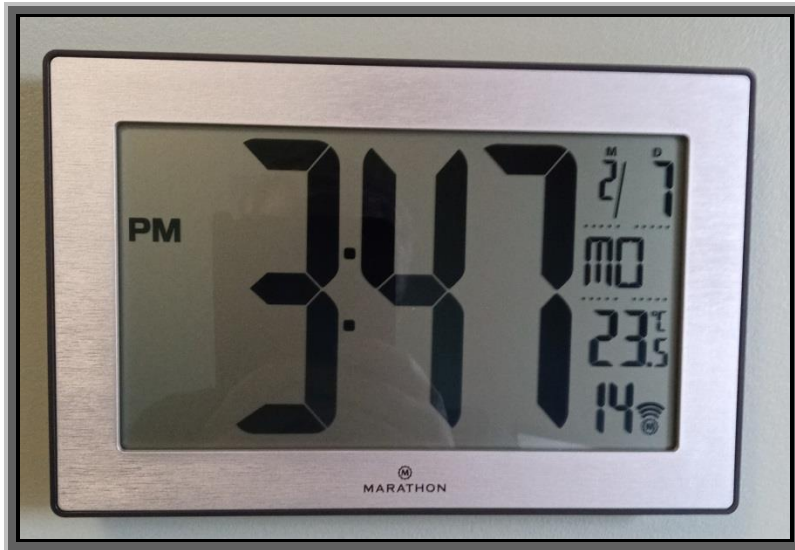


Marathon Atomic Self-setting Clock



This is a Radio Controlled Clock that I found on Amazon, series model cl030068. It was inexpensive and what was interesting is that it would use the WWVB 60 KHz signal for synchronization so I assumed the accuracy would be quite good. My location is about 1300 KMs (810 miles) from WWVB. The manual quotes a range of up to 2000 miles. What the clock appears to do is look for the signal after midnight for synchronization. After synchronization it free runs until the next night. This clock will gain about a second and a half a day when free running. Here's a quote from the manual. "The internal quartz mechanism is very accurate; therefore, it does not matter if the clock is occasionally unable to receive the time signals". A second and a half a day doesn't seem all that accurate especially using a quartz reference. I assume they mean a quartz crystal here. I haven't taken the clock apart (yet) but I doubt that there is an adjustment for the quartz crystal to make the clock more accurate during the free running period. I use the WWV signal at 10 MHz to check the clock accuracy.

You can do a manual search for the WWVB signal. There is a button on the back called WAVE to do this. I have tried this on a number of occasions and it almost always never works while attempting this in the HAM shack. This room is on the south side of the house facing WWVB and on the ground floor.

I have an SDR receiver that covers 60 KHz. I don't have a proper antenna for 60 KHz but was curious what the signal strength was like. The signal strength indicator showed between -100 dBm and -90 dBm over a period of a day. This was with an outside antenna during the winter. Not super strong but it was there. With a loop of wire I checked the noise at 60 KHz around the Ham shack. My 32" computer monitor appears to be the worst source of noise around this frequency and maybe enough to block the signal from WWVB but the monitor would normally be off during the synchronizing period. With everything off in the HAM shack the clock will still not synchronize although with today's electronics not much can truly be turned off. This is unfortunate because this is where I wanted to use the clock.

Here is a link to a document by NIST providing signal format and other interesting information.

<https://tf.nist.gov/general/pdf/2422.pdf>

This clock does not appear to meet some of the recommendations provided in this document, for example, accuracy while the clock is free running, that is, between synchronization periods. Also, if the clock hasn't synchronized in a while (many days) the clock still indicates it is receiving the signal and it's good to go.

I have tried the clock in another room on the south side of the house where it synchronizes when doing a manual synchronization but never synchronizes when it is supposed to do it automatically at night, so this night synchronization does not work.

So that's it for now. The clock may work for some people but not for me.

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