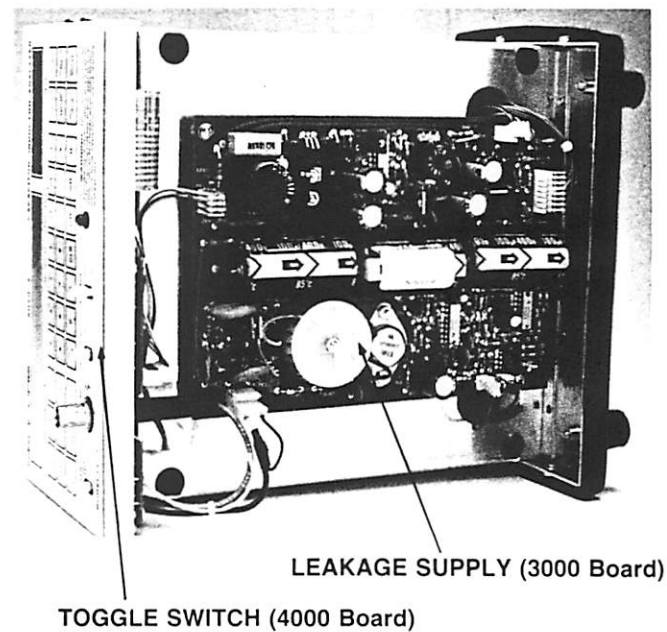
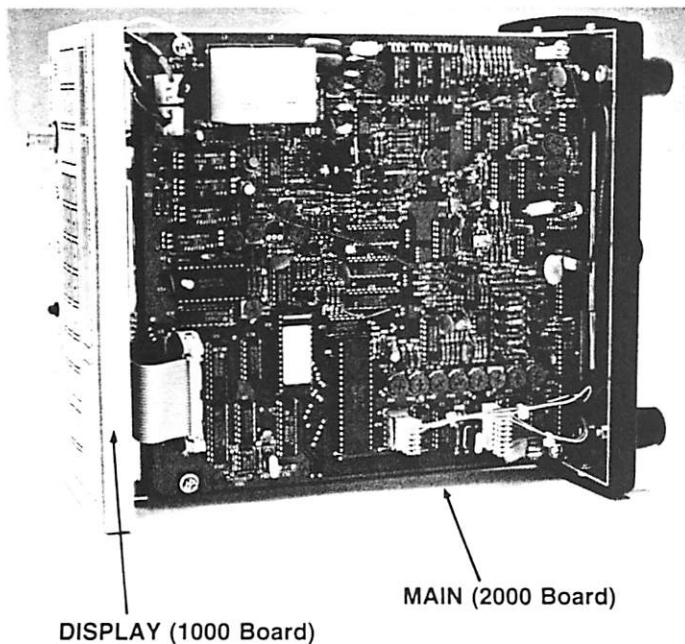


LC77

“AUTO-Z”

CAPACITOR — INDUCTOR ANALYZER

Schematic & Parts List



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This sheet includes parts list, P.C. board layouts, and board numbers 1000 and 4000.

SHEET 1

**SCHEMATIC
REFERENCE**

PART NO.

DESCRIPTION

DISPLAY BOARD ASSEMBLY (1000 Board)

| | | |
|---------|---------|----------------------------|
| IC1,2,3 | 69G92 | IC,4332,LCD Driver |
| IC4 | 69G150 | IC,MN74C374N,D Flip-Flop |
| IC5 | 69G57-B | IC,4042,Quad Latch |
| IC6 | 69G205 | IC,7556,Dual Timer |
| TR1 | 19A33-1 | Transistor,2N3904,NPN |
| C1,4 | 24G223 | Capacitor,MYLAR,.15uF,100V |
| C2,3 | 24G207 | Capacitor,DISC,.01uF,100V |
| C5 | 24G382 | Capacitor,LYTIC,10uF,16V |
| D1 | 23A86 | Display,LCD,6-Digit |
| D2 | 23A87 | Display,LCD,4-Digit |
| CR1-9 | 20G24 | LED Indicator |
| SW1-36 | 25G353 | |

MAIN BOARD ASSEMBLY (2000 Board)

| | | |
|--|----------|--------------------------------|
| IC1,13,39,42 | 69G210-B | IC,HEF4071,Quad OR |
| IC2 | 69G209 | IC,HEF4001B,Quad NOR |
| IC3 | 69G107 | IC,78L15,+15V Reg. |
| IC4 | 69G171 | IC,LM236H,2.5V Voltage Ref. |
| IC5,18 | 69G211 | IC,74C244,Not Inverting Buffer |
| IC6 | 69G238 | IC,Pullup Resistor,8X10K |
| IC7 | 69G202 | IC,74C373,D Flip-Flop |
| IC8 | 69G207 | IC,80C39,Microprocessor |
| IC9 | 69G266 | IC,27C256,EPR0M |
| IC10 | 69G172 | IC,Resistor Network,5X10K |
| IC11,12,19,35,37,40 | 69G150 | IC,MN74C374N,D Flip-Flop |
| IC14 | 69G47 | IC,MC14433,A/D Converter |
| IC15-17 | 69G65-B | IC,4051,8 Input Switch |
| IC20,25 | 69G169 | IC,HEF4011BP,Quad NAND |
| IC21 | 69G123-B | IC,4066B,Quad Switch |
| IC22,23,28 | 69G46 | IC,TL084,Quad BIFET OP-AMP |
| IC24,41 | 69G212 | IC,LM317,Adj. Voltage Reg. |
| IC26,33,43,44 | 69G63 | IC,TL081,BIFET OP-AMP |
| IC27 | 69G213 | IC,LM319,Comparator |
| IC29 | 69G113 | IC,LM306,Voltage Comparator |
| IC30 | 69G208-B | IC,4081,Quad AND |
| IC31 | 69G214 | IC,74HC4040,Counter |
| IC32 | 69G8-B | IC,4013,D Flip-Flop |
| IC36,38 | 69G130 | IC,DAC0802,D/A Converter |
| IC45 | 69G295 | IC,MM5369AA-N,Divider |
| TR1,4,6,14,16,20-22, 27,29,30,32,34,36, 38,45,47 | 19A33-1 | Transistor,2N3904,NPN |
| TR2,3,5,7,9,10,17, 31,33,35,37,39,46 | 19A34-1 | Transistor,2N3906,PNP |
| TR8 | 19G68 | Transistor,MTP3055A |
| TR11,12 | 19A45 | Transistor,2N5771,PNP |
| TR15 | 19G58 | Transistor,2N6559,NPN |
| TR18 | 19A30-1 | Transistor,MJE170,PNP |
| TR19 | 19G50 | Transistor,J211,N-Channel FET |
| TR24-26 | 19G62 | Transistor,MPF930,MOSFET |
| TR40-42 | 19G70 | Transistor,2N7000,Fetlington |
| CR1,24 | 50C4-13 | Diode,1N4733,Zener,5.1V |
| CR2,4 | 16G21 | Diode,UF4002B |
| CR3,6,7,9,11,13, 15-23,26-28,31,32 | 50C5-2:A | Diode,1N4148 |
| CR5 | 50C12-1 | Diode,1N825,Zener,6.2V |
| CR25 | 50C3-2:A | Diode,1N695 |
| CR29,30 | 50G24 | Diode,PAD20 |
| CR33,34 | 16G18 | Diode,1N4007 |

**SCHEMATIC
REFERENCE**

PART NO.

DESCRIPTION

| | | |
|---|-------------|-----------------------------|
| R8 | 14A38-1502A | Resistor,150 Ohm,1/4W,1% |
| R13 | 14A38-1603A | Resistor,1.6K,1/4W,1% |
| R18 | 14A38-1604A | Resistor,16K,1/4W,1% |
| R21,22,24,25,76,134, 143,144,180,181 | 14A38-1004A | Resistor,10K,1/4W,1% |
| R34,35 | 14A72-5 | Resistor,100 Ohm,22W |
| R47 | 14A38-3013A | Resistor,3.01K,1/4W,1% |
| R49,137 | 14A38-1005A | Resistor,100K,1/4W,1% |
| R56 | 14A38-1476A | Resistor,1.47M,1/4W,1% |
| R60 | 14A38-1474A | Resistor,14.7K,1/4W,1% |
| R72 | 14A38-1694A | Resistor,16.9K,1/4W,1% |
| R74 | 14A38-3244A | Resistor,32.4K,1/4W,1% |
| R81 | 14A38-2001A | Resistor,20 Ohm,1/4W,1% |
| R82 | 14C32-3300A | Resistor,3.3 Ohm,1W,1% |
| R104 | 14A38-4992A | Resistor,500 Ohm,1/4W,1% |
| R106 | 14A38-2403A | Resistor,2.4K,1/4W,1% |
| R108 | 14A38-9093A | Resistor,9.09K,1/4W,1% |
| R110 | 14A38-2704A | Resistor,27K,1/4W,1% |
| R112 | 14A38-9094A | Resistor,90.9K,1/4W,1% |
| R114 | 14A38-2705A | Resistor,270K,1/4W,1% |
| R116 | 14A38-9095A | Resistor,909K,1/4W,1% |
| R120,172 | 14A38-1002A | Resistor,100 Ohm,1/4W,1% |
| R125 | 14A38-3322A | Resistor,332 Ohm,1/4W,1% |
| R127 | 14A38-1003A | Resistor,1K,1/4W,1% |
| R130 | 14A38-3323A | Resistor,3.32K,1/4W,1% |
| R136 | 14A38-3324A | Resistor,33.2K,1/4W,1% |
| R138,139,150,153 | 14A38-4993A | Resistor,4.99K,1/4W,1% |
| R149,151,161 | 14A38-4994A | Resistor,49.9K,1/4W,1% |
| R159 | 14A38-1501A | Resistor,15 Ohm,1/4W,1% |
| R162 | 14A38-7803A | Resistor,7.8K,1/4W,1% |
| R163 | 14A38-2703A | Resistor,2.7K,1/4W,1% |
| R164 | 14A38-4224A | Resistor,42.2K,1/4W,1% |
| R169 | 14A38-1105A | Resistor,110K,1/4W,1% |
| R171 | 14C29-1001A | Resistor,10 Ohm,1/2W,1% |
| R175 | 14A38-1501A | Resistor,1.5K,1/4W,1% |
| R177 | 14A38-1103A | Resistor,1.1K,1/4W,1% |
| R182,183 | 14A38-2496A | Resistor,2.49M,1/4W,1% |
| R187 | 14A38-1605A | Resistor,160K,1/4W,1% |
| R9 | 15C26-12 | Pot,20 Ohm,1/2W |
| R14 | 15C26-13 | Pot,200 Ohm,1/2W |
| R19,71,91,109 | 15C26-18 | Pot,2K,1/2W |
| R20,147 | 15C26-21 | Pot,5M,1/2W |
| R46,55,189,191 | 15C26-14 | Pot,100K,1/2W |
| R48,59 | 15C26-15 | Pot,1K,1/2W |
| R80 | 15C26-17 | Pot,100 Ohm,1/2W |
| R95,115 | 15C26-19 | Pot,50K,1/2W |
| R105,107 | 15C26-3 | Pot,500 Ohm,1/2W |
| R111 | 15C26-20 | Pot,5K,1/2W |
| R113,188 | 15C26-10 | Pot,20K,1/2W |
| R117 | 15C26-11 | Pot,200K,1/2W |
| R158 | 15C26-16 | Pot,10 Ohm,1/2W |
| C1,6,9,13,17 23,40,49-54 | 24G104 | Capacitor,DISC,.1uF,100V |
| C2,3 | 24G452 | Capacitor,DISC,8.2pF,100V |
| C5,7,38 | 24G384 | Capacitor,LYTIC,2.2uF,50V |
| C8,32,37 | 24G188 | Capacitor,POLY,.001uF,33V |
| C10,11,21,22,34 | 24G70 | Capacitor,DISC,100pF,500V |
| C12 | 24G279 | Capacitor,POLY,470pF,125V |
| C16,18,19,44 | 24G216 | Capacitor,MYLAR,.1uF,100V |
| C20,42,48 | 24G214 | Capacitor,DISC,.001uF,500V |
| C24 | 24G262 | Capacitor,POLY,150pF,125V |
| C26 | 24G345 | Capacitor,POLY,.0022uF,160V |

| SCHEMATIC REFERENCE | PART NO. | DESCRIPTION |
|---------------------|----------|-----------------------------|
| C27 | 24G403 | Capacitor,POLY,.01uF,400V |
| C28 | 24G404 | Capacitor,POLY,.033uF,200V |
| C29,30,31 | 24G176 | Capacitor,DISC,47pF,500V |
| C33,36,39,45,46 | 24G382 | Capacitor,DISC,.01uF,100V |
| C35,47 | 24G207 | Capacitor,DISC,.01uF,100V |
| C41 | 24G195 | Capacitor,MYLAR,.022uF,250V |
| C43 | 24G450 | Capacitor,LYTIC,1uF,50V |
| C55 | 24G83 | Capacitor,DISC,33pF,500V |
| C56 | 24G151 | Capacitor,DISC,22pF,500V |
| L1,9 | 41G13 | Relay,SPST |
| L2,3 | 41G6 | Relay,SPDT |
| L4 | 41G15 | Relay,SPST |
| L5-8,10 | 41G12 | Relay,SPST |
| X1 | 47A38 | Crystal,6Mhz |
| X2 | 47A47 | Crystal,3.579545Mhz |

LEAKAGE SUPPLY BOARD ASSEMBLY (3000 Board)

| | | |
|----------------------|-------------|------------------------------------|
| IC1 | 69G46 | IC,TL084,Quad BIFET Op-Amp |
| IC2 | 69G189 | IC,TL082CP,Dual Op-Amp |
| IC3,4 | 69G223 | IC,TL594I,Pulse Width Modulator |
| IC5 | 69G212 | IC,LM317,Voltage Reg. |
| IC6 | 69G231 | IC,LM317LZ,100mA Adjustable Reg. |
| IC7 | 69G273 | IC,79M05,-5V,.5A Reg. |
| TR1,7,9-12 | 19A33-1 | Transistor,2N3904,NPN, |
| TR2,3,13 | 19A34-1 | Transistor,2N3906,PNP |
| TR4 | 19G61 | Transistor,MTM6N60,600V,6A MOSFET |
| TR5,6 | 19G71 | Transistor,MTP2N85 |
| TR8 | 19G70 | Transistor,2N7000,Fetlington |
| TR14,15 | 19A68 | Transistor,MTP3055A |
| CR1-5,13-15,19,22 | 50C5-2:A | Diode,1N4148 |
| CR6,7 | 50G23 | Diode,Zener,200V |
| CR8,9,10 | 16G22 | Diode,MR817,Fast Recovery |
| CR11 | 50C4-9 | Diode,Zener,68V |
| CR12,21 | 16G21 | Diode,UF4002B |
| CR16,24 | 16G10 | Diode,1N4004 |
| CR17,25 | 16G14 | Diode,1N5401 |
| CR18 | 16G24 | Diode,1N5822,Schottky |
| CR20 | 50C4-26 | Diode,Zener,15V |
| CR23 | 16G19 | Diode,1N5158,Schottky |
| R32,33,65,66 | 14C29-4995A | Resistor,499K,1/2W,1% |
| R41 | 14A38-2403A | Resistor,2.4K,1/4W,1% |
| R43,52 | 14A38-2402A | Resistor,240 Ohm,1/4W,1% |
| R45 | 14B49-18 | Resistor,5 Ohm,5W |
| R54 | 14A38-3013A | Resistor,3.01K,1/4W,1% |
| R53 | 15C26-3 | Pot,500 Ohm,1/4W |
| C1 | 24G442 | Capacitor,LYTIC,100uF,16V |
| C2,5,7,9,16 | 24G104 | Capacitor,DISC,.1uF,100V |
| 22,23,24,25 26,29,30 | | |
| C3,31 | 24G207 | Capacitor,DISC,.01uF,100V |
| C4,20 | 24G214 | Capacitor,DISC,.001uF,500V |
| C6,18,24 | 24G382 | Capacitor,LYTIC,10uF,16V |
| C8,19,28 | 24G437 | Capacitor,LYTIC,470uF,25V |
| C10-12 | 24G469 | Capacitor,LYTIC,100uF,400V |
| C13,32 | 24G221 | Capacitor,DISC,.01uF,2000V |
| C14 | 24G424 | Capacitor,LYTIC,2200uF,25V |
| C15 | 24G9 | Capacitor,DISC,.005uF,600V |
| C17 | 24G450 | Capacitor,LYTIC,1uF,50V |
| C21,27 | 24G411 | Capacitor,LYTIC,220uF,50V |
| L1 | 46G129 | Inductor,500uH |
| T1 | 28A100 | Transformer,High Voltage Flyback |
| T2 | 28A97 | Transformer,Switching Power Supply |

**SCHEMATIC
REFERENCE**

PART NO.

DESCRIPTION

TOGGLE SWITCH ASSEMBLY (4000 Board)

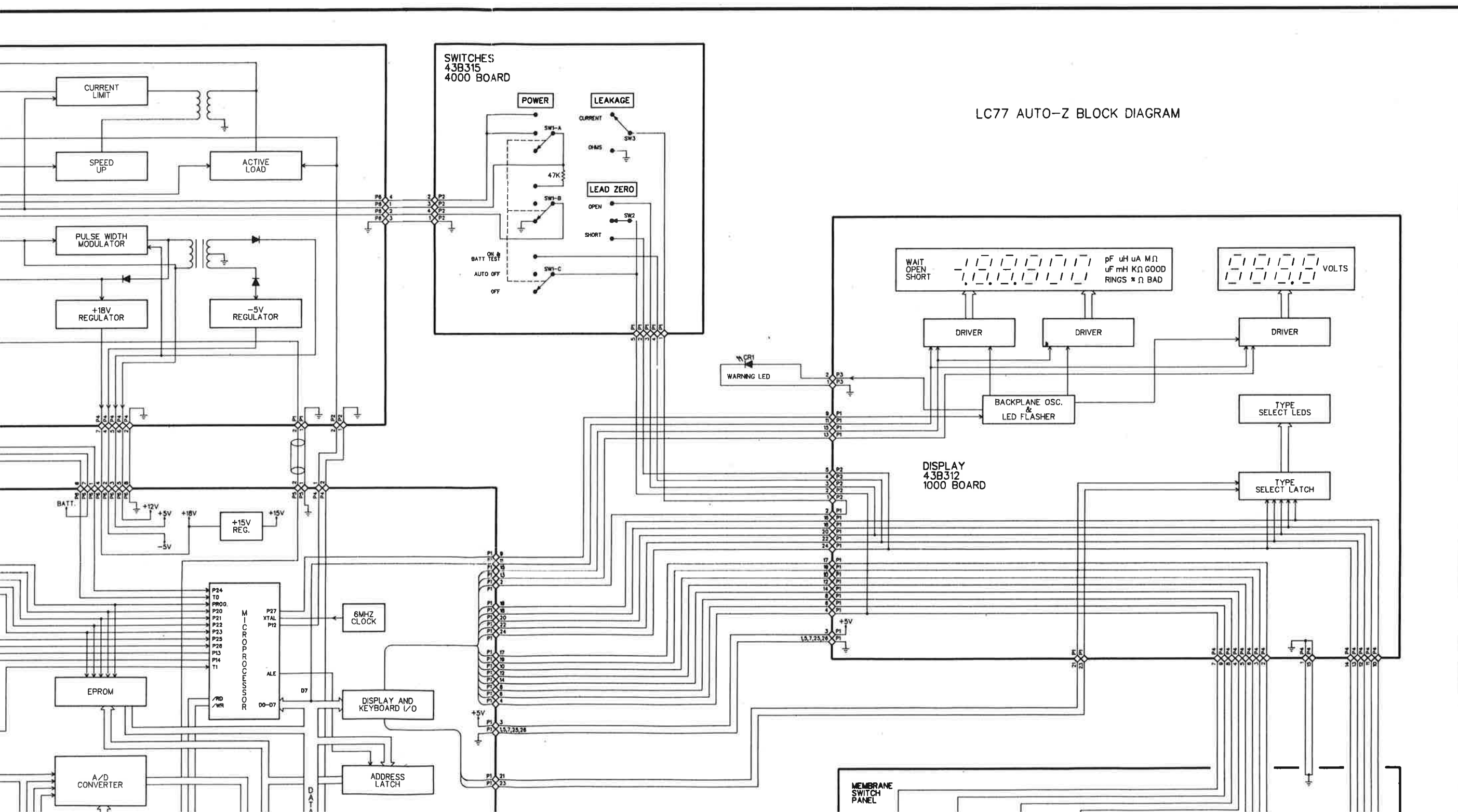
25G352
25G355
25G384

Switch,LEAD ZERO
Switch,POWER
Switch,LEAKAGE

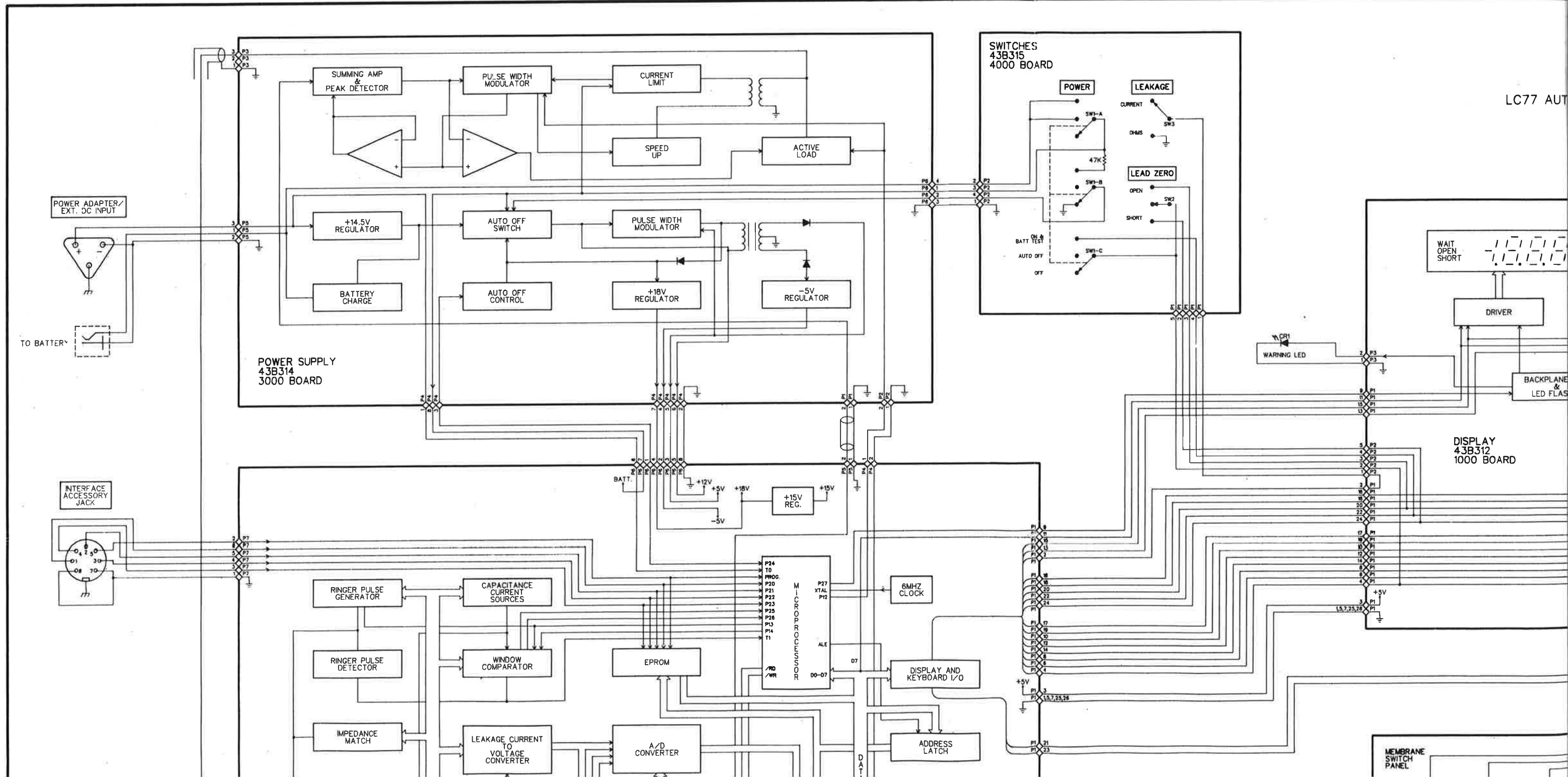
MISCELLANEOUS

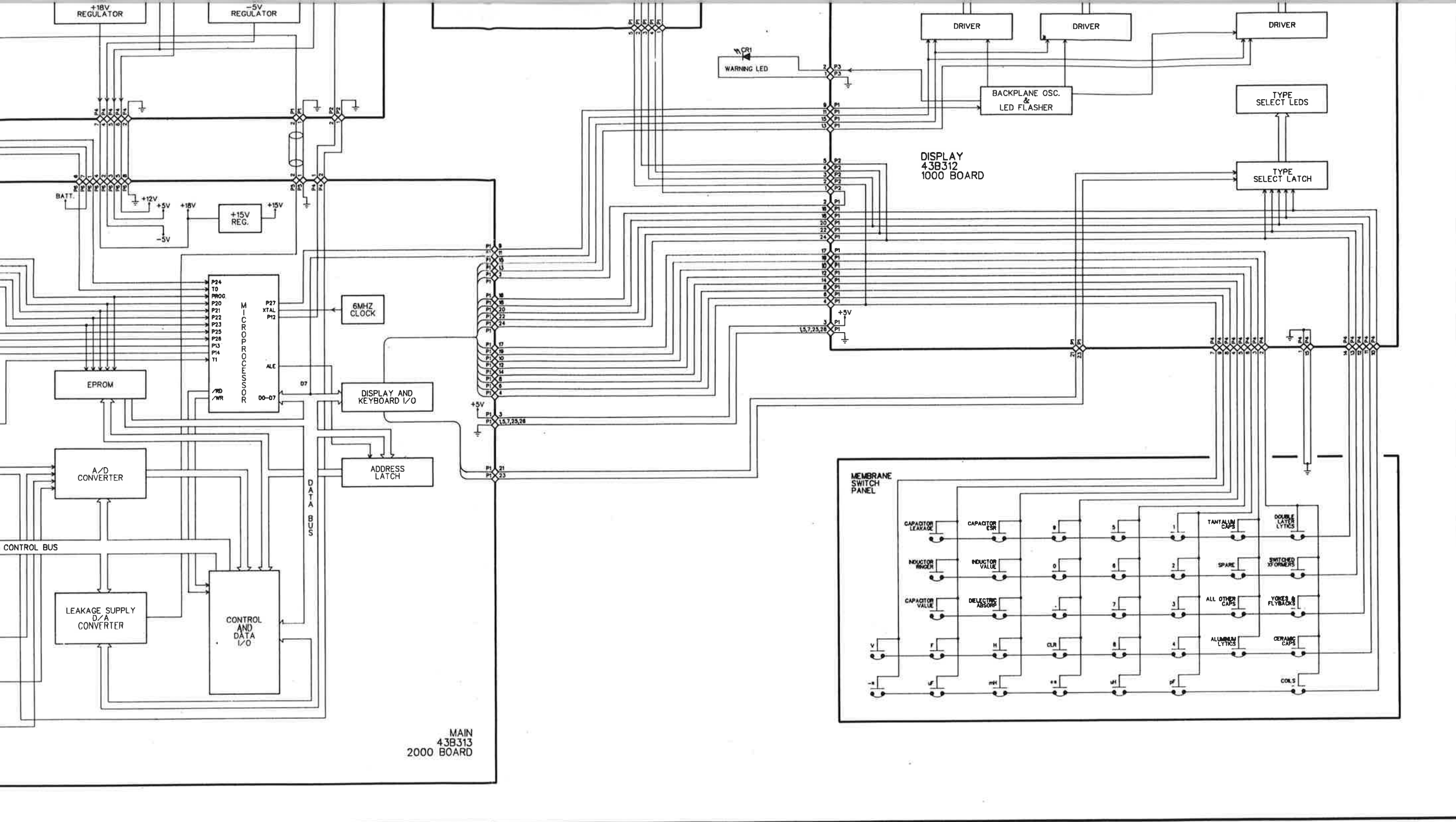
44G20
20G26

Fuse,Slowblow,3AG,1Amp
LED Indicator

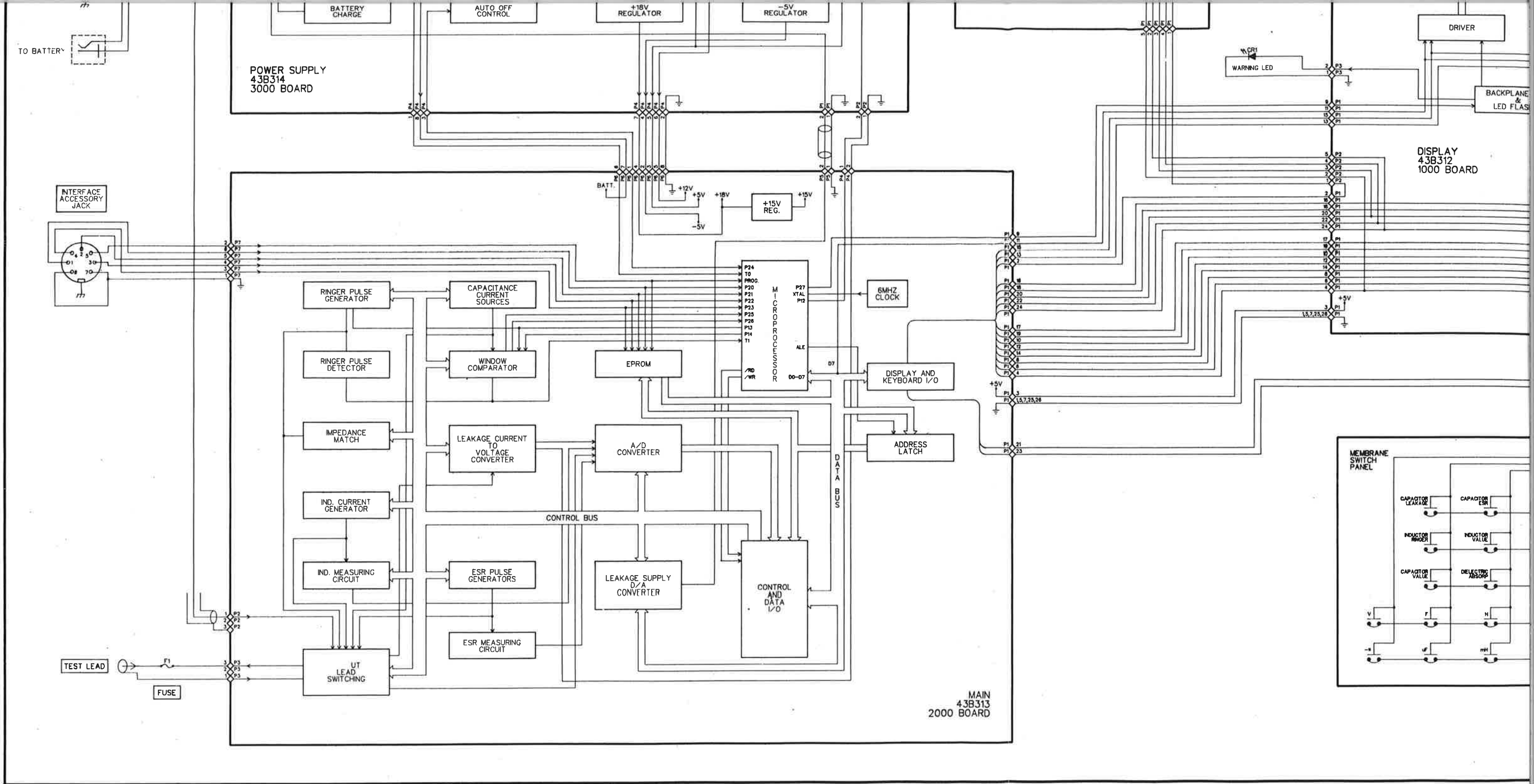


LC77 AUTO-Z BLOCK DIAGRAM

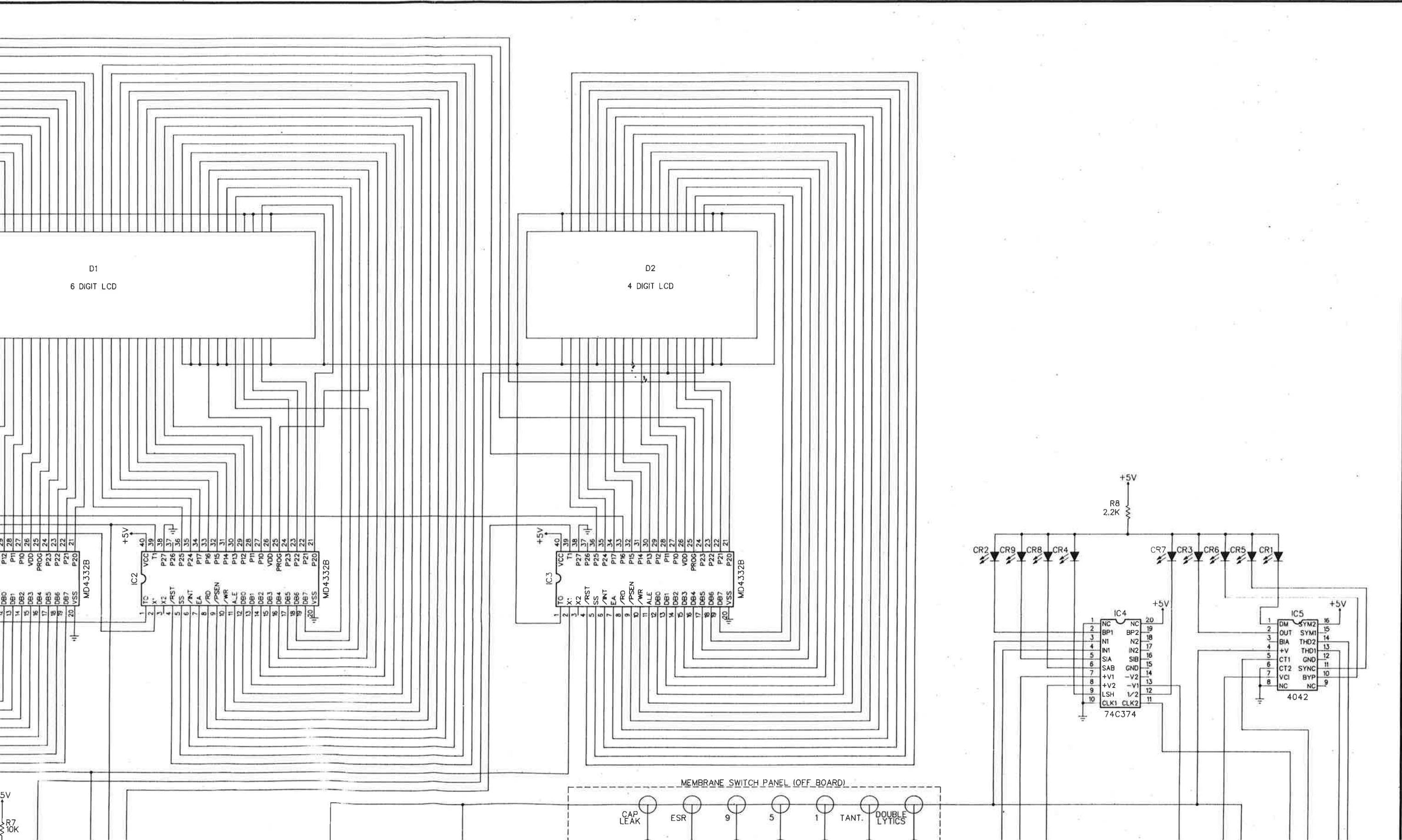




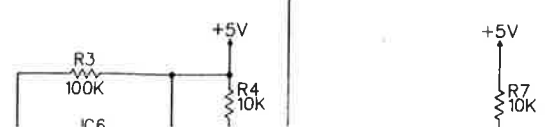
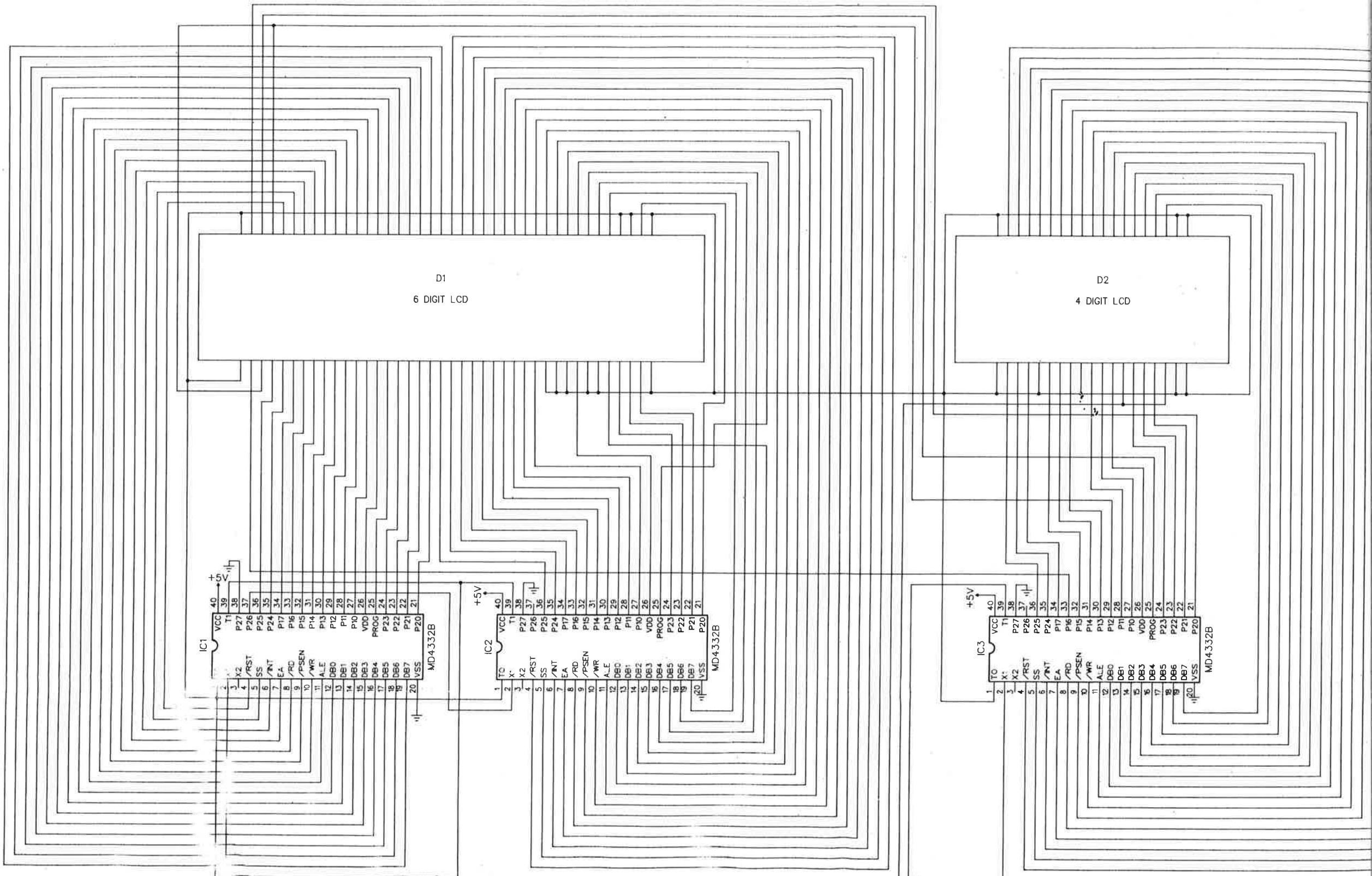
LC77 BLOCK DIAGRAM



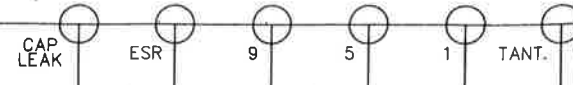
LC77 BLOCK DIAGRAM

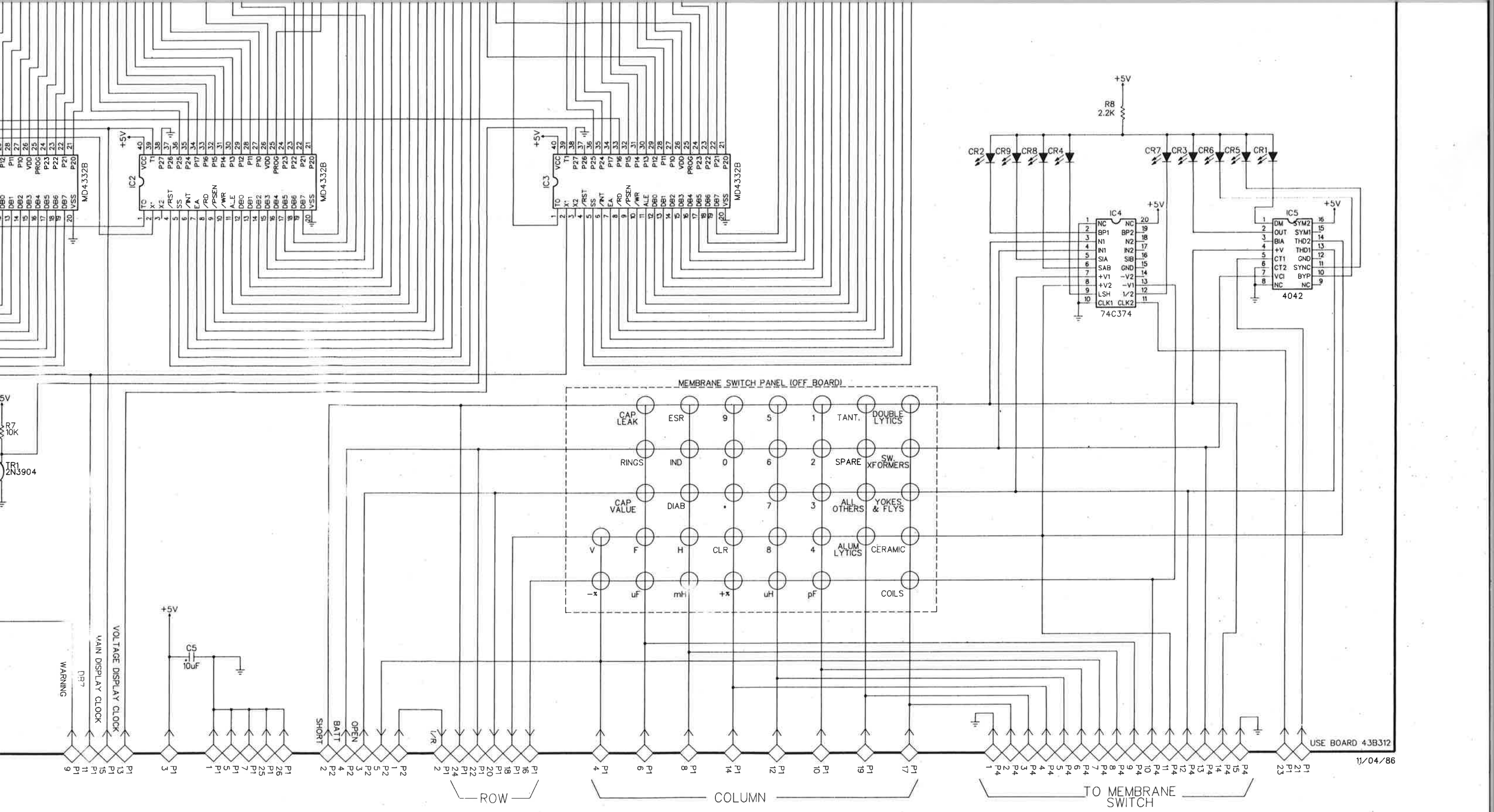


LC77 DISPLAY
43B312
1000 BOARD

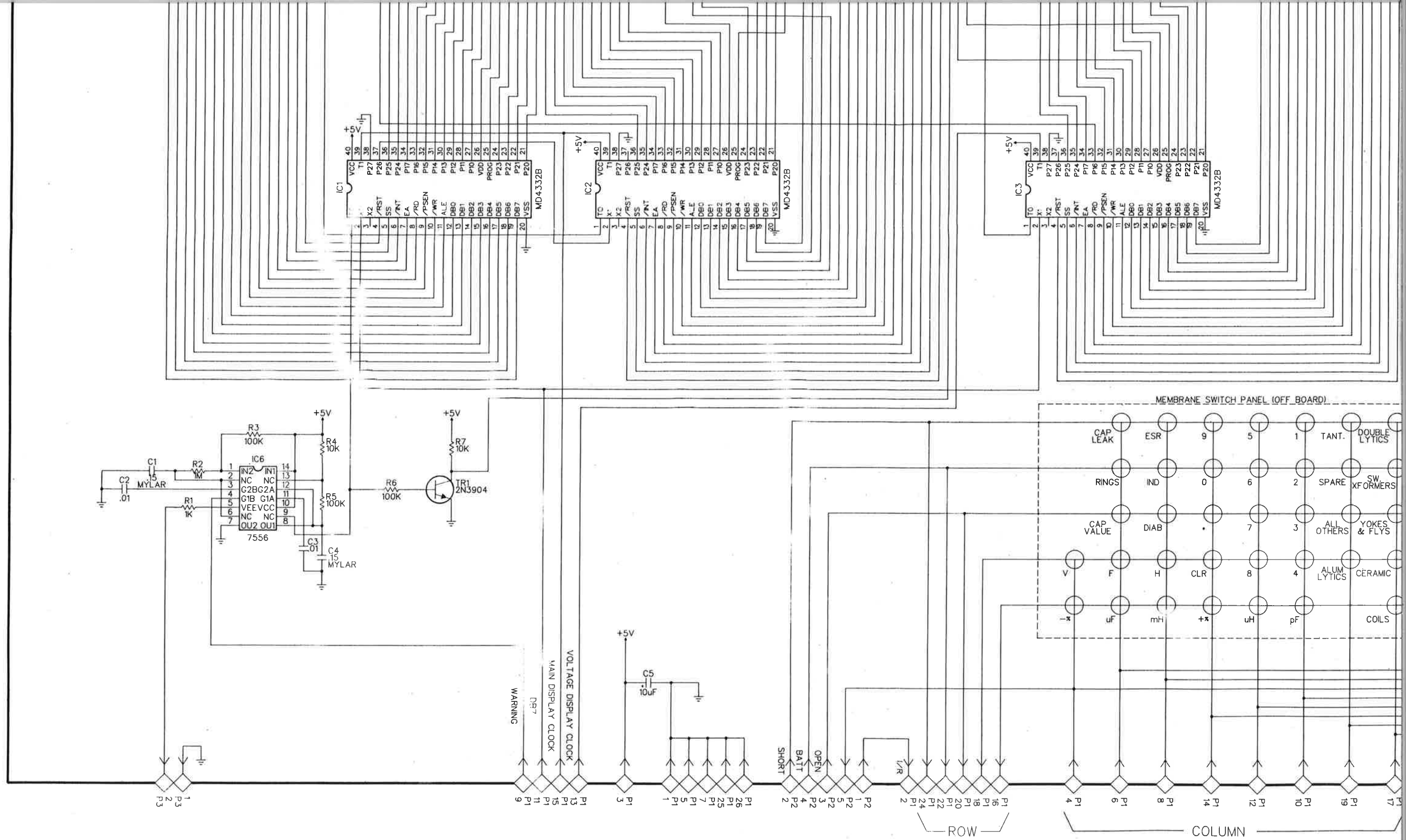


MEMBRANE SWITCH PANEL (OFF BOARD)



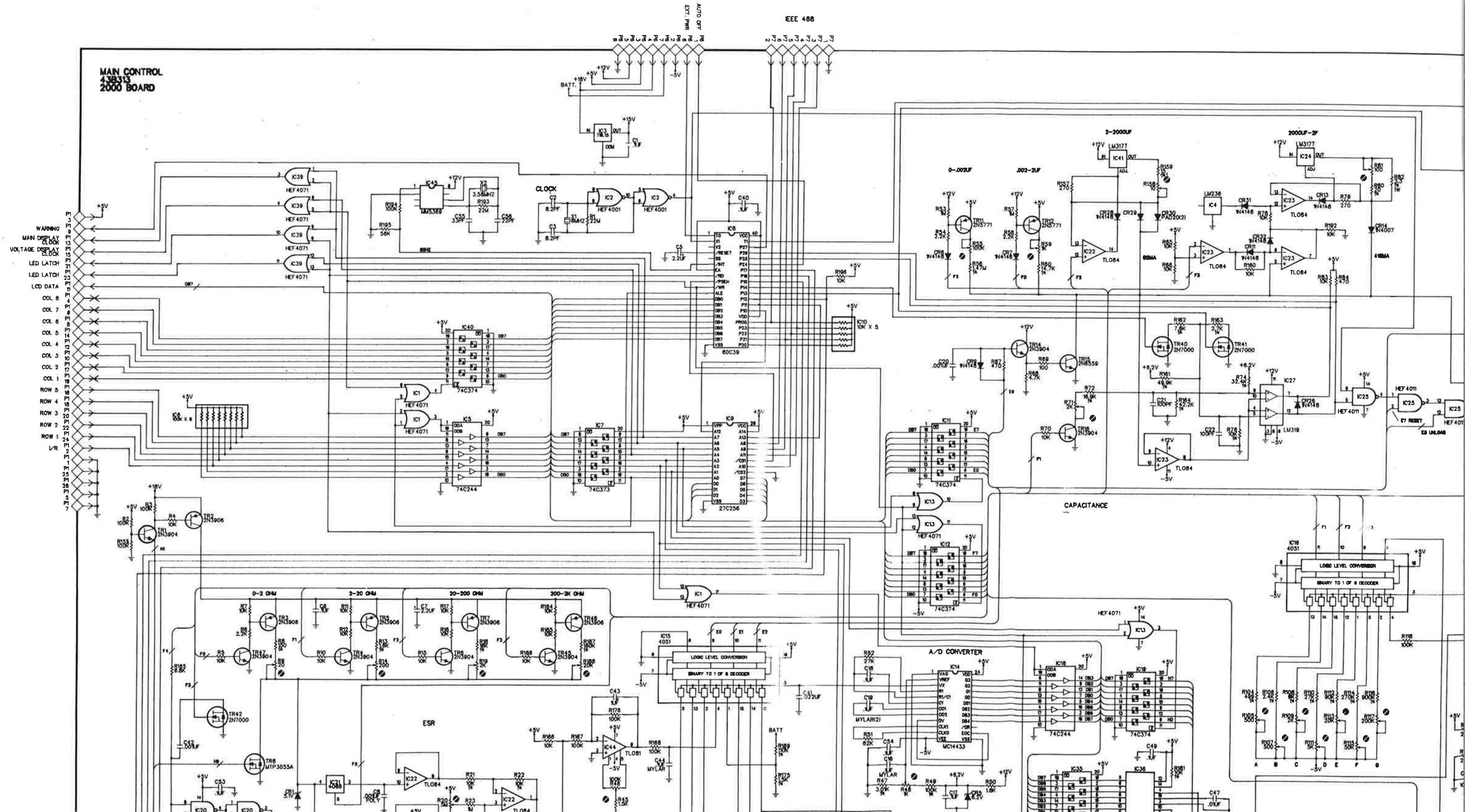


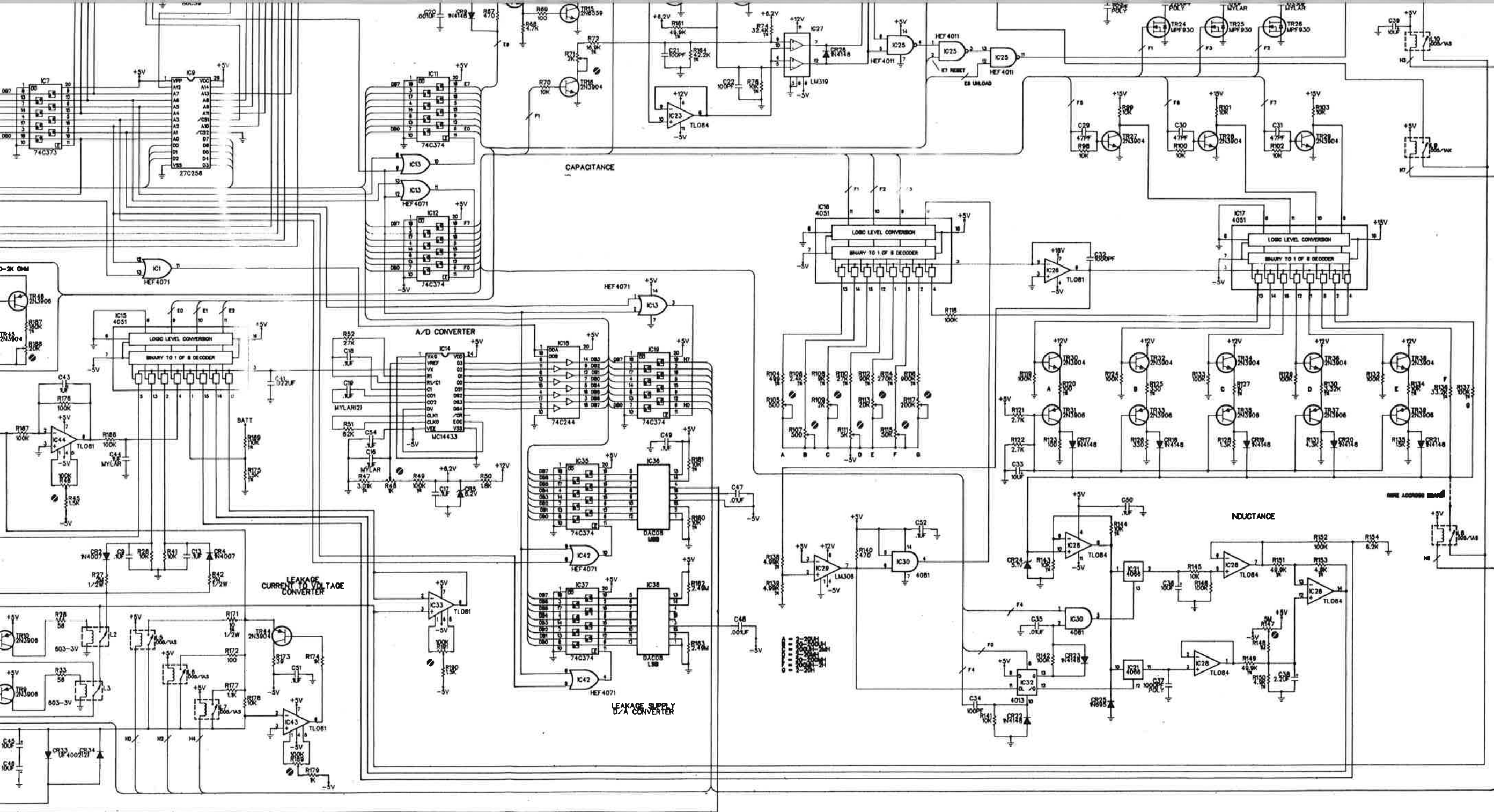
1000 BOARD - DISPLAY



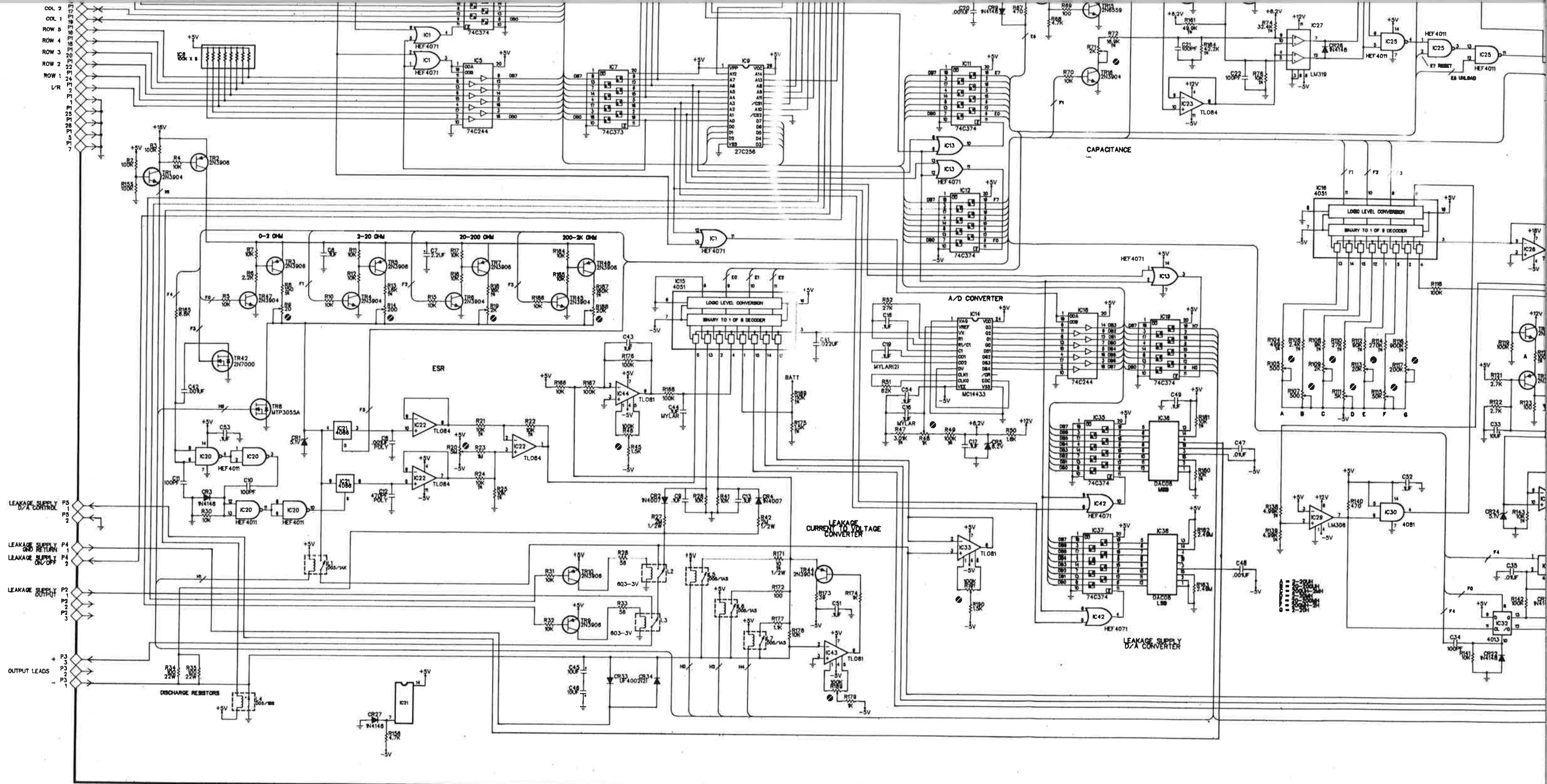
1000 BOARD — DISPLAY

MAIN CONTROL
438313
2000 BOARD

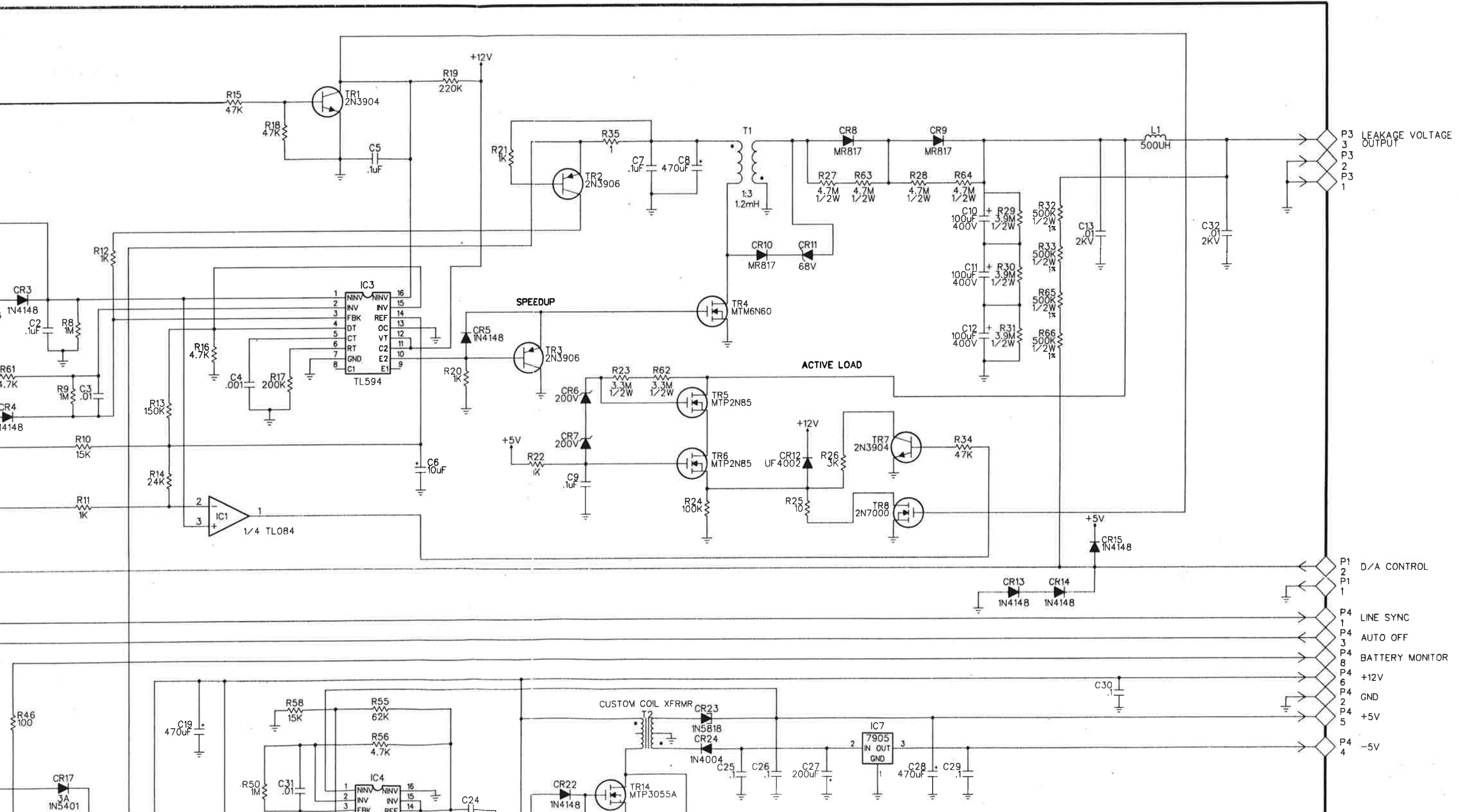




12/16/86 FOR BOARD 438313-A



2000 BOARD — MAIN

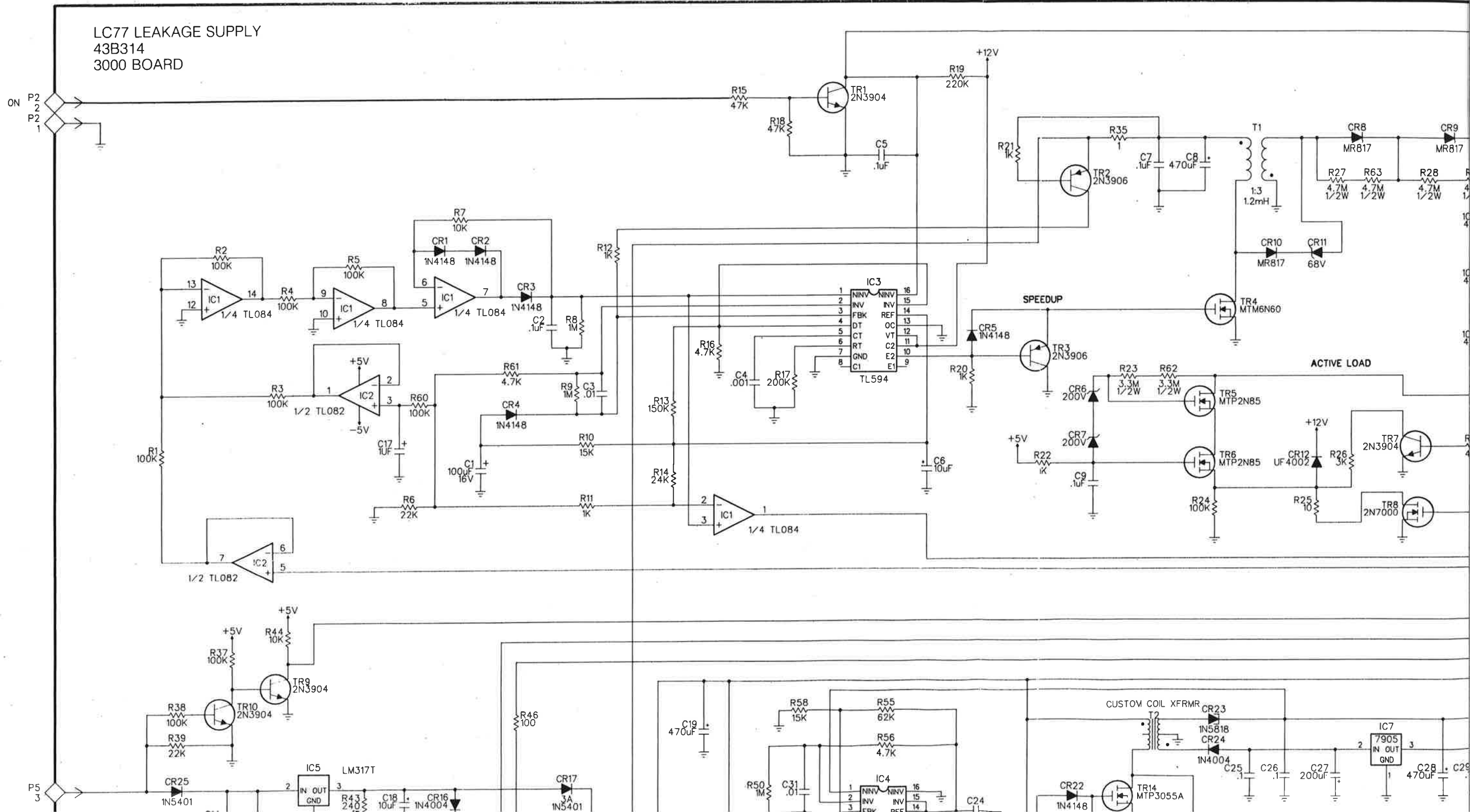


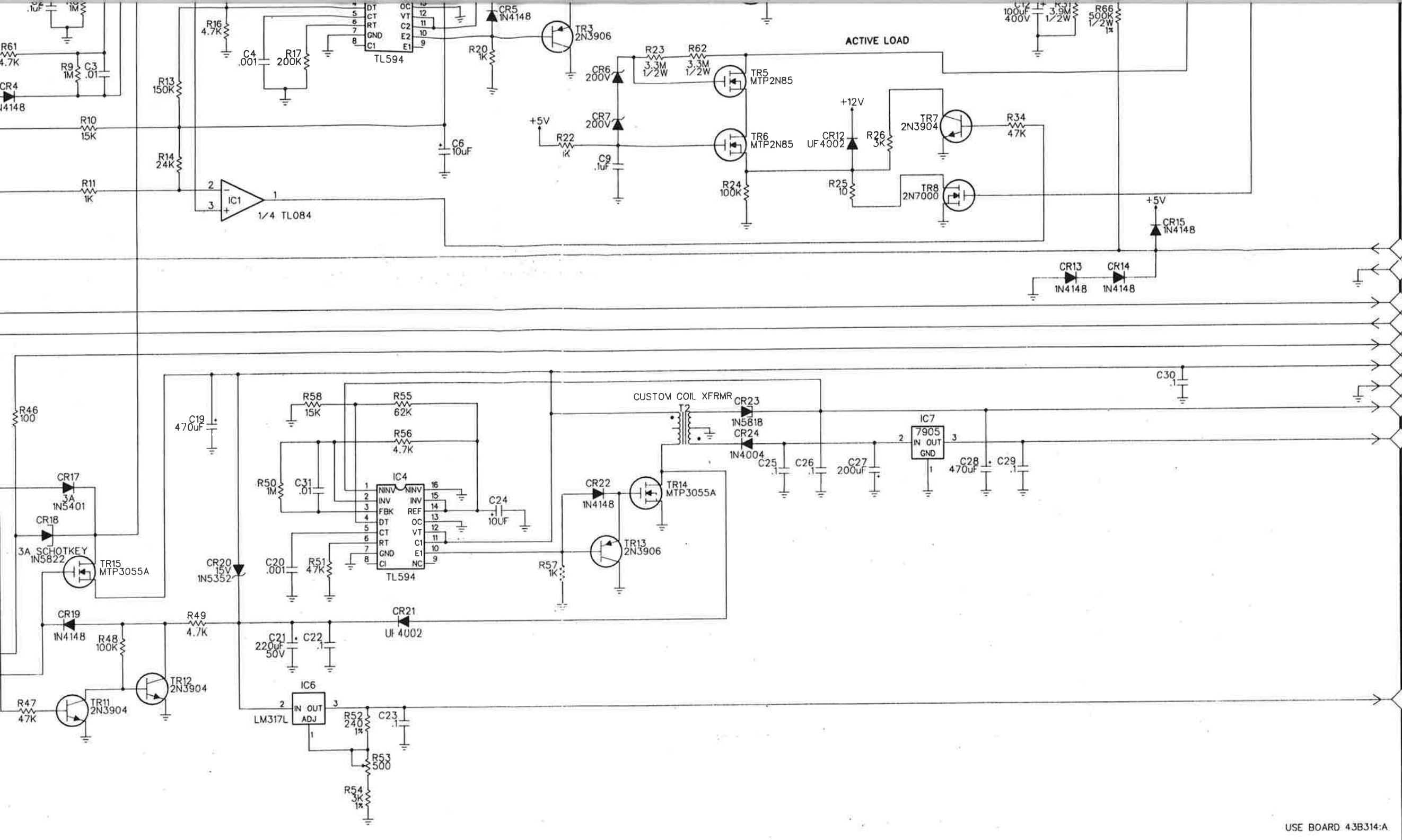
This sheet includes board numbers 2000 and 3000.

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LC77 LEAKAGE SUPPLY
43B314
3000 BOARD





- P1 2
- P1 1
- P4 1
- P4 3
- P4 8
- P4 6
- P4 2
- P4 5
- P4 4

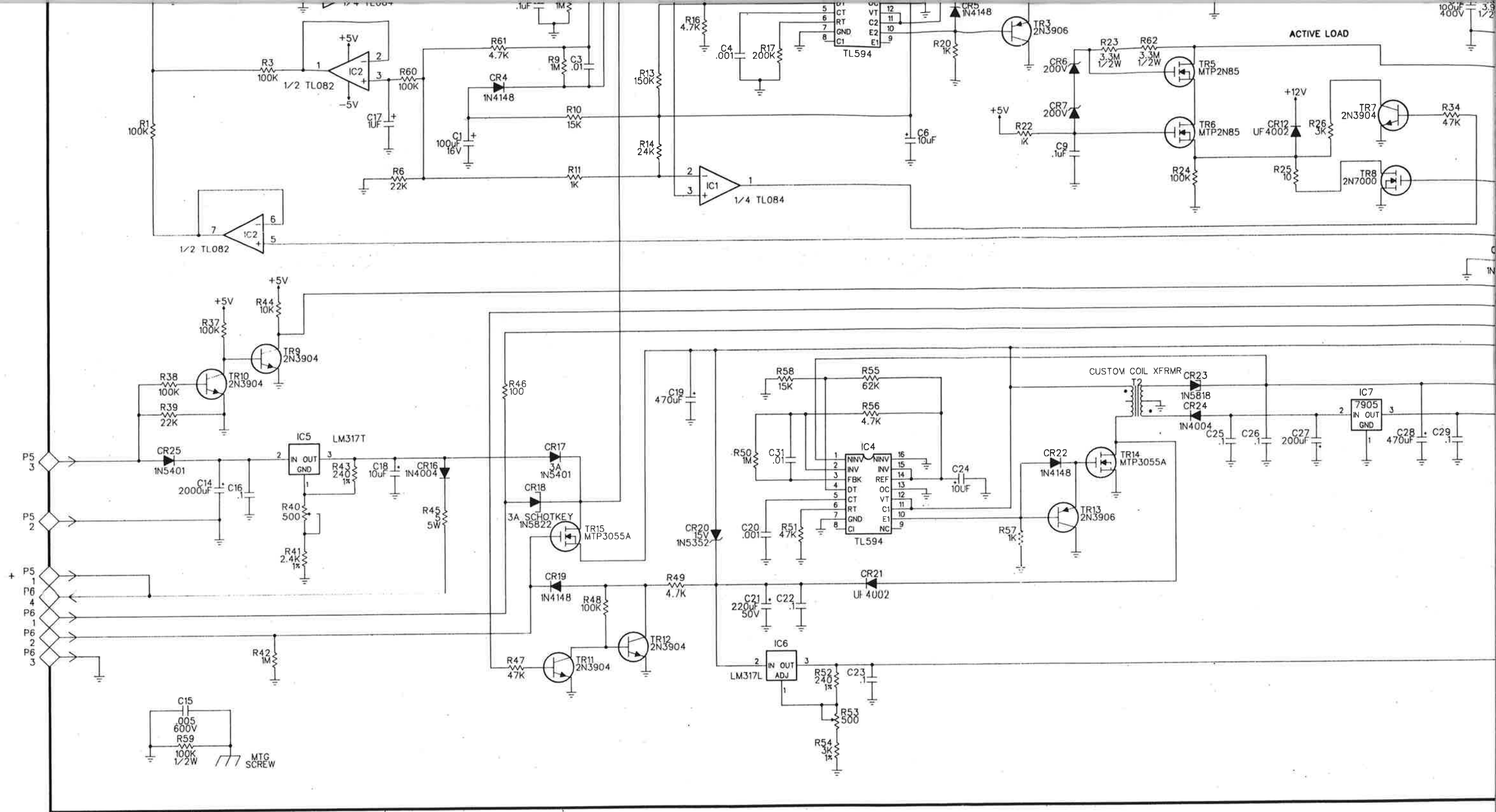
- D/A CONTROL
- LINE SYNC
- AUTO OFF
- BATTERY MONITOR
- +12V
- GND
- +5V
- 5V
- +18V

USE BOARD 43B314:A

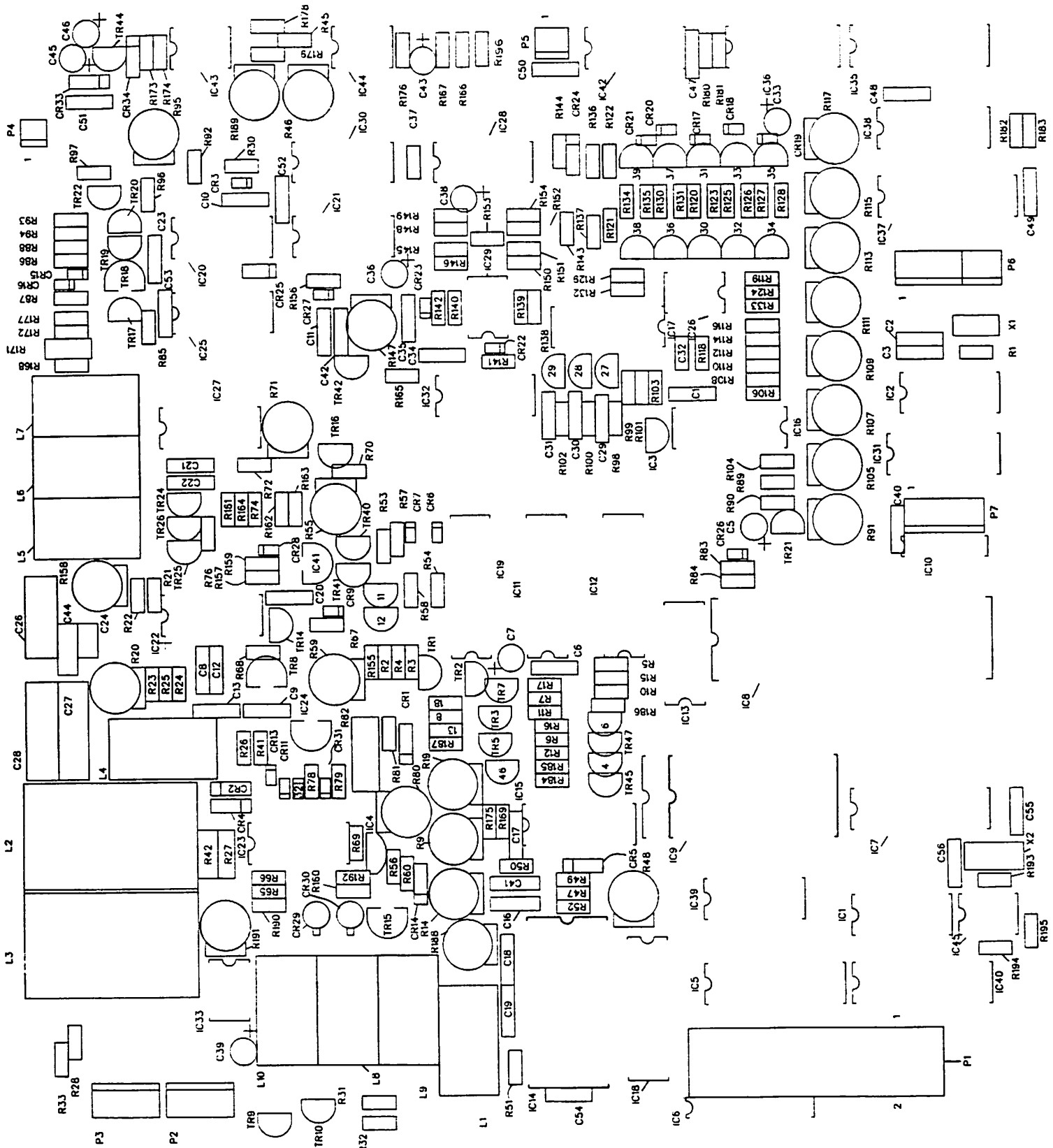
11/18/86




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3000 BOARD — LEAKAGE SUPPLY

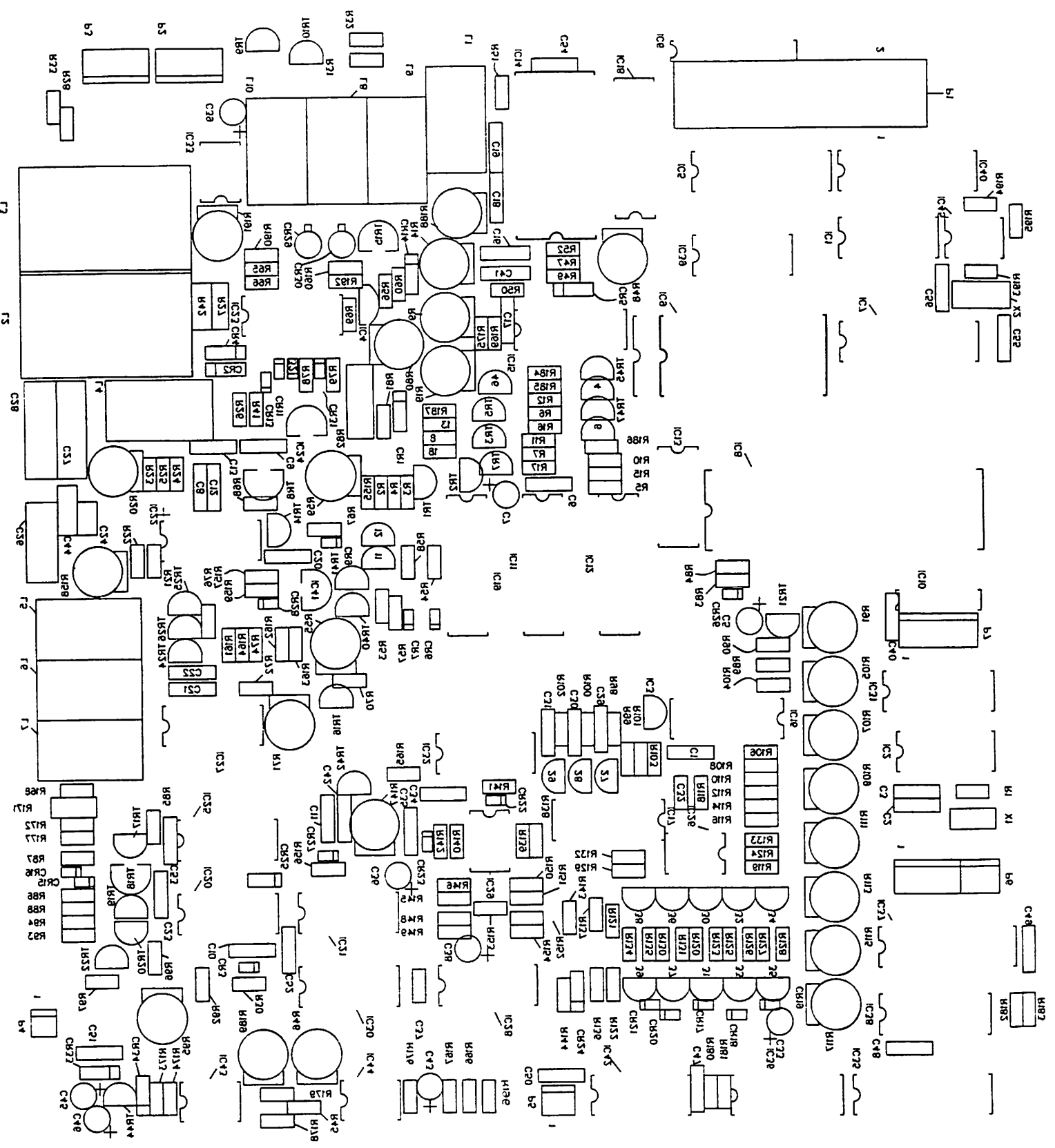


MAIN BOARD (Component Side)

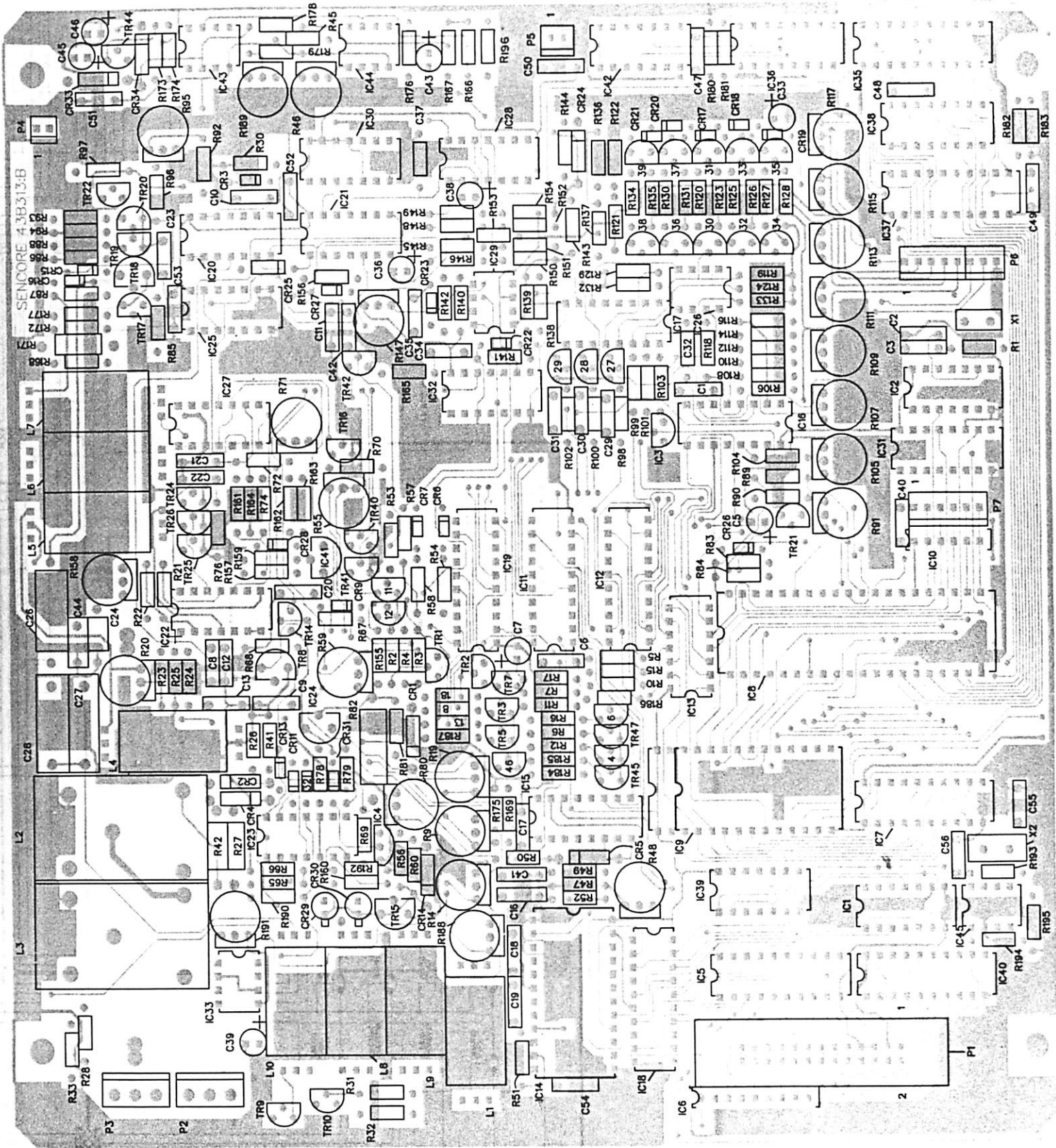

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This sheet includes P.C. board layouts and Block Diagram.

SHEET 3



MAIN BOARD (Foil Side)



MAIN BOARD (Component Side)



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SENCORE

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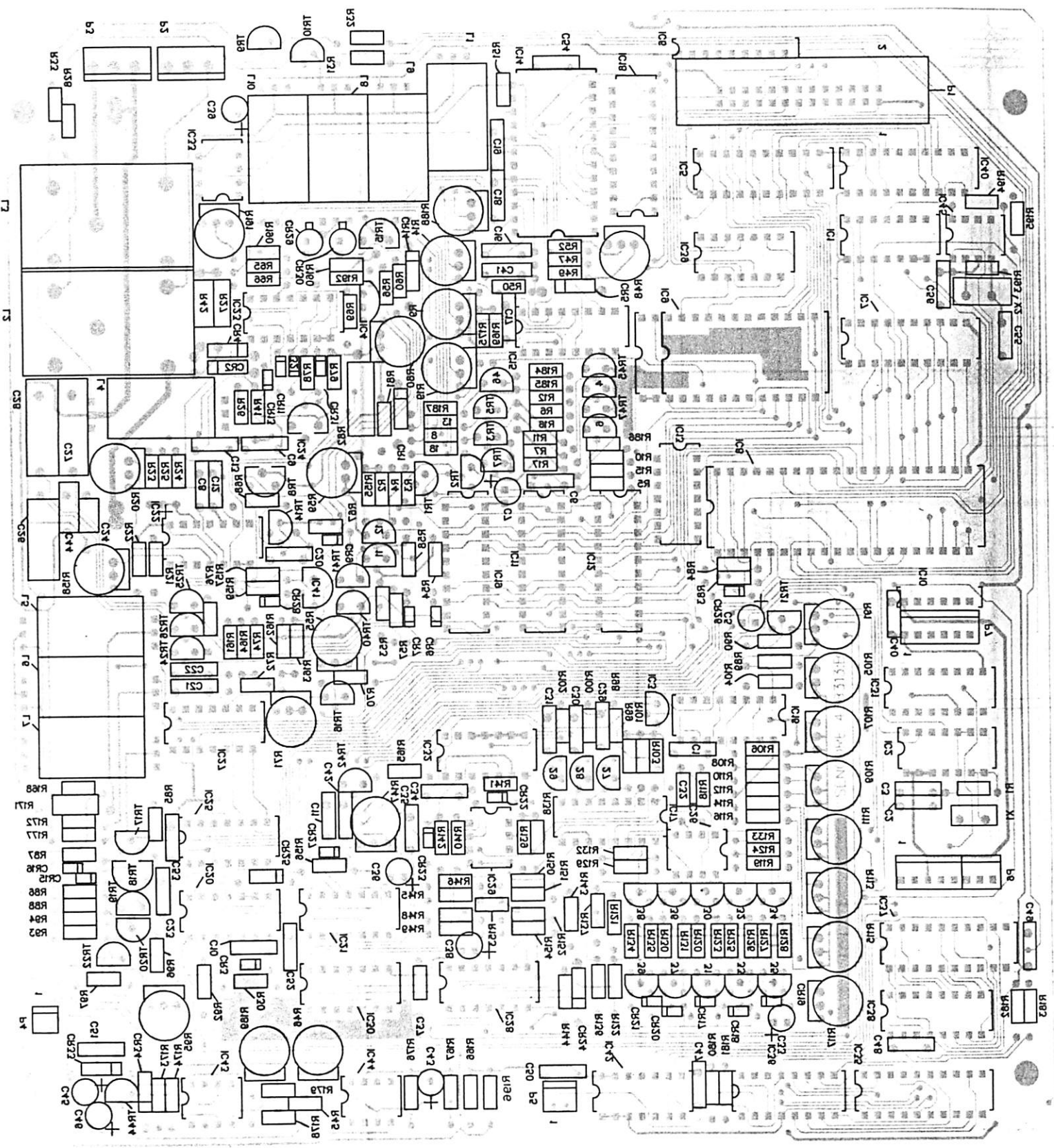
Sioux Falls, SD 57107

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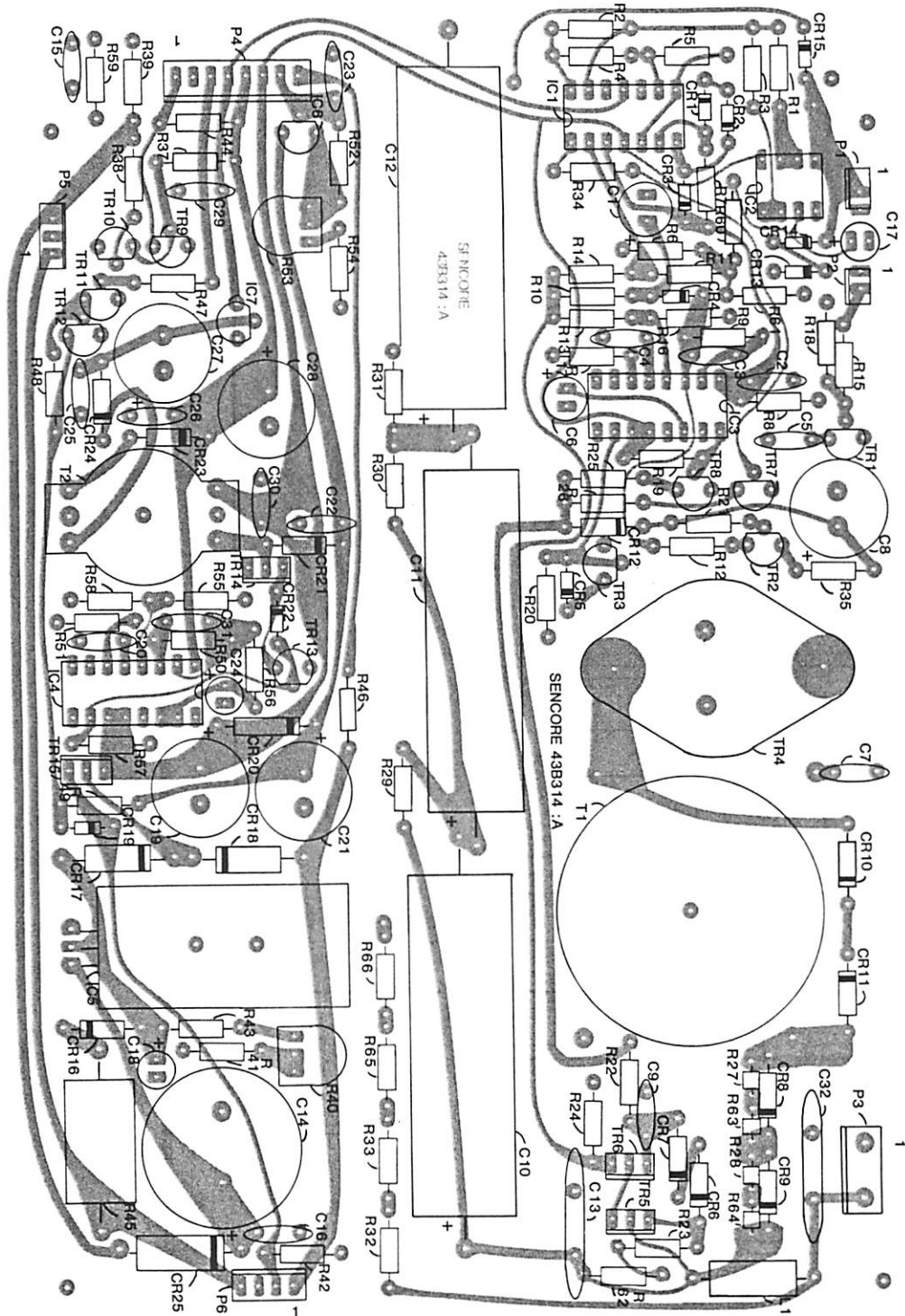
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This sheet includes P.C.
board layouts and Block
Diagram.

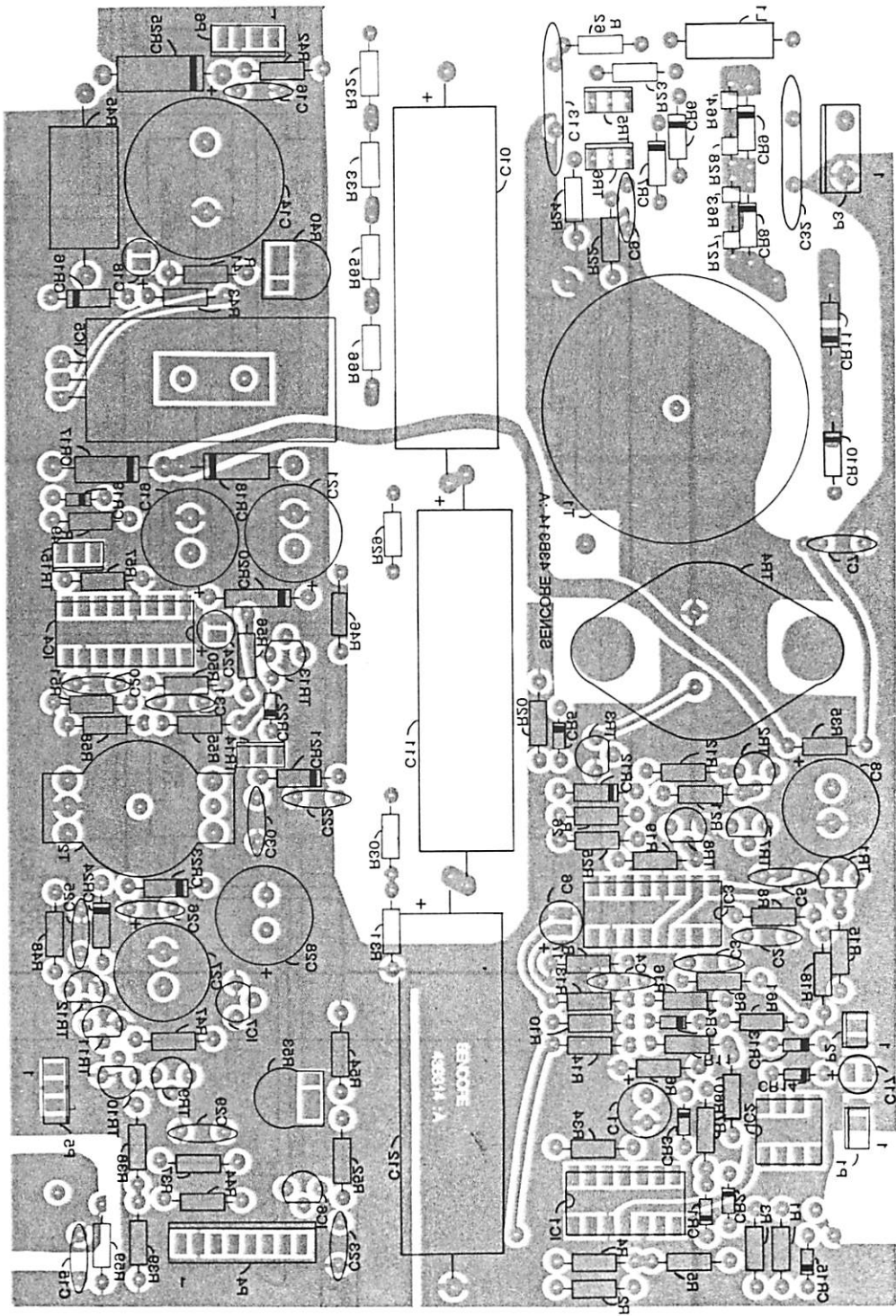
SHEET 3



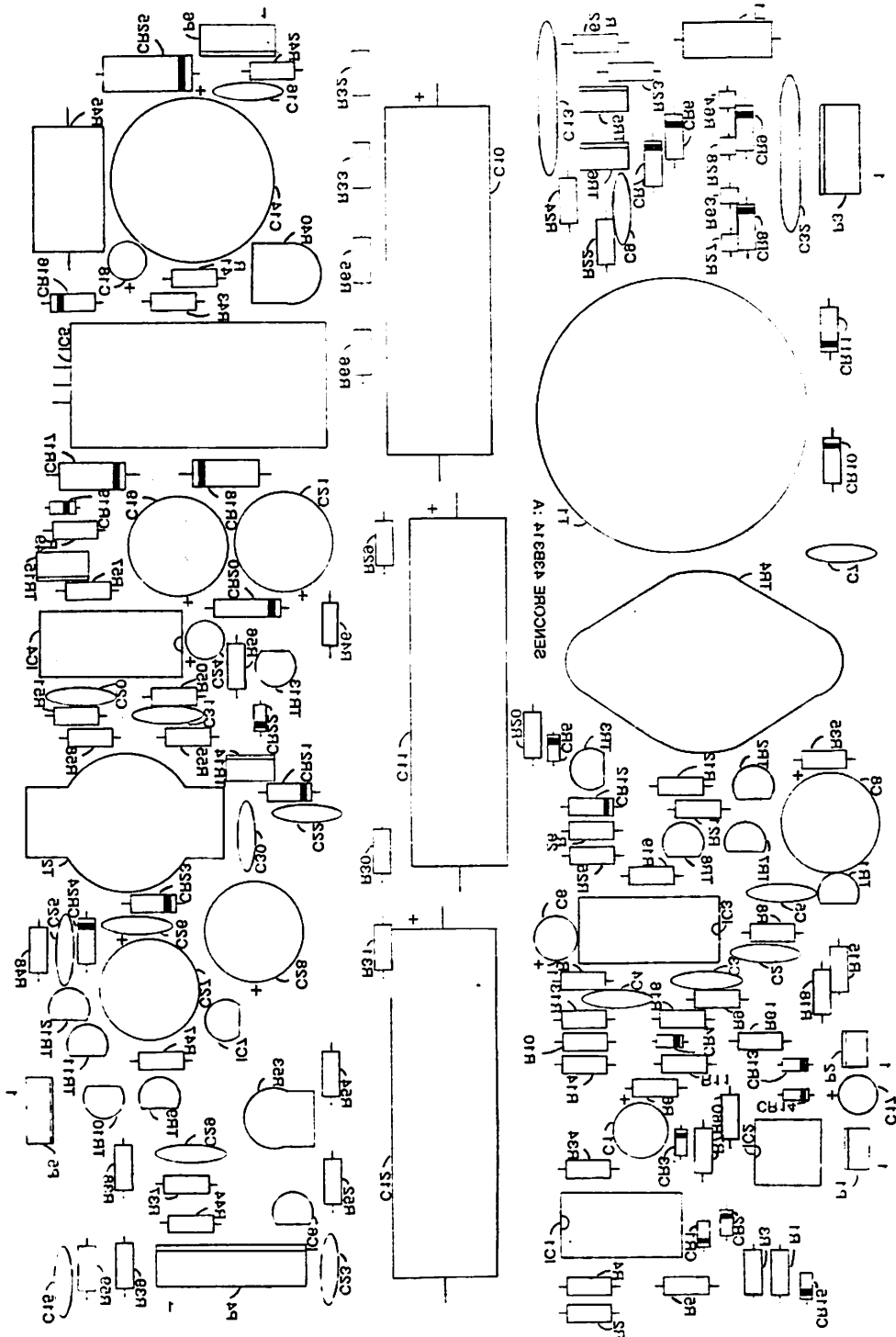
MAIN BOARD (Foil Side)



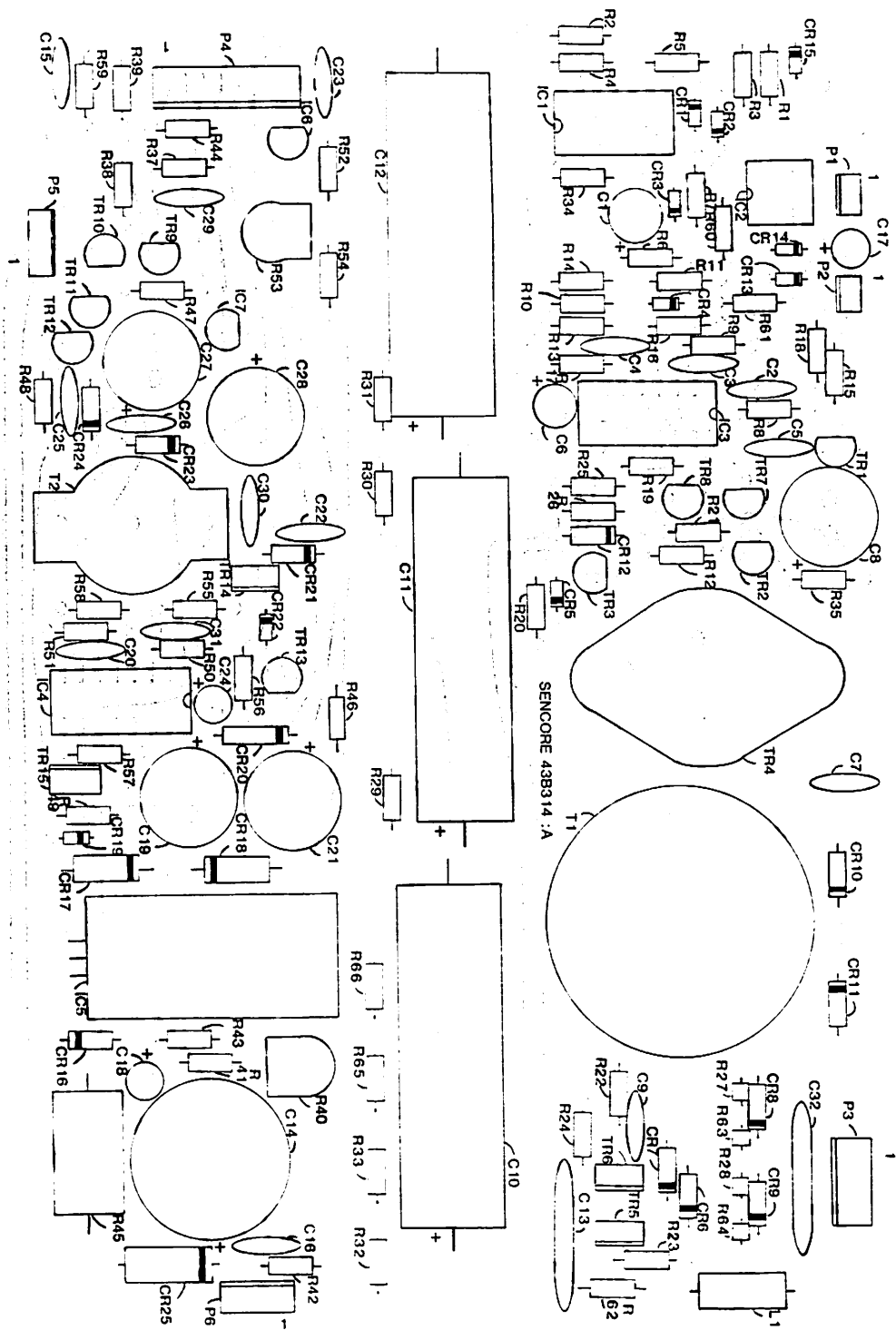
LEAKAGE SUPPLY BOARD (Component Side)



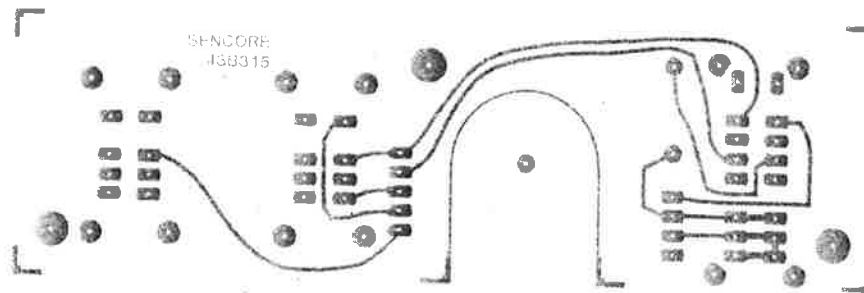
LEAKAGE SUPPLY BOARD (Foil Side)



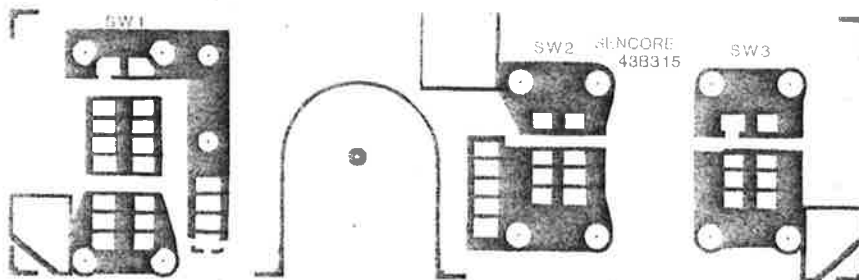
LEAKAGE SUPPLY BOARD (Foil Side)



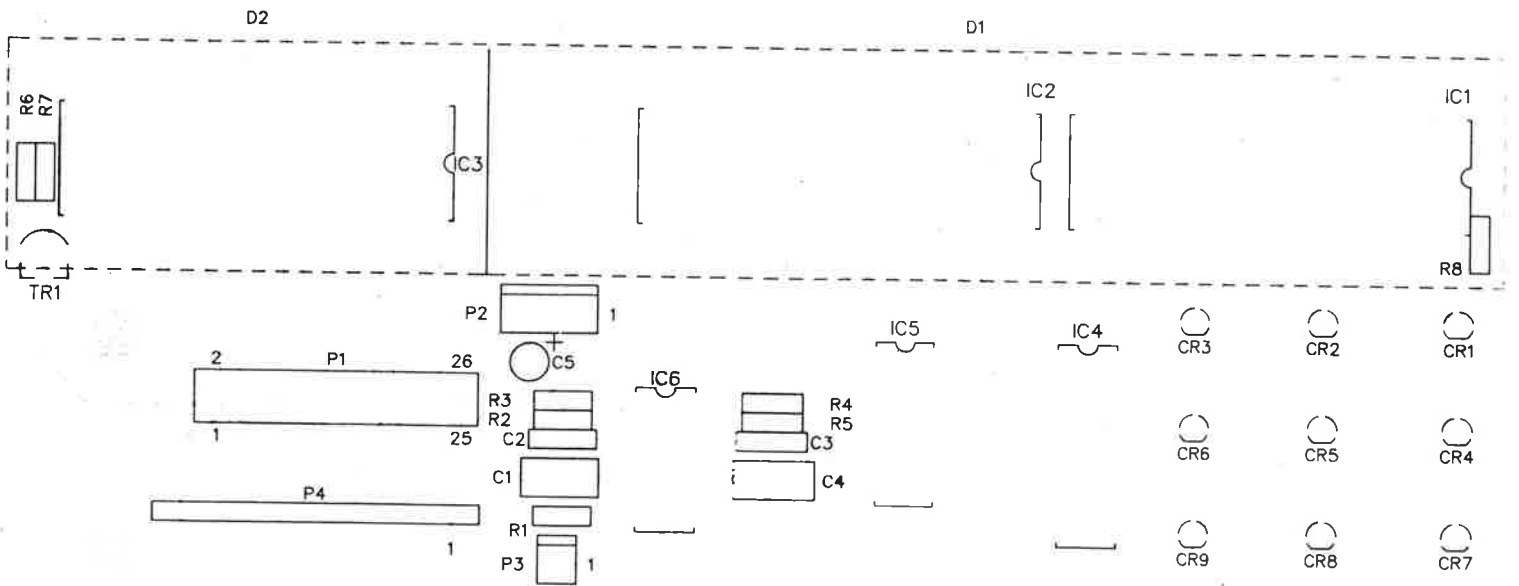
LEAKAGE SUPPLY BOARD (Component Side)



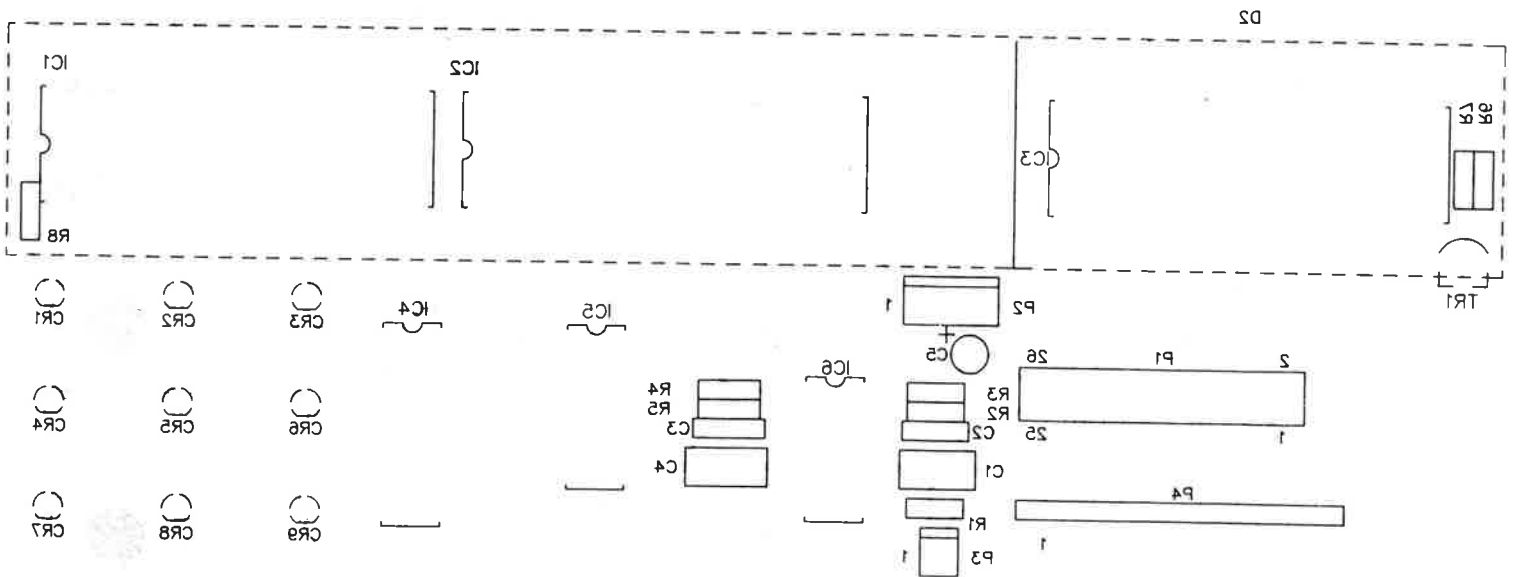
TOGGLE SWITCH BOARD (Foil Side)



TOGGLE SWITCH BOARD (Component Side)



DISPLAY BOARD (Component Side)



DISPLAY BOARD (Foil Side)

NOTES:

- 1 All resistances in ohms
- 2 All capacitances greater than one are in pF, less than one in uF, unless otherwise indicated
- 3 Board interconnection notes:
 - denotes a single push-on type connector.
 - denotes wire soldered to PC board.
 - ◇ denotes molex connection. Numbers inside or along side indicate the pin number of the plug-in connector.
4. All controls, jacks, and displays on exterior of unit are shown with box around the name

WARNING



Avoid damage to parts caused by static electricity!

Most solid-state devices and film resistors are susceptible to damage due to discharge of static electricity. Observe the following precautions when a PC board is removed from the unit, or when handling components:

1. The person handling the part must be grounded through a 1 megohm resistor via a wrist strap or similar ground connection.
2. A PC board or component should never be placed on an insulated surface. The surface must be grounded (through a 1 megohm resistor) and conductive.
3. All replacement parts must be left in a completely enclosed, conductive container or package until ready for use. The person removing the part from the container must be properly grounded. All parts susceptible to static damage are shipped in conductive containers when ordered from the Sencore Service Department.

Components not listed are standard replacement parts and may be purchased locally. When ordering parts, please specify instrument model number, schematic reference, part number, and description. Please include remittance (check or money order) with your order, otherwise invoice will be shipped C.O.D. Minimum billing is \$5.00



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