Cornerstone Project

EMF ADVISORY UNIT
FACT SHEET SERIES

HOW IT WORKS

An explanation of mobile phone operators radio networks and how radio base stations make communications possible.

The network

- In the UK mobile phone operators run a cellular radio telecommunications system using parts of the radio spectrum at discrete frequencies between 890 and 2100 megahertz.

- These frequencies are allocated to mobile phone operators by the Office of Communications (Ofcom). Ofcom also issues licences to the other operators of communications services.

How it works

A mobile phone communicates with a base station just as a cordless phone in the home communicates with its own base unit.

Without a good signal from a base station, your mobile will simply not work. In the same way, if you take a cordless phone too far from its base unit, you will lose the call.

Each base station sends and receives signals within a small area called a "cell". As you travel from one area to another, the base station in one cell detects a weakening of the signal and hands the call over to another. A gap between cells will result in a "dropped call".

Radio base stations are low-powered devices (between 2 and 200 watts per operator) communicating with low-powered handsets (less than 1 watt) and

The Cornerstone Team is comprised of individuals employed either by Telefónica O2 UK Limited or Vodafone UK Limited. It exists to facilitate network infrastructure sharing arrangements between the two companies, but not as an entity in its own right. Neither company is an agent for the other and the members of the Cornerstone Team employed by one company are not agents for the other company. The Cornerstone Team is not a partnership, nor is it incorporated as a limited company. It cannot enter into contracts, and cannot be responsible for debts, whether in its own name or on behalf of Telefónica O2 UK Limited or Vodafone UK Limited.

can only cover limited geographical areas. Whilst in theory radio signals can travel for tens of kilometres, in reality, the landscape, trees or buildings will severely restrict this. In heavily built-up areas, a single small base station might cover as little as a few hundred metres. For this reason, it is essential that base stations are located where people need to use their mobiles – where they live, work and travel.

Each base station can only take a limited number of calls or data downloads. A base station can take around 100 at any one time and the 101st caller will get a "network busy" signal. When a base station reaches full capacity, it may be necessary to adapt the base station or construct a new one.

Radio base stations are designed to operate at the lowest possible power levels compatible with a good service. They automatically reduce and increase power in response to demand throughout the day and night, but power levels are also limited by design. Once the maximum has been reached, no more calls will be handled and power levels cannot increase.

Handsets also vary their power levels. In an effort to locate a distant base station, the handset will increase in power. With a good signal from a nearby radio base station, once the connection has been made, handset power levels will reduce.

For further information please contact:

EMF Enquiries, Cornerstone
1210 Parkview, Arlington Business Park, Theale, Berks, RG7 4TY
Tel. 07764 658 537, Kevin.Hull@cornerstonemobile.net

The Cornerstone Team is comprised of individuals employed either by Telefónica O2 UK Limited or Vodafone UK Limited. It exists to facilitate network infrastructure sharing arrangements between the two companies, but not as an entity in its own right. Neither company is an agent for the other and the members of the Cornerstone Team employed by one company are not agents for the other company. The Cornerstone Team is not a partnership, nor is it incorporated as a limited company. It cannot enter into contracts, and cannot be responsible for debts, whether in its own name or on behalf of Telefónica O2 UK Limited or Vodafone UK Limited.