

Limitless Free Indirect Solar Energy from Schumann Resonances?

by

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Is the “Lost Secret” of the 1926 “Moray Valve” real?

Jackson’s *Classical Electrodynamics* says Tesla had discovered Schumann Resonances 65 years before Schumann.

In 1926 Tesla-observer Dr. T. Henry Moray stunned credentialed witnesses by producing 25 kW of AC power 26 miles from the nearest power line using a short antenna plus a “germanium triode” decades before transistors!

HARNESSING THE WHEELWORK OF NATURE

TESLA'S SCIENCE OF ENERGY



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High Voltage

Science

This book contains these exclusives:

- Niagara Falls Electrification History
- Wireless Transmission of Power Story
- Declassified FBI Documents on Tesla
- Two New Biographies of Nikola Tesla

Metal
Ball

Tesla
Coil

Tesla

Extra
Coil

Harnessing the Wheelwork of Nature presents for the first time, the feasibility argument for Tesla's most ambitious dream, **the wireless transmission of power**. Pictured on the cover near Tesla's feet, the 187-foot Wardenclyffe Tower was the means to deliver natural 8 Hz electricity anywhere in the world, **by longitudinal waves** with only about 5% loss. See why Tesla's dream answers the energy crisis worldwide, saves electrical conversion losses, and provides a real alternative to transmission lines. Why wasn't the prototype of Wardenclyffe finished in 1903? ***"The world was not prepared for it. It was too far ahead of time. But the same laws will prevail in the end and make it a triumphal success... Let the future tell the truth and evaluate each one according to their work and accomplishments. The present is theirs; the future, for which I really worked, is mine."*** – Nikola Tesla

"Tesla is one of the great overlooked geniuses of science and electricity. His full story deserves to be told. Tom Valone sheds important new light on his life and work." –Nick Cook, Editor, *Jane's Defence Weekly*, author of *The Hunt for Zero Point*

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11 Self-Sustained Longitudinal Waves

Robert W. Bass, Ph.D.

Reprinted from *Proceedings of the Tesla Centennial Symposium*, 1984

SELF SUSTAINED NON-HERTZIAN LONGITUDINAL WAVE OSCILLATIONS AS RIGOROUS SOLUTIONS OF MAXWELL'S EQUATIONS FOR ELECTROMAGNETIC RADIATION

In contradiction to common belief, Maxwell's classical theory of electromagnetic radiation does predict the existence of longitudinal electromagnetic waves *in vacuo*. (Longitudinal non-Hertzian compression waves are very likely to be the type that Tesla produced with the TMT. — Ed. note) This preliminary note contains what appears to be the first rigorous proof of the theoretical existence of such non-Hertzian self-sustained longitudinal wave oscillations. The E-fields and B-fields in such waves are everywhere parallel (so that the Poynting vector vanishes identically and no energy is transported along the waves, though it does appear possible in theory to transport force at a distance without attenuation via such waves *in vacuo*). The waves have the following geometry. Choose a static vector potential (A) parallel to the static magnetic field configuration of an arbitrary force-free magnetic field (B) of the type discovered in 1952 by Schluter and Lust.¹ Then pick an arbitrary frequency $\omega = \lambda c > 0$ corresponding to an arbitrary wave number $\lambda > 0$ where c is light speed, and multiply the vector potential A by $\lambda \cos \omega t$ to obtain the longitudinal wave B-field whose oscillations at frequency ω generate an E-field obtainable by multiplying the vector potential by $\omega \sin \omega t$. The vector potential and both fields are parallel and typically in infinite cylindrical or toroidal configurations as depicted in Figures 1 & 2.²

To derive, let R denote an unbounded or bounded open connected region of real Euclidian 3-space E^3 . Let the boundary ∂R of R consist of the union of piece-wise smooth 2-surfaces. Let $\lambda > 0$ denote an arbitrary

¹ R. Lust and A. Schluter, Axial symmetrische magnetohydrodynamische Gleichgewichtskonfigurationen, *Z. Naturforsch.* 12a (1957), 850-854.

² Ed. note: Compare with 'Curl-Free Vector Potentials,' R. Gelinas, *Proc. ITS 1986*, p.4-43, & Gelinas patents #4,447,779, #4,429,288, #4,429,280 on modulating/demodulating scalar waves, as well as J. Corum patents #4,622,558, #4,751,515 using toroidal fields.

positive constant wave number. Then according to potential theory, there exists on \mathbb{R} , corresponding to every set of arbitrarily assigned Dirichlet or Neumann boundary condition on $\partial\mathbb{R}$, a unique real analytic solution $\varphi = \varphi(\mathbf{r})$ of Helmholtz's scalar wave equation.

$$(1) \quad \nabla^2 + \lambda^2 = 0, \quad (\mathbf{r} \text{ in } \mathbb{R}), \text{ on } \mathbb{R}$$

Next, let \mathbf{u} be an arbitrary constant unity vector in E^3 , and define frequency $\omega = \lambda c$ where c denotes light-speed.

Now define a static vector field $\mathbf{A} = \mathbf{A}(\mathbf{r})$ on \mathbb{R} by

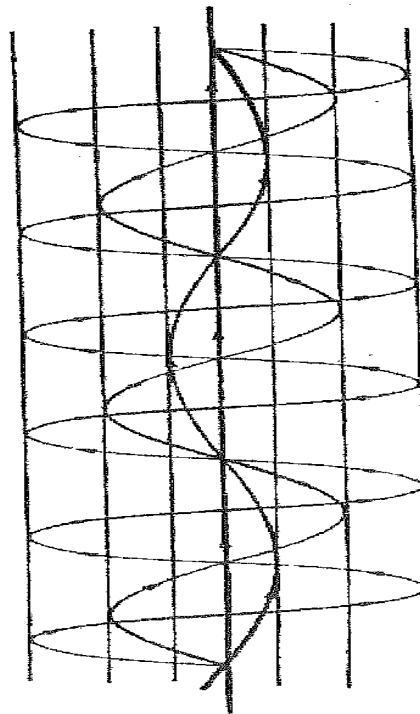
$$(2) \quad \mathbf{A} = \nabla \times (\varphi \mathbf{u}) + (1/\lambda) \nabla \times (\nabla \times (\varphi \mathbf{u})).$$

Finally define

$$(3a) \quad \mathbf{B} = \lambda \mathbf{A} \cos \omega t,$$

$$(3b) \quad \mathbf{E} = \omega \mathbf{A} \sin \omega t.$$

Figure 1. Illustrating a force-free magnetic field having axial symmetry. The axis is itself a line of force of the field. The other lines of force shown here are helices around this line as axis (with pitch angles decreasing away from the axis)



$$(14) \quad I = I(r_b, t) = J(r_b) \cos \omega t .$$

This current, I on ∂R will generate the previously defined longitudinal radiation waves on R .

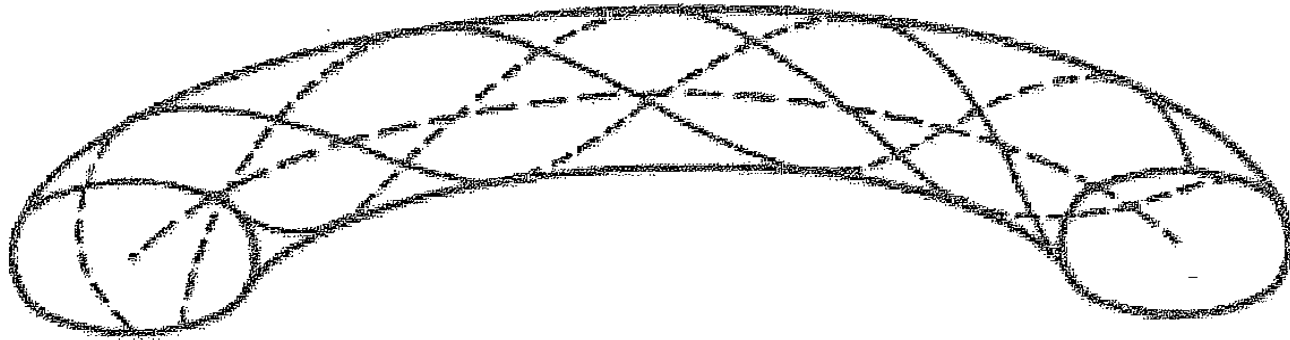


Fig 2. The lines of force of a force-free field must therefore lie on nests of torus-like surfaces, one inside the other, with a limiting curve which is itself a line of force.

Ed. note: The Bass-cited paper by *Schluter and Lust* is required reading in magnetohydrodynamic courses, such as the one at the University of Montana (PHYS

The resonant frequencies (8.105) are called *Schumann resonances*.^{*} They are extremely low frequencies: with $a = 6400$ km, the first five resonant frequencies are $\omega_l/2\pi = 10.6, 18.3, 25.8, 33.4, 40.9$ Hz. Schumann resonances manifest themselves as peaks in the noise power spectrum of extremely low frequencies propagating around the earth. Lightning bolts, containing a wide spectrum of frequencies, act as sources of radial electric fields. The frequency components near the Schumann resonances are propagated preferentially because they are normal modes of the earth-ionosphere cavity. The first definitive observations of these peaks in the noise power spectrum were made in 1960,[†] although there is evidence that Nikola Tesla *may* have observed them before 1900.[‡] A typical noise power

^{*}W. O. Schumann, *Z. Naturforsch.* **72**, 149, 250 (1952).

[†]M. Balser and C. A. Wagner, *Nature* **188**, 638 (1960).

[‡]In U. S. patent 787,412 (April 18, 1905), reprinted in *Nikola Tesla, Lectures and Patents and Articles*, Nikola Tesla Museum, Beograd, Yugoslavia (1956), this remarkable genius clearly outlines the idea of the earth as a resonating circuit (he did not know of the ionosphere), estimates the lowest resonant frequency as 6 Hz (close to the 6.6 Hz for a perfectly conducting sphere), and describes generation and detection of these low-frequency waves. I thank V. L. Fitch for this fascinating piece of history.

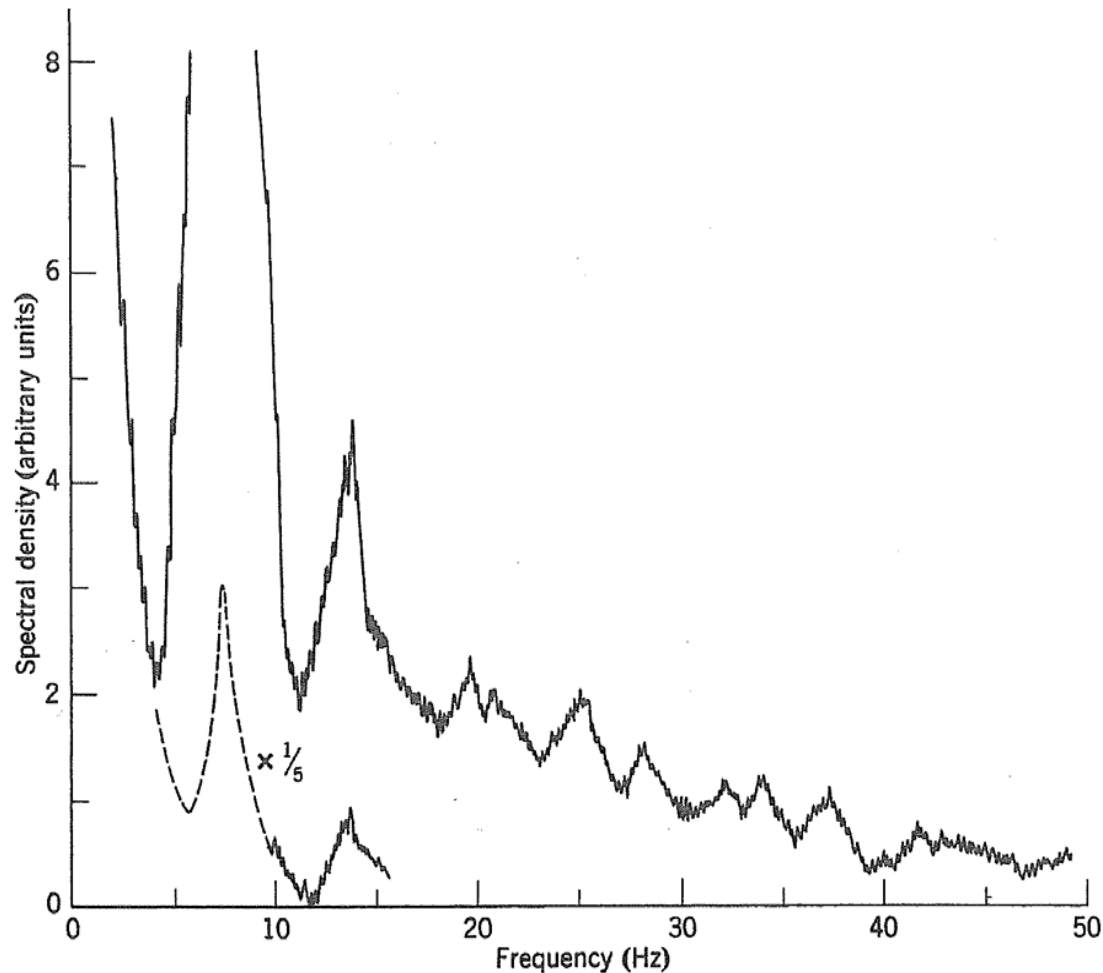


Figure 8.9 Typical noise power spectrum at low frequencies (integrated over 30 s), observed at Lavangsdalen, Norway on June 19, 1965. The prominent Schumann resonances at 8, 14, 20, and 26 Hz, plus peaks at 32, 37, and 43 Hz as well as smaller structure are visible. [After A. Egeland and T. R. Larsen, *Phys. Norv.* 2, 85 (1967).]

Chapter 6. Electropulsations Occur in Nature

The earth-ionosphere cavity acts as a spherical capacitor, which capacitively couples with the condenser (capacitor) of the human body. This statement is not just speculation. Much research has been done to show the profound EEG entrainment that the earth's "micropulsations" (Schumann resonances) cause in the human body, as long as the person is isolated from stronger EMFs. The picotesla (nanogauss) *micropulsations* of the earth at a fundamental frequency of 8 Hz, easily entrain the alpha rhythm of the human brain, also centered at 8 Hz, which only exhibits 1/1000 of the earth's AC magnetic field strength.¹⁵⁶ Human magnetoencephalograms (MEG) are in the femtotesla (picogauss) range.¹⁵⁷ As seen in the simultaneous worldwide recording below,

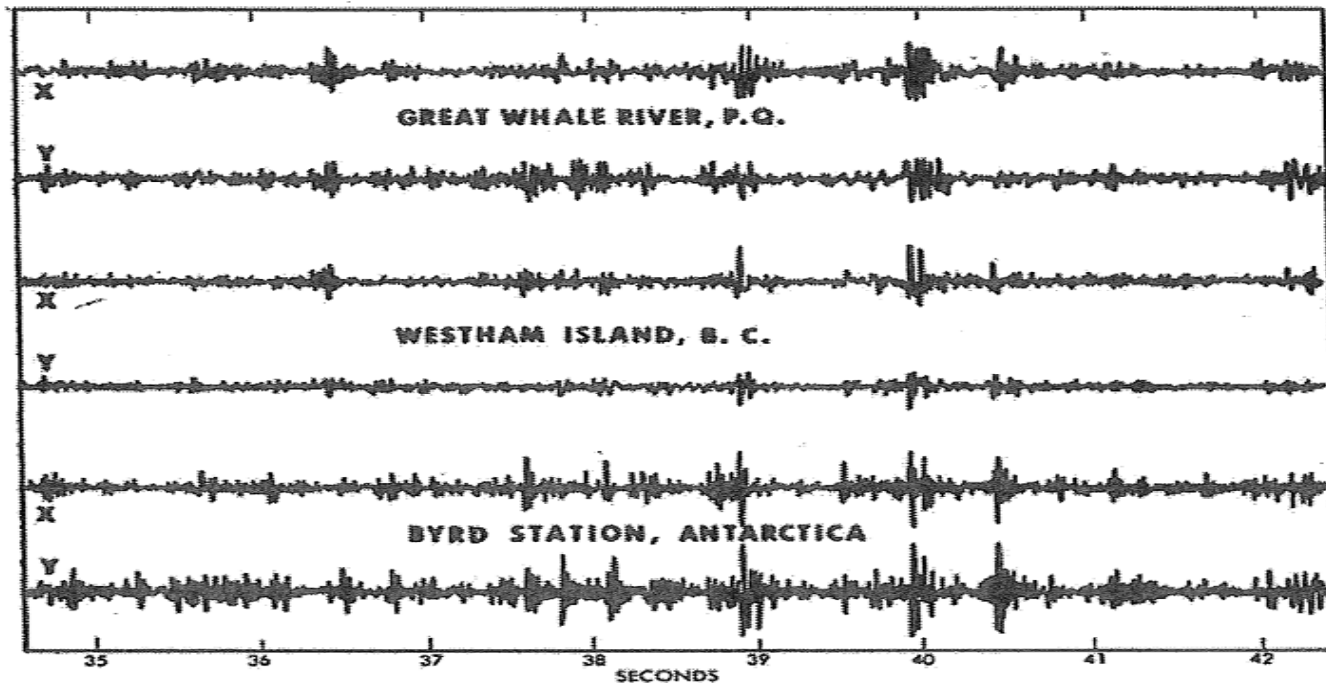


Fig. 12 Earth micropulsations (2 -- 30 Hz) recorded simultaneously. Source: Galejs, *Terrestrial Propagation of Long Electromagnetic Waves*, Pergamon Press, 1972

Below is the compilation of the earth's micropulsations.¹⁶² Comparing this graph to the declining E and B fields of Figure 7, it has the same slope. Therefore, *the earth-ionosphere cavity must deliver a fixed amplitude of its pulsating E field inside the human body, estimated to be 1-10 pV/m, independent of frequency.*¹⁶²

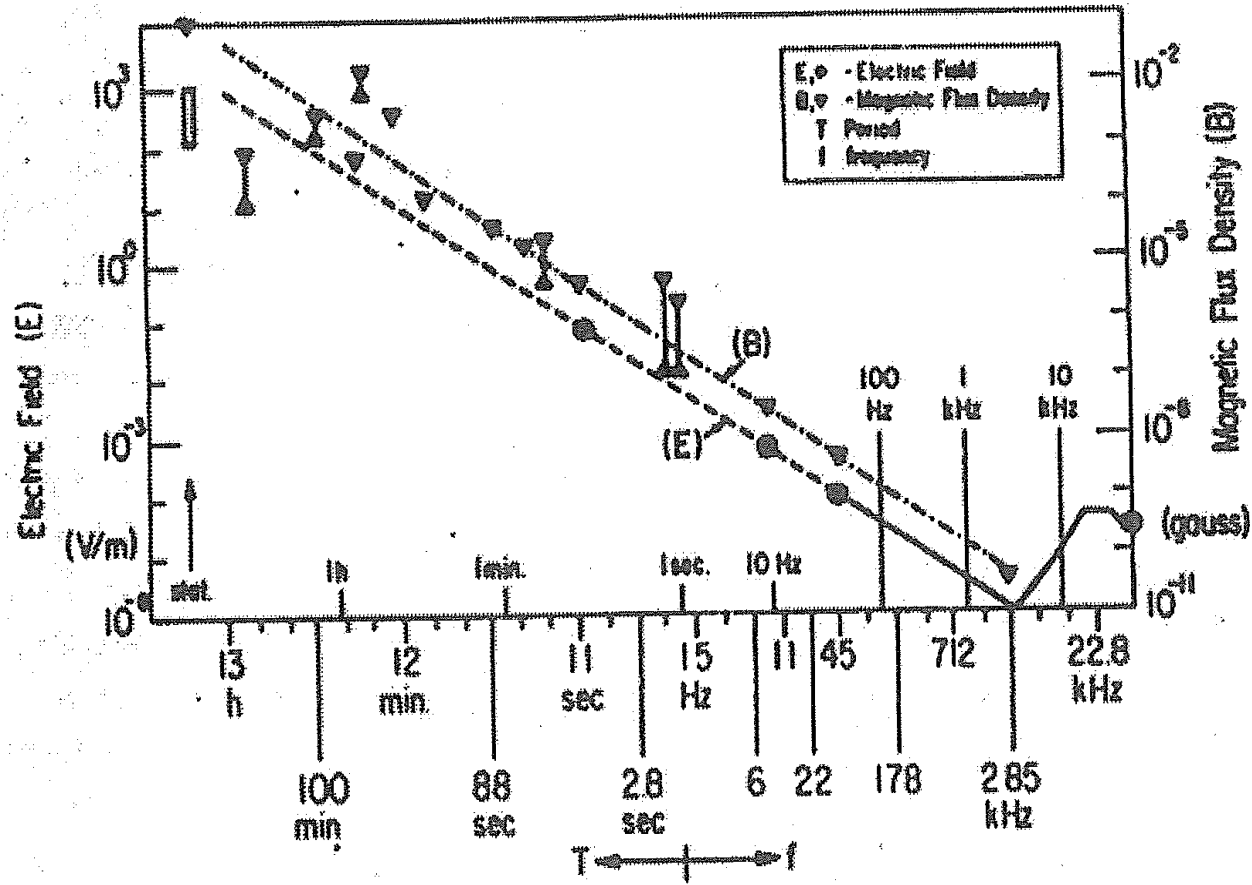


Figure 13 Earth Schumann cavity E and B fields from 0 to 50 kHz

what they saw. It was dusk when they left the canyon.¹⁰

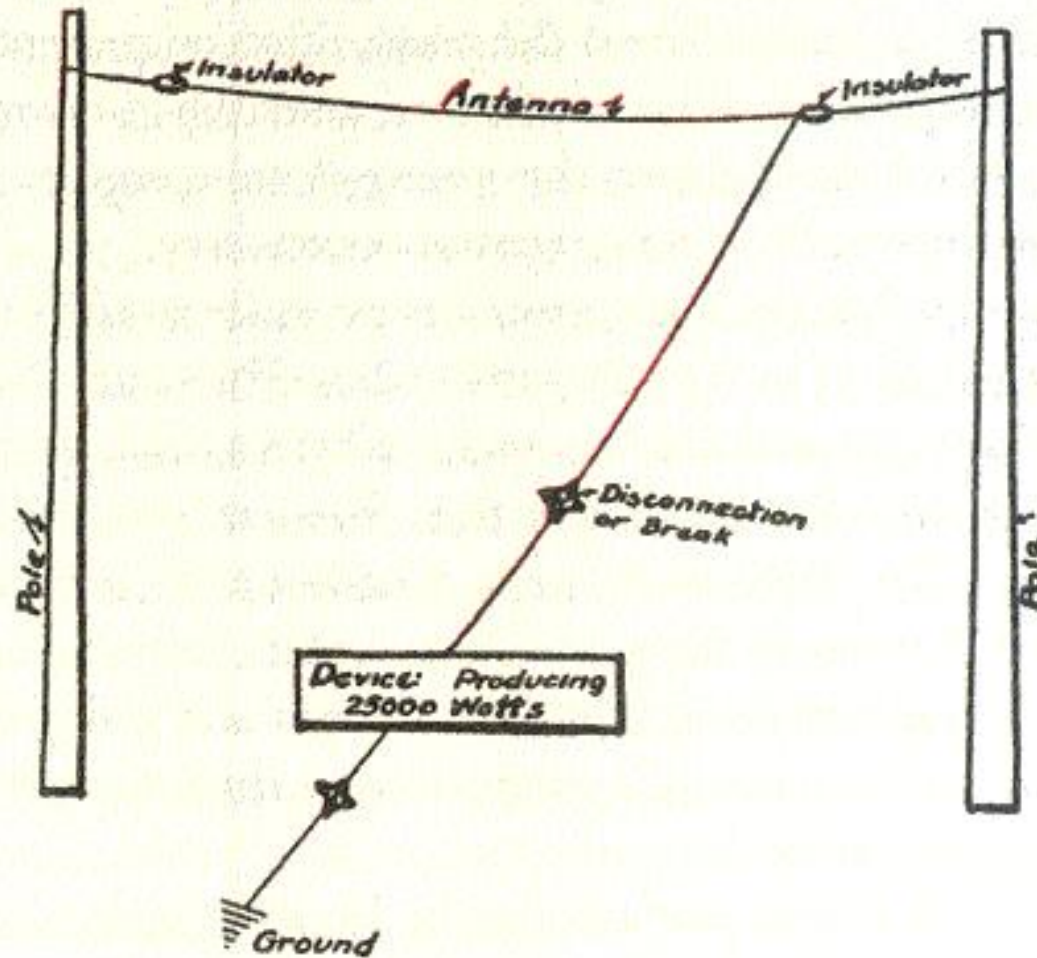


FIGURE 3.1 Antenna set-up employed by T. Henry Moray's Radiant Energy Device.

since they had no means of heating the cathode inside them.

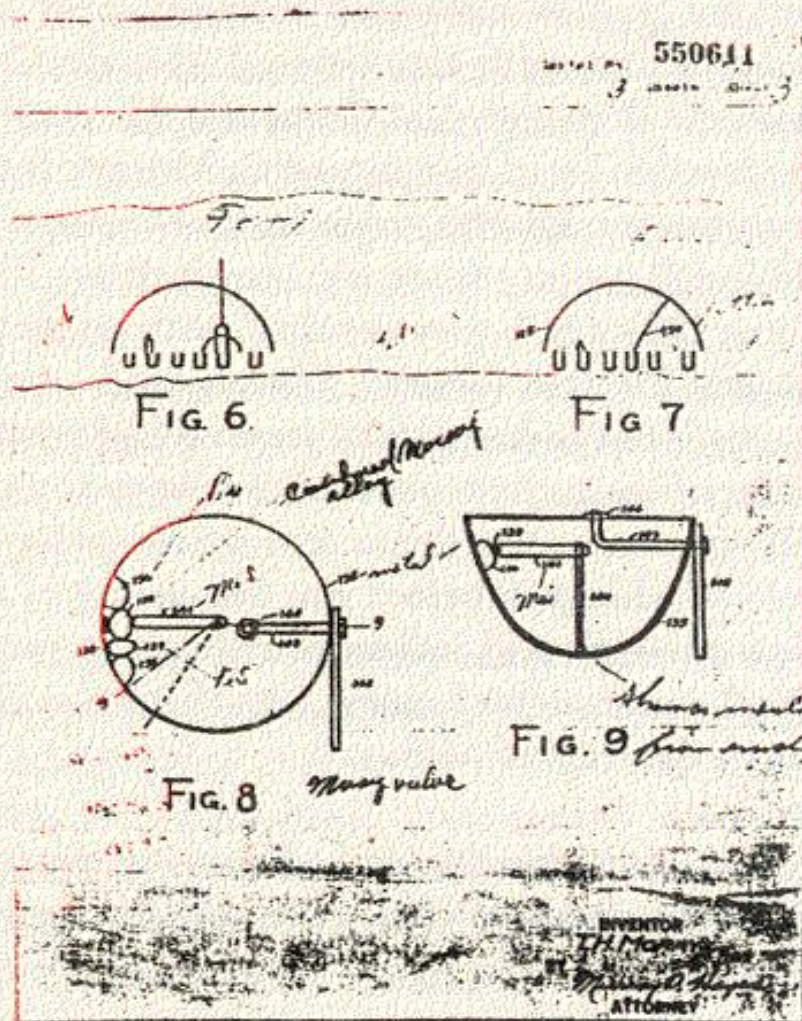


FIGURE 3.2 Image from T. Henry Moray's patent application No. 550611.

- The most credible witness of the Moray Valve was the late Harvey Fletcher [1884-1981], called the “father of stereophonic sound” and long-time Director of Research at Bell Labs.
- While a student of Milliken, Fletcher had measured the charge on an electron in an oil-drop experiment for which Milliken had received a Nobel Prize. Decades after fruitlessly trying to persuade Moray to disclose his secret, Fletcher set up a solid-state physics project which resulted in the transistor and for which one of his subordinates received a Nobel Prize. Around 1980, when he was around 97 years of age, Fletcher told me face-to-face that the Moray Effect was real but still left him baffled and puzzled because he had never been able to figure out how it could possibly have worked.

- In the 1980s I gave papers at several conferences in honor of Tesla in which I showed that there is enough energy in the Schumann Resonances in the Earth-Ionosphere cavity, which is replenished by lightning strikes, that one kW could be “tapped” continuously from every square meter on the surface of the earth without depleting the total amount of energy, based upon studies of the amount & frequency of lightning strikes around the globe which make up for the “lossy” boundaries.
- Of course the clouds are lifted by solar energy and so the energy in lightning strikes comes ultimately from the sun. The problem is how to get a “VERY high-frequency AC current” from a standing wave which is oscillating at about 8 Hz and in which the B-field circles the entire earth like an equator while the E-field is always radial but continually reversing its direction. Conventional antenna theory for Extremely Low Frequency (ELF) waves requires an antenna thousands of miles long.
- But it seems to me that there is some “trick” for getting around that proposition onto which Moray had stumbled during invention of his “radiant energy device” without actually understanding what he had done. He wrote about “the sea of energy in which the earth floats” and said that the “radiant energy” comes in “surges” like oceanic tides, so one may need to go beyond the standard theory of the Schumann Resonances by means of the theory of “electromagnetosonic waves” based upon an ElectroMagnetoFluidDynamic (EMTFD) theory disclosed by R.W. Bass in the second one of his BYU Topolotron Patents (issued but now expired), available on his website www.innoventek.com at http://www.innoventek.com/US004236964_TopolotronPatent.pdf