

## Mobile Phone Base-Station Audit

Audit site: Ysgol Bro Dewi  
Nun Street  
St. Davids  
SA62 6NU

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](mailto: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](http://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 Bro Dewi on 3 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
Soft play area	2.97E-06	1/337100
Centre of playing field	1.59E-06	1/627427
Tarmac play ground	8.03E-07	1/1245916
Corridor outside cleaners cuboard	1.07E-07	1/9360680
Reception/entrance	3.15E-08	1/31710103
Centre of main hall	8.27E-09	1/120860112

Issued on behalf of the Radiocommunications Agency.

Issued by:

Received by:

Keith Stanton  
Radiocommunications Specialist

Mr Griffiths  
Head Teacher

**Site:** Ysgol Bro Dewi

**Location:** Soft play area

**NGR:** SM 7536 2560 **Taken from GPS**

**Start Time:** 03 October 2002 10:11:27

**Officer:** Keith Stanton

**Receiver:**

Manufacturer: ROHDE&SCHWARZ

Model: EB200

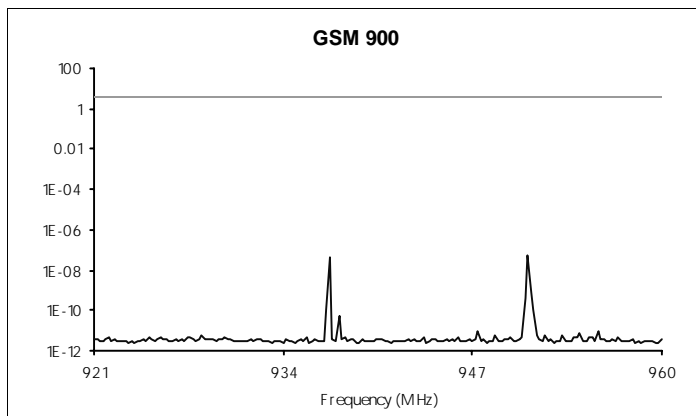
Serial Number: 836.378/014

**Antenna:**

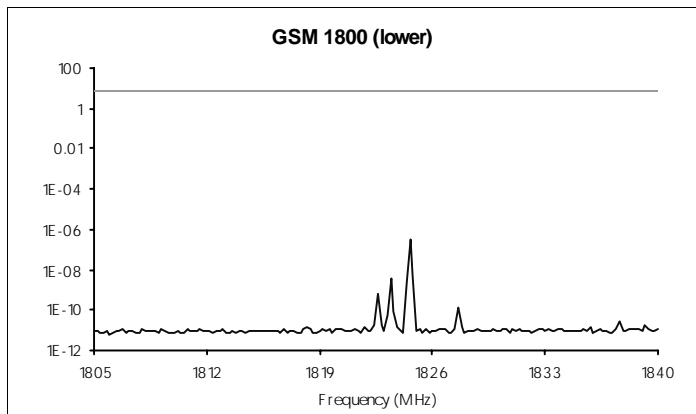
Manufacturer: Rohde & Schwarz

Model: HE200.4050.3609.02

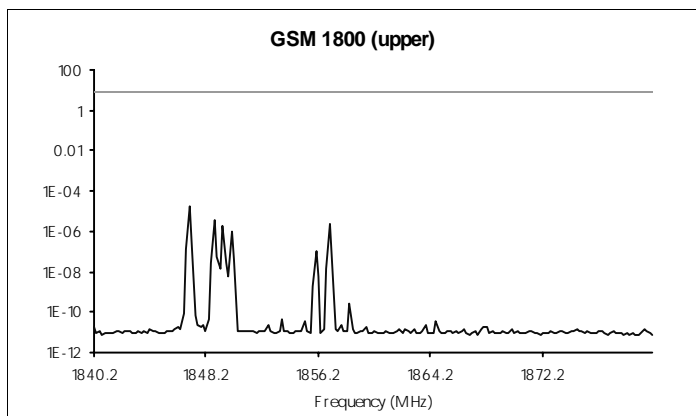
Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
950.800	5.69E-08	4.75	1.20E-08
937.200	4.48E-08	4.69	9.56E-09
951.000	7.33E-10	4.75	1.54E-10
950.600	4.21E-10	4.75	8.86E-11
951.200	1.04E-10	4.76	2.18E-11
937.000	9.79E-11	4.68	2.09E-11
937.800	5.03E-11	4.69	1.07E-11
947.400	9.36E-12	4.74	1.98E-12
955.600	8.70E-12	4.78	1.82E-12
954.400	7.56E-12	4.77	1.58E-12
<b>Band Exposure Quotient:</b>			<b>2.20E-08</b>



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,824.600	3.04E-07	9.12	3.33E-08
1,824.800	5.79E-09	9.12	6.34E-10
1,823.400	3.90E-09	9.12	4.28E-10
1,824.400	2.15E-09	9.12	2.36E-10
1,822.600	6.78E-10	9.11	7.44E-11
1,827.600	1.27E-10	9.14	1.39E-11
1,823.600	8.74E-11	9.12	9.59E-12
1,823.200	5.03E-11	9.12	5.52E-12
1,837.600	2.71E-11	9.19	2.94E-12
1,839.200	1.88E-11	9.20	2.04E-12
<b>Band Exposure Quotient:</b>			<b>3.49E-08</b>



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,847.000	1.70E-05	9.23	1.84E-06
1,848.800	3.90E-06	9.24	4.21E-07
1,857.000	2.38E-06	9.29	2.56E-07
1,849.400	1.87E-06	9.25	2.02E-07
1,850.000	1.08E-06	9.25	1.16E-07
1,847.200	2.51E-07	9.24	2.72E-08
1,846.800	1.20E-07	9.23	1.30E-08
1,856.000	1.14E-07	9.28	1.23E-08
1,849.000	5.38E-08	9.24	5.82E-09
1,857.200	4.24E-08	9.29	4.56E-09
<b>Band Exposure Quotient:</b>			<b>2.91E-06</b>

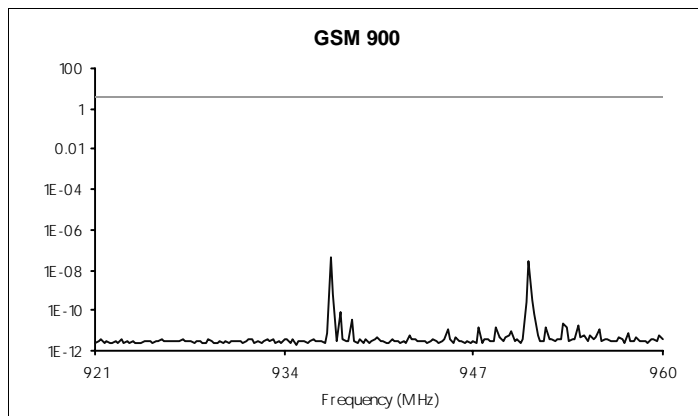
Total number of measurements: 572

**Total Band Exposure Quotient:** **2.97E-06**

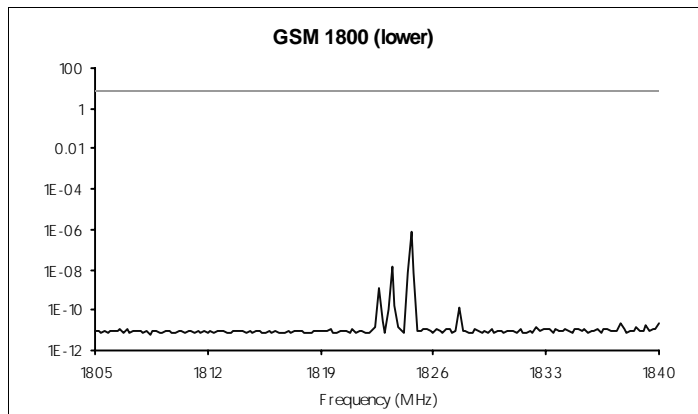
**Site:** Ysgol Bro Dewi  
**Location:** Centre of playing field

**NGR:** SM 7535 2563 **Taken from GPS**  
**Start Time:** 03 October 2002 10:26:00  
**Officer:** Keith Stanton

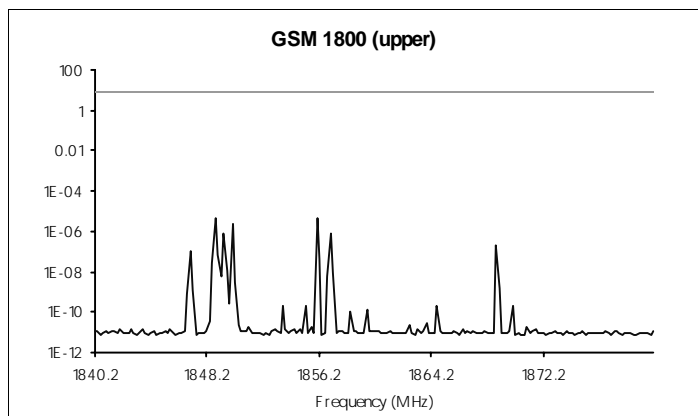
**Receiver:**  
Manufacturer: ROHDE&SCHWARZ  
Model: EB200  
Serial Number: 836.378/014  
**Antenna:**  
Manufacturer: Rohde & Schwarz  
Model: HE200.4050.3609.02  
Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
937.200	3.90E-08	4.69	8.33E-09
950.800	2.48E-08	4.75	5.22E-09
937.400	5.91E-10	4.69	1.26E-10
951.000	3.13E-10	4.75	6.57E-11
950.600	2.37E-10	4.75	4.98E-11
937.800	8.55E-11	4.69	1.82E-11
951.200	6.39E-11	4.76	1.34E-11
938.600	3.41E-11	4.69	7.26E-12
953.200	2.08E-11	4.77	4.36E-12
954.200	1.99E-11	4.77	4.16E-12
<b>Band Exposure Quotient:</b>			<b>1.40E-08</b>



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,824.600	7.29E-07	9.12	7.99E-08
1,823.400	1.35E-08	9.12	1.48E-09
1,824.800	6.80E-09	9.12	7.45E-10
1,824.400	6.64E-09	9.12	7.28E-10
1,822.600	1.20E-09	9.11	1.32E-10
1,823.600	1.74E-10	9.12	1.91E-11
1,827.600	1.27E-10	9.14	1.39E-11
1,823.200	1.07E-10	9.12	1.18E-11
1,822.800	2.64E-11	9.11	2.89E-12
1,837.600	2.47E-11	9.19	2.69E-12
<b>Band Exposure Quotient:</b>			<b>8.32E-08</b>



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,848.800	5.02E-06	9.24	5.43E-07
1,856.000	4.53E-06	9.28	4.88E-07
1,850.000	2.30E-06	9.25	2.49E-07
1,857.000	7.70E-07	9.29	8.30E-08
1,849.400	7.43E-07	9.25	8.04E-08
1,868.800	2.07E-07	9.34	2.21E-08
1,847.000	1.05E-07	9.23	1.13E-08
1,849.000	6.93E-08	9.24	7.50E-09
1,856.200	4.74E-08	9.28	5.11E-09
1,848.600	3.02E-08	9.24	3.27E-09
<b>Band Exposure Quotient:</b>			<b>1.50E-06</b>

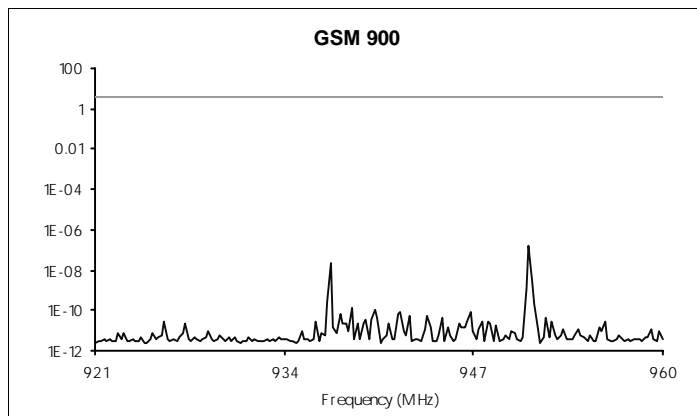
Total number of measurements: 572

**Total Band Exposure Quotient:** **1.59E-06**

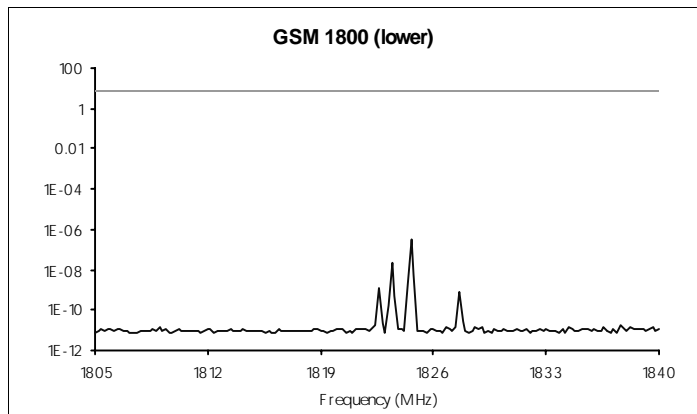
**Site:** Ysgol Bro Dewi  
**Location:** Tarmac play ground

**NGR:** SM 7536 2566 **Taken from GPS**  
**Start Time:** 03 October 2002 10:38:46  
**Officer:** Keith Stanton

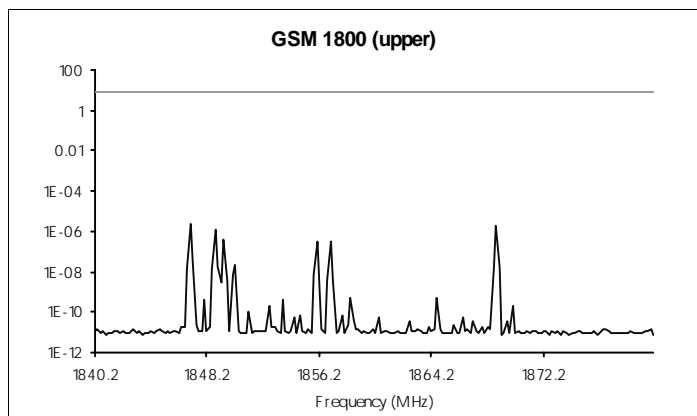
**Receiver:**  
Manufacturer: ROHDE&SCHWARZ  
Model: EB200  
Serial Number: 836.378/014  
**Antenna:**  
Manufacturer: Rohde & Schwarz  
Model: HE200.4050.3609.02  
Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
950.800	1.68E-07	4.75	3.53E-08
937.200	2.46E-08	4.69	5.25E-09
951.000	2.26E-09	4.75	4.76E-10
950.600	1.36E-09	4.75	2.87E-10
937.000	2.40E-10	4.68	5.13E-11
951.200	1.97E-10	4.76	4.15E-11
938.600	1.36E-10	4.69	2.89E-11
940.200	1.19E-10	4.70	2.52E-11
946.800	8.53E-11	4.73	1.80E-11
942.000	8.43E-11	4.71	1.79E-11
<b>Band Exposure Quotient:</b>			<b>4.18E-08</b>



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,824.600	3.33E-07	9.12	3.65E-08
1,823.400	2.35E-08	9.12	2.58E-09
1,824.800	5.79E-09	9.12	6.34E-10
1,824.400	1.79E-09	9.12	1.96E-10
1,822.600	1.20E-09	9.11	1.32E-10
1,827.600	7.49E-10	9.14	8.20E-11
1,823.600	5.27E-10	9.12	5.78E-11
1,823.200	1.52E-10	9.12	1.67E-11
1,827.800	2.85E-11	9.14	3.12E-12
1,822.800	2.30E-11	9.11	2.52E-12
<b>Band Exposure Quotient:</b>			<b>4.04E-08</b>



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,847.000	2.29E-06	9.23	2.48E-07
1,868.800	1.84E-06	9.34	1.97E-07
1,848.800	1.26E-06	9.24	1.36E-07
1,849.400	4.28E-07	9.25	4.62E-08
1,856.000	3.52E-07	9.28	3.79E-08
1,857.000	3.44E-07	9.29	3.71E-08
1,847.200	3.23E-08	9.24	3.50E-09
1,850.200	2.00E-08	9.25	2.17E-09
1,869.000	1.93E-08	9.35	2.07E-09
1,849.000	1.70E-08	9.24	1.84E-09
<b>Band Exposure Quotient:</b>			<b>7.20E-07</b>

Total number of measurements: 572

**Total Band Exposure Quotient:** **8.03E-07**

**Site:** Ysgol Bro Dewi  
**Location:** Centre of main hall

**NGR:** SM 7536 2566

**Start Time:** 03 October 2002 10:51:26

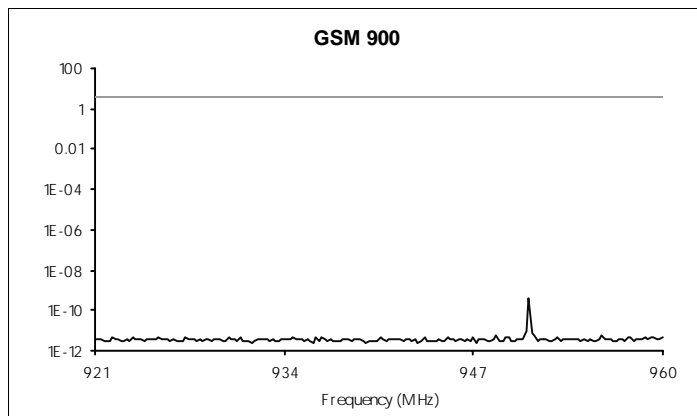
**Officer:** Keith Stanton

**Receiver:**

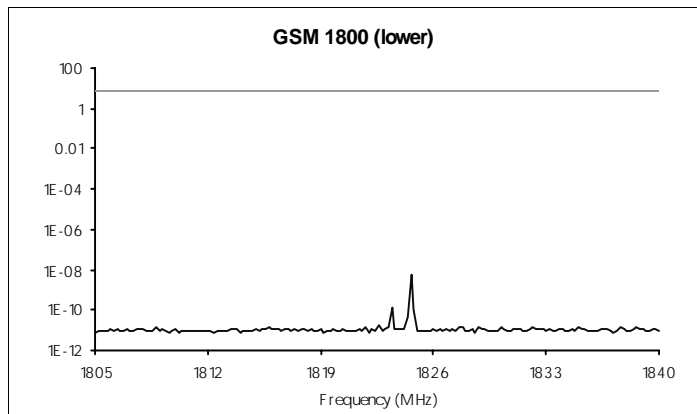
Manufacturer: ROHDE&SCHWARZ  
Model: EB200  
Serial Number: 836.378/014

**Antenna:**

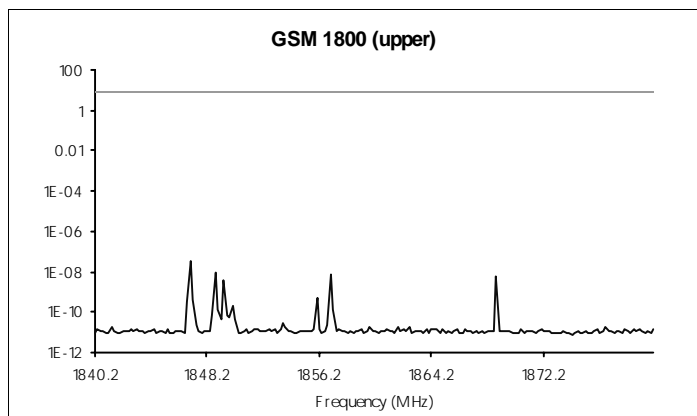
Manufacturer: Rohde & Schwarz  
Model: HE200.4050.3609.02  
Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
950.800	4.41E-10	4.75	9.28E-11
950.600	9.43E-12	4.75	1.98E-12
951.000	7.85E-12	4.75	1.65E-12
951.200	6.53E-12	4.76	1.37E-12
948.600	5.66E-12	4.74	1.19E-12
955.800	5.62E-12	4.78	1.18E-12
931.000	4.95E-12	4.66	1.06E-12
957.800	5.03E-12	4.79	1.05E-12
936.600	4.90E-12	4.68	1.05E-12
940.600	4.84E-12	4.70	1.03E-12
<b>Band Exposure Quotient:</b>			<b>2.44E-10</b>



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,824.600	5.66E-09	9.12	6.20E-10
1,823.400	1.23E-10	9.12	1.35E-11
1,824.800	1.01E-10	9.12	1.10E-11
1,824.400	4.70E-11	9.12	5.15E-12
1,822.600	1.66E-11	9.11	1.83E-12
1,823.200	1.55E-11	9.12	1.70E-12
1,827.600	1.53E-11	9.14	1.67E-12
1,835.000	1.51E-11	9.18	1.65E-12
1,815.800	1.43E-11	9.08	1.58E-12
1,837.600	1.42E-11	9.19	1.55E-12
<b>Band Exposure Quotient:</b>			<b>8.47E-10</b>



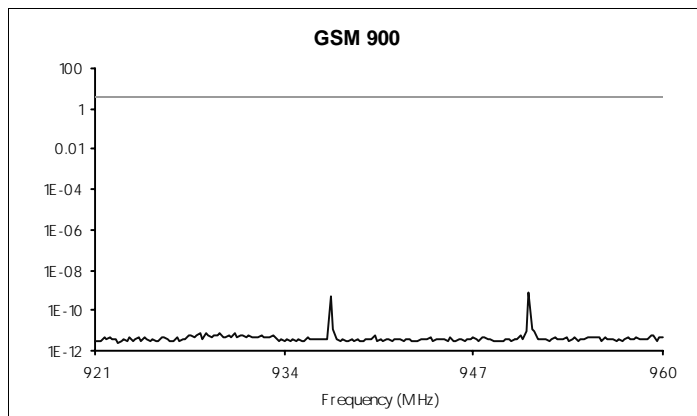
Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,847.000	3.62E-08	9.23	3.92E-09
1,848.800	1.00E-08	9.24	1.08E-09
1,857.000	6.87E-09	9.29	7.40E-10
1,868.800	5.32E-09	9.34	5.69E-10
1,849.400	3.81E-09	9.25	4.12E-10
1,856.000	5.57E-10	9.28	6.00E-11
1,847.200	3.98E-10	9.24	4.30E-11
1,846.800	3.46E-10	9.23	3.75E-11
1,850.000	2.30E-10	9.25	2.49E-11
1,849.000	1.38E-10	9.24	1.50E-11
<b>Band Exposure Quotient:</b>			<b>7.18E-09</b>

Total number of measurements: 572

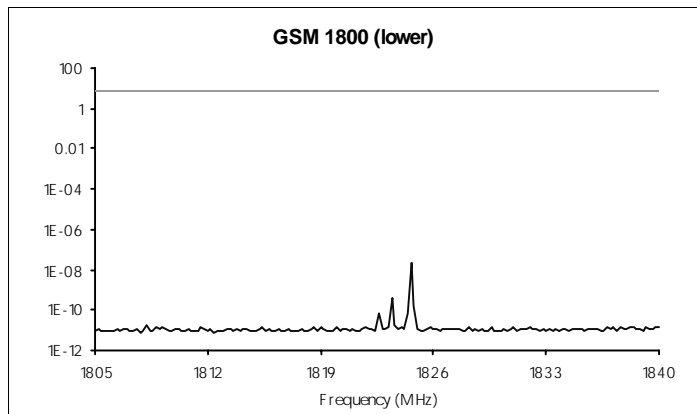
**Total Band Exposure Quotient:** 8.27E-09

**Site:** Ysgol Bro Dewi  
**Location:** Reception/entrance  
**NGR:** SM 7536 2560  
**Start Time:** 03 October 2002 11:04:14  
**Officer:** Keith Stanton

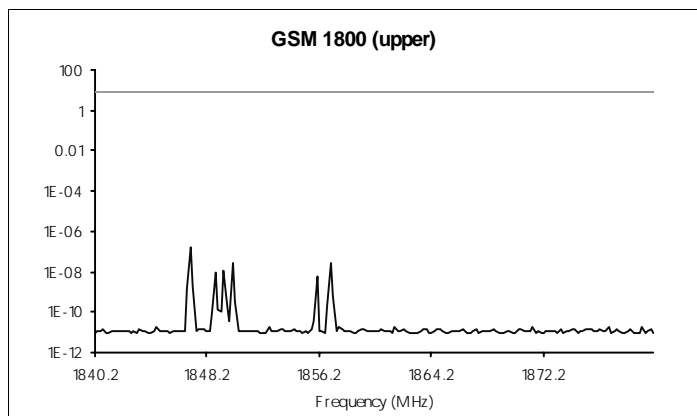
**Receiver:**  
 Manufacturer: ROHDE&SCHWARZ  
 Model: EB200  
 Serial Number: 836.378/014  
**Antenna:**  
 Manufacturer: Rohde & Schwarz  
 Model: HE200.4050.3609.02  
 Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
950.800	8.41E-10	4.75	1.77E-10
937.200	5.39E-10	4.69	1.15E-10
951.000	1.27E-11	4.75	2.68E-12
937.400	1.21E-11	4.69	2.57E-12
951.200	9.66E-12	4.76	2.03E-12
950.600	9.43E-12	4.75	1.98E-12
929.600	8.01E-12	4.65	1.72E-12
928.200	7.45E-12	4.64	1.61E-12
930.600	6.83E-12	4.65	1.47E-12
928.600	6.65E-12	4.64	1.43E-12
<b>Band Exposure Quotient:</b>			<b>4.65E-10</b>



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,824.600	2.10E-08	9.12	2.30E-09
1,823.400	4.38E-10	9.12	4.81E-11
1,824.800	1.52E-10	9.12	1.67E-11
1,822.600	7.43E-11	9.11	8.15E-12
1,824.400	6.96E-11	9.12	7.62E-12
1,808.200	1.62E-11	9.04	1.79E-12
1,823.600	1.63E-11	9.12	1.79E-12
1,815.400	1.50E-11	9.08	1.65E-12
1,808.800	1.48E-11	9.04	1.64E-12
1,811.600	1.45E-11	9.06	1.61E-12
<b>Band Exposure Quotient:</b>			<b>2.59E-09</b>



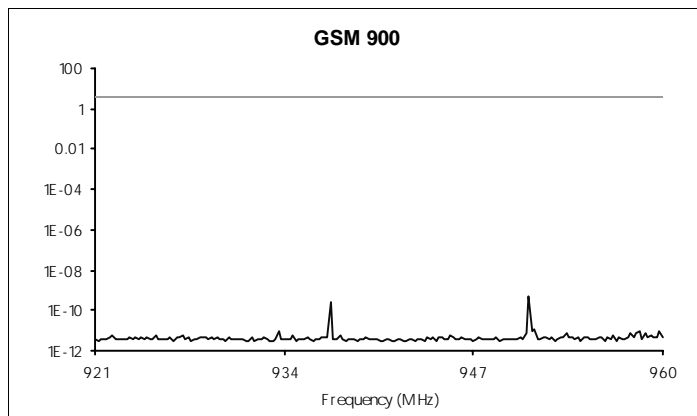
Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,847.000	1.73E-07	9.23	1.88E-08
1,857.000	2.73E-08	9.29	2.94E-09
1,850.000	2.70E-08	9.25	2.92E-09
1,849.400	1.26E-08	9.25	1.36E-09
1,848.800	9.35E-09	9.24	1.01E-09
1,856.000	6.40E-09	9.28	6.89E-10
1,847.200	1.82E-09	9.24	1.97E-10
1,846.800	1.48E-09	9.23	1.60E-10
1,857.200	5.71E-10	9.29	6.15E-11
1,850.200	3.10E-10	9.25	3.35E-11
<b>Band Exposure Quotient:</b>			<b>2.85E-08</b>

Total number of measurements: 572

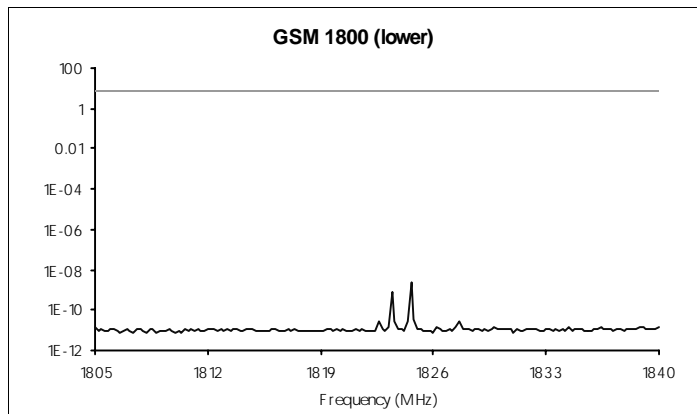
**Total Band Exposure Quotient:** 3.15E-08

**Site:** Ysgol Bro Dewi  
**Location:** Corridor outside cleaners cuboard  
**NGR:** SM 7536 2566  
**Start Time:** 03 October 2002 11:17:58  
**Officer:** Keith Stanton

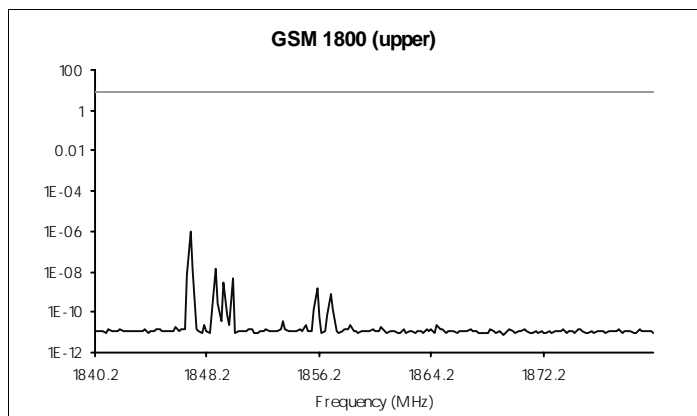
**Receiver:**  
 Manufacturer: ROHDE&SCHWARZ  
 Model: EB200  
 Serial Number: 836.378/014  
**Antenna:**  
 Manufacturer: Rohde & Schwarz  
 Model: HE200.4050.3609.02  
 Serial Number: 836287/009



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
950.800	4.73E-10	4.75	9.95E-11
937.200	2.46E-10	4.69	5.25E-11
951.200	1.08E-11	4.76	2.28E-12
951.000	9.66E-12	4.75	2.03E-12
959.800	9.20E-12	4.80	1.92E-12
958.400	9.17E-12	4.79	1.91E-12
933.600	8.27E-12	4.67	1.77E-12
958.800	7.29E-12	4.79	1.52E-12
957.800	7.27E-12	4.79	1.52E-12
953.400	6.72E-12	4.77	1.41E-12
<b>Band Exposure Quotient:</b>			<b>3.28E-10</b>



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,824.600	2.25E-09	9.12	2.47E-10
1,823.400	8.16E-10	9.12	8.95E-11
1,824.800	3.41E-11	9.12	3.74E-12
1,822.600	3.10E-11	9.11	3.40E-12
1,824.400	2.83E-11	9.12	3.11E-12
1,827.600	2.78E-11	9.14	3.05E-12
1,823.600	2.64E-11	9.12	2.90E-12
1,827.400	1.57E-11	9.14	1.71E-12
1,838.800	1.52E-11	9.19	1.66E-12
1,805.000	1.47E-11	9.03	1.63E-12
<b>Band Exposure Quotient:</b>			<b>5.48E-10</b>



Frequency (MHz)	Maximum Exposure (W/m <sup>2</sup> )	ICNIRP Limit (W/m <sup>2</sup> )	Frequency Exposure Quotient
1,847.000	9.32E-07	9.23	1.01E-07
1,848.800	1.55E-08	9.24	1.68E-09
1,847.200	1.15E-08	9.24	1.24E-09
1,846.800	6.75E-09	9.23	7.31E-10
1,850.000	5.15E-09	9.25	5.56E-10
1,849.400	2.83E-09	9.25	3.06E-10
1,856.000	1.47E-09	9.28	1.58E-10
1,857.000	7.19E-10	9.29	7.74E-11
1,849.000	2.35E-10	9.24	2.54E-11
1,855.800	1.43E-10	9.28	1.54E-11
<b>Band Exposure Quotient:</b>			<b>1.06E-07</b>

Total number of measurements: 572

**Total Band Exposure Quotient:** **1.07E-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( $\mu$ V/m)) converted to an equivalent power density (W/m<sup>2</sup>)
- 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/m<sup>2</sup>)
- ICNIRP Limit:** The reference level given by the International Commission for Non-Ionizing Radiation Protection (ICNIRP) for general public exposure to electromagnetic fields

<b>Frequency</b>	<b>ICNIRP limit</b>
10MHz to 400 MHz	2 W/m <sup>2</sup>
400MHz to 2GHz	f / 200 W/m <sup>2</sup>
2GHz to 300GHz	10 W/m <sup>2</sup>

(where f is frequency in MHz)

**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