

I used to use an AC output adapter to get the line clock but at the cost of doing the rectification/filtering on the clock. I didn't like this for a few reasons:

1. I had AC output adapters mixed with DC output adapters and would eventually plug an AC adapter into a DC project... not good.

2. The rectifier/filter were large and inefficient adding extra space and heat to the project, leaving this in the adapter was better.

3. The cost of the rectifier, filter and assembly at the adapter level made use of a built in quantity discount for those parts and the labor that I could never hope to match on my end.

Although the schematic for the processor-less clock is "mostly" correct, the actual circuit is a bit more complex and does the following: The ripple voltage present on any AC to DC adapter (Unregulated!) is low pass filtered and then AC coupled into a DC reference point into the (-) input of the comparator. The (+) input of the comparator is biased similarly and has hysterisis built in by virtue of the positive feedback from the output. A capacitor in parallel with the feedback resistor provides a high speed feed back path that helps to wipe off any remaining high frequency noise, thus preventing the comparator form multi-clocking the rising and falling edges of the 120Hz output. (The LM311 is actually very sensitive and fast for being such an old device!)