

5.28.20

In that last sound byte you can see I can go back and forth from Volume to Pitch ideally.

The way you captured the schematic PDF file this time was the best yet, clear and could enlarge with + button totally. You are trying to take the Voodoo out of my science.

As I work on this project I realize it will exist long after you and I are gone. Your excellent schematic moves us away from Ikea instructions. Put our names on the schematic in "blazing glory", and the latest date. Bigger than that little box in the lower right corner.

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google will list the schematic only as a piece of a puzzle.

I did not arrive at my results by accident rather trial and error, nor was your invitation to be part of this project an accident. The gift in it for me was twenty years of stubbornness and special moments I can not put into words, they happened along the way.

Because you have no experience with other theremins in time you will realize how good "our" work is. This begins with the basic design you had at my house on your visit long ago, it just evolved. Daily the project would inch itself forward. I had no idea of 2020 being the anniversary of the theremin until 2020. You and I teaming back up in 2020 is also a long shot and has meaning.

S4 Switch at U2a no longer exist on the board, I found the answer or results I was looking for.

C4 10uf on the schematic "U2-8 +9V" by itself seems to be a duplicate of C4 above the 555

Many years ago I learned tantalum was better at removing spikes from power rails if next to the offender. You did indicate as tantalum, good. A theremin is extremely sensitive to everything. That is why there is that 470uf and 100 ohm resistor in the oscillator section. That filter allows the use of a switching power supply without noise getting into the sound.

U1 8 +5 C49 .1uf You would like this added? Kool I think I can, real estate is precious.

As you are learning there is something freaky in the way she allows some to succeed and others to fail. One engineer wanted to convert the entire thing to surface mount and I could not convince him to do it my way first. He has since vanished from the scene like every other home built design.

Valery is correct as the theremin boards I sent him worked but were finicky; he was never able to get back to that original sound. Hopefully I have ironed that kink out. Only after everything is mounted in the EtherWave Standard box will I know. What made Valery's boards squirrely is the way I used the ungrounded IF transformer shields.

I give everything away; I have my eye on a Thereminist in So. Cal who is well respected. He even drives down the 15 frwy once in a while on business trips to San Diego. Thank goodness for the sound byte Valery made, that is the key to gathering interest or proof of concept.

C26 is 10uf not 1uf, by the green wire on schematic, this is near the green Led

On the right side VTL5C1 terminal-1 should have a R37 1k to the positive rail. This rail seemed better than the other rail. This lowers the impedance on the audio line. If a jumper wire is across the Vactrol LDR side terminal when experimenting, it does have about 4 milliamps flowing rail to rail, I can live with that.

VTL5C1 audio "out" can be taken from the RCA Jack or the TRS Jack next to S2, the switch is so both channels can feed into a computers sound card, otherwise mono into an amplifier.

VTL5C1 audio "in" must be done through the RCA Jack next to it or the J2 TRS Jack which has power on it, Tip +, Ring is audio, sleeve is - or ground. This seems complicated to express in the schematic. This is the easiest way to connect the two boards.

I see you added that direct +9v to the oscillators, good, bypassing the 10 ohm resistor.

This is not necessary on the schematic; I added pads next to the 3.3k on the oscillator emitters. If Pot-3 maxes out to one side without ideal results, to improve it I know that adding a 100k or what ever in parallel with the 3.3k will shift the current flow balance and control thermal drift better. I had seen this work long ago where I could actually shift the thermal drift to go the other directions; in the middle is a balance point. The pad spacing is 3.5mm and fits a Mouser terminal I have.

The 5 volt regulator for the LM358 is so hitting the rails has a better chance. Not sure if the skew on top of the audio wave shape is strictly the transformer or partial rail hitting. This involves Voodoo science to get the proper wave shape, I can not explain it. Early on it was elusive, even built hybrid tube oscillators looking for The Sound. It would appear then disappear for the longest time. Today it is solid, the Gift for 2020. Many will study your schematic trying to figure it out. There is also Voodoo happening in the oscillator section as you have experienced.

L3 Osc section should indicate "Induction Coupling" as it makes no sense what it is there for. I discovered this approach a week before sending the boards to Valery. I was amazed in how good it worked. That specific L3 3300uh worked others did not, same with heavy current antenna coils.

C5 should be indicated as Var-5 3-33pf The larger it is the harder to do a one time tune.

C19 33pf, in the L2 green terminal for volume better as 100pf, 33pf would be more like for the Pitch board, your guess is as good as mine LOL

The TRS Jack I used for AC power input is inappropriate I think but the simplest way I know for 3 pin power input connections. Moog used the 5 pin Din

You indicated L3 as 3.3MH this is good, it shows a difference between L4 & L5 as 3300uh

I have the latest software to draw a modern day 2 layer board but that would require a lot of effort. My old software is broken and I must copy parts from other or old projects.

Having no through-hole plating makes part removal much easier. We both appreciate that. LOL Toner transfers are also easier. When some say they are building the EM theremin, makes me sad.