TS-930S Repair/Refurbish Check Sheet

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1 Introduction

This is a quick and dirty checklist of things that typically need to be done to a newly-received TS-930S. It is by no means complete and it assumes that you have access to the Service Manual, all the Service Bulletins, and the W6NL mods/repairs sheet. These are widely available on the web. A complete rebuild of the fragile parts of the radio (including new PA and driver transistors) can be done for about $200 and about 10 hours. You'll need at minimum a screwdriver, diddle stick, and DMM, although an oscilloscope is handy.

2 Initial Check Out

1. Inventory filters and options
   - Antenna Tuner.
   - Plug-in IF Filters.
   - Wire-in IF/roofing Filters.
   - Piexx Digital Board.
2. Inventory owner modifications
   - RX antenna port.
   - W6NL power supply mod.
   - W6NL AGC overshoot mod.
   - Other.
3. Power Supply
   (a) Disconnect PA 28B V+ line.
   (b) Power ON.
   (c) Check 28B line voltage at 28.5 volts.
   (d) Power OFF.

4. PLL
   (a) Reconnect PA 28B V+ line.
   (b) Power ON.
   (c) Check PLL lock on each band/mode combination, spinning dial.
5. RX sensitivity
   (a) Connect antenna and check RX on all bands and modes.
6. TX power
   (a) Connect power meter and dummy load to output
   (b) Advance CAR control fully CW.
   (c) Choose CW mode.
   (d) Choose SEND.
   (e) Key transmitter (should see 100-110 watts on all bands).

3 Power Supply

1. Identify and repair lifted PCB traces.
2. Do W6NL mod.
3. If original, replace all six electrolytic capacitors.
4. Bypass thermal fan control and run fan all the time.

4 Power Amplifier

1. Check Taiko-Denki RF in and out connectors for loosening or cold solder joints and repair/reflow.
2. Check 28B DC input lines for loosening or cold solder joints and repair/reflow.
3. Identify and repair lifted PCB traces.
4. If original, replace all electrolytic capacitors using the highest temperature/voltage rating that will fit the board.
5. If MRF-422 PA transistors are dead, replace all carbon composition resistors (lots of them).
6. If MRF-485 gain is not coded red or orange (yellow, green, blue, or violet), change bias network per service bulletin.
7. MRF-422 may be replaced with 2SC2510A.

8. MRF-485 may be replaced with NTE236/ECG236, although the MRF-485 is easier to obtain these days.

9. Reference W6NL mods for more information on replacing semiconductors.

10. Set all bias levels and power output according to the Service Manual.

11. Connect dummy load and leave radio in SEND on SSB for an hour or two while monitoring the bias current for burn-in.

12. Bypass thermal fan control and run fan all the time.

5 PLL

1. Reflow all solder joints.

2. Spray all connectors with contact cleaner and reseat.

3. Adjust signal unit L77 (master heterodyne oscillator, front corner of the radio behind the PITCH/AF TUNE knob) as needed. Adjust until the oscillator drops out (radio loses lock), then back up until it comes back and drops again. Then, split the difference. KA5IPF procedure.

6 Parts Vendors

- Capacitors and Carbon Composition Resistors: Mouser Electronics, Digi-Key

- Transistors: RF Parts