

The significant changes made to this version for continuous sweep hand clocks since the version originally posted on the *Silicon Chip* website for stepping type clocks (ver 1.2).

Bug fixes:

- Modified to remove the chance that an interrupt might change variables while the mainline code is using them.

New Features:

- Modified to drive continuous sweep hand clock movements. Accordingly this version must be used with modified controllers as described in the November 2009 issue of *Silicon Chip*.
- The clock is started by setting the hands to exactly the next hour or half hour and inserting the batteries. The clock will wait until the correct time and then automatically start running.
- The Setup button can be pressed (while the clock is running) to force an immediate synchronisation using the GPS. Note that the button needs to be held down for a couple of seconds.
- When the clock is running and it successfully synchronises via the GPS the startup LED will flash once. This is of dubious value as the clock will spend most of its time with the controller board hidden, but it may be useful if you used the Setup button to force a synchronisation and wanted to check the result.
- If the battery is flat the clock will stop at exactly the hour or half hour. Before you replace the batteries you need to position the hands at the next hour or half hour.
- If the GPS module is completely dead, the microcontroller will retry 10 times with a delay of 4 hours each time before stopping at 10 minutes before the hour or half hour.
- If the GPS module cannot lock onto enough satellites it will retry 10 times with a delay of 4 hours each time before stopping at 5 minutes before the hour or half hour.
- The setup menu has an additional option to manually run the clock for a specified amount of time. This enables you to easily test different values for the clock pulse width.
- While the clock is waiting to start (after the batteries have been inserted) you can press the setup button to force the clock to run. This is a handy way of getting the second hand to the exact 12 o'clock position.