2 FREQ-MAGCLASH TPU

Ver. 1.2 - 04-18-2007
by ronotte

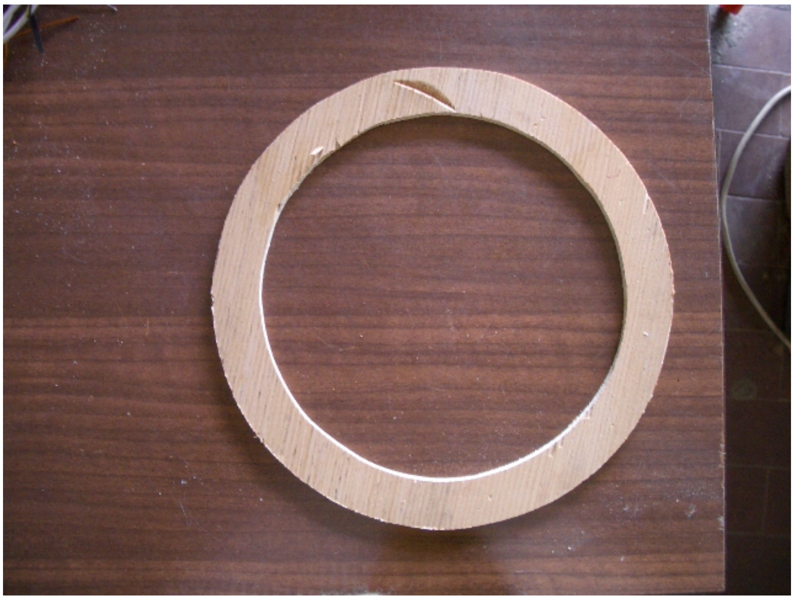
1 INTRODUCTION

This 'One Ring' TPU is composed by:

1. An internal annular support.
2. An Inner Collector coil.
3. Four Control coils.
4. An outer Collector coil.

1.1 Internal annular support

The internal annular support media has the purpose to provide a dimensionally stable platform on and around which all the coils will be placed. In this case, just to be quick, I choose to make use of a **5 mm**. compensated wood but of course you may want to use plastics or perhaps better: expanded polyurethane sheet (normally used to make walls thermal isolation), this because it is 'soft' and would help to absorb the inner collector jerks. It follows a picture of this wood support.



Coil's support

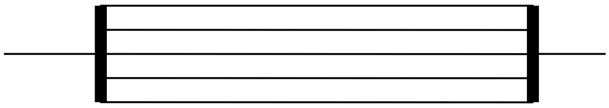
To cut it from a sheet I used a Jig-saw and a template printed and glued over.

Dimensions:

- Inner diameter 18,0 cm
- Outer diameter 23,0 cm
- Width 2,5 cm
- Thickness 5 mm.

1.2 Inner Collector Coil

The Inner collector coil in this version is made by 3 turns of 5 Litz wire in parallel, each Litz wire is composed by 40 copper leads 0,05 mm/each. As in following figure. So in total I have 40 x 5 = 200 leads.



These Litz wire must be put over the support and placed near the centre. I just glued them onto the wood in order to keep them steady.

In alternative I think that you could use standard 1 mm standard stranded wire…..eventually you could put 2 4 wire in parallel….or what you want to try.

Note: About the turns number I used 3, but probably <u>1 could be enough</u>.

1.3 Control Coils

The Control coils are of **bifilar kind**. There are 4 coils at 90 degrees each other as usual to setup a rot mag field as per pat 390721. These coils, in consideration of the support, will be of **flat**-type as the width is bigger of the thickness. It follows a picture of these wired CC that shows well what I mean.

Bifilar CC

Here you can see that there is a gap of about 1,5 cm. between a coil and the next one (the wood width inequality is due to my fault in preparing the support).

Each coil is made by standard 1mm stranded electrical wire with standard CE isolation. There are **21 bifilar turns for each coil**.

It is possible to see also the two output leads of paralleled Litz wire (that with Faston red pins).

I do suggest to pre-cut 8 x lengths of just a bit more than 1 mt each before start the windings in order to get equal turns for all the coils. Different colours also help (after) to identify the leads.

1.4 Output collector

The output collector coil is of bifilar kind. I used the same wire of CC. The hint is to cover all the available surface.

Output Collector

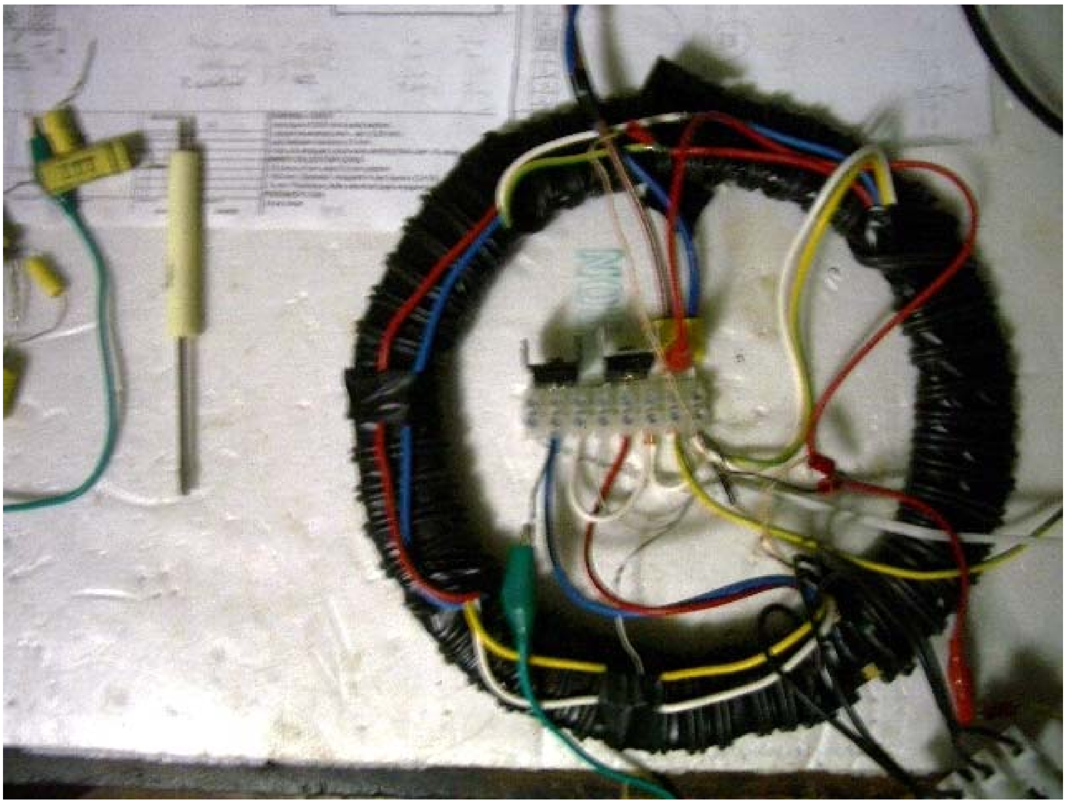
In the picture the collector does appear spaced but I did it again covering all the surface.

1.5 Overall consideration on building

As you see this TPU is very simple & easy to build. It weights also less than 100gm.

I do suggest strongly to provide a wood base (the same you already cutted…for example) to put inside the TPU itself and were to fix all the electronics or at least the 2 power MOSFET needed.

Here is what I mean. It’s a dirty example but at that time I were anxious to make it quick.



Completely wired TPU

2 CONNECTIONS SCHEMATIC

This design is divided into 4 sections:

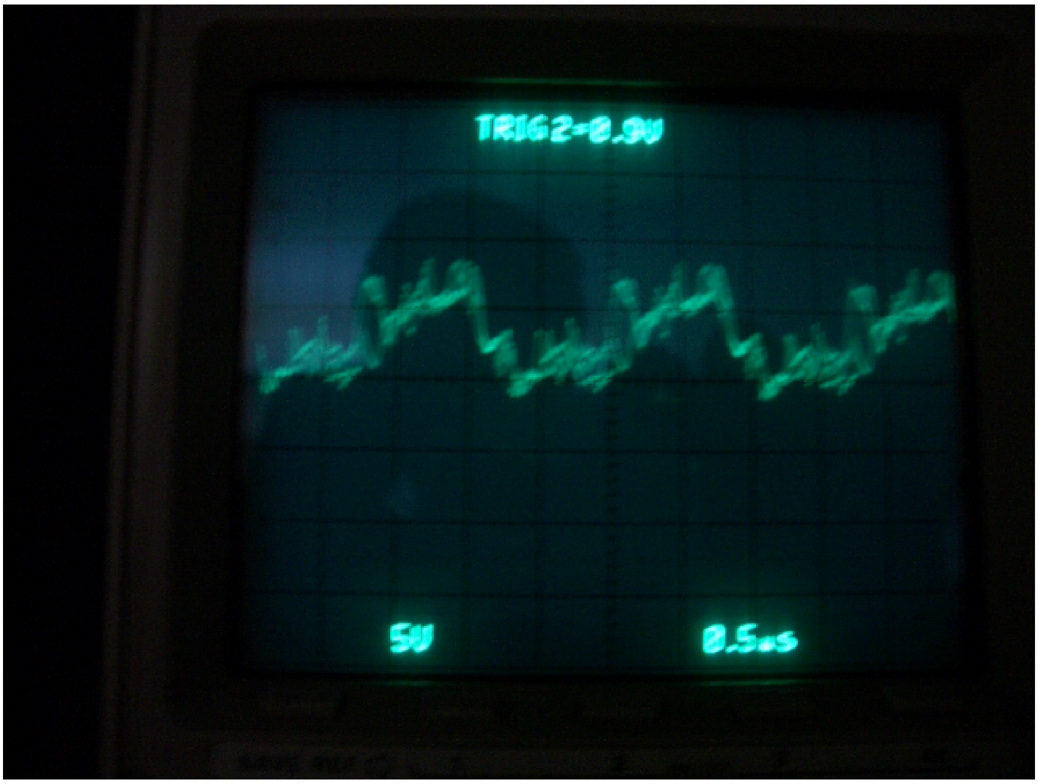
1. An Input section.
2. A driver section,
3. A Coil section.
4. An output section.

Particular attention must be observed to setup a **common return ground. This is mandatory.** I've used a big terminal block to converge all the +VDC and all the ground leads (this terminal block is placed inside or on the TPU itself).
Again is **MANDATORY** to put between these two points a **10 microF/100V polyester capacitor**. If you don't do this you will see that all your equipment, starting from the power supply, **will be affected by returning radiation/currents** (I experienced the Power supply driven by the TPU!!!!!). I took lot of time to get rid of this effect!!

INPUT SECTION
The purpose of the input section (lower left in the drawing) is to provide an interface to a square-wave signal generator and a suitable way to provide synched square-waves (first and second harmonic). This task is simply done with a CMOS flip-flop.

The problem here is that I found my Wavetek 145 not able to fully drive the IRF7307 and the FF itself at top speed (till 2 MHz) so I've been forced to drive the IRF7307 with an high speed switching transistor (2N914). Of course you may use what you have, probably a 2N2222 or similar is also good for the purpose (the collector resistance value missing is 220 ohm). I will supply additional info if you need.

MOSFET DRIVER SECTION
After many tests I choose to use the standard suggested (by constructor) interface IRF7307. This effectively provide a good solution to fully drive the power MOSFET by correct charging its input capacitance. Anyway I've seen that the waveform on POWER-MOSFET gate when in operation at full speed is far from being perfect!!! The transient spikes are so high that inevitably they reflect in every thinkable mode on the gate (that is the main reason to use the IRF7307 as this last does provide a very low impedance path and so minimizing other influences).
I see ground of ulterior improvement here. So you may tryout other solutions providing to have a scope with at leas 100 MHz bandwidth.

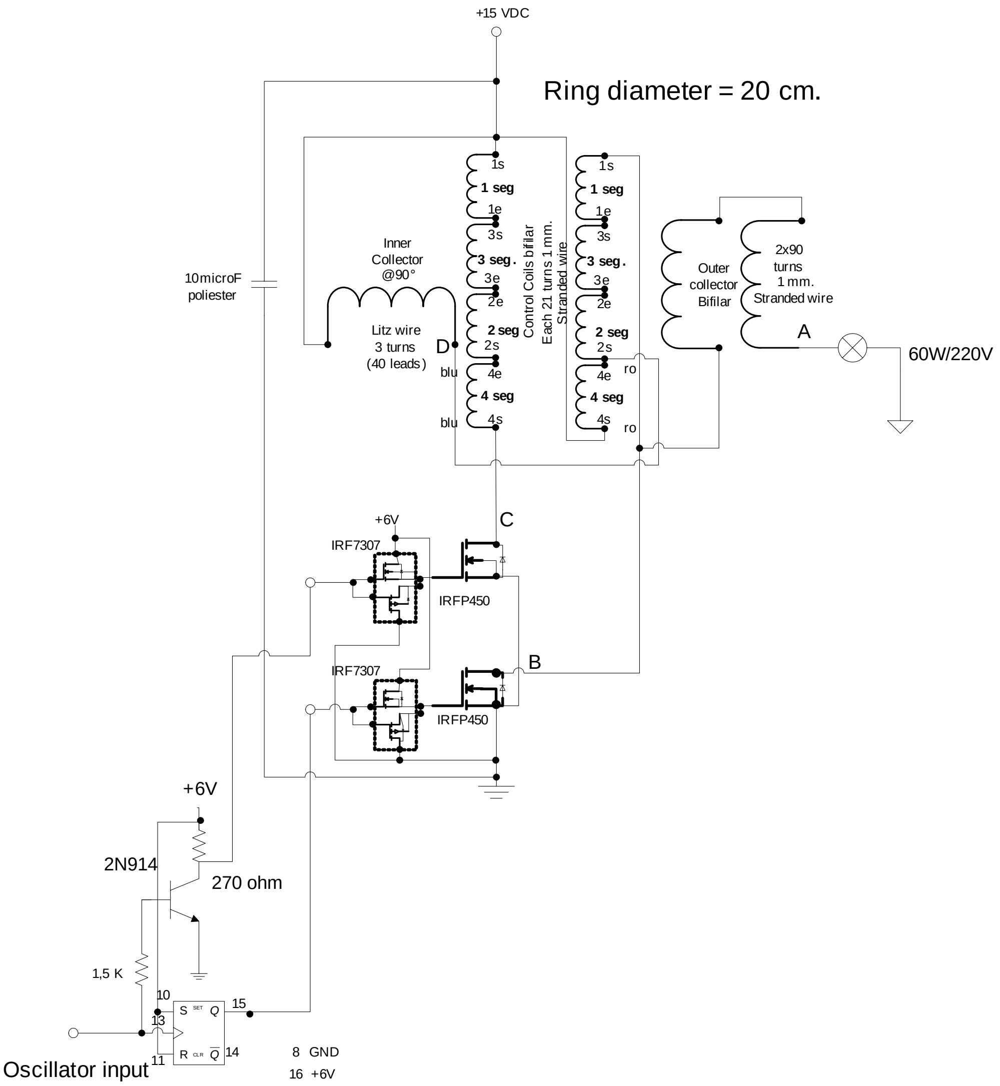


POWER MOSFET gate under full load

As you see the waveform does appear full of superimposed noise coming from the high-speed high-current switching action. In my opinion part of it is coming from ground (and so could be optimized), partly from Miller effect (very difficult to compensate), partly from electrostatic couplings from the near circuits.

In spite of all this the MOSFETs, as you have seen does appear to switch normally!!!!!
Really at the moment is difficult to say if there's space for improvements.

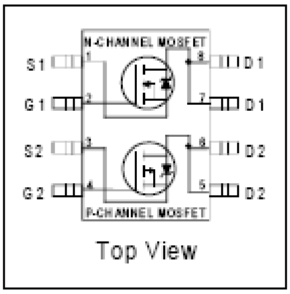
What it follows is the complete schematics.



TITOLO	REVISIONI 1.0	
TPU V4 Magnetic clash test	N. / DATA / DESCRIZIONE	**Output section:** Bifilar, series connected Collector Coil, about 90 turns 1 mm. diam. Wire, all over the ring. **Inner Collector:** Bifilar, @90 deg. Respect to CC. 3 turns Litz wire **Control Coils**: Bifilar contro-phase connected, each 21 turns, each side is connected as per 37021 pat.
DATA ORIGINALE / SCALA		
ULTIMA REVISIONE: April 2 2007 / N.LAVORO	VERIFICATO: ronotte / DISEGNATO: ronotte	

The CMOS flip-flop and the IRF7307 must be connected to a +7VDC (not 6V as in fig) to obtain max driving of final MOSFETs.

Here are some excerpts from the book.



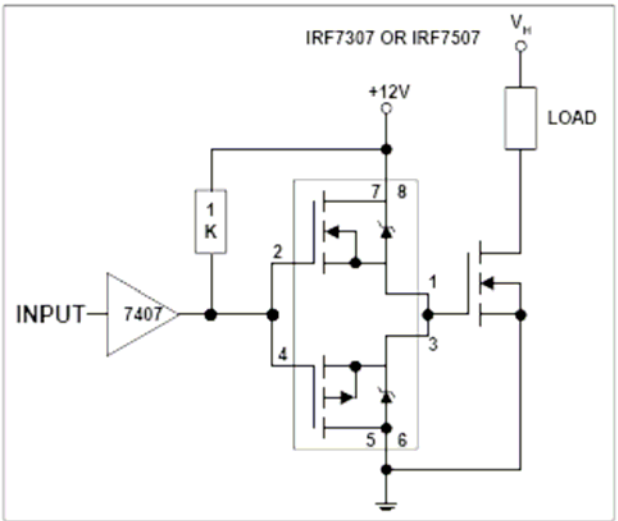


Figure 9. Simple Interface to Drive HEXFETs from TTL

I suggest also to use a shield cable from your oscillator to the driver section in order to lessen the induced voltages coming from current spikes.

I point out as well that due to the adopted configuration it does not need an accurate & very stable oscillator…a standard LM555 or better LM556 is good for the job providing to use a multi-turn potentiometer to vary the freq.

About the power MOSFET used I bought 25 of IRFP460 (for about 1 € each) so I can ship at pure cost some unit if needed, same apply for IRF7307.

The IRFP460 is a very powerful unit I did with them lot of work…..never had any problem!!!
If you must buy them I suggest to try IRF840 as they are a bit quicker (they have less input capacitance) It should be interesting to try as here speed is the key (BEMF amplitude is in a sense proportional to the speed of this switch).

OUTPUT SECTION
The output section is composed by the OC bifilar coil. The coils are connected in non-inductive mode to the higher freq MOSFET switch.

Note:
For the moment the only way this TPU does deliver power is to connect a light-bulb or a standard 50-80 ohm resistance.

In a next section I'll provide documentation about tests done.

3 TESTS WITH 2 CONTRO-ROTATING MAG FIELS

3.1 Load connected to Outer Collector – Inner Collector in feedback

I've been much interested about Iacob reconnection theory so I've conducted a whole series of testing to check/prove it. Briefly here are the results (with Inner Collector in feedback as in previousschematic).

After many tests I discovered that there were many interesting couples of frequencies able to make similar results. Considering that the objective is also to lower the power supply requirements (to obtain the same output results) I've chosen F1=0,700 MHz and F2=1,400 MHz. These are very high frequencies of course necessary as I've used few turns of 1mm wire (in Control Coils). Here the interesting thing is that best output is obtained using first and second harmonic....not any other different freq....of course results are good with 3rd harmonic as well......after that all begin practically difficult as frequencies are too high and driving circuits should be completely changed.

With power supply delivering +15V @ 0,7-0,9A (checked also with a current clamp meter) I do obtain output pulses in the first quadrant of about 150 - 400V (under load) depending of various side conditions. The output waveform (checked on the bulb), when correct, is suddenly clean & repetitive, the main pulse (@1,4MHz) is about 0,8-1,0 microsecond wide and are always followed by the well known 5 MHz dumped sinusoidal oscillation (100V) -still in the first quadrant). The waveform seen on both MOSFET drain are just nice clean DC pulses of 300-600DCV (depending on side conditions).

The light bulb is shining quite bright but not full brightness. I mean that the filament is almost white and hot. It's very difficult to measure the effective output power as all is impulsive and is just the filament that provide the necessary integration!!! The current on the bulb (measured with the DC current clamp meter is about 0,2 A !!???). Just for fun I tried to connect the very same bulb to the Power Supply: it doesn't light at all.

Disconnecting the bulb doesn't change more than a percent the amplitude of output waveform...I should try to connect several bulbs.....I did it but the light dim…so there's a necessity of more output current…this translates in more coils in parallel.

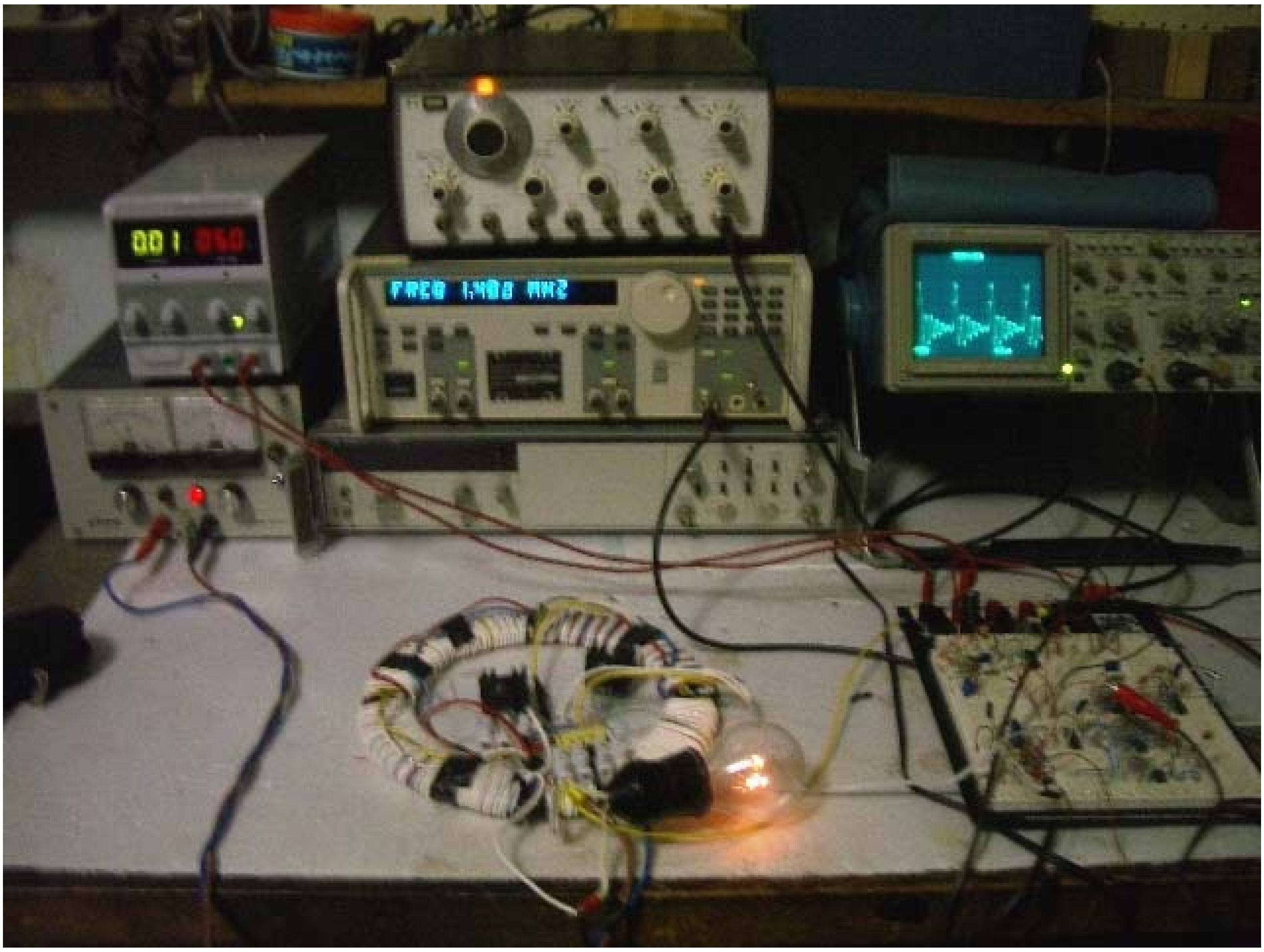
I've tried also to <u>resonate</u> the output collector. The condition is met with a 3Kpf/1000V condenser. In this case I do obtain a **perfect & stable sinusoidal waveform at 1,4 MHz** - with more than 100V amplitude but this time around the zero level.

I've also tried to bridge rectify that waveform to obtain a usable DC level/power but I did not succeed as in the moment I put a polyester 10microF/100V levelling capacitance, it tamper the MOSFET and collapse the oscillations. The funny thing here's that the resonance capacitor (3Kpf/1000V) **gets hot** and for safety I've had to interrupt the test after few seconds!!!....too much internal dissipation!???

ATTENTION: later I discovered that the diode I used (just these I had in the junk-box) were not correct for the freq used…I've to try with BYV26 (1000V @ 1A < 30 nsec recover time).

DEFINITELY THIS IS THE BEST RESULT I'VE HAD WITH ANY KIND OF 3 LAYERED TPUs.

In figure there's the test bench I make use of.

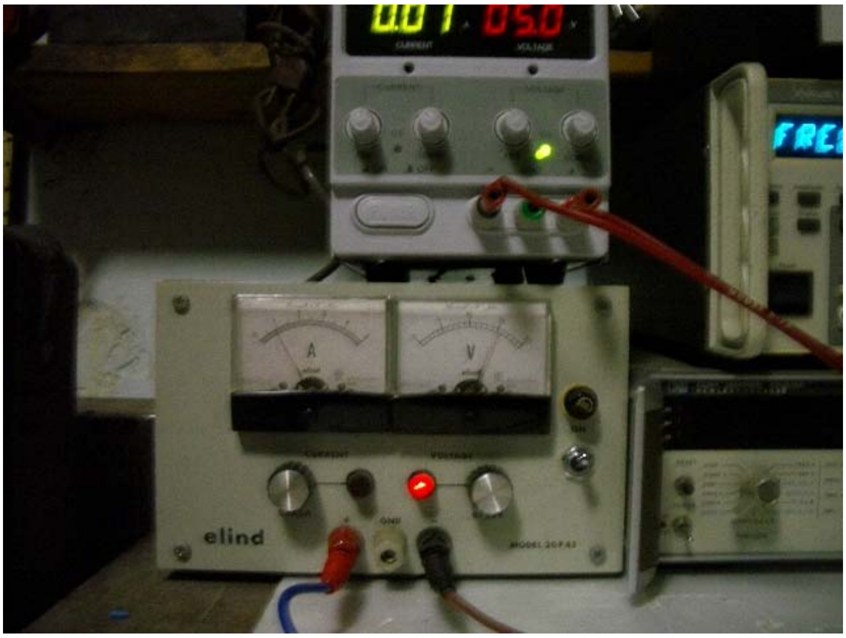


Test Bench

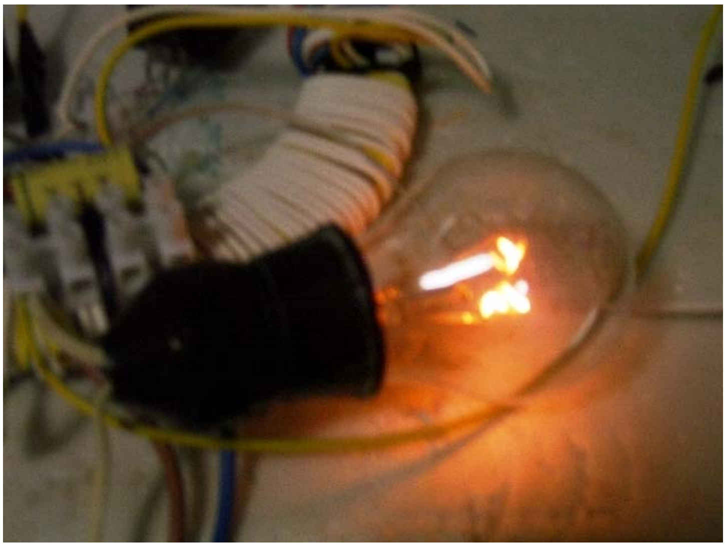
What is shown is the up-mentioned setup in operation at a selected sweet point i.e. the lower oscillator is set 1.4 MHz and the upper at 0,7 MHz (square wave).

The upper PS is for driving electronics supply and is set to +6VDC @ 0.01A. It does supply only the IRF7307, CD4027 (flip-flop), transistor 2N915.

The lower PS is supplying the Power Mosfet only and in that operational point (1.4 and 0.7 MHz) is delivering +15VDC @ 0,7-0,8A.



The Output Collector Coil is directly connected to light-bulb lamp (60W/220V). The lamp does appear with filament bright white …but not with full brightness.



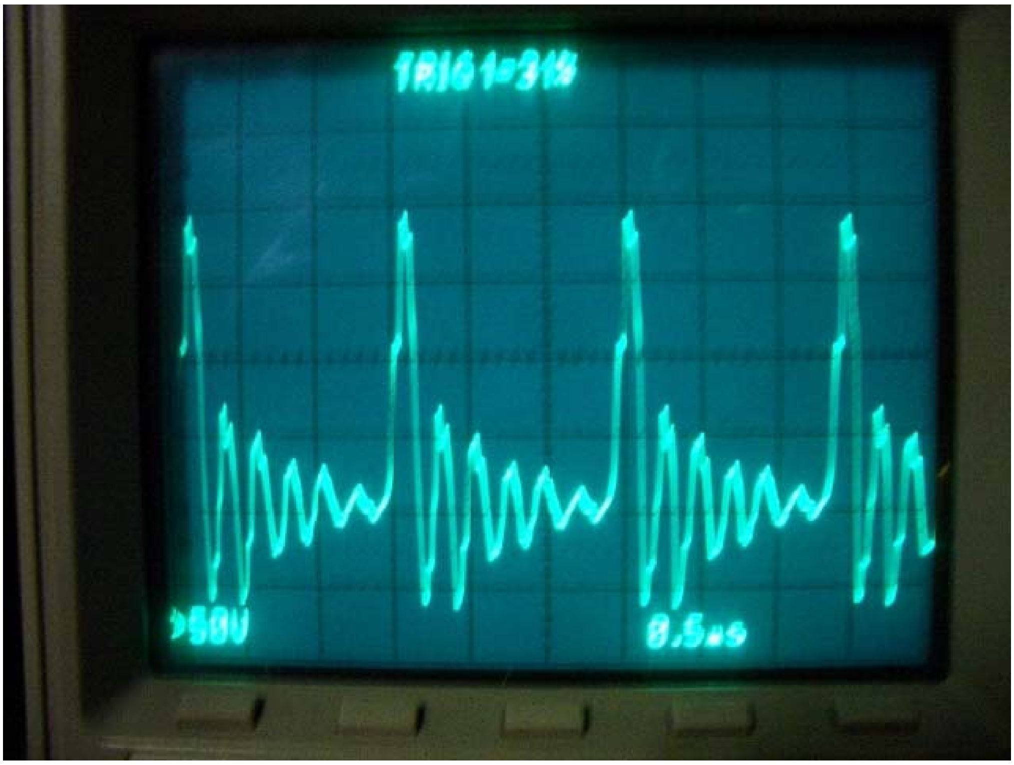
Please note the 10 microF yellow polyester capacitor put on big brown and blue leads just on top of ring. The driver electronics is put on the breadboard on the right.

The scope probe is hooked to bulb.

Please do note that in this photo I were not using the flip flop…that's the reason why there are 2 external oscillators.

Comments

Reviewing the waveforms obtained on load it struck me the evidence of this one which seems to be perfectly aligned with the already proposed & well accepted theory about SM TPU.



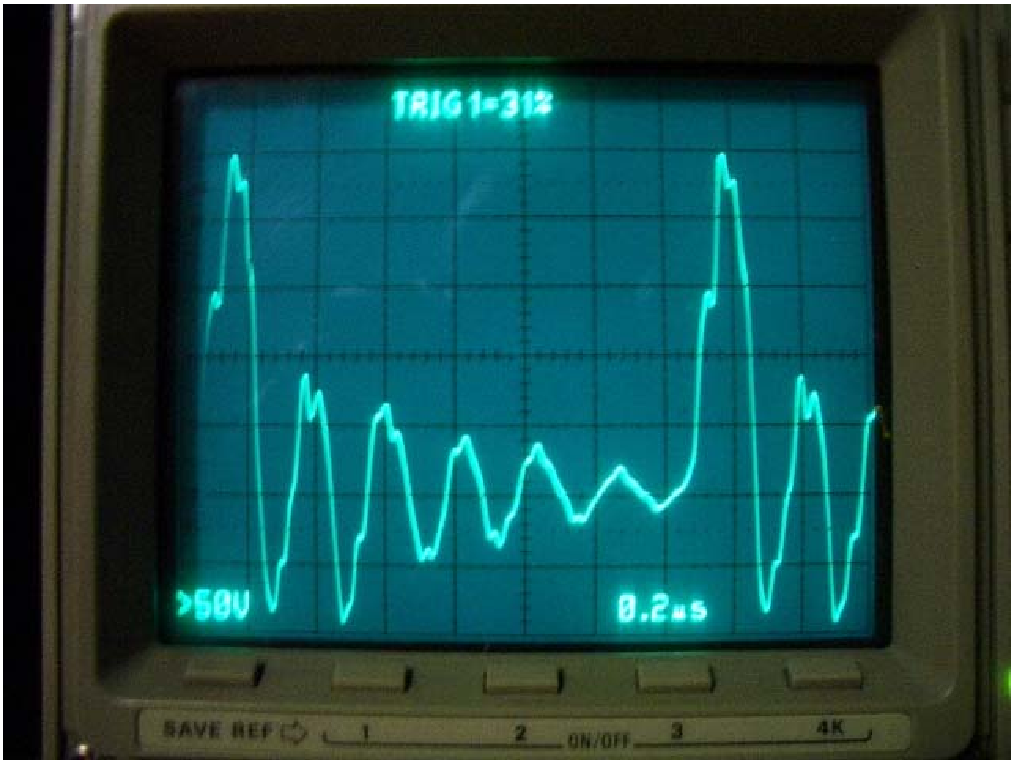
It seems been created by art (the zero level is just the 2 cm over screen bottom, the scope is set on DC input); the big pulse freq is about 1,4 MHz amplitude 250VDC; the dumped oscillations are about +120VDC @ about 5 MHz.

What is nice is that the ‘waveform itself’ is absolutely **clean & stable & repetitive**, this condition is met only with the up-mentioned freq.....if you don't set them correctly (there’s a good window of only few hertz....so you need a synthesized generator...) you don’ get anything but trash.
Of course you have to optimize the two freq according to the inductance you have. In my case as I wonted to see quick a results I choose to use low inductance (less than 10 microH per control coils).

You can optimize the 2 frequencies (first and second harmonic) almost where you want providing a suitable set of coils. (please note that after initial discovering, I used only one oscillator and a flip-flop divider to get auto-synched waves).

I don't see relations with the ring diameter (18 cm inner - 21 cm outer border) as the wavelength associated to 1400 KHZ is far distant.

Here it follows a more detailed picture in a more favourable conditions that led to: almost +350VDC peak and 180 VDC for the 5 MHz component.



Has easy noted, the waveform is STABLE & REPETITIVE.

In fact here we have:
1 – A very big kick (+350V)

Excerpt-1:

As the moving magnetic field intersects a wire at 90 degrees the familiar kick will emerge.

Excerpt-2:

If you place copper in a rotating magnetic field one of two outcomes will happen. The copper will be physically dragged along with the moving magnetic field, or if the angle intersects wire at 90 degrees you will produce an electric flow. You get torsion or EM and the two are not the same.

2 – The kick appears followed by 5-6 sinusoidal 5 MHz wave.

Excerpt-1

If you stretch this pulse out on your scope you will notice a series of sine waves at the NMR frequency. Maybe about 6 sine pulses at approximately 5 Mhz.

Excerpt-2

Copper will act like a magnet at the Proton layer and it will follow a moving magnetic field, precessing around the polar alignment. These NMR pulses were discovered in the 50's by a nobel prize winner, and then abruptly forgotten.

Because the Proton will lag the turn of the magnetic field due to its higher mass we get a dragging effect from that layer that pulls the electron shell into a negative or dragged state. Induction lags in time frame, and the NMR rate is the factor by which it lags.

3 – I'm using a 90 degree pulsing coil.

Excerpt-1

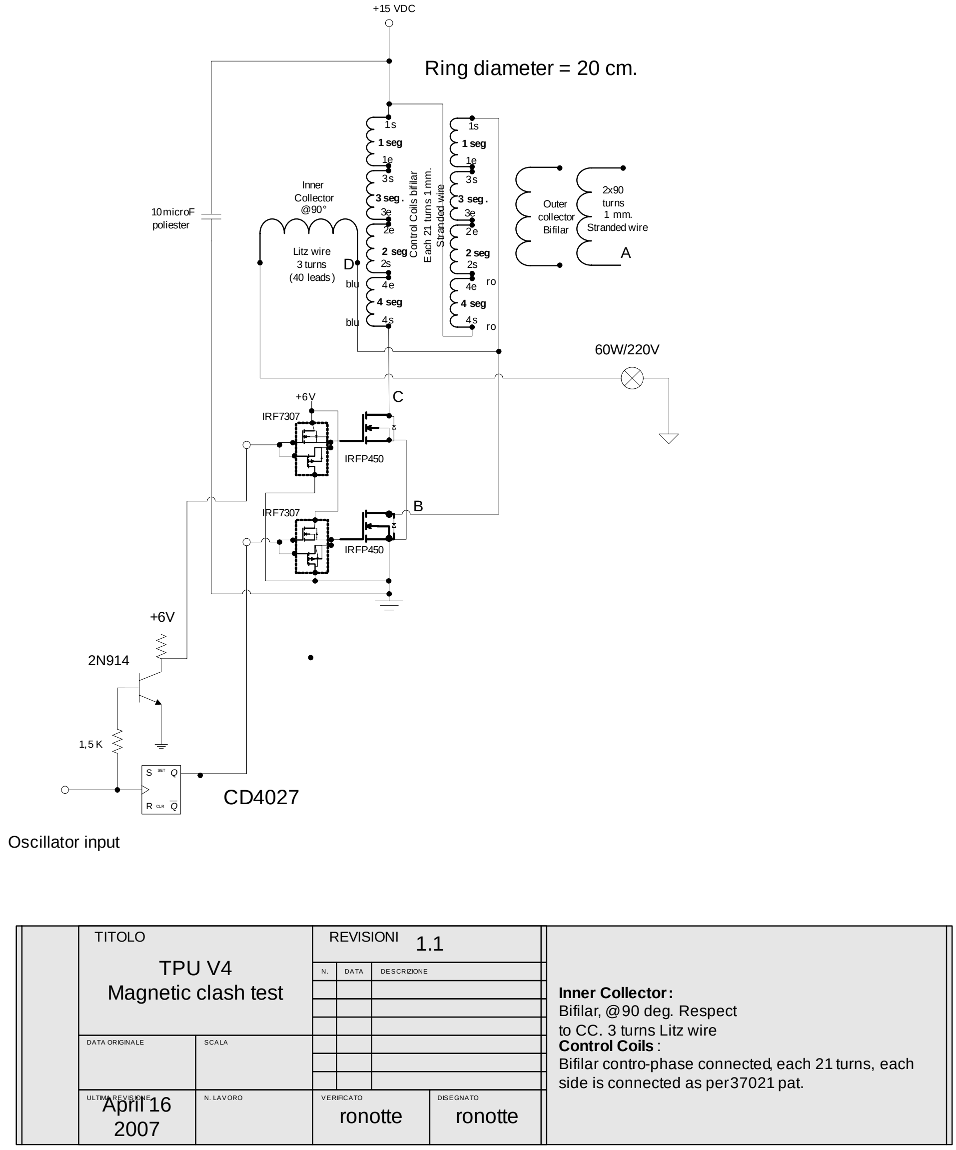
The TPU would seem to be turning the magnetic field in the copper atoms, using 90 degree pulsing coils. To make it turn completely over takes only a synchronized pulsing scheme. The magnetic field will rotate its poles through the collector wire loop. As the poles cross

the wire no current will flow and energy will move into the torsion field, as the magnetic field moves past the 90 degree angle with the collector wire the energy will shoot into the electric field and the series of very high pulses will be shot down the wire as it crosses. The TPU is embedded in cork to stop it from vibrating to pieces. Each time the magnetic field moves between the torsion state and the Electric state it creates a small jerk and makes a physical motion of the wires.
The TPU exhibits an inertial momentum, or gyro effect because its Proton layer is in a spinning motion of its magnetic poles, this creates a "forced precession".

Anyway in the actual setup the effects are of course similar because there is always the copper charging effect on Outer Collector due to Kicks & clashing rot mag fields.

3.2 Load connected to Inner Collector coil

After suggestion coming from Gn0stic I did several efforts to check this new condition named by Rich as: ‘***the other way around’***. At first time I did not succeed as I connected the inner collector with wrong polarity. After some days I tried again this time reversing the inner collector leads and this time I had a **big output** and this leaving the Output collector leads ‘opened’ as in figure.
Sweeping the frequencies range (200 KHz – 2 MHz) the bulb is <u>always at least red.</u>
It follows the updated schematic.

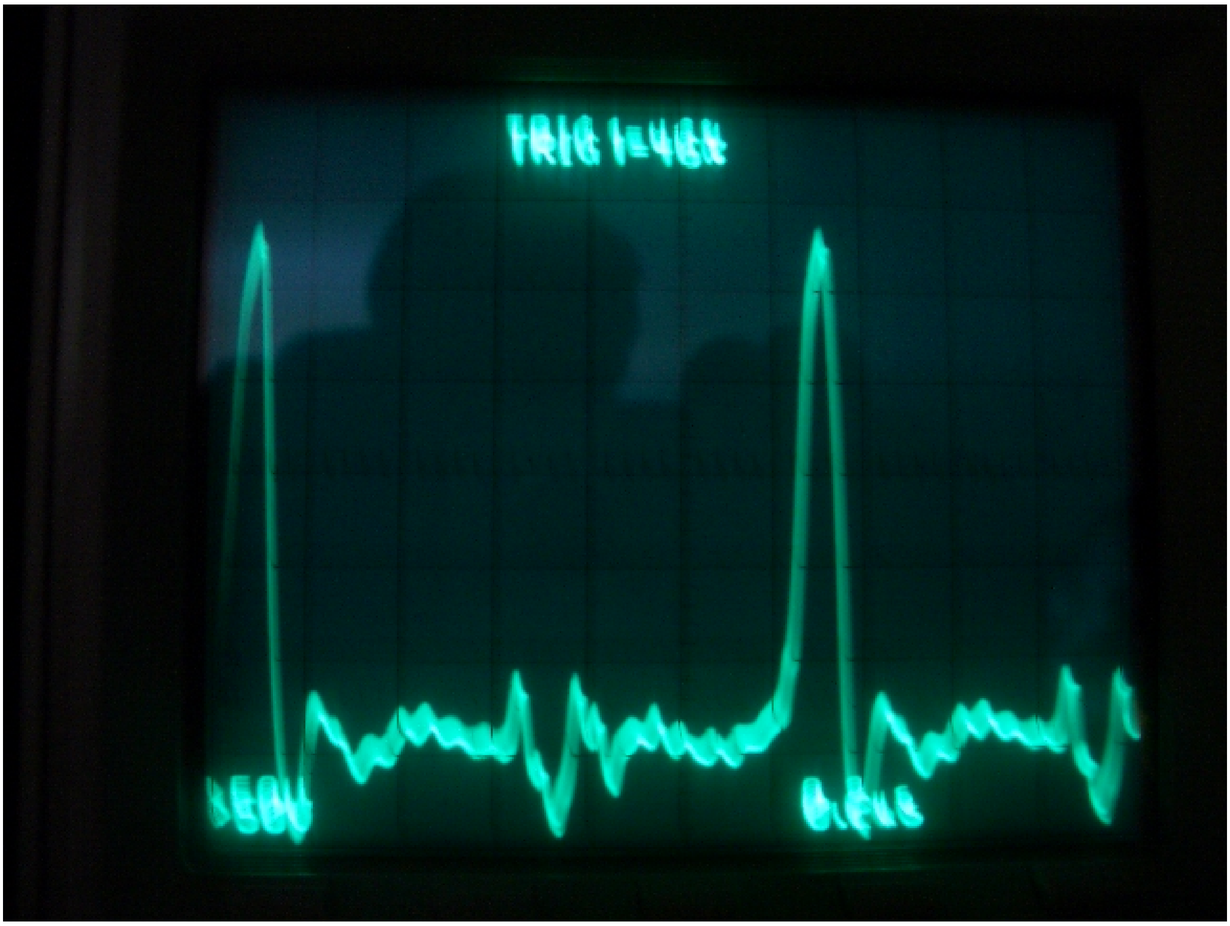


In the following picture the waveform is taken <u>across the light-bulb load</u> connected to Inner Collector.

The zero level is the screen bottom, the main peak amplitude **@50V/div** is almost +300VDC.
It is possible to see that:

1. The peak wave itself does appear ‘different’ from the previous one.
2. Lack of 5 MHz component.

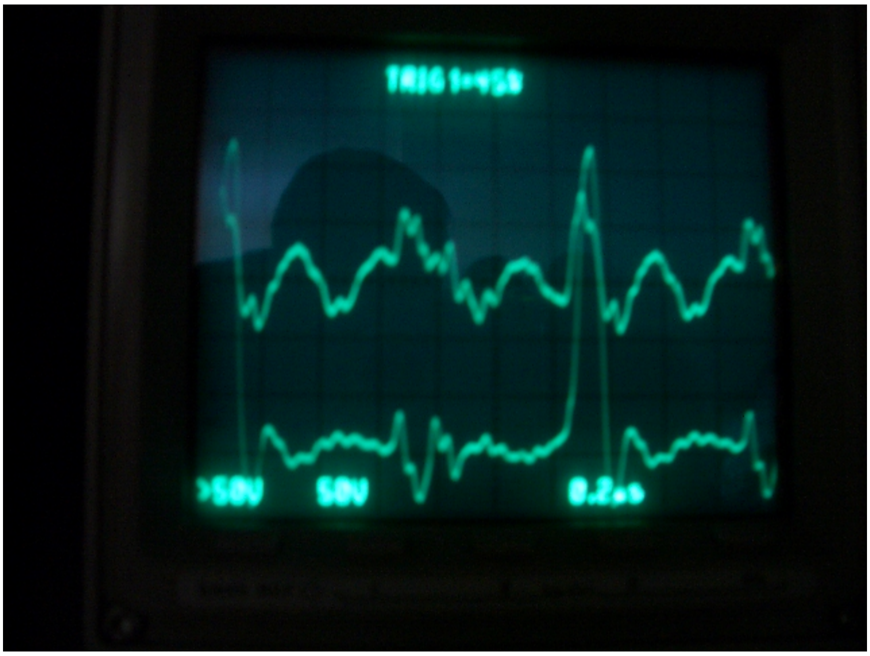
3. Base line is trash but does have a variable positive DC value.
4. The central component (on base-line) has no meaning as is probably provoked by an artifact on the input signal coming from driver circuits.



Waveform on Inner Collector Coil under light-bulb load

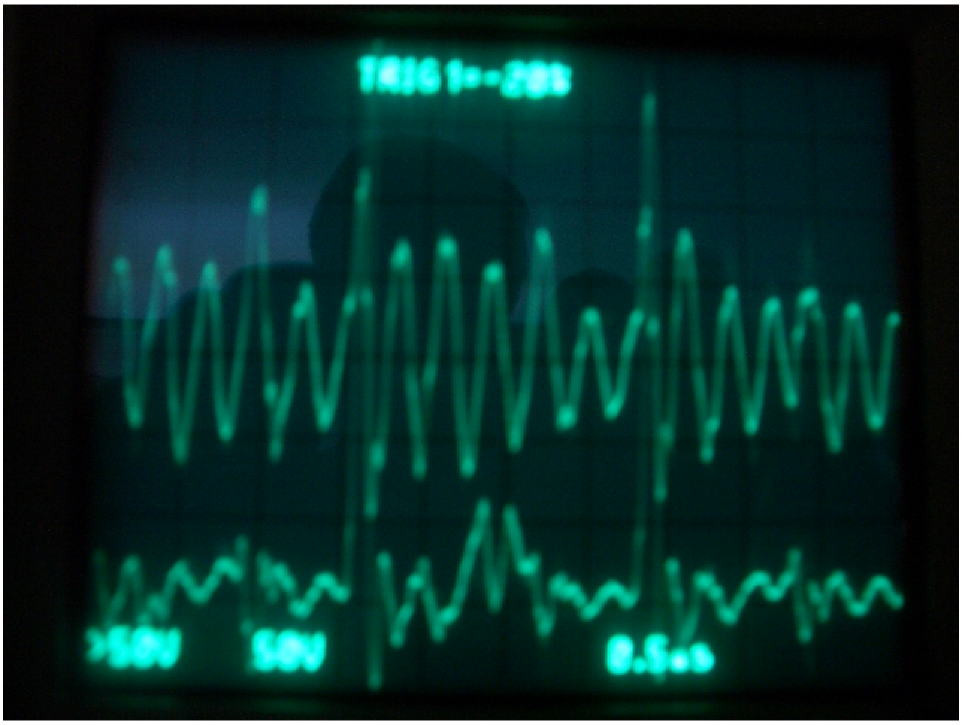
Just have a look at ‘**<u>the growth curve’</u>** it is really different from that obtained in ‘the other way around’!

Just for reference it follows the comparison with the waveform seen on Output collector coil with open ends. You can read about 120 V



Comparison between Inner Collector loaded and Output collector not loaded

Removing the light-bulb (on inner collector coil) here’s the situation:



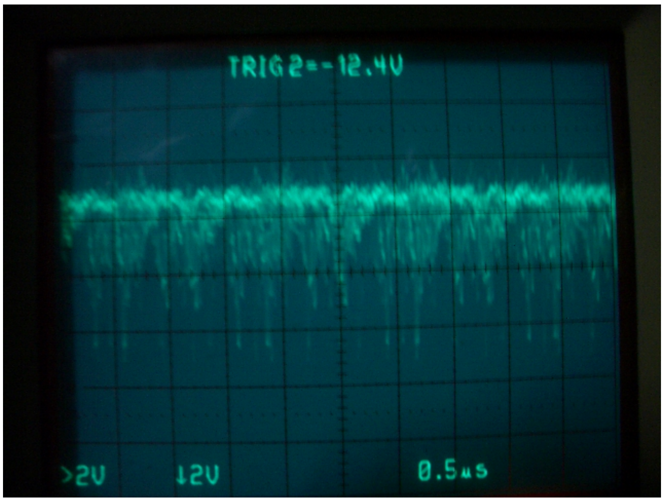
Comparison between Inner Collector not loaded and Output collector not loaded

On Inner collector (lower waveform) it seems that the base line increase in amplitude while the peak voltage rise to well over +400VDC…so just a little bigger than the ‘loaded’ case. This is really encouraging!.

On ‘opened’ Outer Collector there is a strong resonance @1.4 MHz with continuous sinusoidal waves of about 200V peak.

Comments

I’ve tried to get just a rough idea about the ‘black-box’ input/output power, so in order to evaluate correctly the input current delivered to black-box I put a 2.1 ohm 20W resistor in series to + PS (18V) lead. In following picture (2129) there’s the voltage taken differentially with two probes (0 DC level is on screen centre).



Voltage across the 2.1 ohm sensor

As the medium voltage read across resistor is just over +2 VDC then I = 2/2.1 = 0,95 Amp that's the output current delivered to ring.

- P = 18 * 0,95 = 17,1 W that's the delivered power.

Then I disconnected the resistor (reconnected + lead to PS) and read on PS panel meters that the current is 0,85A @ 18VDC, so the power delivered to ring is 0,85 * 18 = 15,3 W which is near (!?) to what measured in the other way. Anyway as you see there’s a difference.

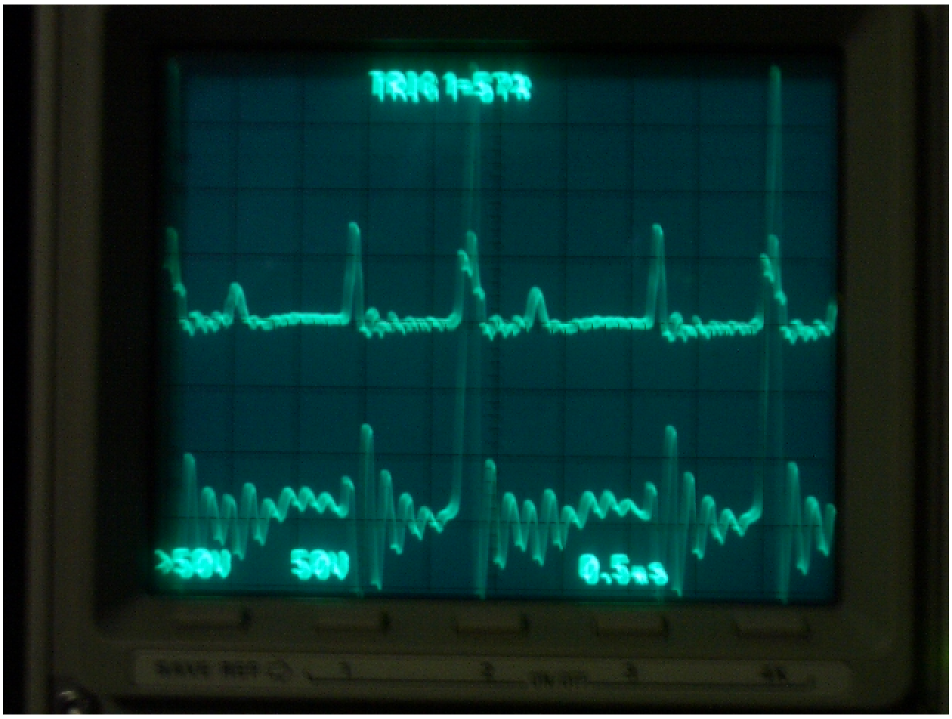
Then I tried to get an idea about output power so I measured the bulb cold resistance that's = 72,5 ohm (ya..I do know that it changes when incandescent..), then connected it to ring and measured again the current flowing under standard setup:

using DC current clamp meter I measured about 0,3A so 0,3*72,5 = 21,75W...

(the supply: +15V @1,1A = 16.5 W...this if the instrument were correct...not tampered by the ring)

So being not so happy I did the same thing but using a bunch of paralleled 2W resistor to obtain 77 Ohm and did the same measure in the same conditions...result were absolutely equivalent ...only a little difference. The good thing is that the resistor within few seconds became crazy hot so I've had to shut off the power supply. **SO THERE IS LOT OF POWER FOR SURE**.

After that I managed to catch some pics of the waveform on the inner collector. I disconnected the inner collector leaving one end free and putting the scope probe on the other lead...this is what I’ve seen.



<u>Comment</u>
Here you have the inner collector on upper trace and the outer collector in the bottom trace. the zero level is respectively on the screen centre for the upper trace (coincident with the waveform bottom) and 1 cm over the bottom of the screen for the OC.

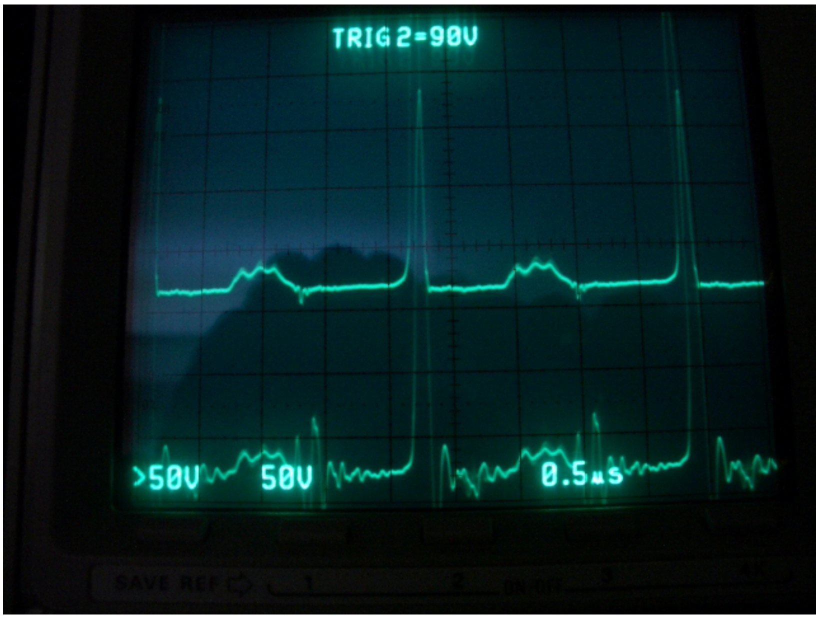
Of course leaving one end free here you see that the voltage (for outer collector) went over the screen I think about 500 VDC. Max Inner Collector peak voltage is about + 75DCV.

What is intriguing is the <u>coincidence of one inner collector peak with the main peak of outer collector (@ F2=0.7 MHz),</u> note also that in this case the inner collector peak is somehow deteriorated.

Note also that the 5MHz component (NMR) on outer collector is resonating in correspondence of F1 peaks (F1= 1.4 MHz).

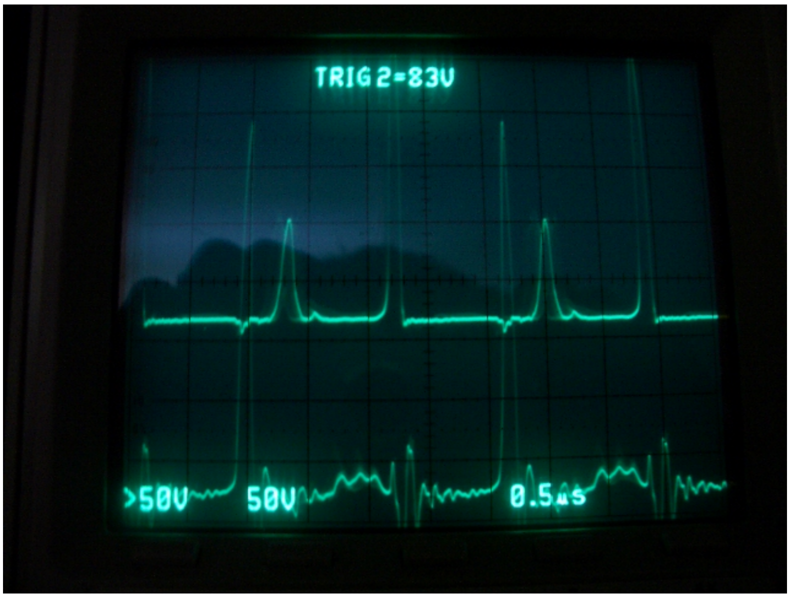
Inner collector does not show any 5MHz component.

For those who may want to see relationships between Inner Collector and MOSFET drains , here is it.



Inner Collector Vs MOSFET drain @ F1

<u>Comment:</u>
it's possible to see a perfect correspondence; its clear that the main pulse is in correspondence with the F1 MOSFET drain.
Again I tried to disconnect the F2....then all goes to ZERO....so even if it seems that there is no contribution (looking at the waveform you don't seen any F2 presence) really THERE IS!



Inner Collector Vs MOSFET drain @ F2

Finally all pictures are shot with following conditions:

- DCV input to MOSFETs = +15 VDC
- Current supplyed to MOSFET = just less than 1 A.
- The light bulb (60W/220V)has medium-high brightness

In conclusion I think that:

1. there is really voltage & power on a piece of wire put @ 90 degrees from control coils,
2. there is ‘copper charging’ effect on outer collector.