ClockFOUR Chronogram Test Plan

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David Pincus
v0.90

Overview:

Chronogram is a clock that tells the time with words. It has a 14x13 RGB pixel matrix that is powered by an external 5V 3A power supply.

Functionality to be tested

PCB assembly

Visual inspection

- Visually inspect each board for defects

Vibration and flex test

- Gently flex and twist the board
- Tap the board several times on each side on a hard surface (like a table)
- Run your hand and fingers over each component to ensure they are not loose

Flash bootloader using ICSP

- Successfully flash the Arduino bootloader onto the board using the ICSP header (with pogo pins)

Flash code using FTDI

- Successfully upload the ClockFOUR software using the FTDI header
- Disconnect the FTDI header

Smoke test

- Connect the external power supply (Solder the power jack to the board with

wires included in the kit BOM)
- Examine the board for any signs of heat or smoke

Self test mode
- Restart the clock by pressing the reset button
- While the welcome message is scrolling across the display press either MODE or COLOR button
- When the message has finished scrolling the clock will enter self test mode
- The LEDs will light up sequentially RED, GREEN and BLUE and then repeat
- Check that all 182 LEDs each display red, green and blue correctly, at the same brightness level
- Press either MODE or COLOR button once and the clock will begin displaying all time words rapidly in bright white
- Check that all LEDs have the same consistent brightness - If you see any colors something is wrong!
- Pressing MORE or COLOR to exit self test mode and return to normal time mode

Button and user interface test
- Check to make sure the clock is working properly
- Tap the color button to cycle between all white, solid color, slow color fade, rainbow color fade, party mode (rapid random colors) and then back to all white
- Press and hold the color button to display the color picker (large colorful circle)
- The circle will slowly fade between all colors
- Release the button and the clock should enter normal time mode with the solid color shows on the color picker
- Press the mode button once to display seconds mode
- Press the mode button again to return to time mode
- Press and hold the mode button to set the time (displays “SET” and “H” and then a large digit)
- Press the color button to increment the hour
- Press and hold the color button to quickly increment numbers
- Press the mode button once to lock in the hour and change to set minute mode (displays “SET” and “M” and then two large digits
- Press color button to advance minutes; press and hold to advance quickly
- Press mode to lock in the selected time, return to normal time mode with the newly set time

Light sensor test
- There are three light sensors behind the faceplate
- Put the clock into a dimly lit room (almost completely dark) - the clock should automatically dim
- Check that the clock returns to full brightness in normal daylight

Battery back-up test

- Ensure the back-up battery (CR2032) is installed correctly
- Disconnect the power supply
- Wait 2-3 minutes
- Reconnect the power supply and verify that the correct time is still shown

Faceplate inspection and manufacturer acceptance criteria

Paint quality inspection (from the front)

- Examine the face plate with a bright lamp
- The surface should be uniform and even without any paint defects
- Fail any faceplate with any signs of drips or paint tears

Light leak test (from the rear)

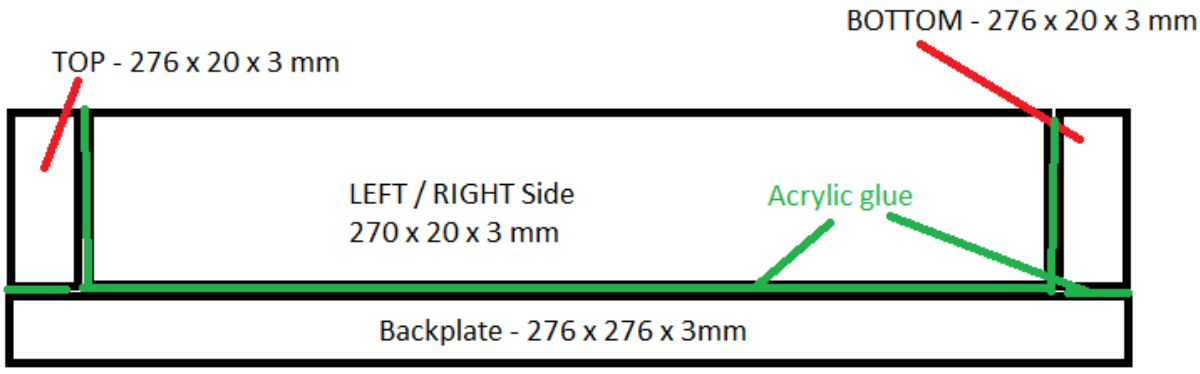
- Hold the faceplate up to a bright light and look for pin-hole sized light leaks
- Fail the faceplate if any small light leaks are present

FInal assembly and inspection

Note: The baseplate and 4 sides are all 3mm smoked acrylic.

Glue the TOP and BOTTOM slides to the backplate using acrylic glue. It is extremely important that you use a gluing jig and a right angle.

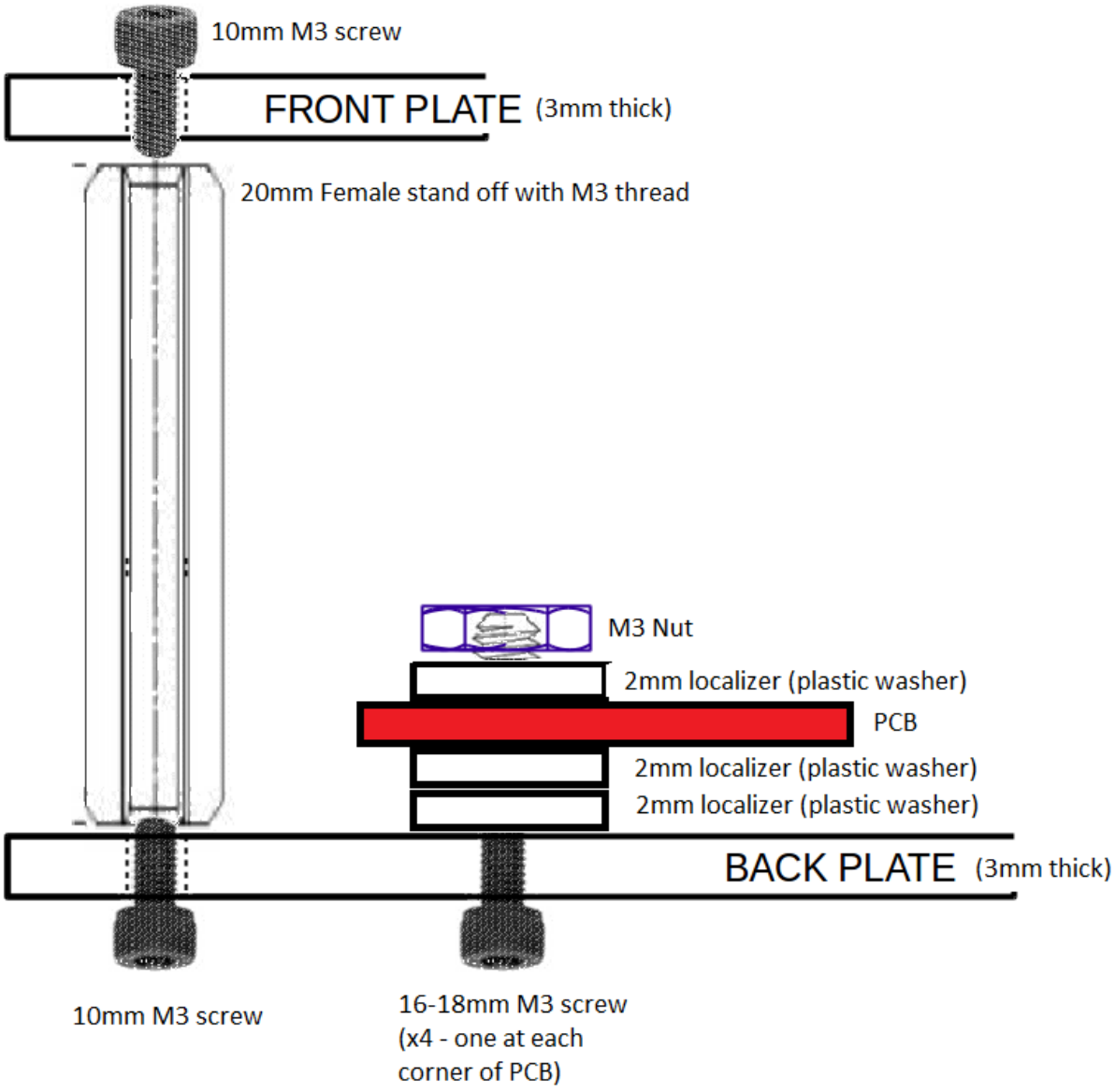
Next glue the LEFT and RIGHT sides to the baseplate and to the top and bottom.



Allow the bottom and sides assembly to cure for 24 hours.

Once the bottom assembly has cured it is time to attach the PCB to the backplate. Push a 16-18mm M3 screw through the backplate (from behind). For each of the four PCB screws

add two localizer washers (2 x 2mm thick washers), the PCB, a third 2mm washer and finally a M3 nut as shown in the diagram below.



Solder wires to the power socket and solder the other end of the wires to the PCB.

Install the power socket to the backplate using the supplied washer and lock nut.

Next, assemble the baffle grid using the supplied 2mm black acrylic pieces. The vertical baffles face upwards while the horizontal pieces face downward. The horizontal pieces have an extra “lip” on the edge of each baffle that hangs over the edge of the PCB. Once assembled the localizer washers should not allow any vertical movement and the horizontal “lips” should only allow 1-2mm of movement side to side.

Next, tape a piece of velum (thin white typing paper) the back side of the faceplate.

The faceplate can not be installed as shown in the above diagram. The four 20mm female M3 posts are attached by a 10mm M3 screw on each side.

Before closing and packing the clock it is vital to check that the baffles are assembled and installed correctly. Use the clock's self test mode to check that ever letter displays correctly and is not cut off.

Final quality check and packaging

- Faceplate and backplate scratch films in place
- Minimise fingerprints on clock surfaces
- Check included, but not installed items (rubber feet, instructions page, etc)
- Clock is securely packed