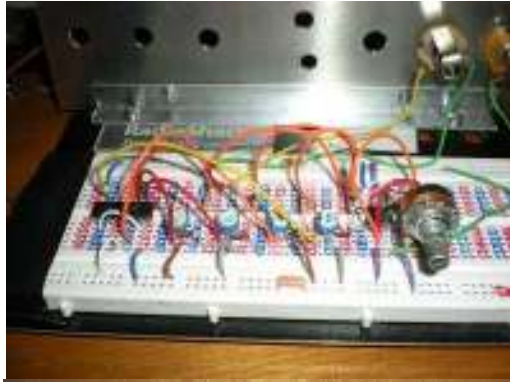


## 4017 "baby sequencer" 10 Step Sequencer

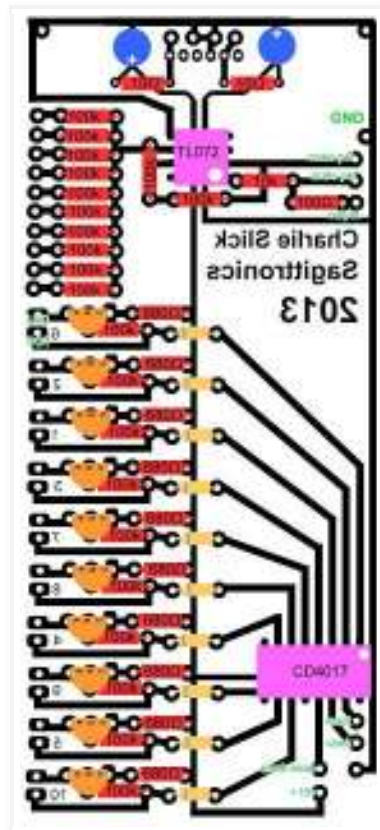
**UPDATE 6/1/13!!!** After playing with my sequencer for a little bit, I've noticed some stuff I'd like to change about it. A redesign in the near future which will include a switchable gate almost identical to the Gate Sequencer I built around the 4017 in this post. I also noticed that you need to convert the incoming clock signal to a very very short square wave, I am probably going to use a "gate to trigger" circuit similar to ken stones, which I think is basically a differentiator. Otherwise when the square wave (clock signal) falls from High to Low, the output voltage of the 4017 changes just enough to make the notes flat. expect a newer design soon!!

This is my first attempt at a sequencer. It's built around the 4017 Decade counter chip. It's my first foray into using CMOS's chips (unless you count the CMOS 555 in the ADSR). The design I came up with is an amalgam of the Baby Sequencer and various sequencers on [MFOS](#). I was trying to get away with as little circuitry as possible. This version of the sequencer doesn't include a gate output. So you can sequence control voltage only, you can't skip steps. My plan was to build a separate gate sequencer, which I thought would stretch the 10 steps farther.

I did a mock up of my design using little trim pots, just to test the basic concept, it seemed unnecessary to do this for all 10 channels.



It's really straight forward design and I never even made a schematic for it. I went straight from breadboard to PCB. so, I don't have a schematic to show you, but the PCB is incredibly easy to follow, so we'll work from there. Read the whole post before you build anything.



### Parts list

- 1x CD4017
- 1x TL072
- 1x 3904 NPN trannies (or equivalent)

1x 100k Pots

1x 50k Pot

1x 100k Pots

1x 50k Pot

2x 1/4" jacks

1x Rotary switch (10 or 12 position)

2x momentary switch (you want ones with a throw, not just open and closed)

22x 100k resistor

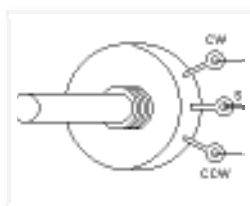
1x 680Ω or 1k resistor

1x 10k

1x 100Ω

2x 10Ω

2x 22uf electrolytic cap



100K POTS: Lets start with how the pots should be wired. I found this little picture online so I can refer to the pot pins without people getting confused. The pot output from the board for each channel should be soldered to the CW of each of 100k pots. The Center pin (labeled S) should be wired to one of the many returns above (the returns are all the points with 100k resistors, it doesn't matter which one, they all get mixed together). the CCW pin should be soldered to ground.

50K POT: you need one 50k pot for the "Scale Knob". Solder the CCW pin to one of the two scale pins on the PCB. Solder the Center Pin to the other point. Doesn't matter which one.

LED: The LED point on each of the Channels should be soldered to the positive pin (longer pin) and the Negative side to GND. I listed 680Ω resistors, but I ended up using 1K resistors with green LEDs.

next up is the clock input and reset and all that junk. this can get confusing.

CLOCK: Solder clock point from the board to the tip of a 1/4" jack, with Gnd to Sleeve. I found later, that depending on what you use for a gate signal, you may want to solder a diode from sleeve to tip (positive end toward ground and negative end to tip), this will stop all negative voltage from flowing into the clock. So, if you use a square wave from an oscillator as a clock signal for example, it will eliminate the negative crests, which I noticed causing the CV voltage to change when the wave swung from positive to negative.

RESET: Solder a wire from the CW pin of each channel pot(except for channel 1) to a pin on a 12 or 10 position rotary switch (in order), any remaining points on the rotary switch should be soldered to ground. Solder the common pin of the rotary switch to the Reset point on the PCB.

OPTIONAL RESET BUTTON: you can also add a push button if you'd like to be able to reset the sequencer with a button. Disconnect the Common pin of the rotary switch from the Reset point on the PCB and Solder it to the Normally Closed pin of the momentary switch. Solder the common pin of a momentary switch to the reset point on the PCB. Solder the +15V point from the PCB to the Normally Open point of the switch. essentially, when you push the button, you disconnect the rotary switch from the Reset point on the PCB and Connect the Reset Point to +15v, causing the sequencer to reset.

LOCK ENABLE: This allows you to pause the sequence. Connect the Clock Enable point on the PCB to the common pin of a momentary or toggle switch. Connect the Normally closed pin of the switch to Ground and the Normally open pin to +15v.



in retrospect. i think it would be nice to have a reset input. that would be added in parallel with the reset button, but with a diode to keep voltage from flowing backwards through the rotary switch to the channels.

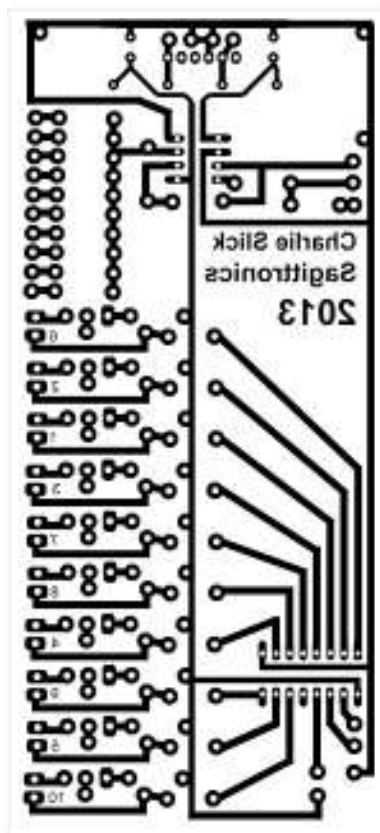
let me know if you noticed any mistakes. I am a novice.

here's a video of it in action with my yu synth wavefolder

Here's a video of it in action with my yu synth wavefolder

0:00

And here's the PCB



Posted by Charlie at 2:21 PM

## 11 comments:



**MIKZED53** May 14, 2013 at 1:36 PM

hi mike , great job , i'm very pressed to see your new version with gate output ; i love your blog page , like you i build synth diy , i hope to seen the new version very soon ,thanks

[Reply](#)

[Replies](#)



**Charlie** May 14, 2013 at 5:14 PM

Thanks, It's next on my list. I'm currently working on what I've been calling a "dividualator". it uses the 4017 to generate 3 sub octaves square waves. it can also be used as a clock divider with my soon to be updated sequencer. The sequencer might take a little while to finish because I'm working on a way to link a couple 8 step sequencers together to make 16 steps. I'm interested to see what you're working on, hit me up on <http://www.facebook.com/charlieslick>



**MIKZED53** May 22, 2013 at 8:14 AM

Hi Charlies , acually i worked on the 10Step sequencer based on baby 10 and the principal difficult as for make good



**MIKZED53** May 22, 2013 at 8:14 AM

Hi Charles , acually i worked on the 10Step sequencer based on baby 10 and the principal difficult as for make good gate , i have found solution with 4081 but i'm sure your next version with 16 Step + Gate will be better and great. I HAVE build yusynth , i making video next soon to see you my working , ;)thanks , mik



**Charlie** May 22, 2013 at 9:11 AM

AWESOME! yeah, I was gonna do a diode AND gate instead of using a chip, I think I would only use half of the 4081. can't wait to see the video. so, you used a 4017 as the basis, did you notice the pitch thing that I mentioned in my amendments in red?



**MIKZED53** May 22, 2013 at 10:20 PM

hi Charles i haave post vid on :[http://www.youtube.com/watch?v=zKCAcs\\_Isqc](http://www.youtube.com/watch?v=zKCAcs_Isqc)  
my sequencer is used wiht the acid sound at the first of this demo and after;  
i'M not sure i good undersand for your pitch problem but for me i thinks its ok.  
the ideal for these sequencer will be to build a quantizer ; thanks for your great blog



**MIKZED53** May 23, 2013 at 12:19 PM

I Have understood and no my clock signal doesn't affect the tune



**Charlie** May 23, 2013 at 12:35 PM

can you do a sketch or do you have a schematic of your sequencer that you would like to share with me via email?sagitttrionics(at>gmail. it would be greatly appreciated. I'm not sure why my sequencer does this but I'm starting to suspect some reasons.



**MIKZED53** May 25, 2013 at 1:36 AM

HI Charlie have you receive my mail ? IF not my base schema as here :  
[http://electro-music.com/forum/phpbb-files/baby10\\_sch\\_212.jpg](http://electro-music.com/forum/phpbb-files/baby10_sch_212.jpg)

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Reply



**nothing** November 21, 2015 at 2:20 PM

hey does this run on 12v?

Reply



**Unknown** October 12, 2016 at 5:54 AM

Hello

I am wondering what you are using as your gate signal in the video?

I am contemplating that a gate sequencer could be easily made within thes circuit, by tapping out on the outputs of the CD4017 before the potmeters..

Best regards, andreas

Reply

Replies



**Charlie** October 13, 2016 at 10:27 PM

yeah, I made a gate sequencer that way with a CD4017. This circuit is very early in my electronics education and experimentation There are a lot of things that are not great about this specific design.