

Using Ice-Cream Cones to make Sine Waves

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I'm writing this blog the day after a very satisfying Thanksgiving holiday, and I still have food on my mind. So what does food have to do with motor control? Well, let me show you how to make beautiful three-phase sine waves using nothing but ice-cream cones.

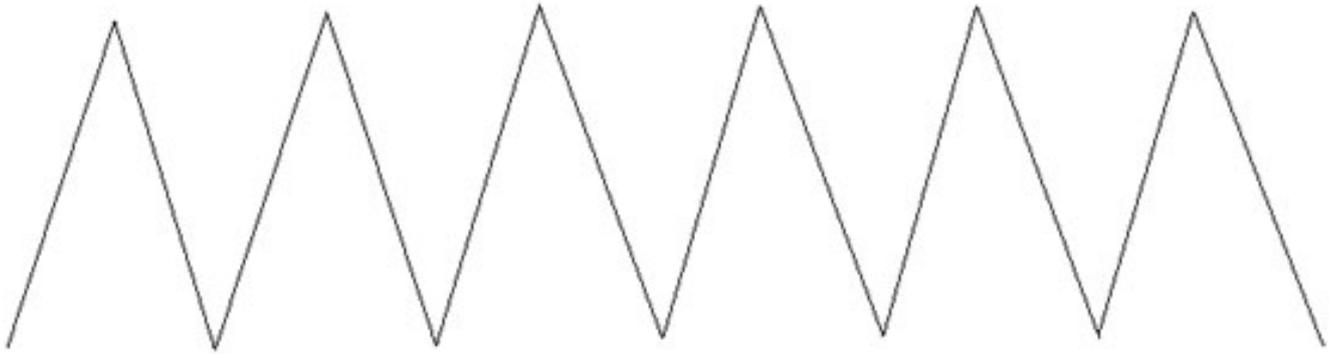
But first, I would like to dedicate this blog to all you managers of motor control engineers. I salute you, as you definitely have your work cut out for you. Motor control touches so many elements of engineering, science, physics, software, etc. that you probably find yourself managing a very diverse team. And your job is made more difficult if you do not have a motor control background yourself, or have gotten a little rusty on some of the technology. For example, have you ever been in a technical meeting with your team and felt left out because you couldn't contribute to the discussion? When your engineers go to the whiteboard, they draw space vector diagrams, but when you go to the whiteboard, you draw project schedules. And even if you wanted to draw a space vector diagram, are you afraid that it would look more like a pie chart than a vector plot? Well, then this blog is for you.

Here's a little trick I learned many years ago that will impress the socks off of your team, and it's the kind of stuff they don't teach in school. Motor control engineers are always drawing three phase sinewaves for one reason or another. Here's a simple yet effective way to draw beautiful three phase sinewaves and maintain almost perfect 120° separation of the waveforms. Your engineers will be in awe as you stride confidently to the whiteboard, and draw these waveforms like a pro. Even if your background is sales (no offence to all you sales folks out there), your team will be convinced that you must have a power engineering background to draw these waveforms with such poise and grace.

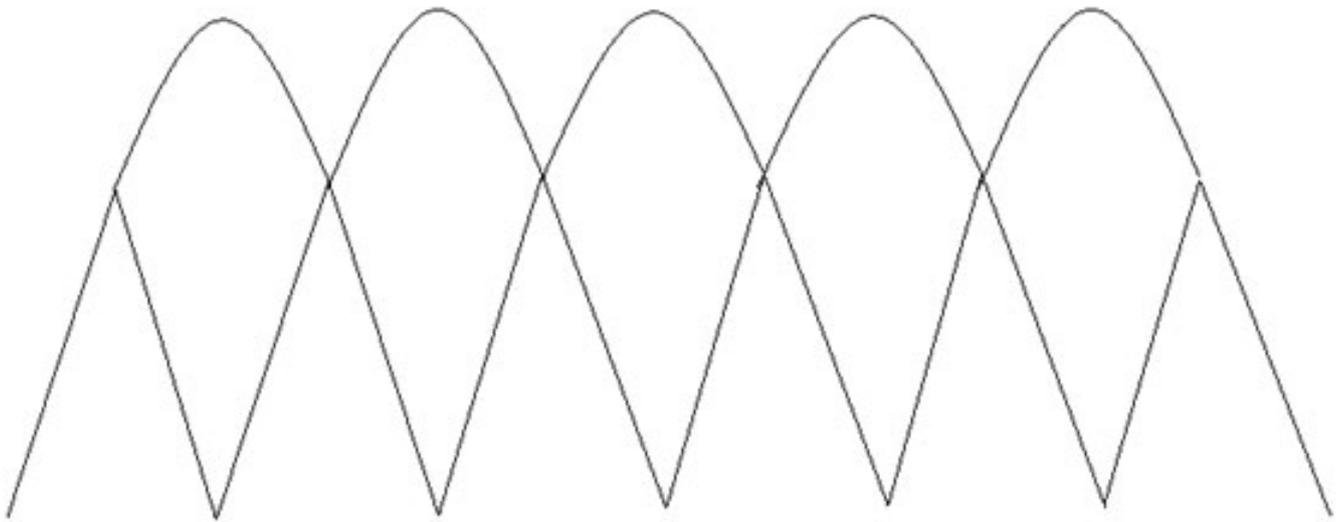
Here's how you do it. First, draw a saw-tooth looking waveform, like this:

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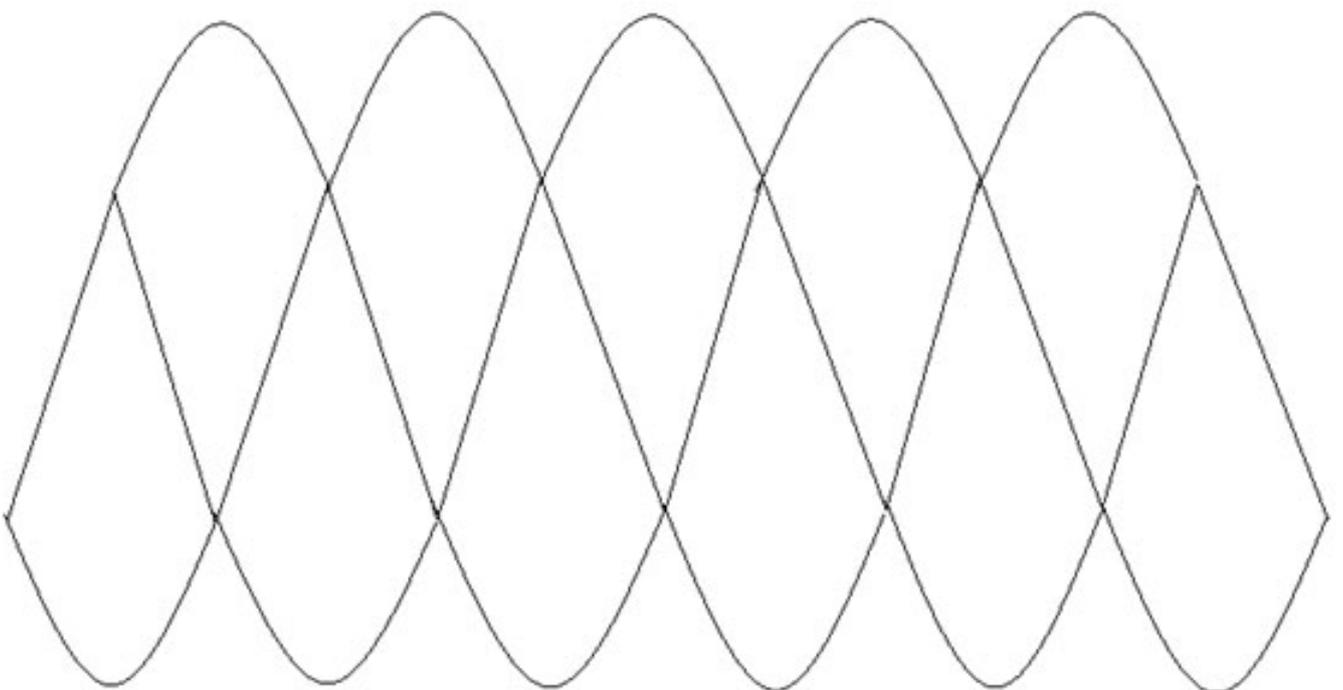
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Next, fill the "right-side-up" cones with ice cream:



Finally, do the same for the "up-side-down" cones:



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With a little practice, you can even do this while talking about something like "the complex math engine on the new 28065 MCU" at the same time! Your engineers will be convinced that you are a motor control god! (Don't worry, I won't tell. It will be our little secret. ;-)

Have fun!

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