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## Sienna Construction Note

3/5/2011

### Rev B Tx mods

This note explains how to convert a rev A transmitter to a rev B model.

#### New Parts List

Reference Designator	Description	Qty
D3, D4, D5, D11, D17	1N4007B Rectifier (large)	5
D1, D2, D6, D15	1N5711 diode (blue)	4
JP1-7, JP9-12	2-pin header for jumpers	11
JP8	3-pin header for jumper	1
JS1-12	2-pin jumper shorting bar	12
T6	T4-1 transformer, 6-pin DIP	1
T2	T36-1 transformer, 6-pin DIP	1
Y15-19	10.73MHz crystal with insulator	5
FL1, FL2	10.7MHz filter (matched pair) w/ins	1
D7, D8, D9, D10, D14	1N5231B 5.1V zener diode (red)	5
D16	1N5239B 9.1V zener (leads bent)	1

**IMPORTANT!** D16 looks identical to D7-10 and D14. For this reason, its leads have been bent to help you identify it. Do not straighten these leads until you are ready to install the diode.

**ALSO!** T2 and T6 look identical. Be sure to read the printing on the part to tell them apart.

The rev B transmitter has the plastic transistors preloaded, whereas the rev A boards required you to load them. If you have not yet built your rev A transmitter, you will not need the transistors. If you have built it, you do not need to remove them.

Rev B boards do NOT have the diodes preloaded. Rev A boards used SMT diodes and these have been changed to through-hole parts that you will load. Therefore you do not need to remove the diodes from the rev A board. (Exception: D14 and D27 are through-hole diodes on both revisions and will need to be removed from rev A boards. Their names change to D12 and D13 on rev B boards.)

#### If you have already loaded your rev A transmitter:

(Note: If you break any parts when removing them from your board, make a note of which parts you need replaced and we will rush them to you.)

- ( ) Remove the TxBPF board and standoffs. Save the board.
- ( ) Remove the screws and shoulder washers from the 4 power transistors, then remove the mounting screws and remove the heatsink.
- ( ) Remove the 4 power transistors that were attached to the heatsink and also Q11, the power MOSFET, and Q14, the 2N2109.
- ( ) Remove all toroids and mica capacitors. It is best to use a lot of heat to the back of the board and use a de-soldering tool or solder wick to remove the parts. Also remove the toroidal transformers T1, T3, T4 and T5.
- ( ) Remove ferrite beads L13 and L14.
- ( ) Remove the 10 SMT relays
- ( ) Remove all connectors. Be careful not to apply too much heat to the white MTA connectors or the heated pins may slip in the housing.
- ( ) Remove all crystals. Do not remove FL1, the 3-pin crystal filter. Be careful not to apply excessive heat when removing the wire soldered to the top
- ( ) Remove through-hole relays K12 and K13. Do not remove K11 or K14. (If you have trouble with either K12 or K13, you can remove K14 and use it in place of the damaged part. Only two of these relays are used on the rev B board.
- ( ) Remove the aluminum electrolytic capacitors and the orange SMT tantalum electrolytic capacitors.
- ( ) Remove the thermistor
- ( ) Remove U10, the 4-pin mixer. Pin 3 on this part is soldered to the ground plane and will require a lot of heat.
- ( ) Remove power resistors R73, R56, R85, R27 and R39.
- ( ) Remove U18, the large voltage regulator.
- ( ) Remove D12 and D13, the 1N914 diodes. These look like some of the new ones you will be loading, so keep them apart from the new ones.
- ( ) Remove the resistor pack, RN1 and the potentiometer, RV1
- ( ) Remove the white coax from the back of the board.

**Installing parts on the rev B board:**

Follow the instructions in the Rev D assembly manual for loading, turn-on and test of the new board.

Also be sure to install the new TX10 BPF board on the TXBPF board for proper output on 10M.

### **IMPORTANT: Intermixing of REV A and REV B Controller, Receiver, and Amp boards with Rev B Transmitter.**

**If you have:**

#### **Controller Rev A (Rev code silkscreened below ribbon cable connectors)**

1. LPTT (transmitter on/off control line) is pulled up to 12V via R3, an SMT resistor. Remove this resistor, which is located near the microphone MTA connector, J20.
2. Does not have a “clickless Sidetone” circuit. Rev B firmware in the keyer microprocessor looks at an input pin to see if the board is rev A or rev B, and adjusts the functionality accordingly. You do not need to do anything to make this work. Just be aware that rev A controllers have a pronounced click when the keyer is first activated. This is most noticeable in QSK mode.
3. Remove C1, an SMT capacitor, located near J11, the VOX/ST connector. This allows FM and VOX detection to work properly.
4. Upgrade main microprocessor firmware to Rev B.01.05 or greater. The “01” means that the firmware has been assembled to work with rev A controllers.
5. Upgrade keyer microprocessor firmware to Rev B.01.00 or greater.

#### **Controller Rev B, B1:**

1. LPTT was split into LtxEn (same functionality, new name, stands for Low-true Tx Enable) and HrxEn (High true Receiver Enable). LtxEn goes to the transmitter and amp ribbon cable connectors, and HrxEn goes to the receiver ribbon cable connector. Both lines are pulled to +5V through separate resistors. Do not change these! Instead, you will remove resistors from rev A receivers and amps, as explained later.
2. Adds a “clickless Sidetone” circuit. Rev B firmware in the keyer microprocessor looks at an input pin to see if the board is rev A or rev B, and adjusts the functionality accordingly. You do not need to do anything to make this work. This feature really helps QSK operation.
3. Remove C1, an SMT capacitor, located near J11, the VOX/ST connector. This allows FM and VOX detection to work properly.
4. Upgrade main microprocessor firmware to Rev B.02.05 or greater. The “02” means that the firmware has been assembled to work with rev B controllers.
5. Upgrade keyer microprocessor firmware to Rev B.01.00 or greater.

#### **Amp Rev A (Rev code silkscreened near large through-hole ICs):**

1. Remove R2, which is an SMT resistor that pulls LPTT up to 12V. Since this line is terminated elsewhere, it should not be necessary to replace it. If you experience odd behavior from the amp (not going out of transmit mode, for example), add a 10K 1/8W or 1/4W resistor between TP2 and TP3. Be careful not to let the resistor extend above the board more than 0.4”.
2. If you have added a 3.3K resistor to ground on the LPTT line, as described in the service bulletin dated 11/12/09, remove it.

**Amp Rev B:** No changes are necessary.

#### **Receiver Rev A, A1 (Rev code silkscreened near ribbon cable connector):**

1. If you are using a Rev A or A1 receiver, remove R147, an SMT resistor located near the black ribbon cable connector.
2. If you have added a 3.3K resistor to ground on the LPTT line, as described in the service bulletin dated 11/12/09, remove it. If you have a rev A1 board, this resistor was added for you as an SMT part, R163. Remove it as well.

**Receiver Rev B:** No changes are necessary.