

# OPERA 6

## DYNAMIC PROGRAMMABLE SYNTHESIZER

DK 600

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THE FEATURES OF THE INSTRUMENT

UPDATED OCTOBER 1983



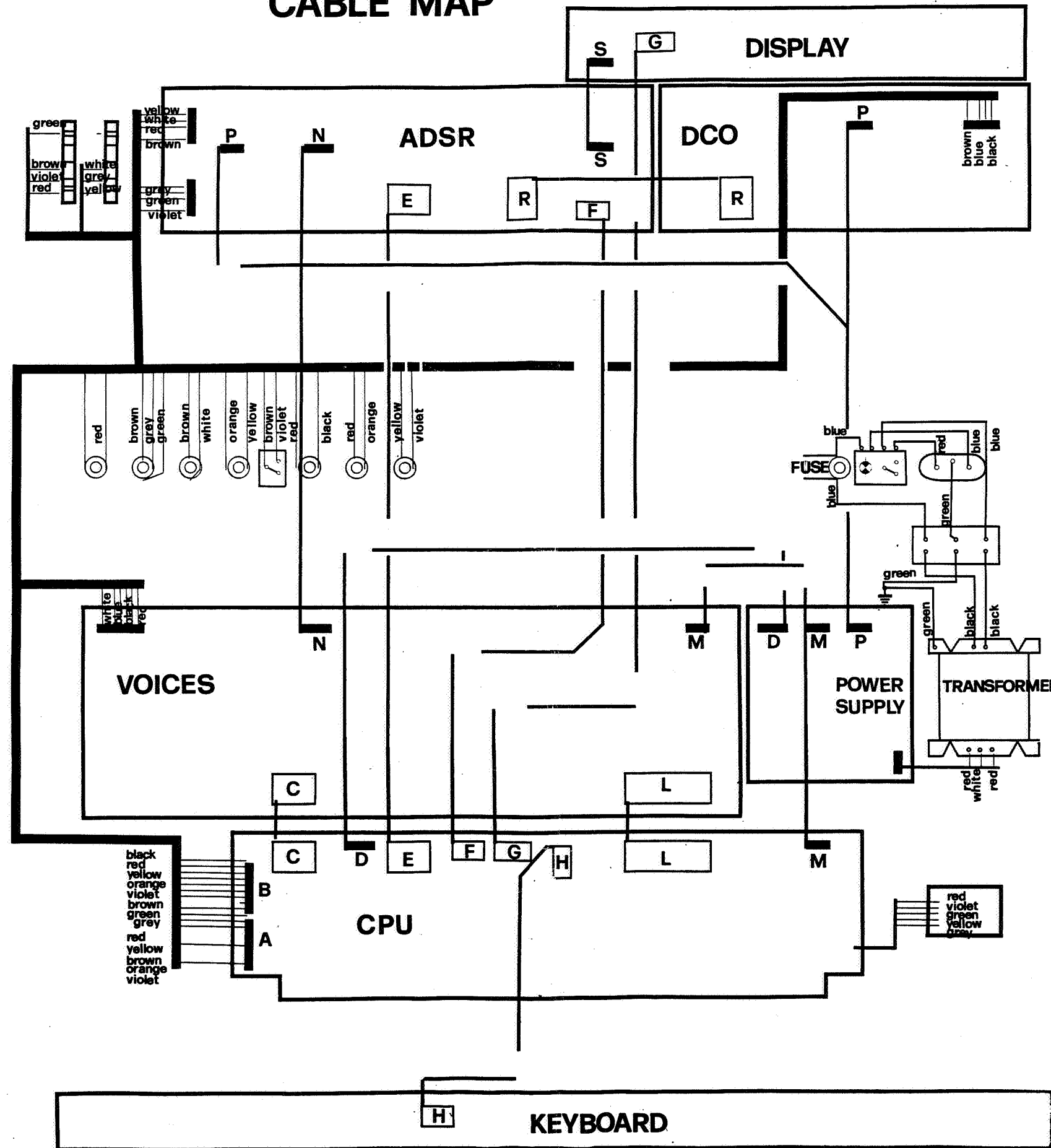
SOCIETÀ INDUSTRIE ELETTRONICHE s.p.a.

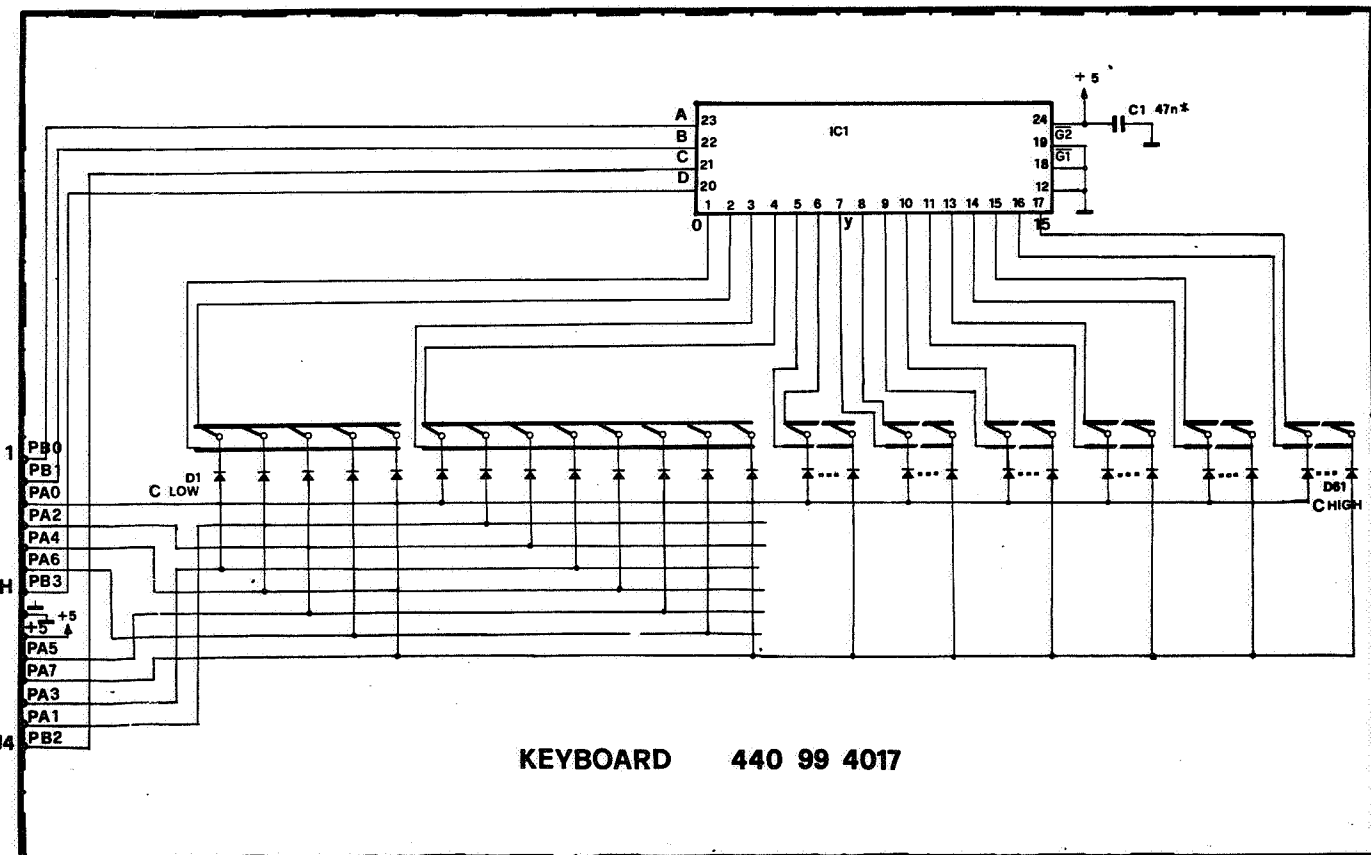
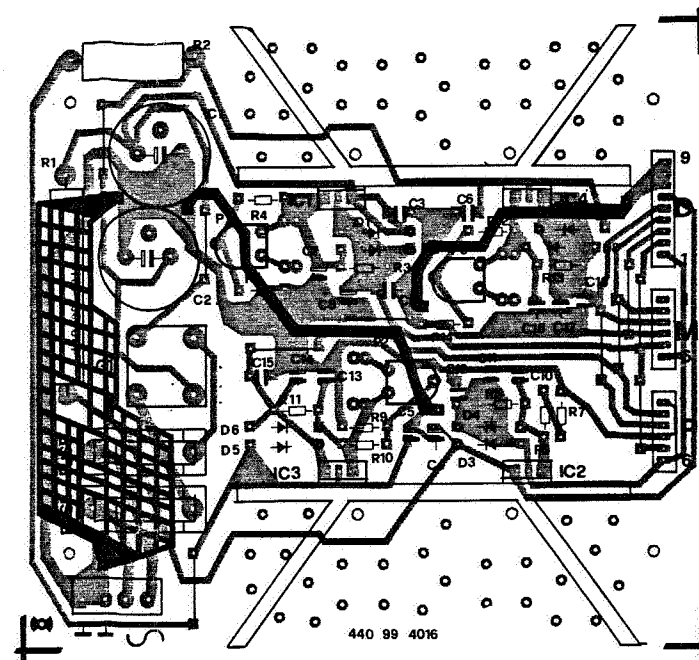
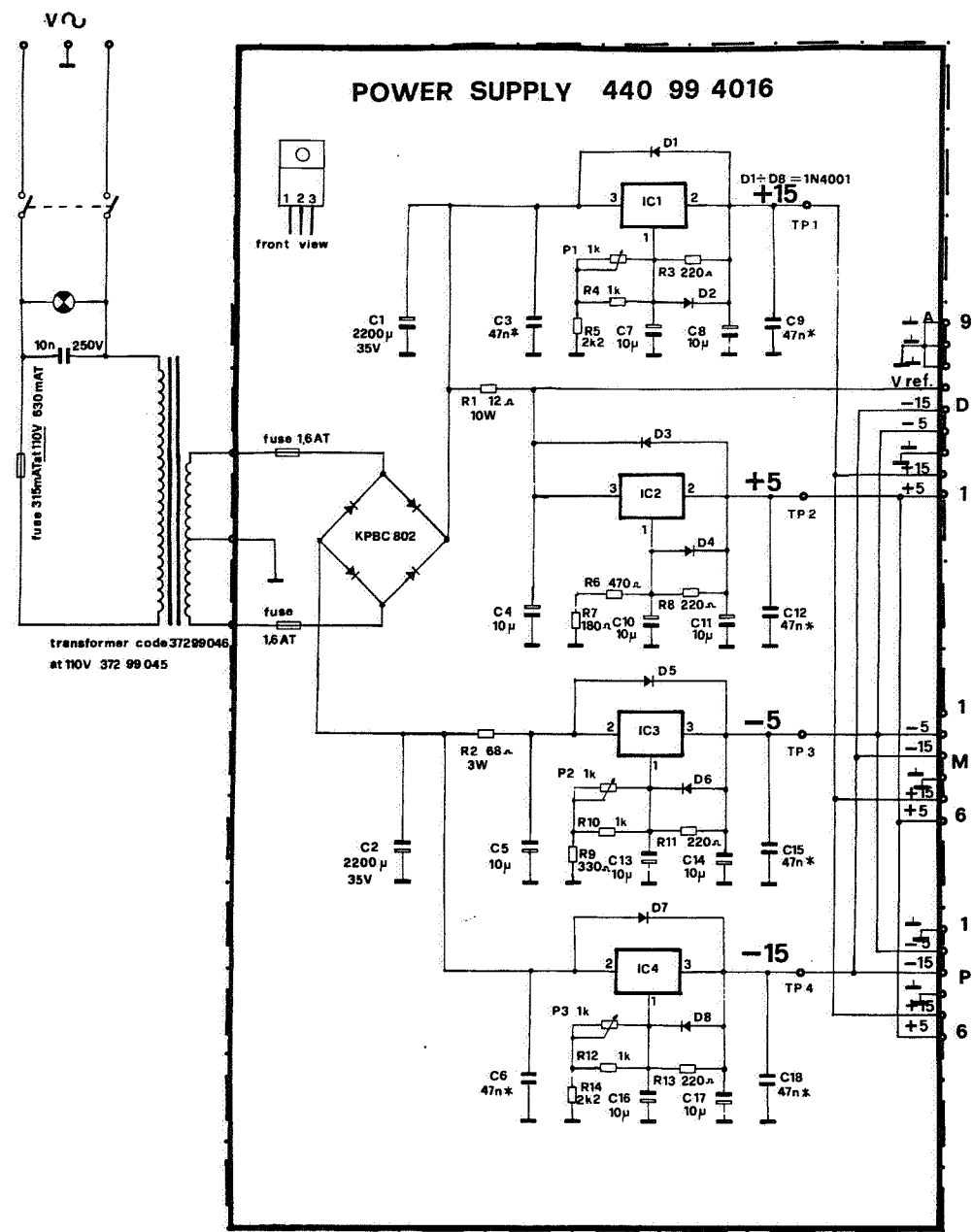
VIA L. DA VINCI n. 11 (Zona Ind.) - 63030 ACQUAVIVA PICENA (AP) ITALY  
P.O. box 199 - 63039 SAN BENEDETTO DEL TRONTO (AP) ITALY  
Tel. 0735/60744 (4 lines) - Telex 573287 SIEL  
Codice Fiscale e Partita I.V.A. 00092010677  
Posizione meccanografica M/790532

SCHEMATIC  
DIAGRAM



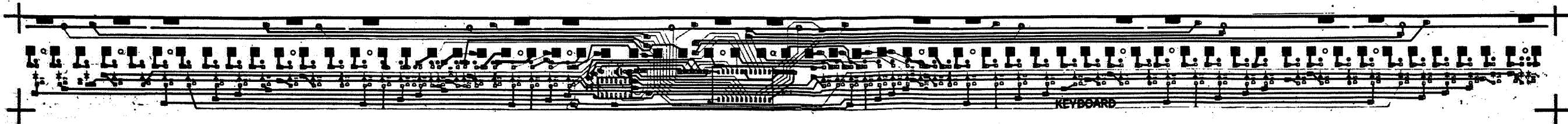
# CABLE MAP



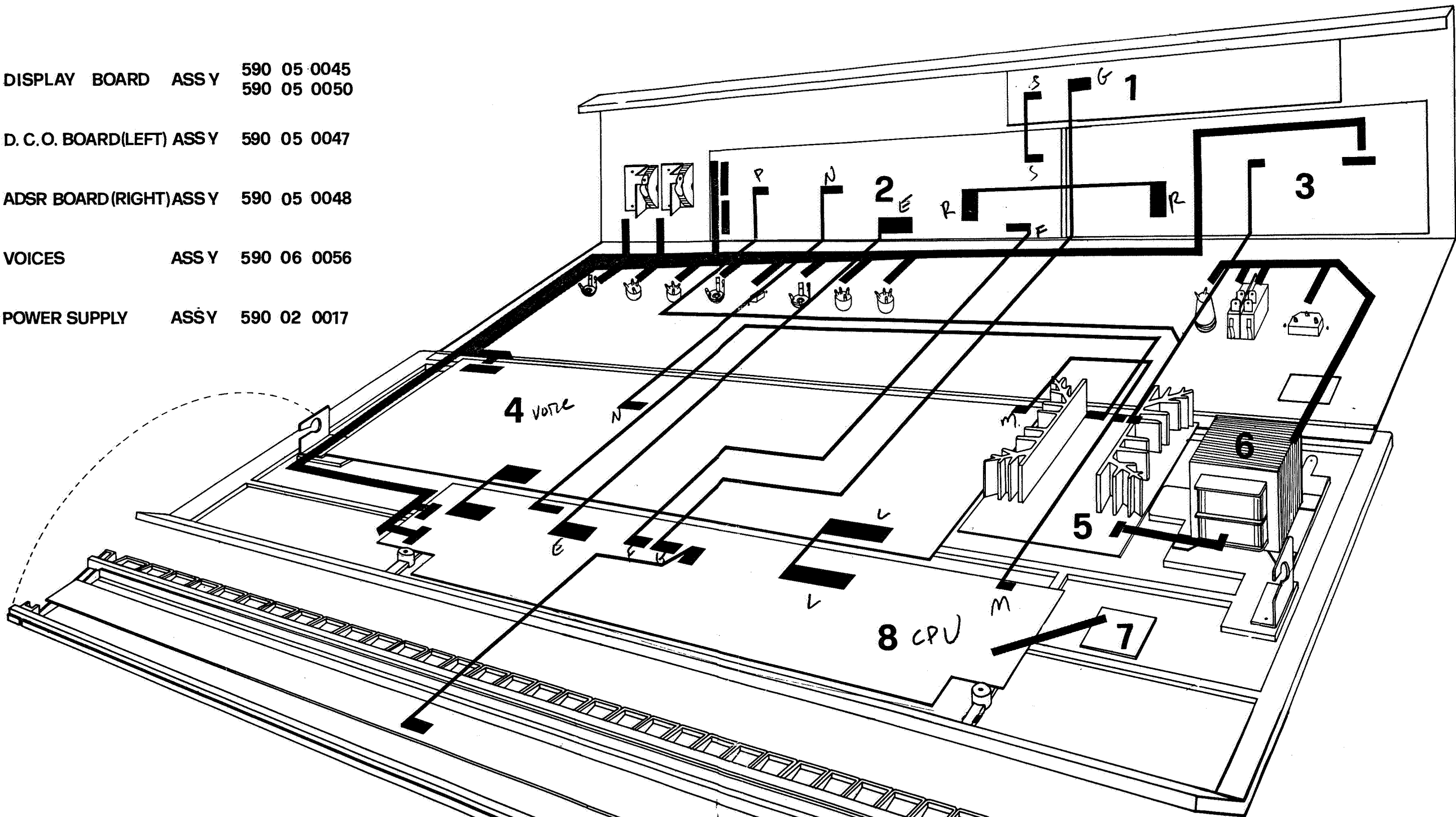


POWER SUPPLY		
I C 1-2	LM 317	367.99.8006
I C 3-4	LM 337	367.99.8005

KEYBOARD		
I C 1	74LS154	367.99.6503



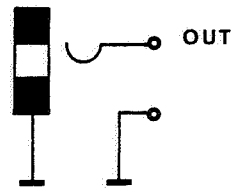
- 1** DISPLAY BOARD ASSY 590 05 0045  
590 05 0050
- 2** D. C. O. BOARD(LEFT) ASSY 590 05 0047
- 3** ADSR BOARD(RIGHT) ASSY 590 05 0048
- 4** VOICES ASSY 590 06 0056
- 5** POWER SUPPLY ASSY 590 02 0017



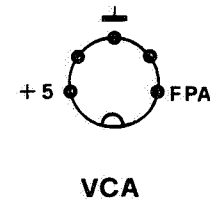
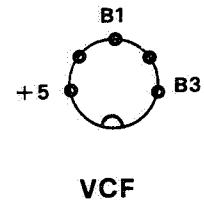
- 6** TRANSFORMER CODE 372 99 0045 · 220 V  
372 99 0046 · 110 V
- 7** BUFFER NOISE BOARD ASSY 590 06 0060  
+ → SINGLE BOARD ASSY 590 06 0061
- 8** C.P.U. BOARD ASSY 590 06 0054
- 9** KEYBOARD ASSY 590 09 0031

# BACK PANEL ASSEMBLY

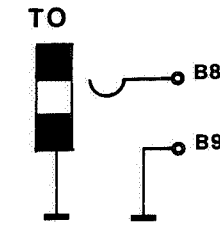
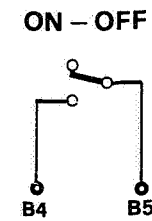
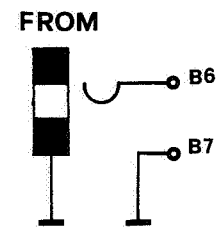
OUT



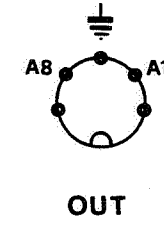
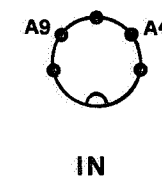
PEDALS



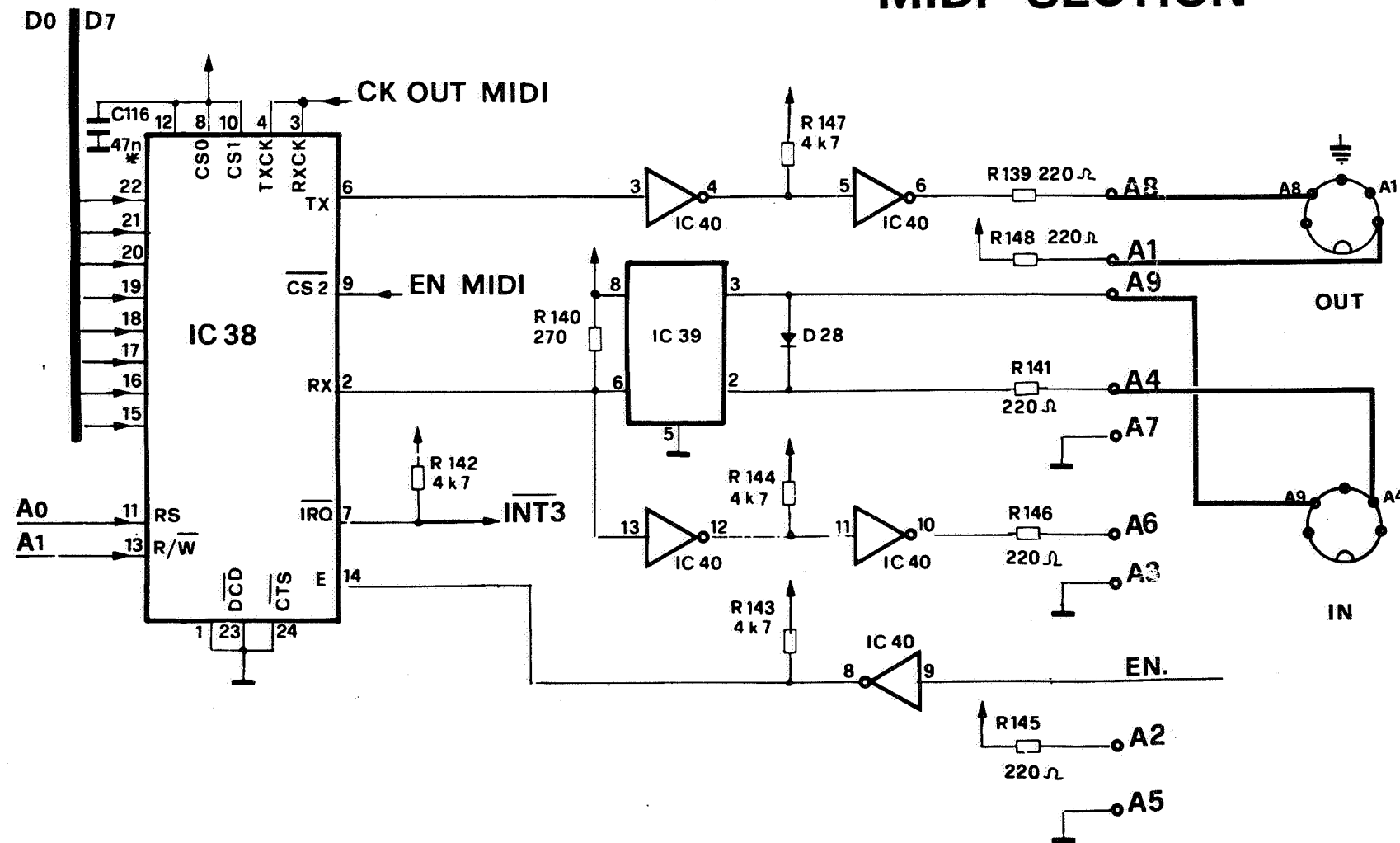
TAPE



MIDI



# MIDI SECTION



## NOTE

Interconnect cables should not exceed fifty feet (15 meters), and must have a corresponding 5-pin DIN male plug (SWITCHCRAFT 05GM5M or equivalent.) The cable should be shielded twisted pair, with the shield connected to pin 2 at both ends. Notice that while the MIDI OUT jack is grounded to the instrument chassis, MIDI IN is not. This allows the cables to provide their shielding services without creating ground loops.

# ADJUSTMENT

## ADJUSTMENT SEQUENCE

1. Power Supply Trim
2. HFO A Tuning
3. Waveforms Gen. Amplitude Adjustment
4. VCA Gain Adjustment
5. HFO B Tuning
6. ADSR Time Adjustment
7. VCF Offset Adjustment

All adjustments must be made after the instrument's power has been on for at least five minutes.

## POWER SUPPLY TRIM

- 1) Switch on the instrument.
- 2) Set DVM to TP1 (.4016) and adjust P1 to read +15.000 V
- 3) Set DVM to TP2 (.4016) and read +5V  $\pm 5\%$ .
- 4) Set DVM to TP3 (.4016) and adjust P2 to read -5.000 V.
- 5) Set DVM to TP4 (.4016) and adjust P3 to read - 15.000 V.

Note: the supply must be fully loaded.

## HFO A TUNING (.5009)

- 1) Press FREE, introduce saw-tooth A (L.E.D. WAVES), set CUTOFF to the max. and RESONANCE to the min.
- 2) Set MASTER TUNE to the center.
- 3) Press the second 'A' (from the right) and adjust P1 to obtain a 440 Hz frequency (use a diapason).

## WAVEFORMS GEN. AMPLITUDE ADJUSTMENT (.5011)

- 1) Press FREE.
- 2) Connect oscilloscope to TP9.
- 3) Introduce saw-tooth A.
- 4) Press the second 'E' (from the right) and set the saw-tooth amplitude to +4.800 Vpp operating trimmer P3.
- 5) Press the first 'E' (from the left - three octaves lower than the former) and set amplitude to +4.800 Vpp operating trimmer P4.
- 6) Verify that the saw-tooth amplitude is +4.800 Vpp on the whole keyboard extension.
- 7) Connect oscilloscope to TP3.
- 8) Repeat point 4) operating P1.
- 9) Repeat point 5) operating P2.
- 10) Repeat point 6).
- 11) This adjustment is to be made for the 6 voices.

## Adjustment Control

- 1) Connect oscilloscope to TP24.
- 2) Recall program 93.
- 3) Verify that the 6 voices' PW's are at 50%.

## VCF CUTOFF AND RESONANCE ADJUSTMENT (.5011)

- 1) Recall program 91.
- 2) Connect oscilloscope to TP24.
- 3) Press any key and set the sine amplitude (any frequency), to 400 mVpp operating P5 of the voice indicated by the lit L.E.D.
- 4) Repeat point 3) for the 6 voices.
- 5) Set P8 to the center.
- 6) Connect freq.m. to TP24.
- 7) Press any key and set the sine frequency to 880 Hz operating P7 of the voice indicated by the lit L.E.D.
- 8) Repeat point 7 for the 6 voices.

## ADSR TIME ADJUSTMENT (.5011)

- 1) Recall program 92.
- 2) Connect oscilloscope to pin 10 (IC 1) or to R7 of voice 1.
- 3) Press any key and set attack time to 5.800 seconds operating P10 of the voice indicated by the lit L.E.D.
- 4) Repeat point 3) for the 6 voices.

## VCA GAIN ADJUSTMENT (.5011)

- 1) Press FREE.
- 2) Introduce saw-tooth A.
- 3) Set CUTOFF to the max.
- 4) Set RESONANCE to the min.
- 5) Connect oscilloscope to TP24.
- 6) Press middle 'C' and adjust P9 of the voice indicated by the lit L.E.D. to obtain a saw-tooth amplitude equal to 400 mVpp.

## HFO B ADJUSTMENT (.5009)

- 1) Recall program 90.
- 2) Press any key and adjust P3 so as to eliminate the beat between HFO A and HFO B.

## VCF OFFSET ADJUSTMENT (.5011)

- 1) Press FREE.
- 2) Set VCF CUTOFF to 3/4.
- 3) Set VCF RESONANCE to the min.
- 4) Connect DMM to TP24.
- 5) Without depressing any key, read voltage on DMM; e.g.: -1.34 mV.
- 6) Press any key and adjust P6 of the voice indicated by the lit L.E.D. so as to read the same voltage as per point 5) on the DMM.
- 7) Repeat point 6) for the 6 voices.

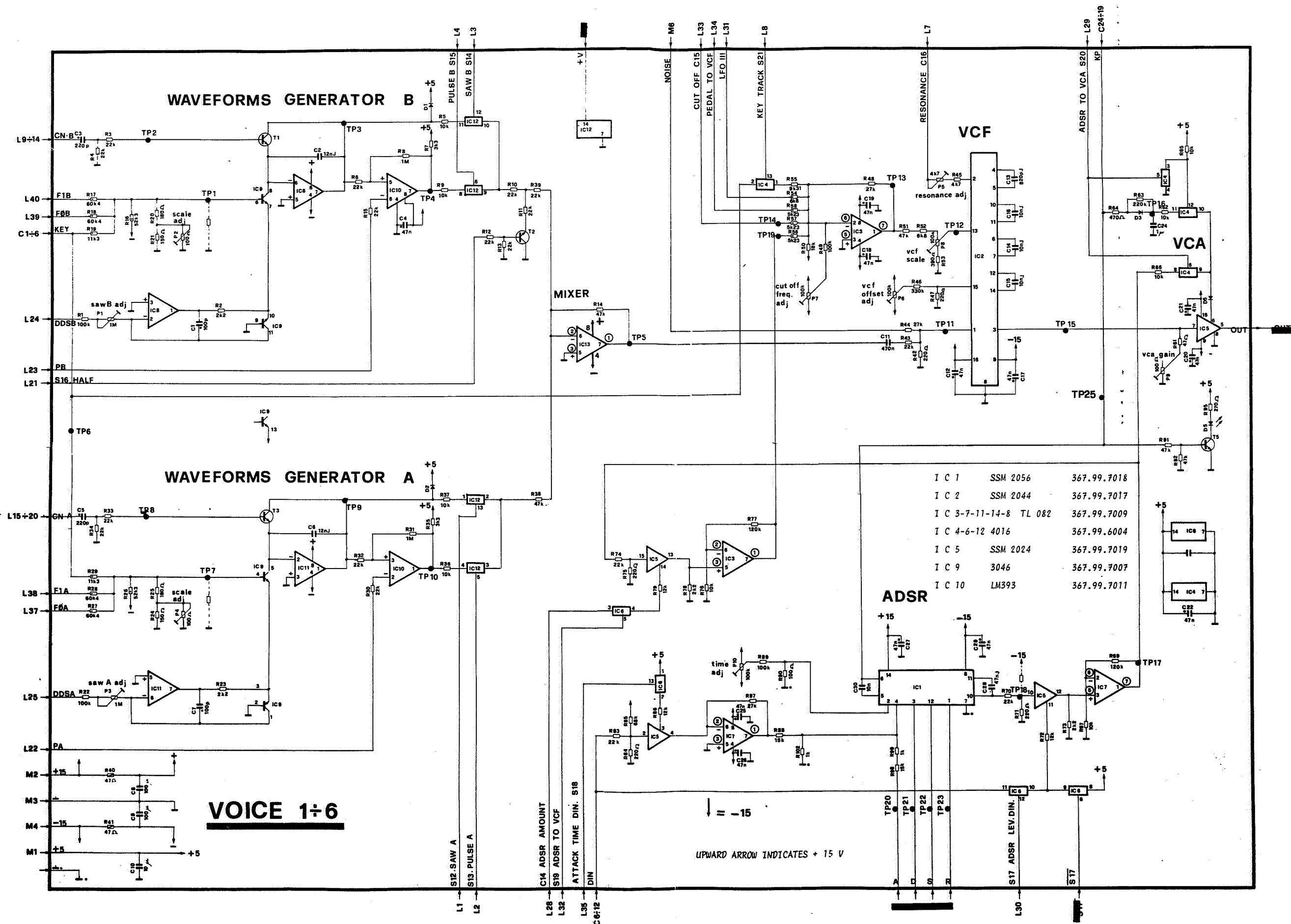
## NOTES

- R\* IMPLIES SPECIAL RESISTOR
- C\* IMPLIES CERAMIC CAPACITOR
- ALL PNP TRANSISTORS ARE BC 560 part code 364.99.0004
- ALL NPN TRANSISTORS ARE BC 239 part code 364.99.0005
- ALL DIODES ARE 1N4148
- ALL RESISTORS ARE 1/4 WATT
- ALL ELECTROLYTIC CAPACITORS ARE 16 V DC UNLESS OTHERWISE INDICATED.





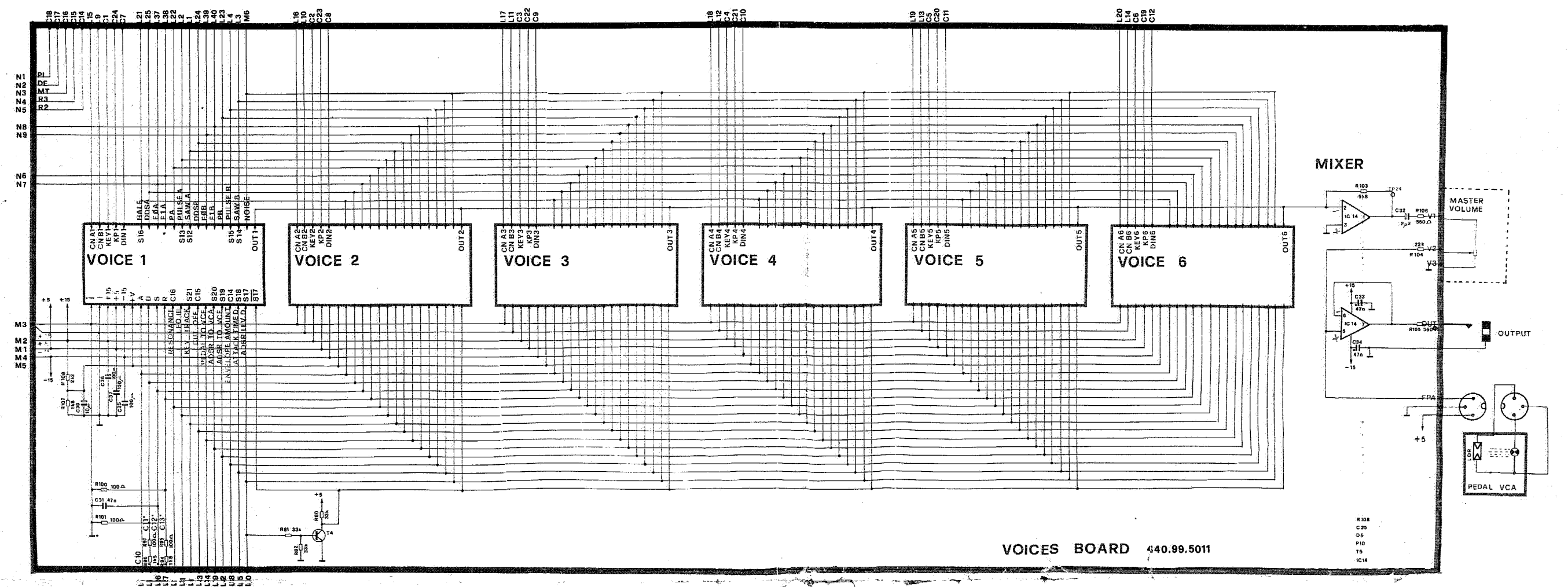
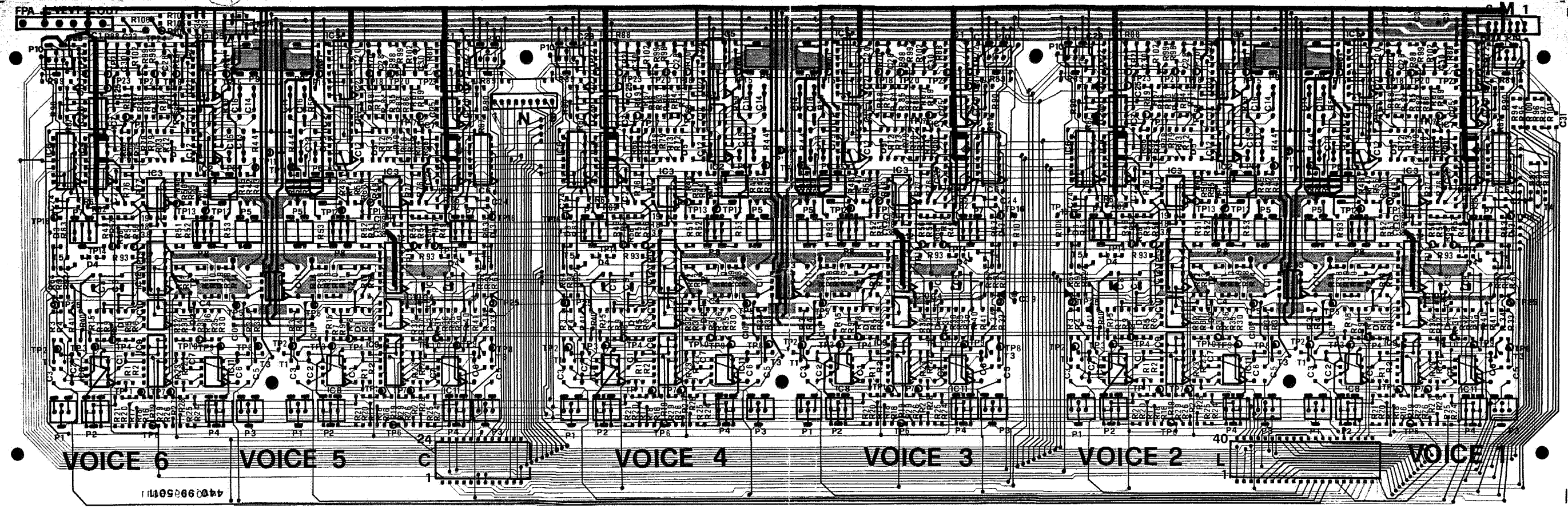


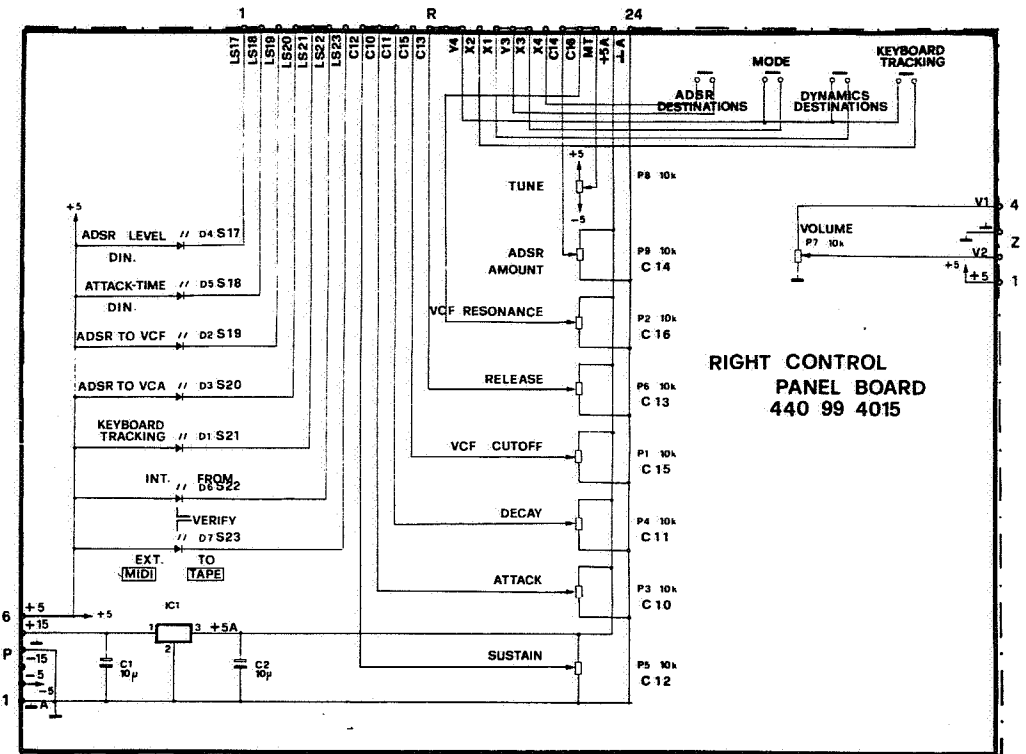
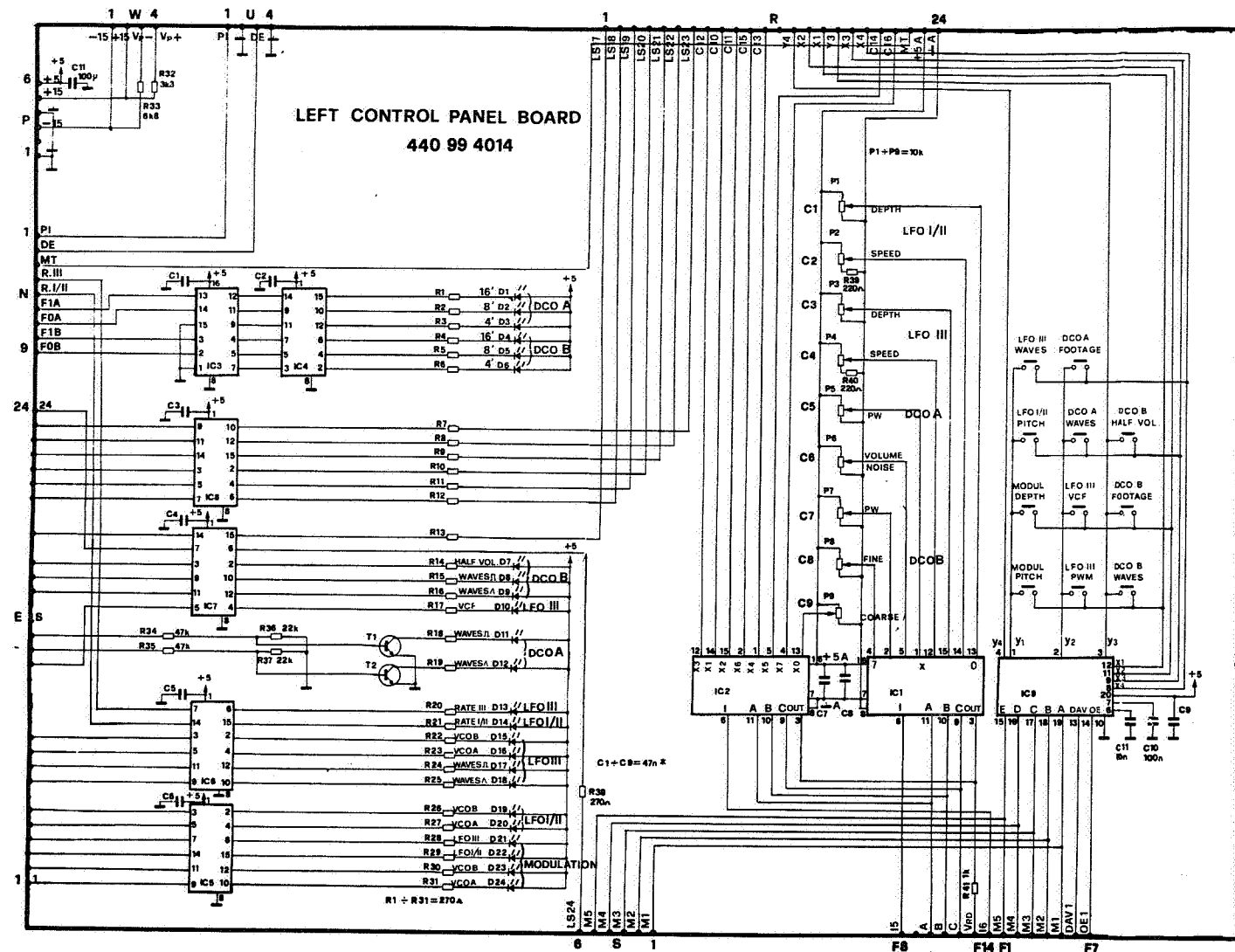


IC 1	SSM 2056	367.99.7018
IC 2	SSM 2044	367.99.7017
IC 3-7-11-14-8	TL 082	367.99.7009
IC 4-6-12	4016	367.99.6004
IC 5	SSM 2024	367.99.7019
IC 9	3046	367.99.7007
IC 10	LM393	367.99.7011

**VOICE 1÷6**

UPWARD ARROW INDICATES + 15 V



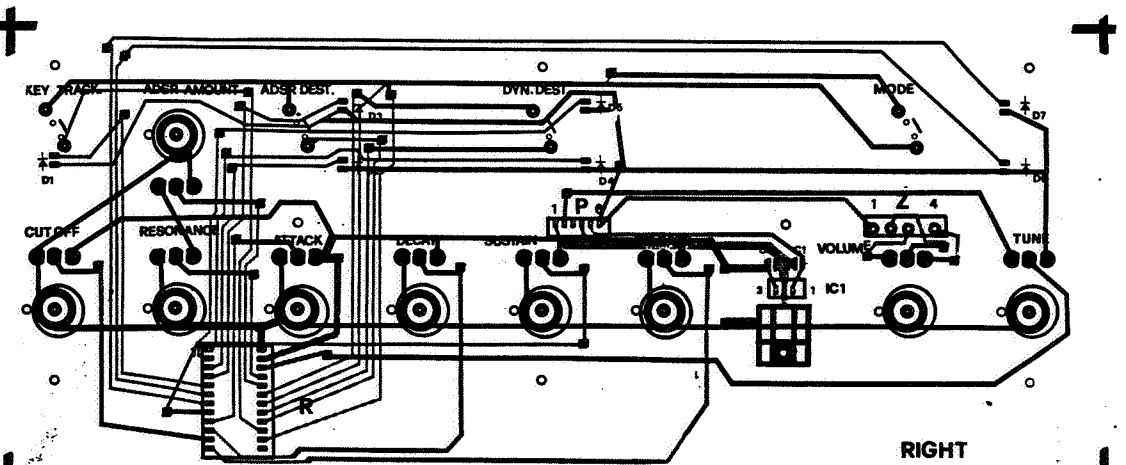
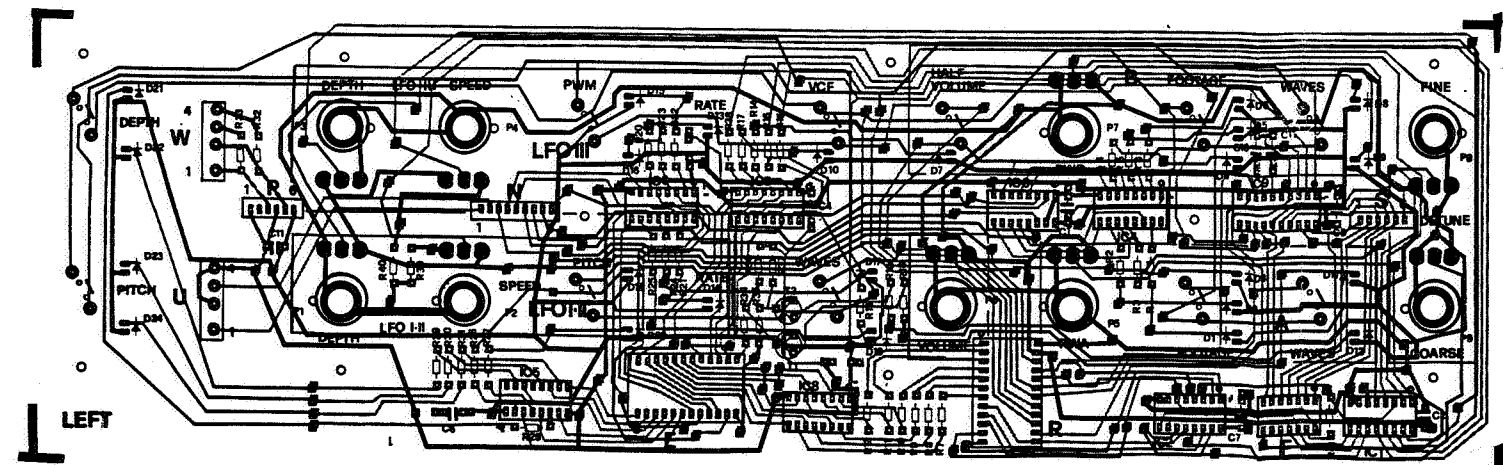


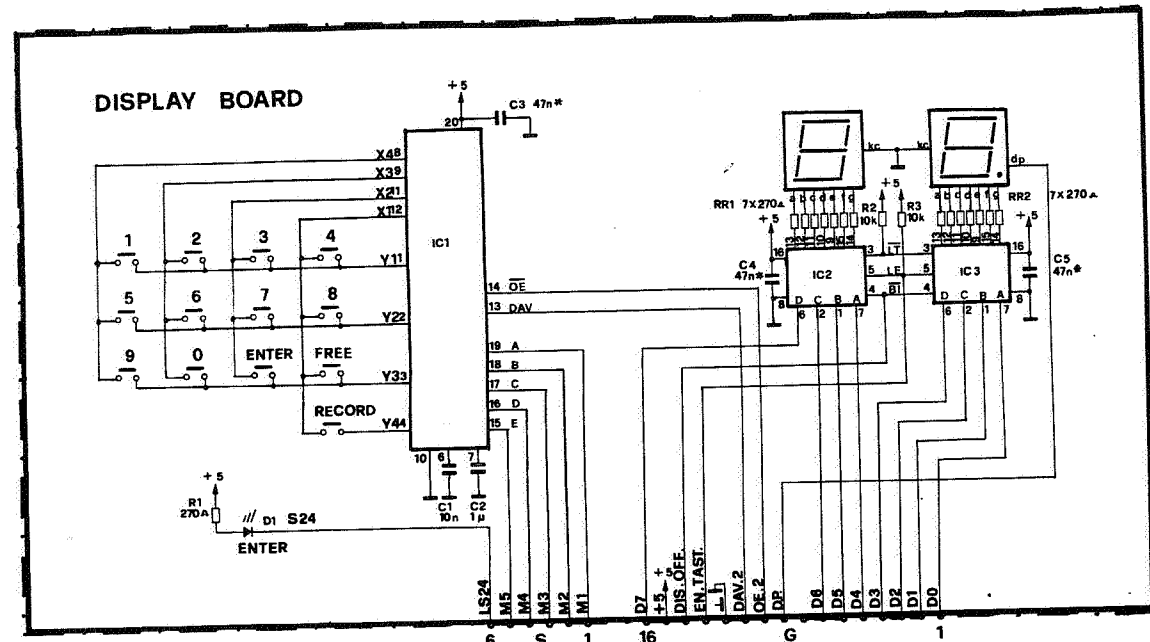
**LEFT CONTROL PANEL D.C.O.**

IC 1-2	4051	367.99.6013
IC 3	4555	367.99.6036
IC 4:8	4049	367.99.6012
IC 9	74C923	367.99.6035

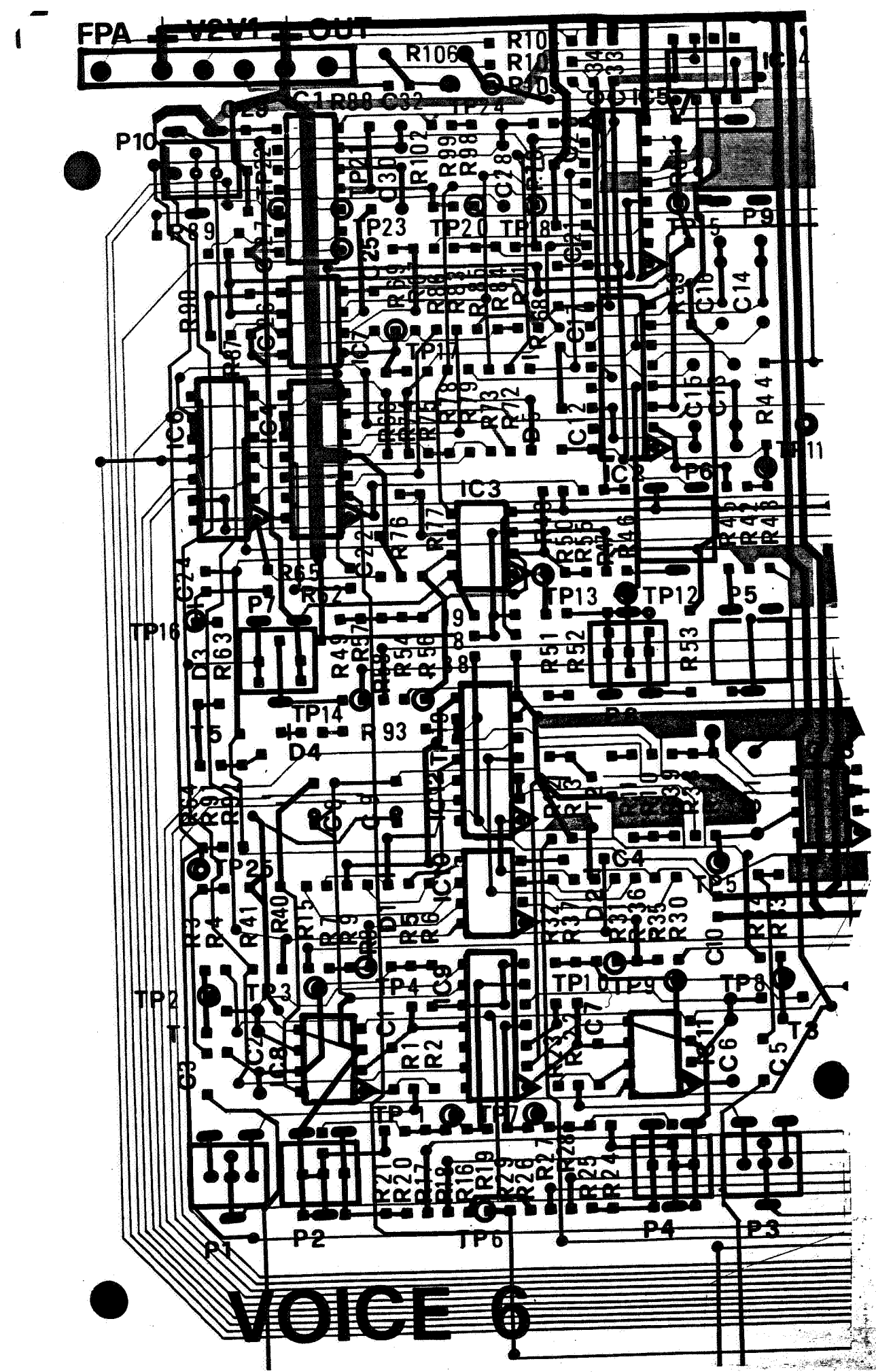
**RIGHT CONTROL PANEL A.D.S.R.**

IC 1	7805	367.99.8009
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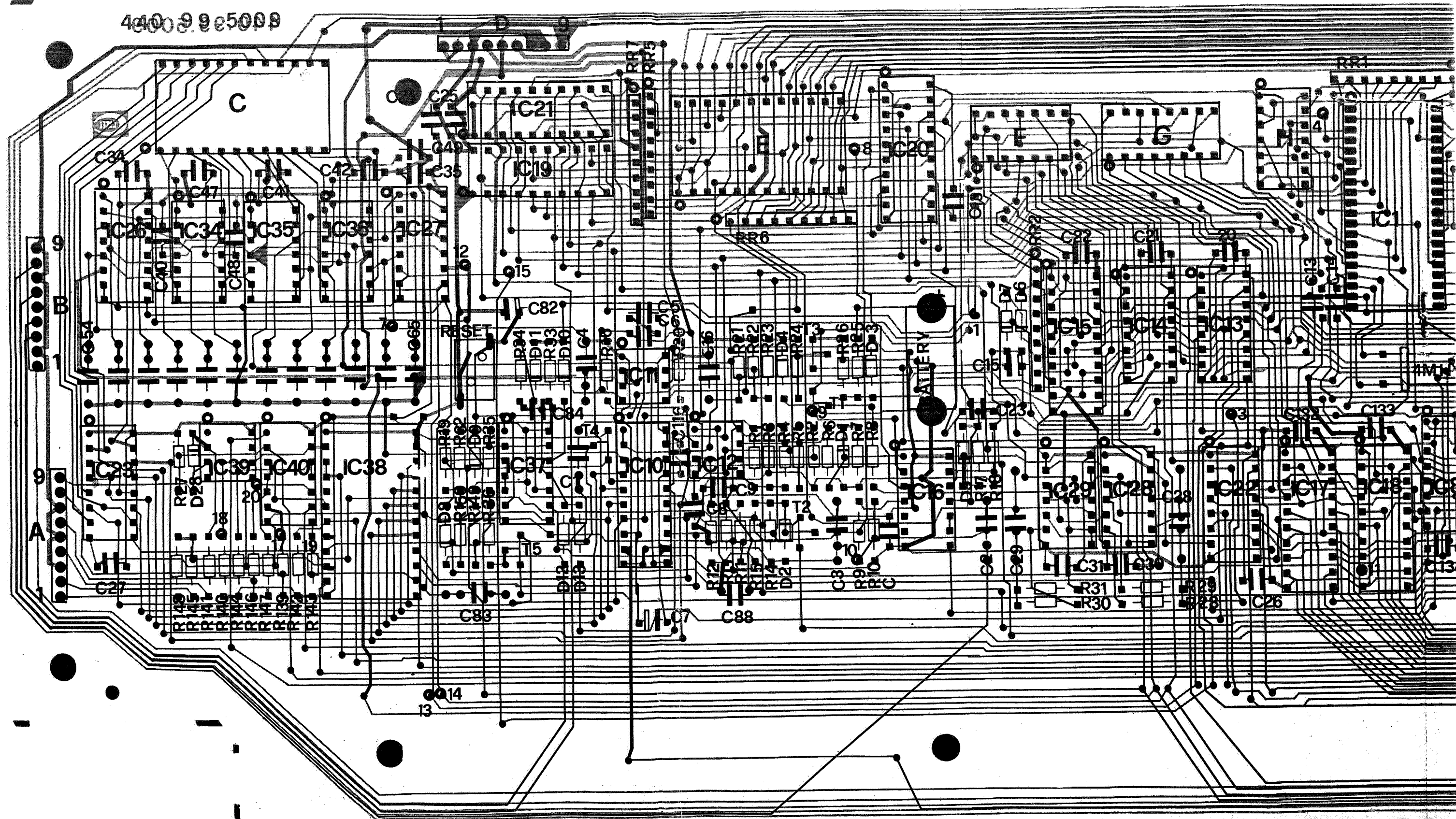


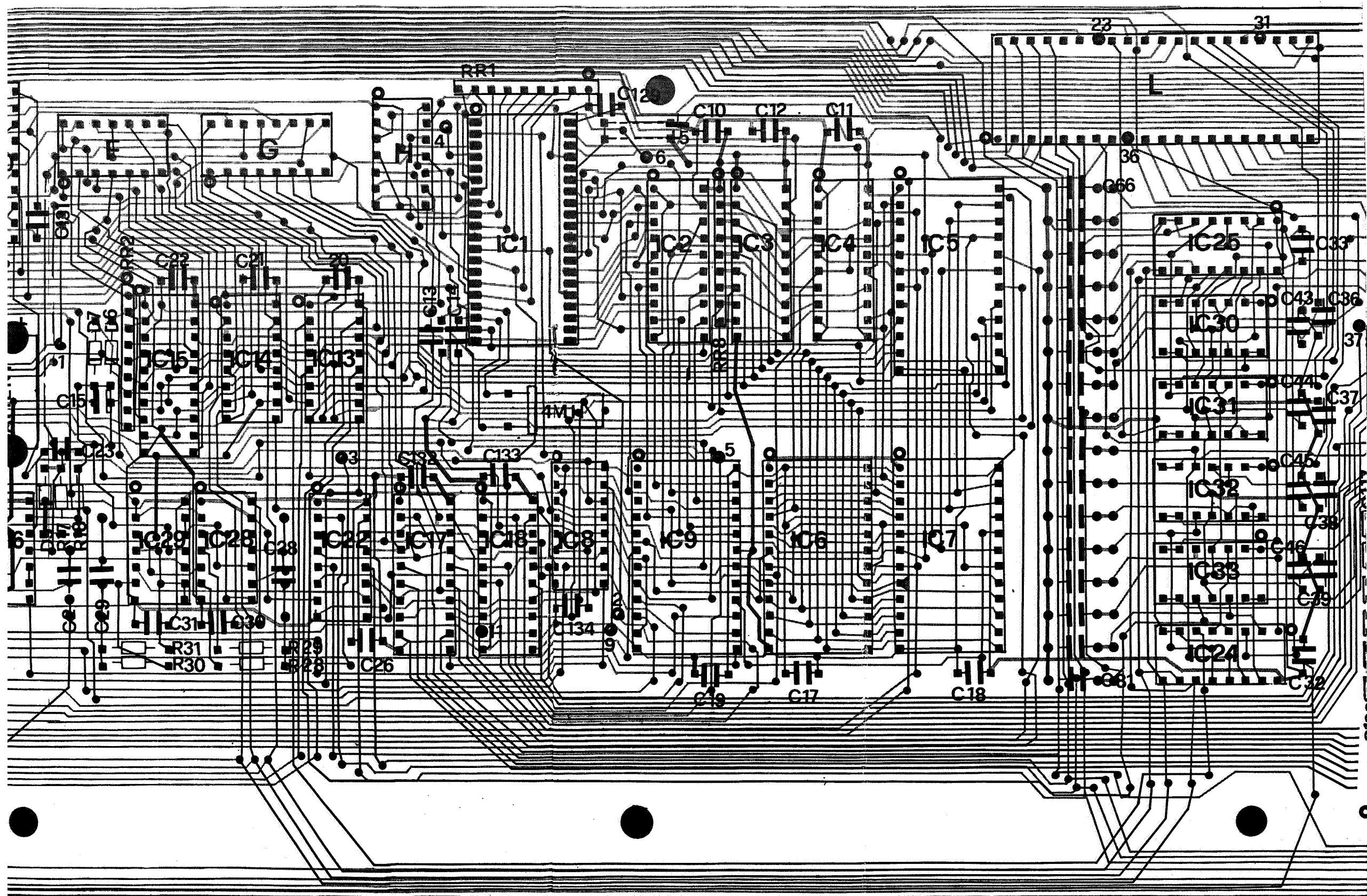


DISPLAY BOARD		
IC 1	74C923	367.99.6035
IC 2-3	4511	367.99.6027
DISPLAY	MAN 4740	361.99.9001

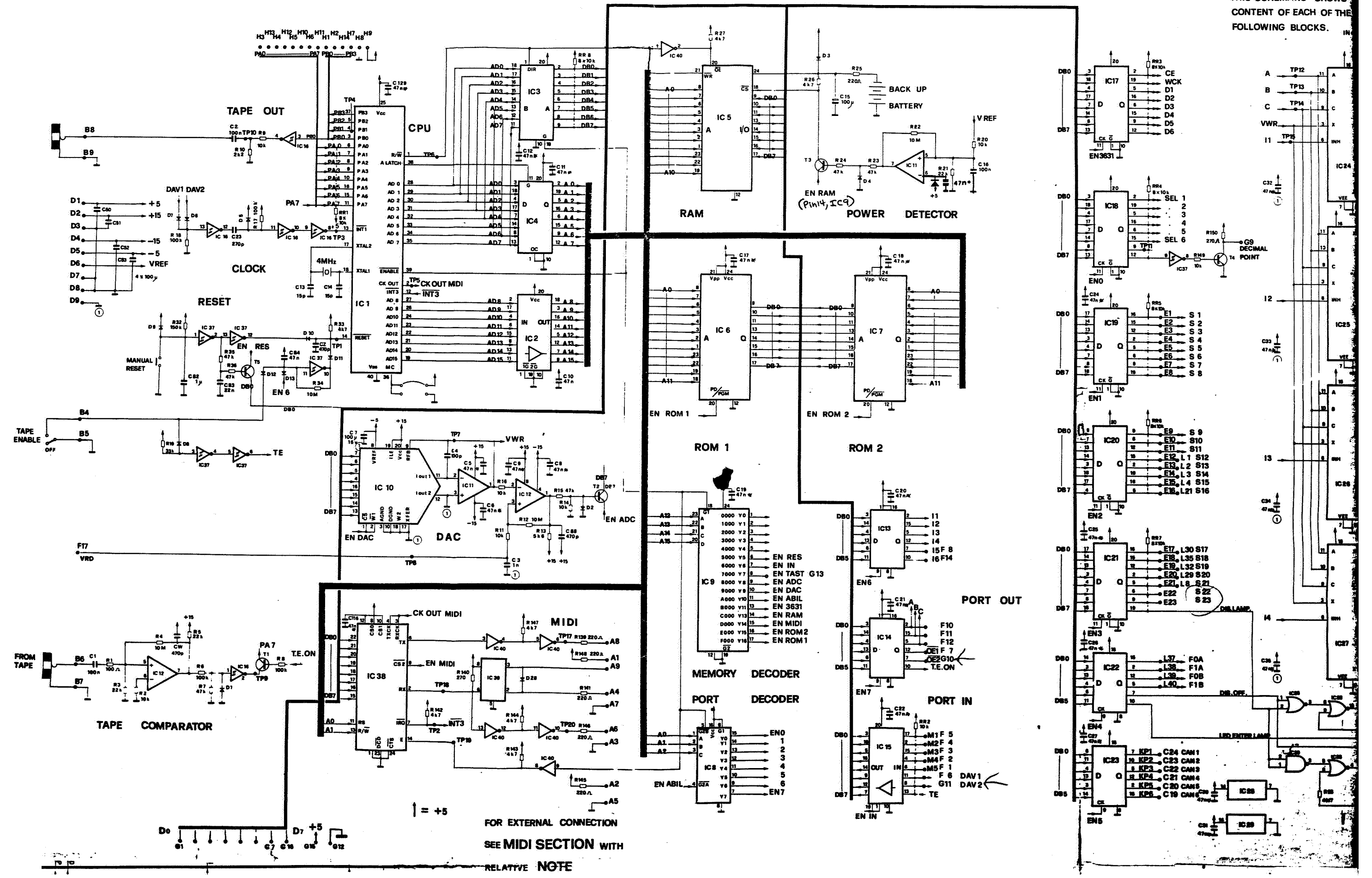


# CPU SECTION P. C. 440 99 5009 OR 5010 (LEFT)





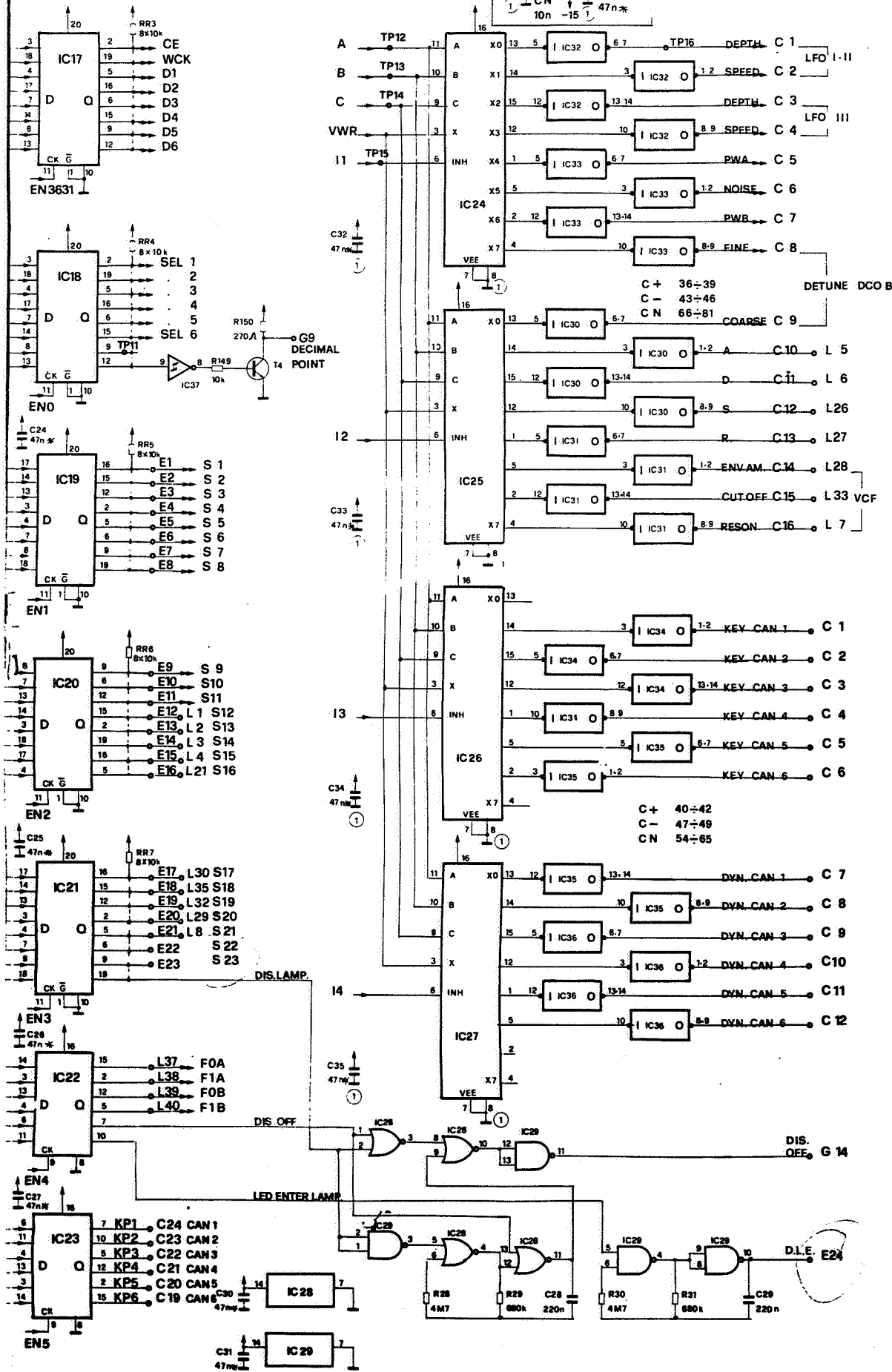
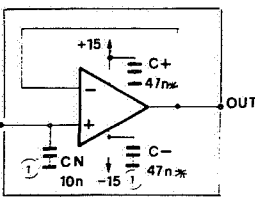
THIS SCHEMATIC SHOWS  
CONTENT OF EACH OF THE  
FOLLOWING BLOCKS.



FOR EXTERNAL CONNECTION  
SEE MIDI SECTION WITH  
RELATIVE NOTE

THIS SCHEMATIC SHOWS  
CONTENT OF EACH OF THE  
FOLLOWING BLOCKS.

C. V. DEMULTIPLEXER  
(SAMPLE/HOLDS)



C.P.U BOARD

IC 1	TMS 7000	367.99.4904
IC 2-15	74LS244	367.99.6510
IC 3	74LS245	367.99.6507
IC 4	74LS373	367.99.6508
IC 5	6116	367.99.4003
IC 6-7	2532	367.99.4802
IC 8	74LS138	367.99.6504
IC 9	74LS154	367.99.6503
IC 10	DAC0831	367.99.7022
IC 11	TL082	367.99.7009
IC 12	LM393	367.99.7011
IC 13-14-22		
23	74C174	367.99.6034
IC 16-37	40106	367.99.6029
IC 17-21	74LS377	367.99.6509
IC 24-27		
59-61	4051	367.99.6013
IC 28	4001	367.99.6001
IC 29-44-46	4011	367.99.6002
IC 30-36		
49-53-58		
65	TL084	367.99.7021
IC 38	68850	367.99.5024
IC 39	6N138	361.99.9501
IC 40	SN 7406	367.99.6301
IC 41-43	4081	367.99.6006
IC 47-48	RI104	367.99.5021
IC 50-54-57	4016	367.99.6004
IC 51-67	3080	367.99.7006
IC 52	4053	367.99.6031
IC 55-56	13700	367.99.7005
IC 60-62	4013	367.99.6003