

# What the technical terms mean

## **RF/R**

Radio Frequency Radiation: part of the electromagnetic spectrum

## **EMR/F**

Electro-magnetic radiation/fields

A spectrum of interacting magnetic and electrical fields that ranges from ultra-low frequencies, through radio waves, microwaves (TETRA and mobile phones), visible light, ultraviolet, to x-rays, measured in increasing frequency

## **Frequency**

The rate of regular variation in transmission waves: how many waves arrive per second. TETRA operates around 400 million cycles per second (Mega Hertz, or MHz), the latest mobile phones operate at 2000 MHz (2 Giga Hertz, or GHz)

## **TETRA / Airwave**

TErrestrial Trunked Radio. A European specification for a microwave radio system, marketed under the brand name of "Airwave" in the UK, and contracted to mmO2, operating as O2 Airwave

## **Base station**

Otherwise called a mast: the structure with associated electronics cabinets that carries aerials, or antennae. Single antennae are also used as "repeaters" to fill in gaps between base stations.

## **Ionising radiation**

EMR at the top of the spectrum that destroys cellular structures through its destructive effects at molecular and atomic level, eg ultraviolet, X-rays, gamma rays ("atomic" or "nuclear" radiation)

## **Non-ionising radiation**

Radiation that apparently does not affect cellular material in the same way: atoms are not broken up into "ions" by this radiation

## **ELF**

Extremely low frequency: typically 0-200 cycles per second (Hz)

## **Pulsing**

Signals transmitted in bursts at regular frequencies. Not to be confused with transmission frequencies. TETRA and mobile phone masts use various ELF pulse frequencies, including ones that coincide with critical bio-electrical frequencies such as brain waves.

## **Thermal effects of radiation**

Radiation can vibrate molecules and generate heat. This underlies the way microwave ovens work. It is generally recognised that heating living organisms up is dangerous.

## **Non-thermal, or biological effects of radiation**

Radiation is known to affect living organisms by inducing currents that interfere with life processes. For example, pulsed EMR at ELF is used to heal bones and soft tissue injuries, and miniscule currents in the body affect the ways in which chemicals travel through cell membranes.

## **Exposure guidelines**

Suggested levels of human exposure to EMR, scaled on power levels at the point of exposure, the frequency of the radiation, and the duration of exposure. An Airwave TETRA mast, for example radiates at a continuous power level 24 hours a day, whereas exposure to a mobile phone handset lasts a few minutes. Generally the lower the frequency the greater the penetration into the body. TETRA therefore penetrates much more than mobile phones.

## **SAR**

Specific Absorption Ratio. The supposed degree of penetration and absorption of radiation by organs of the body. A way of suggesting the effects of particular equipment such a mobile phones and TETRA handsets.

## **ICNIRP**

International Commission on Non-Ionising Radiation Protection

## **ICNIRP Guidelines**

Based on the premise that "if it can't heat you it can't hurt you" these international standards ensure that electromagnetic radiation cannot even come close to raising the body heat of anyone in range of an EMR source, by 1 degree C over a period of several minutes.

## **NRPB**

The UK's National Radiological Protection Board. Now embraced by the Health Protection Agency, headed by Sir William Stewart, chairman of the Independent Expert Group on Mobile Phones (IEGMP) that produced the 2000 "Stewart Report" that recommended both a precautionary approach to the new mobile technology, and the avoidance of frequencies around 16Hz (see ELF).

## **AGNIR**

Advisory Group on Non-ionising Radiation. Produced a report in response to Stewart in 2001 "Possible Health Effects from Terrestrial Trunked Radio (TETRA)", and updated the Stewart in 2004 as "Health Effects from Radiofrequency Electromagnetic fields".

## **Safe**

A relative term, but one when used for public health and safety is usually given parameters. Pharmaceutical drugs, for example, warn of known side effects discovered through rigorous testing, and foodstuffs with known allergic associations are declared on labels.

Is TETRA "safe"? No-one will say that it is, or under what conditions. All the official reports declare an inadequacy in the current research, and call for more. There is no testing of the health effects of TETRA in the research literature, and there is no research into the health effects from TETRA masts in any of the government or industry research programmes.