AKAI

MODEL CD-A70

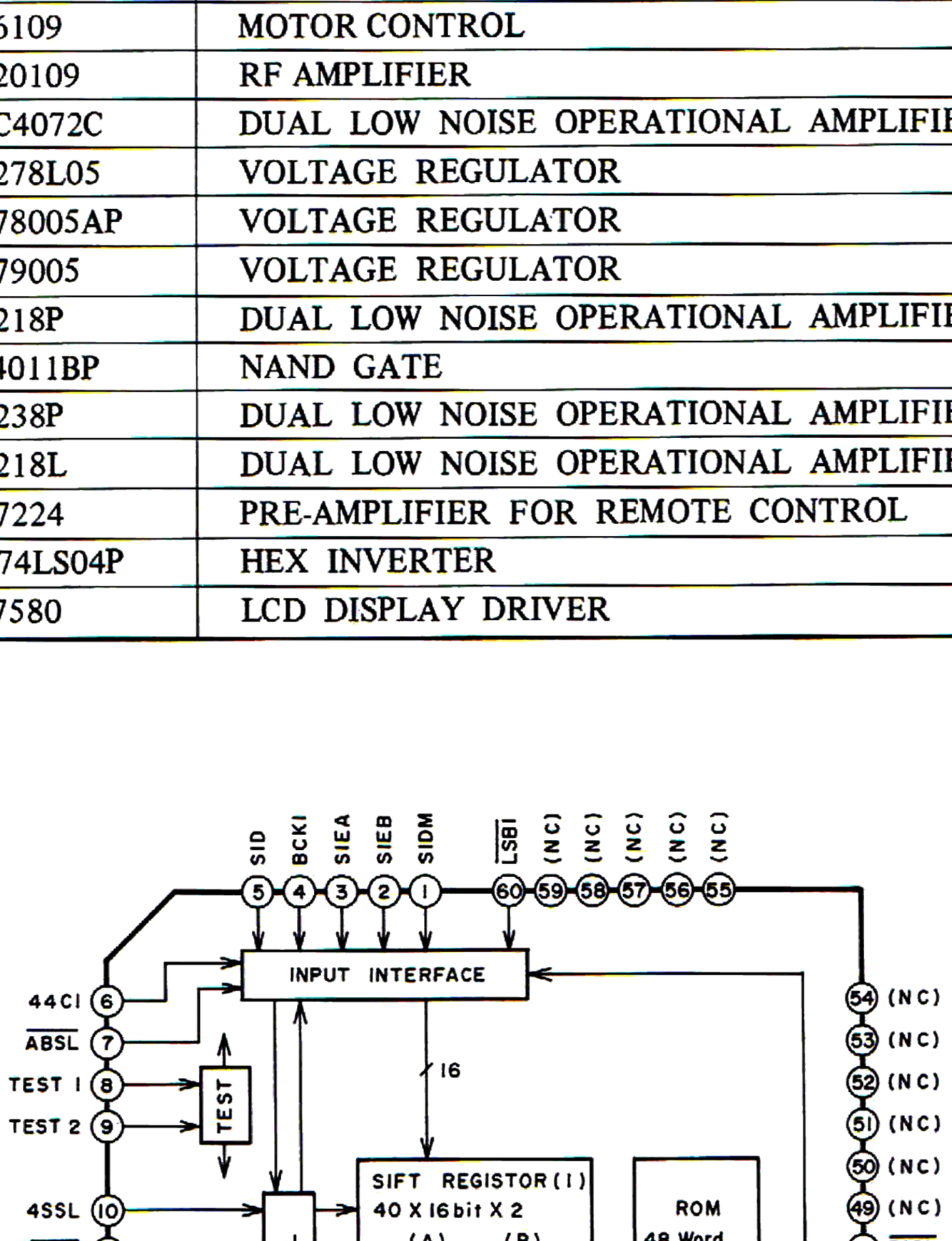
SCHEMATIC DIAGRAM AND PC BOARDS

TABLE OF CONTENTS

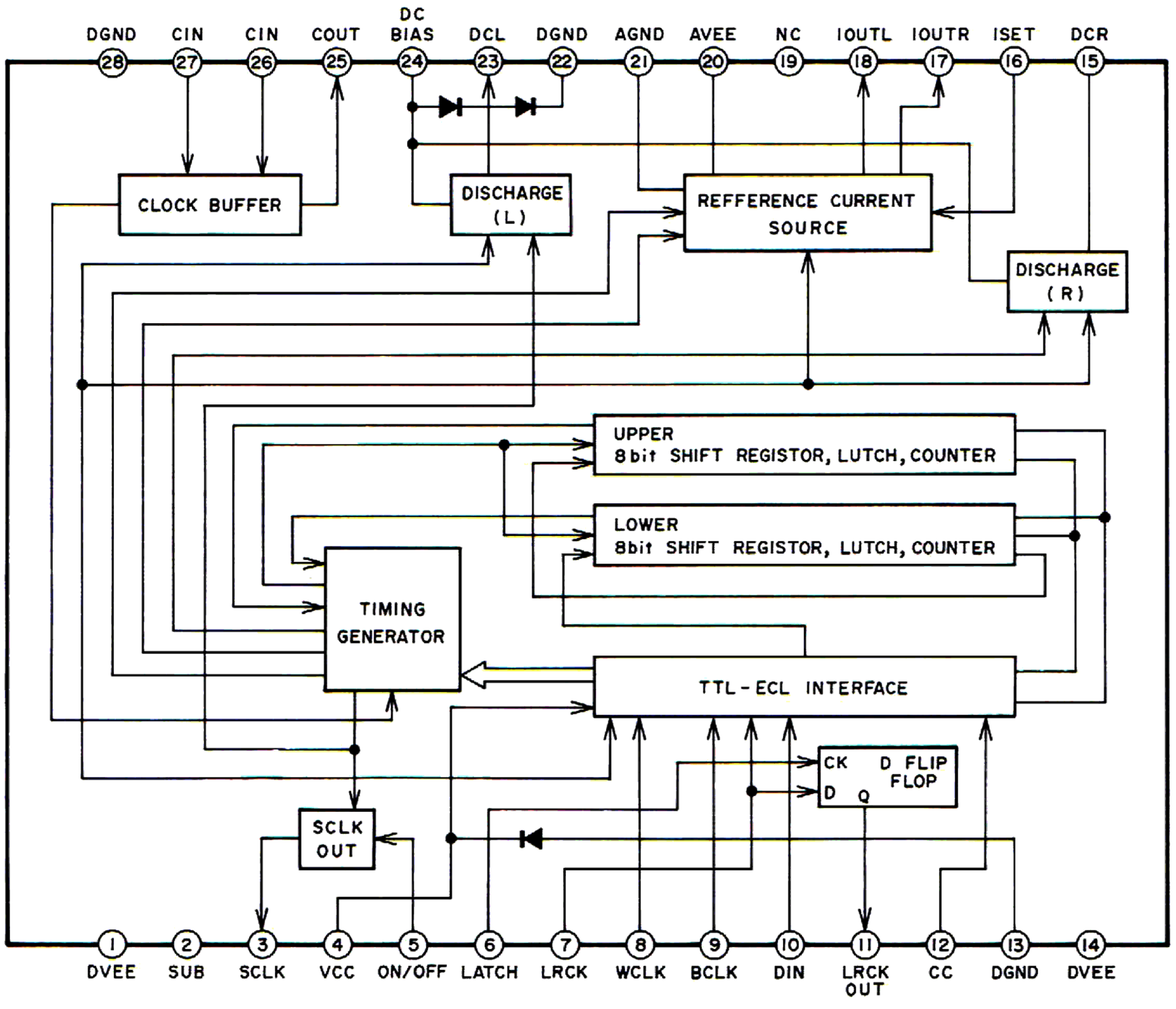
PURPOSE OF IC's

IC NO.	NAME OF IC's	PURPOSE
IC1	CX23035	EMF DEMODULATOR, ERROR DETECTION AND CORRECTION, FRAME SYNC DETECTION, SUB CODE DETECTION AND DEMODULATION, SPINDLE MOTOR SERVO
IC2	CX20108	SERVO SIGNAL PROCESSER
IC3	SRM2016C15	16K BIT RAMDAM ACCESS MEMORY
IC4	M50754-417SP	SYSTEM CONTROL (8 BIT MICROCOMPUTER)
IC5	AX80	OVER-SAMPLING DIGITAL FILTER
IC6	CX20152	16 BIT D/A CONVERTOR
IC7	MB84053B	TRIPE-2 CHANNEL MULTIPLEXER/DEMULTIPLEXER
IC8	HD6805SD	SYSTEM CONTROL (4 BIT MICROCOMPUTER)
IC9	BA6109	MOTOR CONTROL
IC10	CX20109	RF AMPLIFIER
IC11, 12	MPC4072C	DUAL LOW NOISE OPERATIONAL AMPLIFIER
IC13, 15	M5278L05	VOLTAGE REGULATOR
IC14	TA78005AP	VOLTAGE REGULATOR
IC16	TA79005	VOLTAGE REGULATOR
IC17	M5218P	DUAL LOW NOISE OPERATIONAL AMPLIFIER
IC18	TC4011BP	NAND GATE
IC19, 20, 21	M5238P	DUAL LOW NOISE OPERATIONAL AMPLIFIER
IC22	M5218L	DUAL LOW NOISE OPERATIONAL AMPLIFIER
IC23	LA7224	PRE-AMPLIFIER FOR REMOTE CONTROL
IC24	HD74LS04P	HEX INVERTER
IC101	LC7580	LCD DISPLAY DRIVER

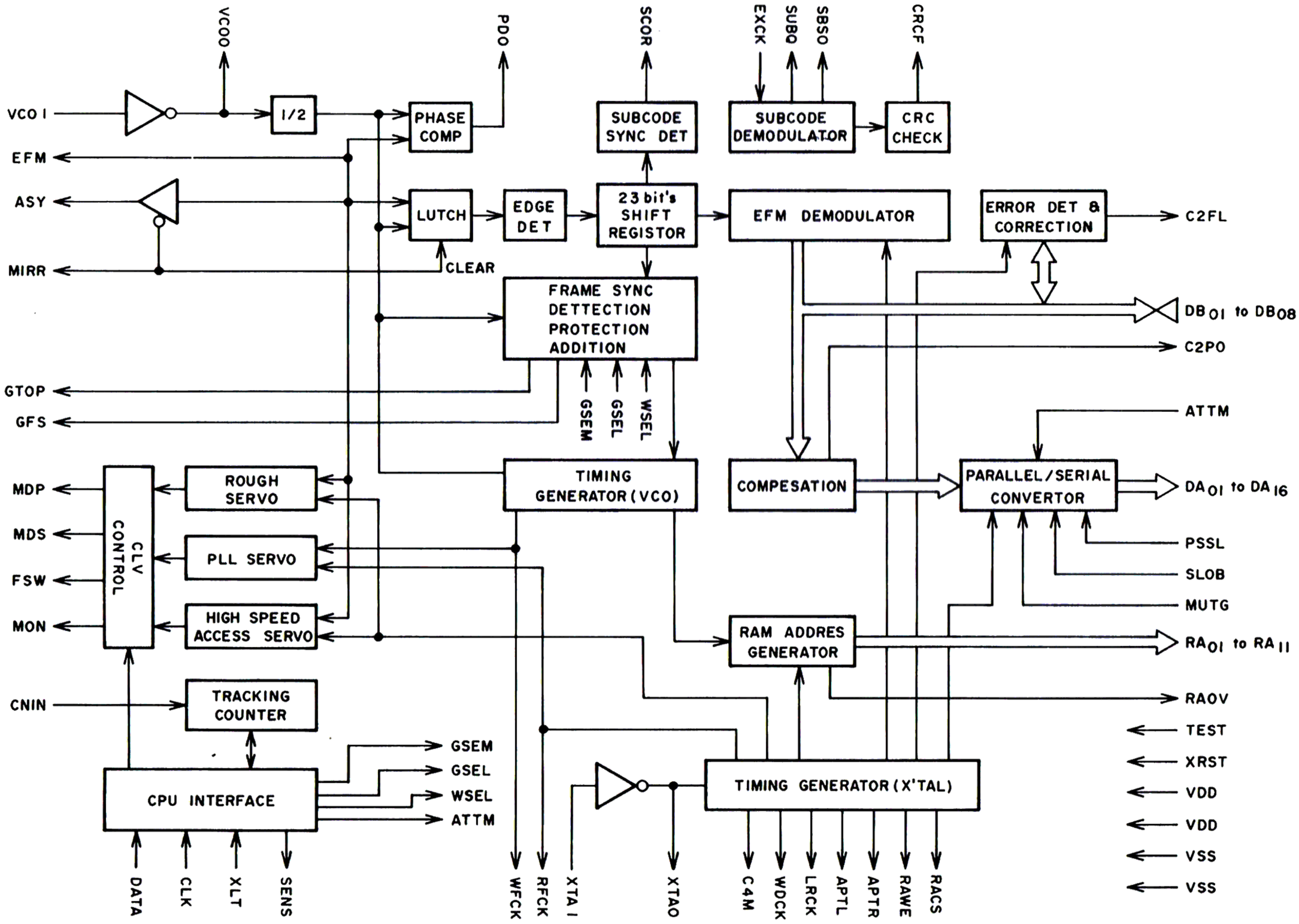
AX-80



(NC) : WHEN PISL = H (or OPEN)



Pin No.	Symbol	Description
1	DV	Digital (–5V) power supply
2	SUB	Base IC (should be connected to pin 1)
3	SCLK	System clock OUTPUT
4	Vcc	Vcc (+5V) for Digital
5	ON/OFF	ON/OFF select for system clock
6	LATCH	Clock for D type lutch
7	LRCK	LRCK input
8	WCLK	WCLK input
9	BCLK	BCLK input
10	DIN	Data input
11	LRCKOUT	LRCK output
12	CC	CC input
13	DGND	Digital GND
14	DV	Digital (–5V) power supply
15	DCR	R CH discharge drive signal output
16	ISET	Integrater ampere terminal
17	IOURT	R CH current output
18	IOUTL	L CH current output
19	NC	No connection
20	AV	Analgue power supply
21	AGND	Analgue GND
22	DGND	Digital GND
23	DCL	L CH discharge drive signal output
24	DCBIAS	Bias for discharge circuit
25	COUT	Clock OSC out
26	CIN	Clock OSC
27	CIN	Clock OSC
28	DGND	Digital GND



Pin No.	Symbol	I/O	Description
1	FSW	O	Spindle motor filter switching control
2	MON	O	Spindle motor ON/OFF control
3	MDP	O	Spindle motor speed and phase control
4	MDS	O	Spindle motor speed control
5	EFM	I	EFM signal input
6	ASY	O	EFM signal slice level control
7	MIRR	I	MIRR signal input "L" on track "H" mirror
8	VCOO	O	VCO output f = 8.6436 MHz
9	VCOI	I	VCO input
10	TEST	I	0V (GND)
11	PDO	O	Phase comp. output
12	VSS	—	GND (0V)
13	CLK	I	Clock signal from CPU
14	XLT	I	Lutch signal from CPU
15	DATA	I	Serial data from CPU
16	XRST	I	RESET input "L" reset
17	CNIN	I	Tracking pulse input (+5V)
18	SENS	O	Output of CPU interface
19	MUTG	I	Mute control signal input
20	CRCF	O	CRC check output of the subcode Q "L" detect error
21	EXCK	I	Clock input for Subcode serial output
22	SBSO	O	Subcode serial output
23	SUBQ	O	Subcode Q output
24	SCOR	O	Subcode sync detection output
25	WFCK	O	Not used (Write frame clock)
26	RFCK	O	Not used (Read frame clock)
27	GTOP	O	Frame sync detection output
28	GFS	O	"H" frame sync lock "L" frame sync unlock

Pin No.	Symbol	I/O	Description
29	DB08	I/O	Data 8 (MSB) } Data Bus line for the EXT. RAM (SRM2016C15)
30	DB07	I/O	Data 7
31	DB06	I/O	Data 6
32	DB05	I/O	Data 5
33	VDD	—	+5V
34	DB04	I/O	Data 4 } Data Bus line for the EXT. RAM (SRM2016C15)
35	DB03	I/O	Data 3
36	DB02	I/O	Data 2
37	DB01	I/O	Data 1 (LSB)
38	RA01	O	ADDR01 (LSB) } Address signal output for the EXT. RAM (SRM2016C15)
39	RA02	O	ADDR02
40	RA03	O	ADDR03
41	RA04	O	ADDR04
42	RA05	O	ADDR05
43	RA06	O	ADDR06
44	RA07	O	ADDR07
45	RA08	O	ADDR08
46	RA09	O	ADDR09
47	RA10	O	ADDR10
48	RA11	O	ADDR11 (MSB)
49	RAWE	O	Write enable signal output "L" active
50	RACS	O	Chip select signal output "L" active
51	C4M	O	Not used
52	VSS	—	GND (0V)
53	XTAI	I	X'TAL OSC. input f = 8.4672 MHz
54	XTAO	O	X'TAL OSC. output f = 8.4672 MHz
55	C2FL	O	Monitor of error detection *
56	C2PO	O	Not used
57	RAOV	O	Not used
58	SLOB	I	0V (GND)
59	PSSL	I	0V (GND)
60	APTR	O	Not used
61	APTL	O	Not used
62	DA01	O	C1F1 *
63	DA02	O	C1F1 *
64	DA03	O	C2F1 * Not used
65	DA04	O	C2F2 * Not used
66	DA05	O	UGFS Not used
67	DA06	O	$\overline{\text{WFCK}}$ INV write frame clock signal output
68	DA07	O	Not used FCKV 1/4 or 1/8 WFCK output
69	DA08	O	Not used FCKX 1/4 or 1/8 RFCK output
70	DA09	O	Not used $\overline{\text{PLCK}}$ 1/2 VCO output
71	DA10	O	Not used $\overline{\text{LRCK}}$ INV. LRCK (Pin 80)
72	DA11	O	Not used C4LR 176.4 kHz strobe signal output
73	VDD	—	+5V
74	DA12	O	$\overline{\text{DENL}}$ L-ch serial data enable signal
75	DA13	O	$\overline{\text{DENR}}$ R-ch serial data enable signal
76	DA14	O	$\overline{\text{C210}}$ INV. C210 (Pin 77)
77	DA15	O	Not used C210 Bit clock f = 2.1168 MHz
78	DA16	O	Data output
79	WDCK	O	Not used Worde clock output 88.2 kHz strobe signal
80	LRCK	O	Not used L-ch. R-ch clock out 44.1 kHz strobe signal

* Monitor Signal refer to Fig. 1 & Fig. 2

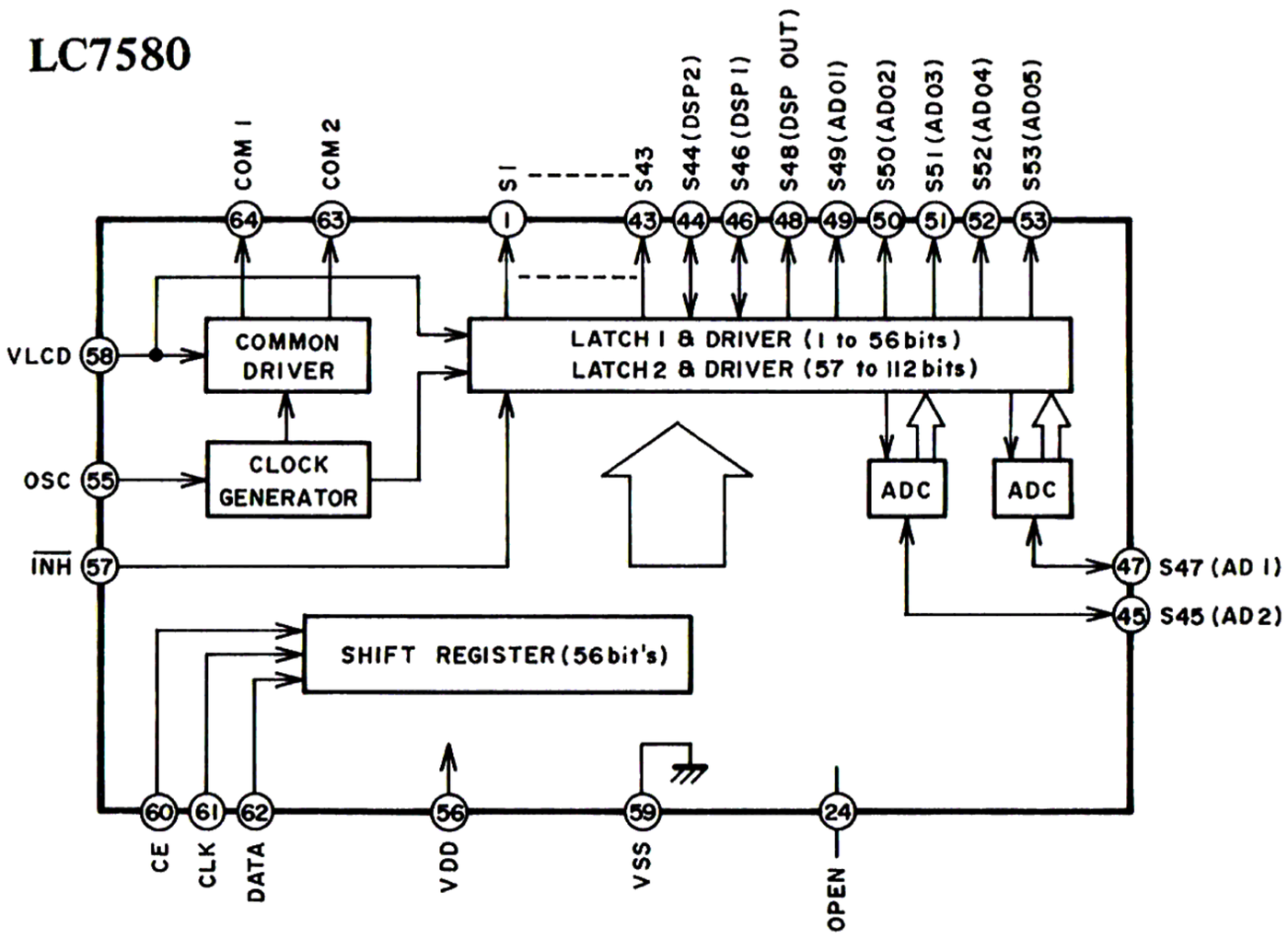
C1F1	C1F2	C1 Correction
O	O	No error
I	O	Signal error correction
O	I	Double error correction
I	I	Irretrievable error

Fig. 1

C2F1	C2F2	C2FL	C2 Correction
O	O	O	No error
I	O	O	Signal error correction
O	I	O	Double error correction
I	I	I	Irretrievable error

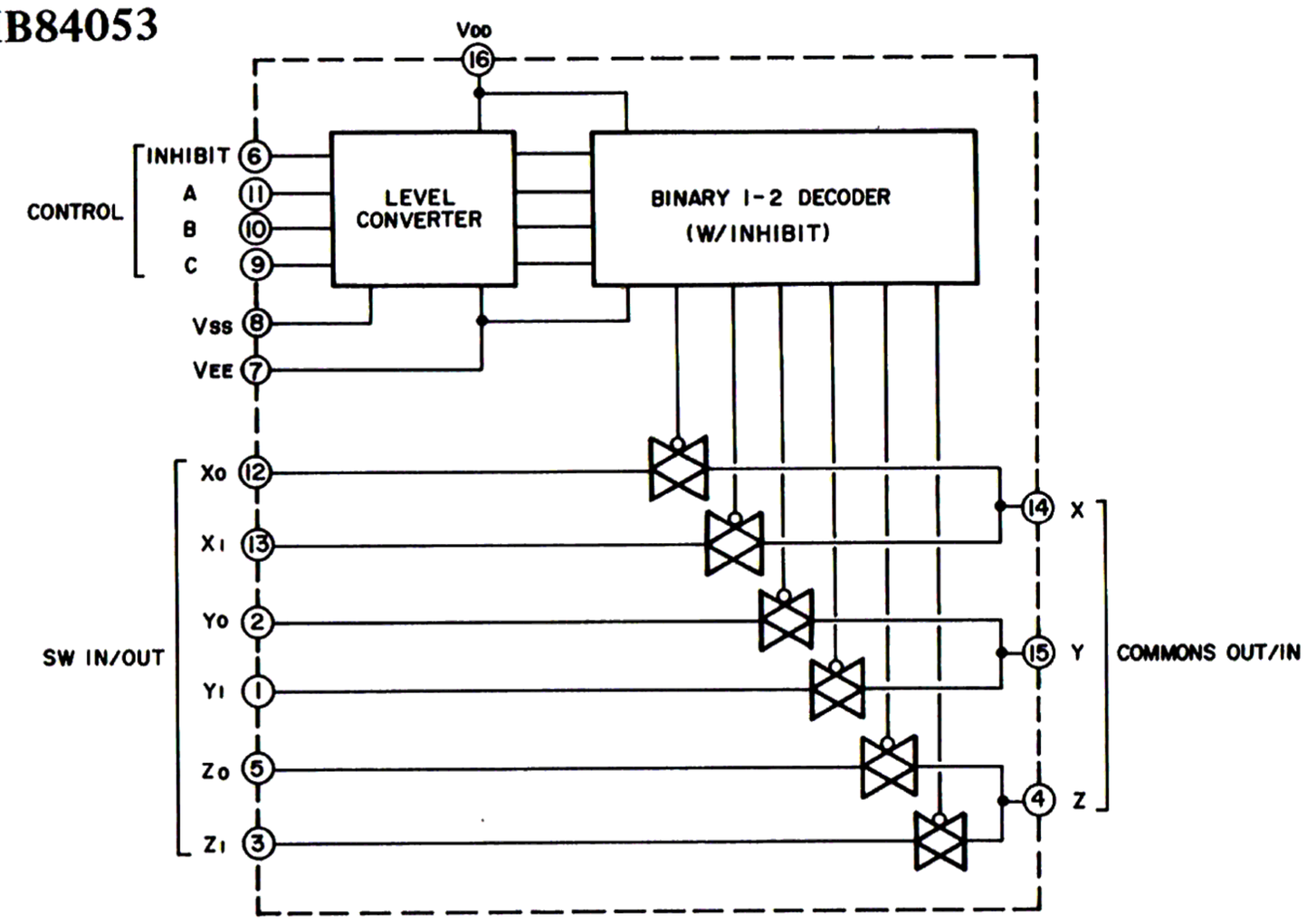
Fig. 2

LC7580



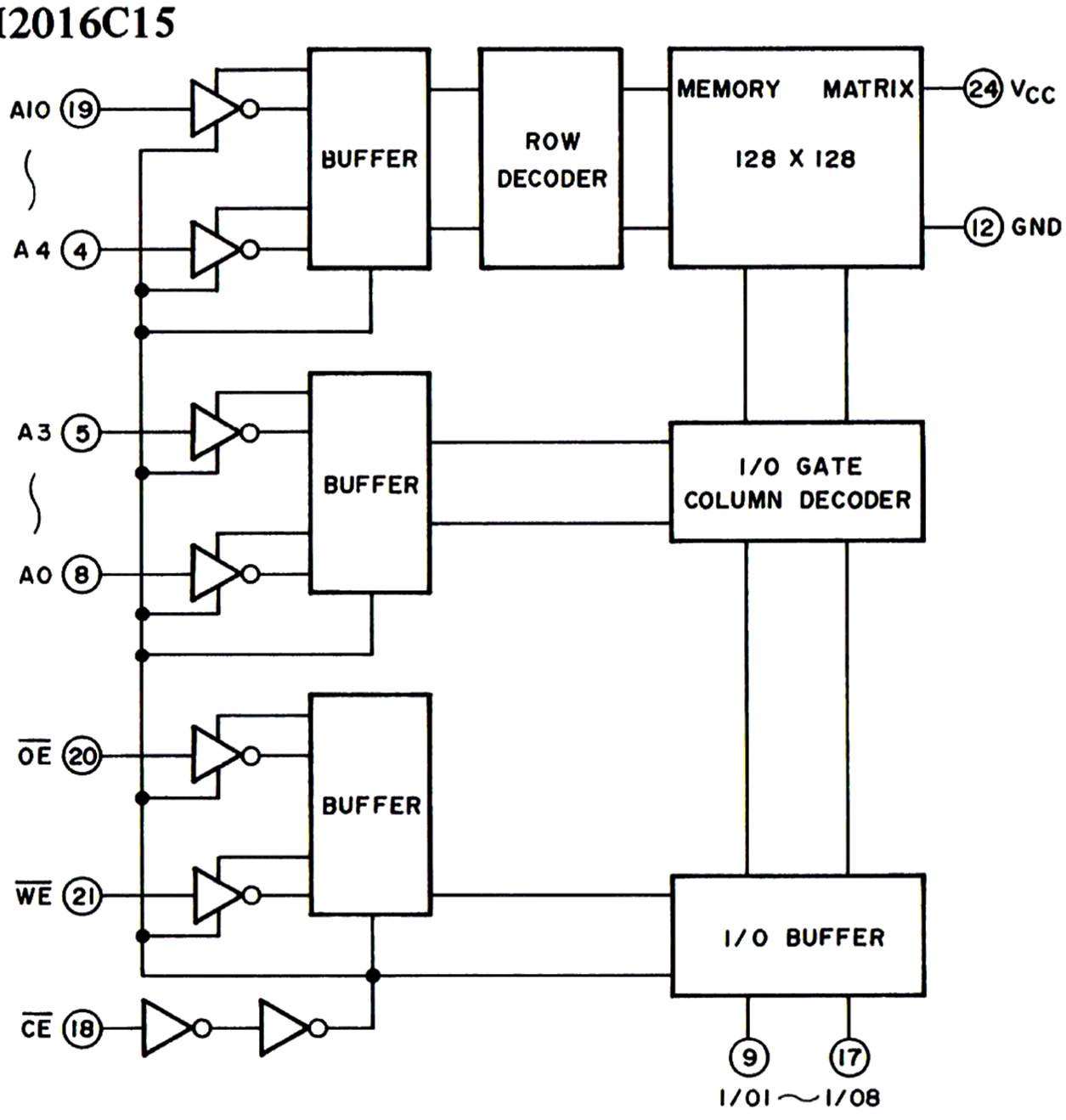
S1 ~ S43	Segment drive Output
S46 (DSP), S44 (DSP2)	Segment drive Output/DSP Input
S47 (AD1), S45 (AD2)	Segment drive Output/AD Input
S48 (DSP OUT)	Segment drive Output/DSP Output
S49 ~ S53	Segment drive Output/AD Output
COM 1, 2	Common Output
V LCD	LCD Bias voltage
OSC	OSC control
CE, CLK. Data	Serial data Input
VSS, VDD	GND, +5V
$\overline{INH}$	Display OFF signal Input
Open	Not used

MB84053

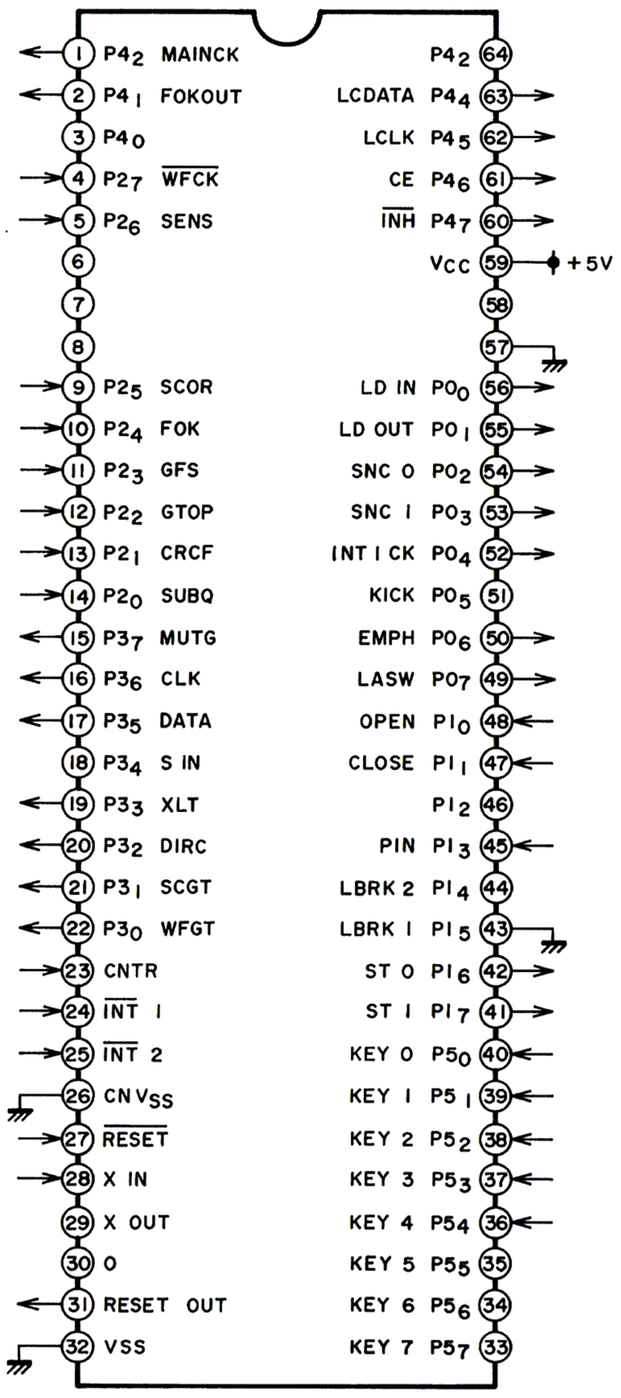


Controls				"ON" channel		
INH	C	B	A			
0	0	0	0	Z_0	Y_0	X_0
0	0	0	1	Z_0	Y_0	X_1
0	0	1	0	Z_0	Y_1	X_0
0	0	1	1	Z_0	Y_1	X_1
0	1	0	0	Z_1	Y_0	X_0
0	1	0	1	Z_1	Y_0	X_1
0	1	1	0	Z_1	Y_1	X_0
0	1	1	1	Z_1	Y_1	X_1
1	–	–	–	None		

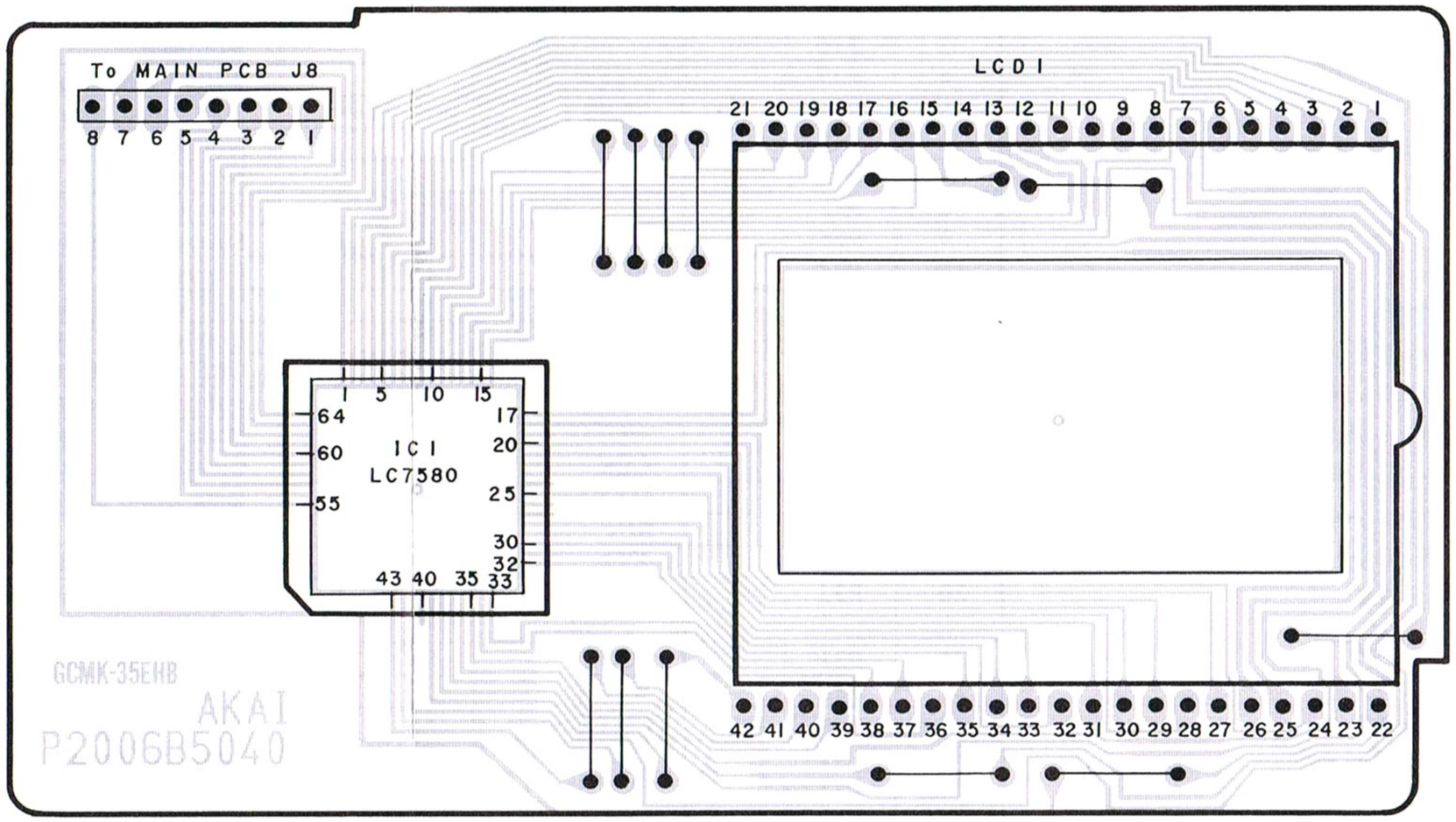
SRM2016C15



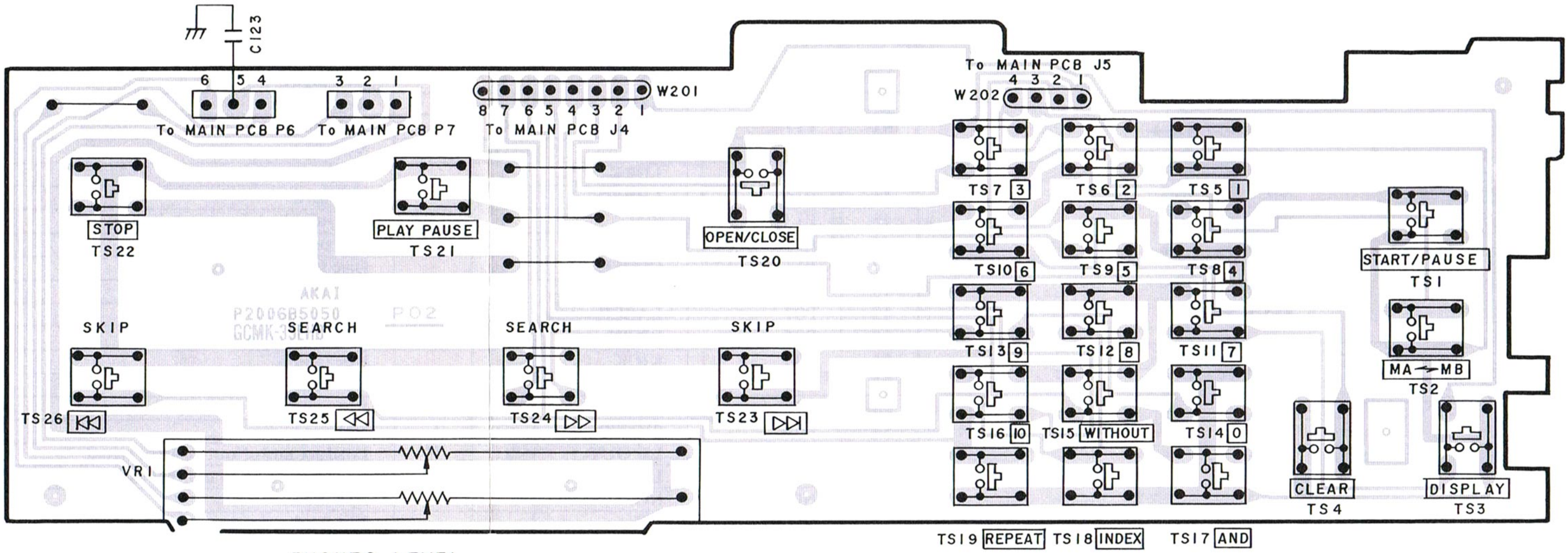
A0 ~ A10	Address input
I/O1 ~ I/O8	Data IN/OUT
$\overline{CE}$	Chip enable signal input
$\overline{WE}$	Write enable signal input
$\overline{OE}$	Output enable signal input
Vcc	+5V
GND	GND



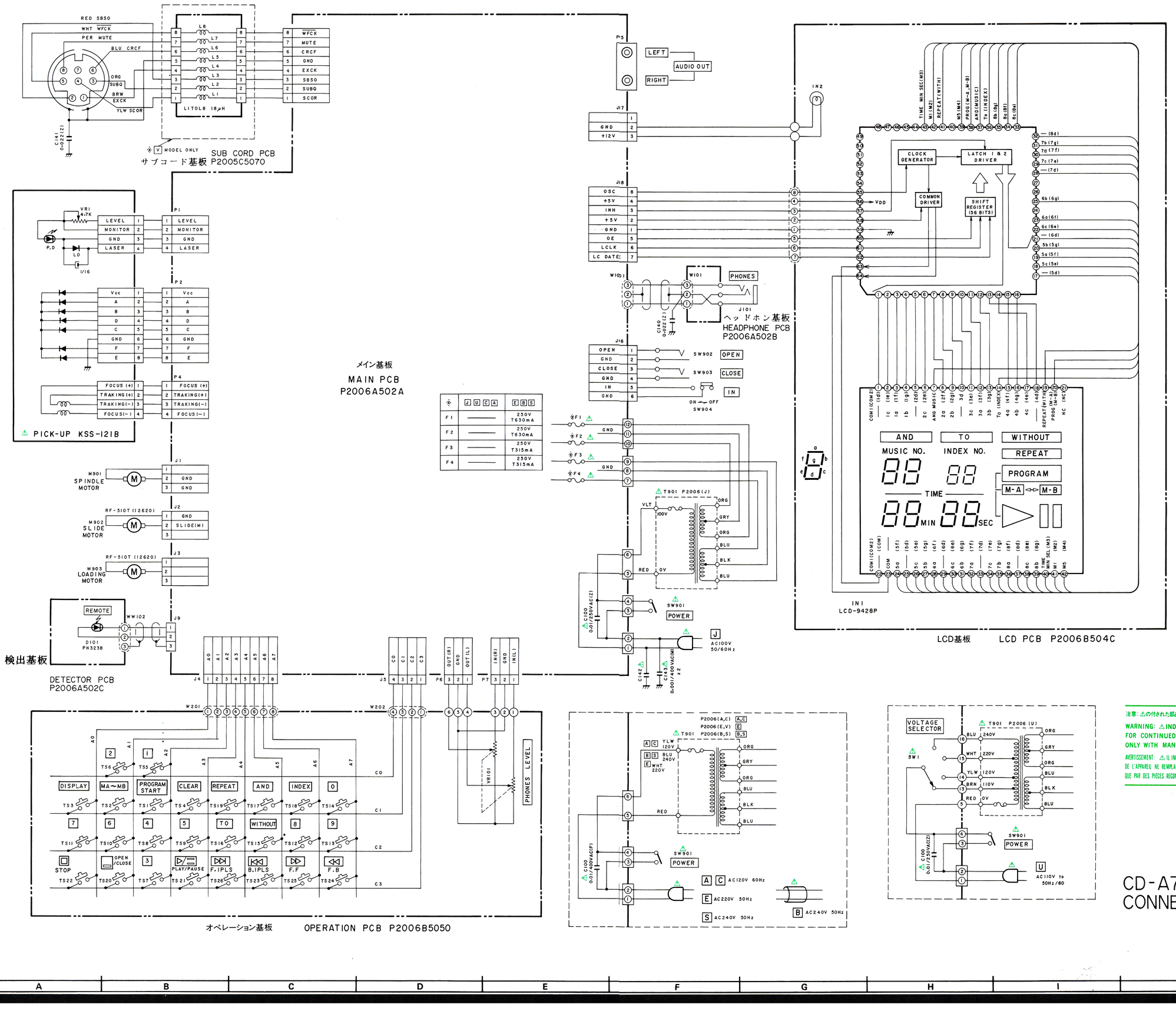
Pin No.	Symbol	Port Name	I/O	Active	Description
1	P42	MINCK	O		Main through check
2	P41	FOK OUT	O	H	FZC level set H: Normal L: Off-Set (+)
3	P40				Not used
4	P27	WFCK	I		Write Frame clock input
5	P26	SENS	I		Sens signal input
6	NC				Not used
7	NC				Not used
8	NC				Not used
9	P25	SCOR	I	H	Subcord detection signal input
10	P24	FOK	I	H	Focus servo "OK" signal input
11	P23	GFS	I	H	"H" Frame Sync. lock, "L" Frame Sync unlock
12	P22	GTOP	I	H	Frame Sync. detection signal input
13	P21	CRCF	I	H	CRC check signal input
14	P20	SUBQ	I		Subcode Q input
15	P37	MUTG	O		Mute control signal input
16	P36	CLK	O		Clock signal output
17	P35	DATA	O		Data signal output
18	P34	SIN	I		Not used
19	P33	XTL	O	L	Lutch signal output
20	P32	DIRC	O	L	Track jump control signal output "H" Normal "L" Track jump
21	P31	SCGT	O	H	Subcode gate signal output
22	P30	WFGT	O	H	Write frame Gate signal output
23	CNTR	CNTR	I		Track control signal input
24	INT1	INT1	I		Subcode Q read control
25	INT2	INT2	I		Focus control
26	CNVss	CNVss			GND
27	RESET	RESET			Reset signal input
28	XIN	XIN			Clock input
29	XOUT	XOUT			Clock output
30	0	0			Not used
31	RESET OUT	RESET OUT			Reset signal output
32	Vss	Vss			GND
33	P57	KEY7	I		Not used
34	P56	KEY6	I		Not used
35	P55	KEY5	I		Not used
36	P54	KEY4	I		Key input
37	P53	KEY3	I		Key input
38	P52	KEY2	I		Key input
39	P51	KEY1	I		Key input
40	P50	KEY0	I		Key input
41	P17	ST1	O	L	Not used
42	P16	ST2	O	L	Not used
43	P15	LBRK1	I		GND
44	P14	LBRK2	I		Not used
45	P13	PIN	I		Pick-up block in switch input
46	P12				Not used
47	P11	CLOSE	I		Disc tray close switch input
48	P10	OPEN	I		Disc tray open switch input
49	P07	LASER	O	L	Laser control signal input
50	P06	EMPH	O	L	Emphasis control signal input
51	P05	KICK			Not used
52	P04	INT1	O	L	Not used
53	P03	SYNC1	O	L	Not used
54	P02	SYNC0	O	L	Not used
55	P01	LD OUT	O	H	Loading motor out control signal
56	P00	LD IN	O	H	Loading motor in control signal
57	NC	NC			Not used
58	NC	NC			Not used
59	Vcc	Vcc			+5V
60	P47	INH	O	L	Display off signal output
61	P46	CE	O	H	Chip enable } Serial data output for display
62	P45	LCLK	O		Clock } Serial data output for display
63	P44	LCDATA	O		Data } Serial data output for display
64	P43				Not used



LCD基板　LCD PCB P2006B5040



オペレーション基板　OPERATION PCB P2006B5050



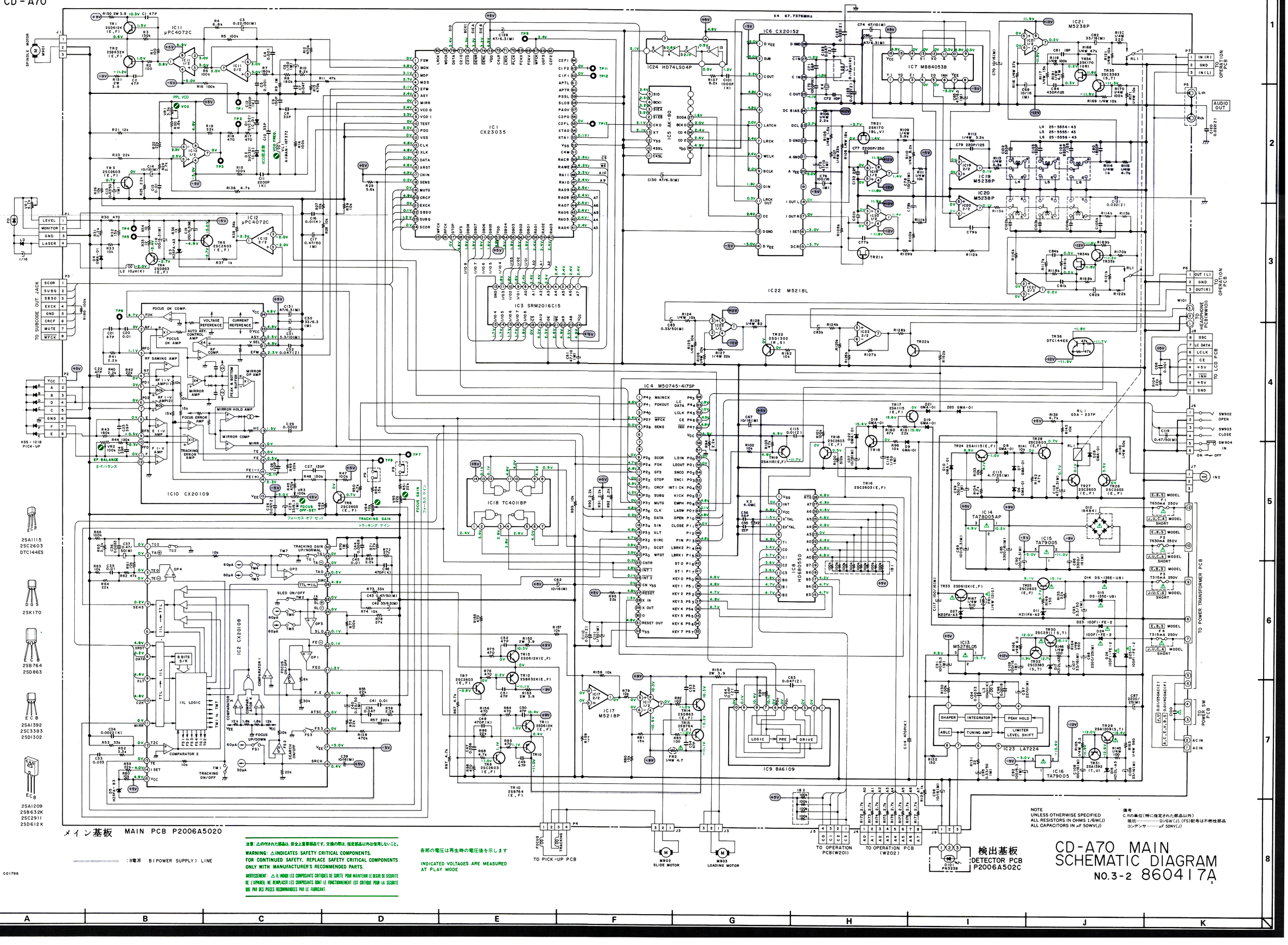
※	J U C A	E B S
F1	———	250V T630mA
F2	———	250V T630mA
F3	———	250V T315mA
F4	———	250V T315mA

注意：⚠の付された部品は、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 INDIQUI 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.

CD - A70



メイン基板 MAIN PCB P2006A5020

検出基板 DETECTOR PCB P2006A502C

:B電源 B(POWER SUPPLY) LINE

注意: △の付された部品は、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 INDIQUE 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.

各部の電圧は再生時の電圧値を示します

INDICATED VOLTAGES ARE MEASURED AT PLAY MODE

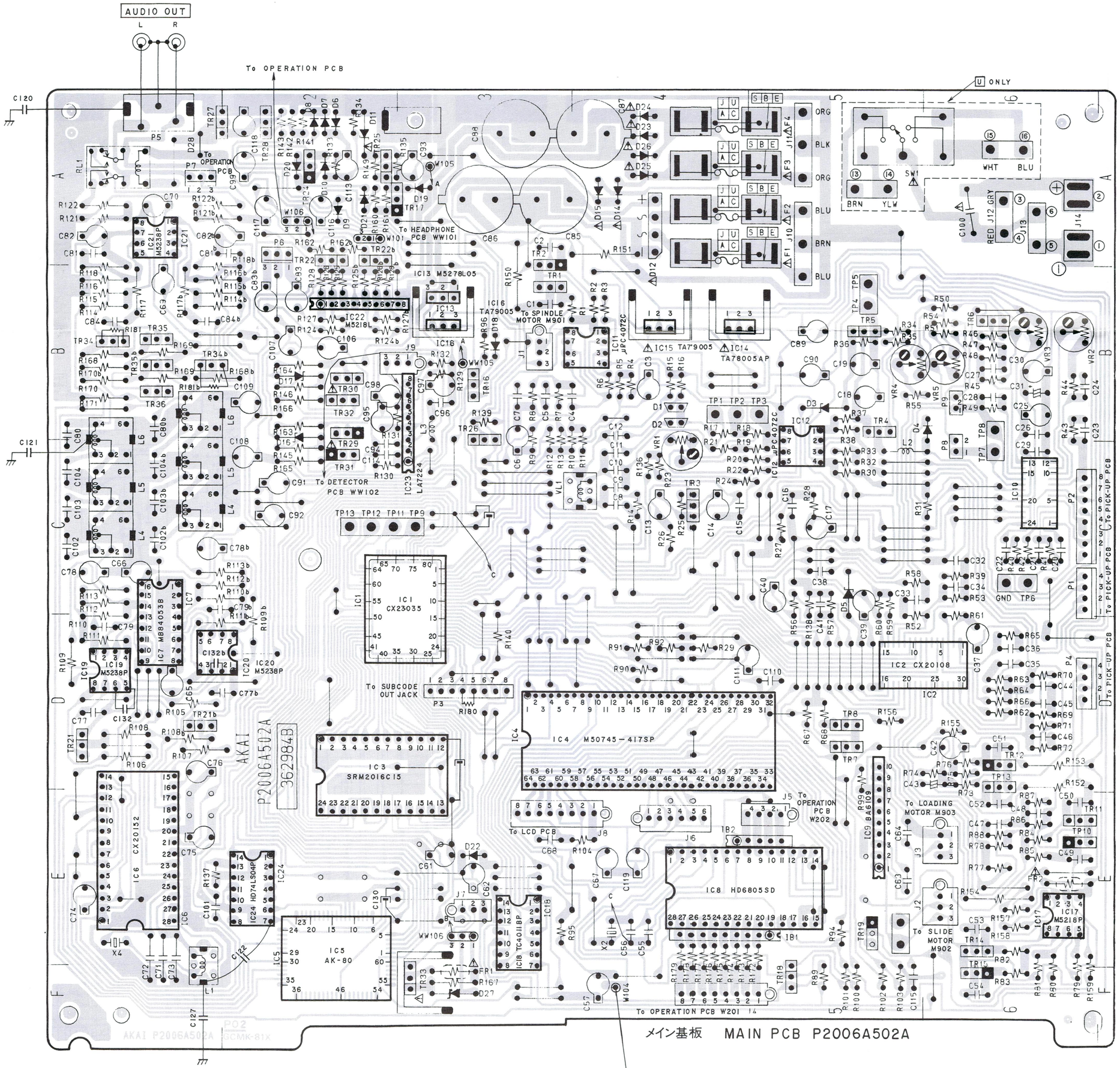
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μF 50WV(J)

備考
C.Rの表位(特に指定された部品以外)
抵抗……Ω1/6W(J), (FS)記号は不燃性部品
コンデンサ……μF 50WV(J)

CD-A70 MAIN SCHEMATIC DIAGRAM

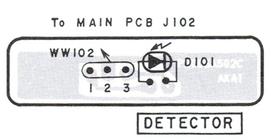
NO.3-2 860417A

001796



メイン基板　MAIN PCB P2006A502A

HEADPHONE PCB P2006A502B



DETECTOR PCB P2006A502C

LOCATION OF COMPONENTS

IC's

IC1---- C2,3, D2,3
IC2----D5,6
IC3----D2,3, E2,3
IC4----D3,4,5
IC5----E2, F2
IC6----D1, E1
IC7----C1, D1
IC8----E4,5
IC9----D5, E5
IC10---- C6
IC11---- B3,4
IC12---- B5, C5
IC13---- B3
IC14---- B4
IC15---- B4
IC16---- B3
IC17---- E6
IC18---- E3
IC19---- D1
IC20---- D1,2
IC21---- A1
IC22---- B2
IC23---- B3, C3
IC24---- E2

TR's

TR1---- B3
TR2---- A3,B3
TR3---- C4
TR4---- B5
TR5---- B5
TR6---- B6
TR7---- D5
TR8---- D5
TR10---- E6
TR11--- E6
TR12--- D6
TR13--- D6
TR14---- E6
TR15---- F6
TR16--- B3
TR17--- A2,3
TR18--- F5
TR19--- E5
TR21--- D1
TR22--- A2
TR24--- A2
TR25--- A2
TR26--- B3, D3
TR27--- A1, 2
TR28--- A2
TR29--- B2
TR30--- B2
TR31--- C2
TR32--- B2
TR33--- F3
TR34--- B1
TR35--- B1
TR36--- B1

CONNECTORS

P1---- C6
P2---- C6
P3---- D3
P4---- D6
P5---- A1
P6---- A2
P7---- A1
J1---- B3
J2---- E6
J3---- E6
J4---- F4
J5---- E5
J6---- E4
J7---- E3
J8---- E3,4
J9---- B2,3

= PNP TRANSISTOR

= NPN TRANSISTOR

TR1,11,13,33 ------- 2SD612K
TR2,12 ------------ 2SB632K
TR3,5 to 8,16,18
25 to 28 --- 2SC2603
TR4,14 ------------ 2SD863-V8
TR10,15 ---------- 2SB764
TR17,19,24 --------- 2SA1115
TR21,34 ---------- 2SK170
TR22 ------------ 2SD1302
TR29 ------------ 2SA1209
TR30 ------------ 2SC2911
TR32,35 ---------- 2SC3383
TR36 ------------ DTC144ES

2SA1115
2SC2603
DTC144ES

2SK170

2SB764
2SD863

2SA1392
2SC3383
2SD1302

2SA1209
2SB632K
2SC2911
2SD612K

注意：⚠の付された部品は、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.

CD-A70

C210 · DENR · DENL · XT · WFCK · LATCH · C OUT · LRCK OUT · DCL

MDP · X'TAL · VCO OUT · PIN 18 CH1 CS · PIN 21 CH2 WE · PIN 1 CH1 · PIN 4 CH2 · PIN 2 CH1 · PIN 8 CH2 · EYE PATTERN · EFM · MIRROR

IC1 CX23035 · IC11 μPC4072C · IC12 1/2 μPC4072C · IC10 CX20109 · IC2 CX20108 · IC5 AX-80 · IC6 CX20152 · IC24 HD74LS04P · IC18 TC4011BP · IC4 M50745-417SP · IC19 2/2 M5238P · IC20 1/2 M5238P · IC21 1/2 M5238P · IC22 1/2 M5218L · IC7 MB4033B · IC9 BA6109 · IC8 HD6805S0 · IC23 LA7224 · IC101 LC7580

16.9344MHz · 8.4672MHz · 4.2336MHz · 176.4kHz · 88.2kHz · 44.1kHz · 32.768kHz · 4.0MHz

WHEN FRAM SYNC IS LOCKED L, f = 7.35kHz · DATA · BIT CLOCK f = 2.1168MHz · Rch SERIAL DATA ENABLE SIGNAL · Lch SERIAL DATA ENABLE SIGNAL

SPINDLE MOTOR · SPINDLE MOTOR DRIVER · SPINDLE MOTOR ON/OFF CONTROL · FILTER T/C CHANGE CONT. · FILTER · PHASE CONT. · SPEED CONT. · EFM · ASSY · VCO FREQ. CONTROL · VCO · VCO FREQ. · MIRROR · PDO · PHASE COMPARATOR · PARALLEL/SERIAL CONVERTER · CRY CONTROL · LATCH · EDGE DETECT · 23 BIT SHIFT REGISTER · PLL TIMING GENERATOR · CPU INTERFACE · TRACKING COUNTER · VCO TIMING GENERATOR · RAM ADDRESS GENERATOR · CRC CHECK · SUB CODE DEMODULATOR · EFM DEMODULATOR · FRAM SYNC DETECT · FRAM SYNC LOCK "ON" · LPF · RESET · SENS · MUTE CONT FROM IC14 · CRCF · CLOCK · SUB CODE P-W · SUB CODE Q · SCOR · 11 BIT ADDRESS BUS · 16K BIT RAM IC3 SRAM2016C15 · 8 BIT DATA BUS · STOP · TOFS

APC CIRCUIT · MONITOR DIODE · LASER DIODE · DRIVE · COMP · LASER ON/OFF CONTROL · L LASER DIODE "ON" · LASW · TO SUBCODE OUT JACK · SCOR · SUBQ · SBSO · EXCK · GND · CRCF · MUTE · WFCK

"H" WHEN ENVELOPE IS MORE THEN 0.6V · FOCUS OK COMP · FOCUS OK AMP · RF COMP. · FOCUS ERROR AMP · TRACKING ERROR AMP · F. I-V AMP · EFM SLICE LEVEL CONTROL · EYE PATTERN · 2/3 PICK UP BLK · EF BALANCE · "ON" WHEN FOCUS ON · MIRROR OUT · FOCUS OFF-SET · FOCUS GAIN · HF GAIN CORRECT. · HF CORRECTION · SLIDE ON/OFF · SLED AMP · FOCUS ON/OFF · ATSC (ANTI SHOCK) · SEARCH ON/OFF · TRACKING ON/OFF · TRACKING GAIN · TRACKING COIL DRIVER · FOCUS COIL DRIVER · SLIDE MOTOR DRIVER · HPF · TZC · MIRROR

INPUT INTERFACE · SHIFT REGISTER (40 x 16 BIT x 2) (A) (B) · ROM 48 WORD x 36 BIT · MULTIPLICATOR (16 x 18 BIT) ACCUMULATOR (25 BIT) · OVERFLOW LIMITER · REGISTER (16 BIT x 2) (A) (B) · OUTPUT LATCH (16 BIT) OUTPUT TIMING · TIMING CONTROL · TEST · OVER-SAMPLING DIGITAL FILTER · DATA

UPPER 8 BIT SHIFT REGISTER LUTCH COUNTER · LOWER 8 BIT SHIFT REGISTER LUCTH COUNTER · TTL-ECL INTERFACE · DISCHARGE (L) · TIMING GEN. · DISCHARGE (R) · CLOCK GENERATOR · SCLK OUT · CK · Q · Lch INTEGRATOR · Rch INTEGRATOR · LOGIC CONT · INH · DEEMPHASIS · CHANGE THE DEEMPHASIS 15μs · MUTE CONT · L OUT · R OUT · PHONE

* IC9	MOTOR DIRECTION
H H	BRAKE
L H	LOADING
H L	UNLOADING
L L	OPEN STOP

LOGIC · PRE · DRIVE · LOADING MOTOR CONTROL & DRIVE · LOADING MOTOR · SLIDE MOTOR

LCDATA · LCLK · CE · INH · OSC · SHIFT REGISTER 56BIT · CLOCK GENERATOR · COMMON DRIVER · LATCH DRIVER · LCD · LCD PCB P2006B5040

OPEN · CLOSE · IN · SW1 · SW2 · SW3 · REMOTE · KEY MATRIX · OPERATION PCB P2006B5050

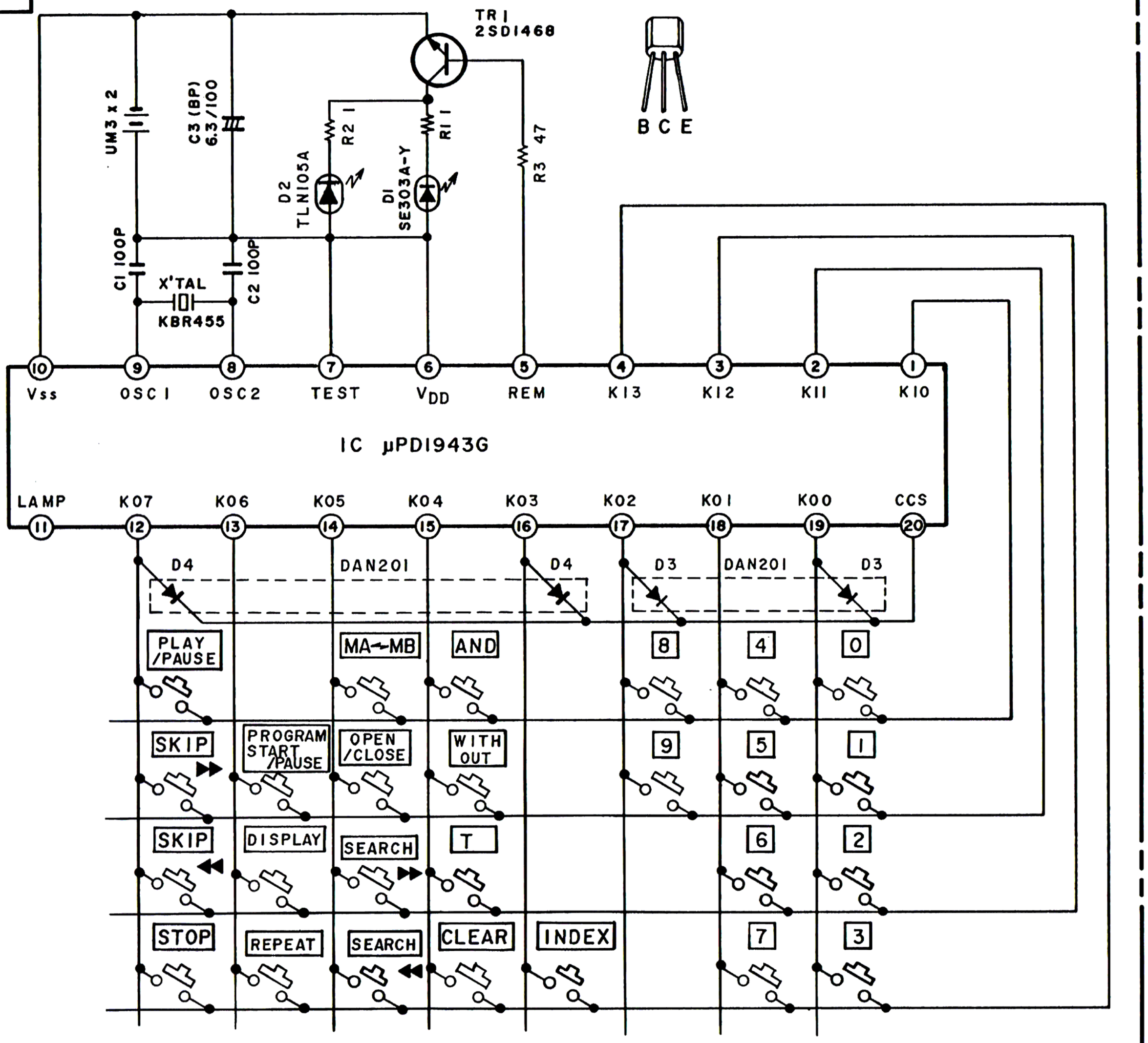
MAIN PCB P2006A502A

FOCUS ERROR · TRACKING ERROR · TRACKING AMP OUT · FOCUS ERROR OUT · SCOR · 3/3 PICK UP BLK · X'TAL · SENS

CD-A70 BLOCK DIAGRAM

NO. 860415A

10



備考

C, Rの単位(特に指定された部品以外)

抵抗……Ω 1/4W(J), (FS)記号は不燃性部品

コンデンサ……μF 50WV(J)

各電圧は、GND間のDC電圧をデジタルボルトメーターにて測定した値です。

NOTE

UNLESS OTHERWISE SPECIFIED

ALL RESISTORS IN OHMS 1/4W(J)

ALL CAPACITORS IN μF 50WV(J)

RC-700 WIRELESS REMOTE CONTROL UNIT SCHEMATIC DIAGRAM

NO.3-3 860418A