

# Stan Meyer Circuit how it works - Stanley A Meyer conference - Max Miller 2019 Bremen, OH

## Stan Meyer Circuit - How It Works

**Speaker:** Max Miller (Iron D Max), with Mark Sebastian (electrochemist)

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## The Circuit: 1970s Technology

So, basically, 1970s technology. He did everything with it. The circuitry is **all 555 timer based**, made back in the 70s. He used the TS555. The **7404 is an inverter**. The **7490 is a decade counter**. The 7414 has a Schmitt trigger which prevents signal bouncing.

## Oscilloscope Observations

### Signal Flow Through the VIC

This is the original signal in from the 555 timer. When it loads the primary, the primary is an inductor as well, so it actually **elongates the pulse**. When it functions into the transformer, you get a **ringing effect, which adds steps to the pulse**. So you have the original pulse, which gets elongated in the primary, and then across the water, you end up with a ringing effect which adds

the multiple steps.

This is around **10 kilohertz**, and then across the primary — in the magnetic pickup, you're going to see where it rings across the primary and the secondary. We have a resonance that's just — you can take the power off of it and **it'll still just sit there and ring like a bell**.

## Voltage Measurements

**832 volts** across the water, measured with a 5,000 volt probe on the oscilloscope. With a times 100 probe.

**Without an oscilloscope, you're just working at Kroger's.**

## Free Induction Decay

This would be 5.7 kilohertz, almost 6 kilohertz. If you look, this is the off time — **it continues to ring**. That's called a free induction decay.

## Isolated Ground: Critical Requirement

You have to watch — the older oscilloscopes all shared a common ground and that's really going to mess with your readings. **In order to do this correctly, you have to have isolated grounds**. Once you add the ground, then you're adding something you don't want.

## Noise Elimination

Everything has to be tuned correctly. With every circuit you have stray capacitance, inductance and that all feeds into your end result. **I've had to go to great lengths to get all of the noise out of this to make everything clean**. Once you have noise you have all kinds of harmonics and resonances that you don't need. A lot of people will see noise or resonance and they'll say, "oh, I went to college, I did it, I'm done."

## Impedance vs. Resistance

**Max:** Impedance is like working resistance. Z is impedance. Z is working resistance.

**Mark:** The equation is  $V = \sqrt{R^2 + (X_L - X_C)^2}$

**Max:** You have to take the inductor and adjust it. Whenever you have a frequency into the primary, the primary is an inductor, so the frequency is altered. Then you have inductance coupling into the

secondary. Then you have the inductors themselves. **Everything gets altered by the time it comes out the end.**

You get into the ballpark with the math and then you do the work. Why give yourself a headache with the math when you can turn the dial?

## Crystal Radio Analogy

Here's the crystal radio — basically you're tuning an inductor with a tunable capacitor. You take your antenna and you turn the knob on the capacitor and you have a germanium diode. So basically you have a signal going through the air and the antenna picks up the signal and then you tune into that signal and then it plays it on the speaker. **There's no battery. The power is the signal itself.**

## Stan's Original Core and Construction

This is Stan's original core. Here's your pickup. Here's your primary and the secondary. And then the chokes. If you look, this one was broke and he put a piece of tape on it with glue.

## TV Flyback Core Alternative

**A TV flyback core costs \$13.** The other flat cores were like \$120 each. I stuck it in the freezer for a couple of days and then just pulled it apart. I wound my bobbins — flat PVC with PVC pipe glued together. **Instead of a \$500 flat core, I got like a \$15 one. It'll do the same job.**

## Core Permeability

Stan's flat core from the car was most probably 99% sure **1,800 to 2,000 permeability.** Most cores you're gonna buy are 2,000 permeability, pretty generic.

## Stan's Original Schematic

The dot shows you where your start is, start of the winding. Here's your **50% duty cycle** in, and T3 — he's adjusting that gate time. Here's your primary and your secondary and the **coil orientation.** Here's your blocking diode, isolated electrical ground, tuned resonant charging choke, resonant charging choke. **This one has an adjustable wiper on it.**

When it comes out, it's altered from what went in. That's just the way inductors work. And the transformer is an inductive transformer.

# Simplified Wiring

You have a primary, secondary, inductor, inductor. **Positive out on one choke, negative out on the other.** The turn directions look opposite but in reality, if you turn it, they're going in the same direction. It's just a toroid.

# Stainless Steel Specification

**He specifically says 304 stainless everywhere.** He even goes out of his way to say that. I ignored those guys who got 316. Obviously he repeats it for a reason.

# Copper Ions in Water

He specifically says **copper ions in the water.** This is the water cell, the water being split. Dislodged electron, positive voltage potential on the plates, negative potential. We'll get into that later today.

# Accidental Power Theft

**Max:** One time I had this — the hydrogen's pouring off, right? And I'm looking at an oscilloscope and I'd never seen that before. And what did I do? **I was actually stealing power from the power company. Accidentally.** Once I figured out that wasn't what I wanted, I did something else.

# Circuit Boards

We made replicated circuit boards and sold them as cheap as we could — **populated board was \$75**, tested before mailing. Per Ritter from Denmark wanted everybody to have them. Then people bought \$75 circuits and put them up for \$350 on their sites, complete with my logo.

# Resources

- **Forum:** [ironmax.com](http://ironmax.com) (free, create account)
  - **Thingiverse:** 3D printable bobbins, winders, and parts
  - **Facebook group:** Daily Q&A
  - Simplified circuit uses capacitors as divide-by-10 instead of decade counters
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