GLOBAL SHORTWAVE CLUB
Newsletter

President

William G Davis Jr

Contact Us!

Don't forget to call or write to us at least once a month. We welcome more if you have time!

Phone Numbers

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Visit our website!

www.ictchurch.org

We have a whole area dedicated to our Global Shortwave Club members. You can also find our current frequencies and times!

Current Radio Schedule

WWCR
Worldwide Christian Radio

Monday through Friday
5.890 - 0300 UTC
7.520 - 0000 UTC

Saturday
4.840 – 0200 UTC

Sunday
9.350 - 2100 UTC

Tesla's Contribution to Radio Part 2

Experiments with high-frequency machines revealed new and unknown properties of alternating currents, which Tesla perfectly described in his lecture before the American Institute of Electrical Engineers at Columbia College in New York on May 20, 1891.

Tesla prepared several exciting and new experiments with the help of Gano Dunn. The lecture was spectacular as his experiments revealed a new world of high-frequency currents and high voltages. Tesla started the lecture by saying that nature is the most captivating and worthy subject of study and added:

"Nature has stored up in the universe infinite energy. The eternal recipient and transmitter of this energy is the ether…Of all forms of nature's energy, which ever and ever changing and moving, like a soul animates the inert universe, electricity and magnetism are perhaps the most fascinating…What is electricity, and what is magnetism?"

In his lecture, Tesla considered the nature of electricity and tried to explain the phenomenon's essence. He assumed that electricity connects to molecular activities, expressed doubts about the existence of two electricities, and considered ether a medium that reacts differently to low—and high-frequency currents.

He conducted experiments with a gradual increase of voltage at the ends of the transformer secondary coil. He pointed out many phenomena and tried to explain them using his limited knowledge of contemporary electrical science.

He described the effects of heating of dielectric exposed to strong fields of high-frequency currents, effects of luminescence, light effects in the vacuum, and gases under pressure. He explained that the emission of light was: *"due to the air molecules coming bodily in contact with the point; they are attracted and repelled, charged and discharged, and their atomic charges being thus disturbed, vibrate and emit light waves."*

It is incredible how close he was to the modern theory of the emission of light photons from atoms stimulated by an external source directly or indirectly caused by electricity. Tesla concluded that it would be possible to use high-frequency currents to produce light and heat, as with an ordinary flame, but without the consumption of material.

When entering the high frequency field A.C. Tesla was in a completely new territory. In this case, he discovered quickly that the iron core was disadvantageous, and he disposed of the iron and produced the air-core transformer, known since as the Tesla coil.

Usually, this transformer was part of a high-frequency generator, and to produce the highest voltage in the secondary, Tesla discovered that the length of wire in the secondary should be about a quarter of the wavelength! The operating frequency of this generator is determined mainly by the primary resonant circuit, and the secondary circuit is composed of the secondary coil's inductance and self-capacitance.

Interestingly, the Tesla coil secondary without extra capacitance is self-resonating close to Tesla's disclosed condition. Tesla never made a full theoretical analysis of his transformer, but in tuning for the maximum secondary voltage, he certainly used the "cut and try method."

The coupling between the primary and secondary also plays a significant role, and these days, this transformer is still studied with a theory of its operation that is more or less approximate. Tesla's best and most detailed theory of his transformer can be found in his Colorado Springs Notes 1899-1900, published by Nikola Tesla Museum in Belgrade in 1978, and in several earlier patents and lectures.