

## JavaScript Tesla Coil Calculator Page

This is the original Javascript Calculator On-Line program written by Jerry Gore in 1997. It is useful for stand-alone equations. For a total design javascript program, I recommend [JavaTC Designer](#).

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Transformer Impedence	▼
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### Transformer Impedence Calculator

Transformer Volts	Transformer Milliamps	Impedence	Resonant Capacitor in Mfd
<input style="width: 100%; height: 100%;" type="text"/>	<input style="width: 100%; height: 100%;" type="text"/>	<input style="width: 100%; height: 100%;" type="text"/>	<input style="width: 100%; height: 100%;" type="text"/>

Enter your Transformer Volts and Milliamps to get the Capacitor value needed for your coil.

**Example:** I would enter 9000 volts and 45 milliamps for my neon sign transformer.

**Note:** If you used two transformers then simply double the milliamps (not volts), etc... also to convert Amps to Millamps multiply by 1000 (.045 Amps = 45 Milliamps).

**Warning:** Assumes 60 Cycles (The cycle rate of common household current in the U.S.A.)

### Reactance of Capacitor Calculator

Frequency of Secondary Coil in Kilohertz	Reactance	Inductance Needed for Primary Coil in Microhenries
<input style="width: 100%; height: 100%;" type="text"/>	<input style="width: 100%; height: 100%;" type="text"/>	<input style="width: 100%; height: 100%;" type="text"/>

Enter the Frequency of your Secondary Coil to get the Inductance needed for your Primary Coil.

**Example:** I would enter 190 as my secondary frequency in kilohertz.

**Note:** To convert megahertz to kilohertz multiply by 1000 (0.190 Mhz = 190.0 KHz).

**Warning:** Capacitor value is taken from equation One!

### Length of Wire AND Frequency of Coil

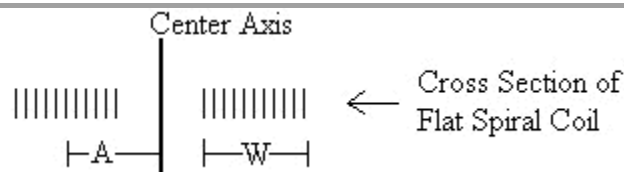
Frequency of Coil in Kilohertz	Length of Wire in Feet
<input style="width: 100%; height: 100%;" type="text"/>	<input style="width: 100%; height: 100%;" type="text"/>

Enter the desired Frequency OR Length of wire and get the other.

**Example:** I entered 1295 for length of wire and found that my coil runs at about 190 kilohertz.

### Flat Spiral Pancake Primary

(A) Average Radius in Inches	(W) Width of Coil in Inches	Number of Turns in the Winding	Inductance in Microhenries
<input style="width: 100%; height: 100%;" type="text"/>	<input style="width: 100%; height: 100%;" type="text"/>	<input style="width: 100%; height: 100%;" type="text"/>	<input style="width: 100%; height: 100%;" type="text"/>



Enter :

(A) the Average Radius as measured from the central axis to the middle of the winding,  
 (W) the Width of the coil,  
 and the Number of Turns to get the Inductance of your Flat Spiral Pancake Primary Coil.

### Number of Turns for Helical Primary

Inductance in Microhenries	Radius in Inches	Height in Inches	Number of Turns Needed
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Enter your desired Inductance in Microhenries, Radius (from center axis to edge), and Height to get the number of turns needed for your Helical Primary.

### Plate Type or Rolled Capacitors

The capacitance value identifies a plate capacitor.  
 For rolled capacitors, multiply the capacitance by 2.

Dielectric Constant K	Area of Plate in Inches	Distance Between Plates in Inches	Number of Plates	Capacitance in Microfarads
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Enter:

- 1) Dielectric constant (K) of the material used (Glass = 4 to 10, Polyethylene = 2 to 2.3 depending on purity).
- 2) The Area of a single plate (width times height).
- 3) Distance between plates (thickness of the glass, etc...).
- 4) The number of plates used in the capacitor.

This will give you the capacitance of your Plate Type capacitor. Multiply result by 2 for a rolled capacitor.

### Jar or Bottle Type Capacitors

Dielectric Constant K	Jar Radius in Inches	Height of Jar Portion Used in Inches	Thickness of Jar Wall in Inches	Capacitance in Microfarads
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Enter:

- 1) Dielectric constant (K) of the material used (Glass = 4 to 10 ).
- 2) The Jar Radius (center axis to edge of jar).
- 3) Jar Height that is actually used (the height of the salt water in the jar).
- 4) The Jar Thickness (the thickness of the glass used).

This will give you the capacitance of a single Jar or Bottle that makes up your capacitor.

### Capacitance of a Sphere in Space

Radius of Sphere in Feet	Capacitance of Sphere in Picofarads
<input type="text"/>	<input type="text"/>

Enter the desired Capacitance of your Terminal Sphere OR the actual Size of the Terminal Sphere.

**Note:** Radius means from the center point of a circle to the edge. A 3 foot diameter sphere would have a radius of 1.5 feet.

### Capacitance of a Toroid

Outside Diameter of Toroid in Inches	Diameter of Cross Section (Cord) in Inches	Capacitance in Picofarads
<input type="text"/>	<input type="text"/>	<input type="text"/>

Enter the Outside diameter of the Toroid and the cord (cross section) to obtain the capacitance in picofarads.

**Note:** This equation is accurate for toroids up to 6 feet in diameter.

This equation courtesy of Bert Pool.