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S/1 NEWS

I have received considerable correspondence the past few weeks concerning various Signal/One related items. Thanks for your time - it is making my job much more enjoyable. I hope S/1 NEWS is proving a useful "tool".

With respect to the modification described in last months issue concerning the audio output change to an LM380: It is desirable to completely remove the audio output transformer from the circuit (as noted last month) since some degradation of audio could result. If 600-ohm output is desired, the transformer can be retained but with some reduction in audio. The speaker and headphones should be connected directly to the LM380 output however and NOT through the transformer. Take your choice.

W4SXK notes that the meter lamp can be replaced with small units available from Allied Radio Shack. They are 6-volt 25 ma units with wire leads.

I have made a few copies of the following Signal/One technical documents that might be of interest to some of you.

CX-7 FINAL TEST PROCEDURE, 01-S0001-001. This 35 page document provides step by step procedures for complete alignment and testing. $5.00 ppd

CX-7 VOLTAGE CHART, 01-S0001-001. This 47 page document provides tables of voltages for most PC board pins, IC's and transistors - a very useful listing for trouble-shooting! $6.00 ppd.

Both for $10.00 ppd. I only printed a limited number of these since quite a few pages are involved. If there is sufficient interest, I will print more when my present supply is exhausted. Write to editor.

THOMAS CX7/CX7A manual and my latest Trouble Guide are available for $20 postpaid for those who are interested. The Thomas manual is a MUST for working on these rigs!

Douglas Electronics, Corpus Christi, Texas, advises that they will only service Signal/Ones they have sold. (About 30 in all)

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As promised in an earlier issue of S/1 NEWS (Number 7), a modification will now be described (courtesy Dick Cunningham, KØHHP) concerning the installation of a MFJ model CWF-2 filter into the CX7. This unit does a great job on CW and has bandwidths of 70, 110, and 180 Hertz. I purchased one of these little units and compared it against my installed Signal/One CW filter - in my opinion the MFJ does a much better job. Even at the narrow bandwidths there is no ringing. The modification to be described places the MFJ unit inside the CX7 near the mode switch and rewires the mode switch such that CW2, CW3, and FSK positions provide bandwidths of 180, 110, 70 hz respcetively. The installed 2.1 hz filter is used for AM, LSB, USB, and CW1. WITH THIS MODIFICATION NO AUXILIARY FILTERS CAN BE USED.

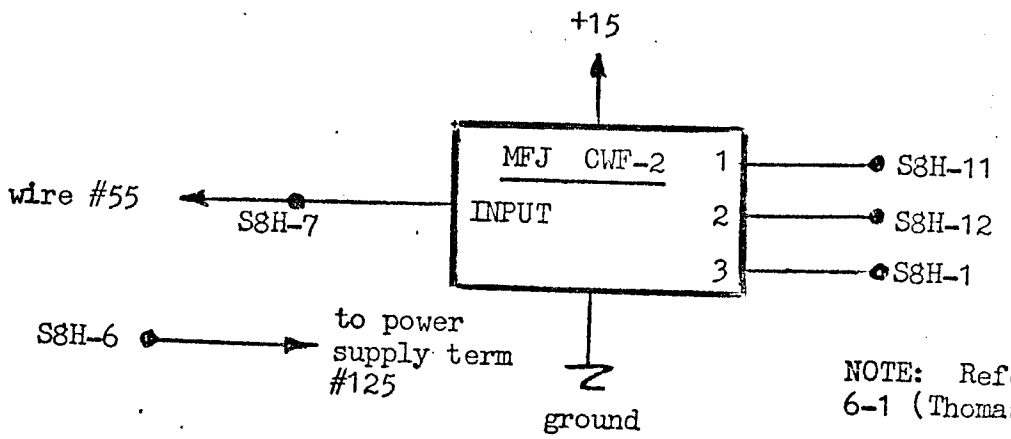
The step-by-step procedure is as follows:

1. Remove Wire #355 from S8H-7.
2. Remove Wire #185 from S8H-6.
3. Solder Wire #355 to Wire #185 and properly insulate the splice.
4. Install a jumper from S8G-6 toS8G-7. (Wire #184 is connected to S8G-6 and Wire #353 is connected to S8G-7.
5. Mount the MFJ filter in a convenient location near the mode switch.
6. Connect the MFJ filter + to any point in the +15 volt line.
7. Connect the MFJ ground to any ground location.
8. Remove coax #35 (audio input to terminal #125 on power supply board) and connect to S8H-7. Coax #35 will not reach this switch terminal and therefore will have to be extended. Shielded wire is not required for this extension. Hookup wire will do.
9. Connect MFJ filter input to S8H-7 (same terminal as in step 8).
10. Connect a new wire from S8H-6 to terminal #125 on power supply board.
11. Connect MFJ filter output #1 to S8H-11 (180 hertz output).
12. Connect MFJ filter output #2 to S8H-12 (110 hertz output).
13. Connect MFJ filter output #3 to S8H-1 (70 hertz output).
14. Clip jumper from S8H-12 to S8H-1.

NOTE: The jumpers between S8H-7, 8, 9, 10 should be left in place.

Many thanks to Dick, KØHHP, for taking the time to lay this out in detail.

The revised circuit will look like so:



NOTE: Refer to Figure 6-1 (Thomas Manual)

Paul, W8CXS, sent me quite a listing of modifications to early CX7 units. Many of these modifications were made in CX7A units and is so stated. What W8CXS sent is reproduced below exactly as received (Many thanks to W8CXS for taking the time to type all these modifications up for our use!)

1. Driver board transistors Q3-Q4 changed to TRW # PT 3657 or KIRTRON K-1013 (only if drive falls off or parasitics occur). See # 2 & 3 for ways to save original ones.
2. Capacitor C-11 changed from 5 pf to 2 pf tubular ceramic on RF driver board to prevent oscillations. (CX-7A change).
3. Modify RF driver board to add CR-8, CR-9, R-20, Terminal, and wire to the green T/R line This reduces heating and improves bias on transistor Q-3. 2- 1N456 diodes, 560 ohm ½ W.
4. Change R-14 to 1 watt size resistor. 470 ohm. on RF driver board. (Not verified).
5. Add capacitor 0.10 Mfd, 100 v. disc ceramic in parallel with C-25 (0.10 Mfd) on top side of RF driver board, R-26 to R-28 ground side. (CX-7A change---Why?).
6. Install High pass filter board A-12. Missing on early models. Reduces BC band overload.
7. Reduce ground loop hum by cutting bare wire connecting Sidetone Pots shielded cable braid to ground at rear of chassis. Slight improvement noted.
8. AGC Detector board A-9. Add 6800 ohm ¼watt resistor between the collectors of Q-12 & Q-13 by cutting foil & installing on bottom of board. (CX-7A change to reduce the AGC popping action. Works good on some units.
9. AGC Detector board A-9. On early models, add "S" meter control R-57, 5000 ohm pot in open spoton board, remove some ground foil ,wire with jumpers. R-28 shown on drawing should be selected for proper range on pot, 22K ohm is about right.
10. Change C-27 on Mode Switch S8G from 20 Mfd to 10 Mfd, 35 V.electrolytic.(CX-7A change to speed up VOX attact speed.) 9 Mfd (measured) worked better. Check actual value!
11. Front End board A-2. Remove resistor R-46. (CX-7A change to increase receiver gain on 10 meters.) About 1 "S" unit improvement.noted.
12. IF Board A-8. Change resistors R-55 from 33K to 150K ohm ¼ Watt and R-79 from 150 ohms to 390 ohms ¼ Watt. (CX-7A change to improve transmitter modulation)
13. IF Board A-8. Add capacitor C-3, Erie 2-8 pf variable to early model to allow separate adjustments on VFO injection for same drive levels on VFO A, VFO B, And A/TO. Rearrange parts and drill holes in board, see instruction book photos.
14. PTO Module A-1 . On early model, replace CR-1 diode, 1N270, with Hewlett-Packard hot carrier diodes HP 5082-2800 as shown in the instruction book. This takes care of some PTO's with too high or low outputs.
15. PTO Modul A-1. The capacitors, RMC .01 Mf +80 -20% used as bypass and coupling have very poor temperature performance. Typical -20% reduction with hand heating. Only capacitor C-12 seems critical in size, but possibly capacitor C-8 which is part of the output circuit should also be replaced. CRL disc ceramic, 1KV size, are much more stable. Capacitors must be bent down to clear the moving coil slug as their size is bigger in diameter. Check capacitors in a tester to find ones that will not change with only hand heating.
16. The Meter Lamp in the CX-7A is a Muralite, 10000 hour, 6 volt, # PTL-200/6 (Mura Corp, Jericho, N.Y.) 5 volts on the brown wire, pin 7, wire #157, at the rear of the counter board cage is used. Lamp is mounted across the top of the meter with two lugs fastened to the meter screws which are not used for mounting.
17. Counter board cage . On early units, add R-24, 3.3 Meg ¼ Watt, if not already in, to the terminal board inside the counter cage, Terminal 367 at C-47 to ground. this reduces switch arcing from the offset Nixie lamp when A/TO button is pressed.

continued...

18. Power Supplyboard A-3. Add 7 8 Zener diodes to the power supply to suppress transients.
a. 1N4754A, 39.0 volt-- - side (hot) of C-6, and the + side, cathode band to ground. Add 0.10 Mf, 100v disc capacitor, if not already in, across the Zener.
b. 1N4754A, 39.0 volt-- cathode band to hot, + side of C-9--- other side to ground. Add 0.10 Mf, 100V disc capacitor, if not already in, across the Zener.
* c. 1N4735A, 6.2 volt-- On board, cathode band to R-32-----other side to foil ground.
d. 1N4754A, 39.0 volt---On board, cathode bandto foil at Q-11 transistor----- other side to adjacent ground foil. (this is collector of Q-11 to ground).
e. 1N4746A, 18.0 volt----On board, cathode band to terminal #168 (one side of R-8)----- other side to ground foil. (this is + 15 volt pins 150,111,112,etc to ground).
f. 1N4746A, 18.0 volt----- On board, other end of Zener to left side of R-31 (this is -15 volt supply pins 147,118,119,etc) -----Cathode band side of zener to ground.
g. 1N4757A, 51.0 volt ----cathode band to hot side + of C-2-----Other end to ground. Add 0.10 Mfd, 100V disc capacitor, if not already in, across Zener.
*c.-Note: This is at pin # 136, the emitter of Q-3 junction of R-32.
NOTES: On picture, figure 4-1---C2 is C-9-----C-3 is C-6-----C-6 is C-3----C-9 is C-2.

19. BFO Board A-4. On early models, change capacitor C-12 from 82 pf to 47 pf dipped silver mica, 5%, 500 V. to agree with instruction book. This requires re-adjust on VFO outputs, Pages 5-17, 5-18, Steps 11 to 20. If Vfo outputs are too high (see #14) they may require reduction.

20. BFO board A-4. Ground case of crystal Y-4 to adjacent foil to reduce dual transmit signal on A/TO. Components associated with the regular 34.2 Mhz circuit are grouped around the 11.4278 Mhz crystal and couple in a weak signal on the frequency of VFO A.

21. Dual signal on transmit A/TO is present in every case, but on one late model CX-7, Wire # 104 from pin # 206 of the BFO board was connected to pin #1 of plug P-3 going to the switch circuit board S-2 (this is the -15 volt line) instead of going to pin # 6 of plug P-3 (the T/R line in the A/TO position) as is shown in the instruction book. This caused the dual signal to be noticable on the air.

22. Audio Board A-6 - Improved transmit low frequency audio response of 3 db. by removal of C-41, 56 Mfd, 6V (Q-1 source to ground) and by addition of a 0.10 Mfd capacitor in parallel with C-3 (or replace C-3 with 0.22 Mfd, 100V dipped paper capacitor.

23. Intermittent transmitter audio is commonly caused by corrosion or lack of tension of the contacts of the MIKE jack . Clean, adjust or replace.

24. Modification of the T/R and R/T voltages from early model -15 volts to the 13.5 volts as shown in the instruction book requires changes on 3 circuit boards.
a. Power Supply: Add CR-20, 3.9 volt, 1 Watt Zener diode (at Q-9).
SEE NOTE d. b. BFO board : Add R-51 & R-52 (1500 ohm, ½ watt).
c. AUDIO board : Add R-65 & R-66 (12 ohm, ½ watt) and some wiring changes to agree with the instruction book. One jumper wire also needed.

25. The new CX-7B power supply board requires removal of all 4 regulating transistors on the chassis near the power board and installation of 3 new transistors. Also, capacitor C-2 must be insulated from the chassis and no cardboard sleeve is provided. Extensive re-wiring of the connecting leads is required. Information for late model units is provided, but the differences with early wiring can be figured out. The early model CX-7 must be modified for the -13.5 volt T/R and R/T control voltages to use this board as it comes. It can probably be modified to work, but no drawing was provided with the new board. A rough drawing with errors was received several months after the installation was tried and removed again. Works fine in late models.

26. Power Amplifier Assembly A-10. The early model CX-7 tube socket is not wired as shown in photo figure 4-26. Re-wiring the socket pin jumpers as in the photograph and using teflon spagetti where shown stabilizes the P.A. tube better.

27. Power Amplifier Assembly A-10. In early model CX-7 units, choke coils L1 & L2 near relay K-1 were high resistance 100 uh. coils. These were replaced in late models with low resistance 22 uh coils for improved external amplifier keying. Also a one ohm, 1 watt, ww. resistor was added between terminal #12 (+1500 VDC) and choke coil L-4, 22 uh as part of the CX-7A change for safety power protection.

MORE.....

NOTES AND continuation...

#24. cont..T/R and R/t changes.
d. Front End Board. Change resistor R19 from 10K to 8200/¼-watt.
e. RF Driver Board. Most units have all the changes, but check circuit around Q7 to see if parts are as shown on schematic.

NOTE:
Early models are serial numbers 00001 to 00201 and probably up to 00300. Check the top of the AGC Detector board, A9 which is visable through the top cover vent holes (100 KHz Xtal adjust) and note if two blue colored vertical mounted pots are in. If only one horizontal mounted pot, it is the early model.

END OF W8CXS INFO.

Problem is receiver insensitive in both slow and fast AGC and S-meter hangs at S-9. When AGC is off, receiver functions normally. The problem is emitter to collector short in Q3, 2N5183 on AGC detector board, A9. (Thanks to Butch, K4BYM, for this information)

According to W2GRU instability in the 43.1 MHZ oscillator can be traced to defective zener diodes CR8 and CR11 located on the BFO board. The fix is to simply replace these units with type 1N4738A. John also suggests you check for overheating of R47 on the BFO board and replace is necessary. (This information was also provided by DK3NG).

INFORMATION WANTED AND FOR SALE

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Apology - Due to the unfortunate phrasing of my add in the last issue of S/1, some readers may have thought I was unhappy with the Face S/1 Repair Service. On the contrary, I would recommend Larry's work to anyone. Sorry, Larry!!! Steve Guerra, El Paso, Tx.

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SIGNAL/ONE FOR SALE. LATE FLORIDA UNIT, SERIAL 01835. HAS ALL MODIFICATIONS INCLUDING LED COUNTER BOARD AND IC POWER SUPPLY. OPERATIONAL FOR LAST TWO YEARS WITH NO PROBLEMS. $1295 FIRM. CONTACT DICK CUNNINGHAM AT 1477 N. 96th AVE., OMAHA, NEB., 68114. PRICE INCLUDES A 90 DAY GUARANTEE!

That's it for this issue. 73

Bob, WØYVA/4