

S/1 NEWS

We hope you are enjoying the improved typing and duplicating of S/1 NEWS. If you have any suggestions concerning improvements or content of our newsletter please write and let us know. We are in need of additional material for publication .. take a few minutes if you have something of interest. The subject of material does not have to be directly related to the CX7 or CX11 but may be of a support nature such as operation with other types of equipment and the like. Thanks .. ed.

An earlier issue of S/1 NEWS promised a description of a synthesizer modification by W7IV. What follows is that modification as sent to us by Harry. Read it over carefully .. we are sure you will find it interesting.

The following paragraphs cover a synthesizer modification for the CX7 series as described by Harry, W7IV. The synthesizer was designed by Ron Treadway, W7EKC and provides output from 41 to 69 Mhz at .75v/75 ohm. This will allow the CX7 to tune continuously from 1 to 30 Mhz. Harry reports the synthesizer works very well and emphasizes the fact that this modification is involved and not to attempt it unless you completely understand what you are doing. Harry does NOT want to become involved in a lot of correspondence but will be glad to answer questions over the telephone. Contact him at (602) 948-7406.

The circuit is built up on a piece of double clad printed circuit board about 4 x 6 inches. The board need not be etched. Most of the cladding is left intact and small cut-outs made where necessary with an Exacto knife. Emitter coupled logic as used by the synthesizer needs lots of ground plane and short leads. Good by-passing is a must! Use 0.1 uf., 50-volt miniature ceramic units.

Recall that S/1 NEWS, Volume II, Number 9 described a modification to the CX7 to allow this synthesizer to be connected. Refer to this previous issue and make the following additions:

Replace the shielded coax in the CX7 that attaches to the "L.O.MON" monitor and "HI IF" jacks with RG-188/U coax. Terminate terminal 71 on the front end board with a 51 ohm resistor.

The following subscriptions are due: WA9UHV, K4RTA, W6MAV, WA3EQ, W8HR, WA8BHR, WA6LVJ, WA6VGJ, K6DYQ, W6HY, W1UD, KØHHP, K8QKT, DK3NG, W2CR, K4BYM, W8VHY, WB6NVX, W6YCK.

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The following description is not intended to be a step-by-step procedure, however, a complete circuit diagram is shown (see last page). Building this unit and getting it into operation requires a fairly high degree of technical sophistication. A 100 Mhz oscilloscope is a NECESSITY and a spectrum analyzer would be handy for checking for parasitics and spurs.

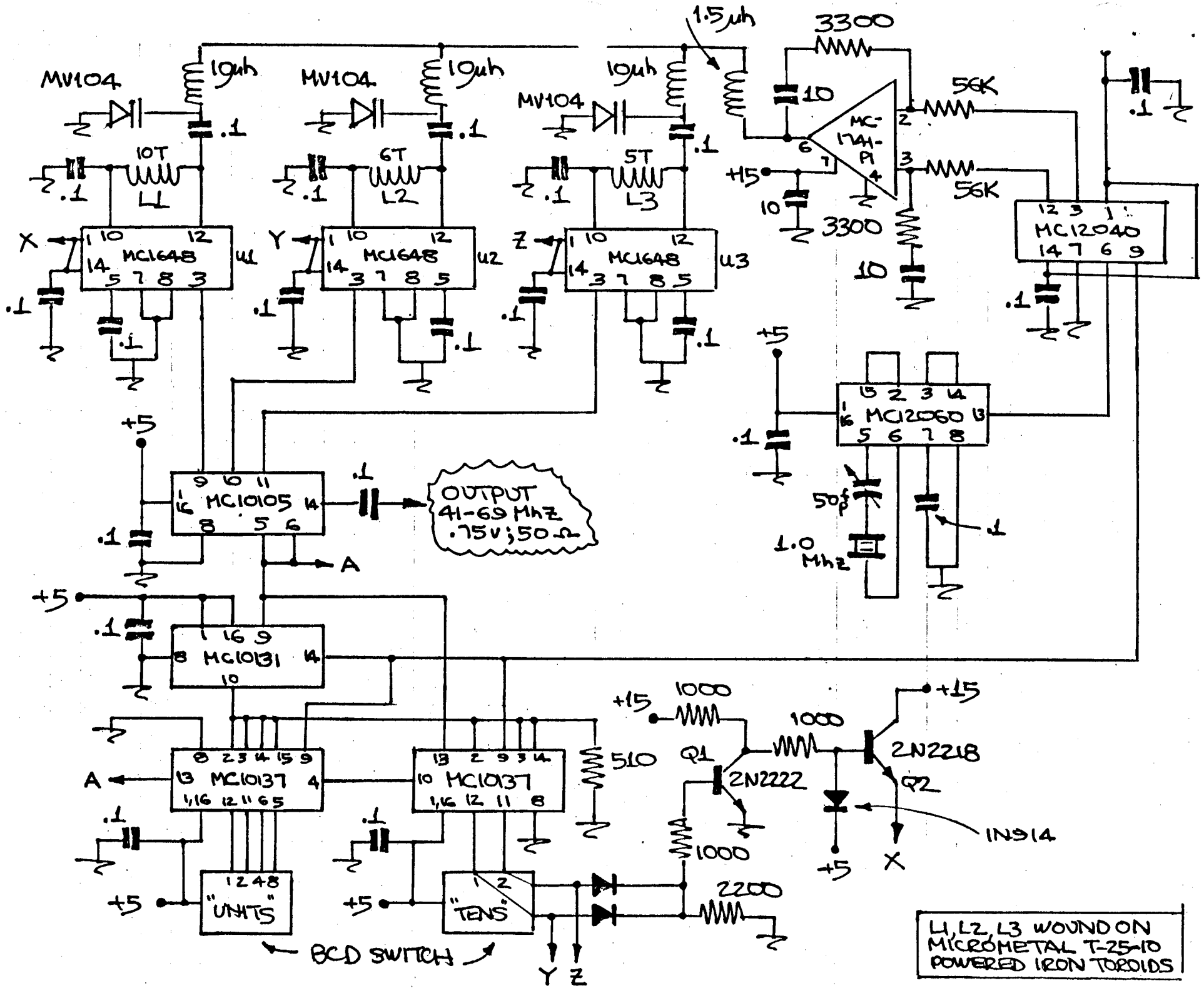
The CX7 requires frequencies from 41 to 69 Mhz in 1.0 Mhz steps to cover the range 1 to 30 Mhz. Basically, this unit consists of three VCO's, covering the ranges 40-50, 50-60, and 60-70 Mhz. The "Tens" BCD switch selects the proper VCO for the chosen band. (Refer to the schematic.)

The VCO output (1 of 3 MC-1648's) is fed to two programmable decade counters (MC-10137) in cascade. These are programmed by the BCD switches to divide the VCO frequency by any number from 41 to 69. The output of the counters will always be 1 Mhz when locked up. This is fed to a MC-12040 Phase-Frequency Detector, where it is compared with the output of a 1 Mhz crystal oscillator (MC-12060). The error signal is amplified by a MC-1741P1 Op-Amp, which also includes RC stabilization networks. The DC error signal then goes to the MV-104 varactors that tune the VCO's. The MC-10105 Triple OR/NOR Gate is used as an output mixer and buffer.

The wiring of the "Tens" BCD switch and the second MC-10137 is unorthodox. This second counter divides only by 4, 5, or 6. The switch controls this and also selects the proper VCO. The switch also subtracts 40 from the count indicated on both switches. When the switches are set to 01, the synthesizer output frequency is 41 Mhz and the CX7 tunes from 1 to 2 Mhz. The switch indication is always the low-frequency limit of the selected band, and 40 Mhz less than the synthesizer output frequency. Of course, it is also necessary to operate the bandswitch in the CX7!

Q1 and Q2 serve to turn on U1, U2, or U3 as required for operation between 40-50, 50-60, or 60-70 Mhz. For a count of 4 (40-50 Mhz) both terminals of the BCD switch will be open. Q1 is cut off and Q2 is on. Q2's base is clamped to +5 volts, and 5 volts will appear at the emitter, turning on U1. For a count of 5 (50-60 Mhz), the 1 terminal on the BCD switch is a +5 volts and the 2 terminal is open. 5 volts will be supplied to U2 and current will pass through CR1 to the base of Q1 which will turn on. This will cutoff Q2, which in turn turns off U1. For a count of 6 (60-70 Mhz), the 2 terminal on the BCD switch will be at +5 volts and the 1 terminal open. U3 will be turned on, CR2 will supply current to Q1 and U1 will remain off.

The unit requires +15 volts at 50 ma and +5 volts at 0.5 ampere which can easily be supplied by low cost IC regulators such as a 7815 and 7805, respectively.



CX11 INFORMATION: Signal/One is running about 3 months behind on the CX11 deliveries according to Payne Radio. If things go well, they should be caught up by this summer. The price remains at \$4000. Schematics are not available and according to Don, the company does not want them available at this time for two reasons: (1) They do not want to make it easy for their competitors to copy their new circuit designs (2) they do not want owners working on the rigs - they prefer the rig be returned to the factory for any repair since they believe most problems are caused by someone trying to repair without sufficient knowledge and causing even more problems. Don did indicate, however, that later this year, schematic information would be made available.

FOR SALE

Johnson 6N2 and matching VFO. Perfect for OSCAR communication - \$100. Good condition but 6N2 cabinet could use painting - front panel looks excellent, however. External power supply is required. Includes all manuals and spare tubes. Some CX7 parts - write with your needs. Bob; WØYVA/4, P. O. Box 6216, Arlington, Va. 22206. (202) 692-8910 days, and (703) 430-6959 evenings.

CX7B original owner, modifications by Signal/One. \$1195. FOB Harry J. Yust, W3GU. Meetinghouse Road, Ambler, Pennsylvania 19002. (215) 659-3778 or 659-3300 days and (215) 646-1492 nights.

I would like to sell one of the following two Signal/Ones:

CX7B, #919 with new CX11 type counter/keyer, modified and completely checked by Dick Cunningham who reports it is an exceptionally good box. This unit delivers almost 300 watts on 80, 40 & 20 and 200 watts on 15 and 10....\$1150.

CX7A, #789, California modified, has been in almost daily service for 3 years without any serious problems. Output is lower than the CX7B, but original 8072 tube still in use, but still delivers in excess of 110 watts on 10 and 15 and 150+ watts on others. Get good reports on audio quality and keying on this unit and keyer is best one I've ever used....\$800.

Prices include prepaid air-freight shipment to any part of continental USA and includes one of the Thomas service manuals. Bob Douglas, W5GEL/W5BT, 3435 Floyd Street, Corpus Christi, Texas, 78411.

John, W2GRU, reports on recent modifications to his CX7 on previous S/1 NEWS information.

1. LM-380 audio output. "An absolute must! The difference in audio quality must be heard to be appreciated. Oscillation does result if a .1 ufd is on the output. I powered the LM-380 from a separate 15 volt regulator after I noticed that the 380 kicked stuff back down the 15 volt line..." A new 380 solved this problem. (See S/1 NEWS, Vol. III, No. 1. ed.)

2. AGC modifications per the TROUBLESHOOTING GUIDE, MODIFICATIONS SECTION. "... a major improvement between this and the 380 (described above), the CX7 sounds like a different radio."

3. Voltage regulator IC's. "Also a great one. Cleans up miscellaneous hum and noise that the low gain discrete regulators left. Suggest a .47 or .68 disc or monolithic ceramic be soldered across each input and common AT THE REGULATOR IC to prevent oscillation, especially on the -15 volt one." (See S/1 NEWS, Vol. I, No. 4, ed.)

4. "I also noticed that my radio, a Florida CX7 reworked to "A", did not have all the changes that the THOMAS manual showed, so spent some time putting those in. The ones on the IF board are especially effective in improving cross-mod resistance."

5. "On the audio board, deleting C41 and changing C3 to 10 uf helped tremendously in giving a more natural audio sound (better lows). Got a lot of on the air comments on this one." (Vol. I, No. 9)

6. "Also put in the magic three diodes to eliminate the frequency offset (when switching from) A to B. Really works well. Think it is worth the effort to match the three diodes for forward voltage." (See S/1 NEWS, Vol. I, No. 4, ed.) *and Vol II, No. 4*

7. "On the RF driver, I had an oscillation that would come up when the rig got warm. This would show up as output power when the TRANSMIT button was depressed in SSB. Turned out to be around 300 Khz! Anyway, adding a .47 uf monolithic ceramic across R12 on the (RF Driver) board fixed this permanently. That was probably why the second .1 was added on the CX7A as in the THOMAS manual."

8. "Grounding the crystal can of Y4 on the BFO board reduces the A/T0 spur by a measured 25 db (-40 to -65 db)." (See S/1 NEWS, Vol. II, No. 42, ed.)

(VOL. I, NO. 9 *and*)
(VOL. III, NO. 2) ↑