

# Reutilization of Power....*from television*

*Author: A.S.Javeed*

## **ABSTRACT:**

The power demand of the world including india is increasing with the increase in electricity requirements and it is the basic necessity for economic development of a country. Many functions necessary to present day living grind to halt when the supply of energy stops. The world is depending heavily on fossil fuels and nuclear power to generate electricity.

The fossil fuel based energy production pollutes the climate leading to global warming. Thus the recent severe energy crisis has forced the world to develop new and alternative methods of power generation which is of high efficiency and low pollution.

One type of alternative method is developed by Stanley Stphen Engineering college student .And it is

nascent technology that uses television to regenerate voltage in kilovolts.

Normally this much amount of power will be generated by powerstations . you people wont beleive that 15 kv to 24 kv will be generated by LOT whenever we switch on the television.

The LOT is special transformer .There will be slight difference between normal transformers and LOT in the view of operation. A LOT for television receiver has a plurality of windings which surround a ferromagnetic core and are wound around an insulating support.

A LOT in its simplest form has current flowing either in its primary, or in its secondary but not both at the same time.

This alternate method made a remarkable change in reutilization of power.

## **INTRODUCTION:**

Energy is the basic necessity for the economic development of country. Many functions necessary to present day living grind to halt when the supply of energy stops. It is practically impossible to estimate the actual magnitude of the part that energy has played in the building up of present-day civilisation.

Energy exists in different forms in nature but most important form is electrical energy. The modern society is so much dependent upon the use of electrical energy that it has become a part and parcel of our life. And electrical energy is superior to all other forms of energy because it have high transmission efficiency, cheapness, easy control and convenient form of energy.

Electrical energy is produced from energy available in various forms in nature. They are the sun , the wind, water, fuels and nuclear energy. But the sources which is useful for reutilization of power will be less .Our concept is standing example for that type source i,e television.

## **REUTILIZATION OF POWER FROM T.V:**

The ever increasing use of electricity for domestic, commercial and industrial purposes to provide bulk electric power economically. For this we have various power plants or electric power generation stations.

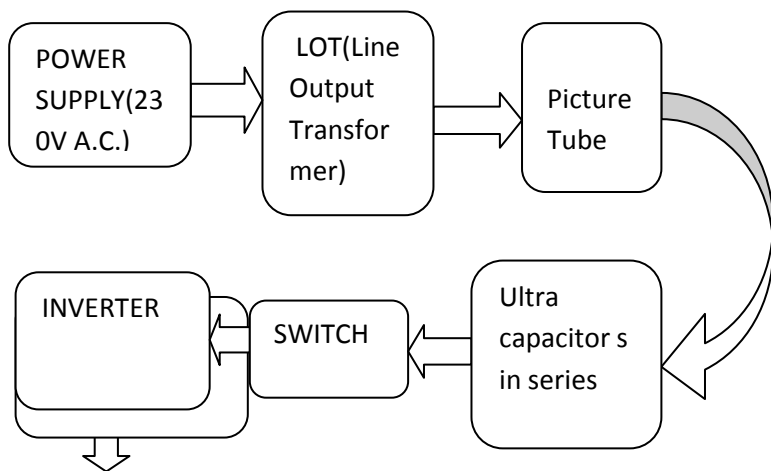
But these plants also required resources for producing huge amount of electricity. Now a days the situation is like that resources for electricity is in less in number and also some of the resources like fossil fuel and nuclear power pollute the climate.

So by using t.v. we can reutilize the voltage of 15kv which is produced by LOT internally for the purpose of brightness of picture.

### BLOCK DIAGRAM:

The power supply of 230v a.c. is given to the line output transformer. LOT is a stepup transformer which stepup the 230v a.c. to 15kv-24kv d.c. depending upon picture tube size.

This voltage is useful for the brightness of picture, ones we switch off the t.v. it will take one day to discharge total voltage of 15kv.



**Fig.reutilization of power from t.v.**

In our concept, without wasting this discharged voltage, we store it by using series of ultracapacitors and reutilize it by using inverter.

### ROLE OF LOT:

A flyback transformer is the main component of a flyback converter that generates high voltage usually in cathode ray tube devices such as television sets and oscilloscopes

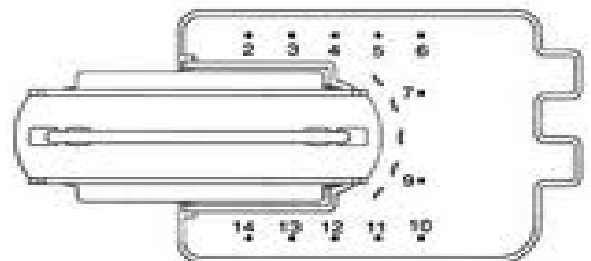
The typical flyback or Line OutPut Transformer (LOPT) consists of two parts (you may also encounter the term IHVT - Integrated High Voltage Transformer):

A special transformer which in conjunction with the horizontal output transistor/deflection circuits boosts the B+ (120 V typical for a TV) of the low voltage power supply to the 20 to 30 kV for the CRT as well as provides various secondary lower voltages for other circuits.

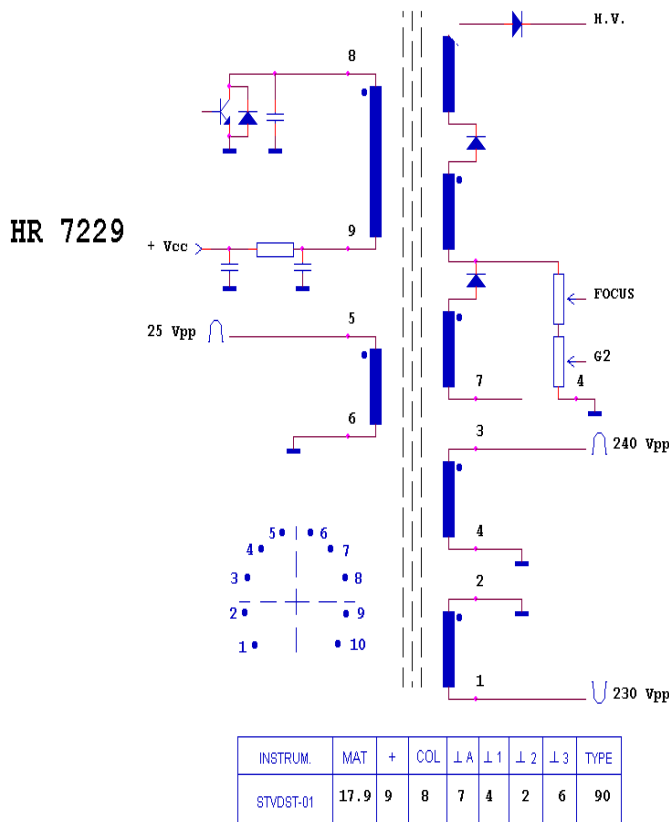
A HV rectifier turns the high voltage pulses into DC and the CRT capacitance smooths it. The HV may be developed from a single winding with many many turns of wire or a lower voltage winding and a diode-capacitor voltage multiplier.

The various secondary voltages power the logic, tuner, video signal, vertical deflection circuits, and CRT filaments. In fact, with many TV designs, the only power not derived from the flyback is for the keep-alive circuitry needed to maintain channel memory and provide startup drive to the horizontal deflection/high voltage system.

A voltage divider that provides the focus and screen supplies. The pots are in this divider network - and these things fail resulting in poor focus, uncontrolled brightness, or fluctuating focus and/or brightness. A total short could also result in failure of other components like the horizontal output transistor. The focus and screen are generally the top and bottom knobs, respectively. In some TVs, the focus and screen divider and/or controls are external to the flyback and susceptible to dust and problems particularly on damp days.



**Fig.Bottom view of LOT**



**Fig. Internal view**

### How is a Flyback Transformer Different than a Regular Transformer?

1. The main difference between a flyback transformer and a regular transformer is that a flyback transformer is designed to store energy in its magnetic circuit, i.e., it functions like a pure inductor, whereas a regular transformer is designed to transfer energy from its primary to secondary and to minimize stored energy.
2. A flyback transformer in its simplest form has current flowing either in its primary, or in its secondary (but not both at the same time). (This is more complicated in practice because of finite turn-off times for transistors and diodes, need for snubber circuits, etc).
3. The reluctance of the magnetic circuit of a flyback transformer is usually much higher than that of a regular transformer. This is because of a carefully calculated air-gap for storing energy (it's an inductor).
4. The voltages applied to a flyback transformer on the primary side are almost always rectangular (pulsed) whereas regular transformers usually have sinusoidal voltages applied to them.

5. The currents flowing through either side of a flyback transformer are either increasing or decreasing linear sawtooths, whereas a regular transformer usually has sinusoidal currents.

6. Finally, due to the properties of core materials, flyback transformers are most conveniently operated in the range from  $10^3$  to  $10^6$  Hz, whereas regular transformers have a much wider range, from a few Hz to  $10^{12}$  Hz.

### ORIGIN OF THE TERM 'FLYBACK' :

The term 'flyback' probably originated because the high voltage pulse that charges the CRT capacitance is generated by the collapse of the magnetic field in the core of the transformer during the short retrace period - when the electron beam in the CRT 'flies back' to the start of a new scan line. The flux in the core changes slowly during scan and is abruptly switched in polarity by the HOT turning off during the flyback or retrace period.

Many off-line switchmode power supplies and DC-DC converters are also of the 'flyback' type with energy transferred to their output circuits mainly during the same time in the cycle - but there is no CRT involved. Indeed, these high frequency ferrite transformers - which generally look like regular transformers often of E-I core construction - may also be referred to as flybacks in transformer company catalogs.

LOPT and LOT derive from the fact that it is the line scan circuit that is involved and the transformer is in the output stage.

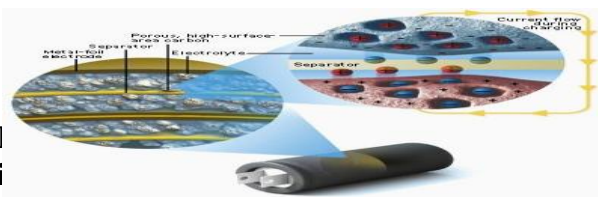


## ULTRACAPACITOR:

The Ultracapacitor is both a battery and a capacitor. Ultracapacitors could allow laptops and cell phones to be charged in a minute. Unlike laptop batteries, which start to lose their ability to hold a charge after a year or two (several hundred charge/discharge cycles), ultracapacitors have hundreds of thousands of charge/discharge cycles and could still be going strong long after the device is obsolete.

## WORKING PRINCIPLE:

Ultra capacitor consists of two highly porous electrodes made up of activated carbon and metal oxides. These electrodes are immersed in the suitable electrolyte for charge transfer and storage mechanism. Typically electrode material has very high surface area of the order of 1000 square meter per gram of material. In the porous electrode, charges are accumulated in the pores resulting in formation of capacitance. Commercially available ultra-capacitors are carbon based with non-aqueous electrolyte.



g  
i  
g  
: Ultracapacitor working

## WHY IS AN ULTRA CAPACITOR:

- 10-100 times the power of battery
- 1000 times the cycle life of batteries
- Faster charging time
- 1,000,00+ times the energy of regular capacitors

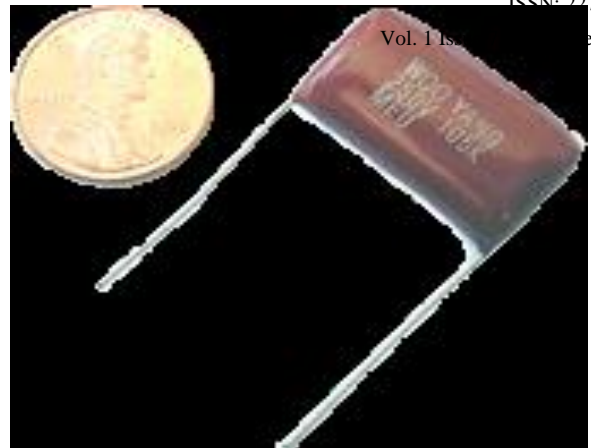


Fig :Regular capacitor of 1µF



Fig :Ultracapacitor of 1F

## CONCLUSION:

The beauty of this alternate method found in the possibility of mankind's utilization of wastage power from television.

**REFERENCES:**

- [http://www.ehow.com/facts\\_5899917\\_flyback-television.html#ixzz26MZJggsy](http://www.ehow.com/facts_5899917_flyback-television.html#ixzz26MZJggsy)
- [www.solrayo.com](http://www.solrayo.com)
- [www.kilofarad.org](http://www.kilofarad.org)
- Dixon, lloyd h, *magnetics design handbook, section 5, inductor and flyback transformer design*, texas instruments, 2001.
- Dixon, lloyd h, *magnetics design handbook, section 1, introduction and basic magnetics*, texas instruments, 2001.
- Glenn zorpette "super charged: a tiny south korean company is out to make capacitors powerful enough to propel the next generation of hybrid-electric cars", "ieee spectrum", january, 2005 vol 42, no. 1, north american edition.