

Kenwood TS-50S Antenna Tuner Control

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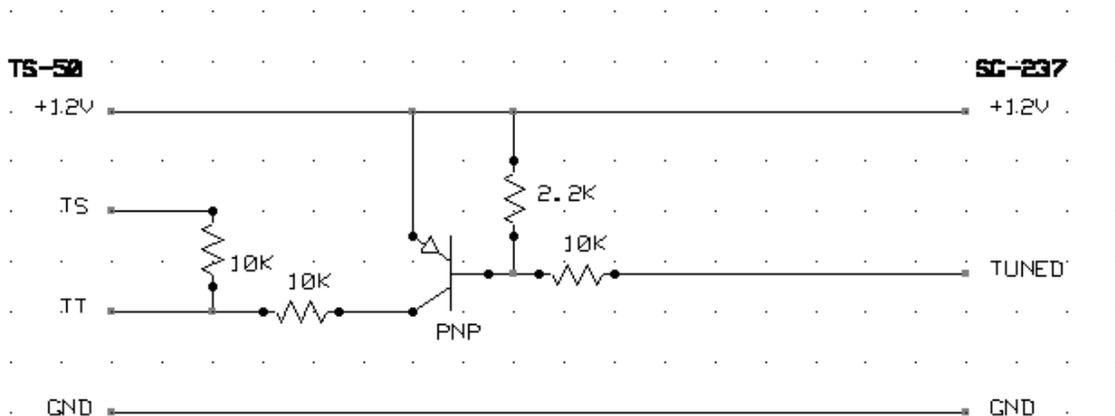
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The TS-50 has two tuner interface protocols. One is a serial data interface used with the AT-50 tuner. The other is a "handshaking" protocol used with the AT-300 tuner. The AT-300 mode is probably suitable for automatic control of an SGC-237 or similar SGC tuner.

The AT-300 mode works as follows: There are two control lines on the TS-50 tuner interface connector, TS (Tune Start) and TT (Tune Terminate). Both are bi-directional, open collector circuits that are also used as data lines in the AT-50 mode. When the TUNE button is pressed, the TS-50 pulls the TS line low. If the TT line goes low at exactly the same time then the TS line stays low, and the radio keys up in CW mode. If the TT line does not follow the TS line low then after about 120mS then the TS line goes back high and the word "check" is send via CW to the speaker. Once the TS-50 is in the CW tune mode, it remains keyed until the TT line is brought back high.

As an experiment, I connected the TS and TT lines via a 10K resistor. Pressing the TUNE button resulted in the radio entering the CW tune mode. Pressing the TUNE button again terminated the CW tune mode. I noted that the resistor did not have to be in place when the radio was first powered up. I turned the radio on without the resistor in place. I then tried pressing TUNE with the resistor in place and with the resistor removed. With it in place the radio entered CW tune and with the resistor removed the radio sent a CW "check" message via the speaker.

With the 10K resistor in place between the TS and TT lines, I connected one end of a second 10K resistor to the TT lead. This allowed me to pull the TT line high by momentarily connecting the other end to +12VDC. Now pressing the TUNE button entered the CW tune mode and connecting +12V to the second resistor caused the radio to return to normal operation (as would pressing the TUNE button a second time). This points to the possibility of using a PNP transistor to switch the second 10K resistor to +12V. The base of the transistor could be connected via a resistor to the TUNED line on an SG-237 or similar tuner in order to automatically terminate the tune process as soon as the tuner finds a match.



Proposed circuit for experimenting with TS-50 automatic tune termination

The SG-237 and several other SGC models have an open collector switch output that pulls the TUNED line to ground when a match has been found. This was intended to light a TUNED LED in their Smart Lock accessory but it can be used as shown here to terminate the TS-50 tune function.