

NIKOLA TESLA UNIVERSAL WIRELESS SYSTEM

by Michael Riversong

[NOTE: A PowerPoint file including relevant photographs has been made to go with this report. Most of the photos have been uploaded to the Internet for free general public viewing at the Tesla Academy / Michael Riversong Photobucket site

<http://s93.photobucket.com/user/mriversong/library/Inventions>

All photos are by the author, except a few obviously antique photos and the shots of Gary Peterson's workshop which he supplied. If you want a copy of that file, please contact us by email to make download arrangements, since the file is over 22 MB in size.]

WIRELESS OVERVIEW

After bringing in the Age of Electricity with his AC power system built by Westinghouse, Tesla decided to take civilization a step further. AC power took off in 1893. Over the next few years its application became nearly universal. Tesla's stature as an inventor was enormous, and his wealth by 1898 was sufficient to allow further development. In 1895 several Tesla Coil assemblies were built and tested. These became the foundation for the next stage, which involved breaking free of transmission wires. Economies of this step were obvious.

In 1899 Tesla built a special laboratory in Colorado Springs to conduct several important experiments to prove the concept and refine techniques. He regarded these experiments, which are well documented in Colorado Springs Notes 1899-1900, as successful. By 1901 he was building the prototype universal wireless transmitter at Wardenclyffe on Long Island.

[antique Tesla photos, Wardenclyffe]

We have some indications that, in his wireless transmission system, the output signal only manifests when it has been brought back into the local region of the universe by a resonant receiver tuned to the original transmitter. Apparently the interim signal was not actually in a path through the material universe in the same way that electromagnetic energies are. Exactly where the wireless signal is when not in a transmitting or receiving circuit can currently be regarded as a mystery.

[LI Conference2006, Wardenclyffe Model, Wmodel2]

Wireless transmission of electricity has many obvious uses. Tesla made several lists. Currently, two problems could readily be addressed by prototype units. Throughout the Midwest and Intermountain regions of the USA, many excellent potential wind power sites have been found which are far enough away from existing powerlines to be considered uneconomical. Any consortium that customarily develops these wind power resources could build cheap transmitters and receivers to try them out. Costs of these units would be a small fraction of what is paid for large wind turbines.

In several Middle Eastern countries, returning soldiers have noted that many communities exist in relatively fertile valleys but need irrigation in order to grow a variety of crops. Most of these valleys are surrounded by ridges and peaks that are known to have steady winds. Crude wind generators based on the Savonius design, built from abundant half oil drums, could be built locally and connected to transmitting units. Receivers, of course, can be located in the valleys at critical pumping stations for irrigation systems.

BASIC TRANSMITTER CONSTRUCTION

Units are typical Tesla coils. Apparently any working coil design is sufficient. Many different tunings have been tried, and each researcher now has unique data on the effects of tuning parameters. We can and should evaluate the effects of triode control, solid state modules, and other alternatives to noisy spark gaps.

[PHI0710 Tube Coil]

RESONANT RECEIVERS

Design of receivers is more flexible than transmitters. After all, the circuit only has to look like the

transmitter from the viewpoint of an electron. This means visual similarities may be meaningless. Only electrical characteristics matter. Therefore, a receiver can be in the form of a foil antenna hanging from a special frame, or a rod wound with wires exactly $\frac{1}{4}$ of the length used in the transmitter assembly. Tesla mentions that fraction several times in his patents.

In Patent 685954 Tesla discusses some alternatives to receiver control, including simple condenser based circuits. This discussion is continued in Patents 685955 and 685956.

COMMUNICATIONS

Tesla had an unexpected approach to communications technology. His universal wireless transmission system was infinitely tunable into individual channels. This is somewhat like the subcarrier system used in the United States today for FM radio and HDTV broadcast bands. Apparently, Tesla could use a binary code of some sort to differentiate signals from each other within the transmitted matrix. Digital control is not mentioned in his patents, however.

POWERING A TRANSMITTER

An essential frontier of this research involves two patents immediately subsequent to the ones discussed: 685957 and 685958. The pair documents Radiant Energy Receivers. This is a relatively simple device, but it has not yet been demonstrated at any of the major conferences so far witnessed by this author. Perhaps nobody has tried building one. Apparently these are capable of receiving energy from cosmic rays and other energies which are constantly bombarding our planet. These could be thought of as being like solar collectors that operate all the time, day and night. Designs involve simply conditioning output current so it can be easily used by other devices, such as wireless transmission Tesla Coils.

It is clear from several statements made by Tesla during the period when he was building Wardencllyffe that power for transmitters could come from wind generators or hydroelectric dynamos. He often hinted at harvesting cosmic ray energy during that period, and in many magazine articles later on.

GARY PETERSON SYSTEM

The first contemporary wireless transmission replica system was built in 2006 by Gary Peterson of Breckenridge, Colorado. He first built Tesla coils and a styrofoam mushroom head in his own workshop. In October he brought the components to a small conference on Long Island which was sponsored by the Friends of Science East. Final assembly was done in his hotel room.

[LI Conference2006, Wardencllyffe Model, GP workshop 7, 11, 13, 16]

During his lecture, Gary emphasized that Tesla had said "Grounding is everything". A public demonstration followed in a basement conference room at the hotel. Only a very small amount of output power was found, enough to light a flashlight bulb near the transmitter assembly. Grounding was a serious problem, and in fact had been noticed at other times during the conference. Several men crawled around on the floor attempting to set up some sort of working ground. Eventually a small increase in power output was noted as a result of these efforts.

[LI Conference2006, Wardencllyffe Model, 5,6,7]

Gary has demonstrated this at several other events with more success. He has experimented with design variations which worked out well. Several innovative methods of tuning the transmitting and receiving units have been found. Included among other demonstrations were ExtraOrdinary Technology conferences in 2009 and 2013, and Philadelphia Tesla Days in 2010. In 2013 he added some flexible metallic air conditioning duct to the transmitter as a supplemental adjustment point.

[ET09 Wireless 1,3]

NELSON LIM-CHUA SYSTEM

In 2011 and 2013 this system was demonstrated during Tesla Days in Philadelphia. During the 2011 tabletop demonstration, which resulted in a weak power output around the receiver, a cheap multiband radio was turned on in the room. It was expected that a large amount of static would be found

on several AM and SW bands. Surprisingly, the only signal found during operation of the demo unit was a faint “woodpecker” signal scattered between 1350 – 1700 kHz on the AM radio band.

[PHI0711 Chua 2 – 6]

For the 2013 demonstration a solar panel was placed as an energy source. According to Harry Oung, who has been working with Mr. Lim-Chua, significant output had not yet been achieved. At that time, July 2013, tuning parameters for the solar part of the circuit were being tried.

[PHI0713 wireless 1 & 2]

MICHAEL LEAS RESEARCH

Several pairs have been built, testing out various parameters. Tesla had stated in the patents that there are many possible ways to accomplish the basic functions of wireless transmission. Most of these systems have worked. Leas has clearly stated that research into wireless is a precursor to free energy generation, and since 2011 has been focusing efforts in that direction.

[ET11 04Leas2, 06Leas4, 08Leas6]

REFERENCES

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