

Transformers Lab Synopsis
Lab Write-up by Ken XXXX
ITEC 261
December 5, 1999

In this experiment a close look was taken at a step down transformer. Although on a much smaller scale the characteristics are the same as those used by electric companies to step up and down the electricity that is carried to individual homes. As with these larger transformers and the one in the experiment the basic operation of this device is to change the voltage and amperage of an electrical source. By changing the number of turns in a coil the voltage or amperage can be changed to any needed amount. A step down transformer has more turns in the primary coil and fewer turns in the secondary coil. Since these two coils are isolated from one another the transference of current and voltage is through magnetic induction. The current in the primary coil produces a magnetic field of flux, which induces a current into the secondary coil. This current in the secondary coil is dependent on the number of turns in the coil. If the number of turns are less than that of the primary than it is a step down transformer. If the number of turns were greater than that of the primary than it would be a step up transformer. Also a lead can be taken off of the secondary side of the transformer at any point of the coil creating a voltage which would only be a portion of the total of the secondary side of the transformer. For instance if the lead were halfway on the coil than the voltage would be half of the total secondary side. No transformer however is 100% efficient. This is due to several factors including the Copper loss, the Eddy current loss, Hysteresis loss, and the load placed on the secondary side of the transformer. The Copper loss is the power dissipated by the windings of the transformer. The Eddy current loss is caused by the changing magnetic flux of the transformer inducing a voltage into the core itself. Hysteresis is caused by the residual magnetism from the current being reversed every half cycle. Last if the load placed on the secondary side is not using all of the voltage supplied by the transformer than the transformer will not operate at a very high efficiency. Since the transformer changes both the voltage and the current there exist an inverse relationship between these. If the transformer steps up the voltage than the amperage is stepped down.