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Sienna Construction Note
11/12/09

10W Tx Final Transistor Burnout

Problem: 10W transmitter finals burn out too easily.

Cause: This problem is caused by the LPTT signal inducing a glitch in the state latches, which in turn open all of the low-pass filter relays. The removal of the load during transmit causes a large flyback pulse in the output transformer, resulting in a very high transient voltage to the collectors of the final transistors, burning them out.

Solution: Add a 3.3K (1/8W or 1/4W) termination resistor to ground on the LPTT line on the receiver board, the transmitter board and the 100W amplifier board (if present). The LPTT line is already pulled high on those boards, but the addition of these resistors lowers the nominal voltage from VCC (which may be as high as 15V) to between 3V and 5V. As this line goes low, it no longer has enough energy to induce glitches in the logic circuits.

The location for the addition of these parts is as follows:

Receiver: Solder the 3.3K resistor across Q31's base and emitter. These pins are on the same side of Q31, with the collector on the other side. Q31 is located next to J3, the 16-pin ribbon cable connector. Mount the resistor vertically. Keep leads as short as possible.

Transmitter: Solder the 3.3K resistor from the base (center pin) of Q7 to ground (the pin closest to the large mounting hole for the TxBPF board). Q7 is located above J1, the 16-pin ribbon cable connector. It is easiest to mount the resistor on the back side of the board and lay it flat so that it does not hit the TxBPF board. Install this resistor after installing Q7.

Amplifier: Solder the 3.3K resistor across the end leads of Q2. Q2 is the large regulator located near the center of the board. Be sure the resistor does not extend more than 3/8" above the board to avoid having it hit the bottom of the DCD/Tuner tray.