

SERVICE MANUAL

SCHEMATIC DIAGRAMS

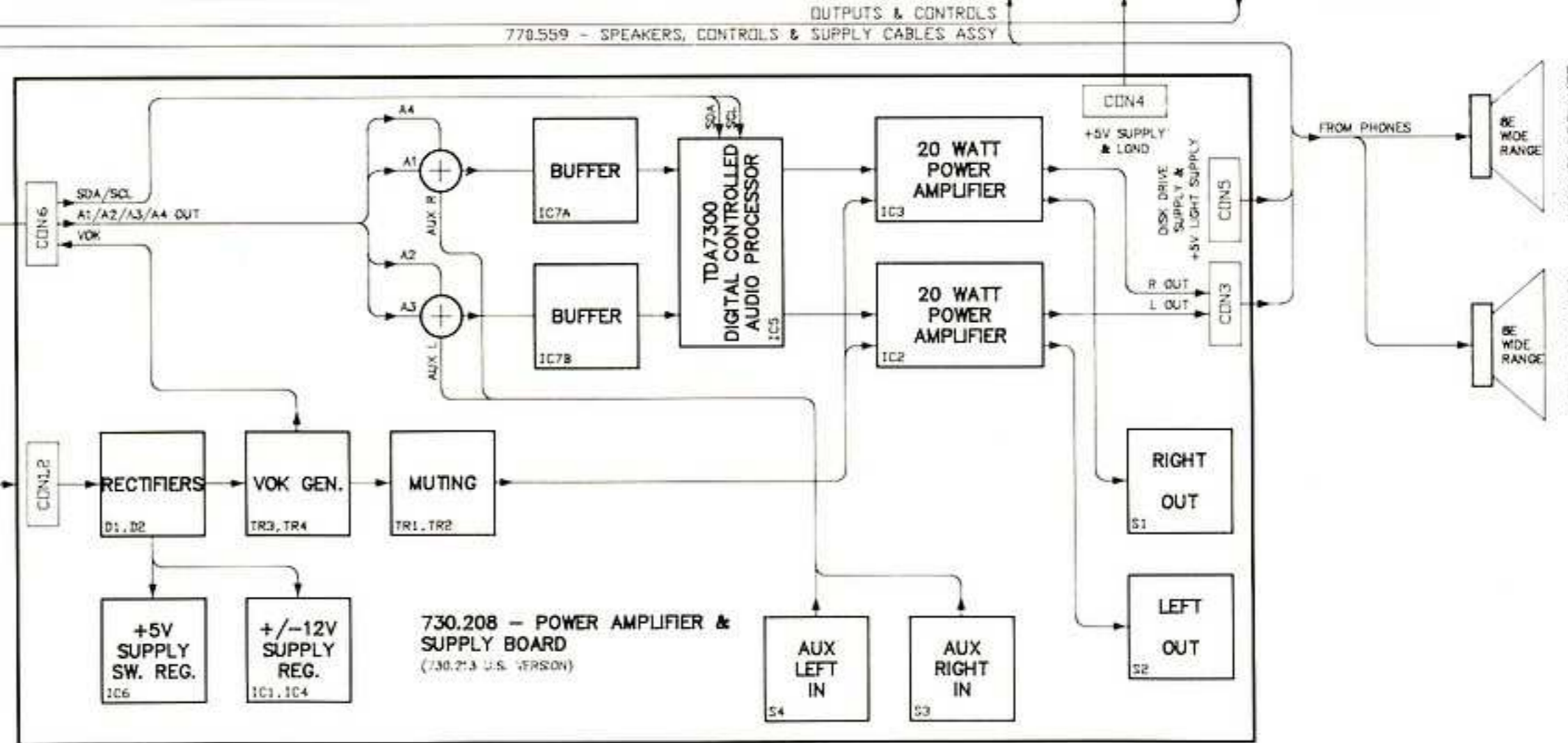
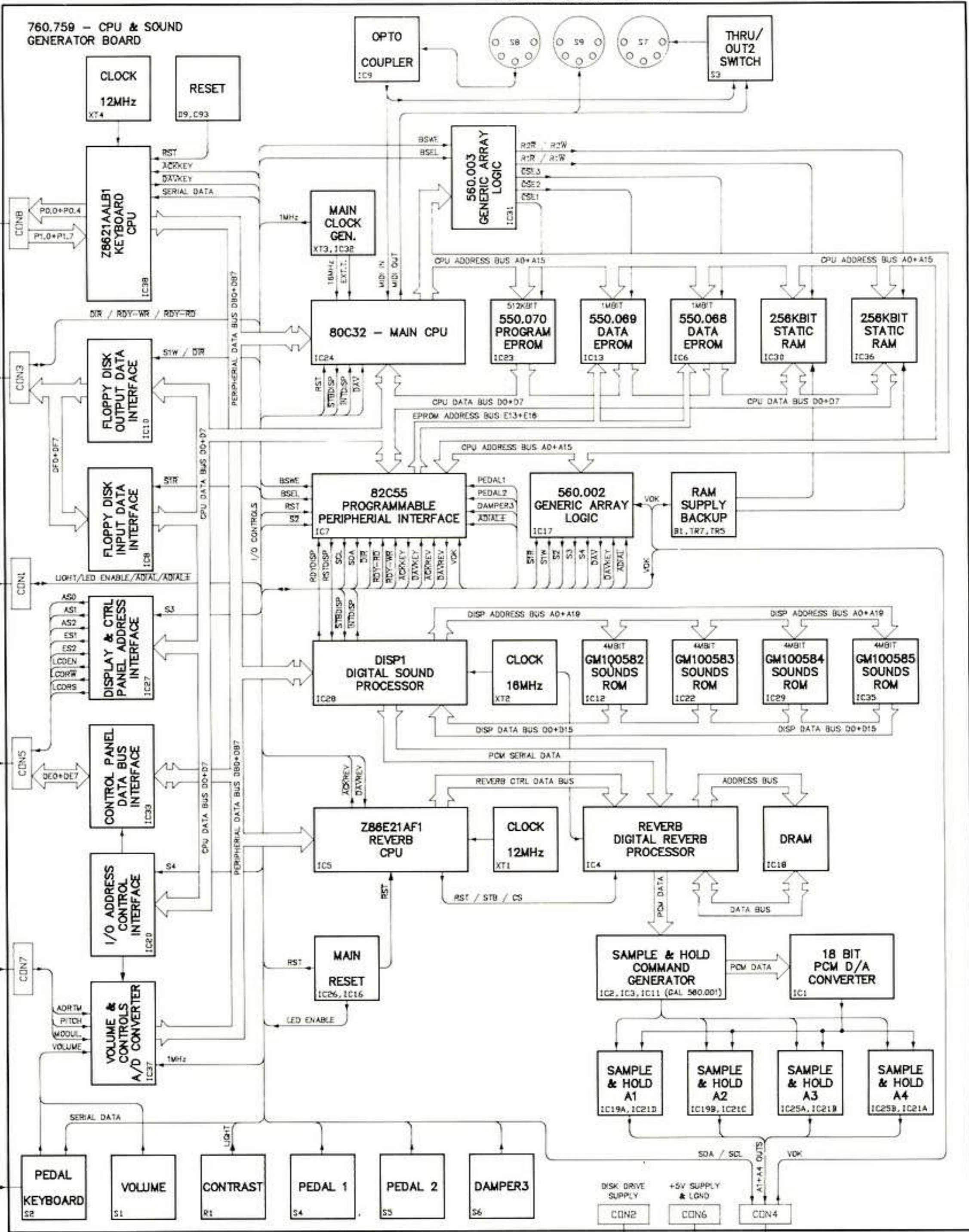
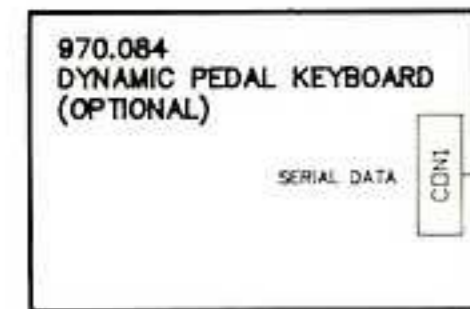
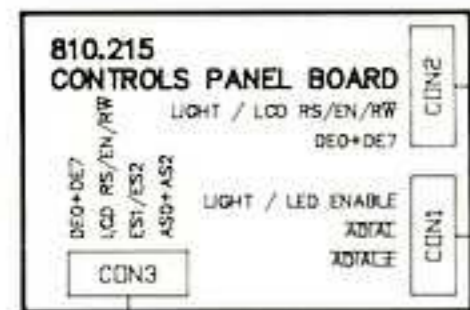
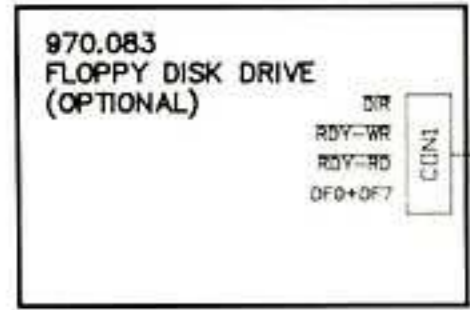
The logo consists of the letters 'VSE' in a bold, stylized font. The 'V' is solid black with a white outline. The 'S' is solid black. The 'E' is outlined in black with a white fill. The letters are slanted to the right.

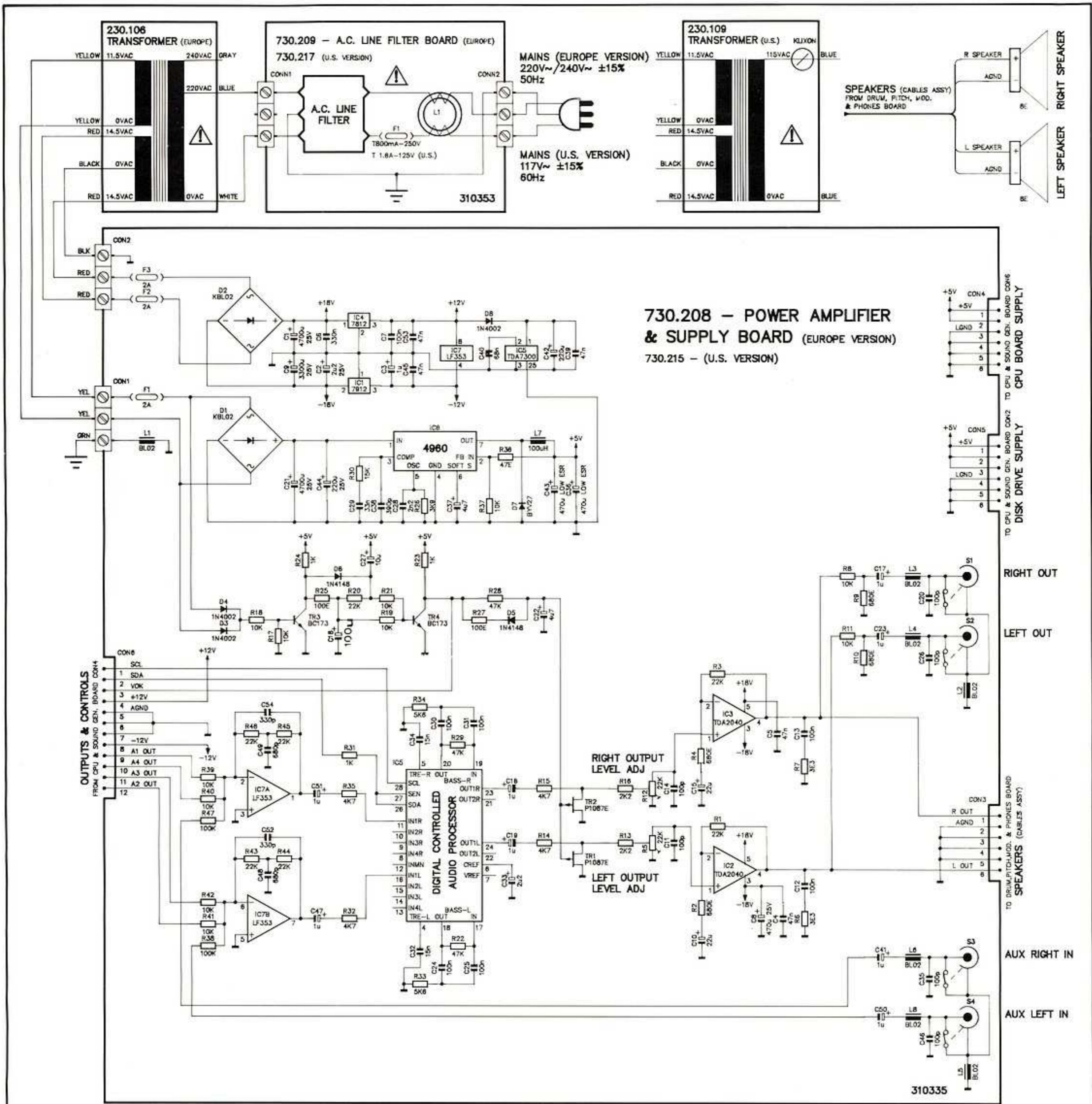
KEYBOARD WORKSTATION

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 **GENERALMUSIC**

760.759 - CPU & SOUND GENERATOR BOARD





730.208 - POWER AMPLIFIER & SUPPLY BOARD (EUROPE VERSION)
730.215 - (U.S. VERSION)

ADJUSTMENT TABLE

N.	ADJUSTMENT TYPE	TEST POINT	REG. "ON"	KEY PRESSED	OPERATION POINT	READING VALUES	NOTE
1	DAC MSB ADJ	R3 SIDE IC3	GLOBAL 63	C3	R7 CPU & S.G. BOARD	SEE NOTE	SET THE OSCILLOSCOPE IN D.C. POSITION AT 20mV/DIV. 0.5mS/DIV., ACTIVE THE NOTE KEY WITH THE LOWEST PRESSURE AND TURN THE TRIMMER UNTIL TO HAVE SINUSOIDAL WAVE WITHOUT DISTORTION.
2	RIGHT OUTPUT LEVEL	R3 SIDE IC3	GLOBAL 63	C3	R12 AMPLIFIER BOARD	3vpp	SET THE OSCILLOSCOPE IN D.C. POSITION AT 0.5V/DIV. 5mS/DIV., ACTIVE THE NOTE KEY WITH THE HIGHEST PRESSURE, TURN THE TRIMMER UNTIL TO HAVE EXACTLY OUTPUT VOLTAGE.
3	LEFT OUTPUT LEVEL	R1 SIDE IC2	GLOBAL 63	C3	R5 AMPLIFIER BOARD	3vpp	SET THE OSCILLOSCOPE IN D.C. POSITION AT 0.5V/DIV. 5mS/DIV., ACTIVE THE NOTE KEY WITH THE HIGHEST PRESSURE, TURN THE TRIMMER UNTIL TO HAVE EXACTLY OUTPUT VOLTAGE.

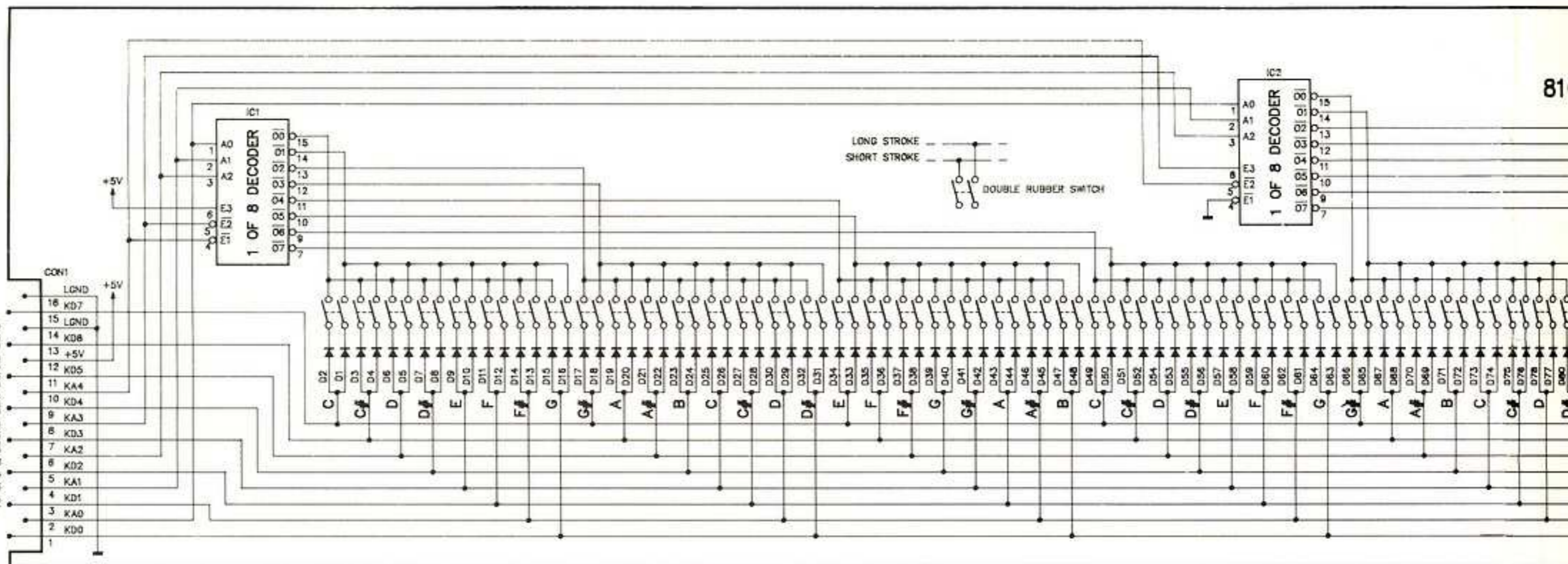
SCHEMATIC NOTES

- ALL NPN TRANSISTORS ARE BC173 (CODE 090182) UNLESS OTHERWISE SPECIFIED.
 - ALL PNP TRANSISTORS ARE BC307 (CODE 090192) UNLESS OTHERWISE SPECIFIED.
 - ALL DIODES ARE 1N4148 OR EQUIVALENT (CODE 080103) UNLESS OTHERWISE SPECIFIED.
 - ALL ELECTROLYTIC CAPACITORS ARE 16VDC RATED VOLTAGE UNLESS OTHERWISE SPECIFIED.
 - ALL RESISTORS 1/4W UNLESS OTHERWISE SPECIFIED.
 - ALL SWITCHES SHOW " OFF " POSITION.
 - ALL D.C. VOLTAGES MEASURED TO GROUND WITH A VOLTMETER 20,000Ω/V.
- ↑ SUPPLY VOLTAGE
 ↓ SUPPLY GROUND
 > SOLDERING POINT
- MALE CONNECTOR
 ○ FEMALE CONNECTOR
 • CONNECTING POINT

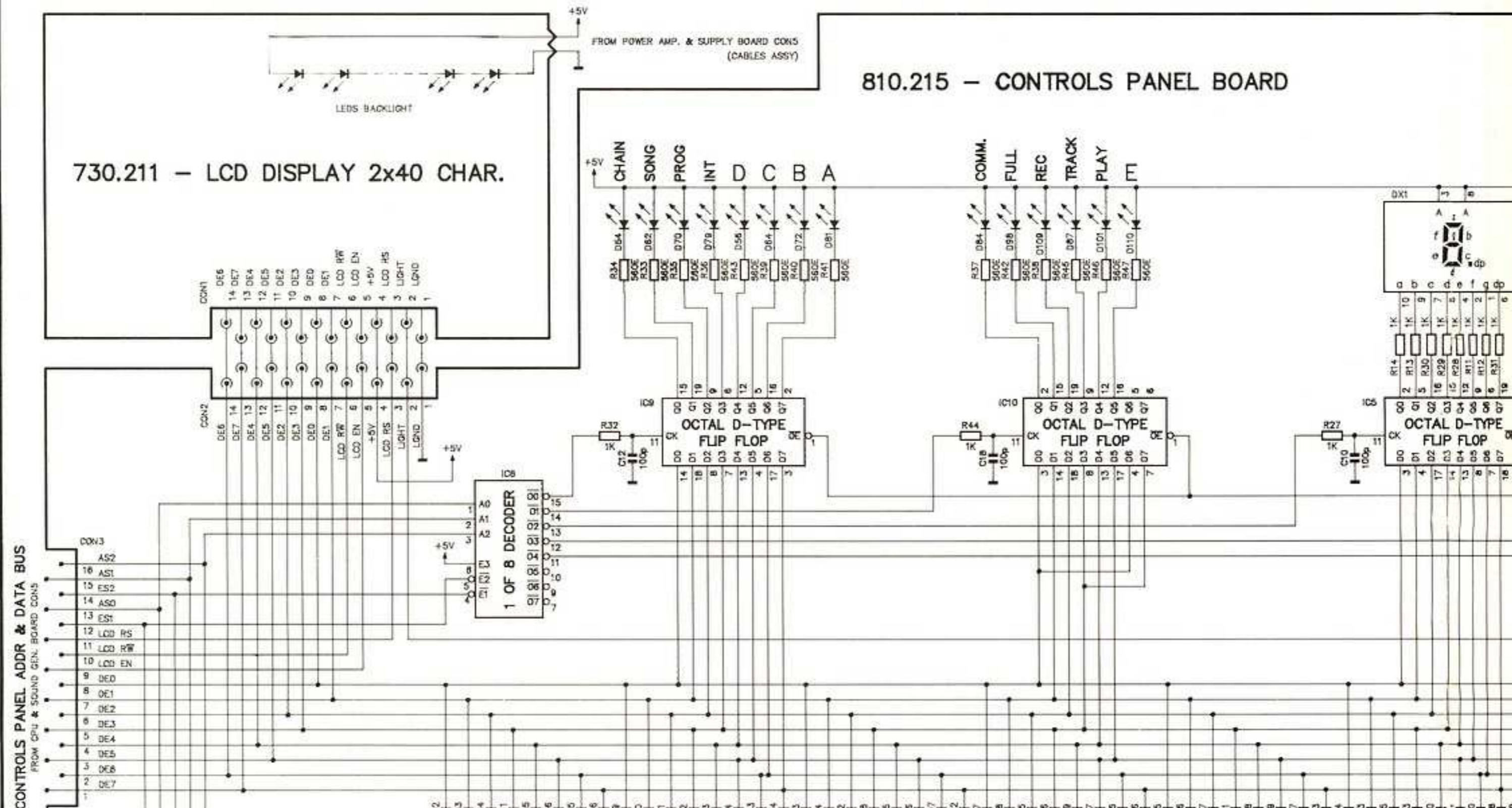
NOTICE

- SERVICE MUST BE CARRIED OUT BY QUALIFIED OPERATORS; ANY TAMPERING DONE BY UNQUALIFIED OPERATORS DURING THE GUARANTEE PERIOD WILL FORFEIT THE RIGHT TO GUARANTEE.
- FOR A CORRECT OPERATION OF THE INSTRUMENT, AFTER HAVING SWITCH IT OFF, BE CAREFUL TO WAIT AT LEAST 3 SECS. BEFORE SWITCHING IT ON AGAIN.
- TO IMPROVE THE ORGAN SPECIFICATIONS, THE SCHEMATIC DIAGRAMS MAY BE SUBJECT TO CHANGE WITHOUT NOTICE.

KEYBOARD ADDR & DATA BUS
TO CPU & SOUND GEN. BOARD CONN

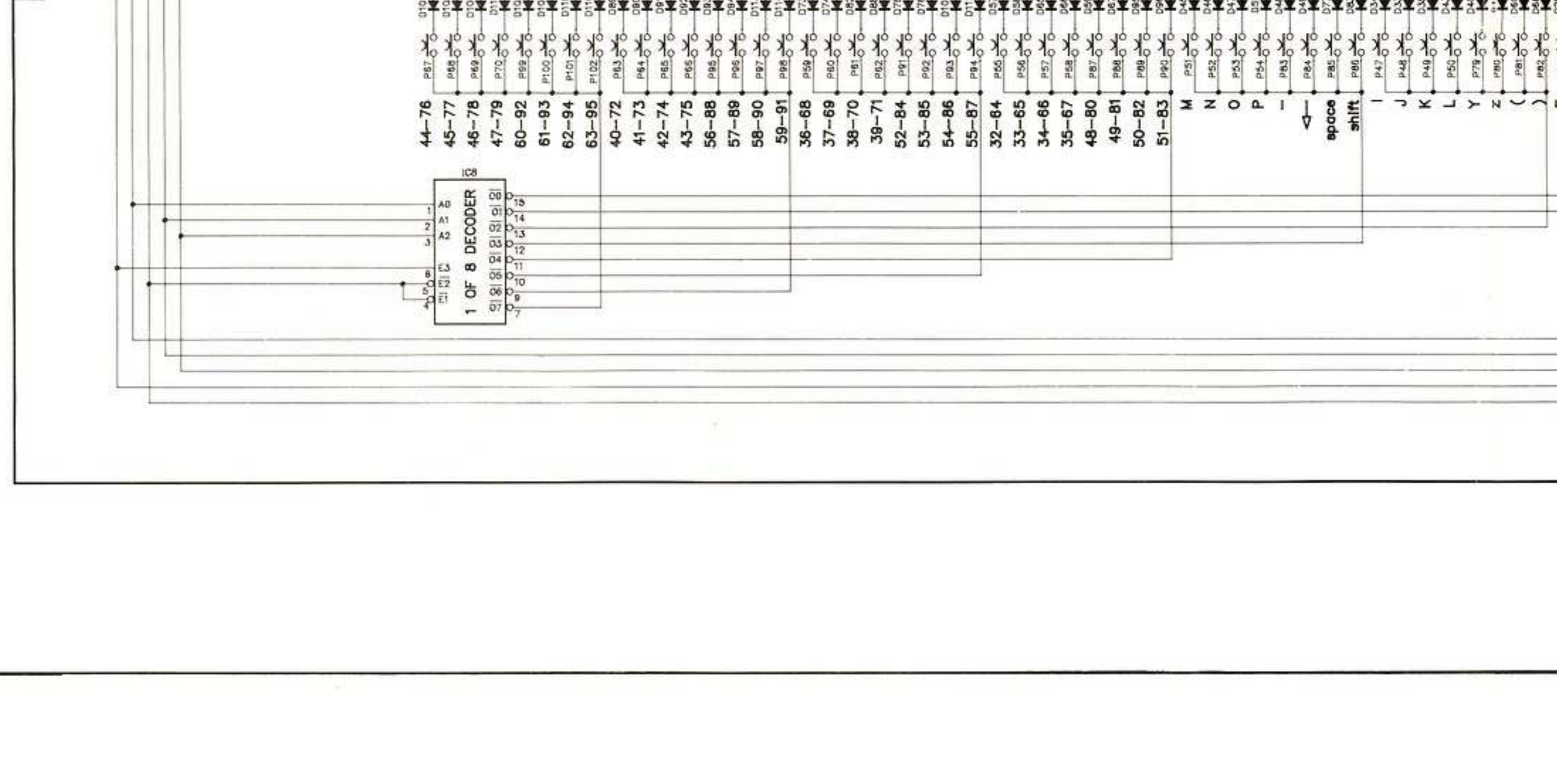


730.211 - LCD DISPLAY 2x40 CHAR.

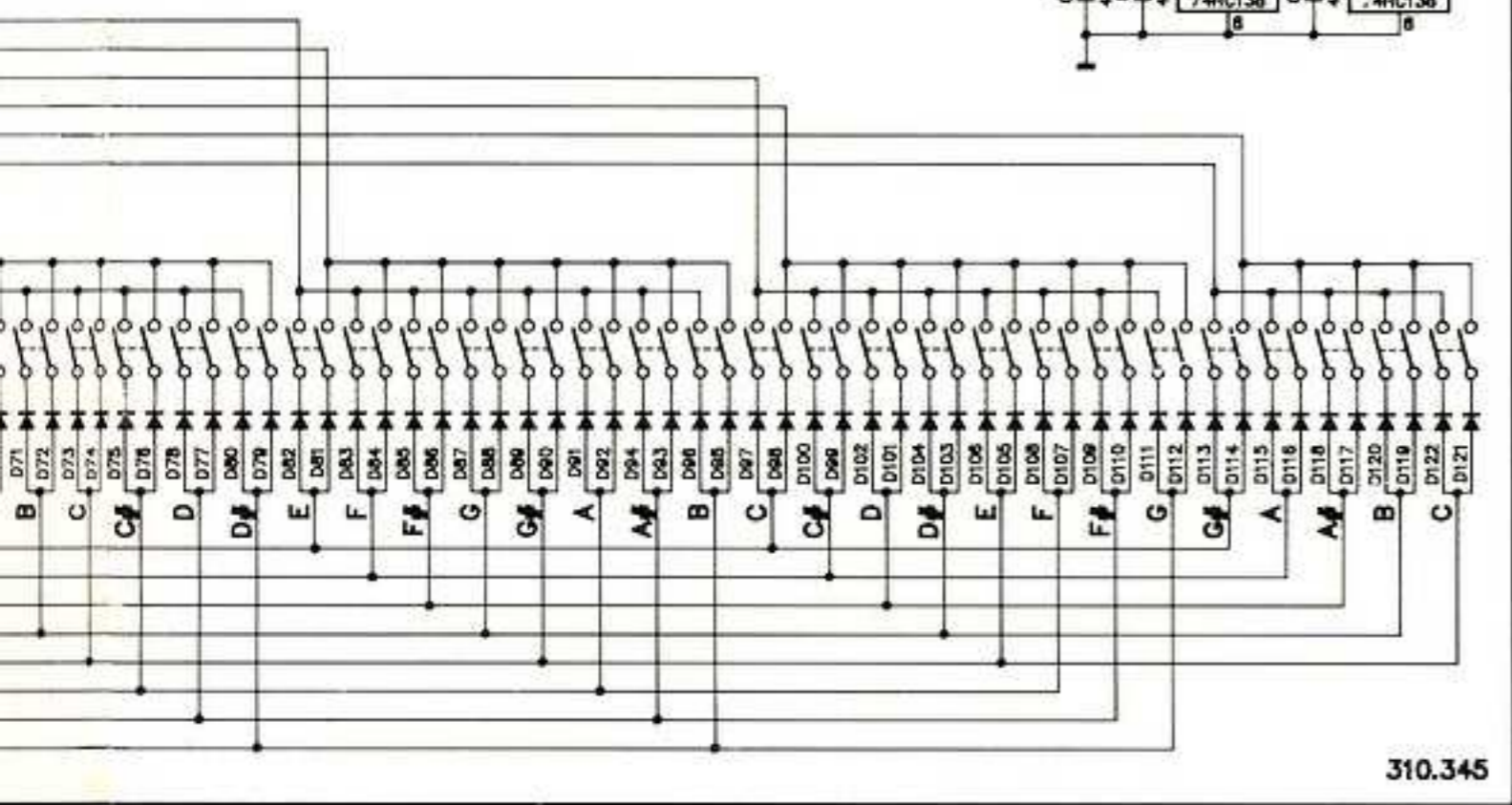


810.215 - CONTROLS PANEL BOARD

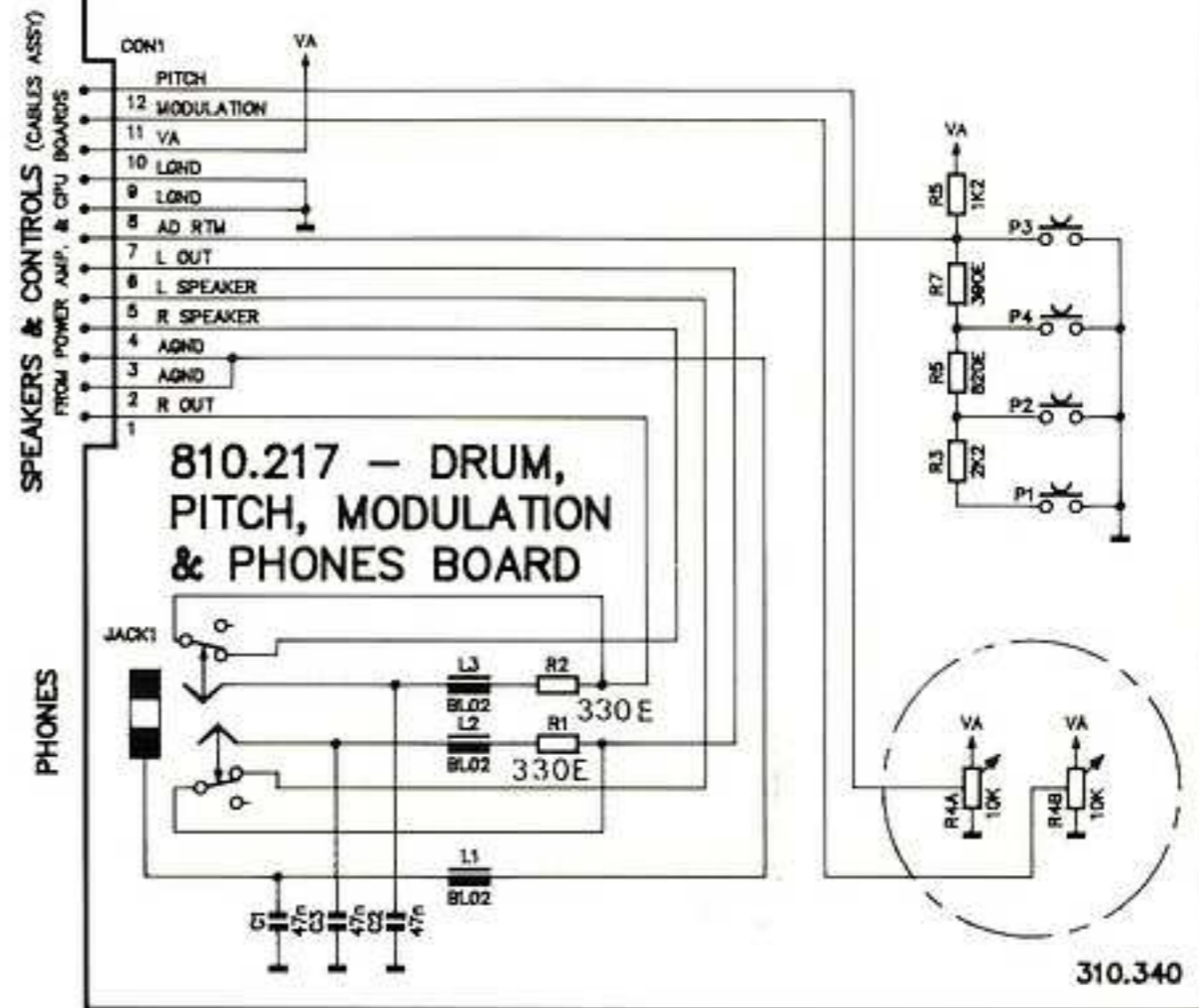
CONTROLS PANEL ADDR & DATA BUS
FROM CPU & SOUND GEN. BOARD CONN



810.518 - DYNAMIC KEYBOARD

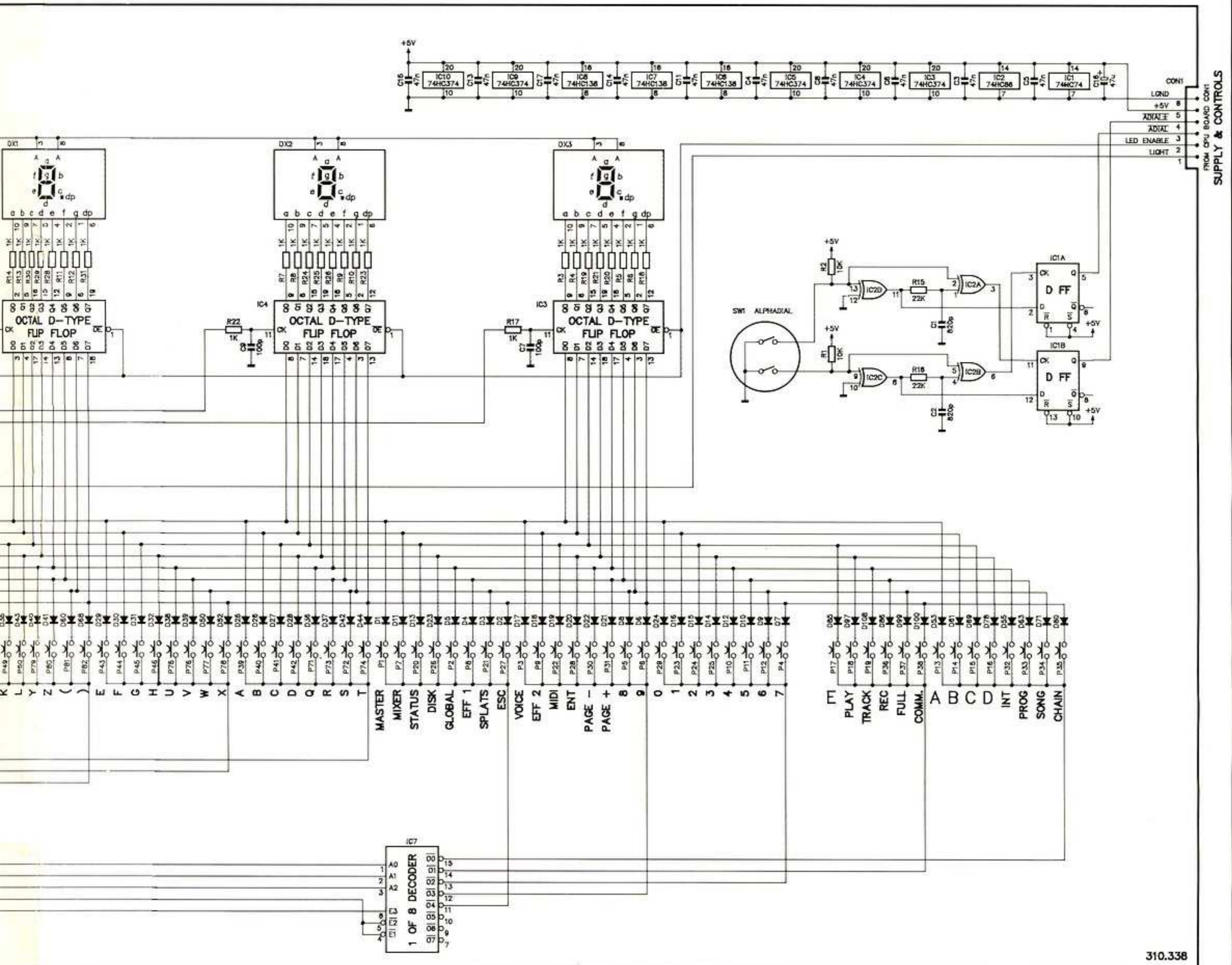


310.345



310.340

- SYNC/CONTINUE
- FILL IN
- START/STOP
- INTRO/END
- PITCH MODULATION



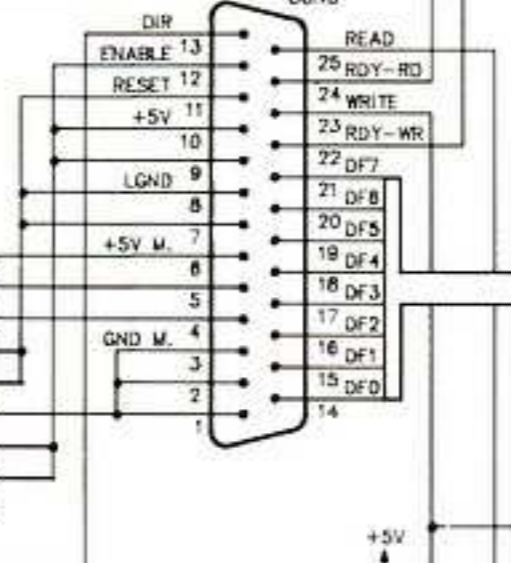
310.338

CPU & SOUND GENERATOR BOARD

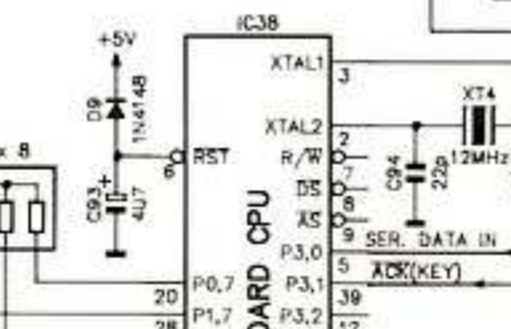
760.758 - WS400
760.759 - WS2

NOTE: L18, L19, L20, L22, L23 ARE CONNECTED TO +5V SUPPLY TO PREVENT RADIO FREQUENCY EMISSION.

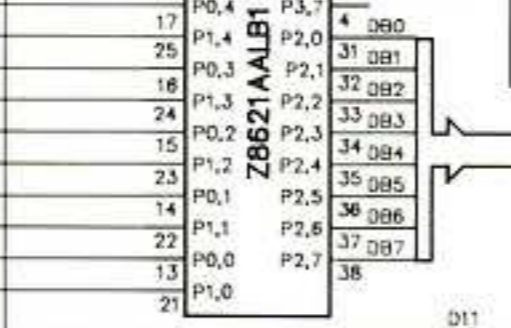
DISK DRIVE DATA & CONTROLS TO FLOPPY DISK DRIVE



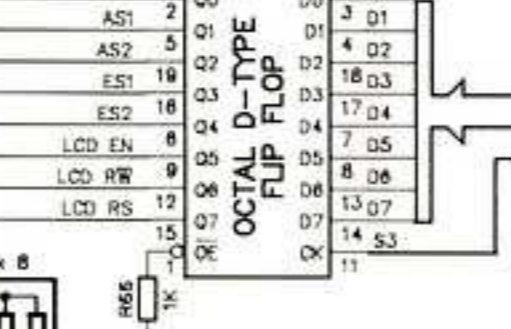
DISK DRIVE SUPPLY FROM P. AMP. & SUPPLY BOARD CON5



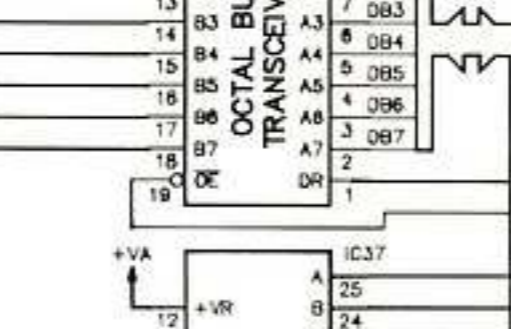
KEYBOARD ADDR & DATA BUS TO DYNAMIC KEYBOARD CON1



SUPPLY & CONTROLS PANEL ADDR & DATA BUS TO CONTROLS PANEL BOARD CON3



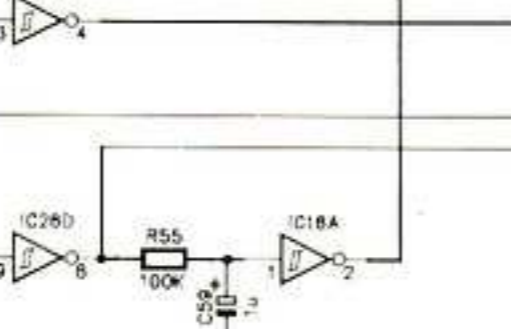
CONTRAST



VOLUME



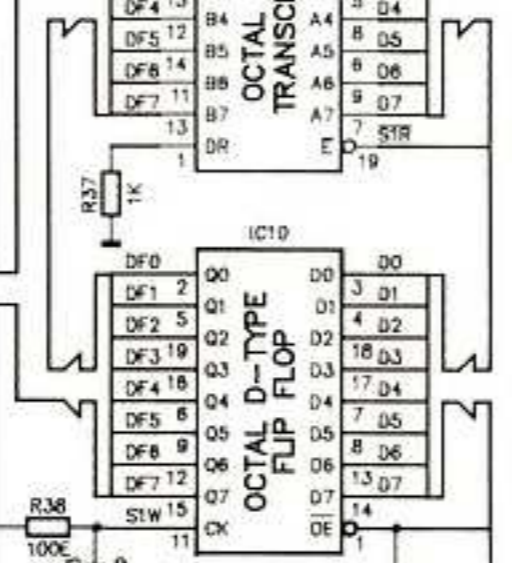
MAIN RESET



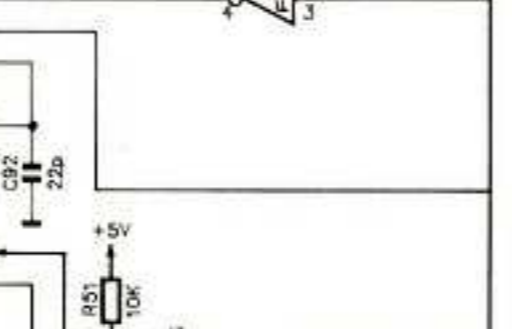
PEDAL KEYBOARD



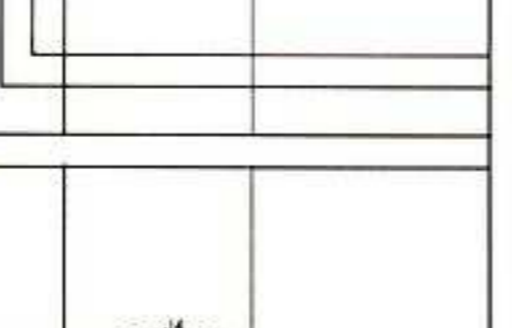
POWER SUPPLY CIRCUIT



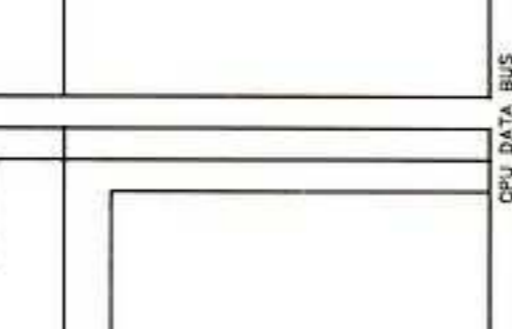
KEYBOARD ADDR & DATA BUS TO DYNAMIC KEYBOARD CON1



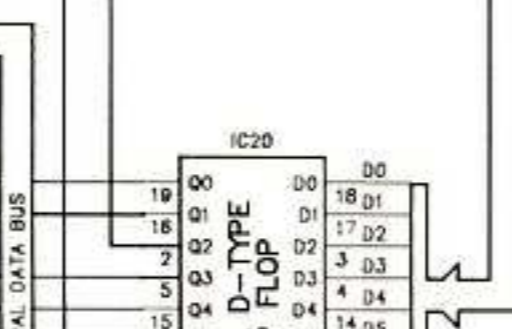
SUPPLY & CONTROLS PANEL ADDR & DATA BUS TO CONTROLS PANEL BOARD CON3



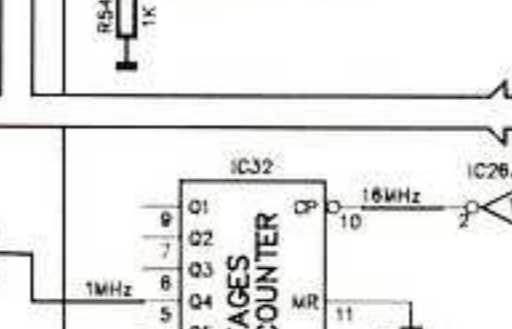
CONTRAST



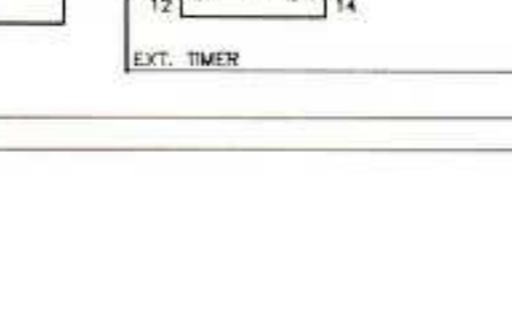
VOLUME



MAIN RESET



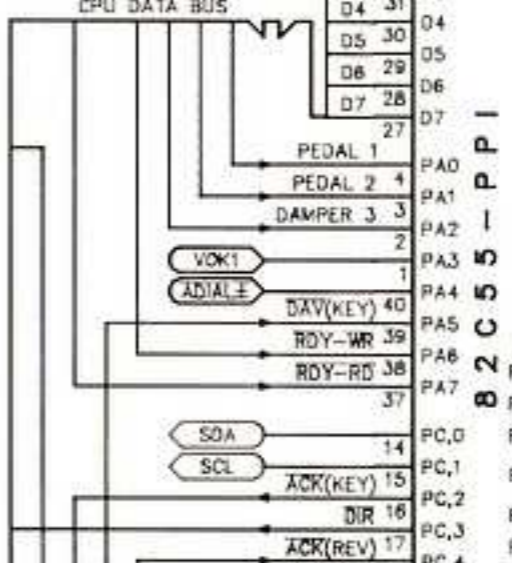
PEDAL KEYBOARD



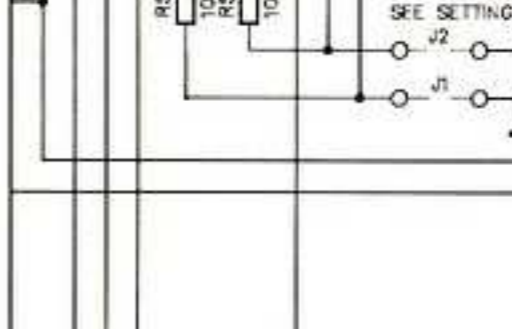
POWER SUPPLY CIRCUIT



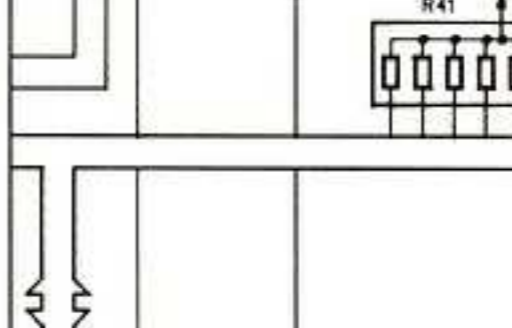
DISK DRIVE DATA & CONTROLS TO FLOPPY DISK DRIVE



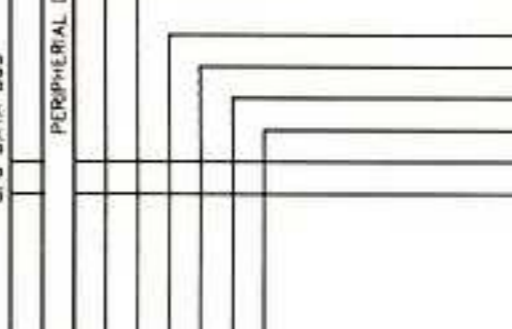
DISK DRIVE SUPPLY FROM P. AMP. & SUPPLY BOARD CON5



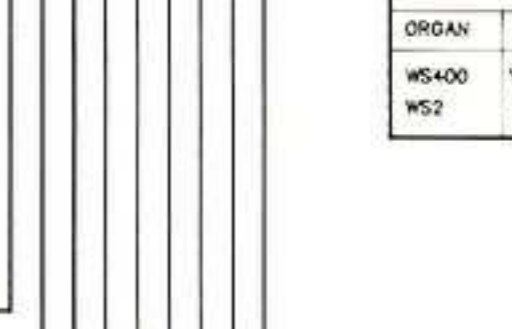
KEYBOARD ADDR & DATA BUS TO DYNAMIC KEYBOARD CON1



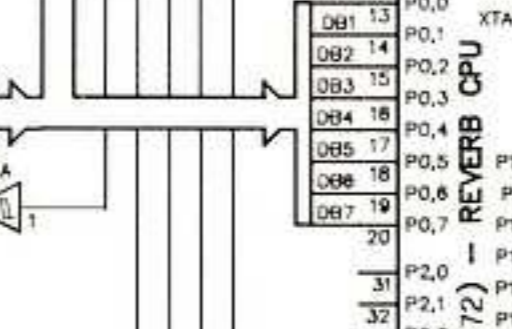
SUPPLY & CONTROLS PANEL ADDR & DATA BUS TO CONTROLS PANEL BOARD CON3



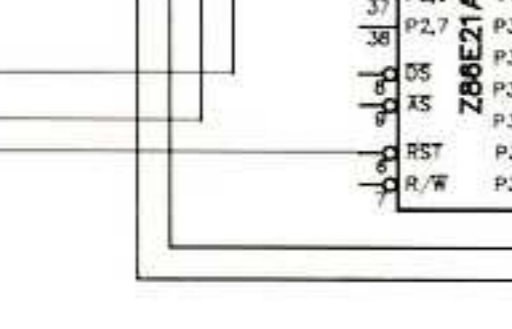
CONTRAST



VOLUME



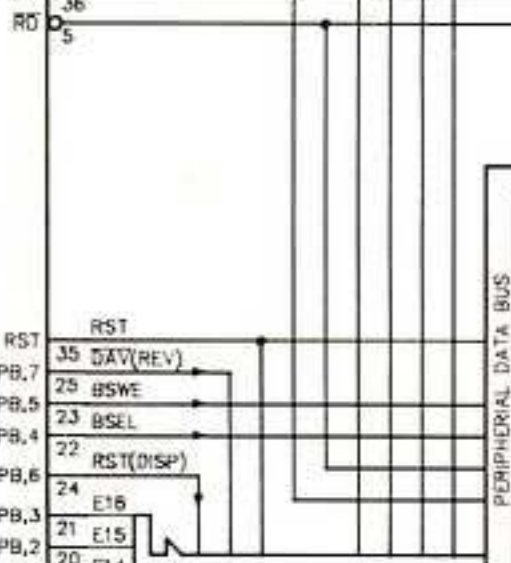
MAIN RESET



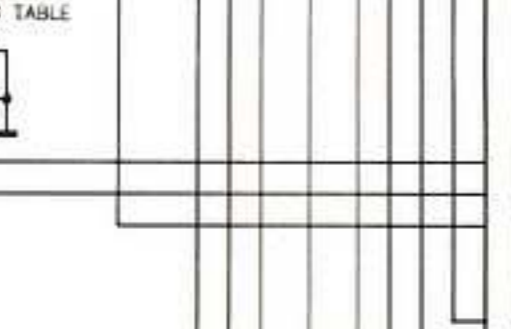
PEDAL KEYBOARD



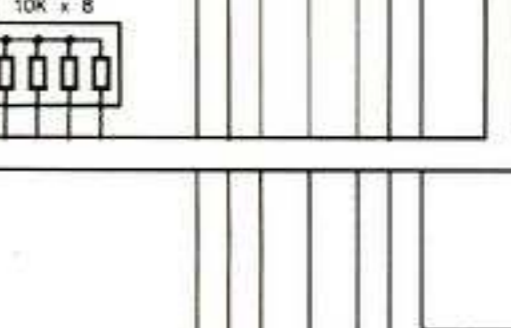
POWER SUPPLY CIRCUIT



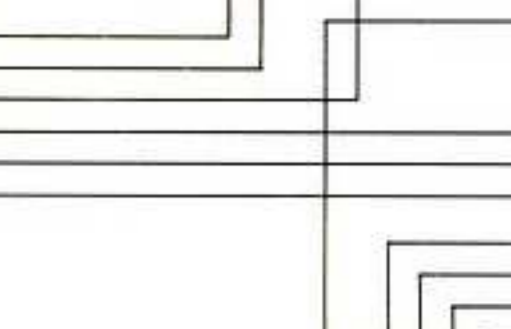
KEYBOARD ADDR & DATA BUS TO DYNAMIC KEYBOARD CON1



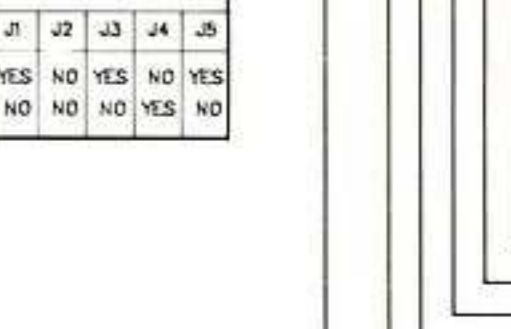
SUPPLY & CONTROLS PANEL ADDR & DATA BUS TO CONTROLS PANEL BOARD CON3



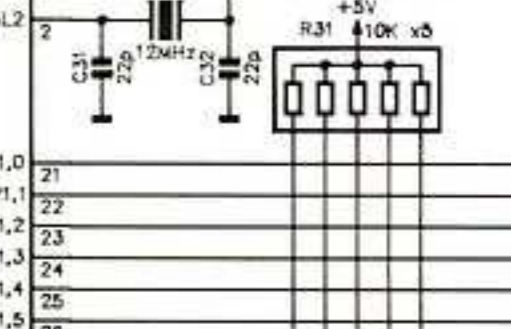
CONTRAST



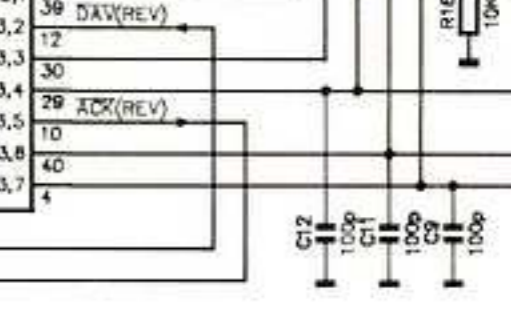
VOLUME



MAIN RESET



PEDAL KEYBOARD



POWER SUPPLY CIRCUIT



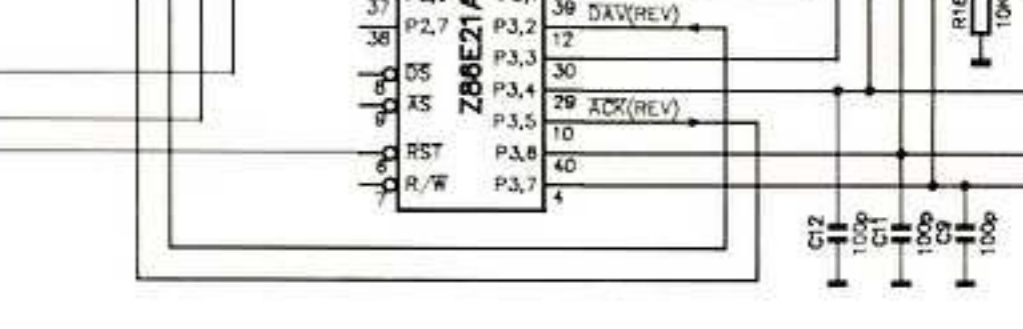
SETTING TABLE					
ORGAN	J1	J2	J3	J4	J5
WS400	YES	NO	YES	NO	YES
WS2	NO	NO	NO	YES	NO



REVERB DIGITAL REVERB PROCESSOR

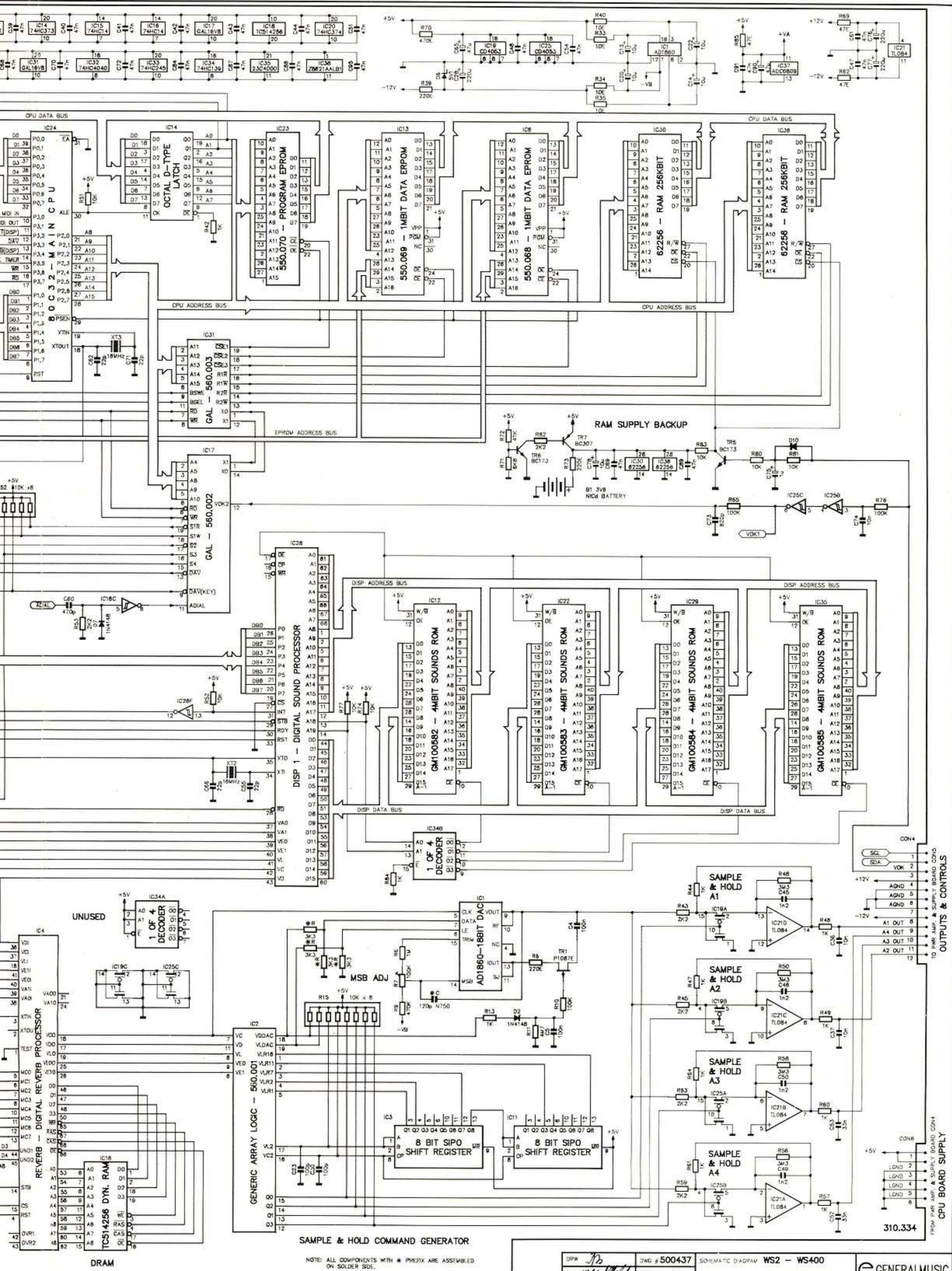


REVERB DIGITAL REVERB PROCESSOR



REVERB DIGITAL REVERB PROCESSOR





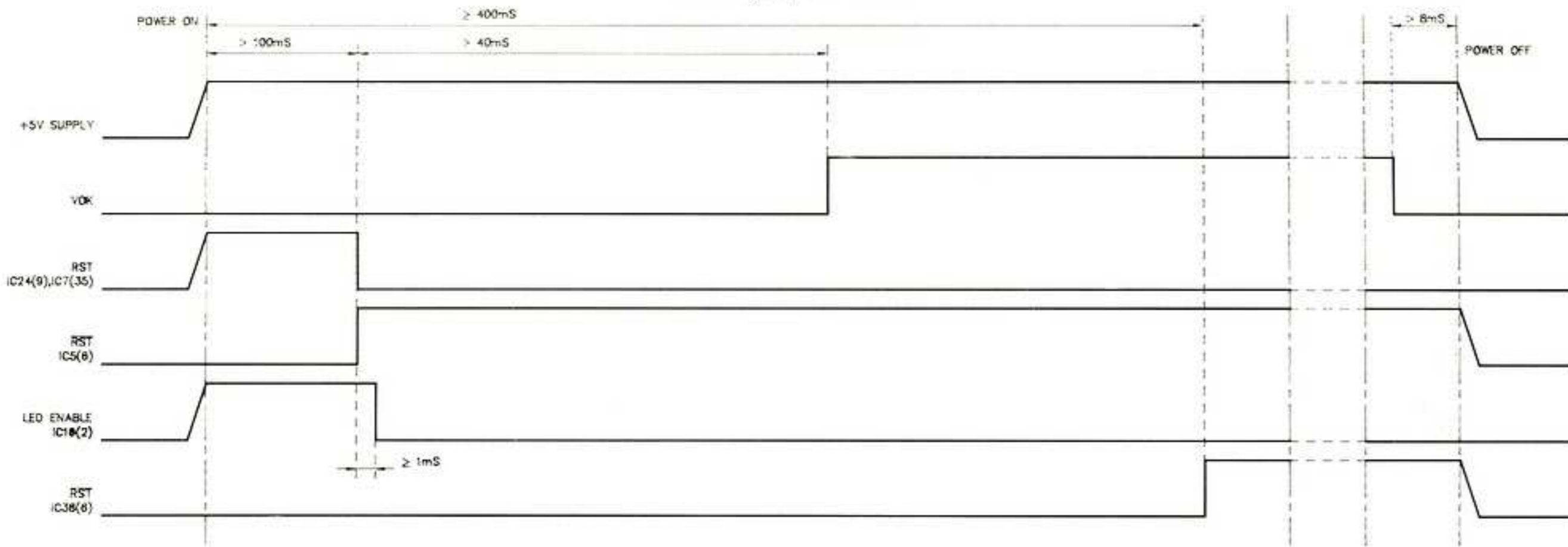
NOTE: ALL COMPONENTS WITH * PREFIX ARE ASSEMBLED ON SOLDER SIDE.

310.334

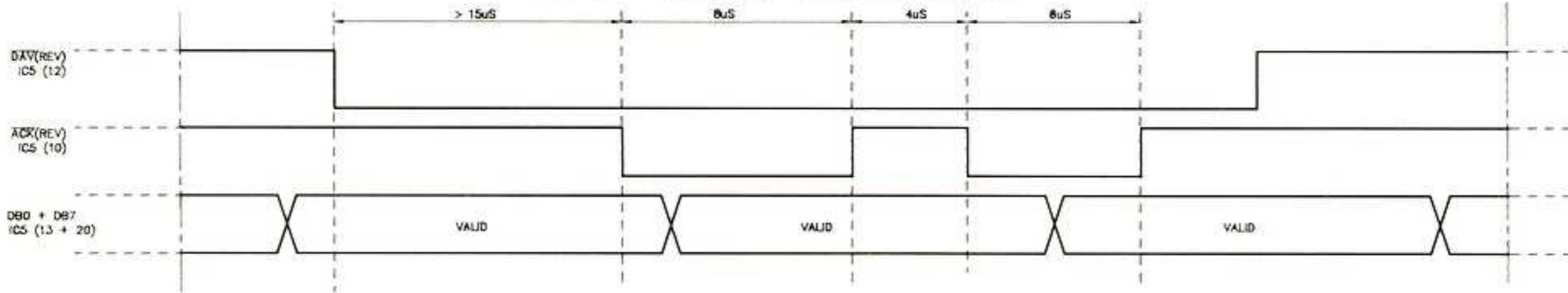
CON4
SCL
SDA
YOK 2
AGND 4
AGND 5
AGND 8
-12V 7
A1 OUT 8
A4 OUT 9
A3 OUT 10
A2 OUT 11
CON6
+5V 1
LQND 2
LQND 3
LQND 4
LQND 5

TO PWR AMP. & SUPPLY BOARD CON4
CPU BOARD SUPPLY

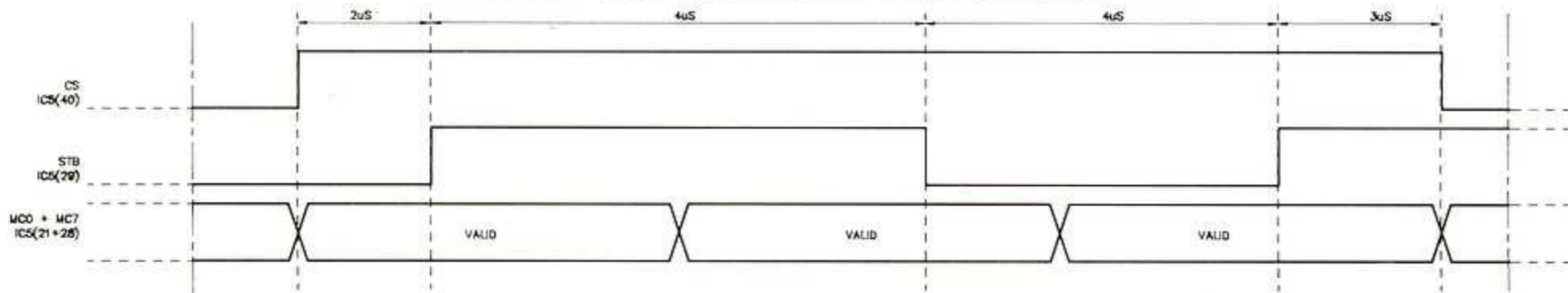
POWER ON/OFF, VOK & RESET



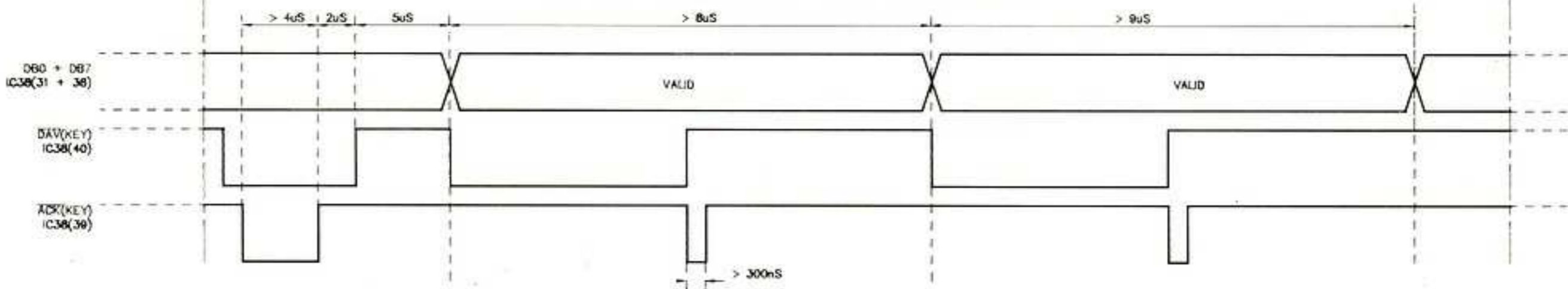
MAIN CPU - REVERB CPU DATA BUS & CONTROLS



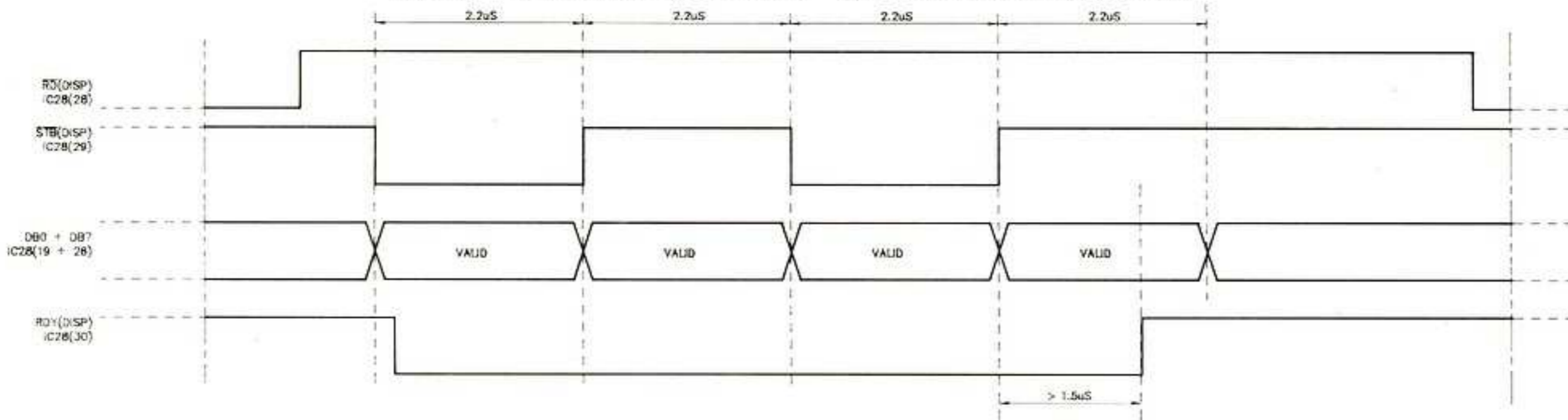
REVERB CPU - DIGITAL REVERB PROCESSOR DATA BUS & CONTROLS



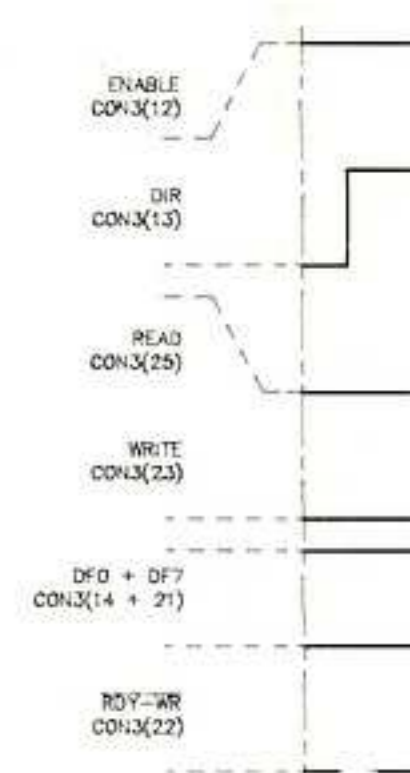
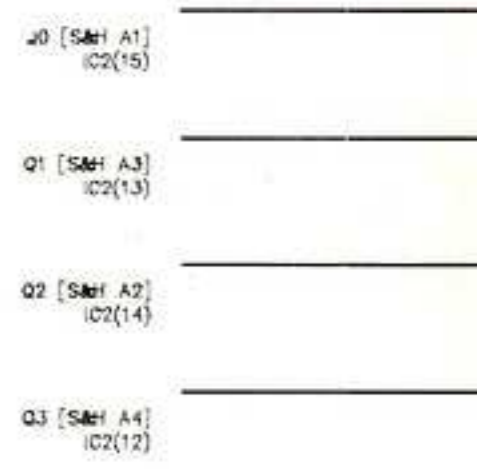
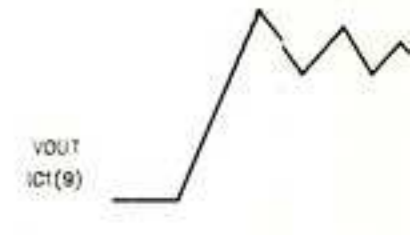
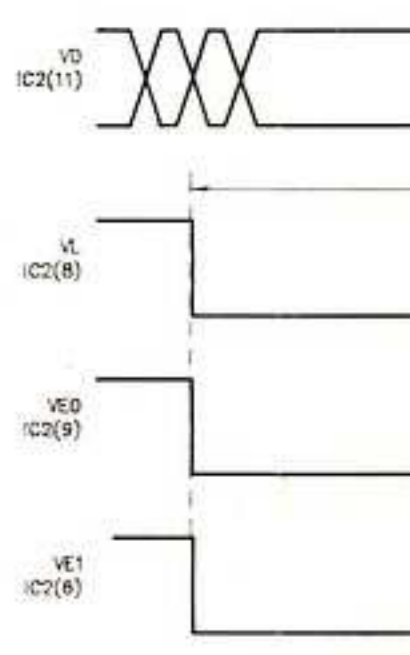
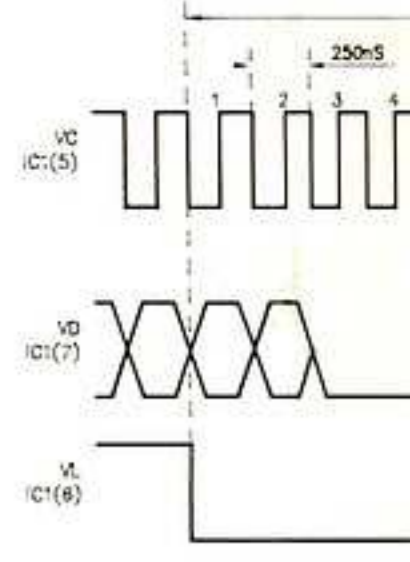
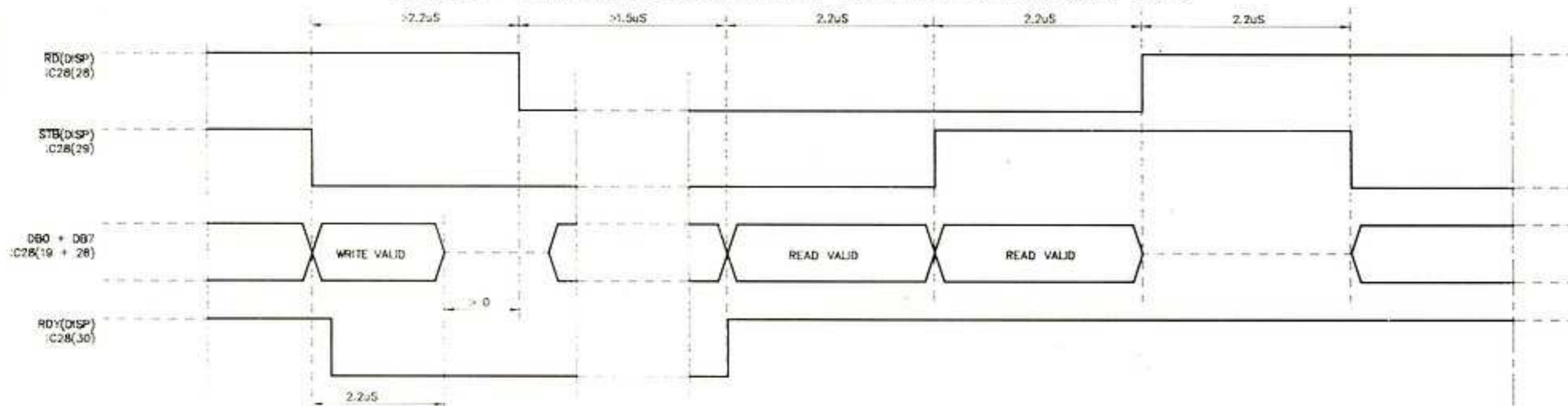
MAIN CPU - KEYBOARD CPU DATA BUS & CONTROLS



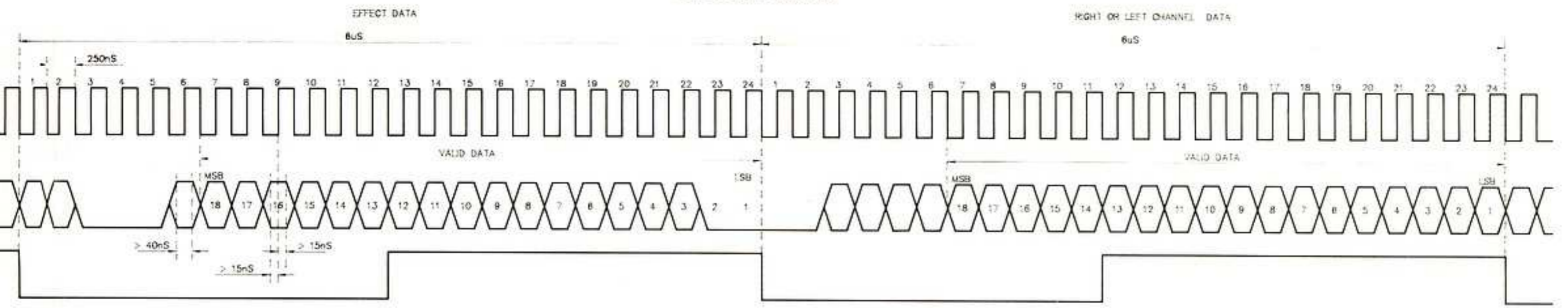
MAIN CPU - DISP1 DIGITAL SOUND PROCESSOR DATA BUS & CONTROLS (WRITE CYCLE)



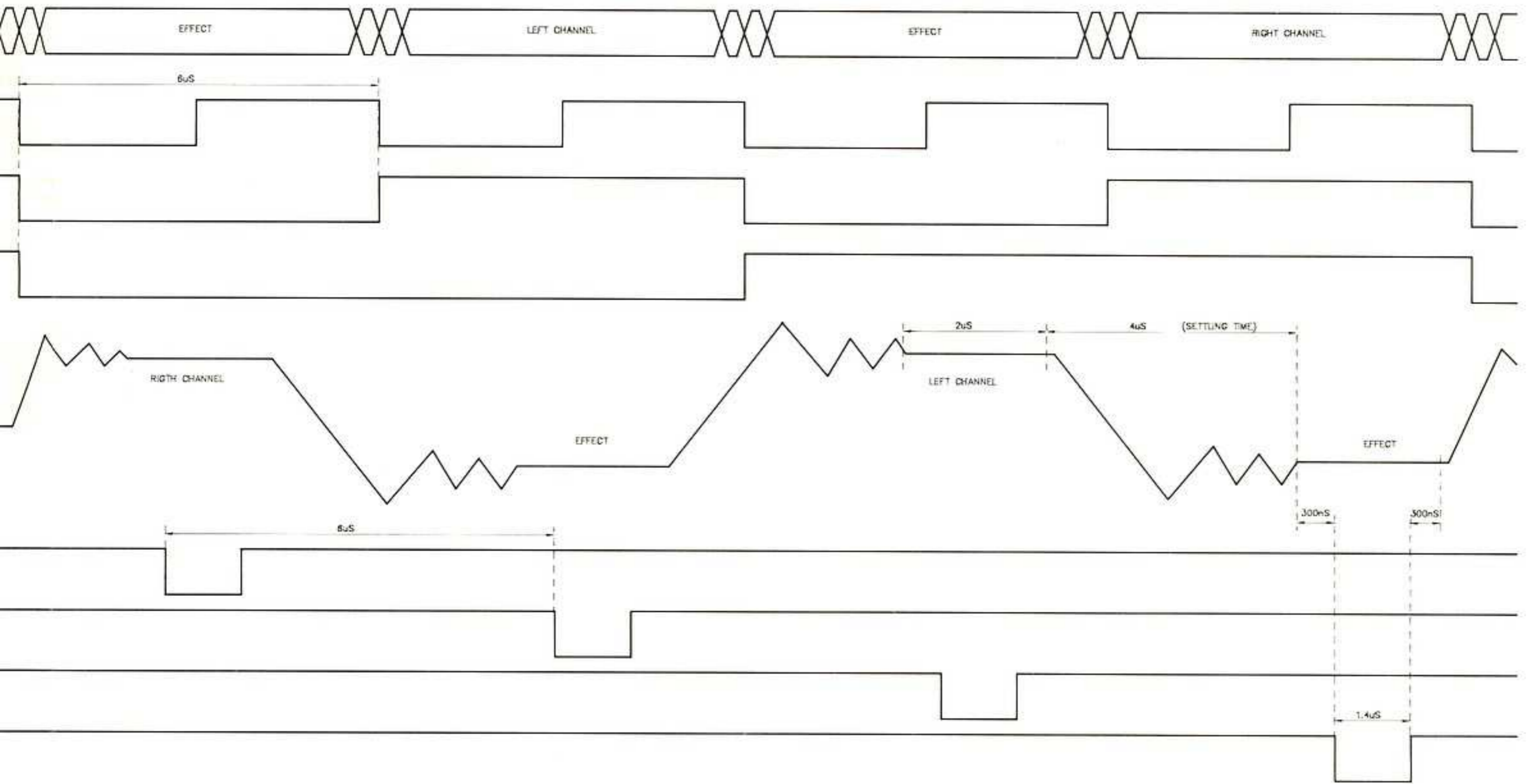
MAIN CPU - DISP1 DIGITAL SOUND PROCESSOR DATA BUS & CONTROLS (READ CYCLE)



PCM SERIAL DATA BUS

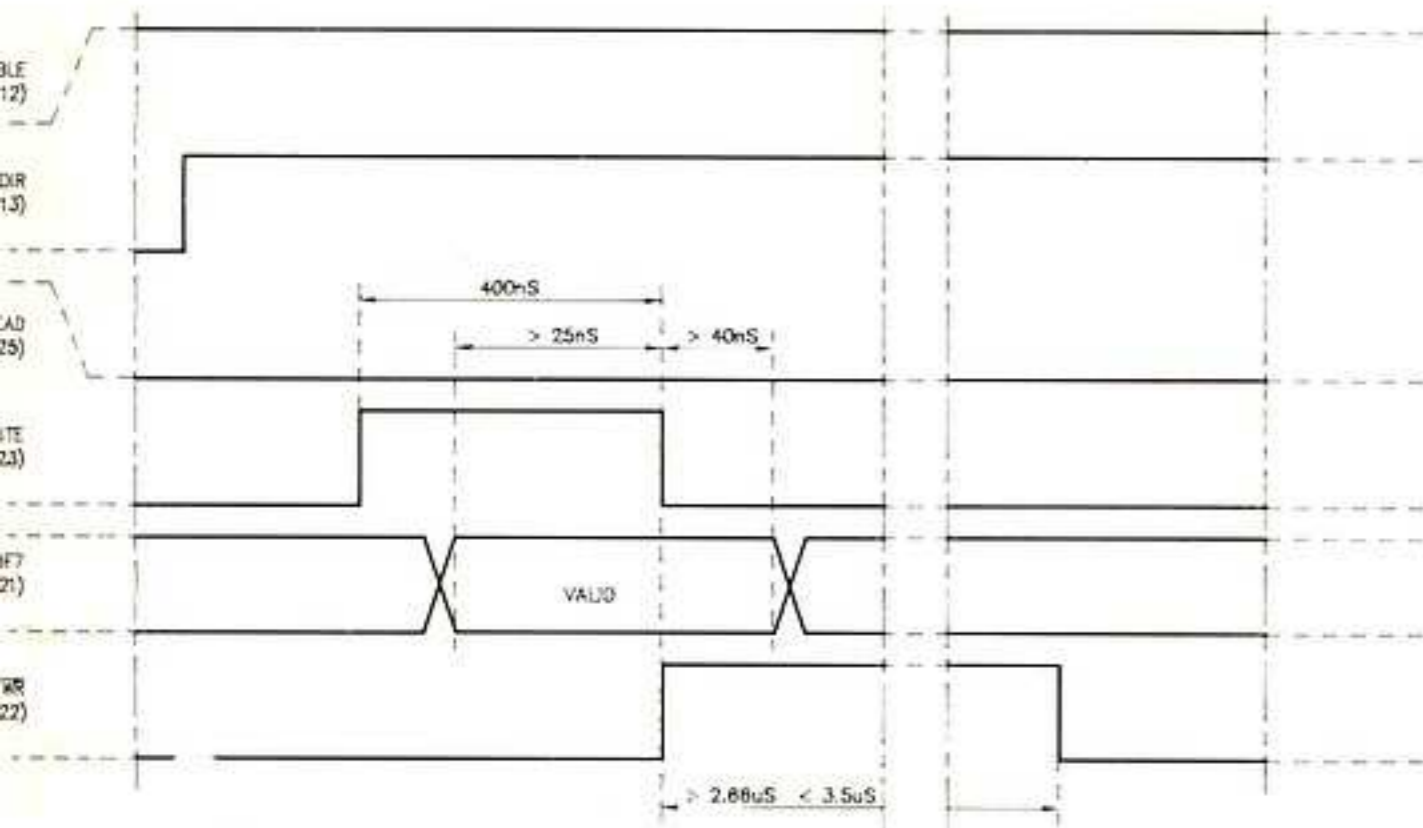


SAMPLE & HOLD

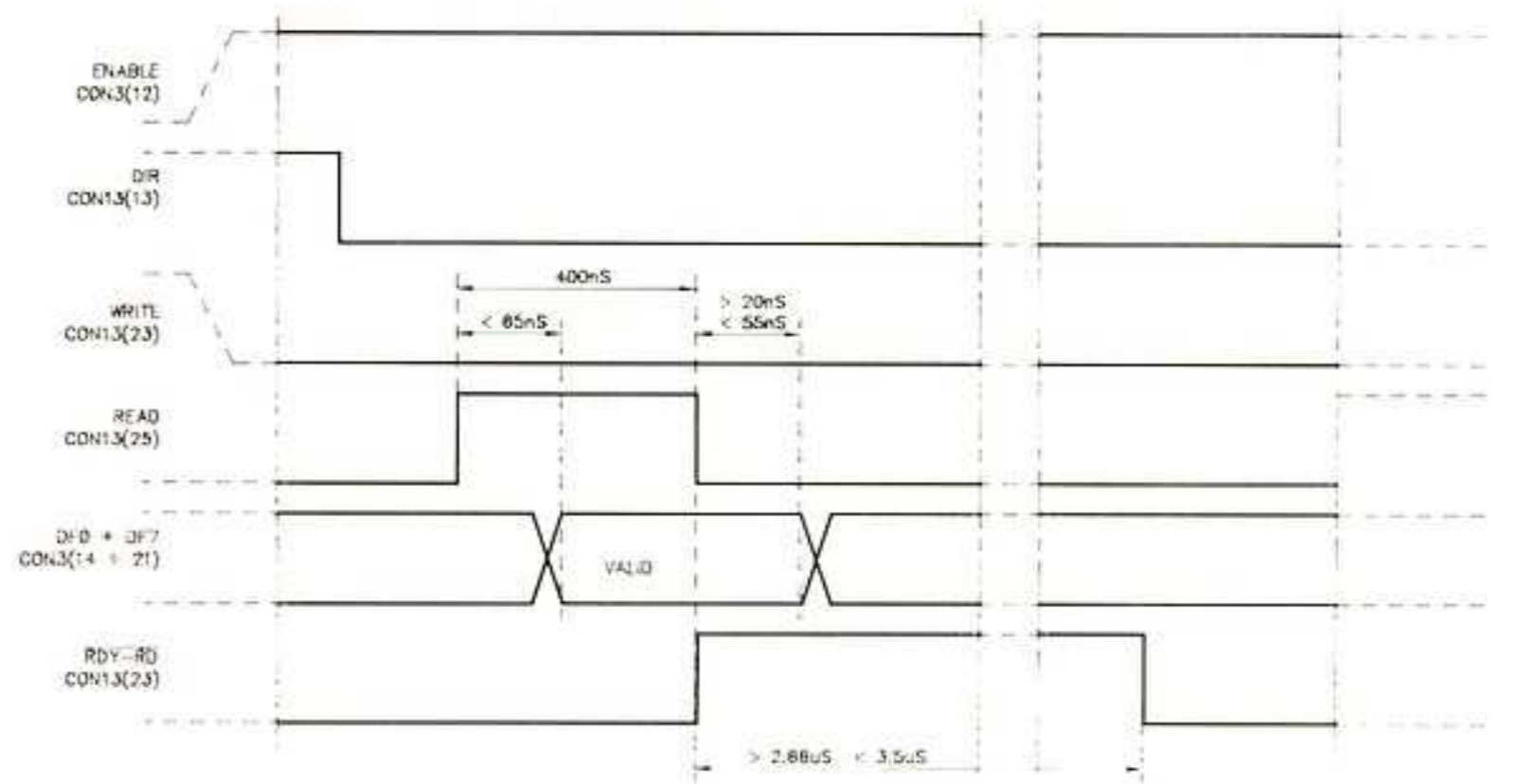


SYSTEM - DISK INTERFACE DATA BUS & HANDSHAKE

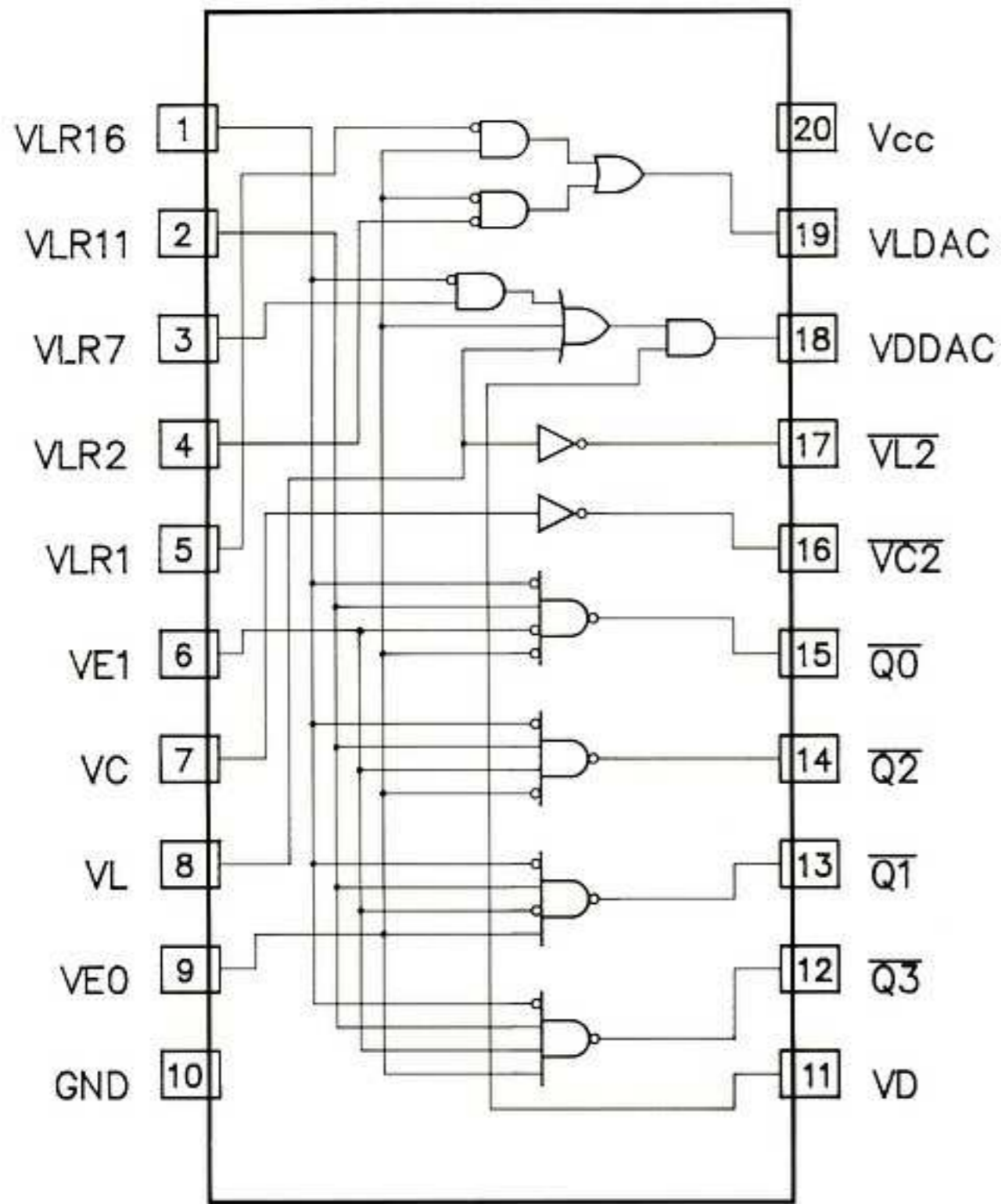
WRITE CYCLE



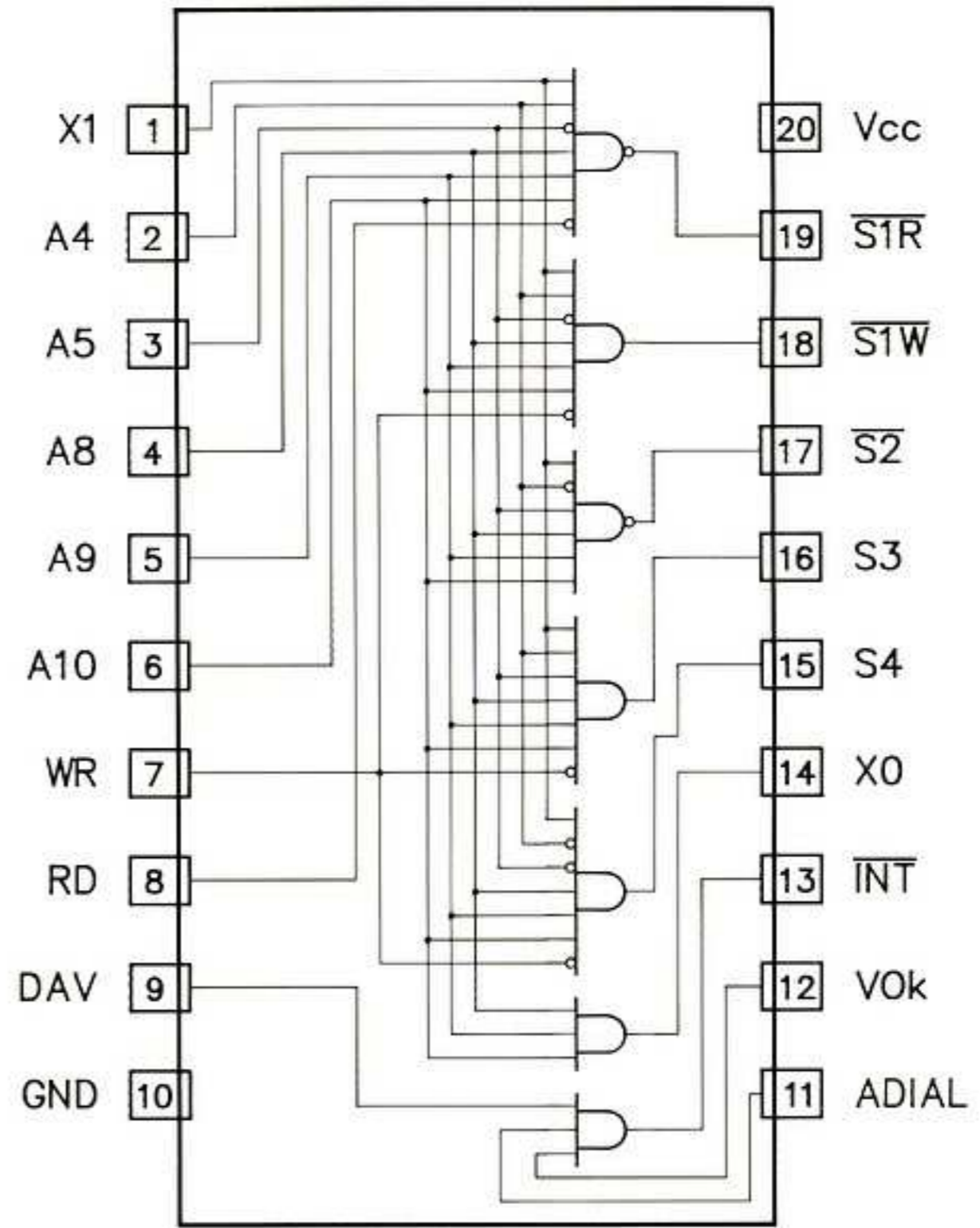
READ CYCLE



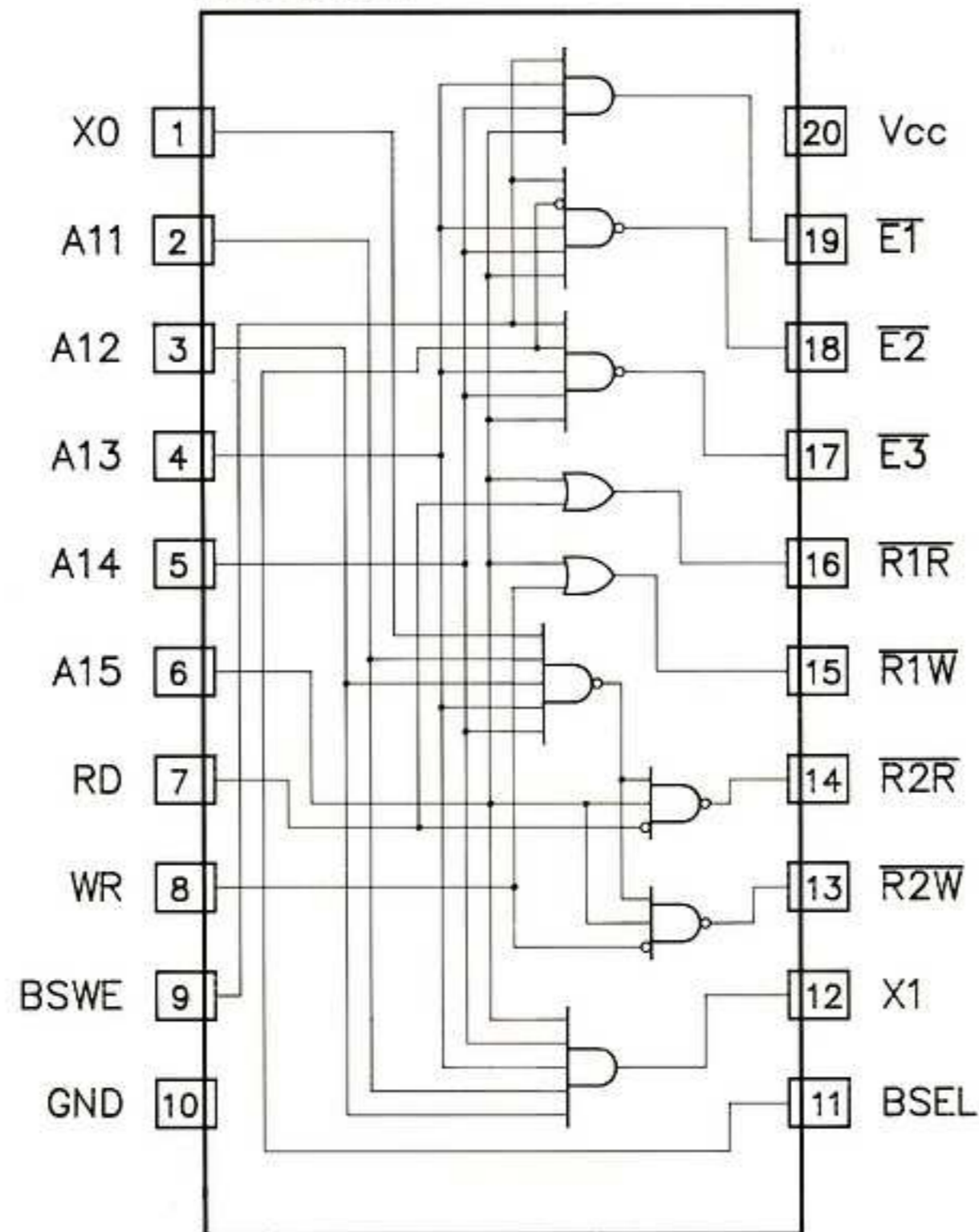
560.001



560.002



560.003



WS2

PART LIST

DESCRIPTION	CODE
ENGLISH OWNER'S MANUAL (GB,U.S.)	970094
FRENCH OWNER'S MANUAL (F)	970092
GERMAN OWNER'S MANUAL (D)	970093
DUTCH OWNER'S MANUAL (NL)	970095
SPANISH OWNER'S MANUAL (E)	970096
ITALIAN OWNER'S MANUAL (I)	970091

ACCESSORIES	
MUSIC STAND	170893
2 M LENGTH MIDI CABLE	130301
WS2 CARRYING BAG	970087
WS2 HOME STAND	970082
WS2 BENCH	970088
WS2 STAGE STAND	970081
WS2 DYNAMIC PEDALBOARD	970084
MULTI SWITCH PEDAL	970080
SINGLE SWITCH PEDAL	970012
VOLUME PEDAL	970013
3.5 DISK DRIVE	970083

CABINET ELECT. & MECH. PARTS ASSEMBLY	
TOP PLASTIC CHASSIS	650967
BOTTOM PLASTIC CHASSIS (GEM)	650966
BOTTOM PLASTIC CHASSIS (BACHMANN)	650989
DISK DRIVE PLASTIC SUPPORT	340231
DISK DRIVE OPENING COVER (WITHOUT DISK DRIVE)	340230
ADESIVE ANTISLIDE RUBBER FOOT	190015
SPEAKER LABYRINTH	340229
BOTTOM LABYRINTH PACKING	210075
TOP LABYRINTH PACKING	210076
BE 16W WIDE RANGE SPEAKER	220091
SPEAKER ACOUSTIC FOAM	210064
METAL SPEAKER GRID	660142

TRANSFORMER ASSEMBLY	
TRANSFORMER ASSEMBLY (EUROPE VERSION)	730210
TRANSFORMER ASSEMBLY (U.S. VERSION)	730213
MAINS SOCKET	140203
POWER SWITCH	110285
TRANSFORMER 220/240VAC (EUROPE VERSION)	230106
TRANSFORMER 117VAC (U.S. VERSION)	230109
A.C. LINE FILTER BOARD (EUROPE VERSION) (310353PC)	730209
A.C. LINE FILTER BOARD (U.S. VERSION) (310353PC)	730217
DOUBLE COIL RF FILTER	230528
A.C. LINE FILTER	110602
FUSE CLIP (EUROPE VERSION)	110113
FUSE CLIP (U.S. VERSION)	110114
T800mA-250V FUSE (EUROPE VERSION)	110015
T1.6A-250V FUSE (U.S. VERSION)	110055

WIRING CONNECTIONS	
MAINS CORD (EUROPE VERSION)	130274
MAINS CORD (U.S. VERSION)	130276
SPEAKERS, CONTROLS & SUPPLY CABLES ASSY	770559
FLAT CABLES :	
14 WIRES - 25 Cm LENGTH (CTRL PANEL BOARD CON2 - LCD DISPLAY)	840553
16 WIRES - 45 Cm LENGTH (CONTROLS PANEL ADDR & DATA BUS)	840532
6 WIRES - 45 Cm LENGTH (SUPPLY & CONTROLS)	840161
16 WIRES - 17 Cm LENGTH (KEYBOARD ADDR & DATA BUS)	840556
12 WIRES - 12 Cm LENGTH (OUTPUTS & CONTROLS)	840253
6 WIRES - 12 Cm LENGTH (CPU BOARD SUPPLY)	840153
25 WIRES - 30 Cm LENGTH (DISK DRIVE DATA & CONTROLS)	840555

KEYBOARD ELECT. & MECH. ASSY 720268	
MECHANICAL KEYBOARD ASSY	500041
C KEY	150983
D KEY	150984
E KEY	150985
F KEY	150986
G KEY	150987
A KEY	150988
B KEY	150989
LAST C KEY	151000
SHARP KEY	151001
KEYS RETURN SPRING	160154
DYNAMIC KEYBOARD CONTACT BOARD (310345PC)	810518
12 CONTACT RUBBER STRIP	340211
13 CONTACT RUBBER STRIP	340212


CONTROLS PANEL ELECT. & MECH. ASSEMBLY	
LCD DISPLAY	730211
PLEXIGLASS DISPLAY SCREEN (GEM)	650962
PLEXIGLASS DISPLAY SCREEN (BACHMANN)	650990
3x4 PUSH CAPS EDIT KEYBOARD	650972
3x4 PUSH CAPS GLOBAL KEYBOARD	650973
"A" "B" "C" TRIPLE PUSH CAP	650974
"D" "E" DUAL PUSH CAP	650976
"int STYLE" "prog STYLE" "song PATT" TRIPLE PUSH CAP	650975
"chain COMPOSE" "REC" DUAL PUSH CAP	650977
"play TRACKS" "track TEMPO" DUAL PUSH CAP	650978
"full GLOBAL" "comm CHORDS" DUAL PUSH CAP	650979
4 PUSH CAP STRIP (STYLES,VOICES)	340257
ALPHADIAL KNOB	340232
ALPHADIAL	110253
CONTROLS PANEL BOARD (310338PC)	810215
INTEGRATED CIRCUIT: 74HC138 1 OF 8 DECODER	100606
74HC374 OCTAL D-TYPE FLIP-FLOP	100612
74HC74 DUAL D-TYPE FLIP-FLOP	100614
74HC86 QUAD 2-INPUT EXOR GATE	100620
HDN1105 7 SEGMENTS DISPLAY	080717
IN-LINE 5PIN DISPLAY SOCKET	140603
RED LED	080711
LED SPACER	340091
MICROSWITCH (0.2mm ACTING-STROKE)	140520

DESCRIPTION	CODE
DRUM, PITCH, MODULATION & PHONES ASSY	720269
HEMISPHERICAL KNOB (PITCH-MODULATION)	340237
M3 THREADED INSERT-BUSH FOR KNOB	120682
DRUM KEYS PLASTIC SUPPORT	340239
"START-STOP" PUSH CAP	650968
"INTRO-END" PUSH CAP	650969
"SYNC-CONTINUE" PUSH CAP	650970
"FILL IN" PUSH CAP	650971
DRUM KEYS RETURN SPRING	160152
DRUM, PITCH, MODULATION & PHONES BOARD (310340PC)	810217
MICROSWITCH (0.5mm ACTING-STROKE)	140519
10K+10K JOYSTICK	070700
FEMALE JACK SOCKET	140207
BL02 DOUBLE COIL FOR RFI SUPPRESSION	230527

CPU & SOUND GENERATOR BOARD (310334PC) 760759	
INTEGRATED CIRCUIT: 74HC14 HEX INVERTING SCHMITT TRIGGER	100618
74HC139 DUAL 1 OF 4 DECODER	100623
74HC164 8BIT SERIAL IN PARALLEL OUT SHIFT REGISTER	100607
74HC245 OCTAL BUS TRANSCEIVER	100610
74HC373 OCTAL D-TYPE LATCH	100611
74HC374 OCTAL D-TYPE FLIP-FLOP	100612
74HC4040 12 STAGES RIPPLE COUNTERS	100617
TCS14256 256Kx4BIT DYNAMIC RAM	100586
CD4053 TRIPLE 2-CHANNEL MULTIPLEXER	100566
GAL-560001 16VB GENERIC ARRAY LOGIC (PROGRAMMED)	560001
GAL-560002 16VB GENERIC ARRAY LOGIC (PROGRAMMED)	560002
GAL-560003 16VB GENERIC ARRAY LOGIC (PROGRAMMED)	560003
6N138 OPTOCOUPLER	100035
AD1860 18BIT PCM DIGITAL TO ANALOG CONVERTER	100593
TL084 QUAD J-FET INPUT OPERATIONAL AMPLIFIER	100084
80C32-16 MAIN CPU	100579
DISP1 DIGITAL SOUND PROCESSOR	100580
REVERB DIGITAL REVERB PROCESSOR	100581
GM100582 uPD23C4000 MASKED SOUND ROM	100582
GM100583 uPD23C4000 MASKED SOUND ROM	100583
GM100584 uPD23C4000 MASKED SOUND ROM	100584
GM100585 uPD23C4000 MASKED SOUND ROM	100585
82C55 PROGRAMMABLE PERIPHERAL INTERFACE	100587
550068 uPD27C1001 DATA EPROM	550068
550069 uPD27C1001 DATA EPROM	550069
550070 27512 PROGRAM EPROM	550070
Z8621AALB1 MASKED KEYBOARD CPU	100725
Z8621AF1 MASKED REVERB CPU	550072
62256 256KBIT STATIC RAM	100576
ADC0809 8BIT ANALOG TO DIGITAL CONVERTER	100574
P1087E P-CHANNEL FET	090856
BC307 PNP TRANSISTOR	090192
BC173 NPN TRANSISTOR	090182
5V1 0.5W ZENER DIODE	080232
1N4148 SIGNAL DIODE	080103
16MHz CERAMIC RESONATOR	010702
12MHz CERAMIC RESONATOR	010700
10Kx8 RESISTOR ARRAY	050492
10Kx5 RESISTOR ARRAY	050494
1K "CONTRAST" POTENTIOMETER WITH KNOB	070123
3.6V NiCd BATTERY	110282
"THRU-OUT2" SWITCH	110287
FEMALE JACK STEREO SOCKET	140207
FEMALE 5 POLES DIN SOCKET	140212
FEMALE 6 POLES DIN SOCKET	140216
BL02 DOUBLE COIL FOR RFI SUPPRESSION	230527

POWER AMPLIFIER & SUPPLY BOARD (310335PC) (EUROPE VERSION) 730208	
POWER AMPLIFIER & SUPPLY BOARD (310335PC) (U.S. VERSION)	730215
INTEGRATED CIRCUIT: TDA2040 20W AUDIO POWER AMPLIFIER	100013
7912 NEGATIVE 12V REGULATOR	100043
7812 POSITIVE 12V REGULATOR	100045
LF353 DUAL J-FET INPUT OPERATIONAL AMPLIFIER	100061
L4960 2.5A POWER SWITCHING REGULATOR	100900
TDA7300 DIGITAL CONTROLLED AUDIO PROCESSOR	100909
P1087E P-CHANNEL FET	090856
BC173 NPN TRANSISTOR	090182
KBL02 DIODE BRIDGE	080605
BYV27 2A 100V FAST RECOVERY TIME RECTIFIER DIODE	080170
100uH SWITCHING COIL	230524
470uF LOW RF IMPEDANCE CAPACITOR	030950
FEMALE RCA PLUG SOCKET	140213

NOTE: ANY REQUEST FOR NOT ABOVE MENTIONED PART MUST ENCOMPASS SPECIFIC DESCRIPTION INCLUDING : 1) MODEL NAME, 2) SECTION, 3) EVENTUAL MODULE CODE, 4) SCHEMATIC DIAG. REFERENCE.

DRW: <i>UB</i>	DWG # 500441	SCHEMATIC DIAGRAM WS2	 GENERALMUSIC MONDAINO (FO) ITALY
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