

S/1 NEWS

I do not have any additional information concerning the CX-11 at this time. Maybe by next issue...

My thanks to those who have written. I am beginning to hear from owners in other countries. It seems these rigs have made it to many countries. If you think YOU have a tough time getting parts imagine being in Spain and trying to find a transistor...!

W4HX writes that a good place to purchase small parts, transistors, etc., is from

Semiconductor Supermarket
P. O. Box 3047
Scottsdale, Ariz., 85257

Rudy, W4HX, has purchased MPSL51, 1N5366A, LM380, and NJE340 from these people which in general, are quite difficult to obtain.

For those who have asked, I will be putting together a package of issues 6 through 12 at the end of the year. I will also compile an index at that time.

I have THOMAS manuals available for shipment. Cost is \$20.00 post paid including the latest version of the TROUBLE GUIDE.

If you have not already done so, and when you have occasion to write, please let me know the serial number of your unit for my master file.

If you have any CX7/7A parts for sale please let me know. I get many letters asking for availability of parts.

The next issue of S/1 NEWS may be a bit slow off the "press". I apologize in advance.

In a previous issue, I described a modification by WA9UHV concerning placing a .01 uf capacitor across the driver transistor while searching for a replacement. Phil, WA9UHV, writes with the following clarification: Place the .01 uf capacitor across the BASE to COLLECTOR of the defective driver. (Remove the defective transistor first..ed). Operation is only possible on 160 through 20 due to reduced system gain.

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OCT-75

CX-11

While attending the ARRL National Convention in Reston, Virginia, I finally saw a CX11! Don Payne was there and I discussed the availability of the CX11 with him. As far as I can tell there are only 3 or 4 units in existence and for some reason connected with legal problems with the "old" Signal/One Company, they will not discuss other existing deliveries with me. There is NO literature of a technical nature available and I was told those receiving CX11's for the time being will not receive any manuals! (Can you imagine working on your present CX7 without a manual?!)

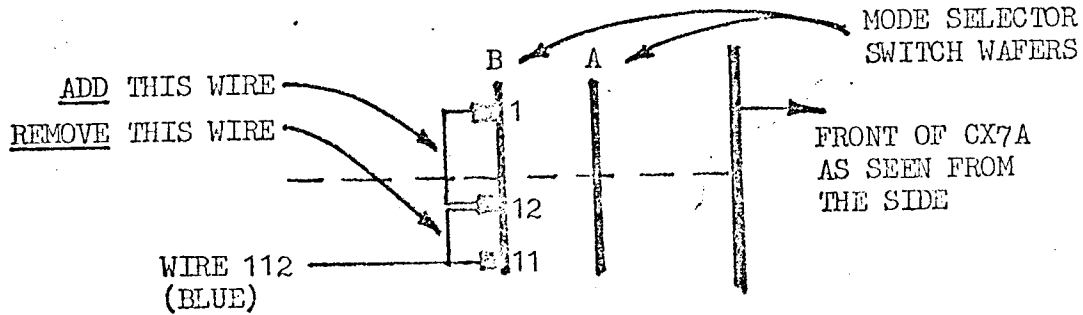
I was told orders are being taken but with no guaranteed price! No delivery time is promised but Don Payne says you can expect to wait 4 to 6 months for a unit.

The unit looks nicely assembled. It is obvious that they are using as much of the existing parts stock as possible. For example, it appears that the new slightly longer bezel for the readouts has been made from two of the old small bezels pieced together. The PC boards look all newly designed but not very much more accessible than in the CX7. I did not like the multicolored readouts (a different color for Mhz, Khz, and tenths of Khz) but it would be easy to change to the same color if desired since the planer readouts plug-in easily.

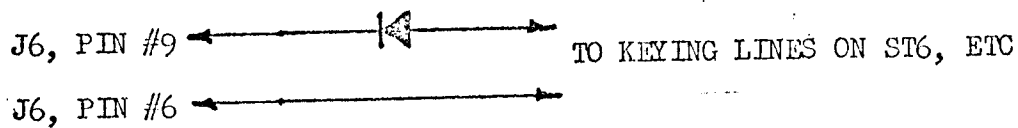
I did not see the unit operating so I cannot make any detailed comments concerning receiver characteristics, etc. If anyone was at the convention and played with the unit please write me with your observations.

WA6NGM writes about his modifications for RTTY operation: He says that in any case, steps 1 and 2 described by W4FQM/1 are necessary as described in Volume I, No. 7 of S/1 NEWS. (600-ohm audio at J19 and FSK keyline cable from P6). He goes on to describe a simple modification to allow LSB mode for FSK:

Deck B of function switch S8 is modified as shown:



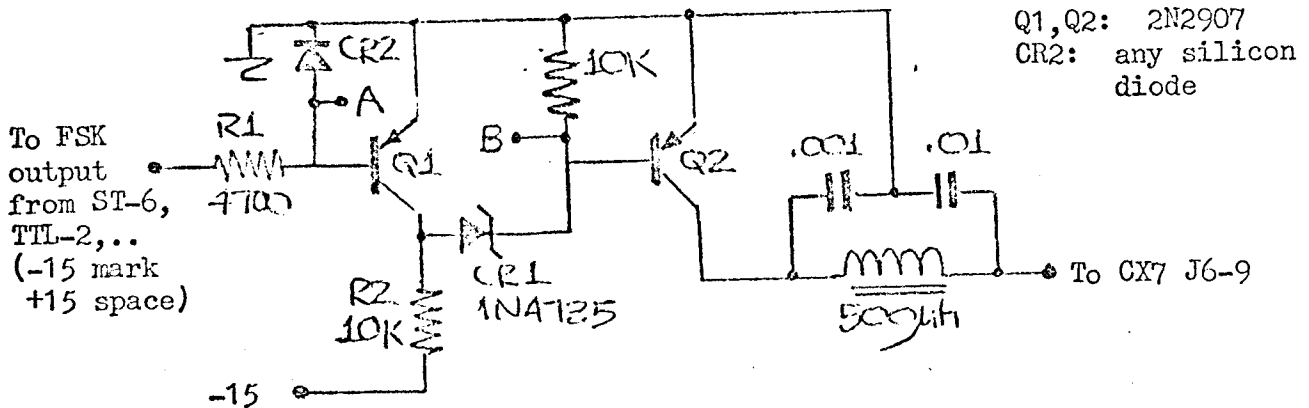
A diode (25-volts PIV or greater) must be installed in the keying line as shown below:



WA6NGM indicated he is using the CX7A with a modified ST6 and 28KSR for RTTY. He notes that the most desirable filter to use for RTTY is the 1200 cycle unit. He recommended if anyone has any questions about his setup to write directly to him at 10919 Firmona Avenue, Lennox, Calif., 90304.

For those of you who have not updated your power supply with the IC type regulators, W6JHN has some suggestions: Replace all pass transistors that are type TIP29A with type TIP29B. Substitute a 5K helipot in place of R27 to allow adjusting the +34 supply to exactly +34 and still maintain regulation.

The following RTTY interface is via W2GRU. The circuit results in mark high for unmodified CX7A. If FSK operation has been modified to LSB (previously described), remove Q1, CR1, R2 and add a jumper from A to B.



I received a very informative letter from John, W2GRU, concerning his problems with spurious emissions. I could not paraphrase what he said any better than he said it so below is reproduced his comments word for word:

"Did have quite a go-around with spurious emissions. These were basically of two different types.

FIRST

When operating 80 meters, any PTO signal that makes its way to the RF driver board will be amplified and generate a signal removed about 100 KHZ from the desired signal. For example, if you are transmitting on 3905 KHZ, a spurious will appear on 4005 KHZ. It takes an awful small bit of leakage to give a significant signal. The way I cured the problem was careful bypassing of the terminals of both PTO'S. I added 2 0.1 uf disc caps on the +15 volt terminal of PTO A and a 1 uf tantalum cap on the -15 volt terminal. On PTO B, added 0.1 uf on the -15 volt terminal and 1 uf tantalum on the +15 volt. Also, added 0.1 uf to ground on the PTO select line Point 355 on A7. These combinations resulted in the spurious going from 35 db below the desired signal to 70 db below the desired signal. I can't emphasize how critical these bypasses were. The 2 0.1's worked where a larger cap didn't work as well.

The technique I used involved a frequency selective voltmeter but a good receiver with a fairly accurate relative strength meter would suffice. The procedure was to add a cap while noting the level of the spur. I loaded the CX-7A to 150 watts into a dummy load and sampled a portion of the RF for the voltmeter. It is interesting to note that the FCC spec for spurs is -35 db below the carrier but this is an incredibly strong signal and we should do much better.

SECOND

This one was considerably tougher. This involves an unwanted mixer product getting around the various band-pass filters on the IF board and finding their way to the RF driver board. This showed up as a power output when the rig is keyed in SSB position and no one is talking. There was an indicated 1.0 watt output all the time. The first thing I suspected was balanced modulator problems but quickly ruled that out when I found the frequency was 4.6215 MHZ while transmitting on 3.995 MHZ. The way this comes about can best be shown by considering the mixing scheme as follows. The left column is the normal and the right column is the spurious.

<u>NORMAL</u>	<u>SOURCE</u>	<u>SPURIOUS</u>
43.1000	Calibrator oscillator	43.1000
-8.8165	USB crystal oscillator	-8.8165
<u>34.2835</u>	IF board mixer IC output	<u>34.2835</u>
-4.0950	PTO module output	-4.0950
<u>30.1885</u>	IF board 30.1-31.1 mixer out.	<u>30.1885</u>
+8.8165	USB crystal oscillator	
<u>39.0050</u>	IF board 39-40 mixer output	
43.0000	Front end local oscillator	43.0000
-39.0050	IF board output	-39.0050
<u>3.9950</u>	Transmit frequency	<u>4.6215</u>

more.....

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This problem only shows up on 80 meters since here we are operating close to the low end of the 39-40 MHz bandpass and the broadbanded final amp is broad enough to pass this signal. I don't think it happens at the other end but don't know for sure. In any case, having identified the problem as an unwanted mixer product from the 30.1 - 31.1 mixer, the cure was kinda easy. I carefully retuned the 39 - 40 MHz bandpass filter with a sweep generator and favored the slope of the bandpass at the low frequency end. That was good enough to get the spur down considerably.

With as many mixers as the CX-7 has, it is a wonder that there aren't more of these kinds of problems. (I guess there could be and I haven't found them yet)."

John Smith W2GRU

Joe, W1NXY, reminds me that some sets will exhibit a narrow bandpass due to the combined effects of FL-1 and FL-2 (IF filters). The cure is to replace FL-1 with a resistor pad as suggested by Joe. See the TROUBLE GUIDE for additional details of this modification.

Also thanks to Joe, attached to this issue are the Signal/One instructions for replacement of the CX7B power supply board. The instructions also include additional circuit changes to the Audio Board, A6. The purpose of the change described is to reinstate the RT/TR key line at a true ground and -15 volt potential eliminating various PTO frequency shift problems. Also attached is a layout of the new Power Supply board.

INFORMATION WANTED AND FOR SALE

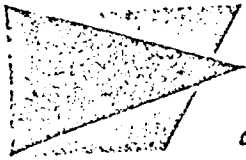
CX7A, Serial 991, California modified. \$1200. Douglas Electronics, 1118 South Staples, Corpus Christi, Texas, 78404

Two rewound power transformers @ \$75. Guaranteed. Mike Kane, W6QJV, 18400 Daves Ave., Monte Sereno, California, 95030

On 20-meters (possibly other bands) and in DUAL RECEIVE, a third "phantom signal" is heard that does not exist on either "A" or "B" receive mode. Any information on this problem, anyone??

W9RER wants to swap or purchase a CW filter. He has a 1.2Khz to swap. Write him at 4027 Harvey Av., Western Springs, Ill., 60558

Counter Board for \$50. or trade. W7UR, Rt 8, Box 700, Tucson, Az., 85730
602 886 1702



SIGNAL ONE

P. O. Box 127, Franklin Lakes, New Jersey 07417

201-891-0459

INSTRUCTION FOR THE REPLACEMENT OF THE CX-7B POWER SUPPLY BOARD



Gathering data from firsthand experience, more than 75% of the failures both in the factory and in field use have been associated with the Power Supply Board.

This replacement board will provide short circuit and thermo overload protection on all low voltage power supplies in the CX-7.

1. Remove the outside dust cover from the radio.
2. Place the radio so that power supply board will be at your upper right (on left end).
3. Remove the four mounting screws holding the board to the standoffs.
4. With care so as not to damage the leads and the push-on "Amp solderless terminals" move the board as required to gain access for the following steps.
5. Located on the radio rear panel, remove Q1 (the tip 29 with the red lead) and replace wire for wire with the provided MC7815. Do not insulate the mounting tab, but use thermal compound provided.
6. As in Step 5, remove Q2 (the tip 30 with the blue lead) and replace pin for pin with the MC7915. Insulate the mounting tab with existing hardware and install in the rear back panel of the chassis with thermal compound provided.
7. As in Step 5, remove Q3 (the tip 29 with the brown lead) and replace pin for pin with the MC7805. Do not insulate the mounting tab, but use thermal compound provided.
8. As in Step 5, remove Q4 (the tip 29 with the orange lead) and replace the leads in the following order:
 - Orange Wire No. 62 to Pin 1 (Base)
 - Wire No. 374 to Pin 2 (Collector)
 - Wire No. 63 to Pin 3 (Emitter)
 with the MJE1103 provided. Insulate the mounting tab (collector) with existing hardware and install at lower rear of back chassis panel with thermal compound provided.
9. Wire jumpers on the new board as desired for either 117 or 230 volts. Pins 163, 164, 165 and 166. Circuit boards are furnished wired for 117.



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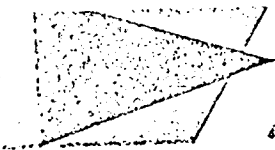
201-891-04

INSTRUCTIONS - CX-7B POWER SUPPLY BOARD (cont'd)

10. Un-solder the transformer primary leads (preferably one at a time) from the old board and connect and solder to the new board (same pins as in Step 9).
11. Carefully disconnect all amp connectors and remaining solder connections and remove old board.
12. Place the new power supply board in position and connect the amp connectors on the new board as shown. USE CAUTION -- the direct interchangeability of the board generates gap pins not used along the rear panel. Do not inadvertently fail to skip unused amp connectors. Carefully solder the high-voltage wiring to Pin 162 and the low voltage transformer secondary to Pins 146 and 153.
13. Screw down the new power supply board to the 4 mounting standoffs, carefully dressing leads and relieving any tension in the vicinity of the antenna change-over relay/high voltage rectifiers.
14. With an Ohmmeter check continuity between the mounting screw of the MJE1103 to the rear panel -- should be infinity ohms.
15. With an Ohmmeter check continuity between the mounting screw of the MC7915 to the rear panel -- should be more than 1000 ohms.
16. Test for continuity between mounting screws on MC7805 and MC7815. Resistance should be less than 1 ohm.
17. Very carefully re-check all wiring and ascertain that all amp connectors are firmly seated.
18. Check for any solder splashes and loose hardware. Connect speaker and dummy load or antenna.
19. Apply power to the radio and perform the following voltage measurements in the receive mode.

Pins 101 - 105 = Approx. 0 volts
 Pins 106 - 110 = -15 volts
 Pins 111 - 115 = +15 volts
 Pins 118 - 122 = -15 volts
 Pin 127 = +38 to +40 volts
 Pin 136 = +5 volts
 * Pin 152 = +300 volts
 Pin 117 = -60 volts
 * Pin 162 = +1600 volts

* EXTREME CAUTION



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INSTRUCTIONS - CX-7B POWER SUPPLY BOARD (cont'd)

20. The radio should now be in an operational condition. Check for normal receive and transmit functions and replace unit in CX-7 dust cover.

ADDITIONAL DATA

The regulated +5, +15 and -15 are now thermally and electrically protected. Momentary short circuits causing excessive temperature will not damage the power supply. The +5, +15 and -15 supplies are now current limited to 1 Amp. The +34 volt supply is electrically protected by a current fold back circuit. In the event of excessive current draw (approximately 1 Amp), the +34 volt supply will fold back to a safe level.

This modification will materially improve the reliability and maintainability of your CX-7/CX-7A.

NOTE: All transistors and diodes are now in Berg gold-plated plug-in sockets and no attempt should be made to unsolder a device. A gentle upward pull will remove it should replacement ever be necessary.

ADDITIONAL CIRCUIT CHANGES TO BE MADE IN AUDIO BOARD A-6:

Install jumper wire in place of R65 and R66 12Ω 1/2 Watt resistors and remove Q16 and Q17 and in its place install MPS U05 carefully observing emitter base collector marked on U05 package in place of 2N5183.

NOTE: Careful lead orientation location of these transistors is very important as the devices will be destroyed if they are installed in the wrong order. The purpose of this modification is to increase the reliability of the Schmitt trigger circuit and to reinstate the RTTR key line at a true ground and -15 volt potential eliminating various PTO frequency shift problems displayed on the counter readout as experienced in the past.

OPTIONAL CIRCUIT CHANGES CAN BE MADE TO INCREASE AUDIO OUTPUT AS FOLLOWS:

Break wire 193 to J1 phone to Pin 1 J1 phone jack.
Connect wire from Pin 1 J1 to power supply board Pin 130.
Route new wire along existing wiring harness.



SIGNAL CORA

9-04-75

8700
89 LCD
90 LCD
91 DALL
92. 3754
93 BLAC
94 230
95 247

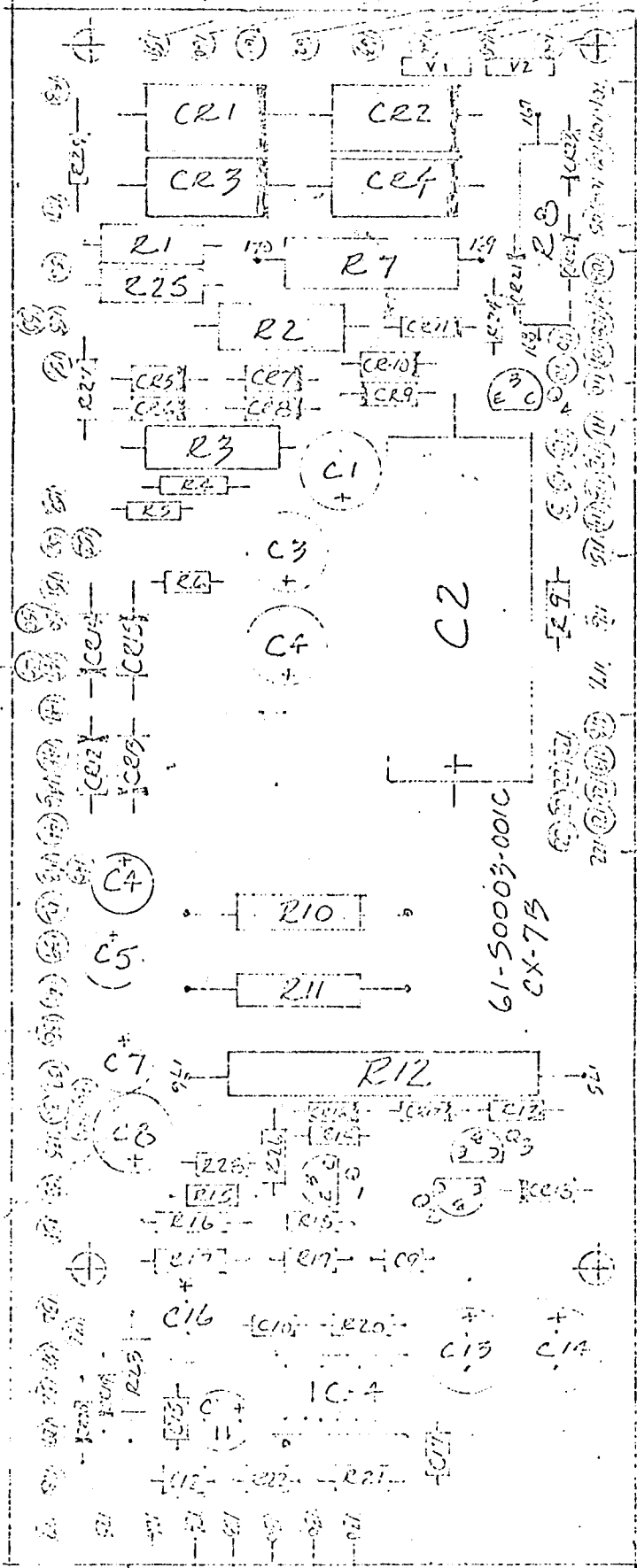
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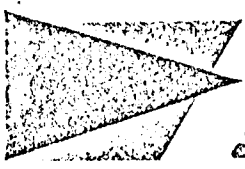
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41 WHITE
42 YELLOW

IC1	72	73	74	75	76	77	78	79	80
IC2	81	82	83	84	85	86	87	88	89
IC3	90	91	92	93	94	95	96	97	98
IC4	99	100	101	102	103	104	105	106	107

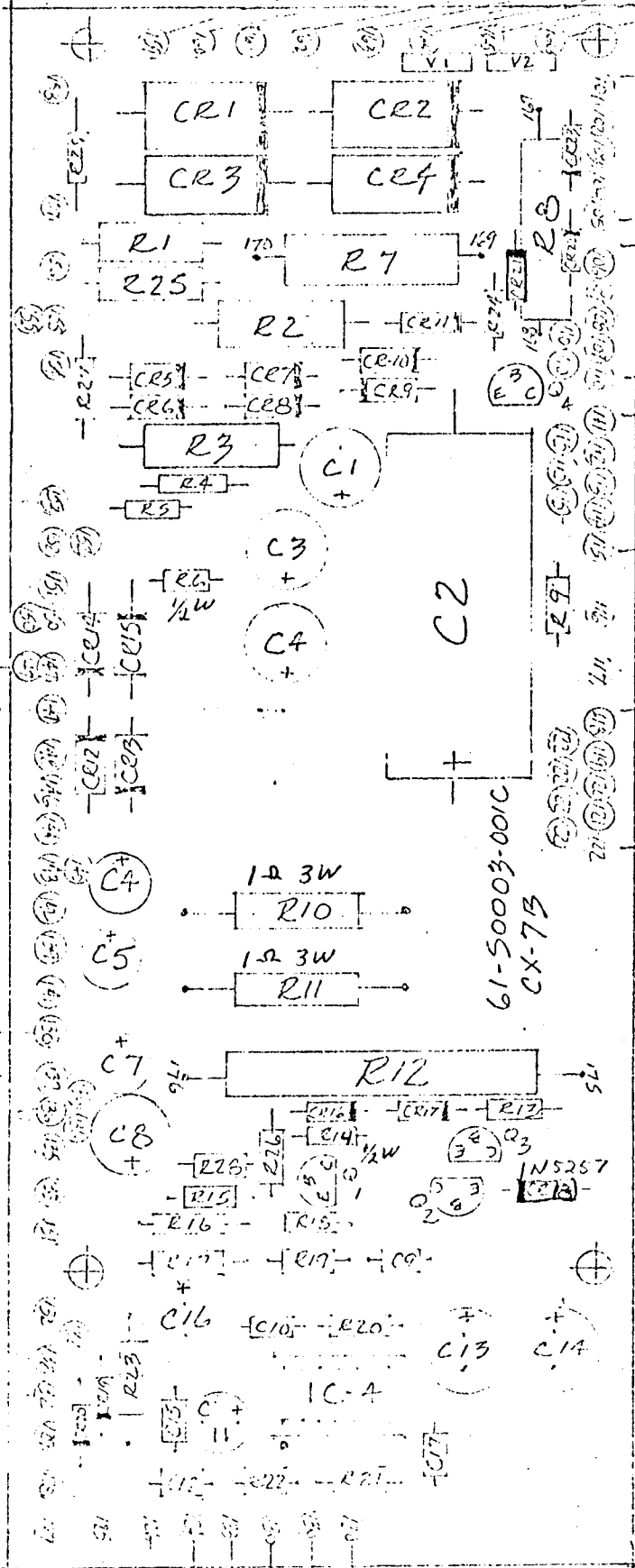
FIGURE 4-5. POWER SUPPLY BOARD (SHEET 1)



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8785
LED-1 YELLOW
XFLUM C.T.
89 RED
90 RED
91 DARK RED
92. 378 YELLOW
93 BLACK
94. 230 WHITE
95. 247. 375 G

86
85
PURPLE FORM 84
178, 82
81.
PURPLE FORM 81
PURPLE 80, 208
ORANGE FORM 79
RED 209, 78
BLUE 75, 210
77
76
ORANGE FORM
72
73, 71
70
68
69
66
67
XORANGE 65, 151, 21
64
63
62
ORANGE
AND
ORANGE
61
BLUE 53
V.P. 157
56



POWER
RED
GREEN
41 WHITE
42 YELLOW

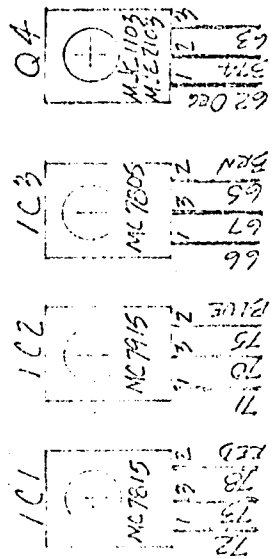


FIGURE 4-5. POWER SUPPLY BOARD (INLET SIDE)

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