



oldtemecula

- Home
- Learn
- Play
- Media
- Tech
- Store
- Forums

search

Home / Forums / Theremin Construction

Pitch Field Linearity II

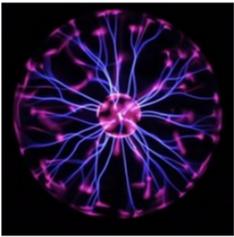
Showing Posts 1 - 3 of 3

Posted: 8/3/2020 9:48:23 AM - delete - edit



oldtemecula
From: 60 Miles North of San Diego, CA
Joined: 10/1/2014
threads - posts

My observation in **Analog Theremins** is that **ideal linearity** is a **natural tuning phenomenon** in how radio frequency energy leaves the pitch antenna. Observing those neon plasma glass globes reveals exactly what is going on. Touch your finger to the globe is the same as touching the Pitch Antenna.



- Looks like Corona Virus -

Early on I referred to this as **Radiation Resistance** and it upset the digital people so I changed my term to **Pitch Field Conductance**. This is why playing bare foot or well earth grounded stretches the pitch field musical note spacing. The capacitive loop concept is cute but makes little sense. When you say no earth ground is necessary I do agree with you but for different reasons. **RF** will still find a way to escape the source controlled or not.

We talk about hand capacitance but the energy flowing in the pitch field is still **RF** something the digital people do not grasp so do not mention in conversation. **RF** is the **elephant in the room** along with the changing capacitive reactance of the tank circuit. Yes this change is extremely small but that is part of the theremin phenomenon.

Linear is the best word I know of for what we are talking in the musical note spread, it does not have to be perfect, Thereminist adapt. The goal after the ideal response is understood is that all theremins should one day have this same theremin pitch field response from model to model. This way muscle memory can be fine tuned which is what every Thereminist is searching for along with a better sound or even their own sound. It is better to demonstrate than throw around lame mathematical equations all day.

The **Moog E-pro** and the **Becker Electrodeum** meet this requirement. In **my video** this is why Master Thereminist Shamarin Valery of St Petersburg Russia adapted so quickly to the pitch field right out of the packing box.

Christopher
www.Hwy79.com

dewster do not miss the point again, what I bring up is there needs to be consistency in playable pitch fields between different models. The **E-pro** arrived there around the same time I did but we accomplished ideal Playable Pitch Fields using different approaches. Next to the antenna/electrode will always compress a bit, normal physics. Above **G7** Classical Musicians do not care, only misinformed engineers.

dew said: "There's only one reality, and - engineer or not, like it or not - we all live in it." The words of a true Trump Supporter.

link

Reply with quote Report Post

Posted: 8/5/2020 3:27:10 PM - delete - edit



oldtemecula
From: 60 Miles North of San Diego, CA
Joined: 10/1/2014
threads - posts

IMHO: In Analog Theremin design hand capacitance and earth ground has little effect on linearity as it stands on its own or separate as a tuned RF pitch/electrode.

In a tuned Pitch Antenna Electrode the voltage across the vertical design is distributed. At any given point the RF energy is a "fraction" of the total RF voltage. Un-tuned Pitch Antennas have the same total Pitch Oscillator developed voltage at any point on the vertical length rod. This overly pulls on the pitch oscillator capacitive reactance Xc in the near field.

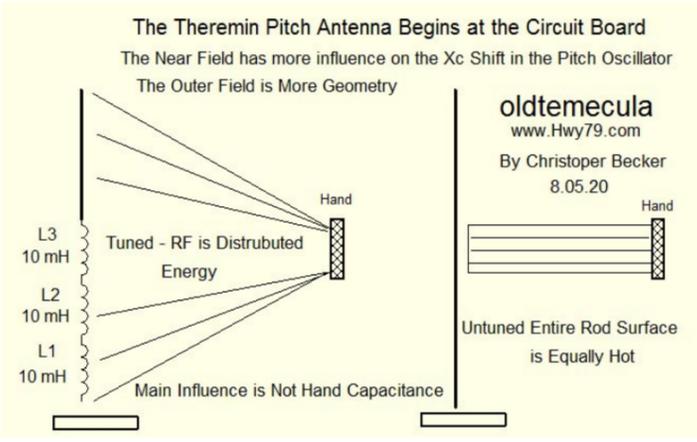
Tuning the Pitch Oscillator slightly higher than the resonant frequency of the antenna circuit is where ideal linearity of the theremin circuit occurs. The Pitch Antenna circuit with inductors will have maximum energy here and it will be distributed energy. You tune the Pitch Oscillator above Antenna resonance because you do not want frequency crossover from the effects of hand capacitance. If cross-over happens the Pitch Field will have an obvious flat spot in the Pitch Field response.

On a tuned theremin pitch antenna hold your palm facing the antenna then bring your other hand up behind it. Now slide it to the side at the same distance and the so called capacitor plate is now twice as wide and the pitch frequency almost remains the same. Pop just a finger forward and the pitch goes up. **There is a little more going on.** If I say what it is the TW monitor will get upset.

All future theremin designs need to take basic RF tuning into consideration, try a single coil and tune to that. Modern theremins should have similar Pitch Field responses between models, which is ideal.

Properly tuned Pitch Antennas allow the EtherWave Standard, the Moog E-pro and the Phoenix Electrodeum to have very similar ideal Pitch Field responses. Perfect linearity is not necessary as in any musical instrument rather needed is similar consistency between models in Pitch Field response.

Christopher



link

Reply with quote Report Post

Posted: 8/6/2020 9:49:06 AM - delete - edit



oldtemecula
From: 60 Miles North of San Diego, CA
Joined: 10/1/2014
threads - posts

The people that say the theremin responds to a magnetic field are just as correct as those that believe in the hand capacitance model.

If you tell people the same thing over and over it eventually becomes their religion if they know no better, whether it is true or not. They back up their belief with endless formulas or even Bible quotes. Some seek friends on social media that have the same belief to reinforce their own lack of common sense.

Hand Capacitance: The hand is not a metal plate, it does not have an alternating positive/negative charge on it and there is no mystical wire leading back to the theremin to complete the circuit.

What is actually going on is the electro-magnetic energy or RF emitted instantaneously from the Pitch Antenna circuit seeks the path of least resistance, just like the **plasma globe** and your finger. This has influence in shifting the capacitive reactance **Xc** of the variable Pitch Oscillator circuit. The **Xc** is the tuning capacitor referenced against another oscillator at the same frequency (heterodyning) that determines which musical note you hear. This is a very small change which the theremin concept is good at enhancing, a minuscule change of less than 1:100,000

Think of the energy around the Pitch Antenna as infinite rings of energy pushing out, where the circumference of the next ring out has less energy on the same line from the Pitch Antenna as it is expanded over a greater area than the inside ring. It is your finger reaching through these infinite rings that increases the current flow in the Pitch Antenna circuit which shifts the **Xc** of the Pitch oscillator, **Xc** is our mystery < 1pf variable capacitor. An **Xc** change of just **.888 pf** is a sweep of over **7 musical octaves** using a 330 uH inductor in the variable Pitch Oscillator LC at 900 kHz.

The higher the p-p voltage on the Pitch/Electrode Antenna the farther out the EMF is detectable. Use an analog AM Radio tuned to the Pitch Antenna frequency and listen to the heterodyned audio to know how far out you can in theory interact with the electro-magnetic field or RF of your theremin's Pitch Field. This can crudely work as a Pitch Preview.

Christopher

- This imaginary image shows why two hands side by side do not change the pitch much, yet a single finger forward is a new musical note -



dewster I will never convince you of anything as that is your nature, so I leave you with my own personal quote:

"Many stupid people think they are really smart, they become your boss and really smart people recognize how stupid they actually are and use it to their advantage."

You may be correct as I highlighted my entire personal quote and google went directly to your reference of the Dunning-Kruger Effect, one of many coincidence over the years that guided my research. Now the question in the end **does it refer to me or you?**

Our own theremin results will best answer this question for all.

link

Reply with quote Report Post

Showing Posts 1 - 3 of 3

You do not receive email notifications for this topic - [Subscribe](#)

Post Reply

Rich text editor toolbar with icons for bold, italic, underline, link, unlink, list, quote, image, video, and other formatting options.

Post