

This months issue of S/1 NEWS features a step by step modification sent by W8CX5 which includes changes suggested by previous issues. The modifications include solid state regulators in the power supply; additional diodes to reduce frequency shift when selecting VFO's; and other useful changes. The step by step procedure is very easy to follow and has been carefully checked for correctness.

MODIFICATION OF CX-7 POWER SUPPLY BOARD FOR I.C. REGULATORS - W8CX5

NOTE: Most of this information is the same as the article by KØHHP in the April, 1975 issue of S/1 News. Also see circuit diagram in the May, 1975 issue.

This step-by-step includes the T/R voltage change to reduce VFO frequency shift and other useful items.

1. Remove Q1, Q2, Q3, Q4, Q7, and Q8 from the power board, A3.
2. Run a wire through the board where the Emitters of Q2, Q3, Q4, Q7, and Q8 were originally. Solder the top end of the wire to the ground foil and the lower end to the original Emitter line.
3. Remove C24 (underside), C10, R28, R32 (with Zener diode, save for reinstall), R31, R17, R16 (pot), R10, C5, R15, CR-18, R24, R18 (reattach Zener).
4. Do not remove CR-11 (ground end), R19, & C8. These complete some ground circuits.
5. Remove R22, R21, R20, R11, and R12. Install jumper wires across the connections, but leave 1" of wire extending through the bottom holes for the jumper across R12 after soldering.
6. Replace R29 with 10 Ohm, 10 Watt WW resistor.
7. Remove R13 and cut the foil away from both connecting terminals. Install a 220 Ohm - 2 Watt resistor on the terminals used by R13. (Top side of board).
8. Bend wire extending from jumper across R12 and solder to Pin #139.
Note that the foil was cut away in step 7 from R13.
9. Install jumper wire from one side of R13 (has .01 cap on top side) to the -15 volt buss, Pins 117-122.
10. Install jumper from the other side of the new R13 to the foil that connects the large holes in the area where R16 pot was located.
11. Locate the positions where the new 1N4001 diodes will be placed near the old R16 pot location. Temporarily attach 1 foot long wires to the points where the diodes will be mounted to allow easy voltage matching. Connect the 3 diodes to the free wire ends and insulate. The 3 diode banded Cathode ends will connect to the foil between the large holes of R16 pot location. The other ends can be connected to any unused isolated foil points.
12. Install jumper from one of the new diode Anode connections to the T/R buss, Pins 106-110.
13. Install jumper from one of the new diode Anode connections to the R/T buss, Pins 101-105.

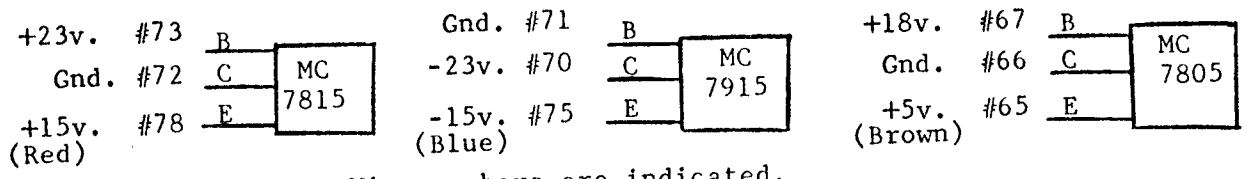
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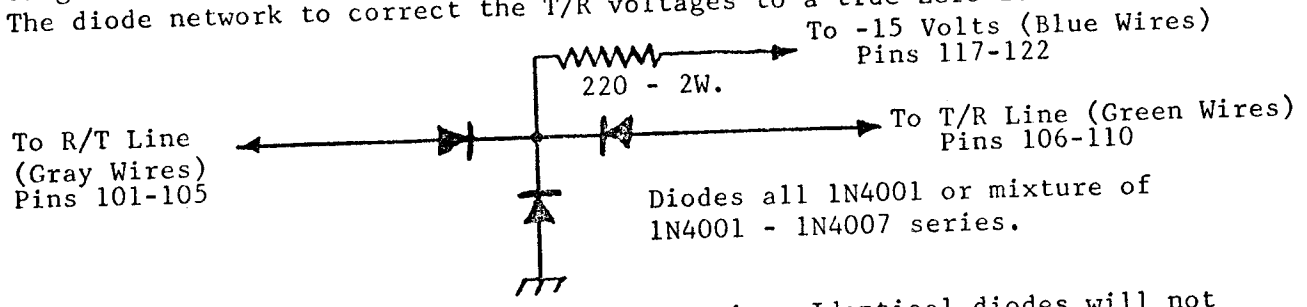
Audio modules and press-in fasteners are still available....

14. Install jumper from the remaining diode Anode connection to ground.
15. Install new .01 μ f disc cap between base and collector holes where Q2 was removed and bend one lead so that the base and emitter holes are connected.(gnd).
16. Install jumper between Pins 139 and 142.
17. Replace CR-12,13,14 & 15 with 3 Amp diodes (leave leads long), and install 1 Ohm, 3 Watt WW resistors between the diode outputs and Pin 148 and to Pin 149 after the foil to these pins is cut away. Space the resistors slightly away from the underside of the board and cut off excess diode lead lengths.
18. Install new 5 μ f - 50 Volt cap in the unused holes of Q8 location. Jumper Neg lead to ground (Q8 emitter connection), and the + lead to Pin 137 / R29. Install a new .01 μ f disc in parallel, under the board.
19. Locate the R32 connection that goes to Pin 136. This is the + side of a new 150 μ f-35 Volt cap. Drill a hole thru foil and board to the foil strip going across the board to the ground side of the new 5 μ f cap from step 18 for the neg lead.
20. If the Zener diode removed in step 3 with R32 is a 1N4734A, replace with a new 1N4735A and relocate to the underside of the board, Anode to ground and banded Cathode to Pin 136 or the new cap installed in step 19.
21. Install a 1 μ f-35 Volt or larger Tantalum cap as close to the new I.C. regulator input side as possible to prevent oscillation. Space exists to put them in the wire leads about 1" from the regulators. The + lead goes to the "B" terminal and the - lead to the "C" terminal on all 3 regulators.
22. Install a MC7815-CP in place of Q1, a MC7915 in place of Q2, and a MC7805-CP in place of Q3 on the rear chassis panel. Only the MC7915 must be insulated from the chassis with the same hardware used with Q2. The MC7815 and MC7805 are bolted directly to the chassis. Larger screws are recommended for these two and use plenty of thermal compound. Wire the new I.C.s as follows:



Front view of I.C.s - Wire numbers are indicated.

23. Circuit changes on the audio board A6 to change the T/R voltages: Install jumper wires in place of R65 & R66 (12 Ohm), and remove Q16 & Q17. In place of these two, install Motorola MPS UO5 transistors. Observe E, B, & C markings stamped on the new transistor pins and connect to the same points as the original 2N5183 types. See October, 1975 issue of S/I News if more info req'd.
24. The diode network to correct the T/R voltages to a true Zero is as follows:



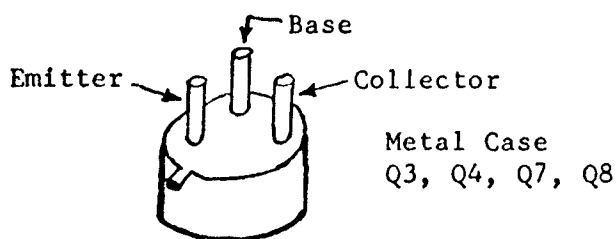
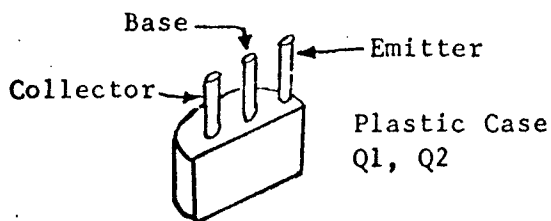
25. The diodes should be matched by experimentation. Identical diodes will not work best. Start with an ohmmeter check for forward resistance. In general, a high voltage drop diode will work best to the Green Wires, a 1N4007 seems to be best. A medium drop diode is best at the one going to ground, a 1N4001 to 1N4004 is best. A low drop 1N4001 or TWO of them in parallel seems best for the one going to the Gray Wires. Start by metering the PTO switching terminal of one VFO with the 3 diodes in place and both the transmit and receive VFO on B or A. This grounds the PTO terminal. With a dummy load on the transmitter and output lowest setting, switch the receive channel to the other VFO, push the TUNE button, and again measure the VFO terminal for PTO switching.

25 cont...

The VFO is now on the T/R line and should still be Zero volts. If not, try different diodes to the Green wires or the common one to ground. When the voltage is closest to Zero, the diode matching for the R/T line can start. Meter one PTO switching voltage terminal on the rear of a VFO with the same receive and transmit channel selected. When the other transmit channel button is pressed, the PTO terminal goes from ground to the R/T line and should be still Zero. If not, try different diodes for the one going to the Gray Wires or parallel combinations.

- 26. It is strongly recommended that a heat sink be added near the I.C. regulator rear chassis location to help radiate the heat. Aluminum fins may be self-tapped in place. See April, 1976 S/1 News.
- 27. Although the following is not a part of the modification, they are easy to add with the power board out:
 - a. Install a G.E. # V130LA10A varistor from terminals 164 to 165 to absorb transient spikes from the transformer and coming in on the AC line. See April, 1976 S/1 News.
 - b. Install a new audio module which is available from Bob, WØYVA/4. This eliminates a lot of excess parts and trouble possibilities.

Existing transistor outlines to help identify emitter leads:



S/1 NEWS, Volume III, Number 6, discussed a problem concerning a modification to allow proper zero-beating of the crystal calibrator with WWV. The discussion did not cover each possible case, namely crystal frequency is too high or too low for proper adjustment. In any case, if you cannot zero your crystal calibrator it is possible to pad it with a small mica capacitor to allow proper adjustment. If the crystal oscillator frequency is too high and cannot be adjusted down, add a small mica capacitor (a few pf's) across the padder and readjust. If the crystal oscillator frequency is too low and cannot be adjusted up, add a small capacitor in series with the crystal and readjust. You might have to try a couple of different size capacitors to obtain proper zero beat but this is less expensive than a new crystal. (Thanks to Jerry, WA1USZ for additional info on this item)

It has been found that receiver response on 160 can be greatly improved by turning the PA LOADING control full CCW!

Has anyone found a source for replacement Mira meter lamps??

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FOR SALE & ETC

CX7 parts wanted and CX7 parts for sale. Looking for cabinets!
Bob WØYVA / N4RS. POB 6216, Arlington, Va., 22206

Has anyone experienced the following: When in SSB mode and VOX selected, the position of the VOX GAIN affects the output! more VOX GAIN, less output. Any ideas anyone? (Posed by N6MG)

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