

Re: Dual sine wave generator with variable frequency and 90 degree phase difference

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On Wed, 20 Aug 2008, Steve wrote:

I'm looking for a waveform generator that outputs two sine waves of the same frequency with 90 degree phase difference (sine and cosine). I need a variable frequency between 0.05 Hz and 10 Hz. Is there a design that uses a single potentiometer or perhaps is voltage controlled? Low distortion is not a requirement.

Steve

The classic solution is a tri-state filter, with feedback to make it oscillate.

If you really need one pot to control it, then you use some gain element as the variable in the filter, and use one pot to control each.

It was all covered well in Don Lancaster's "Active Filter Cookbook" and for that matter in all kinds of material about electronic music.

Of course, if distortion isn't an issue, especially given the low frequencies, you might want to generate two signals 90 apart, easily done digitally with a couple of flip-flops, and then use some method to convert it to stepped sine waves. Walking ring counters and summing resistors on the output were the way decades ago, well covered in Don Lancaster's "CMOS Cookbook" among other places. It seemed to be the method used in a lot of ICs. And done right, you can generate the two 90 degree apart waveforms with one walking ring counter and suitable summing resistors.

Michael