## The Curious Saga of the Magic Lamp

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guess it has been long enough that I can reveal some secret insider details of my favorite **pseudoscience** yarn, **the saga of the magic lamp**.

The only "correct" way of measuring power in a changing waveform is to take very small samples and then multiply their instantaneous voltage times their instantaneous current. **Known as a "RMS" or "Root Mean Square" measurement**. Per details you can find **here** and **here**.

Until recently, true RMS measurements were outrageously expensive and virtually all cheap instruments measured average rather than RMS values. On a full and clean sinewave, the difference was only eleven percent or so. Which the meter people dealt with by stretching their scale and everybody else simply ignored.

**Painting the "eleven percent" on a meter face had the curious side effect of convincing everybody it was an immutable physical constant**, rather than being highly and excessively waveform sensitive.

What was little known and eventually became Beginning EE Student Blunder #001-A was that **the differences between average and RMS could become utterly outrageous for low duty cycle waveforms!** Ferinstance, any half wave **phase control** set in the 130 degree range would have an average to RMS error of around 3:1!

An individual was playing around with a circuit pretty much the same as a half wave thyratron phase control from a 1939 industrial electronics text. On the cheap meters they were using, they noted a 3:1 voltage difference and a 3:1 current difference, which led them to the conclusion that their "magic" circuit only was drawing one ninth of the normal power.

The key waveform involved had a very low duty cycle, which let them run a 28 volt light bulb off the 110 volt line.

At this point, they could have saved bunches of hassle and trouble by **touching** the lamp and noticing that it was not any cooler than normal.

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— The Saga of the Magic Lamp 1—
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Or simply recognizing that a 9:1 energy savings in an old stock and popular circuit might have been noticed by somebody else somewhere along the way.

In general, **perpetual motion machines are frowned upon** and the immediate question that should have been asked was "Exactly where and how did I fuck up?"

Instead, they went out and **patented** their miracle energy saver. The fact that the patent was granted was sort of strange since it was an old textbook circuit that I alone had published nationally in one form or another in dozens of projects over several decades. As had many **others**.

Albeit without any energy anomalies.

At any rate, they offered a construction story and kits in a national magazine, not recognizing that what they had was criminal fraud rather than an earth shaking new energy breakthrough.

The magazine managed to work out from under their part of the **four paw** by coincidentally having the story run in an April issue and later publishing some disclaimers in their letters column.

Wait. It gets worse. Besides being not even wrong, the circuit is illegal under power factor correction regs! Even the best of new rms instruments force highly restrictive crest factor limits. Late phase angles have raised both sensitivity and stability issues elsewhere. The chosen late phase angle came close to absolutely optimizing the possible error.

Bulb life is more than **hypersensitive** to easily exceeded currents. Low voltage, high power bulbs are presently rare and expensive. Besides offering very limited choices. And, of course, waiting in the wings were the LED's with their genuine 9:1 improved efficiency.

The closest that I personally dared to get to all of this was **this column** and **this column** in a related magazine.

But finding out exactly where and how they screwed up was certainly a highlight of my ongoing **pseudoscience bashing activities**.

More on the perils of patenting here. More on bashing pseudoscience here. More on product design and development here. An adaption of the original magic lamp story here.

