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[Speaker and Cab simulators](#)

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[Re: Speaker and Cab simulators](#)

by [pz](#) » 22 Oct 2011, 10:38

phatt wrote: Can't comment on Victor K except to say the When i tried to use discreet fets in the building of my tone circuits and like stuff ,, well it worked but noise was a problem. Unless something stunning can be shown it really is much simpler to use a chip.

I bet, not noisier than the LXH Fender i just found in the drawer, built many years ago using prehistoric 741's 😊

I haven't seen many build reports about these speaker sims, probably due to rather complex schematic and the lack of "vero".

So, as a reference and to add more data to this thread i have just recorded a short riff using my home build 4W tube amp and RLC dummy load straight into the LHX Fender cabsim.

Plus a real frequency response of the unit.

Personally i find the sound a little bit too dark.

[Sound sample](#)

[Schematic](#)

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[pz](#)

Solder Soldier

Posts: 192

Joined: 17 Aug 2007, 17:55

Location: Germany/Poland

Has thanked: [2](#) times

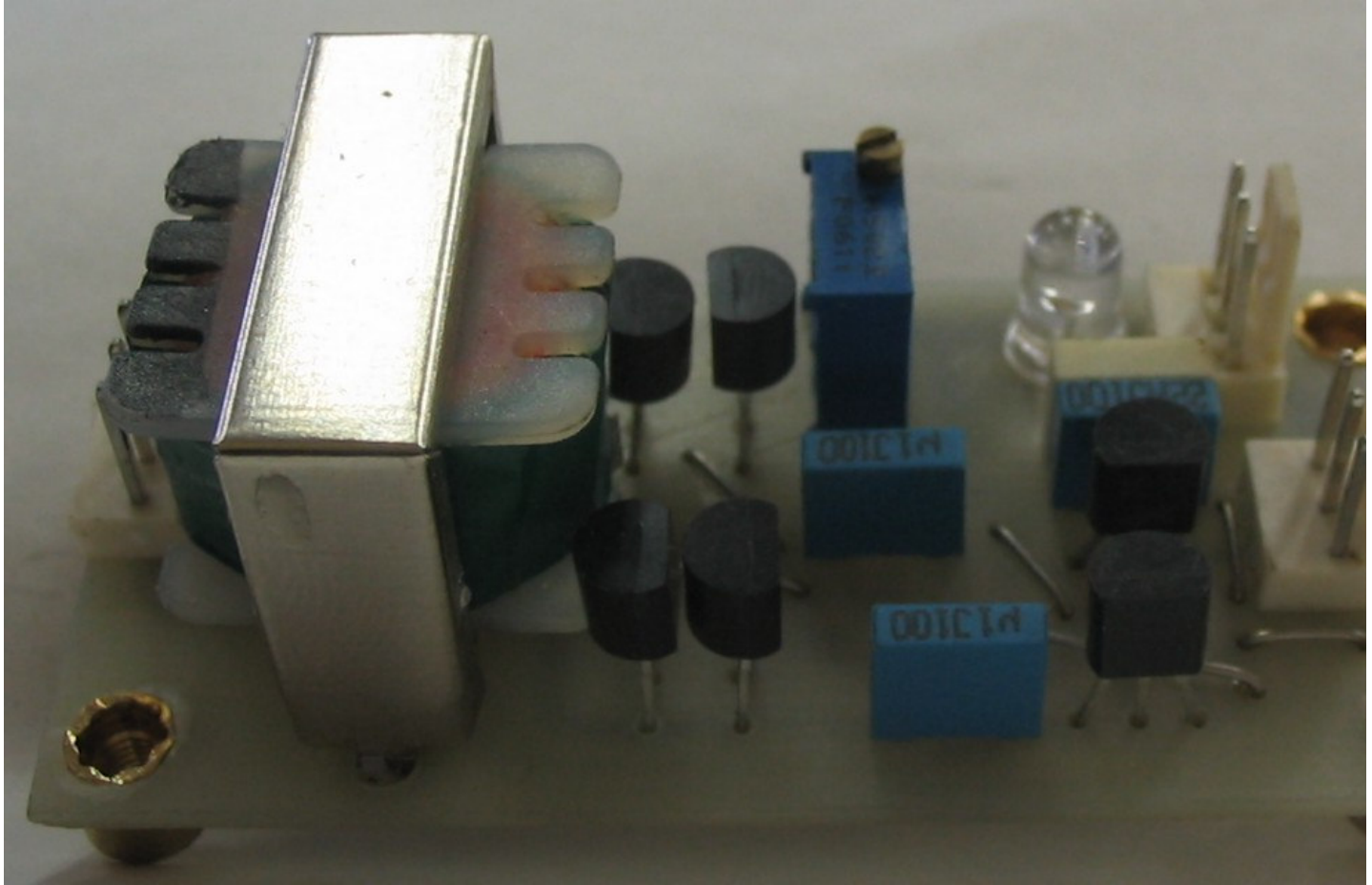
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Re: Speaker and Cab simulators

by [KMG](#) » 22 Oct 2011, 12:24

A way to simulate sound using micro PA, load equivalent & speaker/mic response simulator.
PA (250mW)



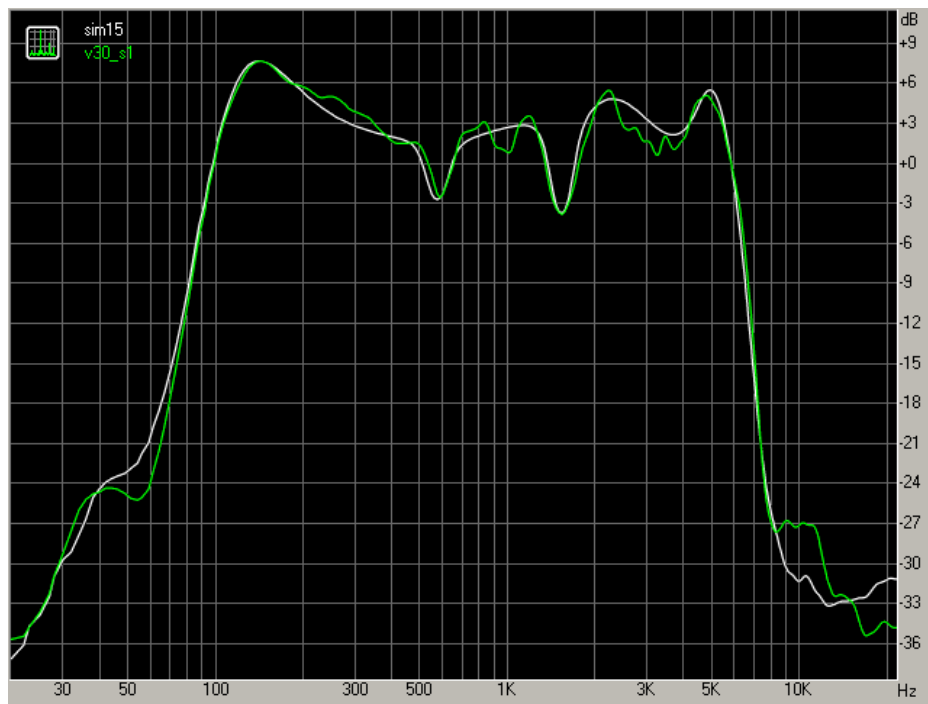
PA schematic:

<http://milas.spb.ru/~kmg/files/projects...croSch.pdf>

Equivalent/Sim schematic:

<http://milas.spb.ru/~kmg/files/projects...im/sim.pdf>

Frequency response Cab/eq+sim:



Comparative samples, cab_s - micro pa 250mW on 4x12 cab (mic E906 2 sm side from speaker center), cs_s1 - micro pa on complex load simulating speaker impedance + speaker simulator.

http://milas.spb.ru/~kmg/files/projects/fetpa/micro/xicon/s/2-Classic%20T_cab_s.mp3

http://milas.spb.ru/~kmg/files/projects/fetpa/micro/xicon/s/2-Classic%20T_cs_s1.mp3

http://milas.spb.ru/~kmg/files/projects/fetpa/micro/xicon/s/4-Criminal%20Def_cab_s.mp3

http://milas.spb.ru/~kmg/files/projects/fetpa/micro/xicon/s/4-Criminal%20Def_cs_s1.mp3

http://milas.spb.ru/~kmg/files/projects/fetpa/micro/xicon/s/6-Kid%20Paul_cab_s.mp3

http://milas.spb.ru/~kmg/files/projects/fetpa/micro/xicon/s/6-Kid%20Paul_cs_s1.mp3

http://milas.spb.ru/~kmg/files/projects/fetpa/micro/xicon/s/8-Southern%20LP_cab_s.mp3

http://milas.spb.ru/~kmg/files/projects/fetpa/micro/xicon/s/8-Southern%20LP_cs_s1.mp3



For this message the author [KMG](#) has received thanks: 3

[kleuck](#) (23 Oct 2011, 02:08), [pz](#) (22 Oct 2011, 13:08), [rcustoms](#) (22 Oct 2011, 14:39)



[KMG](#)

Solder Soldier

Posts: 181

Joined: 02 Feb 2010, 21:26

Location: Russia

Has thanked: 3 times

Have thanks: 58 times

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[Re: Speaker and Cab simulators](#)

by [pz](#) » 22 Oct 2011, 13:08

Cool stuff KMG! 😊

[pz](#)

Solder Soldier

Posts: 192

Joined: 17 Aug 2007, 17:55

Location: Germany/Poland
Has thanked: [2](#) times
Have thanks: [21](#) times

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[Re: Speaker and Cab simulators](#)

by [rcustoms](#) » 22 Oct 2011, 19:05

great job 🙌

have no problem if we could see the entire work,your approach is very interesting and we have more to learn about it



[rcustoms](#)

Solder Soldier

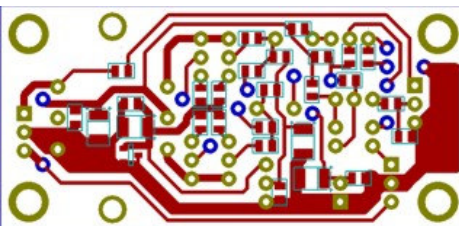
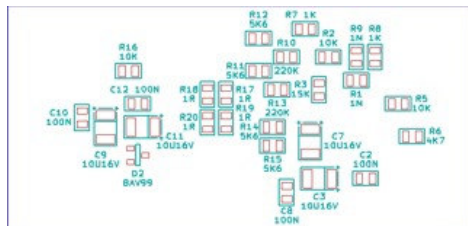
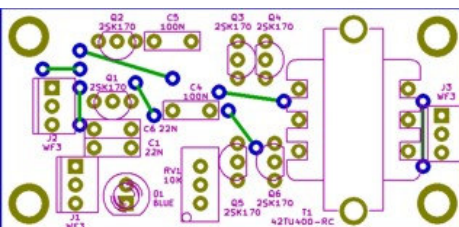
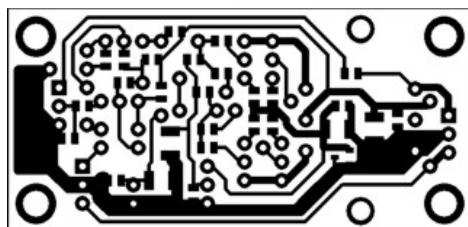
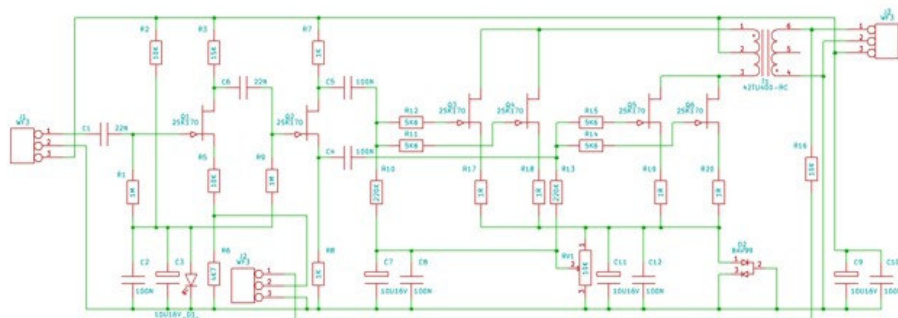
Posts: 233
Joined: 01 Oct 2009, 15:12
Has thanked: [80](#) times
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[Re: Speaker and Cab simulators](#)

by [KMG](#) » 22 Oct 2011, 19:45

Full micro PA project



Speaker equivalent & sim just prototypes, not finished yet





[KMG](#)

Solder Soldier

Posts: 181

Joined: 02 Feb 2010, 21:26

Location: Russia

Has thanked: 3 times

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[Re: Speaker and Cab simulators](#)

▣ by [rcustoms](#) » 22 Oct 2011, 20:01

thanks, can you show connector details j1, j2, j3



[rcustoms](#)

Solder Soldier

Posts: 233

Joined: 01 Oct 2009, 15:12

Has thanked: 80 times

Have thanks: 181 times

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[Re: Speaker and Cab simulators](#)

▣ by [KMG](#) » 22 Oct 2011, 20:23

J1 input

1- signal input.

2- signal gnd.

3- 12V (output to possible fet preamp).

J2 feedback (possible Presence/Depth controls)

1- feedback output from OT.

2- feedback input.

3- gnd.

J3 output/PSU

1- PA output (load).

2- gnd (load/PSU).

3- 12V input from PSU.



[KMG](#)

Solder Soldier

Posts: 181

Joined: 02 Feb 2010, 21:26

Location: Russia

Has thanked: 3 times

Have thanks: 58 times

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[Re: Speaker and Cab simulators](#)

by [uncleboko](#) » 22 Oct 2011, 21:01

pz wrote:

rcustoms wrote: http://www.hexeguitar.com/diy-cabsims_e
thanks to mr darthoverdrive for info

I wrote this article, i believe back in 2003. A few years later, with the help of Teemu and Markus it was translated into English. I wanted to create a kind of summary of different speaker simulators on the market or known diy projects. For years my preferred cabsim type was one setting on Marshall SE100. About 2 years ago i posted a project of a stripped down version of the SE100 - SE33. You can find all details (schem, pcb) here:

http://www.hexeguitar.com/diy-se33_e

[Sound sample](#)

At some point i decided to design my own speaker sim, but instead of trying to simulate a particular type of box i took another path: adjustable presence and low thump control a parametric mid notch filter. The prototype was breadboarded and tested, but after that i pretty much lost interest in analog "EQ" type speaker simulators. Turned out, that the digital techniques provide much more realistic results, at least for me. The simple LP+HP + sometimes a mid notch filter approach does the job well for clean and light crunchy sounds, but in my opinion it fails in case of heavier sounds. A real speaker frequency response has many peaks and notches, which among other factors are responsible for the typical "granular" hi gain sound. Something that all those simple cabsims lack of (well, maybe except the LHX design). For a comparison, check out the frequency plots of the Korg PX4 speaker simulator section at the end of the article. I could find the notes and schems and post the tweakable cabsim if anyone is interested. I believe, i have a few soundsamples somewhere, too.

It would be nice to have the article updated with corresponding sound samples. Maybe i'll try to breadboard the circuits and record a few sounds.

Frank Nitsch created a nice speaker sim comparison with a lots of sound samples. Worth checking:

<http://www.franknitsch.com/speaker-sims/>

--

Piotr

There seems to be an assumption that the required sound is gross distortion - wrong.

[uncleboko](#)

Resistor Ronker

Posts: 299

Joined: 25 Mar 2008, 21:19

Has thanked: [2](#) times

Have thanks: [2](#) times

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[Re: Speaker and Cab simulators](#)

by [pz](#) » 22 Oct 2011, 21:32

uncleboko wrote: There seems to be an assumption that the required sound is gross distortion - wrong.

Then you haven't probably noticed i used "for me" or "in my opinion" several times. I'm just sharing my point of view, not trying to preach. In case_ of hi gain sounds a simple analog speaker simulators do not work for me. In other cases they did, many times.

[pz](#)

Solder Soldier

Posts: 192

Joined: 17 Aug 2007, 17:55

Location: Germany/Poland

Has thanked: [2](#) times
Have thanks: [21](#) times

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[Re: Speaker and Cab simulators](#)

▣ by [rcustoms](#) » 22 Oct 2011, 21:45

the Speaker emulation should be good on both clean and driven or distorted, correct me but the cab emulation has nothing to do with the preamp or pedal that we use, unless we add some control to enhance the distortion and make it more real.



[rcustoms](#)

Solder Soldier

Posts: 233
Joined: 01 Oct 2009, 15:12
Has thanked: [80](#) times
Have thanks: [181](#) times

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[Re: Speaker and Cab simulators](#)

▣ by [okgb](#) » 23 Oct 2011, 01:38

I think using a transformer is a key factor for the gtr signal, even cheaper ones on splitters seem to sound better, my best efforts for non mic recordings have been into a millenia STT 1 mic preamp with transformer selected, and don't be afraid to apply as much EQ & compression as it takes. Although some people may think they are losing dynamic range, the sustain from compression makes it easier to play in headphones. Nice work lads, i wish i wasn't so overloaded in building projects!

[okgb](#)

Resistor Ronker

Posts: 411
Joined: 16 Mar 2010, 04:58
Has thanked: [37](#) times
Have thanks: [11](#) times

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[Re: Speaker and Cab simulators](#)

▣ by [rcustoms](#) » 24 Oct 2011, 04:02

unverified pcb speaker simulator based on mr Piotr z. work. stay tune for pcb based on mr phil ss.jpg

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[rcustoms](#)

Solder Soldier

Posts: 233
Joined: 01 Oct 2009, 15:12
Has thanked: [80](#) times
Have thanks: [181](#) times

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[Re: Speaker and Cab simulators](#)

▣ by [rcustoms](#) » 26 Oct 2011, 06:31

PCB REV 1.1 UNVERIFIED

Untitled-2.jpg

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[rcustoms](#)

Solder Soldier

Posts: 233

Joined: 01 Oct 2009, 15:12

Has thanked: [80](#) times

Have thanks: [181](#) times

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[Re: Speaker and Cab simulators](#)

▣ by [KMG](#) » 26 Oct 2011, 11:59

Micro PA, load equivalent & speakersim assembled in box.



For this message the author [KMG](#) has received thanks:

[rcustoms](#) (26 Oct 2011, 14:21)



[KMG](#)

Solder Soldier

Posts: 181

Joined: 02 Feb 2010, 21:26

Location: Russia

Has thanked: [3](#) times

Have thanks: [58](#) times

- [Website](#)
- [ICQ](#)

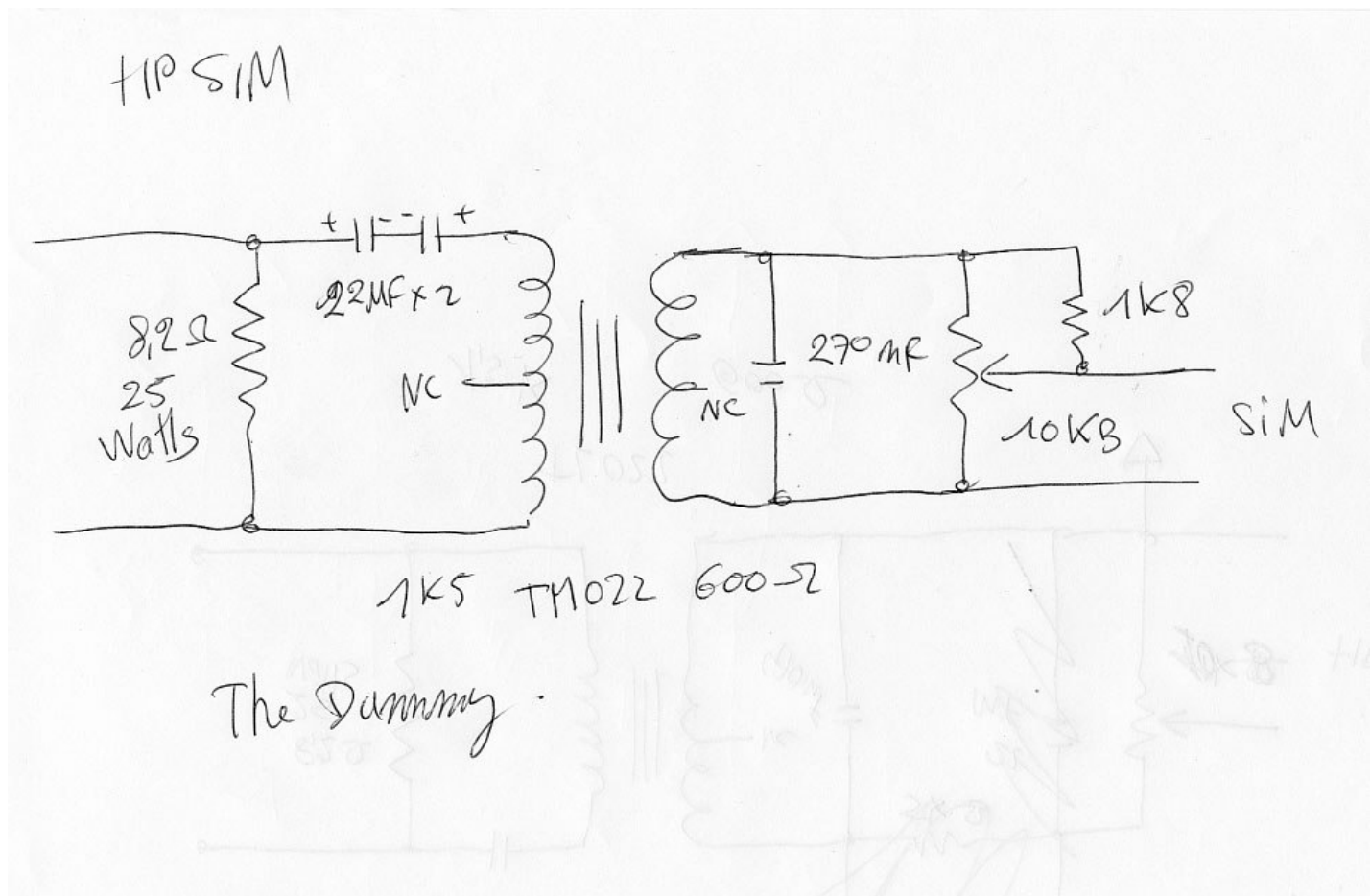
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[Re: Speaker and Cab simulators](#)

▣ by [kleuck](#) » 26 Oct 2011, 12:12

I made a cheap and passive LSPkr simulator, not perfect i suppose (but really good enough by ear) inspired by this one : <http://scopeboy.com/ssim.html>

Here's mine, was meant to emulate a Jensen P10R at the time :



Randall Aiken said :

Q: Is there any advantage to using solder with a 2% silver content?

A: Yes. Silver solder keeps werewolves away from your amp.

For this message the author [kleuck](#) has received thanks:

[rcustoms](#) (26 Oct 2011, 14:19)



[kleuck](#)

Resistor Ronker

Posts: 372

Joined: 16 Nov 2008, 00:24

Location: France

Has thanked: [34](#) times

Have thanks: [23](#) times

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[Re: Speaker and Cab simulators](#)

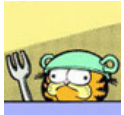
by [meffcio](#) » 26 Oct 2011, 17:06

I don't know if you seen this.

http://gtlab.net/gtlab2/readarticle.php?article_id=31

For this message the author [meffcio](#) has received thanks:

[rcustoms](#) (26 Oct 2011, 18:28)



[meffcio](#)

Breadboard Brother

Posts: 128

Joined: 25 Mar 2009, 19:31

Has thanked: 0 time

Have thanks: [8](#) times

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[Re: Speaker and Cab simulators](#)

▣ by [rcustoms](#) » 26 Oct 2011, 18:29

good link 🍷🍷



[rcustoms](#)

Solder Soldier

Posts: 233

Joined: 01 Oct 2009, 15:12

Has thanked: [80](#) times

Have thanks: [181](#) times

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[Re: Speaker and Cab simulators](#)

▣ by [rcustoms](#) » 29 Oct 2011, 03:16

dont forget sansamp gt2 speaker emulator stage

GT2 SS.png

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[rcustoms](#)

Solder Soldier

Posts: 233

Joined: 01 Oct 2009, 15:12

Has thanked: [80](#) times

Have thanks: [181](#) times

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[Re: Speaker and Cab simulators](#)

▣ by [phatt](#) » 29 Oct 2011, 15:21

pz wrote:

phatt wrote: Can't comment on Victor K except to say the When i tried to use discreet fets in the building of my tone circuits and like stuff ,, well it worked but noise was a problem. Unless something stunning can be shown it really is much simpler to use a chip.

I bet, not noisier than the LXH Fender i just found in the drawer, built many years ago using prehistoric 741's 😊

I haven't seen many build reports about these speaker sims, probably due to rather complex schematic and the lack of "vero".
So, as a reference and to add more data to this thread i have just recorded a short riff using my home build 4W tube amp and RLC dummy load straight into the LHX Fender cabsim.
Plus a real frequency response of the unit.
Personally i find the sound a little bit too dark.

Hi PZ, Thanks for sharing.

Yeah this stuff can be done in so many different ways it's easy for the novice to miss the detail.

You obviously have a Valve Amp to work with but other folks may only have a SS setup so you have to approach things in a different manner.

Re Valve outputs;

I did research a lot of the RLC stuff but (as I mentioned earlier in this thread)

I found it far simpler to implement a simple load R followed by a voltage division running into a graphic EQ > onto poweramp or direct to recording.

I agree that IF the tube amp delivers close to the required tone shape it takes little effort to get great things to happen.

Some tube amps will obviously need more tweaking and my Valve setup like yours does not need much to capture the tone.

In testing both my Reamplified Valve poweramp setup and my Hybrid SS setup there is only a slight improvement with the Valve powerstage soaked.

Examples;

1/ FPV (PhAbbTone) > DDC > Graphic > Old Laney Keyboard Amp.

2/ FPV (PhAbbTone) > Valve Amp > Load box > Graphic > Laney Amp.

(The Valve pwr stage does sing a little better.)

Both these setups reap very similar results and I negate a whole mine field of Mathematical RLC Gymnastics.

I went thru months testing all kinds of RLC stuff for Valve outputs and IMHO they are a pain to work with. Big clunky inductors, coneless speaker, iso cabs, the list goes on.

Sorry but Iza been around too long to waste time on stuff that just complicates a simple issue. A lot are overrated (for what they deliver) when an old HiFi Graphic can open a whole list of different results. I just added a switch and 2x 6.5mm sockets on the GEQ and threw the silly stuff in the bin.

Note For Valve Amps*

The Load R was my biggest hurdle until I found a small bit of text written by the maker (I assume) of the UA (Ultimate Attenuator).
(and without side tracking this too much)

The Load R is a big factor.

An 8 Ohm System needs around 3 to 4 times the R to match the Z so I use 24 Ohms Load R. this overcomes a lot of the RLC voodoo maths.

Using 8 R load just turns your Valve Amp into a fizzy SS sounding dirt box and kills any chance of sustain.

That's why simple Attenuators don't work you need to Re EQ and Reamplify it other wise they sound rather bland.

To give you an idea about the liquid sustain I wanted, Google *Guytron GT100*,,, that is the sound I wanted to achieve. (it's a Reamp All valve setup, 2 Amps in one box)

I feel that with some SS circuit tricks I maybe able to replicate the Guytron but the sustain is very hard to nail down when competing with all Valve.
I'm still not quite there but I'm getting closer. Winky.

Meantime back on topic,

The Valve front end (on Example 1 above) does a pretty good job and I use it more than the other. (One less box to cart around to gigs, Even small Valve Heads are heavy)

If I was to start all this all over again I would certainly take *KMG's* great work and test it out as it does look promising. But I have the liquid tone of Guytron implanted in my head and it won't go away easy. 😊

I did actually try some of your circuits but it was so long ago I forget which ones,,, might of been the one with lots of opamps which I felt was getting way to complex for what I needed but hey It obviously works. 🤔
Phil.

[phatt](#)

Cap Cooler

Posts: 466

Joined: 04 Aug 2010, 06:17

Location: Nambour, Queensland, Australia

Has thanked: 0 time

Have thanks: [70](#) times

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[Re: Speaker and Cab simulators](#)

by [phatt](#) » 29 Oct 2011, 15:25

rcustoms wrote: dont forget sansamp gt2 speaker emulator stage
GT2 SS.png

I just simed that and the *top end roll off is very close* to the traces I posted before.
Problem is,,,,, it has NO Roll off in the low end,, 😊 maybe it's not the whole circuit.
Phil.

[phatt](#)

Cap Cooler

Posts: 466

Joined: 04 Aug 2010, 06:17

Location: Nambour, Queensland, Australia

Has thanked: 0 time

Have thanks: [70](#) times

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