Mobile Phone
Base-Station Audit

Audit site: Bishop King Primary School
Kingsway
Lincoln Lincolnshire
LN5 8EU

The Office of Communications (Ofcom) is responsible for management of the civil radio spectrum in the UK. Following recommendations of the Stewart Report in 2000 Ofcom is continuing 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 grleen 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 Ofcom officers at the time of the audit or by contacting Ofcom on 020 7981 3040 or by e-mail at contact@ofcom.org.uk A glossary of terms can be found at the end of the report.

Results taken from all audit sites and further information on the audit programme can be found on the Ofcom website at www.ofcom.org.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.

Ofcom performed this survey of the RF emission environment prevailing in the vicinity of Bishop King Primary School on 13/12/2005

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 spot of hard court playground	2.41313E-05	1/ 41440
Paved area - adjacent to building works	2.33231E-05	1/ 42876
Centre of football pitch	9.12149E-06	1/ 109631

Issued on behalf of Ofcom.

Issued by:	Received by:
CC	David Tinsley
TIO	Headteacher

Survey Methodology

EM power density levels have been measured in this survey using a carefully designed and controlled methodology. Elements of this methodology include:

1. A peak search around the identified location in order to determine with accuracy the spot where the maximum radiation levels are being received. To achieve this, the survey engineer walked in the area surrounding the site along a pre-defined template path, using the hand-held probe and noted the location of maximum reading.
2. The probe was then positioned on a tripod at the exact location of the maximum radiation level readings and the measurement taken. The height of the probe is approximately 1.5m above the ground.
3. The exact measurement position was recorded using a GPS receiver and photographs of the location were taken where appropriate.

Survey equipment

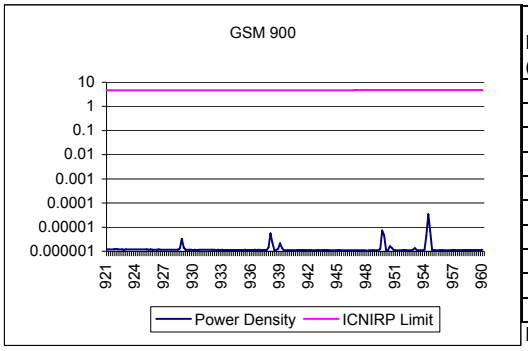
The measurements were performed using:

* an isotropic field probe, which reacts to all polarisations (directions) of the electric field, in a similar way to biological tissue.
* a carefully calibrated exposure level meter for all cellular frequencies to ensure that that the measurements are meaningful and accurate.

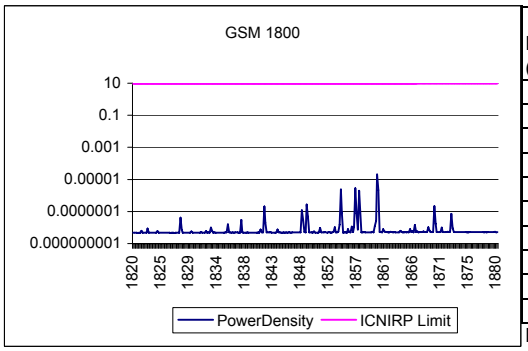
Receiver:	
Manufacturer:	Rohde & Schwarz
Model:	FSH6
Serial Number:	100683
Probe:	
Manufacturer:	Rohde & Schwarz
Model:	TS-EMF
Serial Number:	100048

Site:	Bishop King Primary School
Location:	Paved area - adjacent to building works
Total Band Exposure Quotient:	2.33231E-05
Total Number of Measurements:	4
NGR:	SK 9787 7014
Start time:	13/12/2005 10:02
Officer:	CC

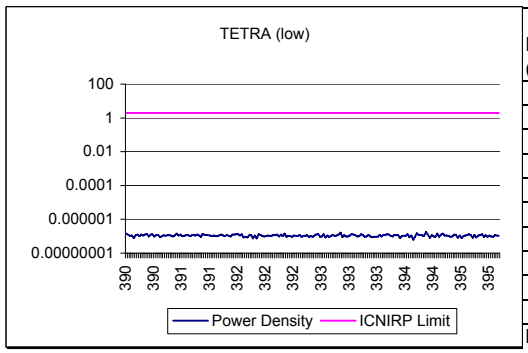
Measurement location: Paved area - adjacent to building works



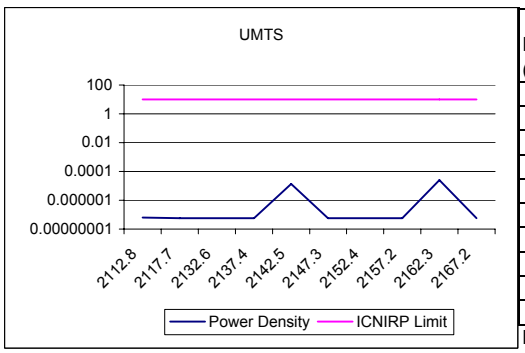
Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
954.4	3.47E-05	4.772	7.28E-06
949.6	7.2E-06	4.748	1.52E-06
954.6	6.59E-06	4.773	1.38E-06
938	5.59E-06	4.69	1.19E-06
954.2	4.59E-06	4.771	9.61E-07
949.8	4.55E-06	4.749	9.57E-07
928.8	3.32E-06	4.644	7.14E-07
938.2	2.28E-06	4.691	4.87E-07
939	2.11E-06	4.695	4.5E-07
950.4	1.61E-06	4.752	3.38E-07
Band Exposure Quotient:			1.53E-05



Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
1860.2	2.05E-05	9.301	2.21E-06
1856.6	2.81E-06	9.283	3.03E-07
1854.2	2.34E-06	9.271	2.53E-07
1860.4	2.15E-06	9.302	2.31E-07
1857.2	1.95E-06	9.286	2.1E-07
1848.6	2.69E-07	9.243	2.91E-08
1869.6	2.15E-07	9.348	2.3E-08
1841.6	2.1E-07	9.208	2.28E-08
1857.4	1.46E-07	9.287	1.57E-08
1847.8	1.2E-07	9.239	1.3E-08
Band Exposure Quotient:			3.31E-06



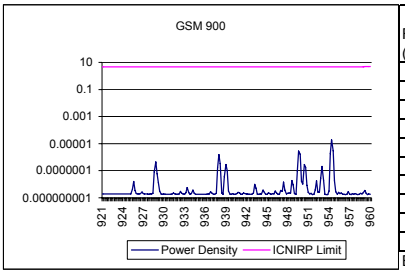
Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
394.025	1.76E-07	2	8.82E-08
392.875	1.61E-07	2	8.06E-08
393.9	1.46E-07	2	7.31E-08
394.175	1.45E-07	2	7.25E-08
394.25	1.44E-07	2	7.19E-08
390.675	1.41E-07	2	7.07E-08
390	1.41E-07	2	7.04E-08
392.125	1.4E-07	2	7.01E-08
392.575	1.39E-07	2	6.95E-08
391.025	1.37E-07	2	6.87E-08
Band Exposure Quotient:			7.36E-07



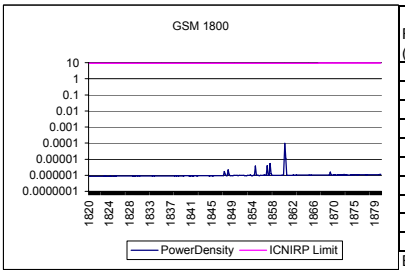
Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
2162.3	2.57E-05	10	2.57E-06
2142.5	1.39E-05	10	1.39E-06
2112.8	6.17E-08	10	6.17E-09
2167.2	5.79E-08	10	5.79E-09
2137.4	5.73E-08	10	5.73E-09
2157.2	5.71E-08	10	5.71E-09
2132.6	5.7E-08	10	5.7E-09
2152.4	5.7E-08	10	5.7E-09
2147.3	5.68E-08	10	5.68E-09
2117.7	5.66E-08	10	5.66E-09
Band Exposure Quotient:			4.01E-06

Site:	Bishop King Primary School
Location:	Centre spot of hard court playground
Total Band Exposure Quotient:	2.41313E-05
Total Number of Measurements:	4
NGR:	SK 9776 7007
Start time:	13/12/2005 10:15
Officer:	CC

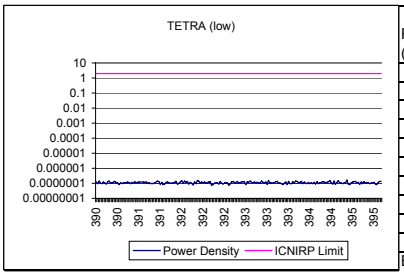
Measurement location: Centre spot of hard court playground



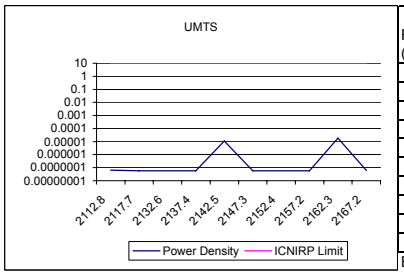
Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
954.4	1.88E-05	4.772	3.94E-06
954.6	2.93E-06	4.773	6.14E-07
949.6	2.76E-06	4.748	5.82E-07
954.2	1.82E-06	4.771	3.82E-07
949.8	1.61E-06	4.749	3.39E-07
938	1.56E-06	4.69	3.32E-07
928.8	4.5E-07	4.644	9.69E-08
938.2	3.45E-07	4.691	7.34E-08
939	2.93E-07	4.695	6.23E-08
950.4	2.83E-07	4.752	5.95E-08
Band Exposure Quotient:			6.48E-06



Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
1860.2	9.74E-05	9.301	1.05E-05
1860.4	1.1E-05	9.302	1.18E-06
1857.2	5.39E-06	9.286	5.81E-07
1856.6	3.88E-06	9.283	4.18E-07
1854.2	3.68E-06	9.271	3.97E-07
1848.6	2.11E-06	9.243	2.28E-07
1847.8	1.73E-06	9.239	1.87E-07
1869.6	1.6E-06	9.348	1.71E-07
1857.4	1.26E-06	9.287	1.36E-07
1848.8	1.15E-06	9.244	1.24E-07
Band Exposure Quotient:			1.39E-05



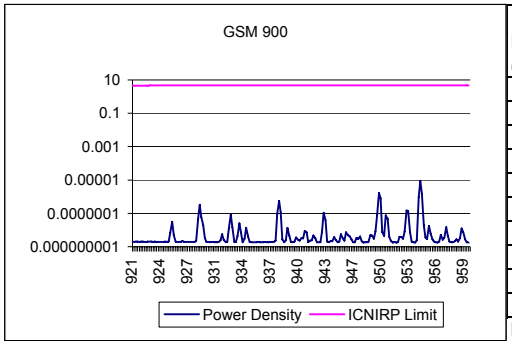
Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
394.4	1.6E-07	2	7.98E-08
391.775	1.57E-07	2	7.87E-08
393.025	1.57E-07	2	7.86E-08
391.5	1.48E-07	2	7.42E-08
394.1	1.47E-07	2	7.37E-08
394.25	1.46E-07	2	7.3E-08
392.7	1.42E-07	2	7.1E-08
392.9	1.42E-07	2	7.09E-08
390.05	1.41E-07	2	7.07E-08
391.55	1.41E-07	2	7.05E-08
Band Exposure Quotient:			7.41E-07



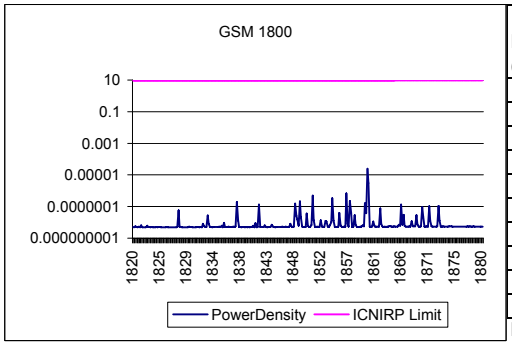
Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
2162.3	1.88E-05	10	1.88E-06
2142.5	1.09E-05	10	1.09E-06
2112.8	6.33E-08	10	6.33E-09
2167.2	5.94E-08	10	5.94E-09
2157.2	5.9E-08	10	5.9E-09
2132.6	5.88E-08	10	5.88E-09
2137.4	5.87E-08	10	5.87E-09
2147.3	5.86E-08	10	5.86E-09
2152.4	5.85E-08	10	5.85E-09
2117.7	5.83E-08	10	5.83E-09
Band Exposure Quotient:			3.01E-06

Site:	Bishop King Primary School
Location:	Centre of football pitch
Total Band Exposure Quotient:	9.12149E-06
Total Number of Measurements:	4
NGR:	SK 9776 7002
Start time:	13/12/2005 10:33
Officer:	CC

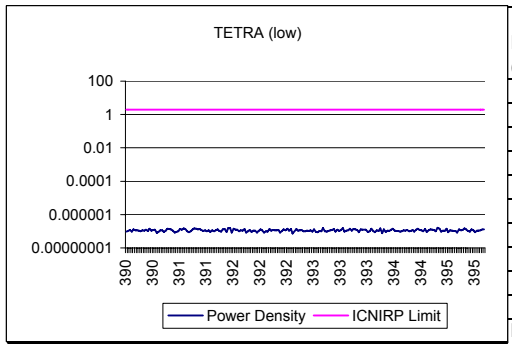
Measurement location: Centre of football pitch



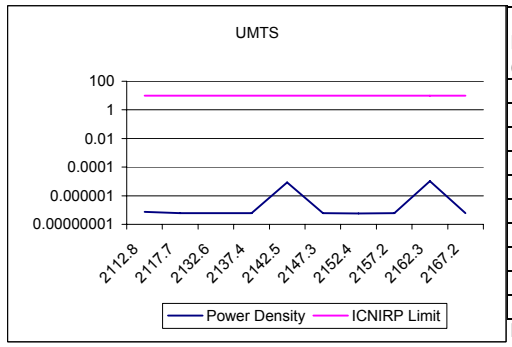
Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
954.4	9.06E-06	4.772	1.9E-06
949.6	1.69E-06	4.748	3.57E-07
954.6	1.46E-06	4.773	3.06E-07
954.2	9.1E-07	4.771	1.91E-07
949.8	7.83E-07	4.749	1.65E-07
938	5.46E-07	4.69	1.16E-07
928.8	3.3E-07	4.644	7.1E-08
952.8	1.5E-07	4.764	3.16E-08
953	1.39E-07	4.765	2.93E-08
938.2	1.13E-07	4.691	2.4E-08
Band Exposure Quotient:			3.19E-06



Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
1860.2	2.45E-05	9.301	2.64E-06
1860.4	3.04E-06	9.302	3.27E-07
1856.6	6.92E-07	9.283	7.45E-08
1850.8	5.01E-07	9.254	5.42E-08
1854.2	3.39E-07	9.271	3.65E-08
1857.2	2.21E-07	9.286	2.38E-08
1848.6	2.15E-07	9.243	2.33E-08
1837.8	1.98E-07	9.189	2.16E-08
1859.8	1.59E-07	9.299	1.71E-08
1847.8	1.53E-07	9.239	1.66E-08
Band Exposure Quotient:			3.23E-06



Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
394.35	1.61E-07	2	8.04E-08
393.025	1.58E-07	2	7.88E-08
391.45	1.57E-07	2	7.87E-08
391.425	1.57E-07	2	7.85E-08
392.75	1.53E-07	2	7.65E-08
394.725	1.51E-07	2	7.53E-08
390.8	1.5E-07	2	7.52E-08
393.55	1.5E-07	2	7.49E-08
390.95	1.45E-07	2	7.27E-08
394.475	1.44E-07	2	7.22E-08
Band Exposure Quotient:			7.63E-07



Frequency (MHz)	Power Density (W/m2)	ICNIRP Maximum (W/m2)	Exposure Quotient
2162.3	1.05E-05	10	1.05E-06
2142.5	8.35E-06	10	8.35E-07
2112.8	7.46E-08	10	7.46E-09
2167.2	5.98E-08	10	5.98E-09
2157.2	5.97E-08	10	5.97E-09
2137.4	5.96E-08	10	5.96E-09
2147.3	5.93E-08	10	5.93E-09
2117.7	5.92E-08	10	5.92E-09
2132.6	5.92E-08	10	5.92E-09
2152.4	5.9E-08	10	5.9E-09
Band Exposure Quotient:			1.94E-06

EM Exposure Background

All radio waves are electromagnetic waves (“EM”), which are composed of electric and magnetic fields. These waves are referred to as ‘non-ionising radiation’ as distinct from the ionising radiation produced by radioactive sources. We are all regularly exposed to EM radiation from a variety of sources.

Exposure to EM waves is measured in terms of the electric and magnetic field strengths, which are produced by a transmitter at locations, which could be accessed by the public. The electric field strength, E, is measured in volts per metre [V.m-1]. The power that could be absorbed by an object at a given location is proportional to the area of the object multiplied by the square of the electric field strength.

In this report, the Exposure Quotient (“EQ”) is calculated to express the ratio of the measured power density levels (expressed in W/m2) to the ICNIRP Reference power density levels (derived from the Reference field strength levels). The EQ is then summed over all the frequencies in each of the surveyed bands to yield the band exposure quotient as shown in the Survey Results section of this document. A band EQ of 1 (unity) means that the ICNIRP Reference level has been reached at the surveyed frequency band.

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 Ofcom 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(μV/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 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

TETRA: Terrestrial Trunked Radio

UMTS: Universal Mobile Telecommunications System (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