

## Re: 1Mhz -> 1hz

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*Source:* <http://sci.tech-archive.net/Archive/sci.electronics.design/2005-12/msg04057.html>

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- *From:* [bill.sloman@xxxxxxxx](mailto:bill.sloman@xxxxxxxx)
  - *Date:* 22 Dec 2005 15:53:08 -0800
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theJackal wrote:

> On 21 Dec 2005 17:11:27 -0800, bill.sloman@xxxxxxxx wrote:  
>  
>  
>>  
>> But 22 flip-flops isn't quite enough, even if two of them aren't in  
>> divide by 12 packages  
>>  
>  
>  
>> I don't think your mathematical exercise took you anywhere useful  
>>  
>>> The real limit is still 20 bistables.  
>>>  
>>> <grin> If I was you I wouldn't bet my life on that ... I got some  
>>> ideas on beating that limit!  
>>  
>> Hmm - ternary logic? I suppose there might be a way of exploiting the  
>> fact that a tri-state output can be in three states ...  
>>  
>>>> Guess. If you can't ask .  
>>  
>> I'd love to know what you've got in mind.  
>>  
>>>> You never seem to understand what I say ...  
>>>>  
>>>> Unfortunately, I understand it all too well - as well as what you don't  
>>>> say because you haven't understood the problem well enough to think it  
>>>> through properly.  
>>> I was acting in a subtle manner, read above ... it wasn't easy for  
>>> anyone to guess where the math was pointing to!  
>>  
>> Nothing complicated about where it was pointing - the puzzling aspect  
>> was why one would want to point the OP that way.  
>>  
>>>>  $2^{20} = 1,048,576$  You won't get 1Mhz with that . You need some more  
>>>> hardware there-  
>>>>

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> >> >The question was restricted to D-type flip-flops, and I've already  
> >> >indicated that I'd use one more to produce a tidy reset pulse.  
>  
> LOL ... Oh gosh  
> Bill there you go again with your desperado tactics. First you say the best I can get to  
> is 24ffs with mod12 counters. I show you that you are wrong and you say ... so what .

You didn't. If you restrict yourself to mod-12 counters, you need six of them, which is 24 bistables.

If you loosen up and use five mod-12 counters and a dual D-type, you still don't get 1MHz down to 1Hz, though you do get pretty close, without any preloading or decoding.

Quite why anyone would bother to do it that way escapes me.

> Then you say why point the OP that way. Did you understand his question with flip  
> flops?... He wants a 1 Hz signal ... and do you understand that counters will get you  
> there? Do you know what counters are made of?

Don't be silly. I'm so old that I've made bistables with discrete transistors. All the computation I did during my Ph.D. project was done on computers that were built entirely with discrete transistors, and the guy that taught how to program the PDP-8 though we needed to know how to build our own bistables, not that I used his notes when I did need to roll my own.

> You claim that 21 flip flops will get you to 1MHz ... and  $2^{21}$  is 2,09715200E+006Hz.  
> Hell whats wrong with you?

Nothing. I do happen to know about decoding the outputs of counters so that they reset before they reach their maximum count. I had thought that everybody who posted here knew that sort of stuff.

If you don't understand decoding, you might be able to understand how to preset a counter. If you plow through enough of this thread, you will find my suggestion that the OP might use 74HCT40103 8-bit counters which are intended to be used in exactly this way -

[http://www.semiconductors.philips.com/acrobat\\_download/datasheets/74HC40103\\_3.pdf](http://www.semiconductors.philips.com/acrobat_download/datasheets/74HC40103_3.pdf)

Have a look and learn something.

> Can you tell a desperate man by looking at his face ? I'm sure you can .

Your confidence is amusing.

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Bill Sloman, Nijmegen

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