

Mobile Phone Base-Station Audit

Audit site: Ysgol Gymraeg Cwmbran
Henllys Way
Cwmbran
Torfaen
NP44 3NB

The Radiocommunications Agency (RA) is responsible for management of the civil radio spectrum in the UK. The Government has asked the RA to implement a national measurement programme to ensure that emissions from cellular base stations do not exceed the guidelines for public maximum exposure set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

Electric field strength measurements made in various bands are referenced to and presented alongside the relevant ICNIRP public maximum exposure levels. On the left hand side of the results page(s) is a graphical representation of the radio spectrum surveyed at each location on the site. The green line on each graph indicates the ICNIRP guideline exposure level for that frequency band. To the right hand side of each graph is a table showing the ten highest level emissions recorded within a band.

Further explanation of the results and their context within the ICNIRP guidelines can be provided by the RA officers at the time of the audit or by contacting the RA on 020 7211 0211 or by e-mail at rfaudit@ra.gsi.gov.uk

Results taken from all audit sites and further information on the audit programme can be found on the RA website at www.radio.gov.uk

Report Summary

As the radio spectrum is continually changing, these measurements can only provide information on the radio frequency (RF) conditions for the specific locations at the time of the survey.

The Radiocommunications Agency performed this survey of the RF emission environment prevailing in the vicinity of Ysgol Gymraeg Cwmbran on 4 October 2002.

The following table, sorted in descending order of signal level, summarises the results obtained at each measurement location.

Summary of results:		
Location	Total Band Exposure	Relationship to ICNIRP Limit
Centre of western tarmac playground	1.07E-04	1/9368
Pedestrian entrance	3.99E-05	1/25062
Centre of eastern tarmac playground	8.96E-06	1/111642
Computer room	3.81E-07	1/2625693
Main hall	2.05E-07	1/4888943
Nursery class	3.43E-08	1/29179415

Issued on behalf of the Radiocommunications Agency.

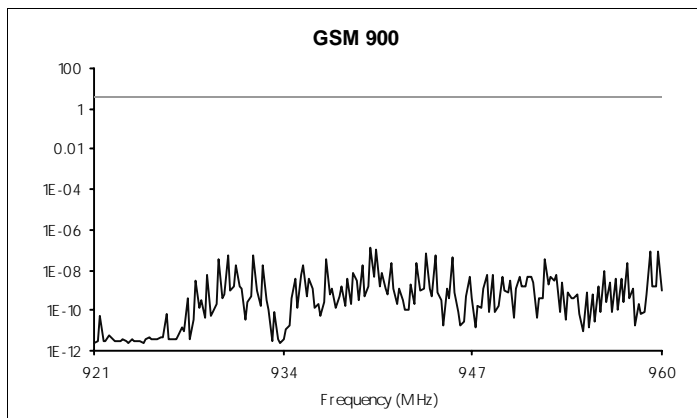
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Received by:

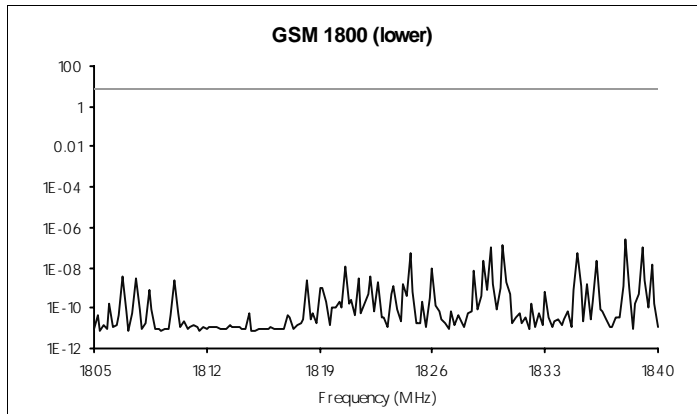
Keith Stanton
Radiocommunications Specialist

Miss H Davies
Head Teacher

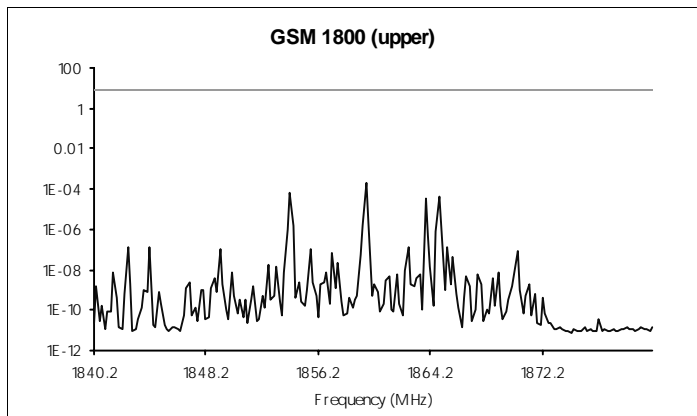
Site: Ysgol Gymraeg Cwmbran	Receiver:
Location: Pedestrian entrance	Manufacturer: ROHDE&SCHWARZ
	Model: EB200
	Serial Number: 836.378/014
NGR: ST 2853 9464 Taken from GPS	Antenna:
Start Time: 04 October 2002 10:58:17	Manufacturer: Rohde & Schwarz
Officer: Keith Stanton	Model: HE200.4050.3609.02
	Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
940.000	1.36E-07	4.70	2.90E-08
940.400	1.16E-07	4.70	2.47E-08
959.800	8.20E-08	4.80	1.71E-08
959.200	8.00E-08	4.80	1.67E-08
943.800	6.28E-08	4.72	1.33E-08
944.400	5.35E-08	4.72	1.13E-08
930.200	5.06E-08	4.65	1.09E-08
932.000	4.97E-08	4.66	1.07E-08
945.600	4.67E-08	4.73	9.88E-09
952.000	3.68E-08	4.76	7.73E-09
Band Exposure Quotient:			2.35E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,838.000	2.53E-07	9.19	2.75E-08
1,830.400	1.40E-07	9.15	1.53E-08
1,829.600	1.04E-07	9.15	1.13E-08
1,839.000	9.85E-08	9.20	1.07E-08
1,835.000	5.76E-08	9.18	6.28E-09
1,824.600	5.28E-08	9.12	5.79E-09
1,829.200	2.17E-08	9.15	2.37E-09
1,836.200	2.09E-08	9.18	2.28E-09
1,839.600	1.33E-08	9.20	1.45E-09
1,820.600	1.05E-08	9.10	1.15E-09
Band Exposure Quotient:			9.13E-08



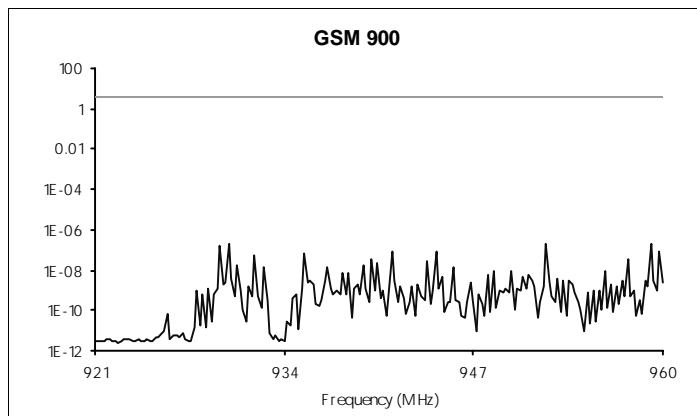
Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,859.600	2.13E-04	9.30	2.29E-05
1,854.200	6.38E-05	9.27	6.88E-06
1,864.800	4.60E-05	9.32	4.93E-06
1,863.800	3.48E-05	9.32	3.74E-06
1,859.800	2.51E-06	9.30	2.69E-07
1,854.400	1.53E-06	9.27	1.65E-07
1,859.400	1.47E-06	9.30	1.59E-07
1,865.000	1.33E-06	9.32	1.42E-07
1,854.000	1.01E-06	9.27	1.09E-07
1,864.600	7.29E-07	9.32	7.81E-08
Band Exposure Quotient:			3.96E-05

Total number of measurements: 572

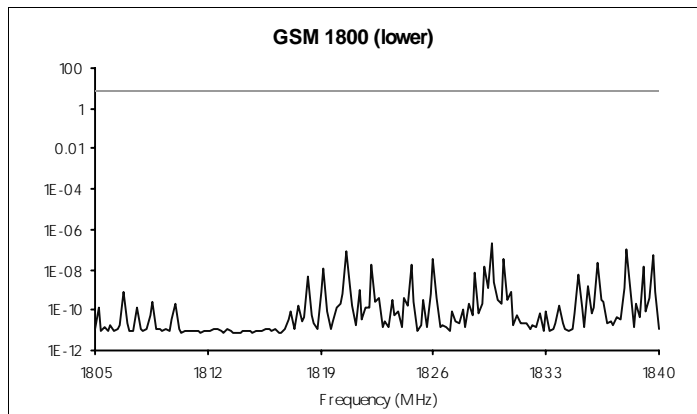
Total Band Exposure Quotient: **3.99E-05**

Site: Ysgol Gymraeg Cwmbran
Location: Centre of eastern tarmac playground
NGR: ST 2858 9459 **Taken from GPS**
Start Time: 04 October 2002 11:11:28
Officer: Keith Stanton

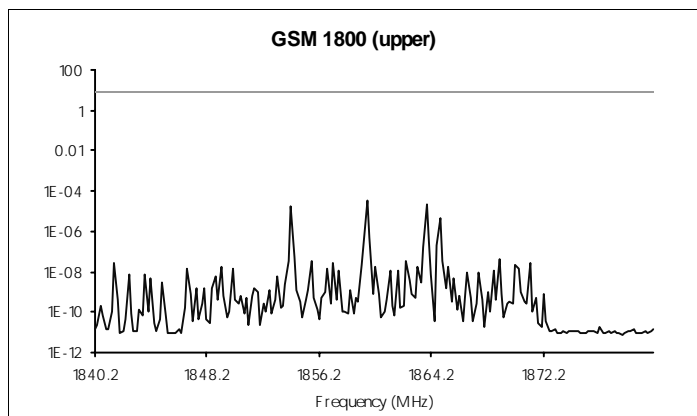
Receiver:
 Manufacturer: ROHDE&SCHWARZ
 Model: EB200
 Serial Number: 836.378/014
Antenna:
 Manufacturer: Rohde & Schwarz
 Model: HE200.4050.3609.02
 Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
930.200	2.21E-07	4.65	4.75E-08
959.200	1.96E-07	4.80	4.10E-08
952.000	1.89E-07	4.76	3.97E-08
929.600	1.56E-07	4.65	3.36E-08
944.400	9.30E-08	4.72	1.97E-08
959.800	8.39E-08	4.80	1.75E-08
941.400	7.86E-08	4.71	1.67E-08
935.400	6.30E-08	4.68	1.35E-08
932.000	5.32E-08	4.66	1.14E-08
957.600	3.56E-08	4.79	7.44E-09
Band Exposure Quotient:			3.21E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,829.600	2.07E-07	9.15	2.26E-08
1,838.000	1.03E-07	9.19	1.12E-08
1,820.600	8.31E-08	9.10	9.13E-09
1,839.600	5.54E-08	9.20	6.03E-09
1,830.400	3.60E-08	9.15	3.94E-09
1,826.000	3.26E-08	9.13	3.57E-09
1,836.200	2.00E-08	9.18	2.18E-09
1,824.600	1.96E-08	9.12	2.15E-09
1,822.200	1.70E-08	9.11	1.87E-09
1,839.000	1.52E-08	9.20	1.66E-09
Band Exposure Quotient:			7.17E-08



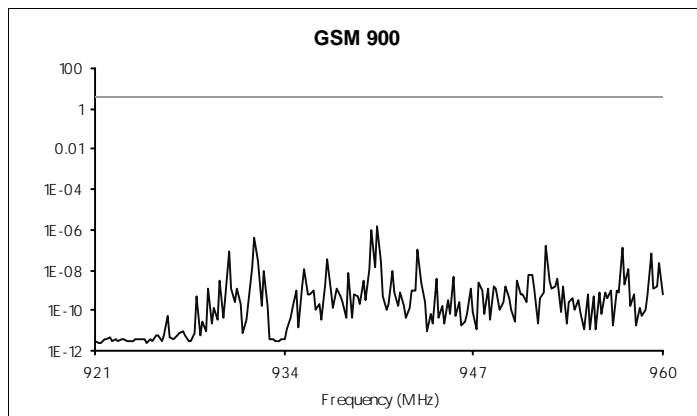
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1,859.600	3.70E-05	9.30	3.98E-06
1,863.800	1.96E-05	9.32	2.10E-06
1,854.200	1.60E-05	9.27	1.73E-06
1,864.800	4.93E-06	9.32	5.28E-07
1,859.800	5.12E-07	9.30	5.50E-08
1,864.000	3.10E-07	9.32	3.33E-08
1,859.400	2.34E-07	9.30	2.51E-08
1,864.600	2.05E-07	9.32	2.20E-08
1,863.600	1.67E-07	9.32	1.79E-08
1,854.400	5.19E-08	9.27	5.59E-09
Band Exposure Quotient:			8.56E-06

Total number of measurements: 572

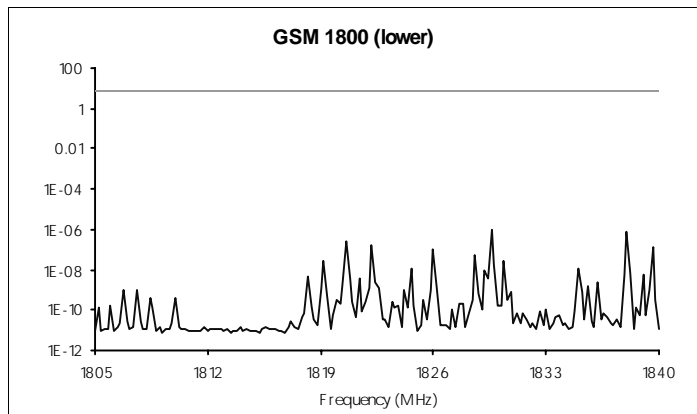
Total Band Exposure Quotient: **8.96E-06**

Site: Ysgol Gymraeg Cwmbran
Location: Centre of western tarmac playground
NGR: ST 2849 9459 **Taken from GPS**
Start Time: 04 October 2002 11:24:40
Officer: Keith Stanton

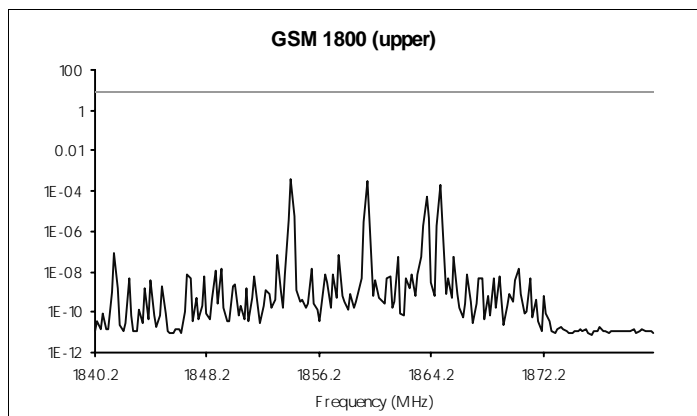
Receiver:
 Manufacturer: ROHDE&SCHWARZ
 Model: EB200
 Serial Number: 836.378/014
Antenna:
 Manufacturer: Rohde & Schwarz
 Model: HE200.4050.3609.02
 Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
940.400	1.60E-06	4.70	3.41E-07
940.000	1.06E-06	4.70	2.25E-07
932.000	4.33E-07	4.66	9.28E-08
952.000	1.61E-07	4.76	3.38E-08
957.200	1.42E-07	4.79	2.96E-08
943.200	1.11E-07	4.72	2.36E-08
930.200	8.59E-08	4.65	1.85E-08
959.200	7.13E-08	4.80	1.49E-08
937.000	3.10E-08	4.68	6.61E-09
932.200	2.79E-08	4.66	5.99E-09
Band Exposure Quotient:			8.41E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,829.600	1.06E-06	9.15	1.16E-07
1,838.000	6.96E-07	9.19	7.57E-08
1,820.600	2.45E-07	9.10	2.69E-08
1,822.200	1.70E-07	9.11	1.87E-08
1,839.600	1.42E-07	9.20	1.55E-08
1,826.000	1.01E-07	9.13	1.10E-08
1,828.600	5.08E-08	9.14	5.55E-09
1,830.400	2.86E-08	9.15	3.13E-09
1,819.200	2.68E-08	9.10	2.95E-09
1,829.800	1.98E-08	9.15	2.16E-09
Band Exposure Quotient:			2.88E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,854.200	3.93E-04	9.27	4.24E-05
1,859.600	3.01E-04	9.30	3.24E-05
1,864.800	2.05E-04	9.32	2.20E-05
1,863.800	5.27E-05	9.32	5.66E-06
1,854.400	5.31E-06	9.27	5.72E-07
1,859.800	5.12E-06	9.30	5.50E-07
1,864.000	4.59E-06	9.32	4.93E-07
1,854.000	3.35E-06	9.27	3.61E-07
1,865.000	3.18E-06	9.32	3.41E-07
1,859.400	3.08E-06	9.30	3.31E-07
Band Exposure Quotient:			1.06E-04

Total number of measurements: 572

Total Band Exposure Quotient: **1.07E-04**

Site: Ysgol Gymraeg Cwmbran

Location: Main hall

NGR: ST 2853 9464

Start Time: 04 October 2002 11:37:55

Officer: Keith Stanton

Receiver:

Manufacturer: ROHDE&SCHWARZ

Model: EB200

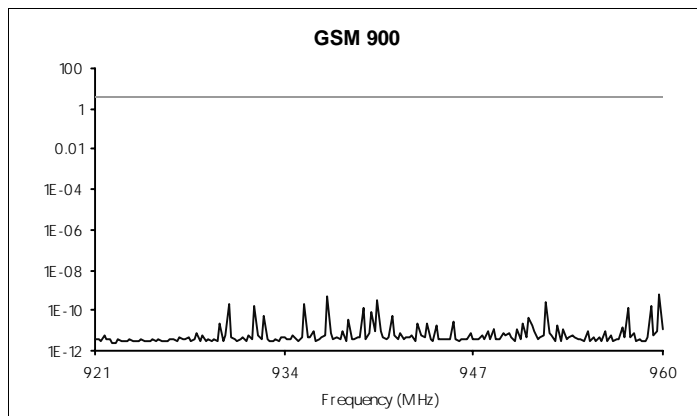
Serial Number: 836.378/014

Antenna:

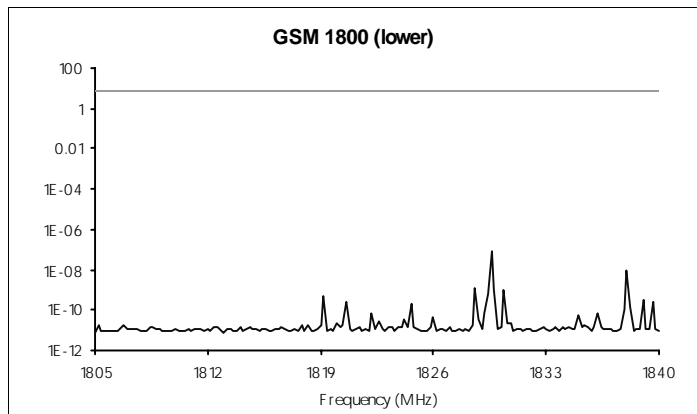
Manufacturer: Rohde & Schwarz

Model: HE200.4050.3609.02

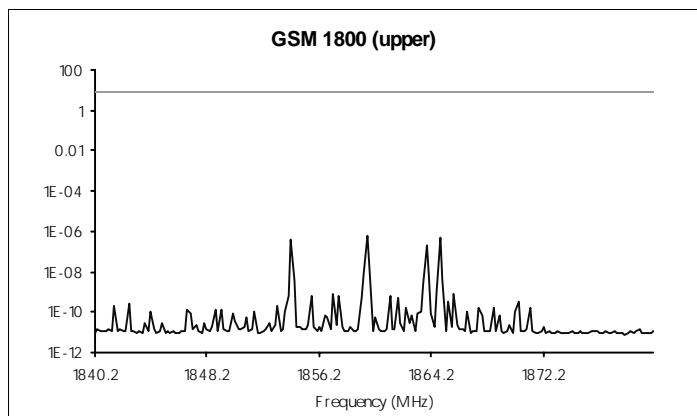
Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m ²)	ICNIRP Limit (W/m ²)	Frequency Exposure Quotient
959.800	5.94E-10	4.80	1.24E-10
937.000	4.58E-10	4.68	9.78E-11
940.400	2.98E-10	4.70	6.34E-11
952.000	2.79E-10	4.76	5.87E-11
930.200	2.11E-10	4.65	4.54E-11
935.400	1.95E-10	4.68	4.16E-11
932.000	1.85E-10	4.66	3.96E-11
959.200	1.52E-10	4.80	3.18E-11
957.600	1.48E-10	4.79	3.10E-11
939.400	1.33E-10	4.70	2.83E-11
Band Exposure Quotient:			8.29E-10



Frequency (MHz)	Maximum Exposure (W/m ²)	ICNIRP Limit (W/m ²)	Frequency Exposure Quotient
1,829.600	8.44E-08	9.15	9.22E-09
1,838.000	9.83E-09	9.19	1.07E-09
1,828.600	1.27E-09	9.14	1.39E-10
1,829.800	1.09E-09	9.15	1.19E-10
1,830.400	9.26E-10	9.15	1.01E-10
1,829.400	6.55E-10	9.15	7.16E-11
1,819.200	4.77E-10	9.10	5.24E-11
1,839.000	3.57E-10	9.20	3.89E-11
1,820.600	2.69E-10	9.10	2.95E-11
1,839.600	2.42E-10	9.20	2.63E-11
Band Exposure Quotient:			1.12E-08



Frequency (MHz)	Maximum Exposure (W/m ²)	ICNIRP Limit (W/m ²)	Frequency Exposure Quotient
1,859.600	6.15E-07	9.30	6.61E-08
1,864.800	5.16E-07	9.32	5.53E-08
1,854.200	3.93E-07	9.27	4.24E-08
1,863.800	2.15E-07	9.32	2.30E-08
1,859.800	1.69E-08	9.30	1.82E-09
1,859.400	7.56E-09	9.30	8.13E-10
1,864.000	6.49E-09	9.32	6.96E-10
1,854.400	3.84E-09	9.27	4.15E-10
1,865.000	3.57E-09	9.32	3.83E-10
1,863.600	2.20E-09	9.32	2.36E-10
Band Exposure Quotient:			1.93E-07

Total number of measurements: 572

Total Band Exposure Quotient: 2.05E-07

Site: Ysgol Gymraeg Cwmbran

Location: Nursery class

NGR: ST 2853 9464

Start Time: 04 October 2002 11:51:09

Officer: Keith Stanton

Receiver:

Manufacturer: ROHDE&SCHWARZ

Model: EB200

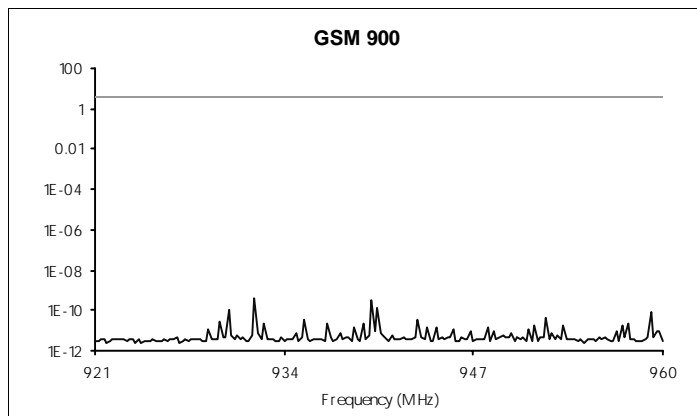
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Antenna:

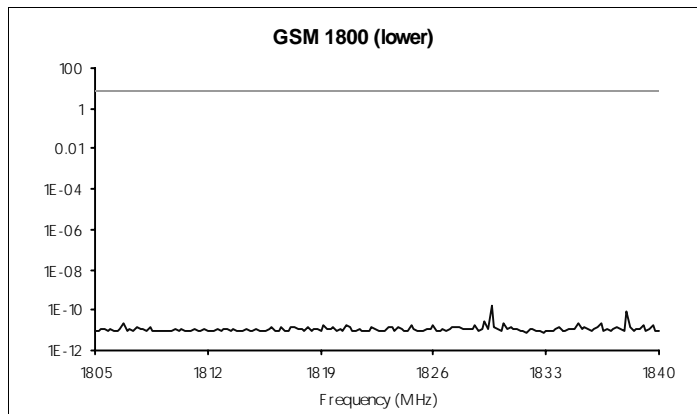
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Model: HE200.4050.3609.02

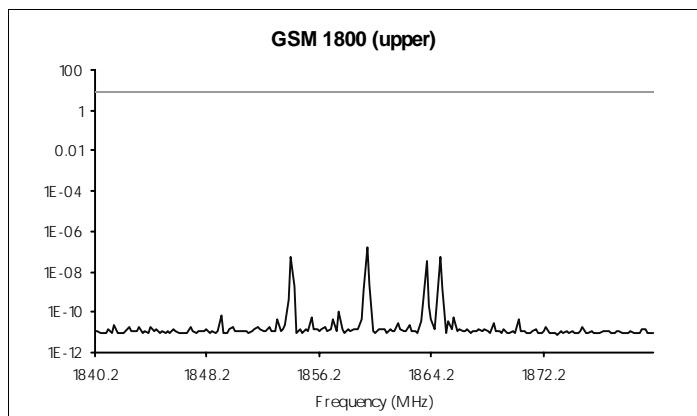
Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m ²)	ICNIRP Limit (W/m ²)	Frequency Exposure Quotient
932.000	3.68E-10	4.66	7.90E-11
940.000	3.12E-10	4.70	6.64E-11
940.400	1.21E-10	4.70	2.58E-11
930.200	1.19E-10	4.65	2.55E-11
959.200	8.38E-11	4.80	1.75E-11
952.000	4.23E-11	4.76	8.88E-12
935.400	3.63E-11	4.68	7.75E-12
943.200	3.53E-11	4.72	7.48E-12
929.600	2.91E-11	4.65	6.26E-12
957.600	2.46E-11	4.79	5.15E-12
Band Exposure Quotient:			4.48E-10



Frequency (MHz)	Maximum Exposure (W/m ²)	ICNIRP Limit (W/m ²)	Frequency Exposure Quotient
1,829.600	1.72E-10	9.15	1.88E-11
1,838.000	8.18E-11	9.19	8.90E-12
1,829.200	2.67E-11	9.15	2.92E-12
1,806.800	2.18E-11	9.03	2.42E-12
1,836.400	2.10E-11	9.18	2.28E-12
1,830.400	2.07E-11	9.15	2.27E-12
1,835.000	2.04E-11	9.18	2.23E-12
1,824.600	1.96E-11	9.12	2.15E-12
1,839.000	1.96E-11	9.20	2.14E-12
1,826.000	1.92E-11	9.13	2.10E-12
Band Exposure Quotient:			2.45E-10



Frequency (MHz)	Maximum Exposure (W/m ²)	ICNIRP Limit (W/m ²)	Frequency Exposure Quotient
1,859.600	1.54E-07	9.30	1.66E-08
1,854.200	5.82E-08	9.27	6.27E-09
1,864.800	5.04E-08	9.32	5.41E-09
1,863.800	3.82E-08	9.32	4.10E-09
1,859.800	2.34E-09	9.30	2.51E-10
1,854.400	1.97E-09	9.27	2.13E-10
1,865.000	1.67E-09	9.32	1.79E-10
1,859.400	1.31E-09	9.30	1.41E-10
1,854.000	3.67E-10	9.27	3.96E-11
1,863.600	3.10E-10	9.32	3.33E-11
Band Exposure Quotient:			3.36E-08

Total number of measurements: 572

Total Band Exposure Quotient: 3.43E-08

Site: Ysgol Gymraeg Cwmbran

Location: Computer room

NGR: ST 2583 9464

Start Time: 04 October 2002 12:04:34

Officer: Keith Stanton

Receiver:

Manufacturer: ROHDE&SCHWARZ

Model: EB200

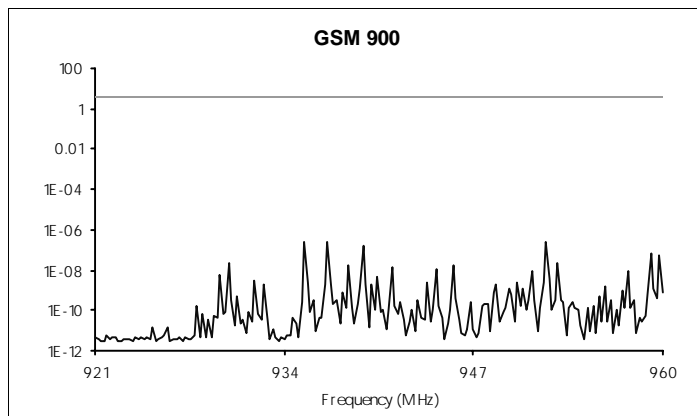
Serial Number: 836.378/014

Antenna:

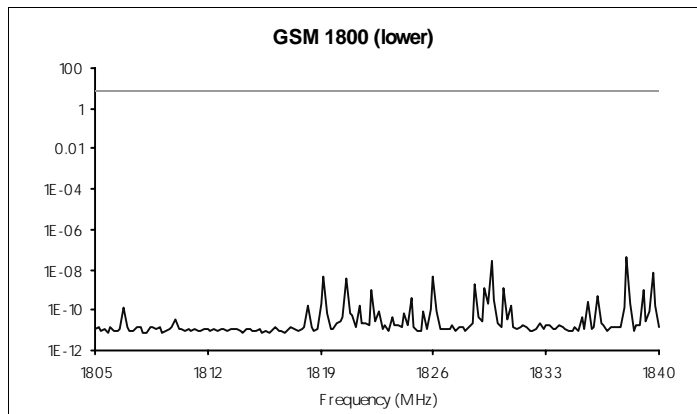
Manufacturer: Rohde & Schwarz

Model: HE200.4050.3609.02

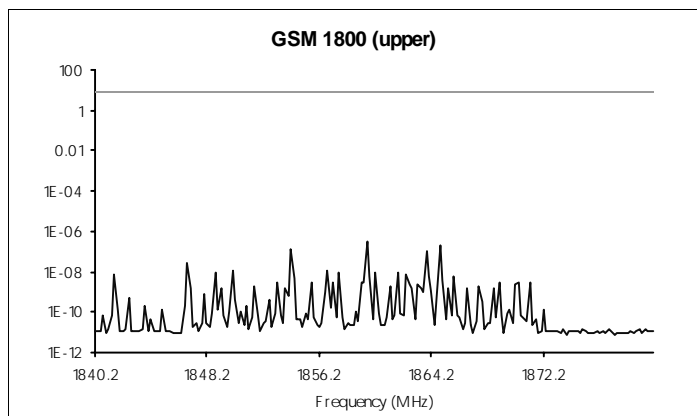
Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
952.000	2.79E-07	4.76	5.87E-08
935.400	2.40E-07	4.68	5.12E-08
937.000	2.30E-07	4.68	4.90E-08
939.400	1.79E-07	4.70	3.82E-08
959.200	7.30E-08	4.80	1.52E-08
959.800	5.29E-08	4.80	1.10E-08
952.800	2.33E-08	4.76	4.88E-09
930.200	2.26E-08	4.65	4.86E-09
945.600	1.82E-08	4.73	3.85E-09
938.400	1.67E-08	4.69	3.56E-09
Band Exposure Quotient:			2.63E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,838.000	4.29E-08	9.19	4.67E-09
1,829.600	2.67E-08	9.15	2.92E-09
1,839.600	7.83E-09	9.20	8.51E-10
1,819.200	4.55E-09	9.10	5.01E-10
1,826.000	4.50E-09	9.13	4.93E-10
1,820.600	3.89E-09	9.10	4.27E-10
1,828.600	1.93E-09	9.14	2.11E-10
1,829.200	1.37E-09	9.15	1.50E-10
1,830.400	1.31E-09	9.15	1.43E-10
1,839.000	1.03E-09	9.20	1.12E-10
Band Exposure Quotient:			1.12E-08



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,859.600	3.23E-07	9.30	3.47E-08
1,864.800	2.25E-07	9.32	2.42E-08
1,854.200	1.43E-07	9.27	1.54E-08
1,863.800	1.13E-07	9.32	1.21E-08
1,846.800	2.51E-08	9.23	2.71E-09
1,850.000	1.10E-08	9.25	1.19E-09
1,856.800	1.09E-08	9.28	1.17E-09
1,848.800	9.79E-09	9.24	1.06E-09
1,860.200	9.31E-09	9.30	1.00E-09
1,857.600	8.46E-09	9.29	9.10E-10
Band Exposure Quotient:			1.06E-07

Total number of measurements: 572

Total Band Exposure Quotient: 3.81E-07

Glossary

- Site:** The building or area around which sets of measurements are taken
- Location:** The position within a site at which a single set of measurements is taken. A set of measurements consists of multiple scans of many frequencies within a number of bands
- Band:** A portion of the electromagnetic spectrum reserved for specific radio services
- NGR:** The Ordnance Survey national grid reference coordinates of the location. In this survey NGRs are specified to 8-digit (10-metre) resolution. E.g. SJ 9755 9888
- GPS:** The Global Positioning System
- Start Time:** The date and time at which the receiver started taking its measurements at a location
- Officer:** The name of the RA representative who carried out the audit
- Receiver:** The receiver used to perform the measurements
- Antenna:** The antenna used to perform the measurements
- Exposure:** The maximum measured electric field strength (dB(μ V/m)) converted to an equivalent power density (W/m²)
- Power Density:** The electromagnetic energy flowing through a unit area normal to the direction of propagation in a unit time. Measured in Watts per square metre (W/m²)
- ICNIRP Limit:** The reference level given by the International Commission for Non-Ionizing Radiation Protection (ICNIRP) for general public exposure to electromagnetic fields

Frequency	ICNIRP limit	
10MHz to 400 MHz	2 W/m ²	
400MHz to 2GHz	f / 200 W/m ²	(where f is frequency in MHz)
2GHz to 300GHz	10 W/m ²	

Frequency Exposure Quotient:

The ratio of the measured maximum power density to the ICNIRP limit at a given frequency. A value close to 1 signifies that exposure levels could be near to the ICNIRP limit for that frequency

Band Exposure Quotient:

The sum of the frequency exposure quotients for a single band at a location

Total Band Exposure Quotient:

The sum of the frequency exposure quotients for all of the measured bands at a location

- GSM:** Global System for Mobile communication
- ETACS:** Extended Total Access Communications
- TETRA:** Terrestrial Trunked Radio
- 3G:** Third Generation mobile-phone services

- 1.00E-03:** Exponential (or 'scientific') number format. Equal to one thousandth
- 1.00E-06:** Equal to one millionth
- 1.00E-09:** Equal to one thousand-millionth
- 1.00E-12:** Equal to one million-millionth