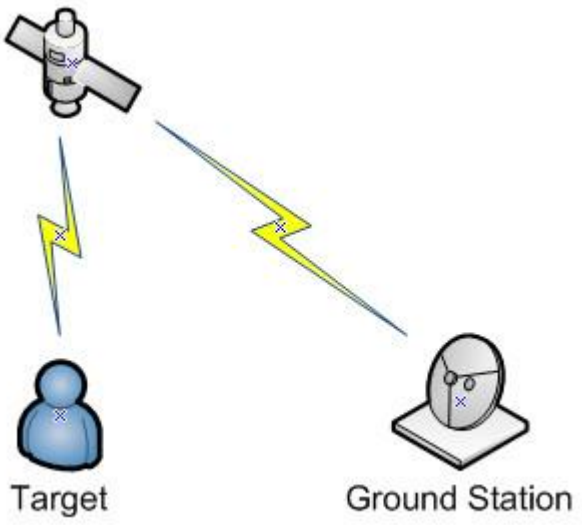
Can A Satellite Read Your Thoughts? - Physics Revealed - Part 2

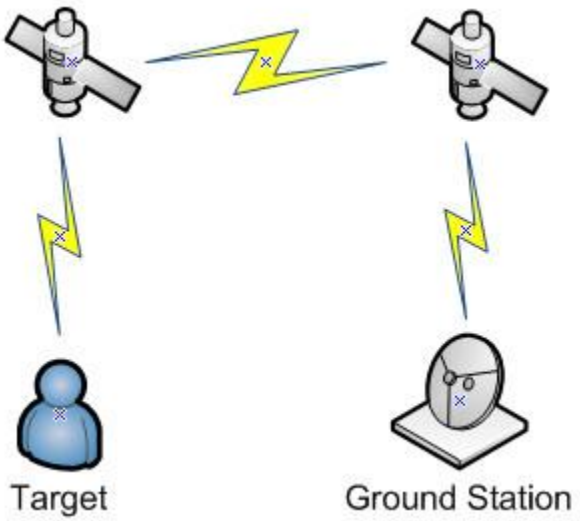
Sep 20, 2010 12:25 PM EDT

science, radio, nsa, spies, ai, microwave, nlp, mri, fmri, sis, intelligence-gathering, bci, brain-computer-interface, gchq, interfaces, transcranial-magnetic-stimulation, nmr, artifical-intelligence, terrahertz, synthetic-telepathy, sentience

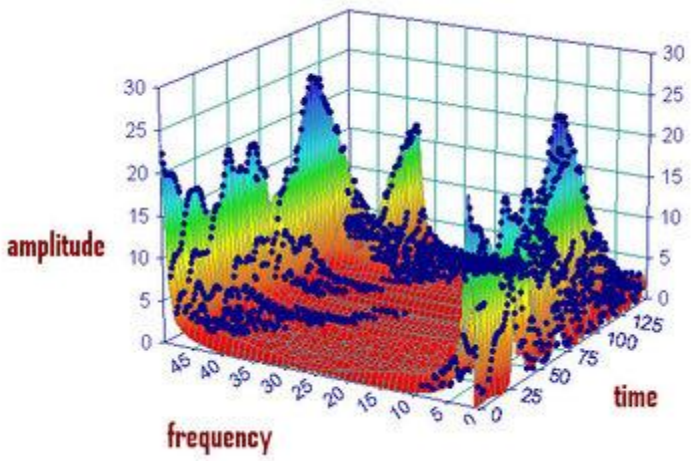
By Deep_Thought



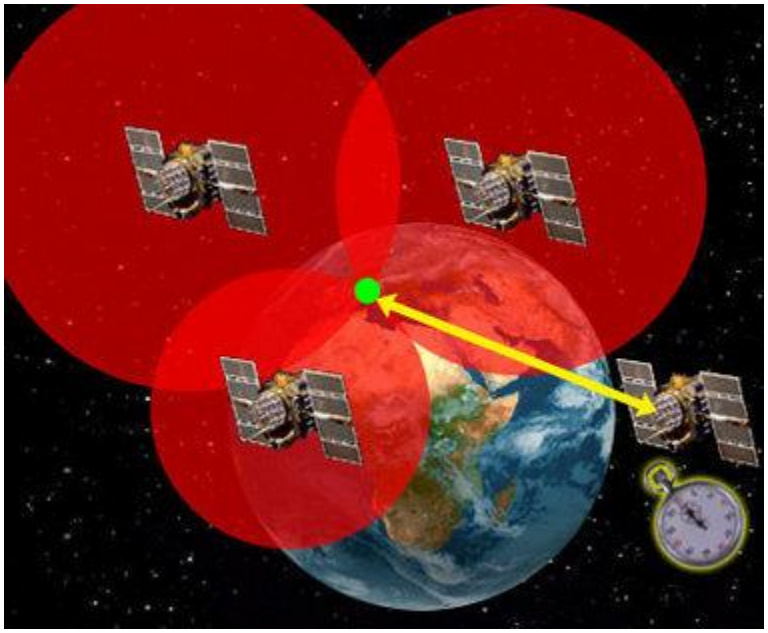
In a single hop scenario, information is captured by satellite and relayed directly to a ground station. Thus, four transmissions are required for a round trip.



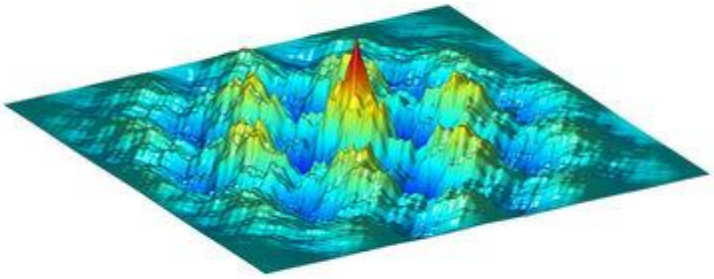
In a centralized relay scenario, information is captured by satellite and forwarded to a second satellite in range of a ground station. Six transmissions are required at minimum .



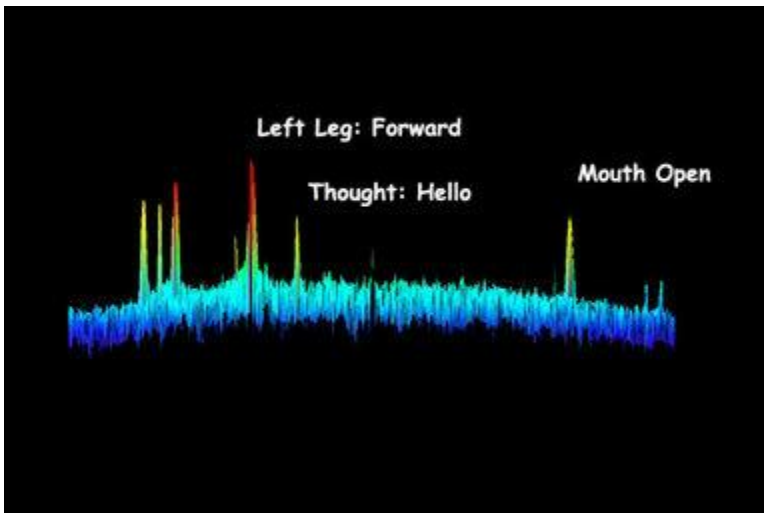
Basic FFT analysis.



Trilateration is employed to accurately define the location of a signal source. Employed by GPS, the reverse process can be used to isolate the location of signals emanating from the surface of the Earth.



Collated diagram representing electrical activity emanating from a single individual.



A side-on view for demonstration purposes. Each peak represents the amplitude of a specific frequency which is indicative of current activity.

The last article in this series caused quite a stir around the Internet. From the legitimate crazies to the classic muddy-the-water tactics employed by various defense departments, the article has drawn attention right across the globe. For those that have been living under a rock, the last article in this series demonstrated that action potentials (firing neurons) produce detectable radio signals in the SLF/ELF bands (1-1000Hz).

These radio signals can be used to reveal the thoughts, feelings, vision, spacial reasoning and unconscious activity of the brain. It is simply a matter of correlating the patterns received with those produced by the various neural networks to decode the activity. I am deliberately avoiding the term demodulate as no information is modulated onto the radio waves.

One question that keeps popping up is the mechanics of the capture and analysis of these radio signals. How do we go from an SLF/ELF radio wave, with limited bandwidth, to usable information or input that an A.I. can process?

Let's find out.

Obeying The Speed Limit

The first major issue we encounter is at what altitude can we place our orbiting satellites? This is a relatively easy thing to approximate. The speed of light, in a vacuum, is constant. It travels at 299,792,458 m/s or nearly 300,000 Km/s and somewhat slower depending on the medium it transverses. Whilst at a glance it would seem that you can place the satellites anywhere you like, there is a practical limit given the need for two-way communication with the human brain.

Whilst it may seem to us that we experience the world as it is happening there is, in fact, a small delay. This can be anywhere from 100-200ms. To be of any use, an A.I. needs to be able to analyze information almost as fast as a human can perceive it. That is, for the A.I. to appear to be "in your head", like a form of Schizophrenia, it must leverage the window provided by the 100-200ms delay. Thus, a round trip, including processing, must be under 200ms for the illusion to be maintained, a maximum of 100ms in either direction. As such, defined limits are imposed upon any solution.

If we examine our first diagram, we can observe a direct relay solution. That is, information captured by the satellite is relayed to a ground station directly. In this scenario, we have four transmissions to complete a round trip to the target. Thus, without considering processing, we know that each transmission can be at maximum 50ms. This gives us a maximum altitude of 14,989.62Km for our satellites which is well below GPS satellites at 20,200Km.

If we now take into consideration processing time, hops between dedicated hardware, lag and atmospheric issues, we could safely approximate 50-80ms. This now reduces our maximum altitude to around 10,000Km.

We cannot always guarantee that our satellite will be in direct line of sight contact with a ground station. In this scenario, we need to relay our information to a satellite that is within transmitting range. This scenario is demonstrated in the second diagram to the right. As a result, our altitude could drop to around 6,000Km or less.

Our constellation is not hindered by line-of-sight requirements of Microwaves as SLF/ELF waves can pass through relatively deep rock and water without a corresponding drop off in signal strength. Thus, a significant drop in altitude would not effect the coverage to any great extent and 30-60 satellites could provide global coverage.

Such a system need only generate around 0.00000002079 Watts, at ground level on the right frequency, to trigger the firing of a neuron. Thus, the SLF/ELF transmitters do not need to be of classical large sizes allowing for dense, power efficient, transmitter arrays in a form factor suitable for satellite deployment. Just keep in mind that an antenna's function is to increase the

amplitude of a wave through electrical resonance. With such small amplitudes, the classical submarine transmitters of 50Km or more are not required. In this form factor, a very rough estimate of a few thousand small antennas, per satellite, is feasible.

So, we have a good approximation of the infrastructure required and the limits that physics imposes. What we need to analyze now is the processing of that information.

Input, Input, Input

If we examine the third diagram, we can obtain a basic idea of the "snapshot" each satellite captures. In a given time frame, a range of frequencies is detected. To isolate a particular person, we use a form of trilateration similar to how GPS functions (see forth diagram). In this case, the Digital Signal Processing equipment on the ground replaces the function of the GPS receiver. Given the nature of SLF/ELF waves, atomic timing and detailed information on satellite drift and atmospheric conditions, millimeter or greater resolution can be achieved. The margin of error in GPS is related to both the lack of a wide range of information and processing power at the GPS receiver.

Once we have determined our desired location, we can collate the frequencies emanating from that particular location and disregard the rest of the information. This provides us with a reduced FFT diagram which represents the electrical activity of a particular individual. We can observe this collated diagram in the fifth image to the right.

From here, it is matter of correlating peaks and patterns against known neural activity. This acts as our translator or lexicon to decode the electrical activity into meaningful information. This is shown in the sixth diagram to the right. Performed in near real-time, every activity, thought, feeling, sight or sound can be captured and recorded.

So, we have shown how signal analysis can be used to infer the activity, both physical and mental, of a targeted individual. It also shows that there is not a giant leap in returning such signals to the brain and effectively hijacking it. Once the frequencies the target's brain emanates have been isolated, an entire stage of processing (trilateration) can be skipped, unless real-time tracking is required.

Of course, certain architecture choices can provide additional features applicable to intelligence gathering. The first is the storage and analysis of historical information. This allows the A.I. to refer to elements in your past, even though it was not specifically examining you at the time. This can be used to increase the Schizophrenic illusion by inferring that the voice, or personality, was always there. Further to this, an individual not aware of the presence of this system, could have their opinions and feelings manipulated. This is especially useful when a certain political outcome is desired, such as peace negotiations or trade decisions.

A second design choice and arguably the most useful, is a modification on keyword analysis. "Key Thought Analysis" reviews all data in a particular grid search (for example a province in Afghanistan) to reveal individuals thinking of specific activity. Once located, the spacial

resolution can be widened to reveal individuals in their presence and whether this was a group planning an attack.

Finally, we could have two or more layers of satellites, one used for real-time interaction with an A.I. and a second set simply gathering information. The latter could be at any altitude.

URL http://deepthought.newsvine.com/_news/2010/09/20/5139785-can-a-satellite-read-your-thoughts-physics-revealed-part-2