SERVICE MANUAL

MIDI DIGITAL SAMPLER

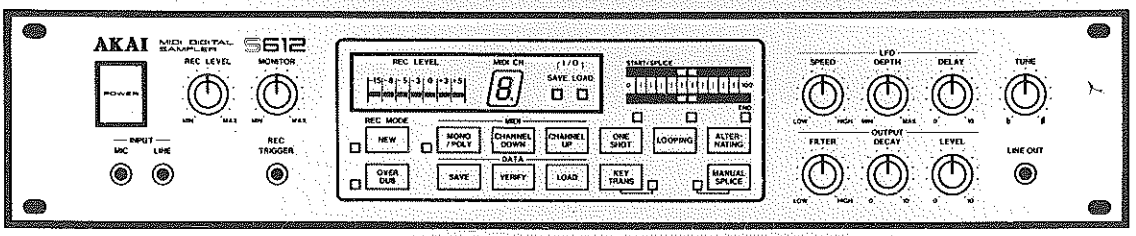
MODEL S612

SAMPLER DISK DRIVE

MODEL MD280

AKAI

AKAI SERVICE MANUAL



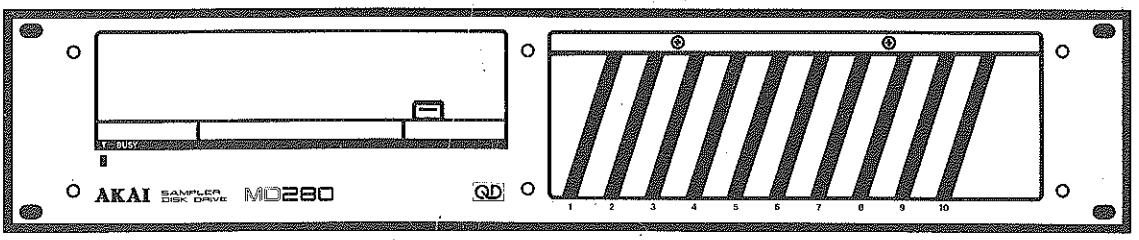
MODEL S612

MIDI DIGITAL SAMPLER

MODEL S612

SAMPLER DISK DRIVE

MODEL MD280



MODEL MD280

ABBREVIATION FOR SERVICE MANUAL

MODEL **S612**

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
ALTER	ALTERnating	MON	MONitor
BUSDIR	BUS DIRection	RFSH	ReFreSH
CASSR	CASSette Read	RXD	Receive Data
CASSW	CASSette Write	RD	RdaD
CH	CHannel	SHOT	one SHOT
CS	Chip Select	SIN	Signal INput
DUB	over DUB	SLTSL	SLoT SeLect
IORQ	I/O ReQuest	TRANS	TRANSpose
LOOP	LOOPing	TRIG	TRIGger
M1	Machin cycle 1	TXD	Transmit Data
MREQ	Memoly REQuest	V.REF	V.REFerence
MIDI	Musical instrument Digital Interface	WR	WRite

MODEL **MD280**

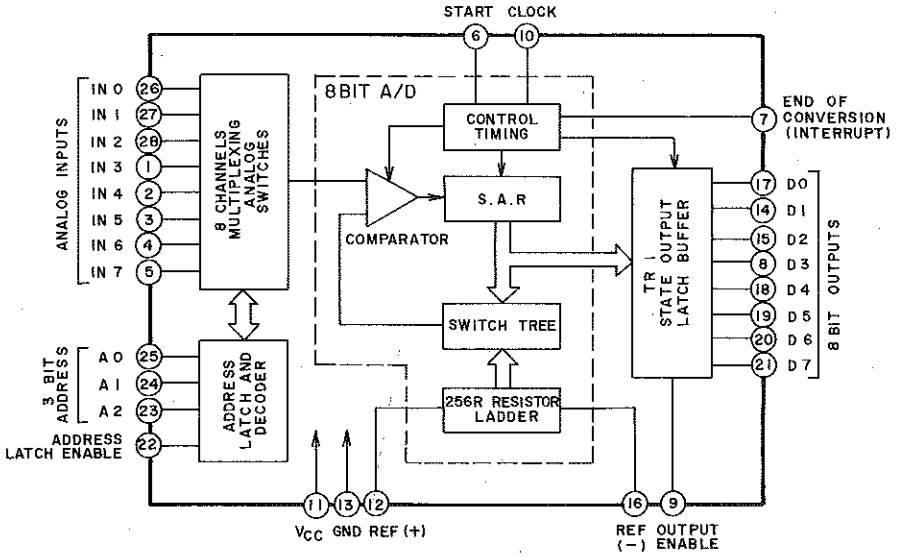
ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
B/A	channel B/channel A	MTON	MoTor ON
C/D	Command/Data	QD	Quick Disk
CE	Chip Enable	RD	ReaD
CRC	Cyclic Redandancy Check Character	RDDT	ReaD DaTa
CS	Chip Select	RTSA	Request To Send A
CTSA	Clear To Send A	RTSB	Request To Send B
D	system Data bus	RXCA	Receive Clock A
DCDA	Data Carrier Detect A	RXDA	Receive Data A
DCDB	Data Carrier Detect B	SIO	Serial Input Output
DIR	DIRection	SLTSL	SLoT SeLect
DTRB	Data Terminal Ready B	TXCA	Transmit Clock A
IEI	Interrupt Enable In	TXDA	Transmit Data A
IORQ	Input/Output ReQuest	WR	WRite
M1	Machine cycle 1	WRDT	WRite DaTa
MDST	Media SeT	WRGA	WRite GAte
MERQ	MEmory ReQuest	WRPR	WRite PRotect
MFM	Modified Frequency Modulation	ϕ	system clock

AKAI SERVICE MANUAL
(ADDITIONAL)

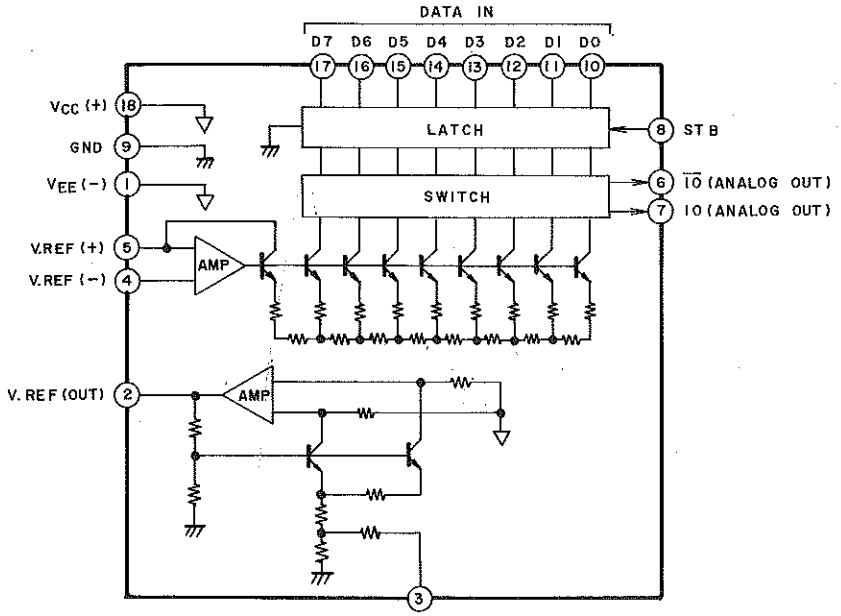
This additional Schematic Diagram is made for the Main PCB of model S612.
Use this additional Schematic Diagram with the model S612 Service Manual which published previously.

DIGITAL SAMPLER
MODEL S612

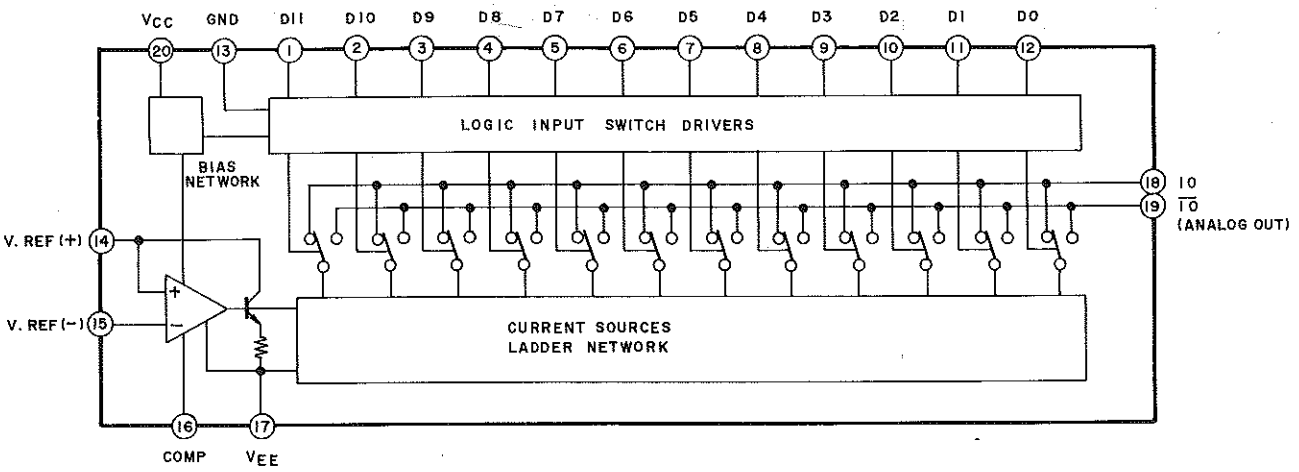
ADC0809 [8 BIT A/D CONVERTER]
(IC58)



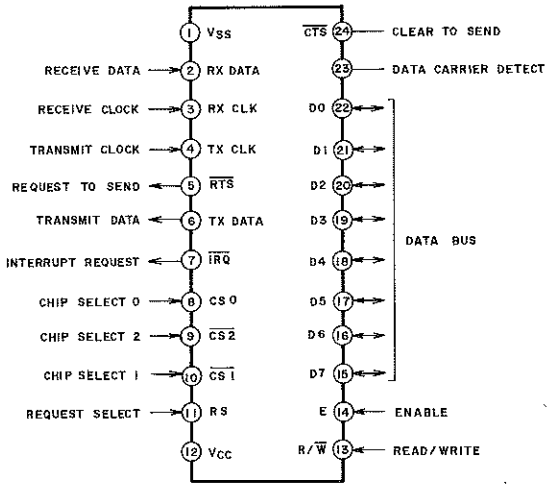
BA9201 [8BIT D/A CONVERTER]
(IC90 to 95)



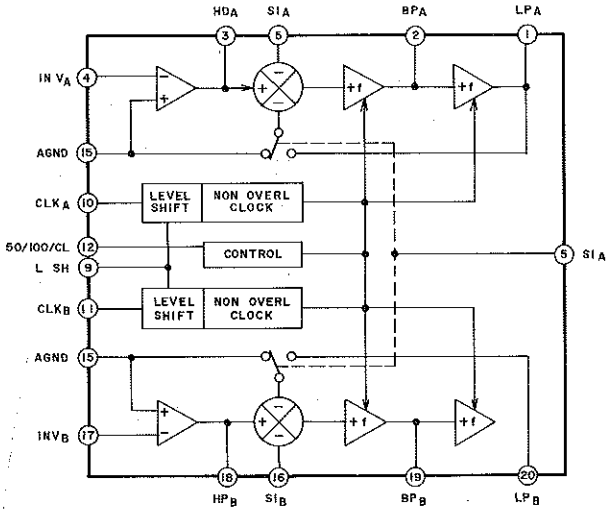
BA9221 [12BIT D/A CONVERTER]
(IC57/67)



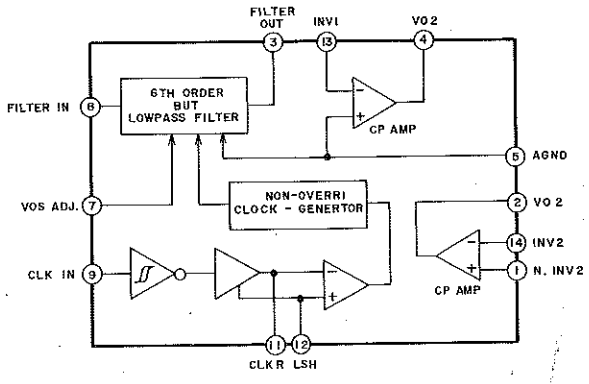
HD6850P (IC4)
[COMMUNICATION INTERFACE ADAPTER]



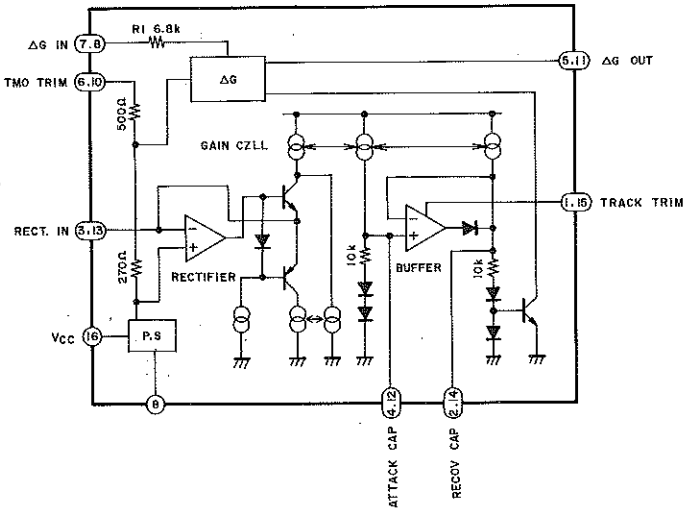
MF10CN (IC52)
[DUAL SWITCHED CAPACITOR FILTER]



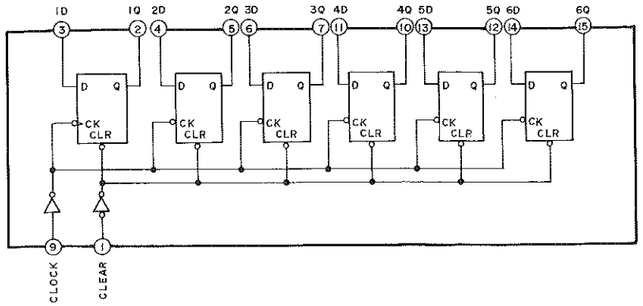
MF6CN-50 [LOWPASS FILTER]
(IC77 to 82)



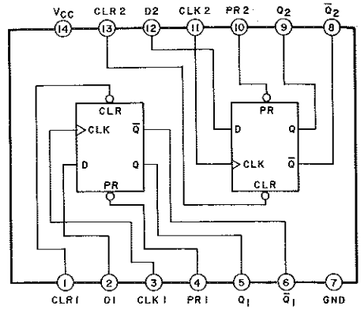
NE572S [ANALOG COMPANDOR]
(IC83,84,85)



TC74C174P [HEX D-FFs] (IC61, 62, 63)



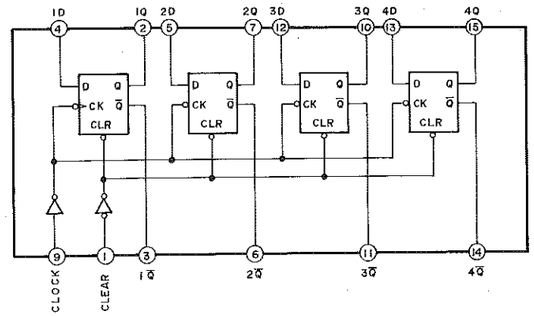
TC74HC74 [DUAL D FLIP-FLOP] (IC17 to 19)



FUNCTION TABLE

INPUTS				OUTPUTS	
PR	CLR	CLK	D	Q	Q̄
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H*	H*
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	L	X	Q0	Q̄0

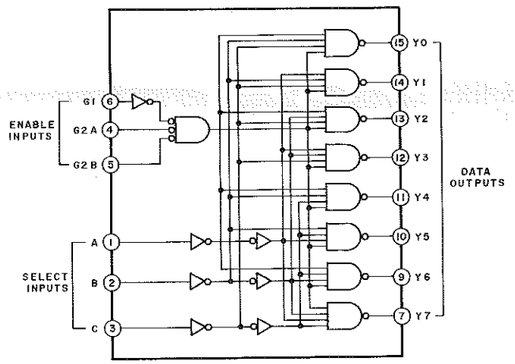
TC74HC175P [QUAD D-FFs] (IC60)



FUNCTION TABLE

INPUTS			OUTPUTS	
Clear	Clock	D	Q	Q̄
L	X	X	L	H
H	↑	H	H	L
H	↑	L	L	H
H	L	X	Q0	Q̄0

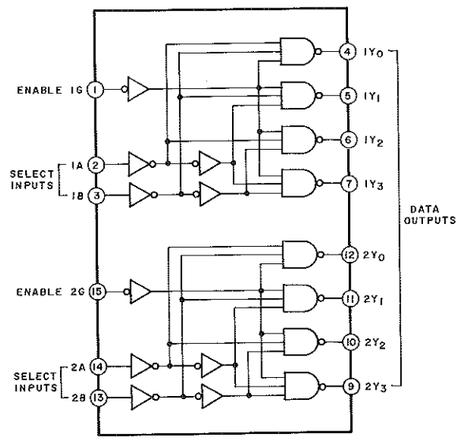
TC74HC138P [3 to 8 DEMULTIPLEXER] (IC11, 12)



FUNCTION TABLE

INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	G2*	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

TC74HC139P [DUAL 2 to 4 DEMULTIPLEXERS] (IC2)



FUNCTION TABLE

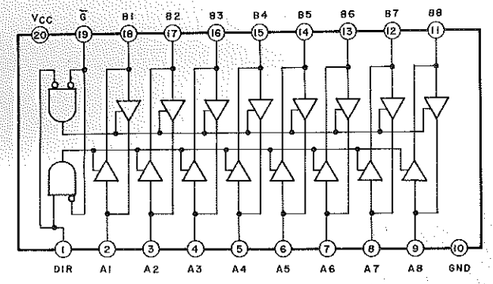
INPUTS			OUTPUTS			
ENABLE	SELECT					
G	B	A	Y0	Y1	Y2	Y3
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

TC74HC157P [2 to 1 DATA SELECTORS] (IC32, 33)

FUNCTION TABLE

INPUTS		OUTPUT
Select	Strobe G	Y
X	H	L
L	L	A
H	L	B

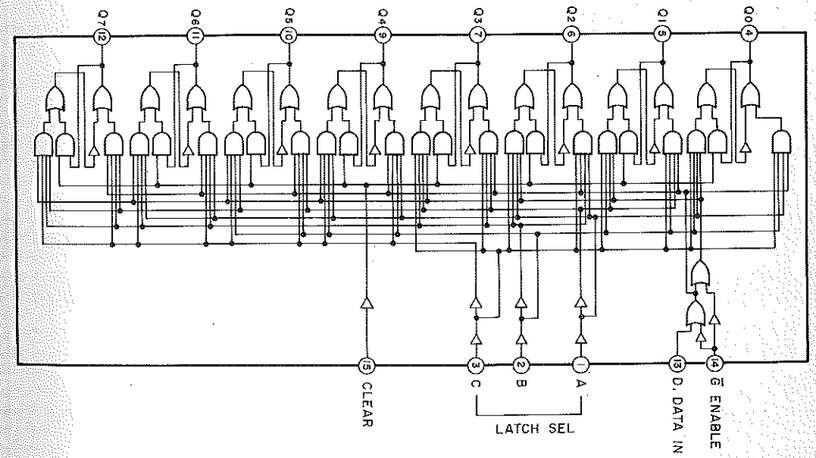
TC74HC245P [QCTAL 3 STATE TRANSCEIVER] (IC25)



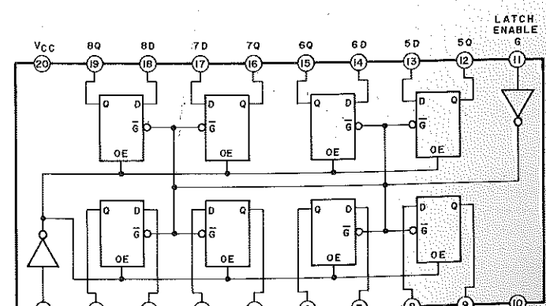
FUNCTION TABLE

Control Inputs		Operation
Ḡ	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

TC74HC259P [8 BIT ADDRESSABLE LATCHES] (IC42, 43)



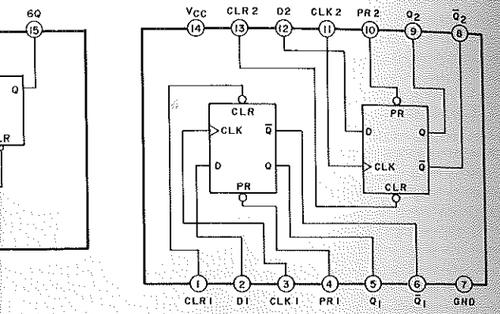
TC74HC373 [3 STATE OCTAL D-TYPE LATCH] (IC21)



FUNCTION TABLE

Output Control	Latch Enable G	Data	373 Output
L	H	H	H
L	H	L	L
L	L	X	Q0
H	X	X	Z

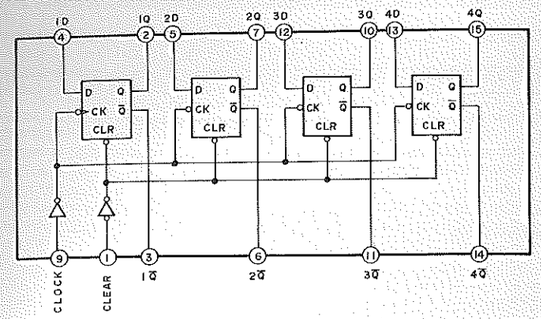
TC74HC74 [DUAL D FLIP-FLOP] (IC17 to 19)



FUNCTION TABLE

INPUTS				OUTPUTS	
PR	CLR	CLK	D	Q	Q̄
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H*	H*
H	H	↑	H	H	L
H	H	↑	L	L	H
H	H	L	X	Q0	Q̄0

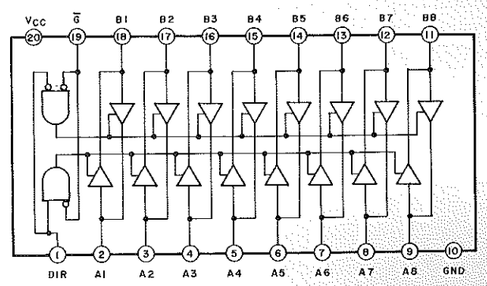
TC74HC175P [QUAD D-FFs] (IC60)



FUNCTION TABLE

INPUTS			OUTPUTS	
Clear	Clock	D	Q	Q̄
L	X	X	L	H
H	↑	H	H	L
H	↑	L	L	H
H	L	X	Q0	Q̄0

TC74HC245P [QCTAL 3 STATE TRANSCEIVER] (IC25)



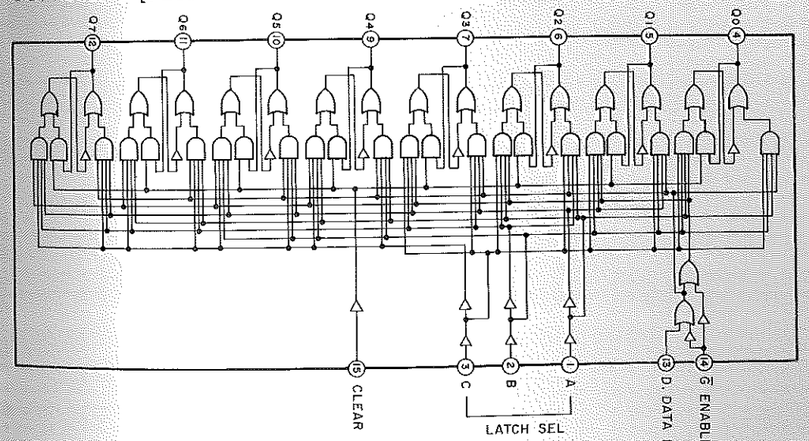
FUNCTION TABLE

Control Inputs		Operation
G̅	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

FUNCTION TABLE

INPUTS				OUTPUTS							
ENABLE		SELECT									
G1	G2*	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L

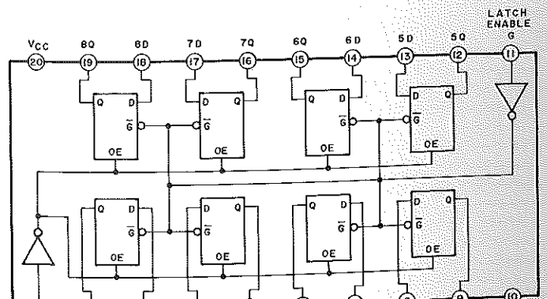
TC74HC259P [8 BIT ADDRESSABLE LATCHES] (IC42, 43)



FUNCTION TABLE

INPUTS			OUTPUTS			
ENABLE	SELECT					
G	B	A	Y0	Y1	Y2	Y3
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

TC74HC373 [3 STATE OCTAL D-TYPE LATCH] (IC21)



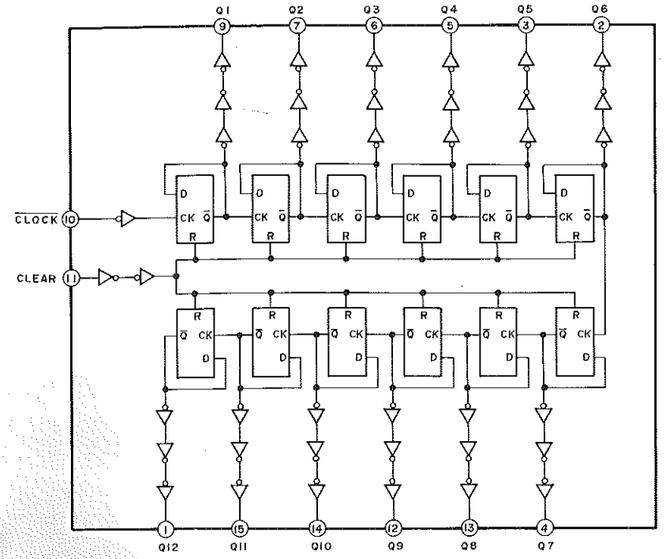
FUNCTION TABLE

Output Control	Latch Enable G	Data	373 Output
L	H	H	H
L	H	L	L
L	L	X	Q0
H	X	X	Z

FUNCTION TABLE

INPUTS		OUTPUT
Select	Strobe G	Y
X	H	L
L	L	A
H	L	B

TC74HC4040P [12-STAGE BINARY COUNTER] (IC23, 24)

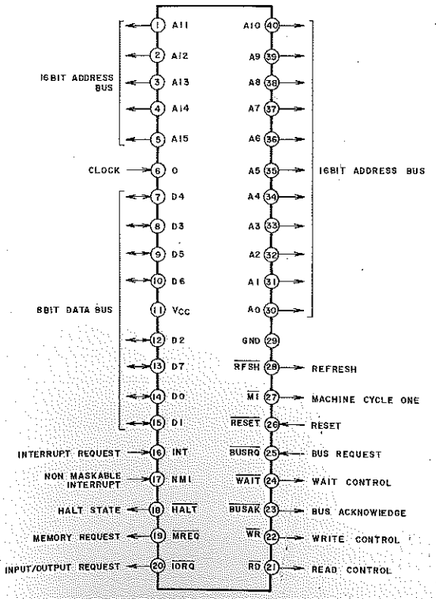


FUNCTION TABLE

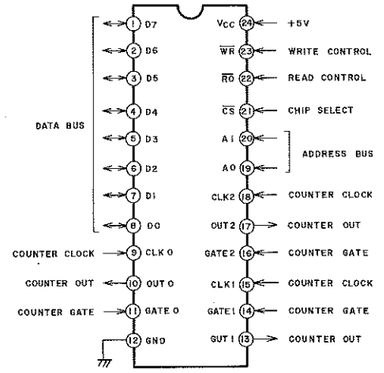
CLOCK	CLEAR	OUTPUT STATE
X	H	ALL OUTPUTS = "L"
↑	L	NO CHANGE
↓	L	ADVANCE TO NEXT STATE

X: DON'T CARE

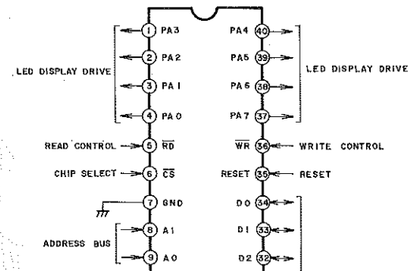
μPD780C [8 BIT CPU] (IC1)



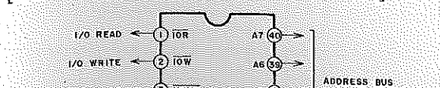
μPD710540P [PROGRAMMABLE μPD8253C-2 INTERVAL TIMER] (IC5, 6, 7, 8)



μPD8255 AC-2 [INTER FACE] (IC41)



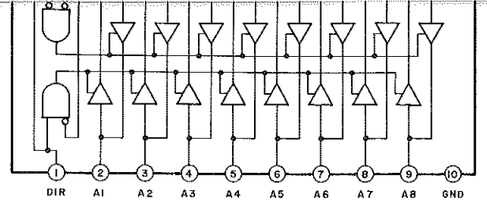
μPD8237 AC-5 (IC9, 10) [PROGRAMBLE DMA CONTROLER]



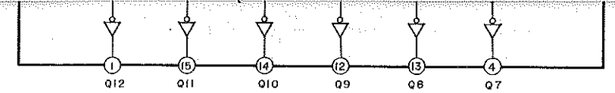
H	H	L	X	Q0	Q0

FUNCTION TABLE

INPUTS					OUTPUTS						
ENABLE		SELECT									
G1	G2*	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L



G	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

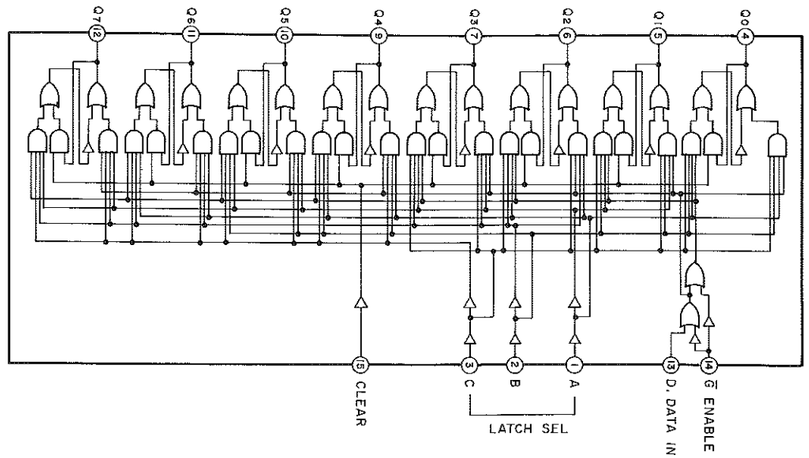


FUNCTION TABLE

CLOCK	CLEAR	OUTPUT STATE
X	H	ALL OUTPUTS = "L"
↑	L	NO CHANGE
↓	L	ADVANCE TO NEXT STATE

X: DON'T CARE

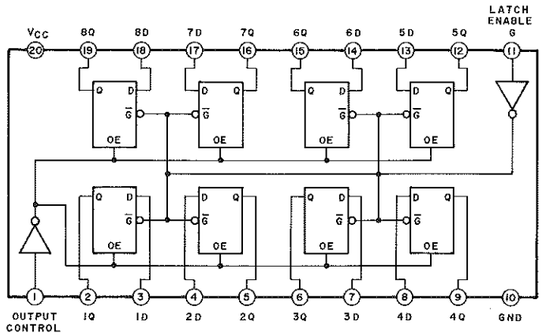
TC74HC259P [8 BIT ADDRESSABLE LATCHES] (IC42, 43)



FUNCTION TABLE

INPUTS		OUTPUTS			
ENABLE	SELECT				
G	B	A	Y0	Y1	Y2	Y3
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

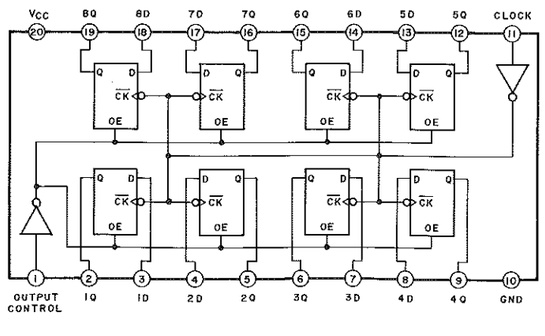
TC74HC373 [3 STATE OCTAL D-TYPE LATCH] (IC21)



FUNCTION TABLE

Output Control	Latch Enable G	Data	373 Output
L	H	H	H
L	H	L	L
L	L	X	Q0
H	X	X	Z

TC74HC374 [3 STATE OCTAL D-TYPE FLIP-FLOP] (IC54)



FUNCTION TABLE

Output Control	Clock	Data	Output
L	↑	H	H
L	↑	L	L
L	L	X	Q0
H	X	X	Z

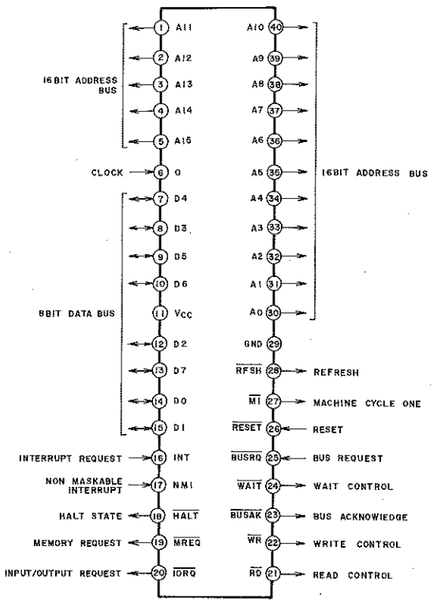
FUNCTION TABLE

INPUTS		OUTPUT
Select	Strobe G	Y
X	H	L
L	L	A
H	L	B

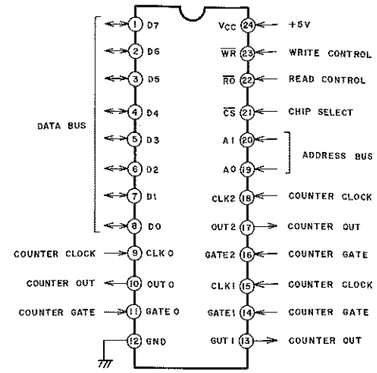
FUNCTION TABLE

INPUT						OUTPUTS
Clear	CK	Enable		Output control		QA ~ QD
		G1	G2	M	N	
L		L	L	–		1D ~ 4D
L	↑	H	X	–		–
		X	H			
H	X	X	X	–		LLLL
–				H	X	Z
				X	H	

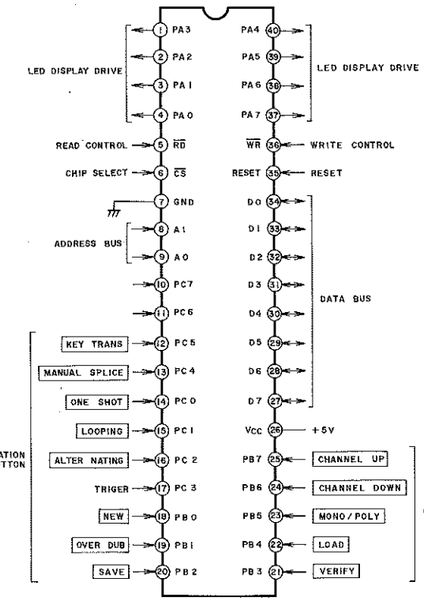
μPD780C [8 BIT CPU] (IC1)



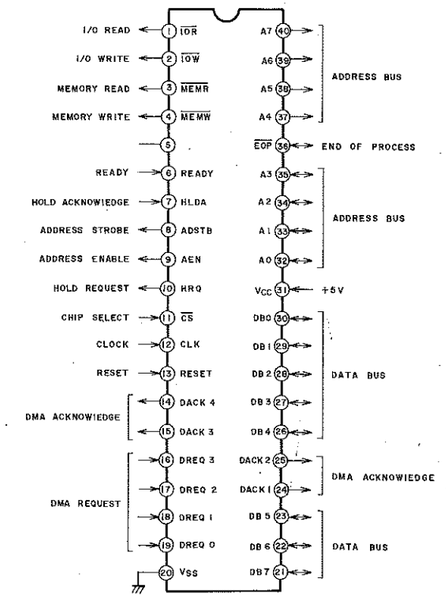
μPD710540P [PROGRAMMABLE μPD8253C-2 INTERVAL TIMER] (IC5, 6, 7, 8)



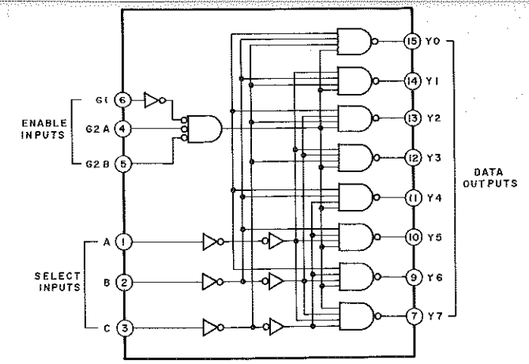
μPD8255 AC-2 [INTER FACE] (IC41)



μPD8237 AC-5 (IC9, 10) [PROGRAMBLE DMA CONTROLER]



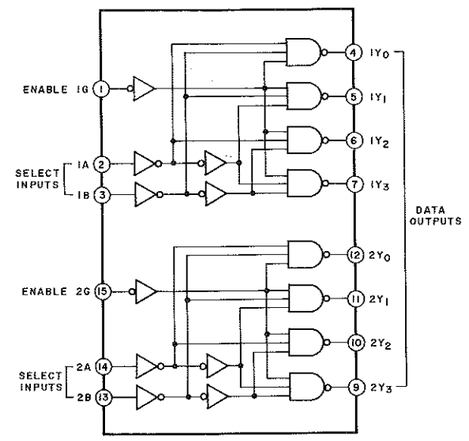
H	H	L	X	Q0	Q0



TC74HC139P [DUAL 2 to 4 DEMULTIPLEXERS]
(IC2)

FUNCTION TABLE

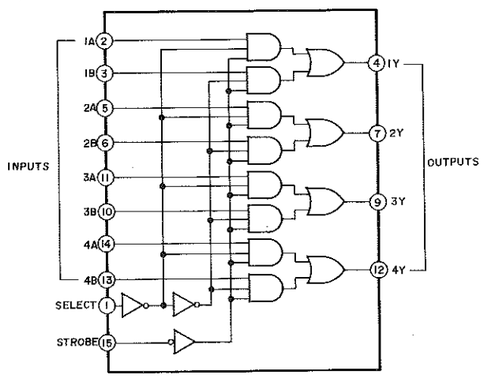
INPUTS					OUTPUTS							
ENABLE		SELECT										
G1	G2*	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H	H
H	L	H	L	L	H	H	H	H	L	H	H	H
H	L	H	L	H	H	H	H	H	H	L	H	H
H	L	H	H	L	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	H	L



FUNCTION TABLE

INPUTS			OUTPUTS			
ENABLE	SELECT					
G	B	A	Y0	Y1	Y2	Y3
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

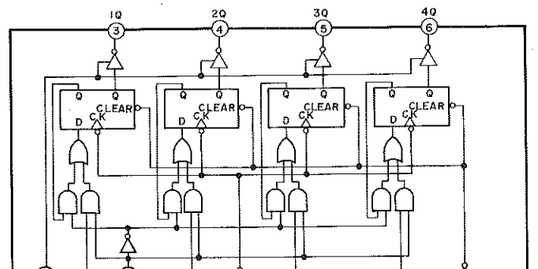
TC74HC157P [2 to 1 DATA SELECTORS]
(IC32, 33)



FUNCTION TABLE

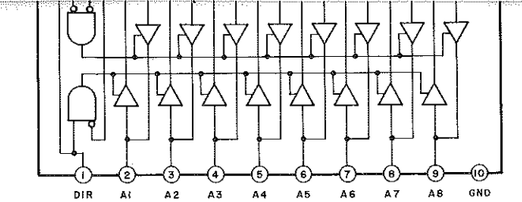
INPUTS		OUTPUT
Select	Strobe G	Y
X	H	L
L	L	A
H	L	B

TC74HC173P [4BIT REGISTER 3-STATE]
(IC55)



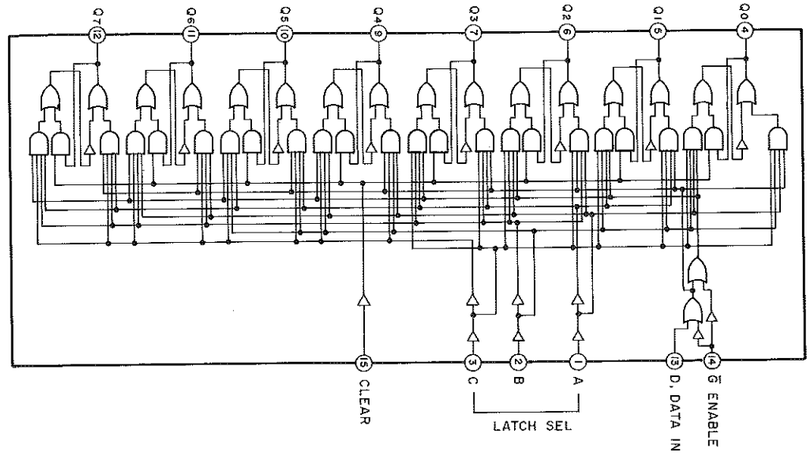
FUNCTION TABLE

INPUT						OUTPUTS QA ~ QD
Clear	CK	Enable		Output control		
		G1	G2	M	N	
L		L	L	–		1D ~ 4D
L	↑	H	X	–		–
		X	H			
H	X	X	X	–		LLLL
–				H	X	Z
				X	H	

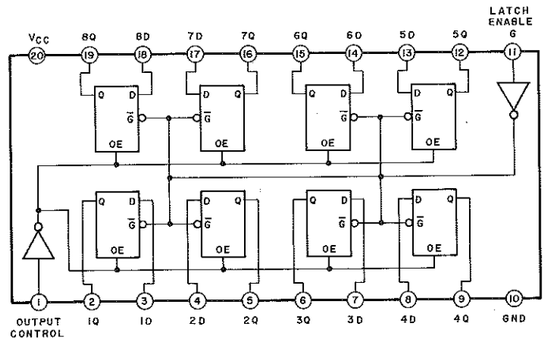


G	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

TC74HC259P [8 BIT ADDRESSABLE LATCHES] (IC42, 43)



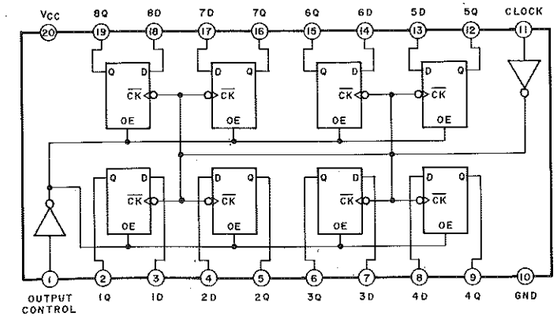
TC74HC373 [3 STATE OCTAL D-TYPE LATCH]
(IC21)



FUNCTION TABLE

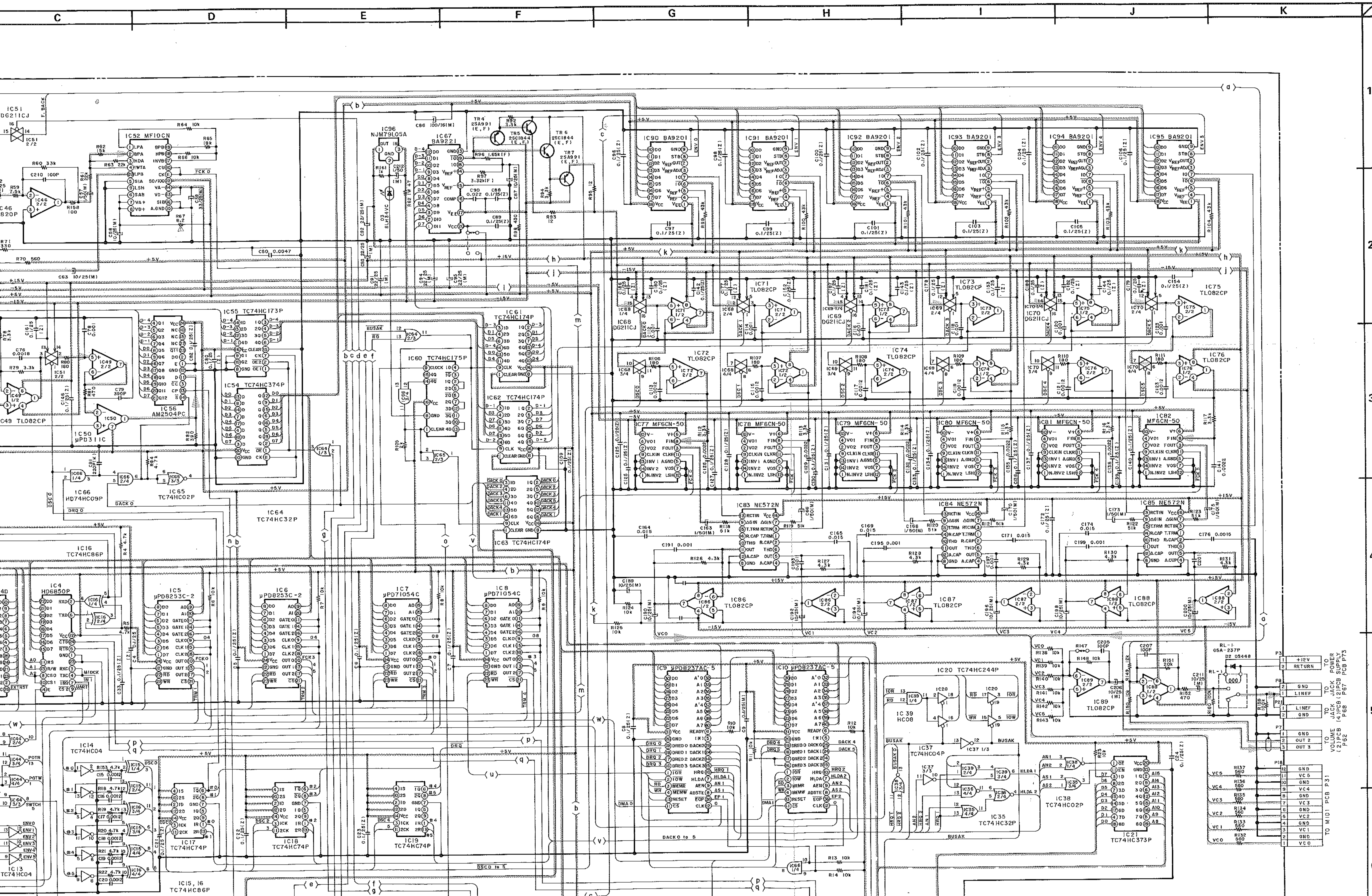
Output Control	Latch Enable G	Data	373 Output
L	H	H	H
L	H	L	L
L	L	X	Q_0
H	X	X	Z

TC74HC374 [3 STATE OCTAL D-TYPE FLIP-FLOP]
(IC54)

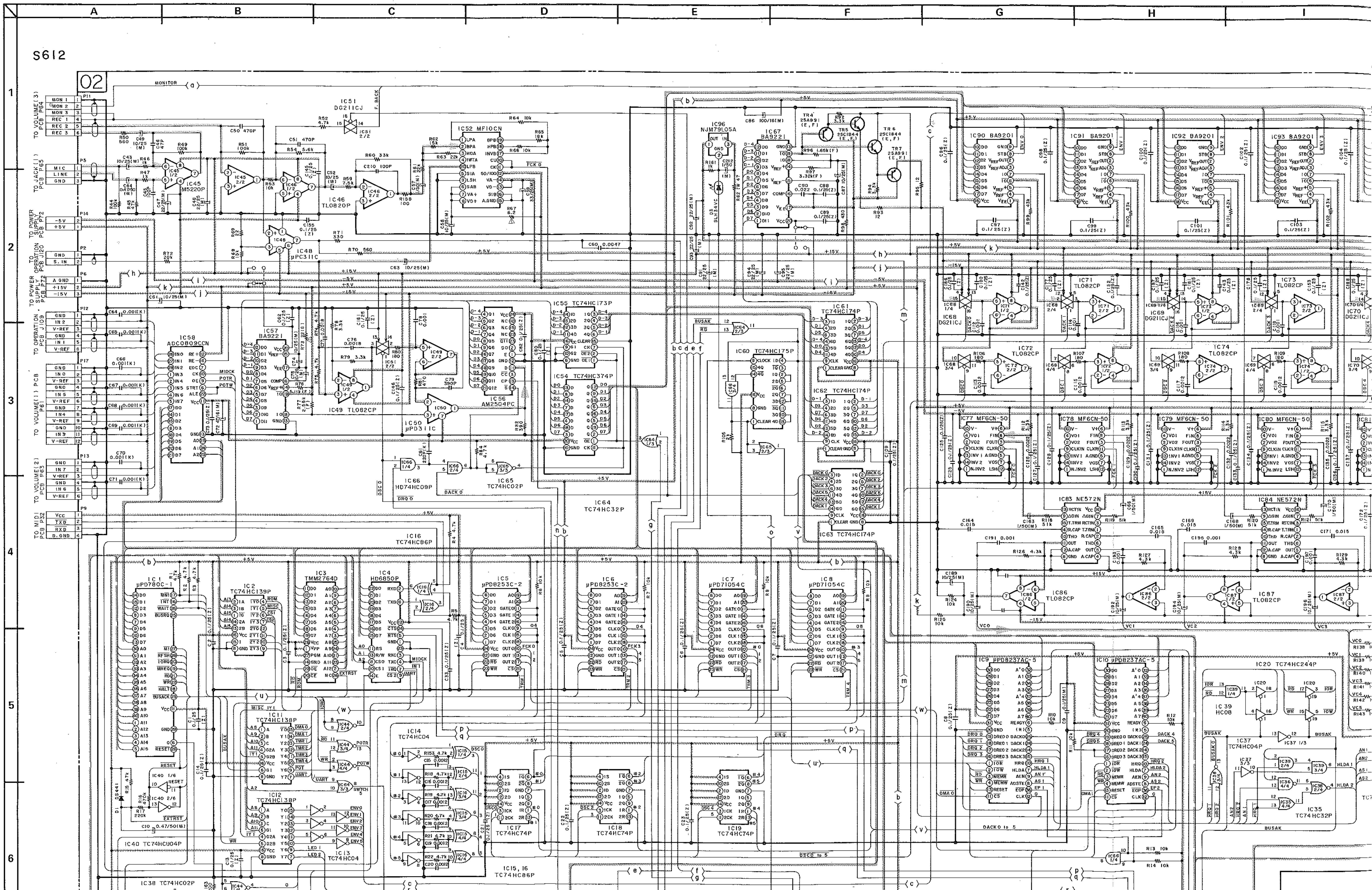


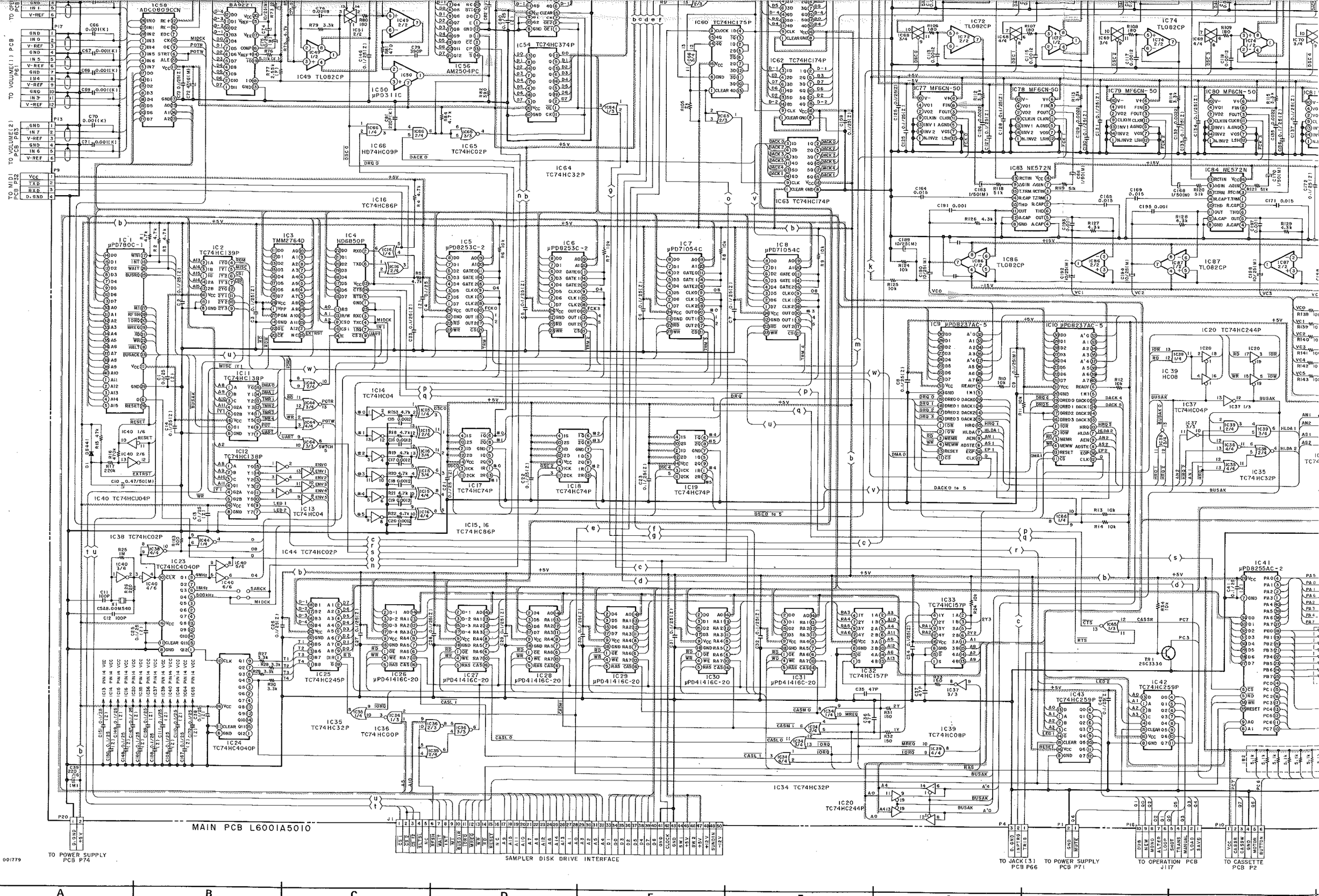
FUNCTION TABLE

Output Control	Clock	Data	Output
L	↑	H	H
L	↑	L	L
L	L	X	Q_0
H	X	X	Z



C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
IC51 DG211CJ
IC52 MF10CN
IC46 TL082CP
IC96 NJM79L05A
IC67 BA9221
TR4 2SA991 (E,F)
TR5 2SC1844 (E,F)
TR6 2SC1844 (E,F)
TR7 2SA991 (E,F)
IC90 BA9201
IC91 BA9201
IC92 BA9201
IC93 BA9201
IC94 BA9201
IC95 BA9201
IC68 DG211CJ
IC69 DG211CJ
IC70 DG211CJ
IC71 TL082CP
IC72 TL082CP
IC73 TL082CP
IC74 TL082CP
IC75 TL082CP
IC76 TL082CP
IC49 TL082CP
IC50 μPD311C
IC55 TC74HC173P
IC54 TC74HC374P
IC56 AM2504PC
IC61 TC74HC174P
IC60 TC74HC175P
IC62 TC74HC174P
IC63 TC74HC174P
IC64 TC74HC32P
IC65 TC74HC02P
IC66 HD74HC09P
IC77 MF6CN-50
IC78 MF6CN-50
IC79 MF6CN-50
IC80 MF6CN-50
IC81 MF6CN-50
IC82 MF6CN-50
IC83 NE572N
IC84 NE572N
IC85 NE572N
IC86 TL082CP
IC87 TL082CP
IC88 TL082CP
IC16 TC74HC86P
IC4 HD6850P
IC5 μPD8253C-2
IC6 μPD8253C-2
IC7 μPD71054C
IC8 μPD71054C
IC9 μPD8237AC-5
IC10 μPD8237AC-5
IC20 TC74HC244P
IC39 HC08
IC37 TC74HC04P
IC38 TC74HC02P
IC35 TC74HC32P
IC21 TC74HC373P
IC89 TL082CP
IC14 TC74HC04
IC13 TC74HC04
IC17 TC74HC74P
IC18 TC74HC74P
IC19 TC74HC74P
IC15, 16 TC74HC86P
RL-1 G5A-237P
+12V
RETURN
TO POWER SUPPLY PCB P73
GND
LINEF
TO JACK PCB P67 (2P)
TO JACK PCB P68
GND
OUT 2
OUT 3
TO VOLUME PCB P62
VC5
VC4
VC3
VC2
VC1
VC0
TO MIDI PCB P31
DACK0 to 5
DSC0 to 5
BUSAK


S612
02
A
B
C
D
E
F
G
H
I
1
2
3
4
5
6
TO VOLUME(3) PCB P64
TO JACK(1) PCB P65
TO POWER SUPPLY PCB P72
TO OPERATION PCB J120
TO POWER SUPPLY PCB P72
TO OPERATION PCB J109
TO VOLUME(1) PCB P61
TO VOLUME(2) PCB P63
TO MIDI PCB P32
MONITOR
IC51 DG211CJ
IC52 MF10CN
IC45 M5220P
IC46 TL082CP
IC48 μPC311C
IC96 NJM79L05A
IC67 BA9221
IC90 BA9201
IC91 BA9201
IC92 BA9201
IC93 BA9201
IC58 ADC0809CCN
IC57 BA9221
IC49 TL082CP
IC50 μPD311C
IC56 AM2504PC
IC55 TC74HC173P
IC54 TC74HC374P
IC61 TC74HC174P
IC60 TC74HC175P
IC62 TC74HC174P
IC63 TC74HC174P
IC64 TC74HC32P
IC65 TC74HC02P
IC66 HD74HC09P
IC68 DG211CJ
IC69 DG211CJ
IC70 DG211CJ
IC71 TL082CP
IC72 TL082CP
IC73 TL082CP
IC74 TL082CP
IC77 MF6CN-50
IC78 MF6CN-50
IC79 MF6CN-50
IC80 MF6CN-50
IC83 NE572N
IC84 NE572N
IC86 TL082CP
IC87 TL082CP
IC16 TC74HC86P
IC1 μPD780C-1
IC2 TC74HC139P
IC3 TMM2764D
IC4 HD6850P
IC5 μPD8253C-2
IC6 μPD8253C-2
IC7 μPD71054C
IC8 μPD71054C
IC9 μPD8237AC-5
IC10 μPD8237AC-5
IC20 TC74HC244P
IC39 HC08
IC37 TC74HC04P
IC35 TC74HC32P
IC11 TC74HC138P
IC12 TC74HC138P
IC13 TC74HC04
IC14 TC74HC04
IC15, 16 TC74HC86P
IC17 TC74HC74P
IC18 TC74HC74P
IC19 TC74HC74P
IC40 TC74HCU04P
IC38 TC74HC02P
DACK0 to 5
DSC0 to 5
BUSAK


IC1 μPD780C-1
IC2 TC74HC139P
IC3 TMM2764D
IC4 HD6850P
IC5 μPD8253C-2
IC6 μPD8253C-2
IC7 μPD71054C
IC8 μPD71054C
IC9 μPD8237AC-5
IC10 μPD8237AC-5
IC11 TC74HC138P
IC12 TC74HC138P
IC13 TC74HC04
IC14 TC74HC04
IC15, 16 TC74HC86P
IC16 TC74HC86P
IC17 TC74HC74P
IC18 TC74HC74P
IC19 TC74HC74P
IC20 TC74HC244P
IC23 TC74HC4040P
IC24 TC74HC4040P
IC25 TC74HC245P
IC26 μPD41416C-20
IC27 μPD41416C-20
IC28 μPD41416C-20
IC29 μPD41416C-20
IC30 μPD41416C-20
IC31 μPD41416C-20
IC32 TC74HC157P
IC33 TC74HC157P
IC34 TC74HC32P
IC35 TC74HC32P
IC36 TC74HC00P
IC37 TC74HC04P
IC38 TC74HC02P
IC39 TC74HC08P
IC40 TC74HCU04P
IC41 μPD8255AC-2
IC42 TC74HC259P
IC43 TC74HC259P
IC44 TC74HC02P
IC49 TL082CP
IC50 μPD3111C
IC54 TC74HC374P
IC56 AM2504PC
IC58 ADC0809CCN
IC60 TC74HC175P
IC62 TC74HC174P
IC63 TC74HC174P
IC64 TC74HC32P
IC65 TC74HC02P
IC66 HD74HC09P
IC72 TL082CP
IC74 TL082CP
IC77 MF6CN-50
IC78 MF6CN-50
IC79 MF6CN-50
IC80 MF6CN-50
IC83 NE572N
IC84 NE572N
IC86 TL082CP
IC87 TL082CP
MAIN PCB L6001A5010
SAMPLER DISK DRIVE INTERFACE
TO POWER SUPPLY PCB P74
TO JACK (3) PCB P66
TO POWER SUPPLY PCB P71
TO OPERATION PCB J117
TO CASSETTE PCB P2
TO VOLUME(1) PCB
TO VOLUME(2) PCB
TO MIDI PCB P32
001779

S612 MAIN SCHEMATIC DIAGRAM NO. 860835A

B(POWER SUPPLY) LINE
DATA BUS LINE
ADDRESS BUS LINE
AUDIO SIGNAL LINE

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W(J)
ALL CAPACITORS IN μF 50 WV(J)

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS
AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

SAMPLER DISK DRIVE INTERFACE
TO JACK(3) PCB P66
TO POWER SUPPLY PCB P71
TO OPERATION PCB J117
TO CASSETTE PCB P2
TO OPERATION PCB J118
TO OPERATION PCB J119
TO JACK JACK POWER SUPPLY (4)PCB (2)PCB P67 P68 P69
TO VOLUME (2)PCB P62
TO MIDI PCB P31

C D E F G H I J K

1 2 3 4 5 6

IC51-1/2 DG211CJ — FEED BACK — SUPED

IC52 MF10CN — LPF — FCK0

IC49-1/2 TL082CP — IC51-1/2 DG211CJ — IC49-2/2 TL082CP — DSC0

IC46-2/2 820P

IC50 μPC311C — COMP

A/D CONVERTER

IC57 BA9221 — D0 — D11 — I/O

IC56 AM2504C — Q1 — Q12 — D

IC54 74HC374P — ID ~ 8D — IQ ~ 8Q

IC55 74HC173P — ID ~ 4D — IQ ~ 4Q

D0 to 7 — D-1 to D-4

DATA BUS

IC 3 TMM2764D — EP-ROM — A0 ~ A12 — A0 to 12

IC 4 HD6850P — RDX — TXD — MIDI INTER FACE — RS/RW/CSΦ — A0, A1,2

IC 5 μPD8253C -2 — CLK 0 to 2 — OUT 0 to 2 — COUNTER — A0, A1 — FCK 0 to 2

IC 6 μPD8253C -2 — OUT 0 to 2 — COUNTER — FCK 3 to 5

IC 7 μPD71054C — OUT 0 to OUT 2 — COUNTER

IC 8 μPD71054C — OUT 0 to OUT 2 — COUNTER

IC 9 μPD8237AC-5 — DRQ0 DACK0 — DRQ3 DACK3 — DMA — A0 to 7 — DRQ0 to 3

IC10 μPD8237AC-5 — DRQ0 DACK0 — DRQ1 DACK1 — DMA — A0 to 7 — DRQ4, 5 — DRCK 4,5

DSC0 to 5

IC17 to 19 74HC74P — 1R 2R — 1Q 2Q

FCK 0 to 5

ADDRESS BUS

IC25 TC74HC245P — B5

IC26 μPD41416C-20 — IC27 μPD41416C-20 — IC28 μPD41416C-20 — IC29 μPD41416C-20 — IC30 μPD41416C-20 — IC31 μPD41416C-20 — RAI

A0 — A3 to 6 A10 to 13 — A1, 2 A8, 9

IC32 TC74HC157P — 1A ~ 4B — 1Y ~ 3Y

IC33 TC74HC157P — 3A ~ 4B

ENV0 to 5

IC90 BA9201 — IC91 BA9201 — IC92 BA9201 — IC93 BA9201 — IC94 BA9201 — IC95 BA9201 — D0 ~ D7 — STB — D/A CONVERTER — D/A CONV. — IO

IC61 74HC174P — D0,1,4,5 — D-3,4 — F.F — ID — IQ — 6D — 6Q

IC62 74HC174P — D2,3,6,7 — D-1,2

IC67 BA9221 — D0 — D11 — I/O — D/A CONV.

BUFFER — TR4,5,6,7

IC68-1/4 DG211CJ — IC71-1/2 TL082C — S/H — IC68-3/4 DG211CJ — IC72-2/2 TL082C — AMP — IC77 MF6CN-50 — LPF — VOICE 1

DACK 0 — DSC0 — FCK1

VOICE 2 — DACK1 — DSC1 — FCK2 — VOICE 2

VOICE 6 — DACK 5 — DSC5 — FCK6 — VOICE 6

IC14 TC74HC04 — IC15,16 TC74HC86P — DSC0 to DSC5

DACK 0 to 5 — F.F — IC63 74HC174P

IC83 NE572N — VCA 1 — VCA 2 — VOICE 1 — RECT IN — VOICE 2

IC86-1/2 TL082CP — AMP — R138 — R139

IC89-2/2 TL082CP — MONITOR — VR9 — VR (3) PCB — IC89-1/2 TL082CP — RL-1

P18 — VOICE OUT — R132 to 137

P8 — FRONT LINE OUT

P21 — REAR LINE OUT

IC85 NE572N — VCA 6 — VOICE 6 — RECT IN

IC88-2/2 TL082CP — R148 — MIX

A0 to 3 — A ~ D — IC43 TC74HC 259P — IC42 TC74HC 259P — Q0

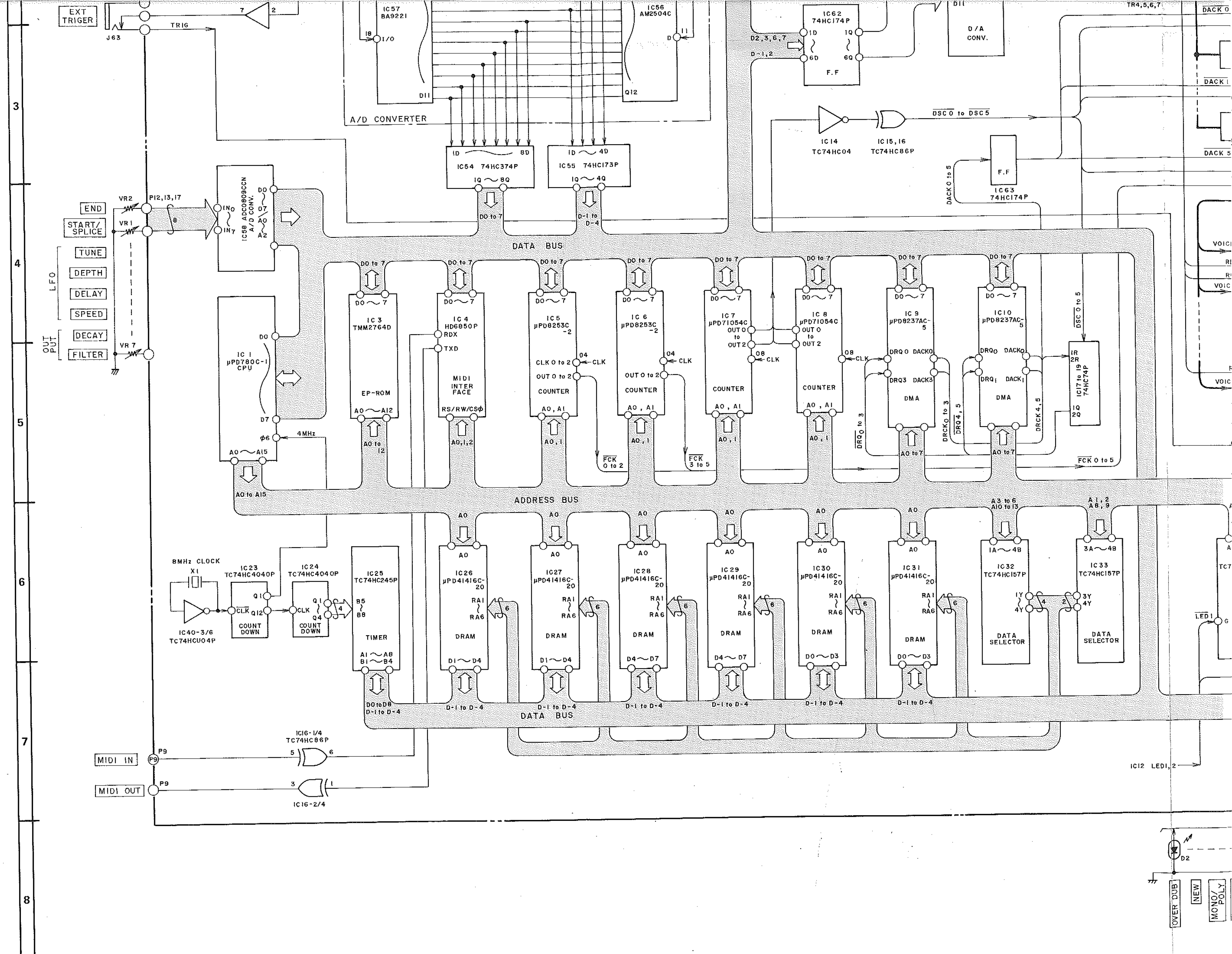
TRG — TR1 — PC3

A0, A1 — PA0 ~ PA7 — P15 — MIDICH 9

A | B | C | D | E | F | G | H

1 2 3 4 5 6

REC LEVEL
VR 8
MIC IN
LINE IN
REC LEVEL IND
EXT TRIGER
J63
TRIG
P11
P5
P2
P4
IC51-1/2 DG211CJ
FEED BACK
SUPED
IC52 MF10CN
LPF
FCK 0
IC45-1/2 IC45-2/2 M5220
IC46-1/2 IC46-2/2 TL0820P
IC49-1/2 TL082CP
IC51-1/2 DG211CJ
IC49-2/2 TL082CP
DSC0
IC50 μPC311C
COMP
IC48 μPC311C
A/D CONVERTER
IC57 BA9221
I/O
IC56 AM2504C
IC54 74HC374P
IC55 74HCI73P
D0 to 7
D-1 to D-4
ENV0 to 5
IC61 74HCI74P
IC62 74HCI74P
F.F
D0,1,4,5
D-3,4
D2,3,6,7
D-1,2
IC67 BA9221
D/A CONV.
IC90 BA9201
D/A CONVERTER TO
STB
BUFFER
TR4,5,6,7
IC68-D621
DACK 0
DACK 1
DACK 5
IC14 TC74HC04
IC15,16 TC74HC86P
DSC0 to DSC5
DACK 0 to 5
IC63 74HCI74P
VOICE 1
RECT
RECT
VOICE 2
RECT
VOICE 6
END
START/ SPLICE
LFO
TUNE
DEPTH
DELAY
SPEED
OUT PUT
DECAY
FILTER
VR2
VR1
VR 7
P12,13,17
8
IC58 ADC0809CCN A/D CONV.
IN0
IN7
A0
A2
IC1 μPD780C-1 CPU
D7
φ6
4MHz
A0 ~ A15
A0 to A15
IC3 TMM2764D
EP-ROM
A0 ~ A12
A0 to 12
IC4 HD6850P
RDX
TXD
MIDI INTER FACE
RS/RW/CSφ
A0,1,2
IC5 μPD8253C-2
IC6 μPD8253C-2
CLK 0 to 2
OUT 0 to 2
COUNTER
A0, A1
04 CLK
FCK 0 to 2
FCK 3 to 5
IC7 μPD71054C
IC8 μPD71054C
OUT 0 to OUT 2
08 CLK
IC9 μPD8237AC-5
IC10 μPD8237AC-5
DRQ0 DACK0
DRQ3 DACK3
DRQ1 DACK1
DMA
DRQ0 to 3
DRQ4,5
DACK0 to 3
DACK4,5
A0 to 7
IC17 to 19 74HC74P
IR 2R
IO 20
DSC0 to 5
FCK 0 to 5
DATA BUS
ADDRESS BUS
8MHz CLOCK
X1
IC23 TC74HC4040P
IC24 TC74HC4040P
IC25 TC74HC245P
CLK
Q1
Q12
B5
IC26 μPD41416C-20
IC27 μPD41416C-20
IC28 μPD41416C-20
IC29 μPD41416C-20
IC30 μPD41416C-20
IC31 μPD41416C-20
IC32 TC74HC157P
IC33 TC74HC157P
RA1
A0
A3 to 6 A10 to 13
A1,2 A8,9
1A ~ 4B
3A ~ 4B
1Y
3Y
IC43 TC74HC-25


3
4
5
6
7
8
EXT TRIGER
J63
TRIG
IC57 BA9221
IC56 AM2504C
A/D CONVERTER
IC54 74HC374P
IC55 74HC173P
IC62 74HC174P
F.F
D/A CONV.
IC14 TC74HC04
IC15,16 TC74HC86P
DSC0 to DSC5
IC63 74HC174P
DACK 0 to 5
END
START/SPLICE
TUNE
DEPTH
DELAY
SPEED
LFO
DECAY
FILTER
OUT PUT
VR2
VR1
VR7
P12,13,17
IC58 ADC0809CCN A/D CONV.
DATA BUS
IC1 μPD780C-1 CPU
4MHz
IC3 TMM2764D
EP-ROM
IC4 HD6850P
MIDI INTER FACE
IC5 μPD8253C-2
COUNTER
IC6 μPD8253C-2
IC7 μPD71054C
IC8 μPD71054C
IC9 μPD8237AC-5
DMA
IC10 μPD8237AC-5
IC17 to 19 74HC74P
FCK 0 to 2
FCK 3 to 5
FCK 0 to 5
ADDRESS BUS
A0 to A15
8MHz CLOCK
X1
IC40-3/6 TC74HCU04P
IC23 TC74HC4040P
COUNT DOWN
IC24 TC74HC4040P
IC25 TC74HC245P
TIMER
IC26 μPD41416C-20
IC27 μPD41416C-20
IC28 μPD41416C-20
IC29 μPD41416C-20
IC30 μPD41416C-20
IC31 μPD41416C-20
DRAM
IC32 TC74HC157P
IC33 TC74HC157P
DATA SELECTOR
D-1 to D-4
DATA BUS
MIDI IN
MIDI OUT
P9
IC16-1/4 TC74HC86P
IC16-2/4
IC12 LED1,2
D2
OVER DUB
NEW
MONO/POLY
DACK 0
DACK 1
DACK 5
VOICE

IC57 BA9221
I8 I/O
D11
IC56 AM2504C
D I1
Q12
A/D CONVERTER
ID 8D
IC54 74HC374P
IQ 8Q
ID 4D
IC55 74HC173P
IQ 4Q
DO to 7
D-1 to D-4
DATA BUS
IC62 74HC174P
D2,3,6,7
D-1,2
ID IQ
6D 6Q
F.F
D11
D/A CONV.
IC14 TC74HC04
IC15,16 TC74HC86P
DSC 0 to DSC5
DACK 0 to 5
IC63 74HC174P
F.F
TR4,5,6,7
DACK 0
DSC 0
FCK 1
VOICE 2
DACK 1
DSC 1
FCK 2
VOICE 2
VOICE 6
DACK 5
DSC5
FCK 6
VOICE 6
IC83 NE572N
IC86-1/2 TL082CP
VOICE 1
RECT IN
RECT IN
VOICE 2
VCA 1
VCA 2
AMP
R138
R139
IC89-2/2 TL082CP
MONITOR
IC89-1/2 TL082CP
VR9
VR (3) PCB
RL-1
P18
R132 to 137
VOICE OUT
P8
FRONT LINE OUT
P21
REAR LINE OUT
RECT IN
VOICE 6
VCA 6
R148
IC85 NE572N
IC88-2/2 TL082CP
MIX
DO to 7
IC 3 TMM2764D
EP-ROM
A0 A12
A0 to 12
IC 4 HD6850P
RDX
TXD
MIDI INTER FACE
RS/RW/CSΦ
A0,1,2
IC 5 μPD8253C -2
CLK 0 to 2
OUT 0 to 2
COUNTER
A0, A1
O4 CLK
IC 6 μPD8253C -2
IC 7 μPD71054C
OUT 0 to OUT 2
O8 CLK
IC 8 μPD71054C
IC 9 μPD8237AC-5
DRQ 0 DACK0
DRQ3 DACK3
DMA
IC10 μPD8237AC-5
DRQ0 DACK0
DRQ1 DACK1
DSC 0 to 5
IR 2R
IC17 to 19 74HC74P
IQ 2Q
FCK 0 to 2
FCK 3 to 5
FCK 0 to 5
DRQ0 to 3
DRCK0 to 3
DRQ4,5
DRCK 4,5
A0 to 7
ADDRESS BUS
DATA BUS
IC25 TC74HC245P
B5 B8
TIMER
A1 A8
B1 B4
IC26 μPD414416C-20
IC27 μPD414416C-20
IC28 μPD414416C-20
IC29 μPD414416C-20
IC30 μPD414416C-20
IC31 μPD414416C-20
RA1 RA6
DRAM
D1 D4
D4 D7
D0 D3
IC32 TC74HC157P
1A 4B
1Y 4Y
DATA SELECTOR
IC33 TC74HC157P
3A 4B
3Y 4Y
A1, 2 A8, 9
A3 to 6 A10 to 13
DO to D8 D-1 to D-4
IC43 TC74HC 259P
IC42 TC74HC 259P
A0 to 3
A D
Q0 Q7
Q3 Q6
LED 1
LED 2
G
IC12 LED1, 2
TRG
TR1
PC3
IC41 μPD8255AC-2
I/O INTER FACE
PA0 PA7
PB0 to PB7
PC0 to PC7
P15
P19
P16
MIDICH
SW9
SW11
SW8
SAVE
LOAD
MANUAL SPLICE
KEY TRANS
ONE SHOT
LOOPING
ALTER NATING
MONO/POLY
NEW
OVEK DUB
D2
D5
D4
OVER DUB
NEW
MONO/POLY
ALTER NATING
LOOPING
ONE SHOT
KEY TRANS
MANUAL SPLICE
LOAD
SAVE

S612 MAIN BLOCK DIAGRAM NO. 860836A

MIDI DIGITAL SAMPLER

MODEL S612

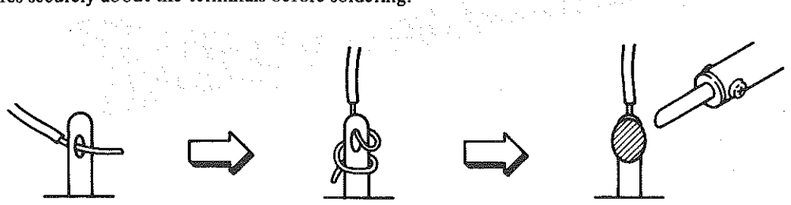
SAFETY INSTRUCTIONS

SAFETY CHECK AFTER SERVICING

Confirm the specified insulation resistance between power cord plug prongs and externally exposed parts of the set is greater than 10 Mohms, but for equipment with external antenna terminals (tuner, receiver, etc.) and is intended for [C] or [A], specified insulation resistance should be more than 2.2 Mohms (ground terminals, microphone jacks, headphone jacks. line-in-out jacks etc.)

PRECAUTIONS DURING SERVICING

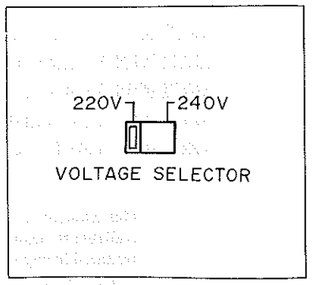
1. Parts identified by the ⚠ symbol parts are critical for safety.
   Replace only with parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with specified replacements.
   Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers (Insulating Barriers)
   4) Insulation sheets for transistors
   5) Plastic screws for fixing microswitch (especially in turntable)
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap ends of wires securely about the terminals before soldering.



6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

Voltage conversion

Models for Canada, USA, and Japan are not equipped with this facillity. Each machine is preset at the factory according to its destination, but some machines can be set to 110V, 120V, 220V or 240V as required.
If your machine's voltage can be converted:
Before conmnecting the power cord, trun the VOLTAGE SELECTOR located on the bottom panel with a screwdriver until the correct voltage is indicated.



SECTION 1
OPERATING MANUAL

TABLE OF CONTENTS

Controls

MONITOR Control
This control adjusts the monitor level while sampling a live sound. The monitor level is not affected by the output LEVEL control. When sampling by microphone and the monitor level is too high, "howling" may result.

REC LEVEL Control
This control adjusts the recording level of the incoming signal.

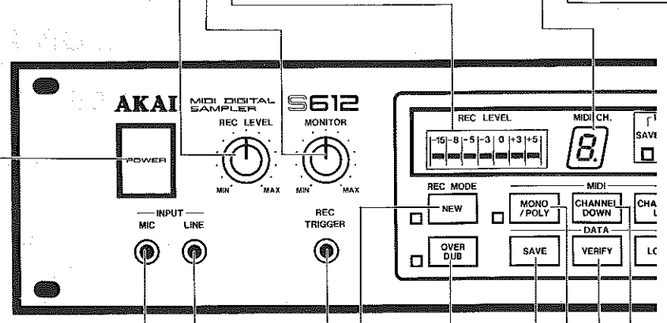
MIDI CH. Display
Normally, this will indicate the **MIDI** reception channel. However the display will light up to confirm proper operation when saving, verifying and loading tone data.
* When the power is on, the display will show "0" (omni on). When the unit receives **MIDI** signals, such as key-on, key-off, etc., the display will brighten momentarily.

REC LEVEL Indicator
Shows the recording level which can be adjusted by the **REC LEVEL** control.

LOOPING Button
Press this button to set the scanning mode to looping. The LED indicator will light.

ONE SHOT Button
Press this button to set the scanning mode to one-shot. The LED indicator will light.

Save Load Indicator
The **SAVE, LOAD** LED will light when the respective function has been selected.



POWER Switch
Use the **POWER** switch to turn the power on and off.
Note: Do not attempt to connect the sampler disk drive MD280 after the S612 has been turned on.

MIC INPUT Jack
This jack is used for sampling from a microphone or a electric guitar. The input sensitivity is —63 dB. Connect a standard 6.3 mmϕ phono plug to this jack.

LINE INPUT Jack
This jack is used for sampling the line out from keyboards or audio equipment, etc. The input sensitivity is —27 dB. Connect a standard 6.3 mmϕ phono plug to this jack.

Note: When both MIC and LINE input jacks are used, the MIC input has priority. priority.

REC TRIGGER Jack
This jack allows the use of a foot switch to trigger the sampling process.

Note: Connect a standard 6.3 mmϕ phono plug to this jack. Use the Akai PS-X80 or the circuit is opened when the connected switch is pushed down.

NEW Button
Press this button when you make a new sample.
* The previous sample will be erased.

OVERDUB Button
Press this button when you wish to overdub one or more sounds.
* You can overdub many times.

SAVE Button
Press this button to save the sound data in the S612 onto disk or tape.

MIDI MONO/POLY Mode Select Button
This button is used to switch between the **MIDI** mono and poly modes. The indicator lights when the mono mode is set.

END Point lever
This lever sets the end-point of the sampled sound.

START/SPLICE Lever
This lever sets the start/splice point of the sampled sound.
Note: Normally, this lever sets the starting point. However, when the **MANUAL SPLICE** button is pressed, it will set the splicing point.

ALTERNATING Button
Press this button to set the scanning mode to alternating. The LED indicator will light.

MANUAL SPLICE Button
Press this button to set a splicing point manually. The LED indicator will light.

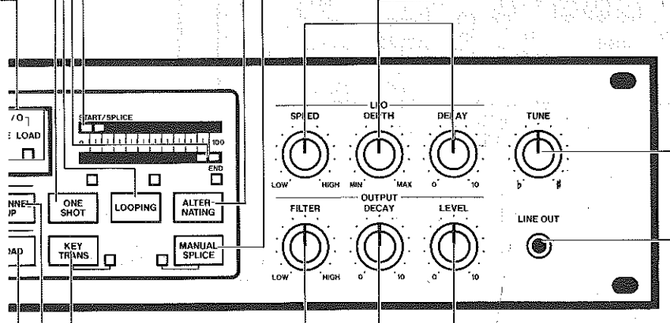
LFO, SPEED, DEPTH, DELAY controls
A vibrato effect can be added to the sampled sound by using the LFO.

SPEED — Adjusts the speed of the vibrato.
DEPTH — Adjusts the depth of the vibrato.
DELAY — Adjust the delay time of the vibrato.

TUNE Control
The sampled sound can be fine tuned using this control. It will also serve as a pitch control when replaying sampled sound.

LINE OUT Jack
The monitor/output signal of the S612 appears at this **LINE OUT** jack, which can be connected to the line input of mixers or amplifiers.
* Connect a standard 6.3 mmϕ phono plug to this jack.

Note: This jack is connected in parallel with the **LINE OUT** jack on the rear panel.



KEY TRANS Button
Press this button to transpose the sampled sound. The LED indicator will light.

MIDI CHANNEL DOWN Button
Press this button to lower the **MIDI** channel number.
* Pressing once decreases the channel by one. Pressing the button while "0" is displayed on the **MIDI CH.** display will revert the display to "9".

VERIFY Button
Press this button to verify the sound data saved on disk or tape.

MIDI CHANNEL UP Button
Press this button to increment the **MIDI** channel number.
* Pressing once increass the channel by one. Pressing the button while "9" is displayed on the **MIDI CH.** display will forward the display to "0".

LOAD Button
Press this button to load the sound data, saved on disk or tape, into the S612.

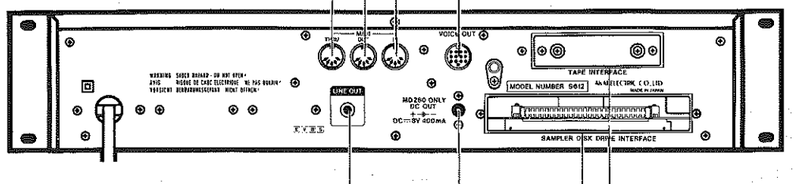
LEVEL Control
This control adjusts the output level of the sampled sound. The monitor level is not affected by the output LEVEL control.

DECAY Control
This control adjusts the decay efect of the sampled sound. Turning the knob clockwise will increase the decay time after key-off.

FILTER Control
This control adjusts the low-pass filtering on the sampled sound. The replayed sampled sound will become mellower as the control is turned towards the **LOW** position.

MIDI OUT Jack
This jack is for sending **MIDI** system exclusive information to other **MIDI** equipment.

MIDI THRU Jack
This jack provides a direct copy of data coming in the **MIDI IN** jack.



MIDI IN Jack
This jack is for receiving **MIDI** information from other **MIDI** equipment.

VOICE OUT Jack
The six voices of the S612 can be individually accessed through this jack.

LINE OUT Jack
The monitor/output signal of the S612 appears at this **LINE OUT** jack, which can be connected to the line input of mixers or amplifiers.

* Connect a standard 6.3 mmϕ phono plug to this jack.

Note: This jack is connected in parallel with the **LINE OUT** jack on the front panel.

DC OUT Jack
This jack provides a DC power supply [8 V] for the MD280.

Commodore Cassette Recorder Connector
This connector allows the S612 to save/load sound data to/from a commodore cassette recorder.

MD280 connector (MD280 ONLY)
This connector is specially designed for connection of the Sampler Disk Drive MD280, and is used for save/load operation onto sampler disks.

Connections

The S612 is a MIDI digital sampler which will function only if input information is received at MIDI-IN. Ensure that all the correct connections have been made between the MIDI-IN and MIDI-OUT of the S612 and any keyboards (such as the Akai AX80) or sequencers. Obviously, unless a sound is being input or a sample has been loaded into the S612, it will not reproduce any sounds. The S612 will not "remember" any data after it has been switched off.

Diagram 1

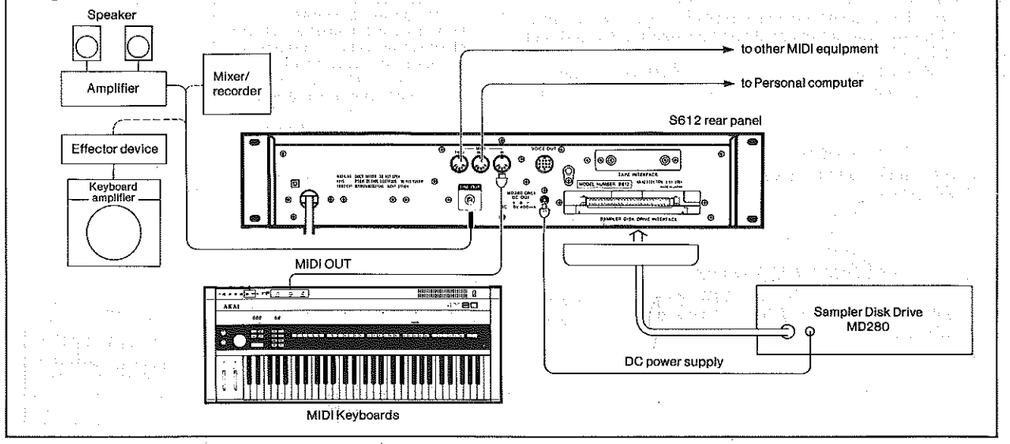
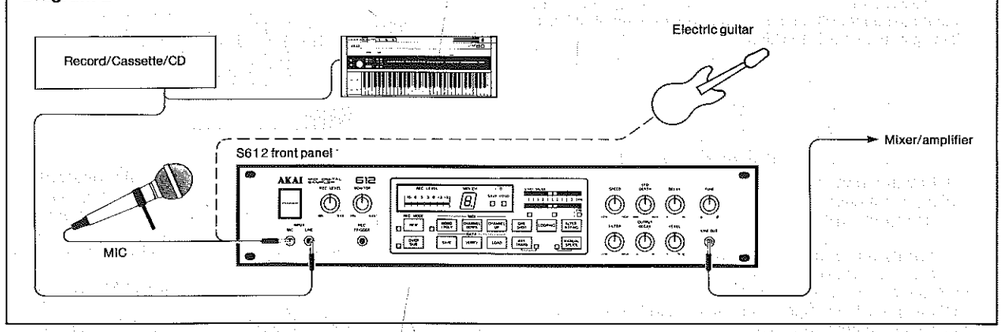


Diagram 2



Sampler Disk Drive MD280

The Sampler Disk Drive MD280 (optional) is the device which quickly and accurately saves the sound data. The format of 2.8" disk makes the filing space very compact.

Note: If the MD280 is to be used, it should be connected with the S612 before switching on the S612, Any sampled data in the S612 will be lost if the MD280 is plugged in or unplugged while the S612 is switched on.

Sampling

PREPARATIONS

Before Turning the Power On

Make sure the various connections with **MIDI** and audio equipment have been completed before turning the power of the S612 on. (Refer to the chapter concerning connection with external equipment on page 6.)
When using the specially designed MD280 Sampler Disk Drive, ensure that the correct connections between the MD280 and the S612 have been made.

Note: Connecting the MD280 while the S612 is switched on will result in the loss of sound data sampled in the S612.

Connections to Input

Connect the sound source that you want to sample to the **MIC** or **LINE INPUT** jacks.

Table 1

Equipment to be connected.	Input.	Input Sensitivity.
Equipment or devices, such as guitars or microphones, have low output levels.	MIC	−63 dB
Audio equipment, such as televisions, cassette tape decks, CD players, tuners or preamplifiers, or musical instruments, such as synthesizers or electric keyboards have higher output levels (line level).	LINE	−27 dB

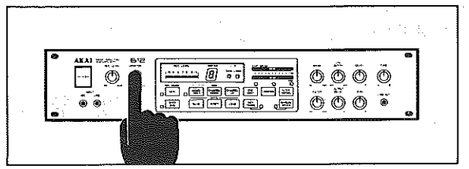
Note: When both the **MIC** and **LINE INPUT** jacks are connected, the **MIC** jack overrides **LINE** jack.

Adjustment of Recording Level

Set the recording level by the **REC LEVEL** control. To obtain the best results in sampling, bring the level close to "+3" on the **REC LEVEL** indicator.

Monitor Level

Use the **MONITOR** level control when monitoring the sound source to be sampled. When using a microphone, feedback may occur if the monitor level is too high.



Designation of the Sampling Frequency

This brief outline may help to clarify some different aspects of sampling technique:
Are you trying to reproduce (a) high or (b) low frequency sounds?
(a) To faithfully reproduce high frequency sounds, a faster (therefore, shorter) sampling time will be required.
The S612 can be "instructed" to accept a wider bandwidth sample by pressing a higher note on the **MIDI** keyboard prior to making the sample; see Table #1.
(b) The reproduction of lower frequency sounds, typically much longer in duration, will require a longer sampling time.
The S612 can be "instructed" to accept a long sample by pressing a lower note on the **MIDI** keyboard prior to making the sample; see Table #1.
(c) For accurate reproduction (pitch) of a sampled sound it is necessary to first press the same note on the **MIDI** keyboard as that being sampled.
This process can be extended to allow for pitch transposition if required.

Example: Press A2 (lowest A) on the **MIDI** keyboard, then play (sample) A3 (A string) on a guitar. Now when A3 is played on the **MIDI** keyboard the actual pitch of the reproduced note will be A4: The pitch has been transposed up by one octave.

This technique can be used to transpose from 1/2 stops through to several octaves if required.

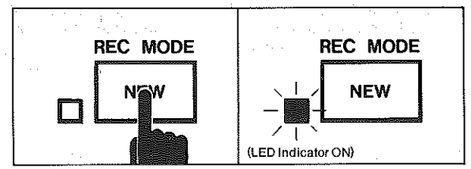
Note: If the **MIDI** keyboard or the S612 have just been switched on and no key has been pressed before sampling, the S612 will automatically designate C4 as the desired pitch.

Key No.	C2	C3	C4	C5
MIDI Note No.	36	48	60	72
Sampling Frequency	4 kHz	8 kHz	16 kHz	32 kHz
Sampling Time	8 sec.	4 sec.	2 sec.	1 sec.

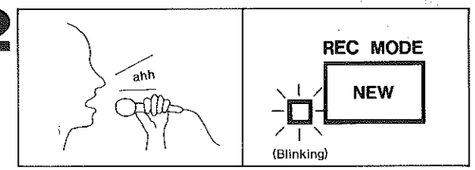
Note: Although only four (4) keys are depicted, other keys may be selected if intermodiate frequencies are desired.

Sampling

1. Once you have adjusted the recording level and designated the desired sampling frequency, you are ready to sample. Press the **NEW** button. The LED indicator will light. This indicates that the unit is standby for sampling.



2. Using a microphone, make a sample. Say "ahh..." for example. The LED indicator should start blinking from the moment you begin speaking into the microphone. After blinking for the length of time of the designated sampling frequency, the LED indicator will go out automatically. This indicates the completion of the sampling process.



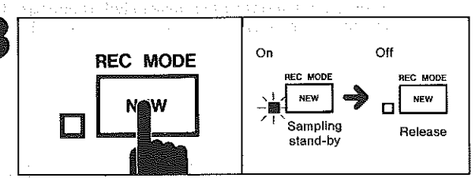
Automatic Trigger

Because the S612 contains an automatic trigger circuit, it will automatically start the sampling process when the sound level reaches a certain preset level. You will notice that the unit may start off the process prematurely by picking up surrounding noise when the sampling is done through a microphone. On the other hand, when the recording level is too low, the sampling process may not begin because the sound level is not high enough to trigger the circuit. In which case, after increasing the recording level, reset the unit by pressing the **NEW** button again to get it into the standby mode, then start sampling.

Cancelling the Sampling Standby Mode

To cancel the sampling standby mode, press the **NEW** button again. The **LED** will go out.

3. Thus, sampling has been completed. This sampled sound data will be maintained until either the power is turned off, the process is repeated for another sampling or other sampled data is loaded from the disk (tape).
   * If necessary, save the sound data for later use with the specially designed Sampler Disk Drive MD280 (optional). Refer to page 22.



4. You should now be able to enjoy six-voice polyphonic, velocity touch sensitive sounds, from the S612, by playing **MIDI** keyboard instruments.

Note: All six voices may not be able to be heard when music is played mostly on the keys around the fifth octave (the highest octave range for the AX80). This is not a defect in the unit.

5. After connecting the **MIDI** keyboards, if sampling is done without any keys being pressed down, the sampling frequency will be set at 16 kHz with a sample time of 2 seconds.

Cautions when Designating the Sample Frequency

1. Because the last key to be pressed down will determine the sampling frequency, if connected with **MIDI** keyboards, make sure to press down the key to designate the frequency before going through the sampling process.

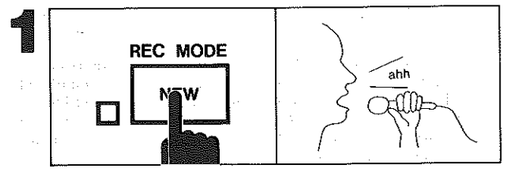
2. The range of the keys to which a sampling frequency can be designated is between **MIDI** key number 36 (C2) and 72 (C5). The keys out of this range are invalid.

Overdubbing

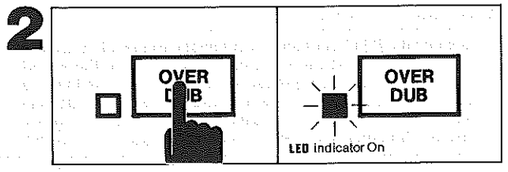
By means of pressing the **OVERDUB** button instead of the **NEW** button for the above mentioned sampling process, you are able to overdub a newly sampled sound without erasing the previously sampled sound.

Let's try to overdub (ohh...) as a second sound over the first sound (ahh...). The setting-up process is identical to the previous chapter for sampling (Refer to page 8).

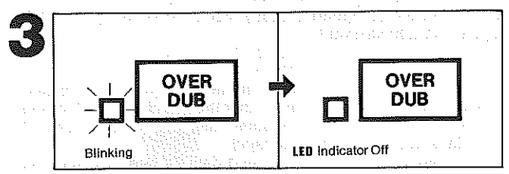
1. After adjusting the recording level and designating the sampling frequency, press the **NEW** button. Sample your voice (ahh...).



2. You are about to overdub (ohh...) on (ahh...), which you have just sampled. (It is possible to designate the sound to a different frequency.) Press the **OVERDUB** button. The **LED** next to the button will light. This indicates the unit is in standby for overdubbing.



3. Say (ohh...) into the microphone. From the moment you started to say (ohh...), the LED should start blinking. This blinking indicates overdubbing is in progress. After blinking for the length of time equivalent to the designated frequency, the LED will go out automatically.



4. Thus, the overdubbing process has been completed. When you play the **MIDI** keyboard, you should be able to hear the combined sounds of (ahh...) and (ohh...).
   Overdubbing can be done as many times as you wish.
   Note: Once the overdubbing is done, there is no way to single out the individually sampled sounds. We, therefore, recommend that you store and save the individual sounds on disk if they are needed for later use.

OVERDUB SOUND LEVEL

As with any overdubbing process, there will be some attenuation (reduction) of previously recorded material (approximately −6 dB) for each "take".
If it is desired that the combined sounds are to be of equal level when replayed, then, the last sound to be sampled should be recorded at a lower level to compensate for the attenuation of previous samples.

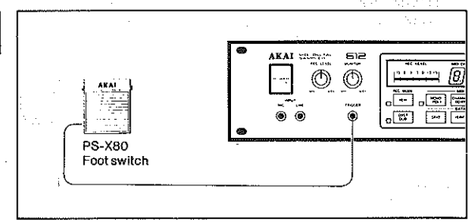
Sampling by Rec Trigger

Although the S612 contains an automatic trigger system, it is possible to start sampling at any desired time by connecting a foot switch to the **REC TRIGGER** jack, (It can be used for overdubbing as well.)

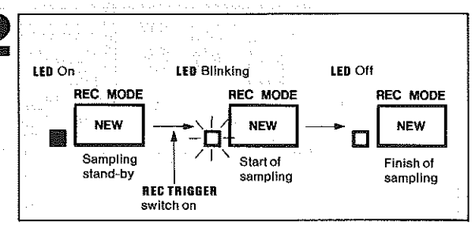
This **REC TRIGGER** feature becomes eapecially useful and effective in situations where the sound is slow in reaching the required trigger level, and therefore, "its" initial attack may not be sampled.

1. Connect the Akai PS-X80 foot switch to the **REC TRIGGER** jack.
   * In this case, the automatic trigger system will be overridden.
   * Use a foot switch of the type shown below, if you do not use the Akai PS-X80 foot switch.

Normal (closed)
Press Down (open)



2. The setting-up process is identical to the chapter for sampling (Refer to page 7). After adjusting the recording level and designating the sampling frequency, press down the **NEW** button (or **OVERDUB** button). The **LED** next to the button (either **NEW** or **OVERDUB**, depending on the process you are using), should light. This indicates the unit is ready for sampling (or overdubbing).



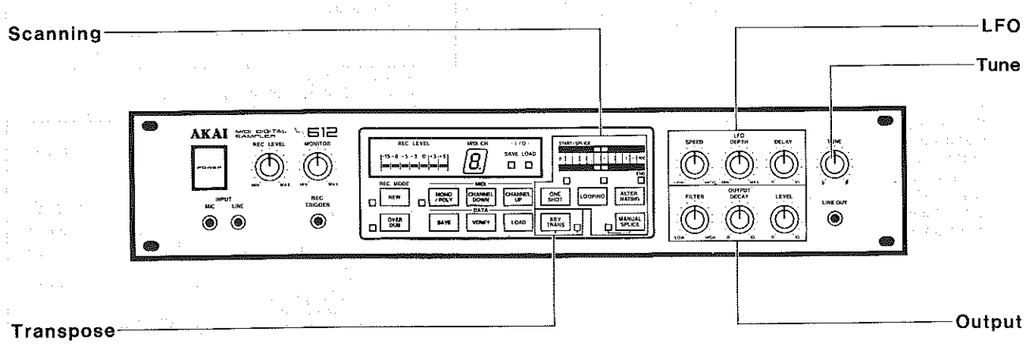
3. Sampling (or overdubbing) is initiated by pressing the foot switch connected to the **REC TRIGGER** jack.

EDIT

Edit

The S612 contains various editing functions so that sampled sounds can be applied more effectively for your musical expressions. These functions include the following:

- **Scanning**
- **LFO**
- **Output**
- **Transpose**
- **Tune**



1. SCANNING
This is the function that is controlled by the "START POINT" and "END POINT" levers, in conjunction with the "ONE SHOT", "LOOPING" and "ALTERNATING" mode buttons, that enables you to decide how the sample will be replayed.

2. LFO
It is possible to add a vibrato effect to sampled sounds.

3. OUTPUT
It is possible to control the degree of mellowness of the sampled sound (FILTER). It is also possible to adjust the length of time the note sounds after the key-off (DECAY).

4. TRANSPOSE
It is possible to transpose the samples.

5. Tune
It is possible to tune the samples up or down within the range of ±100 cents.

When saving to disk, the editing parameters will also be stored along with the sampled data, therefore, when the sampled data is retrieved (loaded) from disk, it is ready for playing in its' original, edited form, until/unless the editing control(s) is/are readjusted. For example, if a sound, which has been edited, using the **LFO**, to contain a very deep vibrato, is saved to disk and then, at some later date is loaded back into the sampler, even though, in the meantime, the **LFO** controls may have been reset to minimum, that sound will still contain a deep vibrato. However, if any of the **LFO** controls are adjusted after the sample has been loaded, they will again affect the character of the sound. This superior feature enhances the "useability" of the S612 Digital Sampler.

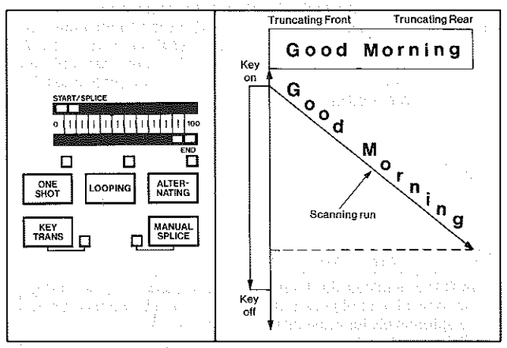
Note: The output **LEVEL** control is not a programmable parameter.

Scanning

The S612 stores sampled sounds in memory IC's in digital data form and reconstructs the pitch by altering the speed at which the memory data is read. It works on the same principle as a tape recorder. The pitch changes according to the tape speed. However, because sounds are recorded differently in memory IC's than on tapes, it is possible for us, using the internal computer of the S612, to control the ways in which the data in the memory IC's is read. In other words, it is possible to designate the point at which the S612 starts reading or stops reading the data in the memory IC's; to make a loop, or to reproduce a reverse version. We call these functions "Scanning".

Normal Setting

In order for the scanning functions to be easily understood, let's suppose a situation where we have sampled a phrase "Good Morning". Picture also the situation where the phrase "Good Morning" is stored in digital data form in the memory ICs of the S612, as seen in the diagram. In the normal setting, scanning is done from truncating front to the truncating rear all the way through. This means that with a key-on, the sampled phrase "Good Morning" will be played, and there will be no more sound. In this case, even if the key is held down, there will be no sound after the phrase "Good Morning" is played once.

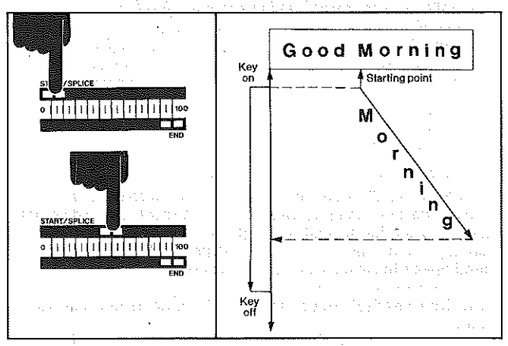


Starting Point and Ending Point

Starting Point

By adjusting the **START/SPLICE** lever, it is possible to set a starting point (the point where the S612 starts replaying from the memory ICs) at any desired point.
For example, if you choose "Morning" to be the starting point, after sliding the lever to the appropriate position, the "Morning" portion of the phrase will be replayed when a key is pressed, as seen in the diagram.

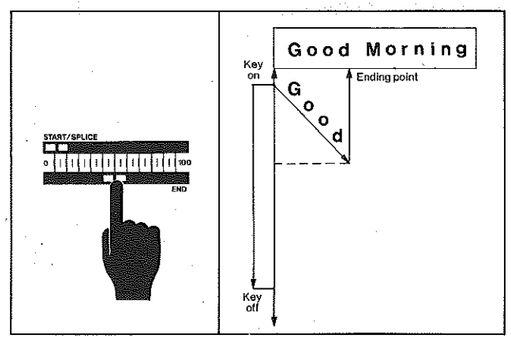
Note: Re-trigger a key each time the lever is moved to determine (hear) the new starting point.



The START/SPLICE lever has two (2) functions.
Normally (if the **MANU. SPLICE** button has not been pressed), the **START/SPLICE** lever has the function of setting a starting point. On the other hand, when the S612 is in the manual splicing mode (the **MANU. SPLICE** button having been pressed), the lever has the function of setting splicing point. (See Page 15)

Ending point

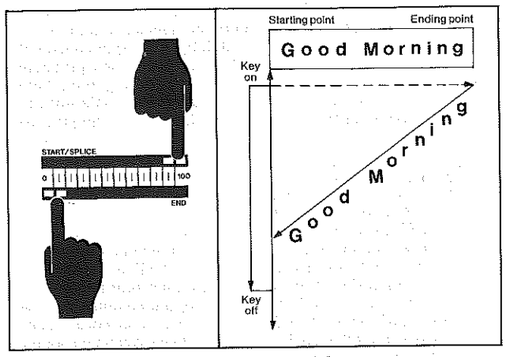
By adjusting the **END POINT** control, it is possible to set an ending point (the point where the S612 stops replaying from the memory ICs) at any desired point.
For example, as seen in the diagram, by adjusting the control to the appropriate point, only "Good" will be played when a key is pressed.



Playback of Reverse Version

If you set the two levers so that the **END** point lever is positioned before the **START** point lever, the playback will be reversed. For example, as seen in the diagram, when the set up is done with the start point at the truncating rear and with the end point at the truncating front, the reverse version "gninroM dooG" will be played when a key is pressed. It follows, therefore, that it is possible to replay any desired portion of the sample in reverse.

Note: Although the **START** and **END** point levers may be reversed, it is not possible to **SAMPLE** in reverse. A sound can only be recorded as it occurs naturally (in its' original form) even through, once sampled, it can be reproduced in reverse.



Scanning Mode

The S612 employs the latest computer technology so that it is not only able to play sampled sounds, but can also be used very extensively for musical application.

The following are three special scanning modes:

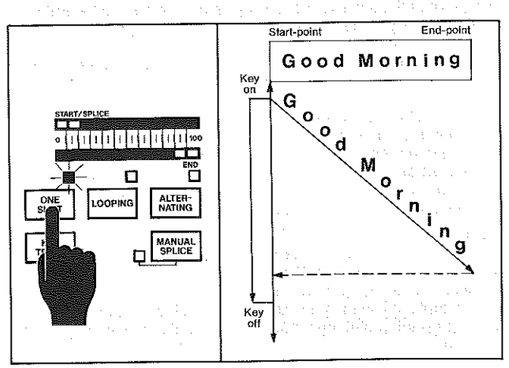
* **One-Shot**
* **Looping**
* **Alternating**

One-Shot mode

In the "One-Shot" mode, the S612 functions as an ordinary sampling device. For example, when it is set as shown in the diagram (the same as the normal setting), the sampled sound "Good Morning" will be played when a key is pressed. There will be no sound thereafter, even if the key is held down.

With the one-shot mode, scanning is done in the following order.

Starting point → Ending point



Looping Mode

In the **LOOPING** mode, the setting up of a loop automatically (automatic splicing system) or manually (manual splice mode) within the S612's memory IC's makes it possible for the sampled sound to be played continuously. With this mode, playing the continuous sounds of strings, brasses, chorus, etc., becomes possible. (The sound starts when a key is pressed and will play continually until the key is released.) This makes the application of the S612 very extensive by opening up more paths for your musical expression.

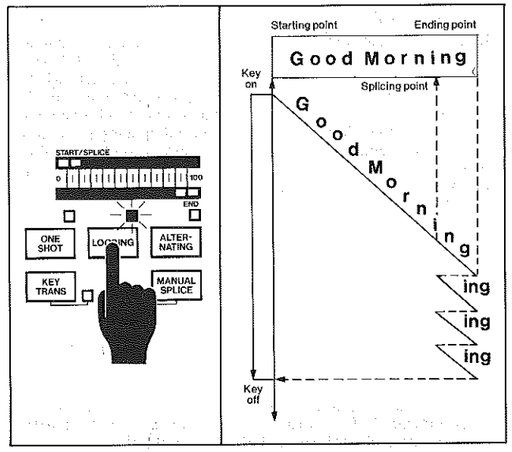
Automatic Splicing System

The S612's looping function makes it feasible, by fully applying today's computer technology, to search out and automatically "Splice" any point ("Splicing Point") of the sample instantaneously. This has been said to be very difficult and time consuming without the aid of the computer.

* The term "Splicing" is used when joining two audio tapes together with a special adhesive tape to make one continuous tape when editing is necessary. Similarly, we call the restarting point of a scanning loop a "Splicing Point".

The moment the **LOOPING** button is pressed, the automatic splicing system of the S612 finds the most appropriate splicing point of the sampled sound. For example, as seen in the diagram, when the **LOOPING** button is pressed, with the **START/END** point levers in the normal position, the key-on (when a key is pressed) will start the sampled phrase "Good Morning". After "Good Morning" is played once, "ing" will repeat continuously until the key-off (the key is released). This means that the S612's computer selected "O" as the beat splicing point.

In the LOOPING mode, the scanning is done in the following order:
Starting point → Ending point → Splicing point



Note: The automatic splicing point is referenced to the position of the **END POINT** lever. Therefore, if the sampled sound does not utilize all of the available memory the computer will be attempting to replay (loop) an "empty" memory; = no sound! This situation can be remedied by repositioning the **END POINT** lever, making a longer sample or, shortening the sample time.
Some sound will not loop well. Sounds which are not produced by musical instruments (human voices, effects and so on) or, with erratic or staccato-like sounds which contain much variation, some noise (splicing noise) may be heard. This is not a defect. Experimentation may be necessary with some sounds.
The automatic splicing system will be overridden if the **MANUAL SPLICE** mode is selected.

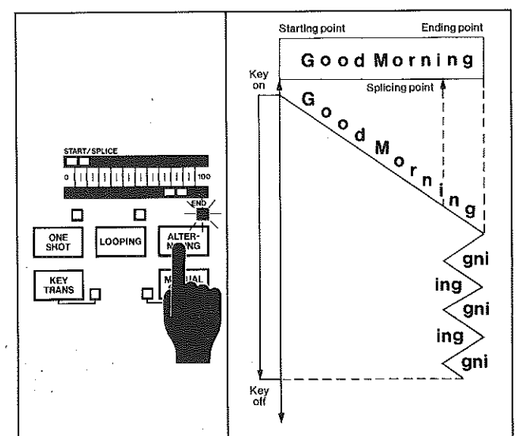
Alternating Mode

The **ALTERNATING** mode is based on the same idea as the **LOOPING** mode where a loop is built by scanning. But it is different from the **LOOPING** mode in the way the loop is built. For example, as seen in the diagram, when the **ALTERNATING** button is pressed, with the **START/END** point levers in the normal position, the key-on will start the sampled phrase "Good Morning". After "Good Morning" is played once, "gni" then "ing" will be replayed continually until the key-off. The scanning simply reverses direction between the end point and the splicing point.
In the **LOOPING** mode the scanning "jumps" back to the splicing point; scans only from the splicing point to the end point; does not scan from the end point to the splicing point.
This difference in scanning should be comprehended more easily in the next chapter for "Manual Splice".

In the ALTERNATING mode, scanning is done in the following order:

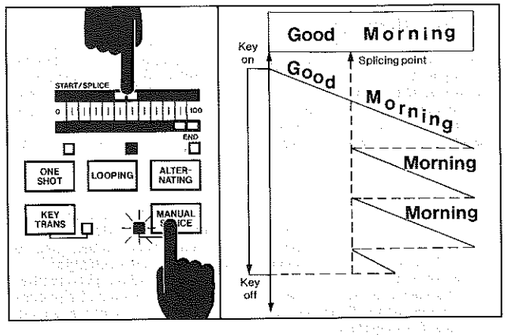
(Reverse)
Starting point → Ending point ⟵ Splicing point

Note: The **ALTERNATING** mode is very useful, especially when it comes to building the continuous sounds of strings. But there are some instances where the sound produced by the looping mode is more acceptable. Compare the **LOOPING** mode and the **ALTERNATING** mode when editing and select the continuous tone which sounds better.



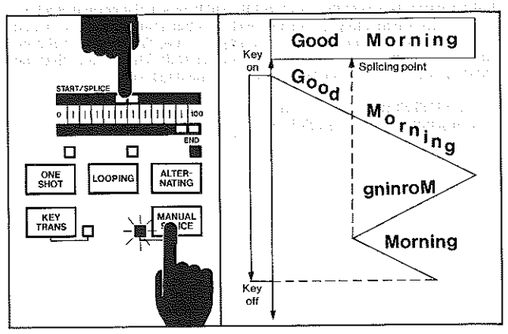
Manual Splice Mode

The S612 normally sets up a splicing point by using the automatic splicing system. However, by pressing the **MANUAL SPLICE** button, the automatic splicing system will be overridden, which makes it possible for you to set a splicing point manually. In this situation, the **START/SPLICE** lever's function is to set a splicing point and by adjusting this lever, a different splicing point may be set. For example, in the **LOOPING** mode, when the **MANUAL SPLICE** button is pressed and the splicing point is set at "Morning" by the lever, a key-on starts the phrase "Good Morning". After the phrase is played once, "Morning" will be repeated until the key-off.



In the **ALTERNATING** mode however, a key-on starts the phrase "Good Morning". After the phrase is played once, "gninroM-Morning-gninroM" will be repeated until the key-off.

Note: The **MANUAL SPLICE** button will not function in the one-shot mode.

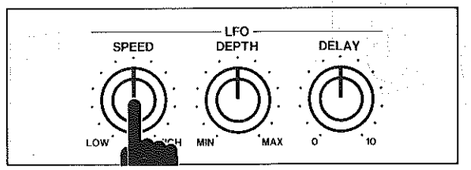


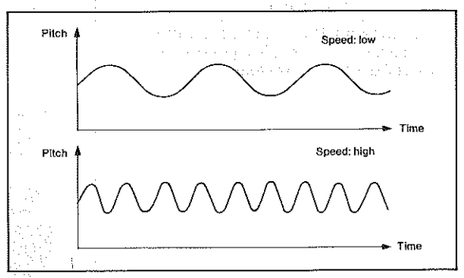
LFO

Because the S612 contains an **LFO** (Low Frequency Oscillator) circuit, it is possible to add vibrato effects to sampled sounds. The waveform of the **LFO** is ~.

SPEED Control

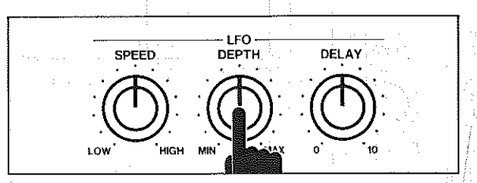
This control sets the modulation rate of the LFO.

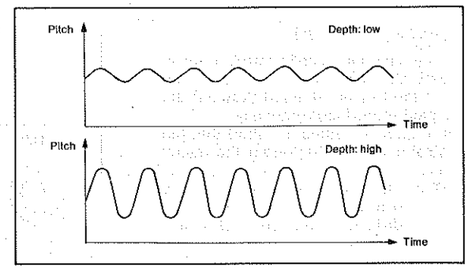




DEPTH Control

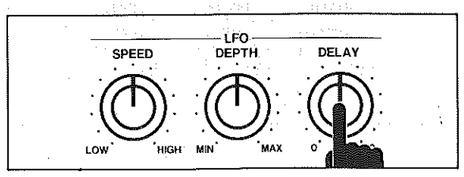
This control sets the depth of the modulation.

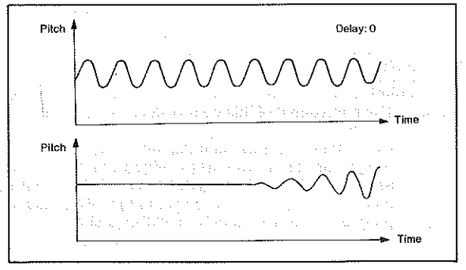




DELAY Control

This control sets the delay time of the vibrato.





Note: The three controls for the **LFO** (**SPEED**, **DEPTH** and **DELAY**) are programmable parameters. When sounds are to be saved on disks, these data will be saved along with the sampling data.

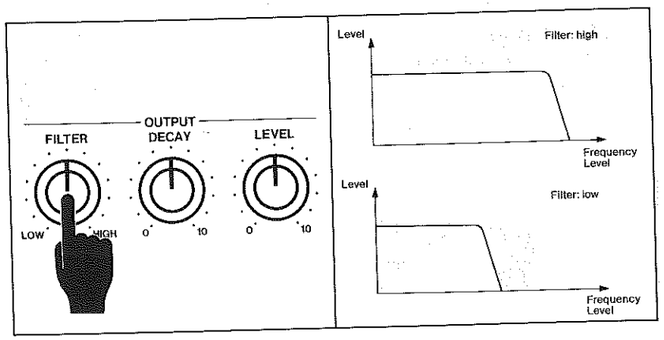
Note: It is possible to add a vibrato effect not only with the **LFO**, but also by operating the modulation wheel on external **MIDI** keyboards. (Refer to **MIDI** on page 20.)

OUTPUT

The S612 has three **OUTPUT** controls, **FILTER**, **DECAY** and **LEVEL**.

FILTER Control

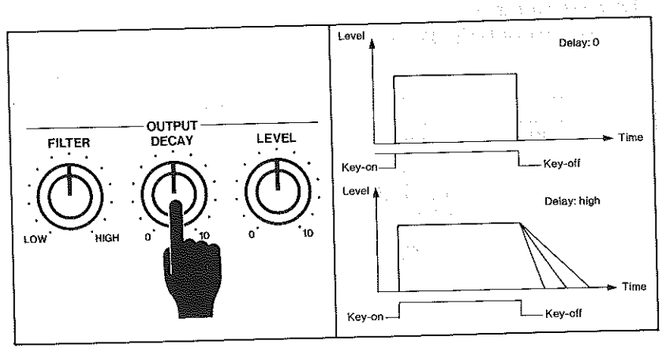
By processing the sampled sound through a low-pass filter, it is possible to give it a milder or a mellow tone.



DECAY Control

By adjusting the **DECAY** control, a decay (reverb-like) effect can be added, so that when the key is released (key-off) the sampled sound fades gradually.
The higher the value (number) that the control is set at, the longer the decay effect.

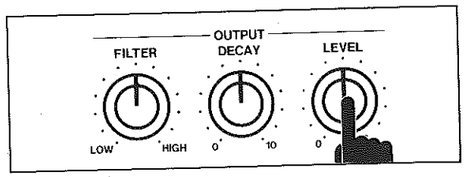
NOTE: The S612 can receives decay effect by "Sustain Pedal On" data from external **MIDI** keyboards.



LEVEL Control

This control is for adjusting the output level of sampled sounds.

Note: The adjustment of this control does not affect the monitor level.
Of the three **OUTPUT** controls, the **FILTER** and **DECAY** are programmable parameters. When the sound data is saved on disks, they will be saved along with the sampled data, However, because the **LEVEL** data is not programmable, it cannot be saved on disks.



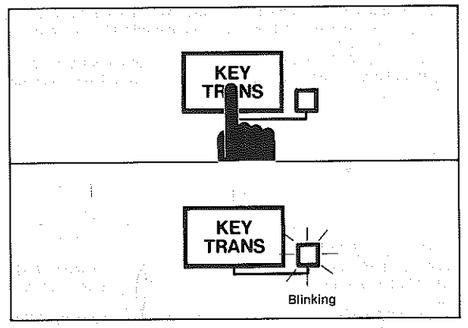
TRANSPOSE

The S612 is able to transpose sampled sounds by a half-step interval through to several octaves, so that they can be played at any desired pitch. The transposition is enabled by the **MIDI** keyboard. For example, let's transpose the sampled sound up by one octave.

Transposition

For example, let's transpose the sampled sound up by one octave.
Note: All transpositions are made relative to middle C.

- Listen to the sampled sound of C4. (Middle C)
- Press the **KEY TRANS** button. The LED indicator will start blinking.

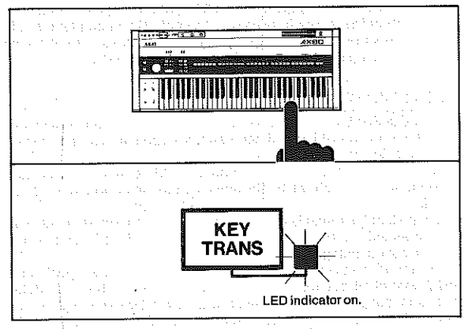


- To move the pitch of the sound by one octave, press down the key of **MIDI** note No. 72 (C5 for AX80). The S612 does not produce any sound in this case.

Upon completion of the key-on process, the LED indicator will stop blinking and stays lit, indicating the completion of the transposition.
At this time when you press down the key of **MIDI** note No. 60, you will get the C5 sound.
The transposition for one octave up has now been completed.

If you wish to transpose to the fifth interval up, press down the key of **MIDI** note No. 67 (G4 for AX80).

When you wish to go back to the original sampled pitch, depress the **KEY TRANS** button while the **KEY TRANS** LED blinking, the transpose mode will be cancelled.



Note: The S612 must be connected to **MIDI** keyboards in order to use the transposing function.
The transposing function is programmable. When you wish to save a sound onto disk, the transposition will be saved along with the other data.

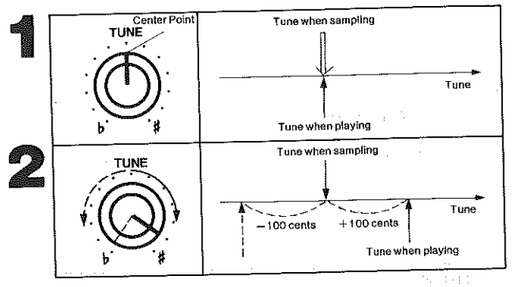
TUNING

With the S612's "Tuning" function, it is possible to freely tune a sampled sound within a range of ±100 cents (a half step), and to save the tuning parameters along with the sampled data. In other words, the data for the **TUNE** control are programmable.

Tuning when Sampling

When sampling, the tuning is based on the center position of the **TUNE** control.

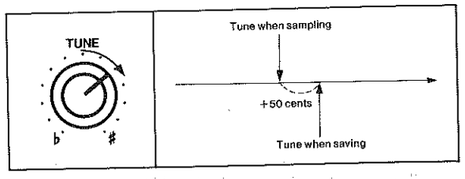
1. When the sampled sound is played and the **TUNE** control points to the center, as shown in the diagram, the sound will be reproduced with the same pitch.
2. When the sampled sound is played, and the **TUNE** control is turned fully right (left) as shown in the diagram, the pitch will be a half step higher (lower).



Tuning when Saving

Because the **TUNE** control is programable, the data to be saved on disks (tapes) will correspond to how much to the right (or left) the control is turned.

Example: If the note A is sampled and then retuned, using the **TUNE** control, by +100 cent and saved to disk, when the A key is pressed the note A# will be played. However, provided that the **TUNE** control is not reset, once the save is verified the tuning will again move by +100 cents. This means that now, when the A key is pressed, the note B will be played. It is possible to achieve the previously desired note of A# by resetting the **TUNE** control to the center position.

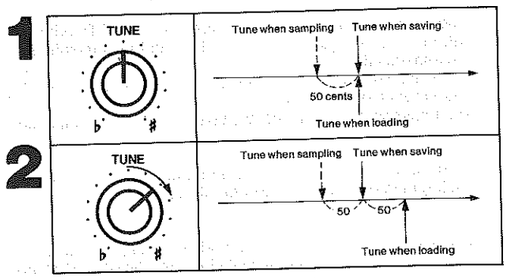


Tuning when Loading

When sound is loaded from disk (tape) the tuning will be either higher or lower than the tuning which had been saved, depending on the present position of the control.

1. When the loaded sound is played and the **TUNE** control is positioned in the center, the pitch will be the same as the tuning which has been saved.
2. When the loaded sound is played and the **TUNE** control is set at +50 cents from the center position, the sound is played +50 cents higher than the saved tuning.

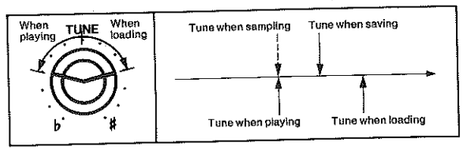
When the sound data is loaded from disk (tapes), the present position of the **TUNE** control will add to, or subtract from, the pitch of the saved data. For example, suppose that the sample was saved 50 cents higher than the originally sampled sound and that the loaded sound is played with the **TUNE** control set at +50 cents. In this case, the pitch will be (+50) cents + (+50) cents = +100 cents, which is a half step higher than the original sound.



Tuning when Playing after Loading

As stated earlier, after the sound data is loaded, the pitch of the replayed sound will depend on the present setting of the **TUNE** control (regardless of where the **TUNE** control was set during loading).

For example, suppose that a sample is retuned to +50 cents and then saved to disk (tape). When that sample is loaded from disk (tape), if the **TUNE** control is still set at +50 cents, then the replayed sound will now be at (+50) cents + (+50) cents = +100 cents; a half step higher than the original sample. However, if the **TUNE** control is reset to the center position, the replayed sound will now be at only +50 cents higher than the original sample; the pitch at which the sample was saved. It follows, therefore, that if the **TUNE** control were to be set at −50 cents, the replayed sound will be (+50) cents + (−50) cents = 0 cent; zero change; which means that the sound will now be the same pitch as the original sample.



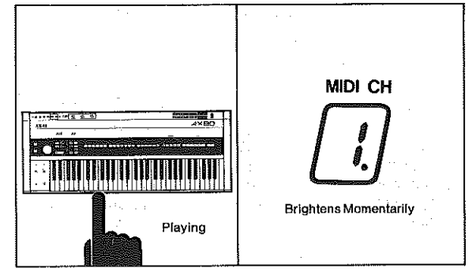
MIDI

MIDI (Musical Instrument Digital Interface)

This is the Internationally recognized standard for electronic musical instruments. It is possible for these instruments to exchange any kind of information needed for musical performance, by utilizing their **MIDI** connections.
The S612 is able to receive the following **MIDI** information through midi cables:

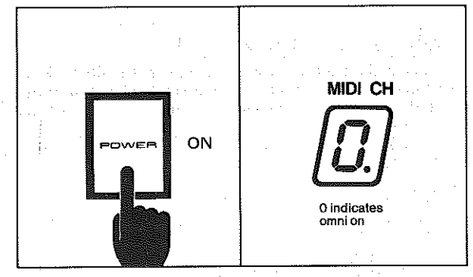
- Note No., Key-On, Key-Off and Key Velocity
- Sustain pedal
- Pitch bend
- Modulation wheel (vibrato)
- Mode change for Mono/Poly
- System exclusive

When the S612 receives the **MIDI** information, its **MIDI CH** display, which indicates the **MIDI** channel numbers, will brighten momentarily to let you know that information has been received. (If the **MIDI** reception channel does not match, the display shows no change.)

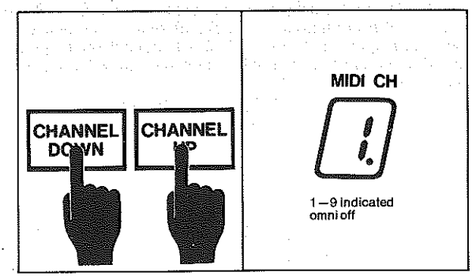


How to set the MIDI Reception Channel

1. When the power is turned on, the S612 initiates to the **POLY** mode of omni on. In this case, it will receive any channel and play according to the information. The digit "0" on the **MIDI CH** displays shows omni on.



2. When you want to reselect the **MIDI** reception channel (1—9), press either the **CHANNEL DOWN** or **CHANNEL UP** button until you reach the desired number. In this case, the S612 receives information only on the designated **MIDI** channel.

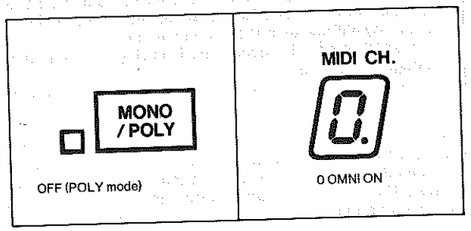


MIDI Mode

There are four **MIDI** modes possible, from combinations of the **MONO/POLY** mode and the **OMNI ON/OFF** mode.

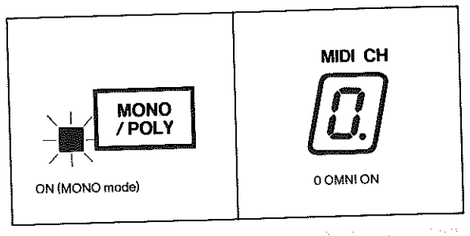
OMNI ON, POLY mode

With this mode, the S612 will receive the MIDI information from any channel, and 6-voice polyphonic sound can be played simultaneously on a channel.
The **OMNI ON. POLY** mode is selected automatically when the S612 is turned on.
(The **MIDI CH** display shows "0" during this mode.)



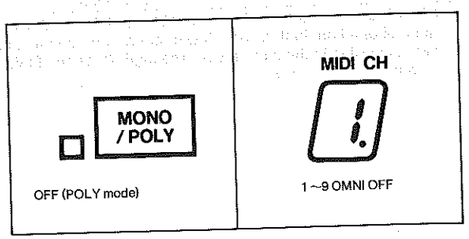
OMNI ON, MONO mode

With this mode, the S612 will receive the **MIDI** information from any channel. However, only one sound can be played at a time on any channel. Press down the **MONO/POLY** button once. (The **LED** indicator will light.)



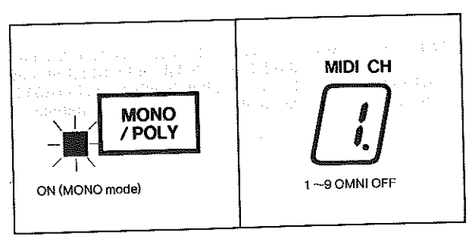
OMNI OFF, POLY mode

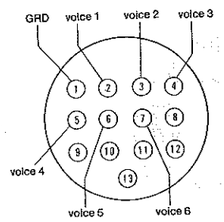
With this mode, the S612 will receive the MIDI information only from the channel which has been designated as the reception channel, and 6-voice polyphonic sound can be played simultaneously on a channel.
When the **MIDI CH** display numbers 1—9 are selected, the S612 is in the **OMNI OFF** mode.



OMNI OFF, MONO mode

With this mode, the S612 will receive the **MIDI** information only from the channel which has been designated as the reception channel. When numbers 1—9 are selected, the One-voice sound corresponding to the designated channel can be played. Also the designated channel voice can go thru the **VOICE OUT** jack.





VOICE OUT jack

SAVE, VERIFY and LOAD

The sampled sound data can be saved, verified or loaded by the specially designed sampler disk drive MD280 (optional) or a Commodore cassette recorder.
The time it takes to save, verify or load with the MD280 is approximately 8 seconds. The Commodore cassette recorder takes approximately 120 seconds.

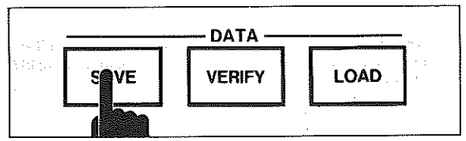
* The sound data is a combination of sampled and edited data.
The operation of the sampler disk drive MD280 or the Commodore cassette recorder, will be controled by the S612.

Note: Make sure the power switch of the S612 is turned off before plugging or unplugging the connection cord of the MD280.

Saving

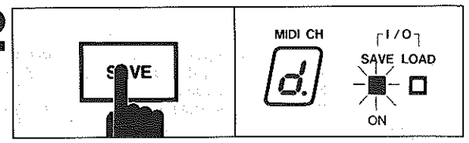
1. Edit the sampled sound of the S612, as required, before saving.
Place the disk into the MD280 sampler disk drive.
(Make sure the tab has not been broken.)
   - Press the **SAVE** button on the S612. The letter *d* will appear on the **MIDI** channel display and start blinking.

1



2. Press the **SAVE** button again, while the display is blinking. The *d* display remain lit and the **SAVE** LED lit, indicating that the save function is in progress.
Note: The *d* display will only blink for several seconds. The **SAVE** button must be pressed a second time while the display is blinking to activate the save function, otherwise, the **SAVE** mode will be cancelled.

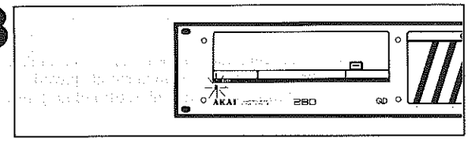
2



3. The **BUSY** LED on the MD280 will light indicating that a save function is in progress.

It takes approximately 8 seconds to accomplish the save. Once saving is completed, the **SAVE LED** of the S612 and the **BUSY** LED of the MD280 will go out. After save function, verify that the data has been properly saved.

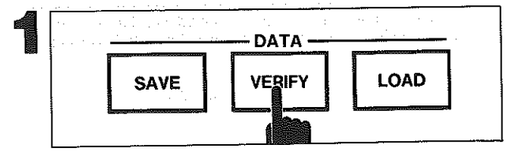
3



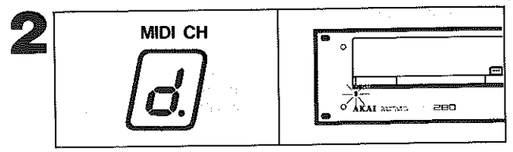
Note: If you encounter any difficulty when trying to save, check the following, and try saving again.
- * The anti-record tab has been broken from the disk.
- * You are trying to save without inserting a disk in the MD280.
- * The power cord of the MD280 is not connected.
- * There is no sample in the S612.

Verifying

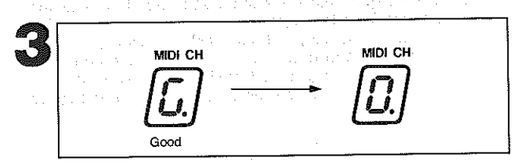
1. After the save process has been completed,
   - Press the **VERIFY** button.



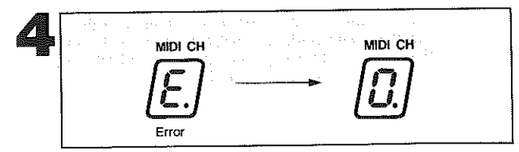
2. The letter *d* will appear on the **MIDI CH** display. At the same time, the **BUSY** LED of the MD280 will light, indicating that it is in the verifying process.



3. The verifying process takes approximately 8 seconds. If the data has been correctly saved, the letter *G* on the **MIDI CH** display will blink for several second.
   The display will return to its previous condition after a few seconds.

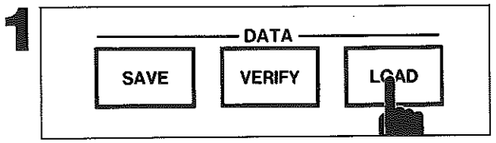


4. If the **MIDI CH** display will indicate the letter *E* and blink for several second the data has not been correctly saved. (After a few seconds, the **MIDI CH** display will return to its previous condition.)
   Try to save function once more time.
   Note: If several unsuccessful attempts have been made to save and verify, the head may need cleaning or the felt may need changing on the MD280 or the sampler disk may need change. Consult your MD280 Operator's Manual for details.

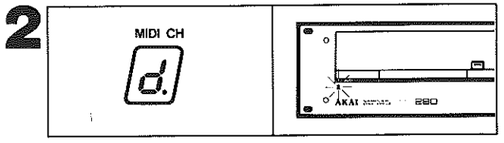


Loading

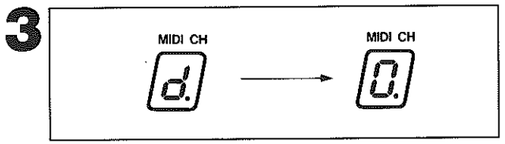
1. Set the sampler disk with sound data into the MD280.
   - Press the **LOAD** button of the S612.



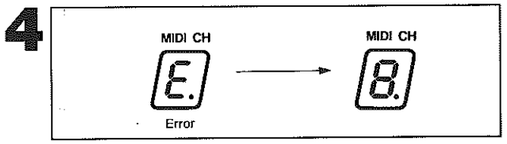
2. The **LOAD** LED will light and loading will begin. At the same time, the letter *d* on the **MIDI CH** display will appear to let you know the S612 is being loaded from the disk.
   Also, the **BUSY** LED of the MD280 will light, indicating that loading is in progress.



3. Loading will take approximately 8 seconds. If the data has been loaded correctly, the **MIDI CH** display will return to its previous condition.



4. If the data has not been loaded correctly, *E* will appear and blink for few seconds before the **MIDI CH** display returns to normal. If this happens, check the following:
   * Has the disk been inserted correctly?
   * Is the disk blank?
   * Has the disk been close to a strong magnetic field?
   * Are the power and interface cables connected properly?



SECTION 2
SERVICE MANUAL

TABLE OF CONTENTS

I. SPECIFICATIONS

FORMAT	12 bit Sampling
Sampling Frequency	4 kHz – 32 kHz (Min ~ Max)
Sampling Time	8 seconds ~ 1 seconds (Max ~ Min)
Frequency Response	Sampling: 25 Hz ~ 12.5 kHz (–3 dB band width) Playback: 25 Hz ~ 20 kHz (–3 dB band width)
Voice	6 voice
Renge	5 octave
FUNCTION CONTROL	Power ON/OFF Recording Level Monitor Level Recording Mode New/Overdub
Edit Scaning	Memory Start (0 ~ 100) Memory End (0 ~ 100) Scaning Mode One Shot, Looping Alternating, Manual Splice (0 ~ 100)
Transpose	Half-Step
Tune	± 100 cent
LFO	Speed (Min ~ Max) Depth (Min ~ Max) Deley (0 ~ 10)
Output	Filter (Low ~ High) Decay (0 ~ 10) Level (0 ~ 10)
MIDI	Mono/Poly Channel Up/Down
Data	Save/Verify/Load
Display	Rec level MIDI ch 0 : Omni on 1 ~ 9 : Omni off I/O : Save/Load
INPUT (Sensitivity/Impedance)	
Mic	–63 dBm/5.6 kohms
Line	–27 dBm/47 kohms
OUTPUT	
Line	6-voice Mix out × 2 output level +2 dBm/2.8 Vp-p
Voice Out	13p/DIN (6-voice separate) level-4 dBm/1.4 Vp-p
DC/8V Out	for the MD280 Sampler Disc Drive
MIDI	MIDI IN (5P/DIN) MIDI THRU (5P/DIN) MIDI OUT (5P/DIN)
INTERFACE	for the MD280 Sampler Disc Drive
POWER REQUIREMENTS	100V 50/60 Hz for Japan 120V 60 Hz for USA & Canada 220/240V 50 Hz Convertible for other contries.
DIMENSIONS	483 (W) × 90 (H) × 379 (D) mm
WEIGHT	6.0 kg (13.2 lbs)

* For improvement purpose, specifications and design are subject to change without notice.

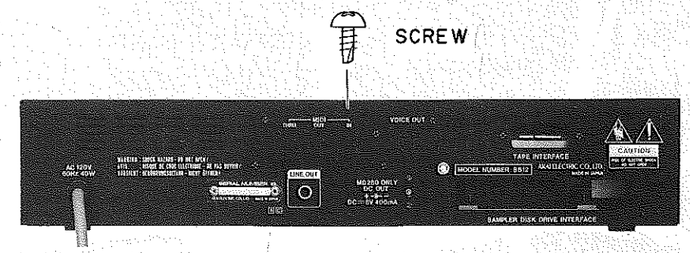
II. DISMANTLING OF UNIT

In case of trouble, etc. necessitating dismantling, please dismantle in the order shown in the photographs.
Reassemble in reverse order.

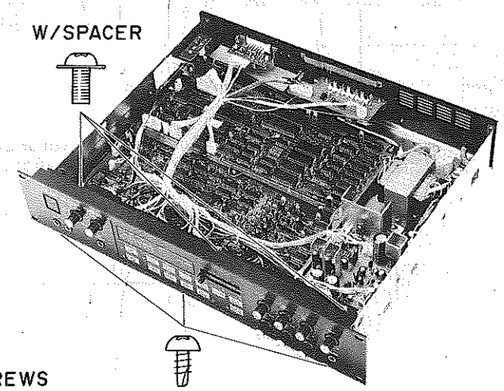
1

SCREWS

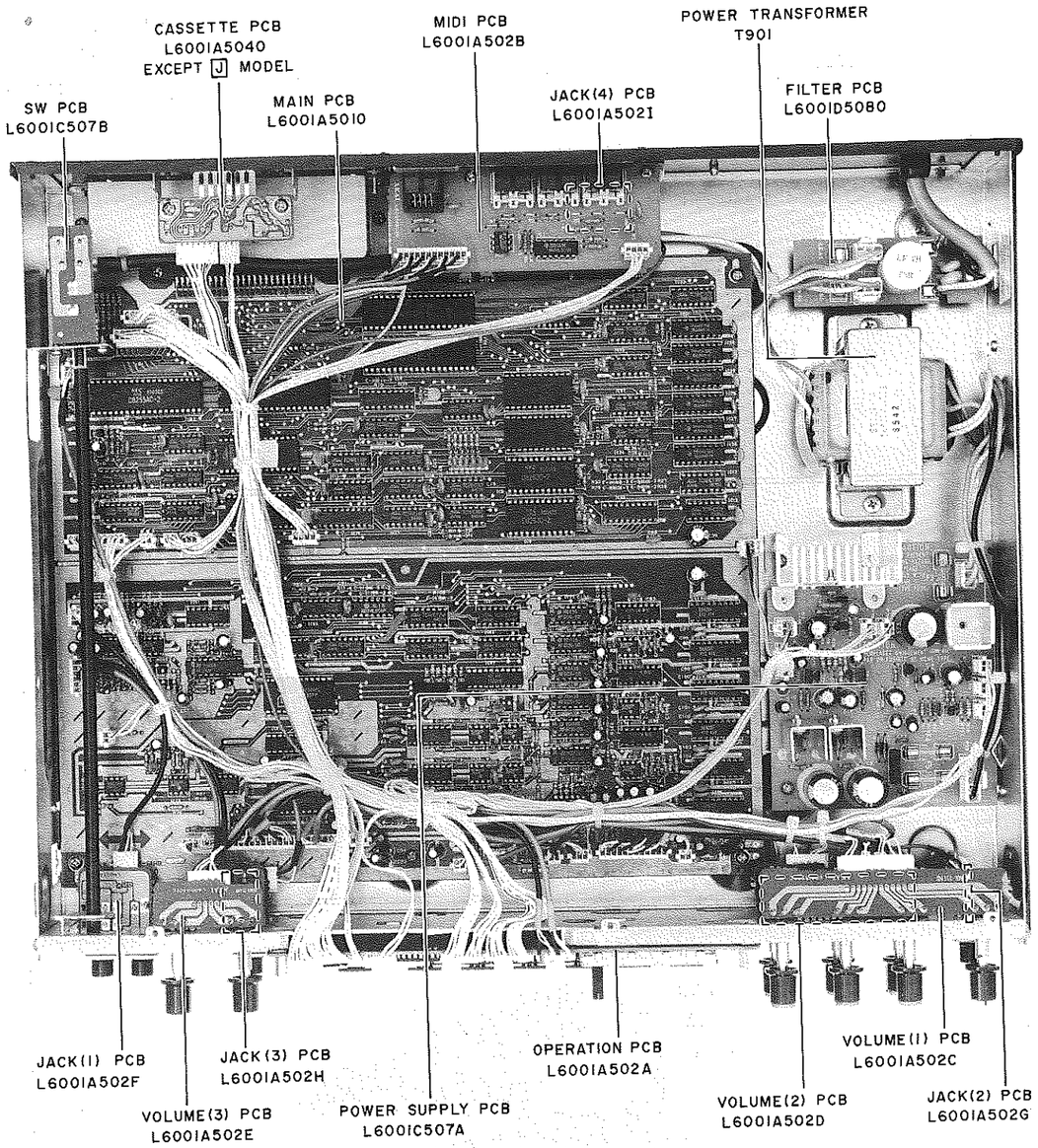
2



3



III. PRINCIPAL PARTS LOCATION



IV. OPERATIONAL CHECKS

For operational checks on Sampler "S612", make connections as illustrated below.

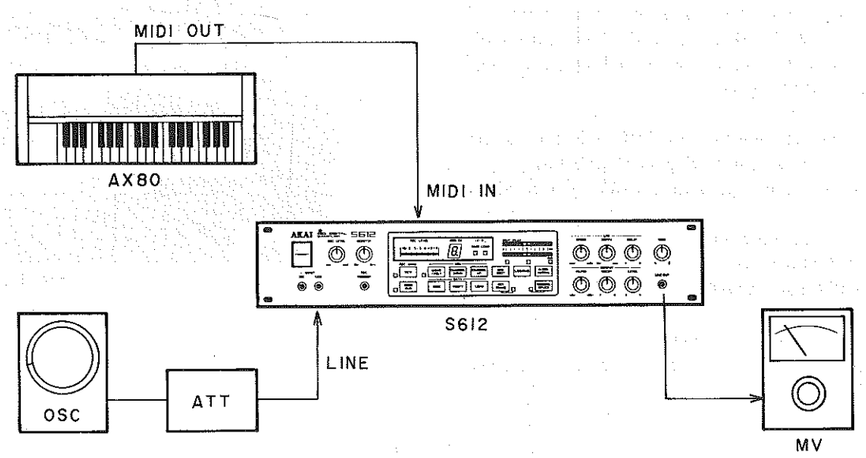


Fig. 4-1

4-1. Power-On Checks

By switching power on, check to assure MIDI-CH to display "0" and the [LOOPING] lamp to glow.

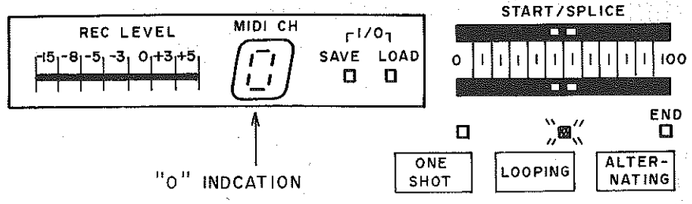


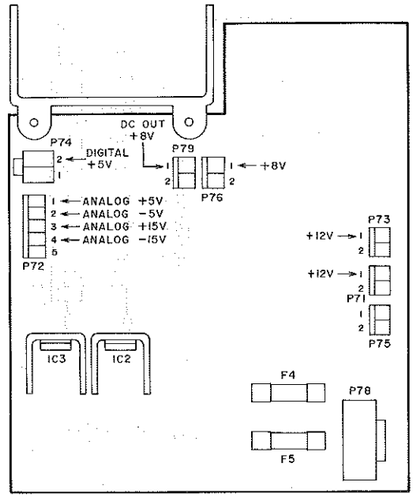
Fig. 4-2 Display of Frontpanel

4-2. B Power Supply Voltage Checks

After switching power on, check to assure the B voltages to be supplied normally.

Check Item	Check Point	Result
ANALOG + 5V	P72-1	+ 5V ± 0.5V
ANALOG - 5V	P72-2	- 5V ± 0.5V
ANALOG +15V	P72-3	+15V ± 1.5V
ANALOG -15V	P72-4	-15V ± 1.5V
DIGITAL + 5V	P74-2	+ 5V ± 0.5V
DC OUT + 8V	P79-1	
DC + 8V	P76-1	
DC +12V	P73-1	+12V ± 1.2V
DC +12V	P71-1	+12V ± 1.2V

Chart-1



POWER SUPPLY PCB L6001C507A

Fog. 4-3 Check point of Power Supply PCB

4-3. MIDI Signal Reception Checks

By operating the keyboard of an AX80 (or another MIDI accommodating synthesizer) that has been connected onto Sampler "S612", check to assure the channel indicator LED for MIDI-CH to glow more birghtly as Sampler receives a MIDI signal.

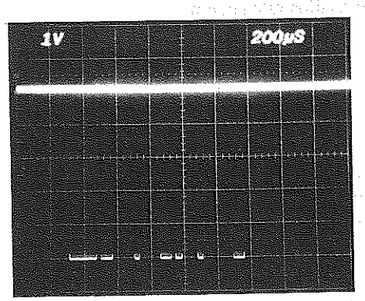


Fig. 4-4

When the channel indicator for MIDI-CH fails to be made brighter, check by following the steps below.

1) Connect an oscilloscope onto IC4 pin 2 within Main PCB.
2) IC4 pin 2 should normally be at an "H" level.
3) Push the AX80 keyboard keys, and observe the received MIDI signal waveforms. (See Fig. 4-4)

A. When no MIDI Signal is observed:
Check IC1 and PH1 in the MIDI signal receiver (MIDI PCB).

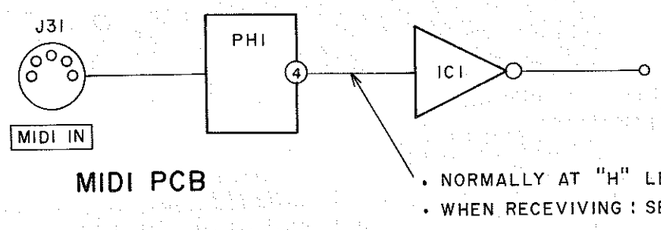


Fig. 4-5

B. When MIDI Signal is observed but MIDI Indicator fails to glow more brightly:
Check the MIDI-CH indicator driving circuit. (See Fig. 4-6)

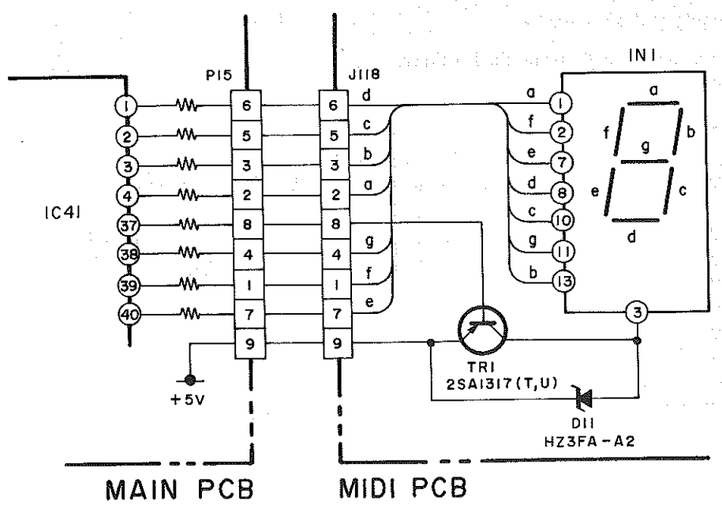


Fig. 4-6 Indicator Driving Circuit

4-4. Operationaly Checks on Operating Buttons. (See Fig. 4-7)

Check to assure IC41 pins 12 to 25 on Main PCB to be at an "H" level (5 VDC) in a normal mode.

1) When Sampler fails to operate despite IC41 pins 12 to 25 at an "H" level in a normal mode, replace IC41.

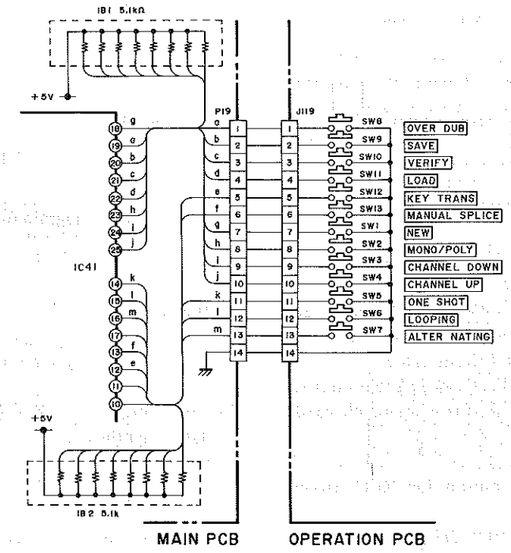


Fig. 4-7 Operation Button Input Circuit

4-5. Operationaly Check on VR (Control) Inputs

1) When all the VRs have been set at their minimum positions, IC58 pins 1 to 5 and 26 to 28 within Main PCB should be at an "L" level (0 VDC).

2) By operating the VRs, check to assure the DC levels at IC58 pins 1 to 5 and 26 to 28 to rise in correspondence with the VR positions, and to reach an "H" level (5 VDC) as the VRs have been set at their maximum positions. (See Fig. 4-8)

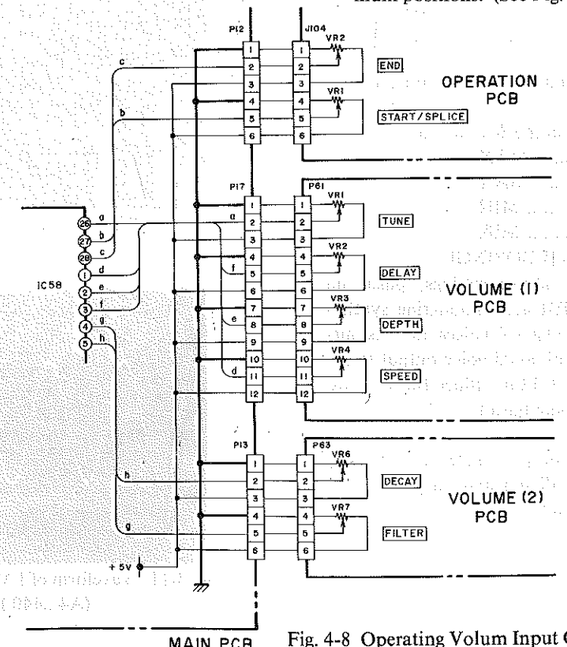


Fig. 4-8 Operating Volum Input Circuit

4-6. Operationaly Checks on In/Output Circuits (Refer to Fig. 4-9)

The audio signal circuit may broadly be broken down into three blocks, the input circuit (analog), the digital circuit (digital), and the output circuit (analog).

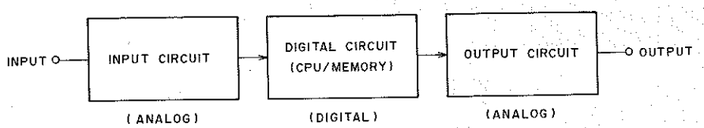


Fig. 4-9 Block Diagram of Main PCB

4-6-1.

When no sound emission or any other trouble due to the audio signal circuit failure has occurred, follow the steps below to localize the trouble to a specific block.
For this job, test signals have already been programmed for. By-block performance should therefore be checked by using these test signals.

1) While holding the [NEW] button for REC Mode down, switch power on.
   By the above operation, MIDI-CH should display 8CH, and the indicator LEDs for [NEW] and [OVERDUB] flash on and off for about 25 to 30 seconds.

2) As the flashing of LEDs ceases, MIDI-CH should return to "0".

3) In this state, a 440 Hz sine wave test signal (key A4 of the synthesizer) should be recorded, irrespective of the input circuit status.

   a) In the above state, connect a millivoltmeter onto LINE OUT.
   b) Set the individual VRs of the S612 as shown below.
      OUTPUT VR..... MAX
      FILTER VR..... MAX
      DECAY VR..... MIN
      Other VRs..... MIN
   c) Set the scaning mode at [LOOPING].
   d) Upon concluding the above settings, push the AX80 (or another MIDI accommodating synthesizer) key board keys to have 6 voices of tones output, and check each individual voice output to assure its being at +2 ± 2 dBm. (Since the keys are touch sensitive, push them hard.)

   * When individual voice outputs have been checked valid at LINE OUT, the digital and output circuits may be judged to have been trouble-free.

- When individual voice outputs cannot be checked:

1) Connect an oscilloscope onto pin 19 or D/A converter IC67 in the digital circuit.

2) Keep holding an AX80 (or another MIDI accommodating synthesizer) keyboard key down, and observe the waveform of a time-shared audio signal emerging at IC67 pin 19. (See Fig. 4-10, 11)
   * When an audio signal has been observed there: The output circuit will have been defective.
   * When no audio signal has been observed there: The digital circuit will have been defective.

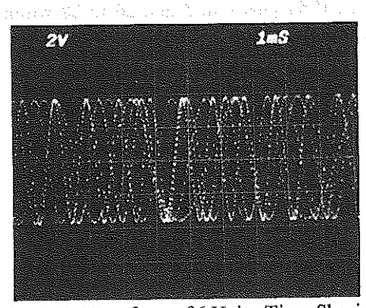


Fig. 4-10 Waveform of 6 Voice Time-Sharing

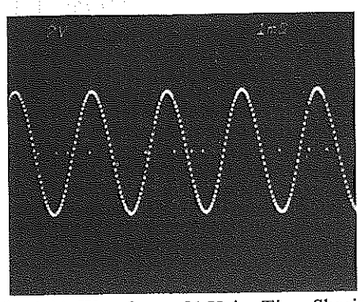


Fig. 4-11 Waveform of 1 Voice Time-Sharing (A4...440 Hz)

4-7. Operationaly Checks on Input, Output, and Digital Circuits

- Check each individual block by observing waveforms at its various locations and checking them against reference waveforms.
- When checking waveforms in the digital circuit, be sure to use a 10 : 1 probe.

4-7-1. Input Circuit (Refer to Fig. 4-13)

1) Input a 400 Hz signal at –29 dBm to LINE IN from an audio signal generator.
2) Set the REC level VR at its maximum position.
3) The voltage waveforms at various locations of the input circuit are shown in Fig. 4-13.

4-7-2. Output Circuit (Refer to Fig. 4-14)

1) By the same procedure as 6-1, record test signals.
2) Disconnect any external input circuit that may have been connected onto LINE IN of the input circuit.
3) Push an AX80 (or another MIDI accommodating synthesizer) keyboard key. In this process, due caution will be required, since the output level varies by the force applied to the key.
4) The voltage waveforms at various locations are shown in Fig. 4-14 to which reference is directed.
   The various waveforms shown apply to the keys for 6 voices that have steadily been held down.
   VOICE 1 ..... A4 (440 Hz)
   VOICE 2 ..... C4 (261 Hz)
   VOICE 3 ..... C5 (523 Hz)
   VOICE 4 ..... E5 (659 Hz)
   VOICE 5 ..... G5 (783 Hz)
   VOICE 6 ..... C6 (1046 Hz)
   The voice numbers will be assigned by the key pushing sequence.

4-7-3. Digital Circuit (Refer to Fig. 4-15)

When observing digital circuit signal waveforms, be sure to use a 10 : 1 probe for the oscilloscope.

1) Clock Generator Performance Checks (See Fig. 4.12)
   Connect an oscilloscope onto IC40 pin 1, and check to assure an 8 MHz signal to have been generated.

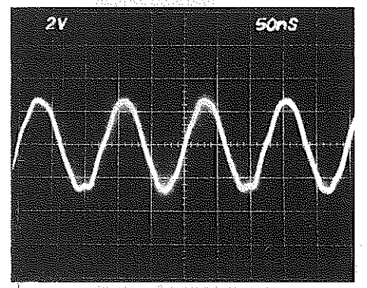


Fig. 4-12

2) The system clock signal input waveforms for the various ICs are shown in Fig. 4-15.

3) If a short-circuit or equivalent occurs while checking the digital circuit, IC(s) may run away, so that in such an event, switch power off and then back on again to kill the runaway.

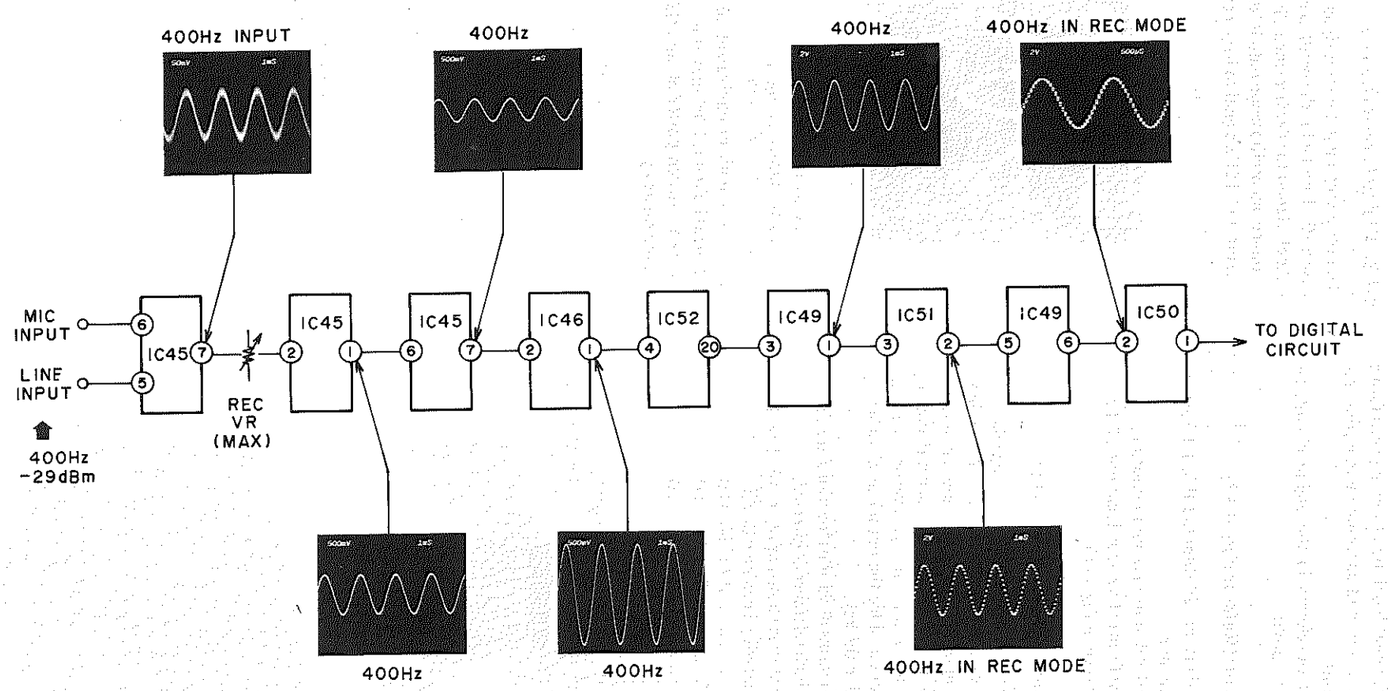


Fig. 4-13 Input Waveform of Input Diagram

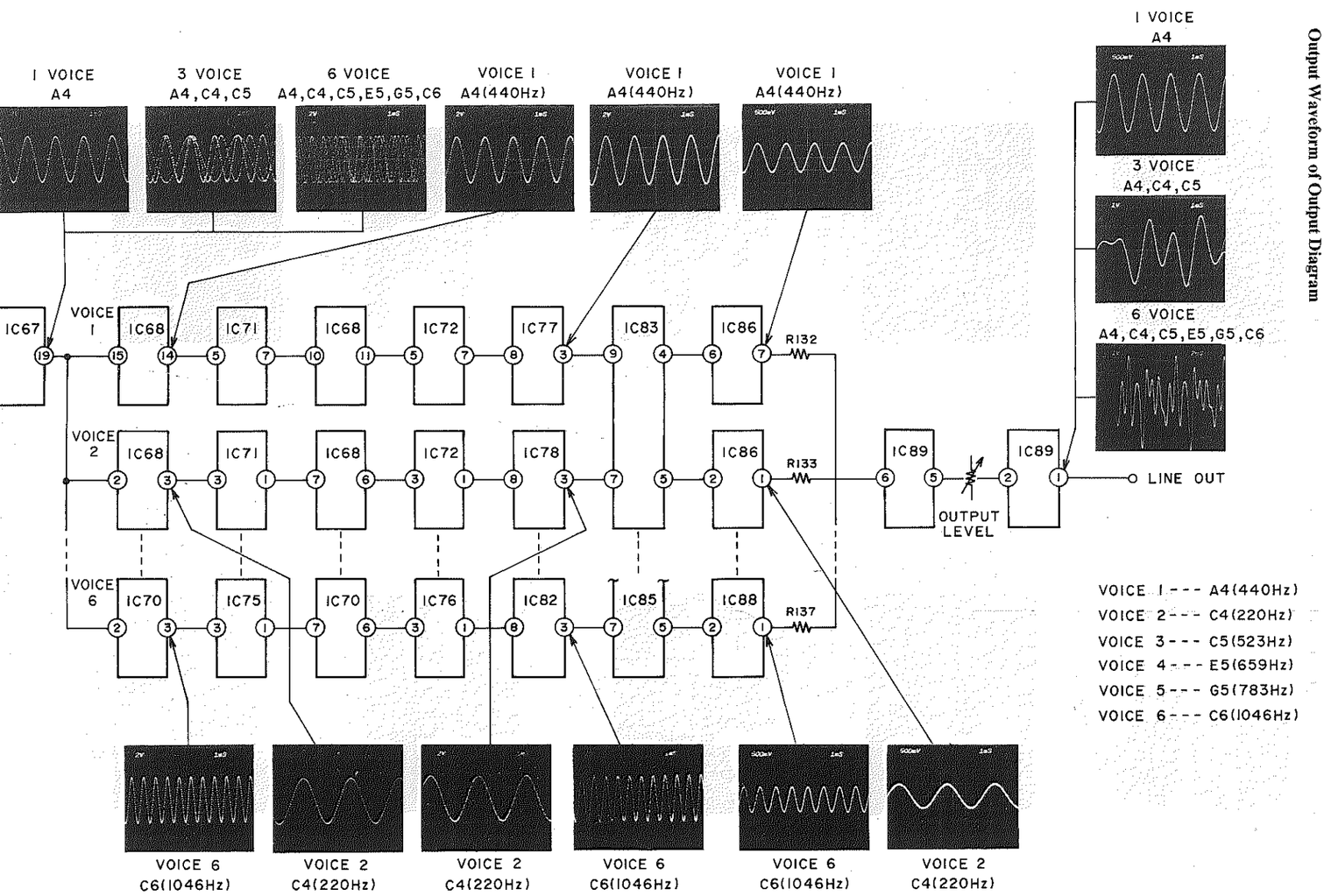
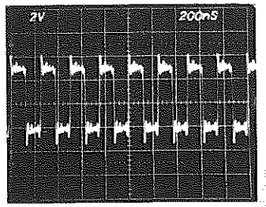
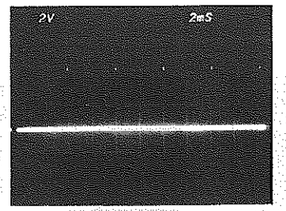


Fig. 4-14 Output Waveform of Output Diagram

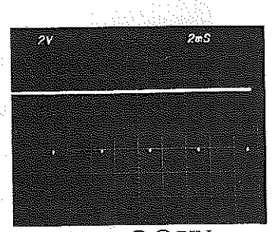
System clock signal Waveform for the various ICs



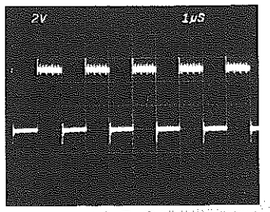
IC5 – ⑨ ⑮ ⑱ PIN
IC6 – ⑨ ⑮ ⑱ PIN



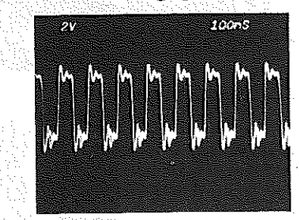
IC54 – ⑪ PIN
IC55 – ⑦ PIN



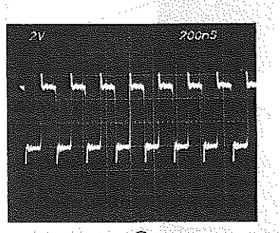
IC17 – ③ ⑪ PIN
IC18 – ③ ⑪ PIN
IC19 – ③ ⑪ PIN



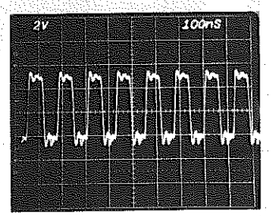
IC4 – ③ ④ PIN
IC58 – ⑩ PIN



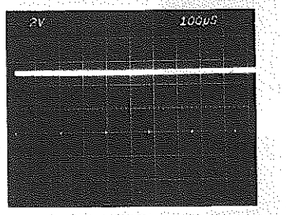
IC7 – ⑨ ⑮ ⑱ PIN
IC8 – ⑨ ⑮ ⑱ PIN



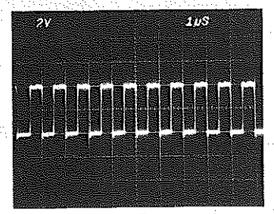
IC60 – ⑨ PIN



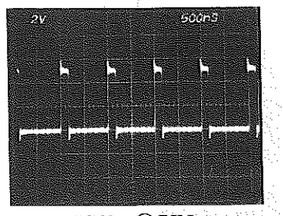
IC23 – ⑩ PIN



IC61 – ⑨ PIN
IC62 – ⑨ PIN



IC52 – ⑩ PINS



IC63 – ⑨ PIN

Fig. 4-15 System clock signal Waveform for the various ICs

4-8. RECord/Playback Level Checks

1) Input to LINE IN a 400 Hz signal at –29 dBm from an audio signal generator.

2) Set the REC Level VR at its maximum position.

3) Set the other VRs as shown below.
   OUTPUT LEVEL VR ..... MAX
   FILTER VR ..... MAX
   MONITOR VR ..... MAX
   Other VRs ..... MIN

4) AL this point in time, check to assure the indication of a millivoltmeter connected to LINE OUT to have been at 0 dBm.

5) Similarly check to assure the REC Level meter indication to have been at 0 dB (with all the green LEDs glowing).

6) In the above state, after pushing key A4 of the AX80, push the [NEW] button for REC Mode, and start recording. (The 400 Hz signal may be played back by pushing key A4 of the AX80.)

7) Upon concluding the recording operation, set the scanning mode at "LOOPING" by pushing the [LOOPING] button.
   Also disconnect the audio signal generator that has been connected onto LINE IN.

8) Push keyboard keys of the AX80 (or another MIDI accommodating synthesizer), and check to assure the output level at LINE OUT to have been made 0 dB.
   - When pushing the AX80 keyboard keys, the output level will vary in accordance with a force applied to the key, so that push the keys hard. A sound will be emitted while the key is held down.

V. PC BOARD TITLE AND IDENTIFICATION NUMBERS

P.C. Board Titile		P.C. Board Number	Remarks
MAIN	P.C Board	L6001A5010	
OPERATION	P.C Board	L6001A502A	
MIDI	P.C Board	L6001A502B	
VOLUME (1)	P.C Board	L6001A502C	
VOLUME (2)	P.C Board	L6001A502D	
VOLUME (3)	P.C Board	L6001A502E	
JACK (1)	P.C Board	L6001A502F	
JACK (2)	P.C Board	L6001A502G	
JACK (3)	P.C Board	L6001A502H	
JACK (4)	P.C Board	L6001A502I	
SW	P.C Board	L6001C507B	
CASSETTE	P.C Board	L6001D5040	[J] EXCLUDE
FILTER	P.C Board	L6001D5080	

SECTION 3
PARTS LIST

TABLE OF CONTENTS

ATTENTION

1. When placing an order for parts, be sure to list the parts no. model no., and description of each part. If any of this information is omitted, there are instances in which parts cannot be shipped or the wrong parts will be delivered.
2. Please be careful not to make a mistake in the parts no. If the parts no. is in error, a part different from the one ordered may be delivered.
3. Because part numbers and part definitions and supply in the Preliminary Parts List may have been the subject of changes, please use this parts list for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List shows those parts which are considered necessary for repairs. Other parts, such as resistors and capacitors, are shown in the "Common List for Service Parts" from which these parts should be selected and parts.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the parts list
   a) Mechanism Block
   b) P.C Board Block

2. HEAD BASE BLOCK

REF. NO.	PART NO.	DESCRIPTION
2-1x	BH-T2023A320A	HEAD BASE BLOCK GX-F66R
2-2	HP-H2206A010A	HEAD R/P PR4-8FU C
2-3	ZS-477876	PAN20×03STL CMT
2-4	ZS-536488	BID20×08STL CMT
2-5	ZG-402895	CS ANGLE ADJUST SPRING

SP (Service Parts) Classification

A small "x" indicates the inability to show that particular part in the Photo or Illustration.

This number corresponds with the individual parts index number in that figure

This number corresponds with the Figure Number

6. SYS. CON. P C BOARD BLOCK

REF. NO.	PART NO.	DESCRIPTION
6-1	BA-T2034A070A	PC SYS CON BLK GX-F44R
6-IC1	EI-324536	IC HD14049BP
6-IC2	EI-336801	IC MB8841-564M
6-IC3	EI-331661	IC SN7405N
6-IC4	EI-336725	IC M54527P
6-TR1to4	ET-200985	TR 2SC2603 F,G
6-TR5to28	ET-554657	TR 2SA733A P,Q
6-D1	ED-318292	D SILICON H 1S2473T-77 T26
6-D2to4	ED-308952	D GERMA V 1K34A-LR F07
6-D5to10	ED-318292	D SILICON H 1S2473T-77 T26
6-X1	EI-318384	OSC X'TAL NC-18C 3.579545MHZ

SP (Service Parts) Classification

These reference symbols correspond with component symbols in the Schematic Diagrams.

5. The kind of part and its installation position can both be determined by the Part Number. To determine where a part number is listed, utilize the Parts Index at the end of the Parts List. It is necessary first of all to find the Part Number. This can be accomplished by using the Reference Number listed at the right of the part number in the Parts Index.

WARNING

⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURE'S RECOMMENDED PARTS

AVERTISSEMENT

⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÉCES RECOMMANDEES PAR LE FABRICANT

RECOMMENDED SPARE PARTS

Because, if the parts listed below are on hand, almost any repair can be accomplished, we suggest that you stock these Recommended Spare Parts Items.

REF. NO.		PART NO.	DESCRIPTION
1	N	BT-360649	⚠ TRANS POWER S612 T-10 (J)
2	N	BT-360650	⚠ TRANS POWER S612 T-30 (C,A)
3	N	BT-360653	⚠ TRANS POWER S612 T-50 (E,V,B,S)
4	N	ED-359534	D LED SLH34VC3F-R RED
5		ED-330319	⚠ D SILICON DBA10B 100/1.0A
6		ED-200213	⚠ D SILICON DBA40C-K15 200/2.6A
7		ED-357754	⚠ D SILICON DS135D 200/1.0A
8		ED-301911	D SILICON H DS448
9		ED-343996	D ZENER H HZ12 B1
10		ED-346592	D ZENER H HZ3 A2
11		ED-331626	D ZENER H HZ3 B2
12		EF-359225	⚠ FUSE BET T 3.15A 250V (B)
13		EF-355374	⚠ FUSE BET T 500MA 250V (B)
14		EF-691007	⚠ FUSE SEMKO T 3.15A 250V (E,V,S)
15		EF-593706	⚠ FUSE SEMKO T 500MA 250V (E,V,S)
16		EF-306124	⚠ FUSE TSC A 250V 0.63A (J)
17		EF-306949	⚠ FUSE TSC A 250V 1.25A (J)
18		EF-306952	⚠ FUSE TSC A 250V 4.00A (J)
19		EF-305703	⚠ FUSE TSC 125V 0.63A (C,A)
20		EF-308847	⚠ FUSE TSC 125V 1.60A (C, A)
21		EF-306957	⚠ FUSE TSC 125V 4.00A (C,A)
22	N	EI-359552	⚠ IC M5236L
23	N	EI-359626	⚠ IC NJM78M15A
24	N	EI-359628	⚠ IC NJM79M15A
25	N	EI-360051	IC ADC0809CCN
26	N	EI-360049	IC AM2504PC
27	N	EI-390060	IC BA9201
28	N	EI-360050	IC BA9221
29	N	EI-360045	IC DG211CJ
30	N	EI-360021	IC HD6850P
31	N	EI-360763	IC HD74HC09P
32	N	EI-360052	IC IR2E02
33	N	EI-360046	IC MF10CN
34	N	EI-360058	IC MF6CN-50
35	N	EI-360043	IC M5220P
36	N	EI-360059	IC NE572N
37	N	EI-360772	IC NJM79L05A
38	N	EI-360023	IC P8254
39		EI-310044	IC SN74LS05N
40	N	EI-360029	IC S612A
41	N	EI-360030	IC S612B
42	N	EI-360032	IC S612C
43	N	EI-360038	IC S612D
44	N	EI-360047	IC S612E
45	N	EI-360040	IC TC74HCU04P
46	N	EI-360037	IC TC74HC00P
47	N	EI-360026	IC TC74HC04P
48	N	EI-360039	IC TC74HC08P
49	N	EI-360025	IC TC74HC138P
50	N	EI-356049	IC TC74HC139P
51	N	EI-360035	IC TC74HC157P
52	N	EI-360048	IC TC74HC173P
53	N	EI-360054	IC TC74HC174P
54	N	EI-360053	IC TC74HC175P
55	N	EI-360042	IC TC74HC259P
56	N	EI-360036	IC TC74HC32P
57	N	EI-360031	IC TC74HC4040P
58	N	EI-360028	IC TC74HC74P
59	N	EI-360027	IC TC74HC86P
60	N	EI-324255	IC TL082CP
61	N	EI-359608	IC TMM2764D
62		EI-354197	IC μPC311C
63	N	EI-359609	IC μPD41416C-20
64	N	EI-354186	IC μPD780C-1
65	N	EI-360024	IC μPD8237AC-5
66	N	EI-354146	IC μPD8253C-2
67		EI-354149	IC μPD8255AC-2
68	N	EI-359563	OSC CE CSA8.00MS40
69	N	EM-359536	IND LE GL-107S12
70	N	EM-359535	IND LE SL-1179
71		EQ-348929	RELAY SIG G5A-232P 2TR 12V
72		ES-344270	⚠ SW PUSH SDLD1P003 01-1
73		ES-306430	⚠ SW SLIDE J-S4013≠01 01-2
74		ES-354115	SW TACT SKHCAC021A
75	N	ET-360687	⚠ TR 2SB1015 Y, GR
76	N	ET-356817	⚠ TR 2SB891 Q ,R
77		ET-349883	⚠ TR2SC3243 D, E
78		ET-354083	⚠ TR 2SD1189 Q, R
79		ET-354167	PHOTO SENSOR PC900
80		ET-349882	TR 2SA1283 D, E
81		ET-355216	TR 2SA1317 T, U
82		ET-338447	TR 2SA991 E, F
83		ET-316523	TR 2SC1844 F
84		ET-353898	TR 2SC3330
85	N	ET-360067	TR 2SC3330 T, U
86	N	EV-359551	VR ROTARY 16P10 A502
87	N	EV-359549	VR ROTARY 16P10 B103
88	N	EV-361200	VR ROTARY 16P10 B502
89	N	EV-359547	VR ROTARY 16P10 (W/CENTER CLICK) B103
90	N	EV-360751	VR SLIDE RSGA1

"NOTE" N: New Parts

SYMBOL FOR DESTINATION

[A] : AAL (U,S,A)
[B] : UK (ENGLAND)
[C] : CSA (CANADA)
[E] : CEE (EUROPE)
[J] : JPN (JAPAN)
[S] : SAA (AUSTRALIA)
[V] : VDE (WEST GERMANY)

1. PC BOARD BLOCK

REF. NO.	PART NO.	DESCRIPTION
1-1	BA-L6001A060A	PC MAIN BLK S612
1-2	BA-L6001A020A	PC OPERATION BLK S612
1-3	BA-L6001A080A	PC CASSETTE BLK S612 (C,A,E,V,B,S) [EXCEPT J]
1-4	BA-L6001A040A	PC POWER BLK S612

NOTE: PC OPERATION BLK CONSISTS OF FOLLOWING PC BOARDS.

- OPERATION PC BOARD
- MIDI PC BOARD
- VOLUME PC BOARD (1)
- VOLUME PC BOARD (2)
- VOLUME PC BOARD (3)
- JACK PC BOARD (1)
- JACK PC BOARD (2)
- JACK PC BOARD (3)
- JACK PC BOARD (4)

PC POWER BLK CONSISTS OF FOLLOWING PC BOARDS.

- POWER SUPPLY PC BOARD
- SW PC BOARD

2. MAIN PC BOARD

REF. NO.	PART NO.	DESCRIPTION
2-IC1	EI-354186	IC μPD780C-1
2-IC2	EI-356049	IC TC74HC139P
2-IC3	EI-359608	IC TMM2764D
2-IC4	EI-360021	IC HD6850P
2-IC5,6	EI-354146	IC μPD8253C-2
2-IC7,8	EI-360023	IC P8254
2-IC9,10	EI-360024	IC μPD8237AC-5
2-IC11,12	EI-360025	IC TC74HC138P
2-IC13,14	EI-360026	IC TC74HCO4P
2-IC15,16	EI-360027	IC TC74HC86P
2-IC17 to 19	EI-360028	IC TC74HC74P
2-IC20	EI-360029	IC S612A
2-IC21	EI-360030	IC S612B
2-IC23,24	EI-360031	IC TC74HC4040P
2-IC25	EI-360032	IC S612C
2-IC26 to 31	EI-359609	IC μPD41416C-20
2-IC32,33	EI-360035	IC TC74HC157P
2-IC34,35	EI-360036	IC TC74HC32P
2-IC36	EI-360037	IC TC74HCOOP
2-IC37	EI-360026	IC TC74HCO4P
2-IC38	EI-360038	IC S612D
2-IC39	EI-360039	IC TC74HCO8P
2-IC40	EI-360040	IC TC74HCUO4P
2-IC41	EI-354149	IC μPD8255AC-2
2-IC42,43	EI-360042	IC TC74HC259P
2-IC44	EI-360038	IC S612D
2-IC45	EI-360043	IC M5220P
2-IC46	EI-324255	IC TLO82CP
2-IC48	EI-354197	IC μPC311C
2-IC49	EI-324255	IC TLO82CP
2-IC50	EI-354197	IC μPC311C
2-IC51	EI-360045	IC DG211CJ
2-IC52	EI-360046	IC MF10CN
2-IC54	EI-360047	IC S612E
2-IC55	EI-360048	IC TC74HC173P
2-IC56	EI-360049	IC AM2504PC
2-IC57	EI-360050	IC BA9221
2-IC58	EI-360051	IC ADC0809CCN
2-IC60	EI-360053	IC TC74HC175P
2-IC61 to 63	EI-360054	IC TC74HC174P
2-IC64	EI-360036	IC TC74HC32P
2-IC65	EI-360038	IC S612D
2-IC66	EI-360763	IC HD74HCO9P
2-IC67	EI-360050	IC BA9221
2-IC68 to 70	EI-360045	IC DG211CJ
2-IC71 to 76	EI-324255	IC TLO82CP
2-IC77 to 82	EI-360058	IC MF6CN-50
2-IC83 to 85	EI-360059	IC NE572N
2-IC86 to 89	EI-324255	IC TLO82CP
2-IC90 to 95	EI-390060	IC BA9201
2-IC96	EI-360772	IC NJM79L05A
2-TR1	ET-353898	TR 2SC3330
2-TR4	ET-338447	TR 2SA991 E, F
2-TR5, 6	ET-316523	TR 2SC1844 F
2-TR7	ET-338447	TR 2SA991 E, F
2-D1, 2	ED-301911	D SILICON H DS448
2-D3	ED-359534	D LED SLH34VC3F-R RED
2-X1	EI-359563	OSC CE CSA8.00 MS40
2-RL1	EQ348929	RELAY SIG G5A-232P 2TR 12V
2-IB1, 2	ER-360201	R COMP RKC1/8B8 512J
2-R67	ER-331188	R FUSE E RD2FC S10 1/4W 8R2J
2-R76	ER-359556	R MF H F10 1/4W 5111F
2-R77	ER-359555	R MF H F10 1/4W 2551F
2-R96	ER-359557	R MF H F10 1/4W 1651F
2-R97	ER-359558	R MF H F20 1/4W 3321F
2-R162	ER-360773	R OMF H S12 FS 1W 470J
2-C45	EC-360719	C PP V S05 CQMFS92 101J 50DC
2-C50	EC-360717	C PP V S05 CQMFS92 471J 50DC
2-C51	EC-360717	C PP V S05 CQMFS92 471J 50DC
2-C79	EC-360716	C PP V S05 CQMFS92 391J 50DC
2-C205, 207 210	EC-360719	C PP V S05 CQMFS92 101J 50DC
2-J1	EJ-359564	SOCKET CONNECT. CE478-25-30-432 50P
2-1	EJ-358691	SOCKET IC DILB28P-8J

3. OPERATION PC BOARD

REF. NO.	PART NO.	DESCRIPTION
3-IC1	EI-360052	IC IR2E02
3-TR1	ET-355216	TR 2SA1317 T, U
3-D1 to 10	ED-359534	D LED SLH34VC3F-R RED
3-D11	ED-346592	D ZENER H HZ3 A2
3-SW1 to 13	ES-354115	SW TACT SKHCAC021A
3-VR1, 2	EV-360751	VR SLIDE RSGA1
3-IN1	EM-359535	IND LE SL-1179
3-IN2	EM-359536	IND LE GL-107S12

4. CASSETTE PC BOARD

REF. NO.	PART NO.	DESCRIPTION
4-IC1	EI-359552	IC M5236L
4-TR1	ET-349882	TR 2SA1283 D, E
4-TR2	ET-355216	TR 2SA1317 T, U
4-R1	ER-360725	⚠ R OMF H S12 FS 1W 221J

5. POWER SUPPLY PC BOARD

REF. NO.	PART NO.	DESCRIPTION
		POWER SUPPLY PC BOARD
5-IC1	EI-359552	⚠ IC M5236L
5-IC2	EI-359626	⚠ IC NJM78M15A
5-IC3	EI-359628	⚠ IC NJM79M15A
5-TR1	ET-360687	⚠ TR 2SB1015 Y, GR
5-TR2	ET-349883	⚠ TR 2SC3243 D, E
5-TR3	ET-354083	⚠ TR 2SD1189 Q, R
5-TR4	ET-360067	TR 2SC3330 T, U
5-TR5	ET-355216	TR 2SA1317 T, U
5-TR6	ET-356817	⚠ TR 2SB891 Q, R
5-TR7 to 9	ET-360067	TR 2SC3330 T, U
5-D1	ED-200213	⚠ D SILICON DBA40C-K15 200/2.6A
5-D2	ED-357754	D SILICON DS135D 200/1.0A
5-D4	ED-330319	⚠ D SILICON DBA10B 100/1.0A
5-D5	ED-331626	D ZENER H HZ3 B2
5-D6	ED-343996	D ZENER H HZ12 B1
5-D7	ED-301911	D SILICON H DS448
5-D8 to 11	ED-357754	D SILICON DS135D 200/1.0A
5-R1	ER-360725	R OMF H S12 FS 1W 221J
5-R2	ER-356113	R MF H F10 1/4W 1302G
5-R3	ER-360732	R MF H F10 1/4W 4301G
5-R6	ER-355400	R MF H F10 1/4W 1101G
5-R7	ER-359644	R MF H F10 1/4W 3901G
5-R8	ER-357831	R MF H F10 1/4W 5101G
5-R9	ER-359644	R MF H F10 1/4W 3901G
5-C2	EC-322804	C EC V CUT SM 472M 16.0DC
5-C3	EC-313825	C SA V F05 R33K 25DC
5-C6, 7	EC-316188	C EC V CUT SM 102M 25DC
5-1	EZ-200473	SILICON RUBBER SHEET TC-30
5-2	ZW-632226	WASHER INSULATOR (BUSH M)
		ASSEMBLY BLOCK
5-F3A	EF-306952	⚠ FUSE TSC A 250V 4.00A [J]
5-F3B	EF-306957	⚠ FUSE TSC 125V 4.00A [C, A]
5-F3C	EF-691007	⚠ FUSE SEMKO T 3.15A 250V [E, V, S]
5-F3D	EF-359225	⚠ FUSE BET T 3.15A 250V [B]
5-F4A	EF-306124	⚠ FUSE TSC A 250V 0.63A [J]
5-F4B	EF-305703	⚠ FUSE TSC 125V 0.63A [C, A]
5-F4C	EF-593706	⚠ FUSE SEMKO T 500MA 250V [E, V, S]
5-F4D	EF-355374	⚠ FUSE BET T 500MA 250V [B]
5-F5A	EF-306124	⚠ FUSE TSC A 250V 0.63A [J]
5-F5B	EF-305703	⚠ FUSE TEC 125V 0.63A [C, A]
5-F5C	EF-593706	⚠ FUSE SEMKO T 500MA 250V [E, V, S]
5-F5D	EF-355374	⚠ FUSE BET T 500MA 250V [B]

6. FILTER PC BOARD

REF. NO.	PART NO.	DESCRIPTION
6-FL1	E0-360068	COIL LF LF-2 B
6-C2, 3	EC-358450	⚠ C CE V B 102M 400AC
		ASSEMBLY BLOCK
6-F1A	EF-306949	⚠ FUSE TSC A 250V 1.25A [J]
6-F1B	EF-308847	⚠ FUSE TSC 125V 1.60A [C, A]
6-F1C	EF-593706	⚠ FUSE SEMKO T 500MA 250V [E, V, S]
6-F1D	EF-355374	⚠ FUSE BET T 500MA 250V [B]

7. MIDI PC BOARD

REF. NO.	PART NO.	DESCRIPTION
7-IC1	EI-310044	IC SN74LS05N
7-D1	ED-301911	D SILICON H DS448
7-J31 to 33	EJ-360770	DIN J TCS4450-01-1111 5P
7-J34	EJ-360771	DIN J TCS5037-01-241 13P

8. VOLUME PC BOARD (1)

REF. NO.	PART NO.	DESCRIPTION
8-VR1	EV-359547	VR ROTARY 16P10 (W/CENTER CLICK) B103
8-VR2 to 4	EV-359549	VR ROTARY 16P10 B103

9. VOLUME PC BOARD (2)

REF. NO.	PART NO.	DESCRIPTION
9-VR5	EV-359551	VR ROTARY 16P10 A502
9-VR6, 7	EV-359549	VR ROTARY 16P10 B103

10. VOLUME PC BOARD (3)

REF. NO.	PART NO.	DESCRIPTION
10-VR8	EV-361200	VR ROTARY 16P10 B502
10-VR9	EV-359551	VR ROTARY 16P10 A502

11. JACK PC BOARD (1)

REF. NO.	PART NO.	DESCRIPTION
11-J61	EJ-359642	PHONE J 3P HLJ4307-01-3060
11-J62	EJ-354269	PHONE J 3P HLJ0540-110 6.3

12. JACK PC BOARD (2)

REF. NO.	PART NO.	DESCRIPTION
12-J64	EJ-354269	PHONE J 3P HLJ0540-110 6.3
12-L1, 2	E0-345909	COIL FIX 1 LAL03KH 4R7K

13. JACK PC BOARD (3)

REF. NO.	PART NO.	DESCRIPTION
13-J63	EJ-354269	PHONE J 3P HLJ0540-110 6.3

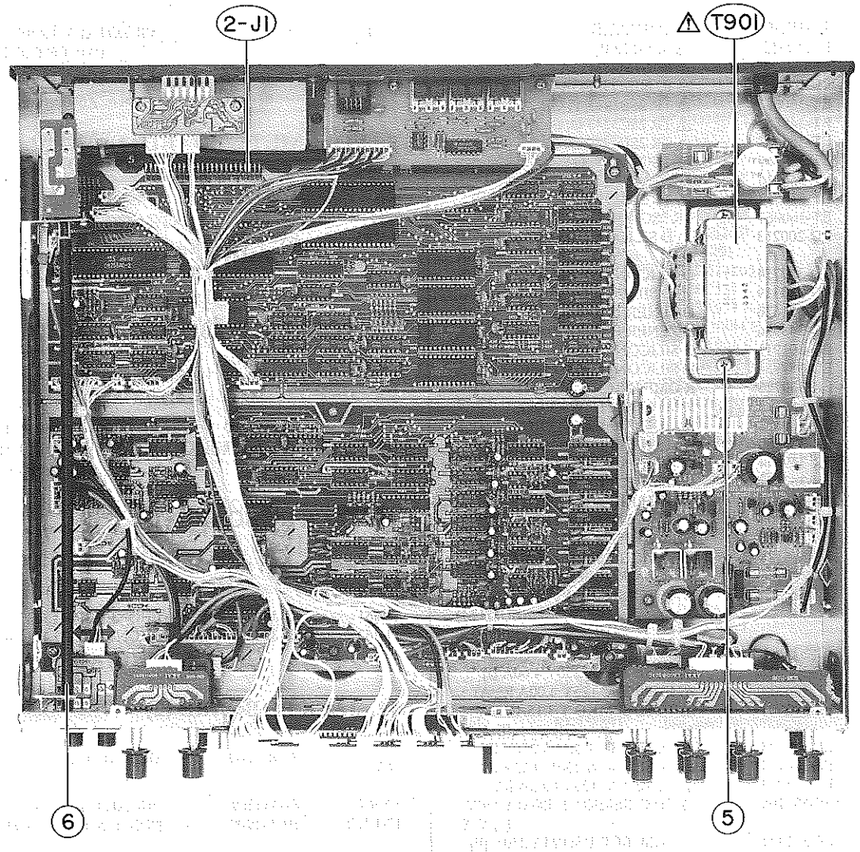
14. JACK PC BOARD (4)

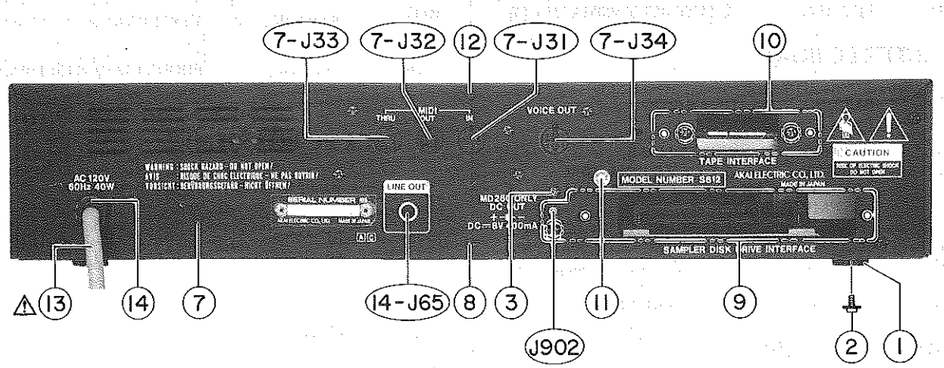
REF. NO.	PART NO.	DESCRIPTION
14-J65	EJ-354269	PHONE J 3P HLJ0540-110 6.3
14-L3, 4	E0-345909	COIL FIX 1 LAL03KH 4R7K

15. SW PC BOARD

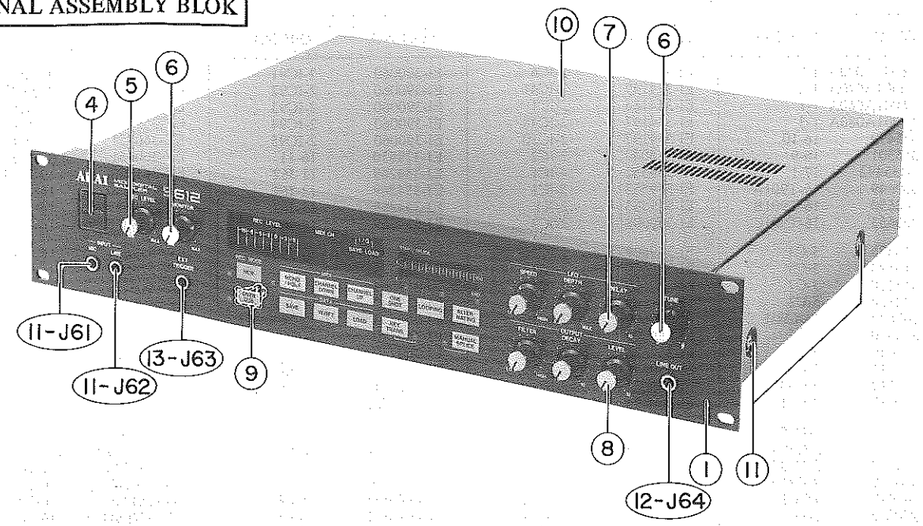
REF. NO.	PART NO.	DESCRIPTION
15-SW1	ES-344270	⚠ SW PUSH SDLD1P003 01-1
15-C1	EC-361942	⚠ C CE V V 103Z 400AC

ASSEMBLY BLOCK





FINAL ASSEMBLY BLOK



16. ASSEMBLY BLOCK

REF. NO.	PART NO.	DESCRIPTION
	ASSEMBLY BLOCK	
16-1	SA-324129	FOOT
16-2	ZS-344754	ST PAN30×06STL CMT C080 [FOOT FIX]
16-3	ZS-350934	PT BR30×08STL BNI [J902 FIX]
16-4x	TC-516598	TRANS. RETAINER [POWER TRANS FIX]
16-5	ZS-361996	ST BID40×10STL CMT TW [POWER TRANS FIX]
16-6	SZ-360712	JOINT POWER
16-7A	SP-355494C	PANEL REAR S612(J)
16-7B	SP-355494B	PANEL REAR S612(C, A)
16-7C	SP-355494D	PANEL REAR S612(E, V, B, S)
16-8	ZS-447761	T2BR30×06STL BNI
16-9	BC-355501	COVER REAR
16-10	BC-355499	COVER CASSETTE
16-11	EJ-329610	TERMINAL W/SCREW UB-0067 L 1P
16-12	ZS-447761	T2BR30×06STL BNI [COVER UPPER FIX]
16-13A	EW-524845	⚠ AC CORD 2 CORES VM1165B, VFF J [J]
16-13B	EW-358858	⚠ AC CORD 2 CORES KP-11 SJTAWG18 [C, A]
16-13C	EW-359641	⚠ AC CORD 2 CORES KP-419C/KS-17 [E, V]
16-13D	EW-358631	⚠ AC CORD 2 CORES KS-17 LTBS2F BS [B]
16-13E	EW-358630	⚠ AC CORD 2 CORES KP560 LTSA2F KS17 S [S]
16-14A	EZ-631945	STRAIN RELIEF SR-4N-4 [J]
16-14B	EZ-302906	STRAIN RELIEF SR-6N-4 [C, A]
16-T901A	BT-360649	⚠ TRANS POWER S612 T-10 [J]
16-T901B	BT-360650	⚠ TRANS POWER S612 T-30 [C, A]
16-T901C	BT-360653	⚠ TRANS POWER S612 T-50 [E, V, B, S]
16-S901	ES-306430	⚠ SW SLIDE J-S4013 #01 01-2
16-J901	EJ-358633	⚠ SOCKET INLET SOTO17 2P [E, V, B, S]
16-J902	EJ-359643	SOCKET INLET HEC 1757-01-030
16-C901	EC-347832	⚠ C CE V F 104Z 25DC
	MAIN PC BOARD	
2-J1	EJ-359564	SOCKET CONNECT CF478-25-30-432 50P

REF. NO.	PART NO.	DESCRIPTION
	MIDI PC BOARD	
7-J31	EJ-360770	DIN J TCS4450-01-1111 5P
7-J32	EJ-360770	DIN J TCS4450-01-1111 5P
7-J33	EJ-360770	DIN J TCS4450-01-1111 5P
7-J34	EJ-360771	DIN J TCS5037-01-241 13P
	JACK PC BOARD (4)	
14-J65	EJ-354269	PHONE J 3P HLJ0540-110 6.3

17. FINAL ASSEMBLY BLOCK

REF. NO.	PART NO.	DESCRIPTION
	FINAL ASSEMBLY BLOCK	
17-1	BD-B355492	PANEL FRONT PART S612
17-2x	ZW-330423	UW40×130×025SUP CMT [PANEL FRONT FIX]
17-3x	ZS-344754	ST PAN30×06STL CMT C080 [PANEL FRONT FIX]
17-4	SK-343017F	KNOB POWER-B
17-5	SK-B352952X2	KNOB MONITOR RED RART
17-6	SK-B352952X4	KNOB MONITOR WHITE PART
17-7	SK-B352952X1	KNOB MONITOR GREEN PART
17-8	SK-B352952X5	KNOB MONITOR BLUE PART
17-9	SE-357978	BASE KNOB (C)
17-10	SP-355493B	COVER UPPER-B
17-11	ZS-341960	ST BID40×06STL BNI [COVER UPPER FIX]
	JACK PC BOARD (1)	
11-J61	EJ-359642	PHONE J 3P HLJ4307-01-3060
11-J62	EJ-354269	PHONE J 3P HLJ0540-110 6.3
	JACK PC BOARD (2)	
12-J64	EJ-354269	PHONE J 3P HLJ0540-110 6.3
	JACK PC BOARD (3)	
13-J63	EJ-354269	PHONE J 3P HLJ0540-110 6.3

INDEX

S612

PART NO.	REF. NO.
BA-L6001A020A	1-2
BA-L6001A040A	1-4
BA-L6001A060A	1-1
BA-L6001A080A	1-3
BC-355499	16-10
BC-355501	16-9
BD-B355492	17-1
BT-360649	16-T901A
BT-360650	16-T901B
BT-360653	16-T901C
EC-313825	5-C3
EC-316188	5-C6
EC-316188	5-C7
EC-322804	5-C2
EC-347832	16-C901
EC-358450	6-C2
EC-358450	6-C3
EC-360716	2-C79
EC-360717	2-C50
EC-360717	2-C51
EC-360719	2-C45
EC-360719	2-C205
EC-360719	2-C207
EC-360719	2-C210
EC-361942	15-C1
ED-200213	5-D1
ED-301911	2-D1
ED-301911	2-D2
ED-301911	5-D7
ED-301911	7-D1
ED-330319	5-D4
ED-331626	5-D5
ED-343996	5-D6
ED-346592	3-D11
ED-357754	5-D2
ED-357754	5-D8
ED-357754	5-D9
ED-357754	5-D10
ED-357754	5-D11
ED-359534	2-D3
ED-359534	3-D1
ED-359534	3-D2
ED-359534	3-D3
ED-359534	3-D4
ED-359534	3-D5
ED-359534	3-D6
ED-359534	3-D7
ED-359534	3-D8
ED-359534	3-D9
ED-359534	3-D10
EF-305703	5-F4B
EF-305703	5-F5B
EF-306124	5-F4A
EF-306124	5-F5A
EF-306949	6-F1A
EF-306952	5-F3A
EF-306957	5-F3B
EF-308847	6-F1B
EF-355374	5-F4D
EF-355374	5-F5D
EF-353574	6-F1D
EF-359225	5-F3D
EF-593706	5-F4C
EF-593706	5-F5C
EF-593706	6-F1C
EF-691007	5-F3C
EI-310044	7-IC1
EI-324255	2-IC46
EI-324255	2-IC49
EI-324255	2-IC71
EI-324255	2-IC72
EI-324255	2-IC73
EI-324255	2-IC74
EI-324255	2-IC75
EI-324255	2-IC76
EI-324255	2-IC86
EI-324255	2-IC87
EI-324255	2-IC88
EI-324255	2-IC89
EI-354146	2-IC6
EI-354149	2-IC41
EI-354186	2-IC1
EI-354197	2-IC48
EI-354197	2-IC50
EI-356049	2-IC2
EI-359552	4-IC1
EI-359552	5-IC1
EI-359563	2-X1
EI-359608	2-IC3
EI-359609	2-IC26
EI-359609	2-IC27
EI-359609	2-IC28
EI-359609	2-IC29
EI-359609	2-IC30
EI-359609	2-IC31
EI-359626	5-IC2
EI-359628	5-IC3
EI-360021	2-IC4
EI-360023	2-IC7
EI-360023	2-IC8
EI-360024	2-IC9
EI-360024	2-IC10
EI-360025	2-IC11
EI-360025	2-IC12
EI-360026	2-IC13
EI-360026	2-IC14
EI-360026	2-IC37
EI-360027	2-IC15
EI-360027	2-IC16
EI-360028	2-IC17
EI-360028	2-IC18
EI-360028	2-IC19
EI-360029	2-IC20
EI-360030	2-IC21
EI-360031	2-IC23
EI-360031	2-IC24
EI-360032	2-IC25
EI-360035	2-IC32
EI-360035	2-IC33
EI-360036	2-IC34
EI-360036	2-IC35
EI-360036	2-IC64
EI-360037	2-IC36
EI-360038	2-IC38
EI-360038	2-IC44
EI-360038	2-IC65
EI-360039	2-IC39
EI-360040	2-IC40
EI-360042	2-IC42
EI-360042	2-IC43
EI-360043	2-IC45
EI-360045	2-IC51
EI-360045	2-IC68
EI-360045	2-IC69
EI-360045	2-IC70
EI-360046	2-IC52
EI-360047	2-IC54
EI-360048	2-IC55
EI-360049	2-IC56
EI-360050	2-IC57
EI-360050	2-IC67
EI-360051	2-IC58
EI-360052	3-IC1
EI-360053	2-IC60
EI-360054	2-IC61
EI-360054	2-IC62
EI-360054	2-IC63
EI-360058	2-IC77
EI-360058	2-IC78
EI-360058	2-IC79
EI-360058	2-IC80
EI-360058	2-IC81
EI-360058	2-IC82
EI-360059	2-IC83
EI-360059	2-IC84
EI-360059	2-IC85
EI-360763	2-IC66
EI-360772	2-IC96
EI-390060	2-IC91
EI-390060	2-IC92
EI-390060	2-IC93
EI-390060	2-IC94
EI-390060	2-IC95
EJ-329610	16-11
EJ-354269	11-J62
EJ-354269	12-J64
EJ-354269	13-J63
EJ-354269	14-J65
EJ-358633	16-J901x
EJ-358691	2-1
EJ-359564	2-J1
EJ-359642	11-J61
EJ-359643	16-J902
EJ-360770	7-J31
EJ-360770	7-J32
EJ-360770	7-J33
EJ-360771	7-J34
EM-359535	3-IN1
EM-359536	3-IN2
EO-345909	12-L1
EO-345909	12-L2
EO-345909	14-L3
EO-345909	14-L4
EO-360068	6-FL1
EQ-348929	2-RL1
ER-331188	2-R67
ER-355400	5-R6
EI-356113	5-R2
ER-357831	5-R8
ER-359555	2-R77
ER-359556	2-R76
ER-359557	2-R96
ER-359558	2-R97
ER-359644	5-R7
ER-359644	5-R9
ER-360201	2-IB1
ER-360201	2-IB2
ER-360725	4-R1
ER-360725	5-R1
ER-360732	5-R3
ER-360773	2-R162
ES-306430	16-S901
ES-344270	15-SW1
ES-354115	3-SW1
ES-354115	3-SW2
ES-354115	3-SW3
ES-354115	3-SW4
ES-354115	3-SW5
ES-354115	3-SW6
ES-354115	3-SW7
ES-354115	3-SW8
ES-354115	3-SW9
ES-354115	3-SW10
ES-354115	3-SW11
ES-354115	3-SW12
ES-354115	3-SW13
ET-316523	2-TR5
ET-316523	2-TR6
ET-338447	2-TR4
ET-338447	2-TR7
ET-349882	4-TR1
ET-349883	5-TR2
ET-353898	2-TR1
ET-354083	5-TR3
ET-354167	7-PH1
ET-355216	3-TR1
ET-355216	4-TR2
ET-355216	2-TR5
ET-356817	5-TR6
ET-360067	5-TR4
ET-360067	5-TR7
ET-360067	5-TR8
ET-360067	5-TR9
ET-360687	5-TR1
EV-359547	8-VR1
EV-359549	8-VR2
EV-359549	8-VR3
EV-359549	9-VR6
EV-359549	9-VR7
EV-359551	9-VR5
EV-359551	10-VR9
EV-360751	3-VR1
EV-360751	3-VR2
EV-361200	10-VR8
EW-358630	16-13E
EW-358631	16-13D
EW-358858	16-13B
EW-359641	16-13C
EW-524845	16-13A
EZ-200473	5-1
EZ-302906	16-14B
EZ-631945	16-14A
SA-324129	16-1
SE-357978	17-9
SK-B352952X1	17-7
SK-B352952X2	17-5
SK-B352952X4	17-6
SK-B352952X5	17-8
SK-343017F	17-4
SP-355493B	17-10
SP-355494B	16-7B
SP-355494C	16-7A
SP-355494D	16-7C
SZ-360712	16-6
TC-516598	16-4x
ZS-341960	17-11
ZS-447761	16-12
ZS-344754	16-2
ZS-344754	17-3x
ZS-350934	16-3
ZS-361996	16-5
ZS-447761	16-8
ZW-330423	17-2x
ZW-632226	5-2