Fast Clock Display Assembly For NCE DCC Systems

Circuit board and components supplied in kits are RoHS compliant. Using RoHScompliant (non-lead) solder will result in a finished board that is also RoHS compliant. If maintaining RoHS-compliancy is not important to you, you may use solder containing lead.

To avoid excessive heating of components, it is recommended that one lead of each component at a time be soldered, followed by the same lead on each other component, before returning to the next lead of each component.

Component Order of Assembly

There is no mandatory order of assembly for components. However, the job will be a little easier by starting with the shortest components (ones that lie flattest on the board) and work towards the components.

Some components must be oriented correctly. These are described in the order of shortest to tallest:

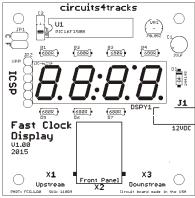


Figure 1

- Diode D1
 - Orientation is important. The cathode lead of the diode is marked by a dark band on the diode and this must be oriented so that it is at the same end as the line on the image on the circuit board.
- Resistors R1 .. R7 Orientation is not important. All are 680 ohm with colour bands: blue, grey, brown, gold.
- Integrated Circuit U1

Pin 1 of the IC must be oriented at the end with the notch image on the circuit board. The end of the device with pin 1 will have a notch similar to the image, and may also have a dot next to pin 1. With the board positioned so that U1 is at the top, the notch will be at the left. Compare the photo in Figure Figure 2 2 with the layout shown in Figure 1.



LED Display DSPY1

Orientation is important. There is an LED dot at top between the third and fourth digits, and decimal point LEDs at the bottom after each digit.

Voltage Regulator VR1

This voltage regulator must be oriented so that its package matches the image on the circuit board. Compare photo in ? with the image in Figure 1. The flat edge of the voltage regulator is at the bottom in both figures.

Capacitor C2

Orientation is not important. This is a flat disk capacitor with the number "104" on one side. The circuit board has three holes to accommodate different widths for this component. Kits are currently supplied with capacitors that use the upper and lower holes, as seen in ?. Smaller capacitors use the centre and lower holes.

Power Connector J1

There is only one way to position this on the board. If the pins on the jack area little tight, they may be filed a little smaller or gently squeezed with pliers in order to fit easier.

· Capacitor C1

This capacitor must be oriented so that their longer lead goes through the hole marked with a "+".

Modular Jack X2

This is the front-panel jack and is mounted on the top of the circuit board with all other components. There is only one way to position this on the board. Once the six pins are inserted, the two larger studs can be pressed through their mounting holes to support the jack in place.

Modular Jacks X1 and X3

These are the rear jacks and are mounted on the bottom of the circuit board. There is only one way to position these. Once the six pins of each are inserted, the two larger studs can be pressed through their mounting holes to support each jack in place. These will have to be soldered from the top of the board.

Installation

See the enclosed installation instruction sheet.

Attaching the Faceplate

The faceplate comes pre-assembled with the bezel and lens for the display and stand-offs already attached. Four #4 Phillips screws with are included to attach the faceplate to the circuit board.

If these screws are on the bottom of the stand-offs, remove them and position the faceplate so that the front modular jack extends through the faceplate so that the jack and the faceplate are even or close to even.

Re-install the four screws through the Figure 3 circuit board to secure everything together.



Warranty

Card and components are warranted against manufacturing defects for a period of 1 year from date of purchase. As the circumstances under which this kit is assembled and installed cannot be controlled, failure of the detector card due to assembly or installation problems cannot be warranted. This includes overheating during assembly, misuse, miswiring, operation under loads beyond its specifications, or short circuits. The warranty is voided if a DC power supply exceeding 14 volts is used.

If the Fast Clock Display fails for non-warranted reasons, it can be replaced, without faceplate hardware, with no questions asked for the cost of \$30 plus shipping for an assembled card, or for \$15 plus shipping for a replacement kit (fees subject to change).

Send an email to circuits@daxack.ca for information on warranty or non-warranty replacement.

Late Production Note

A late circuit design changes resulted in the need for two additional resistors. For this release of the Fast Clock Display, SMT versions of these have been pre-installed on the circuit board.

When assembling a Fast Clock Display, be aware of these tiny devices, located near the ICPS header pads as indicated in Figure 4.

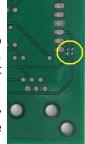
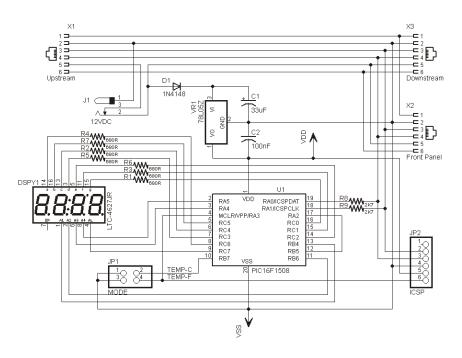


Figure 4

Circuit Schematic



Part values:

C1	33 µF, 35 volt electrolytic capacitor
C2	100 nF, 10 volt or greater capacitor
D1	1N4148 diode
DSPY1	LED 7-Segment, 0.4" 4-Digit Super Red
J1	PJ-007 power jack
R1-R7	680 ohm, ¼ watt resistor
R8, R9	2k7 SMT resistor (pre-installed on circuit board)
U1	PIC16F1508 micro-controller
VR1	78L05Z regulator
X1- X3	6P6C modular connector (RJ-12)
JP1	2x2 header *
JP2	6-pin 90° header †

^{*} optional jumper block for temperature option - not included in kit † In Circuit Serial Programming (ICSP) header - not included in kit

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