Assembling IV-11 VFD Clock recommendations

It is quite easy to assemble this clock. Please have a look at circuit diagram and components layout pictures to see what and were components should be soldered in.
Here is some recommendation, which I hope will help you to assemble your clock smoothly.

Assembling main uC PCB:

- You are welcome to solder components in any order you would like to do, but below are my recommendations based on the experience I got .

- Firstly I solder all SMD components I have to. At the current PCB release these is only one SMD component on the main board – 220uH inductor. Its size is relatively big to other SMD components, so it should not be a problem to solder it. Just put in the marked position on the board, hold it by few fingers and sold one contact. Have a look if its position on the board is OK, then solder opposite contact.

- Next step is to solder all low height components, like resistors, diode, fuse, small capacitors. Please refer to the components layout picture to see were to mount these components.

- Solder PDIP chips – MAX771 and PIC16F628A. Double check that first pin of the chip match squire pad on the board.

- Please bend all 3 IRF720 pins at the edge of plastic case on 90 degrees towards to unmarked flat metal side of transistor case. Insert in to the main board and check that is fully laying down on the marked area and there is no gap between PCB and transistor. Solder it.

- Don't forget to solder connectors and buzzer. Please note that buzzer should be installed with correct polarity.

- Don't mix polarity on your 9v connection

Assembling tube PCB:

- Solder MAX6921AWI chip to PCB first. Use tiny amount of solder. I also recommend to use liquid flux even your solder wire has it inside. Extra liquid flux and small amount of solder will prevent shortcuts between pads.

- When you have soldered MAX6921AWI, hold the PCB up to the light and look through the PCB to check that there is no shortcuts.

- Solder TSC428CBA SMD chip to PCB. Use tiny amount of solder. I also recommend to use liquid flux even your solder wire has it inside. Extra liquid flux and small amount of solder will prevent shortcuts between pads.

- When you have soldered TSC428CBA, hold the PCB up to the light and look through the PCB to check that there is no shortcuts.

- Wash with soap the PCB to remove liquid flux, then dry it well.

- **Please note,** that tube PCB has places for 1206 SMD LEDs, which you have to solder if you plan to use it in the future. Current SW release does not support this feature, but would be available in the future. You have to solder SMD LEDs now, if you intend to use it later on. You can not solder LED later, as access to it will be blocked once you have installed IV-11 tubes.

- Solder all capacitors and resistor as shown on the component layout diagram.

- Please bend all three 7809 (KP142EH8A) pins at the edge of plastic case on 90 degrees towards to unmarked flat metal side of its case. Insert in to the board from the marked side. and check that is laying up 2-3mm from the marked area and there is no contact between PCB pads and the regulator. Solder it

- Solder pin connectors to the PCB. Insert it from the white silk mark side.

- Insert your IV-11 VFD tubes from the marked side. Tube has 12 wires, with one bigger gap between legs. Turn the tube in to the position, when the tube gap matches gap on the PCB. By slightly bending wires, insert it one by one in the PCB holes.
  Do not try to push the Tube too hard and insert it very close to PCB, leave 3-4 mm between tube and PCB.

- Adjust tubes position, so it stays on PBC vertically and parallel to each other tube. Have a look at the clock from the different angles of view, and adjust it again if nessesary.

- When you are happy with the tube position, solder three tube wire to fix its position to the tube PCB.

- Double check the tubes position and solder the rest of the tube wires.

- Tube PCB is assembled now.