

# Sandevices E682 RGB Pixel Controller Assembly Manual

## Revision History:

June 04 2014 changes to reflect version 4 firmware and version 1.3 PCB

Dec 19, 2012 (minor revisions)

Oct 17, 2012 (minor revisions)

Jan 12, 2013 component change for C2-C5, minor revisions

Aug 14, 2012 Sep 17, 2012 (added Ethernet module sockets and ref to PC board rev 1.1)

Kit Packaging: You will receive a printed circuit board, a bag that contains all of the connectors, a bag that contains all of the small electronic parts, and a bag that contains all of the integrated circuits (ICs) and the Ethernet module. Typically one extra part is provided for several parts for use in the case of a miscount while packaging or if a part is damaged in shipping or during assembly.

## Before you Begin:

**Prior electronic assembly experience is assumed. This is probably not a good 'first' soldering project. If you don't have prior PC board assembly experience, please seek the assistance of someone who has.**

## Tools required:

**A good-quality temperature-controlled soldering station is important.** There are several large component leads/pins that will require quite a bit of heat to be soldered properly. Please use a good quality soldering tool.

**Good solder is critical. Radio Shack solder is inferior.** Please use a good 63/37 tin/lead solder such as Kester 44. I recommend .031" diameter. **Protective glasses are recommended when soldering due to the possibility of splashing liquid solder.**

A good pair of **flush-cutting** diagonal pliers. This is an indispensable tool for PC assembly work as it allows you to trim component leads very close to the board after soldering.

**Note: Many components must be installed with the proper orientation, these are POLARIZED components and will be identified as such in the instructions and in the component illustrations. Please take the time to insure that all POLARIZED components are installed with the proper orientation, as these parts will most likely be destroyed if installed incorrectly. Examples of POLARIZED components include (most) connectors and sockets, all ICs, all diodes, all LEDs, and some capacitors.**

**Note: Effective sometime in June of 2014, PCBoard Rev 1.3 will be phased in as a replacement for the currently-shipping Rev 1.1. These are the changes for the Rev 1.3 PCB. The rev number of the PCB is located in the lower-left corner.**

There is now a location for an optional surface-mount eeprom immediately to the left of the CPU. It is designated IC4B. As of now only DIP package eeproms are being shipped with kits, and the surface mount part is not used. This IC location is to allow the use of surface mount eeproms in the future if needed.

There is a new jumper J26, located to the right of the crystal. This is to select the type of eeprom. The upper two pins should be jumpered for Microchip parts, the lower 2 pins should be jumpered for Atmel or On Semi parts. Currently we are shipping ON Semi eeproms, part number 24M01. Current firmware (4.033 as of this writing) does not yet support Microchip eeproms.

The RESET button has been eliminated since the reset function is now done by pressing and releasing the PROG button.

There is a new 4-pin header, J25, located in the upper-left corner of the PCB. This header may be used to add a remote PROG button and/or a remote GREEN LED. This allows for the E682 to be installed in an enclosure with an external pushbutton and LED to allow board overrides to be done without physical access to the PCB.

The two .1uf capacitors (C6 and C7) that were previously soldered to the bottom side of the PCB are now installed on the top side.

There are some additional capacitor locations (c14-C16) between J23 and J24. These are not presently used and will be left unpopulated.

The Wiznet Ethernet module on the Rev 1.3 PCB is held in place by a Ty-Rap threaded through the 2 new holes located just above and below the sockets for the Wiznet module. This replaces the hot-melt glue method used on earlier boards.

Please use reasonable static precautions when handling ICs. Static electricity can destroy them. Before touching an IC, make sure to ground your body by touching your hand briefly to a grounded metal object. Try to work in an area that isn't subject to generation of static electricity.

The order of parts installation isn't critical but in general proceeds from shortest to tallest, to allow the board to be turned over without parts dropping out. If you're fairly new to this I would suggest sticking to the order specified, if you're experienced feel free to do it in whatever order you choose, but please take note of the following: 2 of the .1uf capacitors mount to the bottom side of the board, and 8 of the resistor networks are not soldered, they plug in to the 2 32-pin connectors.

You will save yourself considerable construction time if you construct a small "jig" that allows you to turn the board over for soldering. I use a spare blank PC board with 4/40 bolts and nuts in the 4 corner mounting holes. I set the jig bolts up and then stack the board being built on top of it by sliding the bolts through the build board's mounting holes from the solder side. The nuts raise the build board just enough that you can insert components such as connectors flush to the board without having to hand hold it. Then after loading parts, carefully lift the board off of the jig, then turn the jig

over and slide the bolts through the build board from the component side, making a “sandwich”. You can then turn the “sandwich” over and place it on your bench without losing any parts. You can do without this obviously, but I’ve found it to be a big time saver. A piece of wood or plastic or metal would work fine, just drill 4 properly spaced holes and install the 4-40 hardware. 1” long bolts suggested, longer if your jig material is thick. Parts loading sequence is intentionally from lowest to highest to allow use of this technique.

When soldering 2-lead components I recommend soldering one lead and letting it cool, rather than immediately soldering the 2<sup>nd</sup> lead. Otherwise the part may shift slightly when you touch the soldering iron to the 2<sup>nd</sup> lead, and if the 1<sup>st</sup> joint hasn’t solidified completely you could get a ‘cold’ solder joint.

For example, if soldering a group of capacitors, I will solder one lead of every cap first, then go back and solder the 2<sup>nd</sup> lead of every cap.

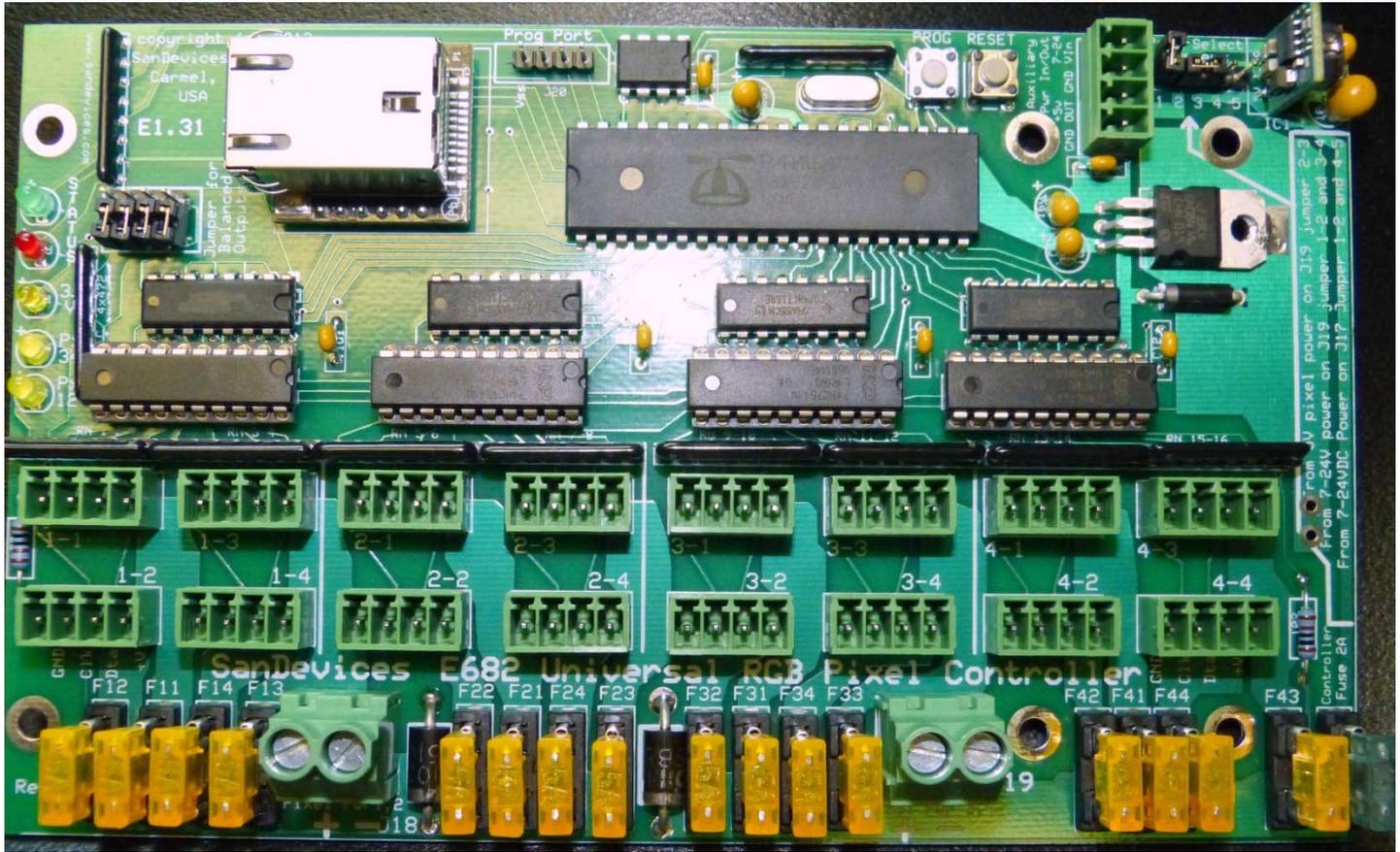
Components are typically installed singly or in small groups, and then soldered, and where necessary the leads are then trimmed with the flush-cutting pliers. When installing components such as sockets and connectors, I recommend first soldering just one pin for connectors, or 2 diagonally opposite pins for ICs and IC sockets. Then double-check to make sure that the parts are fully seated against the PC board (and double-check orientation where applicable), before soldering the remaining pins. If you completely solder an IC socket and then discover it’s not fully seated, or it’s been installed facing the wrong way, it will be time-consuming and difficult to correct. When only 1 or 2 pins are soldered it’s easy to ‘seat’ an out-of-position socket by applying finger pressure to the part while heating one soldered pin at a time, and it will just “pop” into place.

**Certain solder joints will require considerable additional time to solder. This is particularly true when component leads are large, such as the large diodes, or when the lead is being soldered to a large copper area. Make sure to allow sufficient time with these joints to allow solder to flow properly.**

Much as carpenter’s use the rule of “measure twice and cut once”, it’s wise to remember that it’s far better to take some extra time to insure proper location and orientation of parts before soldering. Removing an improperly installed part is difficult, time consuming, and risks damage to the part and the board.

Assembled E682 (version pictured is a Rev 1.0 PCB and does not have a socketed Ethernet module)

Rev 1 PC board shown, Rev 1.1 boards are about ¼" taller.



## Parts Identification:

Note: The parts quantities listed represent the quantity of the part used in building the board. Several components will have an extra part provided in the kit.

C1            Quan 1            10uf 35V Tantalum Capacitor:



Will be marked with "35" or "35V". POLARIZED. The longer lead is positive (+)

-C5                   Quan 4                   10uf 16V Capacitors. Two different capacitor types may be supplied for C2-C5 for kitshipped after 01/01/2013. If tantalum capacitors are supplied, their appearance is the same as C1 above, but slightly smaller. They will be marked with "16" or "16V" and are POLARIZED. The longer lead is positive.

The alternate part for C2-C5 is a multi-layer ceramic capacitor. The MLCC parts are smaller and are not polarized and are similar to the part illustrated below. They may be blue or yellow in color. They will have equal-length leads spaced .1" apart. The MLCC capacitors are NOT polarized and may be installed in either direction.



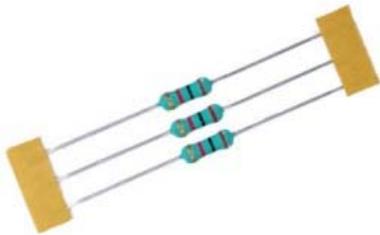
**Important: If your kit includes TANTALUM capacitors for C2-C5, they ARE POLARIZED, and polarity is CRITICAL. If your kit includes MLCC capacitors for C2-C5 they are not polarized and the polarity markings on the circuit board may be ignored.**

C6-C13   Quan 8   .1uf capacitor:



Appearance is similar to the tantalum capacitors (but smaller), and nearly identical to the MLCC capacitors described above. There will be 8 (9 if a spare is provided) identical capacitors. These capacitors are Not polarized and will not have a "+" marking. Lead lengths are the same. Note that two of these capacitors mount from the BOTTOM side (solder side) of the PC board, underneath the CPU. These capacitors will have leads spaced 0.2" apart.

R1,R2                   Quan 2                   1K ohm resistors, ½ watt:



(3 shown, 2 supplied) (about ½" long), color code of BROWN BLACK BLACK BROWN BROWN or BROWN BLACK RED. Note: BODY SIZE AND COLOR OF RESISTORS MAY VARY

X1            Quan 1            5mhz crystal:



D1            Quan 1            1N5340BG Diode:



This is the smallest of the 3 diodes. POLARIZED. The end marked with the band is the cathode. It must be installed in the direction illustrated on the circuit board silkscreen, (banded end up).

D2,D3            Quan 2            SB5100 Diodes:



Similar in appearance to D1 but “fatter” and with thicker leads. POLARIZED. Must be installed with banded end down matching circuit board silkscreen.

LED1-LED5            Quan 5 total            T1 size LEDs: 3 Yellow, 1 Green, 1 Red



There are 5 LEDs. 3 Yellow, 1 Red, and 1 Green. POLARIZED. All LEDs mount along the left-hand edge of the PC board. The longer lead is the anode (+). The (+) lead must be facing as indicated on the silkscreen. On the E682, the (+) lead of ALL LEDs is toward the upper edge of the board. LED locations are identified on the board by a color letter, eg Rled, Gled, Yled for red green, and yellow respectively.

RNA, RNB, and RNC Resistor networks, RNA and RNC are 4.7 K ohms, RNB is 270 ohms.



These 3 resistor networks will be identified by a number printed on the body. Although some resistor networks are polarized, these are not polarized and may be installed in either direction. RNA and RNC will have a part number containing “472”. RNB will have a part number containing “271”. Resistor networks may be yellow or black in color.

RN1-2, RN3-4, RN5-6, RN7-8, RN9-10, RN11-12, RN13-14, and RN15-16

These 8 resistor networks are identical in appearance to RNB and will have the number “271”. They are not polarized.

SW1,SW2 Quan 2 Pushbutton switches: **(REV 1.3 PCB ONLY USES ONE SWITCH)**



(When mounting, please note that the lead arrangement is rectangular, not square.)

IC1 Quan 1 5V DC-DC Converter OKI-78SR-5/1.5-W36-C:



Must be installed so that the side shown in the photo (front) faces the right edge of the board.

IC2 Quan 1 3.3V regulator (usually LF33CV):



Bend the leads as required and mount flat to the circuit board and secure with a 4-40 machine screw and nut. Tighten bolt first, **THEN** solder!

IC3

Quan 1

Propeller CPU, Parallax Semiconductor P8X32A-D40



As with ALL ICs, it's POLARIZED. Insert into the PC board with the Pin 1 end (indicated by a notch on the short side, on the left as shown in this illustration) facing to the LEFT (this is the only IC that faces LEFT).

IC4

Quan 1

EEPROM: Atmel AT24C1024BPU "ATML"



POLARIZED. The notched end, pin 1, faces to the right when installed.

IC5-IC8

Quan 4

74HCT541:



POLARIZED. The notched end, pin 1, faces right when installed in the sockets.

10 pins per side.

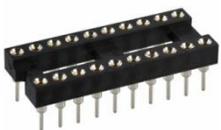
IC9-IC12

Quan 4

74HCT158:

Identical in appearance to IC5-IC8 except only 8 pins per side instead of 10. POLARIZED.

IC Sockets: Quan 4 20-pin (IC5-IC8):



20-pin IC sockets are POLARIZED and all mount with pin 1 (notched end) facing right. Only the 4 74HCT541 ICs (IC5-IC8) are socketed, all other ICs solder directly to the circuit board.

Fuseholders    Quan 17



These all mount along the lower edge of the board and accept Mini ATO fuses. Not polarized, but installing all in the same direction will look neater.

Fuse, 5 Amp    Quan 16

Fuse, 2 Amp    Quan 1



NOT POLARIZED. The 5 amp fuses are yellow/tan in color and marked "5" on the top edge. The single 2-amp fuse is blue-grey in color, marked with a "2" on the top edge, and installs in the right-most fuseholder.

J1-J16 and J19    Quan 17

4-pin Eurostyle Pluggable Connectors :



These POLARIZED SOCKETS must mount in the orientation that matches the image on the silkscreen. The upper edge as illustrated in the photo will be toward the top of the board for J1-J16 and towards the left for J19.



These PLUGS are the supplied mating connectors that will be wired to the pixel strings.

J18,J19

Quan 2

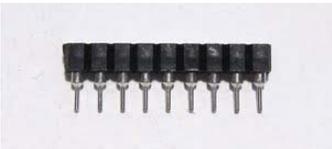
2-pin 6.35mm Screw Terminal Blocks:



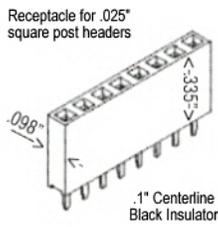
Note: 3 shown, only 2 supplied. MUST MOUNT WITH WIRE OPENINGS

FACING DOWN.

32-pin SIP sockets Quan 2:



Note: a 9-pin SIP socket is shown, 2 32-pin SIP sockets are supplied. Not polarized.



J23,J24 Quan 2:  
black in color)

6-pin SIP sockets (drawing of 8-pin socket shown, supplied sockets are 6-pin and



WIZ820IO Ethernet Module Quan 1

Polarized, must be plugged in or soldered with the LAN connector facing left as indicated on silkscreen. This part is socketed.

## .1" Pin Headers:



Illustration only shows general appearance of pin headers. 4 separate pin headers are used on the E682. Two 4-pin headers mount just to the right of the green and red LEDs. A 4-pin header mounts at J20 "Prog Port" along the top edge, and a 5-pin header mounts to the right of J17 in the upper-right corner. The short legs of the headers are inserted into the circuit board, the long legs are where the shunts (jumpers) are plugged. Not polarized. Typically a single 20-pin header will be provided. Cut the 1x20 header to make three 4-pin and one 5-pin parts. Install 2 of the 4-pin parts side by side at the location near the Ethernet module.

**Note for Rev 1.3 PCBs: There are 2 additional pin headers, J25 and J26.**

Shunts (jumpers)      Quan 6 **(an additional jumper is provided for Rev 1.3 PCBs for use at J26)**



4 Shunts are for the 2x4 header near the LEDs. To enable 2-wire balanced outputs, install the corresponding jumper. Store unused jumpers by just attaching one leg. One or two jumpers will be used on the "Power Select Jumper" header, see the manual. Not polarized.

## Recommended Assembly Sequence:

**Board orientation as referenced in the following instructions is assumed to be looking at the component side, with the fuseholders at the bottom, the same orientation in the earlier image of an assembled board.**

Typically each instruction will call for the installation of one or a small group of components. Install by inserting the component leads from the top side of the PC board (with the exception of 2 capacitors), then finish the operation by soldering the leads on the bottom side of the board, and where appropriate, trimming them with the flush cutting pliers.

Please heed the previous suggestion re just soldering one or two pins of multi-pin components, then verifying that the positioning and orientation is correct, before soldering the remaining pins.

- 1) Install the crystal near the top edge of the PC board just above the mounting location for the CPU.
- 2) Install the two 1K ohm ½ watt resistors one near the right edge of the board, the other near the left edge.
- 3) Install the 4 POLARIZED 20-pin IC sockets at locations IC5 thru IC8 5 thru 8. **All 4 IC sockets face to the right. The end of the IC sockets with the notch is the pin 1 end.**
- 4) Install the two 32-pin SIP sockets just below the 4 IC sockets. (8 of the resistor networks will plug into these sockets.)

**Note regarding capacitor installation:** All capacitors are supplied with the proper lead spacing. It should never be necessary to modify the lead spacing to install a capacitor on the PC board. If the lead spacing isn't right for the part you are installing you do not have the proper part.

- 5) Install C6 and C7, two of the .1uf capacitors. **FOR Rev 1.0 and Rev 1.1 PCBS ONLY: These capacitors install on the BOTTOM side of the PC board, their leads will protrude through the TOP side of the PC board inside of the area where the CPU IC will mount, as indicated on the silk screen. Unlike ALL other components, these two capacitors must be inserted from the BOTTOM side of the PC board and soldered on the top side, so as not to interfere with the mounting of the CPU. After soldering, trim the leads flush on the top side of the PC board and bend both parts toward each other so that they lie nearly flat against the PC board.**

**For Rev 1.3 PCBs: these parts mount from the top side like all other components**

- 6) Install the 6 remaining .1uf capacitors (not polarized). One below J17, one to the right of IC4, and 4 spaced along the two rows of four ICs.
- 7) Install the 3 diodes (polarized). The smaller diode (1N5340) mounts just below IC2 with the band to the left, the 2 larger diodes (SB5100) mount near the lower edge of the board with the bands facing down.
- 8) Install the 3 soldered resistor networks, RNA, RNB, and RNC. RNA and RNC are identified by the part number containing "472", RNB has a part number containing "271". **Resistor networks RNA and RNC should be installed with pin 1, indicated by a white line or dot on the part, towards the right (RNA) or the top (RNC). The parts currently being supplied for RNA and RNC are not polarized parts, but there is a compatible polarized version that can be substituted, so it's a good idea to properly orient pin 1 of these parts.** RNB can be installed facing either way. The suggested procedure for installing resistor networks is to bend the outer pins toward the outside just enough to hold the part in place. Then solder one of the middle pins. Now straighten the two outer pins and finish soldering. NOTE: The remaining 8 resistor networks are not soldered, they will be plugged into the 32-pin connectors at a later step.

- 9) Install the five LEDs along the left edge of the board. The longest lead (+) is always nearest the top edge of the PC board. From top to bottom the LEDs are GREEN, RED, then 3 YELLOW.
- 10) Install C1, the **POLARIZED** 35 volt tantalum capacitor, it's the largest capacitor and will have the number 35, it mounts in the 2<sup>nd</sup> location from the top right corner.
- 11) Install the 4 remaining 10uf capacitors at C2 thru C5. As noted in the parts description these capacitors may be tantalum capacitors, (similar to C1 but slightly smaller), or MLCC capacitors, (similar in appearance to C6-C13, but with .1" lead spacing). These capacitors install in the very top right corner, two to the left of IC2, and one to the left of the crystal.
- If you have tantalum capacitors for C2-C5:** If your parts are tantalum capacitors they will be yellow in color and they will USUALLY have one lead longer than the other and will ALWAYS have a + mark. Polarity is **CRITICAL** and they must be installed with the + mark side (longest lead if leads are different lengths) nearest the + mark on the circuit board. **POLARITY OF TANTALUM CAPACITORS IS CRITICAL! They can disintegrate if installed backwards. Verify proper polarity of these capacitors by verifying that the "+" symbol near the positive lead corresponds with the + symbol on the circuit board.**
- If you have MLCC capacitors for C2-C5:** If your kit has MLCC capacitors, they will be very small, have leads of the same length, and no + designation and will NOT be yellow in color. These capacitors are not polarized and the + markings on the circuit board may be ignored.
- 12) Install the multi-pin headers. **FOR VER ALL PCB VERSIONS:** Two 4-pin headers mount side-by-side to the right of the red and green LEDs. Cut or snap the supplied single row pin header strip to the needed lengths. The 3<sup>rd</sup> 4-pin header mounts at J20 "Prog Port" on the top edge, and the 5-pin header mounts to the left of IC1 marked "Power Select Jumpers".
- For Rev 1.3 PCBs ONLY:** Install a 4-pin header at J25 (upper left corner) and a 3-pin header at J26 (to the right of the crystal).
- 13) Install the two pushbutton switches to the right of the crystal. **NOTE: ONLY ONE SWITCH FOR REV 1.3 PC BOARDS.** These will 'snap' into place. Make sure that the leads are not bent and are properly seated before soldering. Note that the pin layout is rectangular, not square!
- 14) Install the 17 fuseholders along the bottom edge of the board. Although these aren't polarized, it will look neater if you install them all facing the same way (crimped side of pins facing right or left). **These parts will take a considerable amount of solder and heat.** You want to use plenty of solder as there can be a lot of mechanical force applied to the fuseholders when inserting or removing fuses. But don't get carried away to the point where you allow solder to wick up into the area where the fuse plugs in. Take care to insure that the fuseholders are fully seated against the PC board before soldering all pins. A spare fuseholder is supplied in case a part is missing or damaged.
- 15) Install the two 6-pin SIP sockets for the ethernet module at J23 and J24. These are not polarized. Hint: To insure proper positioning of these parts, it is suggested that you plug the two sockets onto the pins of the Ethernet module, then set the assembly in place on the board and solder. This will insure that the 6-pin sockets are properly aligned with the Ethernet module. The 6-pin sockets are not polarized.

- 16) Install the 17 POLARIZED 4-pin euro pluggable sockets at J1 thru J16, and J17. Be 100% certain of correct orientation. The ‘jagged’ or ‘keyed’ side of the connector contact positions face **up** for the 16 string connectors, and **left** for the aux power connector. **When positioned correctly the part outline will match the silk-screened outline on the board, if reversed the part outline will be offset from the silkscreen outline.**
- 17) Install the POLARIZED 3.3V regulator, IC2. Use the supplied ¼” x 4-40 bolt and nut to attach it to the PC board, after bending the 3 leads down at a 90-degree angle to line up with the mounting holes. Try to apply some hand pressure to the regulator body when tightening the nut to prevent the part from rotating as the nut is tightened. **IMPORTANT: Solder the 3 leads AFTER the regulator is bolted in place, not before.** Trim the 3 leads after soldering.
- 18) Install the POLARIZED 5-volt DC-DC converter IC1. **The side with the round protruding part with the sticker faces to the right, in other words, that side faces the two tantalum capacitors. Be careful of solder bridges.**
- 19) Install the 2 large 2-pin pixel power terminal connectors at J18 and J19. **Make sure the wire openings face the bottom lower edge of the board.** Trim the leads after soldering.

This completes the installation of all soldered parts with the exception of 6 ICs . **At this time you should carefully inspect the solder side of the board. Check every solder joint to make sure that all joints are soldered and that there are no solder ‘bridges’ or ‘cold’ solder joints. Touch up any questionable joints. PLEASE DO NOT SKIP THIS STEP! The most likely locations for solder bridges are the DC-DC converter, the IC sockets, and the two 32-pin SIP sockets.**

**Also visually check for proper orientation of the tantalum capacitors (C1 and possibly C2-C5). The side with the writing should be the side that faces the right side of the board.**

Install the supplied fuses into the 17 fuse holders. The right-hand fuse holder will get a 2 amp fuse (grey). Visually verify that this is a 2A fuse. The other 16 fuses will typically be 5 amp fuses. **Considerable pressure is needed to seat the fuses in the fuse holders.** Place your fingers on the back side of the board for support, and use your thumb to press the fuse in place.

Plug the eight remaining 270 ohm (part number containing “271”) resistor networks into the 64 pin (2x32) SIP socket row. They are not polarized. The eight 8-pin networks will completely fill the 64 socket holes. Note: other values may be provided for these 8 resistor networks, but they will be 8 identical parts.

Install four of the shunts at the 4x2 pin header by just attaching one end of the shunt to a single pin of the header (in other words this is just storage so that the shunts will be handy later if you need to install them).

Install the power select shunts at “Power Select Jumpers” according to the voltage source you will be using to power the E682:

**If using 5 volt pixel power on clusters 3 and 4 (J19),** install a shunt between 2 and 3 only. **If using 12 volt pixel power at J19,** install **two** shunts, one between pins 1 and 2, and the other between pins 3 and 4.

**For Ver 1.3 PC boards only: Install a shunt at J26. This should be across the bottom 2 pins if the eeprom IC is an ATMEL or ON SEMI (24M01A) part. Only if the eeprom is a Microchip part, install the jumper across the 2 upper pins. As of this writing (06/2014) only Atmel and ON Semi parts are being supplied.**

Connect an appropriate **regulated** power source (matching the jumper selection above) to the “Pixel Power 3,4” connector J19, observing polarity. For the initial testing the power supply needs to be capable of providing about 300ma. Turn power on. 2 Yellow LEDs should be lit (all but the bottom one). If you have a voltmeter, check for +5 volts DC on the top (input) pin of the 3.3 volt regulator, and +3.3 volts DC on the bottom (output) pin. **Be careful that the voltmeter lead doesn’t slip and short circuit the regulator terminals.**

## Final Assembly:

**If the above test is successful, Remove power.** Then solder in the six non-socketed ICs: IC3, IC4, and ICs 9-12.. **Make sure all ICs are installed facing in the proper direction, pin 1 to the right on all ICs EXCEPT the CPU.**

**Inserting ICs can be tricky.** First ‘roll’ each side of the IC against a hard flat surface to get the pin rows properly lined up at a 90-degree angle to the IC body. As shipped, the IC pins are slightly “splayed” out. **You must get the IC pins positioned exactly right before trying to install the IC in the circuit board or you will risk bending pins.** Make sure that every pin is started in its corresponding hole, and only then apply just a bit of force on the IC to seat it fully. Once the ICs are in place, double-check for proper orientation, and solder all pins. Next insert the four 74HCT541 ICs into the sockets at IC5 thru IC8. Once again, pre-straightening the IC pins as described above is very important. **Don’t try to force the IC into the socket if you can’t be sure that every pin is started in its hole;** remove the IC and re-check pins for straightness. If the IC sockets are of the “machined” type (round holes) it will take considerable force to seat the ICs in the sockets. Make sure that every IC lead has seated properly and that there are no bent pins. If you have a bent pin you will need to VERY CAREFULLY remove the IC, straighten all pins, and try again. **TRY TO DO IT RIGHT THE FIRST TIME AND YOU WILL SAVE A LOT OF GRIEF.**

Next install the WIZ820IO Ethernet module. This parts plugs into the connectors at J23 and J24. **It must be installed with the LAN connector facing to the left as shown on the silkscreen.** For Rev 1.0 and 1.1 PC boards: It is recommended to secure the Ethernet module in its sockets with beads of hot-melt glue along the joints where the sockets and module meet.

**For Rev 1.3 boards only: Secure the Ethernet module by using the supplied cable tie. Thread the tie through one of the mounting holes from the bottom side of the PCB, route it up and over the Ethernet module, back down through the other mounting hole and secure it through the tab. The cable tie should be sufficiently snug to hold the Ethernet module in place.**

This completes the assembly of the E682.

Now take a moment to inspect the solder joints on the 6 soldered ICs.

Re-apply power to the board and observe the RED and GREEN LEDs. After a second or so you should see the green status LED flickering and the RED status LED on steady. The flickering green LED means that a test pattern is enabled on the E682.

If you don’t see the indicated LED activity remove power and re-check for proper insertion of ICs (proper direction and all pins seated), also recheck the solder side of the board carefully, looking for missed solder joints or solder bridges.

If you have a way to measure the power supply current, you should see a current draw of about 250 ma if using a 5 volt supply, somewhat less if using 12 volts.

At this time you should be able to access the E682 configuration/status page by pointing your web browser to 192.168.1.206 (if your LAN uses 192.168.1.X addressing). Please refer to the E682 Operating Manual for detailed information on configuring and using the E682.

Kits are now shipped with firmware version 4.033 or later. This affects the startup procedure as described in the manual.