Low Cost Pure Sine Wave Solar Inverter Circuit
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Goal
- Our goal is to create a pure sine wave solar inverter circuit while maintaining a low cost.
- The circuit will have a 12V DC input from a solar panel and a 120V AC output at 60 Hz.

Research Challenges
- Implementing a cost-effective control strategy for the circuit
- Maintaining a relatively high power efficiency
- Obtaining a pure sine wave output from a square wave input

Methodology
- A clock signal for the circuit will be generated through the use of a 555 timer IC.
- The clock signal will control a decade counter IC which is responsible for optimization of the waveform and triggering of the H-bridge circuit.
- The H-bridge circuit will provide a square wave output similar to that of a modified sine wave.
- A passive filter circuit will keep power dissipation low while properly integrating the square wave into a pure sine wave.
- A transformer will be used to achieve the correct output voltage.

Results
- The circuit and obtained 120V 60hz output signal are shown above. Note the signal has minimal distortion and resembles a pure sine wave.
- Modern sine wave inverters create a very similar output; however at $50, our design is half the price.

References