

Mobile Phone Base-Station Audit

Audit site: Sutton High School
Woodchurch Lane
Ellesmere Port
Cheshire
CH66 3NG

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 Sutton High School on 19 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
Bottom of Playing Field - South	9.90E-05	1/10096
Bottom of Playing Field - North	7.58E-05	1/13189
Front of school next to twin black gates	4.60E-05	1/21723
Centre of goal mouth next to business centre	3.98E-05	1/25095
School Playing Field - By Tower Block	3.32E-05	1/30138
Outside G04	2.42E-05	1/41393

Issued on behalf of the Radiocommunications Agency.

Issued by:

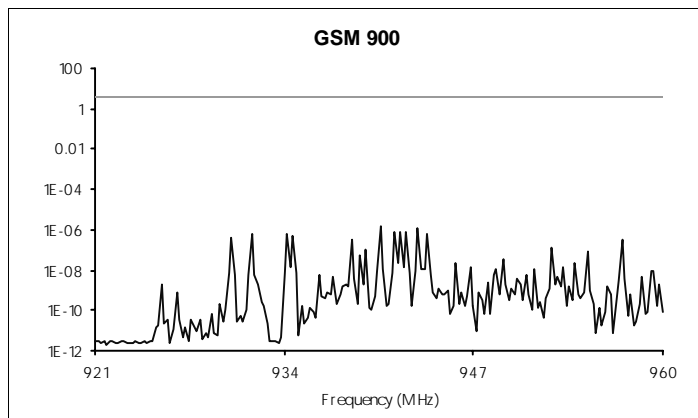
Received by:

D Thornber/P.Baguley
Radiocommunications Specialist

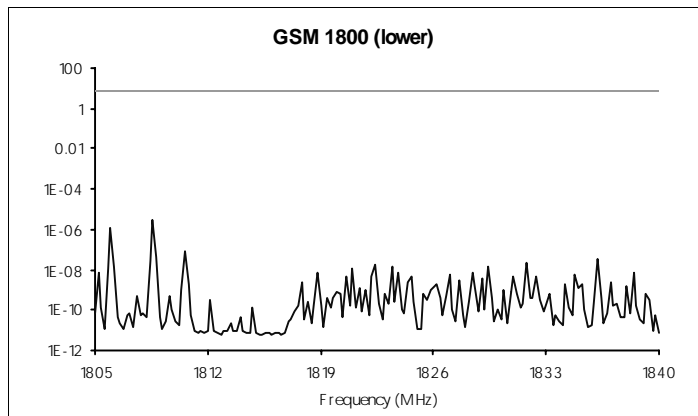
Kevin Lyth
Site Manager

Site: Sutton High School
Location: School Playing Field - By Tower Block
NGR: SJ 3814 7644 **Taken from GPS**
Start Time: 19 March 2003 10:39:22
Officer: D Thornber/P.Baguley

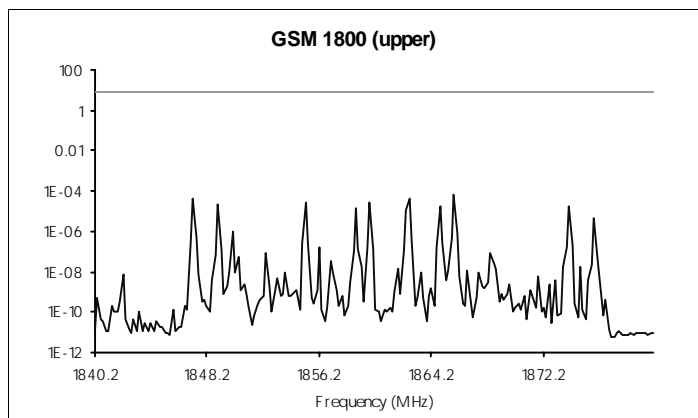
Receiver:
 Manufacturer: ROHDE&SCHWARZ
 Model: EB200
 Serial Number: 838.681/031
Antenna:
 Manufacturer: Rohde & Schwarz
 Model: HE200.4050.3609 02
 Serial Number: 100090



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
940.600	1.64E-06	4.70	3.49E-07
943.200	1.17E-06	4.72	2.48E-07
942.400	8.44E-07	4.71	1.79E-07
942.000	8.24E-07	4.71	1.75E-07
941.600	7.86E-07	4.71	1.67E-07
934.200	6.58E-07	4.67	1.41E-07
943.800	6.57E-07	4.72	1.39E-07
931.800	5.97E-07	4.66	1.28E-07
934.600	4.77E-07	4.67	1.02E-07
930.400	4.21E-07	4.65	9.05E-08
Band Exposure Quotient:			2.02E-06



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,808.600	3.24E-06	9.04	3.58E-07
1,806.000	1.25E-06	9.03	1.39E-07
1,810.600	9.37E-08	9.05	1.04E-08
1,808.800	4.17E-08	9.04	4.62E-09
1,836.200	3.24E-08	9.18	3.53E-09
1,808.400	3.02E-08	9.04	3.34E-09
1,831.800	2.44E-08	9.16	2.67E-09
1,822.400	1.87E-08	9.11	2.05E-09
1,806.200	1.47E-08	9.03	1.63E-09
1,823.400	1.45E-08	9.12	1.59E-09
Band Exposure Quotient:			5.44E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,865.800	6.81E-05	9.33	7.30E-06
1,847.200	3.89E-05	9.24	4.21E-06
1,862.600	3.81E-05	9.31	4.09E-06
1,859.800	2.56E-05	9.30	2.76E-06
1,855.200	2.54E-05	9.28	2.74E-06
1,849.000	2.05E-05	9.24	2.21E-06
1,864.800	1.59E-05	9.32	1.71E-06
1,874.000	1.58E-05	9.37	1.69E-06
1,858.800	1.37E-05	9.29	1.48E-06
1,862.400	1.12E-05	9.31	1.21E-06
Band Exposure Quotient:			3.06E-05

Total number of measurements: 572

Total Band Exposure Quotient: **3.32E-05**

Site: Sutton High School

Location: Outside G04

NGR: SJ 3824 7649 **Taken from GPS**

Start Time: 19 March 2003 10:52:34

Officer: D Thornber/P Baguley

Receiver:

Manufacturer: ROHDE&SCHWARZ

Model: EB200

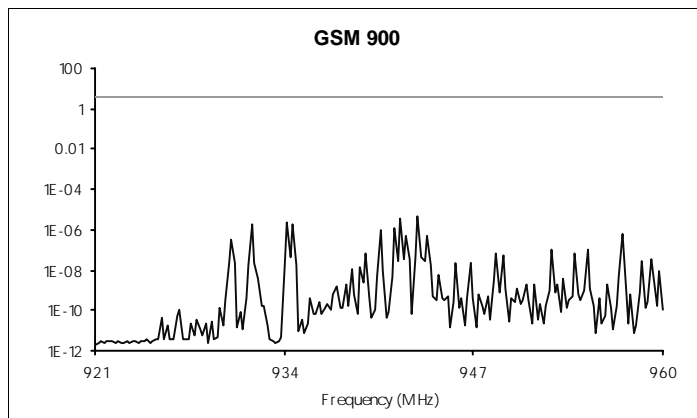
Serial Number: 838.681/031

Antenna:

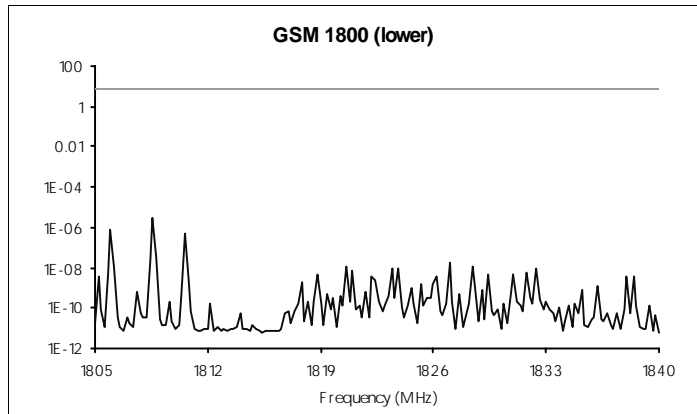
Manufacturer: Rohde & Schwarz

Model: HE200.4050.3609 02

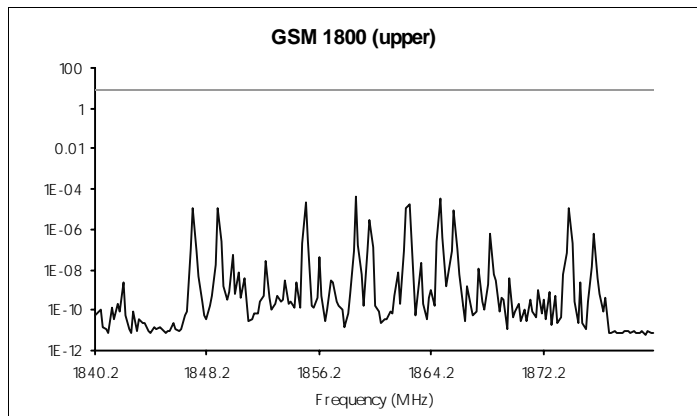
Serial Number: 100090



Frequency (MHz)	Maximum Exposure (W/m ²)	ICNIRP Limit (W/m ²)	Frequency Exposure Quotient
943.200	4.65E-06	4.72	9.85E-07
942.000	3.60E-06	4.71	7.64E-07
934.200	2.33E-06	4.67	5.00E-07
931.800	2.02E-06	4.66	4.34E-07
934.600	1.81E-06	4.67	3.88E-07
941.600	1.11E-06	4.71	2.36E-07
940.600	1.06E-06	4.70	2.25E-07
957.200	6.94E-07	4.79	1.45E-07
942.400	5.45E-07	4.71	1.16E-07
943.800	5.22E-07	4.72	1.11E-07
Band Exposure Quotient:			4.20E-06



Frequency (MHz)	Maximum Exposure (W/m ²)	ICNIRP Limit (W/m ²)	Frequency Exposure Quotient
1,808.600	3.09E-06	9.04	3.42E-07
1,806.000	8.29E-07	9.03	9.18E-08
1,810.600	4.59E-07	9.05	5.07E-08
1,808.800	3.47E-08	9.04	3.84E-09
1,808.400	2.89E-08	9.04	3.19E-09
1,827.000	1.71E-08	9.13	1.88E-09
1,806.200	1.17E-08	9.03	1.30E-09
1,828.400	1.06E-08	9.14	1.16E-09
1,820.600	1.02E-08	9.10	1.12E-09
1,823.800	9.37E-09	9.12	1.03E-09
Band Exposure Quotient:			5.09E-07



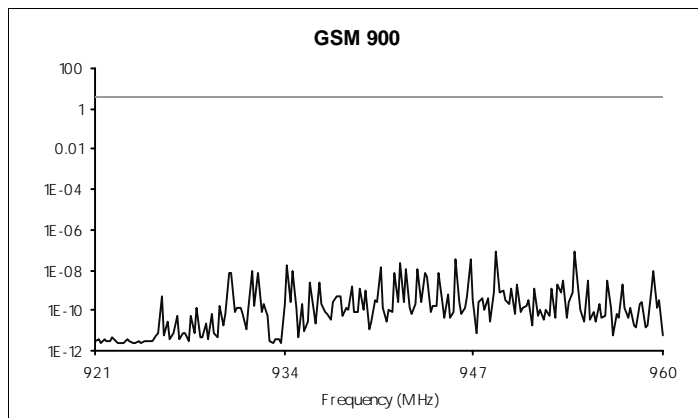
Frequency (MHz)	Maximum Exposure (W/m ²)	ICNIRP Limit (W/m ²)	Frequency Exposure Quotient
1,858.800	4.06E-05	9.29	4.36E-06
1,864.800	3.57E-05	9.32	3.83E-06
1,855.200	2.27E-05	9.28	2.44E-06
1,862.600	1.91E-05	9.31	2.05E-06
1,874.000	1.23E-05	9.37	1.31E-06
1,849.000	1.20E-05	9.24	1.30E-06
1,847.200	1.09E-05	9.24	1.19E-06
1,862.400	1.07E-05	9.31	1.15E-06
1,865.800	9.62E-06	9.33	1.03E-06
1,859.800	2.88E-06	9.30	3.09E-07
Band Exposure Quotient:			1.95E-05

Total number of measurements: 572

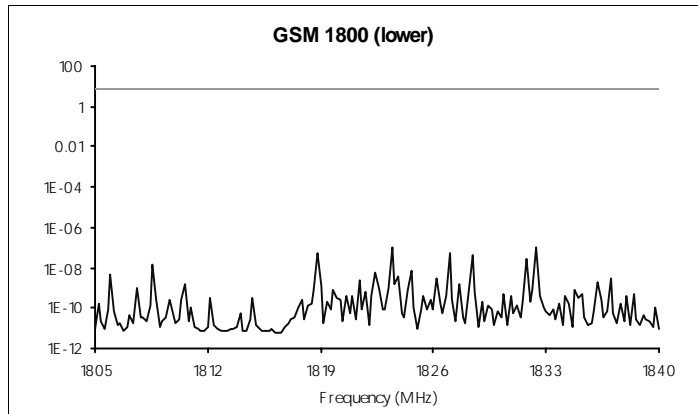
Total Band Exposure Quotient: **2.42E-05**

Site: Sutton High School
Location: Bottom of Playing Field - North
NGR: SJ 3801 7643 **Taken from GPS**
Start Time: 19 March 2003 11:07:37
Officer: J Wildridge / S Culling

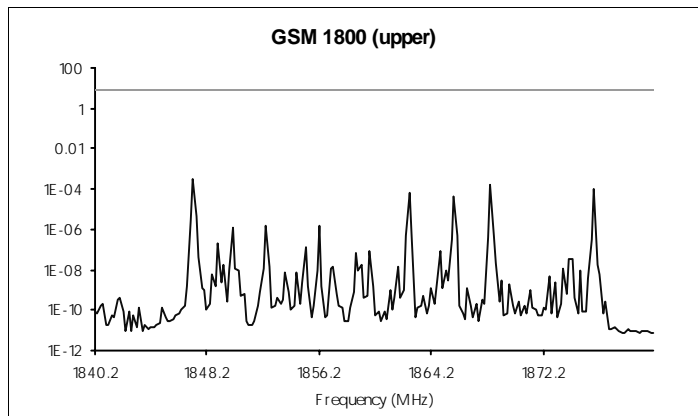
Receiver:
 Manufacturer: ROHDE&SCHWARZ
 Model: EB200
 Serial Number: 838.681/031
Antenna:
 Manufacturer: Rohde & Schwarz
 Model: HE200.4050.3609 02
 Serial Number: 100090



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
954.000	8.67E-08	4.77	1.82E-08
948.600	7.81E-08	4.74	1.65E-08
946.800	3.64E-08	4.73	7.68E-09
945.800	3.47E-08	4.73	7.33E-09
942.000	2.22E-08	4.71	4.71E-09
934.200	1.94E-08	4.67	4.16E-09
940.600	1.49E-08	4.70	3.18E-09
942.400	1.25E-08	4.71	2.65E-09
943.200	1.11E-08	4.72	2.36E-09
931.800	1.01E-08	4.66	2.18E-09
Band Exposure Quotient:			9.32E-08



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,823.400	1.15E-07	9.12	1.26E-08
1,832.400	1.04E-07	9.16	1.14E-08
1,818.800	5.35E-08	9.09	5.88E-09
1,827.000	5.06E-08	9.13	5.54E-09
1,828.400	4.52E-08	9.14	4.95E-09
1,831.800	2.56E-08	9.16	2.79E-09
1,808.600	1.38E-08	9.04	1.53E-09
1,824.600	7.81E-09	9.12	8.56E-10
1,822.400	6.04E-09	9.11	6.63E-10
1,806.000	4.88E-09	9.03	5.41E-10
Band Exposure Quotient:			5.14E-08



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,847.200	3.16E-04	9.24	3.42E-05
1,868.400	1.57E-04	9.34	1.68E-05
1,875.800	1.05E-04	9.38	1.12E-05
1,862.600	6.78E-05	9.31	7.28E-06
1,865.800	4.30E-05	9.33	4.61E-06
1,847.400	4.16E-06	9.24	4.51E-07
1,847.000	2.88E-06	9.23	3.12E-07
1,852.400	1.46E-06	9.26	1.57E-07
1,856.200	1.40E-06	9.28	1.51E-07
1,850.000	1.18E-06	9.25	1.27E-07
Band Exposure Quotient:			7.57E-05

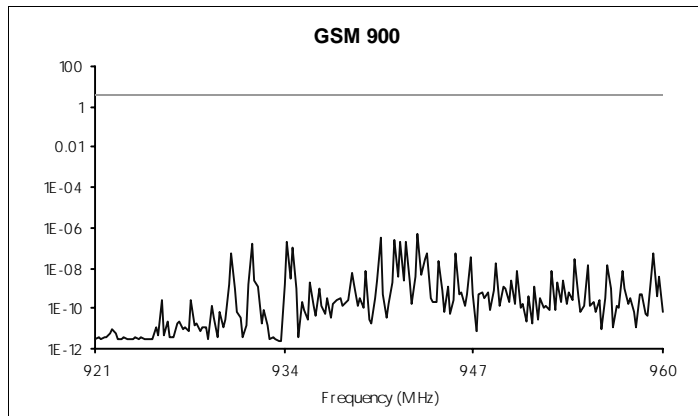
Total number of measurements: 572

Total Band Exposure Quotient: **7.58E-05**

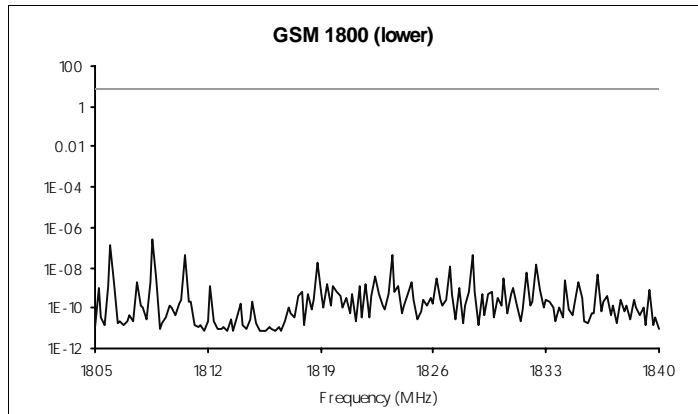
Site: Sutton High School
Location: Bottom of Playing Field - South

NGR: SJ 3805 7626 **Taken from GPS**
Start Time: 19 March 2003 11:21:41
Officer: D Thornber/P Baguley

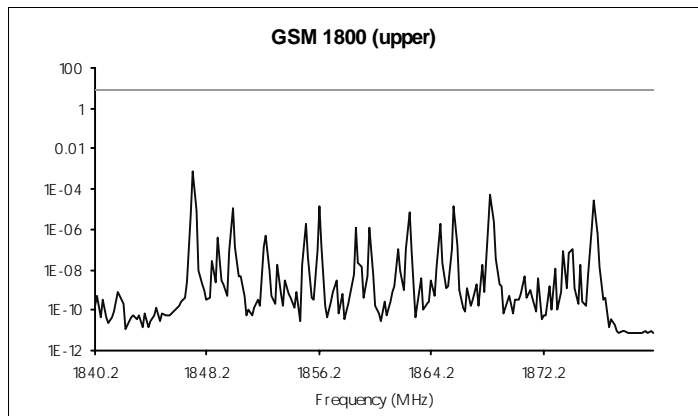
Receiver:
 Manufacturer: ROHDE&SCHWARZ
 Model: EB200
 Serial Number: 838.681/031
Antenna:
 Manufacturer: Rohde & Schwarz
 Model: HE200.4050.3609 02
 Serial Number: 100090



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
943.200	5.10E-07	4.72	1.08E-07
940.600	2.91E-07	4.70	6.20E-08
941.600	2.73E-07	4.71	5.79E-08
942.400	2.27E-07	4.71	4.82E-08
934.200	1.99E-07	4.67	4.25E-08
942.000	1.89E-07	4.71	4.01E-08
931.800	1.64E-07	4.66	3.53E-08
934.600	9.74E-08	4.67	2.08E-08
930.400	5.68E-08	4.65	1.22E-08
945.800	5.75E-08	4.73	1.22E-08
Band Exposure Quotient:			5.19E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,808.600	2.35E-07	9.04	2.59E-08
1,806.000	1.44E-07	9.03	1.60E-08
1,823.400	4.80E-08	9.12	5.27E-09
1,810.600	4.70E-08	9.05	5.19E-09
1,828.400	3.94E-08	9.14	4.31E-09
1,818.800	1.69E-08	9.09	1.86E-09
1,832.400	1.51E-08	9.16	1.65E-09
1,827.000	1.24E-08	9.13	1.36E-09
1,831.800	5.47E-09	9.16	5.97E-10
1,836.200	4.69E-09	9.18	5.11E-10
Band Exposure Quotient:			6.91E-08



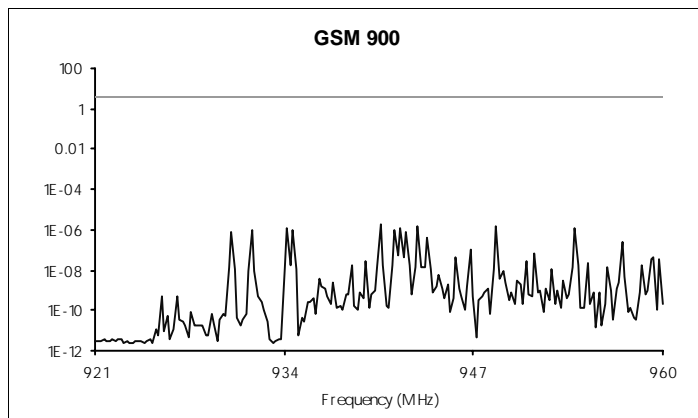
Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,847.200	7.58E-04	9.24	8.20E-05
1,868.400	4.96E-05	9.34	5.31E-06
1,875.800	2.96E-05	9.38	3.15E-06
1,856.200	1.31E-05	9.28	1.41E-06
1,865.800	1.30E-05	9.33	1.39E-06
1,850.000	1.08E-05	9.25	1.16E-06
1,847.400	9.54E-06	9.24	1.03E-06
1,862.600	7.43E-06	9.31	7.98E-07
1,847.000	6.02E-06	9.23	6.51E-07
1,868.600	2.37E-06	9.34	2.54E-07
Band Exposure Quotient:			9.85E-05

Total number of measurements: 572

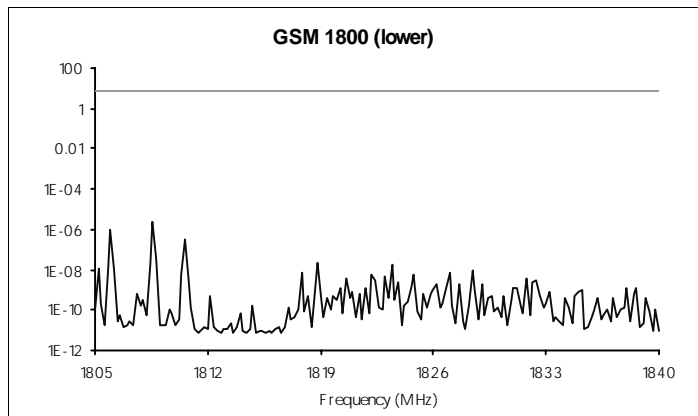
Total Band Exposure Quotient: **9.90E-05**

Site: Sutton High School
Location: Centre of goal mouth next to business centre
NGR: SJ 3826 7637 **Taken from GPS**
Start Time: 19 March 2003 11:41:34
Officer: D Thornber/P Baguley

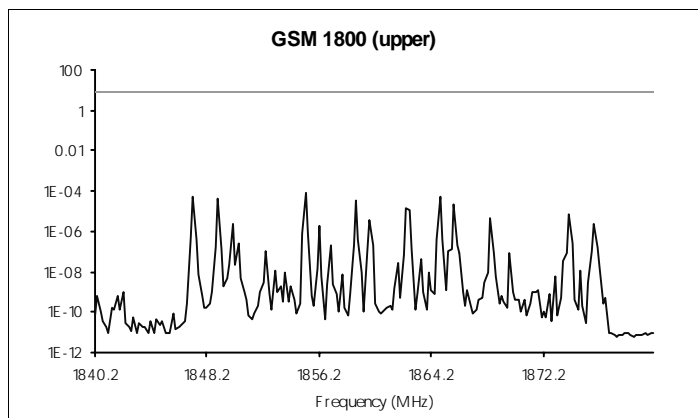
Receiver:
 Manufacturer: ROHDE&SCHWARZ
 Model: EB200
 Serial Number: 838.681/031
Antenna:
 Manufacturer: Rohde & Schwarz
 Model: HE200.4050.3609 02
 Serial Number: 100090



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
940.600	1.72E-06	4.70	3.65E-07
943.200	1.44E-06	4.72	3.05E-07
948.600	1.42E-06	4.74	3.00E-07
954.000	1.34E-06	4.77	2.82E-07
934.200	1.17E-06	4.67	2.50E-07
942.000	1.11E-06	4.71	2.36E-07
931.800	9.46E-07	4.66	2.03E-07
941.600	9.03E-07	4.71	1.92E-07
934.600	8.68E-07	4.67	1.86E-07
930.400	8.60E-07	4.65	1.85E-07
Band Exposure Quotient:			3.01E-06



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,808.600	2.24E-06	9.04	2.48E-07
1,806.000	1.04E-06	9.03	1.16E-07
1,810.600	3.03E-07	9.05	3.35E-08
1,808.800	3.17E-08	9.04	3.50E-09
1,808.400	2.29E-08	9.04	2.54E-09
1,818.800	1.99E-08	9.09	2.18E-09
1,823.400	1.70E-08	9.12	1.87E-09
1,806.200	1.12E-08	9.03	1.24E-09
1,805.800	1.07E-08	9.03	1.18E-09
1,805.200	1.07E-08	9.03	1.18E-09
Band Exposure Quotient:			4.22E-07



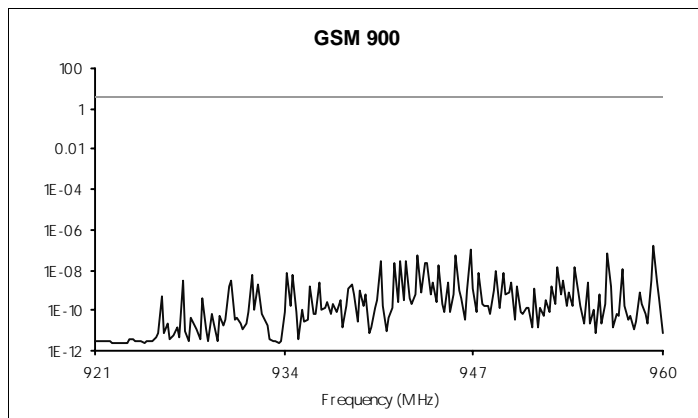
Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,855.200	7.86E-05	9.28	8.47E-06
1,847.200	5.36E-05	9.24	5.81E-06
1,864.800	4.82E-05	9.32	5.16E-06
1,849.000	4.69E-05	9.24	5.07E-06
1,858.800	3.37E-05	9.29	3.63E-06
1,865.800	2.15E-05	9.33	2.31E-06
1,862.400	1.38E-05	9.31	1.49E-06
1,862.600	1.20E-05	9.31	1.29E-06
1,874.000	7.75E-06	9.37	8.27E-07
1,868.400	4.73E-06	9.34	5.07E-07
Band Exposure Quotient:			3.64E-05

Total number of measurements: 572

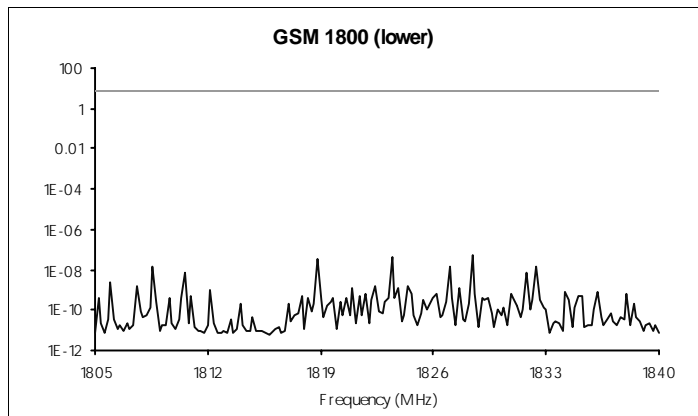
Total Band Exposure Quotient: **3.98E-05**

Site: Sutton High School
Location: Front of school next to twin black gates
NGR: SJ 3834 7642 **Taken from GPS**
Start Time: 19 March 2003 11:54:40
Officer: D Thornber/P Baguley

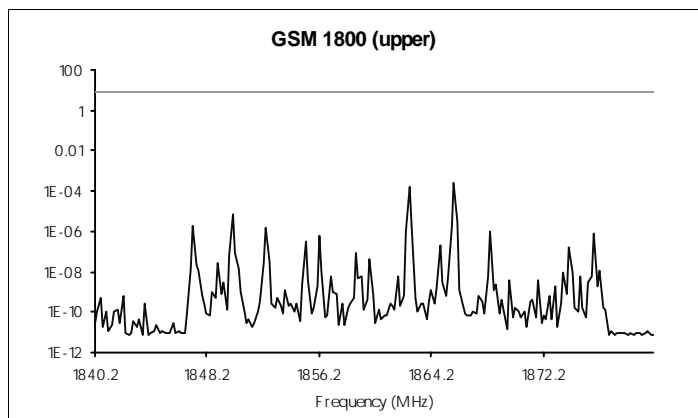
Receiver:
 Manufacturer: ROHDE&SCHWARZ
 Model: EB200
 Serial Number: 838.681/031
Antenna:
 Manufacturer: Rohde & Schwarz
 Model: HE200.4050.3609 02
 Serial Number: 100090



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
959.400	1.79E-07	4.80	3.74E-08
946.800	9.57E-08	4.73	2.02E-08
956.200	6.03E-08	4.78	1.26E-08
943.200	5.46E-08	4.72	1.16E-08
945.800	5.25E-08	4.73	1.11E-08
942.400	2.86E-08	4.71	6.07E-09
940.600	2.66E-08	4.70	5.65E-09
942.000	2.49E-08	4.71	5.28E-09
943.600	2.13E-08	4.72	4.51E-09
941.600	2.07E-08	4.71	4.39E-09
Band Exposure Quotient:			1.58E-07



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,828.400	5.83E-08	9.14	6.37E-09
1,823.400	4.28E-08	9.12	4.70E-09
1,818.800	3.22E-08	9.09	3.54E-09
1,808.600	1.52E-08	9.04	1.68E-09
1,827.000	1.43E-08	9.13	1.56E-09
1,832.400	1.37E-08	9.16	1.50E-09
1,831.800	7.55E-09	9.16	8.24E-10
1,810.600	6.79E-09	9.05	7.50E-10
1,806.000	2.18E-09	9.03	2.41E-10
1,822.400	1.59E-09	9.11	1.74E-10
Band Exposure Quotient:			2.46E-08



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,865.800	2.31E-04	9.33	2.47E-05
1,862.600	1.74E-04	9.31	1.87E-05
1,850.000	7.79E-06	9.25	8.42E-07
1,866.000	2.84E-06	9.33	3.05E-07
1,865.600	1.92E-06	9.33	2.06E-07
1,862.800	1.78E-06	9.31	1.91E-07
1,847.200	1.70E-06	9.24	1.84E-07
1,852.400	1.67E-06	9.26	1.81E-07
1,862.400	1.03E-06	9.31	1.10E-07
1,868.400	9.23E-07	9.34	9.88E-08
Band Exposure Quotient:			4.58E-05

Total number of measurements: 572

Total Band Exposure Quotient: **4.60E-05**

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
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