

## Re: countdown 555 timer values?

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*Source:* <http://sci.tech-archive.net/Archive/sci.electronics.basics/2005-07/msg00638.html>

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- *From:* John Fields <[jfields@xxxxxxxxxxxxxxxxxxxxxxxx](mailto:jfields@xxxxxxxxxxxxxxxxxxxxxxxx)>
  - *Date:* Tue, 26 Jul 2005 16:14:54 -0500
- 

On Tue, 26 Jul 2005 11:36:27 -0400, John Popelish <[jpopelish@xxxxxxx](mailto:jpopelish@xxxxxxx)> wrote:

>John Fields wrote:

>

>> The tricky part is shortening up that first 555 pulse in astable mode  
>> (which is longer than the rest because of the need to get the timing  
>> cap up to 2/3V<sub>cc</sub> from 0V (instead of 1/3V<sub>cc</sub>) on startup) and getting  
>> all the shift register outputs to go high on startup.

>

>I think this is easily solvable by using a pair of capacitors in  
>series across the supply as the timing capacitor. If you use one  
>capacitor about twice as large as the other, the mid point voltage  
>will begin the first timing cycle at about 1/3rd of the total voltage,  
>just like it will be at the end of the next cycle.

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Yeah, that's clever!

---

>> Using something like three HC74's would solve the "start high" problem  
>> by using the Qbars as outputs, using their SET inputs for POR, and  
>> using their RESET inputs to start the timing sequence. Getting rid of  
>> the extended first pulse problem could be done by using a couple of  
>> 555 as monostables in a ring counter.

>>

>> Schematic on abse as "555 countdown timer (from seb), or:

>>

>> [news:poece11tgcals43avpikokbd73ubinh5kj@xxxxxxx](mailto:news:poece11tgcals43avpikokbd73ubinh5kj@xxxxxxx)

>>

>>

>> Then, of course, there's always:

>>

>> VCC>-----+-----+

>> || V+

>> | [RT] |

>> || [10K]

>> [R7] +-----|-\ |

>> ||| >--+--->180s

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```
>> +-----|-----|+/  
>> || V+  
>> |||  
>> [R6] | [10K]  
>> | +-----|-\\ |  
>> ||| >---+--->150s  
>> +-----|-----|+/  
>> || V+  
>> |||  
>> [R5] | [10K]  
>> | +-----|-\\ |  
>> ||| >---+--->120s  
>> +-----|-----|+/  
>> || V+  
>> |||  
>> [R4] | [10K]  
>> | +-----|-\\ |  
>> ||| >---+--->90s  
>> +-----|-----|+/  
>> || V+  
>> |||  
>> [R3] | [10K]  
>> | +-----|-\\ |  
>> ||| >---+--->60s  
>> +-----|-----|+/  
>> || V+  
>> |||  
>> [R2] | [10K]  
>> | +-----|-\\ |  
>> ||| >---+--->30s  
>> +-----|-----|+/  
>> ||  
>> | +-----D  
>> [R1] | G--+  
>> | [CT] S |  
>> ||||  
>> GND>-----+-----+-----+ |  
>> _ |  
>> R/T>-----+-----+-----+  
>>
```

>> In this circuit we use six comparators with references derived  
>> ratiometrically from Vcc, which will make the circuit insensitive to  
>> longish-term variations in Vcc. The circuit works by applying a short  
>> positive pulse to the gate of the MOSFET, which discharges CT and  
>> forces all of the inverting (-) inputs to the comparators lower than  
>> the reference voltages on their non-inverting (+) inputs. This will  
>> cause all of the outputs to go high. Then, when CT charges it will  
>> rise through each of the reference voltages on the + inputs  
>> sequentially, turning each of the comparators ON sequentially,  
>> forcing, and holding, their outputs low, one at a time.  
>>

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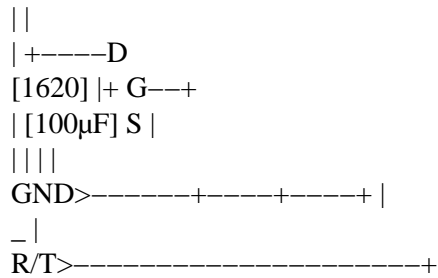
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>> In order to determine the widths of the various outputs we can use  
 >>  
 >> Vcc  
 >>  $T = RC \ln \frac{V_{cc}}{V_{th}} = kRC$   
 >> Vcc - Vth  
 >>  
 >> to determine what the voltages will be on the - inputs of the  
 >> comparators at the times we're interested in.  
 >  
 >This is a lot simpler than a whole batch of 555s running in parallel.

---  
 Yup, and here are the values for the passives:

```
VCC>-----+-----+
|| V+
|[787K] |
|[10K]
|+-----|-\ |
||| >---+--->180s
+-----|-----|+ /
|| V+
|||
|[232] |[10K]
|+-----|-\ |
||| >---+--->150s
+-----|-----|+ /
|| V+
|||
|[340] |[10K]
|+-----|-\ |
||| >---+--->120s
+-----|-----|+ /
|| V+
|||
|[511] |[10K]
|+-----|-\ |
||| >---+--->90s
+-----|-----|+ /
|| V+
|||
|[750] |[10K]
|+-----|-\ |
||| >---+--->60s
+-----|-----|+ /
|| V+
|||
|[1050] |[10K]
|+-----|-\ |
||| >---+--->30s
+-----|-----|+ /
```

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I haven't shown any hysteresis, but a megohm or so from each of the comparators' outputs back to their non-inverting inputs ought to take care of it without upsetting the thresholds too much, considering that that 100µF is +/- 10% at best.

Unfortunately, it turns out that the OP needed something other than what he asked for, so he won't be able to use the circuit. :-(

Fortunately, it was a fun exercise to linearize that cap's response without having to resort to an active current source! :-)

—  
John Fields  
Professional Circuit Designer

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• **References:**

- ◆ **[countdown 555 timer values?](#)**  
◇ From: Tristar500
- ◆ **[Re: countdown 555 timer values?](#)**  
◇ From: John Fields
- ◆ **[Re: countdown 555 timer values?](#)**  
◇ From: aman
- ◆ **[Re: countdown 555 timer values?](#)**  
◇ From: John Fields
- ◆ **[Re: countdown 555 timer values?](#)**  
◇ From: John Popelish
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