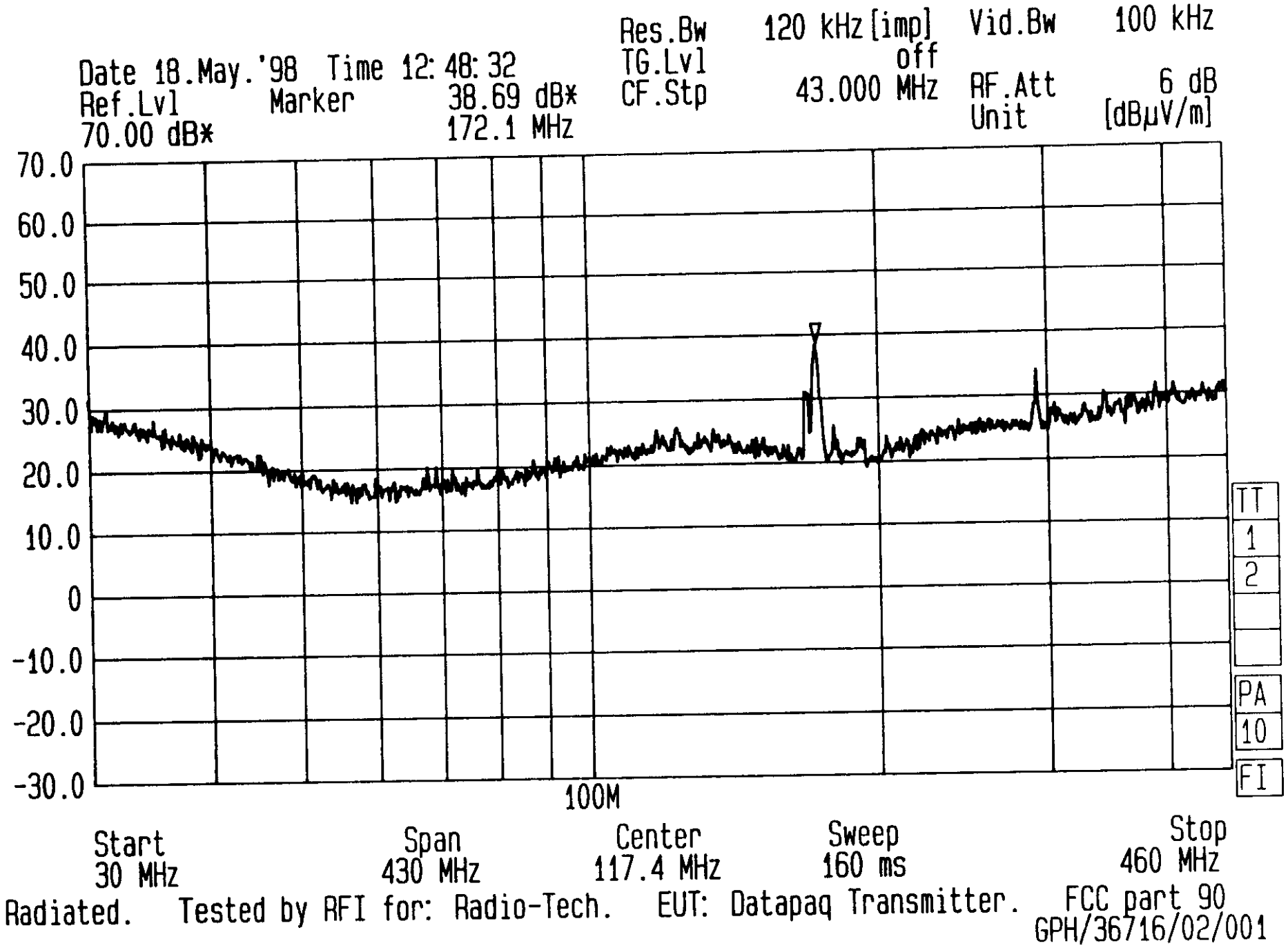
Configuration of Remote Support Equipment

Appendix 5. Graphical Test Results

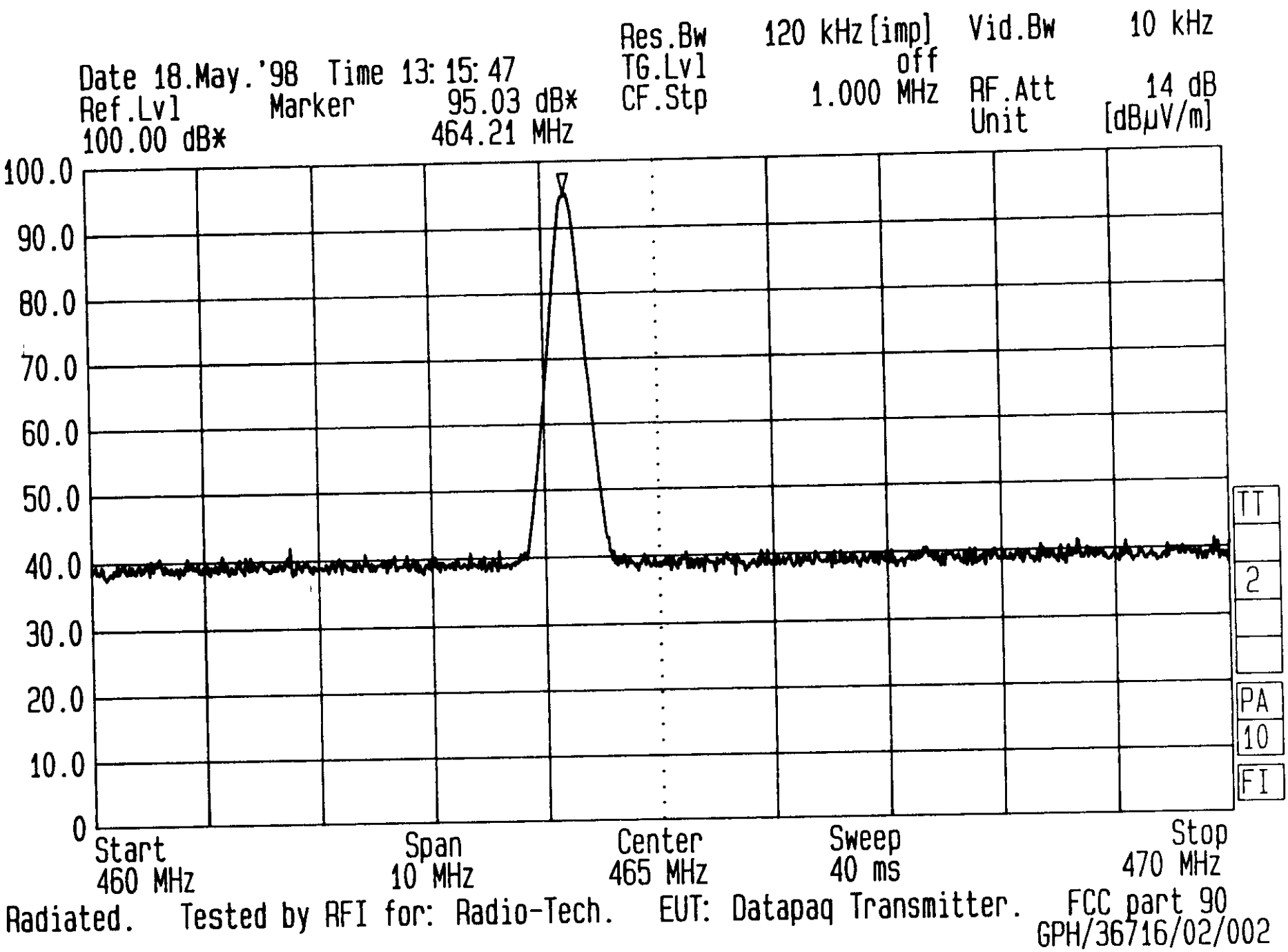
This appendix contains the following graphs:

Graph Reference Number	Title
GPH\36716\02\001	Scan of radiated emissions: (30 MHz to 460 MHz)
GPH\36716\02\002	Scan of radiated emissions: (460 MHz to 470 MHz)
GPH\36716\02\003	Scan of radiated emissions: (470 MHz to 1000 GHz)
GPH\36716\02\004	Scan of radiated emissions: (1 GHz to 2 GHz)
GPH\36716\02\005	Scan of radiated emissions: (2 GHz to 4 GHz)
GPH\36716\02\006	Scan of radiated emissions: (4 GHz to 5 GHz)

These pages are not included in the total number of pages for this report.



Radiated. Tested by RFI for: Radio-Tech. EUT: Datapaq Transmitter. FCC part 90
GPH/36716/02/001



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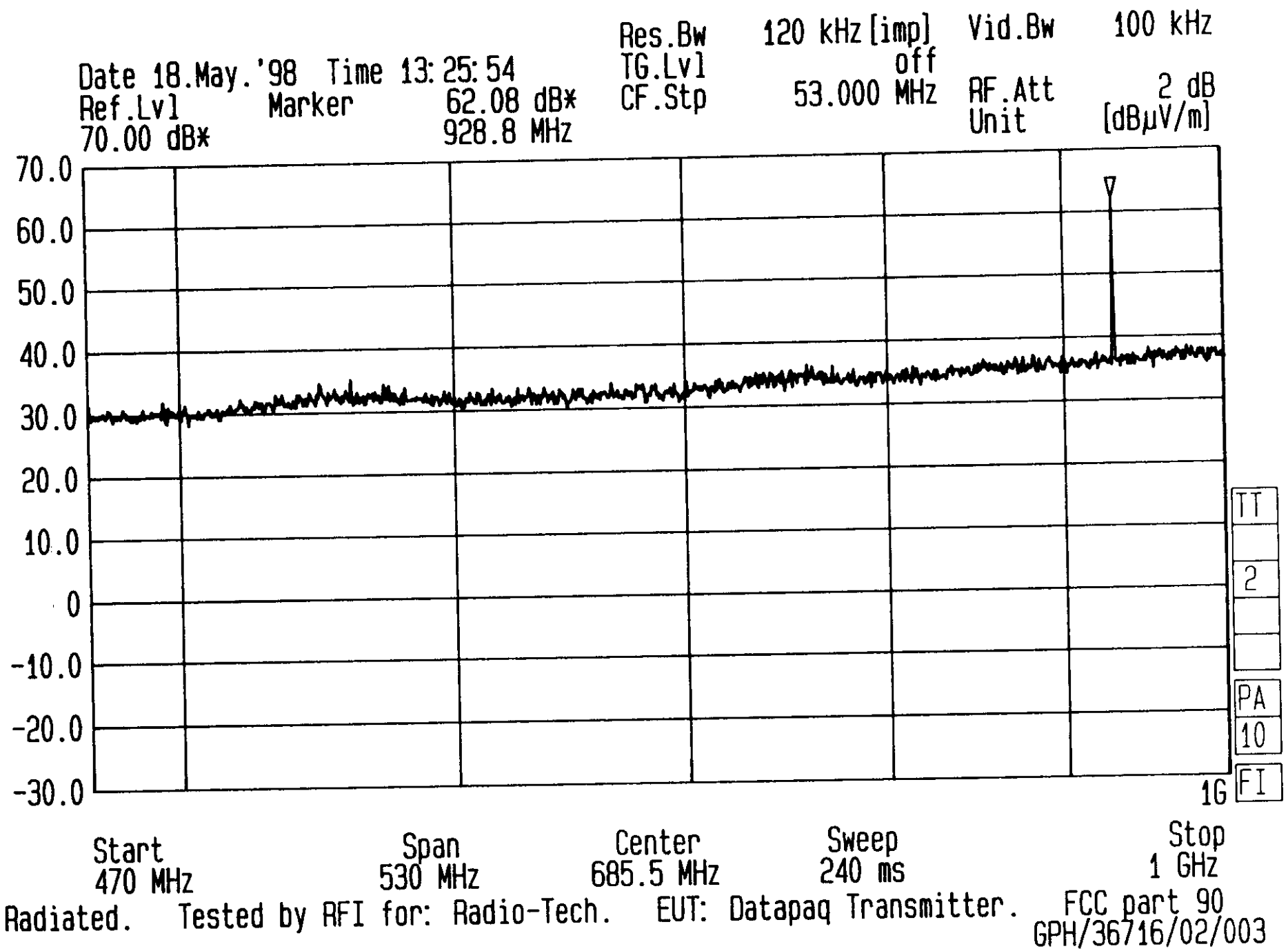

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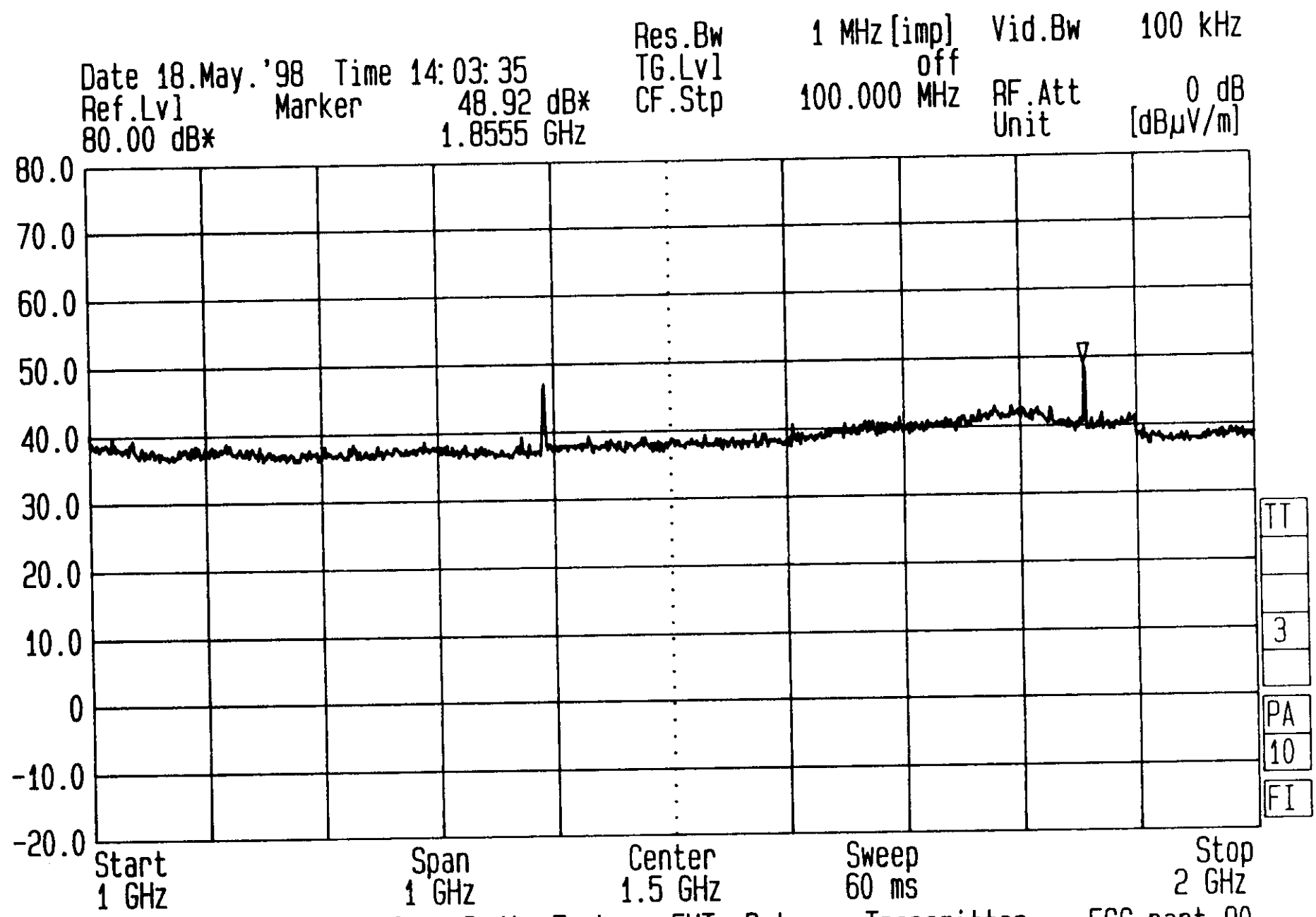

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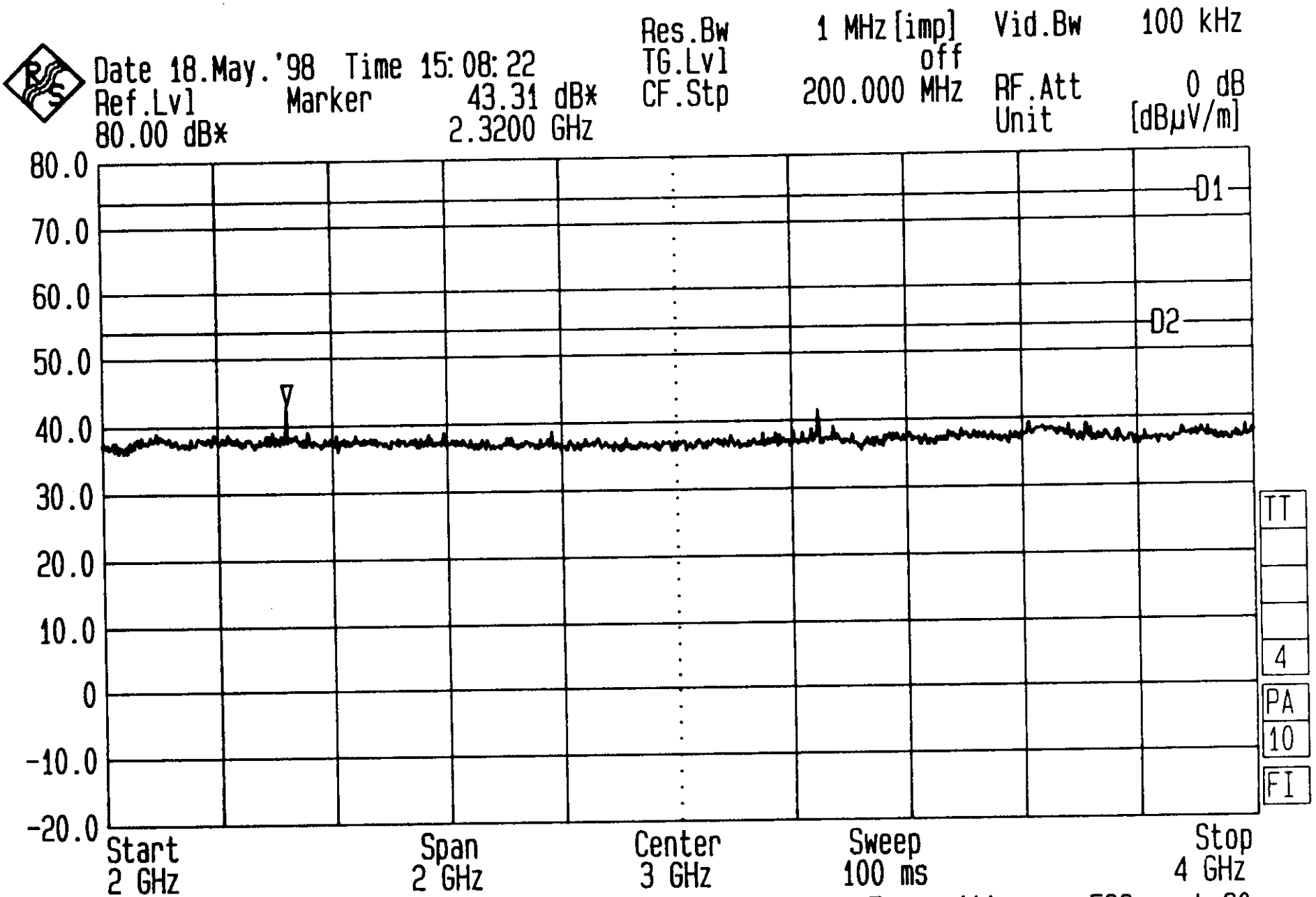

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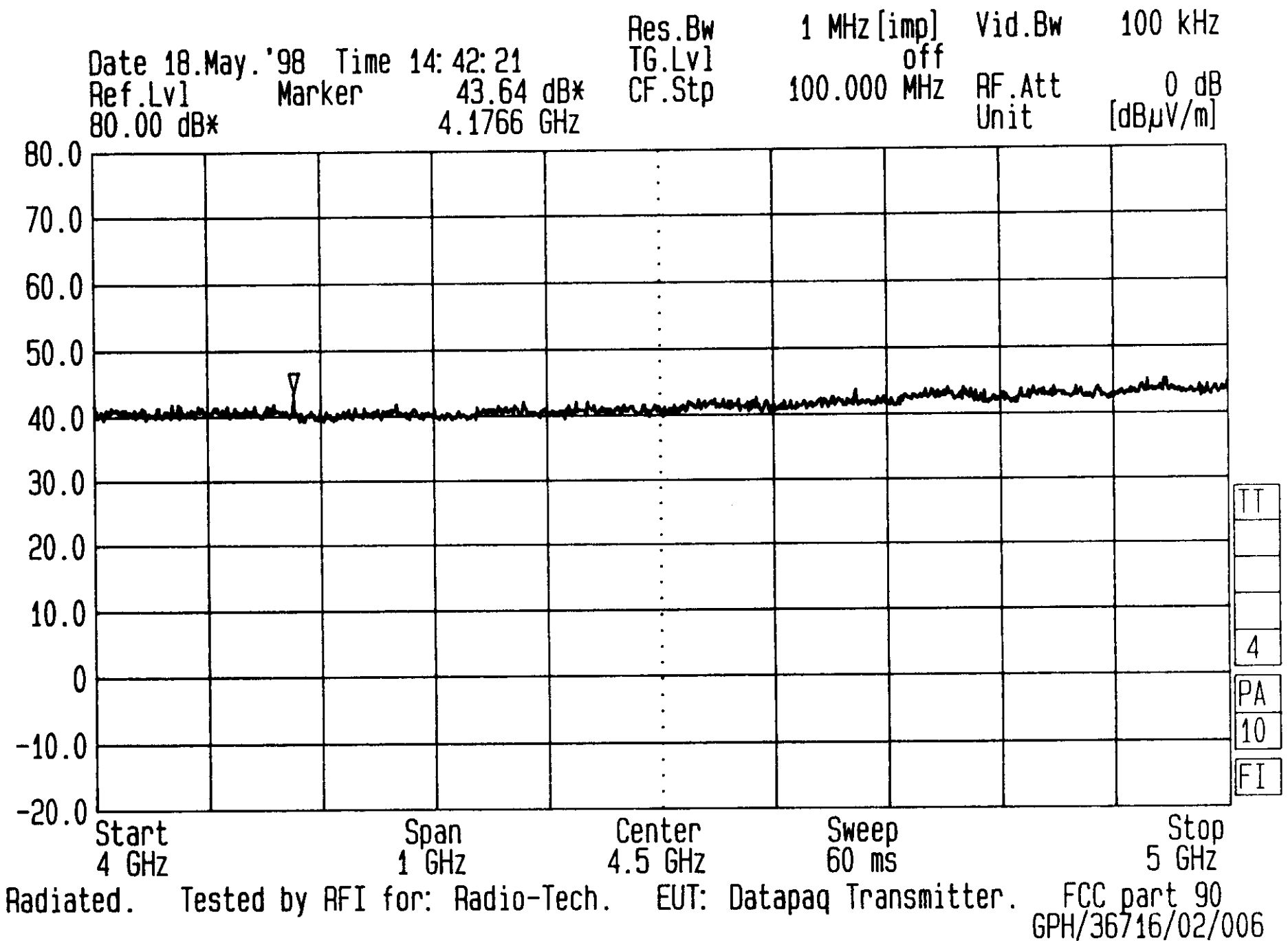

Radiated. Tested by RFI for: Radio-Tech. EUT: Datapaq Transmitter. FCC part 90

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Appendix 6. Photographs of EUT

This appendix contains the following photographs

Photo Reference Number	Title
PHT\36716\001	Left hand side view of EUT.
PHT\36716\002	Right hand side view of EUT.

These pages are not included in the total number of pages for this report