

# Two-phase Magic Sinewaves

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**A** newly discovered class of mathematical functions known as **Magic Sinewaves** holds great promise for dramatic improvements of power electronics efficiency for such tasks as **ac motor speed controls, electric vehicles, telephone & datacomm, power quality conditioning, solar pv conversion, aerospace apps, and battery powered inverters.**

Magic sinewaves offer the **FEWEST switch events for highest possible efficiency, allow any chosen number of low harmonics to be forced to near-ZERO values, and are highly low end microcomputer friendly,** among many other advantages.

Included in the many hundreds of resources in our **Magic Sinewave** library page are this **Single Phase** tutorial, this **Three Phase** tutorial, this **Demo Hardware** or this **Software, Consulting & Seminar** services, and a **Development Proposal.**

## Two-phase Magic Sinewaves

Several clients have asked about the feasibility of **two phase magic sinewaves.** These would be useful for permanent split capacitor reversible drives and similar servo style motors. They also offer opportunities to generate lower frequency ultra low distortion in-phase "**I**" and quadrature "**Q**" waveforms over a reasonably wide frequency range and an extreme amplitude range.

It is a simple matter to create a 90 degree phase shifted magic sinewave by minor sourcecode alterations of existing 0-phased designs. A single chip **best efficiency** solution that produces both I and Q channels would seem difficult because the **I** and **Q** outputs can **lead, overlap, center, or be centered on** as a function of your amplitude. Thus, the **port patterns would have to vary with output amplitude.** This restriction is greatly eased with **normal** magic sinewave sequences, especially those with an **even** number of pulses per quadrant.

Thus a **two-chip Magic Sinewave** solution seems eminently practical. While a one-chip approach might prove somewhat costly and complex. For further details, you can **email me** for additional assistance.