

[Print Page](#) | [Close Window](#)

LFO5a

Printed from: Electronics For Music

Topic URL: http://www.ele4music.com/forum/topic.asp?TOPIC_ID=85

Printed on: 05/09/2005

Topic:

Topic author: yusson

Subject: LFO5a

Posted on: 03/01/2004 6:10:57 PM

Message:

Hi all

Tonight I finished assembling my two LFO5a boards (I bought them during the clearance sale for such a nice low price...) . Before assembling them, I checked the lfo5a documentation for correction of tracks or component layout. As a matter fact the board I have, are from the latest batch and all the corrections were already made.

After powering them up, I noted that the LFO was not delivering the right signals : the triangle was truncated and I could not obtain a sawtooth signal.

I checked the PCB tracks and found a track bug : pin 1 and pin 5 of U2 are connected by a very short track instead of being connected through R9 ! I fixed the problem by cutting this track and

I obtained a nice triangle waveshape. Still, I could not obtain a proper sawtooth signal.

I checked the schematic and component layout is noted that Q6 (2N3819) is reversed ! The source

is connected to pin 5 U4 while it must be connected to ground, and conversely the drain is connected

to ground while it must be connected to pin 5 U4. Therefore I rotated Q6 by 180° and I obtained

a nice sawtooth!

Concerning the noise generator I changed the value of C5 to 1microF (tantalum, polarized) in order

to increase the spectrum range towards low frequencies. With the original 10nF value the noise signal sounds bluish (only high frequencies) !

Well that's all for now.

Cheers

Electronics For Music : <http://www.ele4music.com/forum/>

© 2003 Electronics For Music

[Close Window](#)

[Print Page](#) | [Close Window](#)

LFO 5a S&H Capacitor Question

Printed from: Electronics For Music

Topic URL: http://www.ele4music.com/forum/topic.asp?TOPIC_ID=93

Printed on: 05/09/2005

Topic:

Topic author: darkbone

Subject: LFO 5a S&H Capacitor Question

Posted on: 03/10/2004 8:00:45 PM

Message:

Hi everyone. I just completed an LFO5a and I noticed that the S&H portion of the circuit isn't holding the sampled voltage for quite as long as I would like it to. I am guessing that this is due to a leaky capacitor. Has anyone else had this problem? Should I use a polystyrene cap? If so, which capacitor is it that I should use it to replace, C7 or C9?

I'm also wondering if I could put in a switch that would toggle between high and low frequency for this module. It doesn't go quite fast enough for my tastes, nor does it go slow enough. I'm guessing that there is a resistor value that could be changed to toggle between high and low. Does anybody know which one it might be? Thanks!

-Rob Currier

Replies:

Reply author: yusson

Replied on: 03/11/2004 05:22:44 AM

Message:

Hi

I recently built two of these and in one case I had voltage droop and not in the other. I used multilayer ceramic cap in both cases. I substituted the faulty cap with a plastic cap (of the yellow LCC kind) with a higher value (680nF) and it solved the problem. The cap that must be changed is C9 which is the one in charge of holding the voltage. C7 is used as a differentiator to shape the sampling signal to a narrow pulse.

Reply author: darkbone

Replied on: 03/11/2004 07:42:04 AM

Message:

Thank you for the prompt reply. I'll give that a try today! I can't wait to have a non-leaky sample and hold!

-Rob

Electronics For Music : <http://www.ele4music.com/forum/>

© 2003 Electronics For Music

[Print Page](#) | [Close Window](#)

LFO5a capacitor values?

Printed from: Electronics For Music

Topic URL: http://www.ele4music.com/forum/topic.asp?TOPIC_ID=106

Printed on: 05/09/2005

Topic:

Topic author: julian

Subject: LFO5a capacitor values?

Posted on: 04/14/2004 11:59:33 PM

Message:

The units are not shown either in the BOM or the schematics.

If they're ceramics, I'd assume the units are uF, but then I see a post mentioning the use of poly layer, and, specifically changing the value of C9 up to 680nF, which would be quite a hike from the 10nF I'd assumed.

Anyway, can anyone give me some confirmation on this?

Cheers, julian

Oh, and the value of C6 - is down as 10/16. Now, is this 10V / 16uF, or is it 10uF / 16V?

Replies:

Reply author: yusson

Replied on: 04/15/2004 04:50:18 AM

Message:

Hi Julian

As a matter of fact for C9, it depends very much on the leakage of your cap if you purchase a high standard 10nF it might work fine, it depends also on the FETs. I built two LFO5a, in one the 10nF cap was alright, in the second I had to increase it to 640nF to tackle voltage droop).

For C6, read 10uF/16V.

Furthermore following the list of my comments concerning LFO5a :

After powering them up, I noted that the LFO was not delivering the right signals : the triangle

was truncated and I could not obtain a sawtooth signal.

I checked the PCB tracks and found a track bug : pin 1 and pin 5 of U2 are connected by a very short track instead of being connected through R9 ! I fixed the problem by cutting this track and

I obtained a nice triangle waveshape. Still, I could not obtain a proper sawtooth signal.

I checked the schematic and component layout is noted that Q6 (2N3819) is reversed ! The source

is connected to pin 5 U4 while it must be connected to ground, and conversely the drain is connected

to ground while it must be connected to pin 5 U4. Therefore I rotated Q6 by 180° and I obtained a nice sawtooth!

Concerning the noise generator I changed the value of C5 to 1microF (tantalum, polarized) in order to increase the spectrum range towards low frequencies. With the original 10nF value the noise signal sounds bluish (only high frequencies) !

quote:

Originally posted by julian

The units are not shown either in the BOM or the schematics.

If theyre ceramics, id assume the units are uF, but then i see a post mentioning the use of poly layer, and, specifically changing the value of c9 up to 680nf, which would be quite a hike from the 10nf id assumed.

Anyway, can anyone give me some confirmation on this?

Cheers, julian

Oh, and the value of C6 - is down as 10/16. Now, is this 10v / 16uF, or is it 10uF / 16v?

Reply author: julian
Replied on: 04/15/2004 06:31:19 AM
Message:

Thankyou,

That is exactly the sort of detailed answer that will be so exceedingly usefull to me when building the module.

Much appreciated.

Julian.

Reply author: Dave Kendall
Replied on: 04/22/2004 7:59:25 PM
Message:

Hi.

quote:

I checked the PCB tracks and found a track bug : pin 1 and pin 5 of U2 are connected by a very short track instead of being connected through R9 !

Is this the(about 1mm) track that connects to one end of R7 and the track between R9 + R10?

For the record, on some boards, the pcb artwork for Q2 has been reversed, and is now correct, and these same boards have R1 and R4 **incorrectly** reversed on the pcb artwork. They also do not need the fixes listed in the LFO5A.pdf. (*cut the trace, and connect the 2 points*)

These boards don't have LFO5A printed on the pcb, and some sample batch codes are H&L-1 4802, and H&L-1 5103.

The (earlier?) boards for which the above does not apply, have codes of H&L-1 1104, and H&L-1 2203, and have LFO5A (C) EF on the pcb artwork.

The track layout around Q6 on all these boards is the same, so needs the fix suggested by Yusson in this thread.

There. Clear as mud. ☺

Regards,

DaveK

Reply author: unease4u

Replied on: 04/23/2004 06:08:54 AM

Message:

Is there some kind of revision numbers on the boards that makes it possible to figure out what fixes should be done without reverseengineering the board??

Reply author: Dave Kendall

Replied on: 04/24/2004 08:55:02 AM

Message:

Hi

There are no revision numbers on the boards - just the batch codes. There will no doubt be others that I haven't found. I've been condensing the oldlist.html, and aim to summarize all the fixes/mods and post them somewhere all in one place. I've started with the LFO5A, and will move on to others as they're built.

For completeness, here is the rest of the stuff I've found, suggested by guys in the forum.

C10 is not on the BOM, but is .01uF

D2 is listed on the BOM but doesn't exist.

Changing C5 to 1.0uF increases LF content of the noise signal (Yusson)

Increasing C9 to 640-680nF fixes voltage droop, if original .01uFcap is a cheap one. (Harry Bissell /Yusson)

Thanks to all the guys at the bleeding edge.

Hope this helps, and with any luck I'll have a working LFO soon☺

Dave

[Print Page](#) | [Close Window](#)

LFO5A track bug!

Printed from: Electronics For Music

Topic URL: http://www.ele4music.com/forum/topic.asp?TOPIC_ID=144

Printed on: 05/09/2005

Topic:

Topic author: Dave Kendall

Subject: LFO5A track bug!

Posted on: 11/25/2004 04:27:48 AM

Message:

Hi All.

Just finished testing a couple of LFO5As. I finally found a nasty track bug, which has been responsible for frying a couple of 74LS93 ICs in the staircase section. On some boards, there is a link between one end of R26 and one end of R22. This means that pin 8 of the chip is getting +15V. It doesn't like that much ☹️. Removing the link fixed the problem.

The offending boards are from batch numbers H&L - 1 4802, and H&L - 1 5103. These boards also have the legend for R1 and R4 reversed. They don't however need the track mods listed in the LFO5A .pdf, but DO need Q6 reversing. On these same boards, Q2 is also the right way round on the component legend.

H&L - 1 1104, and H&L - 2203 need the .pdf mods, Q2 and Q6 reversing, but don't have the nasty pin 8 bug, and R1/R4 are the right way round. These earlier boards have fatter pads, and LFO5A etched on the solder side.

I'll test the 1104 and 5103 boards soon. Hopefully there won't be any surprises.

As the square wave output was giving nearly $\pm 15v$ swings, I've put in a couple of resistors to drop the level to something comparable to the saw and triangle wave outputs. Output H now goes via a 2K resistor to a new attenuated output, and a 200ohm resistor goes from this new point to ground. You could also simply add a 5K LIN pot to the front panel wired in place of the new resistors, giving easy control of the amplitude of the Square out.

Cheers,

Dave K

Replies:

Reply author: Dave Kendall

Replied on: 12/02/2004 4:03:39 PM

Message:

Hi guys.

Just finished a few tweaks.....The H&L - 1104 board seems to be exactly the same as the 2203 board. the 5103 board is the same as the 4802. 😊

Re: rates for the LFO, the setting for T1 is quite critical to get the slowest possible speed. I

ended up with 12.82Kohms between +V and wiper, and 12.79K between -V and wiper, giving a difference of around 30 ohms, with the greater of the 2 resistances between wiper and +V. If it's the other way round the LFO won't cycle. All 4 tested boards showed very similar figures.

It's possible to set the minimum speed at about 1 cycle every minute or so, but if set too slow, sometimes it will "hang" and not oscillate when the pot and/or CV input is at minimum. T1 can also be replaced with a pair of slightly different value 13K resistors, saving the trimmer for another day.....

A 1M LOG pot for RATE gives smoother control in the lower frequencies. Replacing R4 with a 220K resistor ups the maximum speed available from the 1M RATE pot to about 20Hz, roughly in line with the CV inputs. If anyone has got a higher max speed out of the LFO, I'd be interested to know the details.

The last mod was to give scaling of the incoming CV, to get better control of rate when running the LFO slowly. If using a pot for this, 1K linear works well. CW end to incoming CV source, wiper to pin D (or E) CCW end to GND.

If front panel space is too tight for a pot, use a DPDT changeover switch + 2 resistors in place of the pot. It works well if the ratio between the 2 resistors is somewhere around 50:1. Increasing the smaller value increases the new (slower) max speed when incoming CV is at max.

If anyone knows how to increase the output level of the noise generator and sawtooth wave, please post the info!

Cheers,

Dave K

Reply author: yusson
Replied on: 12/02/2004 5:40:05 PM
Message:

Hi Dave

Thanks for these interesting information.

Concerning your two last questions :

- in order to increase the sawtooth level you can increase the value R36, for instance you can double it, then you must play with the 50K trimmer (T ?).
- concerning the noise output, you can increase the value of R15, using 2M2 for example you double the output level BUT BEWARE ! The output spectrum won't be flat anymore since the bandpass of the OPA tends to reduce drastically for very high gains and the noise is no longer white (it tends to get pinker and pinker)!

The other thing is to try and test various trannies for Q2 since the noise level may vary a lot from one transistor to another.

Yves

Reply author: Dave Kendall

Replied on: 12/05/2004 09:08:21 AM

Message:

Hi All.

Thanks for the tips Yves.

Replacing R36 with 20K brought the voltage swings of the saw up to about $\pm 3.4V$, the same as the Triangle. Tiny adjustments were needed to T2 to compensate.

The square got tweaked some more. The new improved values are 2K7 between pin H and the new output, and 1K between this new output and ground. The new output now produces roughly $\pm 3.4V$ swings, like the other 2 waveforms. If normalising the square to the S+H and staircase clock inputs, use pin H for this, not the new attenuated out.

Changing the value of R15 in the noise section to 3.3M - 3.6M brought the output up to a level where, when using it as an input to the S+H section, the voltage swings on the output of the S+H were greater - and closer to the LFO waveforms. Using a 330 or 470 nF capacitor for C5 produced a reasonably white noise output. With these value changes it works well.

I went up as high as 9M1 for R15, which increased the voltage swing of the S+H a lot when fed with this noise, but made the noise output seriously loud, and pinker than I'd like. If greater variation in voltage swing is needed from the S+H generator, the best thing would probably be to feed it from an external source.

In the sample + hold section, I noticed that at very slow clock speeds, when the voltage was negative, the output during each hold period would drift slowly upwards towards + voltage. This was much less pronounced when the S+H output was a positive voltage. The Caps used were 1.0nF metallised polyester, and didn't improve the situation very much over the original ceramic caps that were installed. Haven't a clue about that one!

Finally, if using the DPDT switch for range, adjust T1 with this switch out of circuit. The switch actually speeds up the minimum rate very slightly when in circuit. Wiring is as follows:

CV source-----O O-----N/C

PIN D (or E)-----O-O (to both centre pins)

CV source----- 100K-----O O-----2K2-----GND

Increasing the 2K2 resistor speeds up the max rate with the switch in circuit.

I guess it's now about time the LFO5A board got a rest....The 4802/5103 boards really don't like being re-soldered lots - plenty of the tracks have now been replaced with wired bridges...Anyway, it still works. 😊

Bye for now,

Dave

Reply author: Dave Kendall
Replied on: 12/06/2004 09:01:11 AM
Message:

Hi (yet again)

I couldn't resist posting this... The Staircase generator is very easily capable of a few more patterns! 😊

Samantha the cat tried to jump on my lap, just as I was about to connect a CV wire to the staircase output. I got jogged, and touched the end of R31 nearest pin J instead. A completely different pattern came out! The other points that produce new patterns are the end of R30 nearest J, and at the junction of R30 and R26. The fun really starts when you connect a CV with one or more of these points shorted together. Even more patterns! (One of them sounds just like one of the FSEQs in a Yamaha FS1R)

Thanks to feline intervention, I'm maybe considering a daughter board to take advantage of this weird feature.....😁

Oh, and 2K7 and 910 ohms is even better for the square wave mod.

Cheers,

Dave

Reply author: unease4u
Replied on: 12/07/2004 08:15:26 AM
Message:

Thanks alot Dave! Lots of good information! I have to try some of these mods to my LFO5a. I've planned to add a simple amplifier stage to the noise output before it is fed to the S&H so that I can have good levels both from the noise output and from the S&H output and not have to worry about the "whiteness" of the noise.

I also was not pleased with the range of the LFO rate, seems your tips can help me out here as well!

Cheers!

Electronics For Music : <http://www.ele4music.com/forum/>

© 2003 Electronics For Music

[Close Window](#)