

harman/kardon

Model FL8350

5 Disc Compact Disc Changer

SERVICE MANUAL



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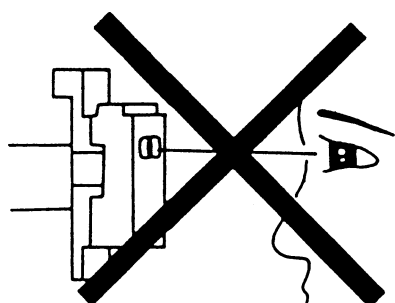
LASER BEAM SAFETY PRECAUTIONS

CLASS 1 LASER PRODUCT

CLASS 1 LASER PRODUCT

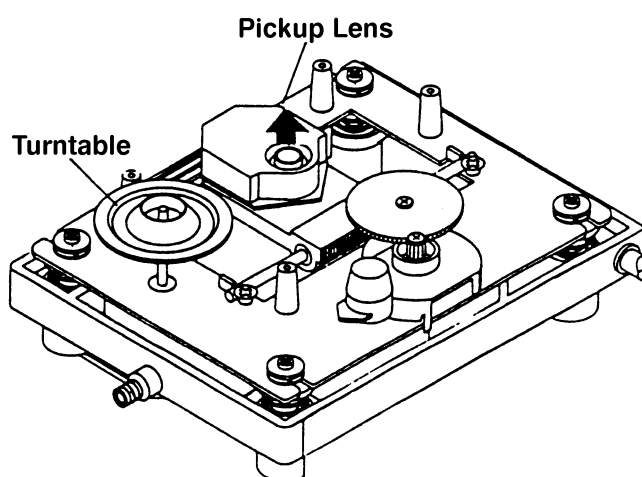
CAUTION
Invisible laser radiation when the unit is open.
Do not stare into beam.

CAUTION: USE OF ANY CONTROLS, ADJUSTMENT, OR PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.



Do not look directly at the laser beam coming from the pickup or allow it to strike against your skin.

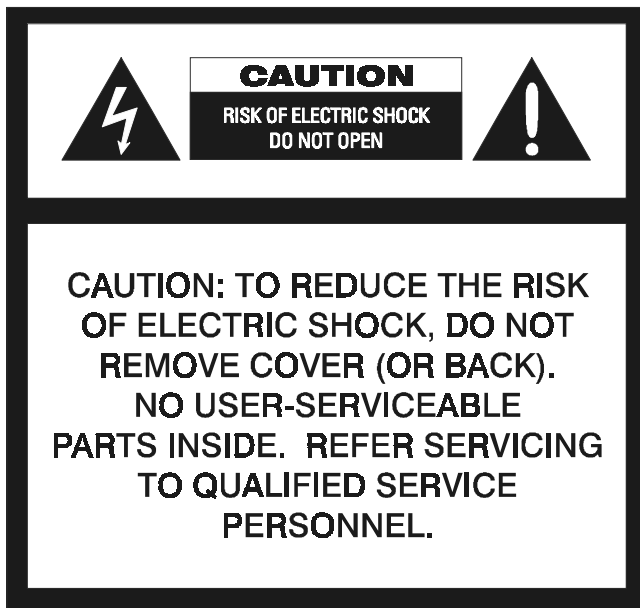
This compact disc player uses a pickup that emits a laser beam. The laser beam is emitted from the location shown in the figure. When checking the laser diode, be sure to keep your eyes at least 1 foot away from the pickup lens when the diode is turned on. Do not look directly at the laser beam.



CAUTION:

Using controls and adjustment, or doing procedures other than those specified herein, may result in hazardous radiation exposure.

SAFETY PRECAUTIONS



WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Caution: To prevent electric shock do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

Attention: Pour prévenir les chocs électriques ne pas utiliser cette fiche polarisée avec un prolongateur, une prise de courant ou une autre sortie de courant, sauf si les lames peuvent être insérées à fond sans en laisser aucune partie à découvert.

HANDLING LASER PICKUP

The laser diode in the optical system of this player can be damaged by electrostatic discharge from your clothes or your body. Proper electrostatic grounding for service personal is required during servicing.

BEFORE REPAIRING THE COMPACT DISC PLAYER

Preparation

Human Body Grounding:

Many of the components used in this compact disc player, including the laser pickup, are sensitive to electrostatic discharge. Service personal should be grounded with an electrostatic armband (1 Mohm).

Caution:

Static charge on clothing does not escape through a body grounding wrist band.

Be careful not to contact the pickup or electrical components with your clothing.

Workbench and Tool Grounding:

A properly-grounded electroconductive plate (1Mohm) or metal sheet should be fitted to the workbench surface. Tools and instruments (such as soldering irons and scopes) should be grounded to prevent AC leakage.

Incorrect



Fig. 1

Correct

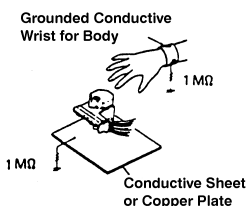


Fig. 2

Note: Laser diodes are so susceptible to damage from static electricity that, even if a static discharge does not ruin a diode, it can shorten its life or cause it to work improperly.

Specification and Features

Specifications

Power Requirement	AC 120V / 60Hz, 230V / 50Hz
AC Cord	H05VVH2-F (CE Versions); SPT-2 (NRTL/C Version)
AC Plug	VDE (CE Version) ULp (NRTL/C Version)
Power Consumption	20W (Rated)
Dimension (H x W x D)	5 1/8 x 17 5/16 x 15 3/16 (130 x 439 x 86mm)
Weight	16.7 lbs (7.6kg)

DATA SPECIFICATION OF FL8350

FL8350 Test Disc Playability

Item	Test Disc	Typical	Limits
1. Black Dot	TCD725A	1000uM	800uM
2. Interruption	TCD725A	1000uM	800uM
3. Finger Print	TCD725A	75uM	65uM
4. Vertical Deviation	MCD151	1.0mm	0.92mm
5. Eccentricity	TCD712	140uM	140uM
6. Long Access Time	YEDS18	10SEC	15SEC
7. 8cm DISC	TCD783	LAST TRACK	LAST TRACK

FL8350 Audio Specification

Item	Typical	Limits
1. Output Level	1.9V	2V/1.75V
2. Level Balance	0dB	+/-0.5dB
3. THD(20Hz ,100Hz ,1Kz 20Kz) (30KHz Filter)	0.02%	0.05%
4. THD (10Kz) (30KHz Filter)	0.04%	0.07%
5. S/N Ratio(A weighting)	98dB	94dB
5. Dynamic Range(A weighting)	96dB	92dB
6. Channel Separation (1KHz)	90dB	85dB
7. Channel Separation (10KHz)	75dB	70dB
8a. De-emphasis(5KHz)	-4.53dB	-4.53dB +/-1dB
8b. De-Emphasis(16KHz)	-9.04dB	-9.04dB +/-1dB
9. Phones Output Level	1.5Vp-p	1Vp-p +/-1dB
10. Frequency Response	20Hz-20KHz : 0/-0.5dB	20Hz-20KHz : 0/-1dB

FL8350 Special Item

1. VFD : Samsung SVA-08MM11
2. DAC Type : Philips TDA1305T
3. Remote Code : Harman Kardon Remote Code
4. Compliance : EMC+LVD, FCC+NRTL/C, DHHS,
5. Input Voltage : 230V, 117/230V, 117V
6. AC on/off Power switch with dual colors LED.

Features

D/A converter	DAC, single-bit / multi-bit dual converters
Digital Output	Coaxial digital output (SPDIF)
Remote Connection	Remote control jacks for connecting to other components
Optical pick up	3 beam laser
Disc Capacity	5

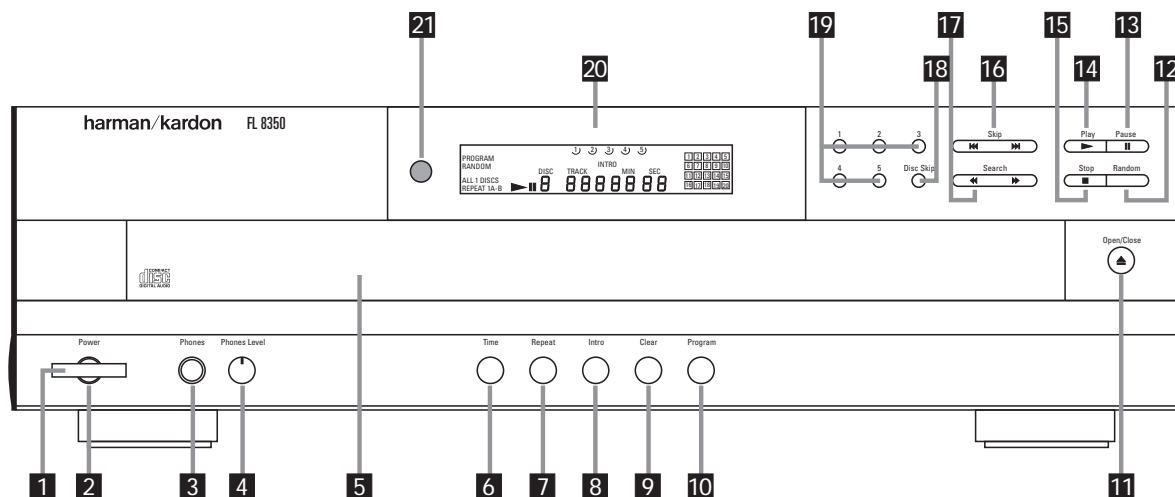
Controls and Switches

Power Standby	Push
Headphone Volume	Rotary
Open / Close	Tact
Play	Tact
Pause	Tact
Stop	Tact
Skip +/-	Tact x 2
Search +/-	Tact x 2
Random	Tact
Time	Tact
Intro	Tact
Repeat	Tact
Program	Tact
Clear	Tact
Disc Skip	Tact
Disc Select 1~5	Tact x 5

Remote Control Feature

Batteries	AA (UM-3) x 2
Range	Approx. 7m / 20 feet
Control	Standby, Disc Skip, Disc Select 1~5, Numeric 1~10, +10, Search +/-, Skip +/-, Play, Pause, Stop, Repeat, Program, Clear, Time, Intro, Random

Front Panel Controls



1 Power Switch: Press this switch to change the FL8350 from STANDBY to ON. When the unit is first connected to AC power, the **Status Mode Indicator 2** will turn Amber (STANDBY mode). Press this switch to turn the unit ON; indicator will Green and the **Information Display 20** will illuminate. Press the switch again to turn the unit off, in STANDBY mode. When the FL8350 is connected to a switched AC outlet, such as those found on the back of many audio products, when power is applied it will return to whatever state it was left in previously, whether ON or STANDBY. In this case, when always left ON, further use of the power switch is not needed.

2 Status Mode Indicator: When the FL8350 is in the ON mode, this indicator will glow green. When the unit is off, the indicator will glow amber, indicating that the unit is still connected to the AC mains supply.

3 Headphones Jack: Connect a set of standard headphones to this jack for private listening.

4 Headphones Level: Turn this knob to increase or decrease the volume level for headphones connected to the FL8350's **Headphones Jack 3**. Note that changing this level will not change the sound level for the unit's main output, as that remains constant.

5 CD Drawer: This drawer holds the discs that will be played. Press the **Open/ Close button 11** **1** to open the drawer so that discs may be inserted.

6 Time Button: In normal operation, this display will show the running time of the track being played. Press the button once to check the time remaining for the track in play. Press

this button again to view the total play time remaining for the disc in play.

7 Repeat Button: Press this button once to constantly repeat the track currently being played. Press it a second time to repeat the entire disc.

8 Intro Button: Press this button to put the FL8350 in the Intro Scan mode. When you press the button, the unit will play the first 10 seconds of each track on the disc, and then move to the next track. Press the button again to defeat the function and continue full play of the current track.

9 Clear Button: Press this button to remove tracks from a programmed sequence. Each press of the button will remove one track, starting with the last track programmed to play.

10 Program Button: This button is used to program the playback of a disc in a particular order.

11 Open/ Close: Press this button to open or close the disc drawer. DO NOT push the drawer to close it, or damage to the transport mechanism may result.

12 Random Button: Press this button to put a disc into play, and to have all of the tracks played in a random order.

13 Pause Button: Press this button once to momentarily pause a disc. When the button is pressed again, the disc will resume play at the point it was paused.

14 Play Button: Press this button to start the playback of a CD. If the CD drawer is open, pressing this button will automatically close the drawer.

15 Stop Button: Press this button to stop the disc currently being played.

16 Skip Button: Press either side of this button to move to the next track ►►, or to move back to the previous track ◀◀ on the disc being played.

17 Search Button: Press either side of this button to search forward ►► or backwards ◀◀ through a disc to locate a particular portion of the selection of the disc being played.

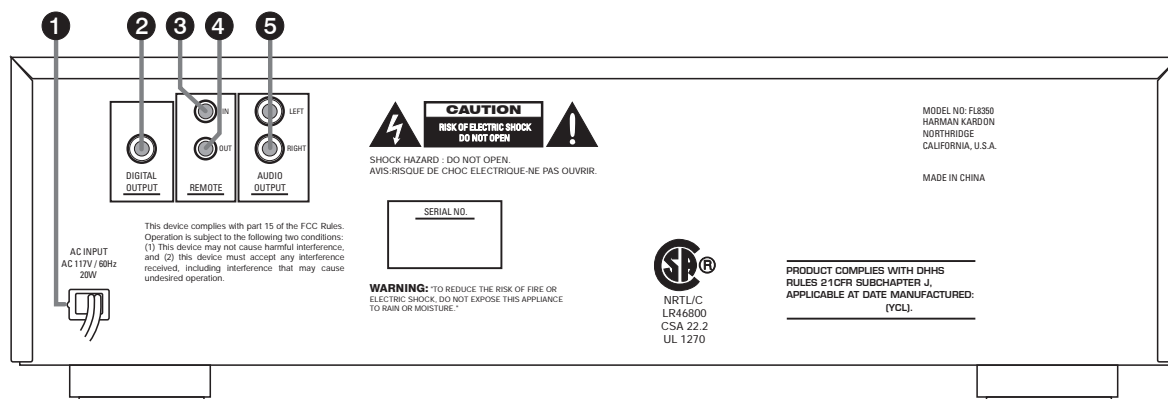
18 Disc Skip Button: Press this button to change to the next disc. If a disc position is empty, the FL8350 will automatically search for the next position that contains a disc.

19 Disc Select Buttons: Press one of these buttons to select the disc in a specific position in the CD drawer.

20 Information Display: This display provides details about the operation of the FL8350.

21 Remote Sensor: The sensor behind this window receives commands from the remote control. Keep this area clear if you wish to use the FL8350 with a remote control.

Rear Panel Connections



1 AC Power Cord

Connect this plug to an AC outlet. If the outlet is switch controlled, make certain that the switch is in the ON position.

2 Coaxial Digital Output

Connect this jack to the coaxial digital input of an external digital-to-analog converter for direct access to the digital signals of the FL8350. DO NOT connect this jack to the standard audio inputs of any device.

3 Remote Control Input

Connect the output of a remote infrared sensor or the remote control output of another compatible Harman Kardon product. This will enable the remote control system to operate even when the front panel **Remote Sensor** 21 is blocked. It will also allow use of the FL8350 with optional, external control systems.

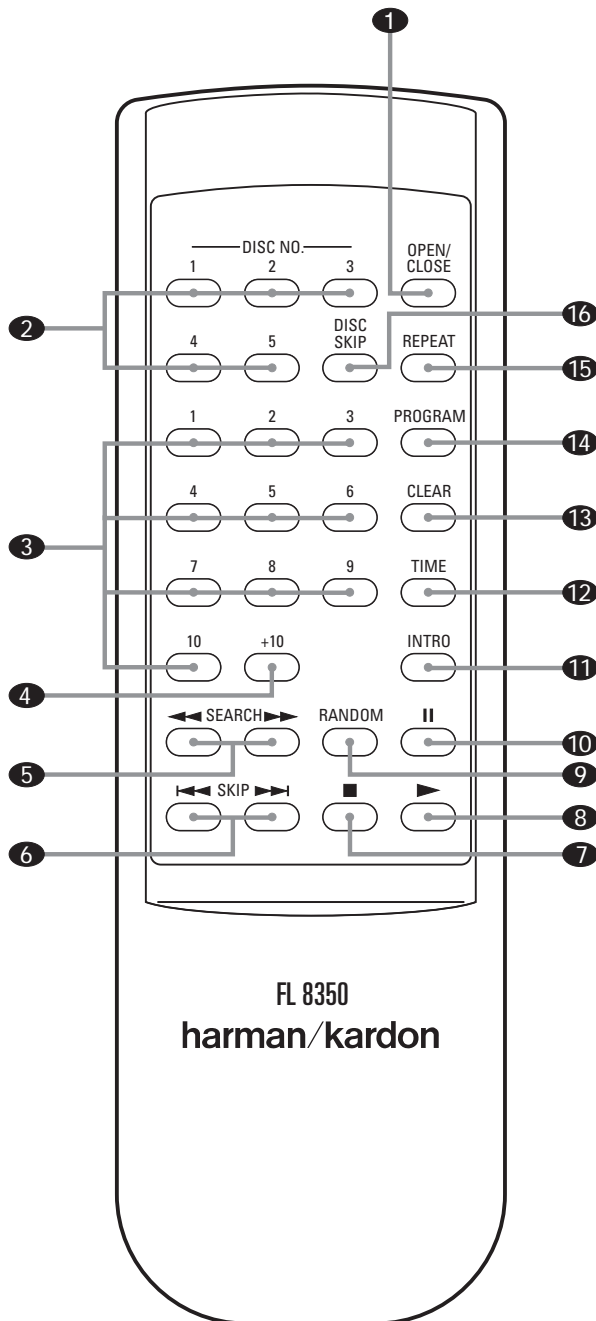
4 Remote Control Output

Connect this jack to the input of another compatible Harman Kardon remote controlled device to have the remote sensor on the FL8350 provide signals to other products.

5 Fixed Audio Outputs

Connect these jacks to the CD audio inputs of your receiver, surround processor or preamplifier.

Remote Control Functions



- 1 Open/ Close Button:** Press this button to open or close the disc drawer. The drawer may also be closed by pressing the **Play** button **14** **8**. DO NOT push the drawer, as damage to the transport mechanism may result.
- 2 Disc Select Buttons:** Press one of these buttons to select the disc in a specific position in the CD drawer.
- 3 Numeric Buttons:** Press these buttons to select a specific track on a disc. The FL8350 will immediately search for the track and begin to play it. For tracks 1 through 10 on a disc, you need only press the desired number. For tracks 10 and above, press the **10+** button **4** to select the first digit of the track number, and then press the second digit from these numeric buttons. These buttons are also used to enter track numbers into the memory for pre-programmed play lists.
- 4 +10 Button:** Press this button to select the first digit of a track number above 10. Each press of the button increases the first digit one increment. Press it once to start accessing tracks 10 through 19 twice to start accessing tracks 20 through 29, and so forth. For example, to select track 22, press the **+10** button twice, and then press the **2** button **3**.
- 5 Search Buttons:** Press these buttons to search forward **▶▶** or backwards **◀◀** through a disc to locate a particular portion of the selection being played.
- 6 Skip Buttons:** Press one of these buttons to move to the next track **▶▶**, or to move back to the previous track **◀◀** on the disc being played.
- 7 Stop Button:** Press this button to stop the disc currently being played.
- 8 Play Button:** Press this button to start the playback of a CD. If the CD drawer is open, pressing this button will automatically close the drawer.
- 9 Random Button:** Press this button to put a disc into play, and to have all of the tracks played in a random order.
- 10 Pause Button:** Press this button once to momentarily stop a disc. When the button is pressed again, the disc will resume play at the point it was stopped.

- 11 Intro Button:** Press this button to put the FL8350 into the Intro Scan mode. When you press this button, the unit will play the first 15 seconds of each track on the disc, and then move to the next track. Press the button again to defeat the function and continue full play of the current track.
- 12 Time Button:** Press this button to select the time display. In normal operation, the display will show the running time of the track being played. Press the button once to check the time remaining for the track in play. Press the button a third time to view the total play time remaining for the disc in play.
- 13 Clear Button:** Press this button to remove tracks from a programmed sequence. Each press of the button will remove one track, starting with the last track programmed to play.
- 14 Program Button:** This button is used to program the playback of a disc in a particular order.
- 15 Repeat Button:** Press this button once to constantly repeat the track currently being played. Press it a second time to repeat the entire disc.
- 16 Disc Skip Button:** Press this button to change to the next disc. If a disc position is empty, the FL8350 will automatically search for the next position that contains a disc.

Troubleshooting

FL8350

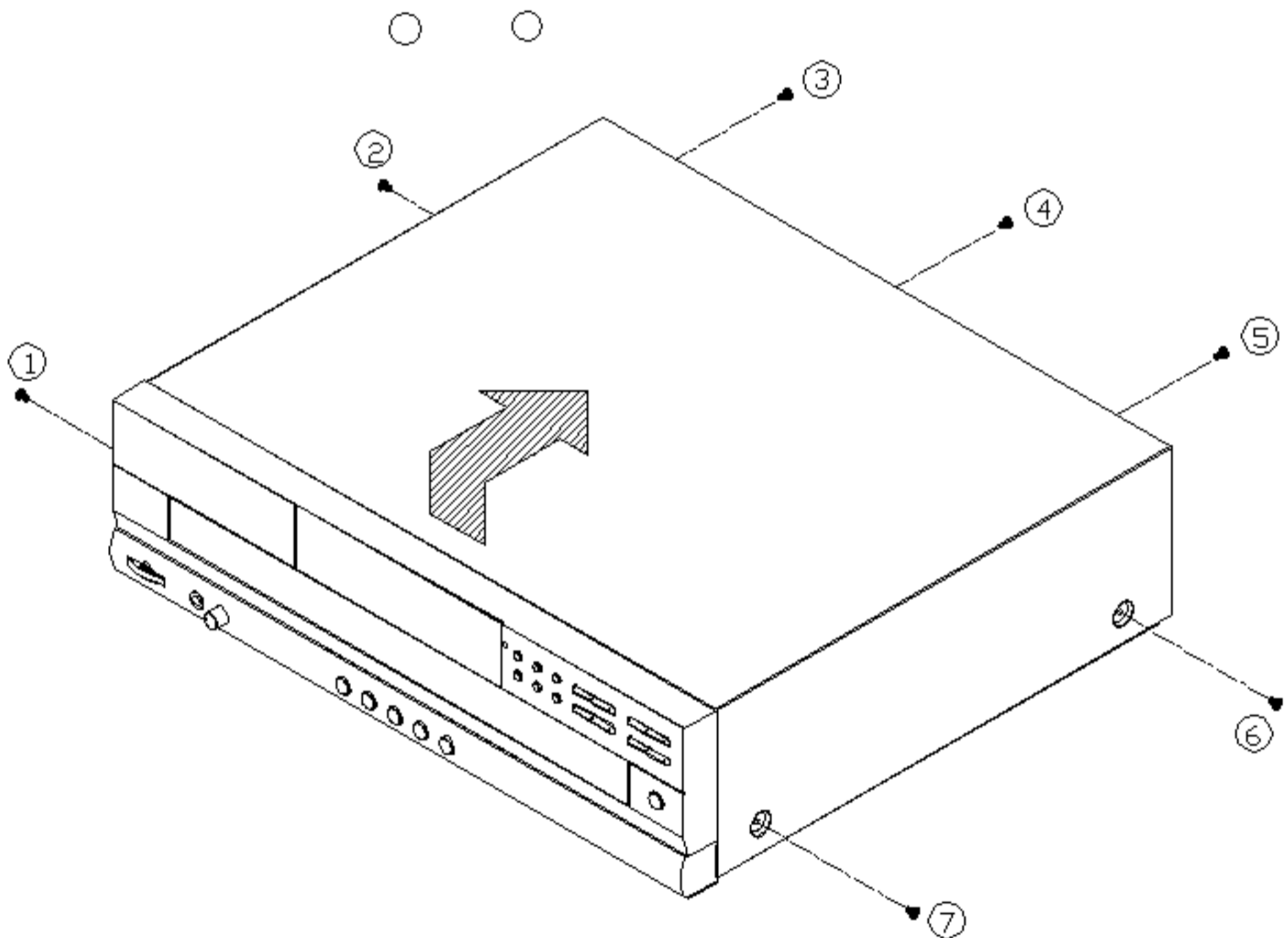
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Troubleshooting Guide

<i>SYMPTOM</i>	<i>CAUSE</i>	<i>SOLUTION</i>
No lights on Front Panel	<ul style="list-style-type: none">• No AC power	<ul style="list-style-type: none">• Make certain that the AC power cord is plugged into a live outlet.
Remote does not appear to operate	<ul style="list-style-type: none">• Main Power Switch turned off• Weak batteries• Blocked sensor	<ul style="list-style-type: none">• Turn on Main Power Switch.• Install fresh batteries, observing polarity indications.• Remove obstructions from the front panel sensor or connect a remote sensor to the Remote In jack on the rear panel.
Front panel lights, but CD does not play	<ul style="list-style-type: none">• Disc upside down• Moisture inside unit	<ul style="list-style-type: none">• Reload disc with label side facing up.• Leave the unit turned ON for 30 minutes to allow moisture to evaporate.
Play indicator lights, but no sound is heard	<ul style="list-style-type: none">• Poor connections• Wrong source selected	<ul style="list-style-type: none">• Make certain connections are secure and made to the correct (e.g., CD) input.• Select CD source on receiver or preamp.
Sound skips or stutters during play	<ul style="list-style-type: none">• Disc may be damaged• Surface vibrations	<ul style="list-style-type: none">• Try another disc.• Isolate the unit from vibration by placing it on a firm surface or move it further away from speakers.
Sound is continually distorted	<ul style="list-style-type: none">• Incorrect input	<ul style="list-style-type: none">• Make certain that the FL8350 is connected to a line-level audio input, NOT a digital audio or phono input.

DISASSEMBLY INSTRUCTIONS

1. Removing the top cover.
 - 1) Remove 7 screws (1 to 7) holding the top cover.

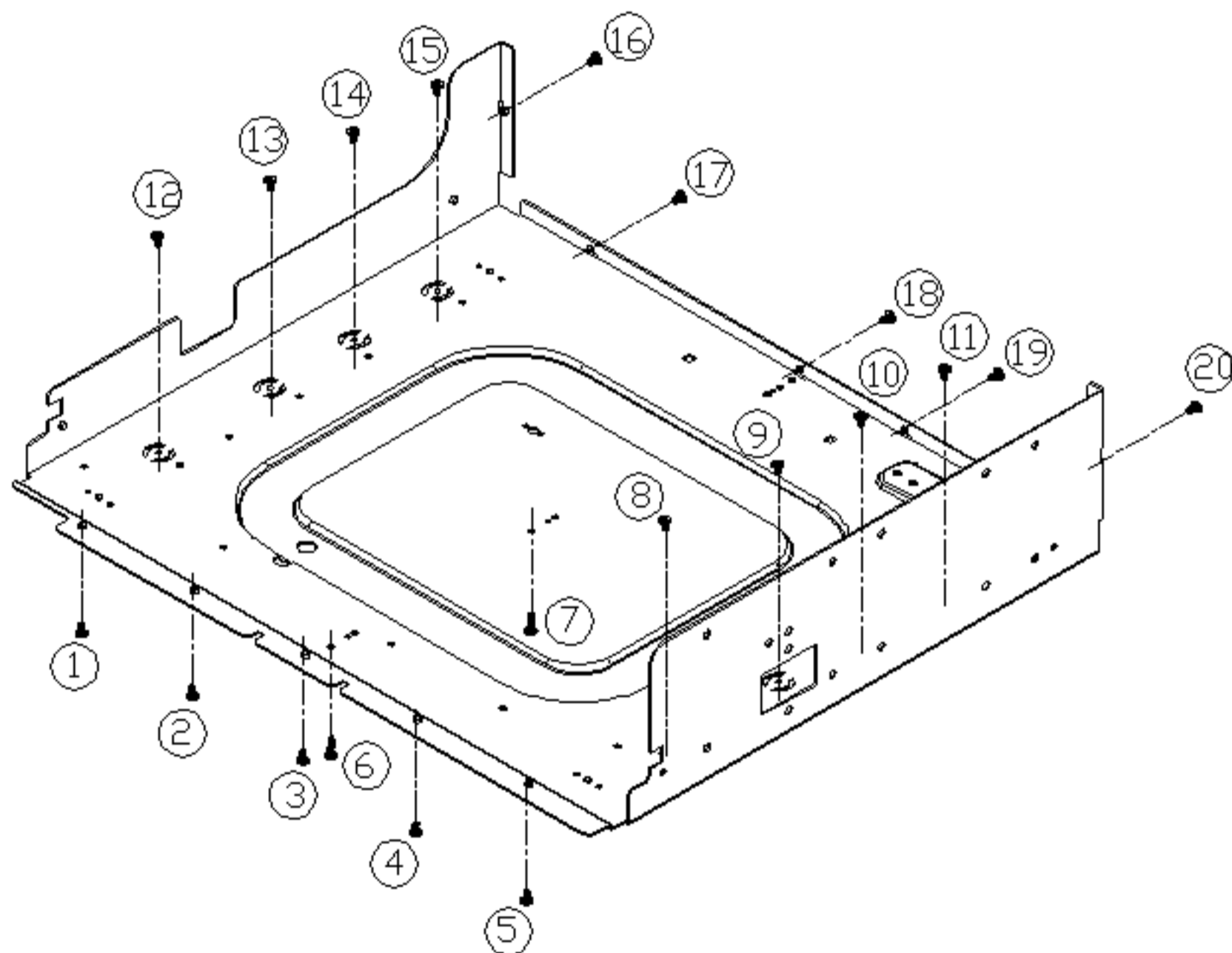


2. Removing the bottom cover.

1) Turn the set over.

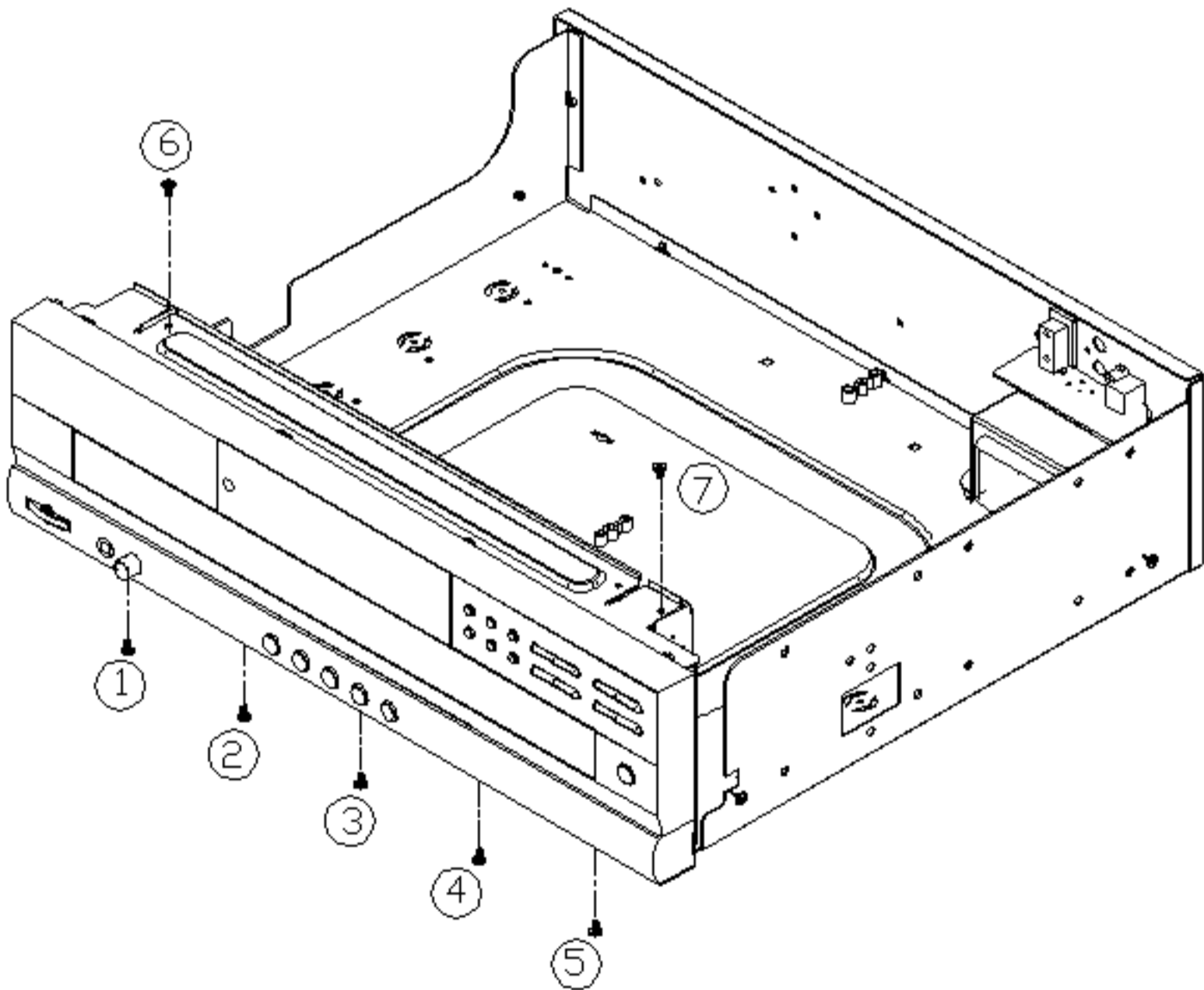
2) Remove 15 screws (① to ⑮) from the bottom chassis.

3) Remove 5 screws (⑯ to ⑳) from the back chassis.



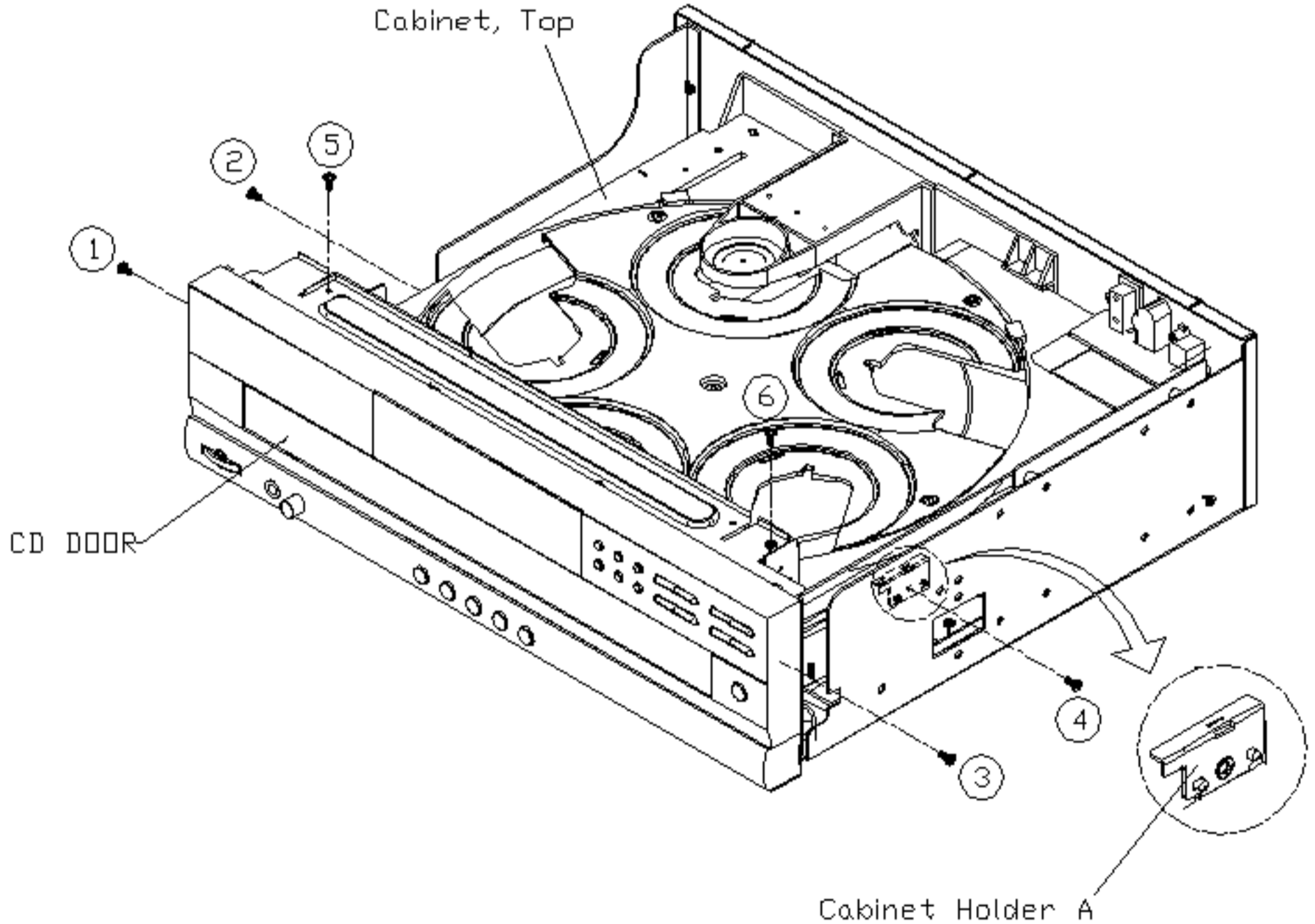
3. Removing the front panel.

- 1) Remove 5 screws (① to ⑤).
- 2) Remove 2 screws (⑥ to ⑦) from the metal of front panel.
- 3) Hold the front panel and pull it up.
- 4) Remove 2 connectors (CN501 , CN502) from the phones board.



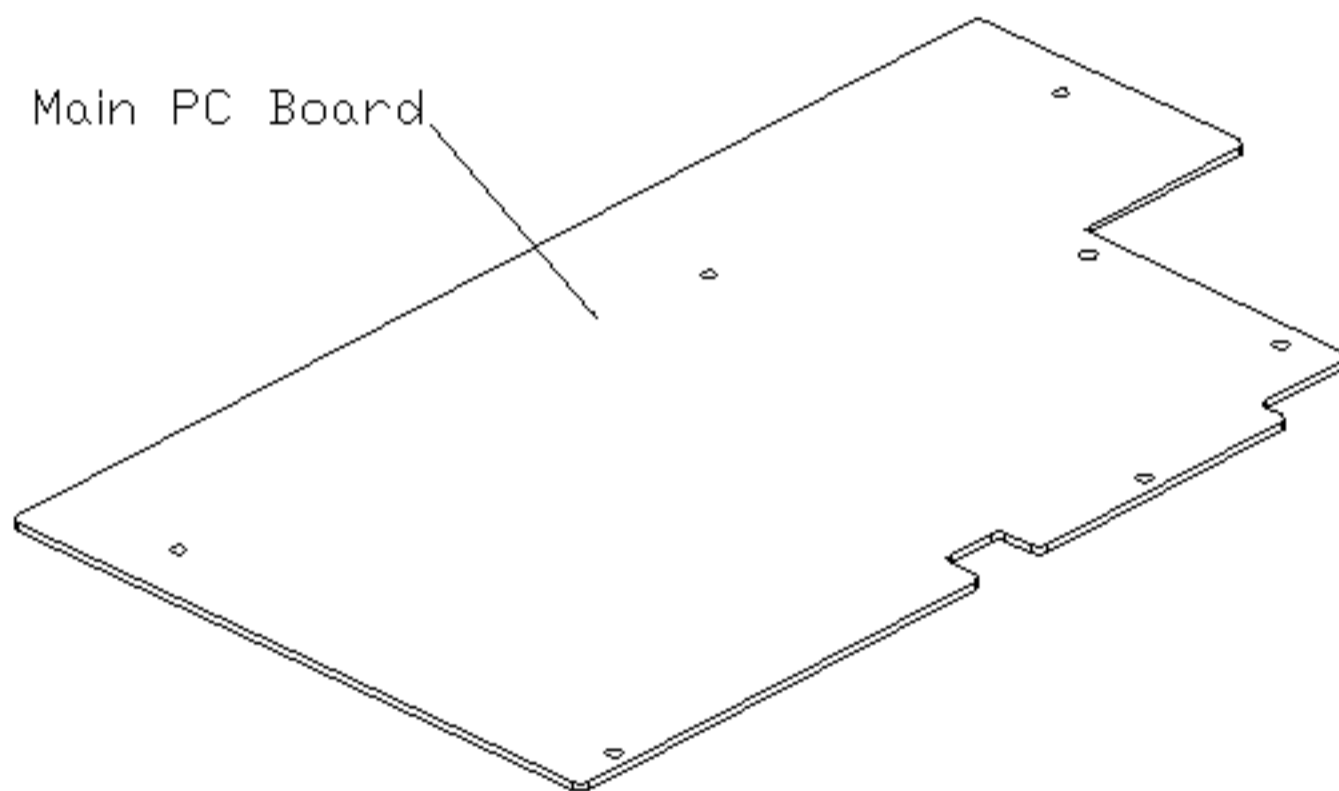
4. Removing the loading table (Cabinet,Top)

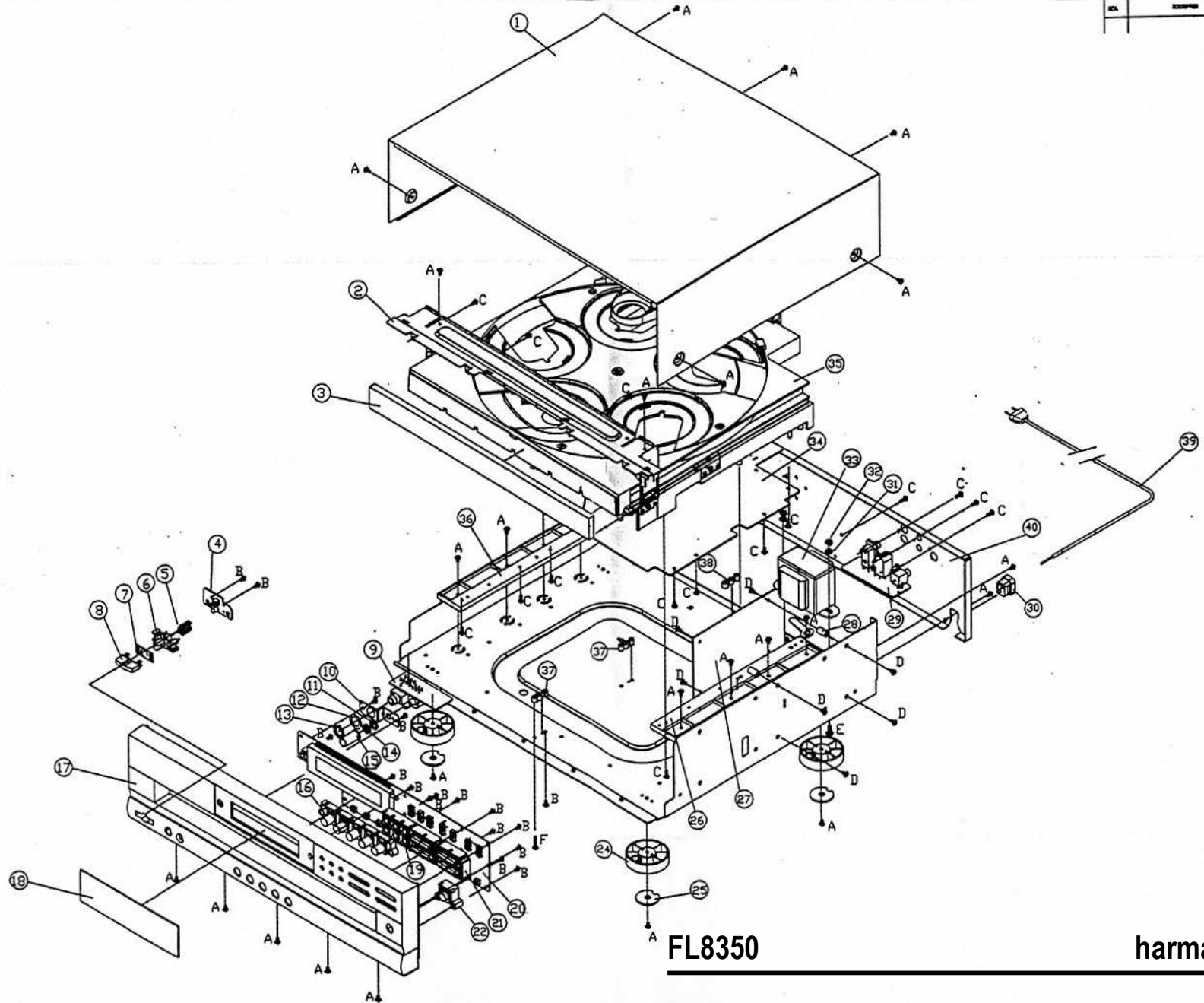
- 1) Remove 4 screws (① to ④) holding the Cabinet holder A & B.
- 2) Remove 2 screws (⑤ to ⑥) Holder the metal frame.
- 3) Remove the Cabinet Holder A and B.
- 4) Remove and hold the loading table up.
- 5) Disconnect the 6 pins wire connector from main PCB Assembly.



5. Removing the main board .

- 1) Remove all screws holding the main board from mechanism.
- 2) Disconnect all lead assembly.





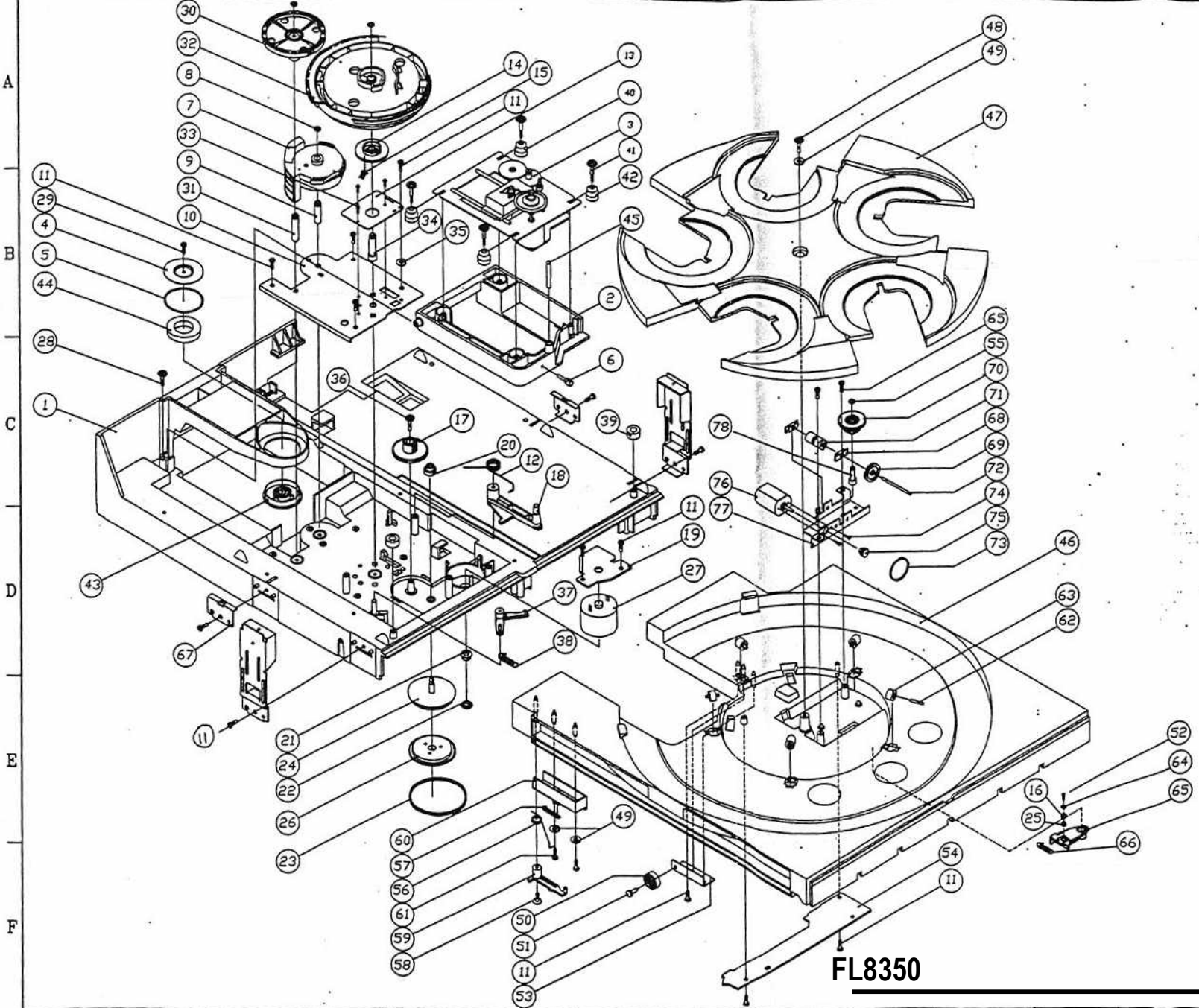
FL8350

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Model : FL8350 Exploded drawing List

Rev. A

<u>Seq. No.</u>	<u>Parts No.</u>	<u>Parts Name</u>	<u>Material</u>	<u>Qty.</u>
1	6583-510002-000-XXXX	Top Cabinet, Painted		1
2	6583-510004-000	Bracket, Front Panel	SECC 1.0t	1
3	6083-510002-000-XXXX	Door, CD, silkscreen		1
4		PCB, Power, Assy		1
5	6600-010293-000	Spring, Power Switch		1
6	6083-510008-000	Lens, Power Knob	Acrylic ,transparenc	1
7	6083-510015-000	Light Sheet, Black		1
8	6083-510007-000-XXXX	Knob, Power , Painted		1
10	6583-510006-000	Bracket, Phones (MIC)	SECC 0.8t	1
11	7107-212005-022	Washer M7		1
12	7112-517506-022	Washer M12		1
13	6600-120120-000	Nuts M12		1
14	6600-120070-000	Nuts M7		1
15	6083-510006-000-XXXX	Knob, VR , Painted		1
16	6083-510005-000-XXXX	Knob, Program , Painted		1
17	6083-510001-000-XXXX	FL8350 Front Panel silkscreened		1
18	6083-510003-000-XXXX	Lens, Diaplay , silkscreen		1
19	6083-510004-000-XXXX	Knob, Disc, Painted		1
20		Display PCB Assy		1
21	6083-510010-000-XXXX	Knob, Play, Pianted		1
22	6083-510009-000-XXXX	Knob, Open/Close, Painted		1
23	6583-510001-000	Bottom Cabinet	SECC 1.2t	1
24	6029-010012-000	Foot		4
25	6600-070003-000	Pad, Foot		4
26	6083-510014-000	Bracket, 5CD-Side 2	ABS, Black	1
27		CPU Broad Assy		1
28	6600-020010-000	CD420L01 PCB Mount		4
29		RCA PCB Assy		1
30	6600-180007-000	Bush, AC 5RF-5B		1
31	6600-120040-000	Nut M4		2
32	7104-010010-022	Washer M4X10X1mm		2
33		Transformer		1
34		Main PCB Assy		1
35	9600-505004-001	5CD Mechanism		1
36	6083-510013-000	Bracket, 5CD-Side 1	ABS, Black	1
37	6083-510011-000	Stand, Front -5CD	ABS, Black	2
38	6083-510012-000	Stand, Rear -5CD	ABS, Black	1
39		Power Cord		1
40	6583-510003-000-XXXX	Rear Cabinet, Silkscreen		1
A	7003-006001-111	Screw M3X6 STP B/H (Black)		22
B	7003-006002-112	Screw M3X6 PTP B/H		23
C	7003-008002-112	Screw M3X8 PTP B/H		16
D	7002-606010-062	Screw M2.6X6 W/H		8
E	7004-010010-112	Screw M4X10 B/H		2
F	7003-016002-112	Screw M3X16 PTP B/H Zn		3



FL8350

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1 2 3 4 5 6 7 8

Model : 5CD Exploded drawing List

Rev. A

<u>Seq. No.</u>	<u>Parts No.</u>	<u>Parts Name</u>	<u>Qty.</u>
1	6505-050050-000	Base, 5CD	1
2	6505-050010-003	Bracket, CD Mecha	1
3	9691-005001-000	Mechan Unit (PU91T-001)	1
4	6590-050001-000	PU91 Idler Gear A	1
5	6600-140001-000	Chucking Metal Plate Felt Ring	1
6	6600-020200-002	Pin, Round	1
7	6005-050008-001	Control Cam	1
8	7105-010005-030	Washer Lock 5X10X0.5	3
9	6600-020198-000	Pin, Control Cam	1
10	6505-050001-001	Bracket Gear	1
11	7003-008002-112	Screw M3X8 B Type B/H Zn	12
12	6600-010211-000	Spring, Lever Lock, Outer	1
13	4841-010700-005	Turntable PCB Rev. E	1
14	6005-050025-000	Switch Cover	1
15	6505-050007-000	Contact Plate	1
16	6600-170056-000	Rubber Ring 3.2X5.2X2	1
17	6005-050009-000	Intermediate Gear	1
18	6005-050014-004	Lever Lock, Outer	1
19	4800-310210-001	Loader Board Ver A	1
20	6005-050011-000	Idler Gear	1
21	6005-050023-001	Pulley Motor	1
22	6005-050024-000	Pulley Disc	1
23	6600-090053-000	Belt Motor Loading	1
24	6005-050013-000	Driven Pulley	1
25	6005-050027-000	Bush, Roller	1
26	6005-050012-000	Driven Pulley Plate	1
27	RF-500TB-11415 D/V9	Motor	1
28	7003-012002-062	Screw M3X12 PTP W/H	1
29	7002-605002-112	Screw M2.6X5 PTP B/H Zn	1
30	6005-050007-000	Gear, Cabinet Top	1
31	6600-020197-000	Pin, Gear, Cabinet Top	1
32	6005-050006-001	Cam Cabinet	1
33	7002-006001-022	Screw M2X6 STP P/H	2
34	6600-020196-002	Pin , Cam Cabinet	1
35	7103-012010-022	Washer M3X12X1mm	4
36	7003-008002-062	Screw M3X8 P Type W/H Zn	1
37	6005-050015-000	Lever Lock	1
38	6600-010210-000	Spring Lever Lock	1
39	6600-170021-000	Cushion Ring	2
40	6600-170019-000	Cushion B	2
41	6600-020181-000	Screw, Special	4
42	6600-170018-000	Cushion A	2

43	6090-050002-003	Chuckling Pulley	1
44	6600-150006-000	Chuckling Magnet	1
45	6600-020199-001	Pin, Lock	1
46	6005-050002-005	Cabinet Top	1
47	6005-050001-005	Turntable	1
48	7003-012002-062	Screw M3X12 PTP W/H	1
49	7103-209008-022	Washer M3.2X9X0.8	3
50	6005-050017-000	Roller	1
51	6600-020202-000	5CD Pin, Roller	1
52	6600-020297-000	Pin, Roller Lock	1
53	6505-050005-000	Bracket, Roller	1
54	9400-501000-131	Sensor Board Assy Rev.A	1
55	7103-006005-130	Washer 3X6X0.5mm Cut	1
56	6600-010213-000	Spring, Gear Block Arm	1
57	6600-010212-000	Spring, Gear Block	1
58	7002-620002-062	Screw M2.6X20 P Type W/H Zn	1
59	6005-050005-001	Gear Block Arm	1
60	6005-050004-003	Gear Block	1
61	7002-608002-062	Screw M2.6X8 W/H P.T.P.	2
62	6600-020203-000	Shaft, T.T. Roller	5
63	6600-080001-000	YN21R 03/04 Pinch Roller	5
64	<u>6005-050028-000</u>	Washer, Bush	1
65	6005-050026-000	Lever Lock, T.T.	1
66	6600-010290-001	Spring, Lever Lock	1
67	6505-050002-001	Cabinet Holder A	2
68	6005-050019-000	Shaft Bushing	2
69	6005-050020-000	Pulley Rotary	1
70	6005-050021-000	Gear Rotary	1
71	6005-050022-000	Gear Worm	1
72	6600-020268-000	Shaft Dia. 2X34mm	1
73	6600-090052-000	Belt Rotary	1
74	7002-003010-111	Screw M2X3 B/H (Black)	2
75	6005-050018-000	Motor Pulley	1
76	FF-130SH-11340-2684A	Motor FF-130SH-11340-2684A	1
77	6505-050004-004	Motor Bracket	1
78	6600-020201-001	Shaft, Gear Rotary	1
79	6505-050003-000	Cabinet Holder B	2
80			

Service bulletin # H/K9901 Rev1 November 2002

Warranty Labor Rate: Major Repair

To: All harman/kardon Service Centers

Models: FL8350/FL8550

Subject: "No disc" reading in display

When a CD is in the carousel at the play position, Infra red light emitted by IR LED D3 is reflected onto IR Photo sensor D2. D3 and D2 are on the PCB located underneath the carousel. When the amount of IR light received by D2 is insufficient, D2 will not saturate and the display will read "No disc".

In the event you receive an FL8350 or FL8550 with the complaint: Display reads "No disc" but a disc is in the tray, perform the modification as listed below:

- 1) Lay the unit on a padded surface.
 - 2) Remove the (7) Black Philips screws holding the Top Cover on; remove cover.
 - 3) Lay unit on its side and remove (5) Black screws on bottom which hold front panel to chassis.
 - 4) Lay unit upright, remove (2) Black screws at top front section holding front panel to the front tray retainer brackets.
 - 5) Pull front panel away, cut plastic cable ties if necessary, and lay the front panel face down on the table.
 - 6) Remove (4) tray retainer brackets, (1) Plated screw each. (Bracket on left side may have a ground terminal).
 - 7) Pull the carousel tray up and out of the unit; turn upside-down to expose the sensor board.
 - 8) Remove the (2) Plated screws holding the sensor board to tray.
 - 9) Lift the board and unplug either molex connector CN1 or CN2 to be able to turn board upside-down.
 - 10) Locate R1 and change from a 470 Ω to a 750 Ω resistor - h/k part# 1007-501316-000.
 - 11) Locate R2 and change from a 750 Ω to a 470 Ω resistor - h/k part# 1004-701316-000.
- Alternately, the two above parts may just be "swapped", as this will result in the correct values.
- 12) Locate D3 and replace with new infra-red LED - h/k part# 3100-204000-002.

REASSEMBLY:

- 13) Replace sensor board, screws, and CN1 or CN2 connectors.
- 14) Turn the carousel tray over and replace back in the track; tray must be positioned all the way at the rear of the unit. When placed correctly, tray should *not* glide back & forth on the track.
- 15) Replace and attach the (4) tray retainer brackets with single screws - ground wire (if present) is re-attached to left front bracket.
- 16) Replace the front panel, both with the (5) bottom screws and the (2) screws at the top. Note: Make sure any washers that were present between the various brackets and the chassis are reinstalled. Replace cable ties as necessary.
- 17) Test the player by inserting one or more compact discs, assure unit reads discs in all slots.
- 18) Locate MCU board, which is mounted vertically on right side of unit. Connect DC Multimeter to Pin 8 (gray wire) of CN705 (10 pin plug, labeled 'DSNS'), and Pin 2 (red wire) of CN701 (2 pin plug). While playing a disc, DC Multimeter reading must be between 4.7 V and 5.0 V.
- 19) Replace top cover and screws.

Model	Serial number (120V)	Serial number (230V)	Status	Action
FL8350 FL8550	YC0001-01001 to YC0001-37014 YC0003-01001 to YC0003-08666	YC0002-01001 to YC0002-16673 YC0004-01001 to YC0004-04884	Needs Modification	Replace: R1 with 750 Ω R2 with 470 Ω D3
FL8350 FL8550	YC0001-37015 and above YC0003-08667 and above	YC0002-16674 and above YC0004-04885 and above	Changed by factory	NONE REQUIRED

Service bulletin # H/K2000-09 November 2000

This is considered a Minor Repair

To: All harman/kardon Service Centers

Models: FL8350/FL8550

Subject: Carousel does not stop

In the event you receive an FL8350 or FL8550 with the complaint: "The carousel does not stop at a given disc position, ...or passes disc positions intermittently", perform the modification listed below:

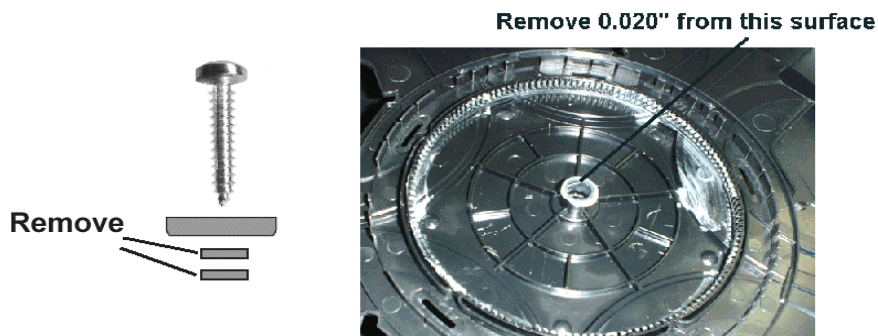
- 1) Lay the unit on a padded surface.
- 2) Remove the (7) Black Philips screws holding the Top Cover on; remove cover.
- 3) In the center of the carousel are a single screw and plated washer; remove these.
- 4) Underneath the larger plated washer are two smaller fiber washers. These are to be removed permanently.
- 5) Examine the larger plated washer carefully. Upon replacement of the larger plated washer and screw, make sure the slightly sharper, stamped edge of the washer is facing upwards.
- 6) Test the player by inserting one or more compact discs, assure the unit reads discs in all slots, and stops at all positions.

IF THIS MODIFICATION DOES NOT CORRECT THE PROBLEM

- 7) Lay unit on its side and remove (5) Black screws on the bottom, which hold the front panel to the chassis.
- 8) Lay unit upright, remove (2) Black screws at top front section holding front panel to the front tray retainer brackets.
- 9) Pull front panel away, cut plastic cable ties if necessary, and lay the front panel face down on the table.
- 10) In the center of the carousel, once again remove the single screw and plated washer.
- 11) Lift the carousel up and off the chassis, towards the front of the unit.
- 12) Turn the carousel upside-down; in the center is a hollow plastic post. Remove any excess lubricant with a clean dry cloth or paper towel, saving it for re-application. The end of this post must be filed down approximately 0.020" (0.5mm) with a file, Dremel tool, or similar tool. Be sure not to remove too much material and keep the surface even (flat). Remove any debris or shavings when finished.
- 13) Spread and replace the saved lubricant on the new surface of the center post.

REASSEMBLY:

- 14) Replace the carousel and mounting screw + washer.
- 15) Replace the front panel, both with the (5) bottom screws and the (2) screws at the top. Note: Make sure any washers that were present between the various brackets and the chassis are reinstalled. Replace cable ties as necessary. Replace the top cover.
- 16) Test the player by inserting one or more compact discs, assure unit reads discs in all slots, and stops at all positions.



Model	Serial number (120V)	Serial number (230V)	Status	Action
FL8350 FL8550	All Serial numbers affected	All Serial numbers affected	May need modification	Remove small fiber washers in center screw of carousel; if necessary file center post down 0.020" (0.5mm)

ADJUSTMENT PROCEDURES

Reference Disk for adjustments: Sony YEDS - 18

Mode: FL8350

Testng Equipment:

- i. 5020 Frequency Response Analyzer
- ii. Oscilloscope
- iii. Frequency Counter
- iv. Frequency Generator (Kenwood AG-203A or similar generator).

Adjustment Procedure

(A) Focus Adjustment

- i. Connect Jitter Meter between TP301(R301) and Vref(J11), then play the reference CD disc.
- ii. Adjust VR301 until the Jitter Meter achieves the minimum valuem.
- iii. Connect Oscilloscope to the same point as the last step. Waveform will appear as a
as a
diamond shape and voltage will be 1.1v opimally. (see figure 1)

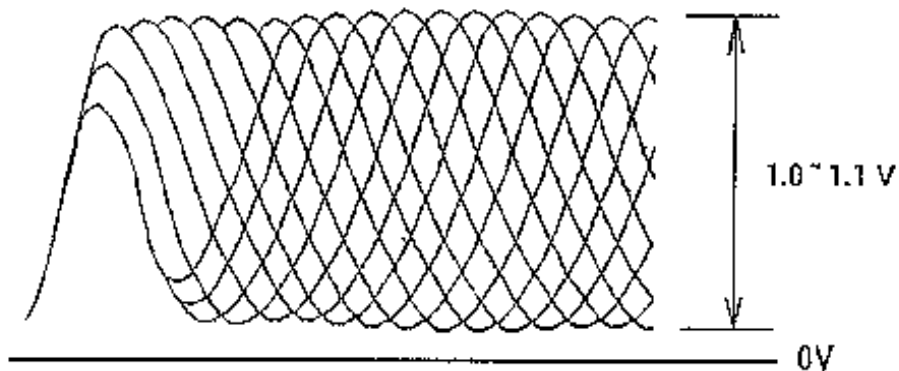


Fig. 1

(B) Tracking Adjustment

- i. Connect oscilloscope to the test point TP1 (KA9220C) and Vref(J11).
- ii. Press PLAY button and adjust VR304 to maximum and press SKIP BACK button to make it tracking off.
- iii. Adjust VR302 to get symmetrical waveform height. Then adjust VR304 to the center position.
- iv. The result should appear as shown in fig. 2

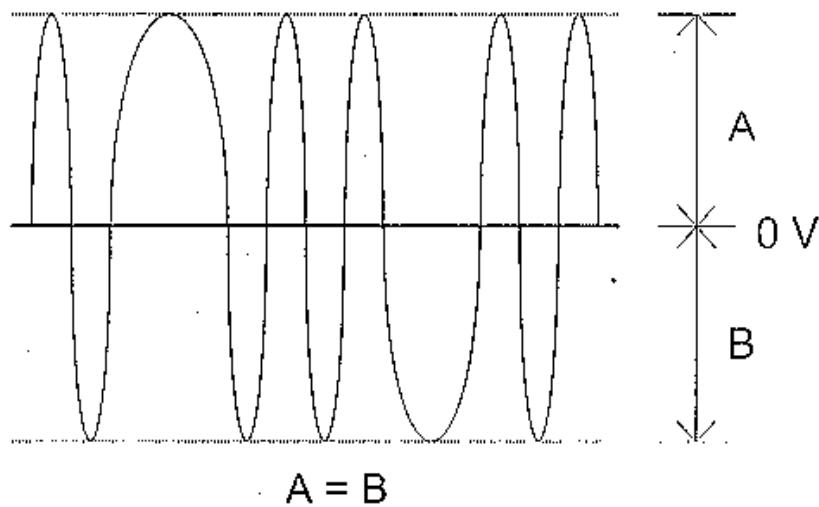
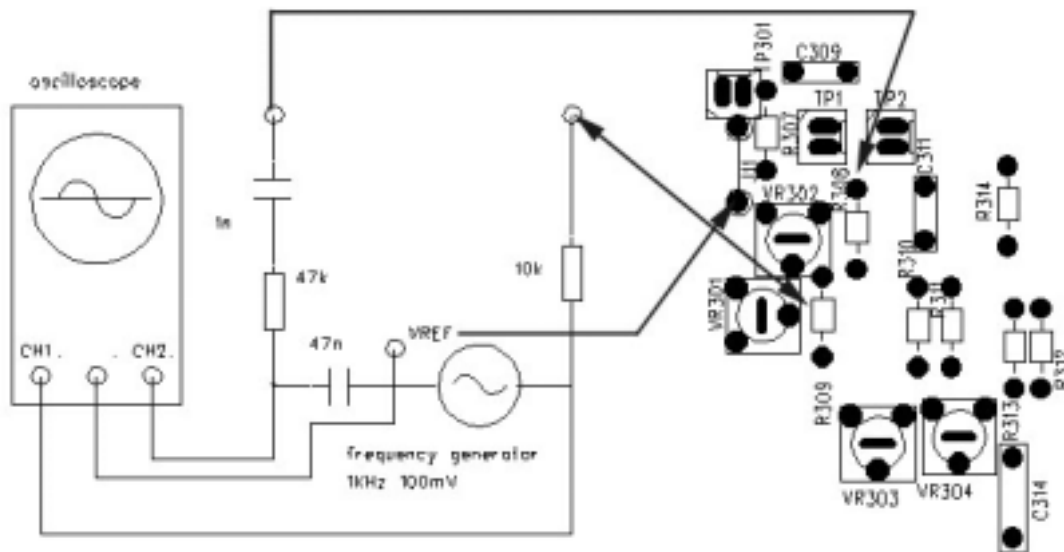


Fig. 2

(C) Focus Servo Loop Gain Adjustment

Connection point	Setting	State	Adjustment Location
U308 (KA9220C) Pin 57 (R308) Pin 56 (R309) See fig 3	1. Oscilloscope Probe: x 10 2. Oscilloscope setting CH1: 20mV/division CH2: 10mV/division Remark: X-Y mode	Play State	Adjustment VR303

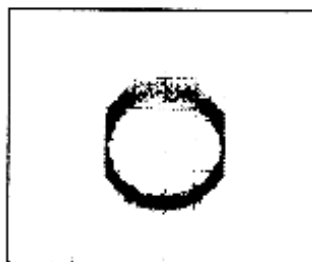
- i. Set the frequency generator output to 1KHz and 100mv.
- ii. Press the play key and press skip key to move the pickup to halfway across the disk (R=35mm).
- iii. Adjustment VR303 (focus gain) so that the Lissajous waveform is symmetrical above and below the X axis and the Y axis. See illustration below.



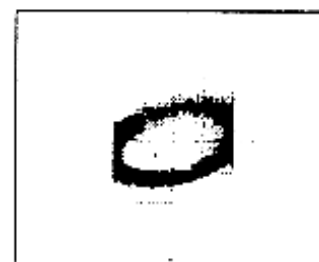
Focus Gain Adjustment



Higher gain



Optimum Gain



Lower Gain

D) Tracking Servo Loop Gain Adjustment

Connection point	Setting	state	Adjustment location
U308 (KA9220C) Pin 53 (R310) Pin 52 (R311) See fig.4	1. Oscilloscope probe: X10 3. Oscilloscope setting CH1: 50mV/division CH2: 20mV/division Remark: X-Y mode	Play State	Adjustment VR304

- i. Set the frequency generator output to 1KHz and 100mV.
- ii. Press the play key and press skip key to move the pickup to halfway across the disk (R=35mm).
- i. Adjustment VR304(track gain) so that the Lissajous waveform is symmetrical above the X axis Y axis. See illustration below.

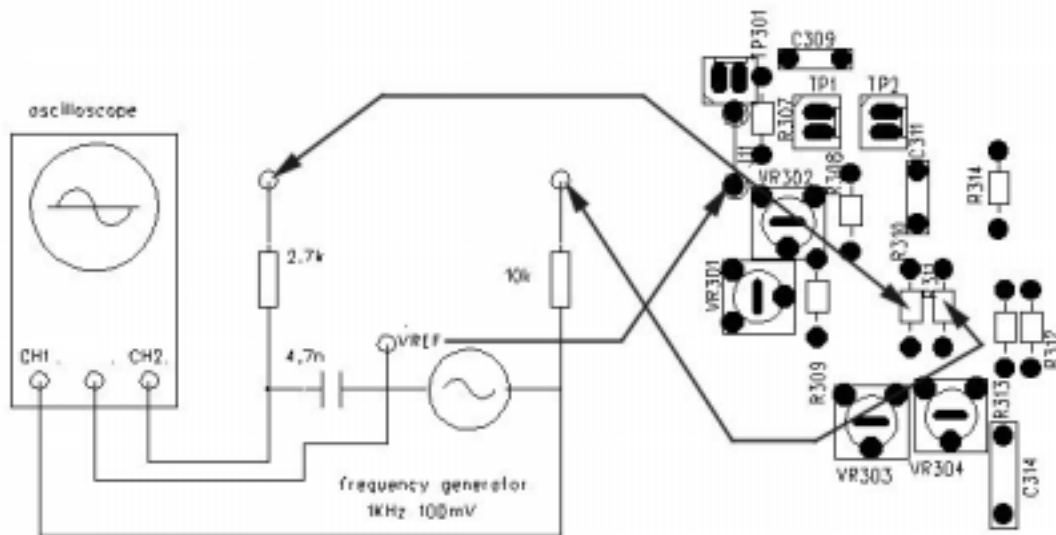
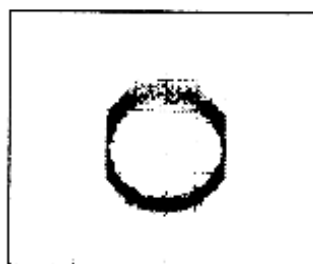


Fig.4

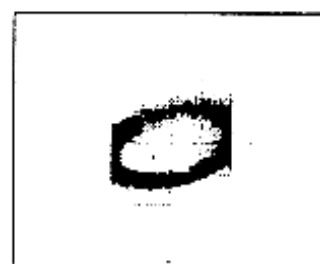
Tracking Gain Adjustment



Higher Gain

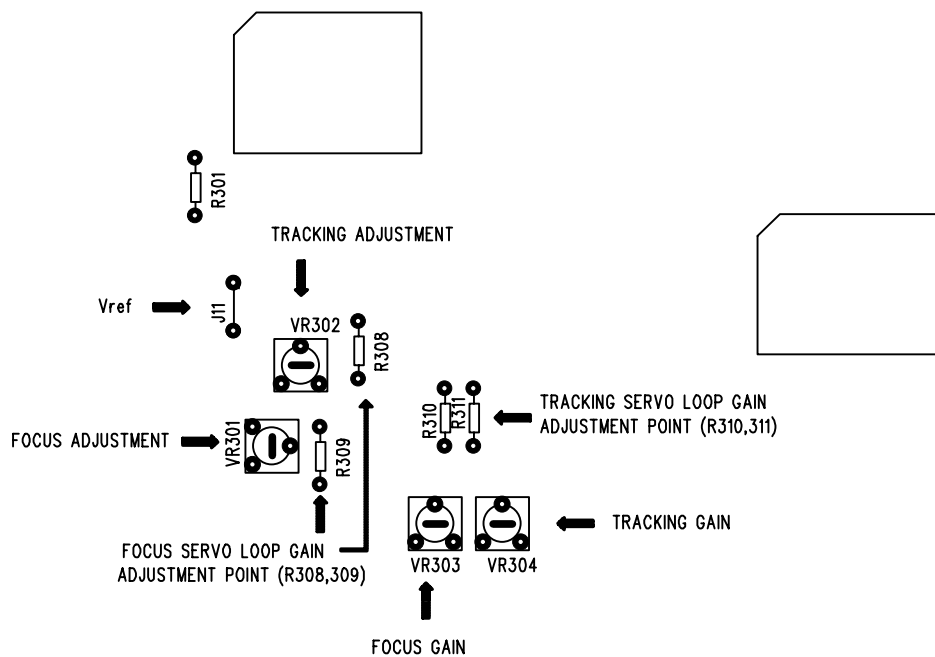


Optimum Gain



Lower Gain

4883-500010-004
FL8350 REV(D)



Audio Characteristics Test Procedure

Test Equipment

- 3346 CD Player Evaluating Filter x 2 (NF Electronic Instrument)
- VP7722 Panasonic Audio Analyzer
- Sony YEDS18 Test CD disc

Procedure

Equipment Setup

- The audio output of the CD player under test is connected to the CD filter L & R inputs.
- The outputs from the filter are connected to the Audio Analyzer.

Check the output Voltage

- Set the mode of the filter to 'THRU'
- Set the mode of Audio Analyzer to 'LEVEL' mode
- Select track 2 of the test disc and play the CD disc
- The output voltage and gain of the R & L channels are taken by pressing the respective buttons on the control board of Audio Analyzer.

Frequency Response

- Set the mode of the filter to reference level mode.
- Select the track 3, 4, 5, and 6 of the test disc and run it under 'Play' mode.
- Check the output of the R & L Channels

Total Harmonic Distortion

- Set the mode of the filter to 'DIST/CH-SP' mode
- Set the audio analyzer to 'DIST' mode.
- Set the unit of the audio analyzer to '%' mode
- Select the track 2, 4, and 5 on the test disc and run them under 'PLAY' mode
- Check the % of each R & L channels

Signal to Noise Ratio

- Set the mode of the filter to 'S/N' mode
- Play track 2 of the test disc
- The unit of the audio analyzer is set to dB mode
- Press the S/N key on the control panel of the audio analyzer
- Play track 7
- Measure the data of S/N ratio

Dynamic Range

- Set the mode of the filter to 'D-Range' mode
- Set the audio analyzer to 'DIST' Mode
- Set the unit of the audio analyzer to 'dB' mode
- Play track 17 of the test disc
- The dynamic range should be $|A| + 60\text{dB}$

Channel Separation

- Set the mode of the filter to 'DIST/CH-SP' mode
- Set the audio analyzer to 'LEVEL' mode
- Play the tracks 8, 9, 10 & 11
- The measured results is the difference between L & R channel

De-emphasis

- Press the 'THRU' button of the CD filter
- Play the track 2 of the test disc
- Press the 'Relative Level' and make it 'ON'
- Select the track 12 and 13 and measure the L & R channels value



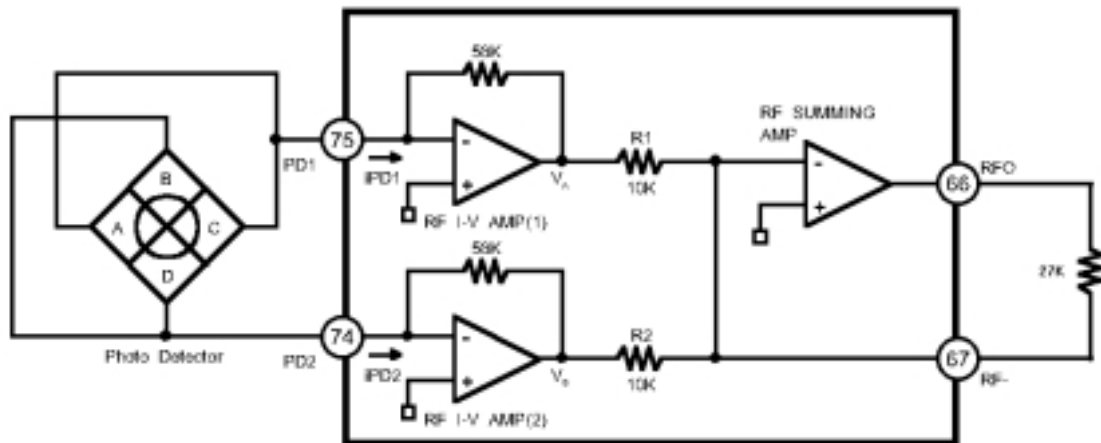
Circuit Description

RF Amp Block

A) Description

The KA9220B is designed for 3-sport type optical pick-up assembly. The photo detector is composed of 6 light sensor (A through F). The photo detector A, B, C, and D detect audio modulation signal on the disc generate focus error signal. The E and F photo detector generate tracking error signal.

B) RF Amplifier



RF1-V AMP (1) and RF 1-V (2) convert current of PD 1(A+B) and PD2 (B+C) through the 58 kohm internal resistor into voltage.

Furthermore, it is added to RF summing amplifier.

This signal (A+B)+(C+D) is outputted form RFO (pin66).

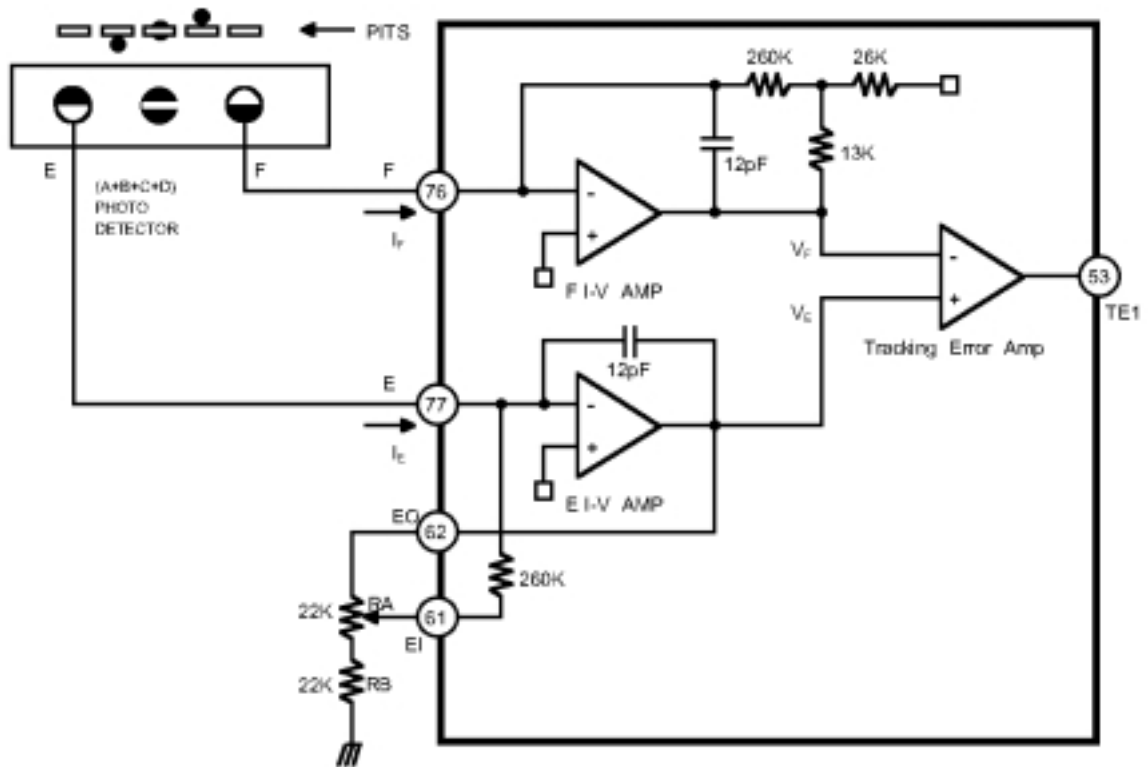
The output voltage is as follow.

$$V_{RFO} = -22K/10K \times (V_A + V_B)$$

$$= -2.2 \times 58K (i_{PD1} + i_{PD2})$$

$$= 127.6k (i_{PD1} + i_{PD2})$$

C) Tracking Error Amplifier



The output of photo detector F is transmitted to the (-) input of FI-V AMP and the output of photo detector E is directed to the (-) input of E I-V AMP.

These input signals are current.

E I-V AMP and F I –V AMP convert current signal to voltage signal. When correct tracking, two input (VF, VE) signal are equal. The occurrence of tracking error is due to difference between FI-V AMP output and EI-V AMP output.

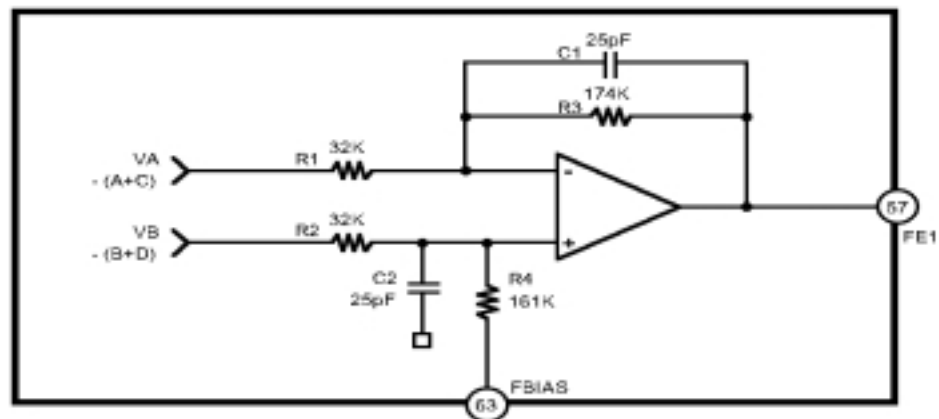
$$V_F = I_F \times 403k\Omega$$

$$V_E = I_E \times 260k\Omega$$

$$V_{TEI} = (V_E - V_F) \times 3.2$$

$$= (I_E - I_F) \times 1290k\Omega$$

D) Focus Error Amplifier



The focus error signal is generated by the difference between RF-I-V AMP (1) output V_A and RF I-V AMP (2) output V_B .

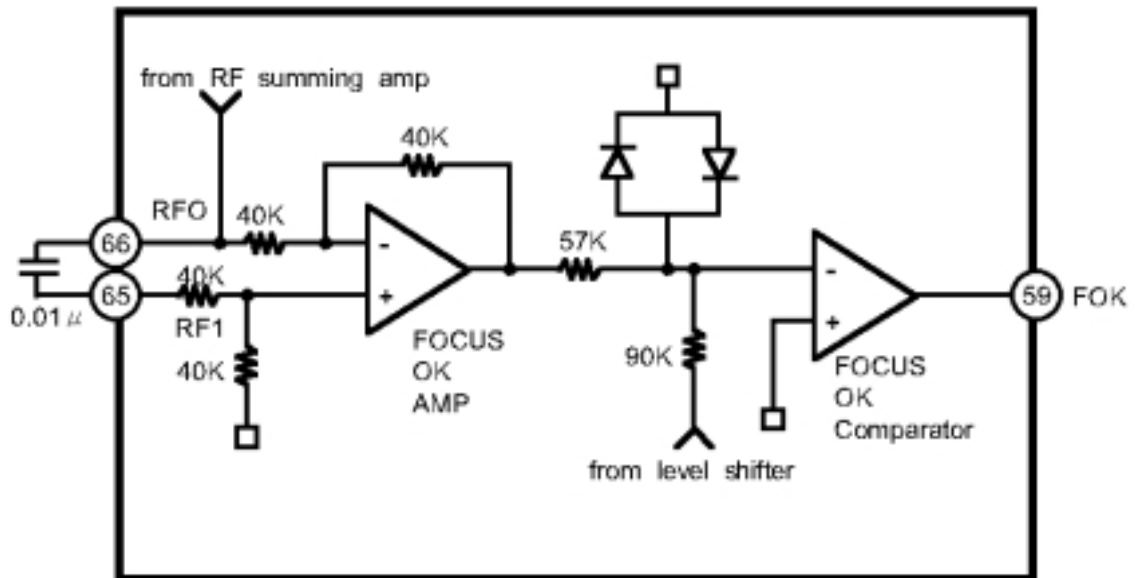
This two (V_A , V_B) Signals are each applied to the (-) and (+) input of focus error amp.

As the result of differential voltage, focus error signal appears at FEI pin (pin 57)

This FEI output voltage (low frequency) becomes $(A + C) - (B + D)$, and

$V_{fe1} = R1/R3 \times (V_B - V_A)$ the focus error voltage is directed to the focus servo block, to maintain an optimum level at all times.

E) Focus OK Circuit

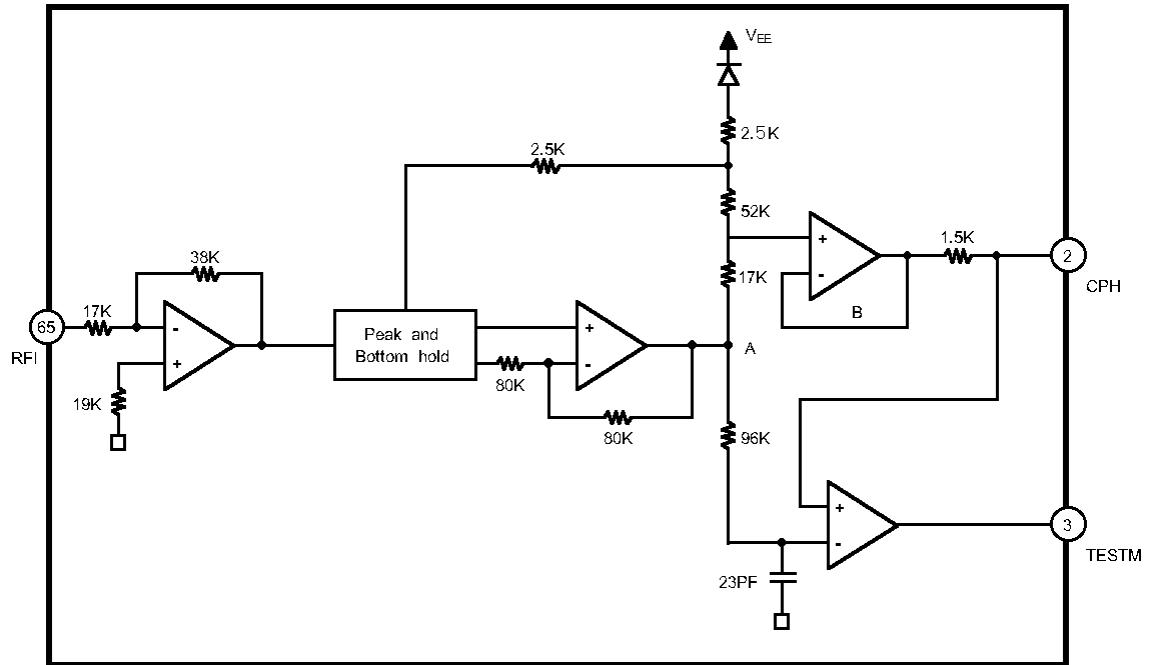


The focus OK circuit generates a timing window to monitor focus search status of focus servo.

When RFO (pin 66) voltage is more than $-0.37V$, the focus OK circuit is inverted .

Time constant of HPF in EFM comparator and mirror circuit and that of LPF in focus ok circuit are determined by capacitor (c301) between RFI and RFO.

F) Mirror Circuit

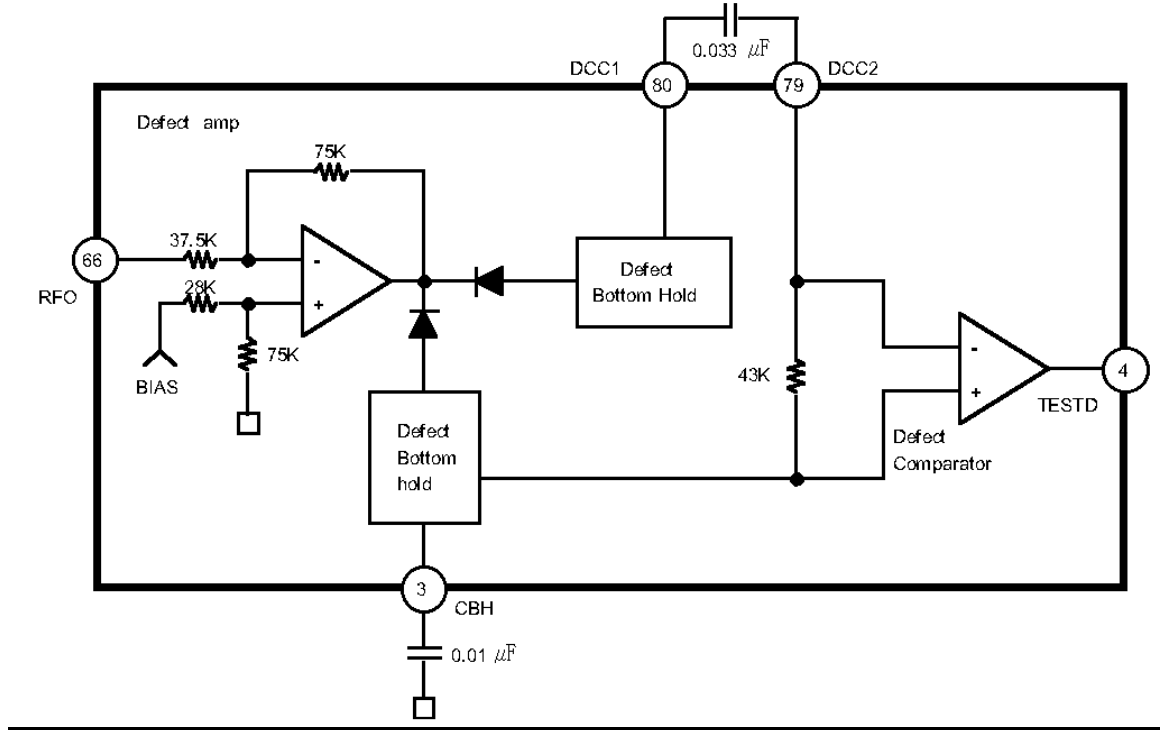


After RF input signal is amplified by mirror amp, it is held in bottom and peak hold circuit.

Such a holding is determined by the time constant. Envelope signal a (demodulated to DC) is two-thirds of the peak value of this signal The value of A signal is held when it is larger than that of B signal.

Therefore, mirror output is low at track on disc, high at between tracks on disc and during detection.

G) Defect Circuit



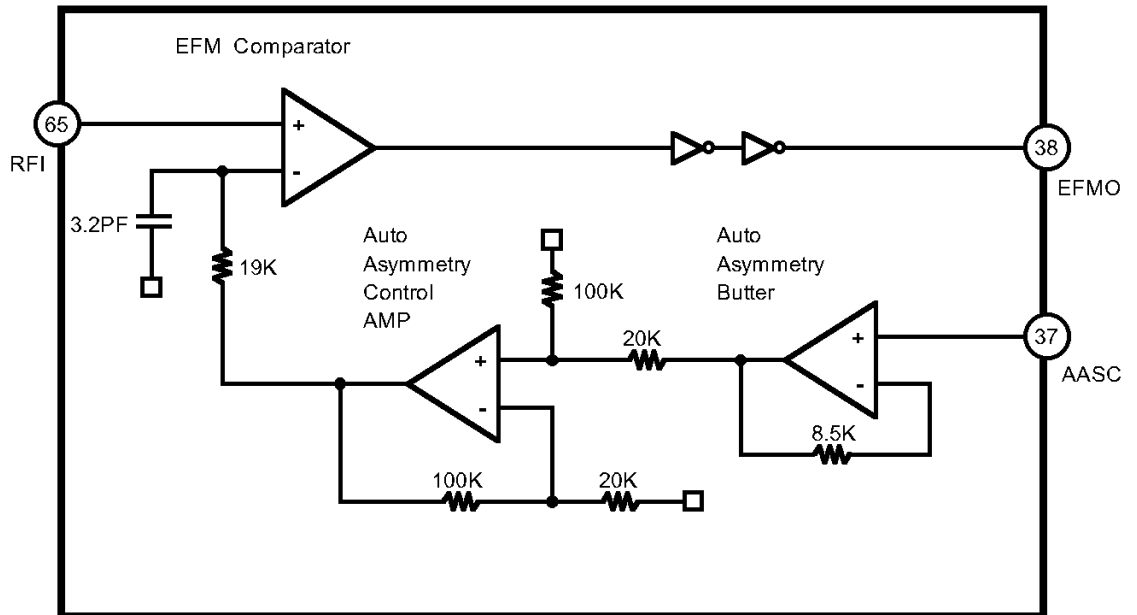
When a defect exists on the disc, drop-out at the upper part of RF signal occurs: At this time, defect signal is generated at defect circuit and shifted into servo part.

The signal shifted into servo part is available for preventing focus and tracking servo from abnormal operation.

The bottom hold has two time constant of long and short, after that the RF signal inverts.

The short time constant of bottom hold is generated shorter than 0.1 msec of disc mirror defect and long time constant is generated by previous mirror level. Mirror defect detection signals are generated by difference on coupling capacitor and transfer level.

H) EFM Comparator

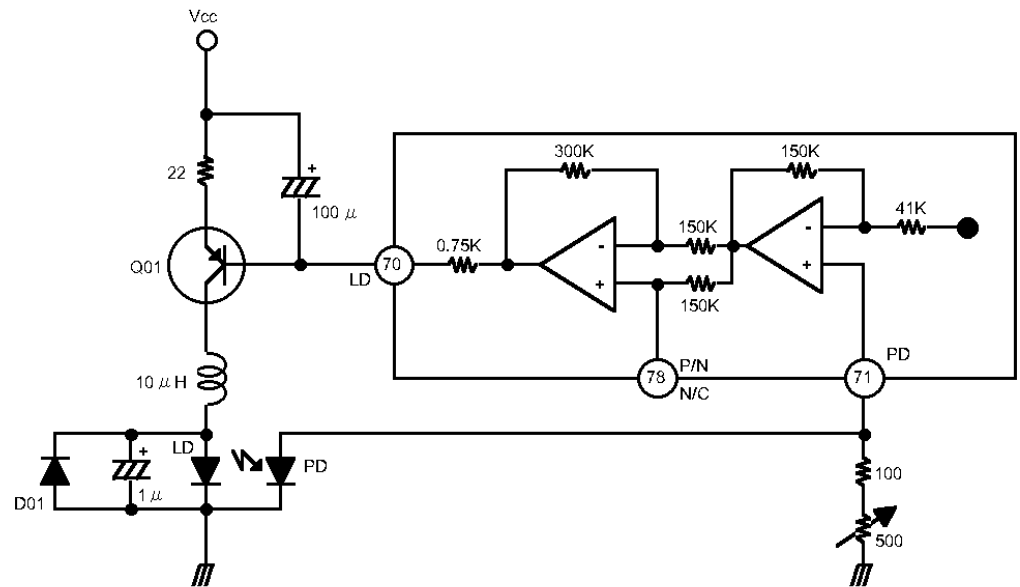


The EFM comparator converts a RF signal into a binary signal. The asymmetry generated for variations on disc manufacturing cannot be eliminated by the ac coupling alone.

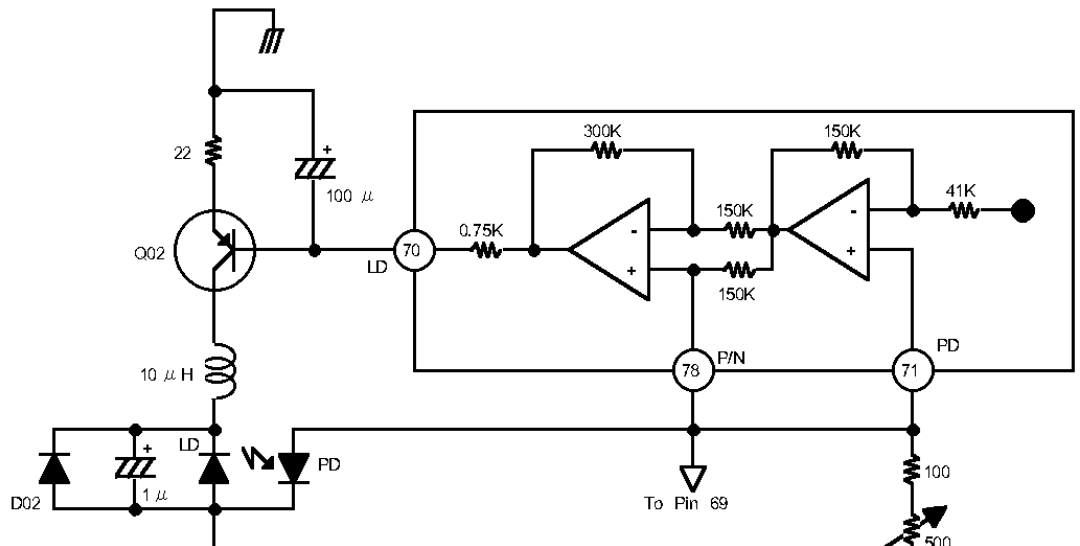
That reference voltage of EFM comparator is controlled utilizing the fact that generation-probability of 1 and 0 is 50% (duty) in the binary EFM signal.

I)APC (Automatic Power Control) Circuit

(1) \pm 5V Signal Power Supply P-sub Laser



(2) + 5V Signal Power Supply N-sub Laser



As a laser diode has large negative temperature characteristics when active and fed by a normal supply current, Therefore, the output current during processing monitor photo diode must be controlled for getting constant output power. Thus APC circuit using p-sub and n-sub of laser diode is for signal power supply operation.

2) DSP BLOCK

A) Description

(1) Operating theory

After CD data detected by pick-up is amplified by RF AMP it is shifted into DSP (KS9282B).

In KS9282B after EFM signal (8→14 bit conversion) shifted from RF Amp of KA9220B is changed into the original signal of (14→ 8 bit conversion), the signal is finally changed into digital audio signal by means of error correction and De-interleave operation.

This digital audio is changed at 16 bit data converter into analog signal after its high frequency element is cut off.

And the analog signal output is out through pin 19 and pin 20 (digital signal output is out through pin 7).

Double speed mode of pin 79 is possible by means of H/L selection.

(2) Features

- EFM Data Demodulation
- Built-in frame sync detection, protection and insertion circuit
- Error correction of C1, C2
- Interpolation
- 8fs oversampling Digital filter (51 th +13 th + 9 th)
- Subcode data serial output
- CLV Servo Controller
- Tracking Counter
- Micom interface
- Built-in 16K SRAM
- Digital Audio out
- Double speed available
- Built-in Digital PLL
- Built-in ,16-bit D/A converter
- Single power supply : + 5V

IC BLOCK DIAGRAMS

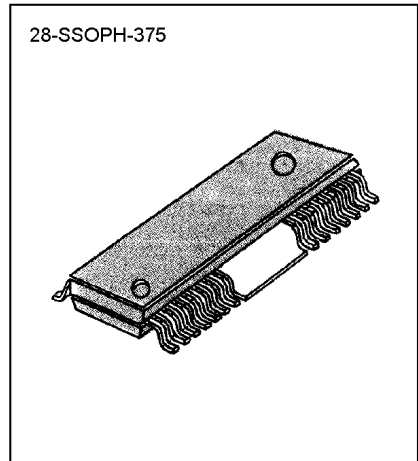
U315 KA9258D

INTRODUCTION

The KA9258D is a quad power operational amplifier to drive spindle motor, sled motor, focus actuator and tracking actuator.

FEATURES

- 4-channel BTL driver
- Built in 5V regulator
- Built-in thermal shut down circuit
- Operating supply voltage: 6 ~ 13V



ORDERING INFORMATION

Device	Package	Operating Temperature
KA9258D	28-SSOPH-375	-25°C~ +75°C

BLOCK DIAGRAM

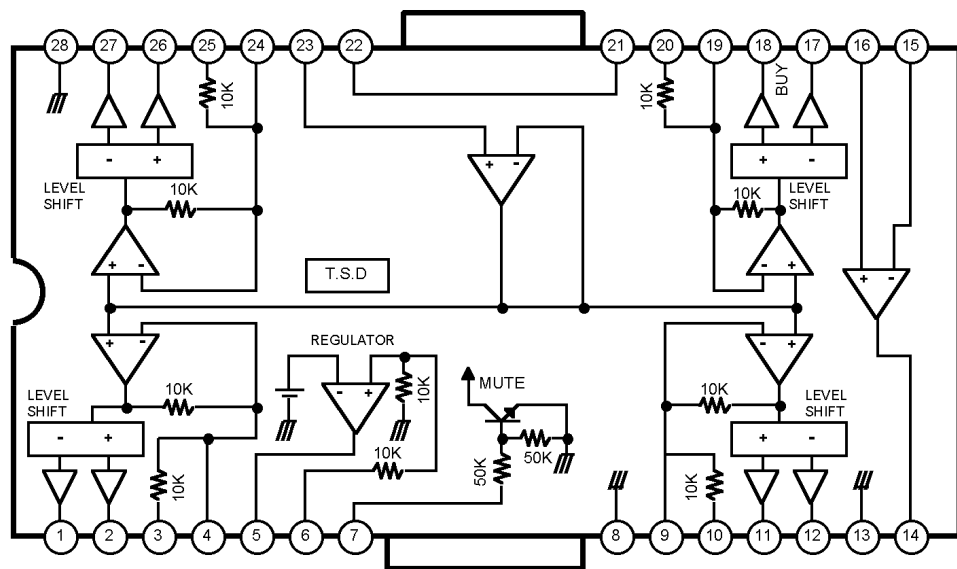


Fig. 1

KA9258D

PIN DESCRIPTION

Pin No.	Symbol	I/O	Description
1	DO1.1	O	DRIVE OUTPUT
2	DO1.2	O	DRIVE OUTPUT
3	DI1.1	I	DRIVE INPUT
4	DI1.2	I	DRIVE INPUT
5	REG		REGULATOR
6	REO	O	REGULATOR OUTPUT
7	MUTE	I	MUTE
8	GND1	-	GROUND
9	DI2.1	I	DRIVE INPUT
10	DI2.2	I	DRIVE INPUT
11	DO2.1	O	DRIVE OUTPUT
12	DO2.2	O	DRIVE OUTPUT
13	GND2	-	GROUND
14	OPOUT	O	OPAMP OUTPUT
15	OPIN (-)	I	OPAMP INPUT (-)
16	OPIN (+)	I	OPAMP INPUT (+)
17	DO3.1	O	DRIVE OUTPUT
18	DO3.2	O	DRIVE OUTPUT
19	DI3.1	I	DRIVE INPUT
20	DI3.2	I	DRIVE INPUT
21	VCC1	-	SUPPLY VOLTAGE
22	VCC2	-	SUPPLY VOLTAGE
23	VREF	I	2.5V BIAS VOLTAGE
24	DI4.1	I	DRIVE INPUT
25	DI4.2	I	DRIVE INPUT
26	DO4.1	O	DRIVE OUTPUT
27	DO4.2	O	DRIVE OUTPUT
28	GND3	-	GROUND

U308 KA9220C

INTRODUCTION

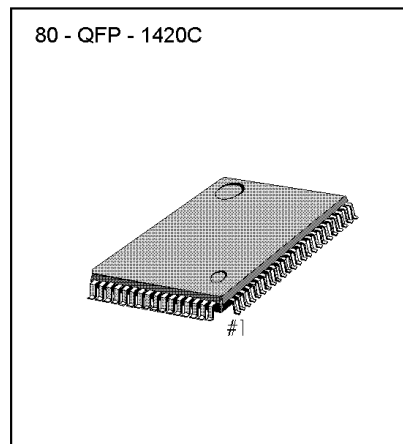
The KA9220C is an 1-Chip BICMOS integrated circuit to perform the function of RF AMP and SSP (Servo Signal Processor) for Compact disc player applications.

It consists of RF signal processing, focus servo, tracking servo, sled servo control, EFM detecting and automatic power control circuits.

FEATURES

- RF Amplifier
- Focus Error Amplifier
- Tracking Error Amplifier
- Mirror Detector
- Focus OK detector
- EFM Comparator and Auto-Asymmetry control Amplifier
- Defect Detector for improvement to playability
- Built-in APC (Automatic power control) Amplifier (Focus, Tracking, sled, spindle servo control)
- Built-in Autosequencer
- Anti-shock function
- The function of preventing sled run away
- Double speed operation available
- Operating supply Voltage range: 3.4 ~ 5.5V

80 - QFP - 1420C



ORDERING INFORMATION

Device	Package	Operating Temperature
KA9220C	80-QFP-1420C	-20°C ~ +75°C

KA9220C

BLOCK DIAGRAM

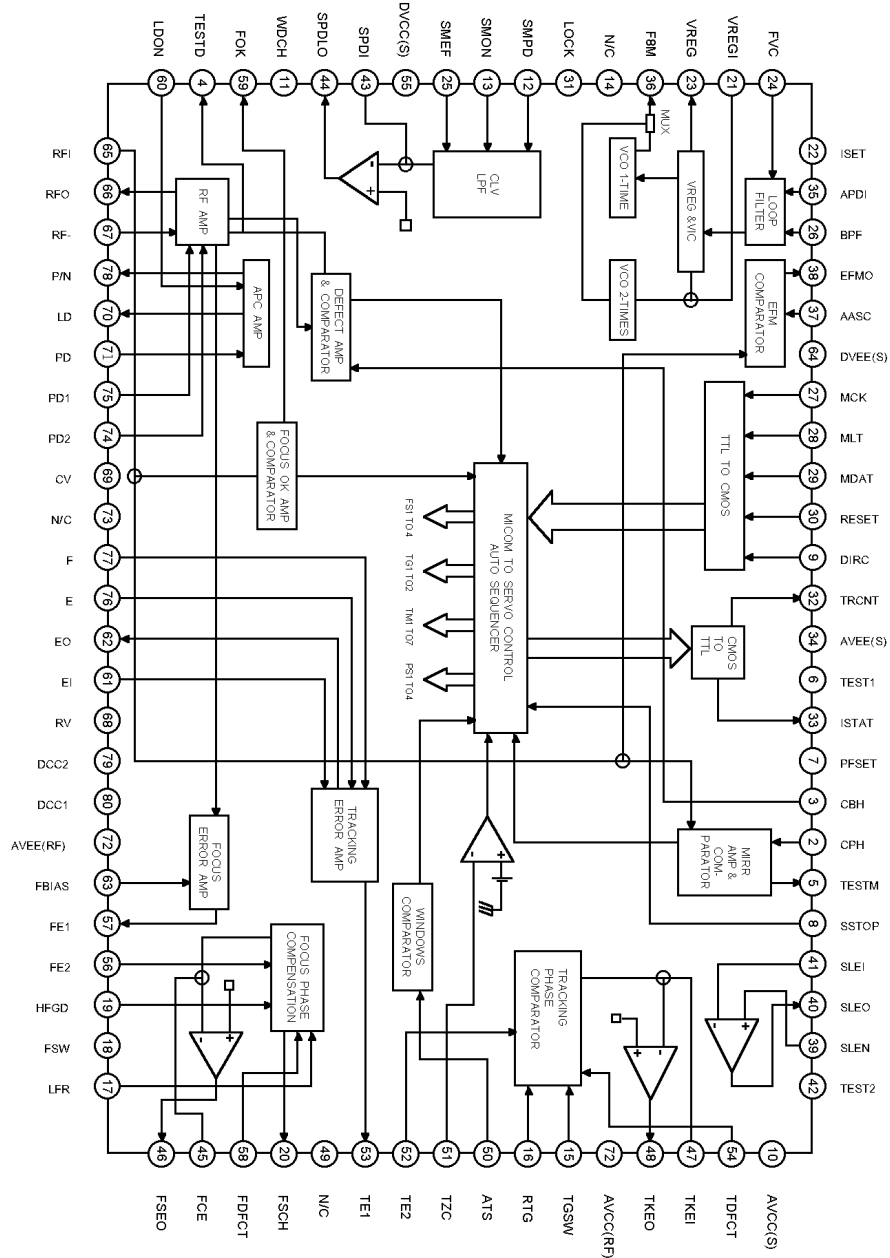


Fig. 1

KA9220 C

PIN DESCRIPTION

Pin No	Symbol	Description
1	AVEE (R)	Analog negative power supply input pin for RF part
2	CPH	Capacitor connection pin of mirror hold.
3	CBH	Capacitor connection pin of defect bottom-hold
4	TESTD	Defect test pin
5	TESTM	Mirror test pin
6	Test1	Input pin for test
7	PPSET	Peak frequency setting pin for focus, tracking compensation and fc (cut off frequency) of CLV LPF.
8	SSTOP	Check the position pin of pick-up whether inside or not.
9	DIRC	Direct 1 Track Jump Control Pin
10	AVCC (S)	Analog positive power supply input pin for SERVO part.
11	WDCH	Auto-sequencer clock-input pin (Normal speed = 88.2KHz, Double speed = 176.4KHz)
12	SMPD	Connection pin of DSP SMPD
13	SMON	Connection pin of DSP SMON, spindle servo ON at "H"
14	N/C	No connection pin
15	TGSW	Providing time constant to change the high frequency tracking gain
16	RTG	Capacitor connection pin to switch the tracking gain of high frequency
17	LFR	Capacitor connection pin to perform rising low bandwidth of focus servo loop
18	FSW	High frequency gain of focus servo loop can be changed by FS3 switch ON or OFF
19	HFGD	Reducing high frequency gain with capacitor connected between pini18 and pin19
20	FSCH	Time constant external pin to generate focus search waveform
21	VREGI	External regulator voltage input pin for VCO
22	ISET	Determining the peak value of focus search, track jump and SLED kick

PIN DESCRIPTION (CONTINUED)

Pin No	System	Description
23	VREG	3.5V Regulator output pin
24	N/C	No connection pin
25	SMEF	Providing an external LPF time constant of CLV SERVO Loop
26	N/C	No connection Pin
27	MCK	Clock input pin from micom
28	MLT	Latch input pin from micom
29	MDAT	Data input pin from micom
30	RESET	Reset input pin from micom, reset at "L"
31	LOCK	Pin for operation of the sled runaway prevention function at "L"
32	TRCNT	Track count output pin
33	ISTAT	Internal status output pin
34	AVEE (S)	Analog negative power supply input pin for SERVO part
35	N/C	No connection
36	N/C	No connection
37	AASC	Auto-Asymmetry control input pin
38	EFMO	EFM comparator output pin
39	SLEN	Non-inverting input pin of SLED SERVO amplifier
40	SLEO	Output pin of SLED SERVO amplifier
41	SLEI	Inverting input pin of SLED SERVO amplifier
42	TEST2	Test input pin to change speed mode Normal speed = "H", Double speed = "L"
43	SPDI	Inverting input pin of spindle servo amplifier
44	SPDLO	Spindle servo amplifier output pin
45	FCE	Inverting input pin of focus servo amplifier.

PIN DESCRIPTION (Continued)

Pin No	System	Description
46	FSEO	Output pin of focus servo amplifier
47	TKEI	Non-inverting input pin of tracking servo amplifier
48	TKEO	Output pin of tracking servo amplifier
49	N/C	No connection
50	ATS	Anti-shock input pin
51	TZC	Tracking Zero Crossing input pin
52	TE2	Tracking Error Servo input pin
53	TE1	Output pin of tracking Error Amplifier
54	TDFCT	Capacitor Connection pin for Defect Compensation of tracking servo
55	DVCC (S)	Digital positive power supply input pin for servo part
56	FE2	Focus error servo input pin
57	FE1	Output pin of focus error Amplifier
58	FDFCT	Capacitor connection pin for defect compensation of focus servo
59	FOK	Output pin of Focus OK comparator.
60	LDON	Laser diode ON/OFF control pin
61	EI	Feedback input pin of E I-V amplifier
62	EO	Output pin of E I-V Amplifier
63	FBIAS	Bias pin of non-inverting input of focus error amplifier
64	DVEE (S)	Digital negative power supply input pin for servo part
65	RFI	Output Signal of RF summing amplifier is inputted through capacitor
66	RFO	Output pin of RF summing amplifier
67	RF-	Inverting input pin of RF summing amplifier
68	RV	Output pin of $(AVCC + AVEE)/2$ Voltage
69	CV	Bias input pin of Center Voltage buffer

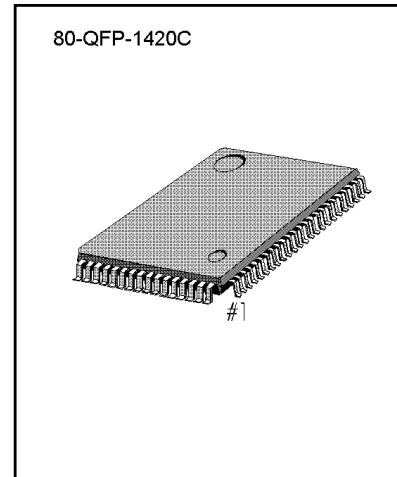
PIN DESCRIPTION (CONTINUED)

Pin No	System	Description
70	LD	Output pin of APC amplifier
71	PD	Input pin of APC amplifier
72	AVEE (R)	Analog positive power supply input pin for RF part
73	N/C	No connection
74	PD2	Inverting input pin of RF I-V AMP2
75	PD1	Inverting input pin of RF I-V AMP1
76	F	Inverting input pin of F I-V AMP
77	E	Inverting input pin of E I-V AMP
78	P/N	Selecting P - sub/N - sub of Laser diode
79	DCC2	Defect bottom - hold output is inputted through capacitor
80	DCC1	Output pin of defect bottom - hold

U310 KS9284

INTRODUCTION

The KS9284 is a CMOS integrated circuit designed for the digital audio signal processor.
 It is a monolithic IC that builds in 16K SRAM and DPLL.
 It is similar to KS9284 IC but has advanced error correction ability.



FEATURES

- EFM data demodulation
- Built-in frame sync detection, protection and insertion circuit
- C1:2 - Error correction, C2:4 - Erasure correction
- Interpolation
- Subcode data serial output
- CLV servo controller
- Tracking counter
- Micom interface
- Built-in 16K SRAM
- Digital audio output (TX)
- Built-In digital PLL and analog PLL
- Double speed function
- Single power supply: +5V

ORDERING INFORMATION

Device	Package	Operating Temperature
KS9284	80-QFP-1420C	- 20°C~ + 75°C

KS9284

BLOCK DIAGRAM

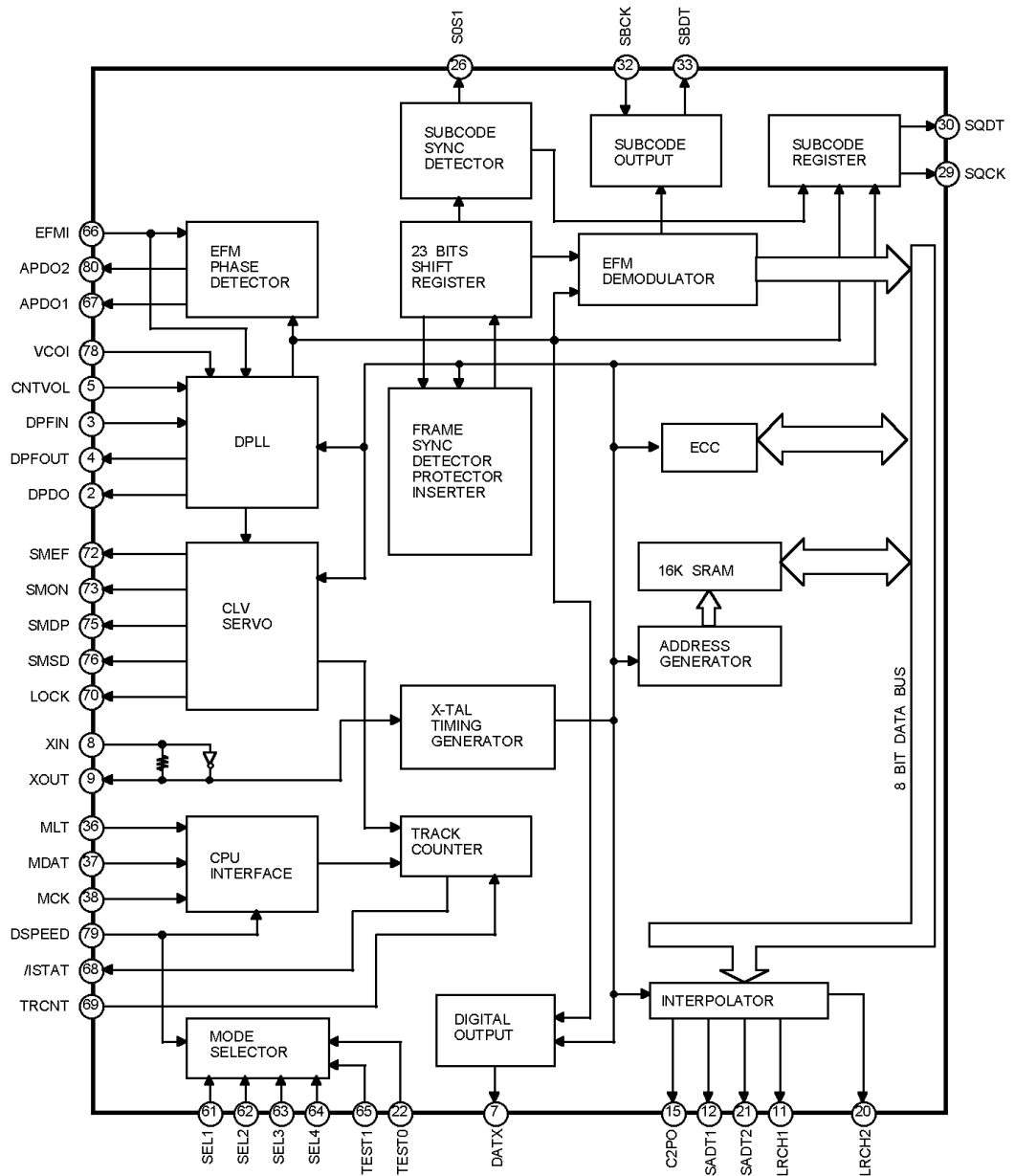


Fig. 1

PIN CONFIGURATION

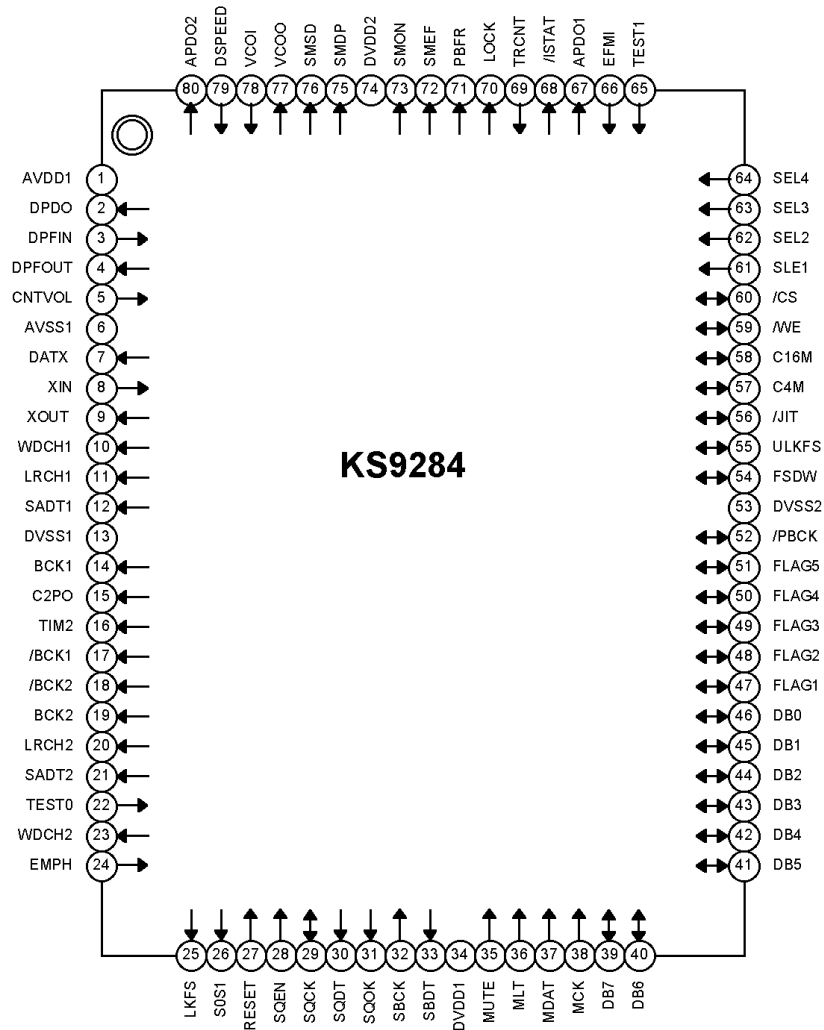


Fig. 2

KS9284

PIN DESCRIPTION

Pin No.	Symbol	I/O	Description
1	AV _{DD} 1	-	Analog supply voltage 1
2	DPDO	O	Charge pump output for master PLL
3	DPFIN	I	Filter input for master PLL
4	DPFOUT	O	Filter output for master PLL
5	CNTVOL	I	VCO control voltage for master PLL
6	AV _{SS} 1	-	Analog ground 1
7	DATX	O	Digital audio output
8	XIN	I	X-tal oscillator input (16.9344MHz / 33.8688MHz)
9	XOUT	O	X-tal oscillator output
10	WDCH1	O	Word clock of 48 bits/slot
11	LRCH1	O	Channel clock of 48 bits/slot
12	SADT1	O	Serial audio data output with 48 bits/slot
13	DV _{SS} 1	-	Digital ground 1
14	BCK1	O	Serial audio data bit clock for 48 bits/slot
15	C2PO	O	C2 pointer for serial audio data
16	TIM2	O	Normal or double speed control output pin
17	/BCK1	O	Inverted clock of BCK1
18	/BCK2	O	Inverted clock of BCK2
19	BCK2	O	Serial audio data bit clock for 64 bits/slot
20	LRCH2	O	Channel clock for 64 bits/slot
21	SADT2	O	Serial audio data output with 64 bits/slot
22	TEST0	I	Test input pin ("L": normal, "H": test)
23	WDCH2	O	Word clock of 64 bit/slot
24	EMPH	O	Emphasis/Non-emphasis output ("H" : Emphasis)
25	LKFS	O	The lock status output of frame sync
26	S0S1	O	Output of subcode sync signal (S0 + S1)
27	RESET	I	System reset at "L"
28	SQEN	I	SQCK control input ("L": internal clock, "H": external clock)
29	SQCK	I/O	Subcode-Q data bit clock
30	SQDT	O	Subcode-Q data serial output

PIN DESCRIPTION (continued)

Pin No.	Symbol	I/O	Description
31	SQOK	O	The CRC check result signal output of subcode-Q
32	SBCK	I	Subcode data bit clock
33	SBDT	O	Subcode serial data output
34	DV _{DD1}	-	Digital supply voltage 1
35	MUTE	I	Mute control input ("H": Mute ON)
36	MLT	I	Latch signal input from micom
37	MDAT	I	Serial data input from micom
38	MCK	I	Serial data transferring clock input from micom
39	DB7	I/O	Data port 7 for external SRAM (MSB)
40	DB6	I/O	Data port 6 for external SRAM
41	DB5	I/O	Data port 5 for external SRAM
42	DB4	I/O	Data port 4 for external SRAM
43	DB3	I/O	Data port 3 for external SRAM
44	DB2	I/O	Data port 2 for external SRAM
45	DB1	I/O	Data port 1 for external SRAM
46	DB0	I/O	Data port 0 for external SRAM (LSB)
47	FLAG1	I/O	Monitoring output for C1 error correction (RA0)
48	FLAG2	I/O	Monitoring output for C1 error correction (RA1)
49	FLAG3	I/O	Monitoring output for C2 error correction (RA2)
50	FLAG4	I/O	Monitoring output for C2 error correction (RA3)
51	FLAG5	I/O	C2 decoder flag ("H": when the processing C2 code is impossible correction status /RA4)
52	/PBCK	I/O	VCOI/2 clock (4.3218/8.6436MHz) ; when locked in with EFMI (RA5)
53	DV _{SS2}	-	Digital ground 2
54	FSDW	I/O	Unprotected frame sync (RA6)
55	ULKFS	I/O	Frame sync protection status (RA7)
56	/JIT	I/O	RAM overflow and underflow status (RA8)
57	C4M	I/O	4.2336MHz clock output (RA9)
58	C16M	I/O	16.9344MHz clock output (RA10)
59	/WE	I/O	Write enable output to external SRAM
60	/CS	I/O	Chip select output to external SRAM

PIN DESCRIPTION (continued)

Pin No.	Symbol	I/O	Description
61	SEL1	I	X-tal selection terminal ("L":16.9344MHz; "H" : 33.8688MHz)
62	SEL2	I	DPLL selection terminal ("L": DPLL, "H" : APLL)
63	SEL3	I	CD-ROM selection terminal ("L": CDP, "H" : CD-ROM)
64	SEL4	I	SRAM selection terminal ("L": internal SRAM, "H" : external SRAM)
65	TEST1	I	Test terminal ("L": normal, "H": test)
66	EFMI	I	EFM data input
67	APDO1	O	Charge pump output for analog PLL
68	/ISTAT	O	The internal status output
69	TRCNT	I	Tracking clock input signal
70	LOCK	O	Output signal of LKFS conditions sampled PBFR/16 (If LKFS is "H", lock is "H". If the LKFS is sampled "L" at least 8 times by PBFR/16, lock is "L")
71	PBFR	O	Write frame clock (Lock : 7.35KHz)
72	SMEF	O	LPF time constant control of the spindle servo error signal
73	SMON	O	ON/OFF control signal for spindle servo
74	DV _{DD2}	-	Digital supply voltage 2
75	SMDP	O	Spindle motor driving output (rough control in the speed mode, phase control in the phase mode)
76	SMSD	O	Spindle motor (Velocity control in the phase mode)
77	VCOO	O	VCO output
78	VCOI	I	VCO input (when the state is lock by means of PBFR, it is 8.6436MHz)
79	DSPEED	I	Double speed mode control ("H": normal speed, "L": 2-times speed)
80	APDO2	O	Analog PLL charge pump output for double speed mode

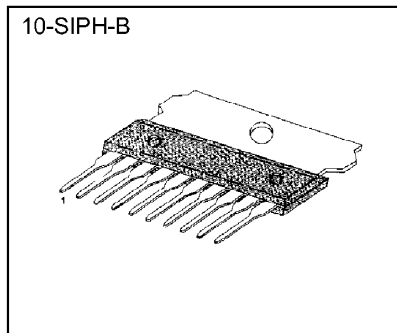
(NOTE)

1. PBFR: 7.35KHz Write frame clock produced by data which being reproduced.
2. /PBCK : Channel bit clock of data which being reproduced.
3. /JIT : Display signal of either RAM overflow or underflow for ± 4 frame jitter margin.

U305/306 KA8301

BI-DIRECTIONAL DC MOTOR DRIVER

The KA8301 is a monolithic integrated circuit designed for driving bi-directional DC motor with braking and speed control, and suitable for the loading motor driver of VCR systems. The speed control can be achieved by adjusting the external voltage of the speed control pin.



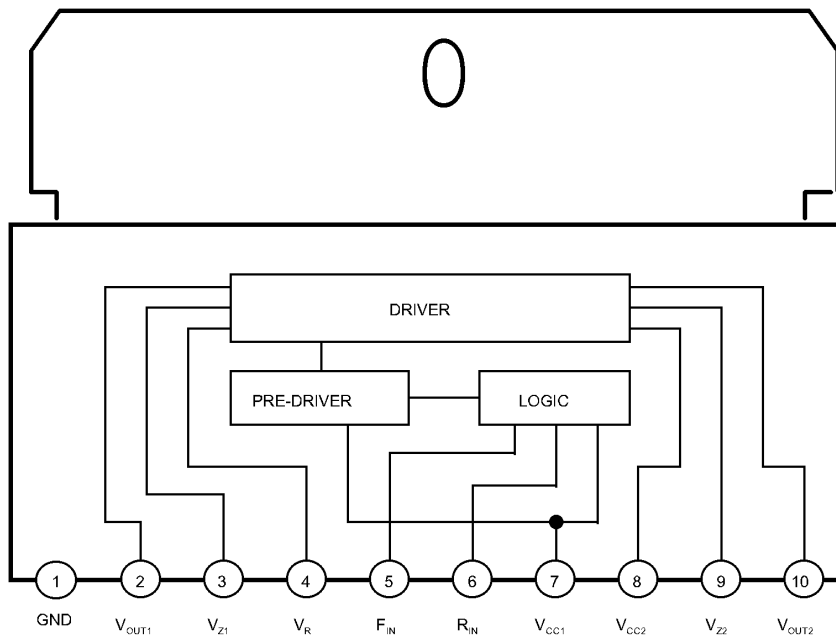
FEATURES

- Built-in brake function for stable brake characteristics.
- Built-in element to absorb a dash current derived from changing motor direction and braking motor drive.
- External motor speed control pin
- Stable motor direction change.
- Interfaces with CMOS devices.

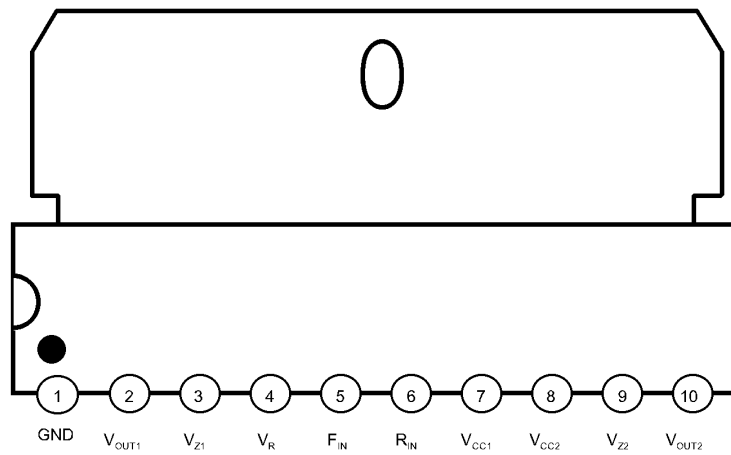
ORDERING INFORMATION

Device	Package	Operating Temperature
KA8301	10-SIPH-B	- 25°C ~ + 75°C

BLOCK DIAGRAM



PIN CONFIGURATIONS



PIN DESCRIPTIONS

Pin no.	Symbol	I/O	Description	Pin no.	Symbol	I/O	Description
1	GND	-	Ground	6	R _{IN}	I	Input 2
2	V _{OUT1}	O	Output 1	7	V _{CC1}	-	Supply Voltage (Signal)
3	V _{Z1}	-	Power Transistor Protection	8	V _{CC2}	-	Supply Voltage (Power)
4	V _R	I	Motor speed control	9	V _{Z2}	-	Phase compensation
5	F _{IN}	I	Input 1	10	V _{OUT2}	O	Output 1

U307 TDA1305T

Philips Semiconductors

Preliminary specification

Stereo 1fs data input up-sampling filter with bitstream continuous dual DAC (BCC-DAC2)

TDA1305T

FEATURES

- Easy application
- 16f_s Finite-duration Impulse-Response (FIR) filter incorporated
- Selectable system clock (f_{sys}) 256f_s or 384f_s
- I²S-bus serial input format (at f_{sys} = 256f_s) or LSB fixed 16, 18 or 20 bits serial input mode (at f_{sys} = 384f_s)
- Slave-mode clock system
- Cascaded 4-stage digital filter incorporating 2-stage FIR filter, linear interpolator and sample-and-hold
- Smoothed transitions before and after muting (soft mute)
- Digital de-emphasis filter for three sampling rates of 32 kHz, 44.1 kHz and 48 kHz
- 12 dB attenuation via the attenuation input control
- Double speed mode
- 2nd order noise shaper
- 96 (f_{sys} = 384f_s) or 128 (f_{sys} = 256f_s) times oversampling in normal speed mode
- 48 (f_{sys} = 384f_s) or 64 (f_{sys} = 256f_s) times oversampling in double speed mode
- Bitstream continuous calibration concept
- Small outline SO28 package
- Voltage output 1.5 V (RMS) at line drive level
- Low total harmonic distortion
- No zero crossing distortion
- Inherently monotonic
- No analog post filtering required
- Superior signal-to-noise ratio
- Wide dynamic range (18-bit)
- Single rail supply (3.4 to 5.5 V).



bitstream converter for low signals while large signals are generated using the dynamic continuous calibration technique, thus resulting in low power consumption, small chip size and easy application.

The TDA1305T is a dual CMOS DAC with up-sampling filter and noise shaper. The combination of high oversampling up to 16f_s, 2nd order noise shaping and continuous calibration conversion ensures that only simple 1st order analog post filtering is required.

The TDA1305T supports the I²S-bus data input mode with word lengths of up to 20 bits (at f_{sys} = 256f_s) and the LSB fixed serial data input format with word lengths of 16, 18 and 20 bits (at f_{sys} = 384f_s). Four cascaded FIR filters increase the oversampling rate to 16 times. A sample-and-hold function increases the oversampling rate to 96 times (f_{sys} = 384f_s) or 128 times (f_{sys} = 256f_s). A 2nd order noise shaper converts this oversampled data to a bitstream for the 5-bit DACs.

The DACs are of the continuous calibration type and incorporate a special data coding. This ensures an extremely high signal-to-noise ratio, superior dynamic range and immunity to process variation and component ageing.

Two on-board operational amplifiers convert the digital-to-analog current to an output voltage. Externally connected capacitors perform the required 1st order filtering so that no further post filtering is required.

The unique combination of bitstream and continuous calibration techniques, together with a high degree of analog and digital integration, results in a single filter-DAC with 18-bit dynamic range, high linearity and simple low cost application.

GENERAL DESCRIPTION

The TDA1305T is a new generation of filter-DAC which features a unique combination of bitstream and continuous calibration techniques. The converter functions as a

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
TDA1305T	SO28	plastic small outline package; 28 leads; body width 7.5 mm	SOT136-1

Stereo 1fs data input up-sampling filter with
bitstream continuous dual DAC (BCC-DAC2)

TDA1305T

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V _{DDD}	digital supply voltage	note 1	3.4	5.0	5.5	V
V _{DDA}	analog supply voltage	note 1	3.4	5.0	5.5	V
V _{DDO}	operational amplifier supply voltage	note 1	3.4	5.0	5.5	V
I _{DDD}	digital supply current	V _{DDD} = 5 V ; at code 00000H	–	30	–	mA
I _{DDA}	analog supply current	V _{DDA} = 5 V ; at code 00000H	–	5.5	8	mA
I _{DDO}	operating amplifier supply current	V _{DDO} = 5 V ; at code 00000H	–	6.5	9	mA
V _{FS(rms)}	full-scale output voltage (RMS value)	V _{DDD} = V _{DDA} = V _{DDO} = 5 V	1.425	1.5	1.575	V
(THD + N)/S	total harmonic distortion plus noise-to-signal ratio	at 0 dB signal level	–	90	–81	dB
			–	0.003	0.009	%
		at –60 dB signal level	–	44	–40	dB
			–	0.63	0.1	%
S/N	signal-to-noise ratio at bipolar zero	at –60 dB signal level; A-weighted	–	46	–	dB
			–	0.5	–	%
S/N	signal-to-noise ratio at bipolar zero	A-weighting; at code 00000H	100	108	–	dB
BR _{ns}	input bit rate at data input	f _s = 48 kHz; normal speed	–	–	3.072	Mbits
BR _{ds}	input bit rate at data input	f _s = 48 kHz; double speed	–	–	6.144	Mbits
f _{sys}	system clock frequency		6.4	–	18.432	MHz
TC _{FS}	full scale temperature coefficient at analog outputs (VOL and VOR)			100 10 ^{–6}	–	
T _{amb}	operating ambient temperature		–30	–	+85	C

Note

1. All V_{DD} and V_{SS} pins must be connected to the same supply.

Stereo 1fs data input up-sampling filter with
bitstream continuous dual DAC (BCC-DAC2)

TDA1305T

BLOCK DIAGRAM

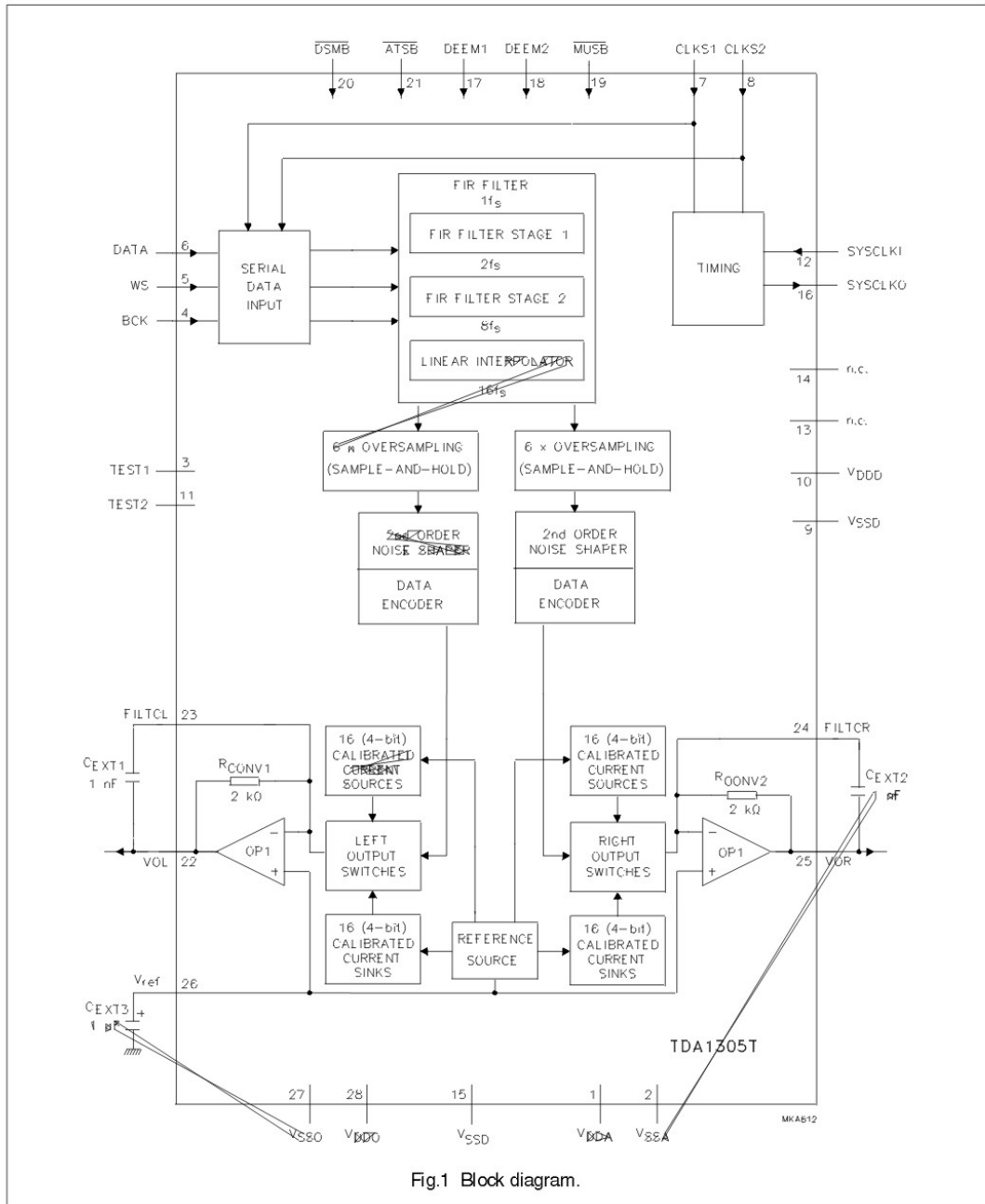


Fig.1 Block diagram.

Stereo 1fs data input up-sampling filter with
bitstream continuous dual DAC (BCC-DAC2)

TDA1305T

PINNING

SYMBOL	PIN	DESCRIPTION
V _{DDA}	1	analog supply voltage
V _{SSA}	2	analog ground
TEST1	3	test input; pin should be connected to ground (internal pull-down resistor)
BCK	4	bit clock input
WS	5	word select input
DATA	6	data input
CLKS1	7	clock selection 1 input
CLKS2	8	clock selection 2 input
V _{SSD}	9	digital ground
V _{DDD}	10	digital supply voltage
TEST2	11	test input; pin should be connected to ground (internal pull-down resistor)
SYSCCLKI	12	system clock input
n.c.	13	not connected (this pin should be left open-circuit)
n.c.	14	not connected (this pin should be left open-circuit)
V _{SSD}	15	digital ground
SYSCCLKO	16	system clock output
DEEM1	17	de-emphasis on/of f; f _{DEEM} 32 kHz, 44 kHz and 48 kHz
DEEM2	18	de-emphasis on/of f; f _{DEEM} 32 kHz, 44 kHz and 48 kHz
MUSB	19	mute input (active LOW)
DSMB	20	double-speed mode input (active LOW)
ATSB	21	12 dB attenuation input (active LOW)
VOL	22	left channel output
FILTCL	23	capacitor for left channel 1st order filter function should be connected between pins 22 and 23
FILTCR	24	capacitor for right channel 1st order filter function should be connected between pins 25 and 24
VOR	25	right channel output
V _{ref}	26	internal reference voltage for output channels (0.5V _{DD})
V _{SSO}	27	operational amplifier ground
V _{DDO}	28	operational amplifier supply voltage

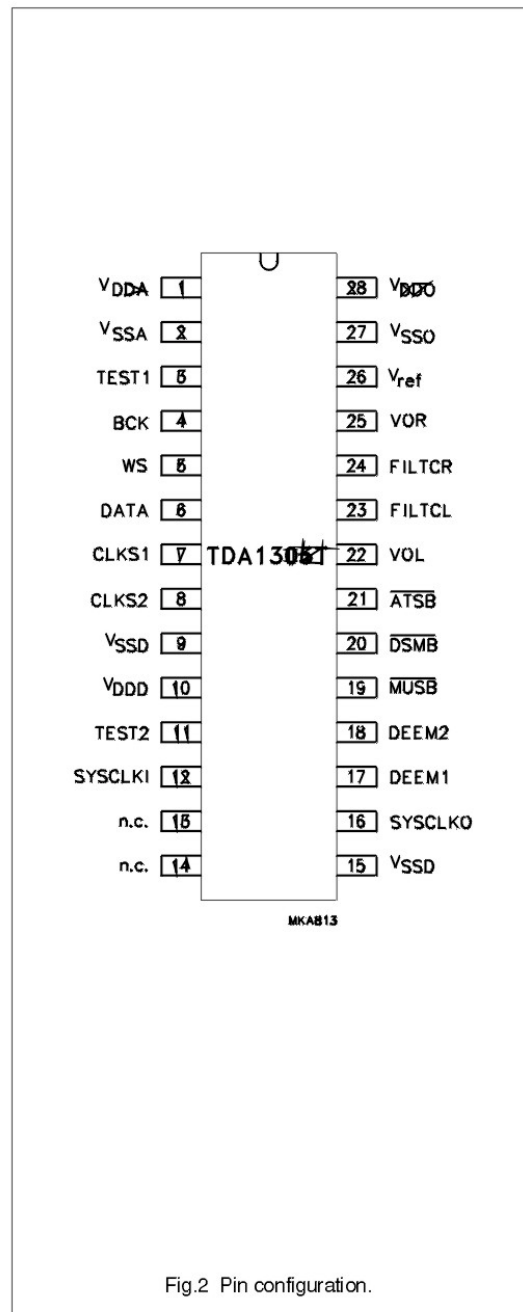


Fig.2 Pin configuration.

Section 1 Overview

1.1 Overview U701 HD6433724E393F MICROPROCESSOR

The H8/300L Series is a single-chip microcomputer (MCU: microcomputer unit), built around the high-speed H8/300L CPU and equipped with peripheral system functions on chip.

The H8/3724 Series is a single-chip microcomputer in the H8/300L Series equipped with high-voltage pins. Its on-chip peripheral functions include a vacuum fluorescent display (VFD) controller/driver, timers, a 14-bit PWM (pulse width modulator), two serial communication interface channels, and an analog-to-digital converter. Together these functions make this chip ideally suited to use as a microcontroller in embedded systems requiring a VFD display.

The H8/3724 Series comes in the following memory configurations for various system scale needs.

H8/3723: 24-kbyte ROM, 384-byte RAM

H8/3724: 32-kbyte ROM, 512-byte RAM

H8/3725: 40-kbyte ROM, 640-byte RAM

H8/3726: 48-kbyte ROM, 1,024-byte RAM

In addition to masked ROM versions available for the H8/3724 Series, H8/3724 and H8/3726 are also available in ZTAT[®] versions which allow the user to freely program the on-chip PROM.

Table 1-1 summarizes the main features of the H8/3724 Series.

Note: * ZTAT (zero turn around time) is a trademark of Hitachi, Ltd.

Appendix D Port States in Each Processing State

Table D-1 Port States

mode

Port Pins Reset Sleep Standby Watch Subactive Active

P0 7 to P0 0 Hi-z Hi-z Hi-z Hi-z Hi-z Standard

input port

P1 7 Hi-z Hi-z Hi-z Hi-z Hi-z High-voltage

input port

P1 6 Hi-z or pull-up Hi-z or Hi-z Hi-z Hi-z Standard

pull-up input port

P1 5 to P1 0 Hi-z or pull-up prev. state Hi-z Hi-z Hi-z Standard I/O

port

P3 3 to P3 0 Hi-z or prev. state Hi-z or Hi-z or Hi-z or High-voltage

pull-down pull-down pull-down pull-down I/O port

P4 7 to P4 0 Hi-z or prev. state Hi-z or Hi-z or Hi-z or High-voltage

pull-down pull-down pull-down pull-down I/O port

P5 7 to P5 0 Hi-z or prev. state Hi-z or Hi-z or Hi-z or High-voltage

pull-down pull-down pull-down pull-down I/O port

P6 7 to P6 0 Hi-z or prev. state Hi-z or Hi-z or Hi-z or High-voltage

pull-down pull-down pull-down pull-down I/O port

P7 7 to P7 0 Hi-z or prev. state Hi-z or Hi-z or Hi-z or High-voltage

pull-down pull-down pull-down pull-down I/O port

P8 7 to P8 0 Hi-z or pull-up prev. state Hi-z Hi-z Hi-z Standard I/O

port

P9 7 to P9 0 Hi-z or pull-up prev. state Hi-z Hi-z Hi-z Standard I/O

port

PA 1 , PA 0 Hi-z or pull-up prev. state Hi-z Hi-z Hi-z Standard I/O

port

Notation:

Hi-z: High-impedance state

Prev. state: Input pins are in high-impedance state. Output pins hold their previous output.

Hi-z or pull-up: Standard ports for which the pull-up MOS mask option is chosen are in pull-up state; ports without the pull-up MOS option are in high-impedance state.

Hi-z or pull-down: High-voltage ports for which the pull-down MOS mask option is chosen are in pull-down state; ports without the pull-down MOS option are in high-impedance state.

REF. NO.	PART NO.	DESCRIPTION	QTY
FL8350 MAIN BOARD			
RESISTORS			
R338/388/390	1001-001316-000	CARBON FILM RESISTOR 100 OHM 1/6 W +-5%	3
R303/308/310/324/334-336/346	1001-002316-000	CARBON FILM RESISTOR 1K OHM 1/6 W +-5%	8
R322/353/355/342/344/358/399	1001-003316-000	CARBON FILM RESISTOR 10K OHM 1/6 W +-5%	7
R312/317/323/352/377/379/387/389	1001-004316-000	CARBON FILM RESISTOR 100K OHM 1/6 W +-5%	8
R320	1001-005316-000	CARBON FILM RESISTOR 1M OHM 1/6 W +-5%	1
R311/316	1001-504316-000	CARBON FILM RESISTOR 150K OHM 1/6 W +-5%	2
R305/306	1001-803316-000	CARBON FILM RESISTOR 18k OHM 1/6 W +-5%	2
R319/328	1001-804316-000	CARBON FILM RESISTOR 180k OHM 1/6W +-5%	2
R302	1002-200316-000	CARBON FILM RESISTOR 22 OHM 1/6 W +-5%	1
R391/393/394/395/605	1002-202316-000	CARBON FILM RESISTOR 2.2K OHM 1/6 W +-5%	5
R307/309	1002-203316-000	CARBON FILM RESISTOR 22K OHM 1/6 W +-5%	2
R301/325	1002-703316-000	CARBON FILM RESISTOR 27K OHM 1/6 W +-5%	2
R330	1002-704316-000	CARBON FILM RESISTOR 270K OHM 1/6 W +-5%	1
326/327/345/347	1003-302316-000	CARBON FILM RESISTOR 3.3K OHM 1/6 W +-5%	4
R313	1003-303316-000	CARBON FILM RESISTOR 33K OHM 1/6 W +-5%	1
R304	1004-700316-000	CARBON FILM RESISTOR 47 OHM 1/6W +-5%	1
R337	1004-701316-000	CARBON FILM RESISTOR 470 OHM 1/6 W +-5%	1
R603	1004-702316-000	CARBON FILM RESISTOR 4.7K OHM 1/6 W +-5%	1
R392.	1004-703316-000	CARBON FILM RESISTOR 47K OHM 1/6 W +-5%	1
R318	1005-104316-000	CARBON FILM RESISTOR 510K OHM 1/6 W +-5%	1
R329.	1005-602316-000	CARBON FILM RESISTOR 5.6K OHM 1/6 W +-5%	1
R315	1005-603316-000	CARBON FILM RESISTOR 56K OHM 1/6 W +-5%	1
R314.	1006-803316-000	CARBON FILM RESISTOR 68K OHM 1/6 W +-5%	1
R396/398/397.	1007-501316-000	CARBON FILM RESISTOR 750 OHM 1/6W +-5%	3
R321	1008-202316-000	CARBON FILM RESISTOR 8.2K OHM 1/6 W +-5%	1
R375/383	1011-004016-000	METAL FILM RESISTOR 100K 1/6W + -1%	2
R370/374/376/384/385/386	1011-502016-000	METAL FILM RESISTOR 1.5K OHM 1/6W +-1%	6
R369/378	1011-803016-000	METAL FILM RESISTOR 18K 1/6W + -1%	2
R372/380	1012-202016-000	METAL FILM RESISTOR 2.2K 1/6W + -1%	2
R373/381	1012-403016-000	METAL FILM RESISTOR 24K OHM 1/6W +-1%	2
R371/382	1015-101016-000	METAL FILM RESISTOR 510 OHM 1/6W + -1%	2
VR301	1051-003500-001	SEMI-FIXED RESISTOR 10K OHM +-30%	1
VR302/303/304	1052-003600-110	SEMI-FIXED RESISTOR 20K OHM +-30%	3
CAPACITORS			
1/392/3 C318/3999	1100-103044-000	CERAMIC CAP. 0.01UF/50V +-20%	4
C342/343/347/345/350/352/357/359/372/ 366/368/370/371/389/	1100-104044-000	CERAMIC CAP. 0.1uF/50V +-20%	24
C338/339	1100-220043-000	CERAMIC CAP. 22pF/50V +- 10%	2
C321	1100-332043-000	CERAMIC CAP. 3300PF/50V +-10%	1
C302/324/327	1100-333043-000	CERAMIC CAP. 0.033UF/50V +-10%	3
C308/336	1100-473044-000	CERAMIC CAP. 0.047UF/50V +-20%	2

C 303/ 363/364	1101-102062-000	POLYESTER/MYLAR CAP. 0.001UF/100V +-5%	3
C322/331/333	1101-103063-000	POLYESTER/MYLAR CAP. 0.01UF/100V +-10%	3
C309/310/314/315/323/325/326	1101-104063-000	POLYESTER/MYLAR CAP. 0.1UF/100V +-10%	7
C337	1101-152063-000	POLYESTER/MYLAR CAP. 0.0015UF/100V +-10%	1
C377/378/380/382/383/390	1101-222062-000	POLYESTER/MYLAR CAP. 2200PF/100V +-5%	6
C307/311/320/335/360/361	1101-223063-000	POLYESTER/MYLAR CAP. 0.022UF/100V +-10%	6
C313	1101-682063-000	POLYESTER/MYLAR CAP. 0.0068UF/100V +-10%	1
C312	1101-683063-000	POLYESTER/MYLAR CAP. 0.068UF/100V +-10%	1
C379/362/365/367/375/376/356/398	1102-100044-000	ELECT. CAP. 10UF/50V +-20%	8
C304/306/319/334/384-387/381/388	1102-101014-000	ELECT. CAP. 100uF/16V +-20%	10
C316/355	1102-220024-000	ELECT. CAP. 22UF/25V +-20%	2
C317/340/395	1102-221014-000	ELECT. CAP. 220UF/16V +-20%	3
C341/349/351	1102-222014-000	ELECT. CAP. 2200uF/16V +-20%	3
C354	1102-331014-000	ELECT. CAP. 330uF/16V +-20%	1
C300/305/329/369	1102-470014-000	ELECT. CAP. 47uF/16V +-20%	4
C344/346/348/353/924	1102-471014-000	ELECT. CAP. 470uF/16V +-20%	6
C328	1102-477024-000	ELECT. CAP. 4.7UF/25V +-20%	1
C330/332	1102-478044-000	ELECT. CAP. 0.47uF/50V +-20%	2

TRANSISTORS

Q302/303/305/306	1300-945000-100	TRANSISTOR NPN KSC945-Y (SAMSUNG)	4
Q304	1301-200300-100	TRANSISTOR PNP KSR2003 (SAMSUNG)	1
Q301	1301-733000-100	PNP TRANSISTOR A733	1
Q307	1301-928000-100	TRANSISTOR PNP KSA928A TO-92 SAMSUNG	1

DIODES

D302-307/309-312	1401-140040-000	DIODE RECTIFIER 1N4004	10
D308	1401-141480-000	DIODE 1N4148	1
ZD301/303	1402-560000-000	ZENER DIODE 5.6V 0.5W	2
ZD302	1402-620001-200	ZENER DIODE 6.2V 1/2W	1
	1503-161280-100	FERRITE COIL T16128 SIZE: 16X12X8	1
L301/302	1503-353400-100	FERRITE COILS B3534	2

MISCELLANEOUS

X301	1600-169343-000	CRYSTAL 16.9344 +- 30 PPM 49U3H TYPE	1
CN313/314/311	2300-002000-001	STRAIGHT CONN WAFER 2PIN 2MMP JST	3
CN312	2300-003000-001	STRAIGHT CONN WAFER 3PIN 2MMP JST	1
CN308	2300-004000-000	STRAIGHT CONN. WAFER 4 PINS 2mmP	1
CN303/304/307/315/316	2300-006000-000	STRAIGHT CONN. WAFER 6 PINS 2mmP	5
CN302	2300-008000-000	STRAIGHT CONN. WAFER 8 PINS 2mmP	1
CN306	2300-010000-000	STRAIGHT CONN. WAFER 10 PINS 2mmP	1
CN305	2300-012000-000	STARIGH CONN. WAFER 12PIN 2MMP	1
CN310	2500-022201-050	2PIN 220MM 1CONN CABLE AWG#28 2MMP	1
CN318 TO HEADPHONE BD. CN502	2500-037001-050	3PIN 700MM 1 CONN CABLE AWG#28 2MMP	1
CN303	2501-062801-150	6PIN 280MM 2CONN RIBBON CABLE AWG#28 2MMP	1
CN302	2501-084001-150	8PIN 400MM 2CONN CABLE AWG#28 2MMP	1
CN316 TO CN307	2506-062201-150	6PIN 220MM 2CONN RIBBON CABLE AWG#28 2MMP	1

CN317 TO CN752	2510-033001-060	3PIN 300MM 1CONN SHIELD CABLE AWG#30 2MMP	1
CN319	2510-036501-050	3PINS 650MM 1 CONN SHIELD CABLE AWG#28 2MMP	1
CN301	2510-052501-060	5PIN 250MM 1CONN SHIELD CABLE AWG#30 2MMP	1
CN313 TO CN314	2511-022001-160	2PIN 200MM 2CONN SHIELD CABLE AWG#30 2MMP (1-GND)	1
CN309 TO CN753	2511-023001-160	2PIN 300MM 2CONN SHIELD CABLE AWG#30 2MM	1
P22/23	2600-100654-200	65MM JUMPER WIRE AWG#26 UL1007 RED	1
P36/37	2600-100804-200	80MM JUMPER WIRE AWG#26 RED	1
FUSE			
F301	4030-100000-000	MICRO FUSE 1A	1
INTEGRATED CIRCUITS			
U307	4113-050102-100	I.C. TDA1305TN2 28PINS SMD (PHILIPS)	1
U311-314	4155-320052-100	I.C. NE5532N 8P DIP PHILIPS	4
U309	4174-740052-100	I.C. 74HC74 DIP (PHILIPS)	1
U304	4178-050311-600	I.C. NJM78L05 3 PINS TO-92 (NEW JAPAN)	1
U301	4178-080301-400	I.C. MC7808AC 3PIN TO-220 (MOTOROLA)	1
U303	4178-080310-000	I.C. 78L08 TO92 (MIRCO)	1
U302	4179-080311-600	I.C. 79L08 TO92 (NJRC)	1
U305/306	4183-010002-400	I.C. KA8301 10PIN SIL	2
U308	4192-200122-400	I.C. KA9220C QFP SAMSUNG SSP	1
U315	4192-580122-400	I.C. KA9258D SMT SAMSUNG MOTOR DRIVE	1
U310	4192-840122-400	I.C.KS9284 QFP SAMSUNG DSP	1
PCB			
	4883-500010-004	FL8350 CD MAIN BOARD REV D	1
FL8350 HEADPHONE BOARD			
RESISTORS			
R511-514	1001-003316-000	CARBON FILM RESISTOR 10K OHM 1/6 W +-5%	4
R507-510	1001-004316-000	CARBON FILM RESISTOR 100K OHM 1/6 W +-5%	4
R503-504	1001-503316-000	CARBON FILM RESISTOR 15K OHM 1/6 W +-5%	2
R501-502	1004-701316-000	CARBON FILM RESISTOR 470 OHM 1/6 W +-5%	2
R515-516	1005-600314-000	CARBON FILM RESISTOR 56 OHM 1/4W +-5%	2
R505	1065-003500-130	VAR. RESISTOR 50k 1/4W +-20% ROTARY B-TYPE	1
	1065-003500-131	VAR. RESISTOR 50K 1/4W +-20% ROTARY B-TYPE W/O NUT	1
CAPACTIORS			
C509-510	1100-102044-000	CERAMIC CAP. 1000PF/50V +-20%	2
C511	1100-103044-000	CERAMIC CAP. 0.01UF/50V +-20%	1
C503/504/511	1100-104044-000	CERAMIC CAP. 0.1uF/50V +-20%	3
C505-508	1102-100044-000	ELECT. CAP. 10UF/50V +-20%	4
C501-502	1102-101044-000	ELECT. CAP. 100UF/50V +-20%	2
MISCELLANEOUS			
CN501-502	2300-003000-001	STRAIGHT CONN WAFER 3PIN 2MMP JST	2
U502	2320-009911-003	6.4MM HEADPHONE JACK (JY-6303-02-030)GOLD PLATED	1
	2320-009911-002	6.4MM HPHONE JACK W/O NUT (JY-6303-01-010) GD	1

		PLT	
	2605-100902-000	90MM GND WIRE 1RING (M3) AWG#22 BLK	1
INTEGRATED CIRCUITS			
U501	4145-580051-600	IC NJM 4558L	1
PCB			
	4883-500020-003	FL8350 HEADPHONE BOARD REV C	1
FL8350 CONTROL BOARD			
RESISTORS			
R831-832	1001-201316-000	CARBON FILM RESISTOR 120 OHM 1/6 W +-5%	2
R833	1001-801316-000	CARBON FILM RESISTOR 180 OHM 1/6W +-5%	1
R834	1002-201316-000	CARBON FILM RESISTOR 220 OHM 1/6 W +-5%	1
R835	1003-301316-000	CARBON FILM RESISTOR 330 OHM 1/6W +-5%	1
MISCELLANEOUS			
S831-835	2400-020200-000	TACT SW 2P2T KPT-1105A (5MM)	5
CN831	2500-022001-040	2 PIN 200MM 1 CONN CABLE AWG#26 2MMP	1
PCB			
	4883-500040-001	FL8350 CONTROL BOARD REV A	1
FL8350 POWER BOARD			
MISCELLANEOUS			
	2610-221000-000	2100MM POWER CORD W/POLARZED PLUG UL SPT-2 AWG#18	1
	3200-480140-401	TRANSFORMER EI48 117V CUL #4801Y44T-1 (WINBOND)	1
	4002-311975-000	TOROID COILS "T31X19X7.5MM"	1
FL8350 POWER CONTROL BOARD			
RESISTORS			
R841	1001-501316-000	CARBON FILM RESISTOR 150 OHM 1/6 W +-5%	1
MISCELLANEOUS			
S841	2402-020200-003	PUSH SWITCH 2P2T ESB64801 MATSUSHITA	1
CN841	2500-032201-050	3PIN 220MM 1CONN CABLE AWG#28 UL1571 2mmP	1
D841	3100-204000-001	LED 5MM BI- COLOR A/G #BL-BAG204	1
PCB			
	4883-500110-002	FL8350 POWER CONTROL BOARD REV B	1
FL8350 MCU BOARD			
RESISTORS			
R701	1001-000320-000	CARBON FILM RESISTOR 10 OHM 2W +-5%	1
R704-705	1001-001314-000	CARBON FILM RESISTOR 100 OHM 1/4 W +-5%	2
R703/722-725	1001-002316-000	CARBON FILM RESISTOR 1K OHM 1/6 W +-5%	5
R731	1001-004316-000	CARBON FILM RESISTOR 100K OHM 1/6 W +-5%	1
R708	1001-005316-000	CARBON FILM RESISTOR 1M OHM 1/6 W +-5%	1
R706	1002-203316-000	CARBON FILM RESISTOR 22K OHM 1/6 W +-5%	1
R730	1002-403316-000	CARBON FILM RESISTOR 24K OHM 1/6W +-5%	1
C704	1003-302314-000	CARBON FILM RESISTOR 3.3K 1/4W +-5%	1
R702	1008-202316-000	CARBON FILM RESISTOR 8.2K OHM 1/6 W +-5%	1

R733	1041-003318-331	RESISTOR ARRAY 10KX4 1/8W TYPE A	1
CAPACITORS			
C701	1100-103044-000	CERAMIC CAP. 0.01UF/50V +-20%	1
C703	1100-104044-000	CERAMIC CAP. 0.1uF/50V +-20%	1
C710/711	1100-220042-001	CERAMIC CAP. 22PF +-5% 'NPO'	2
C707	1102-100004-000	ELECT. CAP. 10uF/10V +- 20%	1
C705	1102-100044-000	ELECT. CAP. 10UF/50V +-20%	1
C706	1102-101014-000	ELECT. CAP. 100uF/16V +-20%	1
C704	1102-221034-000	ELECT. CAP. 220UF/35V +-20%	1
C702	1102-330014-000	ELECT. CAP. 33uF/16V +-20%	1
TRANSISTORS			
Q702	1300-100300-100	TRANSISTOR NPN KSR1003 (SAMSUNG)	1
Q701	1300-805000-100	TRANSISTOR NPN 8050D TO92 SAMSUNG	1
DIODES			
D701-704	1401-140020-000	DIODE RECTIFIER 1N4002	4
D706/707	1401-141480-000	DIODE 1N4148	2
Z701	1402-240001-200	ZENER DIODE DZ24V	1
Z702	1402-620001-200	ZENER DIODE 6.2V 1/2W	1
MISCELLANEOUS			
X701	1602-800002-000	REASONATOR 8.0MHZ	1
CN701	2300-002000-001	STRAIGHT CONN WAFER 2PIN 2MMP JST	1
CN710	2300-003000-001	STRAIGHT CONN WAFER 3PIN 2MMP JST	1
CN704	2300-004000-000	STRAIGHT CONN. WAFER 4 PINS 2mmP	1
CN707	2300-007000-000	STRAIGHT CONN. WAFER 7 PINS 2mmP	1
CN705	2300-010000-000	STRAIGHT CONN. WAFER 10 PINS 2mmP	1
CN706	2300-012000-000	STARIGH CONN. WAFER 12PIN 2MMP	1
CN709	2370-014100-000	STRAIGH HEADER 14PIN 2.5MMP	1
CN711	2370-020100-000	STRAIGHT HEADER 20PINS 2.5MMP	1
CN705	2501-103001-151	10PIN 300MM 2CONN CABLE AWG#28 UL1751 2MMP (GRAY)	1
CN706	2501-123001-151	12PIN 300mm 2CONN CABLE AWG#28 2mmP. (GRAY)	1
INTEGRATED CIRCUITS			
U701	4201-835000-601	I.C. 5 DISC VFD MCU 5FL15 HD6433 724E93F	1
PCB			
	4805-010230-005	5CD MCU BOARD (VFD) REV A	1
FL8350 DISPLAY BOARD			
RESISTORS			
R811	1001-201316-000	CARBON FILM RESISTOR 120 OHM 1/6 W +-5%	1
R805/817	1001-802316-000	CARBON FILM RESISTOR 1.8K OHM 1/6 W +-5%	2
R813	1002-201316-000	CARBON FILM RESISTOR 220 OHM 1/6 W +-5%	1
R812	1003-001316-000	CARBON FILM RESISTOR 300 OHM 1/6W +-5%	1
R802/814	1003-301316-000	CARBON FILM RESISTOR 330 OHM 1/6W +-5%	2
R803/815	1005-601316-000	CARBON FILM RESISTOR 560 OHM 1/6 W +-5%	2
R806/818	1005-602316-000	CARBON FILM RESISTOR 5.6K OHM 1/6 W +-5%	2

R801	1006-201316-000	CARBON FILM RESISTOR 620 OHM 1/6W +-5%	1
R804/816	1009-101316-000	CARBON FILM RESISTOR 910 OHM 1/6W	2
CAPACITORS			
C801	1102-221014-000	ELECT. CAP. 220UF/16V +-20%	1
MISCELLANEOUS			
CN805	2300-002000-001	STRAIGHT CONN WAFER 2PIN 2MMP JST	1
CN804	2300-003000-001	STRAIGHT CONN WAFER 3PIN 2MMP JST	1
CN801	2370-014110-000	RIGHT ANGLE HEADER 14PIN 2.5MMP	1
CN802	2370-020110-000	RIGHT ANGLE HEADER 20PIN 2.5MMP	1
S801-806/811-819	2400-020200-000	TACT SW 2P2T KPT-1105A (5MM)	15
CN803	2500-072601-040	7PIN 260MM 1CONN CABLE AWG#26 2MMP	1
	2507-145002-240	D-ROW CABLE 14PIN 500MM 2.54MMP	1
	2507-205002-240	D-ROW CABLE 20PIN 500MM 2.54MMP	1
U801	3001-120430-001	INFRARED SENSOR PIC-12043TM	1
VFD1	3106-081100-000	VFD DISPLAY SVA-08MM11	1
PCB			
	4883-500260-002	FL8350 DISPLAY BOARD (VFD) REV B	1
FL8350 DIGITAL OUTPUT BOARD			
RESISTORS			
R751	1001-001316-000	CARBON FILM RESISTOR 100 OHM 1/6 W +-5%	1
R753	1002-701316-000	CARBON FILM RESISTOR 270 OHM 1/6W +-5%	1
R750	1003-902316-000	CARBON FILM RESISTOR 3.9K OHM 1/6 W +-5%	1
R754/755	1004-700316-000	CARBON FILM RESISTOR 47 OHM 1/6W +-5%	2
R752	1004-703316-000	CARBON FILM RESISTOR 47K OHM 1/6 W +-5%	1
CAPACITORS			
C761-763	1100-103044-000	CERAMIC CAP. 0.01UF/50V +-20%	3
C7654/755	1100-104044-000	CERAMIC CAP. 0.1uF/50V +-20%	2
C751-752	1100-151045-000	CERAMIC CAP. 150PF/50V +80% -20%	2
C750	1102-101014-000	ELECT. CAP. 100uF/16V +-20%	1
TRANSISTORS			
Q750	1301-200300-100	TRANSISTOR PNP KSR2003 (SAMSUNG)	1
MISCELLANEOUS			
CN753	2300-002000-001	STRAIGHT CONN WAFER 2PIN 2MMP JST	1
CN752	2300-003000-001	STRAIGHT CONN WAFER 3PIN 2MMP JST	1
U751	2320-004911-002	3.5MM EARPHONE JACK (JY3552-31-230)MONO	1
U753	2330-002901-000	RCA JACK RJ-1081-020-000	1
U752	2330-003911-003	RCA JACK AV-2-8.4-9	1
CN752 TO CN711	2500-031501-050	3PIN 150MM 1CONN CABLE AWG#28 UL1571 2mmP	1
	2605-100502-000	50MM GND WIRE 1RING (M3) AWG#22 BLK	2
INTEGRATED CRICUITS			
U750	4181-700010-000	I.C. LTV817B LITON	1
PCB			
	4883-500290-003	FL8350 DIGITAL OUTPUT BOARD REV C	1

FL8350 SENSOR BOARD

RESISTORS

R2	1004-701316-000	CARBON FILM RESISTOR 470 OHM 1/6 W +-5%	1
R1	1007-501316-000	CARBON FILM RESISTOR 750 OHM 1/6W +-5%	1

MISCELLANEOUS

CN1	2300-002010-000	RIGHT ANGLE CONN WAFER 2PIN 2MMP	1
CN2	2300-006010-000	HORIZONTAL CONN. WAFER 6 PINS 2mmP	1
	2500-021201-050	2PIN 120MM 1CONN CABLE AWG#26 2MMP	1
	2506-062501-150	6PIN 250MM 2CONN RIBBON CABLE AWG#28 2MMP	1
D2	3001-820000-000	INFARED SENSOR ST-8LR2 OPTO-SENSOR	1
D1	3004-206000-000	PHOTO COUPLER SG206 OPTO-SENSOR	1
D3	3100-800000-000	EMITTING FIODE EL-8L OPTO-SENSOR	1

PCB

	4841-010130-003	5CD SENSOR BD REV C	1
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FL8350 SWITCH BOARD

MISCELLANEOUS

J1	2300-003000-001	STRAIGHT CONN WAFER 3PIN 2MMP JST	1
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FL8350 LOADER BOARD

MISCELLANEOUS

J1	2300-003000-001	STRAIGHT CONN WAFER 3PIN 2MMP JST	1
	2300-006010-000	HORIZONTAL CONN. WAFER 6 PINS 2mmP	1
	2411-010120-012	PU91 E04 LEAF SWITCH (SANYO 1EA4S13A00800)	1
	3002-000000-000	SANYO OPICAL PICK UP	1

OPTICAL PICK-UP

	4800-310210-001	5CD LOADER BOARD REVA	1
	4891-000060-002	PCB,SPINDLE MOTOR CD-PCB-06UL REV B	1
	6091-050001-000	PU91 IDLER GEAR A (DIA. 25X10MM)	1
	6091-050002-001	PU91 IDLER GEAR B (DIA. 23.3X10.5MM)	1
	6091-050003-000	PU91 MOTOR GEAR (DIA. 6X6.7MM)	1
	6091-050004-000	PU91 FEEDING GEAR (43X12)	1
	6091-050005-001	PU91 TURNTABLE ASS'Y	1
	6600-020006-000	PU91L02 GUIDE PIN B (DIA. 3X80MM)	1
	6600-020007-000	PU91L01 GUIDE PIN A (DIA. 3X68MM)	1
	7002-003010-022	SCREW M2X3 P/H	5
	7002-005010-042	SCREW M2X5 NO.1 FLAT (1/K) COUNTER HEAD	2
	7002-606004-032	SCREW M2.6X6 1/P C.T.P.	4
DGMEWD980120/98-6-10	9101-633700-000	SOLDER WIRE 63/37	0
	9113-000000-000	SCREW GLUE SL-118, RED	0
	9115-000020-000	GREASE DIAMOND #2	0
	9115-000501-000	SILICON GREASE SHINETSE #G501	0

	9291-050000-010	PU91 BASE ASSY	1
	6591-050001-003	PU91T BASE	1
	6600-020008-001	PU91L03a IDLER GEAR SHAFT	2
ALT PART 4A0200	RF-310T-11400-04917A	MOTOR RF-310T-11400 (19.7)	1
ALT PART 4A210	RF-310T-11400-04918A	MOTOR RF-310T-11400 (10.9)	1
	9115-000501-000	SILICON GREASE SHINETSE #G501	1

FL8350 TURN TABLE

	2300-006000-000	STRAIGHT CONN. WAFER 6 PINS 2mmP	1
	2501-062801-150	6PIN 280MM 2CONN RIBBON CABLE AWG#28 2MMP	1
	4841-010700-005	5CD TURN TABLE PCB REV E	1

FL8350 FCC

J7,C366/CN2	1100-103044-000	CERAMIC CAP. 0.01UF/50V +-20%	4
C334(+),CN318(GND)/C368,C359(GND)	1100-104044-000	CERAMIC CAP. 0.1uF/50V +-20%	2
CN313,CN314	1503-161280-100	FERRITE COIL T16128 SIZE: 16X12X8	1
CN752/753	4002-311975-000	TOROID COILS "T31X19X7.5MM"	2

FL8350 PACKING

	2611-310009-000	1M AUDIO CABLE (ㇿ 岐工 白)	1
	2617-210009-000	MIC INTERCONNECTION CABLE 1M	1
	5000-835001-000	POLYFOAM, FL8350	2
	5013-835001-000-0001	HARMAN/KARDON FL8350 C/B (W 120V)	1
	5013-835001-000	CARTON BOX FOR FL8350	1
	5100-835000-100	OPERATION GUIDE (FL8350 120V)	1
	5103-835000-100	LIMITED WARRANTY SHEET HARMAN V/E KARDON BLK	1
	5103-835000-200	WRRANTY SERVICE SHEET HARMAN KARDON 16.5X43CM V/E	1
	5113-000000-000-0001	SERIAL NO LABEL (PRODUCT) FL8350 (120V)	1
	5113-000000-000	SERIAL NUMBER LABEL, BLANK (6.5X35.5MM)	1
	5113-000000-000-0005	MANUFACTURE DATE CODE LABEL (PRODUCT) FL8350 120V	1
	5113-000000-000	SERIAL NUMBER LABEL, BLANK (6.5X35.5MM)	1
	5113-835100-100-0001	BAR CODE SERIAL NUMBER LABEL (YC0001-01001)	2
	5113-835100-100	SERIAL NUMBER LABEL, BLANK 70X17MM (WHITE)	1
	5199-835000-100	SAFETY PRECAUTIONS SHEET HARMAN KARDON V/E BLK	1
	5200-230321-030-0001	POLYBAG FOR ACCESSORIES (FL8350/FL8550)	1
	5200-230321-030	POLYBAG 230X321X3C MM (PE)	1
	5200-600600-040-0003	POLYBAG FOR UNIT (FL8350/FL8550)	1
	5200-600600-040	POLYBAG 600X600X4C MM	1
	5206-500160-050	E.P.E. SHEET P-EP500160-05	1

FL8350 REMOTE UNIT

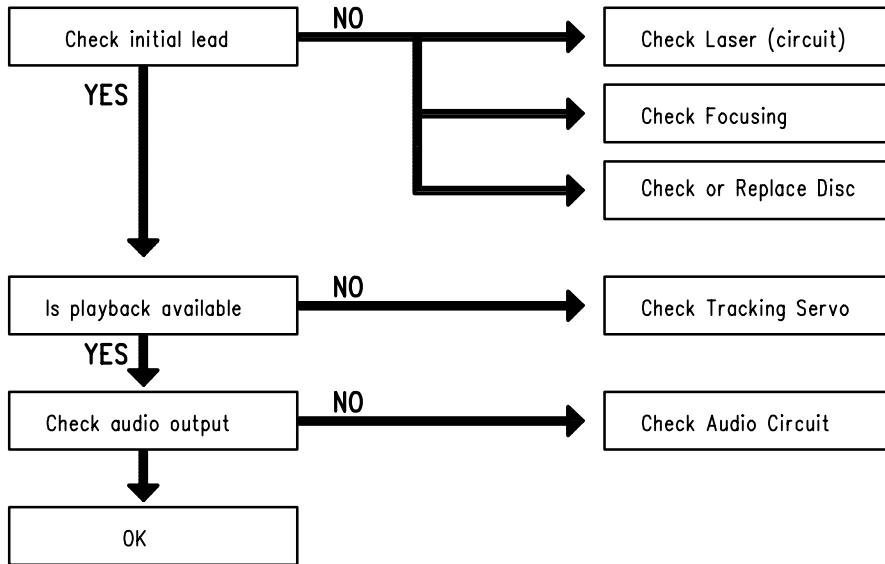
	5200-080250-030	POLYBAG 80X250X3C MM	1
--	-----------------	----------------------	---

	6002-000001-000-0010	HARMAN/KARDON FL8350 TOP CASE (W/G PRINTED)	1
	6002-000001-000	RT02-P001 CASE TOP	1
	6002-000002-000	RT02-P002 CASE BOTTOM	1
	6002-000003-000	RT02-P003 COVER BATTERY	1
	6003-000012-000-0001	HARMAN/KARDON FL8350&8550 R/C INLAY	1
	6003-000012-000	INLAY 31 KEYS FOR RT03	1
	6600-010156-001	CONTACT BATTERY COMMON	1
	6600-010157-000	RT02-S002 CONTACT BATTERY POS	1
	6600-010158-000	RT02-S003 CONTACT BATTERY NEG	1
	6600-070088-000	KEY PAD 31 KEYS FOR RT03	1
FOR REAR PANEL	7002-008002-021	SCREW M2X8 P TYPE P/H BLK	1
FL8350 REMOTE CONTROL BOARD			
RESISTORS			
R2-5	1001-004316-000	CARBON FILM RESISTOR 100K OHM 1/6 W +-5%	4
R1	1001-507314-000	CARBON FILM RESISTOR 1.5 OHM 1/4W +-5%	1
CAPACITOR			
C2-3	1100-221043-000	CERAMIC CAP. 220pF/50V +- 10%	2
C1	1102-470114-000	ELECT. CAP. 47uF/6.3V +-20% MINI SIZE	1
TRANSISTORS			
Q1	1300-246800-103	TRANSISTOR NPN 2SD468C	1
DIODE			
D1	1401-113300-000	DIODE 1SS133, ROHM	1
MISCELLANEOUS			
Y1	1600-455001-990	CERAMIC RESONATOR KBR455BTLR22 "KYOCE"	1
LED1	3100-120000-001	INFRARED LED EL-1L2	1
INTEGRATED CRICUIT			
U1	4122-220103-800	I.C. PT2222	1
PCB			
	4883-500080-001	FL8350 REMOTE CONTROL BOARD REV A	1

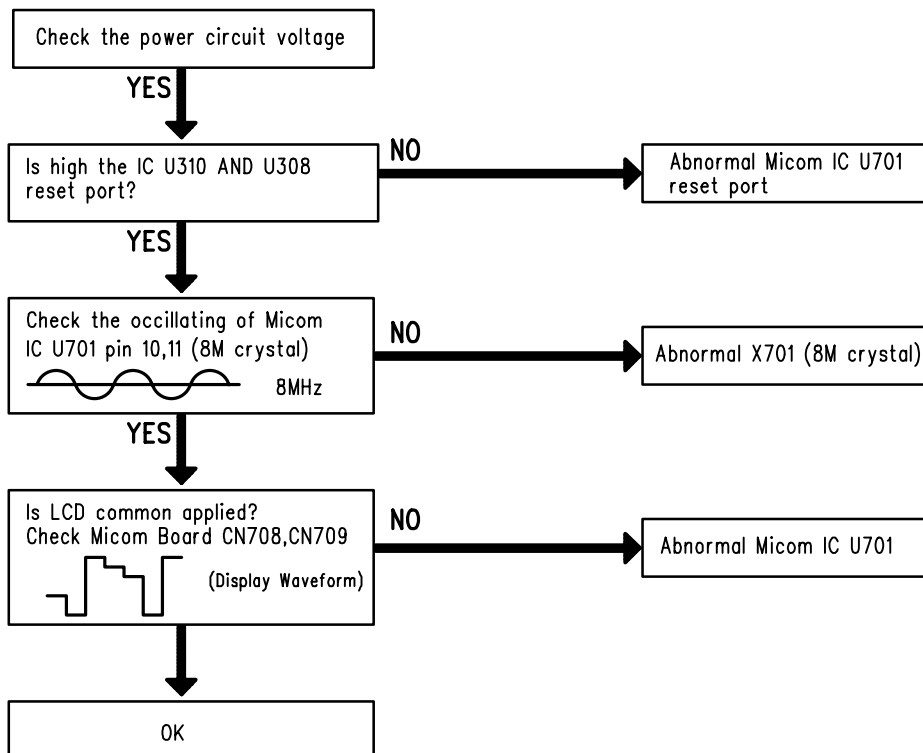
MECHANICAL PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	QTY
1	9801-835000-001	FL8350 120V CUL (HARMAN) REV A	1
2	9683-501000-002	FL8350 MECHAN ASSY 120V CUL REV B	1
3	6029-010012-000-XXXX	PLASTICS FOOT, HOT STAMP	4
4	6029-010012-000	PLASTICS FOOT	1
5	6083-510001-000-0001	HARMAN/KARDON FL8350 FRONT PANEL (W SILKSCREEN&P)	1
6	6083-510001-000	FL8350 FRONT PANEL	1
7	6083-510002-000-0001	HARMAN/KARDON FL8350&FL8550 TRAY DOOR(W SILKSCREEN)	1
8	6083-510002-000	DOOR, CD	1
9	6083-510003-000-0002	HARMAN/KARDON FL8350 DISPLAY LENS (W SILKSCREEN)	1
10	6083-510003-000	LENS, DISPLAY	1
11	6083-510004-000-XXXX	KNOB, DISC, PAINTED	1
12	6083-510004-000	KNOB, DISC	1
13	6083-510005-000-XXXX	KNOB, PROGRAM, PAINTED	1
14	6083-510005-000	KNOB, PROGRAM	1
15	6083-510006-000-XXXX	KNOB, VR, PAINTED	1
16	6083-510006-000	KNOB, VR	1
17	6083-510007-000-XXXX	KNOB, POWER, PAINTED	1
18	6083-510007-000	KNOB, POWER	1
19	6083-510008-000	LENS, POWER KNOB	1
20	6083-510009-000-0001	HARMAN/KARDON "EJECT" KNOB (W SILKSCREEN&PAINTED)	1
21	6083-510009-000	KNOB, OPEN/CLOSE	1
22	6083-510010-000-0001	HARMAN/KARDON FUNCTION KNOB (W SILKSCREEN&PAINTED)	1
23	6083-510010-000	KNOB, PLAY	1
24	6083-510011-000	STAND, FRONT-5CD	2
25	6083-510012-000	STAND, REAR-5CD	1
26	6083-510013-000	BRACKET, 5CD-SIDE 1	1
27	6083-510014-000	BRACKET, 5CD-SIDE 2	1
28	6083-510015-000	LIGHT SHEET, BLACK	1
29	6083-510016-000	BRACKET, WIRE	1
30	6505-050003-001	5CD CABINET HOLDER B	2
31	6583-510001-001	BOTTOM CABINET	1
32	6583-510002-000-XXXX	TOP CABINET, PAINTED	1
33	6583-510002-000	TOP CABINET	1
34	6583-510003-001-0002	HARMAN/KARDON FL8350 R/P (W 117V FCC&CSA	1

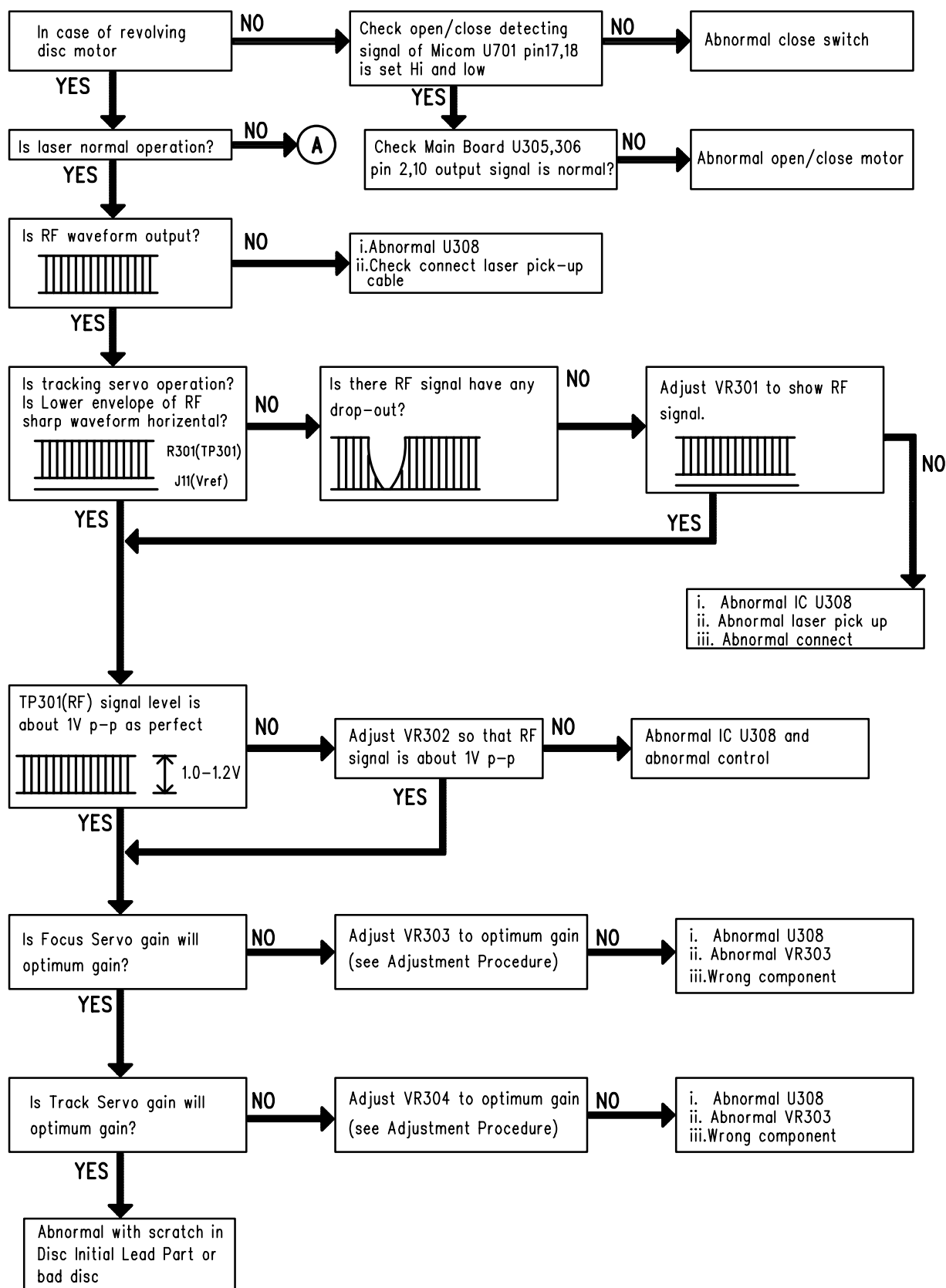
		VR)	
35	6583-510003-001	REAR CABINET	1
36	6583-510004-000	BRACKET, FRONT PANEL	1
37	6583-510006-000	BRACKET, PHONES (MIC)	1
38	6600-010293-000	SPRING, POWER SWITCH	1
39	6600-020010-000	CD420L01 PCB MOUNT.	4
40	6600-070003-000	CD90R05 RUBBER PAD,LEG	4
41	6600-120030-001	NUT M3 HEX M3X5.5X2.4MM	1
42	6600-120040-000	SCREW NUT M4X7X3	2
43	6600-210035-000	PADCOCK 10X10X7MM	1
44	6600-210036-000	PADCOCK FL 70X12X2.5MM	1
45	6600-260001-000	LUG CS-1 BLK	2
46	7002-606010-062	SCREW M2.6X6 W/H	8
47	7003-006001-111	SCREW M3X6 S.T.P. B/H (BLACK)	32
48	7003-006002-112	SCREW M3X6 P.T.P. B/H	10
49	7003-008001-111	SCREW M3X8 S.T.P. B/H BLK	1
50	7003-008002-111	SCREW M3X8 P.T.P. B/H (BLACK)	7
51	7003-008002-112	SCREW M3X8 P.T.P. B/H	28
52	7003-008003-112	SCREW M3X8 B TYPE B/H ZN	2
53	7003-008010-111	SCREW M3X8 B/H BLACK	1
54	7003-016002-112	SCREW M3X16 PTP B/H ZN	3
55	7004-010010-112	SCREW M4X10 B/H	2
56	7103-206005-022	METAL WASHER M3.2X6X0.5MM	1
57	7104-010010-022	WASHER M4X10X1MM	2
58	9110-120000-000	CABLE TIE L=120MM	7

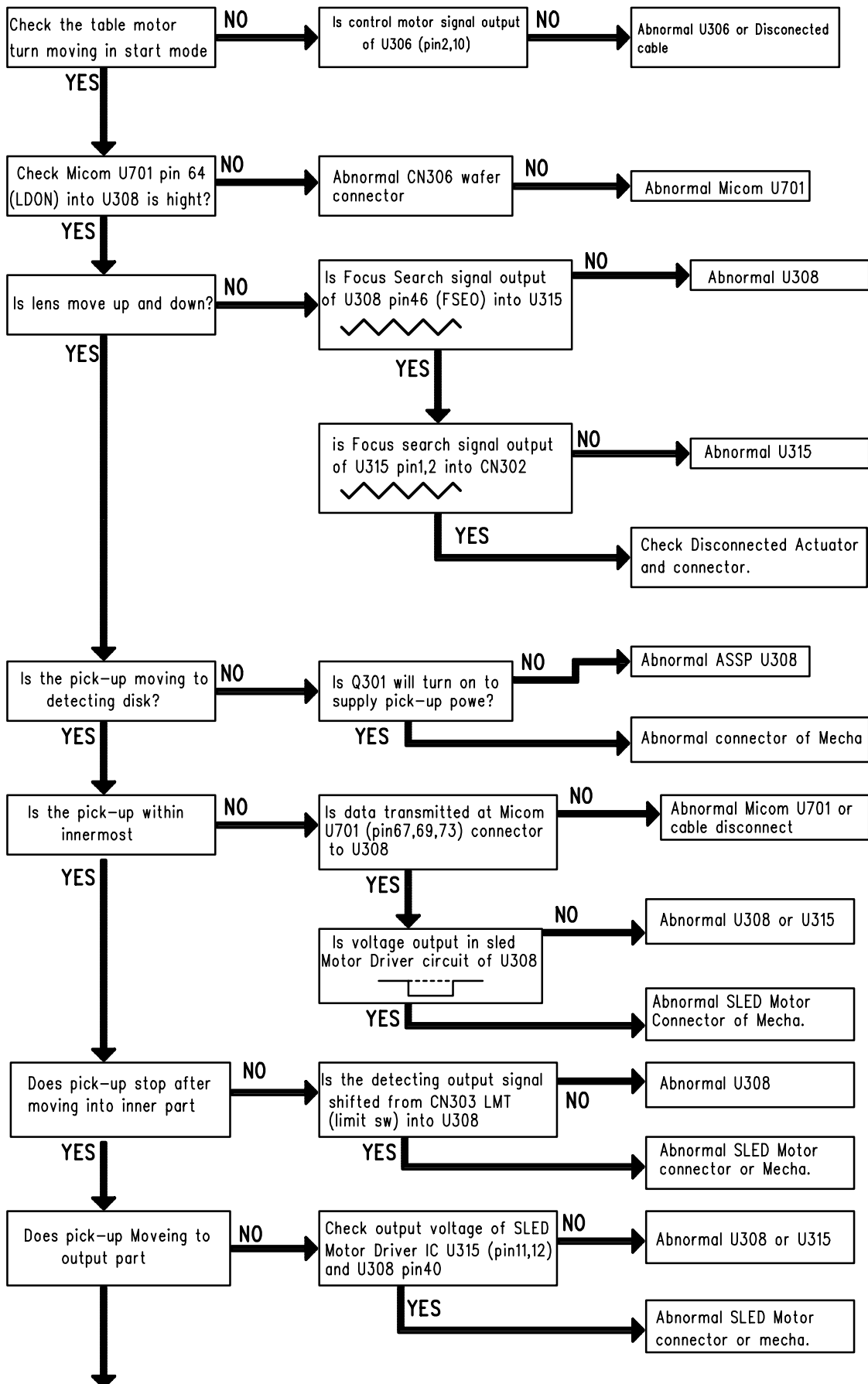


In Case of Abnormal Indication

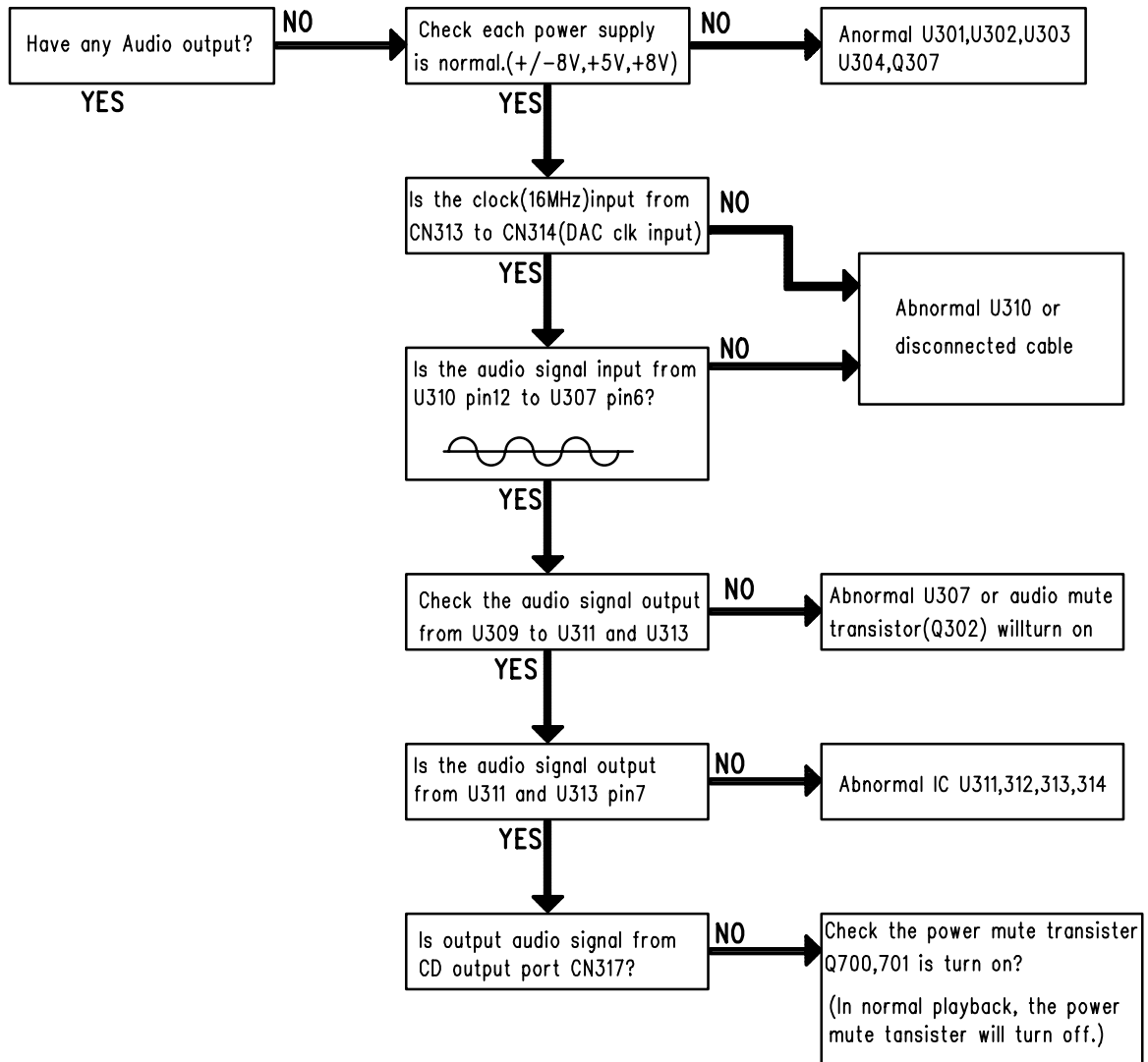


When Initial Lead-In Is Not Operational

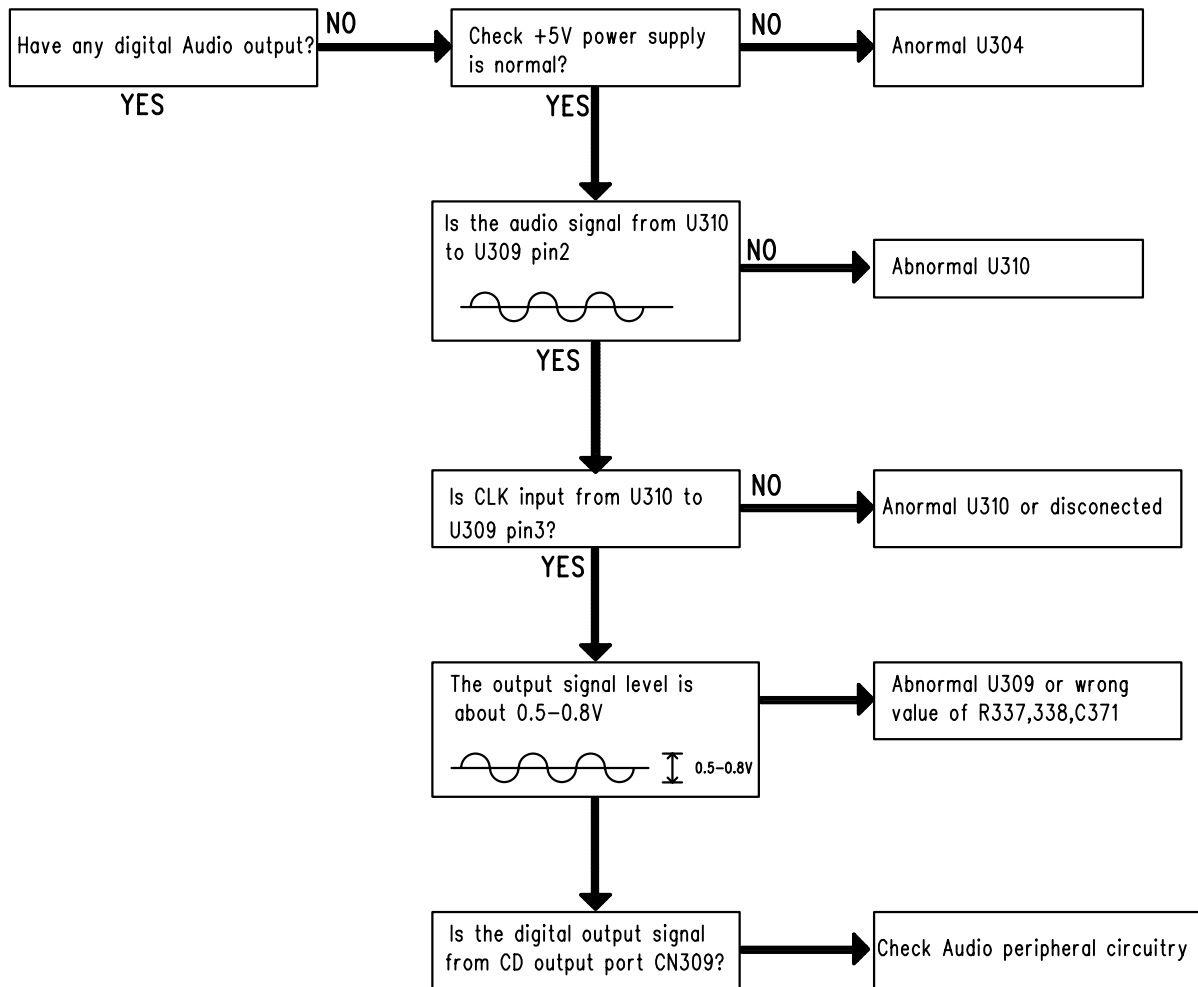




2) Audio Circuit Checking

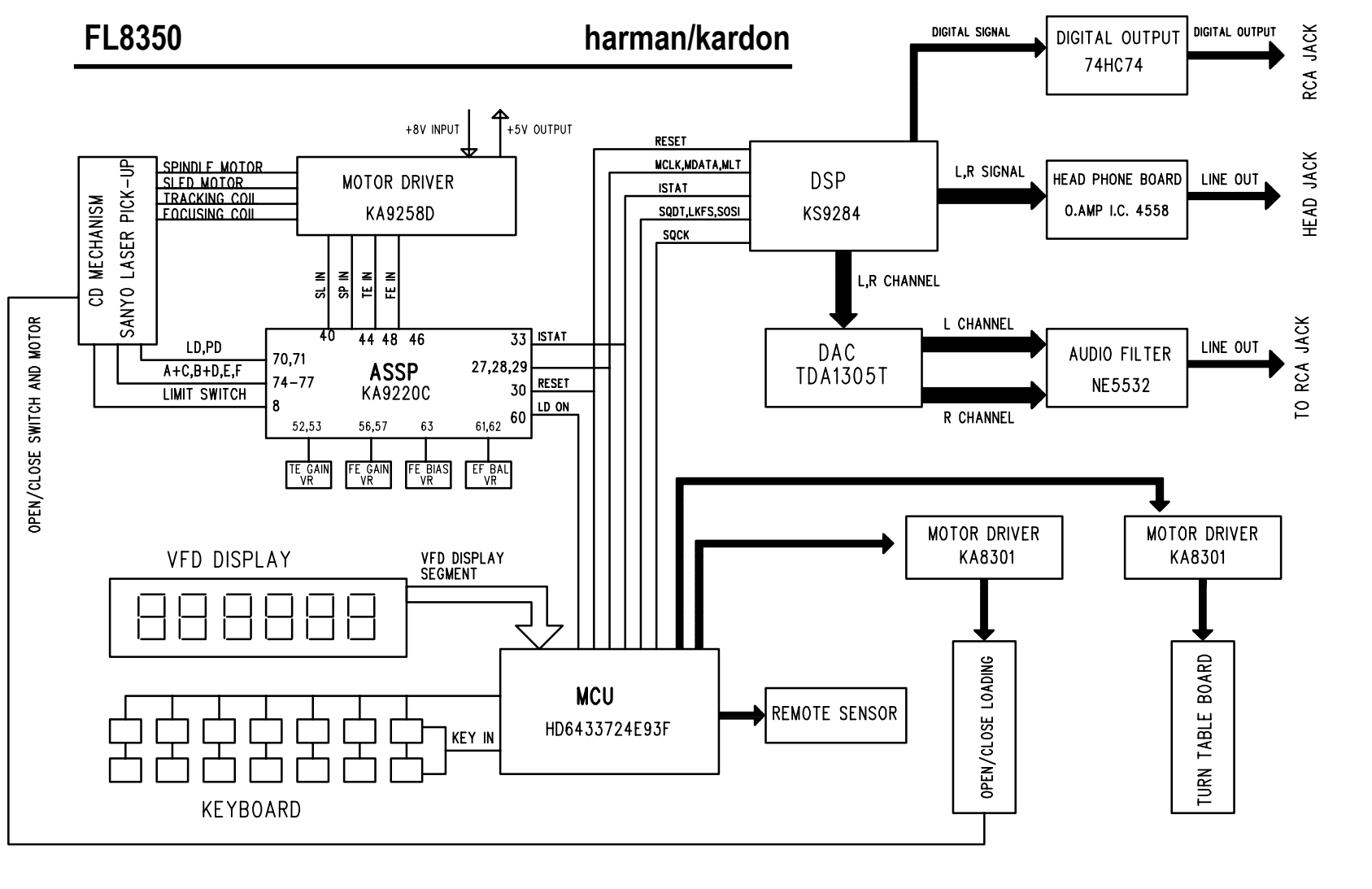


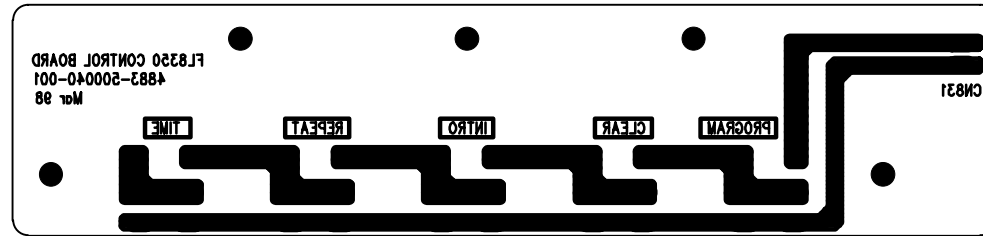
3) Digital Audio Circuit Checking



FL8350

harman/kardon



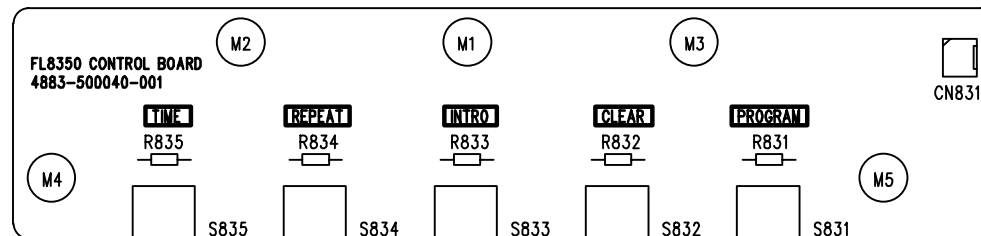
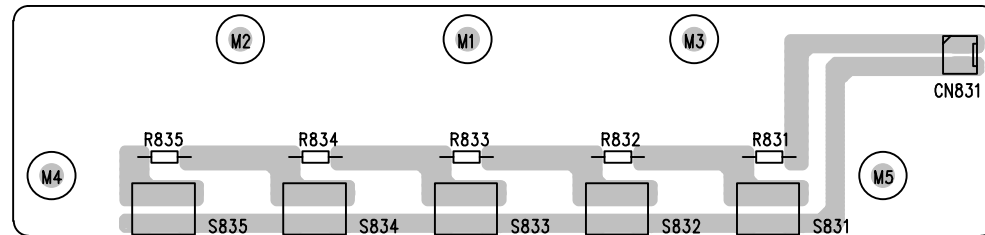


PROJECT : FL8350

CONTROL BOARD

3022 230102

P/N : 4883-500040-001



PROJECT : FL8350

CONTROL BOARD

SILK SCREEN

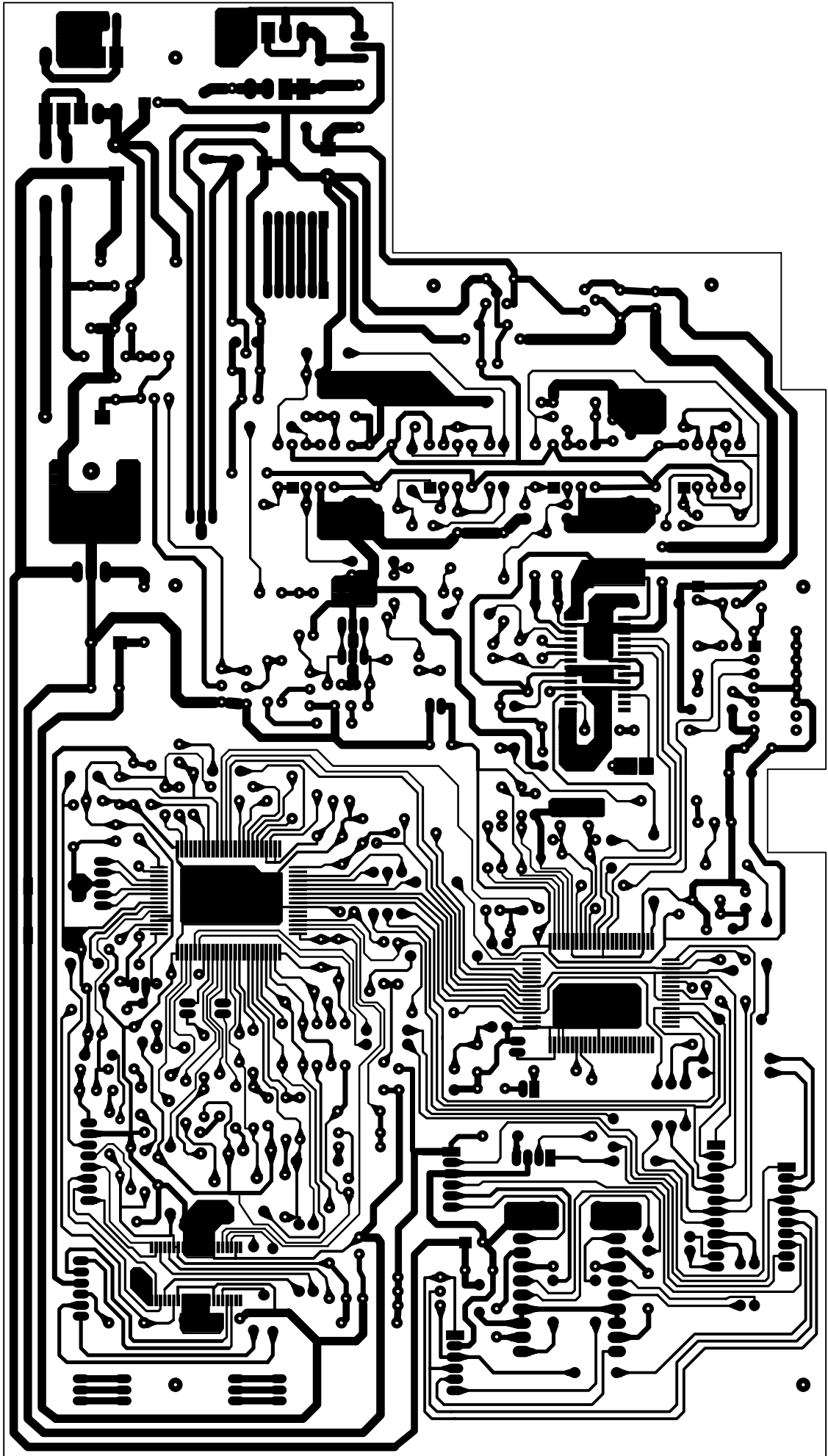
P/N : 4883-500040-001

5CD-MD4.JOB
01-06-1998

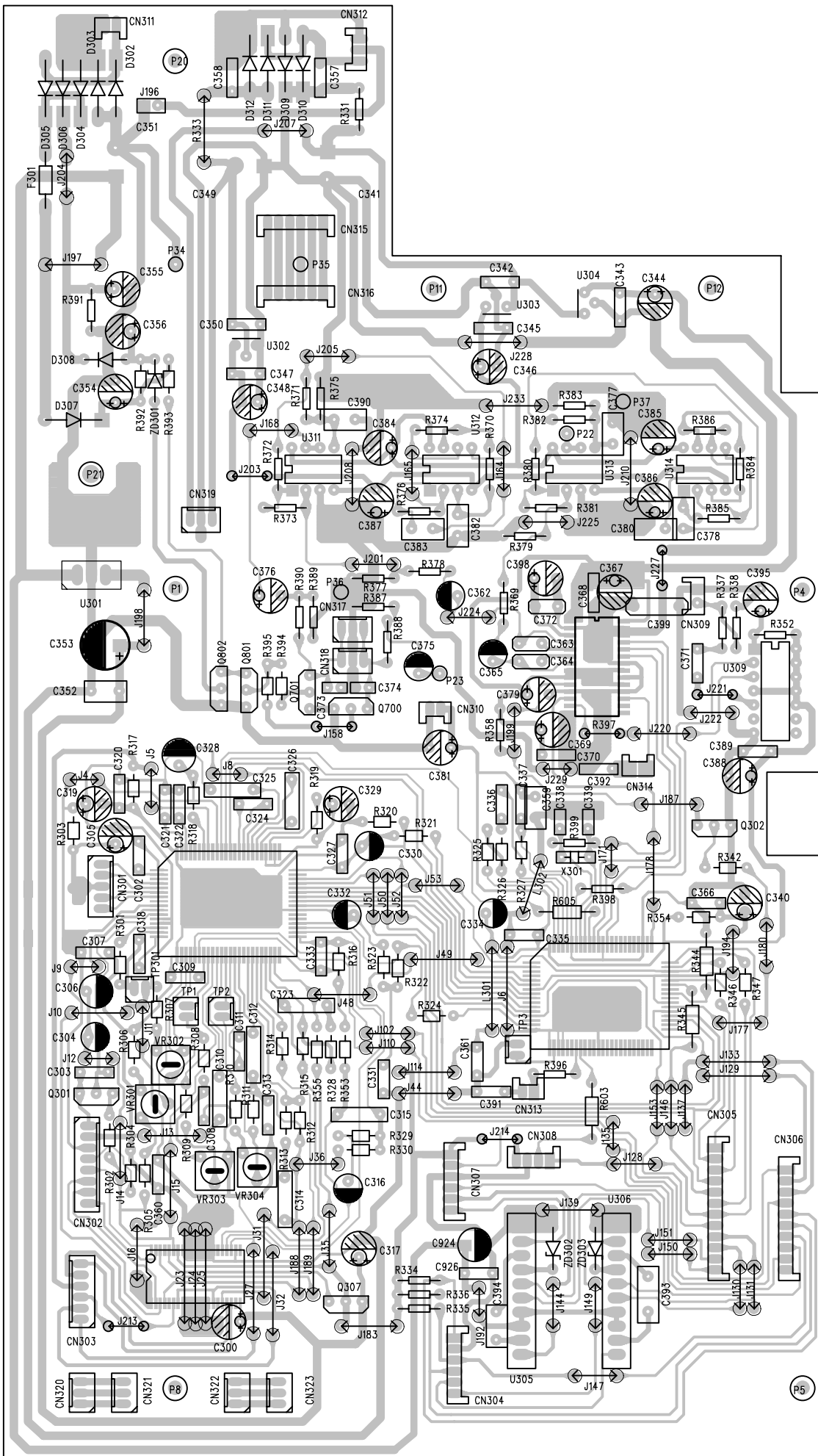
FL8350 MAIN BOARD

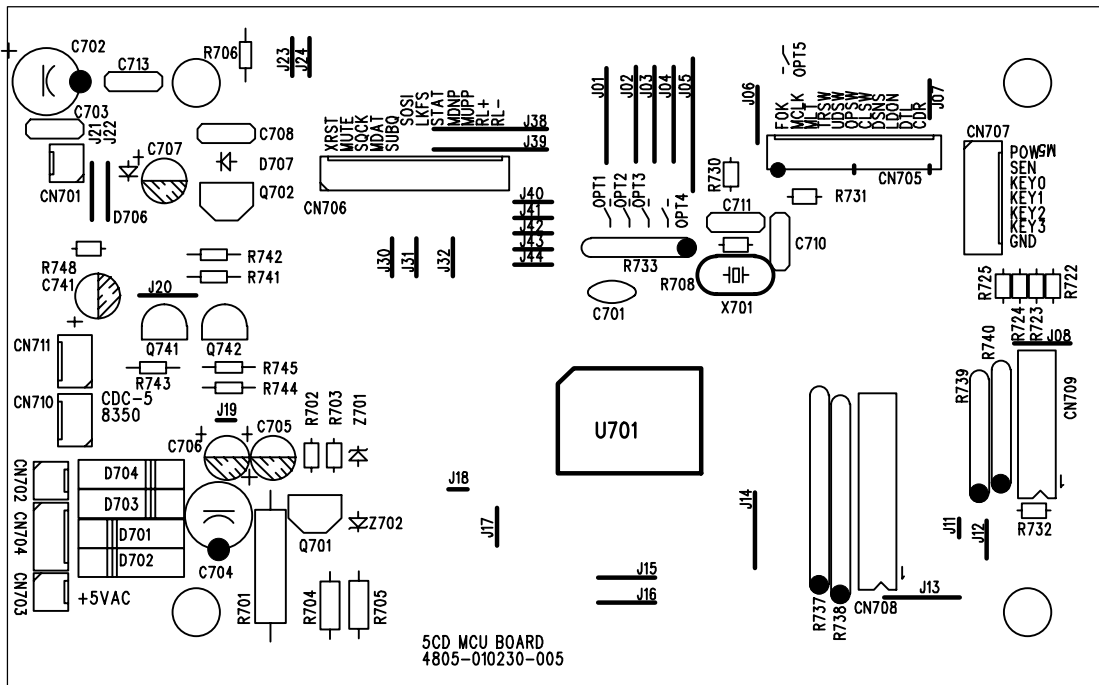
4883-500010-004

FL8350



20TDER SIDE





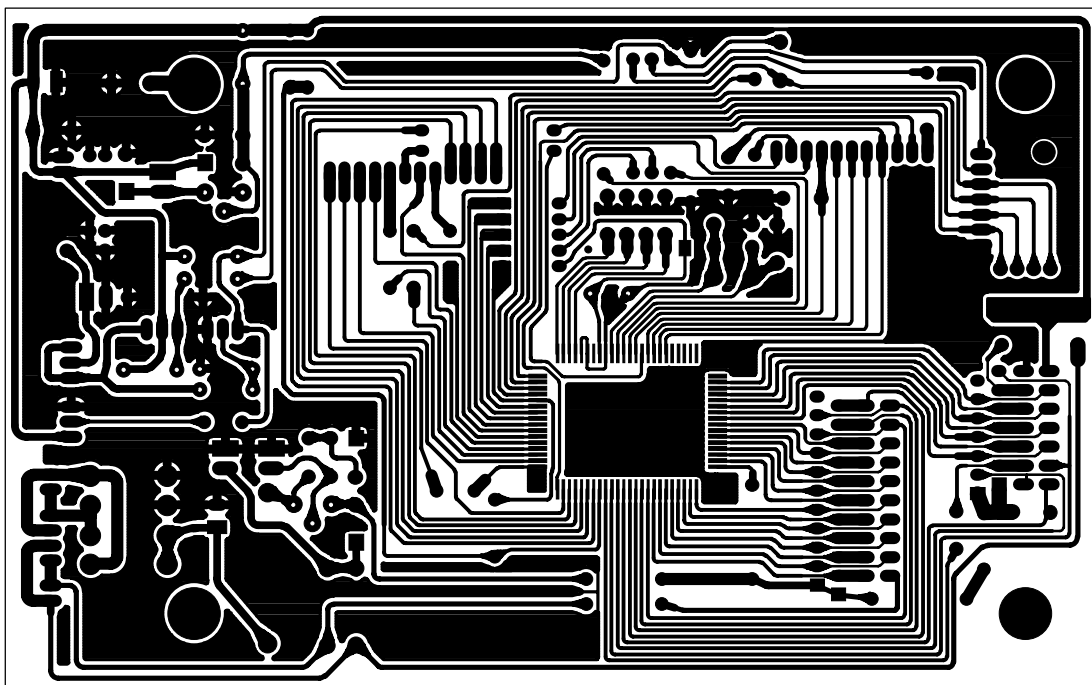
EM

PROJECT : FL8350

SILK SCREEN

SUB-PROJECT : MCU BOARD (VFD)

P/N:4805-010230-005

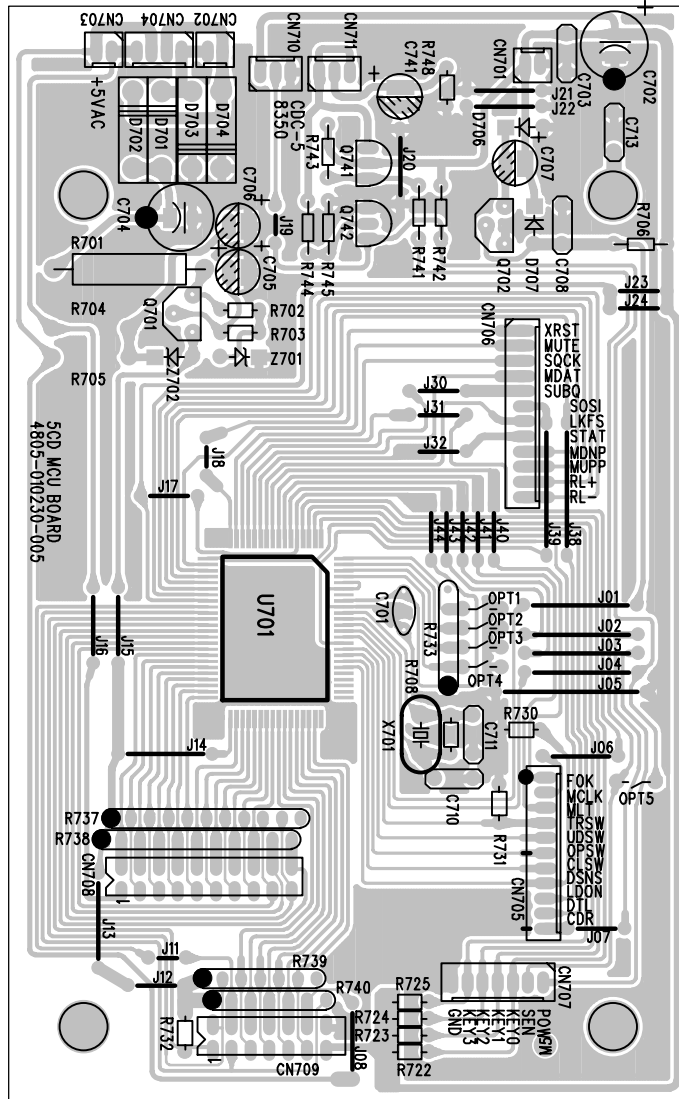


PROJECT : FL8350

SUB-PROJECT : MCU BOARD (VFD)

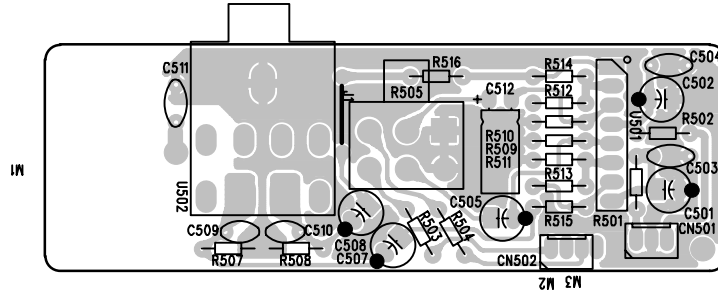
20LDER SIDE

P/N:4805-010230-005

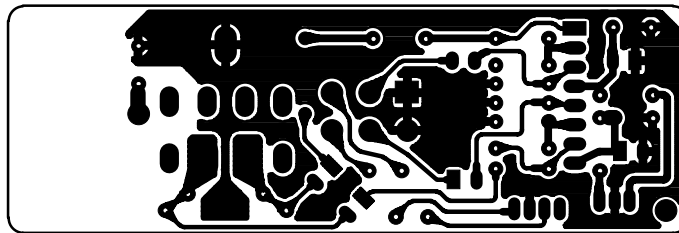
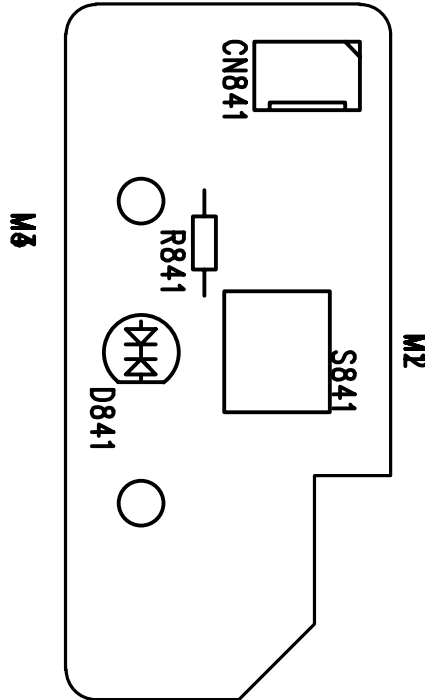


PROJECT : FL8350
SUB-PROJECT : MCU BOARD (VFD)
P/N:4805-010230-005

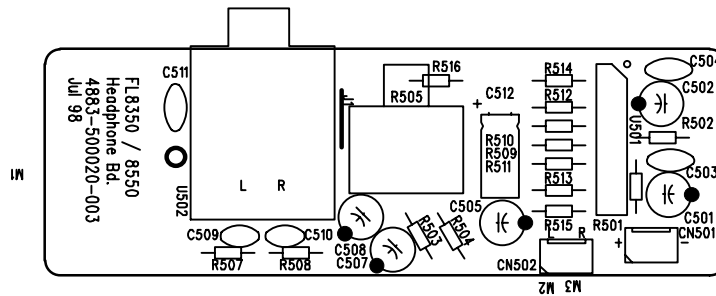
SILK SCREEN



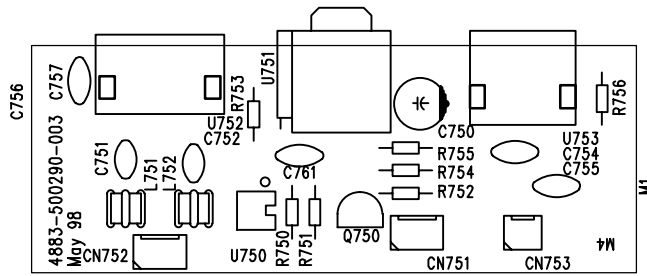
PROJECT : FL8350 HEADPHONE BOARD
P/N : 4883-500020-003



PROJECT : FL8350 HEADPHONE BOARD
P/N : 4883-500020-003
20TDER 2IDE

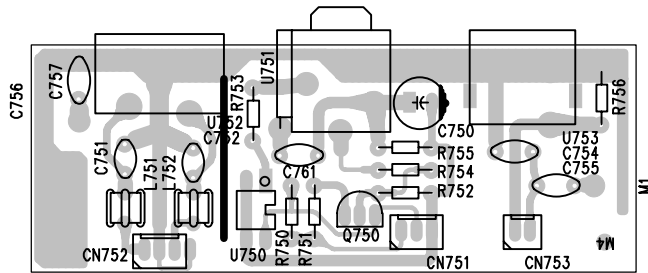


PROJECT : FL8350 HEADPHONE BOARD
P/N : 4883-500020-003



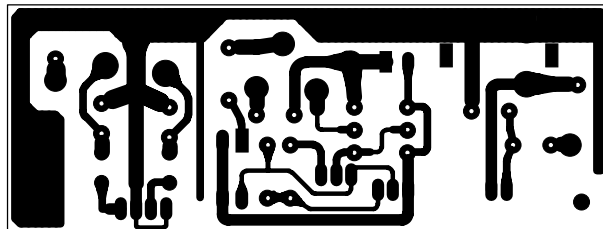
Silk Screen

PROJECT : FL8350^{M6}
Remote Connection Board
P/N : 4883-500290-003



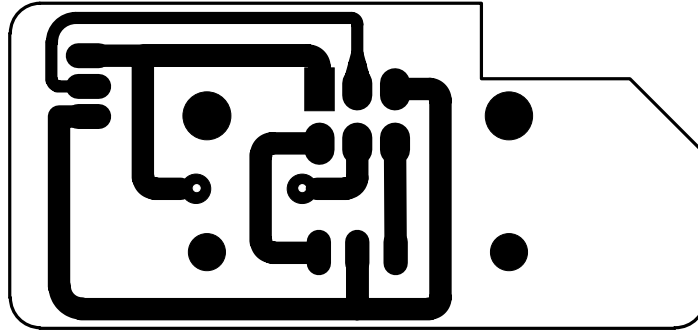
Reverse Side

PROJECT : FL8350^{M6}
Remote Connection Board
P/N : 4883-500290-003



Reverse Side

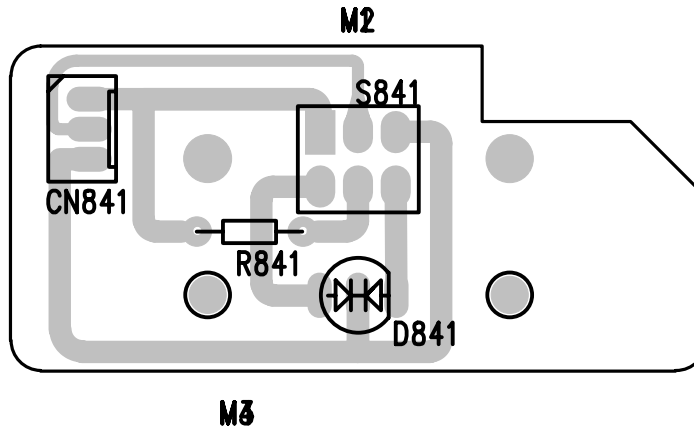
PROJECT : FL8350
Remote Connection Board
P/N : 4883-500290-003



PROJECT : FL8350

POWER CONTROL BD. 20LDER SIDE

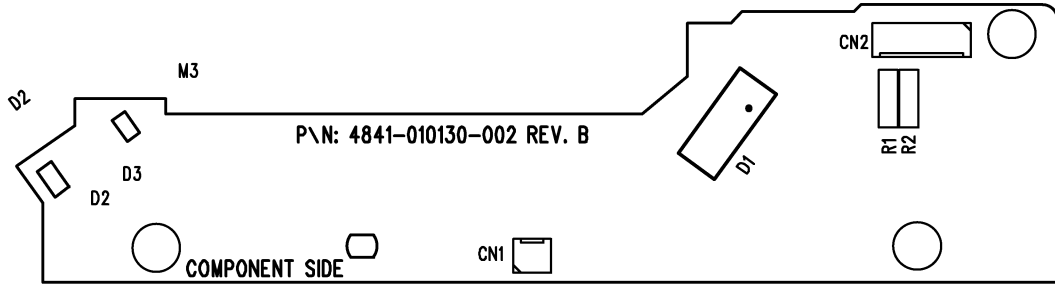
P/N : 4883-500110-002



PROJECT : FL8350

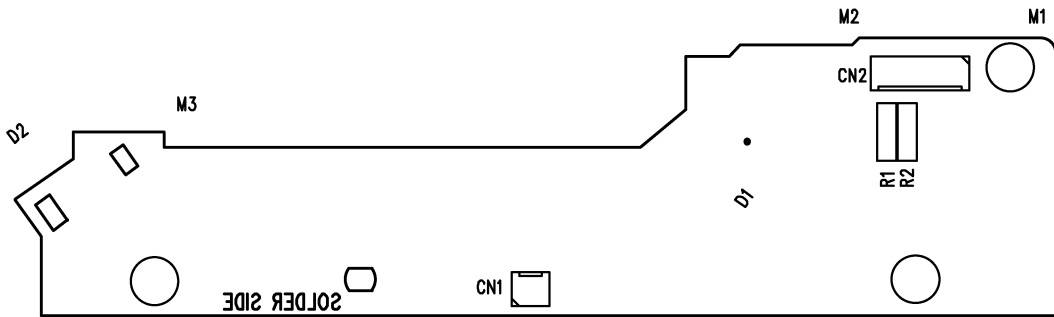
POWER CONTROL BD. 20LDER SIDE

P/N : 4883-500110-002



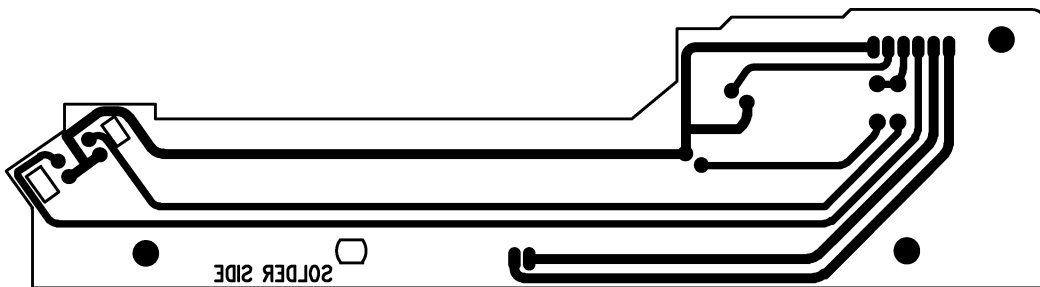
PROJECT: 5CD
SUBPROJECT:SENSOR BOARD
P\N: 4841-010130-002 REV.B
MATERIAL : 94V0, SINGLE SIDE, 1.6MM

SILK SCREEN



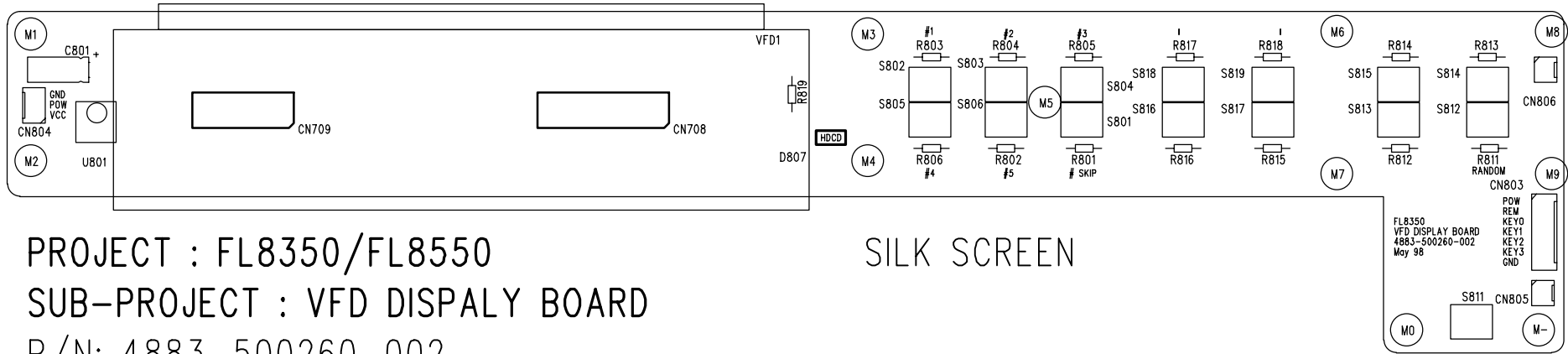
PROJECT: 5CD
SUBPROJECT:SENSOR BOARD
P\N: 4841-010130-002 REV.B
MATERIAL : 94V0, SINGLE SIDE, 1.6MM

SOLDER SIDE



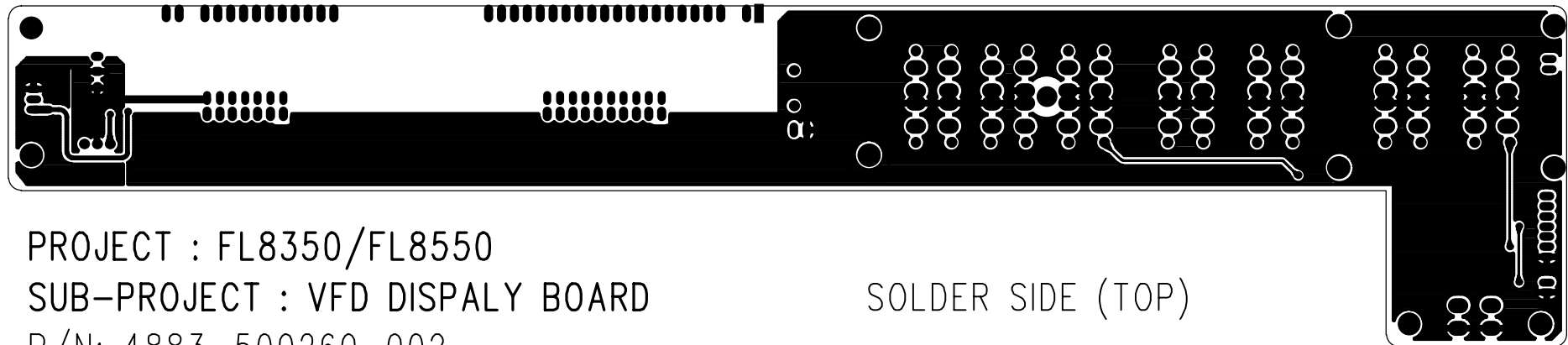
PROJECT: 5CD
SUBPROJECT:SENSOR BOARD
P\N: 4841-010130-002 REV.B
MATERIAL : 94V0, SINGLE SIDE, 1.6MM

SOLDER SIDE



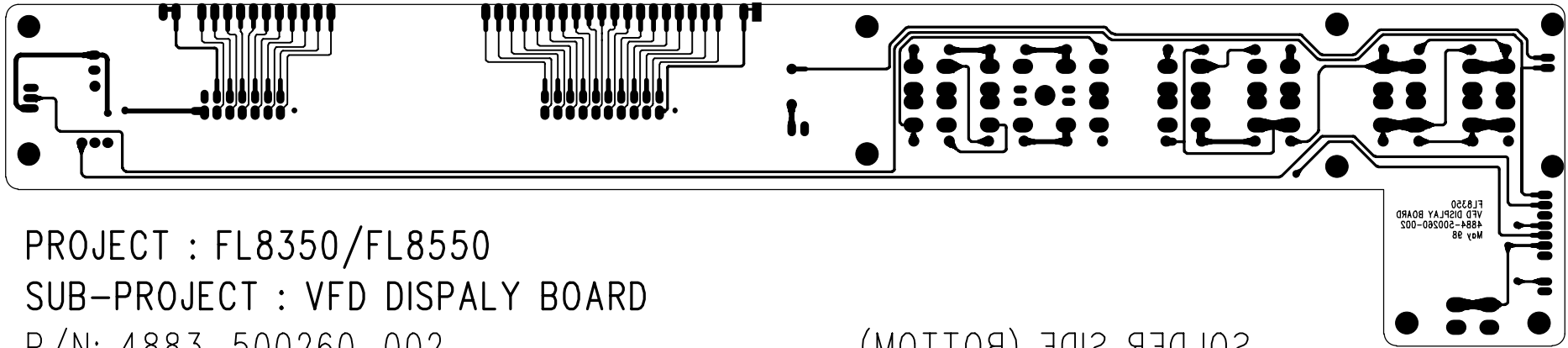
PROJECT : FL8350/FL8550
SUB-PROJECT : VFD DISPALY BOARD
P/N: 4883-500260-002

SILK SCREEN



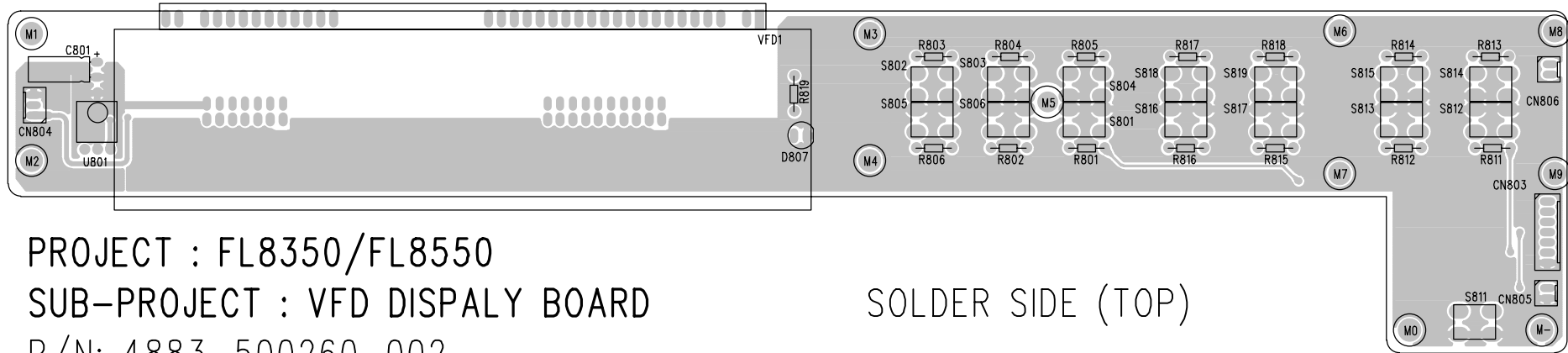
PROJECT : FL8350/FL8550
SUB-PROJECT : VFD DISPALY BOARD
P/N: 4883-500260-002

SOLDER SIDE (TOP)



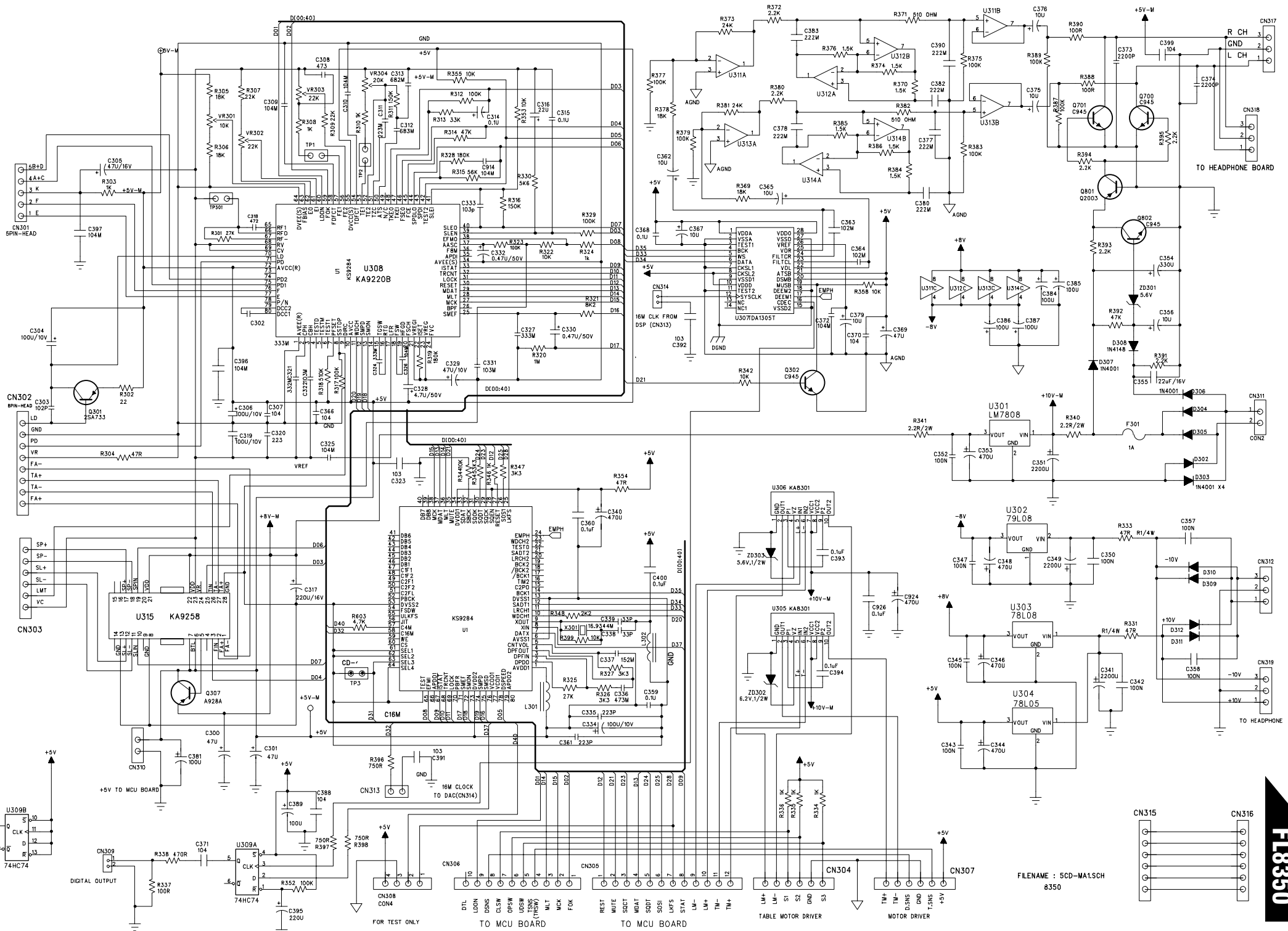
PROJECT : FL8350/FL8550
 SUB-PROJECT : VFD DISPALY BOARD
 P/N: 4883-500260-002

SOLDER SIDE (BOTTOM)



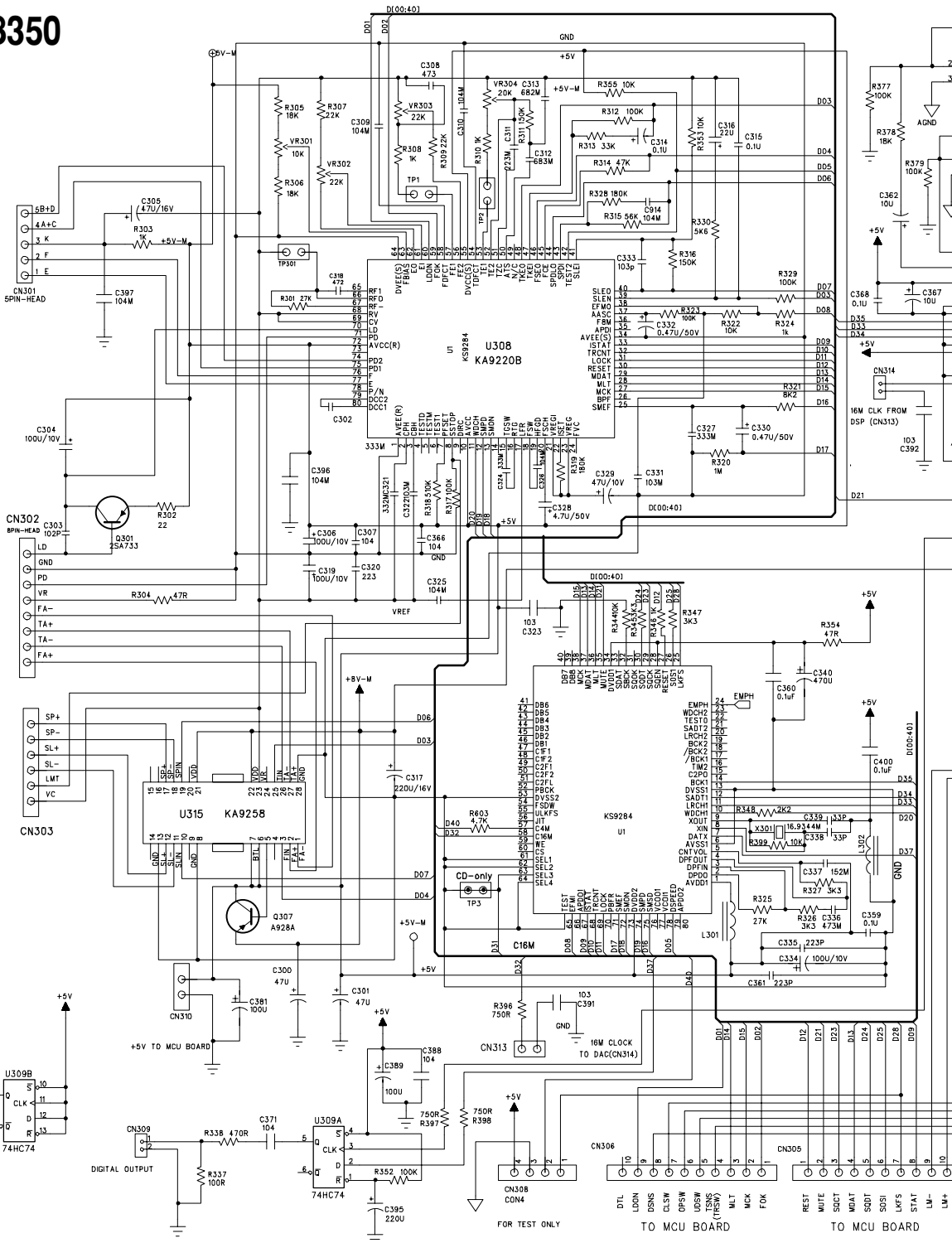
PROJECT : FL8350/FL8550
 SUB-PROJECT : VFD DISPALY BOARD
 P/N: 4883-500260-002

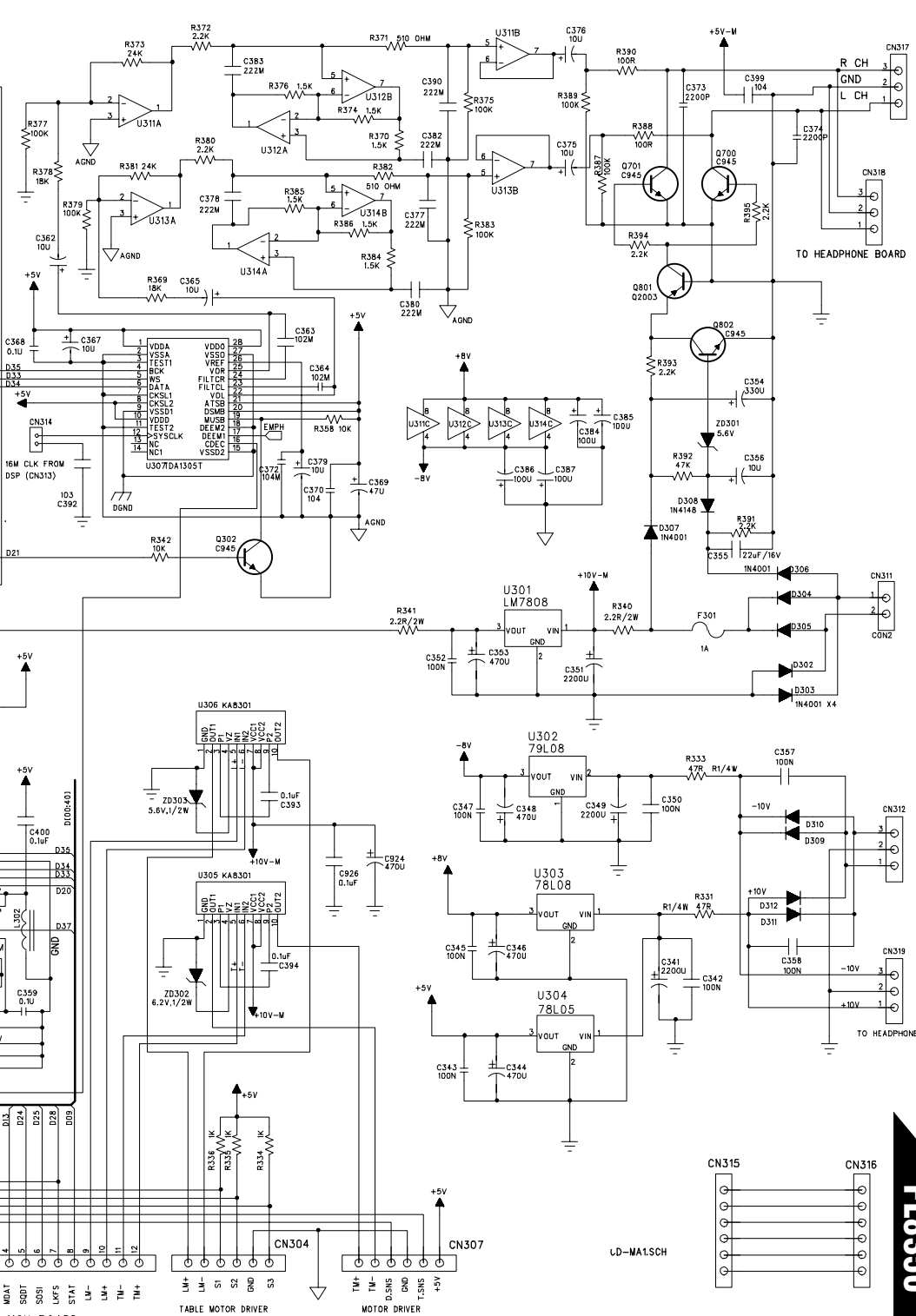
SOLDER SIDE (TOP)



FILENAME : 5CD-MA1.SCH
8350

FL8350





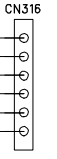
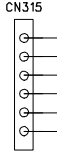
FL8350

MCU BOARD

TABLE MOTOR DRIVER

MOTOR DRIVER

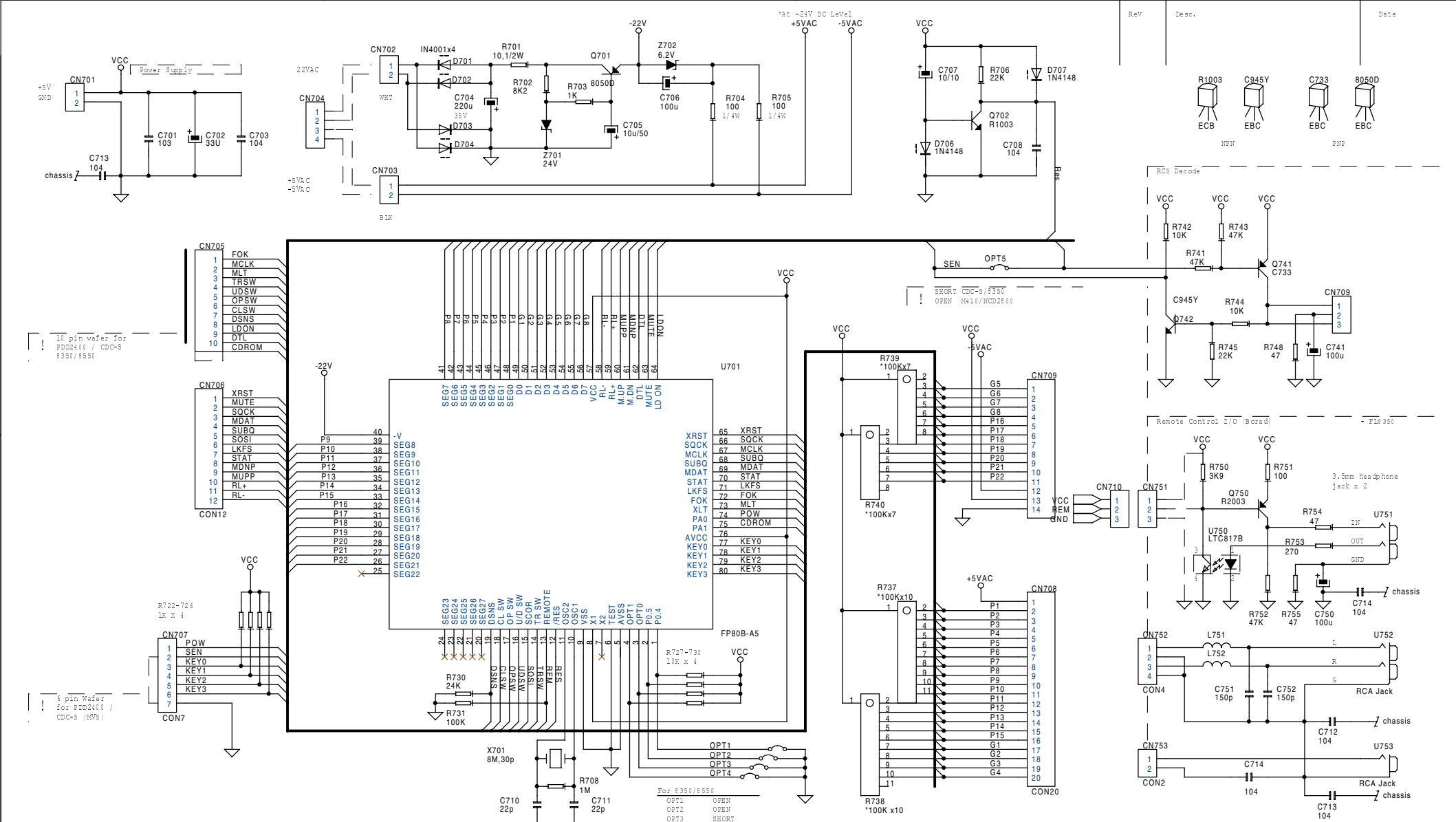
CD-MA15SCH



SCHEMATIC DRAWING

FILE NAME: 835MCU1
 DATE: 1998-05-23
FL8350

MODEL NO.: FL8350/8550
 PART NO.: 8493-501000-232
 REV.:
 PART NAME: FL8350 MCU Board Assy
 FL8350 Digital Output Board Assy



REMARK: 1) ALL RESISTORS ARE CARBON FILM ±5% 1/4W UNLESS SPECIFIED.
 2) ALL CAPACITORS WITH VALUE <1UF ARE CERAMIC ±80% ±20% UNLESS SPECIFIED.
 3) ALL CAPACITORS WITH VALUE >=1UF ARE ELEC-CAP ±20% 16V UNLESS SPECIFIED.
 4) ALL DCAP ARE 0.1UF CERAMIC CAP ±80% ±20%
 * SUBJECT CHANGE WITHOUT NOTICE *

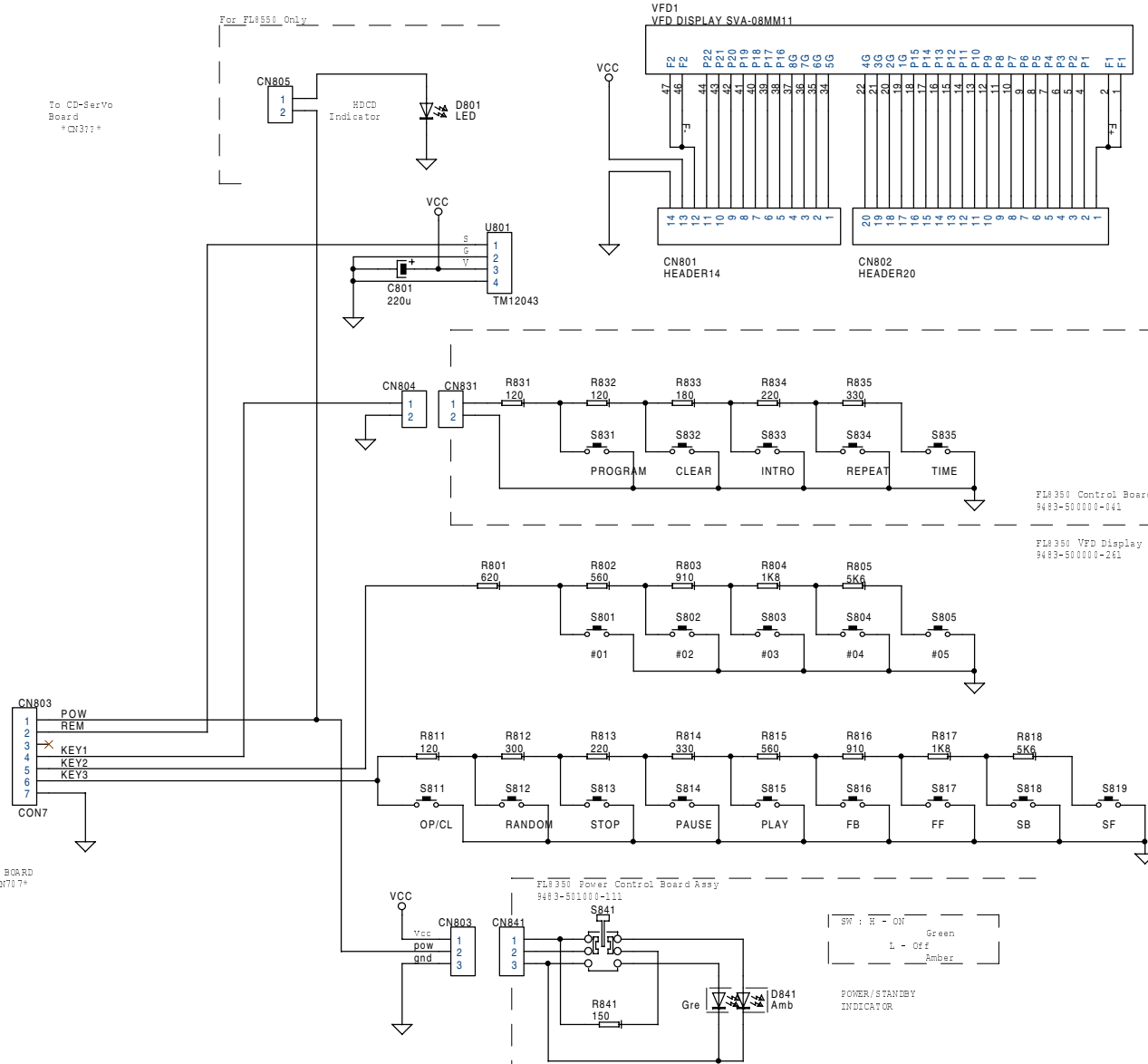
PURPOSE: SAMPLE MAKING [X] PRODUCTION []
 PREPARED BY: [] CHECKED BY: []
 SHEET OF 1 1
 APPROVED BY: []
 Ref: 8350\835MCU0 LOGO
 VER. B

SCHMATIC DRAWING

FILE NAME : 835VFD1.SCH
DATE : 1998-05-23

FL8350

MODEL NO. : FL8350/8550 PART NO. : 9483-501000-071 9483-501000-111 REV. : B PART NAME : FL8350 Control Board Assy FL8350 Power Control Board Assy
9483-501000-261 / 9485-501000-261 FL8350 Display Board (VFD) Assy / FL8550 Display Board (VFD) Assy



FL8350 Control Board Assy
9483-501000-041

FL8350 Vfd Display Board Assy
9483-501000-261

FL8350 Power Control Board Assy
9483-501000-111

SW : H - ON Green
L - Off Amber

POWER / STANDBY
INDICATOR

Ref: 8350\835VFD1.SCH

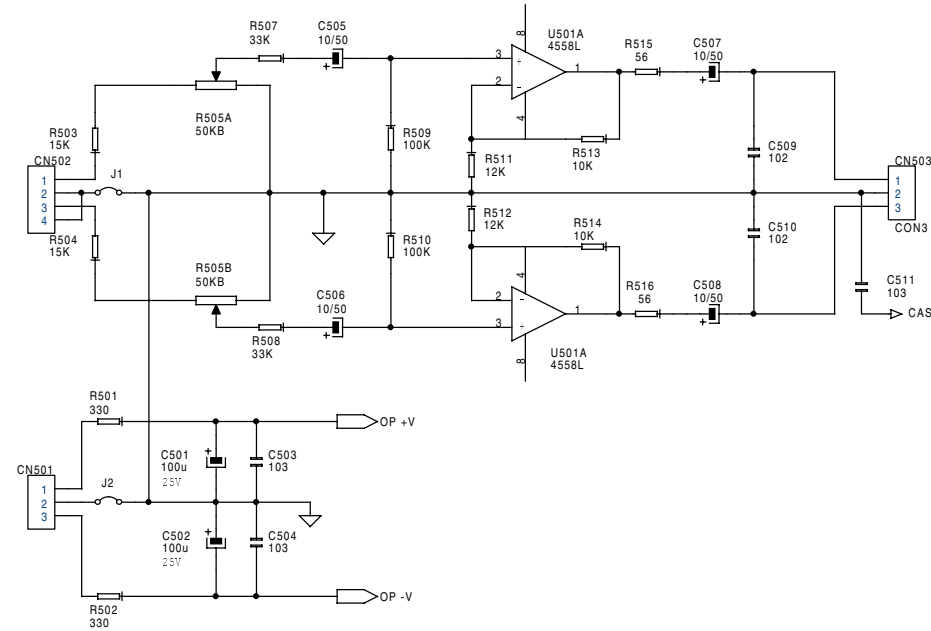
PURPOSE :	SAMPLE MAKING [X]	PRODUCTION []	SHEET OF	1	1	VER.	B
PREPARED BY :	AMAS NG	CHECKED BY :	APPROVED BY :				

SCHEMATIC DRAWING

FILE NAME : 835PHO1.SCH
DATE : 1998-05-23

MODEL NO. : FL8350/8550 PART NO. : 9493-501100-021 REV. : A PART NAME : FL8350 Headphone Board Assy

FL8350



* J1 and J2 are used to select to GND path

Ref: 8350/835VFD1.SCH

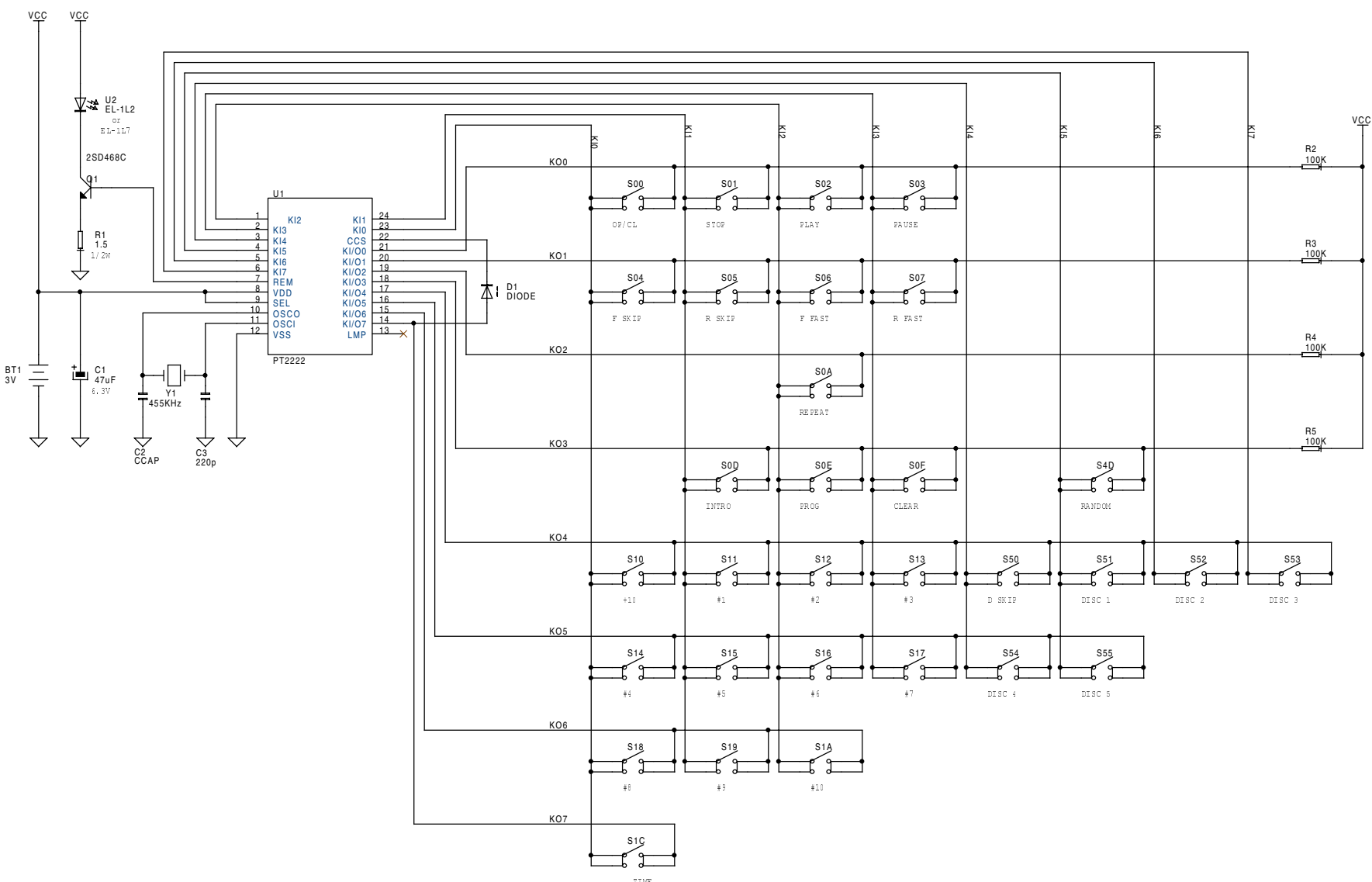
PURPOSE :	SAMPLE MAKING []	PRODUCTION [X]	SHEET OF 1	1	VER. B
PREPARED BY :	AMS NG	CHECKED BY :	APPROVED BY :		

SCHEMATIC DRAWING

DWG. NO. : 835REMO.SCH
 DATE : 1998-03-10

MODEL NO. : FL8350 PART NO. : 9483-500000-081 REV. : PART NAME : FL8350 Remote Control Bd

FL8350



FL8350 Remote Control Layout

-- Disc No --	1	2	3	OP/CL
	4	5	SKIP	Repeat
-- Track No --	1	2	3	Prog
	4	5	6	Clear
	7	8	9	Time
	10	#10		Intro
<<	>>	Ran		
<	>		>	

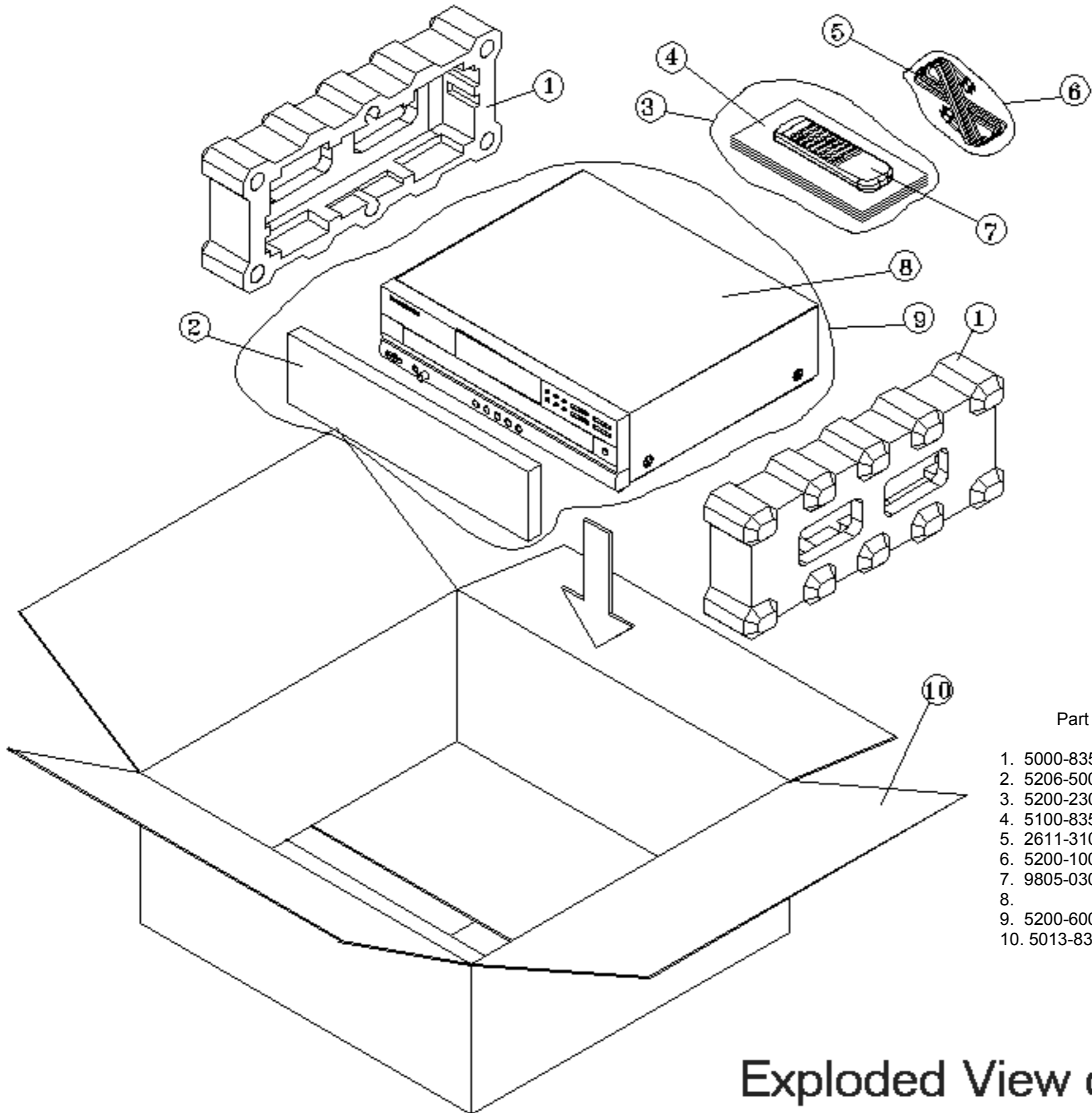
Customer Code : #8070h

- REMARK: 1) ALL RESISTORS ARE CARBON FILM +/-5% 1/8W UNLESS SPECIFIED.
 2) ALL CAPACITORS WITH VALUE <1UF ARE CERAMIC +5% -20% UNLESS SPECIFIED.
 3) ALL CAPACITORS WITH VALUE >=1UF ARE ELEC-CAP +/-20% 16V UNLESS SPECIFIED.
 4) ALL DCAP ARE 0.1UF CERAMIC CAP +5% -20%
 * SUBJECT CHANGE WITHOUT NOTICE *

Ref: 8350/835MCU

PURPOSE : SAMPLE MAKING [X] PRODUCTION [] SHEET OF 1 1 VER. A

PREPARED BY : CHECKED BY : APPROVED BY :



Part Number	Description	Qty
1. 5000-835001-000	Polyfoam, FL8350	2
2. 5206-500160-050	E.P.E. Sheet	1
3. 5200-230321-030-01	Polybag For Manual	1
4. 5100-835000-100	Owner's Manual	1
5. 2611-310009-000	IM Audio Cable	1
6. 5200-100180-030	Polybag For Audio Cord	1
7. 9805-030000-051	FL8350 Remote Control	1
8.	FL8350 Main Unit	1
9. 5200-600600-040	Polybag 600x600x40 mm	1
10. 5013-835001-0001	FL8350 Outer Carton	1

Exploded View of Unit packaged