

**Draft 2**

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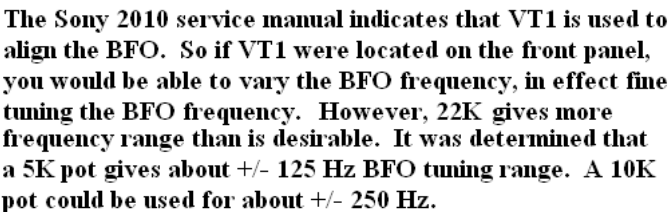
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## DL 12/3/06



**Remove jumper and add two insulated wires routed to front panel pot.**

**Replace VT1 with a 20K 25 turn 3/8 inch pot on rear side of the PC board**

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appropriate directions, trimmed to appropriate lengths, and soldered. The 25 turn pot was affixed to the PC board and shield with black Permatex silicone automotive adhesive. The SYNC shield on the front of the PC board was unsoldered and removed so that the jumper could be removed using a hemostat. Two insulated wires were soldered to the two jumper holes (pads) and routed to the front panel where the 5K pot is mounted (I mounted mine near the bottom left corner of the front panel). A rectangular hole was cut in the large rear shield so that the VT1 replacement would clear the rear shield. Then the shields were reinstalled and resoldered. VT2 was unsoldered, removed, and reinstalled on the trace side of the PC board to simplify alignment of the SYNC detector.

Realignment of the 20K ohm 25 turn pot and VT2 were done with the two AA batteries installed and an external 4.5 volt power supply. With the 2010 modified in this way it is trivial to align the BFO fine tuning mod and SYNC detector.

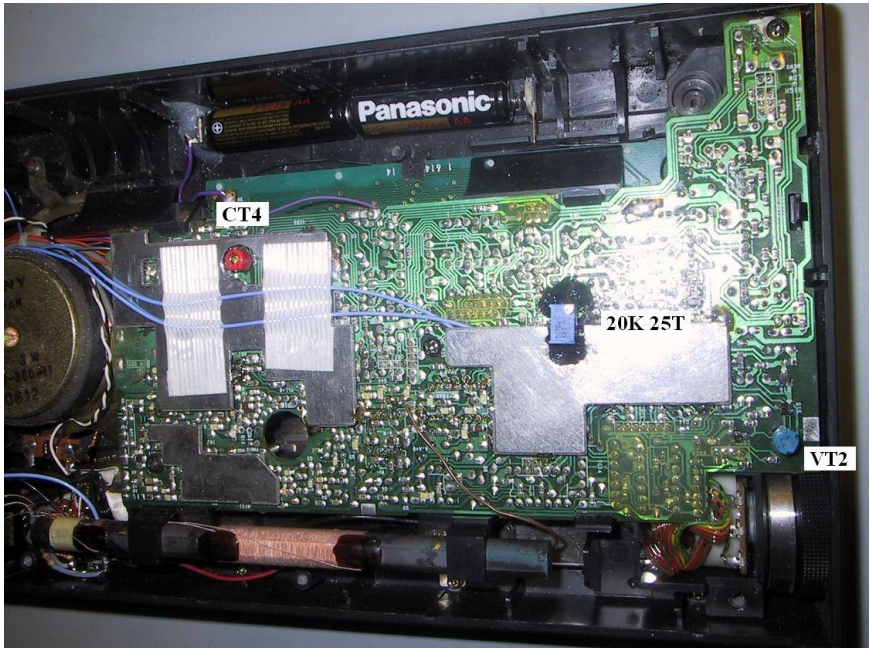
Using the 0.1 kHz step tuning mode, tune a strong and steady MW signal, say 540.0 kHz. Select USB mode and set the 5K vernier fine tuning pot to mid range. Then using headphones with good low frequency response adjust 20K ohm 25 turn pot for zero beat. Select LSB and zero beat should also be observed. If it is difficult for you to hear zero beat, tune higher and lower by 0.1 kHz and you should hear a beat tone of about the same

frequency (the beat note is louder and easier to hear in one or the other of USB or LSB depending on whether you are tuned higher or lower). If necessary, adjust the pot so that the beat notes are about the same frequency when you are tuned 0.1 to 0.3 kHz higher and lower. Some may find it easier to adjust zero beat with a station playing music.

Next select SYNC mode. If the “lower” LED is on, adjust VT2 until the “upper” LED just turns on. If the “upper” LED is on, tune to 539.9 and adjust VT2 until the “lower” LED just turns on. Finally, tune back and forth (slowly) between 540.0 and 439.9. The “upper” LED should be on when the frequency is 540.0 and the “lower” LED should be on when the frequency is 539.9.

The BFO vernier fine tuning frequency range is about  $\pm 125$  Hz. If you want more tuning range, say  $\pm 250$  Hz, then a larger value pot should be used, say 10K. I recommend against a wider tuning range because the resolution is not as good, and adjusting for zero beat is more difficult. The  $\pm 125$  Hz seems to be the best choice to me because if you can tune withing 100 Hz using the 2010, then the “ $\pm 125$ ” vernier control will allow you to zero beat. The pot I recommend is a Sfernice/Vishay Mouser # 594-657-0-0-502. It is rated at 1,00,000 rotations, and will fit into a small space beneath the RF PC board, between the left side of the case and the speaker, near the bottom left corner (viewed from the front). I recommend mounting it as high as possible above the bottom, given the space constraints determined by the speaker. I used a black anodized 0.75 inch diameter Eagle (EPD) knob, Mouser # 450-7005.

Trimmer capacitor CT4 was also moved to the rear side of the PC board to facilitate alignment of the 100 MHz oscillator. One can use the service manual procedure to align the 100 MHz oscillator, but that is quite difficult



to do. Instead, after aligning the BFO on a strong daytime signal in the MW band, I tuned WWV 15 MHz and uses CT4 to zero beat WWV 15 in USB or LSB. Then I checked zero beat by tuning 0.1 to 0.3 kHz higher and lower to verify the upper and lower beat notes were about the same.