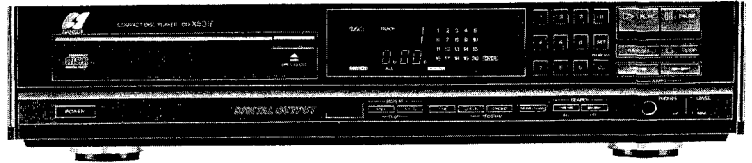




SERVICE MANUAL

CD-X501i COMPACT DISC PLAYER



CAUTION

1. Parts identified by the \triangle symbol on the schematic diagram and the parts list are critical for safety.
Use only replacement parts that have critical characteristics recommended by the manufacturer.
2. Make leakage-current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit before returning the appliance to the customer.

•SPECIFICATIONS

Format Compact disc digital audio
Pick-up 3-beam, semiconductor laser
No. of channels 2 channels (stereo)
Decoding (D/A) 16-bit linear
Frequency response 4 Hz ~ 20 kHz \pm 0.3 dB
Total harmonic distortion .. Less than 0.003% (1 kHz)
Signal-to-noise ratio (S/N) .. Better than 106 dB
Dynamic range Better than 97 dB
Wow and flutter Below measurable limit
Output voltage/load impedance
 Normal output (LINE OUT)
 2V/10 kohms
 Digital output (DIGITAL OUT)
 $0.5 \pm 0.1V_{p-p}/75$ ohms
 Headphones 45 mW (variable maximum)/
 with 32-ohms load
Power requirements AC 120V/220V/240V,
 50/60 Hz
 For U.S.A. & Canada .. AC 120V, 60 Hz

Power consumption 16 watts
Dimensions 448 mm (17-11/16") W
 98 mm (3-7/8") H
 317 mm (12-1/2") D
Weight 5.4 kg (11.9 lbs) net

Remote controller: RS-1020

Control system Infra-red ray pulse system
Power requirements DC 3V
Dimensions 63 mm (2-1/2") W
 18 mm (3/4") H
 148 mm (5-7/8") D
Weight 115 g (0.3 lbs)
 including dry batteries

- * Design and specifications subject to changes without notice for improvements.
- * Due to local laws and regulations, this unit sold in some areas are not equipped with variable voltage selectors.

NOTE

1. The symbols, UL, CSA, SA, BS, UK, EU, AS, SEV, SS and XX <EXPORT> on the parts list and the schematic diagram mean followings respectively.

- UL..... Manufactured for U.S.A market.
(Underwriters Laboratories approved model.)
- CSA Manufactured for Canadian market.
- SA..... Manufactured for South African market.
- BS, UK..... Manufactured for United Kingdom market.
- EU..... Manufactured for European market.
- AS..... Manufactured for Australian market.
- SEV..... Manufactured for Swiss market.
- SS..... Manufactured for Saudi Arabia market.
- XX..... Standard Version.
- <EXPORT>
- NON MARK..... Common Parts.

2. Some printed circuit boards are not supplied assembled. To separate these in this service manual, the stock numbers are not indicated for these boards. However, stock numbers for individual parts are indicated.

3. Since some capacitors and resistors are omitted from parts lists in this service manual, refer to the Common Parts List for capacitors and resistors, which was issued on June 1987.

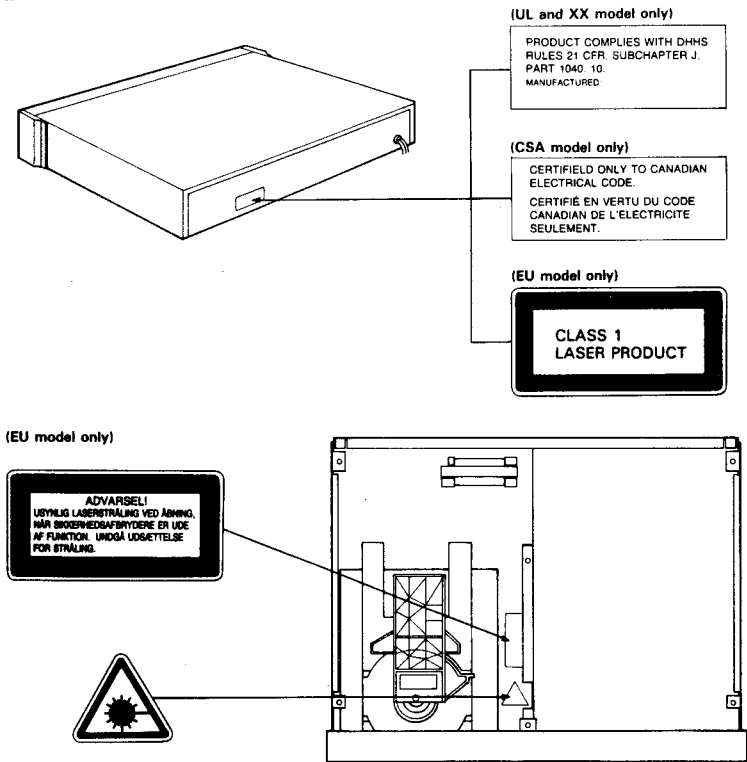
4. Abbreviations in this service manual are as follows.

•Abbreviations List

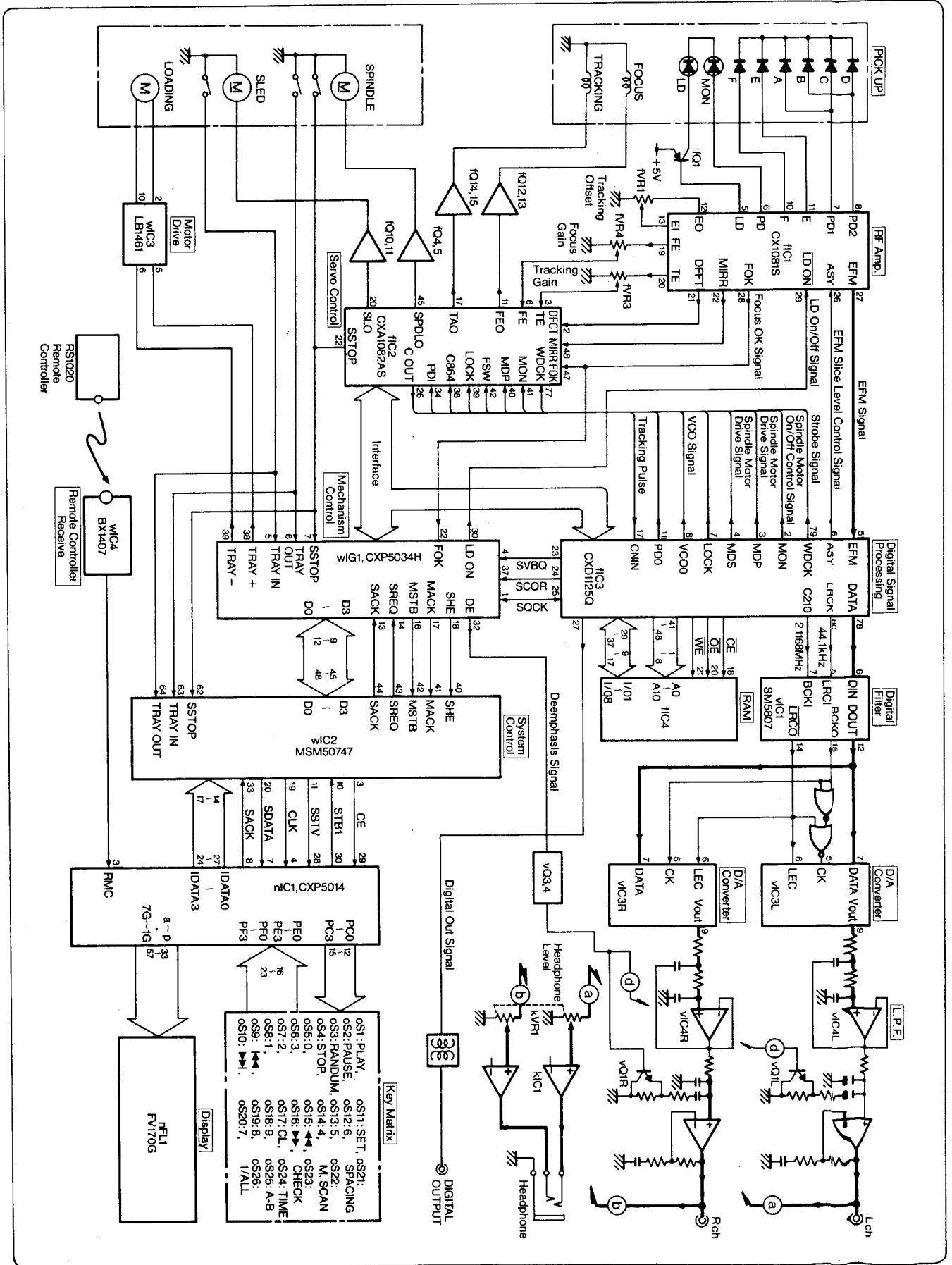
C.R.	: Carbon Resistor
S.R.	: Solid Resistor
Ce.R.	: Cement Resistor
M.R.	: Metal Film Resistor
F.R.	: Fusing Resistor
N.I.R.	: Non-Inflammable Resistor
A.R.	: Array Resistor
C.C.	: Ceramic Capacitor
C.T.	: Ceramic Capacitor, Temperature Compensation
E.C.	: Electrolytic Capacitor
E.L.	: Low Leak Electrolytic Capacitor
E.B.	: Bi-Polar Electrolytic Capacitor
E.B.L.	: Low Leak Bi-Polar Electrolytic Capacitor
Ta.C.	: Tantalum Capacitor
F.C.	: Film Capacitor
M.P.	: Metalized Paper Capacitor
P.C.	: Polystyrene Capacitor
M.M.C.	: Metalized Mylar Capacitor
A.C.	: Array Capacitor
V.R.	: Variable Resistor
S.V.R.	: Semi Variable Resistor
SW.	: Switch
Chip R.	: Chip Resistor
Chip C.	: Chip Capacitor

Cautions Concerning Handling of The Laser

The following table has been affixed to the unit, listing the proper procedure for working with the laser beam.

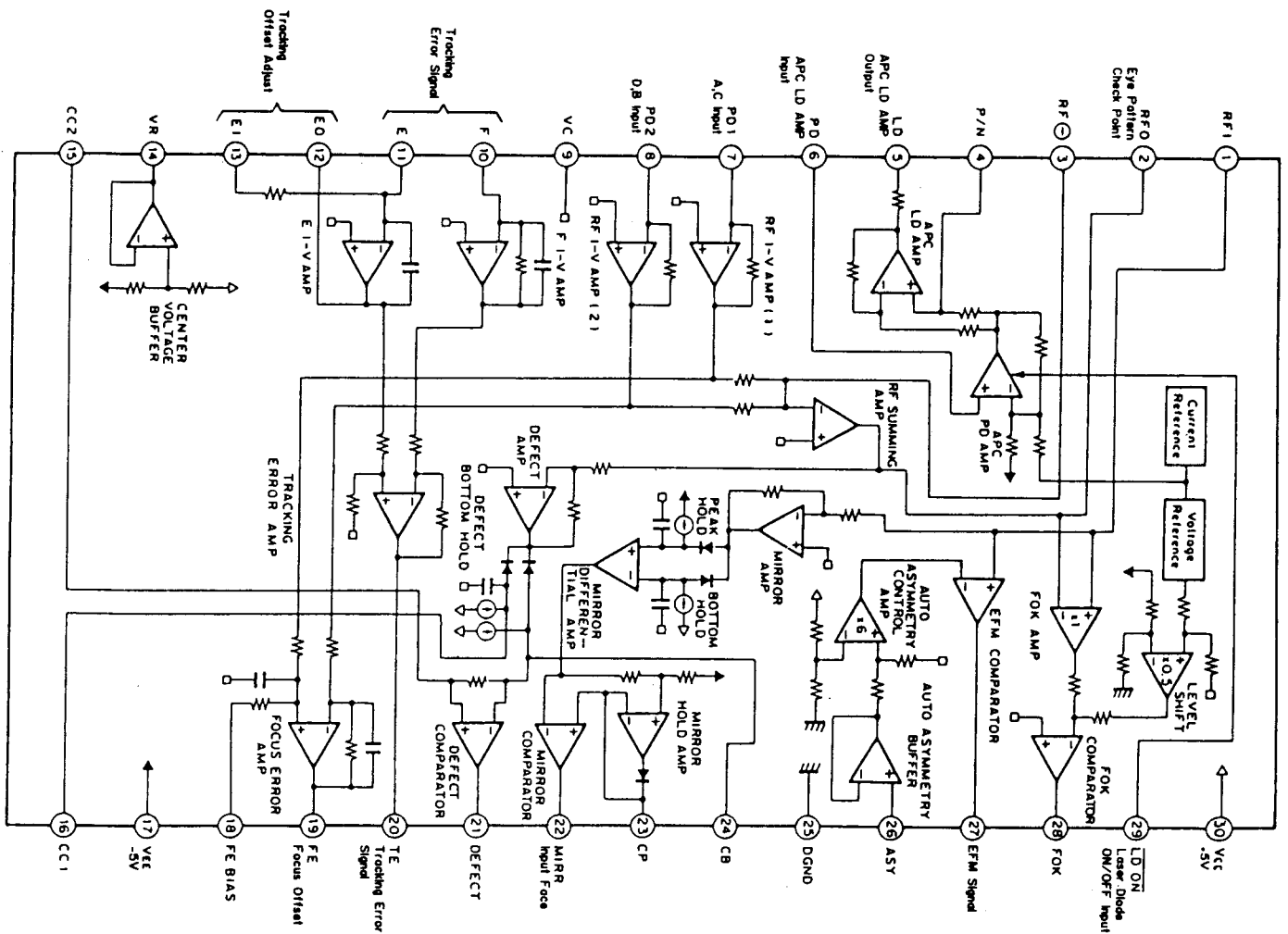


1. BLOCK DIAGRAM



2. INTERIOR BLOCK DIAGRAM AND TERMINAL FUNCTION OF IC

•CX A1081S (RF Amp.)

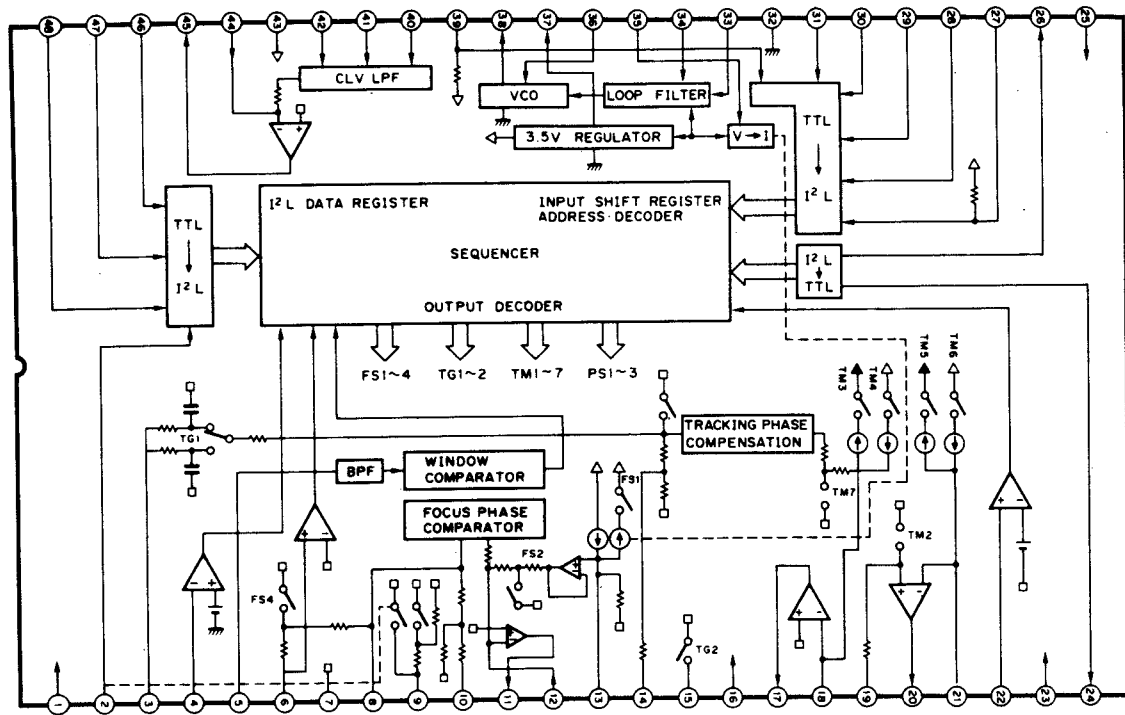


◆ Terminal Function <CX A1081S>

Pin No.	Pin Name	I/O	Description
1	RFI	I	RF summing amplifier input.
2	RFO	O	RF summing amplifier output.
3	RF ⊖	I	RF Summing amplifier feedback signal input.
4	P/N	I	Terminal for switching P-sub/N-sub of LD (laser diode).
5	LD	O	APC LD amplifier output.
6	PD	I	APC PD amplifier input.
7	PD1	I	RF I-V amplifier (1) inverting input. This terminal is connected to the pin diode (A + C).
8	PD2	I	RF I-V amplifier (2) inverting input. This terminal is connected to the pin diode (B + D).
9	VC	-	Ground
10	F	I	F I-V amplifier inverting input. This terminal is connected to the pin diode (F).
11	E	I	E I-V amplifier inverting input. This terminal is connected to the pin diode (E).
12	EO	O	E I-V amplifier output.
13	EI	I	E I-V amplifier feedback input.
14	VR	O	(Vcc + VEE)/2 voltage output.

Pin No.	Pin Name	I/O	Description
15	CC2	I	Defect amplifier bottom hold input. This terminal is connected Pin 16 with a coupling capacitor.
16	CC1	O	Defect amplifier bottom hold output.
17	VEE	-	Negative supply voltage: -5V.
18	FEBIAS	I	Bias terminal for the focus error amplifier non-inverting.
19	FE	O	Focus error amplifier output.
20	TE	O	Tracking error amplifier output.
21	DEFECT	O	Defect comparator output.
22	MIRR	O	Mirror comparator output.
23	CP	I	Mirror comparator non-inverting input. This terminal is connected a mirror hold capacitor.
24	CB	I	This terminal is connected a defect bottom hold capacitor.
25	DGND	-	Ground.
26	ASY	I	Auto asymmetry buffer control signal input.
27	EFM	O	EFM comparator output.
28	FOK	O	FOK comparator output.
29	LD ON	I	Laser diode ON/OFF switching input.
30	Vcc	-	Positive supply voltage: +5V.

•CXA1082AS (Servo Control)

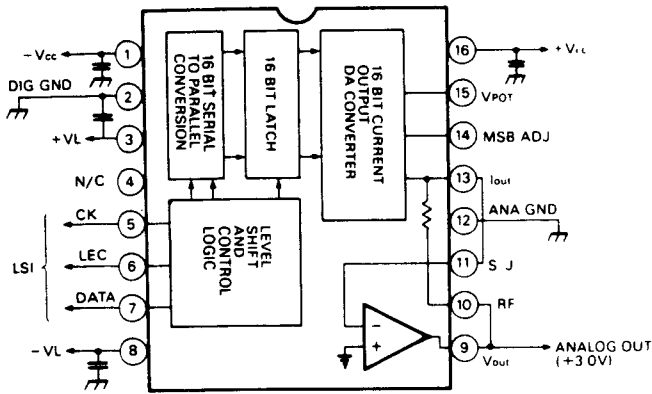


◆ Terminal Function <CXA1082AS>

Pin No.	Pin Name	I/O	Description
8	FGD	I	A capacitor is connected between this Pin and F3 (Pin 9) for decreasing high-frequency gain of focus servo.
9	FS3	O	Terminal for switching high-frequency gain of focus servo.
10	FLB	-	This Pin is used to connect a time constant for increasing low-frequency characteristic of focus servo.
11	FEO	O	Terminal for outputting a signal for driving focus coil.
17	TAO	O	Terminal for outputting a signal for driving tracking coil.
20	SLD	O	Terminal for outputting a drive signal for sled motor.
45	SPDLO	O	Terminal for outputting a drive signal for spindle (disc) motor.
12	FE ⊖	I	Focus amplifier inverting input.
13	SRCH	I	This terminal is used to determine time constant for generating focus search waveform.
14, 15	TGU, TG2	-	Terminals are used to determine a time constant for switching tracking high-frequency gain.
18	TA ⊖	I	Tracking amplifier inverting input.
19	SL ⊕	I	Sled (Feed) amplifier non-inverting input.
21	SL ⊖	I	Sled amplifier inverting input.
22	SSTOP	I	Terminal for inputting a signal from limit switch ON/OFF for detecting innermost track of disc.
23	FSET	I	Terminal for setting focus and tracking phase-compensation peaks and fo of CLV LPF.
24	SENS	O	Terminal for outputting internal condition data.
26	C.OUT	O	Terminal for outputting a signal for counting track number of disc.
27	DIRC	-	This terminal is used for one-track jump operation.
28	XRST	-	Terminal for inputting a reset signal. Reset operation in "L" level.
29	DATA	I	Serial data input from the CXP5034H mechanism control.

Pin No.	Pin Name	I/O	Description
30	XLT	I	Terminal for inputting a latch signal for serial data from the CXP5034H mechanism control.
31	CLK	I	Serial data clock input the CXP5034H mechanism control.
32	DGND	-	Ground.
34	PDI	I	PDO signal input from the phase-comparator of the CXD1125Q digital signal processing.
35	ISET	O	Terminal for outputting a current to determine focus search, track jump and slewing kick height.
36	VCOF	I	VCO free-frequency is practically proportional to resistance between this Pin and Pin 37.
38	C864	O	Internal 8.64 MHz VCO output.
40	MDP	I	A spindle motor driving signal input from the CXD1125 digital signal processing (MDP terminal).
41	MON	I	A spindle motor ON/OFF signal input from the CXD1125 digital signal processing (MON terminal).
42	FSW	-	This terminal is used to determine a time constant for LPF of CLV servo error signal.
44	SPDL ⊖	I	Spindle drive amplifier inverting input.
46	WDCK	I	Auto sequence clock input Typical frequency = 88.2 kHz.
47	FOK	I	FOK signal input from the CXA1081S.
48	MIRR	I	Mirror comparator signal input from the CXA1081S.
2	DFCT	I	Defect comparator signal input from the CXA1081S.
3	TE	I	Tracking error amplifier signal input from CXA1081S.
4	TZC	I	Tracking zero cross comparator signal input.
5	ATSC	I	Window comparator input for ATSC detection.
6	FE	I	Focus error amplifier signal input.

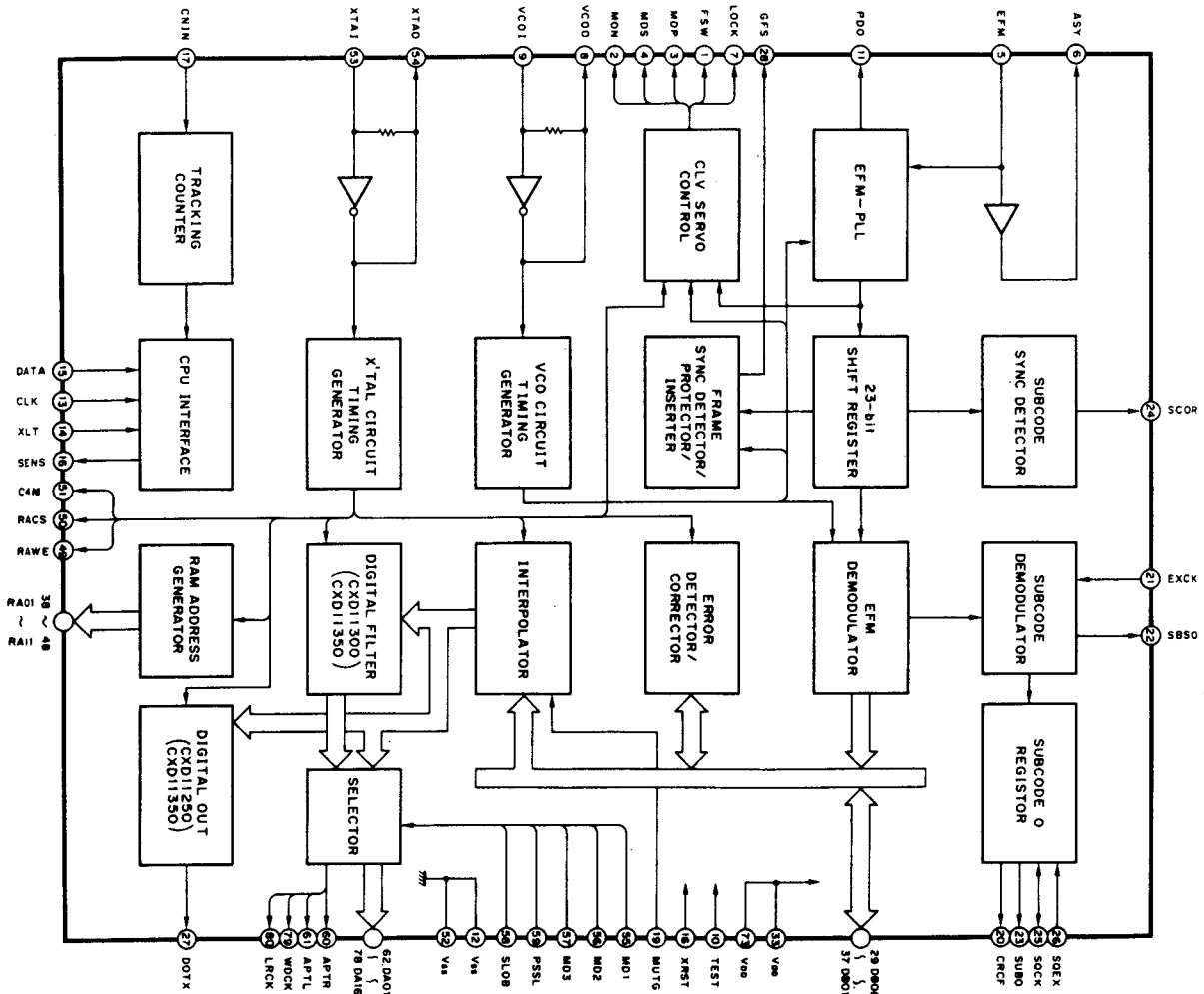
•PCM56 (16 bit D/A Converter)



◆ Terminal Function < PCM56 >

Pin No.	Pin Name	I/O	Description
1	-Vcc	-	Negative supply voltage: -5V.
2	DIG GND	-	Digital ground.
3	+VL	-	Positive supply voltage: +5V.
5	CK	I	Input data clock. The rising edge of this clock defines input data valid.
6	LEC	I	Latch enable control input.
7	DATA	I	Data input. Each data is in two's complement format with the most-significant bit first.
8	-VL	-	Negative supply voltage for logic circuit.
9	Vout	O	Analogue output.
10	RF	-	This terminal is used to connect a resistor for feedback.
11	S·J	I	Summing Junction (Operational amplifier input).
12	A GND	-	Analogue ground.
13	I OUT	O	Current output.
14	MSB ADJ.	-	This terminal is used for adjusting MSB.
15	V POT	-	This terminal is used to connect a potentiometer for MSB.
16	+Vcc	-	Positive supply voltage.

•CXD1125Q (Digital Signal Processing)



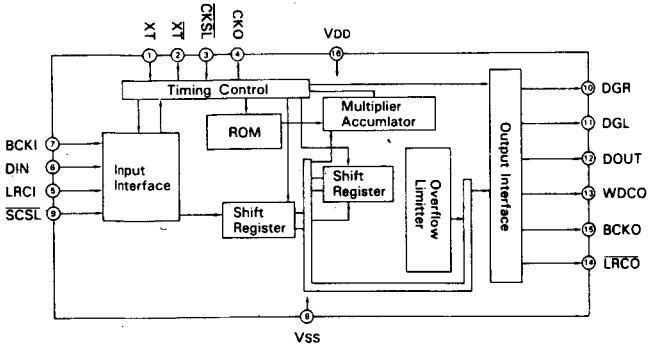
◆ Terminal Function <CXD1125Q>

Pin No.	Pin Name	I/O	Description
1	FSW	O	Terminal to output a time constant switching signal for output-filter of spindle motor.
2	MON	O	Terminal to output a control signal for spindle motor ON/OFF.
3	MDP	O	Spindle motor drive output. For CLV-S mode rough control and CLV-P mode phase control.
4	MDS	O	Spindle motor drive output. For CLV-P mode speed control.
5	EFM	I	Terminal to input a EFM signal from RF amplifier (CXA1081S).
6	ASY	O	Terminal to output a control signal for EFM signal slice level.
7	LOCK	O	The GFS signal is sampled at WFCK/16: if "H", "H" is output through this terminal. If "L" for 8 consecutive times, "L" is output.
8	VCOO	O	VCO output. When locked to the EFM signal, $f=8.6436$ MHz.
9	VCOI	I	VCO input.
10	TEST	I	(0 V).
11	PDO	O	Terminal to output a phase comparison signal for EFM signal and VCO/2.
12	VST	—	Ground (0 V)
13	CLK	I	Terminal to input a transfer clock for serial data from the CXP5034H. Serial data is latched on the rising edge of the transfer clock.
14	XLT	I	Terminal to input a latch signal from the CXP5034H. Latches a data (serial data from the CXP5034H) of 8-bit shift register to each register.
15	DATA	I	Serial data input from the CXP5034H.
16	XRST	I	System reset input. Reset is performed at "L" input.
17	CNIN	I	Tracking pulse input.
18	SENS	O	Outputs internal condition data for each address.
19	MUTG	I	Muting input. When the internal register ATTM is "L", MUTG sets the normal condition at "L" input, and the muted condition at "H" input.
23	SUBQ	O	Subcoding Q data output.
24	SCOP	O	Subcoding data sync S0 + S1 output.
25	SQCK	I/O	Subcoding Q data readout clock input/output.
27	DOTX	I	Digital data output.
28	GFS	O	Frame sync locked condition indicating output.
29	DB08	I/O	External RAM data terminal. DATA8 (MSB)
30	DB07	I/O	External RAM data terminal. DATA7
31	DB06	I/O	External RAM data terminal. DATA6
32	DB05	I/O	External RAM data terminal. DATA5
33	VDD	—	Positive supply voltage.
34	DB04	I/O	External RAM data terminal. DATA4
35	DB03	I/O	External RAM data terminal. DATA3
36	DB02	I/O	External RAM data terminal. DATA2
37	DB01	I/O	External RAM data terminal. DATA1 (LSB)
38	RA01	I/O	External RAM address output. ADDR01 (LSB)
39	RA02	I/O	External RAM address output. ADDR02
40	RA03	I/O	External RAM address output. ADDR03
41	RA04	I/O	External RAM address output. ADDR04
42	RA05	I/O	External RAM address output. ADDR05
43	RA06	I/O	External RAM address output. ADDR06
44	RA07	I/O	External RAM address output. ADDR07
45	RA08	I/O	External RAM address output. ADDR08

Pin No.	Pin Name	I/O	Description
46	RA09	I/O	External RAM address output. ADDR09
47	RA10	I/O	External RAM address output. ADDR10
48	RA11	O	External RAM address output. ADDR11
49	RAWWE	O	Write enable signal output to the external RAM (active at "L").
50	RACS	O	Chip select signal output to the external RAM (active at "L").
51	C4M	O	X'tal division output. $f=4.2336$ MHz.
52	VSS	—	Ground (0V).
53	XTAI	I	X'tal oscillator circuit input. $f=8.4672$ MHz or 16.9344 MHz, depending on the selected mode.
54	XTAO	O	X'tal oscillator circuit input. $f=8.4672$ MHz or 16.9344 MHz, depending on the selected mode.
55	MD1	I	Mode selection input 1.
56	MD2	I	Mode selection input 2.
57	MD3	I	Mode selection input 3.
58	SLOB	I	Terminal to input a switching signal for audio data output cord. Serial data output at "H". Parallel data output at "L".
59	PSSL	I	Audio data output mode switching input serial output at "L", and parallel output at "H".
62	DA01	O	Outputs DA01 (parallel audio data, LSB) when PSSL="H", and C1F1 ¹ when PSSL="L".
63	DA02	O	Outputs DA02 when PSSL="H", and C1F2 ¹ when PSSL="L".
70	DA09	O	Outputs DA09 when PSSL="H", and PLCK ² when PSSL="L".
71	DA10	O	Outputs DA10 when PSSL="H", and UGFS ³ when PSSL="L".
72	DA11	O	Outputs DA11 when PSSL="H", and GTOP ⁴ when PSSL="L".
73	VDD	—	Positive supply voltage: +5 V.
74	DA12	O	Outputs DA12 when PSSL="H", and RAOV ⁵ when PSSL="L".
75	DA13	O	Outputs DA13 when PSSL="H", and C4LR ⁶ when PSSL="L".
76	DA14	O	Outputs DA14 when PSSL="H", and C210 ⁷ when PSSL="L".
77	DA15	O	Outputs DA15 when PSSL="H", and C210 ⁸ when PSSL="L".
78	DA16	O	Outputs DA16 (parallel audio data MSB) when PSSL="H", and DATA ⁹ when PSSL="L".
79	WDCK	O	Strobe signal output. 176.4 kHz at DF ON, 88.2 kHz at DF OFF.
80	LRCK	O	Strobe signal output. 88.2 kHz at DF ON, and 44.1 kHz at DF OFF.

- *NOTES: 1. C1F1: C1 decoding error correction condition data monitoring output.
 C1F2: VCO/2 output. $f=4.3218$ MHz when locked to the FFM signal.
 2. PLCK: Unprotected frame sync pattern output.
 3. UGFS: Frame synchronization protected condition indication output.
 4. GTOP: ± 4 -frame jitter absorbing RAM overflow/under flow indicating output.
 5. RAOV: Strobe signal. 352.8 kHz at DF ON, 176.4 kHz at DF OFF.
 6. C4LR: C210 inverting output.
 7. C210: Bit clock output 4.2336 MHz at DF ON, 2.1168 MHz at DF OFF.
 8. DATA: Audio signal serial data output.

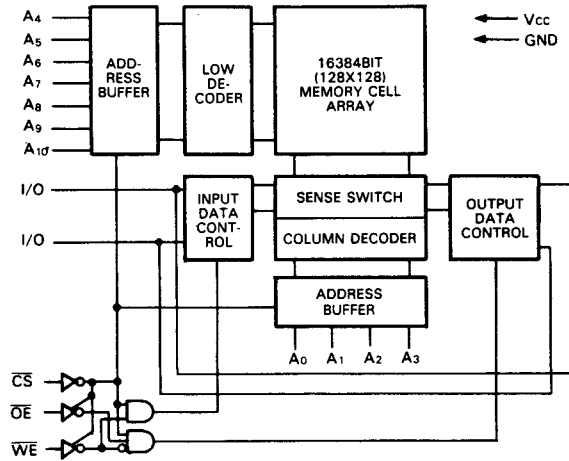
•SM5807 (Digital Filter)



◆ Terminal Function < SM5807 >

Pin No.	Pin Name	I/O	Description
1	X _T	I	Clock input from crystal circuit.
2	X _T ⁻	O	Clock output.
3	CKSL	I	16.9344 (or 17.2872) MHz/ 8.4672 (or 8.6436) MHz select signal input. When CKSL is HIGH: Clock (16.9344 or 17.2872 MHz) is inputted to X _T Terminal. When CKSL is LOW: Clock (8.4672 or 8.6436 MHz) is inputted to X _T Terminal.
4	CKO	O	Clock output.
5	LRCI	I	Clock (44.1 kHz) input.
6	DIN	I	Serial data input. Serial data is valid on the rising edge of the serial bit clock (BCLK).
7	BCKI	i	Serial bit clock input.
8	V _{SS}	-	Ground
9	SCSL	I	SCSL = "H": System clock = 192fs SCSL = "L": System clock = 196fs (fs = Sampling frequency)
10	DGR	O	Right channel deglitch signal (176.4 kHz) output.
11	DGL	O	Left channel deglitch signal (176.4 kHz) output.
12	DOUT	O	Serial data output. Left and right channel serial data is outputted alternately. The serial data is valid on the rising edge of the output bit clock (BCKO).
13	WDCO	O	Output data control (352.8 kHz) output.
14	LRCO	O	Output data control clock (176.4 kHz) output.
15	BCKO	O	Serial bit clock output. Typical frequency = 8.4672 or 8.6436 kHz. BCKO = 8.4672 kHz: SCSL is HIGH or OpenSystem clock = 192fs BCKO = 8.6436 kHz: SCSL is LOWSystem clock = 196fs
16	V _{DD}	-	Positive supply voltage: +5V.

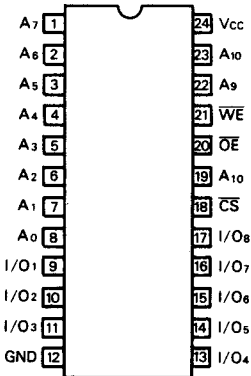
•TC5517AP/MSM5128/CXK5816/μPD446C
(2048 Word x 8 bit Static RAM)



◆ Action Mode

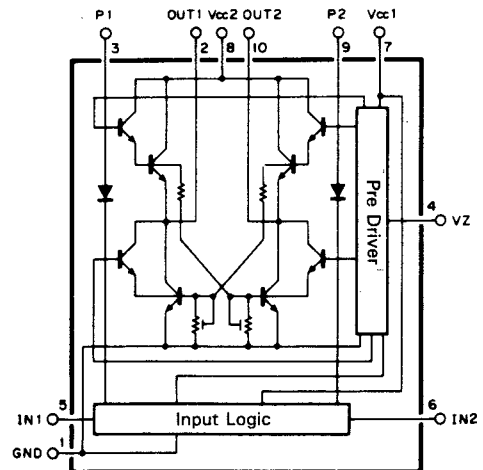
CS	OE	WE	CHIP	OUTPUT MODE	CURRENT
H	X	X	Non Select	High Impedance	I _{CCS}
L	H	H	Read	DOUT	I _{CCA}
L	L	H	Write	DIN	

H: High Level
L: Low Level
X: High or Low Level



A₀ - A₁₀: Address Input
I/O₁ - I/O₈: Data Input
CS: Chip Select Input
WE: Write Enable Input
OE: Output Enable Input
V_{CC}: +5V Power Supply
GND: Ground

•LB1461 (Motor Drive)



•M50747 (System Control)

◆ Terminal Function

Pin No.	Pin Name	I/O	Description
1	Vcc	—	Positive supply voltage: +5V.
3	CE	O	Terminal to output a chip enable signal for serial data to the CXP5014.
4	PKO	O	Terminal to output a feed-kick signal in POWER ON mode.
10	STB1	I	Terminal to input a timing signal for parallel data from the CXP5014.
11	SSTB	O	Terminal to output a timing signal for serial data to the CXP5034.
13	ACK2	O	Terminal to output a response signal for parallel data to the CXP5034.
14~17	IDAT3~IDAT0	I	Terminal to input a key switch and remote controller data from the CXP5014.
19	CLK	O	Terminal to output a clock for serial data to the CXP5014.
20	SDATA	O	Serial data output to the CXP5014.
26	QINT	I	Terminal to input an interrupting signal from the CXP5034.
27	CNVss	—	0V
28	RESET	I	Terminal for inputting a reset signal.
29	EXTAL	I	System clock input: Typical frequency = 4.2336 MHz.
32	Vss	—	Ground
33	SACK	I	Terminal to input a response signal for serial data from the CXP5014.
34	TEST1	I	Test input; not used in normal operation.
35	TEST2	I	Test input; not used in normal operation.
40	SHE	I	Terminal to input a signal for high-speed access mode from the CXP5034H.
41	MACK	I	Terminal to input a response signal for parallel data from the CXP5034H.
42	MSTB	I	Terminal to input a strobe signal for parallel data from the CXP5034H.
43	SREQ	O	Terminal to output a timing signal for parallel data to the CXP5034H.
44	SACK	O	Terminal to output a response signal for parallel data to the CXP5034H.
45~48	D3~D0	I/O	Data bus lines from/to the CXP5034H.
59	TIMER1	I	This terminal is used for inputting a signal for TIMER operation.
62	SSTOP	I	Terminal for inputting a signal from lead-in switch.
63	TRAY-IN	I	Terminal for inputting a signal from loading-in switch.
64	TRAY-OUT	I	Terminal for inputting a signal from loading-out switch.

•CXP5034H (Mechanism Control)

◆ Terminal Function

Pin No.	Pin Name	I/O	Description
1	SQCK	I	Terminal to input a clock for subcoding Q-channel signal for the CXD1125.
4	SUBQ	O	Subcoding Q-channel signal input from the CXD1125.
5	TRAY OUT	I	Disc tray out (loading out) switch input.
6	TRAY IN	I	Disc tray in (loading in) switch input.
7	S STOP	I	Lead-in switch signal input.
8	CHANGER	I	Terminal for selecting single and changer. This terminal is fixed at "L" level usually.
9~12	D0~D3	I/O	Data bus lines from/to the MSM50747.
13	SACK	I	Terminal to input a response signal for parallel data from the MSM50747.
14	SREQ	I	Terminal to input a timing signal for parallel data from the M50747.
15	QINT	O	Terminal to output an interrupting signal to the M50747.
16	MSTB	O	Terminal to output a timing signal for parallel data to the M50747.
17	MACK	O	Terminal to output a response signal for parallel data to the MSM50747.
18	SHE	O	Terminal to output a signal for high-speed access mode to the MSM50747. High-speed access mode is set at "H" level.
20	TCTC	I	Terminal to input a count signal for track number of disc.
21	Vss	—	Ground.
22	FOK	I	Terminal to input a signal for focus servo OK. Focus servo OK mode in "H" level.
23	GFS	I	Terminal to input a signal for frame sync locked condition from the CXD1125.
24	SENS	I	Terminal to input a condition signal from the CXA1082 and CXD1125.
26	MUTG	O	Terminal to output a muting signal. In muting, this terminal becomes an "H" level.
27	DATA	O	Terminal to output a serial data to the CXA1082 and CXD1125.
28	XLT	O	Terminal to output a latch signal for serial data to the CXA1082 and CXD1125.
29	CLK	O	Terminal to output a clock for serial data to the CXA1082 and CXD1125.
30	LDON	O	Terminal to output a signal for the laser diode ON.
31	XRST	O	Terminal to output a reset signal to the CXA1082 and CXD1125.
32	DE	O	Terminal to output a driving signal for deemphasis circuit. Active "H".
35	EXTAL	I	System clock input, typical frequency = 4.2336 MHz.
36	RESET	I	Terminal for inputting a reset signal.
37	SCOR	I	Terminal to input a subcoding sync S0+S1 from the CXD1125.
38, 39	TRAY+ TRAY-	O	Terminal to output a signal for loading motor drive.
42	VDD	—	Positive supply voltage: +5V.

•CXP5014 (Display Control)

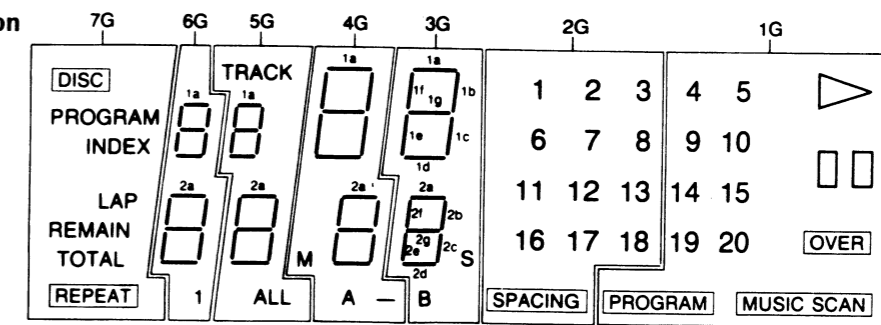
◆ Terminal Function

Pin No.	Pin Name	I/O	Description
3	RMC	I	Remote controller signal input.
4	CLK	I	Serial data clock input from the M50747.
7	SDATA	I	Serial data input from the M50747.
8	SACK2	O	Terminal to output a response signal for receiving serial data to the M50747.
12~15	PC0~PC3	O	Terminals for outputting a key return signal to externally connected key matrix.
16~19	PE0~PE3	I	Terminals for inputting a key return signal from externally connected key matrix.
20~23	RMD0~RMD3	I	Terminals for inputting a key return signal from externally connected key matrix.
28	SSTB	I	Terminal to input a timing signal for receiving serial data from the M50747.
29	CE	I	Terminal to input a chip enable signal for receiving serial data from the M50747.

Pin No.	Pin Name	I/O	Description
30	STB1	O	Terminal to output a timing signal for parallel data from the M50747.
31	ACK2	I	Terminal to input a response signal for parallel data from the M50747.
32	Vss	—	Ground
33~48	a~p	O	Terminals for Outputting segment signals to FL display.
50~56	7G~1G	O	Terminals for outputting grid signals to FL display.
57	VfDP	—	Terminal for connecting a supply voltage to filament of FL display.
59	QINT	I	Terminal to input a chip enable signal for serial data from the M50747.
61	EXTAL	I	System clock input, typical frequency = 4.2336 MHz.
62	RESET	I	Terminal for inputting a reset signal.
64	VDD	—	Positive supply voltage: +5V.

3. DESCRIPTION OF FV170G FL DISPLAY

•Grid Configuration



•Anode Configuration

	7G	6G	5G	4G	3G	2G	1G
a	DISC	1a	1a	1a	1a	1	4
b	PROGRAM	1b	1b	1b	1b	2	5
c	—	1c	1c	1c	1c	6	9
d	—	1d	1d	1d	1d	8	10
e	—	1e	1e	1e	1e	7	10
f	INDEX	1f	1f	1f	1f	3	▷
g	—	1g	1g	1g	1g	—	—
h	—	—	TRACK	M	S	—	—
i	LAP	2a	2a	2a	2a	11	14
j	RAMAIN	2b	2b	2b	2b	12	15
k	—	2c	2c	2c	2c	16	19
l	—	2d	2d	2d	2d	18	MUSIC SACN
m	—	2e	2e	2e	2e	17	20
n	TOTAL	2f	2f	2f	2f	13	OVER
o	REPEAT	2g	2g	2g	2g	—	—
p	—	1	ALL	A-	B	SPACING	PROGRAM

•Pin Configuration

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42		
CONNECTION	F	F	N	p	l	m	k	N	o	n	j	i	N	h	d	e	c	N	g	f	b	a	N	N	N	N	N	N	N	N	N	N	N	7	6	5	N	4	3	2	1	N	F	F

4. ADJUSTMENTS

Note: 1) Required test disc CD-1 of EIAJ.
 2) Test pins and adjustment parts are shown in Figs. 4-1 and 4-2.

STEP	SUBJECT	MEASURE OUTPUT	ADJUST. PARTS	ADJUSTMENT	SETTING CONDITIONS AND REMARKS
1	VCO Temporary Adj. (STOP mode)	Test Pin TP (VCO) on the F-5939 board. Frequency Counter	fVR5 (F-5931)	4.32 MHz ± 30 kHz	1. Connect TP (EFM) to ground on the F-5931 board. 2. For this adjustment run the unit for more than one minute after the power is switched ON.
2	Tracking Offset Adj.	Test Pin TP (T1) on the F-5931 board. Oscilloscope	fVR1 (F-5931)	• Oscilloscope: DC range Fig. 1 • Adjust fVR1 to satisfy as shown in Fig. 1.	1. Connect TP (T2) to ground on the F-5931 board. 2. Play the 8th music on the TESTDISC CD-1. 3. Connect a probe of oscilloscope to TP (T1) during PLAY mode.
3	FOCUS Offset Adj.	Test Pin TP (T2) on the F-5931 board. Oscilloscope	fVR2 (F-5931)	• Oscilloscope: DC range Fig. 2 • Make eye-pattern waveform best. (Widen center portion (◇) of waveform sufficiently and symmetrically.)	1. Play the 8th music on the TEST DISC CD-1. 2. Connect a probe of oscilloscope to TP (T2) during PLAY mode.
4	Tracking Gain Adj.		fVR3 (F-5931)	 Fig. 3 • Set the end of groove of fVR3 to the direction of arrow A as shown in Fig. 3	
5	Focus Gain Adj.		fVR4 (F-5931)	 Fig. 4 • Set the end of groove of fVR4 to the direction of arrow B as shown in Fig. 4.	
6	VCO Adj. (STOP mode)	Test Pin TP (VCO) on the F-5939 board. Oscilloscope	fVR5 (F-5931)	4.250 MHz ± 1kHz	• Connect TP (EFM) to ground on the F-5931 board.
7	Distortion Adj.	LINE OUT Terminal. Oscilloscope and Distortion Meter	vVR1L and vVR1R (F-5931)	Minimum distortion.	1. Play first music of the TEST DISC CD-1. 2. Check of both left channel and right channel.

Fig. 4-1 F-5939

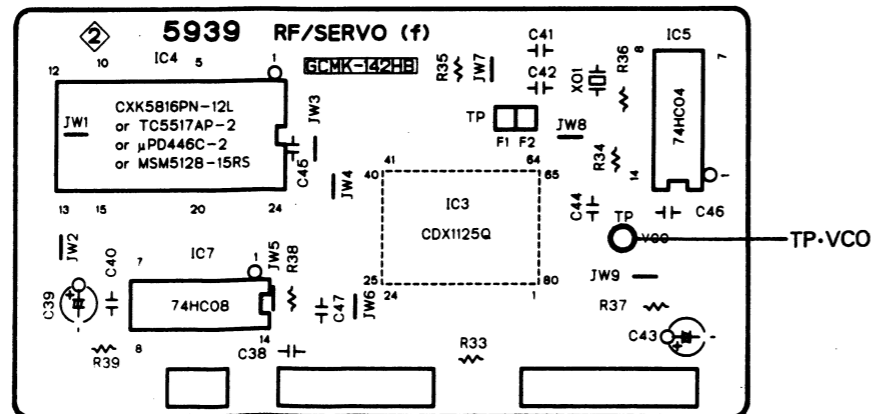
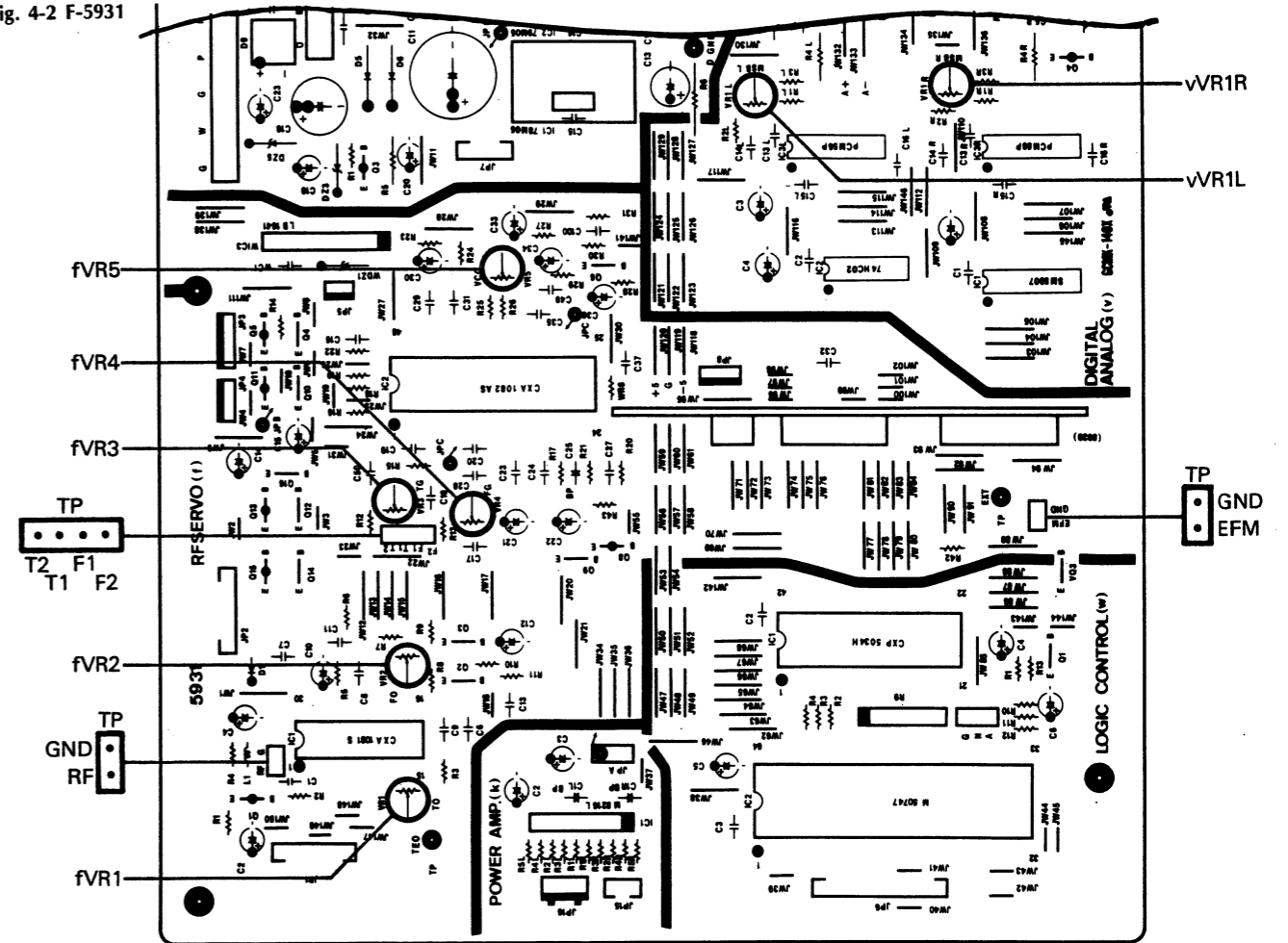


Fig. 4-2 F-5931

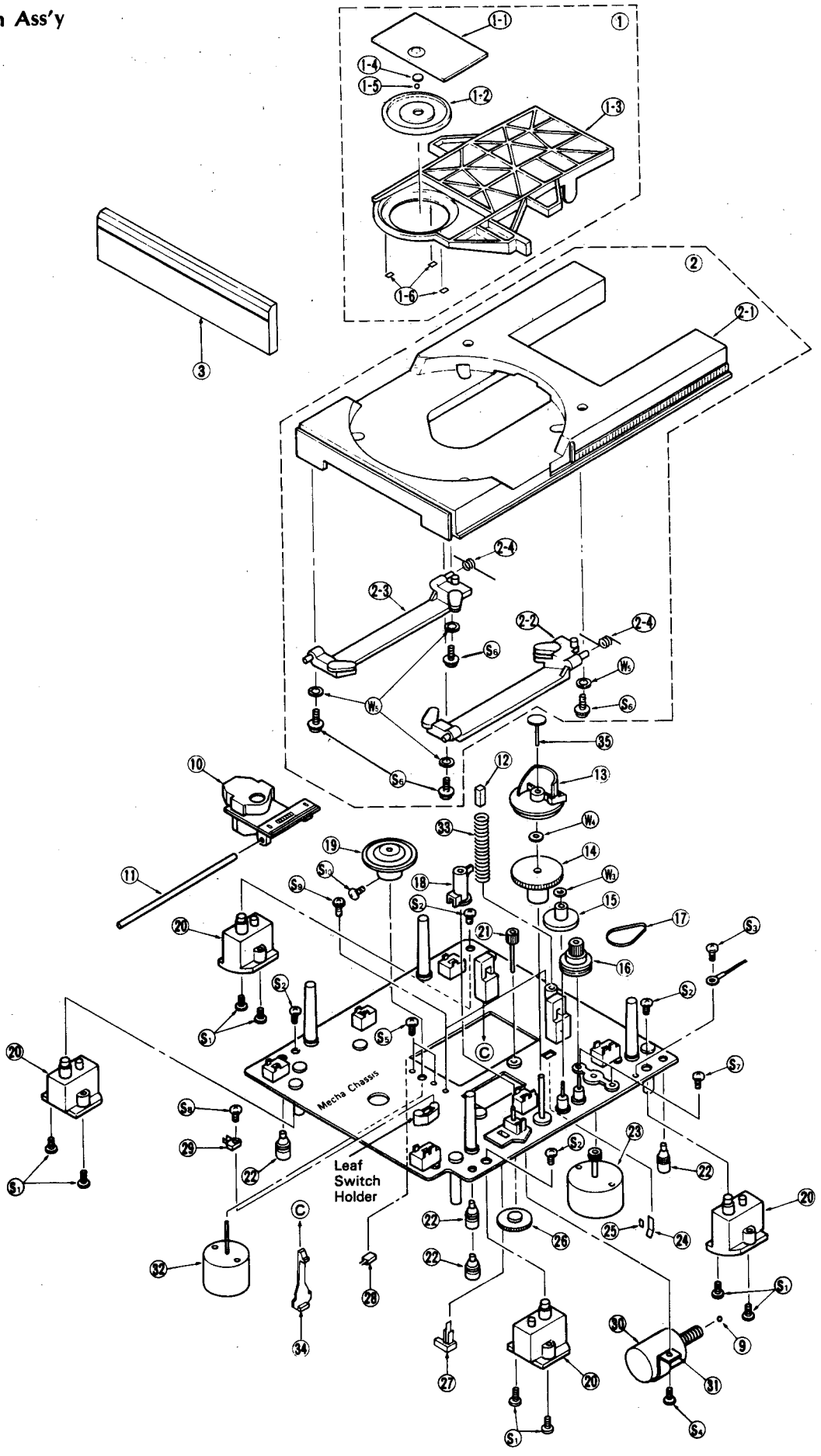


5. EXPLODED VIEW OF MECHANISM ASS'Y AND PARTS LIST

Parts List <CD Mechanism Ass'y>

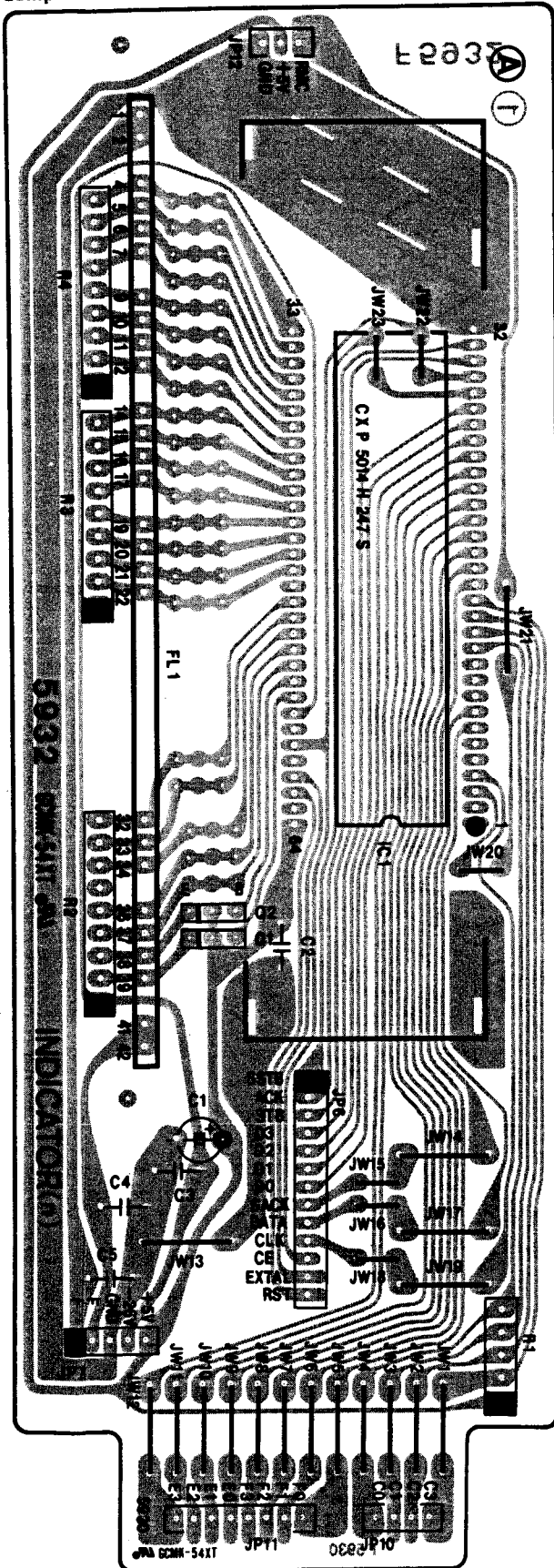
Parts No.	Stock No.	Description	Parts No.	Stock No.	Description
1	18178700	Clamp Arm Ass'y	25	27379410	Spacer
1-1	27365600	Clamp Cover	26	27365000	Sled Gear B
1-2	27365700	Clamp Plate	27	48574400	Loading IN Detector Switch
1-3	27365800	Clamp Arm	28	48794000	Sled IN Detector Switch
1-4	27365410	Thrust Plate	29	48829000	Loading OUT Detector Switch
1-5	27279100	Steel Ball	30	18159300	Sled Motor Ass'y (with Worm Gear)
1-6	27423200	Cushion Sheet			
2	18176101	Disc Tray Ass'y	31	27366600	Motor Band
2-1	27538100	Disc Tray	32	48584900	Spindle Motor
2-2	27423400	Right Lifter Ass'y	33	27593500	Clamp Arm Spring
2-3	27423300	Left Lifter Ass'y	34	27463700	Arm Stopper
2-4	27364800	Lifter Spring	35	47420900	Lock Pin
3	27553900	Disc Tray Panel			
9	27279100	Steel Ball	S1	46319800	M3x8 Bind Head Deltite Screw
10	48830500	Pick-up Ass'y	S2	46268000	M3x8 Franged Head Deltite Screw
11	27363800	Support Rail	S3	13122300	M3x6 Bind Head Machine Screw
12	27364500	Spring Damper	S4	18158700	M3x8 Bind Head Screw
13	27367000	Cam Gear	S5	46609800	M2x3 Bind Head Machine Screw
14	27364000	Drive Gear	S6	49198900	M2.6x6 Washer Head Tapping Screw
15	27365200	Loading Gear			
16	27422600	Loading Pulley	S7	00421300	M2.6x6 Bind Head Screw
17	27422700	Belt	S8	13301100	M2x8 Bind Head Tapping Screw
18	27364700	Switch Arm	S9	51625200	M3x10 Washer Head Tapping Screw
19	27537600	Turn Table Ass'y			
20	27462120	CD Holder	S10	18154800	M2x4 Pan Head Machine Screw
21	27364910	Sled Gear A			
22	27364400	Floating Rubber	W3	27364300	2.5φ Slit Washer
23	18159100	Loading Motor Ass'y (with Pulley)	W4	27364600	6.6φ Thrust Washer
24	27365500	Plate Spring	W5	27537500	Silicon Washer

•CD Mechanism Ass'y

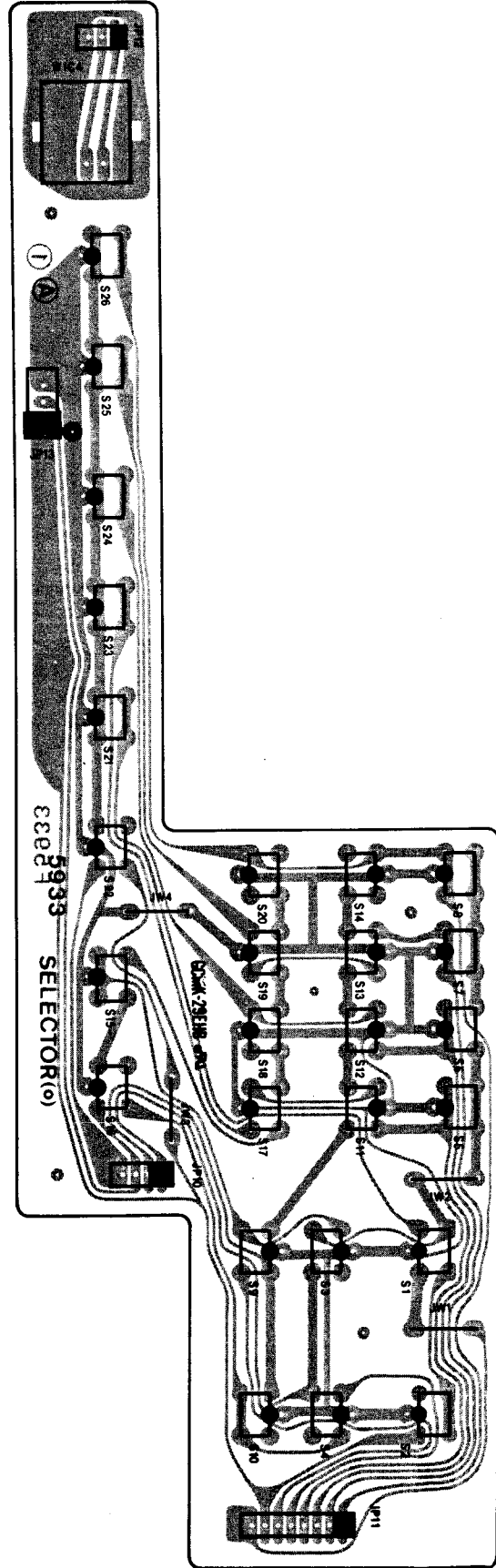


6. PARTS LOCATION ON BOARD

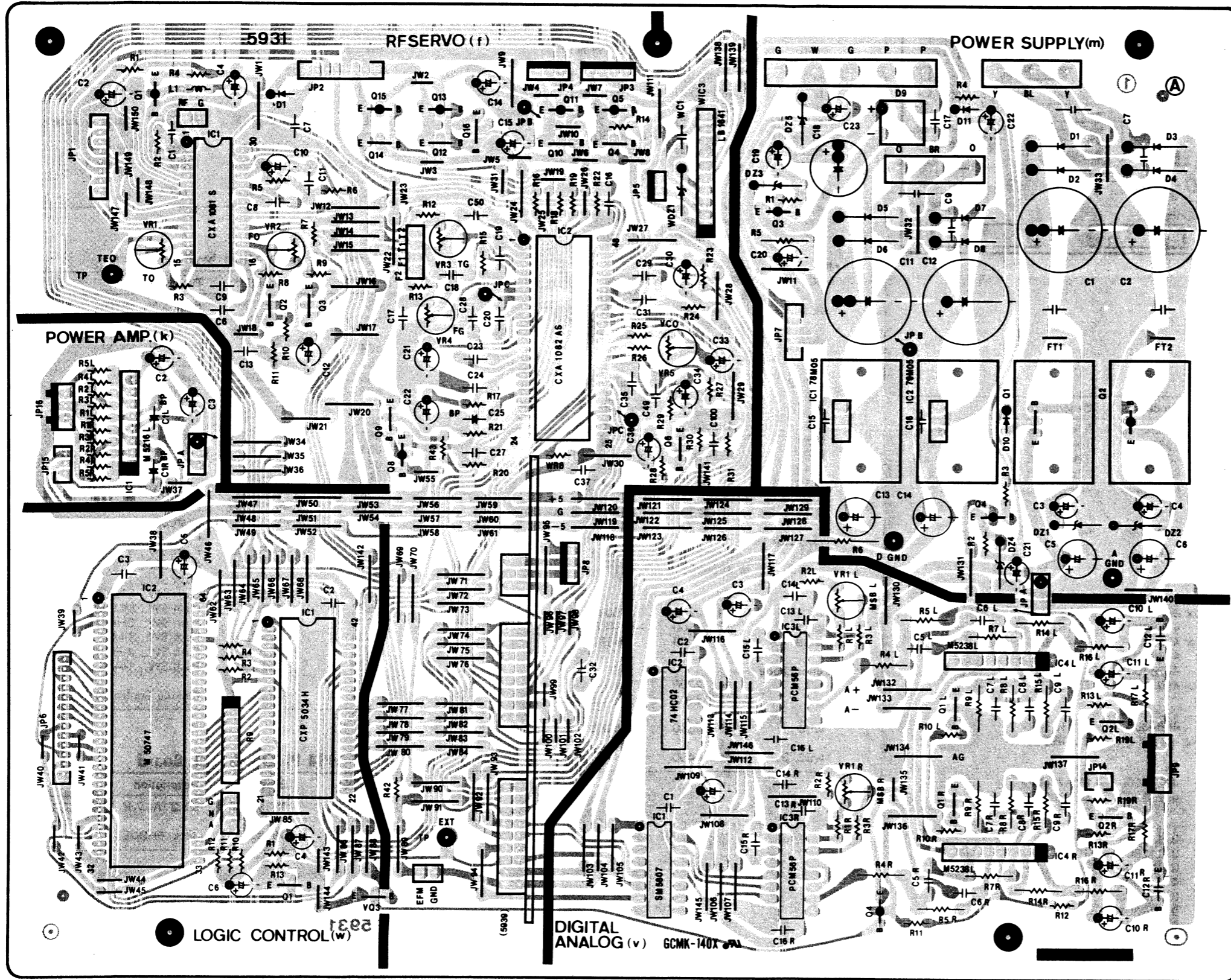
6-1. F-5932 FL Display Tube Board
Component Side



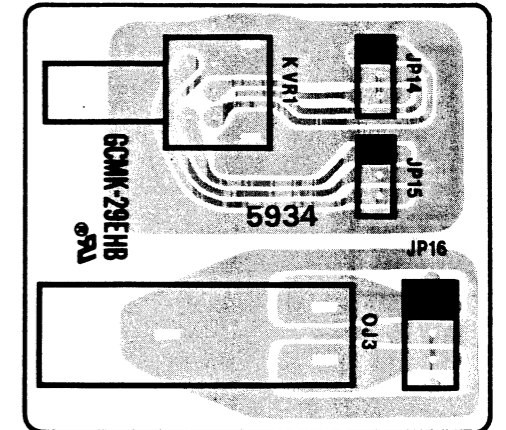
6-2. F-5933 Operation Switch Board
Component Side



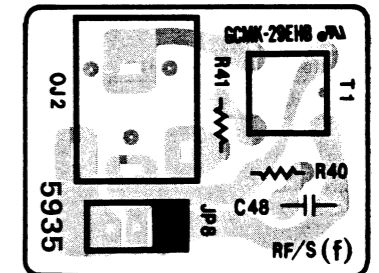
6-3. F-5931 Main Board
Component Side



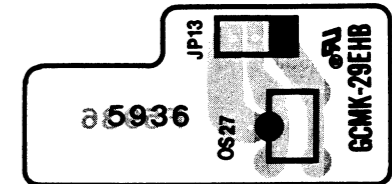
6-4. F-5934 PHONES Jack Board
Component Side



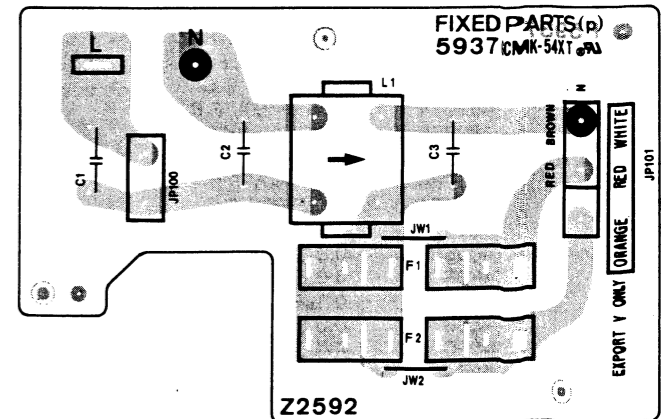
6-5. F-5935 DIGITAL OUT Terminal Board
Component Side



6-6. F-5936 OPEN/CLOSE Switch Board
Component Side



6-7. F-5937 Line Filter Board
Component Side



7-6. F-5936 OPEN/CLOSE Switch Board

Parts No.	Stock No.	Description
oS27	48306900	Push SW., OPEN/CLOSE

7-7. F-5937 Line Filter Board

Parts No.	Stock No.	Description
Δ pC1	46943200	0.01μF 400V C.C.
Δ pC2	46426500	3300pF 400V C.C.
Δ pC3	46943200	0.01μF 400V C.C.
Δ pL1	49197100	Line Filter

7-8. F-5938 LINE OUT Terminal Board

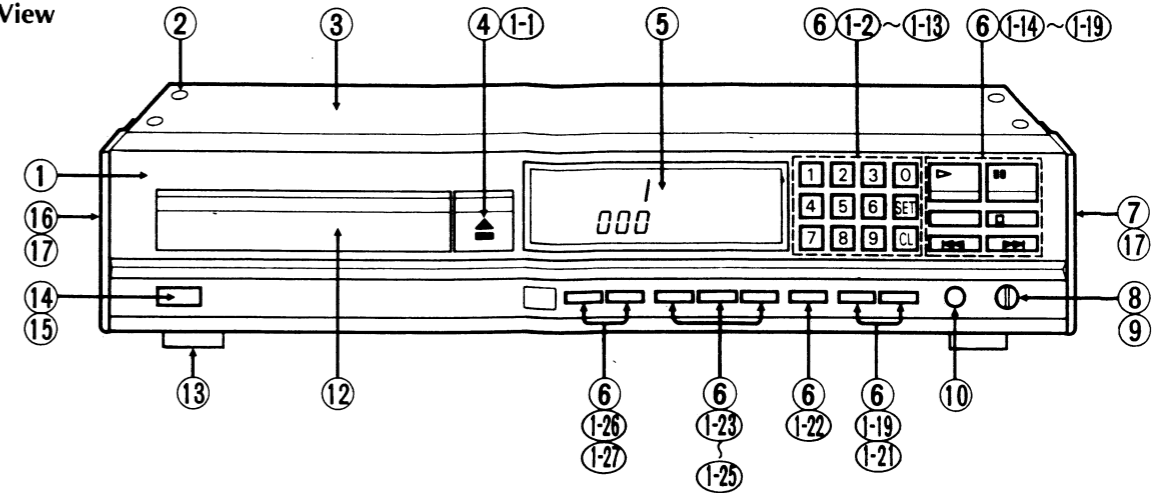
Parts No.	Stock No.	Description
oJ1	48792100	2P Pin Jack, LINE OUT

7-9. F-5939 Digital Signal Processing Board

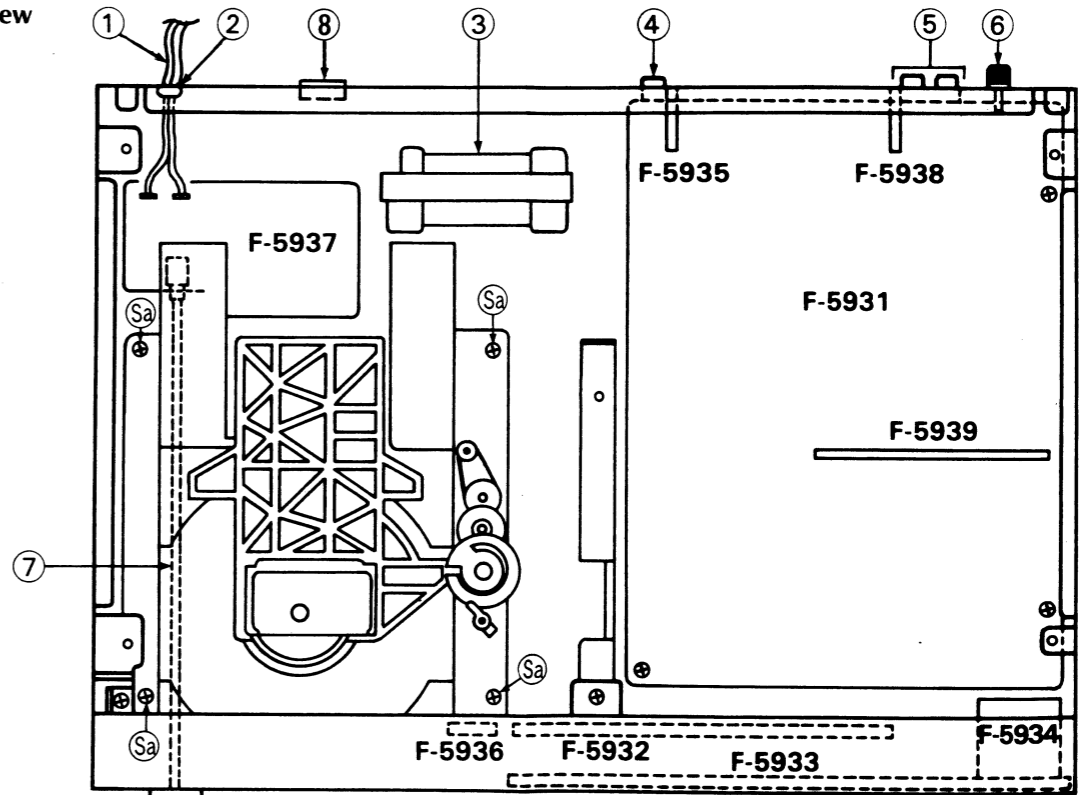
<Stock No. 01099401>

Parts No.	Stock No.	Description
•IC		
fIC3	48976700	CXD1125Q-Z
fIC4	48718000	TC5517AP-2
	or 48718100	μPD446C-2
	or 48718300	MSM5128-15RS
	or 48839700	CXK5816PN-12L
	or 49260400	CXK5816PN-15L
	or 49260500	CXK5816PS-12L
	or 49260600	CXK5816PS-15L
fIC5	48423400	TC74HC04P
	or 48723600	μPD74HC04C
	or 49265200	TC74HC04AP
fIC7	48423500	TC74HC08P
	or 48723700	μPD74HC08C
	or 49265300	TC74HC08AP
fX01	48592500	16.9344MHz Quartz Element
fC38	48748400	0.1μF 50V C.C.
fC40	48748400	0.1μF 50V C.C.
fC44~47	48748400	0.1μF 50V C.C.
fC102	48748400	0.1μF 50V C.C.

•Front View



•Top View



8. OTHER PARTS

Parts List <Front View>

Parts No.	Stock No.	Description
1	27555900	Front Panel Ass'y
1-1	27591700	OPEN/CLOSE•Knob
1-2	27419300	1•Knob
1-3	27419400	2•Knob
1-4	27419500	3•Knob
1-5	27419600	4•Knob
1-6	27419700	5•Knob
1-7	27419800	6•Knob
1-8	27419900	7•Knob
1-9	27420000	8•Knob
1-10	27420100	9•Knob
1-11	27420200	0•Knob
1-12	27549200	SET•Knob
1-13	27549300	CL•Knob
1-14	27547100	PLAY•Knob
1-15	27547200	PAUSE•Knob
1-16	27546500	RANDOM•Knob
1-17	27546600	STOP•Knob
1-18	27546700	◀•Knob, AMPS
1-19	27546800	▶•Knob, AMPS
1-20	27548900	◀•Knob, FR
1-21	27549000	▶•Knob, FF
1-22	27548800	MUSIC SCAN•Knob

Parts No.	Stock No.	Description
1-23	27548500	TIMER•Knob
1-24	27548600	CHECK•Knob
1-25	27548700	SPACING•Knob
1-26	27548300	1/ALL•Knob
1-27	27548400	A-B•Knob
2	27290910	BO Holder
3	27389300	Bonnet
4	48306900	Push SW., OPEN/CLOSE
5	48903700	VF170G FL Display
6	49250300	Push SW., Operation
7	27293110	Dress Side Panel Right
8	47639310	Knob, LEVEL (Phones)
9	49197300	50kΩ (A) V.R., Phones Level
10	48792100	Pin Jack, PHONES
12	27553900	Disc Tray Panel
13	47716600	Leg Ass'y
Δ 14	49197200	Push SW., POWER
15	27554100	Power Knob Ass'y (Included SW. Rod and SW. Joint)
16	27321910	Dress Side Panel Left
17	48719700	M5x10 H. Socket Head Screw, Dress Side Panel

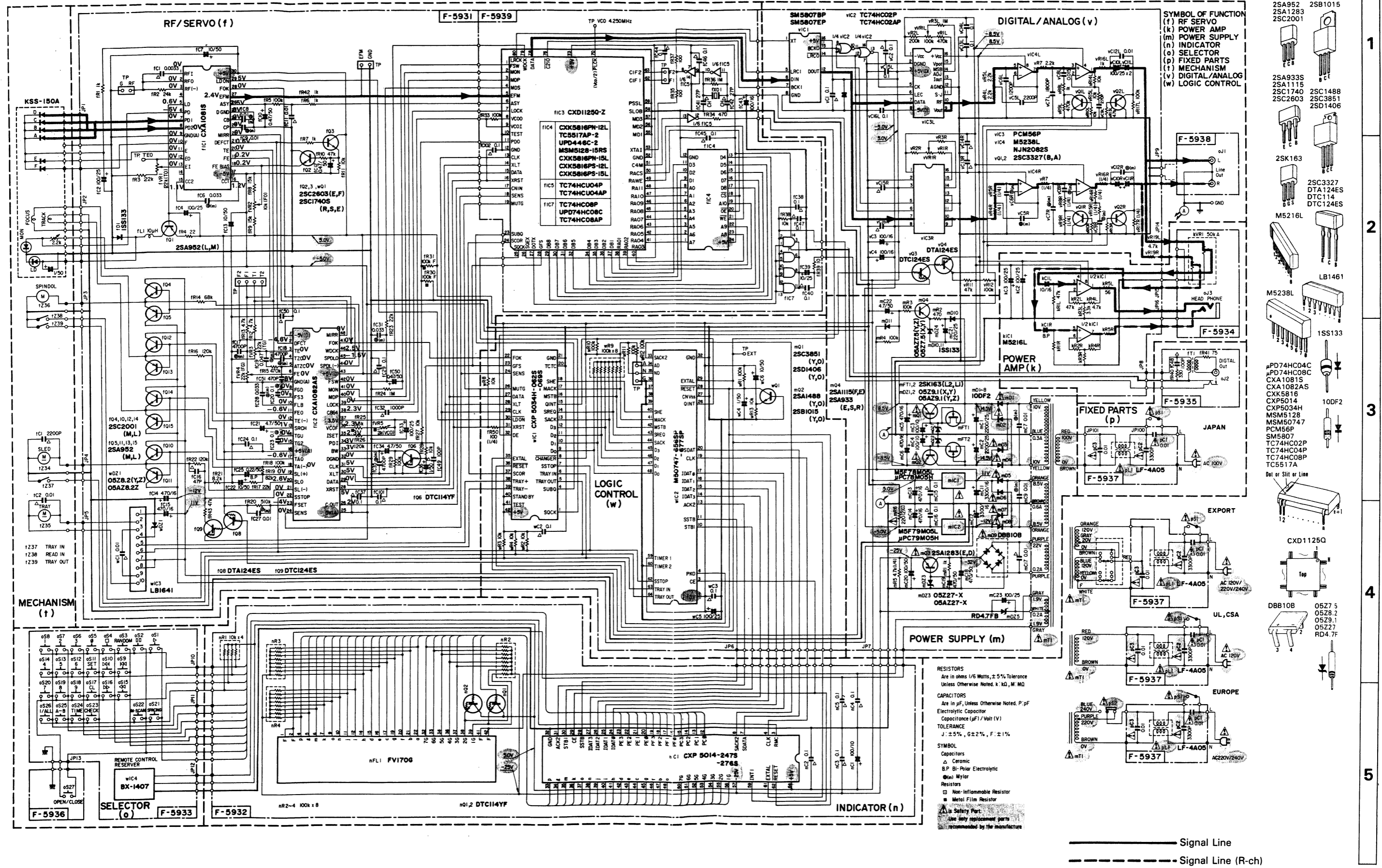
Parts List <Top View>

Parts No.	Stock No.	Description
Δ 1	38004700	Power Supply Cord (XX)
Δ	48837700	Power Supply Cord (SS)
Δ	46321000	Power Supply Cord (UL-CSA)
Δ	38004500	Power Supply Cord (EU-SEV)
Δ	49252900	Power Supply Cord (UK)
2	39104900	Strain Relief (UL-CSA)
	39106000	Strain Relief (XX)
	48913500	Strain Relief (EU-UK-SEV-SS)
Δ 3	15031809	Power Transformer (XX-SS)
Δ	15031802	Power Transformer (UL-CSA)
Δ	15031805	Power Transformer (EU-UK-SEV)

Parts No.	Stock No.	Description
4	49197500	1P Pin Jack Terminal, DIGITAL OUT
5	48792100	2P Pin Jack Terminal, LINE OUT
6	48587600	GND Terminal
7	27570010	Rod Ass'y
Δ 8	48175200	Voltage Selector (XX)
Δ	07204700	Slide SW., Voltage Selector (EU-UK-SEV)

9. SCHEMATIC DIAGRAM

* Design and specifications subject to change without notice for improvement.
 * La présentation et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
 * Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.



10. HOW TO REPLACE MAIN PARTS

(See Exploded View of Mechanism Ass'y on Page 9)

A. Disc Tray Ass'y ① (See Fig. 10-1 and 10-2)

- 1) Remove the bonnet.
- 2) Turn the loading gear ⑮ clockwise until the clamp arm ass'y ① is fully up.
- 3) Grasp the disc tray with your hand and pull it forward until it is secured by the leaf switch holder (See Fig. 10-2).
- 4) Turn the leaf switch holder fully counterclockwise (in the direction of the arrow) (See Fig. 10-2).
- 5) Pull the disc tray out forward.

Note:

Be sure to set the leaf switch holder back in its original position after installing the disc tray.

Fig. 10-1

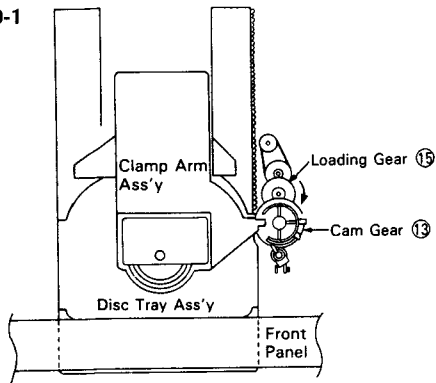


Fig. 10-2

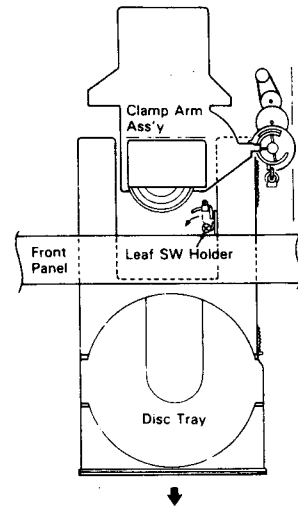
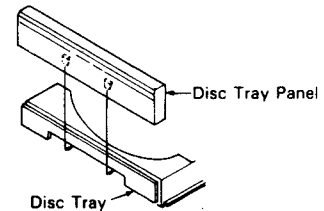


Fig. 10-3



B. Disc Tray Panel ③

- 1) Pull the disc tray ass'y forward.
- 2) Take off the disc tray panel from the disc tray as shown in Fig. 10-3.

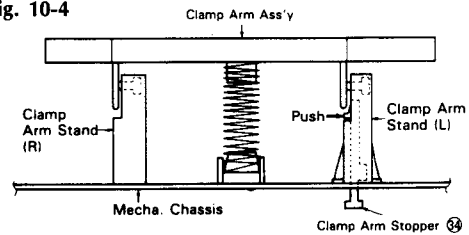
C. Mechanism Ass'y

- 1) Remove the bonnet.
- 2) Remove the disc tray ass'y from mechanism ass'y.
- 3) Disconnect five lead wires connectors JP1, JP2, JP3, JP4 and JP5 from the F-5931 board.
- 4) Take out the mechanism ass'y from the unit.
(Loosen four screws ⑤, see top view figure on page 12)

D. Clamp Arm Ass'y ①

- 1) Take out the mechanism ass'y.
- 2) Push the clamp arm stopper ⑳ as shown in Fig. 10-4, and remove it from left side clamp arm stand.
- 3) Detach the clamp arm ass'y from clamp arm stand (See Fig. 10-4).

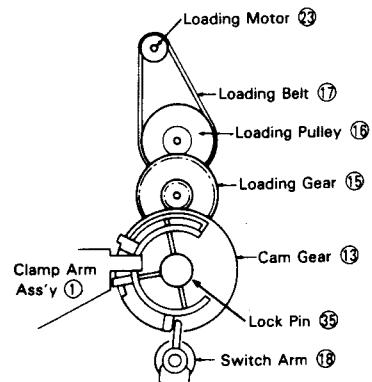
Fig. 10-4



E. Loading Belt ⑰ (See Fig. 10-5)

- 1) Remove the disc tray ass'y from mechanism ass'y.
- 2) Remove the switch arm ⑱ from mechanism chassis.
- 3) Pull out the lock pin ㉔ from cam gear.
- 4) Remove the cam gear ⑬ and drive gear ⑭.
- 5) Remove the loading gear ⑮.
- 6) Remove the loading belt ⑰ from the loading pulley ⑯.
- 7) Remove the loading pulley.

Fig. 10-5



F. Spindle Motor ㉓

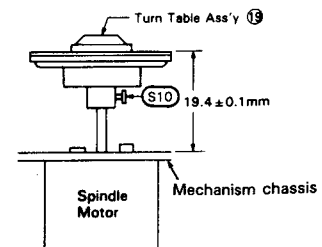
- 1) Remove the disc tray ass'y.
- 2) Take out the mechanism ass'y.
- 3) Remove the clamp arm ass'y from mechanism ass'y.
- 4) Detach the turntable ass'y ⑲ from the shaft of spindle motor.
- 5) Remove the two screws ㉕ fixing spindle motor.

Note:

Be sure to adjust the height whenever the spindle motor and turntable ass'y have been replaced.

- 1) Adjust the distance between the upper surface of the turntable ass'y and the mechanism chassis to 19.4±0.1 mm as shown in Fig. 10-6.
- 2) Fix them with the screw ㉕ after distance has been adjusted.

Fig. 10-6



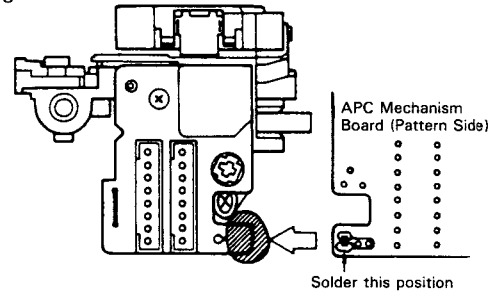
G. Pick-Up Ass'y ⑩

- 1) Take out the mechanism ass'y from unit.
- 2) Remove the clamp arm ass'y.
- 3) Remove the two screws ⑨ fixing the support rail ⑪ (with pick up ass'y ⑩).
- 4) Remove the pick up ass'y ⑩ from the support rail.

Note:

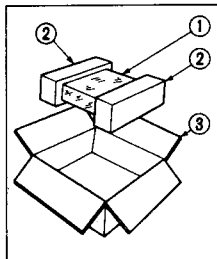
1. Note when removing the pick-up for repairing.
Before removing the laser pick-up, short-circuit the terminals by soldering. This is to prevent damage to the pick-up during removal operation.
 - 1) Solder the pick-up terminals as shown in Fig. 10-7.
 - 2) Disconnect the two lead connectors.
2. Note when replacing the pick-up.
 - 1) Connect the two lead connectors of pick-up to the APC mechanism board.
 - 2) Unsolder the short-circuited terminal soldering for protection. (See Fig. 10-7)

Fig. 10-7 Pick-up Ass'y



11. PACKING LIST

Parts No.	Stock No.	Description
1	27306700	Vinyl Bag
2	27413700	Styrofoam Packing
3	27556020	Carton Case



12. ACCESSORY LIST

Parts No.	Stock No.	Description
		RS-1020 Remoto Controller
		SUM-3K Dry Battery
	07193400	Pin Plug Cord
	27636200	CS-1 Single CD Adaptor Ass'y
	49037600	Operating Instruction (*E•F•S)
	49037700	Operating Instruction (*G•I•Sw)

***Note:**

- E•F•S:** English•French and Spanish Version
G•I•Sw: German•Italian and Swedish Version



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