

Computing overview

Computer monitors (Visual Display Units or VDUs)

Old cathode ray tube (CRT) type screens used to give off very high electric and magnetic fields from the screen and associated scanning coils. In the late 1980s a Swedish trade union whose workers were concerned about the reported health risks, demanded that the EMFs from computer VDUs be strictly limited to levels way below those being emitted by most of the VDUs in use at that time. In 1990, the Swedish National Board for Measurement and Testing issued guidelines known as MPRII. The rest of the industry was pressurised into offering monitors that complied with the MPRII standard. This competition had the result that within a few years low EMF computer monitors were the most readily available type of monitor.

Despite this, the number of people affected by suspected hypersensitivity to electricity increased dramatically during the latter half of the 80s. An article in a Swedish computer magazine in 1989 included " ... *Stopping working with VDUs was the most well-tried, and similarly the most effective method of reducing symptoms. Changing to a "low-emission" VDU usually did not lead to improvements - on the contrary, in several cases deterioration was noted ...*" So, even low-emission VDU monitors can provoke symptoms in electrically hypersensitive people.

TCO95 (TCO is the Swedish Confederation of Professional Employees) screens gave off low EMFs, less than 10 V/m & 0.20 μ T at 50cm. TCO95 became the first global environmental labelling scheme. The product did not contain cadmium or lead, the plastic housing had to be of biodegradable material and free of brominated flame retardants and the production process had to avoid the use of CFCs (freons) and chlorinated solvents. TCO standards also require that screens be treated with conductive coatings to reduce the static charge on the monitor.

When traditional cathode ray tubes (CRTs) were first used in VDUs the phosphor coating, that glows when hit by the internal electron beam, had a long persistence time; i.e. it continued to glow for about 10 to 20 milliseconds after it had first lit up. This was what had been found to be best for television displays as it is similar to the persistence of vision of the human eye. The display is produced by scanning horizontally, line by line, from the top left corner down to the bottom right. The time taken for a full scan was about 20 ms or 50 times every second, so the amplitude modulation of a white spot in the picture was only between about 25% and 50% of full brightness. The viewer's persistence of vision only had to make up this relatively small amount in order for the spot not to flicker.

TCO99 replaced TCO95 and was intended to further reduce eye fatigue caused by image flicker. For 20 inch screens, the minimum required refresh rate was increased to 85Hz, with 100MHz recommended, and a minimum of 75Hz for 20in or greater. More exacting attention is paid to power saving and environmental impact, with TCO99-certified monitors saving up to 50% more energy than TCO95 displays.

The default vertical scan for most PC computers is 60 times a second, though 75 times a second is now the slowest recommended for general use, and 90 to 100 times a second is not uncommon. In our experience it is unwise to have a vertical refresh rate slower than 75 or faster than 100 times a second as more people report eye strain and headaches outside of this range.

Make sure that the vertical refresh rate is between 72 and 96 times each second. This can be checked on a PC by choosing:

My Computer -> Control Panel -> Display -> Settings -> Advanced Properties

and looking at the refresh rate. If unsure, contact your IT technician or a local dealer.

One factor, which to our knowledge has not been properly researched, that may be extremely important is the very short persistence time of the phosphors used in modern high-resolution computer displays. When examined using a fast photodiode sensor, it turns out that the pixels (smallest dots) light up VERY brightly only for 5 to 15 microseconds and are dark for the rest of the time. So what looks like a sharp non-flickering image is actually **flashing at you blindingly bright** for very small periods of time and your eye and brain are averaging these flashes to produce a steady image. As the image is being repeated between (hopefully!) 75 and 96 times each second, this is faster than your persistence of vision and hence appears flicker free. But this flicker free image is being produced by a form of illumination that human eyes had never seen until about 10 to 15 years ago. Before then the averaging was achieved by a combination of eye and screen so that the screen itself was fairly flicker free. Now you have a blindingly bright flash of say 10 microseconds repeated about 100 times per second. So that bright flash is actually 1000 times brighter than the screen actually appears to the viewer (averaged over time), and can be up to 5000 times as bright. We have no idea what the long-term consequences might be of this novel form of illumination, especially as some people sit in front of their screen for many hours every day. This extreme form of pulsing will certainly affect visual evoked potentials (VEP) in the viewer and will probably affect other EEG signals as well. Sandström et al (1997) found that the VEPs of people reporting EHS symptoms could react to higher frequencies than non-affected people. This area needs to be actively researched using actual light from a variety of modern high resolution VDUs.

It is now illegal for employers to have environments in which employees work with a computer with any visible screen display instability, flicker or wobble. (EU and UK Display Screen Equipment Regulations 1992). If your monitor behaves in this way, it is almost certainly in magnetic fields which are far too high for *you* to work in, as well as being illegal.

There should be a label on the monitor stating compliance with a particular guideline. It is unlikely that any monitor (including second hand ones) will still be in use that does not conform to one of the guidelines above.

All VDUs give off higher fields at the back and sides. Computer screens should be 70-80cm from where people sit, and glasses for use during computer work should be adjusted for this distance. You should ensure that there is more than 1 metre from the rear of a VDU, at home, or in the office. Magnetic fields travel through walls, so be aware of any monitors in the room next to you if you sit next to a wall. Smaller VDUs are not necessarily better, either, because the field strength depends more on the internal design than on the screen size.

Shields placed in front of a VDU's screen do not block the magnetic fields that CRT displays give off from their scan coils. Modern CRTs intended for use with computers all seem to have a built-in earthed electrostatic screening layer on their front face and give off minimal levels of electric fields (which is all that anti-glare and anti-radiation screens stop). Some expensive VDUs have a conductive coating on the glass or consist of a very fine wire mesh, and come with an "Earthing wire"; these will remove the electric field. These are sometimes described as 'anti-static' screens. As the most commonly reported symptoms of EHS are eye problems, then even just reducing glare can also be helpful.

Advanced semiconductor 'TFT' colour screens are only a few inches thick and have very clear displays. Although they do cost more than an equivalent CRT display, they give off very low EMFs.

Modern flat (e.g. TFT) screens will need the conductive coated glass rather than the wire mesh which can give visible 'moire fringing' patterns (visible distortions). ES people should go for a good quality flat screen display. Extremely ES people could consider using a ceiling mounted projector, such is used by people giving illustrated talks. These are expensive but do separate the user from the display circuitry and EMFs.

Screen savers designed to blank out the screen after a short period of inactivity are useful to prevent "burn in" or damage to the VDU's phosphor coating from constant use, but even if the image is blank, the components which generate EMF emissions are still active. Similarly, dimming the display will do nothing to reduce the fields.

Some monitors are US EPA "Energy Star" compliant. These detect a shut-down signal from the computer software and do almost completely turn themselves off when not required. These take about 30 seconds to come back on line when you need them. They also need a special driver card and software in the computer itself.

Ideally take a 5 minute break every hour when using a VDU, preferably leaving the desk area.

When you buy a new computer monitor, switch it on in an unused well-ventilated room for at least two weeks. The casing and internal electronic components contain fire-retardant chemicals that are released when the VDU is being used. These can produce quite toxic side-effects in people who use them and could provoke electrical hypersensitivity. Some companies who use a lot of VDUs and have had sensitivity / allergy problems now 'burn in' new VDUs leaving them to run for 24 hours a day in an unused room for two weeks before they are moved to the office where they are to be used. This can help, but the offending chemicals can continue to be 'outgassed' for up to 6 months and it can sometimes take even longer.

Plants are excellent for cleansing the air of formaldehyde and other chemicals in small quantities. NASA (the American Space Agency) suggests spider plants, Boston ferns and peace lilies amongst others, and these are easy to grow, and will survive when you go on holiday. Root microbes biodegrade the pollutants into structures that can be used as a source of food for the microbes and the plant. So there is nothing toxic left to remove, such as the positive ions on cactuses (see below). Boston ferns thrive in areas where there is less light (where there is no convenient window space), as do most ferns. Peace lilies excel at removing bioeffluents (Carbon monoxide, hydrogen, methane, alcohols, phenols, methyl indole, aldehydes, ammonia, hydrogen sulphide, volatile fatty acids, indol, mercaptans and nitrogen oxides, which are emitted through normal biological processes by people just sitting, being). Plants in a room also release phytochemicals that suppress mould spores and bacteria by up to 60%, when compared with a room with no plants. It is unclear how long the plants can transform the chemicals before they become exhausted and need replacing.

Wired and optical mice

The original optical-mouse technology bounced a focused beam of light off a special mouse mat, covered in grid lines, onto a sensor. The grid lines cut the beam and so registered the movement. This kind of mouse was difficult to use, needing a great degree of accuracy of movement. Damage to the pad rendered the mouse useless until another mat was bought.

Introduced in 1999, the new-type optical mouse uses a tiny camera to take 1,500 pictures every second. Able to work on almost any surface, the mouse has a small, light-emitting diode (LED) that uses light to detect changes in the image and move the cursor accordingly. The advantages of LED mice include, their being easier to keep clean and they don't require a special surface.

Most wireless mice communicate using radiofrequency microwaves, we cannot recommend them. Some use infra red and are not a problem.

Health effects

In 2005, a study by Carbonari and colleagues, found significant cellular damage in people, especially women, working on CRT VDUs for 5 years or more. There was an increase in central nervous system and ocular disease and a *very significant* increase in skin problems (a common EHS symptom). 50% of the study participants reported these problems. The study was small, but

the authors were able to use standard biological tests to determine the extent of cellular damage. It should, therefore, be easy for further research to check their findings. The authors concluded *“extensive studies and standardised tests to evaluate biological damage at different levels are recommended to public agencies concerned with environmental quality and public health.”*

Cabonari's work reinforces the findings of Estécio & Silva, 2002, who found twice as many chromosomal aberrations in VDU users than a control group.

Sandström and her team (1995) found a significant link between people experiencing skin problems, increased electrical fields and low-frequency magnetic fields from VDUs in their workplace.

Professor Olle Johansson of the Karolinska Institute (and the Swedish National Institute of Working Life) has investigated numbers of people suffering from exposure to computer monitors (VDUs) and other EMF sources. Many of these people first suffer from skin irritation such as itching, heat sensations and reddening. In some of these EHS people he has found the nerve fibres in the epithelium are significantly damaged. He has clear photo-micrographs showing peripheral damage in the nerve endings which can be found within 10 to 20 μm (0.010 to 0.020 mm) of the skin surface (epidermis). The normal purpose of these nerve fibres is unclear, but it does appear they are involved in at least some cases of EHS. They seem to become super-sensitive and react both more quickly and more highly to external stimuli - especially electric fields and some chemicals. It is known that new electronic equipment, including computers, give off significant levels of volatile organic fire-retardant chemicals that can mimic natural body messenger chemicals, and these are believed to be involved in the triggering of EHS in some people. In a study in [1996](#), Professor Johansson concluded *“We cannot, based upon the present results, draw any definitive conclusions about the cause of (skin) changes observed. Whether this is due to electric or magnetic fields, a surrounding airborne chemical, humidity, heating, stress factors, or something else, still remains an open question.”*

Mast cells play a large role in various types of well known allergic reactions, such as asthma, and have been seen to increase in the skin of healthy volunteers sitting in front of some computer monitors.

In Sweden, there is a phenomenal increase in asthma amongst youngsters up to the age of 18 years. It is thought that this may be the result of an idiopathic reaction to intensive use of computers. This may be exacerbated by Henshaw's research on the attraction of pollutants to the static field generated by computer monitors.

Work done at Bristol University has shown that the static electric field generated by monitors and TV screens attract negatively charged particles to the screen and positively charged particles are attracted in the opposite direction - towards the user. These particles may include chemicals that can trigger or perpetuate EHS symptoms. There has been some speculation that high levels of positive ions such as found in offices where VDUs are used are responsible for impairing health in a number of ways. Cactuses can be useful in a room where a computer is in use, as the spines can attract positive ions. However, cactuses need to be earthed to discharge them.

If you work in an office, keep it as free from dust as possible, having a clean desk and floor. Electric fields act as a 'magnet', attracting all sorts of unwanted particles, including bacteria and toxins to the computer monitor. It is important to keep the screen clean using an anti-static wipe, and to avoid pollutant materials, including all chemicals (air fresheners, perfume etc., spray polish), in your office space.

Another study by Sandström and others (1997) hypothesised that the exposure to flickering light might be one of the factors that can be considered as a trigger for further neurochemical disturbances, leading to typical symptoms of hypersensitivity. It is known that the nervous system is able to respond to amplitude-modulated light with frequencies above the critical flicker fusion frequency, i.e. the frequency of the flickering light above which the light is perceived as

continuous. They also noted that the higher the amplitude modulation level was, the more negative effects were reported. (Note, 100% modulation is the light pulsing on and off, 50% is full brightness falling to half brightness before rising to full brightness, etc.)

The small finger movements used with laptop keys in some cases can induce repetitive strain injuries (RSI) if you type a lot ~ occasional or low use isn't a problem. RSI appears when your fingers make lots of small distance and small force movements over a long period of time. Most laptops have sockets that can take full size keyboards, which do not have the same effect. They can also take full CRT displays and normal mice. If you need to use a laptop as your main computer, we recommend that you consider using these full-sized accessories in your main workplace.

Photosensitive epilepsy is a rare condition, affecting only about 0.04% of the population. It may become more of a problem as computer monitors have started to produce the frequencies of light which can activate the epileptic fits.

Laptop computers

Laptops with LCD or TFT screens give off very low EMFs. They do not need the strong low frequency magnetic fields of a traditional CRT monitor, however they use high-frequency fields for driving the back-illumination and also can emit significant levels of radio-frequency electric fields (30 kHz to 300 kHz) from the back illumination and scanning processes.

However when they are run from the mains adapters they can give off VERY high electric fields next to the keyboard and display. This is because they usually come with two-wire mains leads or adapters and are often described as being double-insulated. This is done for a variety of reasons, including protecting against electric shock. It is cheaper to cover metal objects in plastic than it is to ensure good electrical earthing of exposed metal parts. Also, if you are holding a plastic object it doesn't provide an electrical return path to earth in the most unlikely event of your also happening to touch a 240v live electrical conductor, so you will not get a severe electrical shock.

The downside is that they tend to 'float' to half the electrical supply voltage (i.e. to about 120 volts a.c.) and this causes them to radiate very high electric fields (often several hundreds of volts per metre nearby). Most of these can be cured of giving off high electric fields by taking an 'earthing' wire from their mains plug to an exposed screw or piece of metal on the laptop. Any metal connector shell on the back of the computer will do. It is often convenient to use a 'crocodile' clip on the earth lead so that it is easy to attach and detach when you need to move it. It is also possible for a qualified electronics engineer to modify the mains charger unit so that it has a three-wire mains lead and the internal 'zero volt' power supply line is connected to the electrical mains safety earth. Or charge the laptop away from where you sit, and then run it off its internal re-charged batteries.

Some laptops seem to come with a three-pin mains cable and an earthed adapter. Check this is the case when you buy. If not, you can buy a laptop mains earthing lead, with or without a plug, from www.emfields.org. For those people who have a laptop with no metal connector parts, you can also buy a USB cable with solder tag, that the earthing lead can clip to.

The heat generated by the underside of the laptop computer is enough to cause a nasty rash, especially if it is used against bare skin for hours at a time (BBC October 2010).

Wireless enabled laptop

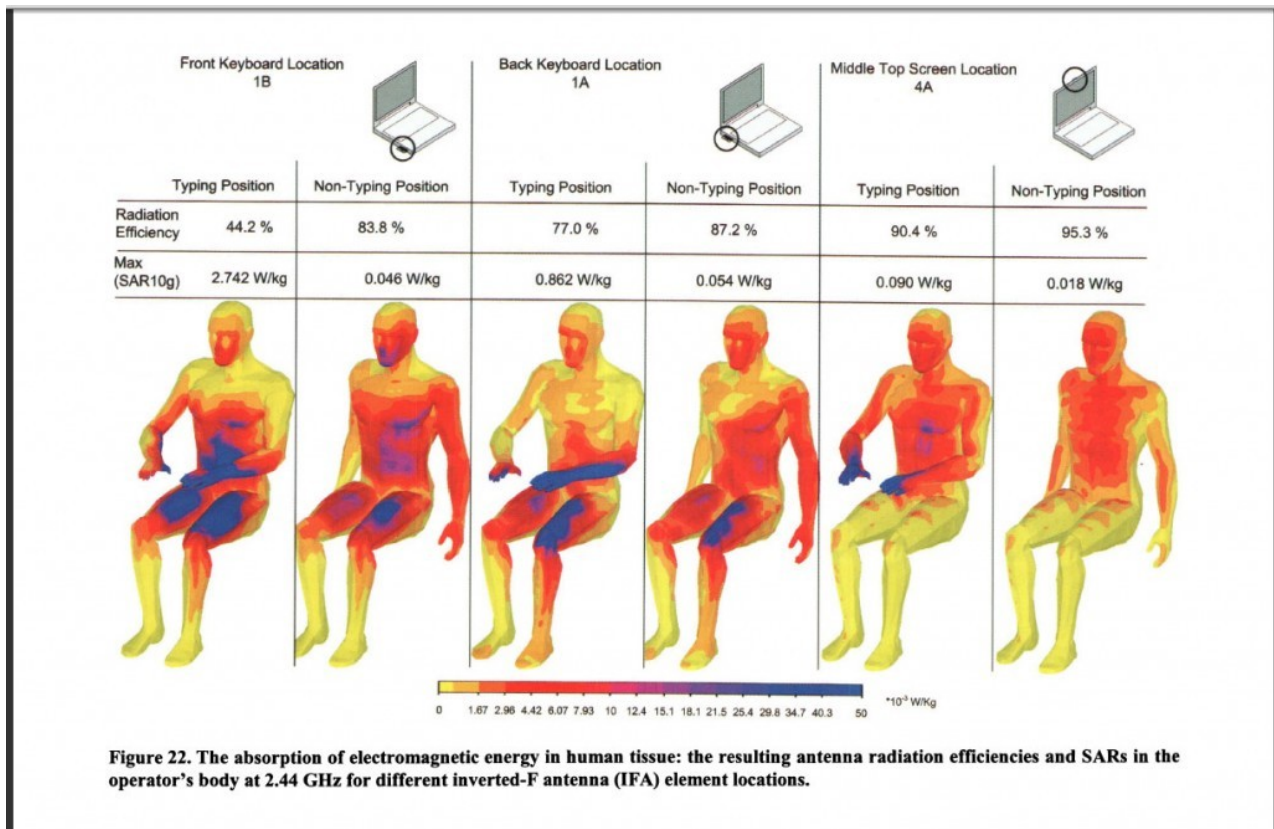
Most laptops now are sold with WiFi built-in, as it is assumed by the manufacturers that they will be used at home with a wireless internet system, or whilst the purchaser is 'on the move'. A study (Papageorgiou [2011](#)) looking at the effects of WiFi found changed attention and memory, especially in males.

Sperm samples exposed for 4 hours to a wireless internet-connected laptop showed a significant decrease in progressive sperm motility and an increase in sperm DA fragmentation (Avendaño [2011](#)).

If you do not wish to use it in this way, you may want to disable the WiFi system as your laptop will continue to radiate RF until it is disabled. Laptops vary as to how to achieve this, so we recommend that you look at the manufacturer's instructions to find out how this can be done. You may need to contact them directly if it is not clear.

Some software updates may re-enable your WiFi system, so it is worth while checking every now and again to ensure that the wireless capacity remains disabled.

Increasingly, laptops are being sold with a Bluetooth capability as well. This may be situated in a different part of the laptop to the WiFi circuitry, and will have to be separately disabled. Again, we refer you to the manufacturer's instructions or we suggest you contact them directly.



From www.wirelesswatchblog.org

Computer wireless LAN (local area network)

Computer wireless LAN broadband connections are becoming increasingly popular. These systems also give access to portable lap-top computers that may be used by different members of a household, offering the apparent freedom to have fast access without needing to have a fixed source. These are sometimes advertised as 'wireless enabled homes'. Systems such as these fill the house with pulsing microwave radiation all of the time (even when the computer(s) is/are not in use), and we believe they should not be used at all.

dLAN devices, are an alternative solution to WiFi. They connect to one another through the mains wiring in a building, allowing access to the network/internet from any mains socket in the building.

There are at least 4 types of dLANs. The 14 Mbit/sec device is the cheapest and the slowest. We would not recommend this device as it is a bit slow and produces a higher level of dirty

electricity (see the article on Dirty Electricity). The 85 Mbit/sec device does not seem to cause a lot of trouble, and it produces low levels of dirty electricity. This is probably the best type of dLAN for most people, though those with ES may still react even to the very low levels near the dLAN device. The 240/250 Mbit/sec device generates more RF noise, and provides too much bandwidth for the needs of most homes. The 1 Gbit/sec device is causing major problems with RF interference, including with FM radios. Radio Amateurs are wanting it banned because of the interference.

dLANs can only be used with earthed laptops, or high electric fields will be generated.

Homeplug devices do add some RF noise to the mains wiring. However, the levels we have measured (a few tens of microvolts) are negligible in comparison with WiFi devices, and what increase in fields that we did see was only in very close proximity to mains wiring (within a few tens of centimetres). Since we already advise against spending large amounts of time in such close proximity to mains wiring, we believe that the fields generated are unlikely to cause problems other than in the the most highly electrically sensitive people.

The RF signals will interfere with short-wave radios and some units with medium-wave and long-wave radios as all of these are sensitive to a few micro-volts per metre AM radio energy.

We still think that wired Ethernet is the best option, however dLAN units seem to be a reasonable compromise provided that you are aware that there are potential problems, and we consider it to be vastly preferential to WiFi. Screened ethernet cables CAT5e or CAT6 shielded cables (STP coded not UTP; U=unshielded) are generally available if asked for. Try 0845 388 5678 <http://www.homestead.co.uk/productioncategorydetail.aspx?categoryid=51151>

There are additional security considerations when it comes to dLANs. Because they use the mains wiring to transfer data, this means that anybody on your wiring circuit can add their own dLAN unit and listen to the network traffic. Since most houses have their own wiring circuit, this is only relevant in shared housing and some flats. Some dLAN units offer features to encrypt the network, which would eliminate this issue. We still consider dLAN units to be significantly more secure than WiFi, which can be listened to simply by being nearby, without requiring physical access to a plug socket. WiFi encryption systems provide some level of security, but they are still not completely secure from network intrusion.

Increasingly wireless LANs are being used in schools, as are interactive whiteboards. Both of these will increase children's exposure to microwave radiation, with the attendant (as yet unknown) consequences. As microwave exposure is associated with memory and concentration problems, and behaviour and mood disturbances, we believe further research should be done before the widespread use of these systems in our places of learning is encouraged. Perhaps some investigation by the school or PTA would be useful in quantifying the effect (if any). Changes in children's abilities or behaviour could be monitored.

Philip Parkin, general secretary of [Voice](#) (the union for education professionals) stated in an interview in May [2009](#) "*There seems to be an increasing quantity of evidence being produced around the world which suggests that exposure to electromagnetic radiation can have long-term health impacts both on children and adults but particularly children. It is a considerable concern that in schools we are installing wi-fi systems and we have no clear evidence that they are safe. We are not trying to turn back the tide as far as technology is concerned but we have to be sure that as well as doing a job for us, and there is no question that wi-fi does a wonderful job, we have to be absolutely sure that it is safe.*"

Schools' reactions

We know of at least 3 schools that re-thought their policy on providing wLAN equipment in their schools due to pressure from parents or teachers. Prebendal School in Chichester had been having problems with the reliability of the wireless network and decided to change it for a conventional cabled system. At Ysgol Pantycelyn, in Carmarthenshire, the Head Teacher agreed to switch off

the wireless network as he said "the concerns of the parents are of greater importance than our need to have a wireless network." A concerned parent said "they are like having a phone mast in the classroom and the transmitters are placed very close to the children." The radiation from microwave transmitters has been associated with loss of concentration, headaches, fatigue, memory and behavioural problems and possibly cancer in the long term.

Stowe School in Buckinghamshire removed part of its wireless network after one of their teachers who had been at the school for 28 years became too ill to teach as he had had such a violent reaction to the network, suffering from headaches, pains throughout his body, sudden flushes, pressure behind the eyes, skin pain and burning sensations and bouts of nausea. The head teacher intends to put cabled networks in all new classrooms and boarding houses.

In October 2007, the Professional Association of Teachers (PAT) gave a guarded welcome to the Health Protection Agency (HPA) announcement that it is to investigate the safety of wireless computer networks. The PAT general secretary commented that it seemed to him, though, that the HPA has pre-judged outcomes before they have done the work; that they are only considering the thermal effects of the RF radiation, and not the potential long-term health risks associated with the non-thermal effects; is assessing the field levels in respect to the totally inadequate ICNIRP guidelines; are ignoring monitoring the health of the children exposed; and are concentrating on measuring radiation levels that are already known. Professor Pat Troop, Chief Executive of the HPA said "*We have good scientific reasons to expect the results to be re-assuring and we will publish our findings.*" It is also very likely that only average levels will be measured, whereas many scientists concerned with the biological effects at non-thermal levels believe it is the change of level and peak levels which may create the adverse symptoms reported. There is a groundswell of opinion that the taxpayers £300,000 could be used more effectively looking at *real* concerns.

Broadband

Access to the internet at home is becoming more and more sought after as children look for help with homework or examination coursework projects, and people of all ages look for information, and leisure activities such as finding music and online game-playing, from chess to fantasy role play. Most urban areas are well served by broadband through their telephone or cable networks. Many small rural telephone exchanges cannot handle the capacity needed for broadband, and satellite access is not possible either.

There are companies which offer microwave broadband facilities to villages, if there are enough subscribers to support the infrastructure. This will usually consist of a main receiver/transmitter attached to a house and then subsidiary transmitter/receivers at the other properties subscribing to the service. This will add to the overall microwave exposure for everyone in the vicinity of the transmitters and receivers.

Our recommendation would be for ADSL or ADSL2 or cable broadband. These are fastest, most secure, and give off virtually no EMFs.

Computer games consoles (e.g. X-Box 360, PS2, Nintendo Revolution etc.)

These consoles usually have a mains transformer which plugs into a power socket. The transformer gives off very high levels of magnetic fields, and should be unplugged when not in use. It is *very* important not to leave transformers plugged into the wall by children's beds as they leak quite high levels of magnetic fields all the time they are connected to the mains electricity supply. Often neither the TV nor the games controller is connected to mains 'earth' and so the hand controllers can give off electric fields of several hundred volts per metre, but it does not seem easy to predict this. Use an EMFields PRO meter to check out the equipment in your home.

Computers and Electrical Hypersensitivity (EHS)

EHS can have a variety of causes. Computer monitors (VDUs) are believed to be one of the most common initiators of the problem. A small student survey in Estonia found 13.5% EHS reactions to computer use, probably a little on the high side, but one of the few pieces of research attempting to quantify the problem.

Many people experience an abrupt onset of EHS symptoms following exposure to a novel EMF such as fields associated with a new computer. Some EHS people react even more strongly to laptop with LCD or TFT screens which is why MPRII and TCO standards specify much lower limits for higher frequencies. ELF (5 Hz to 2 kHz) allowed electric and magnetic fields EMFs are about 10 times higher than those allowed at VLF (2 kHz to 400 kHz).

British biophysicist Peter Alexander said, "*Once the individual is sensitized to an agent the initial aggressor is immaterial. The biological reaction will be the same to all agents.*"

Many electrically sensitive people seem to have quite dry skin and can carry high electrostatic charges on their body. Not only can other people experience a 'zap' when touching the person, but the electrostatic charges can also be transferred to electronic equipment causing equipment to malfunction. This can sometimes give an appearance of clumsiness or ineptitude, which can lead to a lack of confidence in using electrical equipment. This is quite concerning when young people, even in pre-school nurseries, are being exposed to computers, and they may develop this sensitivity, which can lead to a lifelong lack of confidence and self-esteem problems.

A high-profile EHS sufferer was reported in the Norwegian papers in March 2002. The World Health Organisation (WHO) Director-General and former Norwegian Prime Minister, medical doctor and master of public health, Gro Harlem Brundtland, has symptoms from her laptop PC, but not a desktop PC. If she holds it to read what's on the screen, she says "*it feels like I get an electric shock through my arms.*" She says "*Some people develop sensitivity to electricity and radiation from equipment such as mobile phones and personal computers. Whether this sensitivity can lead to serious outcomes such as cancer or other diseases, we still do not know, but I am convinced this must be taken seriously.*"

Some people with mercury/amalgam fillings in the teeth seem to react more to VDUs.

Using a computer if you have severe EHS symptoms

One EHS sufferer found that he could use his computer occasionally if he kept the computer base unit 6 metres away from where he sits and has an LED-lit data projector for display and an infra red keyboard and mouse.

Protection devices against EMFs from computers

Many devices are available on the market that claim to help protect against or neutralize the EMF / ELF or other output from electrical appliances such as computers. With most of the products we have seen and tested there is no scientific foundation for the claims of neutralisation. The pseudo-scientific literature that is associated with the product is usually flawed and completely useless. The only thing you can be sure of is that the manufacturers see a market for the device that will create money for them.

There is a possibility that *some* of these devices may have a very subtle effect on the body's immune system, and help the person using the device to be able to resist the damage from EMFs by improving their immune function. However, the effect is likely to be very subtle and at the moment we do not have the scientific instruments to measure such subtle changes in body dynamics. (Kirlian photography and Harry Oldfield's phasic aura photography may be

exceptions; there may be others we are currently unaware of). The 'protection devices' certainly do not eliminate or remove the source of the potential damage, which is still verifiably present.

Individual people's immune systems and general biological responses to the environment vary greatly, due to inherited factors, and many unquantifiable characteristics. Subtle effects on the immune system may make a significant difference to the well-being of many people.

We suggest that if you are tempted to try one of these devices, obtain it on a money-back if not satisfied arrangement. If it works for you, keep it; if it doesn't, return it.

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