

Mobile Phone Base-Station Audit

Audit site: Elliott Durham School
Ransom Drive
Nottingham
NG3 5LR

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 Elliott Durham School on 11 March 2003.

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
Classroom 146	1.61E-04	1/6218
Roadway by 5 a side pitch	1.31E-04	1/7661
Seating area outside South Block entrance	5.46E-05	1/18306
Classroom 121	1.64E-05	1/60963
Corner of basket ball area	5.18E-06	1/193106
Dining Hall - Room 31	3.84E-06	1/260395
Gym	1.53E-06	1/651968

Issued on behalf of the Radiocommunications Agency.

Issued by:

Received by:

John Taylor
Radiocommunications Specialist

Martin Carrington
Site Manager

Site: Elliott Durham School

Location: Classroom 146

NGR: SK 5848 4256 **Taken from GPS**
Start Time: 11 March 2003 10:33:31

Officer: John Taylor

Receiver:

Manufacturer: ROHDE&SCHWARZ

Model: EB200

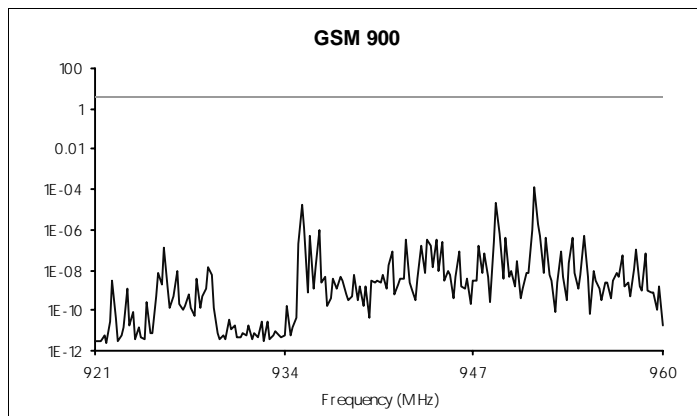
Serial Number: 837.752/003

Antenna:

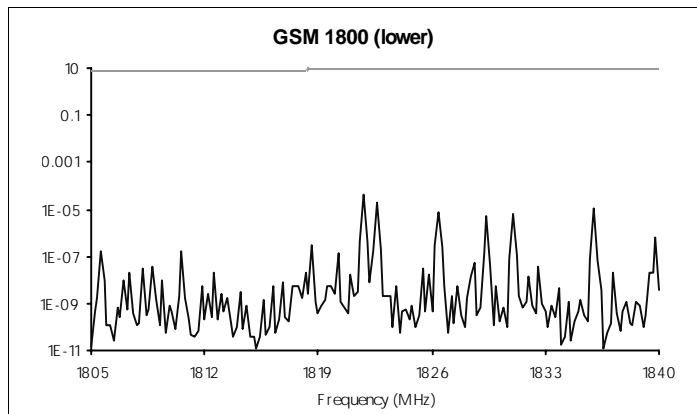
Manufacturer: Rohde & Schwarz

Model: HE200

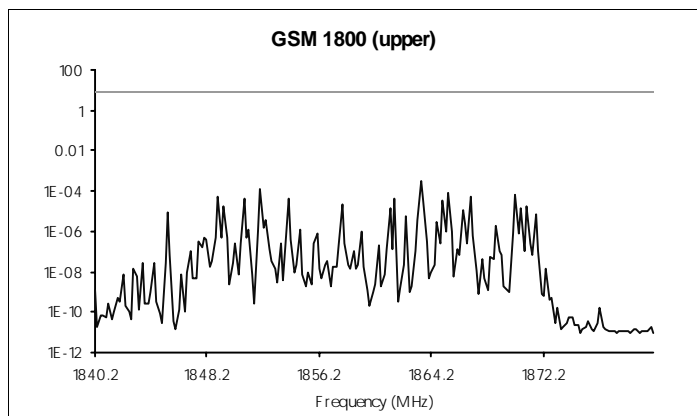
Serial Number: 728264/025



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
951.200	1.27E-04	4.76	2.68E-05
948.600	2.41E-05	4.74	5.09E-06
935.200	1.95E-05	4.68	4.16E-06
951.400	1.93E-06	4.76	4.06E-07
935.400	1.15E-06	4.68	2.45E-07
936.400	1.07E-06	4.68	2.29E-07
951.000	9.02E-07	4.75	1.90E-07
948.800	6.21E-07	4.74	1.31E-07
935.800	4.78E-07	4.68	1.02E-07
951.600	4.85E-07	4.76	1.02E-07
Band Exposure Quotient:			3.85E-05



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,821.800	3.98E-05	9.11	4.37E-06
1,822.600	2.05E-05	9.11	2.25E-06
1,836.000	1.18E-05	9.18	1.28E-06
1,826.400	7.48E-06	9.13	8.19E-07
1,831.000	6.27E-06	9.15	6.85E-07
1,829.400	5.45E-06	9.15	5.95E-07
1,839.800	6.37E-07	9.20	6.92E-08
1,821.600	4.17E-07	9.11	4.58E-08
1,822.000	4.08E-07	9.11	4.48E-08
1,826.200	3.12E-07	9.13	3.41E-08
Band Exposure Quotient:			1.05E-05



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,863.400	3.32E-04	9.32	3.57E-05
1,852.000	1.18E-04	9.26	1.28E-05
1,865.400	8.38E-05	9.33	8.98E-06
1,870.200	6.71E-05	9.35	7.17E-06
1,849.000	5.14E-05	9.24	5.56E-06
1,867.000	5.06E-05	9.34	5.42E-06
1,861.600	4.27E-05	9.31	4.59E-06
1,854.000	4.21E-05	9.27	4.54E-06
1,850.800	4.00E-05	9.25	4.32E-06
1,863.600	3.17E-05	9.32	3.41E-06
Band Exposure Quotient:			1.12E-04

Total number of measurements: 572

Total Band Exposure Quotient: **1.61E-04**

Site: Elliott Durham School

Location: Classroom 121

NGR: SK 5851 4260 **Taken from GPS**
Start Time: 11 March 2003 10:52:30

Officer: John Taylor

Receiver:

Manufacturer: ROHDE&SCHWARZ

Model: EB200

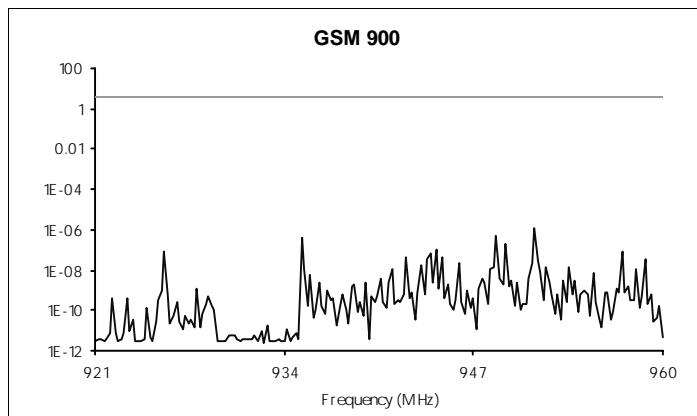
Serial Number: 837.752/003

Antenna:

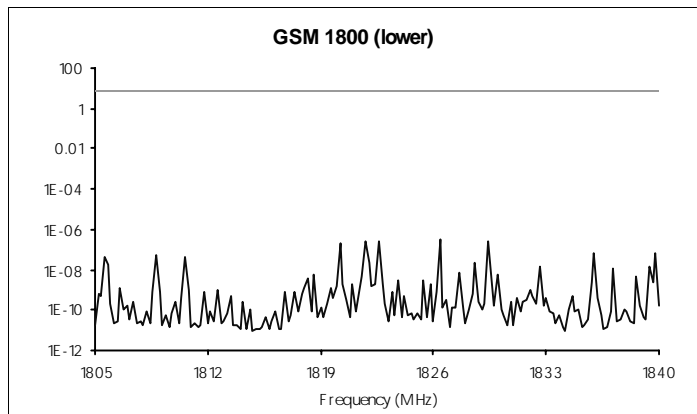
Manufacturer: Rohde & Schwarz

Model: HE200

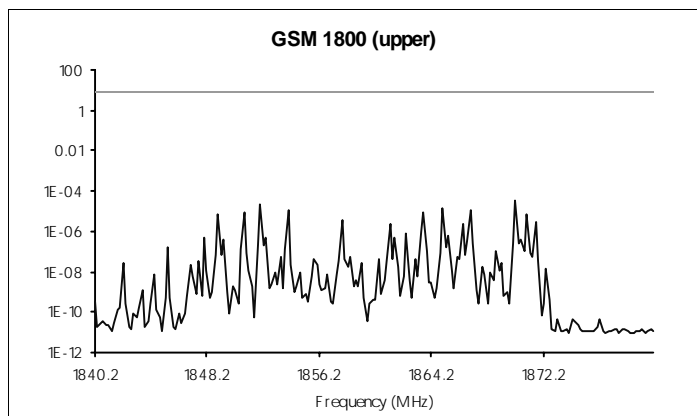
Serial Number: 728264/025



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
951.200	1.27E-06	4.76	2.68E-07
948.600	4.49E-07	4.74	9.47E-08
935.200	3.79E-07	4.68	8.12E-08
949.200	2.10E-07	4.75	4.43E-08
944.400	9.51E-08	4.72	2.01E-08
925.800	8.12E-08	4.63	1.76E-08
957.200	7.78E-08	4.79	1.63E-08
944.000	6.58E-08	4.72	1.39E-08
944.800	4.45E-08	4.72	9.43E-09
942.400	3.95E-08	4.71	8.38E-09
Band Exposure Quotient:			6.51E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,826.400	3.12E-07	9.13	3.41E-08
1,822.600	2.82E-07	9.11	3.10E-08
1,829.400	2.79E-07	9.15	3.05E-08
1,821.800	2.57E-07	9.11	2.82E-08
1,820.200	2.18E-07	9.10	2.40E-08
1,839.800	6.67E-08	9.20	7.25E-09
1,836.000	6.47E-08	9.18	7.05E-09
1,808.800	5.63E-08	9.04	6.23E-09
1,805.600	4.55E-08	9.03	5.04E-09
1,810.600	4.38E-08	9.05	4.84E-09
Band Exposure Quotient:			1.99E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,870.200	3.21E-05	9.35	3.43E-06
1,852.000	2.15E-05	9.26	2.32E-06
1,865.000	1.52E-05	9.32	1.63E-06
1,867.000	1.21E-05	9.34	1.30E-06
1,854.000	1.13E-05	9.27	1.22E-06
1,863.600	9.81E-06	9.32	1.05E-06
1,850.800	8.36E-06	9.25	9.03E-07
1,871.000	7.71E-06	9.36	8.25E-07
1,849.000	6.77E-06	9.24	7.33E-07
1,857.800	3.29E-06	9.29	3.54E-07
Band Exposure Quotient:			1.56E-05

Total number of measurements: 572

Total Band Exposure Quotient: **1.64E-05**

Site: Elliott Durham School

Location: Dining Hall - Room 31

NGR: ZU 0000 0000

Start Time: 11 March 2003 11:26:51

Officer: John Taylor

Receiver:

Manufacturer: ROHDE&SCHWARZ

Model: EB200

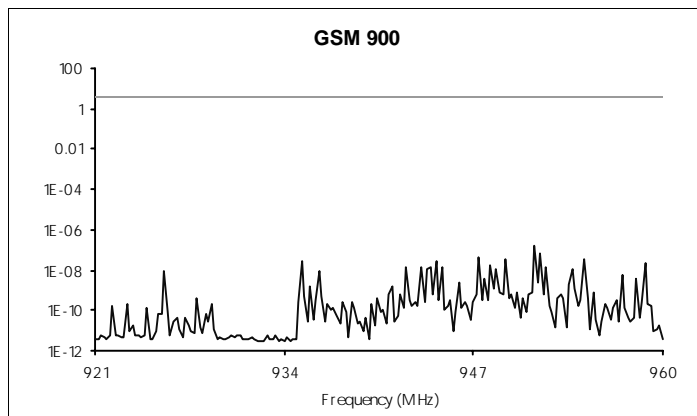
Serial Number: 837.752/003

Antenna:

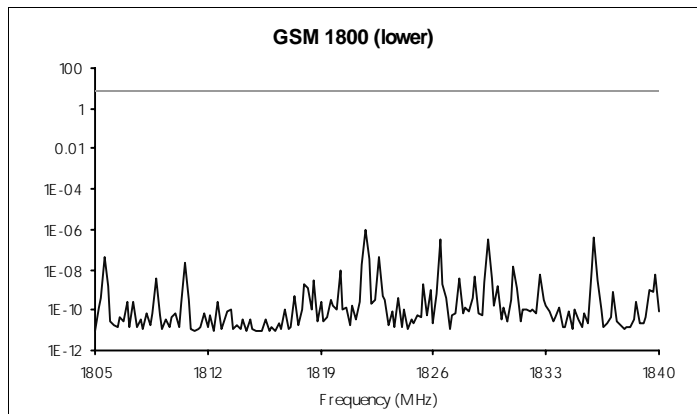
Manufacturer: Rohde & Schwarz

Model: HE200

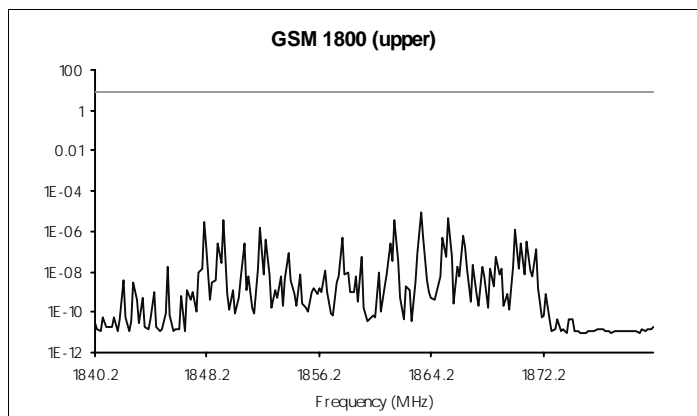
Serial Number: 728264/025



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
951.200	1.68E-07	4.76	3.53E-08
951.600	7.17E-08	4.76	1.51E-08
947.400	4.09E-08	4.74	8.63E-09
949.200	3.74E-08	4.75	7.89E-09
954.600	3.54E-08	4.77	7.41E-09
935.200	2.63E-08	4.68	5.61E-09
944.400	2.50E-08	4.72	5.30E-09
958.800	2.05E-08	4.79	4.29E-09
948.200	1.96E-08	4.74	4.13E-09
952.000	1.50E-08	4.76	3.15E-09
Band Exposure Quotient:			1.30E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,821.800	9.34E-07	9.11	1.03E-07
1,836.000	4.28E-07	9.18	4.66E-08
1,826.400	3.42E-07	9.13	3.74E-08
1,829.400	3.06E-07	9.15	3.35E-08
1,805.600	4.55E-08	9.03	5.04E-09
1,822.600	4.48E-08	9.11	4.91E-09
1,822.000	3.72E-08	9.11	4.08E-09
1,810.600	2.41E-08	9.05	2.66E-09
1,821.600	1.70E-08	9.11	1.87E-09
1,831.000	1.40E-08	9.15	1.53E-09
Band Exposure Quotient:			2.49E-07



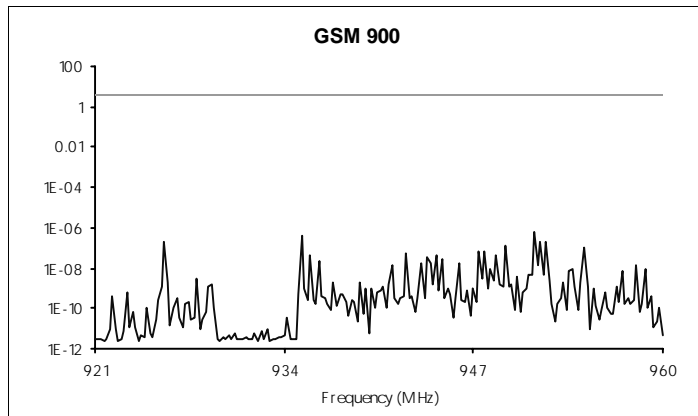
Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,863.400	8.94E-06	9.32	9.60E-07
1,865.400	4.60E-06	9.33	4.94E-07
1,849.400	4.08E-06	9.25	4.42E-07
1,861.600	3.55E-06	9.31	3.81E-07
1,848.000	2.82E-06	9.24	3.05E-07
1,852.000	1.56E-06	9.26	1.68E-07
1,870.200	1.25E-06	9.35	1.34E-07
1,866.400	5.67E-07	9.33	6.08E-08
1,857.800	5.34E-07	9.29	5.75E-08
1,863.600	5.27E-07	9.32	5.65E-08
Band Exposure Quotient:			3.46E-06

Total number of measurements: 572

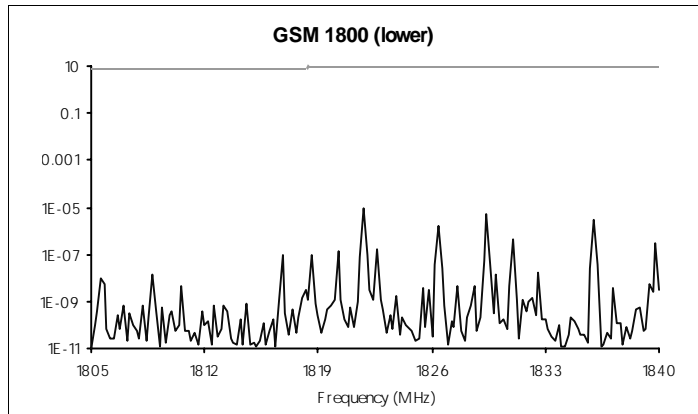
Total Band Exposure Quotient: **3.84E-06**

Site: Elliott Durham School
Location: Seating area outside South Block entrance
NGR: SK 5843 4256 **Taken from GPS**
Start Time: 11 March 2003 11:41:03
Officer: John Taylor

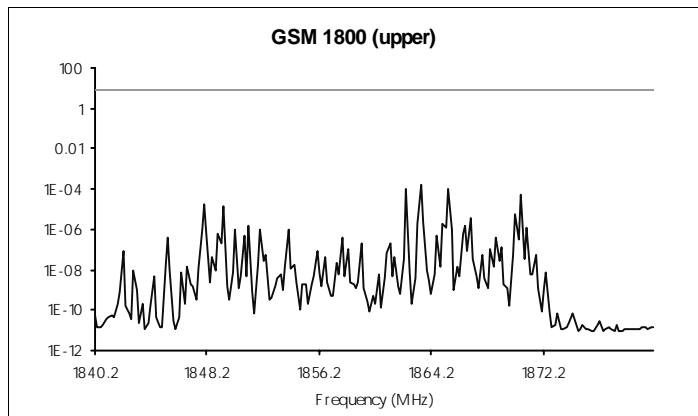
Receiver:
 Manufacturer: ROHDE&SCHWARZ
 Model: EB200
 Serial Number: 837.752/003
Antenna:
 Manufacturer: Rohde & Schwarz
 Model: HE200
 Serial Number: 728264/025



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
951.200	5.69E-07	4.76	1.20E-07
935.200	3.97E-07	4.68	8.50E-08
952.000	2.17E-07	4.76	4.55E-08
951.600	2.17E-07	4.76	4.55E-08
925.800	2.09E-07	4.63	4.51E-08
949.200	1.36E-07	4.75	2.86E-08
954.600	1.17E-07	4.77	2.45E-08
947.400	7.44E-08	4.74	1.57E-08
947.800	6.05E-08	4.74	1.28E-08
942.400	5.33E-08	4.71	1.13E-08
Band Exposure Quotient:			5.27E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,821.800	9.13E-06	9.11	1.00E-06
1,829.400	5.45E-06	9.15	5.95E-07
1,836.000	2.89E-06	9.18	3.15E-07
1,826.400	1.64E-06	9.13	1.79E-07
1,831.000	4.44E-07	9.15	4.85E-08
1,839.800	2.91E-07	9.20	3.16E-08
1,822.600	1.59E-07	9.11	1.74E-08
1,820.200	1.35E-07	9.10	1.48E-08
1,818.600	9.95E-08	9.09	1.09E-08
1,816.800	9.48E-08	9.08	1.04E-08
Band Exposure Quotient:			2.28E-06



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,863.400	1.63E-04	9.32	1.75E-05
1,865.400	1.03E-04	9.33	1.10E-05
1,862.400	9.79E-05	9.31	1.05E-05
1,870.600	5.46E-05	9.35	5.83E-06
1,848.000	1.74E-05	9.24	1.88E-06
1,849.400	1.52E-05	9.25	1.64E-06
1,870.200	5.21E-06	9.35	5.57E-07
1,867.000	3.42E-06	9.34	3.67E-07
1,863.600	2.20E-06	9.32	2.36E-07
1,865.000	1.96E-06	9.32	2.10E-07
Band Exposure Quotient:			5.18E-05

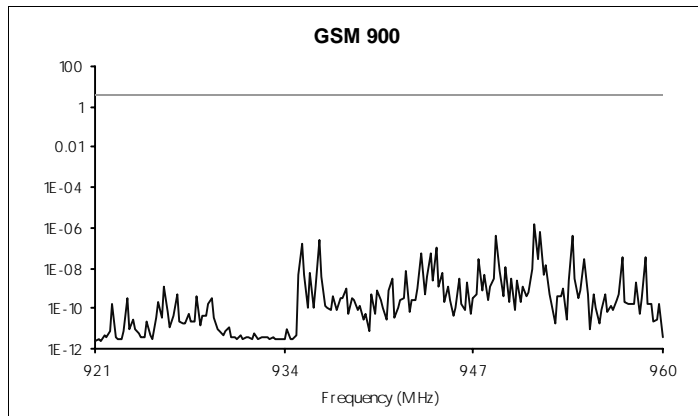
Total number of measurements: 572

Total Band Exposure Quotient: 5.46E-05

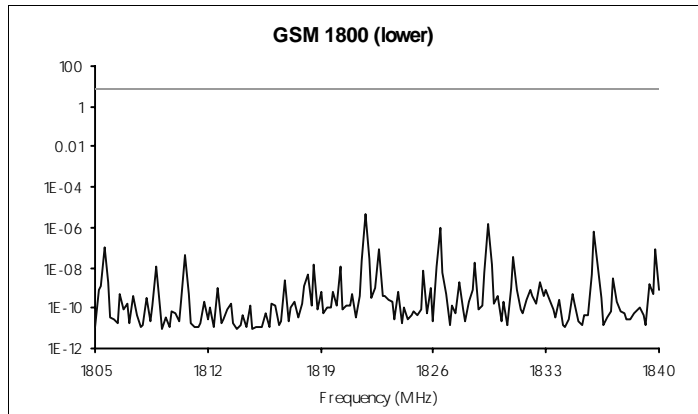
Site: Elliott Durham School
Location: Corner of basket ball area

NGR: SK 5843 4268 **Taken from GPS**
Start Time: 11 March 2003 12:28:29
Officer: John Taylor

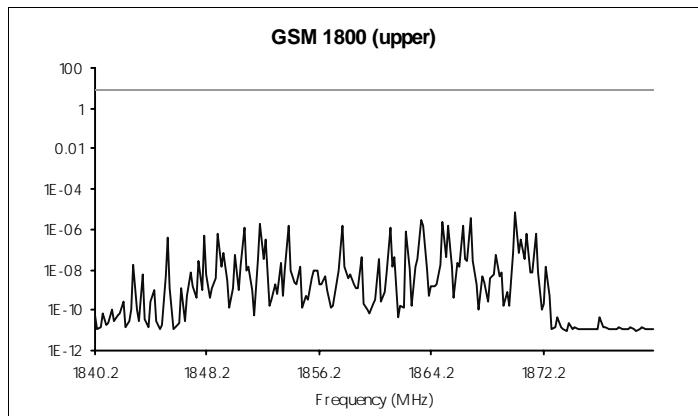
Receiver:
Manufacturer: ROHDE&SCHWARZ
Model: EB200
Serial Number: 837.752/003
Antenna:
Manufacturer: Rohde & Schwarz
Model: HE200
Serial Number: 728264/025



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
951.200	1.43E-06	4.76	3.01E-07
951.600	6.85E-07	4.76	1.44E-07
953.800	4.44E-07	4.77	9.32E-08
948.600	3.74E-07	4.74	7.88E-08
936.400	2.46E-07	4.68	5.25E-08
935.200	1.51E-07	4.68	3.23E-08
944.400	1.17E-07	4.72	2.48E-08
943.400	5.99E-08	4.72	1.27E-08
944.000	5.47E-08	4.72	1.16E-08
957.200	3.24E-08	4.79	6.78E-09
Band Exposure Quotient:			8.11E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,821.800	4.27E-06	9.11	4.69E-07
1,829.400	1.68E-06	9.15	1.84E-07
1,826.400	9.63E-07	9.13	1.05E-07
1,836.000	6.93E-07	9.18	7.55E-08
1,805.600	1.04E-07	9.03	1.16E-08
1,822.600	9.35E-08	9.11	1.03E-08
1,839.800	8.39E-08	9.20	9.12E-09
1,810.600	4.09E-08	9.05	4.52E-09
1,831.000	3.22E-08	9.15	3.51E-09
1,822.000	2.89E-08	9.11	3.17E-09
Band Exposure Quotient:			8.96E-07



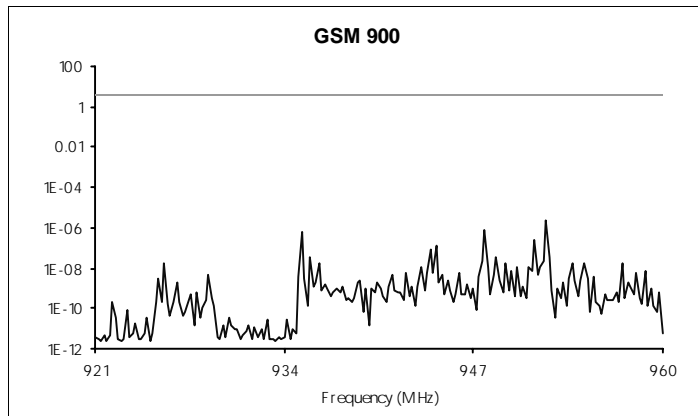
Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,870.200	6.56E-06	9.35	7.01E-07
1,867.000	3.58E-06	9.34	3.84E-07
1,863.400	2.70E-06	9.32	2.90E-07
1,865.000	2.41E-06	9.32	2.59E-07
1,852.000	1.79E-06	9.26	1.93E-07
1,863.600	1.67E-06	9.32	1.79E-07
1,866.400	1.60E-06	9.33	1.71E-07
1,865.400	1.56E-06	9.33	1.67E-07
1,857.800	1.47E-06	9.29	1.58E-07
1,854.000	1.39E-06	9.27	1.50E-07
Band Exposure Quotient:			3.47E-06

Total number of measurements: 572

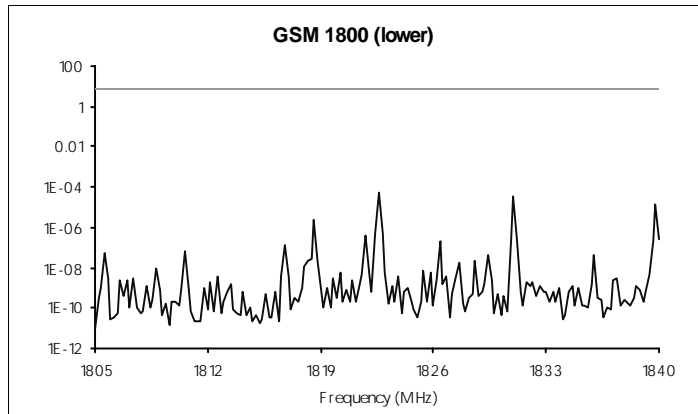
Total Band Exposure Quotient: **5.18E-06**

Site: Elliott Durham School
Location: Roadway by 5 a side pitch
NGR: SK 5838 4241 **Taken from GPS**
Start Time: 11 March 2003 12:46:40
Officer: John Taylor

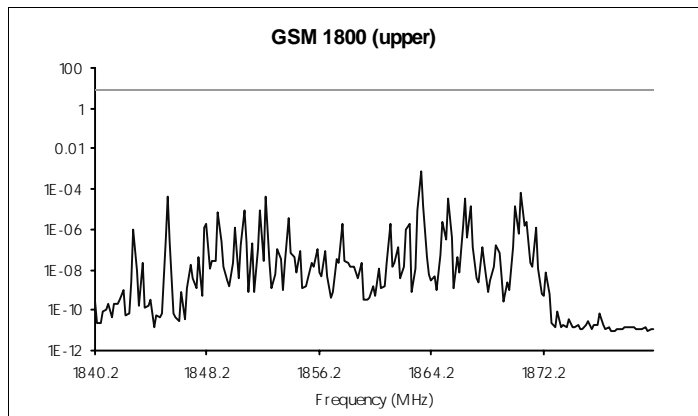
Receiver:
 Manufacturer: ROHDE&SCHWARZ
 Model: EB200
 Serial Number: 837.752/003
Antenna:
 Manufacturer: Rohde & Schwarz
 Model: HE200
 Serial Number: 728264/025



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
952.000	2.32E-06	4.76	4.88E-07
947.800	7.27E-07	4.74	1.54E-07
935.200	6.91E-07	4.68	1.48E-07
951.200	2.60E-07	4.76	5.47E-08
944.400	1.20E-07	4.72	2.54E-08
944.000	7.73E-08	4.72	1.64E-08
935.800	3.71E-08	4.68	7.94E-09
948.600	3.41E-08	4.74	7.19E-09
952.200	3.36E-08	4.76	7.06E-09
951.800	2.22E-08	4.76	4.66E-09
Band Exposure Quotient:			9.86E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,822.600	5.14E-05	9.11	5.64E-06
1,831.000	3.45E-05	9.15	3.76E-06
1,839.800	1.27E-05	9.20	1.38E-06
1,818.600	2.44E-06	9.09	2.69E-07
1,822.800	4.69E-07	9.11	5.15E-08
1,822.400	4.48E-07	9.11	4.91E-08
1,821.800	4.17E-07	9.11	4.58E-08
1,840.000	2.84E-07	9.20	3.09E-08
1,831.200	2.74E-07	9.16	2.99E-08
1,830.800	2.55E-07	9.15	2.79E-08
Band Exposure Quotient:			1.14E-05



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,863.400	7.79E-04	9.32	8.36E-05
1,870.600	6.56E-05	9.35	7.01E-06
1,852.400	4.30E-05	9.26	4.64E-06
1,845.400	4.06E-05	9.23	4.40E-06
1,866.600	3.50E-05	9.33	3.75E-06
1,865.400	3.04E-05	9.33	3.26E-06
1,867.000	1.43E-05	9.34	1.53E-06
1,863.600	1.39E-05	9.32	1.49E-06
1,870.200	1.37E-05	9.35	1.46E-06
1,852.000	9.62E-06	9.26	1.04E-06
Band Exposure Quotient:			1.18E-04

Total number of measurements: 572

Total Band Exposure Quotient: **1.31E-04**

Site: Elliott Durham School

Location: Gym

NGR: ZU 0000 0000

Start Time: 11 March 2003 13:13:05

Officer: John Taylor

Receiver:

Manufacturer: ROHDE&SCHWARZ

Model: EB200

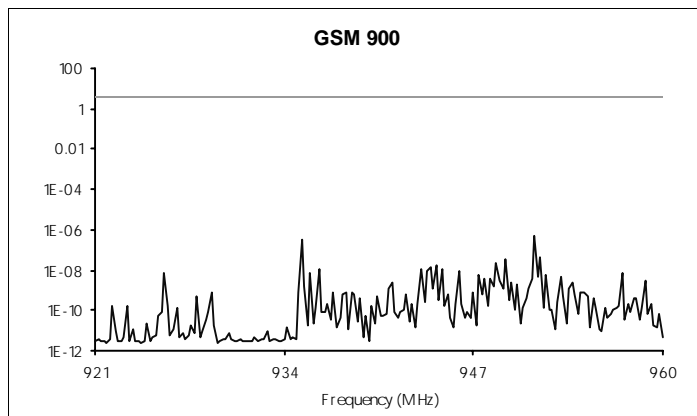
Serial Number: 837.752/003

Antenna:

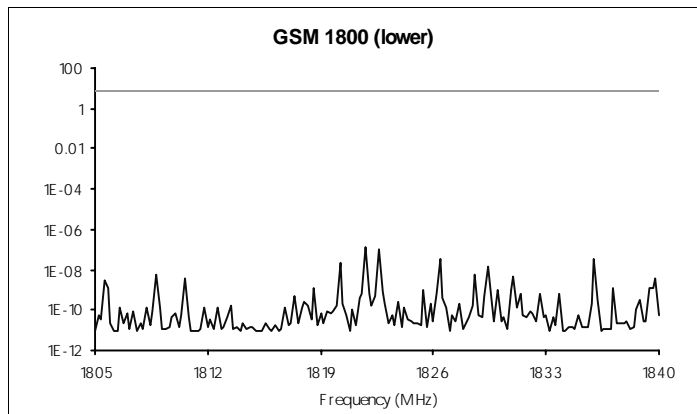
Manufacturer: Rohde & Schwarz

Model: HE200

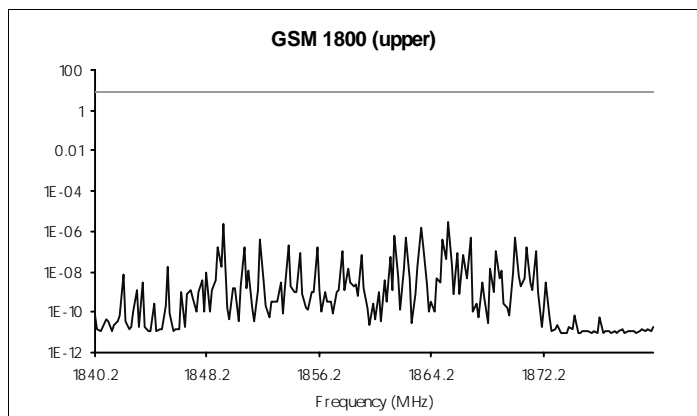
Serial Number: 728264/025



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
951.200	4.73E-07	4.76	9.95E-08
935.200	3.31E-07	4.68	7.07E-08
951.600	4.22E-08	4.76	8.88E-09
949.200	3.34E-08	4.75	7.03E-09
948.600	2.47E-08	4.74	5.21E-09
944.400	1.86E-08	4.72	3.93E-09
944.000	1.54E-08	4.72	3.27E-09
936.400	1.26E-08	4.68	2.69E-09
943.400	1.09E-08	4.72	2.31E-09
944.800	1.04E-08	4.72	2.21E-09
Band Exposure Quotient:			2.31E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,821.800	1.41E-07	9.11	1.55E-08
1,822.600	1.12E-07	9.11	1.23E-08
1,826.400	3.19E-08	9.13	3.49E-09
1,836.000	3.10E-08	9.18	3.37E-09
1,820.200	1.99E-08	9.10	2.19E-09
1,829.400	1.43E-08	9.15	1.57E-09
1,828.600	5.83E-09	9.14	6.37E-10
1,808.800	5.63E-09	9.04	6.23E-10
1,831.000	4.44E-09	9.15	4.85E-10
1,839.800	3.75E-09	9.20	4.07E-10
Band Exposure Quotient:			4.40E-08



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,865.400	2.97E-06	9.33	3.19E-07
1,849.400	2.30E-06	9.25	2.48E-07
1,863.400	1.35E-06	9.32	1.45E-07
1,861.600	6.31E-07	9.31	6.78E-08
1,862.400	5.26E-07	9.31	5.65E-08
1,870.200	5.21E-07	9.35	5.57E-08
1,867.000	5.18E-07	9.34	5.55E-08
1,852.000	4.40E-07	9.26	4.75E-08
1,865.000	3.92E-07	9.32	4.20E-08
1,863.600	2.10E-07	9.32	2.25E-08
Band Exposure Quotient:			1.26E-06

Total number of measurements: 572

Total Band Exposure Quotient: 1.53E-06

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

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

(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