Modify R3500D Receiver to 40-meter

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R3500D is the upgraded version of the popular PJ-80 ARDF receiver. The kit version is available at http://crkits.com at a reasonable price. If you don't really know ARDF, and you like 40-meter more than 80-meter band, you might want to modify the kit a bit to QSY (change frequency) to 40-meter to receive a few CW or SSB signals. I did some research online about this modification, and I found a few pages in Japanese. Although I don't read Japanese and the online translation does not do good enough job for Japanese to English or Chinese translation, I roughly figured out how. By experiment on 2 kits, I confirmed the modification. The modified receiver can cover the full 40-meter band from 7.000 to 7.300-MHz and the sensitivity is okay because I can hear CW signals in room with the built-in magnetic rod antenna. By leveraging the existing parts, the modification only requires two additional parts: a 68 pF monolithic capacitor and a 40-meter band IF transformer in shielded can (such as DIY7-7). You can order the modification kit at 5 USD (shipping and handling included for worldwide). Just PayPal rongxh@gmail.com and leave the message and your address.

Please refer to the part list of R3500D, and do the following changes:

Capacitors:
C3* 50 pF → Not installed for DIY7-7 as it has the built-in capacitor
C10 100 pF → 68 pF (newly added, monolithic capacitor)
C11 200 pF → 100 pF (leverage C10, monolithic capacitor)
C13 1000 pF → 200 pF (leverage C11, monolithic capacitor)
C14 2200 pF → 1000 pF (leverage C13, monolithic capacitor)

Coils:
T1 → DIY7-7 (newly added, 7-MHz band IF transformer, capacitor is built-in)
T2 → T1 (leverage T1, black cap)
Magnetic rod coils → Primary winding: remove 11 turns; Secondary winding: remove 4 turns

Again, the local oscillator works at half frequency of 7-MHz. To cover 7.000~7.300-MHz, make sure the local oscillator can cover at least 3.500~3.650-MHz. If the coverage is not enough, you can reduce the value of R13* from 910-ohm to 820-ohm or even 750 or 680-ohm.

The rework of the magnetic rod coils is not difficult. Remove turns from the two ends instead of the tap. The primary winding has more turns than the secondary winding. After the rework, you can reuse the wax to fix the ends, and tin the wire ends.

DIY7-7 is not a perfect part for T1, as it is too small to fit in the 10x10 size IF Transformer holes. My way to fix this problem is shown as the photos below.