


## ClaroPDF Markup and Multimedia Guide



# Annotation Tools




## Highlight tool

^ History 

The Tesla coil transformer employed a capacitor which, upon break-down of a short [spark gap](#), became connected to a coil of a few turns (the primary winding set), forming a resonant circuit with the frequency of oscillation, usually 20–100 kHz, determined by the capacitance of the capacitor and the inductance of the coil. The capacitor was charged to the voltage necessary to rupture the air of the gap, about 10 kV by a line-powered transformer connected across the gap. The line transformer could tolerate the




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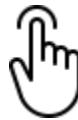
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Aa

With the loose coupling the voltage gain is instead proportional to the square root of the ratio of secondary and primary inductances. Because the secondary winding is wound to be resonant at the same frequency as the primary capacitor, the stray capacitance of the secondary, [citation needed]

Oscillation frequency is 20-100 kHz

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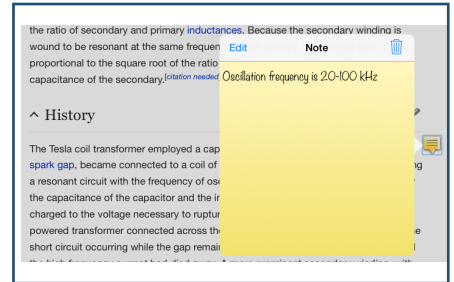
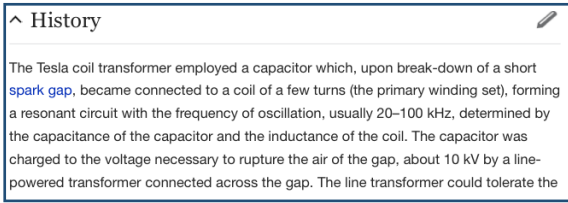
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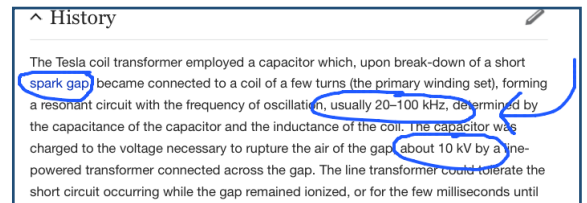
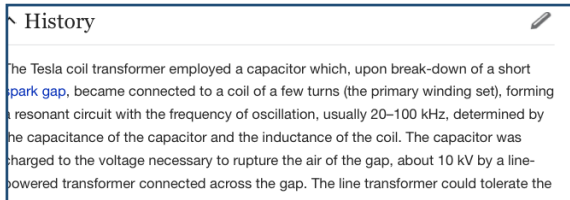




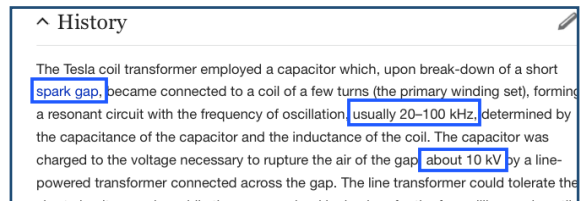
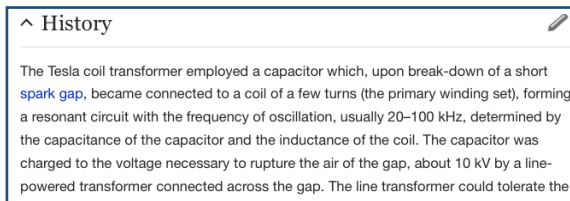
## Note tool



## Free draw tool




## Square tool






### Circle tool

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### Polygon tools

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History



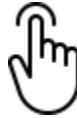
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## Insert sound tool

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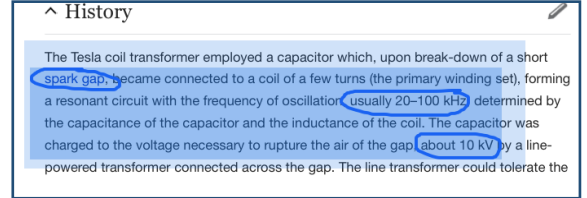
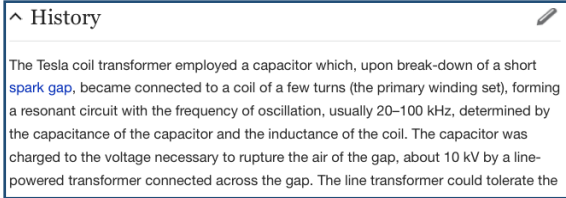
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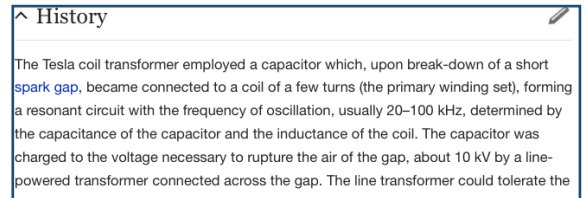
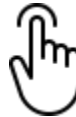
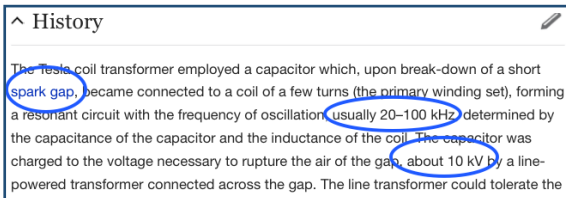




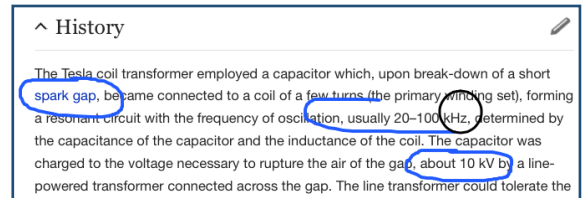
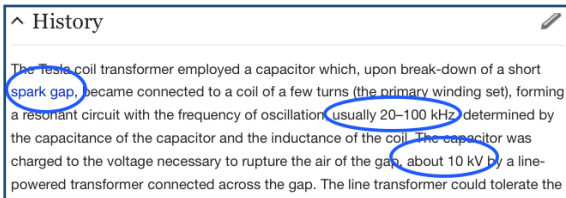
Select tool



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# Multimedia Tools



## Audio

The later and higher-power coil design has a single-layer primary and secondary. These Tesla coils are often used by hobbyists and at venues such as science museums to produce long sparks. The *American Electrician*<sup>[1]</sup> gives a description of an early Tesla coil wherein a glass battery jar, 15 × 20 cm (6 × 8 in) is wound with 60 to 80 turns of AWG No. 18 B & S magnet wire (0.823 mm<sup>2</sup>). Into this is slipped a primary consisting of eight to ten turns of AWG No. 6 B & S wire (13.3 mm<sup>2</sup>) and the whole combination is immersed in a vessel containing linseed or mineral oil.<sup>[12]</sup>

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Video

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secondary circuit. The voltage achievable than a conventional transformer, because solenoid widely separated from the surround voltage per turn in any coil is higher because high frequencies,<sup>[citation needed]</sup>

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Tesla coil - Wikipedia, the free encyclopedia

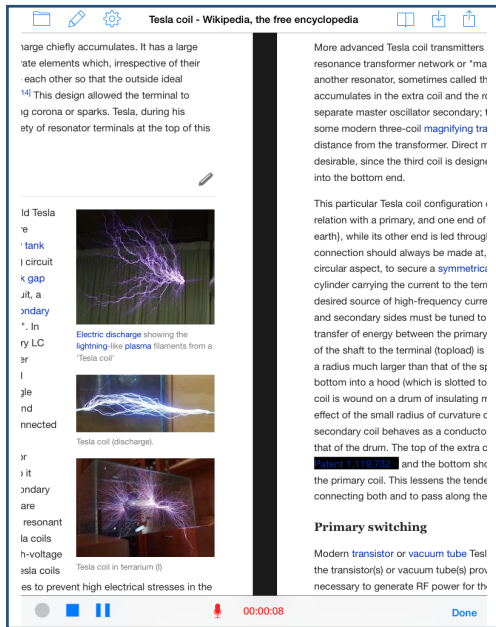
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[4] This design allowed the terminal to  
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More advanced Tesla coil transmitters  
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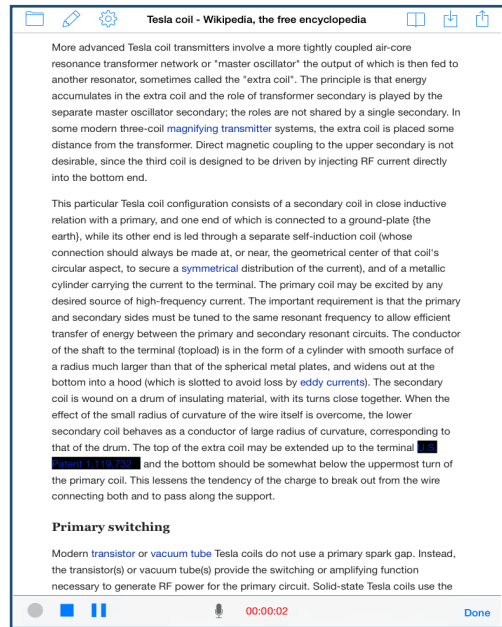
Tesla coil - Wikipedia, the free encyclopedia

More advanced Tesla coil transmitters involve a more tightly coupled air-core  
resonance transformer network or "master oscillator" the output of which is then fed to  
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accumulates in the extra coil and the role of transformer secondary is played by the  
separate master oscillator secondary; the roles are not shared by a single secondary. In  
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This particular Tesla coil configuration consists of a secondary coil in close inductive  
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**Primary switching**

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Page 3

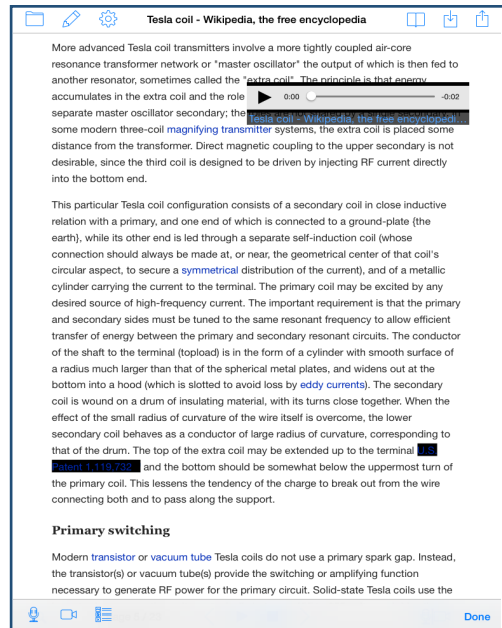
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elevated conductor is where the electrical charge chiefly accumulates. It has a large radius of curvature, or is composed of separate elements which, irrespective of their own radii of curvature, are arranged close to each other so that the outside of the surface enveloping them has a large radius of curvature. Tesla coils are designed to support very high voltages without generating a significant amount of heat. In a patent application process, described a variety of resonator terminals at the top of this later coil.<sup>[10]</sup>

^ Modern-day Tesla coils

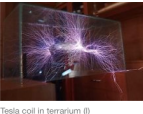
Modern high-voltage enthusiasts usually build Tesla coils similar to some of Tesla's "later" air-core designs. These typically consist of a primary tank circuit, a series LC (inductance-capacitance) circuit composed of a high-voltage capacitor, spark gap and primary coil, and the secondary LC circuit, a series-resonant circuit consisting of the secondary coil plus a terminal capacitance or "top load". In Tesla's more advanced design, the secondary LC circuit is composed of an air-core transformer secondary coil placed in series with a helical resonator. Most modern coils use only a single helical coil comprising both the secondary and primary resonator. The helical coil is then connected to the terminal, which forms one 'plate' of a capacitor, the other 'plate' being the earth (or 'ground'). The primary LC circuit is tuned so it resonates at the same frequency as the secondary LC circuit. The primary and secondary coils are magnetically coupled, creating a dual-tuned resonant air-core transformer. Earlier oil-insulated Tesla coils needed large and long insulators at their high-voltage terminals to prevent discharge in air. Later Tesla coils spread their electric fields over large distances to prevent high electrical stresses in the



Electric discharge showing the lightning-like plasma filaments from a Tesla coil



Tesla coil (discharge).



Tesla coil in terrarium (I)



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secondary circuit. The voltage achievable from a Tesla coil can be significantly greater than a conventional transformer, because the secondary winding is a long single layer solenoid widely separated from the surroundings and therefore well insulated. Also, the voltage per turn in any coil is higher because the frequency is higher. Tesla coils are designed to support very high voltages without generating a significant amount of heat. In a patent application process, described a variety of resonator terminals at the top of this later coil.<sup>[10]</sup>

With the loose coupling the voltage gain is instead proportional to the square root of the ratio of secondary and primary inductances. Because the secondary winding is wound to be resonant at the same frequency as the primary, this voltage gain is also proportional to the square root of the ratio of the primary capacitor to the stray capacitance of the secondary.<sup>[citation needed]</sup>

^ History

The Tesla coil transformer employed a capacitor which, upon break-down of a short spark gap, became connected to a coil of a few turns (the primary winding set), forming a resonant circuit with the frequency of oscillation, usually 20–100 kHz, determined by the capacitance of the capacitor and the inductance of the coil. The capacitor was charged to the voltage necessary to rupture the air of the gap, about 10 kV by a line-powered transformer connected across the gap. The line transformer could tolerate the short circuit occurring while the gap remained ionized, or for the few milliseconds until the high frequency current had died away. A more prominent secondary winding, with vastly more turns of thinner wire than the primary, was positioned to intercept some of the magnetic field of the primary. The secondary was designed to have the same frequency of resonance as the primary using only the stray capacitance of the winding itself and that of any "top hat" placed at the upper end.

The later and higher-power coil design has a single-layer primary and secondary. These Tesla coils are often used by hobbyists and at venues such as science museums to produce long sparks. The American Electrician<sup>[11]</sup> gives a description of an early Tesla coil wherein a glass battery jar, 15 × 20 cm (6 × 8 in) is wound with 60 to 80 turns of AWG No. 18 B & S magnet wire (0.823 mm). Into this is slipped a primary consisting of eight to ten turns of AWG No. 6 B & S wire (13.3 mm<sup>2</sup>) and the whole combination is immersed in a vessel containing linseed or mineral oil.<sup>[12]</sup>

