

1. RF Driver board: Changed transistors Q3 & Q4 to TRW #PT-3657 or Kirtron K-1013 to eliminate spurious outputs. (All CX-7 units) Motorola 2N5641 may be used.
2. RF Driver board: Change underrated R14 to 1 Watt size, 470 Ohms. (S/1 News).
3. RF Driver board: Add CR8, 1N456 - CR9, 1N456 - R20, 560 Ohm, 1/2 W - and green wire to T/R voltage to cool Q4 and cut receiver noise. (All units after #200 was standard).
4. RF Driver board: Add 0.1 μ f, 100 disc cap across C25 to stop low frequency oscillation. Locate under board across R12. (CX-7A).
5. RF driver board: Change C30 from 1KV to 3 KV size. .01 μ f disc to protect against tube shorts. (S/1 News) (Probably not needed, CR-1 in A-10 protects).
6. BFO Board: Change C12 from 82 to 47 pf \pm 5%, 500 V dipped mica. (Standard on all units after #200).
7. BFO Board: Cut hole in top of cover for access to adjust R43 pot, Offset frequency. (W8CXS).
8. BFO Board: Grounded case of crystal Y4, 11.4278 MHz, with short wire to reduce dual transmit signal level using A/T0. Problem is the 43.1 MHz oscillator circuitry surrounds the 34.2 MHz offset circuit and couples in a weak signal also (W8CXS).
9. BFO Board: Grounded case of Y3 crystal 43.1 MHz on #00121 only. No change was noted (W8CXS).
10. S-2 Board: Add 1N456 diode underside of switch board. Cathode to pin #12 of switch S2B (A/T0) - Anode to pin #17 of switch S2E (Spot). To cutoff A/T0 oscillator on receive to stop dual receive signals on A/T0 operation. (S/1 News).
11. Counter Board: Add R24, 3.3 Meg resistor, 1/4 W from terminal #367 (C47) to ground inside counter cage to reduce arcing of switch from Nixie decimal for offset. (Standard on all units after #200).
12. Counter board: To speed up keyer dot start time, add .003 to .005 μ f disc cap from base of Q5 to Pin #362 (Pin #6 of IC-15). Best average size is .0035 μ f made from pair of smaller sizes and measured on cap tester. (W8CXS).
13. Counter Board: On early LED counter boards, the ground foil at all 4 corner mounting holes is not carried together. Wire jumpers to all 4 corners, top and bottom both. (K4FU).
14. IF Board: Add capacitor C3 to allow separate adjustments of PTO A or A/T0 injection. Erie 2-8 pf ceramic trimmer installed and existing parts rearranged. (Standard on all units after #200).
15. IF Board: Change R55, 33K Ohms to a 150K Ohm resistor and R79, 150 Ohm to a 390 Ohm resistor to reduce cross modulation. (CX-7A).
16. IF Board: Installed shielded cable between plug-in filters on mode switch to reduce leakage around the filters. (Standard on all units after #200).
17. IF Board: Change C27 on mode switch from 20 μ f to a 10 μ f, 20-35 Volt tantulum cap to speed up the VOX attact time. (CX-7A & late production).
18. RF Driver Board: Change C11 from 5 pf to 2 pf tubular ceramic to stop spurious oscillations. (CX-7A).
19. AGC Detector Board: Add R57, 5 K Ohm pot for "S" meter adjustment and change series resistor R28 to 22 K Ohm for centering the range. 18 K Ohm size was correct for one other. Rearrange parts & drill holes to fit. (Standard on all units after #200).
20. AGC Detector Board: Add 6800 Ohm, 1/4 W resistor between collectors of Q12 and Q13 to eliminate AGC "Pop" action. (CX-7A).
21. Front End Board: Install sockets for Q1 & Q2 to allow selection for best cross-mod. Install two Vector pin sockets at R8 location (Fits 1/4 W resistor) to allow selection of R8 for lowest cross-mod, a 100K or 120 K seems best. (W8CXS).
22. Front End Board: Washered up the rear switch bracket to better align the shaft coupling. (W8CXS).

23. PTO Modules: Replaced CR1, 1N270 diode with Hewlett-Packard #HPA-5082-2800 diode. (Standard on all units after #200).
24. PTO Modules: Reduced output levels to reduce spurious & noise to 160 Mv min to IF board. R7 to 200 - 330 Ohms. Output to counter is not critical.
25. PTO Modules: Add 47 Ohm resistor in series with R2 to +15 v line to reduce zener drain and decoupling. (CX-7B).
26. PTO Modules: Installed 100 Ohm, 1/4 w resistor in series with -15 volt lines. (CX-7B). For decoupling.
27. PTO Modules: Installed a 1 μ f, 35 or 50 volt tantulum and a pair of 0.1 μ f discs at each + & - 15v. terminal to reduce the \pm 100 KHz spurious transmitter outputs. (S/1 News).
28. PTO Modules: Add a ferite bead to each of the - and + 15 volt leads close to each PTO. Whitehouse #FB73-801 or Amidon. To reduce \pm 100 KHz transmitter spurious outputs. (W8CXS).
29. PTO Modules: Cut off from PTO A terminal, wire #6 coax to rear plug and tape back to reduce PTO leakage and loading. (W8CXS).
30. Audio Board: Replaced Q16 & Q17 with MPS-U05 transistors. (CX-7B T/R voltage change to 0 and -15 volts). Replaced R65 & R66 with jumper wires. (See #40 & #71).
31. Audio Board: An .01 μ f disc capacitor was installed across R61 (Q9 to ground) on CX-7A modifications in Calif. It causes a 6 dB receive audio rolloff on receive to reduce the white noise level. Helpful in most cases.
32. Audio Board: Changed C3 from 0.1 μ f to a 10 μ f, 20 volt tantulum with + toward gain control side. Improves low frequency transmit audio 1 1/2 dB at 500 Hz. (Standard on CX-7A).
33. BFO Board: Install R51 & R52, 1500 Ohms. (Standard on all units after #200, but missing on early production). (Also see note 74).
34. Audio Board: Phone patch filter not in. Installed L2, 100 μ h and C43, 56 pf mica under board at pin #335 to C8. (Standard on #300 ? or above).
35. Counter Board: Installed WB4VVF keyer inside counter cage, but cut foil at & IC-U1, pin #2 to defeat the Dash memory feature. Switching mode switch caused
36. keyer to operate, so installed shielded pair wire from rear of counter cage to the keyer jack to stop induced voltage. Grounded shield at jack end only and used pair of .005 μ f disc caps at jack. Must modify output circuit to prevent short dots. Change Q3 to MPS-3702 and Q4 to 2N5184 transistors. Also wiring changes. (W8CXS).
37. Front End Board: Remove R46, 1000 Ohms to increase 10 meter receiver gain. (CX-7A).
38. Power supply Board: Add 7 Zener diodes to power supplies for +15, -15, +5, +34, for spike protection. (CX-7A). Also see note 65 and 74.
39. Power supply Board: Modify for IC voltage regulators for +15, -15 & +5 volt supplies. (KØHHP)(S/1 News).
40. Power Supply Board: Add diode network to change T/R & R/T voltages to a true 0 and -15 volts. (Signal/One, New Jersey) (CX-7B). One 220 Ohm, 2 Watt resistor and 3 or 4 1N4001- 1N4007 diodes needed. Typical : 1N4007 at Green wires, 1N4004 or medium drop 1N4001 at common, parallel two 1N4001 at Gray wires. (W8CXS). Reduces PTO frequency shift using split operation. (Notes 30&71).
41. Power Supply Board: Install 1 μ f, 35 volt tantulum cap at each IC regulator to prevent oscillation. Locate about 1" from the IC, spliced into the wire going to the Input side. 1 mfd, 50 v monolithic ceramic may be used. (W8CXS)
42. Power Supply Board: Remove foil from R14 to pin #152 (+300 volt lead) and replace with Teflon covered wire to prevent arcing. (S/1 News).
43. Power Supply Board: Add G.E. #V130LA10A varistor to 120 VAC input, Pins # 164 to #165 to absorb transient spikes. (CX-7B). Two required if 240 volt operation is planned. One across each primary winding.

44. Power Supply Board: Installed W0YVA/4, N4RS Audio Board and a MC7818CP regulator, plus a 150 μ f, 35 volt cap on IC reg output, plus 1 μ f, 35 volt tantulum on input side of IC reg to keep audio out of + supplys. (See note @bottom).
45. Power Circuit: Insulated chassis electrolytic cans C2 & C9 and ran grounds to same point as the power transformer center-taps go. Moved ground braid of the power board corner to the same point. To reduce hum if used on 240 volt operation due to transformer winding unbalance. (W8CXS).
46. Power Circuit: Installed fuse holder on chassis rear (1/16 Amp fuse) in the lead to PA screen, +300 volt lead. Add 100 K Ohm, 2 watt to ground on units with Nixie counter or a 15 K Ohm, 10 Watt resistor for units with LED counters to prevent tube plate current runaway if fuse blows due to internal tube screen voltage generation. (Eimac). The larger resistor also regulates the +300 volt supply if Nixie counter is not used. To reduce plate current overshoot. (W8CXS) (S/1 News). Replace R4 on power board with a size to re-zero the screen current meter reading. About 36 K to 39K Ohms for Nixie and LED counters. Experiment for best size. (W8CXS). See item 85.
47. Power Circuit: Power transformers went bad on all first 100 units. (Mfg error).
48. Power Amplifier: Early production units, the tube sockets were not wired as in book photograph, figure 4-26. Rewired and used Teflon tubing as in the photo. (W8CXS). Ok after #200.
49. Power Amplifier: On all units up to about #300, the hole in the rear of the chassis which passes the heat sink to tube clamp block was too small to permit full contact of the heat transfer block. Enlarged hole to 1" high which is minimum for clearance. Ok on later units. (W8CXS).
50. Power Amplifier: On early units up to #200, the choke coils L1 & L2 were high resistance 100 μ h size. Changed to 22 μ h low resistance coils. (Standard in later units).
51. Power Amplifier: Installed 100 Ohm, 2 watt resistor at relay contact #13 to choke L2 in lower PA cage to reduce relay arcing when using Alpha type linear amplifiers. (W4ETO) (S/1 News).
52. Power Supply Board: Early boards did not have CR20, 3.9 Volt Zener diode. Installed. (Standard in all units after #200) (W8CXS). See note 74.
53. Replaced Audio/Rf gain pot with 2K - 20K Ohm size to agree with drawings and allow the receive audio to be turned down to zero. Pot was 2K-2K. (W8CXS).
54. Wiring Errors: High serial numbers: Wire #104 connected to switch connector plug P3-1. Should have been on P3-6 terminal. Error causes excess 2 tone transmitter output on A/TO. (W8CXS). **This is a Blue wire.**
55. Wiring Errors: Early serial numbers: 10 K Ohm resistor R23 at TUNE switch was on terminal #11 with wire #156. Moved resistor to terminal #10 as shown on circuit drawing, figure 3-10. (W8CXS).
56. Problems: Signals leak into front end board. Tried shielded leads for speaker lead to front Phone jack, No improvement. --- Reroute speaker lead from directly crossing the front end board, small help. ----- Add Ferite beads to speaker leads at rear jack, no help, but might reduce RF feedback. (W8CXS).
57. Problems: RF getting into CX-7 when using Alpha linears, possibly other types also. Feedback is via the RLY (Amplifier keying relay) jack. External Pi filter added as in S/1 News cures problem, 22 μ h choke and pair of .001 μ f caps in shielded box. Also can add Ferite beads to leads at RLY jack. (W8CXS). This makes the amplifier appear not to be neutralized on one or more bands.
58. Problems: Trouble with corrosion on MIKE jack, modulation loss and hum. Clean, adjust, or replace. Lockwasher too thin on some units and paint on surface. (W8CXS).
59. Problems: Receive hum from ground loops. Eliminated by cutting bare wire connecting sidetone pots ground lugs to braid on the shielded wires. (S/1 news).

NOTE #44. Use of LM-380 amplifier board or CX-7B power board requires reverse polarity on C-18 (1uf-50V) on Audio board, A6. (K6BE/5).

60. High Pass Filter missing on some early units. Installed. (W8CXS).
61. Add Meter Lamp, Mura Corp. #PTL-20D/6, 6 volt. Connect to +5 volt connection at rear of counter cage. Mount to top of meter with bent solder lugs. On LED counter board installations, install Mura Corp. #PTL-20D/12, 12 volt lamp with series 27 Ohm, 1 Watt resistor. Connect to 13.8 volt PA filament connection to reduce +5 volt power supply load.
62. Power Supply Board: Add 1 Ohm, 3 Watt resistor at output of CR12 & CR14. Also at output of CR13 & CR15 (0.5 Ohms w/L.E.D. counters) Used in CX-7B boards.
63. Cabinet: Install 12 press-in chassis nuts on all bottom chassis holes, 4-40 size. A #19 drill hole is required. Available from WØYVA/4 - N4RS.
64. Cabinet: Install finned aluminum heat sink (4 1/2" high x 4 3/8" wide with notch for key jack) on rear panel to cool the four regulators. (W8CXS).
65. Power Supply Board: The Zener diode supplied on CX-7A change was a 1N4734, 5.1 volt across the +5 volt supply. This diode conducts heavily at all times and degrades the regulation of standard boards. It adds to the load on I.C. regulated supplies. Replace with 1N4735A, 6.2 volt Zener to stop current drain, but retain surge protection. (W8CXS).
66. Service Items: Dow Corning #340 silicon grease is used for thermal conduction. After several years of heavy use, it dries out to a powder. Recommend that the tube clamp block be disassembled and greased every 2 years. I.C. and transistor regulators should be inspected and greased as required. (W8CXS).
67. Service Items: Apply "Lacquer Stick" to worn push button lettering.
68. Power Supply Board: On some early CX7B and some modified standard boards used with I.C. regulators, CR13 & CR15 were not changed to 3 amp diodes. ONLY CR12 & CR14 can remain 1 amp size or changed as desired. (S/l News) (W8CXS).
69. Wiring Errors: Info in S/l News called for the screen current to be run through the thermal time delay relay. This can cause tube plate current runaway by opening the screen to cathode path. Recommend that standard circuit with relay in the bias lead be retained. (W8CXS) (Eimac tube spec.)
70. Audio Receive Circuit: Changed audio gain control circuit to be located between the audio board amplifiers and the power supply I.C. audio amplifier. Add 20 µf, 25 volt tantulum capacitor (pair of 10 µf) to audio board with + to drain of Q19 and the - to Pin #313. Add 1800 Ohm, 1/4 W resistor from pin #485 (or #489 on some) on AGC board to ground. Add new shielded wire from pin # 485 (or #489) on AGC board to Pin # 308/309 on audio board. Remove shielded wires from audio board pins # 308/309, wire #136 and pins # 313/314, wire #55 and connect wires together. Remove wire #186 from pin #485 (or #489) of AGC board (cut loose and add a connector terminal on early units). Pull wire # 186 back and connect to pins #313/314 of audio board. Cut ground on AF gain control (shields to ground lug). Must run new ground wire to RF gain control. Note: On late models, pins #485 and #489 are separate. This modification still needs work due to high/low levels on the SPOT tone. It allows the AF gain to control the sidetone level. Distortion may be higher and maximum audio output is low. (CT1VX).
71. Problems: The T/R voltage change to -15 v applied to AGC circuit modifies the action and requires readjustment of "S" meter and AGC pots. Still needs work to find optimum resistor values for AGC. Selection of R51 size & R26 adjustment for 2.00V (AGC Off) & -.15V (Max signal/AGC On) at pin #509 on A9, works good.
72. Drawing Errors: On photograph, Figure 4-1 : Capacitors are marked wrong. C2 should be marked C9---- C9 should be marked C2 ---- C3 should be marked C6 ---- C6 should be marked C3.--- C5 should be C7 --- C7 should be C5.
73. CX-7B Power Boards: C11 (150 uf) audio output coupling cap is reversed polarized on all boards. Metering resistors on some boards were not precision types or wrong sizes, R2, R3, R6. 18 volt regulator input connection must be moved to the +23.5 volt side of the 7.5 or 10 Ohm dropping resistor or it will not regulate due to low voltage, early boards mostly.

74. T/R voltage Change on Early Models: The first 100 CX-7 units had a T/R voltage of +0.5 and -15 volts. Changes required on 4 circuit boards:
 - a. Power Supply Board: Add CR20, 3.9 volt, 1 Watt Zener diode under board near Q9.
 - b. BFO Board: Add R51 & R52, 1500 Ohm, 1/4 watt under board.
 - c. Audio Board: Add R65 & R66, 12 Ohms, 1/2 Watt. Some wiring changes needed to agree with instruction book drawing.
 - d. Front End Board: Change resistor R19 from 10 K Ohm to 8200 Ohm, 1/4 W.
 - e. RF Driver Board: Most units have all changes, but check circuit around Q7 to see if parts are as shown on the drawing.Many units were corrected when returned to the factory for early trouble and all after #200 have the changes. T/R now will be +.5 v and -13.5 volts.
75. Power Supply Circuit: Zener diode locations in CX-7A: Also see notes #38 and #65:
 - a. 1N4754A, 39.0 volt: Anode to hot side (-) of C6 & cathode (banded side) to ground. Add 0.1 μ f, 100 v disc across it if not already in.
 - b. 1N4754A, 39.0 volt: Cathode band to hot (+) side of C9 & anode to ground. Add 0.1 μ f disc across it if not already in.
 - c. 1N4735A, 6.2 volt: On the board, Cathode band to R32 (This is the emitter of Q3 junction to R32 at pin #136) and anode to foil ground. (+5 v supply).
 - d. 1N4754A, 39.0 volt: On board, cathode band to foil at Q11 transistor & anode to ground foil. (Collector of Q11 is connected to small foil area).
 - e. 1N4746A, 18 volt: On board, cathode band to terminal #168 (One side of R8) and Anode to foil ground. (+ 15 volt supply).
 - f. 1N4746A, 18 volt: On board, Anode to left side of R31 (This is -15 volt supply pins 147, 118, 119, etc) and Cathode band to ground foil.
 - g. 1N4757A, 51.0 volt: Cathode to hot side (+) of C2 and Anode to ground. Add 0.1 μ f disc across it if not already in.Also see note 72 for chassis capacitor locations.
76. Counter Board: On early Nixie counters, Resistors R22, 23, 24, 25, 38 were mounted tight to the board causing overheating and burning the board. Also when the Nixie tubes start to glow with a Blue tint, the resistors have lowered their resistance. The decimal light may glow also. Resistors should be mounted 3/8" above the board. Ok on #300? and above. (W8CXS).
77. Drawing Error: On Figure 6-10, AGC board, lower right: Pin #483, -15v does not exist on the board. R54 & R55 are connected to Pin #491, T/R. No wire exists to the left of R54, R55 going toward the C21/R27 junction. (W8CXS).
78. Replacement Parts: The large toroids in the lower PA cage are same as Amidon # T-200-2 Iron Powder Toroid cores. Two glued together and taped with glass tape make up the large one. Slots must be filed with a 1/4" round file inside the cores to clear the switch assembly.
79. PTO Modules: Wiring error on some units. C-17 & C-18 were reversed.
80. PTO Modules: Add 2 transistor isolation switches to reduce frequency change. Add "Break timing circuit" to hold RF output on longer. (CX-7B)(K6BE). Used modified circuit by W8CXS with 2 MPS-3702 transistors, 2 - 47 K resistors, 1 - 1N270 diode, 27 Ohm resistor, & 15 μ f, 20 v tantulum cap. (See item 89).
81. IF Board: To increase PTO Spot audio level, cut foil at Q5, Gate #1. Add 15K Ohm resistor to ground and .001 μ f capacitor to Pin #403 (PTO A input). Note that spot audio level is still slightly lower than the Offset spot audio level. (W8CXS).
82. IF Board: Moved ground from center corner of board from common transformer ground point to separate ground screw to reduce hum. (S/1 News).
83. Front End Board: Add 220 Ohm & .01 μ f disc at pins 58 & 66 to stop motorboating (S/1 News). (Only the 220 Ohm resistors are required in most cases).
84. Front End Board: Change xtal Y7 to 43.500 Mhz to reduce spurious outputs, band now tunes 3.5 to 4.5 Mhz. Add xtal at socket "A", 41.000 Mhz to reduce spurious outputs & increase receiver sensitivity on 160 meters. (Tunes 1.8-2.8 Mhz)(S/1 News).

85. Power Circuit: Install switch in the 13.8 volt AC lead to the PA tube filament. Use double pole switch for reliability. Locate on rear of chassis. If a screen fuse holder is in place, it may be relocated inside to free the hole for the switch mounting. (S/l News), (W8CXS).
86. Front End Board: Moved the ground strap (corner of board) from the power transformer mounting bolt to a separate point to reduce high AC hum voltage getting on the board. Hole drilling is required. (W8CXS).
87. Power Circuit: Some power transformers have a higher radiated AC field and can induce hum into nearby wiring. Insure that wiring is dressed away from the transformer. Some transformers have a small voltage on the frames that will go through the ground straps going to the front end and IF boards. Straps should be relocated and the transformer mounting bolt hardware changed from a flat washer to a toothed lockwasher close to the chassis. (W8CXS).
88. Counter Board: Hash from the counter getting into the front end board. Most noticeable when calibrating. A ground loop between the AGC and Counter boards exists on some units. Re-route coax wire #154 direct from AGC board pins (100 KHz) to the counter board pins #358 & #359 by removing the teflon feedthru at the counter cage rear and running the cable through the hole. This is used on the CX-11. (W8CXS).
89. PTO Modules: The "Break Timing" circuit alone (See item 80), with 1N270 diode, 27 Ohm resistor, & 15 mf-20 v capacitor, gives adequate isolation for frequency change due to slight voltage differences in most cases. (Used alone in CX-7B).
90. AGC Board: R23, 390 Ohms, $\frac{1}{4}$ watt is running hot in the S meter circuit. Replace with $\frac{1}{2}$ watt size to reduce drift. (W8CXS).
91. R.I.T. for Receiver: Replace FSK pot with 10 K Ohm ^{linear} pot equipped with push-pull switch. Components on a small perf board: 1 - 6.8 v Zener, 1 - 15 K, 1 - 150K, 1 - 1 K, 2 - 2700 ohm, 1 MPS-3702 transistor. Connect to -15 v supply and use T/R voltage to disable on transmit. *Class-stab is best and higher S/N*
92. BFO Board: To check Zener diodes in cases of frequency jumping, measure the voltage from both sides of the Calibrate pot to ground. Should be about 9 or 10 volts + or - for a good one. (W8CXS).
93. Front End Board: Receiver gain on 14 Mhz is not as high as the lower bands due to the RF choke in the output of the RF amplifier transistor not being the optimum size to cover all bands. Separating the switch, S7G, contacts # 6 & 7 from the others and adding a separate RF choke from the contacts to one hole in the board where resistor R46 was removed will allow the gain to be equalized. A 10 microhenry ferrite choke, shunted with a resistor, which is selected for the gain that is required, about 1500 Ohms, works nicely. A longer wire is needed to connect the remaining contacts, #1 to #5, to the board. (W8CXS).
94. AGC DETECTOR BOARD: "S" meter readings are typical 2-3 dB/"S" point and no action at low signals. The dynamic range can be increased so S-1 is about 1 uV by adding a resistor in series with the base of Q7 and reducing the resistance setting of pot R57 to maintain S-9 at 50 uV. The value of R28 may be reduced to center the adjustment of pot R57. Select value of resistor at Q7 base to give 5 dB/"S" point near S-9 and give the correct 10 dB steps up to at least 40 over S-9. About 82K to 330K Ohms at the base. Note that too high of a value will prevent the meter from returning to zero with no signal input. Typical R28 is 15K Ohm.
95. IF BOARD: The Deluxe CW filter has 6-10 dB additional loss. Add 2N3904 transistor amplifier on small circuit board soldered to the filter socket pins. Connect with small coax and power from the -15 Volt supply. Adjust the gain by selecting the size of the unbypassed emitter resistor.
96. BFO BOARD: The difference between the 2 crystals 8.8 MHz, should be exactly (+50Hz) 3.000 KHz with good IF filters. The specs on page 5-16, Paragraph 5.3.2.d, steps 6 & 7 should be changed. Step 6 should be 8.8165 MHz \pm 0 Hz. Step 7 should be 8.8135 MHz \pm 25 or 50 Hz. This aids getting the carrier down on the filter sides better. Better sideband suppression and ease in setting the IF Offset control. In CX-11, the frequencies are set exactly at 8.8165 & 8.8135 MHz with trimmer cap.

97. I.F. Board: Coax #25 running near ungrounded coax #180 in the noise blanker area (Pin #456) has some noise pickup which can be heard good at 1825 KHz. Re-route coax #25 away from this area.
98. I.F. Board: Wiring error on many California radios, serial numbers ending in 420 to 440 series. Capacitor C115, located between filter FL-3 & CW filter bracket, was installed as a .01 uf ceramic disc instead of the required 120 pf silver mica.
99. AGC Board: Coil L3 was found to be 3.3 uh size (Orange-silver-orange) in many California radios instead of the required 2.2 uh size (Red-silver-red). The lower carrier insertion level was partially corrected by removal of C-19, (.01 uf disc). When coil is changed, re-install C-19.
100. Front End Board: Wiring error on many California radios, serial numbers ending in 420 to 440 series. Capacitor C4 installed as a 10 pf mica instead of the required 1000 pf mica. Correct code marking is CM05CD - 102D03. Located under a band switch wafer. Improper size causes poor 40 meter receiver front end preselector peaking.
101. Power Supply Circuit: To prevent shorts on -25 / -27 Volt supply on early model radios using Aerovox capacitors which are uninsulated, cover chassis mounted capacitor (1500 uf - 50 Volts) with fiber or plastic sleeve, 1-3/8" diameter x 2-1/8" long. Capacitor is marked C3 on uncorrected figure 4-1). Later radios used Mallory capacitors with plastic covers. (Capacitor is C-2).
102. Power Supply Circuit: To prevent shorts at the hot mounting screws for two of the rear panel mounted voltage regulators, CHANGE THE INSULATING PLASTIC should washer to a position at the regulator, inside the chassis, and the 4-40 nut & lockwasher on the outside of the chassis. If the regulator has too small of a hole, unlarge with a #25 drill (Remove burrs carefully). Mount the other two grounded regulators with 6-32 hardware for better cooling. (This insulator method is used in the CX-11A).
103. PTO Modules: To test for PTO oscillators which will not turn off, use 7 MHz band, tune "A" to 196.5 on digital display, tune "B" to 500.4 on display and select "A" receiver to hear the "B" oscillator running. Reverse to test "A".
104. Audio Board: Transmitter audio gain checks: With 1000 Hz tone at 10 millivolt input to "patch" jack (using 600 Ohm termination at generator) should get about 34 mV at pin #501 on AGC board, high impedance meter. With 10 mV input to "Mike" jack (Using 600 Ohm termination at generator) and mike gain control set at maximum, should get about 36 mV at "Patch" jack with high impedance meter.
105. R.F. Driver Board: To replace Q3 & Q4 transistors with Motorola 2N5641 type which are larger than the original transistors: The hole in the board must be enlarged with a file to a "D" shape to fit properly. The distance from the bottom of the circuit board to the outside of the metal plate that connects the two transistors must be exactly 3/16". The additional length of the 2N5641 must be compensated for by reducing the two spacing washers in thickness from 1/16" to about 1/32" (.031") to avoid bending the board or breaking the transistors.
106. Transmitter Troubles: Spurious outputs is evidenced on a monitor scope on 28.5 MHz by "Fuzz" (a dual signal overlap of 10% or more on scope pattern) on "Tune". Problem is transmitter mixer I.C.# 1 (CA-3028A) on front end board or a leaky gate on Q4 (40603) transistor.
107. Power Supply Circuit: Typical power supply hum levels with R.F. Gain full CCW and Audio Gain full CW: +15V = 2.2 to 4.5 Millivolts. ---- -15V = 1.65 to 2.45 mV ----- +18 V = 1.1 to 2.35 mV ----- +34 V = 2.5 to 4.5 mV ----- CR13/CR15 diodes, banded ends (+) = 1.2 to 1.35 Volts ----- CR12/CR14 diodes, unbanded ends (-) = .77 to .8 Volts ----- Input to +18V regulator = .5 to .8 Volts----- Audio Input = 4 to 10 mV with hiss ---- Audio Output = 20 to 51 mV with hum & hiss ---- -60 V = 21 mV ----- D.C. Voltage: Audio Input coax at power board = 8.74 to 9.6 Volts D.C. ---- A.C. High Volts = 572 to 595 VAC depending on line supply.

NEW A3A BOARD INST.

- 1.) CHECK ALL WIRES FOR NUMBERS (SOME ARE IN THE WIRE & SOME ARE ON TAGS STOCK TO THE WIRES. ESPECIALLY MAKE SURE NO.
- # 95/249/375 ON PIN 166
 - # 94/230 ON PIN 165
 - # 93 ON PIN 164
 - # 92/378 ON PIN 163
 - + 1400V # 91 ON PIN 162
 - 1150 AC # 90 ON PIN 161
 - 1150 AC # 89 ON PIN 160
 - RED/YELLOW STRIP. # 87/88 ON PIN 159
 - PURPLE WIRE 230 AC # 81 ON PIN 153
 - ORANGE WIRE 21V AC # 74 ON PIN 146

- 2.) THEN REMOVE OLD A3 BOARD

- 3.) REMOVE T-2 (SMALL TRANSFORMER ON BACK ^{TOP} ~~BOTTOM~~ OF CHASSIS)
- REMOVE a) 2 LEADS TO J-6 (POWER PLUG) # 225/^{YEL}/_{BLK} 224
- REMOVE b) 2 SPliced LEADS ~~#~~ NO 59 CUT AT PIN (AUDIO OUTPUT) 198
- CONNECTOR & PULL PURPLE LEAD NO. 198 (TO ^{PHONE} JACK ON FRT. OF UNIT) FAR EDGE OF UNIT AND CUT.
- c) CUT ORANGE WIRE # 372 AT EXT KEYER ON BACK OF UNIT.

4. GO TO T-1 WIRES AND SEPERATE ALL FOR USE LATER ON.

5.) REMOVE ALL WIRES TO Q1, Q2, Q3, Q4

a. 62 }
63 } TO Q4 THEN REMOVE Q4
374 }

b. 72 }
73 } TO Q1 THEN REMOVE Q1
78 }

c. 70 }
71 } TO Q2 THEN REMOVE Q2
75 }

d. 65 }
66 } TO Q3 THEN REMOVE Q3
67 } (LABELED 56)

IMPORTANT: SAVE INSULATORS FROM BACK OF UNIT ON SCREWS FOR RECTIFIERS, USED LATER!

6.) REROUTE COAX LEADS TO J-8, 9, 10, 11 - TO J-7 (H.V. RUG UNDER FUSE SOCKET) TO MAKE ROOM FOR NEW RECTIFIER HEAT SINK

7.) BUILD UP NEW HEAT SINK ASSEM. (SEE INST.)

8.) PREPARE J-6 BY REMOVING ALL WIRES EXCEPT TERMINAL #6, #7, #14 (SAVE WIRES #12, #14 TO RUN TO MOLEX PLUG LATER) ALL OTHERS CAP COVER W/HEAT SHRINK TUBING ~~BEST~~ FASTEST!

9.) INSTALL HEAT SINK ASSEM. IN BACK OF THE UNIT. DRILL 4 NEW HOLES IN THE SINK

10) MAKE UP 36 PIN MOLEX PLUG (SEE DIAGRAM) ADD 4" TO FOLLOWING WIRES #209, (#120, #14, #128, #86, #82, THE PINS FROM J-6) ADD 6" TO WIRES CRIMP THEN SOLDER PUSH PINS IN ALL THE WAY IN KEEP THEM STRIGHT.

11) ~~INSTALL BOARD~~ PUT 36 PIN PLUG CAP RED/YEL WIRES #87, 88 CAP. OFF NOT USED. SPLICE WIRE #93 TO WIRES #95, 249, 375 SPLICE WIRE #94 TO #92, 230, 378 PUT HEAT SHRINK TUBING OR ELEC. TAPE PLACE UNDER THE BOARD CABLE TIE

12) MAKE UP H.V WIRES OUTPUT WIRE # ~~88~~ +1400 #91 - C8-1 MALE CONNECTOR INPUT WIRES # ~~88~~ OR #89, 90 FEMALE CONNECTOR

13) INSTALL BOARD PUT 36 PIN PLUG AND H.V WIRES

14) MAKE UP DIP PLUGS (SEE BOARD COUN SHEET)

15) HOOK UP AUDIO WIRES COAX #55 AND #198
(SEE TOP LAYOUT FOR LOCATION) SPLICER VOX WIRE
#60 ~~TO~~ INTO #198 TAKE #53 SOLDER TO A
GROUND LUG

16) DOUBLE CHECK ALL WIRING FOR ~~ACCURACY~~ ~~THESE~~

9-27-83

Hi MATT,

I WILL SURE APPRECIATE THE W2PV INFORMATION. AS YOU CAN SEE FROM ENCLOSED MODIFICATION LIST TO MY OLD #21 FROM THE FIRST PRODUCTION RUN, I HAVE DONE QUITE A BIT OF WORK ON MY RADIO. W2PV SOLVED MANY PROBLEMS THAT I COULD NEVER FIGURE OUT AND I WILL PASS ON THE INFORMATION TO OTHERS VIA ADDITIONS TO MY LIST.

ENCLOSED 7 PAGE MOD LIST AND PAGE 5-5 FROM THE THOMAS BOOK OF JULY, 1973 AS YOU REQUESTED. ALSO OTHER PAGES WITH MARKED CHANGES / CORRECTIONS TO FILL ENVELOPE.

LET ME KNOW IF YOU NEED OTHER PAGES TO FILL IN YOUR BOOK.

73, Paul

W8CXS
Paul J. Kollar
29317 Bonnie Drive
Warren, Michigan
48093

MARK (302) 454-8248
317 RODNEY F
NEWARK DE 19711

29317 Bonner Drive
Wager Mich 48093
Paul Kollar

313 751-7712 H
827-9905 O

VT52

100

load
till 12 mill
peak
Screen

set for
10 ma
peak
on

output

Desy of Luminous
on picture

MHz
360

Drive always
zero

use flat
mic

HEIL shaped

D 104 > Lafayette
Dial - 1m

Directional - MAGNETIC

Cpath thru JFET?

Send notes

WBCXS

on mods.

send hamilton too

no kenwood.

617-

JFET OK

C2 OK (NOT SHORT)

R = 3K / 1.5K
33G-4

Vox Pot OK

R1 350/400 Ω !

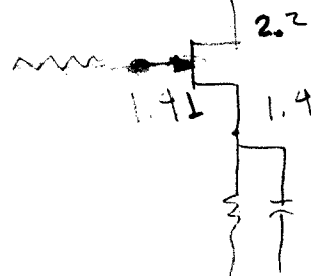
What is JFET Q POINT?

check ANTI VOX
CCW - u down

0.27V

↑

CX7-A



IG FET

Took at
2-way
G.E.

replaced Elect.

gate should be 0.
transistor is shorted

CLIPPING

read

just kick

up

for punch

3

mean goes

25

orig 40468A w/ metal shield

G-S
200 - KXH

can act out cap

Source should be 1-1.5V
Drain @ 9V

1. 5.5 D
2. .4 - 1 S
3. 0 G
4. .4 - 1

Mods of #21

Voltage Checks

1 KC @ 10 MV at
patch jack

34 mv at 501 on

AGC

5-5 104F

set gain @
30 mv for

10 mv on mic
-20V on patch
w/ wide gain.

20
H clipped
not static
peak it! for
max TX out
PAC side is fast drop
needs to be on other
side.

@ 3-400 MV at
Test point
17VM 10/RF