

# MODIFICATION TO PUT CW ON USB FOR THE KENWOOD TS-700A, S, SP

F=TS700CW.DOC  
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W0PN

The following paragraph is an excerpt from a letter to Kenwood (which received a negative response, as expected):

"Why did you put the CW carrier on LSB in the TS-700? This design quirk is creating mass confusion and operating inconvenience for all your TS-700 customers. Picture the following: you are calling a distant station on CW, which means that you are automatically transmitting and receiving in LSB mode... the called station answers, but on SSB. You will probably not even hear that response; in any case, the response will at best be unintelligible, since you are in LSB mode and the other station is in USB mode, which is the convention on all amateur bands above 14.0 MHz!"

Readers, take heart! This design flaw is easily corrected in 30 minutes with a simple modification which requires only one additional switching diode and which relieves the aggravation by putting CW on USB, producing an 750 Hz note in any other transceiver operating in USB mode which is tuned to the same frequency as the one which is doing the transmitting. Additionally, it does not affect compatibility with unmodified transceivers.

**Steps 1 - 5 below apply to the 700A CARRIER board, or the 700S CARRIER-VOX board.**

1. Using an accurate frequency counter, record the frequency of the generated carrier in all modes by connecting the counter to the TP following the buffer Q2 (700S = Q11). **The following listed frequencies are from my TS700 and are provided as an example only:**

USB	10.698558	<b>NOTE:</b> <i>Ensure that an open circuited key jack is inserted to prevent transmitting a carrier which could affect counter readings.</i>
LSB	10.701525	
CWtx	10.700775	
CWrx	10.701525	

2. Interchange crystals 'X1' and 'X2'. Unsolder one end of C3 (700S = C23) and ensure it does not short to adjacent components... it will be left permanently disconnected.
3. Interchange one end of L2 and L3 by lifting the wire from their respective terminals and installing criss-cross jumpers.
4. Interchange the wires to the USB and LSB connection posts on the board... there are 2 wires on each post.
5. Adjust the oscillators to the relative frequencies shown, using the trimmers indicated. USB and LSB are to be adjusted to the original frequencies recorded in step 1, and CWtx is to be adjusted to be 850 Hz higher than the USB frequency. CWrx will be identical to USB and requires no adjustment.

USB	10.698558	adjust TC3
LSB	10.701525	adjust TC1
CWtx	10.699308	adjust TC2
CWrx	10.698558	requires no adjustment

**THIS COMPLETES THE MODIFICATION FOR THE TS-700A**

**CORRECTING THE FREQUENCY READOUT ON THE 700S and 700SP:**

6. On the 700S/SP COUNTER board, perform the following steps:
  - a. Cut the PC trace at the USB post. Bridge a 1N914 (or equivalent) diode across the cut with the

anode toward the post. This diode will be referred to as D4a.

- b. Disconnect the cathode end of D1 from its current position and reconnect it to the cathode end of the newly installed D4a.
- c. Place the transceiver in USB mode and note the dial reading. Switch to CW mode, place in the **transmit** condition (***make certain than an open-circuited key jack is in place in the KEY jack***) and adjust TC2 **on the counter board** for a reading 750 Hz higher than the USB reading just noted.

NOTE: on some 700S/SP's, it may be necessary to disconnect one end of C16 and place a 10pF capacitor in series with TC2 to achieve your goal. Otherwise, settle for the same readout as that shown in USB mode. *Some 'X2' crystals just won't pull far enough for +750 Hz.*

### **THIS COMPLETES THE MODIFICATION FOR THE 700S/SP**

*This material is presented for your personal information only... no guarantees, warranties or other messy things are either expressed or implied. This modification has been installed by hundreds of VHFers with no problems reported.*

*Ron*

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