

Re: Accurately measure C of electrolytic capacitors ?

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From: gmv (noemail_at_please.123)

Date: 02/07/05

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"Watson A.Name - "Watt Sun, the Dark Remover"" <NOSPAM@dslextreme.com> wrote in message news:110cnbn267cd7fe@corp.supernews.com...

>
> "gmv" <noemail@please.123> wrote in message
> news:jJdNd.21541\$C24.9629@attbi_s52...
>> Interesting,
>> I always thought the opamp buffered the output
>> so you could hook it to anything between 2K
>> and infinity.
>> I will keep in mind what you have said.
>> I have noticed a terrible ringing effect at Q
>> 5 and above.
>> Maybe that is what you are talking about.
>> In any case I really need to see things between .5Hz
>> and 2Hz. It is only the noise in my local area that
>> keeps me from doing this as far as I can tell.
>>
>> <http://home.mchsi.com/~gmvoeth/index.html>
>>
>> will show a bit more of what I am doing.
>
> Buy the RS printed circuit board that has the same layout as the
> breadboard. Build the circuit on that board, and put it inside of a
> metal enclosure, so that most of the noise is kept out of the circuit.

What is "RS printed circuit board " ?

I have settled on using only a single filter as is now posted to my web site. This will limit one to only seeing P waves but in this noisy environment it is the best I can do. I agree with everything you say except I can not put a preamp outside with the Geophone. There is a circuit I have included not on the schematic and it is a 567 tone decoder on the back

end to decode WWV calibration marks.

Thanks for your advice, I can see a lot of common sense to it. But I still do not know how to buy a circuit board that already has my layout on it. I figure I will have to do the layout and etching etc... myself.

>
> *All preamplification should be done as close as possible to the geophone, to get the signal well above the noise _before_ it goes any distance.*
>
> *Filtering should be done at the other end, to get rid of noise in the long transmission line between the sensor and the PC.*
>
> *One other important point. The outside can of the electrolytic is at signal level, and is a large capacitance to the outside world. Just shielding these from outside noise should help. You might consider putting some aluminum foil over the ones at the input, and grounding the foil to common. Just to see how much it will help to put the whole thing in an enclosure.*
>
>> *"Watson A.Name – "Watt Sun, the Dark Remover"" <NOSPAM@dslextreme.com> wrote in message news:1109v26sjt1i70c@corp.supernews.com...*
>>>
>>> *"gmv" <noemail@please.123> wrote in message news:EJINd.51210\$eT5.4698@attbi_s51...*
>>>>
>>>> *"Watson A.Name – "Watt Sun, the Dark Remover"" <NOSPAM@dslextreme.com> wrote in message news:11097hnlc4n3q25@corp.supernews.com...*
>>>>>
>>>>> *"gmv" <noemail@please.123> wrote in message news:f_QMd.49525\$eT5.27123@attbi_s51...*
>>>>>> *Sorry, Do not know what a DSP/FIR is.*
>>>>>> *I am using only 8 bit data.*
>>>>>> *Surprising enough the filters work quite well between 1Hz and DC just like they do between 1Hz and infinity. The only problem I have is getting those capacitors in a non-electrolytic form.*
>>>>>> *I have found I can get pretty good matches in frequency simply if I can know the true value of the capacitors.*
>>>>>> *The design matches the theory if only I can match the capacitors.*
>>>>>> *I used to laugh at precision and accuracy but I have found that is the only way to go when dealing with filter circuits and possibly oscillator circuits too.*
>>>>>> *The only way I will play with things like FIR or DSP is if it will handle data from a non-linear I still think*

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>> >> >> *kind of sensor that tends to overdrive the
>> >> >> preamp at high freqs making it impossible to
>> >> >> look at the low freqs also it got to be cheap.
>> >> >> I need to filter out
>> >> >> the upper freqs right off the bat or it is
>> >> >> impossible to get enough gain to look at the low.
>> >> >
>> >> > I still think you need to raise the impedance of the circuits
>> >> > up high enough so that the capacitors are much smaller.
>> >>
>> >> That increases the noise.
>> >>
>> >> >
>> >> > Using FET input opamps and megohm resistors, you should be able
>> >> > to get down to very low freqs with caps of a microfarad.
>> >>
>> >> I think I need BJT types if I remember right
>> >> they are lower in noise. I have found chopper
>> >> amps to be out of the question.
>> >>
>> >> >
>> >> > I offered that Action Electronics web page with the motor
>> > capacitors,
>> >> > but I don't know if they are electrolytic or not. Maybe someone
>> >> > could help. They also have tantalom caps, which are more stable
>> >> > than 'lytics. <http://www.action-electronics.com/capacitr.htm>
>> >>
>> >> motor caps are too high power for my needs
>> >> I am just using small signal here.
>> >> NP caps are what i need.
>> >>
>> > Well, the motor caps are non-polarized. That's what you want.
>> > And they are not electrolytic, I believe, but I'm not certain.
>> > And the power doesn't make any diff, but they are large, and
>> > that might be a problem. As I already mentioned, there are
>> > ceiling fan capacitors at the local hardware store that are
>> > about 10 uF, and are not very large. ANd reasonably priced IIRC.
>> >>
>> > About noise, you decrease noise by reducing the bandwidth. You
>> > reduce the bandwidth by reducing the load on the tuned circuit.
>> > You do this by increasing the impedance of the load on the tuned
>> > circuit, IOW use a higher resistance, and that means FETs or
>> > other very high impedance amps.
>> >>
>> > I think you are getting more noise because you are decreasing
>> > the bandwidth by keeping the load the same impedance, but
>> > increasing the tuned circuit impedance. That's backwards
>> > from what you should be doing.
>> >>
>> >> I think the ceramic ones would be perfect.
>> >> I just want ones that will read consistant with my C meter.*

>> >>
>> >>
>> >> *Thanks to everyone for your answers*
>> >> *but like always I must seek a solution myself*
>> >> *because it is so rare I really find any answers*
>> >> *on these newsgroups.*
>> >> *It is as if the Engineers and Scientists*
>> >> *avoid this internet stuff like it is the plague.*
>> >> *I just tried building my own cap and a monster*
>> >> *size it was and only 3.3nf...they must be very*
>> >> *hard to make at 10uf or higher and be small.*
>> >> *You need to use the same technology that makes*
>> >> *ICs. Thin layer of metal, thin layer of insulator,*
>> >> *do this repeatedly until you get the right value.*
>> >> *Surely there must be a breakthrough in technology*
>> >> *to make decent high value caps.*
>> >> *Sort of like the movie THIS ISLAND EARTH*
>> >> *I need to find that engineers supplier of*
>> >> *interocitor parts.*
>> >>
>> >>
>> >>
>> >>
>> >> >
>> >> >
>> >> >> *Yes, a log amp is a possibility, I have already*
>> >> >> *considered that. But the signals I now receive*
>> >> >> *are good enough for myself and all I wish to do*
>> >> >> *is to bring closure to my circuit be acquiring what*
>> >> >> *I consider to be decent capacitors. These electrolytics*
>> >> >> *are seemingly only for one frequency because*
>> >> >> *funny things start happening if you read the*
>> >> >> *capacitance with different frequencies.*
>> >> >> *Like I get a lower capacitance at a higher frequency.*
>> >> >> *I have found no such problems with regular*
>> >> >> *caps that do not use an electrolytic form.*
>> >> >> *Your solution would be possible if I had a sensor*
>> >> >> *resonant at 20 seconds but the Geophone I am using*
>> >> >> *is resonant at something over 1 Hz.*
>> >> >> *Geospace has just the device I would like to have*
>> >> >> *they have a .5 Hz Geophone but they want about*
>> >> >> *\$3000 for one and that is way too high for someone*
>> >> >> *living on Social Security.*
>> >> >>
>> >> >>
>> >> >> *"Rob Gaddi" <rgaddi@bcm.YUMMYSPAMtmc.edu> wrote in message*
>> >> > *news:cu0elc\$t4c@gazette.corp.bcm.tmc.edu...*
>> >> >> > *While I hate to give my usual answer, have you considered just*
>> >> >> > *digitizing the data and running it through a DSP? You're talking*
>> >> >> > *about some massively slow filters to be trying to make with*
> *any*

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>> >> > *reliable tolerance in analog, and with component values that*
> *large*
>> >> >> > *it's not going to be cheap. Plus you can use a linear FIR*
> *filter*
>> >> > *and not have to worry about the phase distortion you were*
>> >> >> > *mentioning.*
>> >> >> >
>> >> >> > *If your noise is really swamping the signal, and dynamic range*
> *is*
>> > *a*
>> >> > *concern, at the low speeds you're talking about you could run*
>> >> >> > *the signal through a log amp before you A/D it.*
>> >> >> >
>> >> >> >>
>> >> >> >> *Lucky for me different phases of Earthquakes*
>> >> >> >> *seem to prefer different frequencies.*
>> >> >> >> *But my picture will never be as good as the*
>> >> >> >> *big boys.*
>> >> >> >> *Just too darn noisy at this location.*
>> >> >> >> *I get a terrible noise at maybe 15 Hz or so.*
>> >> >> >> *Need to filter like crazy to get rid of it.*
>> >> >> >> *It drowns out just about everything i try to do.*
>> >> >> >> *I suspect but can not prove that my geophone*
>> >> >> >> *is out of spec and not working at the 1Hz*
>> >> >> >> *it is supposed to.*
>> >> >> >> *The only adjustment I can make is to center the*
>> >> >> >> *mass in the housing. If there is a way to lower the*
>> >> >> >> *resonant freq I would sure like to know.*
>> >> >> >> *I am thinking of finding some weights to put on*
>> >> >> >> *the adjustment screw as much weight as can still be*
>> >> >> >> *centered.*
>> >> >> >> *But it is my experience that for a spring to*
>> >> >> >> *lower its frequency it needs to extend or compress*
>> >> >> >> *farther in distance. similar to a pendulums length.*
>> >> >> >> $T=2\text{Pi}\sqrt{\text{length}/\text{gravity}}$
>> >> >>
>> >> >>
>> >> >
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>> >
>>
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>
>