



# CALIFORNIA STATE SCIENCE FAIR

## 2007 PROJECT SUMMARY

Name(s) <b>Keal D. Jones</b>	Project Number <b>S0810</b>
<b>Project Title</b> <b>Transforming the Way Transformers Work: Electrical Conservation Utilizing an End Device Detection Circuit</b>	
<b>Objectives/Goals</b> The purpose of this study was to determine if I could develop a circuit that could detect if an end device was plugged into a transformer or not, thereby turning off when no end device was present. With my new circuit, if no devices,(such as a cell phone, camera battery,)are plugged in or attached to the transformer, the input circuit would be opened not allowing electricity to flow to the transformer, thereby saving energy. If an end device was detected it would allow electricity to flow to the transformer and the end device.	<b>Abstract</b>  
<b>Methods/Materials</b> I created an ASP web page that would collect data from an e-mail research experiment. The purpose of this was to determine the average number of transformers and their Wattage/Amps per household. Analysis was performed using the Microsoft Access and Excel programs. I then conducted many lab experiments with several different ideas, tools and concepts including a contact switch, battery and relay.	
<b>Results</b> The relay experiment appeared to work best. When the end device was plugged in, it switched the relay on and therefore the main power energized the transformer and held the relay closed. When the end device was unplugged it opened the circuit and switched off the main power to the transformer. Using a switched-mode power supply an internal control circuit switches power rapidly on and off in order to stabilize the output voltage or current more efficiently.	
<b>Conclusions/Discussion</b> I was not able to fully develop a reliable and useable circuit that could detect if an end device was plugged into a transformer or not, thereby turning off when no end device was present. My experiments did however lead me to discover an alternative technology called switched-mode which is 95% - 99% efficient. My hypothesis was on the right track. The concept is correct that if devices are plugged in or attached to the transformer, an input circuit could be opened so as to not allow electricity to flow to the transformer, thereby saving energy, however in terms of being able to actually create a workable model, I would need more development. Failure is one of the roads to the future. Try, try again.	
<b>Summary Statement</b> This project is about transforming the way transformers work and electrical conservation utilizing an end device detection circuit.	
<b>Help Received</b> Father instructed use of electronic measurement equipment	