QCHORD

DIGITAL SONGCARD GUITAR

SERVICE MANUAL

SUZUKI OMNICHORD heaven

1. SPECIFICATIONS

Sturmplate & Melody Keyboard Voice	Four Full Octaves
Strumplate Range	100 GM Instrument Voices
Chord Buttons	36 Soft Touch Buttos, 84 Chord Combinations : Major, Minor 7^{th}, Major 7^{th}, Minor 7^{th}, Augmented and Diminished
Rhythms	10 Professionally produced Rhythm Styles an additional 30 available
Variable Controls	Master Volume, Strumplate Volume, Strumplate Sustain, Rhythm Volume, Rhythm Tempo, Bass Volume, Chord Volume, Chord Plus Volume, Reverb Control, Chorus Depth Control, Vibrato Depth Control, Pitch Bend Wheel, Transpose, Tuning, Octave Shift
Button Controls	Power, Demo, Strumplate Voice Select, Rhythm Style Select, Rhythm Fill, Rhythm Intro/End, Start/Stop
Song / Style / Cartridge	Q Card Play/Pause, Q Card Search Up/Down, Stop
Effects	100 GM Instrument Voices
Other Functions	Rhythm Fill, Rhythm Intro/End, Pitch Bend Wheel, MIDI IN & MIDI OUT, Transpose, Tuning, Octave Shift
Tune	+/- 50 Cents
Display	Two Digit LCD, Two LED Light Bars, 13 LED's
Jacks	AC Power In, 1/4" Line Out/Headphone, MIDI IN, MIDI OUT
Power Requirements	12 Volts DC, 8 'C' cell batteries
Dimensions	21 1/4" L * 11 3/4" W * 2 1/8" H
Weight	3.25 Lbs

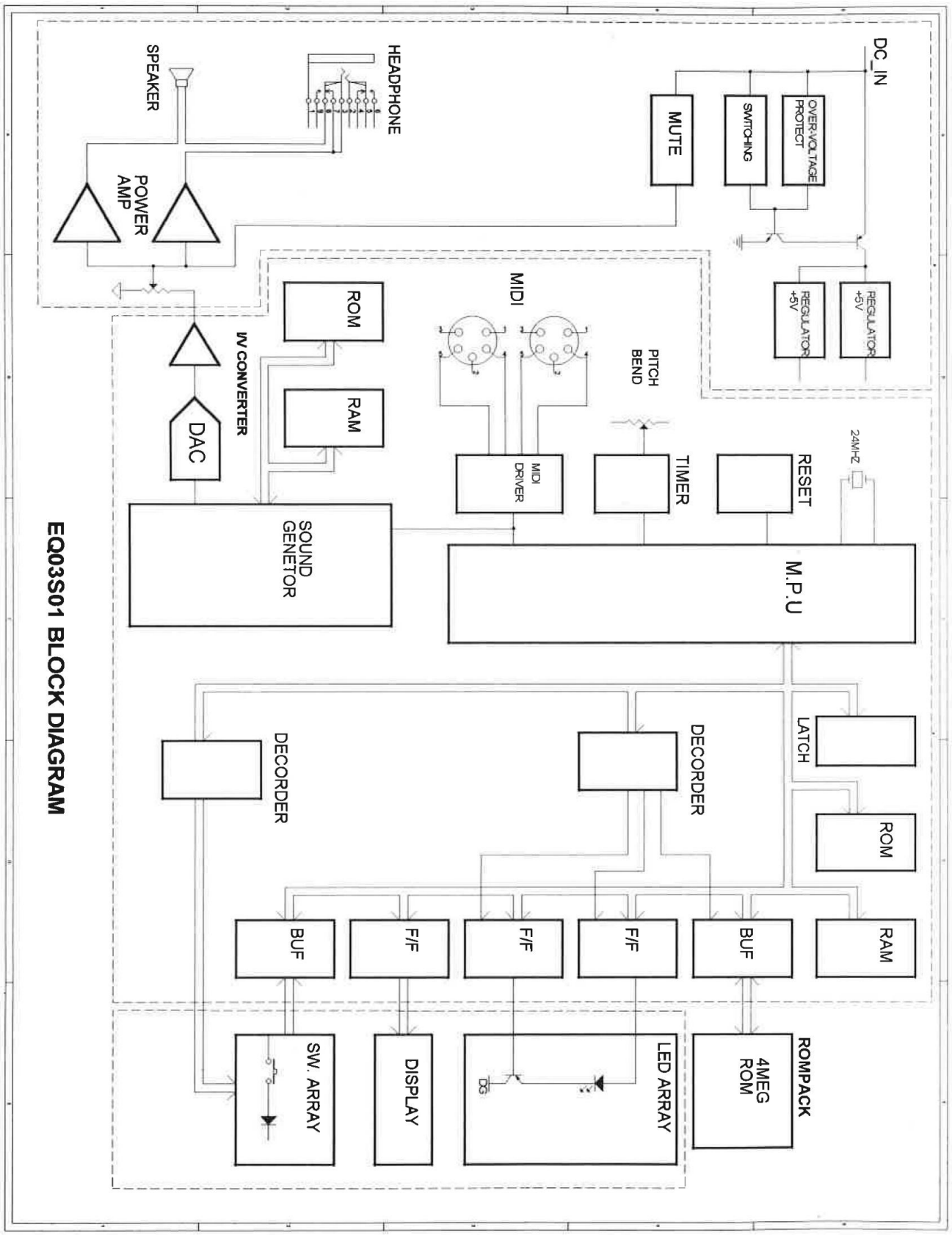
2. TROUBLE SHOOTING

PROBLEM	CHECK POINT
1.System does not work (No display)	← Check power supply source(New Battery? Or proper ac adopter and firmly plugged in?) ↑ Check CN504 connection. → Press the power switch, measure the voltage between the lead C208(which is lay electric capacitor) of Main p.c.board(between dc +9 ~ + 14V ?) ↓ Measure the voltage Q601 80C51 MPU #40pin and #20pin ground. (DC 5.0V) o Check the connection all. (CN605: LCD display, CN604:LED display and button control)
2. Function key	- check the connection CN604(#29 pin flat ribbon wire) - Clock 24Mhz at #19pin Q601 80C51 - Signal output from Q604 74HC154 #1pin to #14pin - Signal toggle at Q612,74HC541 #1pin, #19pin
3. Chord key	- check the connection CN603(#15 pin flat ribbon wire)
4. Pitch bend	- check the connection CN607 - Signal input #2 pin of Q602, 555 timer for trigger - Signal output #3pin of Q602, 555 timer for count

3. PCB FUNCTIONS

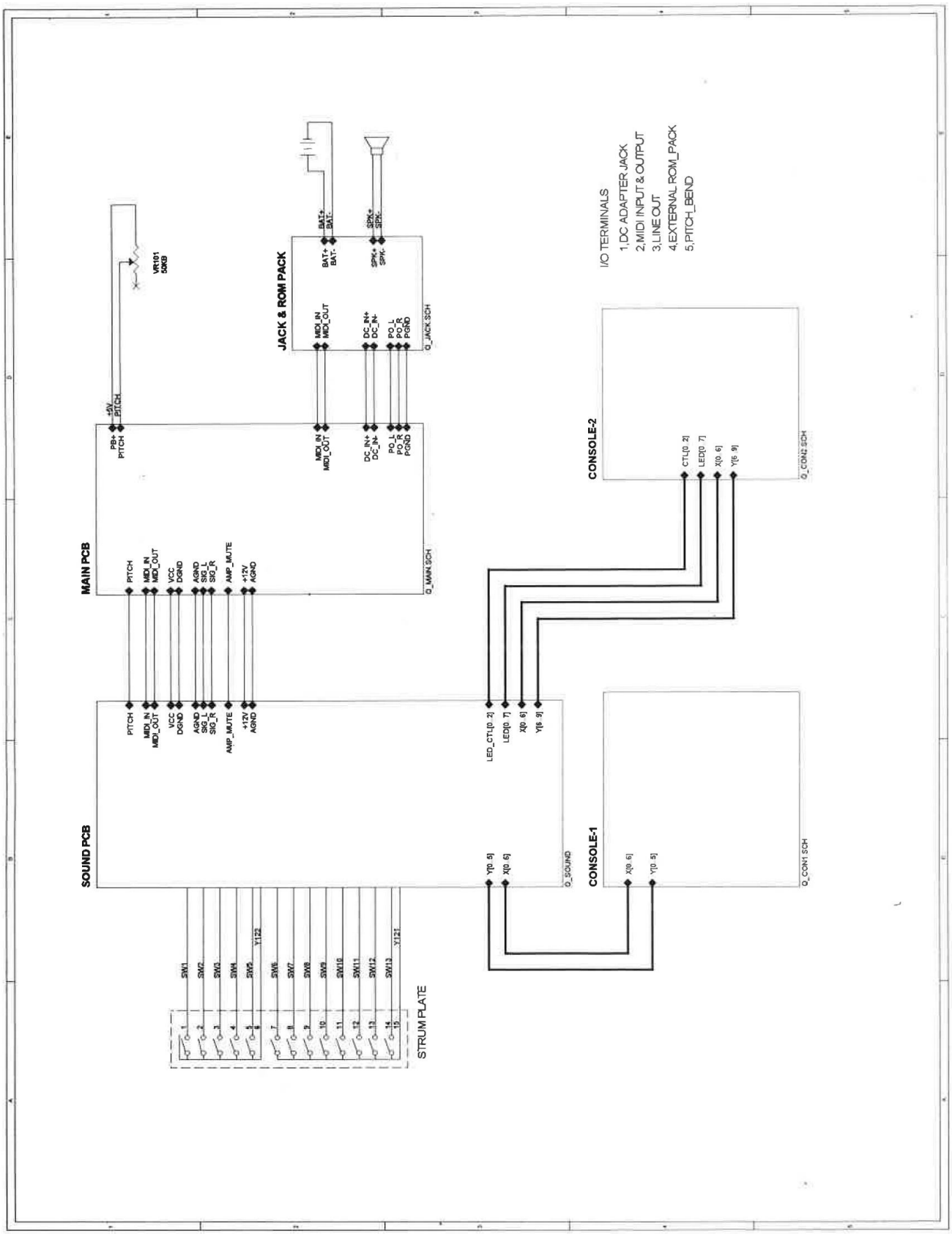
PCB NAME		FUNCTION
PEKZ13	SOUND	CPU, Reset, console LED control, LCD display control, Pitch-bend control, Strumplate control, Sound generate and DAC output, Q Card Interface
PEKM10	MAIN	Power source control, convert, Power Amplifier and MIDI Input / Output driver
	CONSOLE	Console button, console LED, LED driver
	JACK	Headphone jack, MIDI jack and DC Input jack
PEKN14	CHORD KEY	Chord button matrix

4. BLOCK DIAGRAM 1



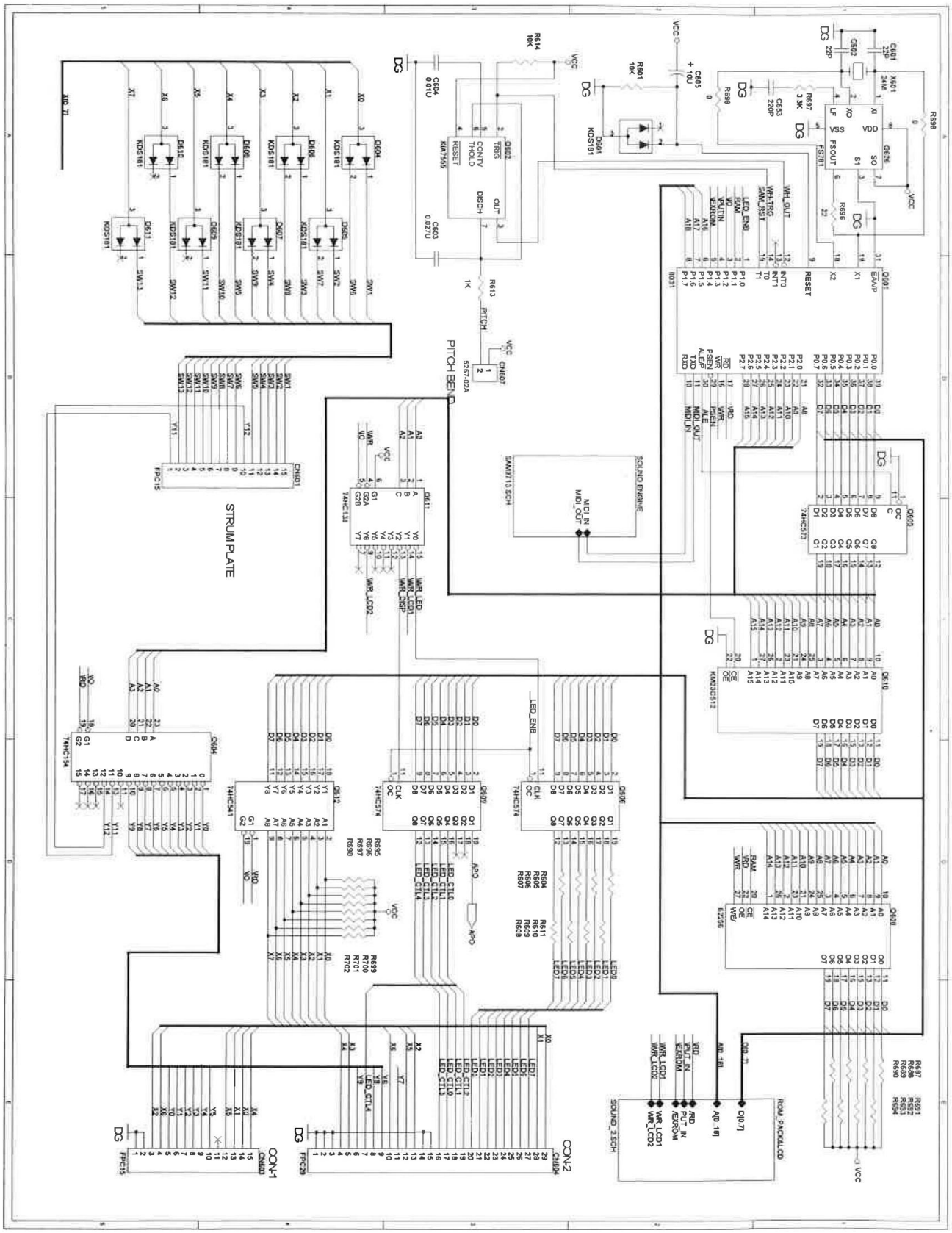
EQ03S01 BLOCK DIAGRAM

BLOCK DIAGRAM 2

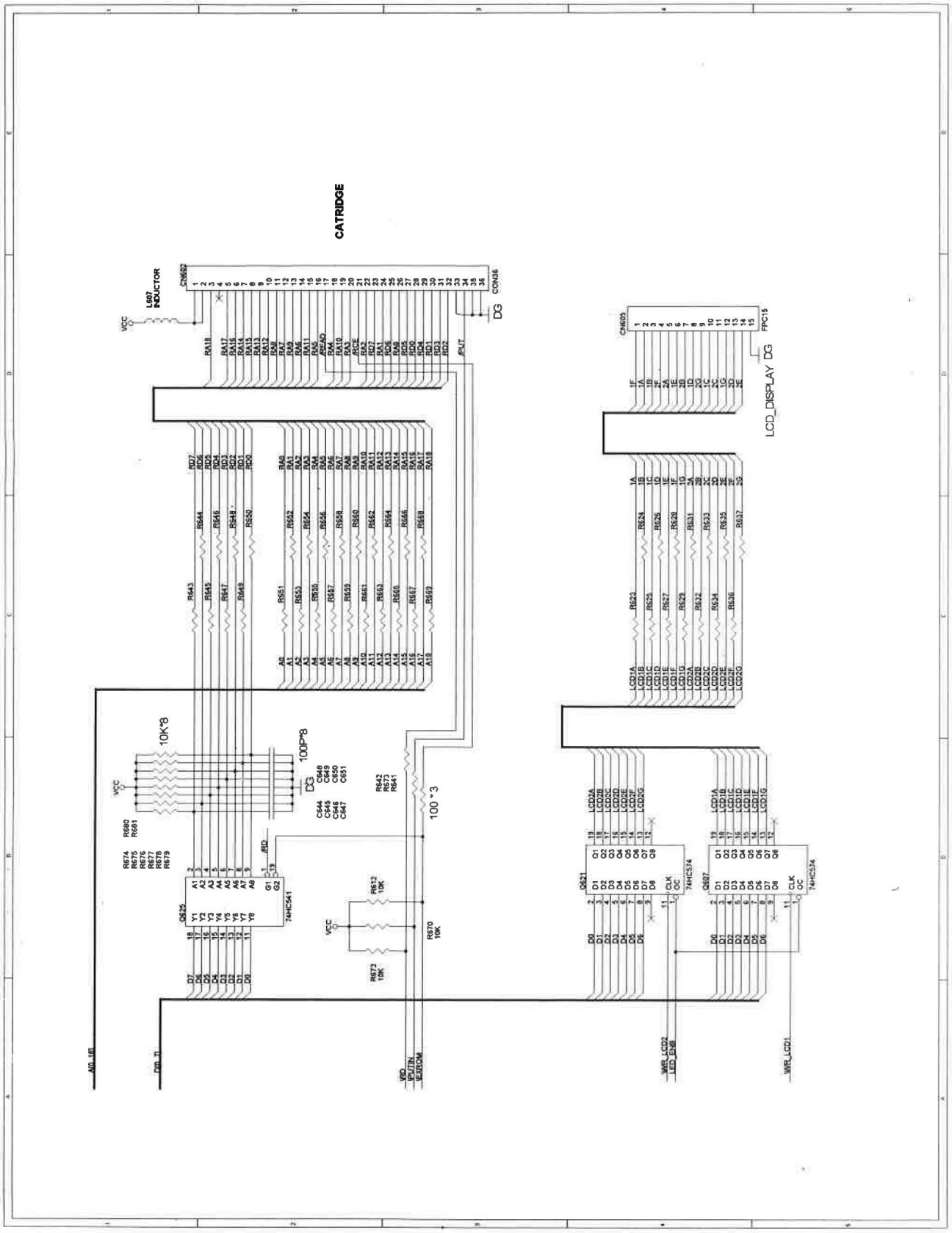


5. SCHEMATIC DIAGRAM

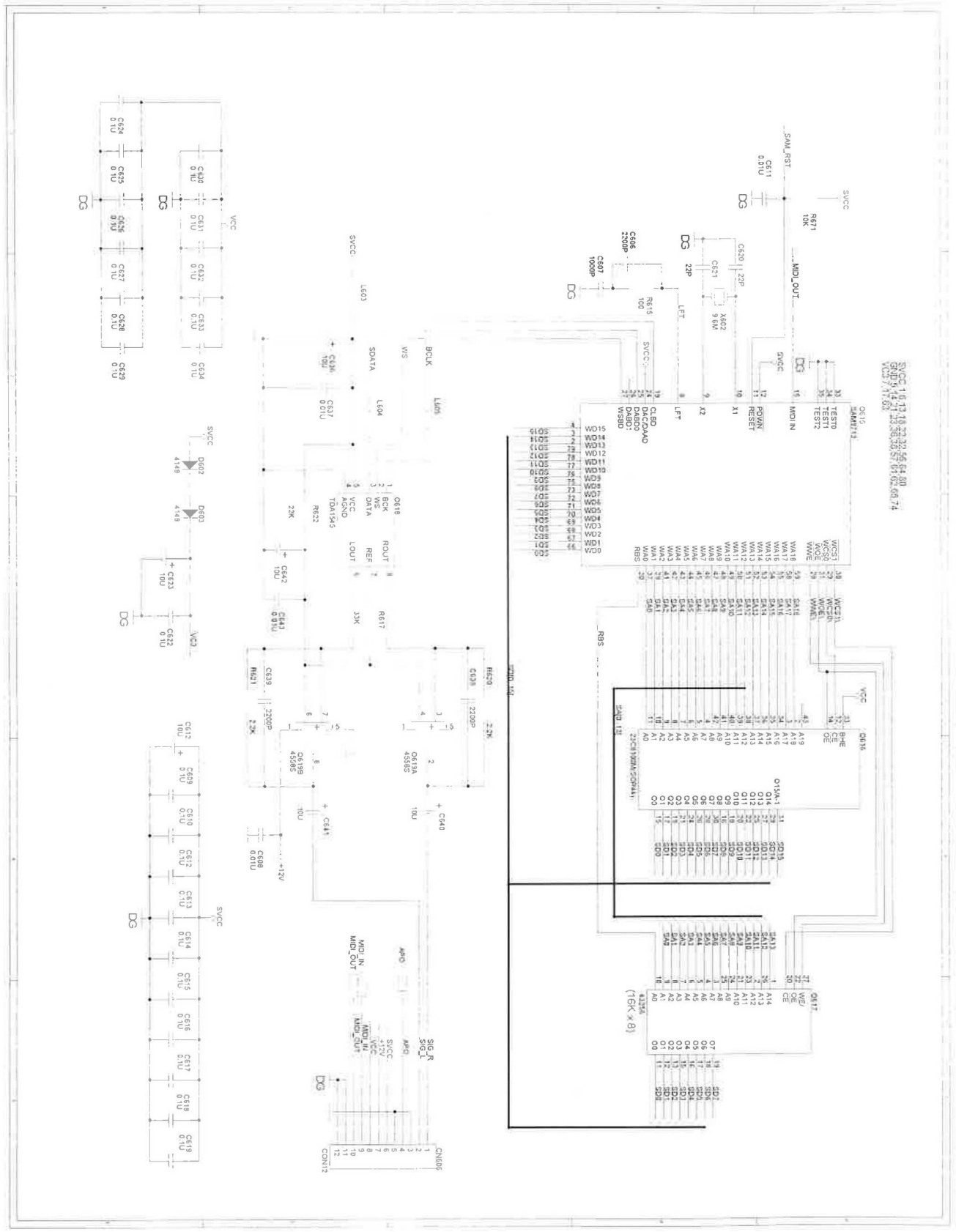
5-1. Digital Sound 1



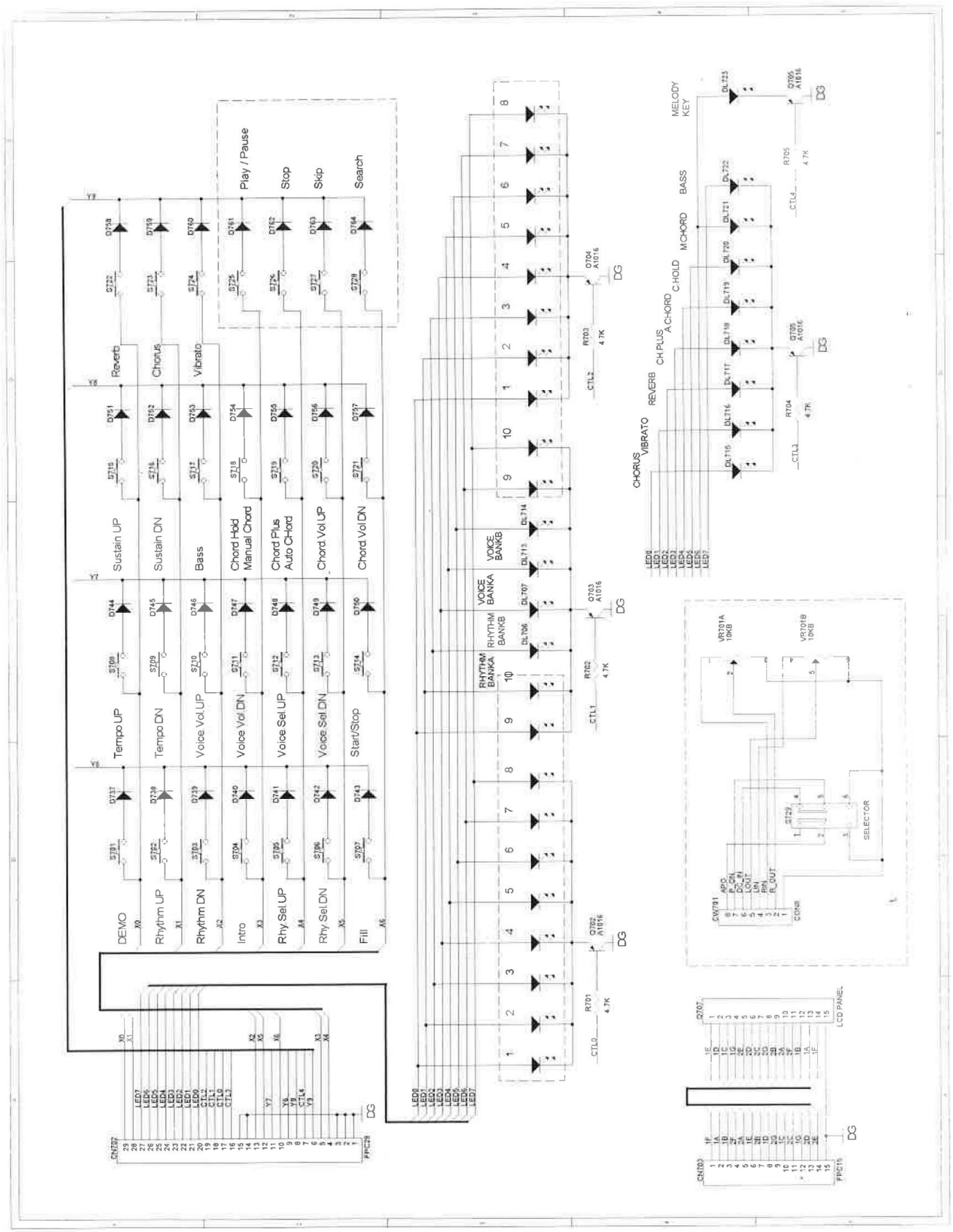
5-1. Digital Sound 2



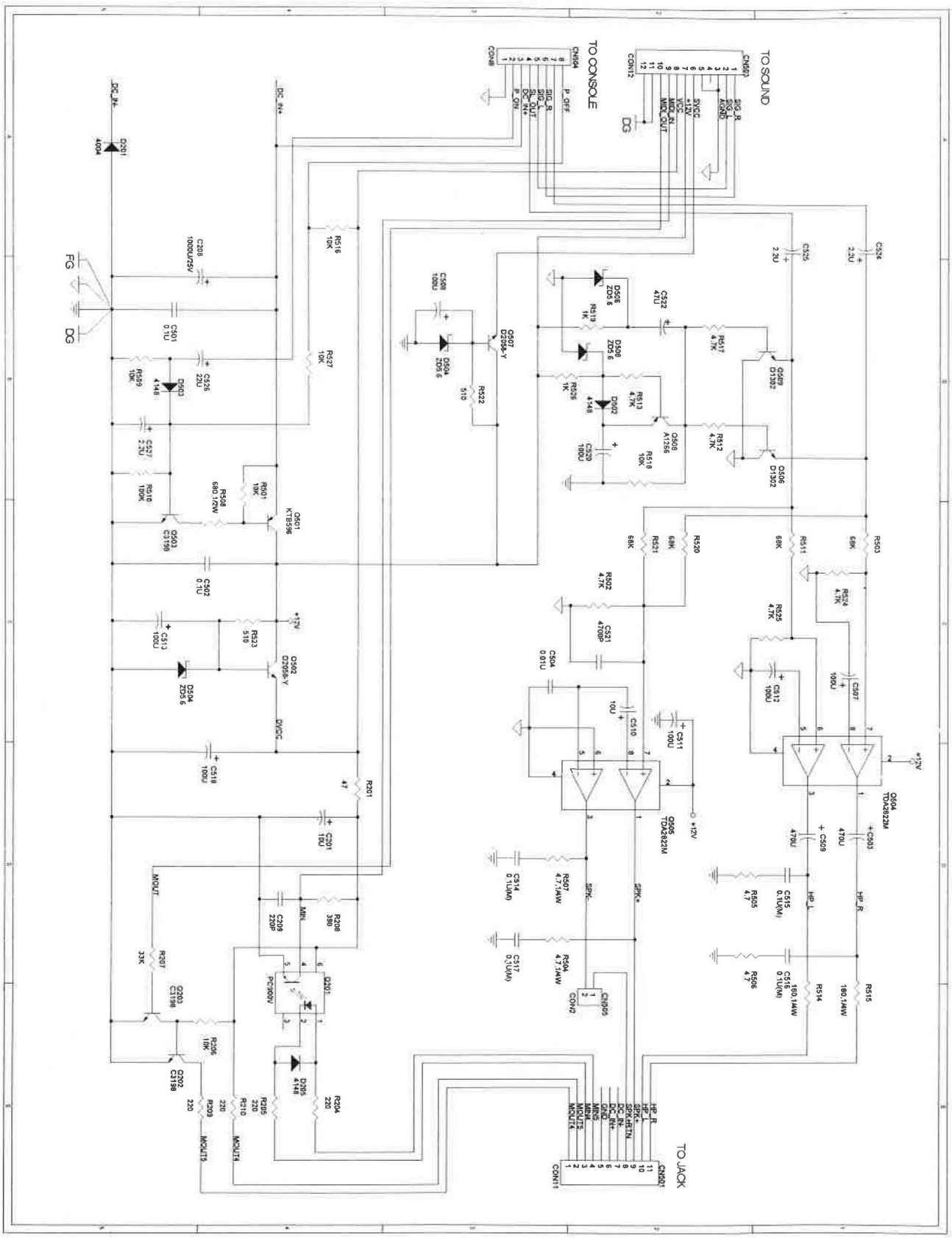
5-1. Digital Sound 3



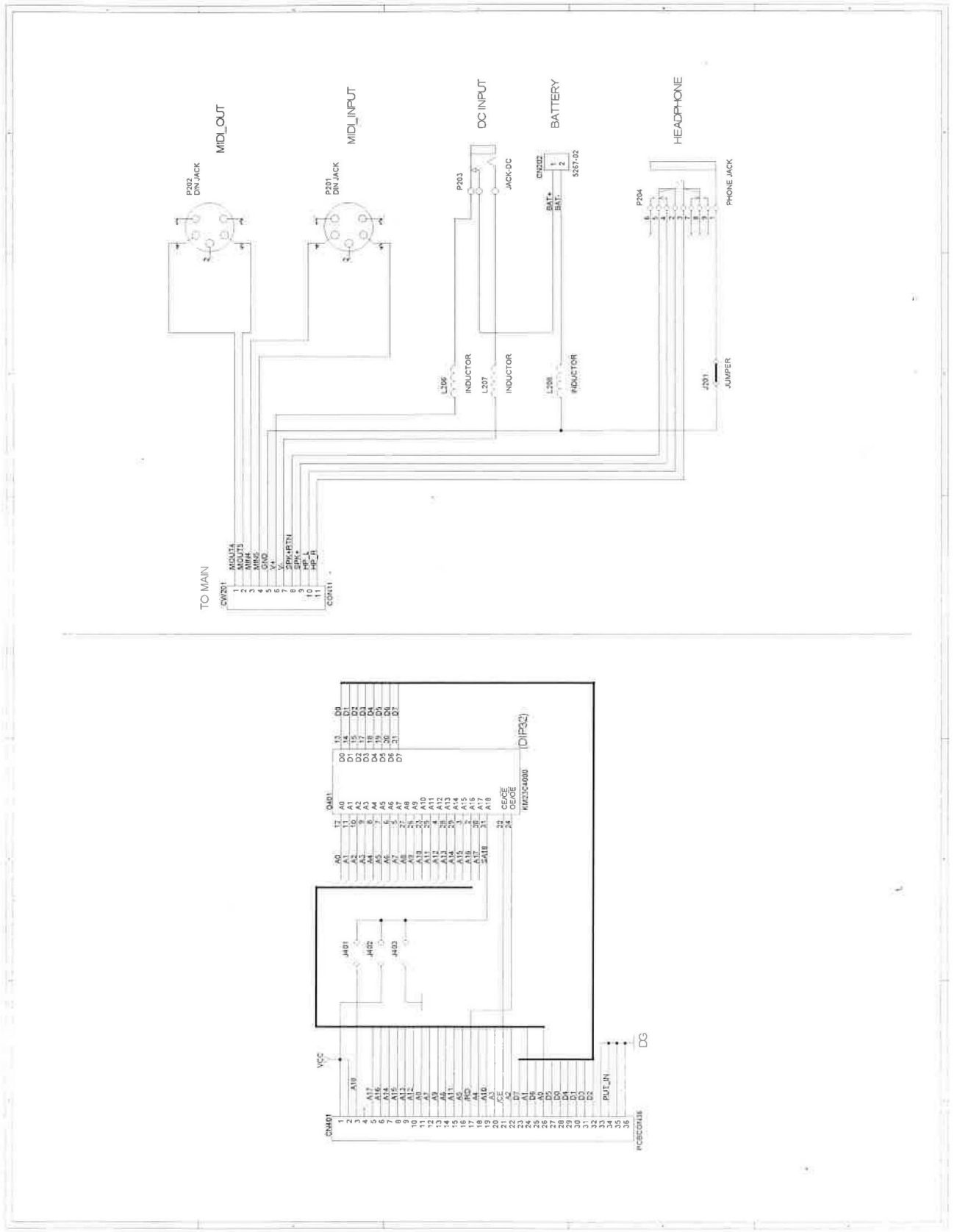
5-2. Console



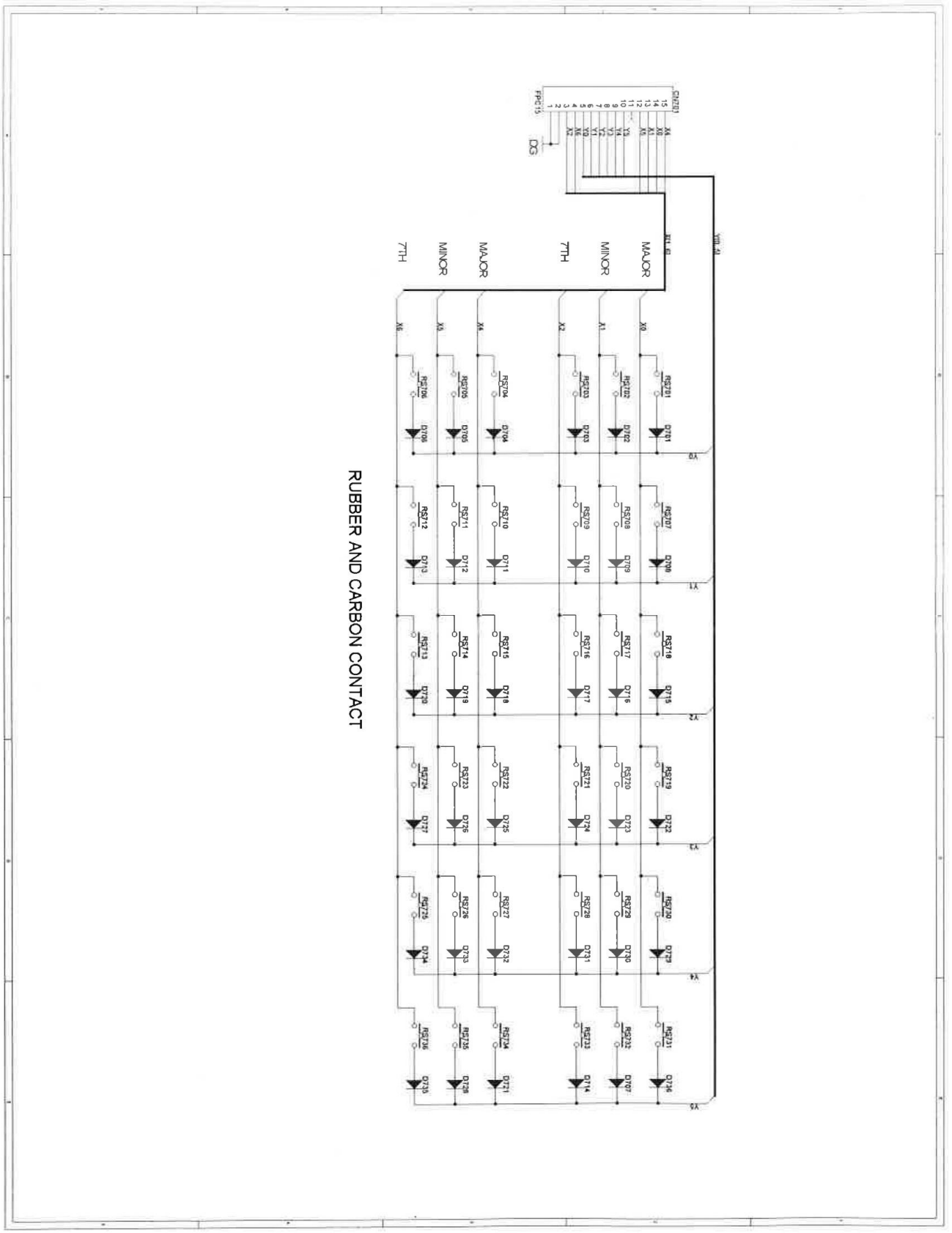
5-3. Main Power



5-4. Cartridag / Jack



5-5. Key Chord


RUBBER AND CARBON CONTACT
MAJOR
MINOR
7TH
MAJOR
MINOR
7TH
DG

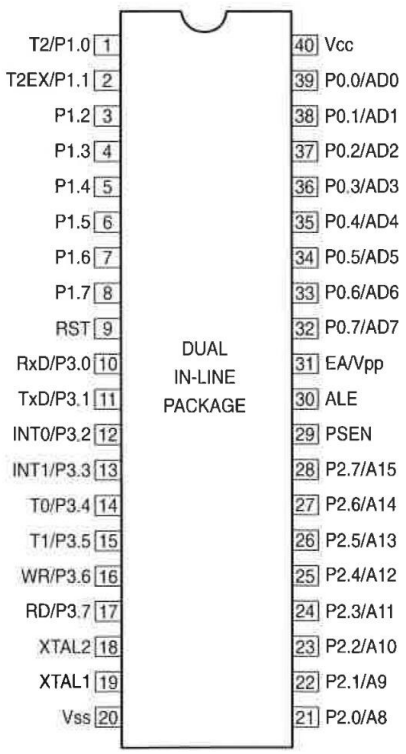
6. LSI FUNCTIONS IN SOUND P.C.BOARD

NAME	SPECIFICATION	FUNCTION
MPU/80C51	80C51BH (Q601)	- main MPU. Speed 24MHz - Control all LSI chip and I/O control - MIDI & Pitch-bend control
ROM	M27C512 (Q610)	- 512Kbit EPROM - include main program
RAM	GM76C256 (Q608)	- 256Kbit SRAM - Working RAM
Sound LSI	SAM9713 (Q615)	- Sound generate LSI(TQFP80 package) - synthesis - Effects - built-in PLL clock(38.4MHz)
Sound Source ROM	GM23C8100 (Q616)	- 8Mbit ROM(512K x 16, SOP44 package) - preset sound data(128 general MIDI sounds)
LSI For Effects	IS61C256 (Q617)	- 256Kbit SRAM - Effects RAM (acts as the digital effector, Reverb, Chorus, Tremolo, Pan)
Timer	KA555P (Q602)	- Pitch Bend control - One-shot multi-vibrator
D/A Converter	TDA1545 (Q618)	- 16 bit D/A Converter
Transparent Latch	74HC573 (Q605)	- address latch
D flip-flop	74HC574 (Q606,Q609)	- console LED control and driver
	74HC574 (Q621, Q607)	- LCD control
Line Decoder	74HC138 (Q611)	- Line selector for I/O control
	74HC154 (Q604)	- Line selector for console buttons, strumplate and chord buttons
Bus Buffer	74HC541 (Q612) (Q625)	- console button ,chord button and strumplate input - Q Card input control
OP Amp	KIA4558S (Q619)	- I/V converter for DAC

7. MAJOR LSI PIN FUCTION

1) M.P.U(80C51)

PIN NAME	PIN NO.	TYPE	FUNCTION
P1.0 - P1.7	1 - 8	I/O	Input Output Port
RESET	9	IN	RESET, input
RXD (P3.0)	10	IN	Serial Input
TXD (P3.1)	11	OUT	Serial Outpu
INT0 (P3.2)	12	I/O	Interrupt 0
INT1 (P3.3)	13	I/O	Interrupt 1
T0 (P3.4)	14	I/O	Timer Input 0
T1 (P3.5)	15	I/O	Timer Input 1
/WR (P3.6)	16	OUT	Write output
/RD (P3.7)	17	OUT	Read output
X1, X2	18 - 19	-	Crystal input
DGND	20	PWR	GND
P2.0 - P2.7	21 - 28	I/O	Input Output Port
PSEN	29	OUT	Program Store Enable
ALE	30	OUT	Address Latch Enable
/EA	31	IN	Enable program memo
P0.0 - P0.7	32 - 39	I/O	Input Output Port
VCC	40	PWR	



SU01063

2) Sound LSI(SAM9713)

PIN NAME	PIN NO.	TYPE	FUNCTION
GND	5, 14, 21, 23, 36, 38, 57, 61, 62, 65, 74	PWR	DIGITAL GND
VCC	1, 6, 13, 18, 22, 32, 56, 64, 80	PWR	POWER SUPPLY, 3.3V to 5.5V
VC3	7, 17, 63	PWER	CORE POWER SUPPLY, 3V to 4.5V
MIDI IN	15	IN	Serial MIDI IN
WA0-WA18	37, 39, 41-5, 58, 59	OUT	External ROM/RAM address for up to 512 K words(8Mbits) of memory. ROM memory holds firmware and PCM data. RAM memory holds working variables and effect delay lines.
WD0-WA15	66-73, 75-79, 2-4	I/O	External ROM/RAM data. Holds read data from ROM or RAM when /WOE is low, write data to RAM when /WWE is low.
/WCS0	29	OUT	External ROM chip select, active low
/WCS1	30	OUT	External ROM chip select, active low
/WOE	31	OUT	External ROM/RAM output enable, active low
/WWE	28	OUT	External RAM write, active low
RBS	20	OUT	RAM byte select. Used as lower address from RAM when 8 bit wide RAM is connected.
CLBD	19	OUT	Digital audio bit clock
WSBD	27	OUT	Digital audio left/right select
DABD0	25	OUT	Digital audio main stereo output
DABD1	26	OUT	Auxiliary digital stereo output.
DAC/DADD	24	IN	DAC type
X1, X2	10, 9	-	9.6MHz crystal connection.
LFT	8	-	PLL external RC network
/RESET	11	IN	Reset Input, active low.
/PDWN	12	IN	Power down, active low. When power down is active, then all outputs pins will be floated.
TEST0-TEST2	33, 34, 35	IN	Test pins. Should be grounded
RUN	16	OUT	When high, indicates that the synthesizer is up and running