TETRAWATCH!

Does TETRA pulse? Does it matter?

TETRA:

What is it, and what are the problems?

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2006 Update

Around the UK people watch the TETRA signal. Some do it with expensive instruments, analysing the frequencies and producing images such as those shown here. Others just listen, and hear various changes from time to time. But some tell us when the local TETRA signal characteristics change because they physically feel it, and the feelings change. TETRAWatch counts all these as valid observations, and when they coincide, tries to make sense.

What disturbs us most is that the signal characteristics are modified as a kind of experiment. And we know that this is unethical, because we proposed a live comparison to prove people could feel these transmissions years ago, and were told it could not be allowed as an experiment on human subjects without total consent.

Has anyone asked you recently if you would like to take part? Because O2 Airwave naturally monitors this website regularly, perhaps looking for an opportunity for libel, damage to their business – or perhaps as a sounding board for what response there is to changes in the TETRA signal.

Recently, at least in some areas, the primary extreme low frequency (ELF) about which there has been most fuss ('the pulse') has been masked out with noise. So for some people, the picture below with the gaps in it no longer holds true.

What we would like to know, is what technical advantage this confers: clearer voice? More data? Less TV interference (how kind!)? No. So why has this been done? Just one of those upgrades that happens to have this effect?

If anyone from O2 would like to tell us, please do. We don't like mysteries, and we have no wish to portray O2 as experimenting unnecesasarily on the people of this country. But O2 does need to know that for some people, this has made matters worse.

One explanation is that by reducing the bio-active ELF components, those remaining stand out even more clearly and become more bio-active for those who are sensitive. Another is that the signal power needs to be higher.

TETRA at Court Farm, Dyke Road, Brighton and Hove, combined with a 3G mast (right). Another local beauty spot, going west. And now yet another illegal mast in the Sussex network: refused retrospective planning permission, November 2004.

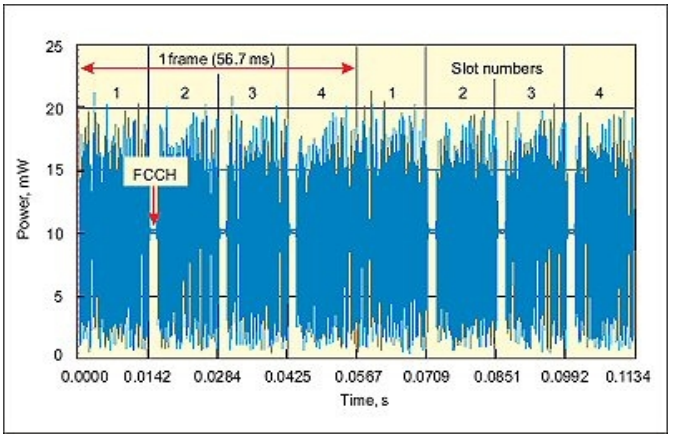
Let's be clear. For anyone suffering more than the inconvenience of TV interference, the specific health concerns around what is referred to as the pulsed radiation of TETRA, and in particular its frequency, are what matter most.

Many people suffer adverse health reactions as soon as their local masts are switched on. Whether **you** are suffering or not, **they** need your help, understanding, and action. This is a national scandal, and

your inaction could mean, at worst and from long-term chronic exposure, the deaths of many people. We look back at tobacco, asbestos, Thalidomide, CJD, and we can all remember the early denials, the research, the arguments, before finally action was taken. Many people had died, many more were disabled, and financial claims on the dogmatic perpetrators have run into many millions.
We do not want to be sensationalist. But there is enough research to suggest that extreme caution must be exercisd **before** TETRA is implemented, not after. Every time a piece of research suggests risk, the call goes out for 'more research'. Not a pause; not precaution; more research, while the effects continue to be felt.

TETRA and 'pulsing'

The signal from base stations and handsets is carried on a microwave frequency at 380 to 400MHz. If that, like commercial mobile phones and masts concerns you, then this is no different at that level. Except that 400Mhz is more penetrative than the 900MHz to 2GHz of mobile phones, and is the resonant frequency of an average adult skull.
The signal or message is imprinted on this carrier wave in compressed bursts. Each TETRA handset sends these bursts out 17.64 times a second (Hz). The burst is so short that three other handset signals can slot in around it to form a group of four, so the masts can receive and transmit four bursts for every one that each handset produces. This group is called a 'frame', and the frames themselves are grouped in 18s (multi-frames) with a break at zero power. TETRA fills up empty slots, so even if four handsets are not in communication, the same pattern continues. Therefore TETRA masts pulse at 70.56Hz (4 x 17.64). However, in this pattern the first and last pulses are not separated, so there is a steady rhythm 'di-di-**dah**-di-di-**dah**', 17.64 times a second. The music of TETRA? Our bodies recognise patterns and rhythms and frequencies exceptionally well: this is not raw energy, it is information to us, interfering with our own informational bioelectromagnetic systems.
This picture below is the official picture from NRPB and AGNIR documentation, which has been verified by our own measurements:



TETRA masts therefore have components at 70Hz (slots), 17.64Hz (frames) and 0.98Hz (the multiframe group). All three are in themselves ELF (extremely low frequency) EMR (electromagnetic radiation), and ELF EMR is particularly regarded as presenting a risk to people. Our own bodies operate in everything they do, utilising infinitessimally small electric currents at these frequencies, but they

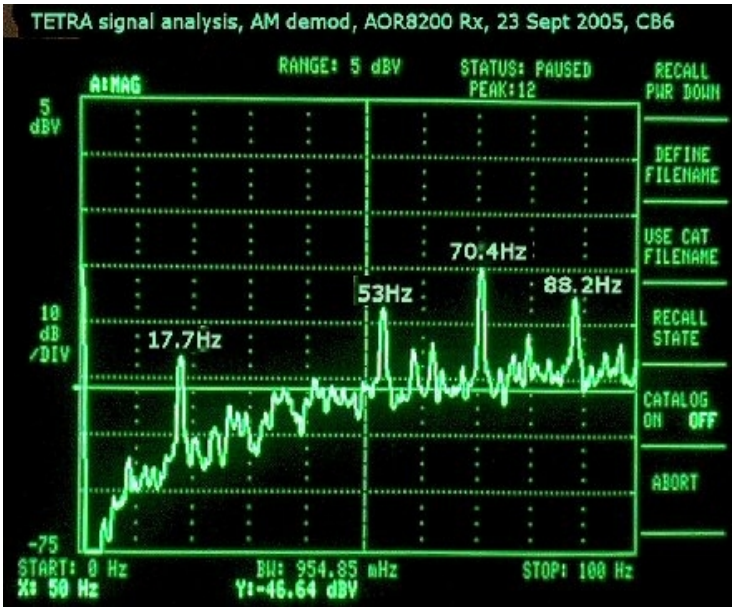
have to vary. 'Locking onto' fixed frequencies happens through entrainment (the stronger pulse drags the weaker into synch) and this is harmful. (As a metaphor, you can ride a bicycle down the white line in teh middle of the road, but ride in a tramline and you fall off.) Specifically, TETRA multiframes coincide with the electrical frequency of the heart, and the 17.64Hz frames (or handset pulses) with beta brain frequencies (13Hz to 40Hz). And the 70.56Hz pulse is a muscular electrical frequency.

Ground waves

Tetrawatch has learned that TETRA base station installations (not the signal in the antennae) also create a strong ground wave at 16.66Hz. This is not something Ofcom will come to measure, because it's not in the handbook. Interestingly, 16.66Hz is the power frequency also used by Swiss and a number of other European railways, and reports show the railway workers have a high risk of leukemia and brain cancer, and exhibit reduced melatonin levels. Tetrawatch wonders if these ground waves play any role in the phenomenon of the TETRA lines.

More importantly, TETRA is the one and only mobile system that runs at full power 24 hours a day, every day. If there are any resonant effects in the body, they will build. (Resonance? Everything has its own natural frequency and 'rings': the glass shatters when an opera singer hits the right note; a building falls if an earthqualke frequency matches it. The same is true for the whole body, and down to cell and molecular level. This is why it is frequency, more than power, that concerns us: hit the right note and very small force has a very great effect.)

The frequency of powerlines at 50 and 60Hz is regarded as one reason why they are correlated worldwide with cancer clusters, and 70Hz is the frequency used by TENS pain relief devices to interfere with nerve impulses. Further, whether TETRA signals when picked up in mains wiring results in an interference frequency of 20Hz (70 – 50, also in the beta brain frequency range) is yet to be tested. Finally, frequencies close to 16Hz have been found specifically to cause calcium, a key part of cell communication, to leak from brain cells. This was the reason the Stewart Report (2000) urged the frequency to be avoided.



Why do the NRPB (and therefore the Home Office) say TETRA masts do not pulse?

Imagine a bungee jumper. Go on, it might not be your thing, but just imagine it! Off they go from the bridge, down into the gorge. The line goes tight, stretches and the jumper's head almost touches the water in the river beneath. Scary. Up they come again towards the bridge, the line goes slack and snakes, before down they go again, back towards the river, the line goes taught, stretches, and up they come again. When eventually they come to rest, they are hanging somewhere half way down. Now if you think about it, that is where they have been **on average** all the time. They could have just stayed there (I would prefer that method of bungee jumping!), but it really would not have been the same to them, or to people watching. Like the NRPB, I don't like to watch the ups and downs; I like to think it's no more dangerous than hanging half way, on average.
That is what NRPB concludes: because the TETRA signal in the picture above is on average at the 10 mark, the changes from 'ups and downs' to hanging half way are not pulsed effects, and no one can possibly notice.

The technical term for this splitting up of messages is TDMA (Time Division Multiple Access). It is the way TETRA works, and it is only one of several ways in which communications can be efficiently managed. Home Office material on their website (see Links:Government) denies that there is any pulsing, on the grounds that there is not absolute silence betwen the bursts, and this is widely quoted. O2 still describe the pulse frequency as 'trivial', and quote Prof Challis insisting that the signal is not pulsed at all. O2 also say that you can only tell that it is pulsing (sorry, contradiction?) with very sensitive demodulating equipment (see our examples taken at Worthing and East Marden). Two recent planning applications in the New Forest state clearly in the specification 'Modulation: Pulsed'.
. This is what a TETRA base station sounds like, compared with other mobile base stations. The sound is achieved by simple rectification and audio amplification of the RF signal, like a basic crystal set.
Pulsing radio waves at extremely low frequencies is used to therapeutic effect. It helps mend bones, among other things. But like X-rays, it can't be used indiscriminately. When the 'TETRA experts' say that pulsing can't affect us, this is quite untrue. The

guidelines from ICNIRP (ie, the standards for safe levels of transmissions) have no relationship at all with the effects of pulsed radiation, and are wholly inadequate. (See also intensity.) What is astounding is that whilst we are told constantly (and falsely) that it's OK, base stations don't pulse, *everyone* agrees that police handsets do! Is *that* OK?

Find out more about pulsing from our Links page.

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Local stories:
TETRA stories from various places, with news links, illustrating what actually is happening

Find out lots more:
Links to all the related issues, from the science to the planning, the health research to finding masts

The science behind the concern:
Find out about why TETRA has caused such concerns as to its safety, what is being said, and what research is going on

All about TETRA:
Find out about the concerns over handsets and masts, the effects, planning, and whether it is the best system to use anyway. Section for police users of Airwave.

Airwave in the UK:
Find out about the Airwave TETRA project in the UK, the main players, the alternatives and UK news stories

latest news and updates

Home page: about TETRAWATCH, shorter introductions to the issues, and the latest news