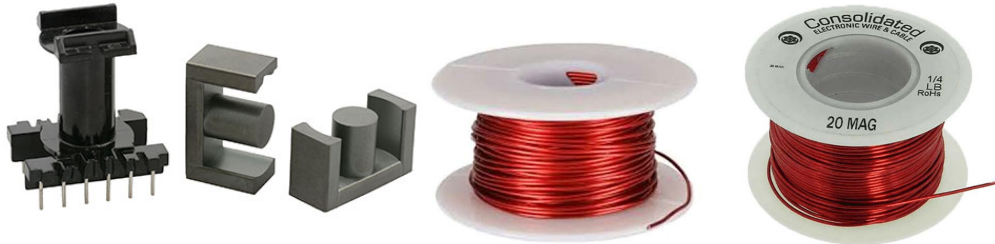


## TRANSFORMER KIT | JAMECO PART NO. 2160681



**Experience Level: Advanced | Time Required: 1 Hour**

*The Club Jameco transformer project listed below is a basic and simple educational kit demonstrating how to build your own transformer. The project below was designed as a starting point to give you a basic core experience that you could work and experiment with. Please note that the design will vary dependent on an individual design requirements.*

### Required Tools & Parts:

Soldering Iron	Solder	Calculator
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### Kit Includes:

26 AWG Magnet wire	Transformer bobbin
20 AWG Magnet wire	Ferrite E core (pair)

### Step 1 - First Calculations

You should read all instruction steps prior to beginning this project. Deciding what the beginning and end voltages are is just as important as building the transformer itself. You need to find out what voltage you are starting with and decide what ratio is needed to get the end result.

Transformers are easily wound using the ratio  $V_p/V_s = N_p/N_s$ , or simply put, the difference in voltage between the primary and secondary coils is in proportion to the difference in the number of turns between them.

If we assume that we are starting with 120 volts and we wind 120 turns on the primary coil than each turn added or subtracted to the secondary coil will also add or subtract one volt. These following instructions will allow us to construct a transformer that will double the input voltage.

For learning tasks it is best to keep the current low (in the milliampere range if at all possible). An AC/AC wall adapter that outputs 350 mAh would be ideal as a power-source.

### Step 2 - Wind the Secondary Coil

Solder one end of the wire to a connector pin. Wind the wire around the core with the number of turns you previously decided on and finish by soldering the other end to another pin. If you are following the steps outlined here, wind eight hundred turns (that's 800 turns) around the bobbin. Keep the windings neat.

Use the thinner wire (26 AWG) for the secondary in a step-up transformer like this.

### Step 3 - Winding the Primary Coil

The same idea as the previous step is used here. Solder one end of the wire to a connector pin (it must be a fresh pin that has not been used). Wind the number of turns around the core that you previously decided on and finish by soldering the other end to another unused pin. In order to double the voltage however, the number of turns in this coil must be exactly HALF the number of turns of the secondary. Since there were eight hundred turns in the secondary, there must be four hundred here.

Use the thicker wire (20 AWG) for the primary in a step-up transformer.

It may be a good idea from a safety aspect to wrap electrical tape over the wires to keep them from being touched. It should be noted that this is your last chance to do this, for energy is sometimes stored in the secondary coil after first use making it unsafe to tamper with after usage.

#### **Step 4 - Inserting the Core**

The core of the transformer is the E shaped piece of metal and roughly snaps onto each end with the center of the E going through the core of the transformer bobbin. A center tap can be added for more advanced transformers by soldering a wire onto the iron core itself. This however will not be used for the standard project.

#### **Step 5 - Finishing Touches**

You will notice that of all the pins only four have been used. This is to aid people with "non-standard" projects using this transformer kit. If following standard instructions the transformer is complete. If you add an AC voltage to the primary wire, it will double it across the secondary.

Congratulations! You're done!