

WIRELESS TECH TODAY (Part 3)

Dr Karl:

G'day. Dr Karl here with Part Three: Benefits of wireless communications. Now we've been using electromagnetic emissions for communications for around 3000 years. Yes. 3000. The non-ionising form of EME that we used back then was not radio or microwaves, but light.

The Greek historian Herodotus describes how beacon fires were used to send messages by the Greeks across huge distances. For example, during their wars with the Persians. Halfway around the world, the Great Wall of China had specific beacon towers. The soldiers would send smoke signals to each other during the day, and flame signals at night to warn of approaching enemies.

The Romans had a similar system of fire and smoke beacons for communication, especially for military purposes. But the big advantage of radio waves, which were first used around 1900, is that they'll work through smoke and fog and around the curve of the Earth, depending on the frequency you use.

Thanks to the GPS system up there, we can now locate ourselves to an accuracy of about five metres pretty well anywhere on Earth. This information is also really handy, indeed almost essential for the agricultural sector.

The so-called 'precision agriculture.' In fact, nowadays your typical farmer will use a variant of GPS to very accurately determine their location to not within five metres, but five millimetres. And this helps them plant the seeds or apply pesticides or fertiliser very precisely. The weather satellites in geostationary orbit. They send us back warnings of big storms. And the information itself is so much easier to get. Now, a few decades ago, if I wanted to get a scientific paper, I had to physically walk to a big university library which might have it.

Or if they didn't have it, they'd send off a fax to another library somewhere else in the world. And then after about 4 or 5 days, a badly photocopied document would squirt out of our local fax machine, and then I could walk down to pick it up for about \$50.

And now, thanks to the internet, I get the same thing and at higher quality, on my phone, within 60 seconds. Back then, you could read only from paper books, but now you can read from e-books, and an entire library weighs virtually nothing. Unlike physical books. And of course, we all listen to music and to our favourite podcasts, and we watch movies via streaming.

One huge change is that entertainment now works backwards. Anybody can become a performer and have their own video channel, podcast and so on. So not only has broadcasting turned narrow casting, it's also become two way. The audience can be the artist. We also have tele-medicine. This is very useful in the case of infectious diseases, where the patient gets quick access to medical care and the health staff are not exposed to the infection.

Wireless technology has spread into the manufacturing industry in smart factories where the manufacturing machines are part of the Internet of Things and they can talk to each other. Another benefit of wireless technology is cloud computing and storage.

Now, during the Covid pandemic, electronic connectivity, especially its wireless aspect, really saved our bacon. During that lockdown period, before the vaccines became available. People around the world were still able to keep on working due to telecommunications at home and being able to have Zooms or Teams teleconferences.

In the correct application, wireless technology can have several advantages. It can allow the user to move around freely rather than being tied to one spot. And wireless connectivity is also important, in fact, essential, to public safety during disasters and emergencies.

So there you have it. The benefits of EME from telecommunications overwhelmingly outweigh the perceived effects on health.

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