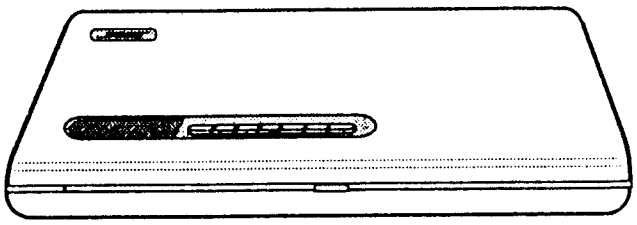
BOSE®

SERVICE MANUAL

614810

LIFESTYLE MUSIC CENTER



CAUTION

1. Parts identified by the ⚠ 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 form the supply circuit before returning the appliance to the customer.

NOTICE

1. 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.

2. The symbols, OO, UL, CSA, EU, EG, UK and XX <EXPORT> on the Parts List and the schematic diagram mean followings respectively.
   - OO..... Manufactured for Japan market.
   - UL..... Manufactured for U.S.A. market. (Underwriters Laboratorries approved model.)
   - CSA..... Manufactured for Canadian market.
   - EU..... Manufactured for European market.
   - EG..... Manufactured for F.R. Germany market.
   - UK..... Manufactured for United Kingdom market.
   - XX..... Standerd Version.
   - <EXPORT>
   - NON MARK..... Common Parts.

3. Abbreviations in this Parts List are as follows.

Abbreviations List

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

Specifications

Frequency response (at 1 watt) Overall (from CD)
.....20 Hz to 20 kHz ± 1 dB
Input sensitivity and impedance (at 1 kHz)
TAPE, VIDEO, AUX ..... 500 mV/22 kΩ
Signal to noise ratio (short-circuit, A-network)
TAPE, VIDEO, AUX..... 95 dB

FM Section
Tuning range.....87.5 to 108 MHz
Usable sensitivity
Mono.....23 dBf
50 dB quieting sensitivity
Mono.....18 dBf
Stereo.....40 dBf
Signal to noise ratio at 65 dBf
Mono.....70 dB
Stereo.....65 dB
Distortion at 65 dBf
Mono..... less than 0.25 % at 1,000 Hz
Stereo..... less than 0.3 % at 1,000 Hz
Stereo separation..... 35 dB at 1,000 Hz
Frequency response..... 30 to 15,000 Hz + 1.0 dB, −1.0 dB
Antenna input impedance..... 300 Ω balanced <XX, UL, CSA>
75 Ω unbalanced <EU, EG, UK>

AM Section
Tuning range.....530 to 1710 kHz <UL, CSA>
531 to 1602 kHz <EU,EG,UK,XX>
Usable sensitivity..... 60 dB/m
Signal to noise ratio..... 50 dB
Image response ratio..... 35 dB at 1,000 kHz

Compact disc player
Type..... Compact disc digital audio system
Optical pick-up..... 3-beam laser
Wow and Flutter..... Below measurment threshold

Power requirements
Power voltage..... 120/220–240 V (50/60 Hz)
Maximum current consumption.....0.13 A <UL, CSA, XX>
0.07 A <EU, EG, UK>
Dimensions..... 420 mm (16-6/16) W
62 mm (2-1/2) H
247 mm (9-3/4) D
Weight..... 3.5 kg (7.7 lbs) net

*** 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.**

CAUTION: USE OF CONTROLS FOR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE. THE COMPACT DISC PLAYER SHOULD NOT BE ADJUSTED OR REPAIRED BY ANYONE EXCEPT PROPERLY QUALIFIED SERVICE PERSONNEL.

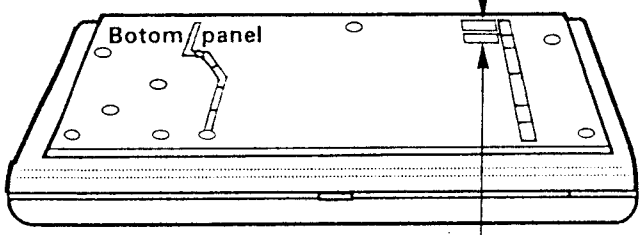
The following label has been affixed to the unit, listing the proper procedure for working with the laser beam.

(UL and XX model only)

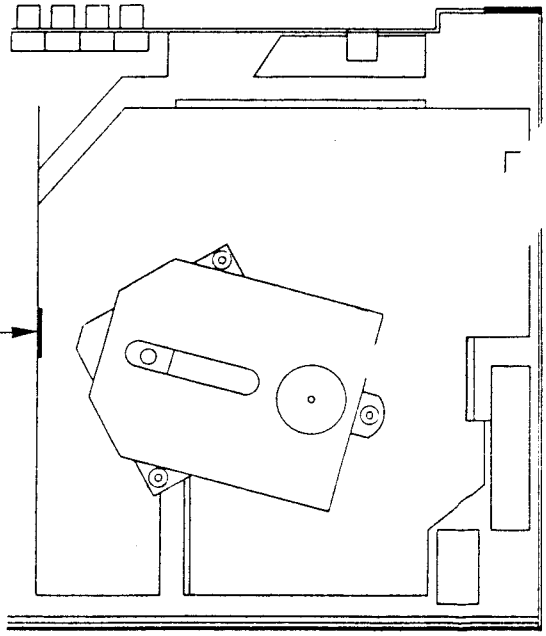
PRODUCT COMPLIES WITH DHHS RULES 21 CFR, SUBCHAPTER J, PART 1040. 10.
MANUFACTURED:

(CSA model only)

CERTIFIELD ONLY TO CANADIAN ELECTRICAL CODE.
CERTIFIÉ EN VERTU DU CODE CANADIAN DE L'ELECTRICITE SEULEMENT.



Top View



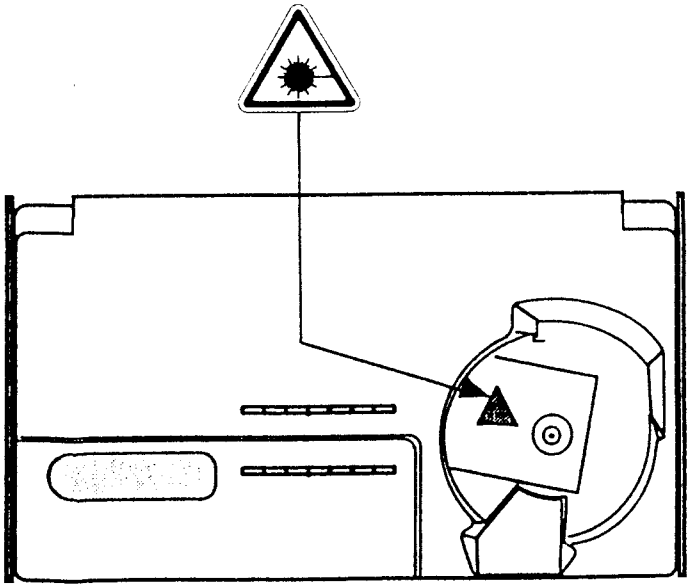
(EU, UK and EG model only)

CLASS 1
LASER PRODUCT

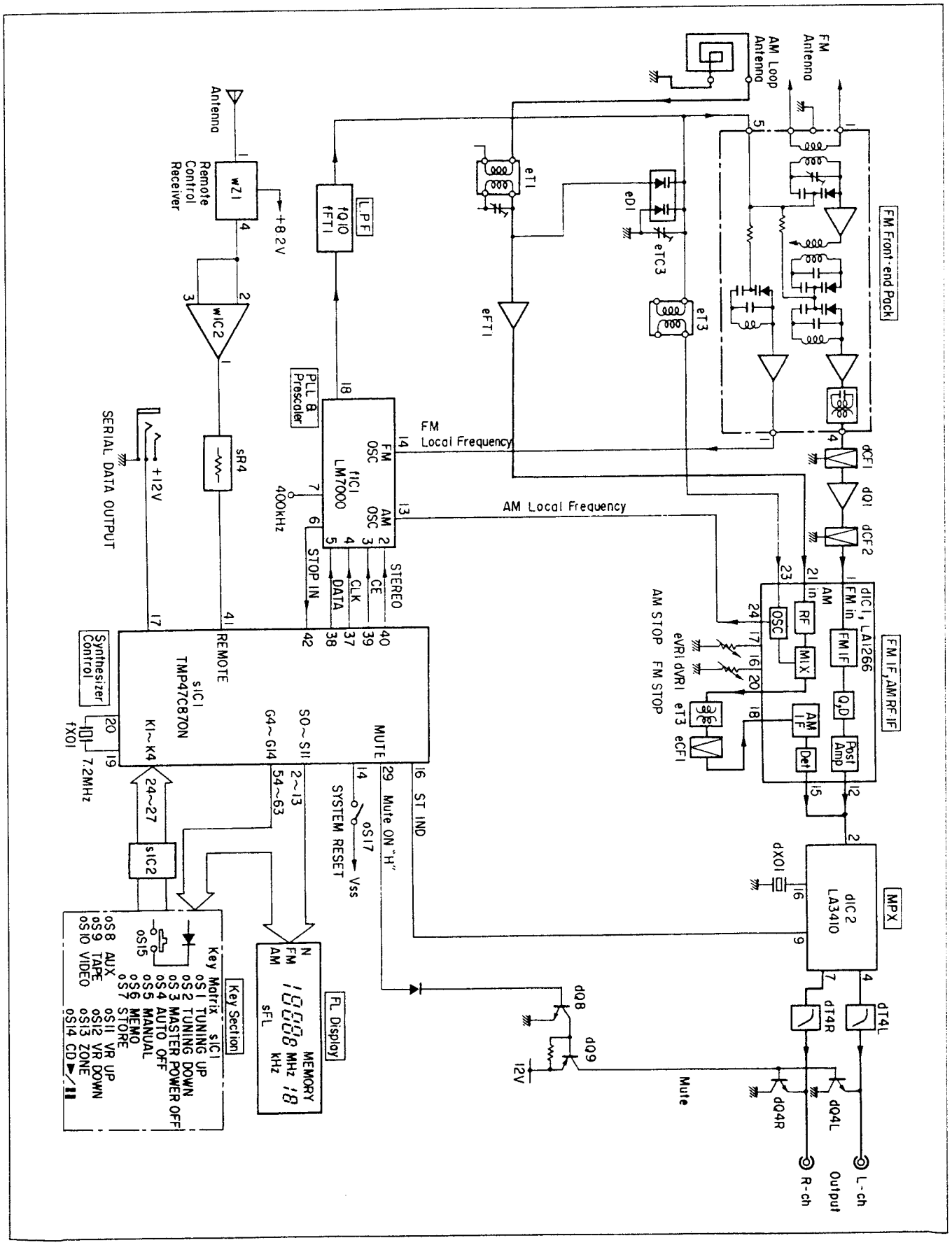
(EU model only)

ADVARSEL!
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING

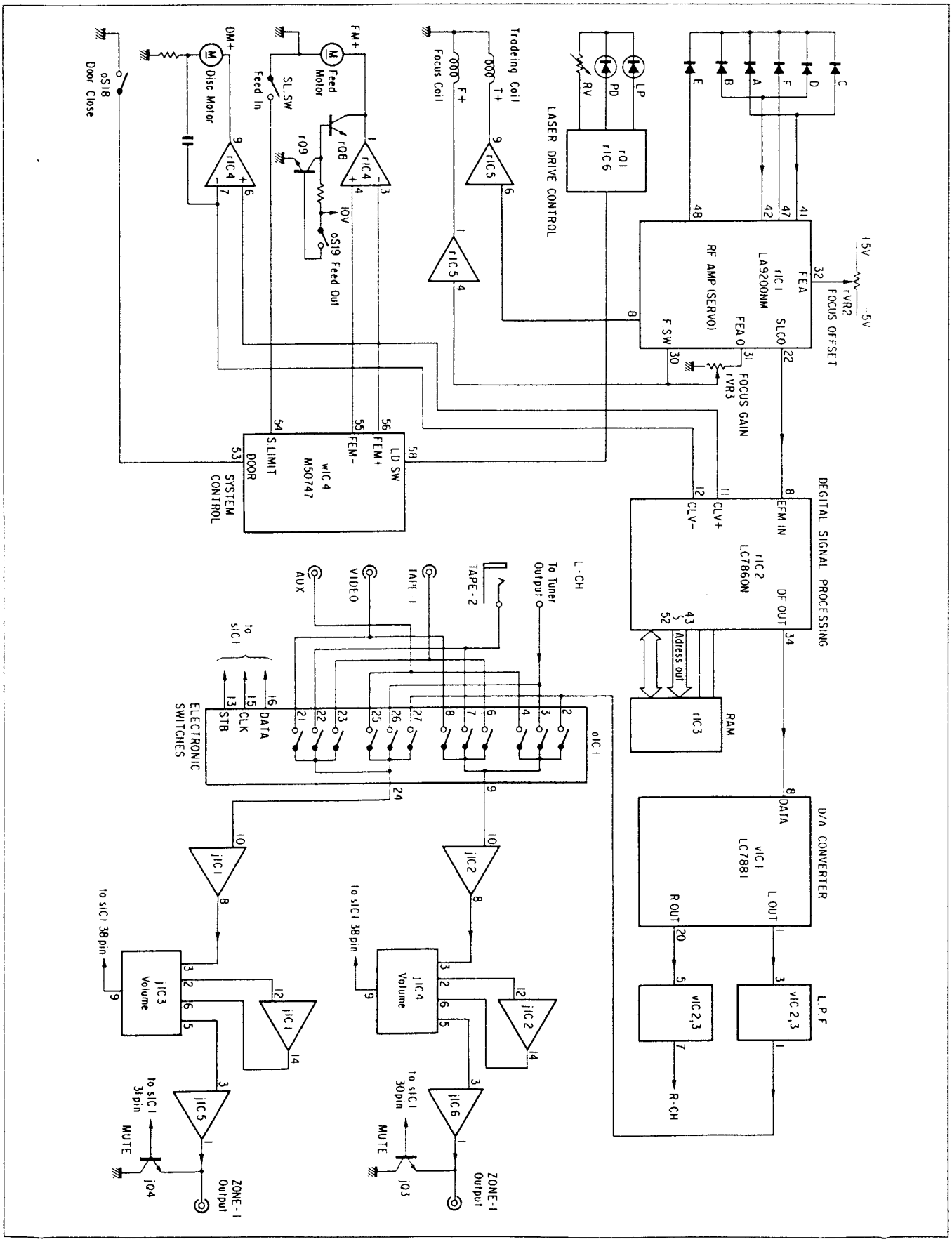
(EU, UK and EG model only)



1. BLOCK DIAGRAM 1-1. AM, FM Tuner Section



1-2. CD & Switching Section



2. ADJUSTMENT

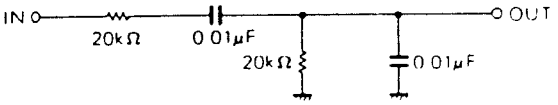
● **Test point and adjustment parts are shown in Top View on page 23.**

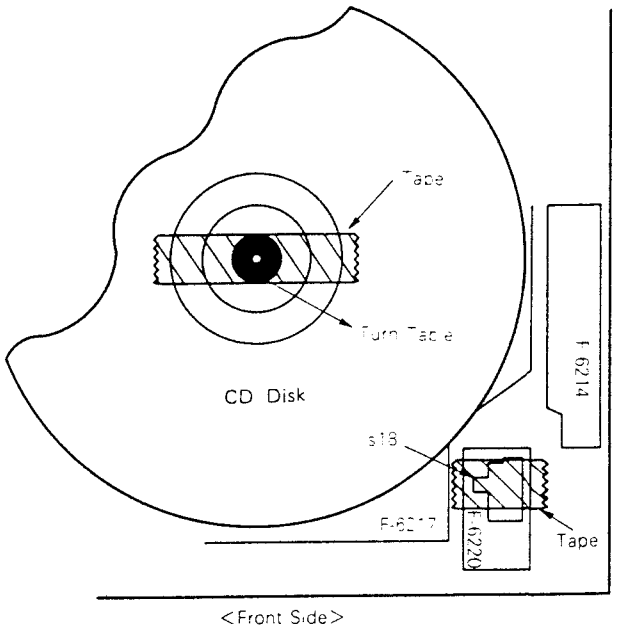
2-1. CD Adjustment

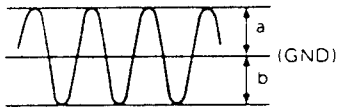
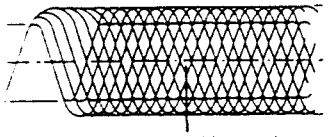
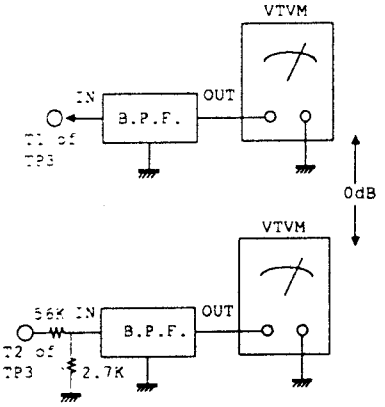
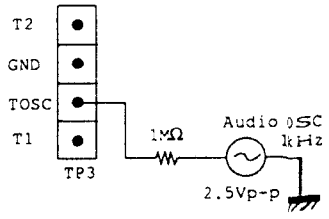
● Cautions

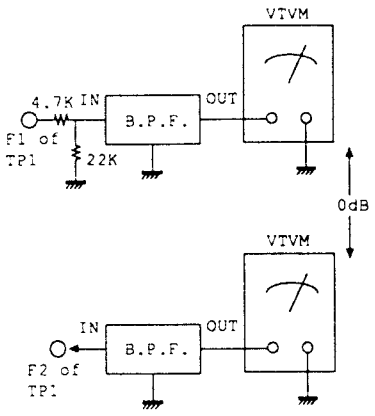
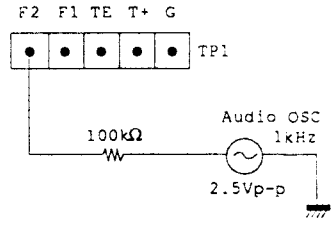
1. Turn the power OFF before removing the bonnet.
2. In executting steps 2 to 5, connect the probe after setting the disk to play.
3. Use the SONY test disc YEDS-18 or EIAJ test disc CD-1.
4. The following band pass filter (BPF) is used for adiustments.
5. Fix the switch S18 on the F-6220 to the ON position using the tape as shown in the figure on the right. (When the switch S18 is set to OFF, the CD cannot operate.)
6. When adjusting the CD, paste the tape as shown in the figure on the right to fix the disc.

Band Pass Filter (BPF)





Step	Item	Measuring Location	Adjustment Location	Adjustment	Conditions and Notes
1	VCO adjustment (carry out in STOP state)	Connect a frequency counter to TP4.	rFL1 (F-6217)	4.32MHz±30kHz	
2	Tracking offset adjustment	Connect an oscilloscope to TE of TP1.	rVR1 (F-6217)	 Set the oscilloscope to the DC range. Adjust so that a and b have the same level.	• Ground ⏚ of TP1. • Playback the 12th track of YEDS-18.
3	Focus offset	Connect an oscilloscope to the RF of TP2.	rVR2 (F-6217)	Set to maximum.  Carry out adjustments to achieve a clean overall pattern and so that the indicated portion is wide and symmetrical.	• Playback the 12th track of YEDS-18.
4	Tracking gain adjustment	Connect VTVM to T1 of TP3 via the BPF. Connect VTVM to T2 of TP3 via the BPF.	rVR4 (F-6217)	 Using the indicated voltage at T1 of TP3 as a reference, adjust the voltage at T2 to 0dB.	 • Playback the 7th track (no signal) of YEDS-18. • Apply an 1kHz signal of 2.5Vp-p from SG to TOSC of TP3 via a resistance of 1MΩ. **Fig. A**  Adjust rVR4 to the position as shown in the Fig. A if you do not have a BPF or if 0dB cannot be achieved.

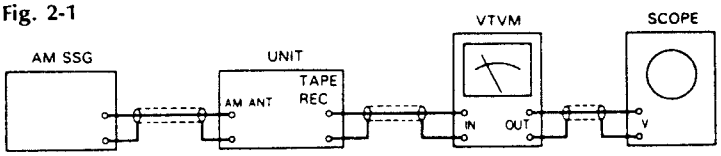
Step	Item	Measuring Location	Adjustment Location	Adjustment	Conditions and Notes
5	Focus gain adjustment	Connect VTVM to F1 of TP1 via the BPF. Connect VTVM to F2 of TP1 via the BPF.	rVR3 (F-6217)	 Using the indicated voltage at F1 to TP1 as a reference, adjust the voltage at F2 to 0dB.	 • Playback the 7th track (no signal) of YEDS-18. • Apply an 1kHz signal of 2.5Vp-p from SG to F2 of TP1 via a resistance of 100kΩ. Fig. B  Adjust rVR3 to position as shown in the Fig. B if you do not have a BPF or if 0dB cannot be achieved.

2-2. AM Adjustment

Note: 1. BAND Switch.....AM

2. Connect as shown in Fig. 2-1

Fig. 2-1



1) AM IF and Tuning Adjustment

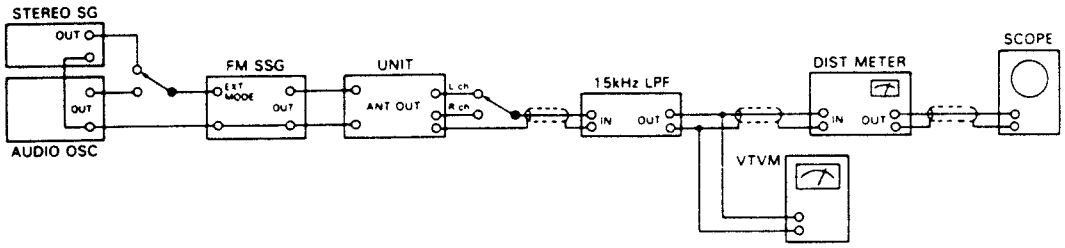
Step	Subject	Feed Signal		Measure Output	Adjust	Adjust For	Remarks
		From	To				
1	531kHz (or 530kHz) Tuning Voltage Adj.	No Input (Reception Frequency, 531kHz or 530kHz)	——	Between 6 Pin (VT) & GND (Tuner Pack) DC Volt Meter	eT3 (F-6221)	DC 1.0V±0.1V	• Repeat Procedures as stated in STEP 1 and 2.
2	1602kHz (or 1710kHz) Tuning Voltage Adj.	No Input (Reception Frequency, 1602kHz or 1710kHz)	——	Same as above	eTC3 (F-6221)	8.0V±0.1V(1602kHz) 9.0V±0.1V(1710kHz)	
3	603kHz (or 600kHz) RF Adj.	603kHz (or 600kHz) ANT Input, 50dB, 400Hz (30% MOD.), AM SSG	AM ANT Terminal	Output L or R ch, Osilloscope	eT1 (F-6221)	Max. Output	• Repeat Procedures as stated in STEP 3 and 4.
4	1404kHz (or 1400kHz) RF Adj.	1404kHz(or 1400kHz) ANT Input, 30dB, 400Hz (30% MOD.), AM SSG	AM ANT Terminal	Same as above	eTC1 (F-6221)	Max. Output	
5	IF Coil Adj.	999kHz (or 1000kHz) ANT Input, 50dB, 400Hz (30% MOD.), AM SSG	AM ANT Terminal	Same as above	eT5 (F-6221)	Max. Output	
6	Auto Stop Level Adj.	999kHz (or 1000kHz) ANT Input, 60dB, 400Hz (30% MOD.), AM SSG	AM ANT Terminal	8 Pin of dIC1, LA1266 and GND DC Volt Meter	eVR1 (F-6221)	Voltage from High level to Low level	

2-3. FM Adjustment

Note: 1. BAND Switch..... FM

2. Connect as shown in Fig. 2-2

Fig. 2-2



Step	Subject		Feed Signal From	Feed Signal To	Measure Output	Adjust	Adjust For	Remarks
1	Reference Frequency Adj. PLL clock		No Input	——	Between Point Ⓐ (Pin 6 of fIC1) and GND (F-6221) Frequency Counter with high Impedance probe	fTC1 (F-6221)	Confirm 400kHz	FL Display 98MHz (Reception Frequency)
2	Discriminator Coil Adj.	1)	98MHz ANT Input, 65dBf (59.8dB), 1kHz (100% MOD.), FM SSG	FM ANT Terminal	Between Point Ⓑ and Point Ⓒ, (Across the dR23 F-6221) DC Volt Meter	dT1 (F-6221)	DC 0±30mV	• Repeat proce dures as stated in subject 1 & 2.
		2)	Same as above	Same as above	Output L or R ch, Dist Meter	dT2 (F-6221)	Min. THD	
3	Auto Stop Level Adj.		98MHz ANT Input, 22dBf (16.8dB), 1kHz (100% MOD.), FM SSG	FM ANT Terminal	Between Point (Pin 8 of dIC1) and GND. (F-6221) DC Volt Meter	dVR1 (F-6221)	Voltage from High level to Low level	
4	Confirm Stereo Separation Adj.		98MHz ANT Input, 65dBf (59.8dB), FM SSG, Pilot 19kHz (9% MOD.), L MODE 1kHz+Pilot (100% MOD.), STEREO SG	FM ANT Terminal	Output L or R ch, VTVM & Oscilloscope	——	Read the indication on VTVM –30dB from the indication above.	• Confirm R–L ch

● NOTICE FOR FM ADJUSTMENT

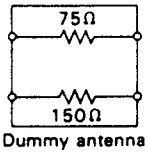
There are two kind in indication of FM SSG output attenuator.

1. Attenuator with marking of 75Ω open ..... open indication type.
2. Attenuator with marking of 75Ω load or close ..... load or close indication type.

FM SG output level in this FM adjustment are described as open indication type.

To feed FM signal, a dummy antenna circuit as Fig. 2 - 3 must be connected between FM SG output and ANT terminal (300Ω) of the unit.

Fig. 2-3



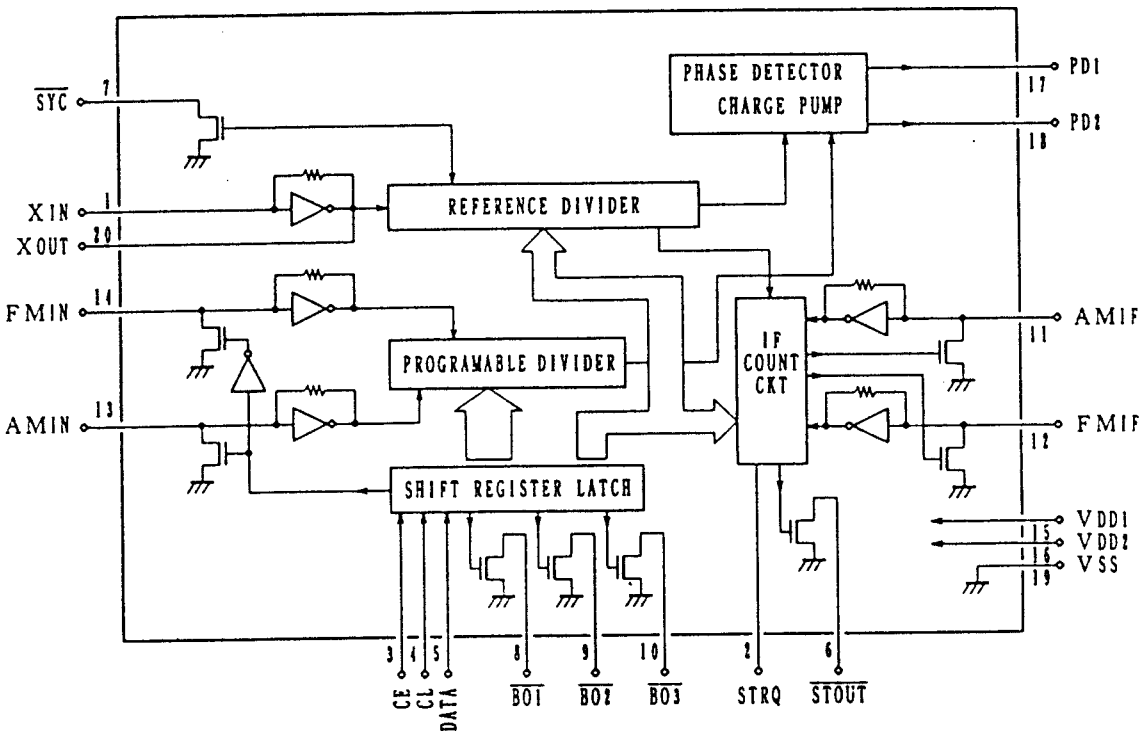
Dummy antenna

- The following table shows relations among FM SG attenuator indication (dB), available power ratio (dBf) and antenna terminal voltage (dB/μV) in each indication type.

	FM SG Attenuator Indication	Available Power Ratio	Antenna Terminal Voltage
Open indication type	0 dB 66 dB	–0.8 dBf 65.2 dBf	–6 dB/μV 60 dB/μV
Load or close indication type	0 dB 60 dB	5.2 dBf 65.2 dBf	0 dB/μV 60 dB/μV

3. INTERIOR BLOCK DIAGRAM & FUNCTION OF IC/FL DISPLAY

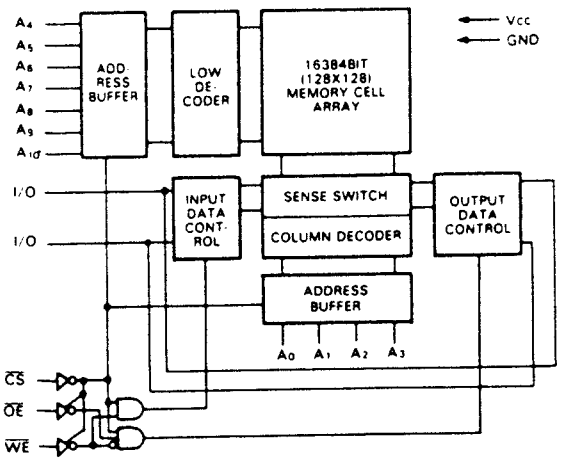
● LM7000 <PLL Frequency Synthesizer>

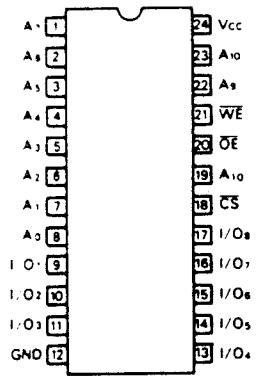


Terminal Function

$\overline{SYC}$	:	Controller Clock (400kHz)
X IN, XOUT	:	X'tal OSC (7.2MHz)
FM IN, AM IN	:	OSC Signal Input
CE, CL, DATA	:	Data Input
$\overline{BO1}$, $\overline{BO2}$, $\overline{BO3}$	:	Data Band Input
STRQ	:	Request Input for IF Calculation
$\overline{ST\ OUT}$	:	Output for Auto Serch
VDD1, VDD2, VSS	:	Power Supply (VDD2 : for Back-up)
AM IF, FM IF	:	IF Signal Input
PD1, PD2	:	Charge Pump Output

● CXK5816PN/LC3517B
<2048 Word x 8bit Static RAM>





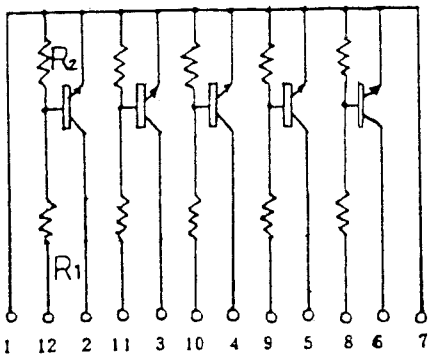
A0 ~ A10: Address Input
I/O1 ~ I/O8: Data Input
CS: Chip Select Input
WE: Write Enable Input
OE: Output Enable Input
Vcc: +5V Power Supply
GND: Ground

◆ Action Mode

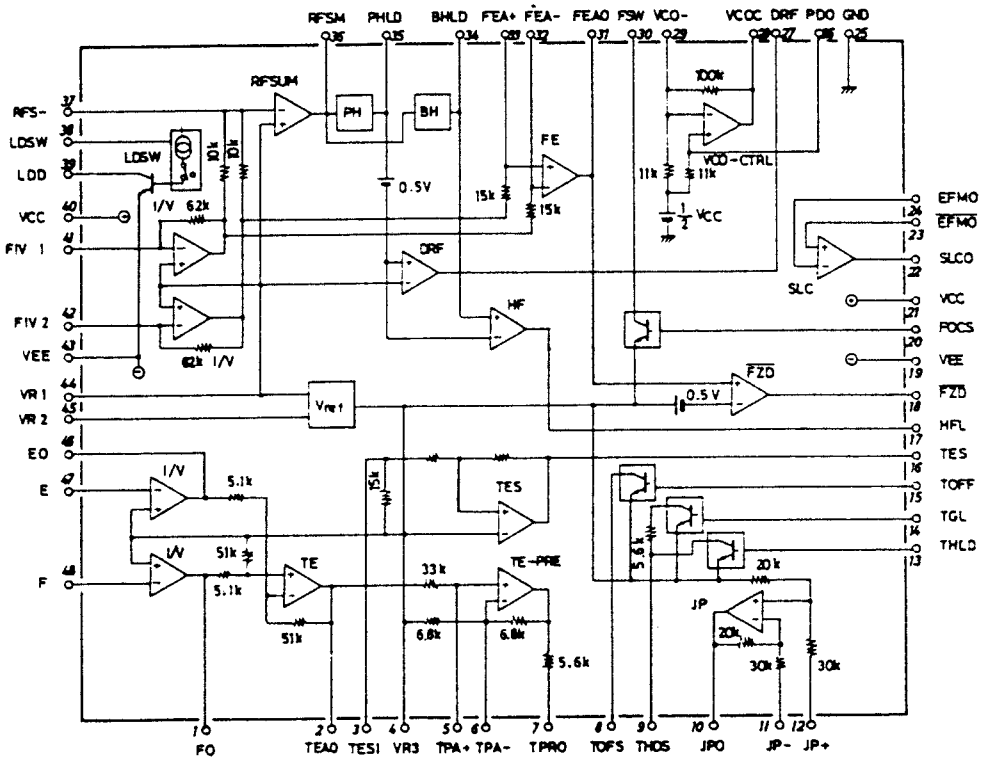
CS	OE	WE	CHIP	OUTPUT MODE	CURRENT
H	X	X	Non Select	High Impedance	Iccs
L	H	H			Icca
L	L	H	Read	Dout	
L	X	L	Write	Din	

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

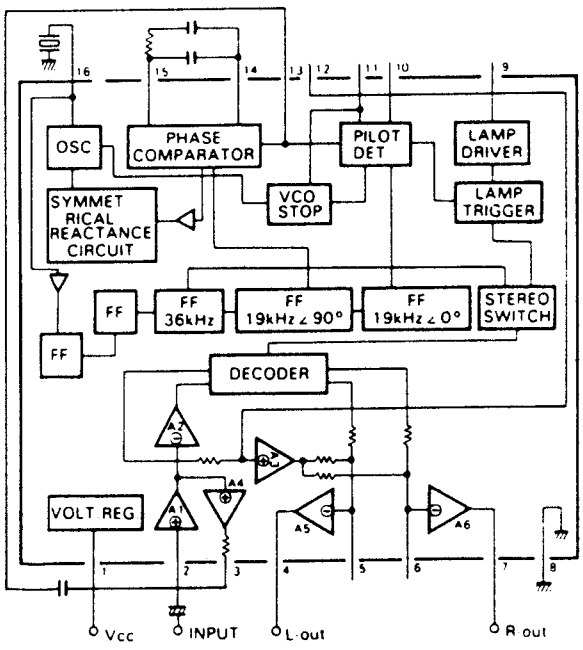
● DT5C1245
<Digital Transistor Array>



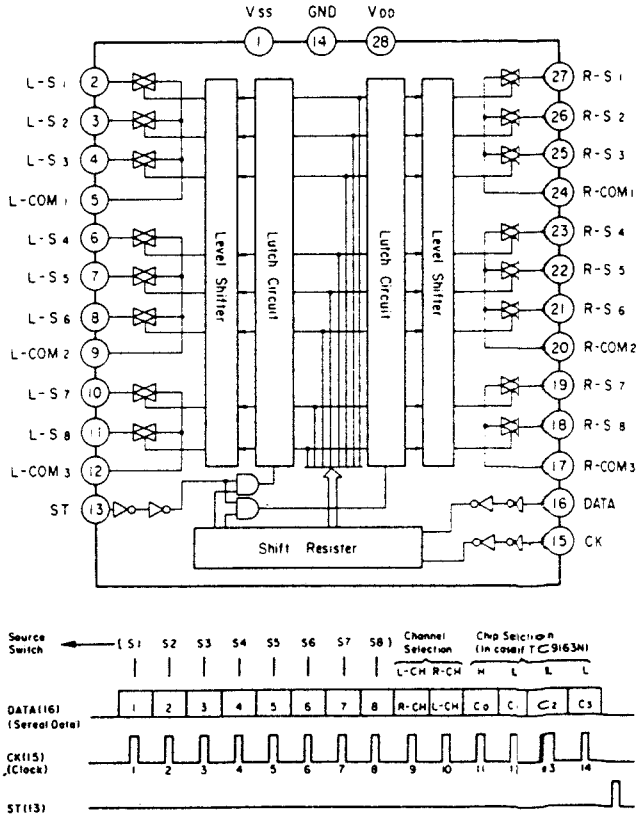
● LA9200NM <RF Amp & Mecha Servo>



● LA3410 <MPX>



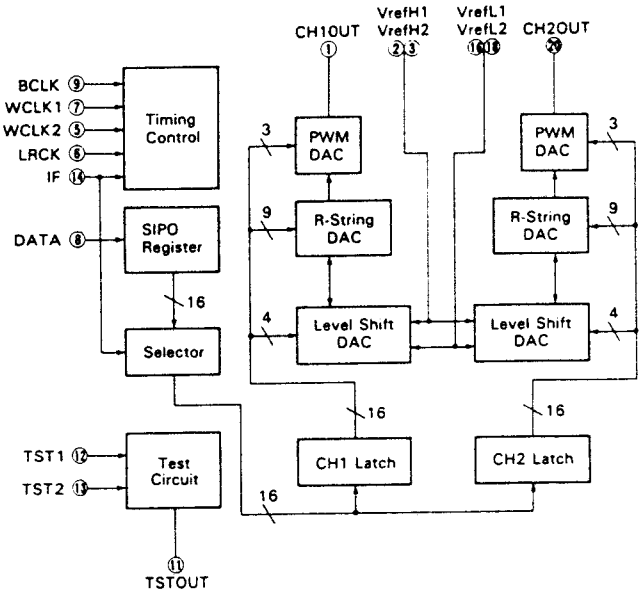
● TC9163N <Analog Switch>



◆ ST Terminal Function

- When data bit 1 is High level, source switch 1 is ON.
  In the same manner, when data bit 2 (3 ~ 8) is Highlevel, source switch 2 (3 ~ 8) is ON.
- Shift resister recieves 14 bit sereal datas, and their datas are sent to the lutch circuit by the ST signal.

● LC7881 <D/A Converter>



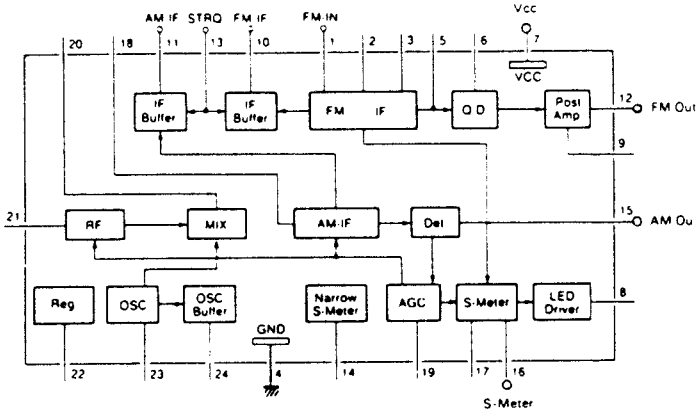
◆ Terminal Function <LC7881>

Pin No.	Pin Name	I/O	Description
1	CH1OUT	O	A channel 1 analogue data output.
2	VrefH1	I	Reference voltage input 1. (HIGH level)
3	VrefH2	I	Reference voltage input 2. (HIGH level)
4	V	–	Positive supply voltage: +5V.
5	WCLK2	I	Word clock input 2. When IF is HIGH, WCLK2 is must be held in LOW. When IF is LOW, channel 1 data is latched by the fallowing edge of word clock (WCLK2).
6	LRCK	I	Strobe signal input from the CXD1135Q. Typical frequency = 88.2 kHz. A channel 1 digital data input when LRCK is HIGH. A channel 2 digital data input when LRCK is LOW.
7	WCLK1	I	Word clock input 1. When IF is HIGH, channel 1 and 2 data are latched by the falling edge of word clock (WCLK1). When IF is LOW, channel 2 data is latched by the falling edge of word clock (WCLK1).
8	DATA	I	Serial data input. When IF is HIGH, the serial data is inputted with most-significant bit first. When IF is LOW, the serial data is inputted with least-significant bit first.
9	BCLK	I	Bit clock input. Typical frequency = 4.2336 MHz. This clock is used to synchronize the serial data.
10	V	–	Positive supply voltage: +5V.
11	TSTOUT	O	Test output; in normal operation this pin should be held open state.
12 13	TST1 TST2	I	Test input; in normal operation this pin should be connected to ground.
14	IF	I	Selects input digital data mode. When IF is HIGH, the digital data is inputted with most-significant-bit first. When IF is LOW, the digital data is inputted least-significant-bit first.

<LC7881>

Pin No.	Pin Name	I/O	Description
15	GND	–	Ground.
16	VrefL1	I	Reference voltage input. (LOW level)
17	GND	I	Ground.
18	VrefL2	I	Reference voltage input. (LOW level)
19	NC	–	Not Connection.
20	CH2OUT	O	A channel 2 analogue data output.

● LA1266 <FM-IF, AM-RF·MIX·IF>



● M50747 <System Control>

◆ Terminal Function

PORT	PIN	I/O	FUNCTION	L	H
VDD	1	–	+5V		
P37	18	O	Sereal Output SRDY	○	
P36	19	I	Sereal Input CLK		
P35	20	O	Sereal Output TXD		
P34	21	I	Sereal Input RXD		
P30	25	I	Power Down	○	
$\overline{INT1}$	26	I	Power Down	○	
CNUSS	27	I	Vss		
$\overline{RESET}$	28	I	Reset Input	○	
XIN	29	I	Clock Input, 4,3218MHz		
VSS	32	–	Vss 0V		
P03	53	I	Door Close Sensor	○	
P02	54	I	Disc Inside Sensor Switch	○	
P01	55	O	Feed Motor Control, EFM –		○
P00	56	O	Feed Motor Control, EFM +		○
P27	57	I	Focus Detection		○
P26	58	I	Laser Switch	○	
P25	59	I	Threshold Detection		○
P24	60	O	Clock for DSP		
P23	61	O	Data for DSP		
P22	62	I	Sub Q Code Input		
P21	63	O	Input/output Switch for DSP	INPUT	OUTPUT
P20	64	I	Sub Q Code Input enable		○

● LC7860NA <Signal Processing Control>

Pin No.	Pin Name	I/O	Description
1	TEST1	I	For LSI test. Not connected in normal use.
2	A0	O	VCO is formed by connecting LC resonance circuit between AI and AO. PDO (8.6436 MHz) is phase output with EFM signal, set so the frequency rises at "+" level.
3	A1	I	
4	PDO	O	
5	VSS	–	GND
6	EFMO	O	1-2 Vp-p HF signal is input to EFMIN. EFM signals which have opposite phases are output from EFMO and $\overline{\text{EFMO}}$ through amplitude limiters. This controls the slice level.
7	$\overline{\text{EFMO}}$	O	
8	EFMIN	I	
9	TEST2	I	For LSI test. Not connected in normal use.
10	VDD	–	+5 V
11	CLV+	O	Output for disc motor control.
12	CLV-	O	
13	FOCS	O	Focus servo is turned OFF when FOCS is "H". Lens is lowered when FST is "L". Lens is gradually lifted when FST is "H". When $\overline{\text{FZD}}$ is generated, FOCS is rest. For focusing.
14	FST	O	
15	$\overline{\text{FZD}}$	I	
16	HFL	I	Generates kick pulses JP+ and JP- according to the track jump command. Specified number of tracks (1, 4, 16, 64) is jumped.
17	TES	I	
18	FSEQ/ PCK	O	When 4.3218 MHz PCK monitor pin/DEMO is "H", set to "H" when the SYNC detected from EFM signal matched with the SYNC of the counter.
19	TOFF	O	Kick pulses JP+ and JP- are generated according to the track jump command. Specified number of tracks (1, 4, 16, 64) is jumped.
20	TGL	O	
21	THLD	O	
22	JP+	O	
23	JP-	O	
24	DEMO	I	For the set adjustment process. Sound function.
25	TEST3	I	For LSI test. Not connected in normal use.
26	EMPH	O	Deemphassis is required with "H".
27	DFOFF	I	Digital filter ON/OFF switch. Filter is OFF at "H".
28	DSPOFF	I	For LSI test. Set to "L" in normal use.
29	SMP2	O	Signal output to DAC, L/R selection, signal for sample hold.
30	LRCLK	O	
31	VDD	–	+5 V
32	SMP3	O	Signal output to DAC, L/R selection, signal for sample hold.
33	SMP1	O	
34	DFOUT	O	
35	DACLK	O	
36	DFIN	I/O	Signal output corresponding to CDROM.
37	LRSY	O	Also sync signal for the above.
38	MSBF	I	Signal output to DAC, L/R selection, signal for sample hold.
39	CK2	O	2.1609 MHz
40	AD10	O	RAM address output.
41	$\overline{\text{OE}}$	O	When $\overline{\text{WE}}$ is "L", output state. When $\overline{\text{WE}}$ is "H", input state. $\overline{\text{OE}}$ is used for I/O control.
42	$\overline{\text{WE}}$	O	
43-52	AD9 -AD0	O	RAM address output.
53	DB7	I/O	DB7-DB0 : Connected to the RAM data terminal.
54	DB6	I/O	
55	DB5	I/O	
56	VSS	–	GND
57-61	DB4-DB0	I/O	DB7-DB0 : Connected to RAM data terminal.
62	TEST4	I	For LSI test. Not connected in normal use.
63	TEST5	I	
64	IOFF	I	CDROM compatible, interpolation with "H", previous data not held.
65	EFLG	O	For the correction monitor of C1, C2.

<LC7860NA>

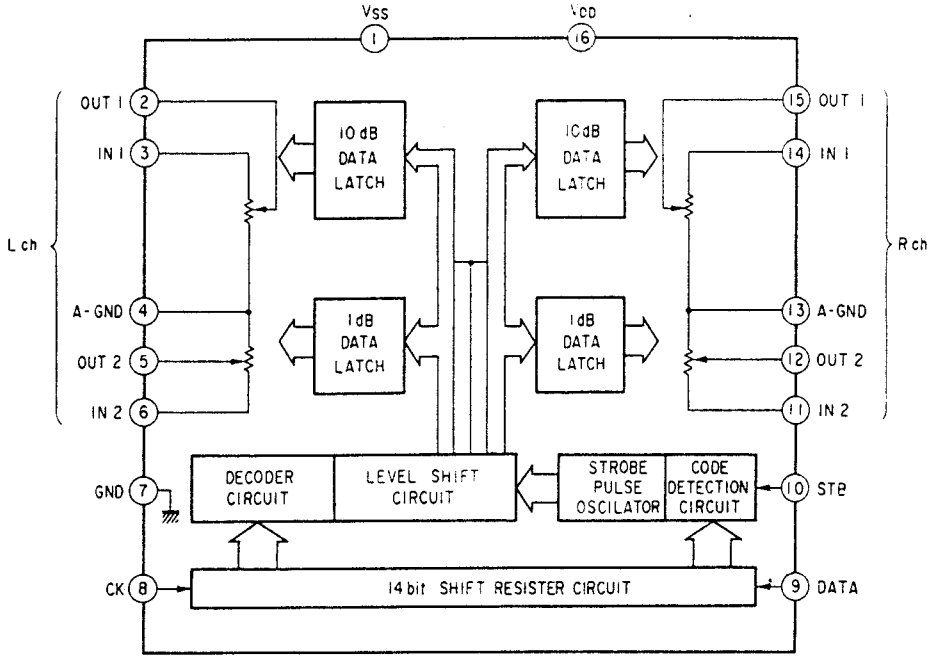
Pin No.	Pin Name	I/O	Description
66	PW	O	PWSY detects the change from H to L with sub/main combined SYNC externally and sends clock pulse 8 times to SBCK and read P, Q, R, S, T, U, V and W sub-codes.
67	PWSY	O	
68	SBCK	I	
69	FSX	O	7.35 kHz sync signal output.
70	WRQ	O	WRQ is set to "H" when the data of sub-code Q passed the CR check. This is detected externally, the data from SQOUT is read out by sending $\overline{\text{CQCK}}$. If the data is needed at LSB FIRST, set M/L to "L". After RWC is set to "H" by microprocessor, the command is given by sending the synchronized $\overline{\text{CQCK}}$ command data.
71	RWC	I	
72	SQOUT	O	
73	VDD	–	+5 V
74	COIN	I	
75	$\overline{\text{CQCK}}$	I	
76	$\overline{\text{RES}}$	I	When the power is turned on, set to "L" for a specified time.
77	M/L	I	
78	VSS	–	GND
79	XIN	I	8.6436 MHz crystal oscillator connection terminal.
80	XOUT	O	

● TMP47C870N <System Controller>

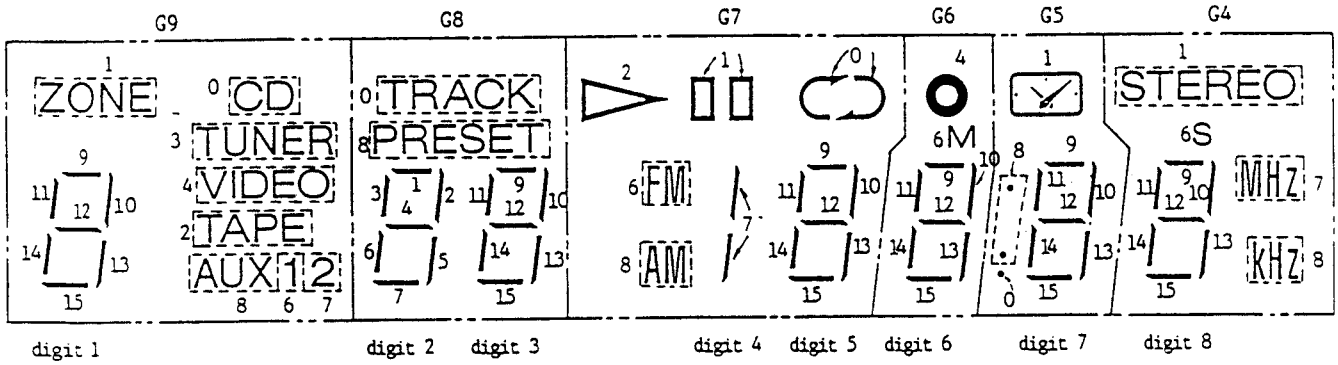
◆ Terminal Function

PORT	PIN	I/O	FUNCTION	L	H
K00	14	I	BACK UP VOLT	RAM CLEAR<1.25	RAM KEEP>1.25
K01	15	I	$\overline{\text{TEST IN}}$	TEST	NORMAL
K02	16	I	STEREO IND. IN	FL ON	OFF
K03	17	I	COMPULINE CHK	IN USE	VACANT
P00 PWM	23	O	PEE OUT		500Hz
P10	28	O	POWER OUT	OFF	ON
P11	29	O	TUNER MUTE	NORMAL	MUTE
P12	30	O	ZONE1 MUTE	NORMAL	MUTE
P13	31	O	ZONE2 MUTE	NORMAL	MUTE
P20	33	O	ANA. SW-1 STB		○
P21	34	O	ANA. SW-2 STB		○
P22	35	O	ICVR1 STB		○
P23	36	O	ICVR2 STB		○
R60	24	I	$\overline{\text{K1}}$	○	
R61	25	I	$\overline{\text{K2}}$	○	
R62	26	I	$\overline{\text{K3}}$	○	
R63	27	I	$\overline{\text{K4}}$	○	
R70	37	O	CLK OUT		○
R71	38	O	DATA OUT		○
R72	39	O	CE PLL (LM-7000)		○
R73	40	O	F. COUNT START		○
R80 INT2	41	I	REMOCON IN	○	
R81	42	I	$\overline{\text{STOP IN}}$	F. OK	NEXT
R82 INT1	43	I	$\overline{\text{CD SEND READY}}$	SEND	
R83	44	I	$\overline{\text{SIGNAL}}$	○	
R90 SI	45	I	SER. DATA IN		○
R91 SO	46	O	SER. DATA OUT		○
R92 CK	47	O	SER. CLK OUT		○
KE0	22	I	BACKUP IN	BACK UP	RUN
R30	48	O	COMPULINE OUT		SEND
R31	49	O	ZONE1 PEE MUTE		○
R32	50	O	ZONE2 PEE MUTE		○
R33	51	O	REC OUT MUTE	NORMAL	MUTE
RA0	52	I			
RA1	53	I	TAPE2 JACK IN	TAPE1	TAPE2

● TC9123P <Electroric Volume>



● DESCRIPTION OF FL DISPLAY, CPR2352



● Pin Assignment

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
Assignment	F	G9	G8	G7	G6	G5	G4	P15	P14	P13	P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1	P0	F

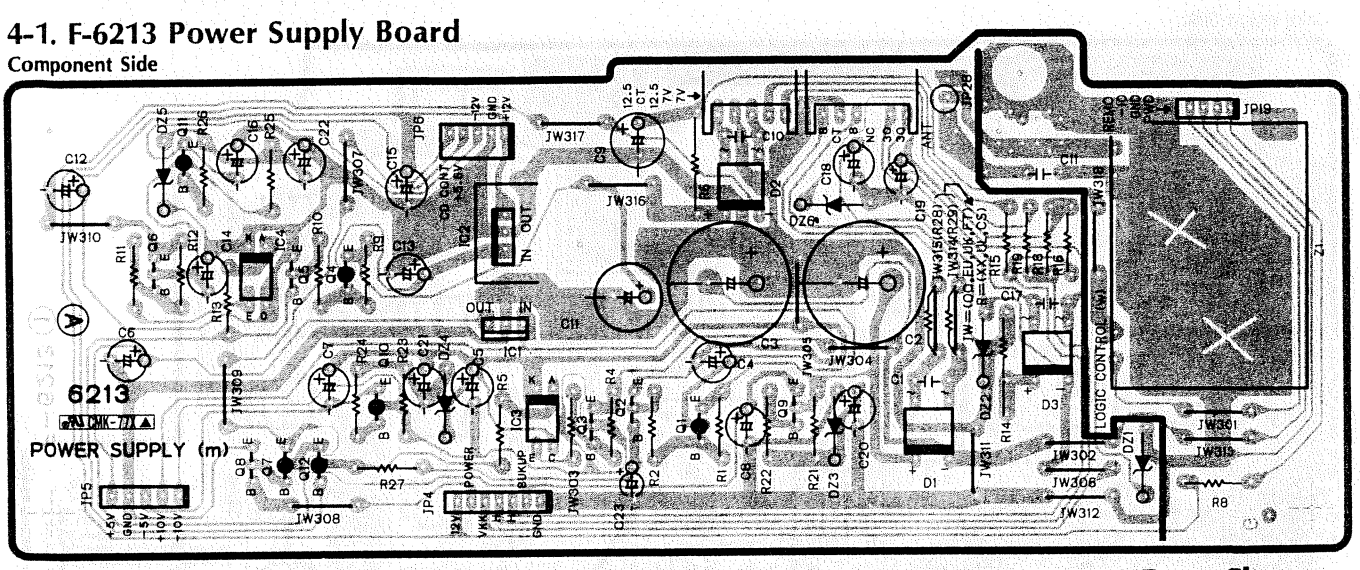
Anode SFL1 \ Grid SFL1 SIC1	SIC1	G4 59	G5 58	G6 57	G7 56	G8 55	G9 54
P0	2	–	(7) DOT	–	⬭	TRACK	CD
P1	3	STEREO	▽	–	□□	(2) a	ZONE
P2	4	–	–	–	▷	(2) b	TAPE
P3	5	–	–	–	–	(2) f	TUNER
P4	6	–	–	◎	–	(2) g	VIDEO
P5	7	–	–	–	–	(2) c	–
P6	8	SECOND	–	MINUTE	FM	(2) e	–
P7	9	MHz	–	–	(4) bc	(2) d	–
P8	10	kHz	TIME COLON	–	AM	PRESET	AUX
P9	11	(8) a	(7) a	(6) a	(5) a	(3) a	(1) a
P10	12	(8) b	(7) b	(6) b	(5) b	(3) b	(1) b
P11	13	(8) f	(7) f	(6) f	(5) f	(3) f	(1) f
P12	63	(8) g	(7) g	(6) g	(5) g	(3) g	(1) g
P13	62	(8) c	(7) c	(6) c	(5) c	(3) c	(1) c
P14	61	(8) e	(7) e	(6) e	(5) e	(3) e	(1) e
P15	60	(8) d	(7) d	(6) d	(5) d	(3) d	(1) d

SIC1 : TM47C87ON SFL1 : CPR2352

4. PARTS LOCATION ON BOARD

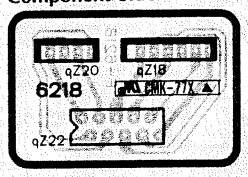
4-1. F-6213 Power Supply Board

Component Side



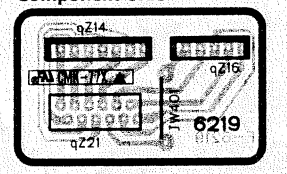
4-2. F-6218 Connector Board

Component Side



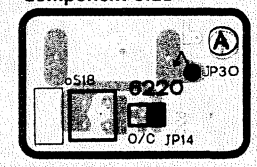
4-3. F-6219 Connector Board

Component Side



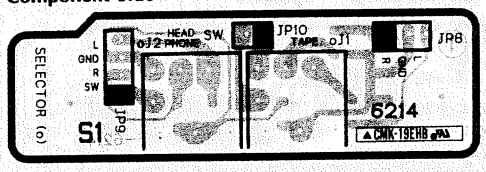
4-4. F-6220 Door Close Detection Board

Component Side

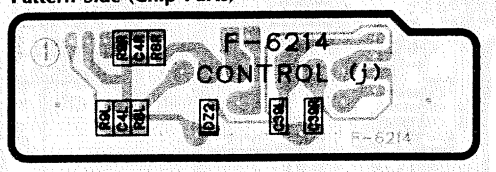


4-5. F-6214 Head Phone & TAPE 2 Terminal Board

Component Side

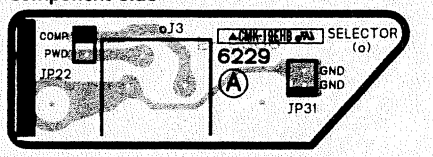


Pattern Side (Chip Parts)



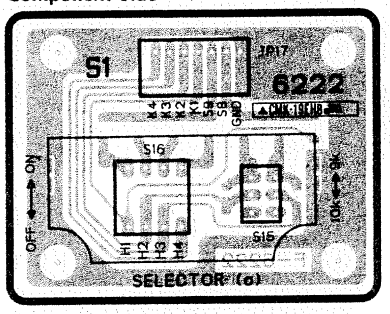
4-6. F-6229 System Control Board

Component Side

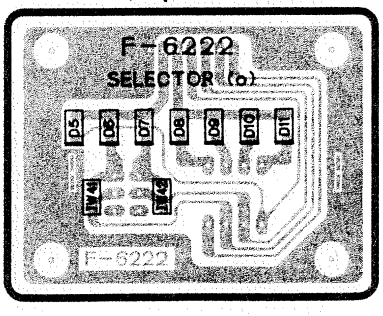


4-7. F-6222 IF Band SW. & House Code SW. Board

Component Side

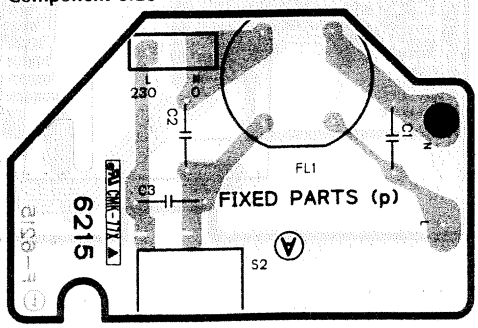


Pattern Side (Chip Parts)



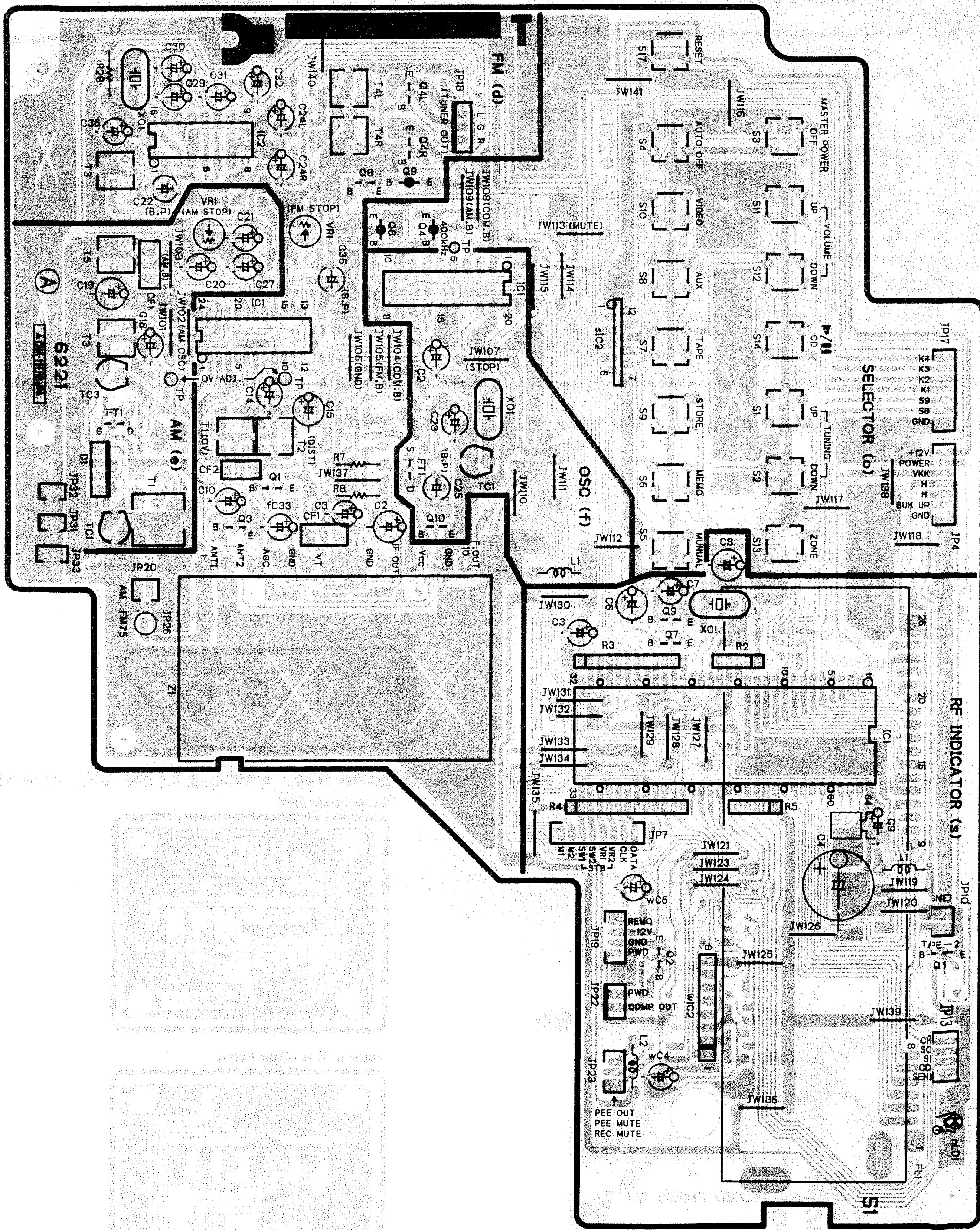
4-8. F-6215 Line Filter Board <EU, UK, EG>

Component Side



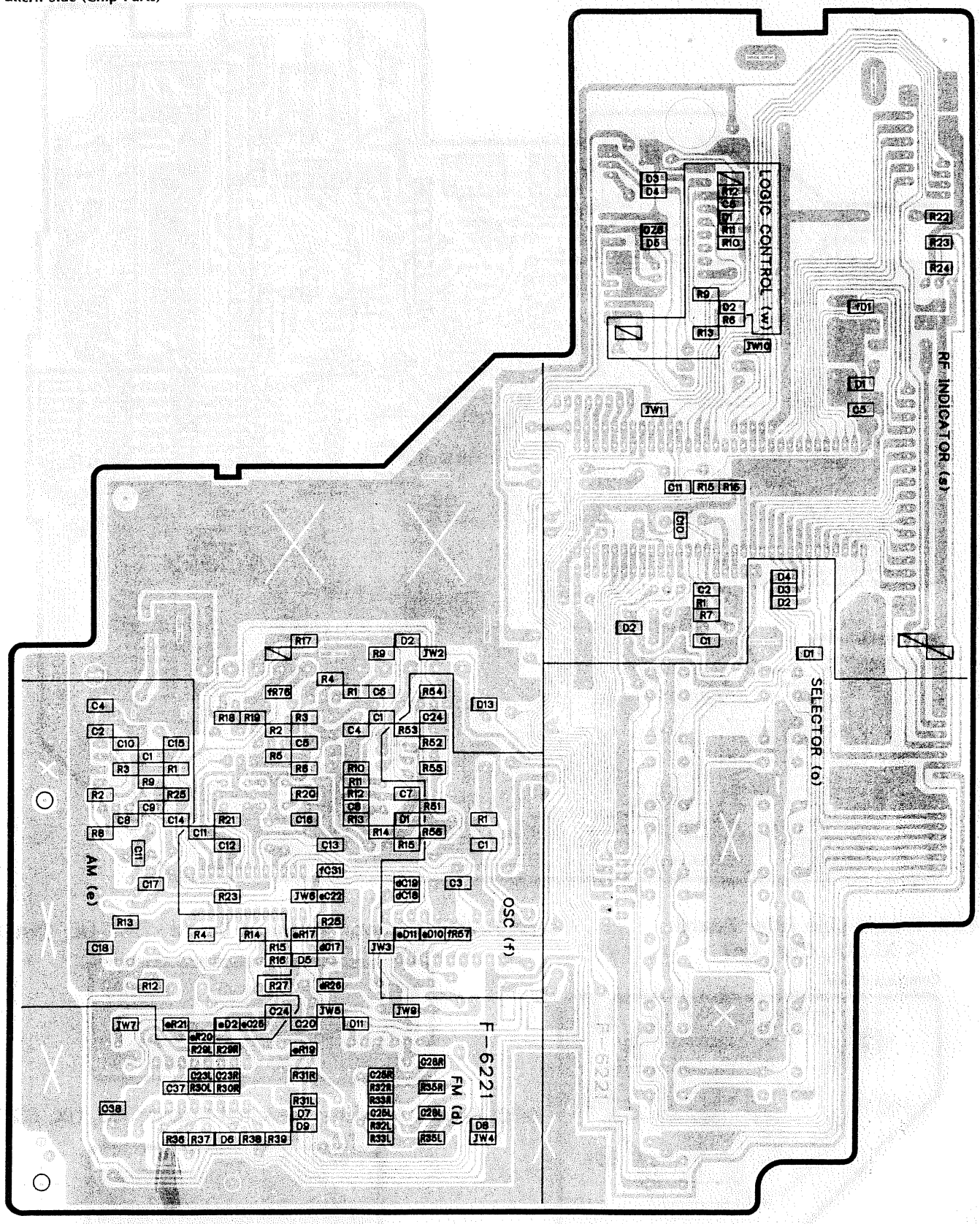
4-9. F-6221 FM, AM Tuner Board

Component Side



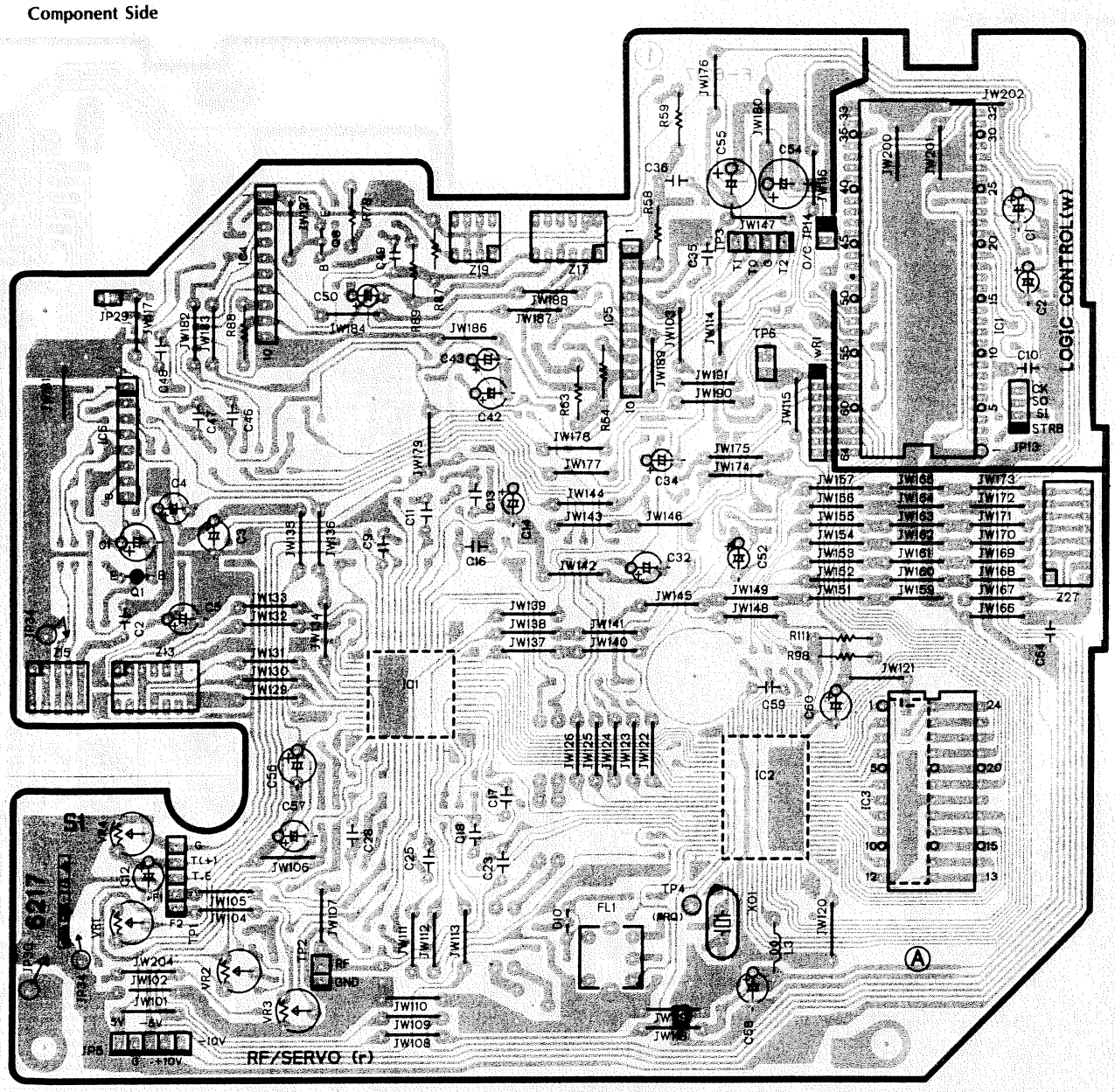
F-6221 FM, AM Tuner Board

Pattern Side (Chip Parts)



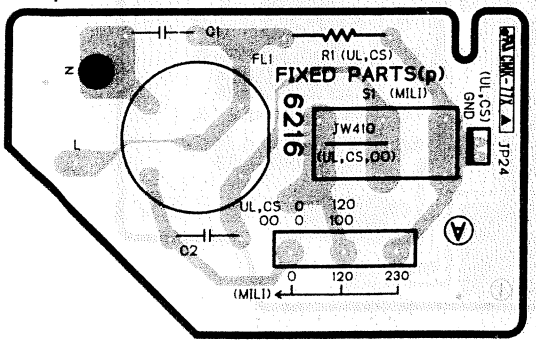
4-10. F-6217 CD Circuit Board

Component Side



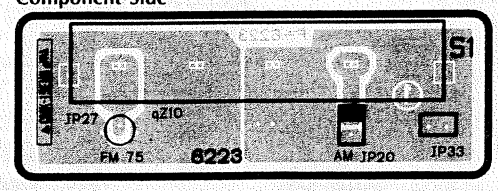
4-11. F-6216 Line Filter Board <XX, UL, CSA, OO>

Component Side



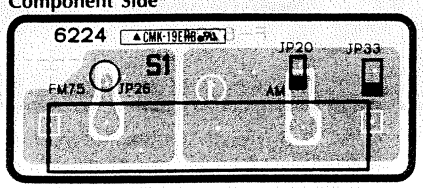
4-12. F-6223 Antenna Terminal Board <XX, UL, CSA>

Component Side



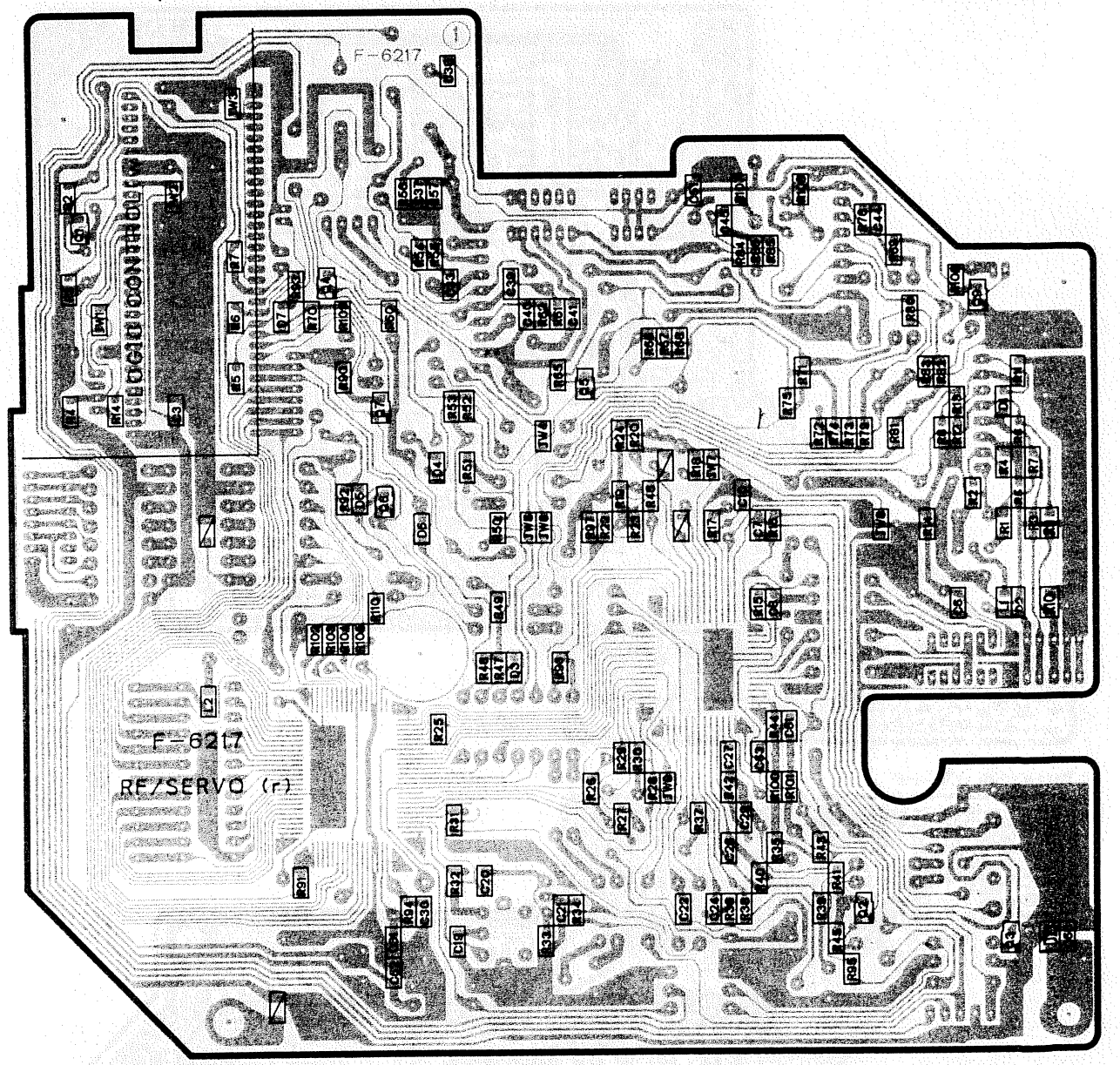
4-13. F-6224 Antenna Terminal Board <EU, UK, EG>

Component Side



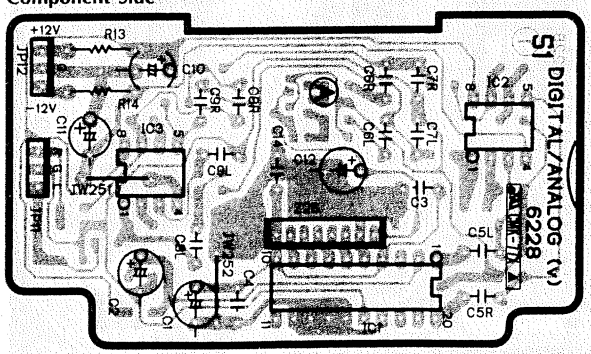
F-6217 CD Circuit Board

Pattern Side (Chip Parts)

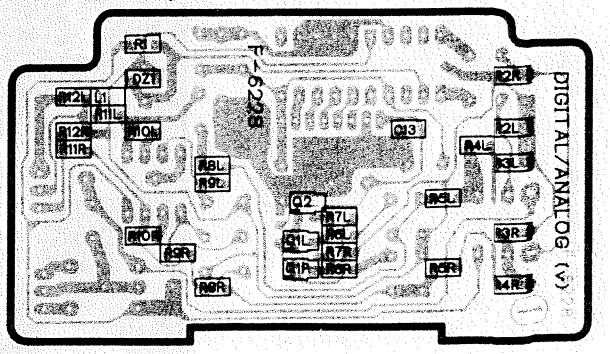


4-14. F-6228 D/A Converter Board

Component Side

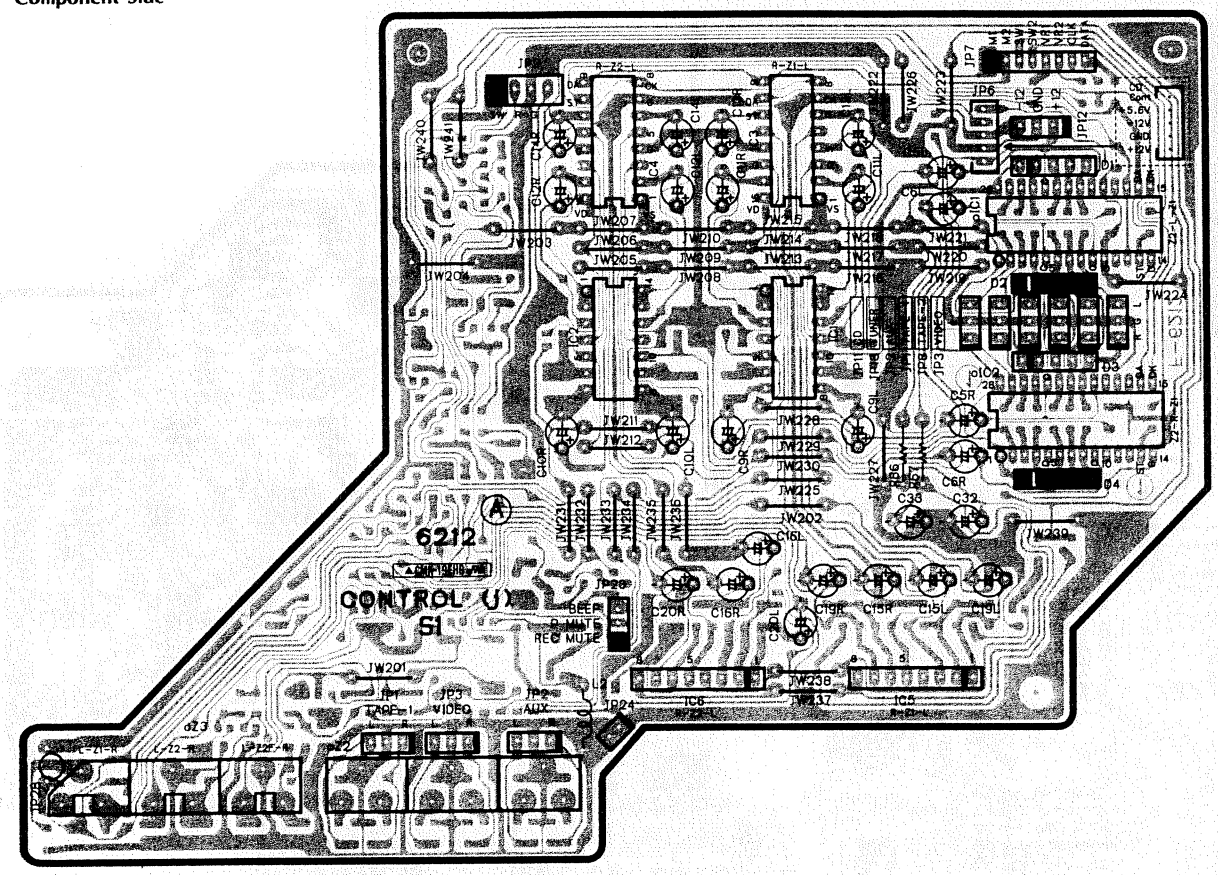


Pattern Side (Chip Parts)

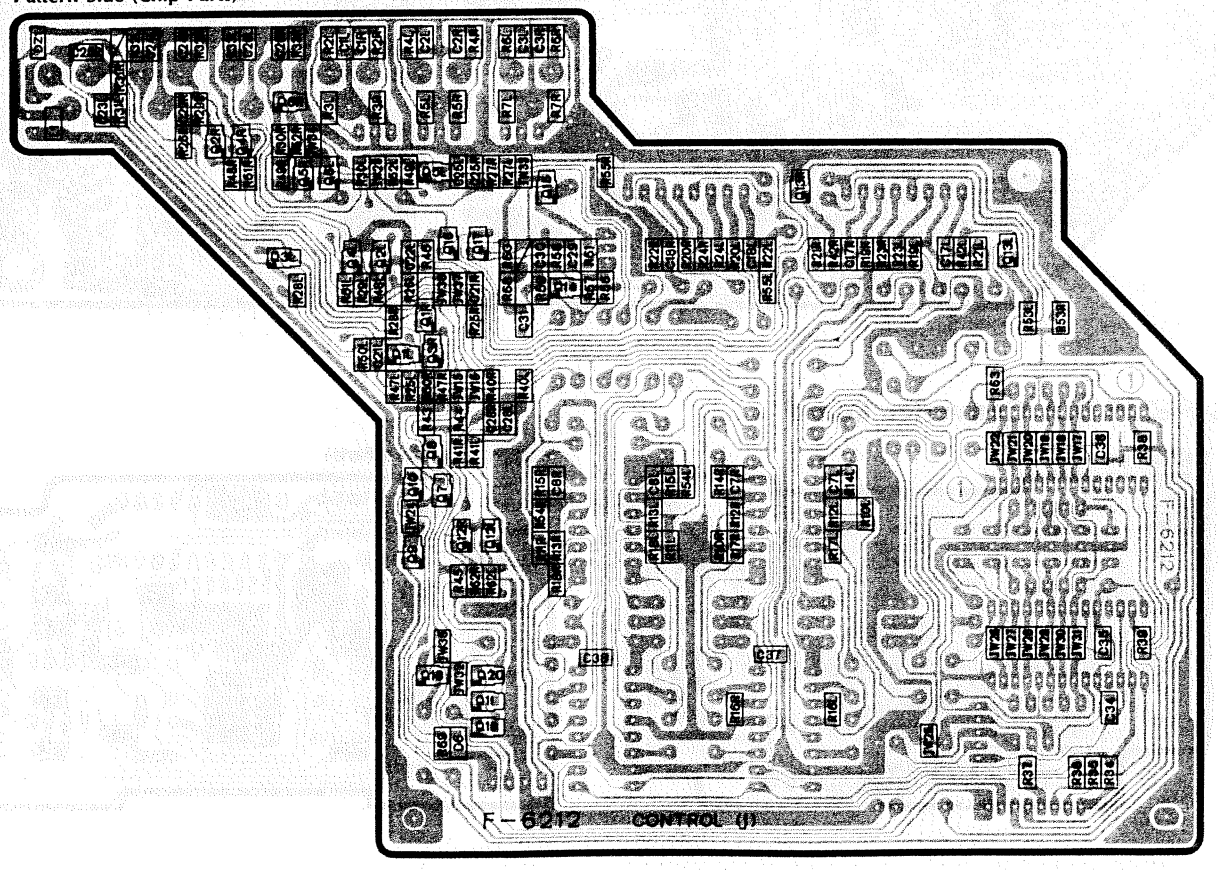


4-15. F-6212 Analog SW & Level Volume Board

Component Side



Pattern Side (Chip Parts)



5. PARTS LIST OF CIRCUIT BOARD

5-1. F-6212 Analog Switch & Level Volume Board <Stock No. >

Parts No.	Stock No.	Description
·Transistor		
jQ1~6	139125	2SC3326
jQ7	139124	DTA124EK
or	139127	RN2403
jQ8	139124	DTA124EK
or	139127	RN2403
jQ9	139128	DTC144EK
or	139129	RN1404
jQ10	139128	DTC144EK
or	139129	RN1404
jQ11	139124	DTA124EK
or	139127	RN2403
jQ12	139125	2SC3326
jQ13	139125	2SC3326
jQ14	139130	2SA1037K
jQ15	139125	2SC3326
jQ16	139124	DTA124EK
or	139127	RN2403
jQ17	139128	DTC144EK
or	139129	RN1404
jQ18	139126	DTA124EK
or	139127	RN2403
jQ19	139128	DTC144EK
or	139129	RN1404
jQ20	139126	DTA124EK
or	139127	RN2403
·IC		
jIC1	139131	NJM2058D
or	139132	M5228P
jIC2	139131	NJM2058D
or	139132	M5228P
jIC3	139133	TC9213P
jIC4	139133	TC9213P
jIC5	139134	M5216L
or	139135	NJM4556L
jIC6	139136	M5218L
·Diode		
jD1	139137	DAN401
jD2	139138	DAP401
jD3	139137	DAN401
jD4	139138	DAP401
jD5	139139	RLS-73
jD6	139139	RLS-73
·IC		
oIC1	139140	TC9163N
oIC2	139140	TC9163N
oZ2	139141	6P Terminal Board
oZ3	139142	6P Terminal Board

5-2. F-6213 Power Supply Board

<Stock No. 139128 = XX, UL, CSA, EG, UK/ 139376 = OO/139375 = EU>

Parts No.	Stock No.	Description
·Transistor		
⚠ mQ1	139143	2SA1296
mQ2	139144	DTC124ES
mQ3	139145	2SC3266
⚠ mQ4	139143	2SA1296
mQ5	139144	DTC124ES
⚠ mQ6	139151	2SC2001
mQ7	139152	DTA143XS
mQ8	139144	DTC124ES
⚠ mQ9	139145	2SC3266
mQ10	139153	2SA952
⚠ mQ11	139153	2SA952
mQ12	139152	DTA143XS

Parts List <F-6213>

Parts No.	Stock No.	Description
·IC		
⚠ mIC1	139155	μPC78M05HF
⚠ or	139159	NJM78M05FA
⚠ mIC2	139165	μPC78M12HF
⚠ or	139164	NJM78M12FA
·Diode		
⚠ md1	139167	DBB10B
⚠ md2	139167	DBB10B
md3	139167	DBB10B
·Zener Diode		
mDZ1	139171	05AZ8.2-Y
or	139180	05AZ8.2-Z
mDZ2	139379	05AZ30-Z
or	139380	05AZ30-R
mDZ3	139383	05AZ6.2-Z
or	139385	05AZ6.8-X
mDZ4	139386	05AZ5.6-Y
or	139387	05AZ5.6-Z
mDZ5	139396	05AZ12-Z
or	139399	05AZ13-X
mDZ6	139410	05AZ9.1-Y
or	139418	05AZ9.1-Z
⚠ mR6	139488	120Ω 1W N.I.R.
⚠ mR28, 29	139487	0.22Ω 1/2W N.I.R.
mIC3	139489	Photo Coupler TLP521-1
mIC4	139489	Photo Coupler TLP521-1
mC2	139490	4700μF 16V E.C.
mC3	139497	2200μF 16V E.C.
or	139498	2200μF 16V E.C.
wZ1	139500	Remote Control Receiver <XX, UL, CSA, UK, EG>
	139501	Remote Control Receiver <EU>
	139502	Remote Control Receiver <OO>
wC11	139796	0.1μF 50V C.C.

5-3. F-6214 Head Phone & TAPE 2 Terminal Board

Parts No.	Stock No.	Description
oJ1	139797	Head Phone Jack
oJ2	139797	TAPE 2 Jack
·Zener Diode		
jDZ2	139798	RD5.1B2
or	139799	RLZ5.1B
jDZ3~5	139998	RLZ5.1A
or	139999	RLZ5.1B
or	140043	RLZ5.1C

5-4. F-6215 Line Filter Board <EU, UK, EG>

Parts No.	Stock No.	Description
⚠ pC1	140044	0.01μF 400V C.C.
⚠ or	140045	0.01μF 400V C.C.
⚠ pC2, 3	140044	0.01μF 400V C.C.
⚠ or	140045	0.01μF 400V C.C.
⚠ pFL1	140046	Line Filter LF-2C
⚠ pS2	140047	Power Switch
⚠ or	140048	Power Switch

5-5. F-6216 Line Filter Board <XX, UL, CSA, OO>

Parts No.	Stock No.	Description
⚠ pC1	140045	0.01μF 400V C.C. <XX, UL, CSA, 00>
⚠ or	140044	0.01μF 400V C.C. <XX, UL, CSA, OO>
⚠ pC2	140045	0.01μF 400V C.C. <XX, UL, CSA, OO>
⚠ or	140044	0.01μF 400V C.C. <XX, UL, CSA, 00>
⚠ pFL1	140046	Line Filter, LF-2C <XX, UL, CSA, OO>
⚠ pS1	140049	Slide SW, Voltage Selector <XX>

5-6. F-6217 CD Circuit Board <Stock No. >

Parts No.	Stock No.	Description
·Transistor		
rQ1	140050	2SA952
rQ2	140051	2SC2712
rQ3	140052	DTC124TK
rQ4	140052	DTC124TK
rQ5	140053	DTC114TK
or	140054	RN1411
rQ6	140055	DTC124XK
or	140056	RN1408
rQ7	140055	DTC124XK
or	140056	RN1408
rQ8	140057	2SD1020
rQ9	140058	DTC123JK
or	140059	RN1405
·IC		
rIC1	140060	LA9200NM
rIC2	140061	LC7860N
rIC3	140062	CXK5816PN-12L
or	140063	LC3517BL-15
or	140064	LC3517BSL-15
rIC4	140065	LA6510
rIC5	140065	LA6510
rIC6	140064	M5218L
or	140067	NJM4558L
rX01	140068	Quartz Element HC-49/U
·Diode		
rD1~7	139139	RLS-73
rD10	140069	Capacitor Diode SVC211SPA
·Zener Diode		
rDZ1	140070	RLZ5.1A
rC2	140071	0.1μF 50V C.C.
rC16	140072	0.33μF 63V M.C.
rC59	140071	0.1μF 50V C.C.
rC64	140073	0.33μF 50V C.C.
rC66	140074	0.1μF 50V Chip C.
rFL1	140074	VCO Coil
rL1	140077	Inductor 10μH
rL2	140078	Inductor 2.2μH
rL3	140082	Ferrite Core
rVR1	140079	100kΩ S.V.R. Tracking Offset
rVR2	140080	47kΩ S.V.R. Focus Offset
rVR3	140081	22kΩ S.V.R. Focus Gain
rVR4	140081	22kΩ S.V.R. Trackcing Gain
·Transistor		
wQ1	139128	DTC144EK
or	139129	RN1404
·IC		
wIC1	140083	M50747-A33SP
wR1	140084	100kΩ×7, Array Ressistor
wC10	140071	0.1μF 50V C.C.

5-7. F-6220 Door Close Detection Board

Parts No.	Stock No.	Description
oS18	140085	Switch, door close sensor

5-8. F-6221 FM, AM Tuner Board

<Stock No. 140086 = XX, UL, CSA/140087 = EU, UK, EG/ = OO>

Parts No.	Stock No.	Description
dZ1	140088	FM Front-end Pack, TFFG3U <XX, UL, CSA>
	140089	FM Front-end Pack <EU, UK, EG>
	140090	FM Front-end Pack<OO>
·Transistor		
dQ1	140091	2SC2786
dQ3	140092	DTC144ES
dQ4	140093	DTC343TS
dQ8	140094	DTC114YS
dQ9	140095	DTA114ES
·IC		
dIC1	140096	LA1266
dIC2	140097	LA3410A
dX01	140098	Ceramic Resonator
or	140099	OSC Element, CSB456
·Diode		
dD5~9	139139	RLS-73
dD11, 13	139139	RLS-73
dC22	140100	4.7pF 25V E.B.
dC35	140100	4.7pF 25V E.B.
dCF1, 2	140101	Ceramic Filter, SFE10.7MS3 <EU, UK, EG>
	140102	Ceramic Filter, SFE10.7MS2 <XX, UL, CSA, OO>
dT1	140105	FM IF Coil
dT2	140106	FM IF Coil
dT3	140103	Filter, TF-7<EU, UK, EG>
dT4	140104	Low Pass Filter
⚠ dR7, 8	140107	22Ω 1/2W N.I.R.
⚠ dR28	140107	22Ω 1/2W N.I.R.
dVR1	140108	100kΩ S.V.R., FM STOP
eD1	140109	Voltage V.C.Diode, KV1236Z2
·Diode		
eD2	139139	RLS-73
eD10, 11	139139	RLS-73
eTC1	140110	Trimmer Capacitor 30pF
eTC3	140110	Trimmer Capacitor 30pF
eCF1	140111	Ceramic Filter CFM2-450BL

to be continued

Parts List <F-6221>

Parts No.	Stock No.	Description
eT1	140112	AM RF Coil
eT3	140113	AM OSC Coil
eT5	140114	AM IF Coil
	or 140115	AM IF Coil
eVR1	140116	47kΩ S.V.R., AM Stop
·Transistor		
fQ10	140117	2SC2603
	or 140118	2SC1740S
·FET		
fFT1	140119	2SK163-K2
	or 140120	2SK163-L1
	or 140121	2SK117-Y
	or 140122	2SK117-GR
·IC		
fIC1	140123	LM7000
fX01	140124	Quartz Element
·Diode		
fD1	139139	RLS-73
fC25	140125	2.2μF 50V E.B.
fTC1	140100	Trimmer Capacitor 30pF
fL1	140126	Inductor
nLD1	140127	SEL3410E<EU, UK, EG>
	140128	SEL3410S<XX, UL, CSA, 00>
·Transistor		
oQ4	140129	DTA144WS
oQ6	140129	DTA144WS
·Diode		
oD1~4	139139	RLS-73
oS1	140130	Push SW., TUNING UP
oS2	140130	Push SW., TUNING DOWN
oS3	140130	Push SW., POWER OFF
oS4	140130	Push SW., AUTO OFF
oS5	140130	Push SW., MANUAL
oS6	140130	Push SW., MEMO
oS7	140130	Push SW., STORE
oS8	140130	Push SW., AUX
oS9	140130	Push SW., TAPE
oS10	140130	Push SW., VIDEO
oS11	140130	Push SW., VR UP
oS12	140130	Push SW., VR DOWN
oS13	140130	Push SW., ZONE
oS14	140130	Push SW., CD ▶/❚❚
oS17	140130	Push SW., SYSTEM RESET
·Transistor		
sQ1	140094	DTC114YS<XX, UL, CSA, 00>
sQ2	140131	DTC143ZS
sQ7	140092	DTC144ES
sQ9	140092	DTC144ES
·IC		
sIC1	140132	TMP47C870N
sIC2	140133	DT5C124E
sX01	1401341	Quart Element AT-49
·Diode		
sD1~5	139139	RLS-73
·Zener Diode		
sDZ6	140135	RLZ5.1B
	or 140136	RD5.1B2 L
sFL1	140137	FL CPR2352

Parts No.	Stock No.	Description
sR2	140138	10kΩ×4, Array R.
sR3	140139	10kΩ×10, Array R.
sR4	140140	10kΩ×12, Array R.
sR5	140138	10kΩ×4, Array R.
sC4	140141	0.047μF 5.5V E.C.
sC11	140074	0.1μF 50V Chip C.
sL1	140142	Inductor
sL2	140124	Inductor
·IC		
wIC2	140066	M5218L
	or 140067	NJM4558L
·Diode		
wD1	139139	RLS-73
wD2	139139	RLS-73

5-9. F-6222 IF Band SW. & House Code SW. Board

Parts No.	Stock No.	Description
oD5	139139	RLS-73<00>
oD6	139139	RLS-73<XX, 00, EU, UK, EG>
oD7	139139	RLS-73<XX, EU, UK, EG>
oD8~11	139139	RLS-73
oS15	140143	Slide SW., IF BAND<XX>
oS16	140144	Switch., HOUSE CODE

5-10. F-6223 Antenna Terminal Board <XX, UL, CSA, 00>

Parts No.	Stock No.	Description
oZ1	140163	ANT Connector<XX, UL, CSA, 00>

5-11. F-6224 Antenna Terminal Board <EU, UK, EG>

Parts No.	Stock No.	Description
oZ1	140162	2P Antenna Terminal <EU, UK, EG>

5-12. F-6228 D/A Converter Board <Stock No. >

Parts No.	Stock No.	Description
·Transistor		
vQ1	140150	DTC143TK
	or 140151	RN1410
vQ2	140152	DTA114TK
	or 140153	RN2411
·IC		
vIC1	140155	LC7881-C
	or 140156	LC7881-B
vIC2	140157	M5238P
	or 140158	NJM2082D
vIC3	140159	NJM4558D
	or 140160	M5218P
·Zener Diode		
vDZ1	139799	RLZ 5.1B
	or 139798	RD5.1B2L
vR2	140161	4.7MΩ 1/8W Chip R.
vC3	140071	0.1μF 50V C.C.
vC4	140071	0.1μF 50V C.C.
vC14	140073	0.33μF 50V C.C.

5-13. F-6229 System Control Board

Parts No.	Stock No.	Description
oJ3	140164	Jack, SERIAL DATA OUTPUT

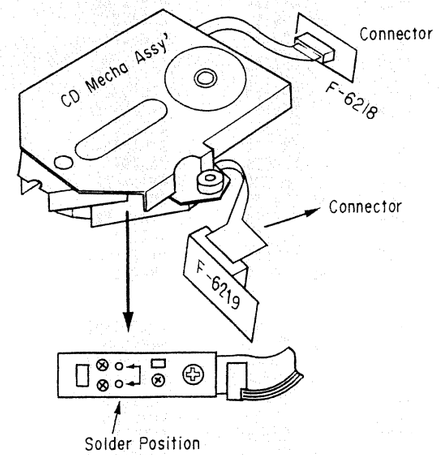
6. CAUTIONS FOR THE PICKUP ASSEMBLY REPLACEMENT

● **Cautions when removing the pickup assembly.**
Solder the points indicated in the figure before disconnecting the two lead connectors. This protects the pickup from damage by statik.

1. Pull out CD mechanism Ass'y from three holder.
2. Solder the points indicated in the figure.
3. Disconnect the two lead connectors.

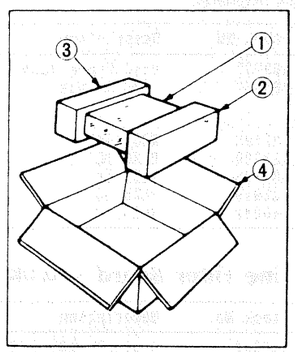
● **Cautions when renewing the laser pickup assembly.**

1. Connect the two lead connectors the new pickup assembly.
2. Desolder the two points that were soldered to protect the device from statik.



7. PACKING & ACCESSORY LIST

● **Packing List**



Parts No.	Stock No.	Description
1	140199	Vinyl Bag
2	140202	Styrofoam Packing, Right
3	140208	Styrofoam Packing, Left
4	140209	Carton Case(Silver)
	140210	Carton Case(Black)

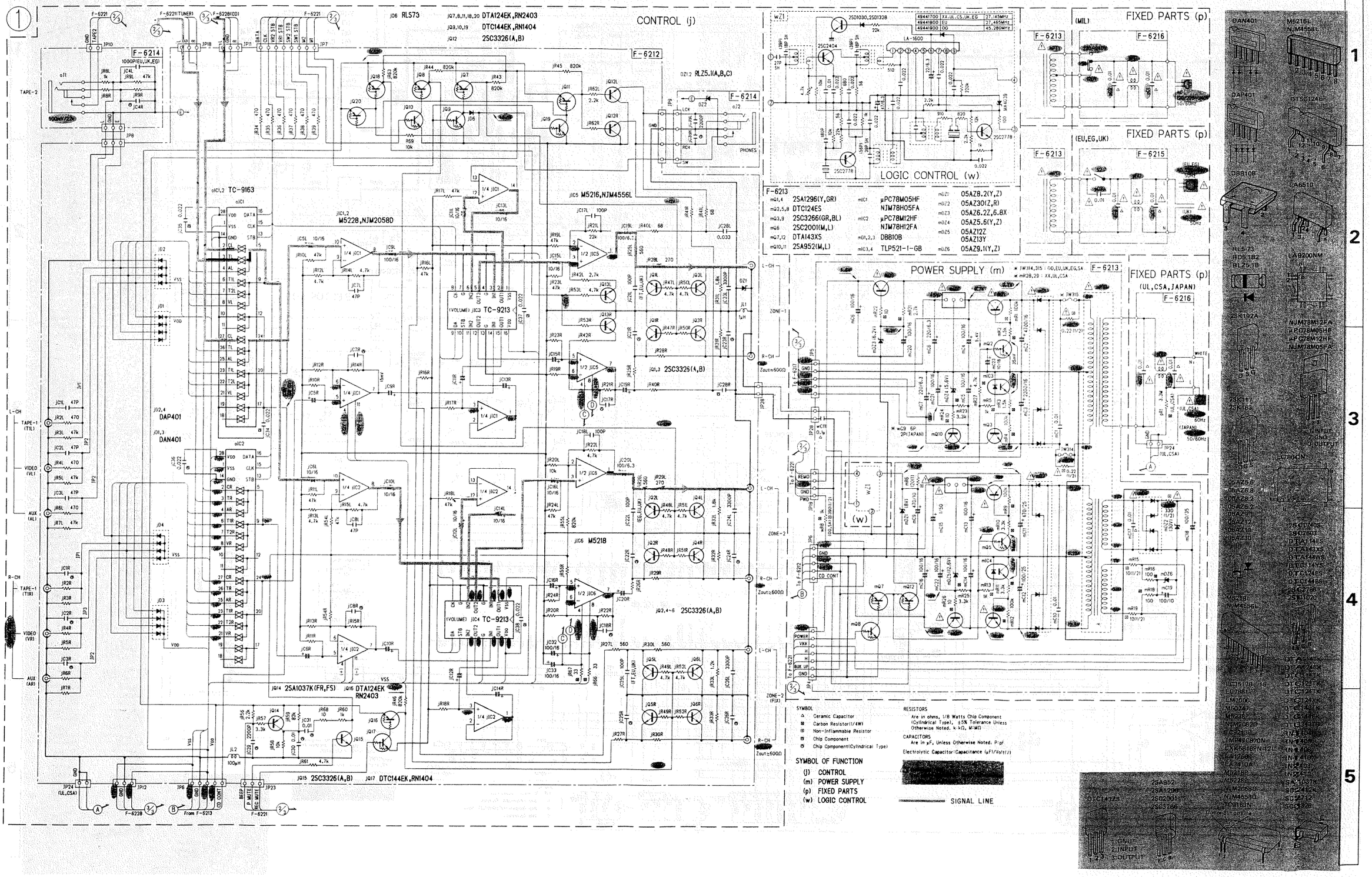
● **Accessory List**

Stock No.	Description
140211	Remote Controller Unit <XX, UL, CSA, UK, EG>
140212	Remote Controller Unit<EU>
140213	Remote Controller Unit<00>
———	Battery Ass'y, SUM-3
140215	AM Loop Antenna
140216	FM Antenna<XX, UL, CSA, 00>
140217	Antenna Holder
140218	Operating Instruction<00>
140219	Operating Instruction, E.F.S <XX, UL, CSA>
140220	Operating Instruction, G.D.SW <EU, UK, EG>

*Note:
E·F·S:English, French and Spanish Version
G·D·Sw:German, Dutch and Swedish Version

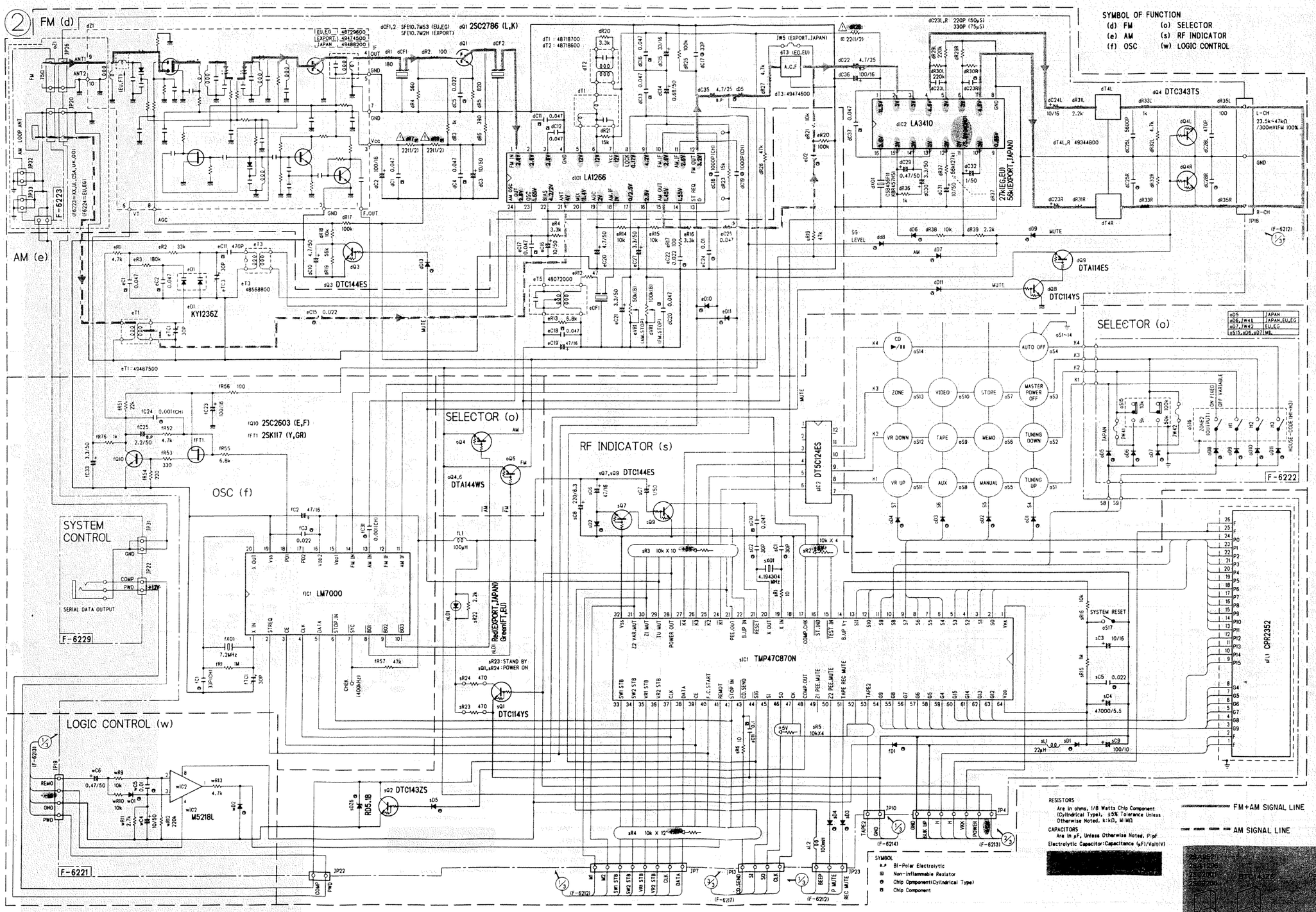
8. SCHEMATIC DIAGRAM 8-1. Control & Power Supply Section

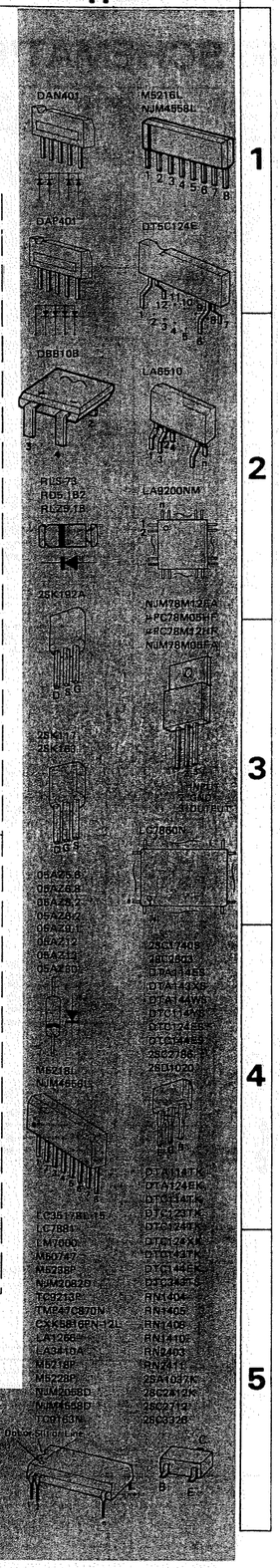
- Design and specifications subject to change without notice for improvement.
- La présention et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
- Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.



8-2. FM, AM Tuner Section

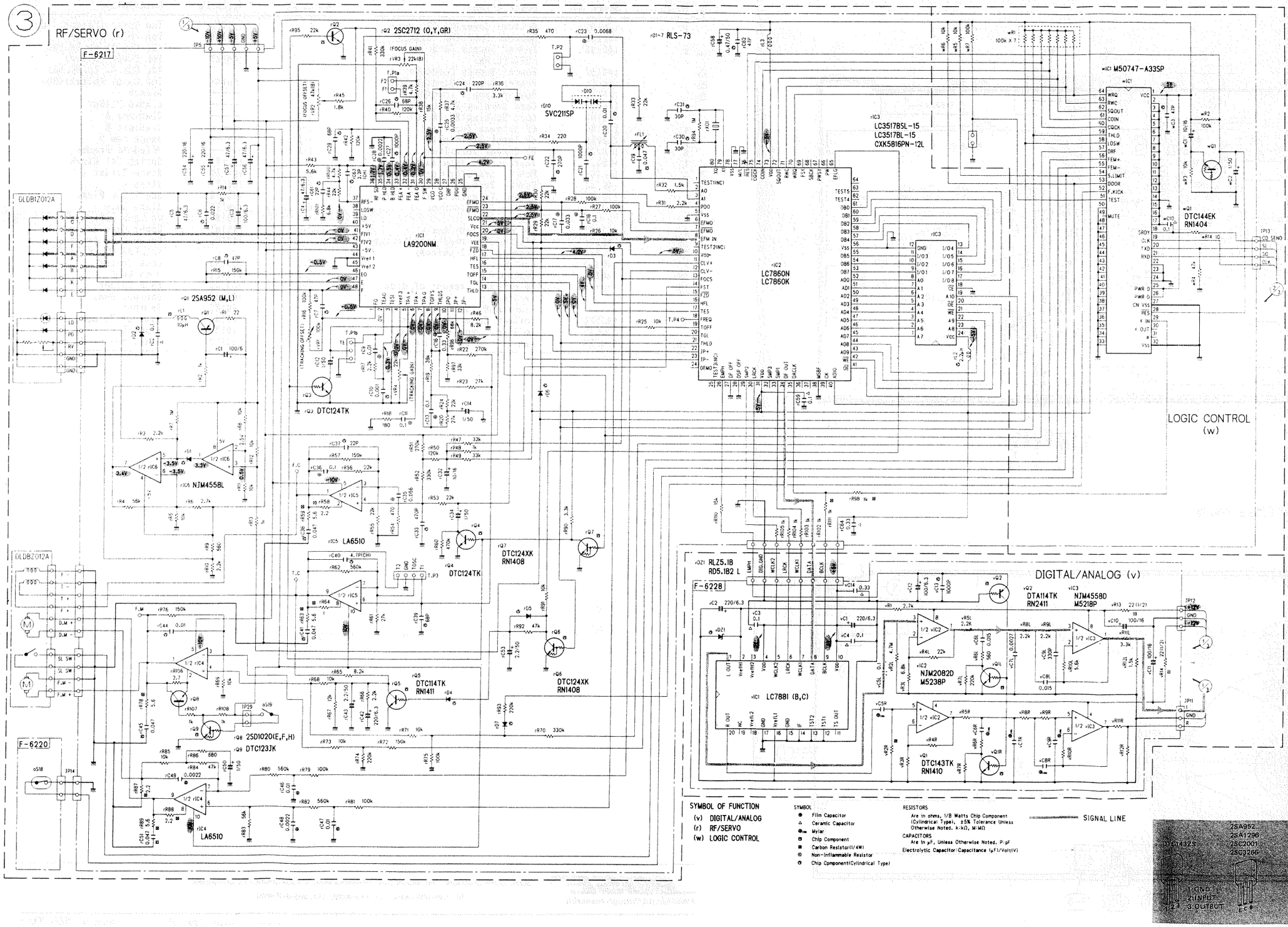
- Design and specifications subject to change without notice for improvement.
- La présention et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
- Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

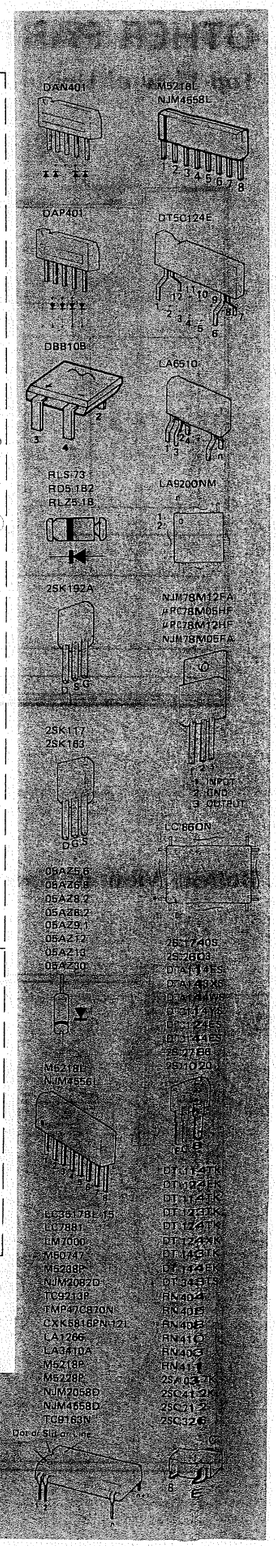




8-3. CD Section

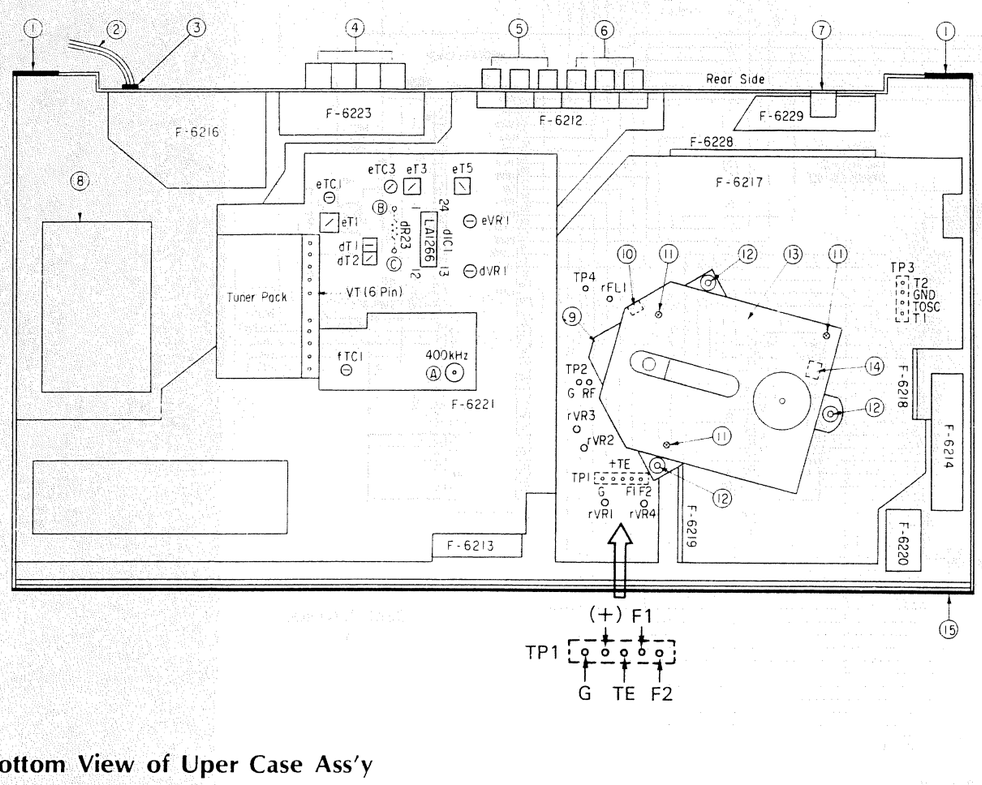
- Design and specifications subject to change without notice for improvement.
- La présention et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
- Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.



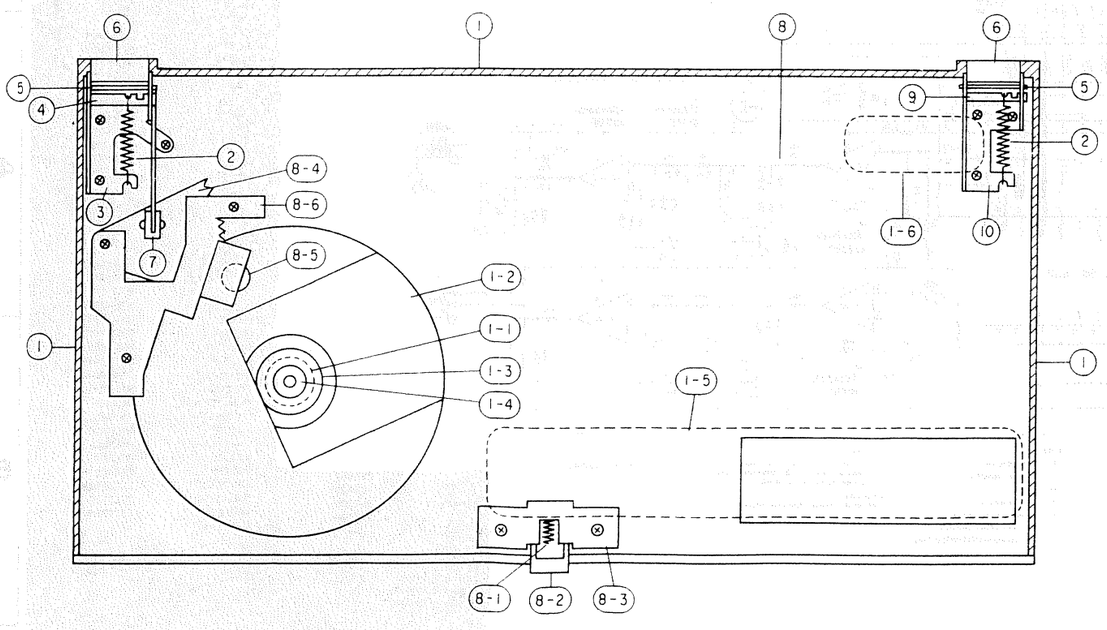


9. OTHER PARTS

9-1. Top View of Unit



9-2. Bottom View of Uper Case Ass'y



Parts List <Top View of Unit>

Parts No.	Stock No.	Description
1	140191	Bottom Cover(B) (Silver)
	140192	Bottom Cover(B) (Black)
⚠ 2	140193	Power Supply Cord <CSA, UL, XX>
⚠	140194	Power Supply Cord<00>
⚠	140195	Power Supply Cord<EU, EG>
⚠	140196	Power Supply Cord<UK>
3	140197	Cord Bushing<XX, UL, CSA, 00>
	140198	Cord Bushing<EU, UK, EG>
4	140163	4P Antenna Terminal
5	140200	6P Input Terminal
6	140201	6P Output Terminal
7	140164	Jack, sereal data output
⚠ 8	140203	Power Transformer<00>
⚠	140204	Power Transformer<XX>
⚠	140205	Power Transformer<UL, CSA>
⚠	140206	Power Transformer <EU, UK, EG>
9	140207	CD Mechanism Ass'y
10	140221	Micro SW., mecha protector
11	140222	Screw, 1.4×2 (Black)
12	140223	Damper
13	140224	Mecha Cover
14	———	Micro SW., sensor of disk inside (Included in mecha ass'y)
15	140226	Bottom Cover(A) (Black)
	140227	Bottom Cover(A) (Silver)
16	140228	Leg for Bottom Plate

Parts List <Bottom View of Upper Case Ass'y>

Parts No.	Stock No.	Description
1	140165	Top Cover (Silver)<00>
	140166	Top Cover (Silver) <UL, CSA, XX, EU, UK, EG>
	140167	Top Cover (Black) <UL, CSA, XX, EU, UK, EG>
	140168	Top Cover (Black)<00>
1-1	———	Magnet
1-2	———	Clamp Holder
1-3	———	Clamper A
1-4	———	Clamper B
1-5	———	Badge Ass'y
1-6	———	Window Frame
2	140175	Spring for Hinge
3	140176	Hinge Holder A
4	140177	Hinge A
5	140178	Shaft for Hinge
6	140179	Hinge Base
7	140180	Damper Link Ass'y
8	140181	Upper Case Ass'y<UL>
	140182	Upper Case Ass'y <XX, CSA, 00, EU, UK, EG>
8-1	140183	Lock Spring
8-2	140184	Open Knob
8-3	140185	Knob Holder
8-4	140186	Damper Gear
8-5	140187	Damper
8-6	140188	Damper Holder
9	140189	Hinge B
10	140190	Hinge Holder B

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