AKAI

MODEL S612

SECTION 4

SCHEMATIC DIAGRAM

AND PC BOARDS

TABLE OF CONTENTS
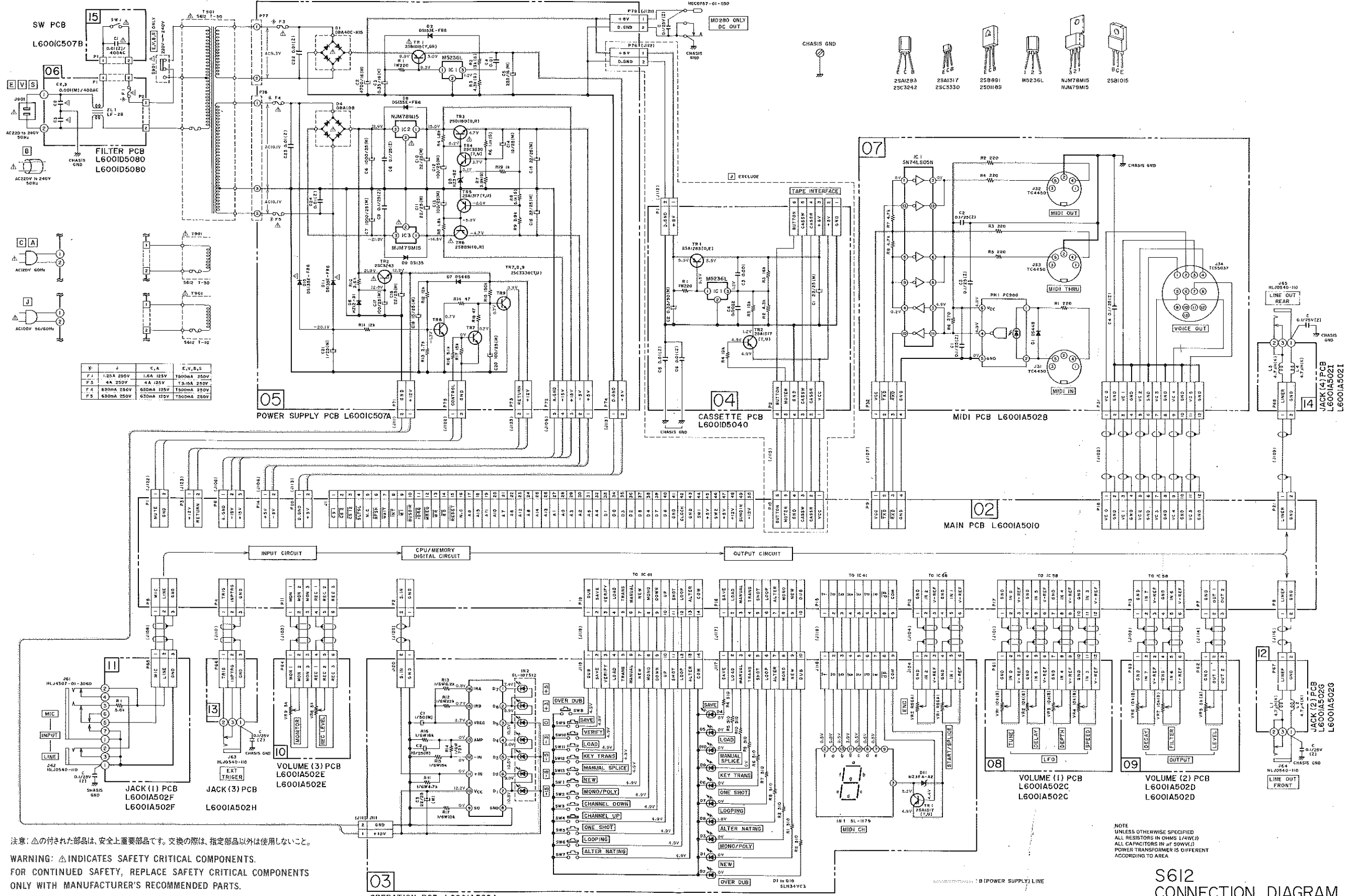
Various IC Parts Location of MAIN PCB

CN1(J1)

TO OPERATION PCB J118
CN2(P15)

CN3(P19)
TO OPERATION PCB J119

CN4 (P4) — TO JACK(3) PCB P66

IC10
IC9
IC38
IC33   IC32
IC35   IC31
IC36   IC30
IC29
IC7   IC28
IC37
IC34   IC27
IC26

IC41   IC1
IC20
IC14
IC44
IC3   IC2   IC19
IC40   IC23
IC11   IC18   IC15   IC8
IC42   IC43   IC4
IC21   IC17   IC16   IC6
IC5
IC24   IC12
IC25   IC13

TO OPERATION PCB J117
CN5(P16)
CN6 (P1)
CN7 (P10)
CN8 (P9)
TO POWER SUPPLY PCB P75
TO CASSETTE PCB P2
TO MIDI PCB P32

CN22 (P20) — TO POWER SUPPLY PCB P74

CN9 (P5) — TO JACK(1) PCB P65

IC51   IC64   IC65   IC66
IC60   IC61   IC77   IC83   IC90
IC45   IC46
IC54   IC55   IC63   IC62   IC78   IC86   IC91
CN10 (P11) — TO VOLUME(3) PCB P64
IC52   IC67   IC79   IC84   IC92
IC56   IC80
CN11 (P2) — TO OPERATION PCB J120
IC81   IC85   IC93
IC57   IC68   IC71   IC72   IC87
IC48   IC49   IC50   IC82
IC58   IC69   IC73   IC74   IC88   IC94
IC70   IC75   IC76   IC85   IC95
IC89

TO VOLUME(1) PCB P61
CN14(P17)
CN13 (P12)   CN15 (P13)   CN16 (P6)
TO OPERATION PCB J104   TO VOLUME(2) PCB P63   TO POWER SUPPLY PCB P72

TO POWER SUPPLY PCB P73
CN12(P3)
CN21(P21)
TO JACK(4) PCB P68

CN17 (P8)   CN18 (P7)
TO JACK(2) PCB P67

TO MIDI PCB
CN19(P18)
TO VOLUME(2) PCB P62

CN20 (P14)
TO POWER SUPPLY PCB P72

IC96

MAIN PCB L6001A5010

SW PCB
L600IC507B

FILTER PCB
L600ID5080
L600ID5080

MD280 ONLY
DC OUT

CHASIS GND

2SA1283
2SC3242
2SA1317
2SC3330
2SB891
2SD1189
M5236L
NJM78M15
NJM79M15
2SB1015

TAPE INTERFACE

MIDI OUT
MIDI THRU
MIDI IN
VOICE OUT

05
POWER SUPPLY PCB L600IC507A

04
CASSETTE PCB
L600ID5040

07

MIDI PCB L600IA502B

JACK (4) PCB
L600IA502I
L600IA502I

LINE OUT
REAR

02
MAIN PCB L600IA5010

INPUT CIRCUIT

CPU/MEMORY
DIGITAL CIRCUIT

OUTPUT CIRCUIT

JACK (1) PCB
L600IA502F
L600IA502F

JACK (3) PCB
L600IA502H

VOLUME (3) PCB
L600IA502E
L600IA502E

03
OPERATION PCB L600IA502A

VOLUME (1) PCB
L600IA502C
L600IA502C

VOLUME (2) PCB
L600IA502D
L600IA502D

JACK (2) PCB
L600IA502G
L600IA502G

LINE OUT
FRONT

08
LFO

09
OUTPUT

OVER DUB
SAVE
VERIFY
LOAD
KEY TRANS
MANUAL SPLICE
NEW
MONO/POLY
CHANNEL DOWN
CHANNEL UP
ONE SHOT
LOOPING
ALTER NATING

MANUAL SPLICE
KEY TRANS
ONE SHOT
LOOPING
MONO/POLY
NEW
OVER DUB

MIDI CH

注意: △の付けられた部品は、安全上重要部品です。交換の際は、指定部品以外は使用しないこと。

WARNING: △INDICATES SAFETY CRITICAL COMPONENTS.
FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS
ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT: △ IL INDIQU LES COMPOSANTS CRITIQUES DE SURETE. POUR MAINTENIR LE DEGRE DE SECURITE
DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE
QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
POWER TRANSFORMER IS DIFFERENT
ACCORDING TO AREA

S612
CONNECTION DIAGRAM
No. 850705A
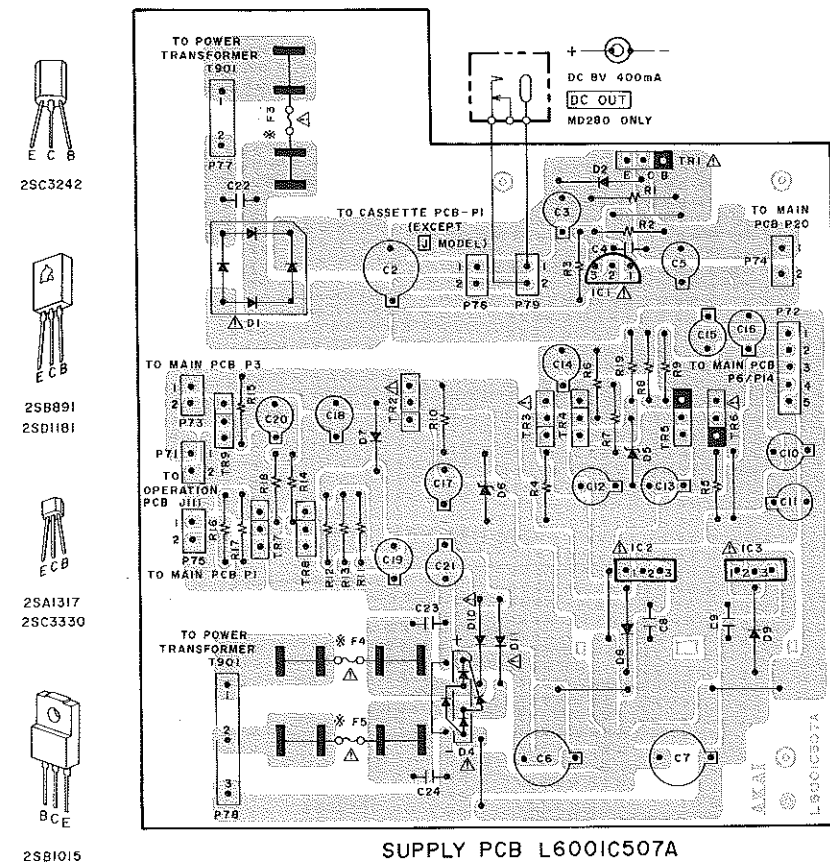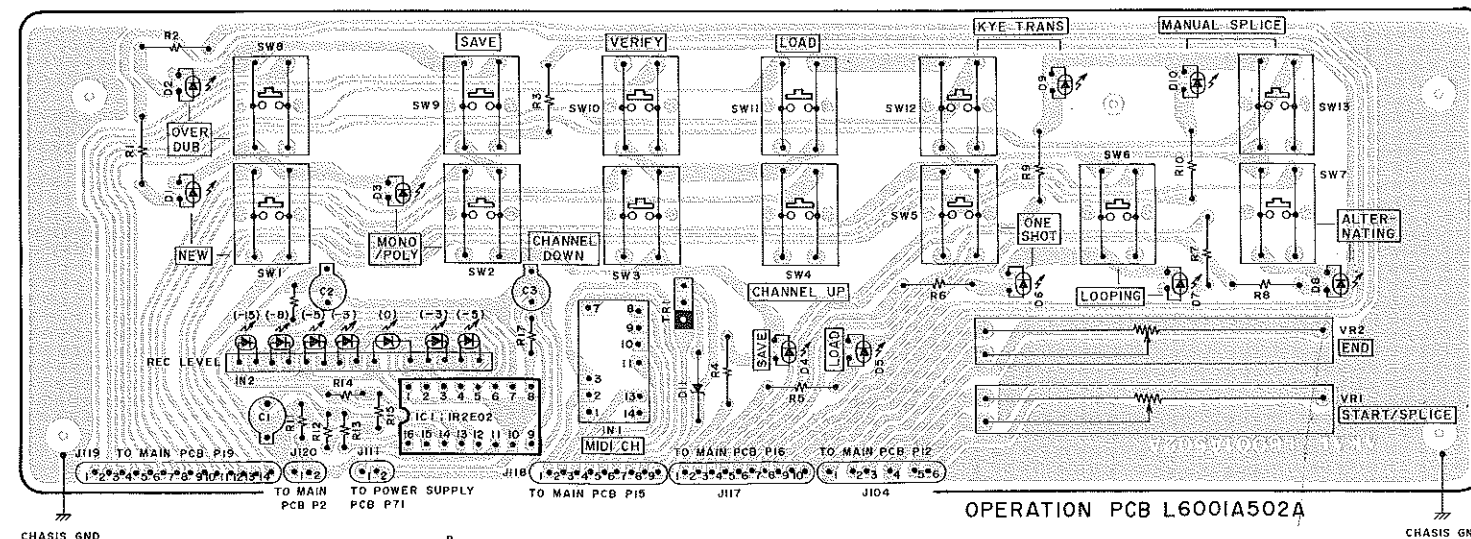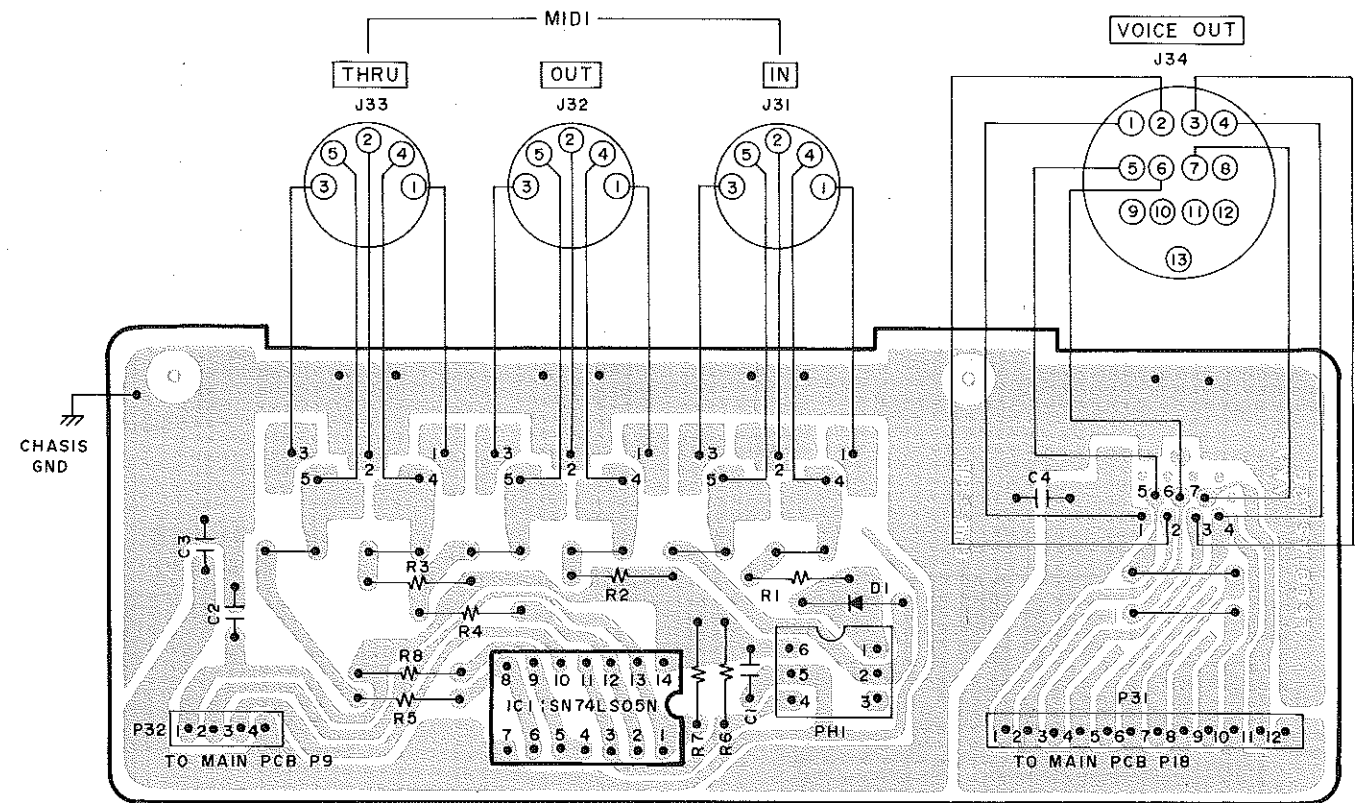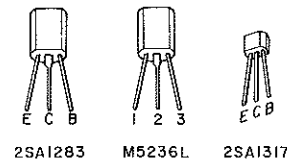
The Voltage Lavels at Various IC Pins of MAIN PCB

Table of DC voltage levels measured at IC pins. Each block is headed by an IC number; columns give PIN NO and DC VOLTAGE. (Ⓟ indicates pulse; GND (DIG) = digital ground; GND (ANL) = analog ground.)

IC-1

PIN NO	DC VOLTAGE
26	4.9
27	Vcc 4.9
28	Vcc 4.9
1	Ⓟ 0.7
2	Ⓟ 0.5
3	Ⓟ 0
4	0
5	Ⓟ 1.8
6	Ⓟ 2.3
7	Ⓟ 1.0
8	Ⓟ 1.4
9	Ⓟ 1.0
10	Ⓟ 1.3
11	Vcc 4.9
12	Ⓟ 1.2
13	Ⓟ 1.3
14	Ⓟ 1.3
15	Ⓟ 1.5
16	1.1
17	Ⓟ 4.0
18	Ⓟ 4.0
19	Ⓟ 1.4
20	Ⓟ 4.1
21	Ⓟ 2.1
22	Ⓟ 4.9
23	Ⓟ 4.1
24	Ⓟ 4.9
25	Ⓟ 4.9
26	Ⓟ 4.9
27	Ⓟ 3.0
28	Ⓟ 2.9
29	GND (DIG)
30	Ⓟ 1.9
31	Ⓟ 2.0
32	Ⓟ 2.2
33	Ⓟ 2.2
34	Ⓟ 2.2
35	Ⓟ 2.0
36	Ⓟ 1.7
37	Ⓟ 0.9
38	Ⓟ 1.4
39	Ⓟ 0.3
40	

(The full page is a dense voltage-reference chart covering IC-1 through IC-95, with each IC block listing PIN NO and DC VOLTAGE values. Due to the extreme density of the grid, remaining blocks IC-2 through IC-95 are transcribed in the source as similar pin/voltage pairs.)

SUPPLY PCB L6001C507A

2SC3242

2SB891
2SD1181

2SA1317
2SC3330

2SB1015

TO POWER TRANSFORMER T901

DC 8V 400mA
DC OUT
MD280 ONLY

TO CASSETTE PCB-P1 (EXCEPT [J] MODEL)

TO MAIN PCB P20

TO MAIN PCB P3

TO MAIN PCB P6/P14

TO MAIN PCB P1

TO OPERATION PCB J111

TO POWER TRANSFORMER T901

AKAI

B
• •	= PNP TRANSISTOR

B
• •	= NPN TRANSISTOR

※	[J]	[C.A]	[E.V.S.B]
F3	4A 250V	4A 125V	T3.15A 250V
F4	630mA 250V	630mA 125V	T500mA 250V
F5	630mA 250V	630mA 125V	T500mA 250V

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
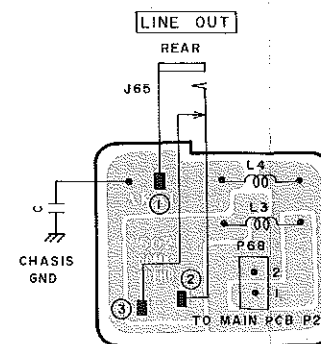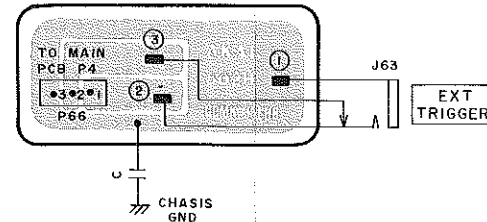
MIDI PCB L6001A502B

MIDI

THRU J33 — OUT J32 — IN J31

VOICE OUT J34

CHASIS GND

IC1 SN74LS05N

P32 TO MAIN PCB P9

TO MAIN PCB P18

OPERATION PCB L6001A502A

SW8 SAVE VERIFY LOAD KYE TRANS MANUAL SPLICE

OVER DUB

SW9 SW10 SW11 SW12 SW13

SW6 SW7

NEW MONO/POLY CHANNEL DOWN ONE SHOT ALTER-NATING

SW1 SW2 SW3 SW4 SW5 LOOPING

REC LEVEL SAVE LOAD VR2 END

IC1 IR2E02 MIDI CH VR1 START/SPLICE

J119 TO MAIN PCB P19 J120 J111 J118 TO MAIN PCB P15 TO MAIN PCB P16 TO MAIN PCB P12 J117 J104

TO MAIN PCB P2 TO POWER SUPPLY PCB P71

CHASIS GND

B
• •	= PNP TRANSISTOR

2SA1317

CHASIS GND

FILTER PCB L6001D5080

※	[J]	[C.A]	[E.V.S.B]
F1	1.25A 250V	1.6A 125A	T500mA 250V

TO POWER TRANSFORMER T901

P2

※F1

FL1

P1

C3

C2

CHASIS GND

TO SW PCB P1

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

[J] AC 100V 50/60Hz
[A.C] AC 120V 60Hz

INLET

[E.V.S] AC220V~240V 50Hz

CASSETTE PCB L6001D5040 EXCEPT [J] MODEL

CHASIS GND

CHASIS GND

TO MAIN PCB P10

TO POWER SUPPLY PCB P76

B
[• • •] = PNP TRANSISTOR

E C B   1 2 3   E C B
2SA1283   M5236L   2SA1317

SW PCB L6001C507B

⚠ C1

TO FILTER PCB P1

P1

SW1 ⚠

POWER
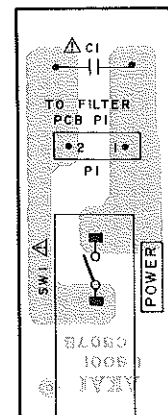
AKAI L6001 C807B

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

JACK(1) PCB L6001A502F
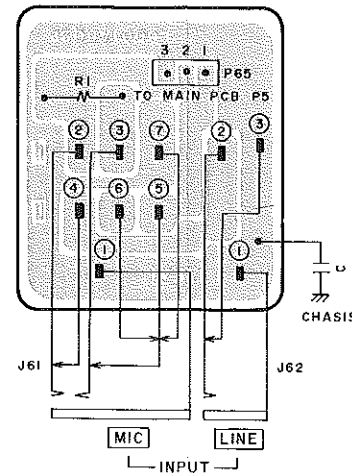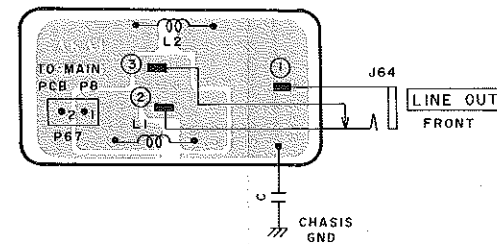
P65

R1

TO MAIN PCB P5

CHASIS

J61   J62

MIC   LINE
└─ INPUT ─┘

JACK(2) PCB L6001A502G

L2

TO MAIN PCB P8

P67   L1

J64

LINE OUT
FRONT

CHASIS GND

JACK(3) PCB L6001A502H

TO MAIN PCB P4

P66

J63

EXT TRIGGER

CHASIS GND

LINE OUT
REAR

J65

L4

L3

P68

CHASIS GND

TO MAIN PCB P21

JACK(4) PCB L6001A502I

VOLUME(1) PCB L6001A502C

TO MAIN PCB P17

P61

VR4   VR3   VR2   VR1
SPEED   DEPTH   DELAY   TUNE
└──────── LFO ──────┘

VOLUME(2) PCB L6001A502D

TO MAIN PCB P13   TO MAIN PCB P7

P63   P62

VR7   VR6   VR5
FILTER   DECAY   LEVEL
└──────── OUTPUT ────────┘

VOLUME(3) PCB L6001A502E

TO MAIN PCB (P11)

P64

VR8   VR9
REC LEVEL   MONITOR
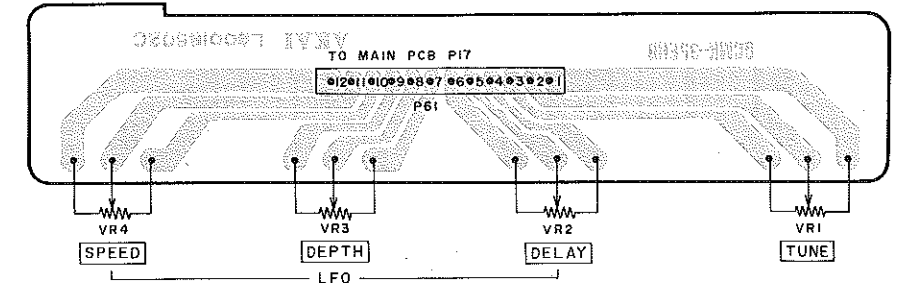
SECTION 5

SERVICE BULLETIN

○ This section describes the information on techniques, revisions and troubleshooting for servicing and adjusting **S612**.

○ To maintain the performance of **S612**, see also **S612** Service Manual for servicing and adjustment.

○ Further technical information will be issured as any arises.
Keep such information carefully under the name of this file.

MODEL : S612

INDEX

001   Subject: To improve performance

In order to make it easy to set a splice point in Manual Splice operation
in Looping or Alternating modes, the program version of ROM IC TMM2764D in
Main P.C. Board has been changed from V1.0 to V1.1.

	Ref. No.	Part No.	Description
(PREV.)	2-IC3	EI-359608	IC TMM2764D S612 CUSTOM
(NEW)	2-IC3Z	EI-362112	IC TMM2764D S612 V1 CUSTOM

NOTE : Accordingly, the Operator's Manual has been changed as follows.

Manual Splice Mode

The S612 normally sets up a splicing point by using the automat-
ic 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. Also, the **END** lever gives a fine adjustment of the splice,
and pressing the **LOOPING** (or **ALTERNATING**) button will advance
the splice point by one. Eight presses will return to the point set
by the levers. 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 Morn-
ing". After the phrase is played once, "Morning" will be repeated
until the key-off.
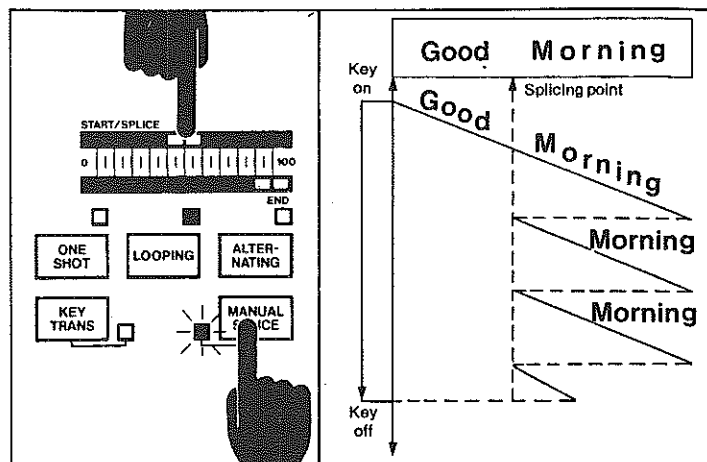
Changed from : Middle of June 1985
Service Ref. No. : CNL0051

MODEL: S612   No. S612/1   DATE: August 1985

002   Subject: To improve reliability

In order to prevent short-circuiting of Power regulator IC in Power Supply
P.C. Board, the insulator has been changed as follows.

	Ref. No.	Part No.	Description
(PREV.)	5-1	EZ-200473	SILICON RUBBER SHEET TC-30
(NEW)	5-1Z	EZ-345459	TRANSISTOR SUPPORT BFG-20TO-3P

Changed from : July 1985
Service Ref. No. : CNA0639

003 Subject: To improve performance

In order to prevent noise or distortion in sound when a chord is played,
the registor value in Main P.C. Board has been changed as follows.

Ref. No.	Prev.	New
2-R105	10K	2K CB

Changed from : July 1985
Service Ref. No. : CNA0763

004 Subject: Costdown purpose

Because of the unfavorable popularity of Commodore type cassette data
recorder, Cassette P.C. Board has been eliminated.
Accordingly, Rear Panel has been changed to a new one without on opening
for cassette connector.

	Ref. No.	Part No.	Description
(PREV.)	1-3	BA-L6001A080A	P.C. CASSETTE BLKS612 (C)
(NEW)	DELETED		
(PREV.)	16-7B	SP-355494B	PANEL REAR S612 (C, A)
(NEW)	16-7BZ	SP-355494E	PANEL REAR (2) S612 (C. A)
(PREV.)	16-7C	SP-355494D	PANEL REAR S612 (E, V, B, S)
(NEW)	16-7CZ	SP-355494F	PANEL REAR (2) S612 (E, V, B, S)
(PREV.)	16-10	BC-355499	COVER CASSETTE
(NEW)	DELETED		

Changed from : July 1985
Service Ref. No. : CNA0782, CNL0057,

005 Subject: Trouble countermeausre

Symptom : Sound distorts when sampled at maximum level.
Countermeasure : The value of registors in Main P.C. Board and Power supply
               P.C. Board have been changed as follows.

Ref. No.	Prev.	New
2-R98	270	430 CB
2-R118-123	27K	51K CB
2-R126-131	2.4K	4.3K CB
5-R7	3.9K	2.7K CB

NOTE : When replacing a new type Main P.C. Board into an old type unit,
       be sure to modify Power Supply P.C. Board for proper function.

Changed from : August 1985
Interchangeability : Not interchangeable
Service Ref. No. : CNA0703, CNA0783, CNA0810
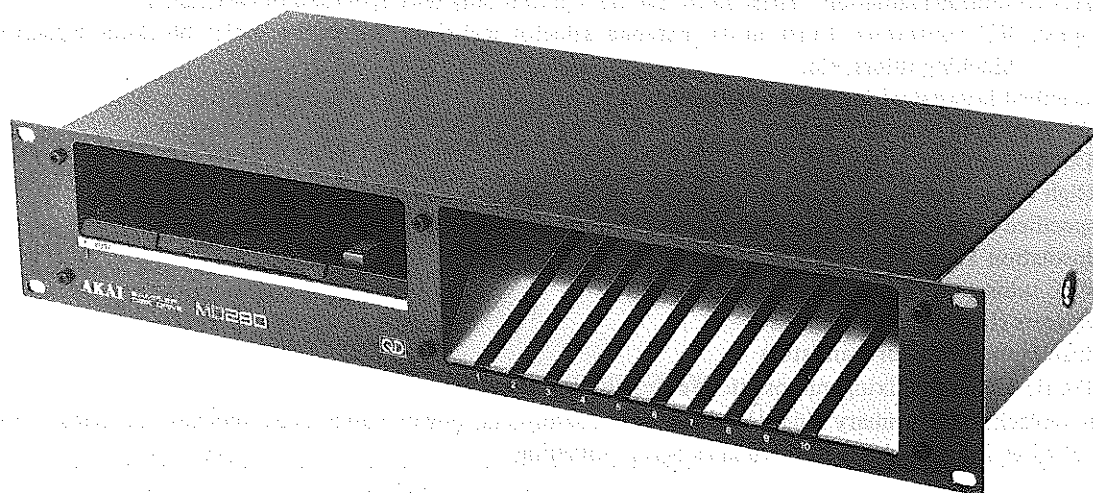
# SAMPLER DISK DRIVE

MODEL MD280

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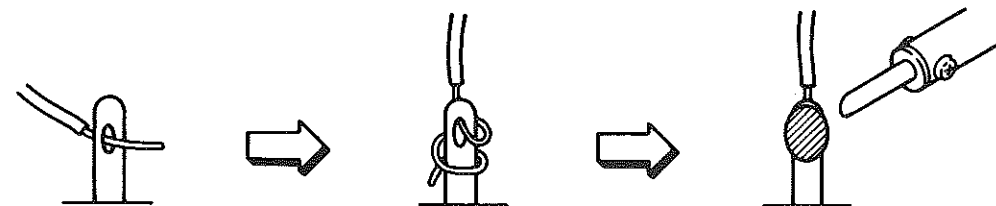
6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Use care that foreign objects (screws, solder droplets,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

SECTION 1

SERVICE MANUAL

TABLE OF CONTENTS

I. SPECIFICATIONS

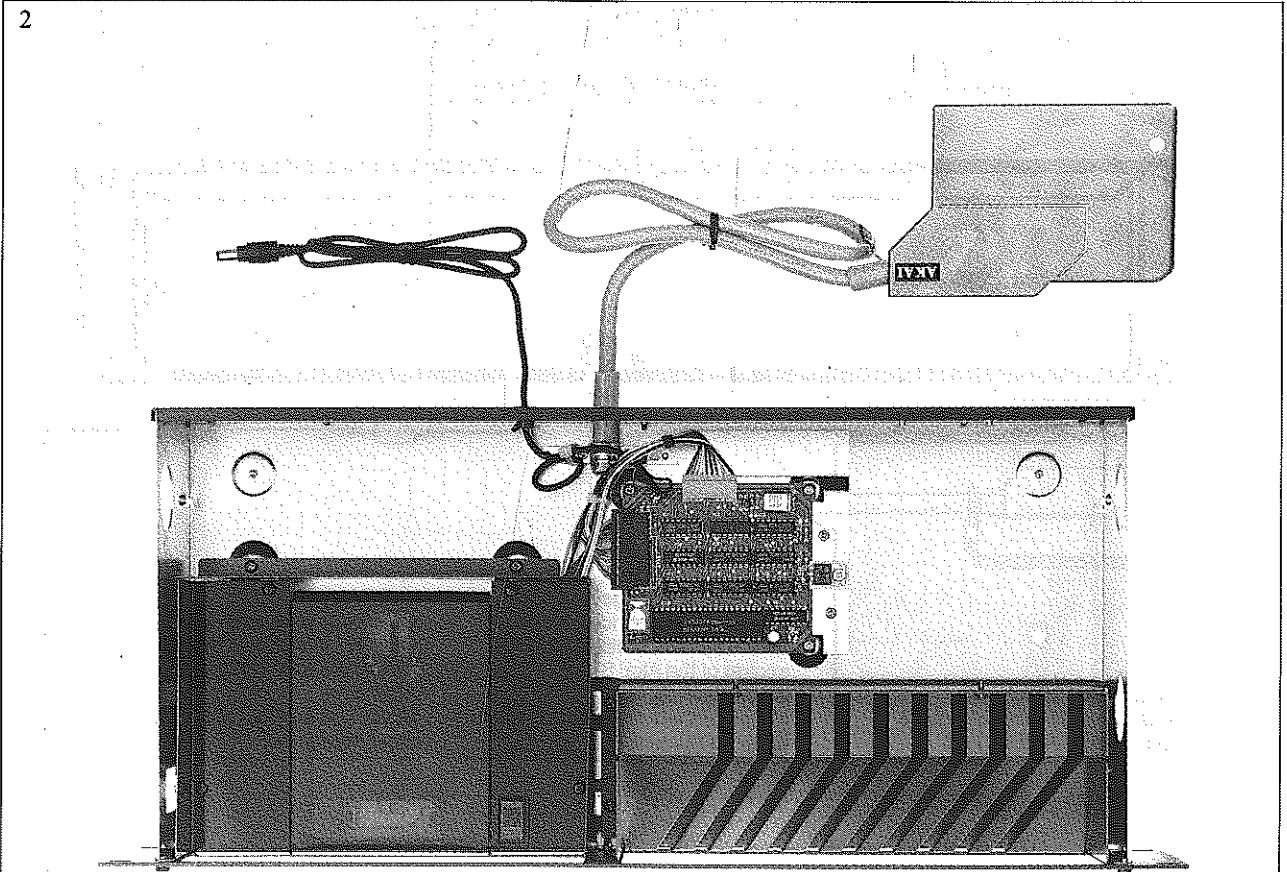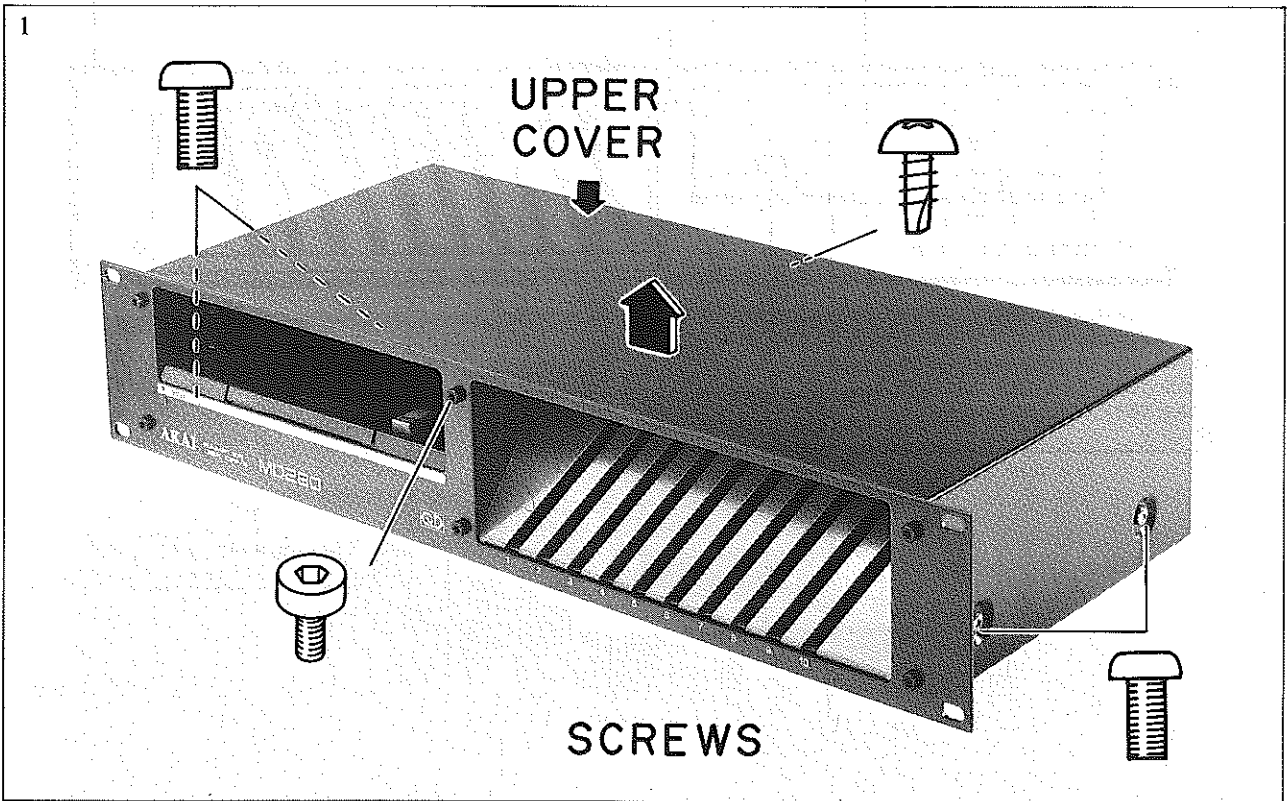|	
Memory capacity	1 voice per side (128 KByte, A and B side)
Track	1 track (Spiral)
Recording media	2.8″ sampler disk
Life of media	2,000 path
Operating temperature	10°C to 35°C
Operating humidity	20% to 80% (No moisture condensation)
Power requirement	DC 8V (Power supplied from Akai S612)
Power comsumption	8.0W (max.)
Front panel	EIA 2U standard size
Dimensions	482.6 (W) × 88.1 (H) × 205 (D) mm (19.0 × 3.5 × 8.1 inches)
Weight	3.7kg (8.1 lbs)

(Standard accessories)
Replacement felt pad 1
Cotton swab 1

* For improvement purposes, 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.
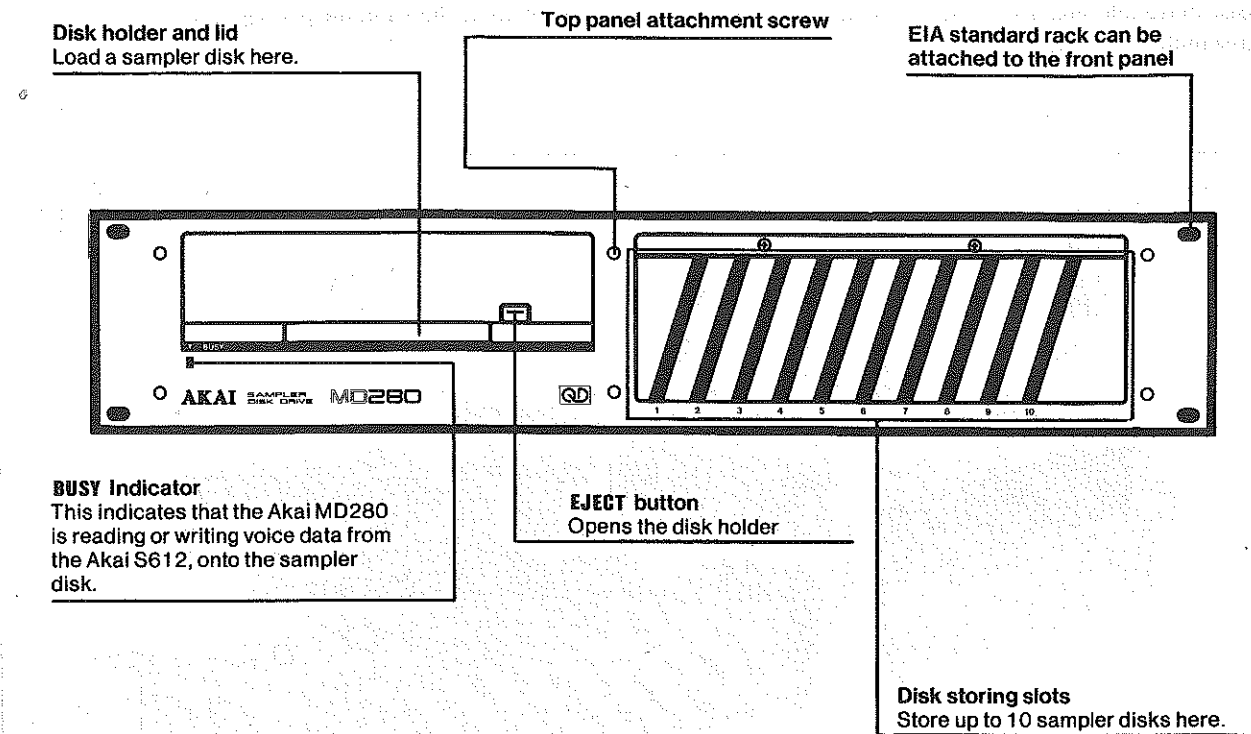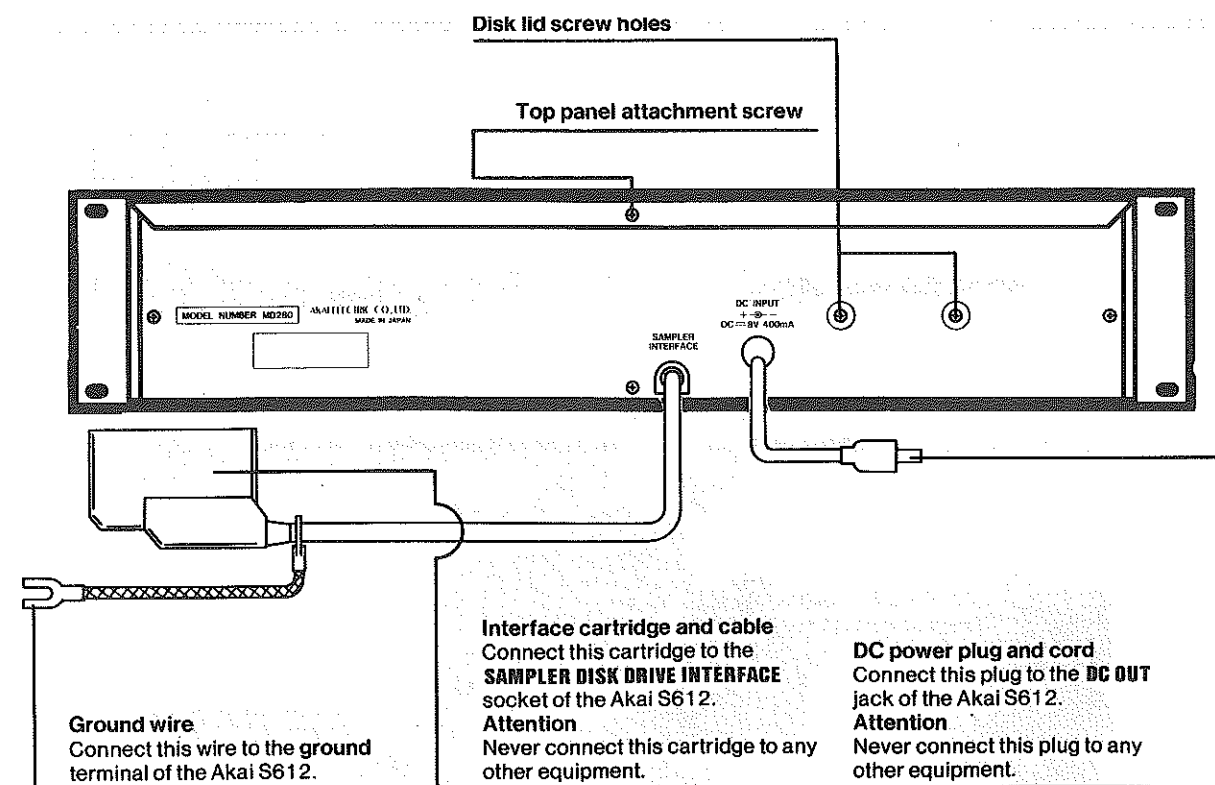
III. CONTROLS

Disk holder and lid
Load a sampler disk here.

Top panel attachment screw

EIA standard rack can be attached to the front panel

AKAI MD280 QD

BUSY Indicator
This indicates that the Akai MD280 is reading or writing voice data from the Akai S612, onto the sampler disk.

EJECT button
Opens the disk holder

Disk storing slots
Store up to 10 sampler disks here.

Fig. 3-1. Front View

Disk lid screw holes

Top panel attachment screw

MODEL NUMBER MD280   AKAI TEC DISK CO.LTD.   MADE IN JAPAN

DC INPUT
DC 8V 400mA

SAMPLER INTERFACE

Ground wire
Connect this wire to the **ground** terminal of the Akai S612.

Interface cartridge and cable
Connect this cartridge to the **SAMPLER DISK DRIVE INTERFACE** socket of the Akai S612.
Attention
Never connect this cartridge to any other equipment.

DC power plug and cord
Connect this plug to the **DC OUT** jack of the Akai S612.
Attention
Never connect this plug to any other equipment.

Fig. 3-2. Rear View

IV. PRINCIPAL PARTS LOCATION

COVER CARTRIDGE (A): LOWER
COVER CARTRIDGE (B): UPPER

I/F CABLE

DC POWER CORD

GND WIRE

CN1

CAPACITOR

GND WIRE

CABLE CLAMP   ROM PCB

CABLE CLAMP

HOLDER ESCUSHEON (L)   HOLDER ESCUSHEON (R)

SIO PCB BLOCK

LED PCB   MECHA BLOCK   DISK LID   DISK HOLDER

Fig. 4-1.

5-1. MD280 SYSTEM BLOCK DIAGRAM
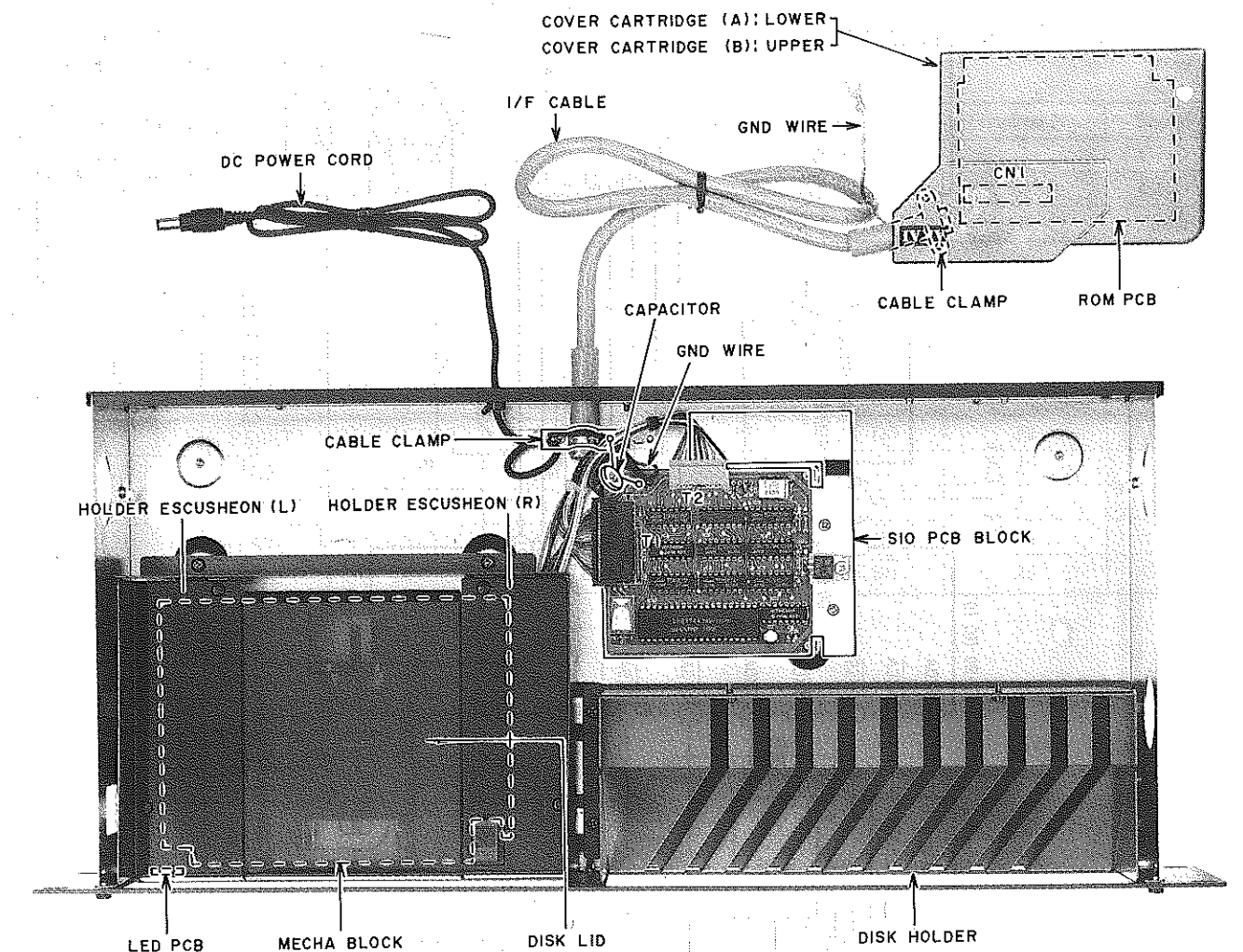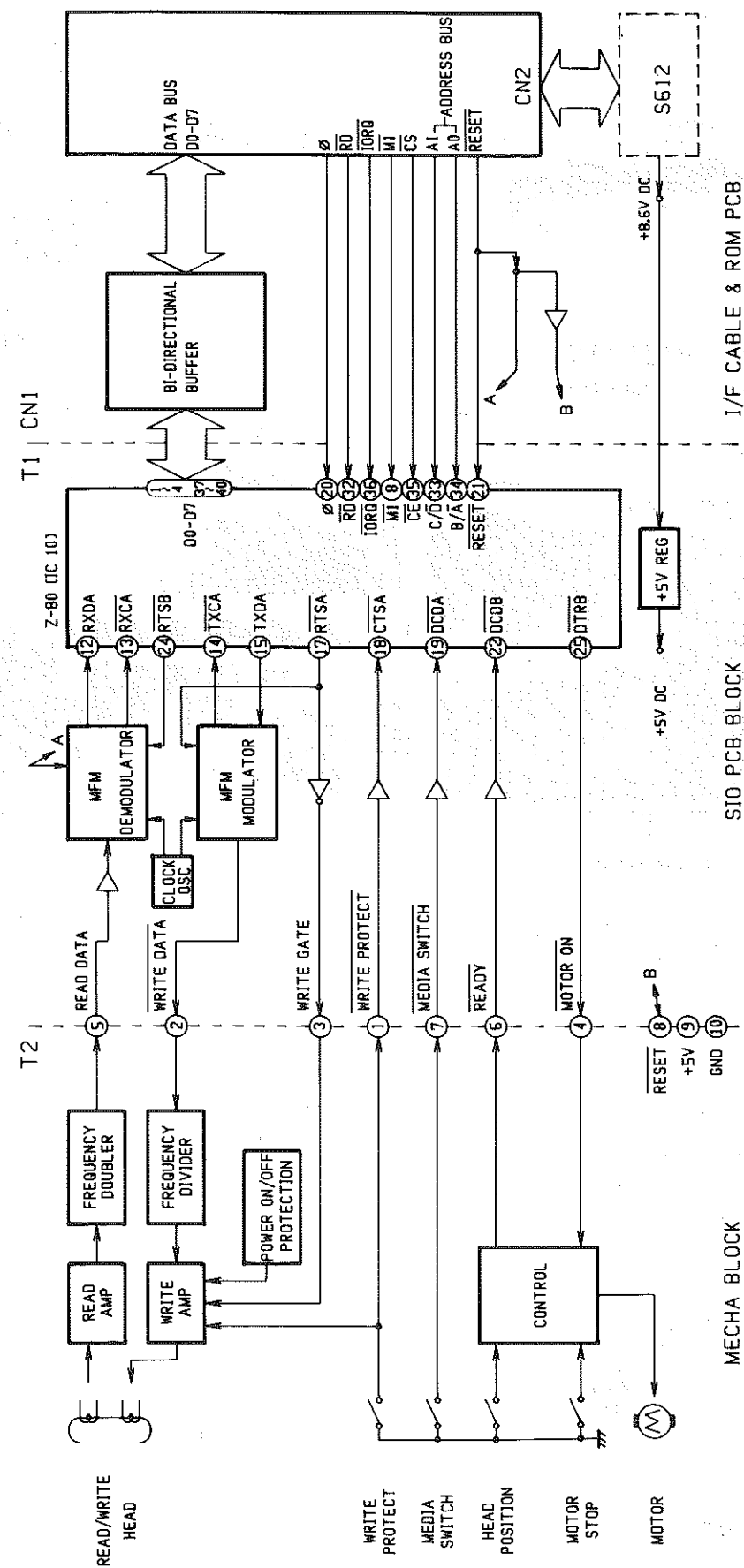

Fig. 5-1. MD280 System Block Diagram

5-2. SIGNAL AND TERMINAL NO. FOR EACH SIGNAL LINE

1) Signal line (1): Digital Sampler S612 CN2 I/F Circuit (ROM PCB)

Parts side		Pattern side	
Terminal No.	Signal	Terminal No.	Signal
1	CS1	2	—
3	—	4	STLSL
5	—	6	—
7	—	8	—
9	M1	10	—
11	—	12	MERQ
13	WR	14	RD
15	RESET	16	—
17	A9	18	—
19	A11	20	A10
21	A7	22	A6
23	A12	24	A8
25	—	26	A13
27	A1	28	A0
29	A3	30	A2
31	A5	32	A4
33	D1	34	D0
35	D3	36	D2
37	D5	38	D4
39	D7	40	D6
41	GND	42	CLOCK
43	GND	44	SW1
45	+5V	46	SW2
47	+5V	48	—
49	—	50	—

2) Signal line (2): I/F circuit (ROM PCB) CN1/T1 SIO PCB

Terminal No.	Signal	Terminal No.	Signal
1	+5V	2	GND
3	D7	4	GND
5	D6	6	GND
7	D5	8	GND
9	D4	10	GND
11	D3	12	GND
13	D2	14	GND
15	D1	16	GND
17	D0	18	RESET
19	CS	20	A1
21	RD	22	A0
23	IORQ	24	φ
25	MI	26	GND

3) Signal line (3): SIO PCB T2 Mecha Block (QD)

Terminal No.	Cable Color	Signal	Terminal No.	Cable Color	Signal
1	BRN	WRPR	2	RED	WRDT
3	ORG	WRGA	4	YLW	MTON
5	GRN	RDDT	6	BLU	READY
7	VLT	MDST	8	GRY	RESET
9	WHT	+5V	10	BLK	GND

5-3. OPERATION DESCRIPTION

1) General

● The MD280 recording track has been arranged spirally from the outer periphery of a disk to the inner (in a single track), and data read/write operations will invariably be started at the outer periphery of a disk (the disk top).

(In a non-operative mode of the mechanical block, the head will always remain at a standstill at the inner periphery of a disk, i.e. the disk end.)

● When in the above state, S612 issues an operating command to the mechanism block, not only will the disk start revolving, but the head will also be shifted rapidly by a cam from the inner periphery to the outer in an initial mode of operation. The head will then be shifted along the recording track from the outer periphery toward the inner, performing either read or write operations in the interim. This shifting will also be made by a cam.

In addition, for the duration when the head is shifted by the motor, an LED ("BUSY") will turn on regardless of whether or not read/write operations are perfromed in the interim.

2) I/F Circuit
1. Bidirectional Buffer
   Not only minimizes influences to the input circuit, but also strengthens drive capabilities for the output circuit.

3) SIO Circuit
1. Bidirectional Buffer
   When $\overline{CE}$ has been made "L", enables data transfers, and with $\overline{RD}$ signals, varies the data input/output relations.
2. SIO
   ● Channel A chiefly performs the serial-parallel as well as parallel-serial conversions of data, and at the same time, also generates CRC that is required for data error checks.
   Channel B serves only for QD control input/output signals.
   ● By its program, SIO performs not only the serial conversion of parallel data and the parallel conversion of serial data, but also the input/output of control signals. Presented below are the individual signals that will be employed for both the channels, A and B, of SIO.
   a. $\overline{CE}$, B/$\overline{A}$, and C/$\overline{D}$
      These signal serve for switching the SIO enable, channel select, and data control operations.

$\overline{CE}$	B/$\overline{A}$ (SO)	C/$\overline{D}$ SI	SIO REGISTER
0	0	0	SIO Channel A DATA
0	1	0	SIO Channel B DATA
0	0	1	SIO Channel A CONTROL
0	1	1	SIO Channel B CONTROL
1	–	–	SIO Not Select

b. Channel A Input/Output Signals
   $\overline{CTSA}$ (Input):
   An input to $\overline{WRPR}$ (Write Protect) of QD that when "H", inhibits recording (write) operations, and when "L" enables recording (write) operations.
   $\overline{RTSA}$ (Output):
   An output to $\overline{WRGA}$ (Write Gate) of QD that when "L", turns $\overline{WRGA}$ ON (makes $\overline{WRGA}$ "H"), and enables write operations by QD and a clock output to TXCA.
   $\overline{DCDA}$ (Input):
   An input to $\overline{MDST}$ (Media Set) of QD that will indicate the medium to have been set when the MEDIA SW output of QD is "L".
   TXDA (Output):
   A transmitting data output.
   $\overline{TXCA}$ (Input):
   The clock for transmission (101.5625 kHz). Transmitting data (TXDA) will be sampled at down-going edges of this clock, for output.
   RXDA (Input):
   A received data input.
   $\overline{RXCA}$ (Input):
   The clock for reception.
   Received data (RXDA) will be sampled at down-going edges of this clock, for fetching by SIO.

c. Channel B In/Output Signals
   $\overline{DTRB}$ (Output):
   A motor-on ($\overline{MTON}$) output to QD.
   The motor is switched on at a down-going edge "H" → "L" of this signal, and will be switched off when this signal is "H" and a motor stop point of QD has been reached.
   $\overline{DCDB}$ (Input):
   A $\overline{READY}$ input from QD.
   Read/write operations will commence at a down-going edge of this signal.
   $\overline{RTSB}$ (Output):
   A signal output for switching the MFDemodulator VFO operation on/off.
   The operations will be switched off when this signal is "H" (and $\overline{RXCA}$ and RXDA will be fixed at "H" and "L" levels, respectively). This signal is used for execising bit synchronization on MFDemodulator.

4) MFM (Modified Frequency Modulation) Modulator
Modulates the data that has been serial-converted by SIO, in conformance with the MFM recording format.

5) MFM Demodulator
Demodulates the read data that has been MFModulated, into the usual serial data.

6) Clock Oscillator
Generates the clock pulses that will be required for MFModulating and MFDemodulating operations.
The original quartz oscillation is at 6.5 MHz.

7) QD Control Circuit
1. Write amplifier
   Drives the current for flowing through the head to write data.
   The write operation may also be inhibited with an external signal ("WRITE PROTECT") or ("WRITE GATE").
2. Read Amplifier
   Amplifies and differentiates the input voltage picked up by the head, and by passing it through a zero-cross comparator, will convert it to a signal waveform at logic levels in correspondence to flux reversal positions on the medium.
3. Motor Controller
   Serves for controlling the rotary speed and speed-torque characteristics of the motor, by increasing the current flowing through the motor when at an increased motor load, and will not only enhance the speed-torque characteristics of the motor above its bare characteristics, but also suppress the effect of power supply voltage fluctuations.
4. Digital Converter
   By inputting signals from the read amplifier, converts them to a signal that will enable the SIO circuit to distinguish the data (read data). The frequency will be doubled by the process.
5. Frequency Divider
   Divides the write data signal into half the frequency.
   (Reverses the direction of a write current in the head, and distributes flux reversals on the medium in correspondence to the write data.)
6. Power-on/off Protector
   Blocks the write current against flowing when the power supply voltage has varied (fluctuated) below a predesignated level or when power has been switched on or off.
7. The Head Position switch serves for detecting the outermost periphery of a medium, and read/write operations commence at a down-going edge of its signal.
8. The Motor Stop switch serves for detecting the motor stopping position, and when during write operations, the head has reached the motor stopping position, the motor will be stopped even if the $\overline{MOTOR\ ON}$ signal had been held "L".

9) Individual QD Drive signals
$\overline{WRDT}$:
A disk writing data transferred from the SIO PCB to the QD drive, that will be used together with WRGA when writing data.
WRGA:
An "H" level of this signal engaged from the SIO side enables disk write operations.
$\overline{RDDT}$:
A data signal that has been waveform-shaped into pulses out of the analog signal read out from a disk.
$\overline{READY}$:
This signal will be made "L" at the timing when disk read or write operations are enabled.
$\overline{MDST}$:
A medium detecting signal that will be made "L" when a medium has been set.
$\overline{WRPR}$:
A medium write protect signal that will be made "L" when a medium with the write protection tab that has not been broken out is set.
$\overline{MTON}$:
A motor-on/off control signal.
As this signal is made "L", the motor will be turned and read or write operations enabled.
$\overline{RESET}$:
When this signal is made "L", the SIO and QD circuits will be initialized. If in the process, the motor has been turning, it will be stopped compulsorily and the $\overline{READY}$ signal made "H".

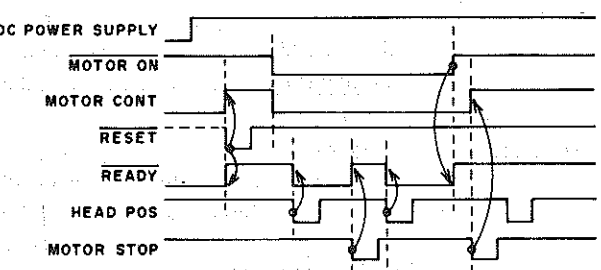### 10. Timings for Individual QD Drive Signals

Fig. 5-2 Control Timing

● A down-going edge of the Head Position signal causes $\overline{READY}$ to be made "L", at which timing, read/write operations will commence.
● A down-going edge of the Motor Stop Position signal causes $\overline{READY}$ to be made "H". If at this timing, $\overline{MTON}$ has already been made "H", the motor will be made to stop. Even when $\overline{MTON}$ has been "L", if WRGA is "H", (a write mode), the motor will similarly be made to stop.
● Requirements for $\overline{READY}$ signal to be made "H": An "L" level of $\overline{RESET}$, a down-going edge of the Motor Stop Position signal, or an up-going edge of $\overline{MTON}$, Requirements for the $\overline{READY}$ signal to be made "L": An down-going

6-1. CAUTION

1) The Akai MD280 has been designed exclusively for use with the Akai S612 Digital Sampler. Never connect any other equipment to the MD280.

2) Make sure to turn off the Akai S612 before connecting the Akai MD280.

3) On the Protection card
   The protection card installed inside of the disk holder of the Akai MD280 is to protect the mechanical parts from damage during transportation.
   Before loading a sampler disk into the Akai MD280, remove this protection card from the disk holder.
   When transporting the Akai MD280 over a long distance, be sure to insert this protection card inside of the disk holder again.

4) Interface cartridge and cable
   Connect this cartridge to the SAMPLER DISK DRIVE INTERFACE socket of the Akai S612.
   Never connect this cartridge to any other equipment.

5) DC power plug and cord
   Connect this plug to the DC OUT jack of the Akai S612.
   Never connect this plug to any other equipment.

6) Ground wire
   Connect this wire to the ground terminal of the Akai S612.

7) Removing a sampler disk
   Never depress the EJECT button when the BUSY indicator is lit, (i.e. during SAVE, VERIFY or LOAD functions).
   Never touch the magnetic sheet, as dust and scratches may cause data error.

8) The Akai MD280 is controlled by the S612. Therefore, the MD280's operations consist only of loading and unloading of sampler disks.

9) When writing (saving) voice data onto the sampler disk with the Akai MD280, the written (saved) voice data is not interchangeable for use with any other personal computers.

10) Write protection tabs (one each for sides A and B)
    If these tabs are not broken, the read/write head can read (LOAD/VERIFY) or voice data can be written (saved) onto a sampler disk. When the write protection tabs are broken, the MD280 can read voice data from the sampler disk, but it cannot write (SAVE) voice data onto the sampler disk. If you want to write again after the tabs have been broken, cover them with adhesive tape.

11) When connecting both the Akai MD280 and a COMMODORE type data recorder to the Akai S612, the Akai MD280 takes priority over the COMMODORE type data recorder during read/write operations. However, if the sampler disk's write protection tabs are broken, the connected COMMODORE type data recorder will operate writing voice data but the Akai MD280 will not operate.

12) If "E" (Error) is displayed on the Akai S612's MIDI CH. display during operation:
    * The read/write head is dirty.
    * The felt pad is worn out.
    * The sampler disk is of poor quality, worn out, etc.
      If a dirty head or worn out felt pad are the cause of malfunction, clean the read/write head or replace the felt pad. Refer to "Maintenance II" on page 13.
      If the sampler disk is the cause, replace the sampler disk with a new one.

13) Do not turn the flywheel in the opposite direction indicated with arrow on the flywheel, as it may damage the cams in the mechanism block.

6-2. MAINTENANCE I

Cleaning of the read/write head (Refer to Fig. 6-1)

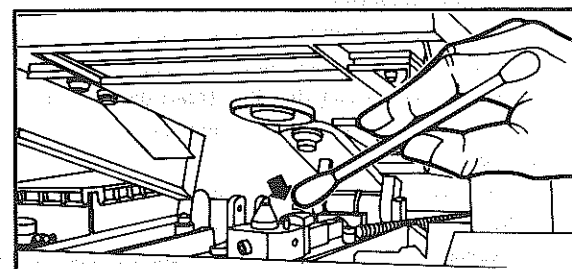

Fig. 6-1

1) A dirty head cannot read and write data onto the sampler disk properly, and may also cause the Akai S612 to malfunction.
   Please clean the read/write head of the Akai MD280 periodically.

2) Depress the EJECT button to open the disk holder.
   Use a liquid cleaner exclusively made for tape decks.

3) Never touch the read/write head with your fingers, it may cause malfunctions.

6-3. MAINTENANCE II
Replacing the felt pad (Refer to Figs. 6-2 to 6-5)

1) When the felt pad is worn out, the MD280 cannot perform read (LOAD, VERIFY) and write (SAVE) operations properly. During SAVE, VERIFY or LOAD operations, if malfunctions occur after you have cleaned the read/write head, replace the felt pad with a new one.

2) Before replacing the felt pad
   Make sure to disconnect the Akai MD280 from the S612 and remove the Akai MD280 from the EIA rack, if attached.

3) Remove the MD280's upper cover
   1. Remove the 4 screws on the left and right side panels (2 each) of the Akai MD280.
   2. Remove the screws from the front and rear panels (1 screw each for both front and rear panels).
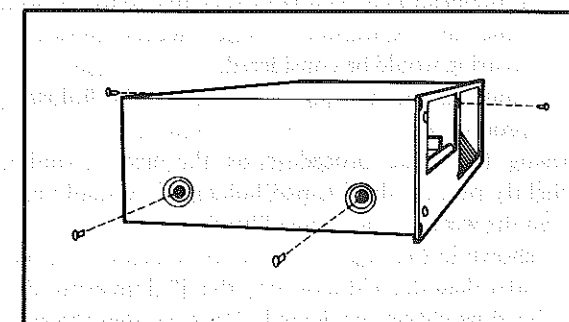   3. Remove the upper cover of the Akai MD280.

Fig. 6-2

4) Remove the disk lid
   1. Remove the 2 screws which secure the disk holder. Insert a screwdriver into the 2 holes on the rear panel.
      Make sure the cassette holder is closed when removing the screws.
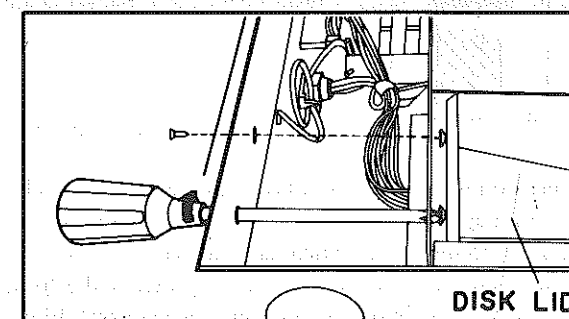   2. Remove the lid from the disk holder.

Fig. 6-3

5) Remove the felt pad
   1. Turn the felt pad clockwise, about 90 degrees, (1/4 turn).
   2. Pull up on the felt pad holder, then remove the felt pad from the holder.
      Hold your finger on the felt pad holder to keep it open until you have attached the new felt pad.
   Akai recommends cleaning the read/write head at the same time you are replacing the felt pad.
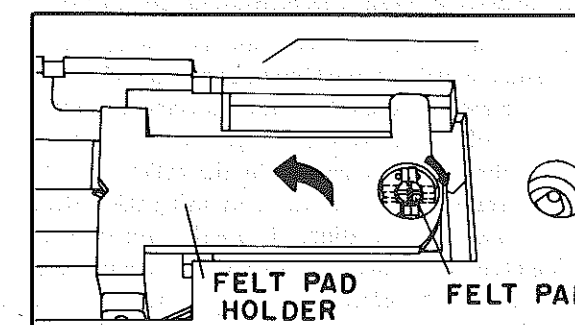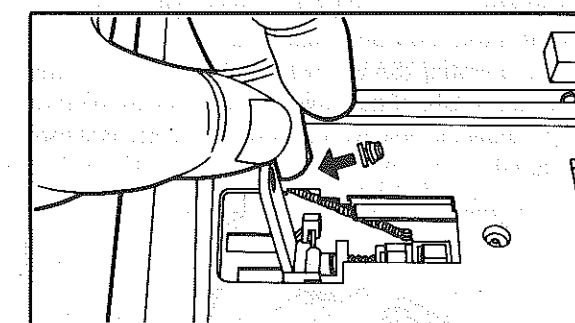

Fig. 6-4

Fig. 6-5

6) Attach the felt pad
   1. Attach the new felt pad to the felt pad holder, then turn the felt pad clockwise about 90 degrees, (1/4 turn). To securely attach the felt pad, a tweezer should be used.
   2. After attaching the felt pad to the felt pad holder, replace into place gently.
      Never touch the read/write head and the felt part of the felt pad with your fingers.

7) Reattach the disk lid and the upper cover
   1. Reattach the 2 screws which secure the disk holder.
   2. Reattach the upper cover to the Akai MD280 with the 6 screws (1 screw each for the front and the rear panels, 2 screws each for the left and right sides of the upper cover).

7-1. THE FOLLOWING DEVICES AND MEDIA ARE REQUIRED FOR THE TROUBLESHOOTING OF MD280.

* Digital Sampler S612
* Test Media (A) MD280 (Parts No.: AT-751375)
* Disk Drive Unit BLK. (Parts No.: BB-360748)
  This block is composed of Mecha BLK, SI0 PCB BLK and I/F BLK (I/F cable + ROM PCB + CARTRIDGE COVER)
* Digital Voltmeter
* Desoldering Tool (HAKKO ACE No. 481 etc.)
* Oscilloscope (or storage-oscilloscope)

7-2. BEFORE THE TROUBLESHOOTING

The MD280 is always used with the Digital Sampler S612 and it is also executed by the operation of the S612. For the reason, if some troubles are occured under the execution of the MD280, the engineer must determine whether the trouble is occured by the MD280 or S612. The determination is performed by using the S612 and the test media for operation. Before the process, the following basic items must be checked. (Of course, even if the S612 shows a correct operation, the following items should be checked.)

1) Disk is incorrectly inserted.
   Refer to the operatior's manual and insert the disk correctly.
2) Write protection tab is removed.
   The re-writing (SAVE) will not be performed without the above tab. If the re-writing is required, perform it by sealing the hole with adhesive tape etc. as shown in Fig. 7-1.
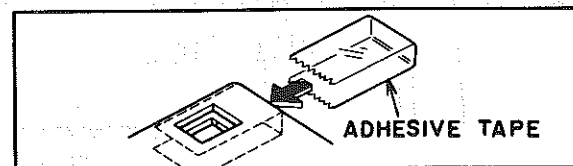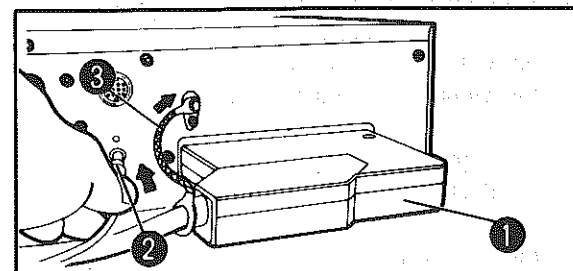

ADHESIVE TAPE

Fig. 7-1

3) The MD280 is not correctly connected with the S612.
   Refer to the operator's manual (or Fig. 7-2) and perform the right connection.


①: CARTRIDGE
②: DC INPUT
③: GND WIRE

Fig. 7-2

4) Disk's scratches, damages or expiration of lifetime.
   By inserting a new disk into the MD280 and executing SAVE/VERIFY/LOAD, or by inserting a test media into the MD280 and executing "LOAD", the determination can be performed.
   Replace it with a new disk if necessary.
5) Dirty head.
   Refer to the head cleaning method as shown in the Maintenance I (page 12) and perform the cleaning.
6) Felt Pad's inferiority or lifetime expiration.
   The determination can be performed by replacing the felt pad with a new one.
   Refer to the replacement method of the felt pad as shown in the Maintenance II (page 13) and perform the replacement of felt pad.

Note: Lifetime expiration of head
   If the head had been used very frequently or long time, the expiration of head lifetime caused by wearing would be considered.
   Confirm the wearing condition by the following procedure:
   a Using the same procedure as the head cleaning, slightly pull up the felt pad holder and visually confirm the wearing condition of head.
   b As shown in the Fig. 7-3, if the width of worn surface is wider than the width of core, the lifetime expiration of head would be considered. Consider that the standard width of rub-out surface is over 2mm.
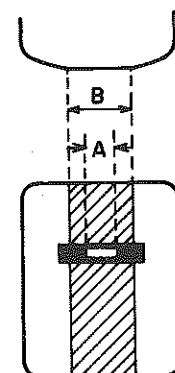
A: Core width
B: rub-out surface width
Head lifetime: A < B (over 2mm)

Fig. 7-3

   c The lifetime expiration of head can be determined by measuring the output level (more than 400mVp-p) of storage-oscilloscope which is connected to the test point (Tp1) on the SUB PCB. Anyway, if the head lifetime is expired, the mecha (mechanism) block must be replaced. Accordingly, replace the mecha block refering to the mecha block replacement method (page 21).

7-3. TROUBLESHOOTING PROCEDURE

1) Firstly, determine whether the trouble is caused by the MD280 or S612 by the following method described below:
   1. Connect the MD280 with the S612 and then switch the power on (must confirm if the connection is surely connected or not).
   2. Insert the test media into the MD280 and execute "LOAD" by pressing the "LOAD" button of the S612.
   3. At this time, the MIDI CH display of the S612 indicates " d. " (data). Confirm the subsequent indications.
   4. When " E. " (Error) is indicated, the MD280 has some trouble.
      item 7-2, 1) ~ 6) or the flowchart of troubleshooting.
   5. When " c. " (check) is indicated, reconfirm the connection of the MD280 and S612 and the insertion of test media. After the reconfirmation, if the " c. " is still indicated, the MD280 has some trouble.
   6. When " 8. " (Omni-on) is indicated, "LOAD" has been executed.
      Then, execute "VERIFY" by pushing the "VERIFY" button. When " b. " (Good) is indicated after the execution of "VERIFY", the MD280 has no trouble.
      (If required, perform the troubleshooting of the S612 by refering the S612 service manual).
      When " E. " is indicated, the MD280 has some trouble. Perform the troubleshooting and repairment by refering to the item 7-2, 1) ~ 6) or the flowchart of troubleshooting.
   7. If there is no indication appeared on the MIDI CH display of the S612 and also the MD280 can not be operated even through the "LOAD" button of the S612 has been pressed, perform the troubleshooting by replacing the three blocks with the other three blocks which are properly operation.
      If there is no indication even if the above process has been performed, it would be considered that the S612 has some trouble. In this case, refer to the S612 service manual and perform the repairment of the S612.

Note: The following symptoms may occur when connection or disconnection of the MD280 interface cable is made while the power of the S612 is on.
   1. None of operation buttons is acceptable.
   2. No character is displayed on the MIDI CH display.
   3. Abnormal character is displayed on the MIDI CH display.
   4. No MIDI signal is received.
   In this case, turn off the power of the S612 and turn it on again to reset the unit.
   If the symptoms still exist, turn off the S612 and disconnect the MD280 from the S612 and see if the S612 works properly by itself.
   Followings are the possible causes on the MD280 of above symptoms.
   1. Bridge within the I/F cable.
   2. Bridge on the SI0 PCB's pattern.
   3. Faulty IC's on the SI0 PCB.

2) Troubleshoot according to the symptom refering to the flow chart (1) to (4) shown on page 17 to 20.

3) Block Replacement
   The troubleshooting of MD280 is unlike the case of other general audio video devices. It employs the "block replacement" method as the basic troubleshooting method. And the supply parts are supplied by each block unit as a general principle.
   The MD280 is composed of three blocks as indicated in the above item 7-1.
   Accordingly, when the troubleshooting is required, a set of each block (a set of Disk Drive Unit BLK MD280) should be prepared to simplify the troubleshooting. Then as the basic troubleshooting process, each block is replaced, any incorrect block is determined and the repairment is performed.
   Refer to Replacement Method of Each Block on page 21.
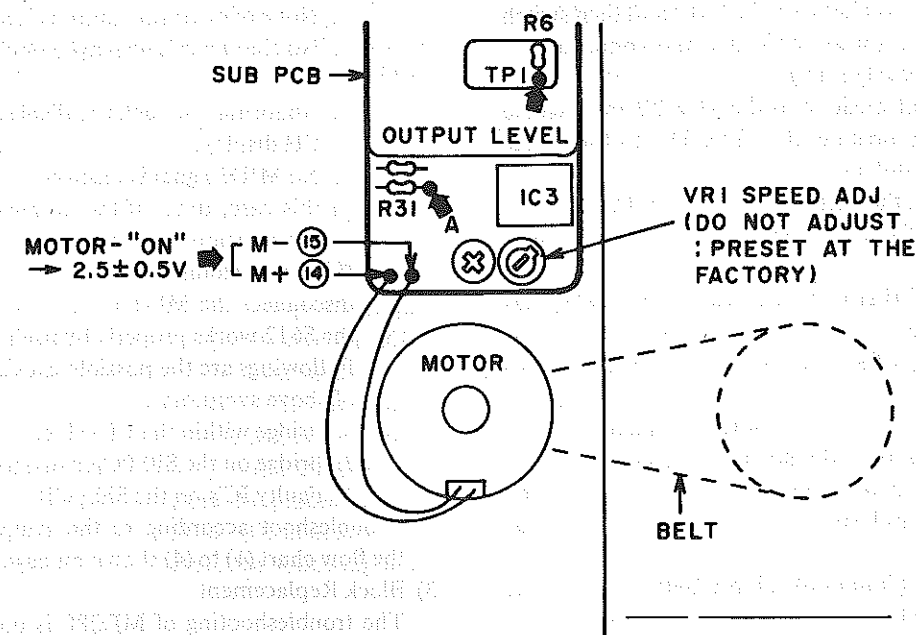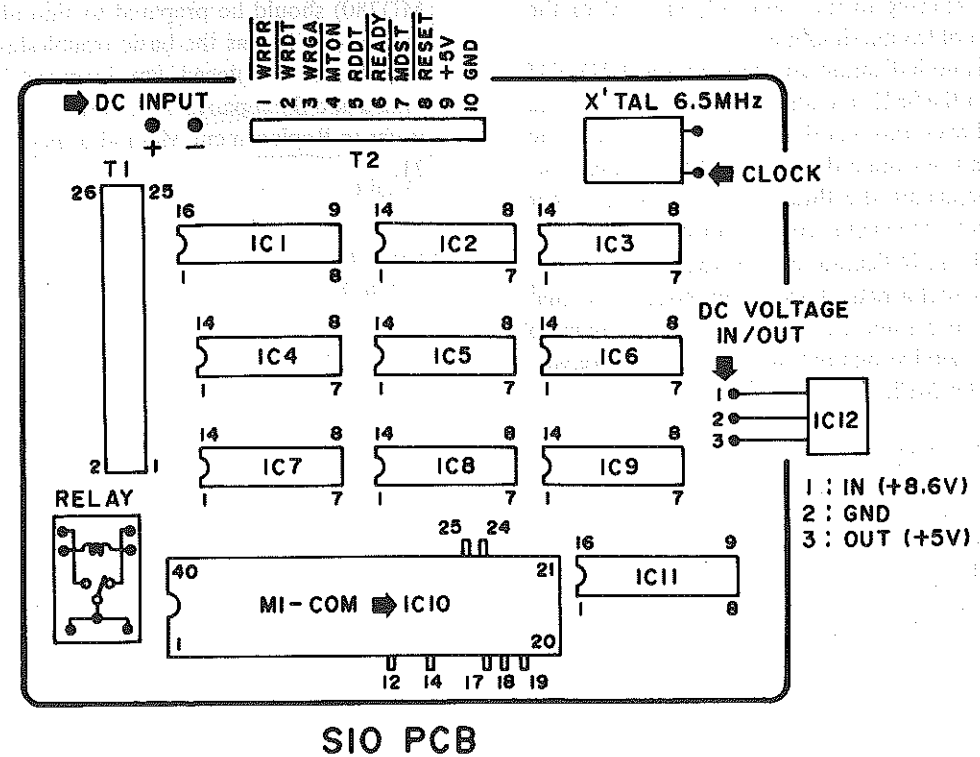
7-4. TROUBLESHOOTING FLOW CHART AND CHECK POINT

Fig. 7-4 Mecha Block Check Point for Troubleshooting

SIO PCB

Fig. 7-5 SIO PCB Check Point for Troubleshooting
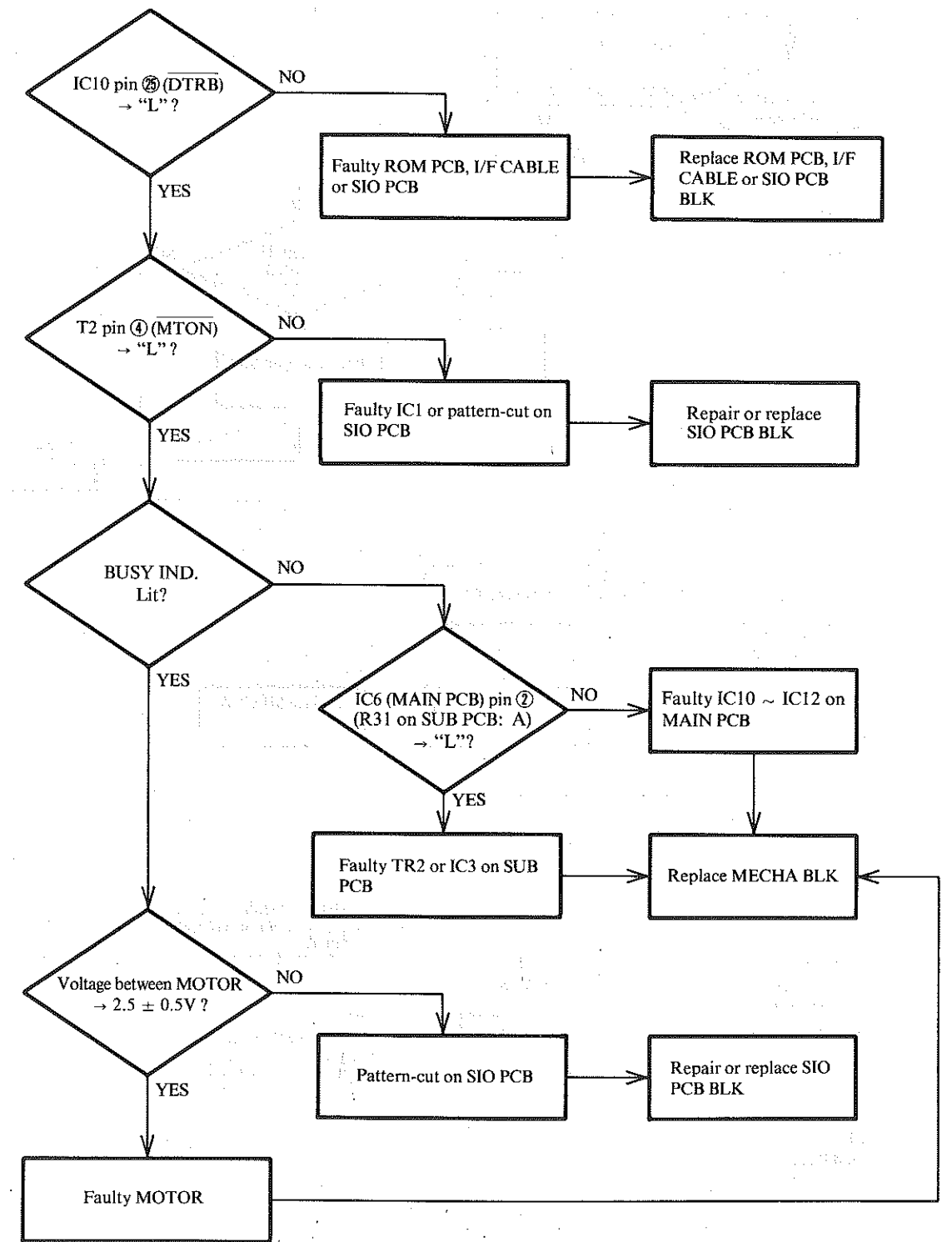
1) MOTOR does not turn

   * Check while Loading (Reading)
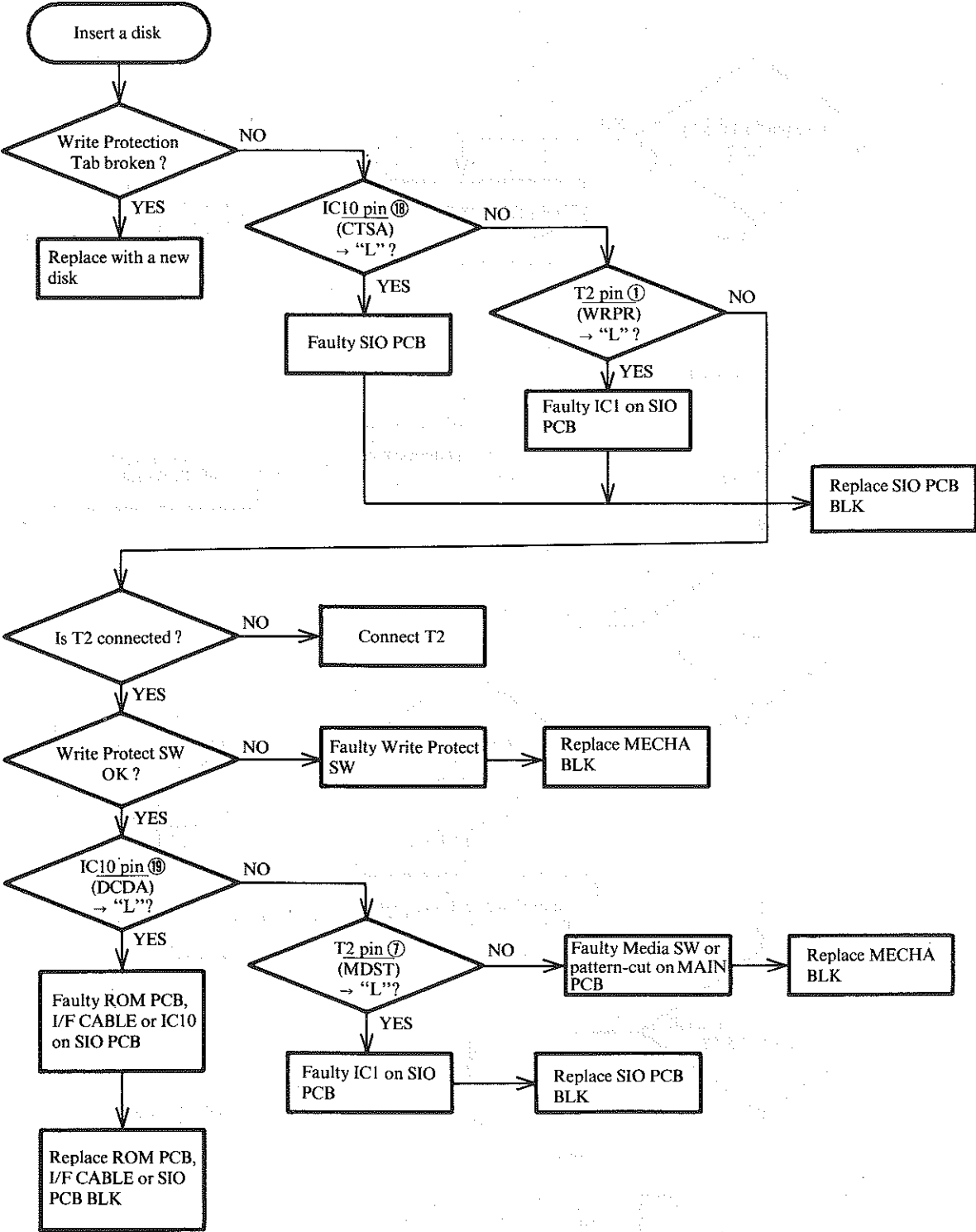

CHART (1)

2) SAVE (WRITE) malfunctions (I)

```
        ┌──────────────┐
        │ Insert a disk │
        └──────┬───────┘
               │
        ◇ Write Protection ──NO──┐
          Tab broken ?           │
               │YES              │
        ┌──────┴─────┐      ◇ IC10 pin ⑱ ──NO──┐
        │ Replace with a new │   (CTSA)           │
        │ disk        │        → "L" ?           │
        └────────────┘           │YES            │
                          ┌───────┴──────┐   ◇ T2 pin ① ──NO──┐
                          │ Faulty SIO PCB │   (WRPR)          │
                          └──────────────┘    → "L" ?          │
                                                 │YES          │
                                          ┌──────┴──────┐      │
                                          │ Faulty IC1 on SIO │ │
                                          │ PCB          │     │
                                          └─────────────┘      │
                                                         ┌─────┴──────┐
                                                         │ Replace SIO PCB │
                                                         │ BLK         │
                                                         └─────────────┘
```

◇ Is T2 connected ? ──NO──→ Connect T2

│YES

◇ Write Protect SW OK ? ──NO──→ Faulty Write Protect SW ──→ Replace MECHA BLK

│YES

◇ IC10 pin ⑲ (DCDA) → "L"? ──NO──→ ◇ T2 pin ⑦ (MDST) → "L"? ──NO──→ Faulty Media SW or pattern-cut on MAIN PCB ──→ Replace MECHA BLK

│YES (DCDA)

Faulty ROM PCB, I/F CABLE or IC10 on SIO PCB

│

Replace ROM PCB, I/F CABLE or SIO PCB BLK

(from T2 pin ⑦ YES) → Faulty IC1 on SIO PCB ──→ Replace SIO PCB BLK

CHART (2)

3) SAVE (WRITE) malfunctions (II)

◇ LOAD function OK ? ──NO──→ Follow LOAD Trouble Shooting

│YES

◇ Disk OK ? ──NO──→ Replace with a new disk

│YES

◇ X'TAL on SIO PCB OK ? (6.5 MHz) ──NO──→ Faulty X'TAL or IC2 on SIO PCB

│YES

- ↓ * Check while Saving (Writing)

◇ IC10 pin ⑰ (RTSA) → "L" ? ──NO──→ Faulty IC10 on SIO PCB

│YES

◇ T2 pin ③ (WRGA) → "H" ? ──NO──→ Faulty IC2 on SIO PCB

│YES → Replace SIO PCB BLK

◇ IC10 pin ⑭(TXCA) any signal input ? ──NO──→ Faulty IC3 (or IC3's peripheral circuit) on SIO PCB

│YES

◇ IC8 $\overline{CLR}$ → "H" ? ──NO──→ Faulty IC2 on SIO PCB

│YES

◇ T2 pin ② (WRDT) OK ? ──NO──→ Faulty MFM Modulator

│YES

Faulty Write Amp on MAIN PCB ──→ Replace MECHA BLK

CHART (3)

4) LOAD (READ) malfunctions

* Check while Loading (Reading)

```
        ┌─────────────────┐  NO   ┌─────────────────┐      ┌─────────────────┐
        │  Clock (6.5 MHz) │──────▶│ Faulty X'TAL or IC3 │────▶│ Replace SIO PCB BLK │
        │     OK ?         │       │ on SIO PCB       │      └─────────────────┘
        └─────────────────┘       └─────────────────┘
               │ YES
               ▼
        ┌─────────────────┐  NO   ┌─────────────────┐      ┌─────────────────┐
        │  T2 pin ⑤ (RDDT) │──────▶│ Faulty Read Amp on │────▶│ Replace MECHA BLK │
        │ any signal input ? │     │ SUB PCB          │      └─────────────────┘
        └─────────────────┘       └─────────────────┘
               │ YES
               ▼
        ┌─────────────────┐  NO   ┌─────────────────┐
        │ IC10 pin ㉔ (RTSB) │────▶│ Faulty IC10 on SIO │
        │ goes ON and OFF ? │      │ PCB, I/F CABLE or │
        └─────────────────┘       │ ROM PCB          │
               │ YES              └─────────────────┘
               ▼
        ┌─────────────────┐  NO   ┌─────────────────┐      ┌─────────────────┐
        │ IC10 pin ⑫ (RXDA), │────▶│ Faulty MFM demodu- │────▶│ Replace SIO PCB BLK, │
        │ pin ⑬ (RXCA) any │       │ lator            │      │ I/F CABLE or ROM PCB │
        │  signal input ?  │       └─────────────────┘      └─────────────────┘
        └─────────────────┘
               │ YES
               ▼
        ┌─────────────────┐
        │ Faulty IC10 on SIO │
        │ PCB              │
        └─────────────────┘
```
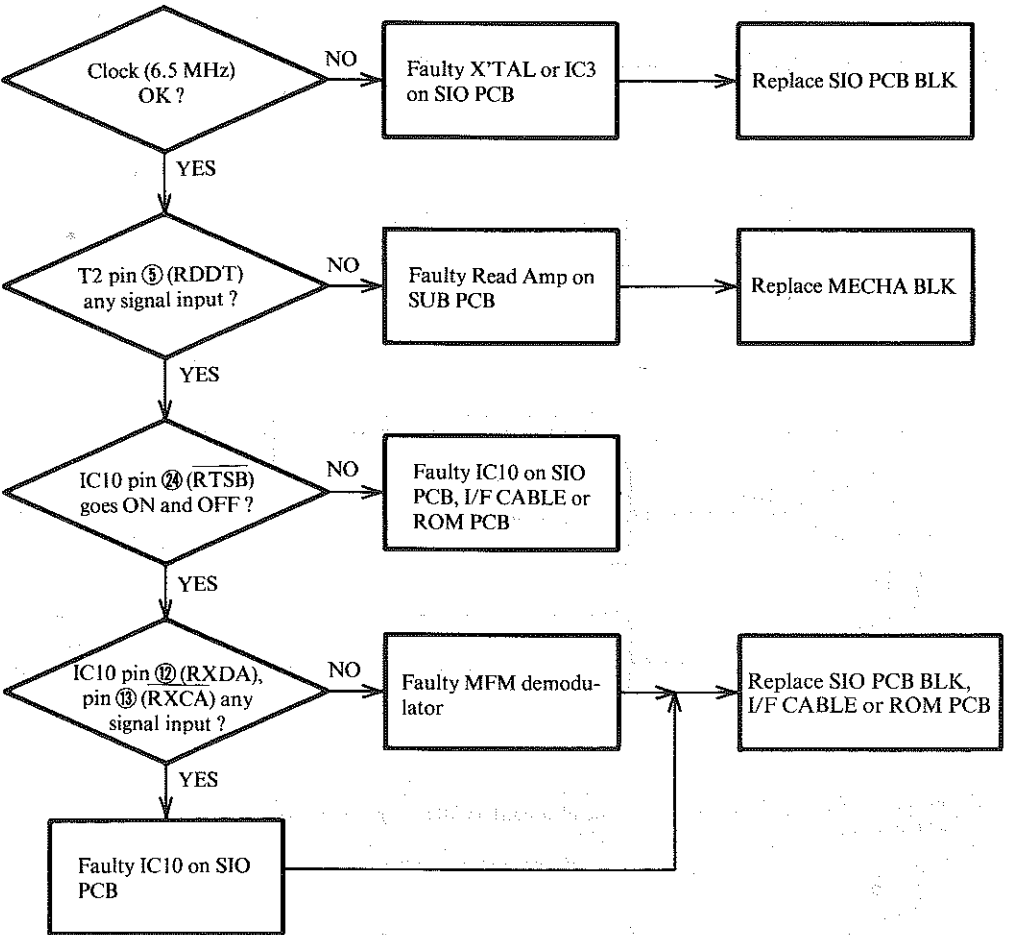
CHART (4)

VIII. REPLACEMENT METHOD OF EACH BLOCK

8-1. MECHA BLOCK REPLACEMENT METHOD

1) Remove the upper cover (6 screws), disk lid (2 screws) and disk escutcheon (L/R) (4 nylon revets).
2) Remove the connector (T2), 3 pieces of lead wire (black, white and red) from the LED PCB and mecha block (4 screws).
3) Install a new mecha block by following the reverse procedure of the above.
4) After the mecha block is replaced, must connect S612 with the MD280 and insert the test media into the MD280. Then confirm the operation.

8-2. REPLACEMENT METHOD OF SIO PCB BLOCK

1) Remove the upper cover (6 screws) and pull out the connectors T1 and T2.
2) After removing the following wires on the SIO PCB, remove the SIO PCB block (5 screws).
   ● DC power cord (+/−)
   ● GND wire (VLT)
   ● Capacitor lead
3) Install a new SIO PCB block by following the reverse procedure of the above.
4) After the replacement, make sure to confirm the operation of the MD280 using the test media.

8-3. REPLACEMENT METHOD OF I/F CABLE

1) Remove the upper cover (6 screws), connector (T1) on the SIO PCB and then remove the cable clamp (2 screws) for the IF cable.
2) Remove the cover cartridge (A) (3 screws) of cartridge section, ROM PCB (2 screws), GND cable clamp and then remove the connector (CN1) from the ROM PCB by using the desoldering tool.
3) Install a new I/F cable by following the reverse procedure of the above.
4) After the replacement, make sure to confirm the operation of the MD280 using the test media.

8-4. REPLACEMENT METHOD OF ROM PCB

1) Remove the cover cartridge (A) (3 screws) of cartridge section.
2) Remove the ROM PCB (2 screws) and then remove the connector (CN1) from the ROM PCB by using the desoldering tool. With this disoldering tool (HAKKO ACE No. 481 etc.), the connector can smoothly removed from the PCB without any damage of pattern surface.
3) Install a new ROM PCB by following the reverse procedure of the above.
4) After the replacement, make sure to confirm the operation of the MD280 using the test media.

IX. PC BOARD TITLES AND IDENTIFICATION NUMBERS

PC Board Title	PC Board Number	REMARKS
MAIN PC Board	—	Located on the Mecha Block
SUB PC Board	—	
SI0 PC Board	69-5133	
ROM PC Board	69-5154	

SECTION 2

PARTS LIST

TABLE OF CONTENTS

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	PAN20x03STL CMT
2-4	ZS-536488	BID20x08STL 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.
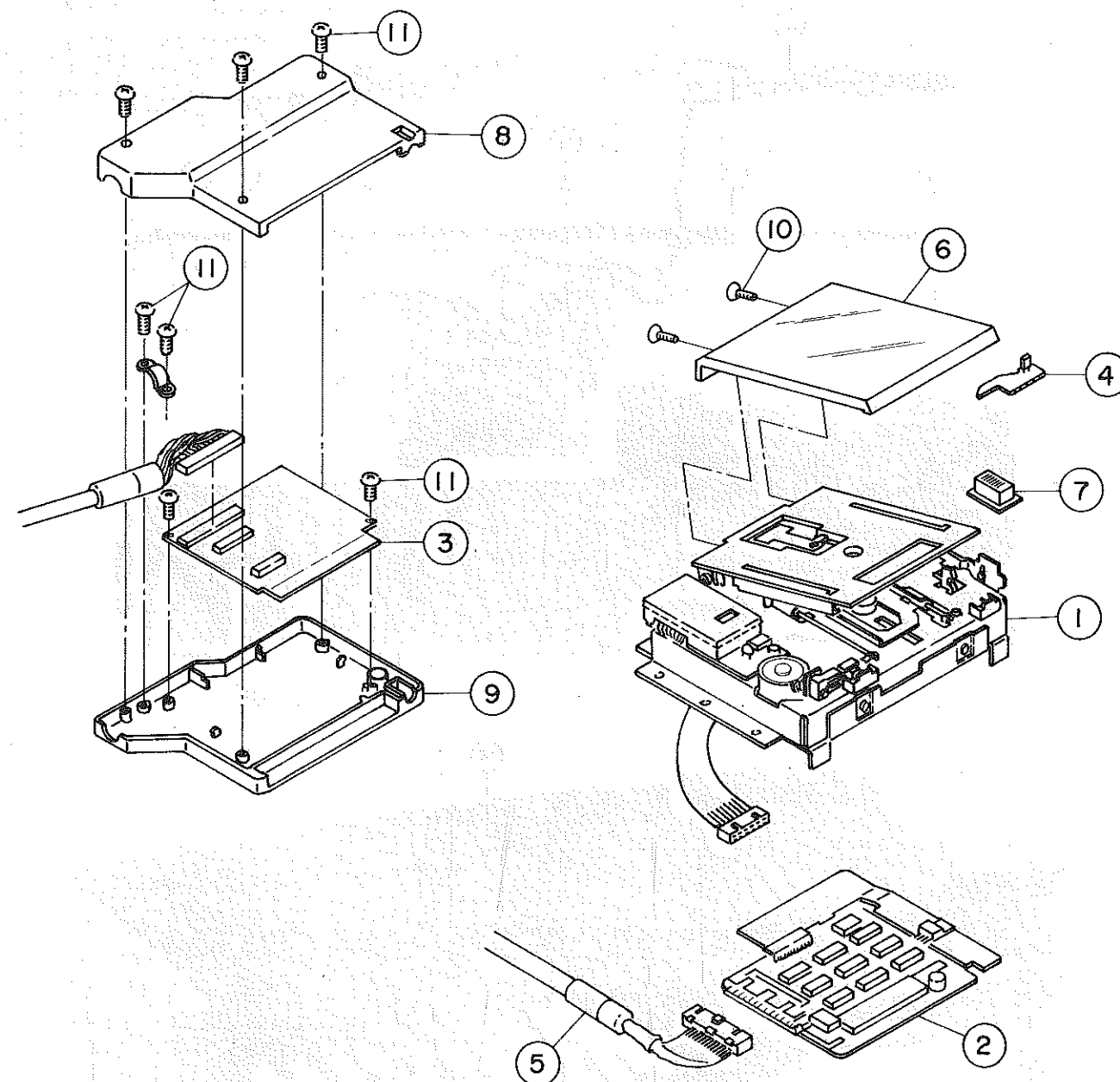
DISK DRIVE UNIT BLOCK

1. DISK DRIVE UNIT BLOCK MD280

REF. NO.	PART NO.	DESCRIPTION
1-1	BB-716800	MECHA BLOCK MD280
1-2	BA-716802	PC SIO BLK
1-3	BA-716806	PC ROM BLK
1-4	BA-716801	PC LED BLK
1-5	EW-716803	CABLE I/F
1-6	BD-716798	LID DISK
1-7	SK-716799	KNOB EJECT
1-8	BC-716808	COVER CARTRIDGE (A)
1-9	BC-716805	COVER CARTRIDGE (B)
1-10	ZS-716807	T2CTS30x060 BNI
1-11	ZS-609120	T2PAN30x06STL CMT
1-12x	MB-717095	BELT

FINAL ASSEMBLY BLOCK
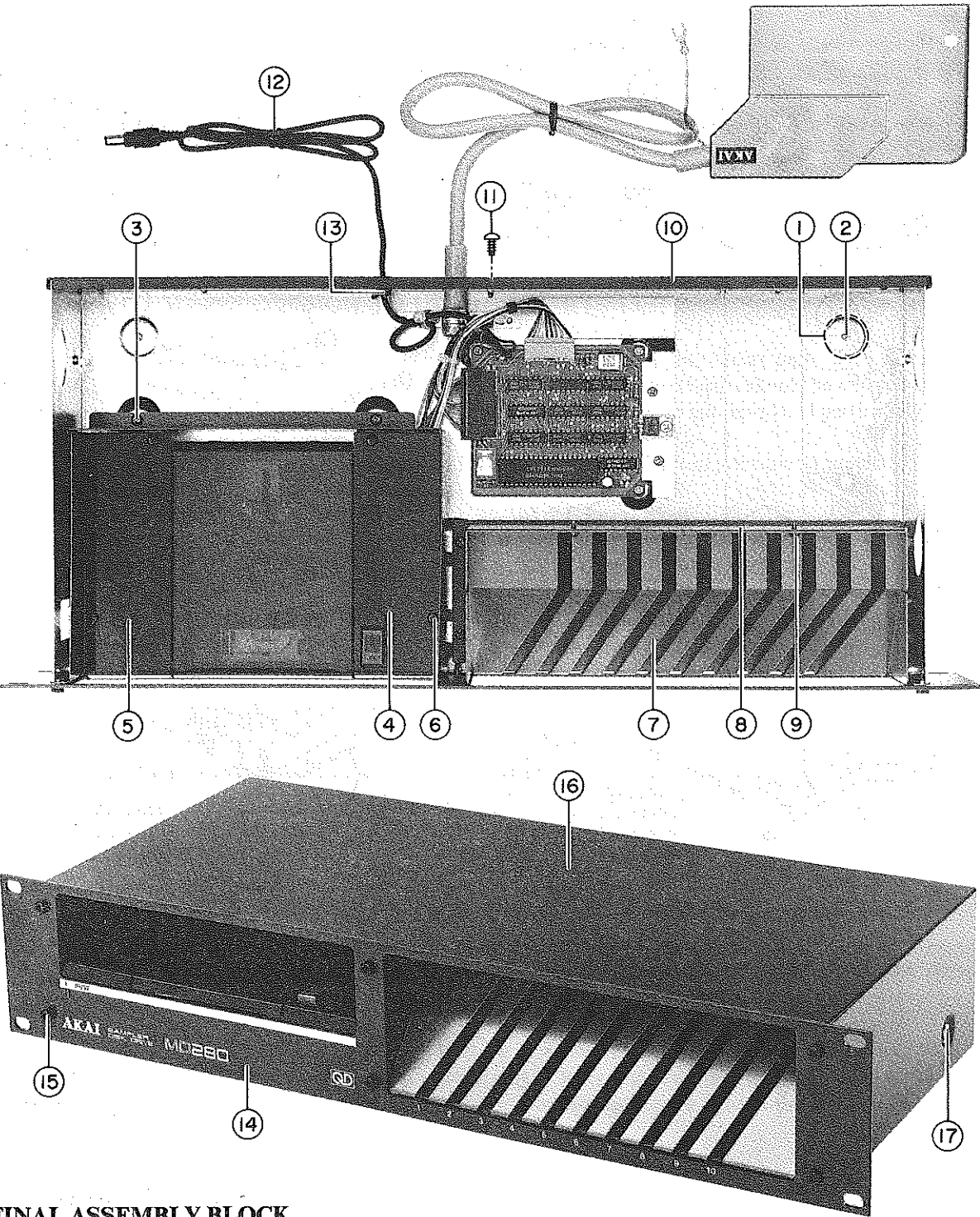
S612 MD280

PART NO.	REF. NO.	PART NO.	REF. NO.	PART NO.	REF. NO.	PART NO.	REF. NO.
AX-717097	1-13x	EZ-309882	2-13	ZS-320906	2-3		
BA-716801	1-4	MB-717095	1-12x	ZS-341960	2-17		
BA-716802	1-2	SA-324129	2-1	ZS-344754	2-2		
BA-716806	1-3	SE-360738	2-8	ZS-345272	2-9		
BB-716800	1-1	SE-360739	2-4	ZS-361253	2-15		
BC-716805	1-9	SE-360740	2-5	ZS-609120	1-11		
BC-716808	1-8	SK-716799	1-7	ZS-716807	1-10		
BD-360734	2-14	SP-360735	2-10	ZW-231030	2-6		
BD-716798	1-6	SP-360736	2-16				
EW-360747	2-12	SZ-360737	2-7				
EW-716803	1-5	ZS-319460	2-11				

2. FINAL ASSEMBLY BLOCK

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
2-1	SA-324129	FOOT	2-10	SP-360735	PANEL REAR
2-2	ZS-344754	ST PAN30×06STL CMT C080 (FOOT FIX)	2-11	ZS-319460	T2BR30×06STL BZN PROJECTION (PANEL REAR FIX)
2-3	ZS-320906	ST BR30×06STL CMT (MECHA FIX)	2-12	EW-360747	CORD JXP1513
2-4	SE-360739	ESCUTCHION DISK (R)	2-13	EZ-309882	STRAIN BELIEF SR-2M-4
2-5	SE-360740	ESCUTCHION DISK (L)	2-14	BD-360734	PANEL FRONT
2-6	ZW-231030	RV NYL30×045 BL (ESCUTCHION DISK FIX)	2-15	ZS-361253	SCREW PANEL (PANEL FRONT FIX)
			2-16	SP-360736	COVER UPPER
2-7	SZ-360737	HOLDER DISK	2-17	ZS-341960	ST BID40×06STL BNI (COVER UPPER FIX)
2-8	SE-360738	MASK DISK			
2-9	ZS-345272	ST BR30×06STL BNI			

AKAI

SECTION 3

SCHEMATIC DIAGRAM

TABLE OF CONTENTS

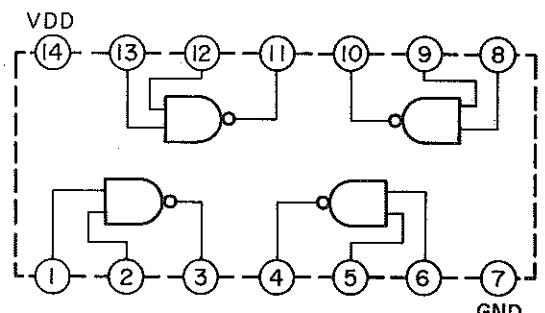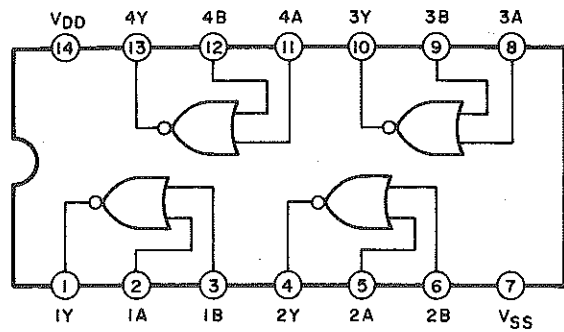μPC17805H (Voltage Regulator)
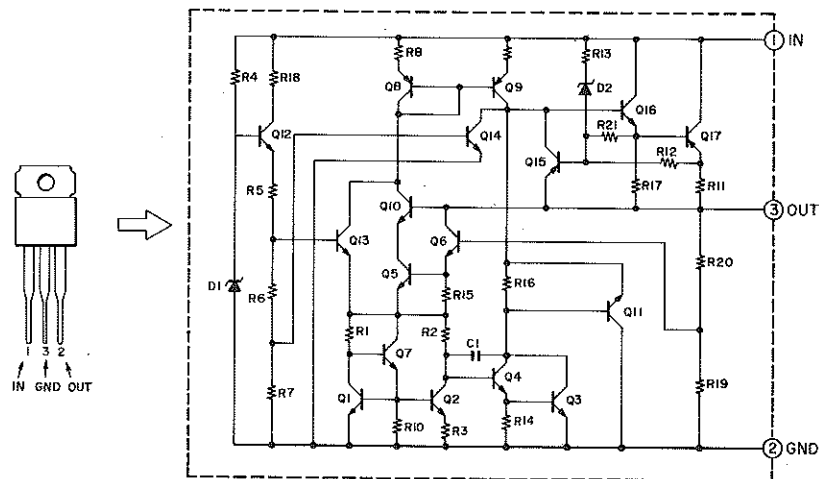
HD14070BP (Quadruple Exclusive-OR Gate)
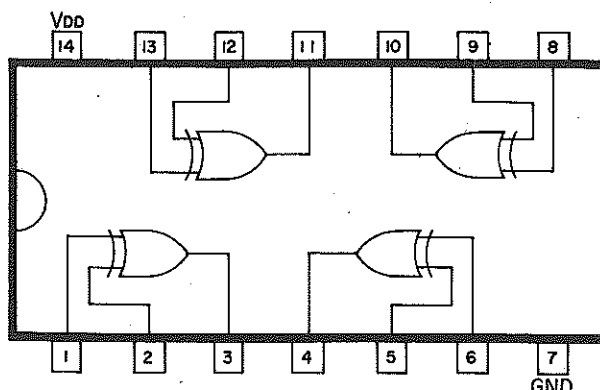
HD14081BP (Quadruple 2-input AND Gate)

TC74HC02P (Quad 2-input NOR Gate)

VDD 4Y 4B 4A 3Y 3B 3A
14   13 12 11 10 9   8

1   2   3   4   5   6   7
1Y   1A 1B 2Y 2A 2B V_SS

HD7438P. TC74HC00P (Quad 2-input NAND Gate)

Vcc 4B 4A 4Y 3B 3A 3Y
14   13 12 11 10 9   8

*

1   2   3   4   5   6   7
1A   1B 1Y 2A 2B 2Y GND

＊OPEN COLLECTOR
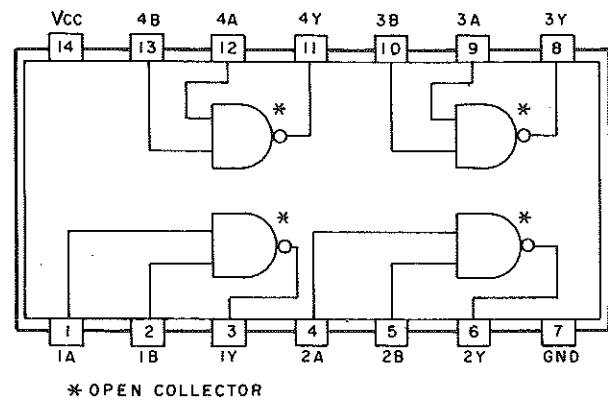
HD14001BP (Quadruple 2-input NOR Gate)

VDD 4B 4A 4X 3X 3A 3B
14   13 12 11 10 9   8

1   2   3   4   5   6   7
1A   1B 1X 2X 2A 2B GND
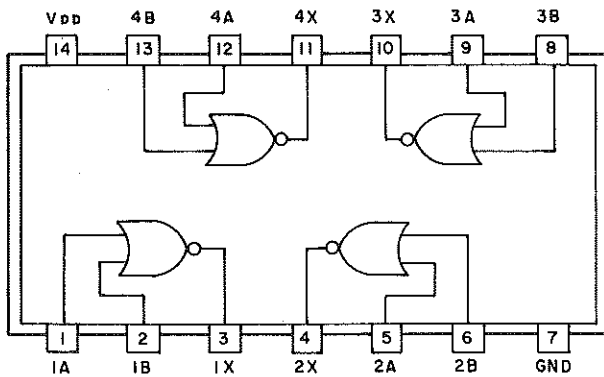
HD14013BP (Dual D-type Flip Flop)

VDD 2Q 2Q̄ 2CLOCK 2CLEAR 2DATA 2PRESET
14   13 12 11   10   9   8

Q̄2 CL2 CK2
Q2   PR2 D2

Q1   PR1 D1
Q̄1   CL1 CK1

1   2   3   4   5   6   7
1Q   1Q̄   1CLOCK 1CLEAR 1DATA 1PRESET Vss
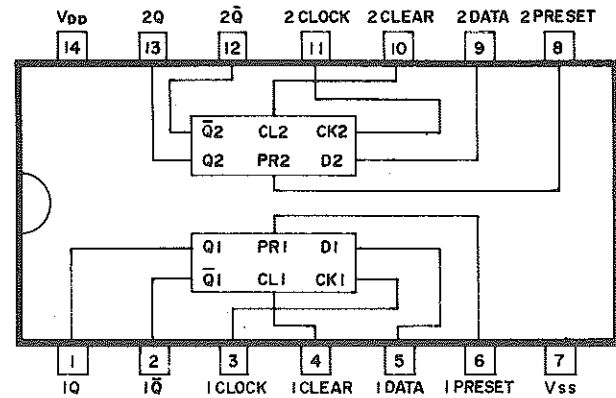
HD14069UBP. TC74CU04P (Hex Inverter)

Vcc 6A 6V 5A 5V 4A 4V
14   13 12 11 10 9   8

1   2   3   4   5   6   7
1A   1V 2A 2V 3A 3V GND
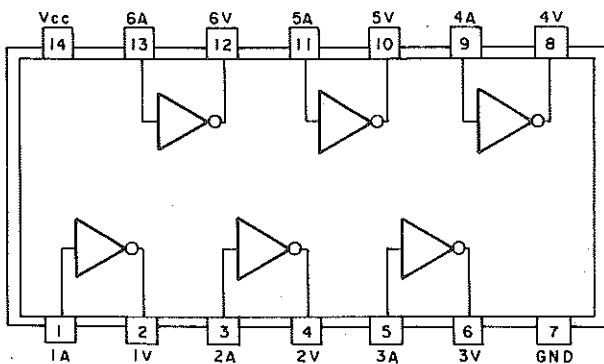
μPC311C (Single Internally Voltage Comparator)

OFFSET NULL 1   8 N C
-I N   2   7 V +
+I N   3   6 OUT
V -   4   5 OFFSET NULL
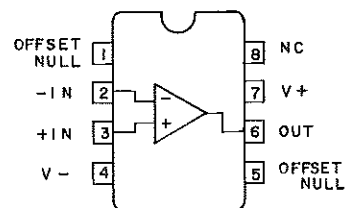
μPC4560 (Dual Operational Amplifier)

V+   out₂ I_I2 I_N2
8   7   6   5

1   2   3   4
out₁   I_I1 I_N2 V⁻
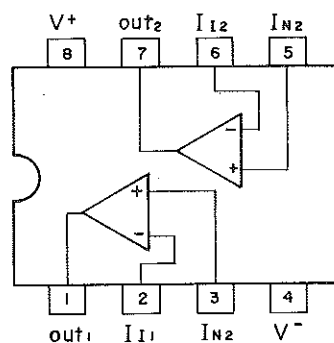
HD74HC4075P (Triple 3-input OR Gates)

HD74HCT245 (Octal Bus Transceiver)

Enable $\overline{G}$	Direction Control DIR	Operation
L	L	B data to A bus
L	H	A data to B bus
H	×	Isolation

H: High level
L: Low level
×: Irrelevant

HD74HC74P (Dual D-type Flip Flop)

Input				Output	
Preset	Clear	Clock	Data	Q	$\overline{Q}$
H	H	×	×	H	L
H	L	×	×	L	H
L	L	×	×	H*	H*
H	H	⟋	H	H	L
H	H	⟋	L	L	H
H	H	L	×	no change	no change
H	H	H	×	no change	no change
H	H	⟍	×	no change	no change

* Stays "H" while Preset and Clear are "L".
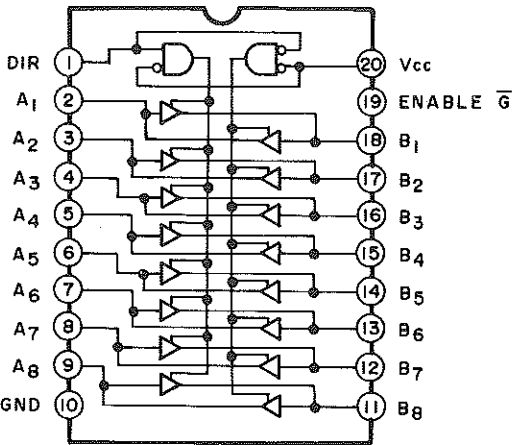
HD74HC365P (Hex Bus Buffer)

Input			Output
$\overline{G_1}$	$\overline{G_2}$	A	Y
H	×	×	Z
×	H	×	Z
L	L	L	L
L	L	H	H

H: High level
L: Low level
Z: High impedance
×: Don't care ("H" or "L")

HD74HC161P (Sync Binary Counter)

Inputs					Outputs
Clock	Clear	Load	Enable P	Enable T	Qn
⟋	L	×	×	×	Reset-Clear
⟋	K	L	×	×	Load Input Data
⟋	H	H	H	H	Count
⟋	H	H	L	×	No Count
⟋	H	H	×	L	No Count
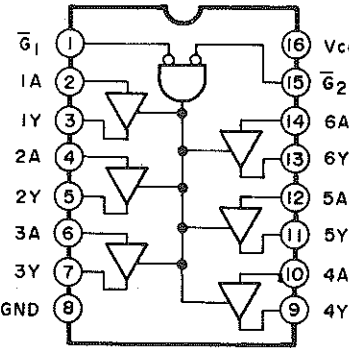
HD74HC393P (Dual Binary Counter)

Clock	Clear	Outputs
×	H	L
H	L	No Change
L	L	No Change
⟋	L	No Change
⟍	L	Advance to Next State

MD280
SCHEMATIC DIAGRAM
NO. 850701A

SUB PCB (PATTERN SIDE)

TO READ/WRITE HEAD

TO S612 DC OUTPUT

DC INPUT

TO MAIN PCB

DO NOT ADJUST:
PRESET AT THE
FACTORY

IC3 µPC1470H
IC1 µPC4560C
IC2 µPC311C

VR1 SPEED ADJ

R42 R33 R44 R43

SW2 MEDIA SW

BLK
RED
BLU
RED

MOTOR M

SW1 WRITE PROTECT SW

WHT RED BLK

TR2 --- 2SC2001

TR2 --- 2SC2001

BLK RED VLT BRN BLK RED GRN

TO MAIN PCB

RED WHT BLK

TO LED PCB

DTA143E   2SC2001

B C E   E C B

B ● ● ● = NPN TRANSISTOR

B ● ● ● = PNP TRANSISTOR

LED PCB

TR3   R43

BUSY

①②③ TO SUB PCB

TR3 --- DTA143E

TO SUB PCB
⑬⑫⑪

WHT RED

TR1 2SA952

HEAD POSITION

T2
BRN WP
RED WD
ORG WG
YLW MO
GRN RD
BLU RY
VLT MS
GRY 5V
WHT
BLK GN

TO SIO PCB (T2)

IC7 HD7438P
IC4 HD14070BP
IC11 HD14069UBP
IC10 HD14081BP
IC12 HD14001BP
IC8 HD14069UBP
IC5 HD14001BP
IC9 HD14013BP
IC6 HD14013BP

MOTOR STOP

GRN RED BLK BLU BRN VLT RED BLK

TO SUB PCB

MAIN PCB
(PATTERN SIDE)

E C B

TO MAIN PCB

X-TAL 6.5MHZ

IC3 TC74HC393P
IC2 MC74HCU04
IC1 TC74HC365P
IC6 TC74HC4075P
IC5 TC74HC02P
IC4 HD74HC00P
IC9 TC74HC74P
IC8 TC74HC74P
IC7 TC74HC74P
IC11 HD74HC161P
IC10 LH0084A (Z80A-SIO/0)

IC12 µPC7805H
IC12
1: INPUT
2: GND
3: OUTPUT

TO ROM PCB (CN1)

RELAY

SIO PCB 69-5133 (PATTERN SIDE)

ROM PCB 69-5154 (PATTERN SIDE)

TO SIO PCB T1 THROUGH I/F CABLE

CN1

IC1

IC2 TC74HC245P

IC5 TC74HC365

PATTERN SIDE
PARTS SIDE

CN2