


ONKYO® SERVICE MANUAL

COMPACT DISC PLAYER MODEL DX-1800

Black model

BUDN, BUD	120V AC, 60Hz
BUG	220V AC, 50Hz
BUU	110/120/220/240V AC, 50/60Hz
BUQA, BUQB	240V AC, 50Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

SPECIFICATIONS

Signal readout system:	Optical non-contact
Reading rotation:	About 500~200 r.p.m. (constant linear velocity)
Linear velocity:	1.2~1.4m/s
Error correction system:	Cross interleave readsolomon code
Decoded bits:	18 bits linear
Sampling frequency:	352.8kHz (8 times oversampling)
Number of channels:	2 (Stereo)
Frequency response:	5Hz~20kHz
Total harmonic distortion:	0.004% (at 1kHz)
Dynamic range:	98dB
Signal to noise ratio:	100dB
Channel separation:	100dB (at 1kHz)
Wow and Flutter:	Below threshold of measurability
Power consumption:	12 watts
Output level:	2 volts r.m.s.
Dimensions (W×H×D):	435×112×305mm 17-1/8"×4-7/16"×12"
Weight:	4.6kg, 11-13/16 lbs.

Specifications are subject to change without notice.



TABLE OF CONTENTS

Specifications	1
Service procedures	2
Note on compact disc	2
Caution of replacement of optical pickup	3
Protection of eyes from laser beam during servicing	4
Laser warning label	4
Mechanism exploded view	5
Exploded view	8
Parts list	9
IC block diagrams and descriptions	10
Adjustment procedures	18
Printed circuit board view	21
Pc board-parts list	22
Schematic diagram	23
Block diagram	27
Packing view	28

NOTE ON COMPACT DISC

● Holding Compact Discs

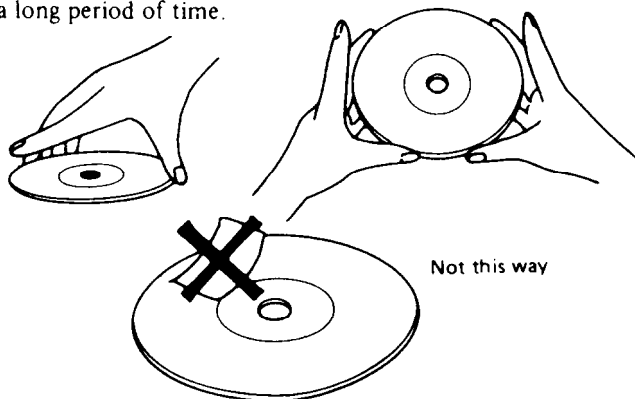
Hold Compact Discs by the edges so that you do not touch the surface of disc. Remember that the side of the disc with the "rainbow" reflection is the side containing the audio information.

Do not attach tape or paper to the label side of the disc and always be careful not to leave fingerprints on the side that is played.

● Storing Compact Discs

Store Compact Discs in a location protected from direct sunlight, high heat and humidity and extremely high and low temperatures. Discs should never be left in the trunk or interior of an automobile in the sun since the temperature can become very high in such a closed environment.

Always store Compact Discs in the holders in which they were sold. Never leave a disc in the player's disc holder for a long period of time.



SERVICE PROCEDURES

1. Safety-check out

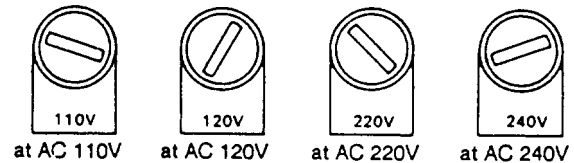
After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Connect the insulating-resistance tester between the plug of power supply cable and chassis.

Specifications: more than 10Mohm at 500V.

2. Voltage selector (back panel)

Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this selector to match the voltage of the power supply in your area before turning the power switch on. Voltage is changed by turning the voltage selector with a screwdriver or similar instrument to the 110V, 120V, 220V or 240V position. Confirm that the selector has been set to the correct position before turning the power switch on. If there is no voltage selector switch on the unit you have purchased, it can only be used in areas where the power supply voltage is the same as that of the unit.



● Cleaning Compact Discs

Before playing a disc wipe off the playing surface with a soft cloth to remove dust and other soil. Wipe the surface in straight lines from the center of the disc outward, not in a circular motion as you would with a phonograph record.

Do not use benzene, chemical cleansers or phonograph record cleaning solutions to clean Compact Discs. Also avoid static electricity prevention solutions since they can damage the surface of Compact Discs.

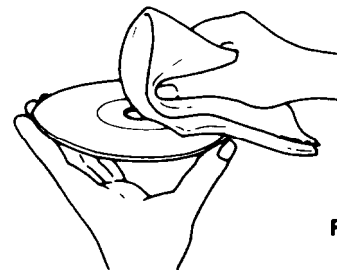


Fig. 9

Problems Caused by Dew

Dew can form inside a Compact player when it is brought from a cold environment into a warm room, when a room is rapidly heated and if a player is left in a humid environment.

This dew can prevent the laser pickup from reading the data contained in the pits in the disc surface. If the player does not operate properly because of dew, remove the disc and leave the player's power switch on for about one hour to remove all moisture.

CAUTION ON REPLACEMENT OF OPTICAL PICKUP

The laser diode in the optical pickup block is so sensitive to static electricity, surge current and etc. that the components are liable to be broken down or its reliability remarkably deteriorated.

During repair, carefully take the following precautions. (The following precautions are included in the service parts).

PRECAUTIONS

1. Ground for the work-desk.

Place a conductive sheet such as a sheet of copper (with impedance lower than $10^6 \Omega$) on the work-desk and place the set on the conductive sheet so that the chassis.

2. Grounding for the test equipment and tools.

Test equipments and toolings should be grounded in order that their ground level is the same the ground of the power source.

3. Grounding for the human body.

Be sure to put on a wrist-strap for grounding whose other end is grounded.

Be particularly careful when the workers wear synthetic fiber clothes, or air is dry.

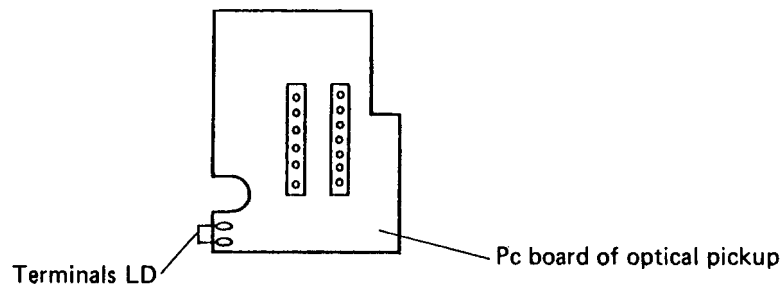
4. Select a soldering iron that permits no leakage and have the tip of the iron well-grounded.

5. Do not check the laser diode terminals with the probe of a circuit tester or oscilloscope.

Care should be taken with the optical pickup.

The optical pickup is sensitive to static electricity, surge currents, and other high electrical noise, and because there is the possibility of damage to performance, in the handling of the pickup, the utmost care must be taken, particularly with regard to static electricity.

1. When checking the laser terminal, avoid making connections using the probes of a tester or oscilloscope, or an ordinary power supply.
2. When replacing the optical pickup, first short the LD terminals and remove the connector. Also, when attaching the new optical pickup, after attaching the connector, unsolder the LD terminals.



PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING!!

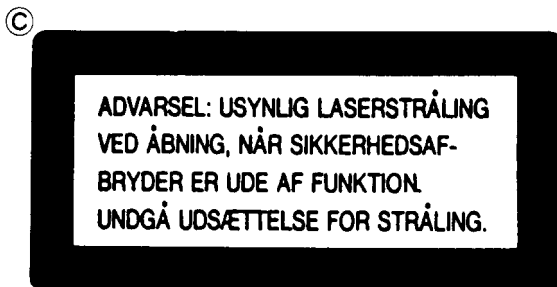
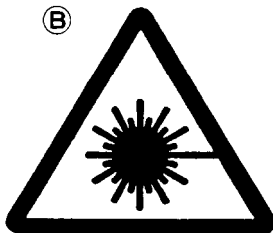
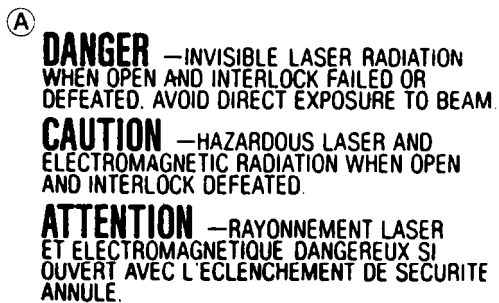
WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

LASER WARNING LABEL

The label shown below are affixed.

1. Warning lable

This label is located on the arm of mechanism.



- Ⓐ : Danger label
 Ⓑ : Except 120V model
 Ⓒ : Except 120V model

Laser Diode Properties

- Material: GaAS/GaAlAs
- Wavelength: 780nm
- Emission Duration: continuous
- Laser output: max. 0.5mW*

*This output is the value measured at a distance about 1.8mm from the objective lens surface on the Optical Pick-up Block.

2. Certification label (120V model)

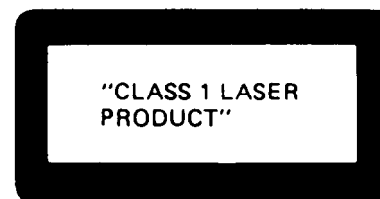
This label is located on the back panel.

PRODUCT IS CERTIFIED BY THE MANUFACTURER TO COMPLY WITH DHHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT THE DATE OF MANUFACTURE.

MANUFACTURED

3. Class 1 label (Except 120V model)

This label is located on the back panel.



ADVARSEL

Denne mærkning er anbragt på apparatets højre side og indikerer, at apparatet arbejder med laserstråler af klasse 1, hvilket betyder, at der anvendes laserstråler af svageste klasse, og at man ikke på apparatets yderside kan blive udsat for utilladelig kraftig stråling.

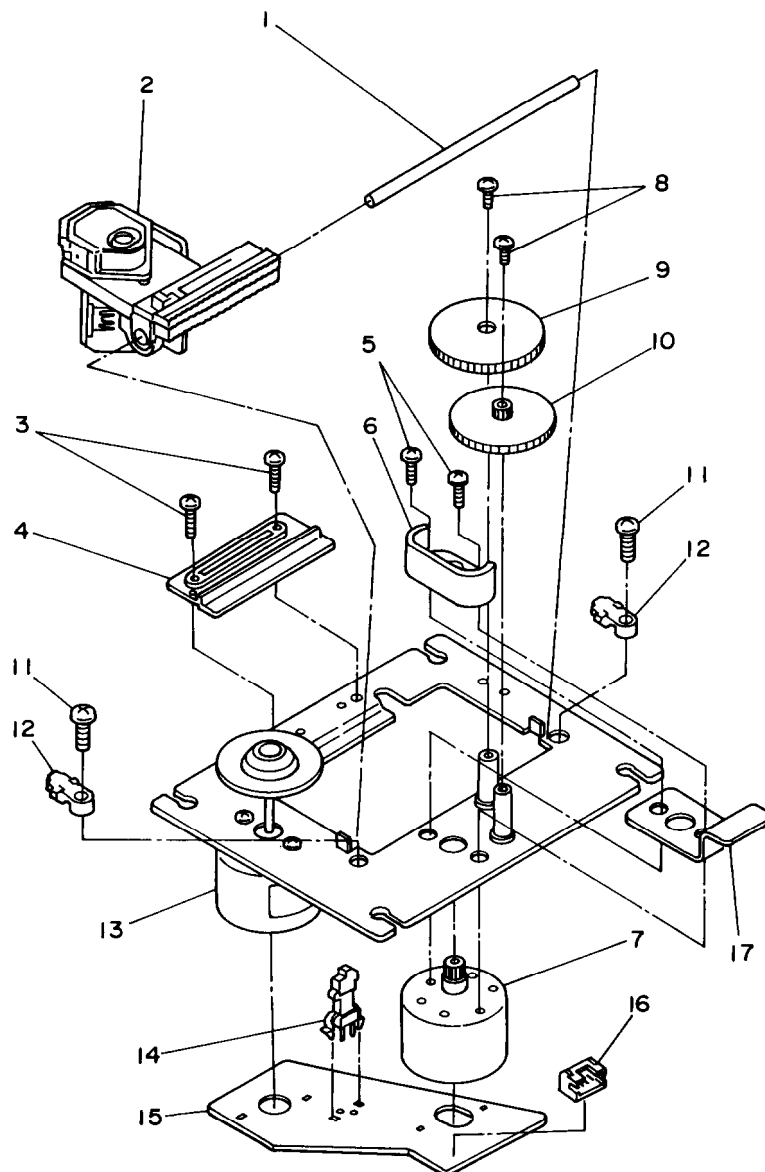
APPARATET BØR KUN ÅBNES AF FAGFOLK MED SÆRLIGT KENDSKAB TIL APPARATER MED LASERSTRÅLER!

Indvendigt i apparatet er anbragt den her gengivne advarselmærkning, som advarer imod at foretage sådanne indgreb i apparatet, at man kan komme til at udsætte sig for laserstråling.

VAROITUS! Laite sisältää laserdiodin, joka lähettää (näkyvä-
töntä) silmille vaarallista lasersäteilyä.

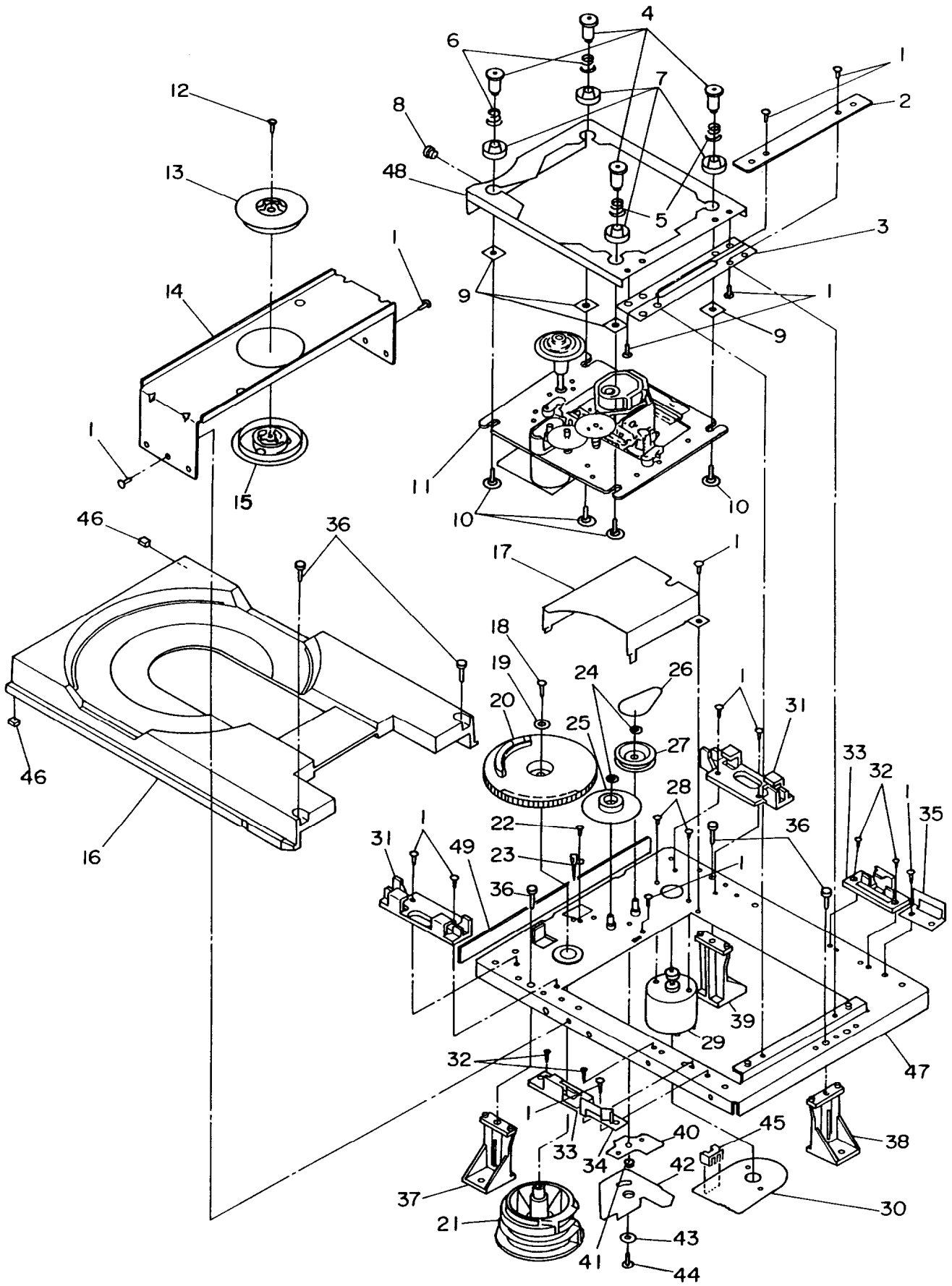
MECHANISM-EXPLODED VIEW

PICKUP UNIT-EXPLODED VIEW



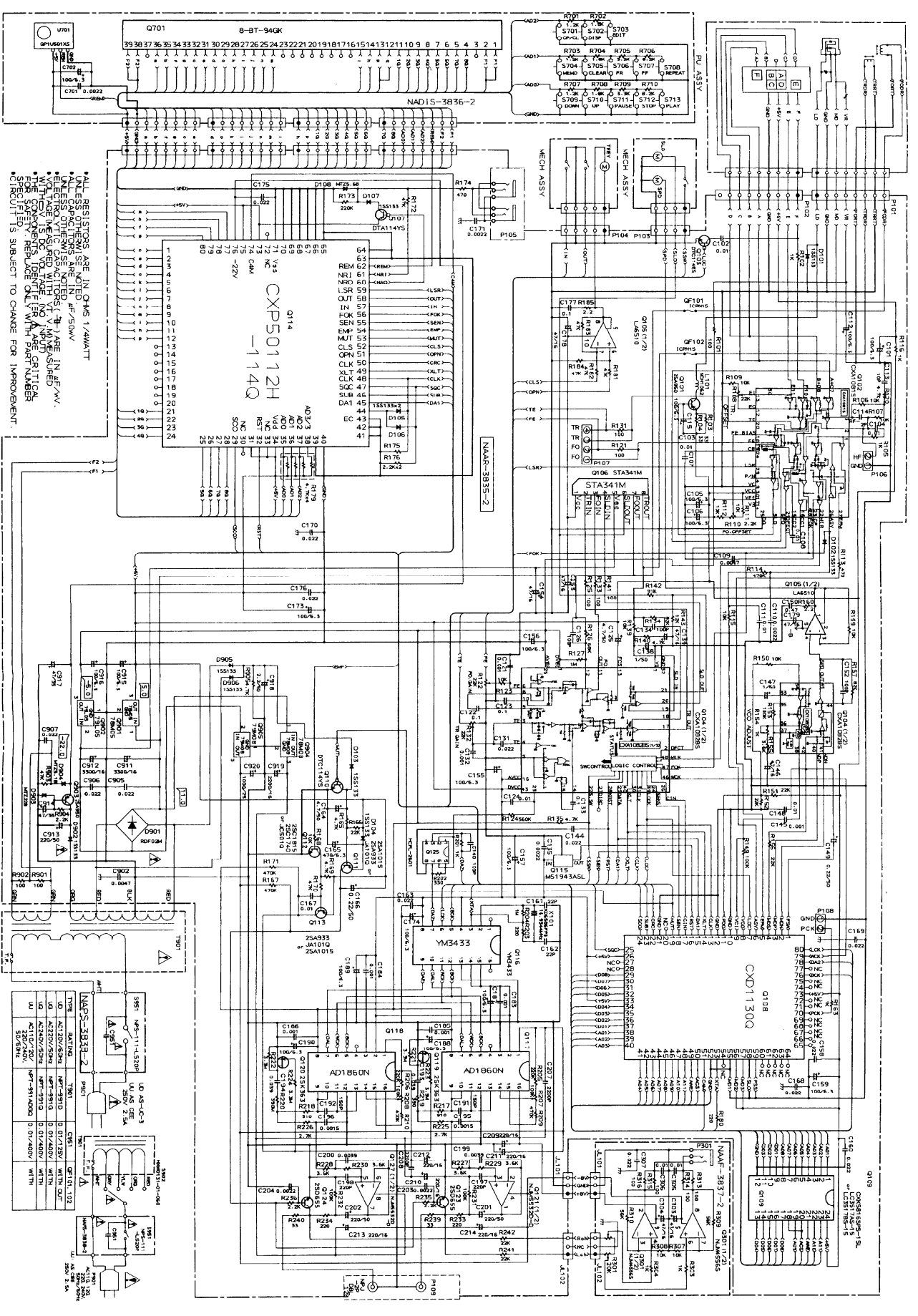
PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1	24506900	Shaft,slide	10	24506904	Wheel B
2	24110005	KSS-150A,Optical pickup	11	801427	+STP2.6x8,Special screw
3	801425	S2x5,Special screw	12	24506905	Clamp,shaft
4	24506901	Holder,slide	13	24502253	Spindle motor ass'y
5	82112005	+P2x5,Pan head screw	14	25065377	NLF-12018,Leafswitch
6	24506902	Cover,gear	15	24505270	Motor pc board
7	24502251	Motor	16	25050396	NSCT-4P223,Socket
8	801426	M1.7x3,Special screw	17	24506906	Stopper
9	24506903	Wheel A			



SCHEMATIC DIAGRAM

A B C D E F G H



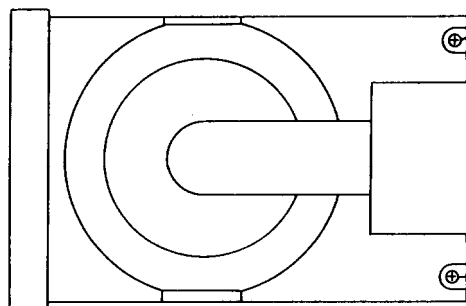
* ALL RESISTORS ARE IN OHMS UNLESS NOTED OTHERWISE.
 * CAPACITORS ARE IN MICROFARADS UNLESS NOTED OTHERWISE.
 * ELECTROLYTIC CAPACITORS ARE IDENTIFIED BY "E" IN THE VALUE.
 * WITH NO VALUE SPECIFIED, NO POLARITY IS ASSUMED.
 * THE COMPONENTS IDENTIFIED BY "A" ARE CRITICAL TO THE CIRCUIT AND MUST BE REPLACED WITH THE SAME PART NUMBER SPECIFIED.
 * CIRCUITS SUBJECT TO CHANGE FOR IMPROVEMENT.

TYPE	RATING	Q101	Q102	Q103	Q104	Q105	Q106	Q107	Q108	Q109	Q110	Q111	Q112	Q113	Q114	Q115	Q116	Q117	Q118	Q119	Q120	Q121	Q122	Q123	Q124	Q125	Q126	Q127	Q128	Q129	Q130	Q131	Q132	Q133	Q134	Q135	Q136	Q137	Q138	Q139	Q140	Q141	Q142	Q143	Q144	Q145	Q146	Q147	Q148	Q149	Q150	Q151	Q152	Q153	Q154	Q155	Q156	Q157	Q158	Q159	Q160	Q161	Q162	Q163	Q164	Q165	Q166	Q167	Q168	Q169	Q170	Q171	Q172	Q173	Q174	Q175	Q176	Q177	Q178	Q179	Q180	Q181	Q182	Q183	Q184	Q185	Q186	Q187	Q188	Q189	Q190	Q191	Q192	Q193	Q194	Q195	Q196	Q197	Q198	Q199	Q200	Q201	Q202	Q203	Q204	Q205	Q206	Q207	Q208	Q209	Q210	Q211	Q212	Q213	Q214	Q215	Q216	Q217	Q218	Q219	Q220	Q221	Q222	Q223	Q224	Q225	Q226	Q227	Q228	Q229	Q230	Q231	Q232	Q233	Q234	Q235	Q236	Q237	Q238	Q239	Q240	Q241	Q242	Q243	Q244	Q245	Q246	Q247	Q248	Q249	Q250	Q251	Q252	Q253	Q254	Q255	Q256	Q257	Q258	Q259	Q260	Q261	Q262	Q263	Q264	Q265	Q266	Q267	Q268	Q269	Q270	Q271	Q272	Q273	Q274	Q275	Q276	Q277	Q278	Q279	Q280	Q281	Q282	Q283	Q284	Q285	Q286	Q287	Q288	Q289	Q290	Q291	Q292	Q293	Q294	Q295	Q296	Q297	Q298	Q299	Q300	Q301	Q302	Q303	Q304	Q305	Q306	Q307	Q308	Q309	Q310	Q311	Q312	Q313	Q314	Q315	Q316	Q317	Q318	Q319	Q320	Q321	Q322	Q323	Q324	Q325	Q326	Q327	Q328	Q329	Q330	Q331	Q332	Q333	Q334	Q335	Q336	Q337	Q338	Q339	Q340	Q341	Q342	Q343	Q344	Q345	Q346	Q347	Q348	Q349	Q350	Q351	Q352	Q353	Q354	Q355	Q356	Q357	Q358	Q359	Q360	Q361	Q362	Q363	Q364	Q365	Q366	Q367	Q368	Q369	Q370	Q371	Q372	Q373	Q374	Q375	Q376	Q377	Q378	Q379	Q380	Q381	Q382	Q383	Q384	Q385	Q386	Q387	Q388	Q389	Q390	Q391	Q392	Q393	Q394	Q395	Q396	Q397	Q398	Q399	Q400	Q401	Q402	Q403	Q404	Q405	Q406	Q407	Q408	Q409	Q410	Q411	Q412	Q413	Q414	Q415	Q416	Q417	Q418	Q419	Q420	Q421	Q422	Q423	Q424	Q425	Q426	Q427	Q428	Q429	Q430	Q431	Q432	Q433	Q434	Q435	Q436	Q437	Q438	Q439	Q440	Q441	Q442	Q443	Q444	Q445	Q446	Q447	Q448	Q449	Q450	Q451	Q452	Q453	Q454	Q455	Q456	Q457	Q458	Q459	Q460	Q461	Q462	Q463	Q464	Q465	Q466	Q467	Q468	Q469	Q470	Q471	Q472	Q473	Q474	Q475	Q476	Q477	Q478	Q479	Q480	Q481	Q482	Q483	Q484	Q485	Q486	Q487	Q488	Q489	Q490	Q491	Q492	Q493	Q494	Q495	Q496	Q497	Q498	Q499	Q500	Q501	Q502	Q503	Q504	Q505	Q506	Q507	Q508	Q509	Q510	Q511	Q512	Q513	Q514	Q515	Q516	Q517	Q518	Q519	Q520	Q521	Q522	Q523	Q524	Q525	Q526	Q527	Q528	Q529	Q530	Q531	Q532	Q533	Q534	Q535	Q536	Q537	Q538	Q539	Q540	Q541	Q542	Q543	Q544	Q545	Q546	Q547	Q548	Q549	Q550	Q551	Q552	Q553	Q554	Q555	Q556	Q557	Q558	Q559	Q560	Q561	Q562	Q563	Q564	Q565	Q566	Q567	Q568	Q569	Q570	Q571	Q572	Q573	Q574	Q575	Q576	Q577	Q578	Q579	Q580	Q581	Q582	Q583	Q584	Q585	Q586	Q587	Q588	Q589	Q590	Q591	Q592	Q593	Q594	Q595	Q596	Q597	Q598	Q599	Q600	Q601	Q602	Q603	Q604	Q605	Q606	Q607	Q608	Q609	Q610	Q611	Q612	Q613	Q614	Q615	Q616	Q617	Q618	Q619	Q620	Q621	Q622	Q623	Q624	Q625	Q626	Q627	Q628	Q629	Q630	Q631	Q632	Q633	Q634	Q635	Q636	Q637	Q638	Q639	Q640	Q641	Q642	Q643	Q644	Q645	Q646	Q647	Q648	Q649	Q650	Q651	Q652	Q653	Q654	Q655	Q656	Q657	Q658	Q659	Q660	Q661	Q662	Q663	Q664	Q665	Q666	Q667	Q668	Q669	Q670	Q671	Q672	Q673	Q674	Q675	Q676	Q677	Q678	Q679	Q680	Q681	Q682	Q683	Q684	Q685	Q686	Q687	Q688	Q689	Q690	Q691	Q692	Q693	Q694	Q695	Q696	Q697	Q698	Q699	Q700	Q701	Q702	Q703	Q704	Q705	Q706	Q707	Q708	Q709	Q710	Q711	Q712	Q713	Q714	Q715	Q716	Q717	Q718	Q719	Q720	Q721	Q722	Q723	Q724	Q725	Q726	Q727	Q728	Q729	Q730	Q731	Q732	Q733	Q734	Q735	Q736	Q737	Q738	Q739	Q740	Q741	Q742	Q743	Q744	Q745	Q746	Q747	Q748	Q749	Q750	Q751	Q752	Q753	Q754	Q755	Q756	Q757	Q758	Q759	Q760	Q761	Q762	Q763	Q764	Q765	Q766	Q767	Q768	Q769	Q770	Q771	Q772	Q773	Q774	Q775	Q776	Q777	Q778	Q779	Q780	Q781	Q782	Q783	Q784	Q785	Q786	Q787	Q788	Q789	Q790	Q791	Q792	Q793	Q794	Q795	Q796	Q797	Q798	Q799	Q800	Q801	Q802	Q803	Q804	Q805	Q806	Q807	Q808	Q809	Q810	Q811	Q812	Q813	Q814	Q815	Q816	Q817	Q818	Q819	Q820	Q821	Q822	Q823	Q824	Q825	Q826	Q827	Q828	Q829	Q830	Q831	Q832	Q833	Q834	Q835	Q836	Q837	Q838	Q839	Q840	Q841	Q842
------	--------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
1	834126069	2.6TTS+6C,Self-tapping screw
2	24506864	Holder,hinge
3	24506865	Hinge
4	24506866	Shaft
5	27180441	Conical coil spring B
6	27180442	Conical coil spring A
7	24509401	Insulator C
8	24506870	Roller
9	24506871	Plate
10	801424	Screw with washer
11	24506873	KSM150ACM,Pickup unit
12	838426068	2.6TTB+6B(BC),Self-tapping screw
13	24506875	Magnet ass'y
14	24506876	Chassis,chucking
15	24506877	Pulley,chucking
16	24506878	Tray
17	24506879	Cover,gear
18	838426108	2.6TTB+10B(BC),Self-tapping screw
19	8761301008	W3x10F,Washer
20	24506882	Gear,drive
21	24506883	Cam,control
22	834120049	2TTS+4C,Self-tapping screw
23	25065374	Leafswitch
24	870144	Washer
25	27301227	Gear,middle
26	24602507	Belt
27	24506884	Pulley,loading
28	838426038	2.6TTB+3C(BC),Self-tapping screw
29	24506886	Motor
30	24505269	Motor pc board
31	27301228	Holder,tray,front
32	833120047	M2x4,Self-tapping screw
33	27301230	Holder,tray,rear
34	24506887	Guide,tray,right
35	24506888	Guide,tray,left
36	838430108	3TTB+10B(BC),Self-tapping screw
37	24506889	Boss,mount,right (for transport)
38	24506890	Boss,mount,back (for transport)
39	24506891	Boss,mount,left (for transport)
40	24506892	Plate,ring
41	24506893	Boss
42	24506894	Link,stopper
43	24506895	Spacer
44	83112608	2.6TTW+8S,Self-tapping screw
45	25050393	NCNT-5220,Connector
46	24506897	Damper
47	27301224	Chassis,main
48	24506898	Chassis,sub
49	28140980	Adhesive tape,front

REMOVEMENT OF DISC TRAY

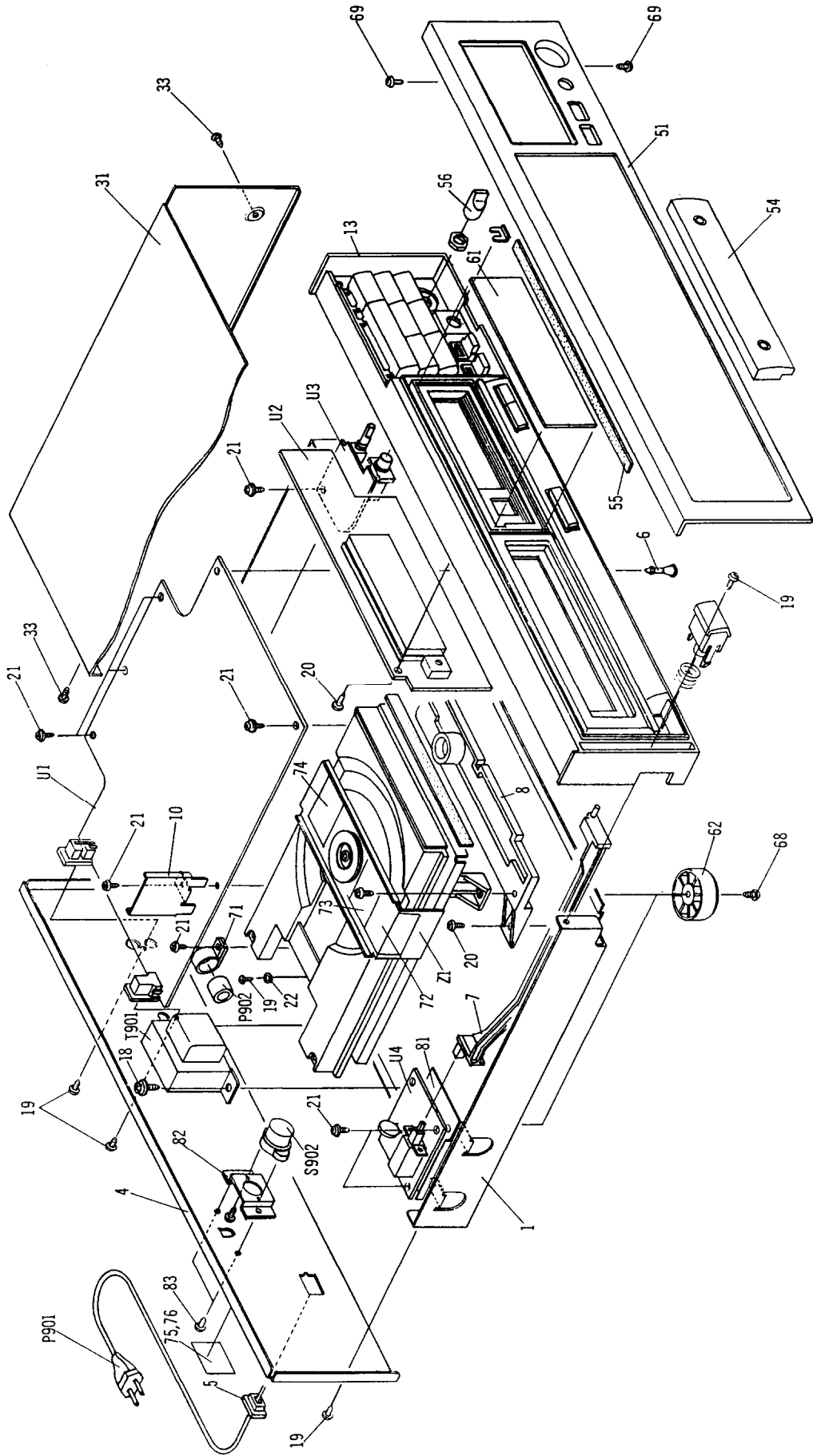


Screw for stopper

- 1.Loosen the screw for stopper until the head of screw and tray are the same height.
- 2.Turn POWER switch to on.
- 3.Press OPEN/CLOSE button to open the tray.
- 4.Turn POWER switch to off.
- 5.Remove the tray.

Screw for stopper

CHASSIS-EXPLODED VIEW



PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1	27100207B	Chassis	P902	230907	TR-16-8-16, Core
4	27121336	Back panel <D>	S1	2000951	NSAS-8P903, Socket (Red), Pickup
	27121336-1	Back panel <G>	S2	2000952	NSAS-8P904, Socket (White), Pickup
	27121336-3	Back panel <W>	S3	2002390810	NSAS-8P0120, Socket, Motor
5	27121336-4	Back panel <QA/QB>	S4	2002391020	NSAS-10P0119, Socket, Motor
6	273000750	Bushing (Strainrelief)	S902	△ 25065168	HXW0131-01-060, Voltage selector switch <W>
7	27190524	Holder	T901	△ 2300291 or △ 2300553	NPT-991D or NPT-1072D, Power transformer <D>
8	27273125A	Joint, power		△ 2300292 or △ 2300554	NPT-991G or NPT-1072G, Power transformer <G>
10	27190753A	Holder, mechanism		△ 2300294 or △ 2300555	NPT-991ADGQ or NPT-1072ADGQ, Power transformer <W>
13	27141397	Bracket S		△ 2300293 or △ 2300556	NPT-991Q or NPT-1072Q, Power transformer <QA/QB>
18	27110551C	Front bracket	U1	1H112535-2	NAAR-3835-2, Main circuit pc board ass'y <D>
	830440089	4TTC+8C (BC), Self-tapping screw		1H112535-2 A	NAAR-3835-2a, Main circuit pc board ass'y <G/W/QA/QB>
19	834430088	3TTS+8B (BC), Self-tapping screw	U2	1H112536-2	NADIS-3836-2, Display circuit pc board ass'y
20	833430080	3TTP+8P (BC), Self-tapping screw	U3	1H112537-2	NAAF-3837-2, Headphone amplifier pc board ass'y <D>
21	831130088	3TTW+8B, Self-tapping screw		1H112537-2 A	NAAF-3837-2a, Headphone amplifier pc board ass'y <G/W/QA/QB>
22	87643010	W3×10F (BC), Washer	U4	1H112538-2	NAPS-3838-2, Power supply pc board ass'y
31	28184452	Top cover	Z1	24506792 260208	NCD-110S, CD mechanism ass'y Binder
33	834430088	3TTS+8B (BC), Self-tapping screw			
51	1H112121	Front panel ass'y			
54	27211174	Tray panel			
55	28140546	Cushion			
56	28323571	Knob, Level			
61	28191555	Clear plate			
62	27175153-1	Leg			
68	834430088	3TTS+8B (BC), Self-tapping screw			
69	833430080	3TTP+8P (BC), Self-tapping screw			
71	260221	NK-10N, Clamp			
72	29360807	Label, DANGER			
73	29361218	Label, LASER <G/W/QA/QB>			
74	29360811A	Label <G/W/QA/QB>			
75	29360840	Label <D>			
76	29360687	Label, CLASS 1 <G/W/QA/QB>			
81	28175175	Insulator plate <G/W/QA/QB>			
82	27141090A	Bracket U <W>			
83	834430088	3TTS+8B (BC), Self-tapping screw <W>			
P901	△ 253099C	AS-UC-3, Power supply cord <D>			
	△ 253148 or △ 253150 △ 253118	AS-CEE 250V 2.5A Power supply cord <G/W> AS-SAA, Power supply cord <QA>			
	△ 728328	Power supply cord <QB>			

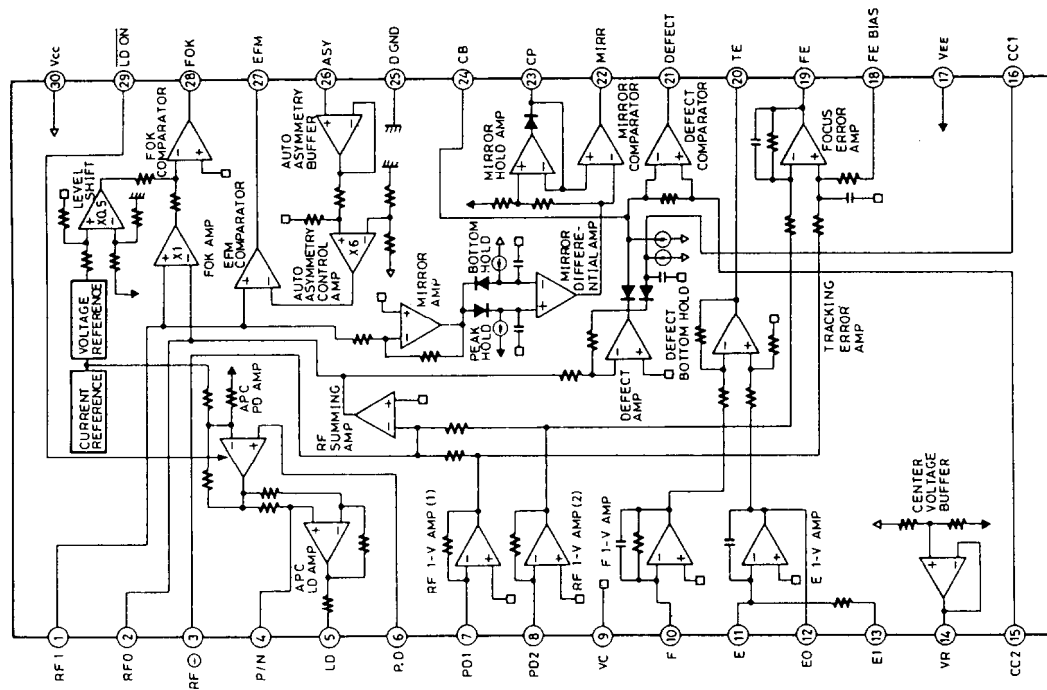
NOTE: <D>: Only 120V model
<G>: Only 220V model
<W>: Only Worldwide model
<QA>: Only Australian model
<QB>: Only British model

NOTE: THE COMPONENTS IDENTIFIED BY MARK
△ ARE CRITICAL FOR RISK OF FIRE AND
ELECTRIC SHOCK. REPLACE ONLY WITH
PART NUMBER SPECIFIED.

IC BLOCK DIAGRAM AND DESCRIPTIONS

Q102

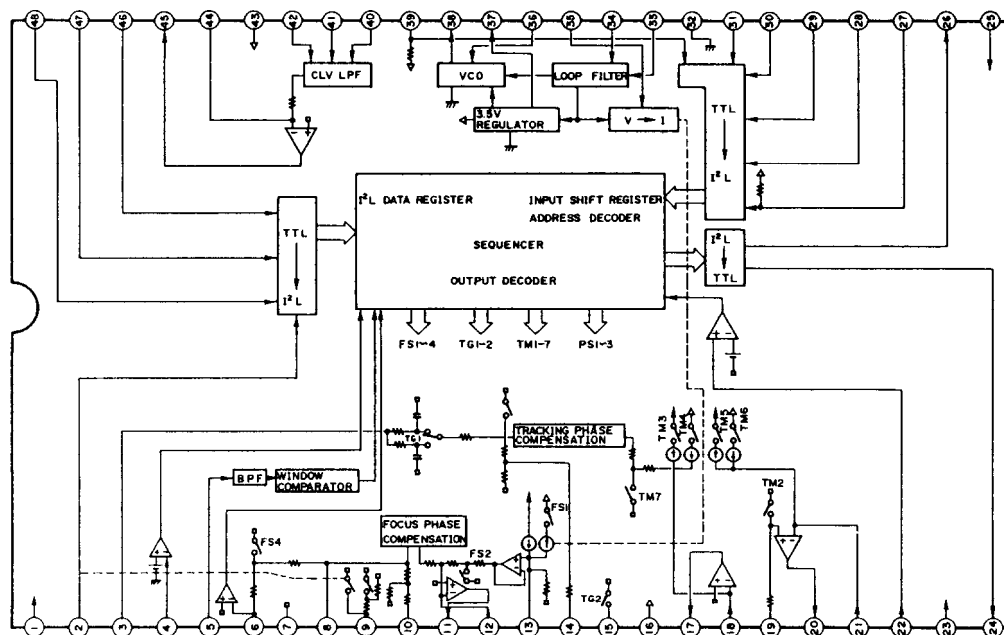
CXA1081S (RF Amplifier)



Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	RF I	Input terminal of output signal of RF summing amplifier via the coupling capacitor	16	CC1	Defect bottom hold output terminal
2	RFO	Output terminal of RF summing amplifier	17	VEE	Negative power supply terminal
3	RF-	Input terminal of RF summing amplifier feedback	18	FE BIAS	Non-inversion bias terminal of focus error amplifier CMR adjustment of focus error amplifier
4	P/N	Switching terminal of P-SUB/N-SUB of LD (laser diode)	19	FE	Output terminal of focus error amplifier
5	LD	Output terminal of APC LD amplifier	20	TE	Output terminal of tracking error amplifier
6	PD	Input terminal of APC PD (Pin diode) amplifier	21	DEFECT	Output terminal of defect comparator
7	PD1	Inversion input terminal of RF I-V amplifier (1) Connect to A+C of PIN diodes.	22	MIRR	Output terminal of mirror comparator
8	PD2	Inversion input terminal of RF I-V amplifier (2) Connect to B+D of PIN diodes.	23	CP	Connection terminal of capacitor for mirror hold Non-inversion input of mirror comparator
9	VC	Connect to GND.	24	CB	Connection terminal of capacitor for defect bottom hold
10	F	Inversion input terminal of F I-V amplifier Connect to F of PIN diode.	25	DGND	Connect to GND
11	E	Inversion input terminal of E I-V amplifier Connect to E of PIN diode.	26	ASY	Auto asymmetry control input terminal
12	E0	Output terminal of E I-V amplifier	27	EFM	Output terminal of EFM comparator
13	E1	Feedback input terminal of E I-V amplifier Gain adjustment of E I-V amplifier	28	FOK	Output terminal of FOK comparator
14	VR	DC voltage output terminal of $(V_{CC} + V_{EE})/2$	29	LD ON	ON/OFF switching terminal of laser diode
15	CC2	Input terminal from defect bottom hold output signal via the coupling capacitor	30	Vcc	Positive power supply

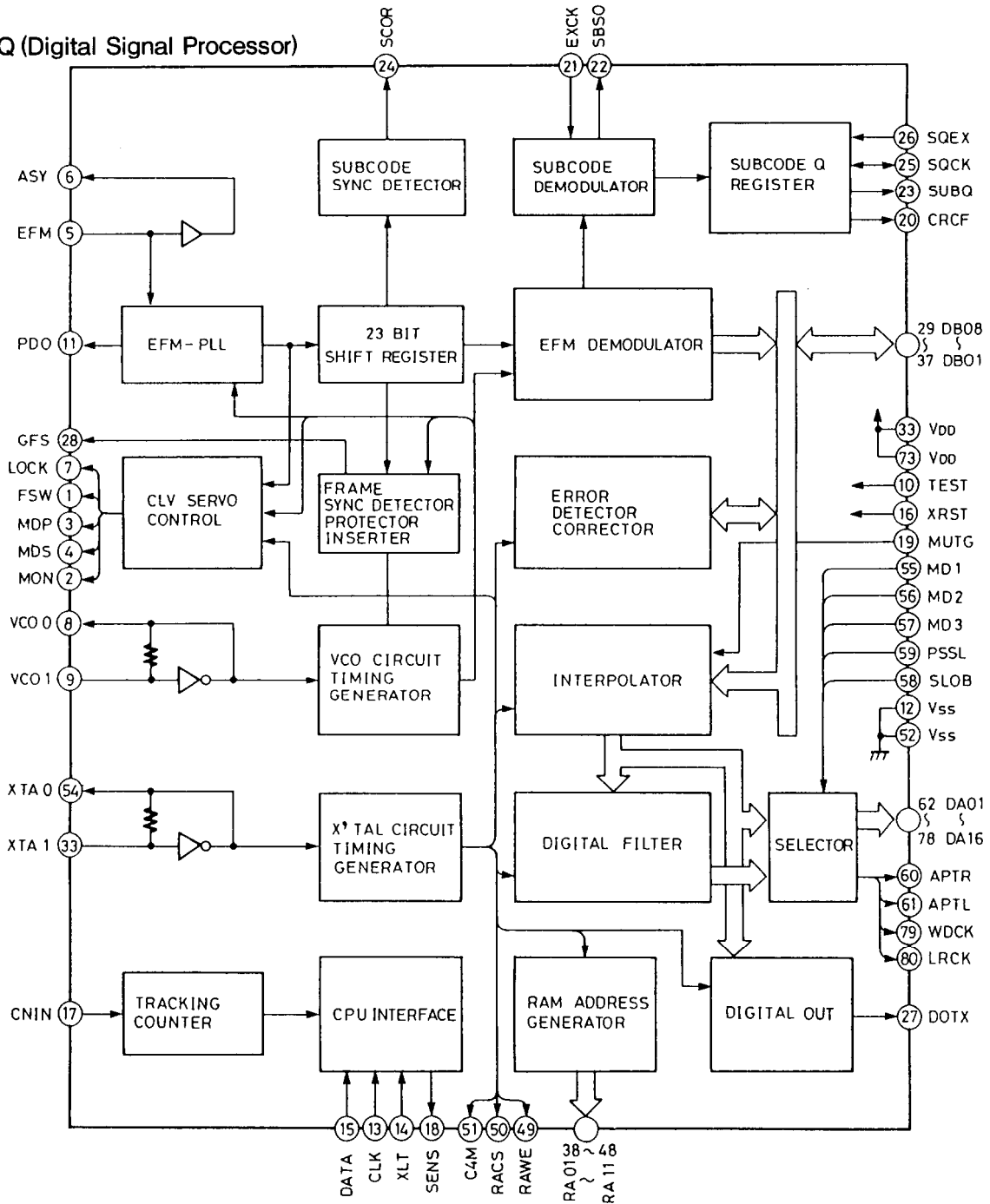
Q104

CXA1082BS (Servo Signal Processor)

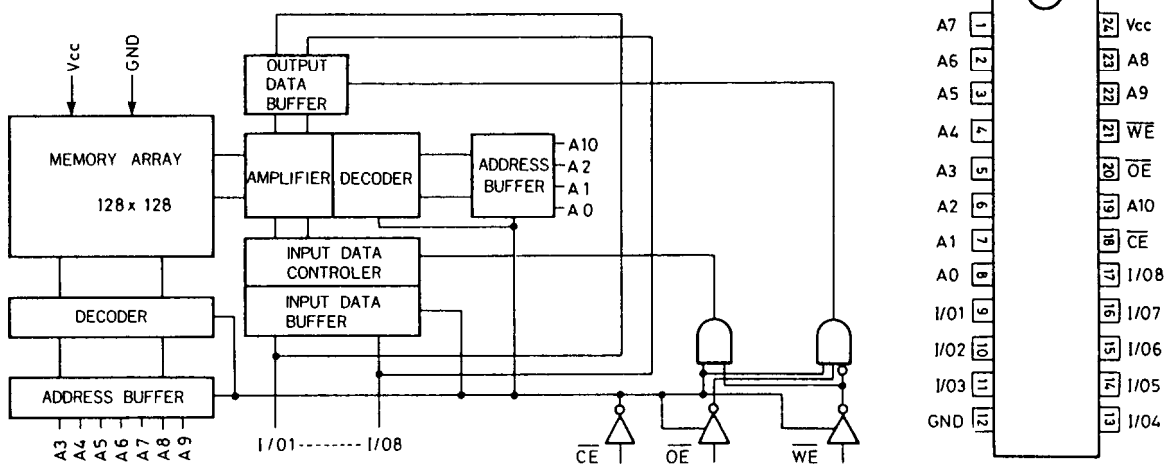


Pin No.	Symbol	Function	Pin No.	Symbol	Function
2	DECT	Defect signal input terminal.	26	C. OUT	Signal output terminal for count of track numbers.
3	TE	Tracking error signal input terminal.	27	DIRC	Use when jumps one track.
4	TZC	Tracking zero cross comparator input terminal.	28	XRST	Reset input terminal. Reset at the low level.
5	ATSC	Window comparator input terminal for ATSC detection.	29	DATA	Serial data input terminal from microprocessor.
6	FE	Focus error signal input terminal.	30	XLT	Latch input terminal from microprocessor.
8	FGD	Insert the capacitor between this terminal and pin 9 when drop the high frequency gain of focus servo.	31	CLK	Clock input terminal serial data transmitter from microprocessor.
9	FS3	Switching terminal of high frequency gain of focus servo.	33	BW	Time constant terminal of loop filter.
10	FLB	Time constant switching terminal when raise the low frequency gain of focus servo.	34	PDI	Input terminal of phase comparator output PDO.
11	FEO	Focus drive output terminal.	35	ISET	Flow the current to decide the focus search, track jump, and kick height.
12	FE-	Inversion input terminal of focus amplifier.	36	VCOF	VCO free run frequency is proportion to resistor value between pins 31 and 37.
13	SRCH	Time constant terminal to make the focus search waveform.	38	C864	VCO (8.64MHz) output terminal.
14	TGU	Time constant terminal for high frequency gain switching of tracking.	39	LOCK	Sled motor run away prevention circuit is operated at low level.
15	TG2	Time constant terminal for high frequency gain switching of tracking.	40	MDP	Connection terminal to terminal MDP of CXD1130Q.
17	TAO	Tracking drive output terminal.	41	MON	Connection terminal to terminal MON of CXD1130Q.
18	TA-	Inversion input terminal of tracking amplifier.	42	FSW	LPF time constant terminal of CLV servo error signal.
19	SL+	Non-inversion input terminal of sled amplifier.	44	SPDL-	Inversion input terminal of spindle drive amplifier.
20	SLO	Sled drive output terminal.	45	SPDLO	Spindle drive output terminal.
21	SL-	Inversion input terminal of sled amplifier.	46	WDCK	Clock input terminal. (88.2kHz)
22	SSTOP	Limit switch ON/OFF detector signal terminal for disc innermost position detector.	47	FOK	Focus OK input terminal.
23	FSET	Terminal for peak of phase compensation of tracking and f_0 setting LPF.	48	MIRR	Mirror signal input terminal.
24	SENS	FZC, AS, TZC, SSTOP and etc. signals are output by the command from microprocessor.			

**Q108
CXD1130Q (Digital Signal Processor)**

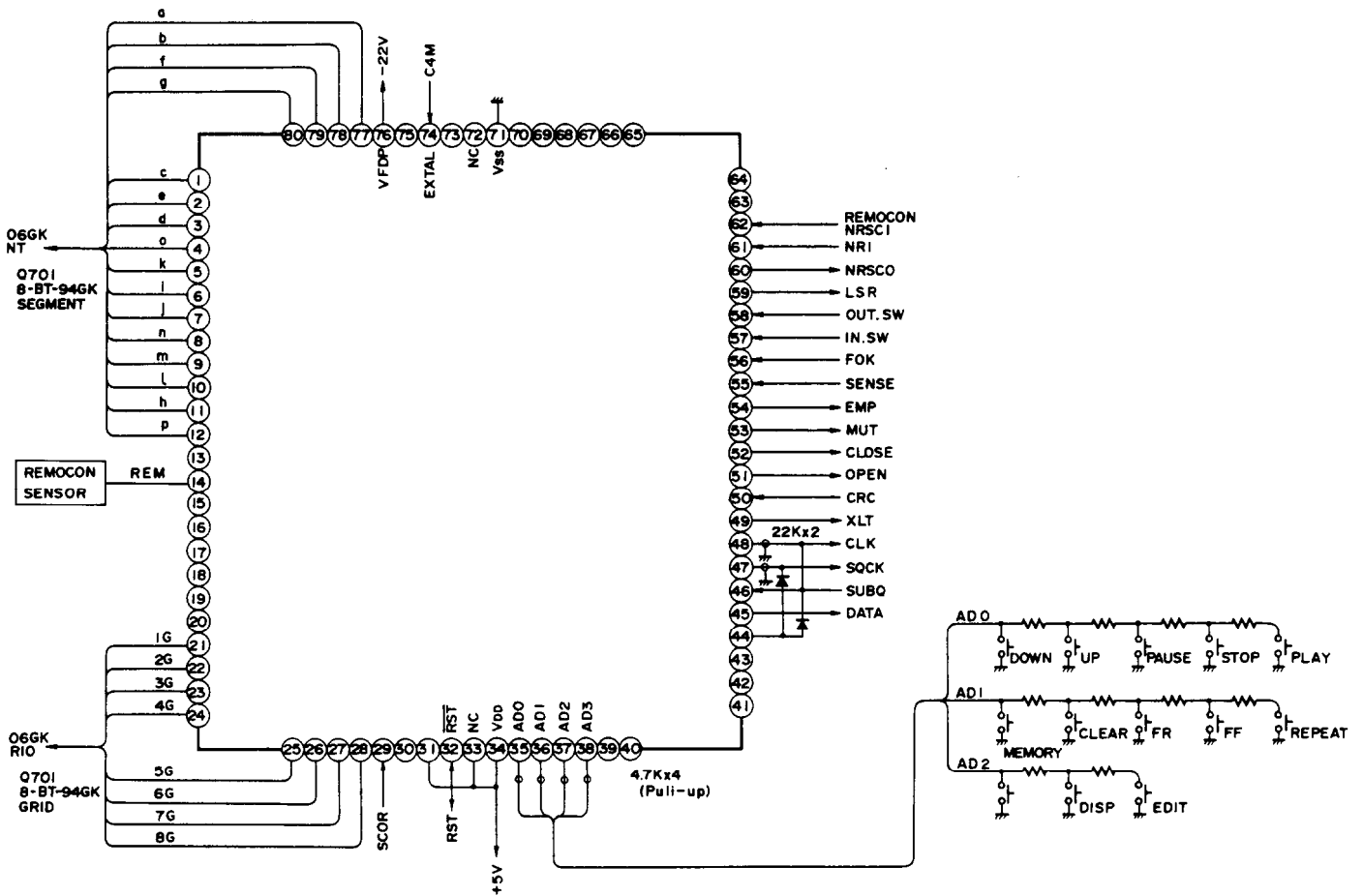


**Q109
CXK5816SPS-15L etc. (16k RAM)**

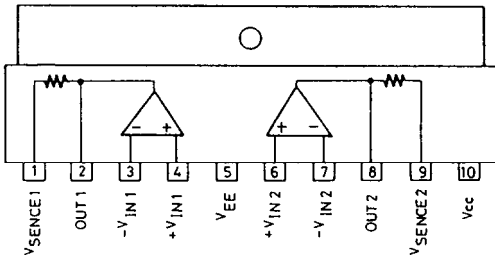


Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	FSW	Time constant switching output terminal of output filter of spindle motor	49	RAWWE	Write enable signal output to external RAM
2	MON	ON/OFF control output terminal of spindle motor	50	RACS	Chip selector-signal output to external RAM
			51	C4M	Divider output of crystal. f=4.2336MHz
3	MDP	Drive output terminal of spindle motor. Rough control when mode CLV-S and phase control when mode CLV-P	52	Vss	Ground
			53	XTAI	Input terminal of crystal oscillator
4	MDS	Drive output terminal of spindle motor. Speed control when mode CLV-P	54	XTAO	Output terminal of crystal oscillator
5	EFM	EFM signal input terminal from RF amplifier	55	MD1	Mode switching input terminals
6	ASY	Output terminal to control the slice level of EFM signal	57	MD3	
7	LOCK	GFS sampling terminal	58	SLOB	Code switching input of audio data output.
8	VCOO	VCO output terminal. 8.6436MHz when lock to EFM signal	59	PSSL	Mode switching input of audio data output. Serial output at low level. Parallel output at high level
9	VCOI	VCO input terminal	60	APTR	Control output for aperture correction. High level when Rch.
10	TEST	0V	61	APTL	Control output for aperture correction. High level when Lch.
11	PDO	Phase comparator output terminal of EFM signal and VCO/2	62	DA01	DA01 (LSB of parallel sound output) output when PSSL = H. C1F1 output when PSSL = L
12	Vss	Ground	63	DA02	DA02 output when PSSL = H. C1F2 output when PSSL = L.
13	CLK	Serial data transmitter clock input terminal from microcomputer	64	DA03	DA03 output when PSSL = H. C2F1 output when PSSL = L.
14	XLT	Latch input terminal from microcomputer	65	DA04	DA04 output when PSSL = H. C2F2 output when PSSL = L.
15	DATA	Serial data input terminal from microcomputer	66	DA05	DA05 output when PSSL = H. C2FL output when PSSL = L.
16	XRST	System rest input terminal. Reset at low level.	67	DA06	DA06 output when PSSL = H. C2PO output when PSSL = L.
17	CNIN	Tracking pulse input terminal	68	DA07	DA07 output when PSSL = H. RFCK output when PSSL = L.
18	SENS	Inner condition output terminal correspond to address	69	DA08	DA08 output when PSSL = H. WFCK output when PSSL = L.
19	MUTG	Muting input terminal	70	DA09	DA09 output when PSSL = H. PLCK output when PSSL = L.
20	CRCF	CRC check output terminal of subcode Q	71	DA10	DA10 output when PSSL = H. UGFS output when PSSL = L.
21	EXCK	Clock input terminal for serial output of subcode	72	DA11	DA11 output when PSSL = H. GTOP output when PSSL = L.
22	SBSO	Serial output terminal of subcode	73	V _{DD}	Power supply (5V)
23	SUBQ	Subcode Q output terminal	74	DA12	DA12 output when PSSL = H. RAOV output when PSSL = L.
24	SCOR	Subcode sink S0 + S1 output terminal	75	DA13	DA13 output when PSSL = H. C4LR output when PSSL = L.
25	SQCK	Clock terminal to read the subcode Q	76	DA14	DA14 output when PSSL = H. C210 output when PSSL = L.
26	SQEX	Selector input terminal of SQCK	77	DA15	DA15 output when PSSL = H. C210 output when PSSL = L.
27	DOTX	Digital output terminal	78	DA16	DA16 (MSB of parallel sound output) output when PSSL = H. DATA output when PSSL = L
28	GFS	Indicator output of lock condition of frame sync	79	WDCK	Strobe signal output. 176.4kHz when DF is on. 88.2kHz when DF is off.
29	DB08	Data terminals of external RAM	80	LRCK	Strobe signal output. 88.2kHz when DF is on. 44.1kHz when DF is off.
32	DB05				
33	V _{DD}	+5V			
34	DB04	Data terminals of external RAM			
37	DB01				
38	RA01	Address output terminals of external RAM			
48	RA11				

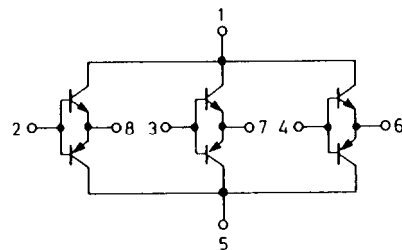
Q114
CXP50112-114Q (Microprocessor)



Q105
LA6510 (Motor Drive)

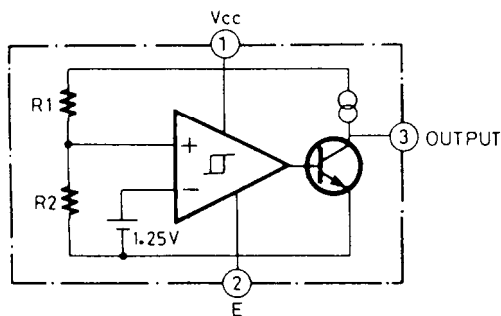


Q106
STA341M-L (Transistor Array)

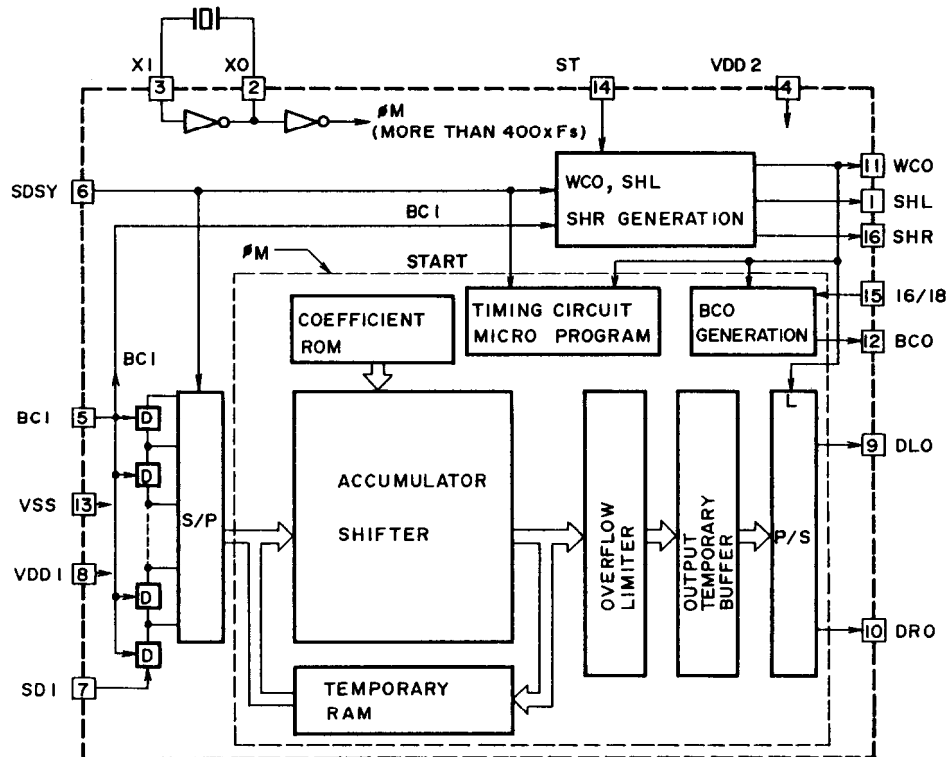


Pin No.	Symbol	I/O	Function
1~12	c~e, h~p	0	Fluorescent tube segment drive output terminals.
21~28	1G~8G	0	Fluorescent tube grid drive output terminals.
29	SCOR	I	Subcode SQ+SI input terminal.
32	RST	I	Reset input terminal. Reset at "L".
34	VDD		Power supply terminal. Connect to 5V.
35~38	AD0~AD3	I	AD input terminals. Connect the operation keies.
45	DATA	0	Serial data signal output terminal.
46	SUBQ	I	Subcode Q input terminal.
47	SQCK	I/O	Subcode Q read clock.
48	CLK	0	Serial data transmission clock output terminal.
49	XLT	0	Command execution output terminal.
50	CRC	I	Subcode check input terminal.
51	OPEN	0	Tray motor control output terminal. Tray opens at "H".
52	CLOSE	0	Tray motor control output terminal. Tray closes at "H".
53	MUT	0	Muting ON/OFF output terminal. Muting switch turns on at "H".
54	EMP	0	Emphasis ON/OFF output terminal. Emphasis switch turns on at "H".
55	SENSE	I	Interface of signal processor and microprocessor ICs.
56	FOK	I	Focus OK input terminal. Focus OK at "H".
57	IN SW	I	Tray close detection input terminal.
58	OUT SW	I	Tray open detection input terminal.
59	LSR	0	Optical pickup control output terminal. Optical pickup turns on at "L".
60	NRSCO	0	Remote control signal output terminal.
61	NRI	I	RI signal input terminal.
62	NRSI	I	Remote control signal input terminal.
74	C4M	I	System clock input terminal. (4.2336MHz)
76	VFDP		Power supply terminal. Connect to -22V.
77~80	a, b, f, g	0	Fluorescent tube segment drive output terminals.

Q115
M51943ASL (Rest IC)

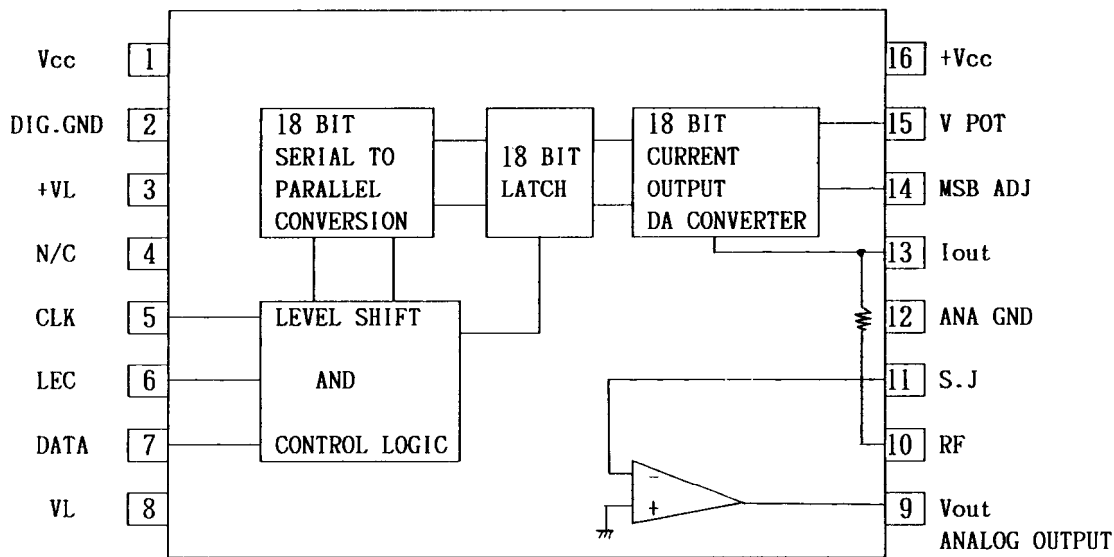


Q116
YM3433 (18 bits/8 times Oversampling Digital Filter)



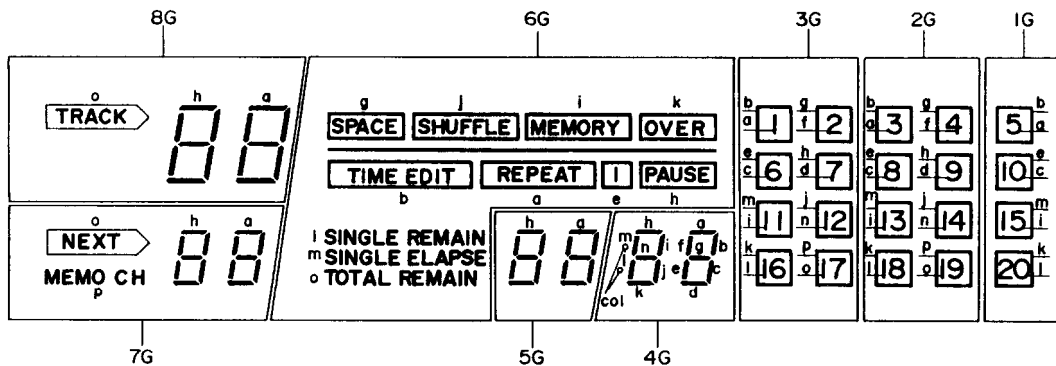
Pin No.	Terminal	Function
1	SHL	ST=L(1 DAC):L channel deglitch signal output. ST=H(2 DACs):L and R channels deglitch signal output. (Not used.)
2	XO	Connect the crystal oscillator for the system clock to these terminals.
3	XI	
4	VDD2	Power supply terminal for crystal oscillator and deglitch signal system.
5	BCI	Bit clock input terminal of input data.
6	SDSY	Clock input terminal to show the input timing and L/R channels partitioned of input data.
7	SDI	Data input terminal.
8	VDD1	Power supply terminal.(Connect to 5V.)
9	DLO	ST=L(1 DAC):L and R channels data output terminal. ST=H(2 DAC):L channel data output terminal.
10	DRO	R channel data output terminal.
11	WCO	Word clock output terminal for output data DLO/DRO.
12	BCO	Bit clock output terminal for output data DLO/DRO.
13	VSS	Ground terminal.
14	ST	1 DAC/2 DAC selection terminal.(1 DAC at low level and 2 DAC at high level.)
15	16/18	Bit number selection terminal.(16 bits at low level and 18 bits at high level.)
16	SHR	1 DAC(ST=L):R channel deglitch signal output.(Not used.)

Q117, Q118
AD1860N (DA Converter)



Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	-Vcc	Analog negative power supply	16	+Vcc	Analog positive power supply
2	DIG GND	Digital ground	15	VPOT	Potential meter output
3	+VL	Logic positive power supply	14	MSB ADJ	MSB adjustment terminal
4	NC	No connection	13	Iout	Current output
5	CK	Clock input	12	ANA GND	Analog ground
6	LEC	Latch enable control input	11	S.J	Summing junction (Operation amplifier input)
7	DATA	Data input	10	RF	Feedback resistor
8	-VL	Logic negative power supply	9	Vout	Voltage output(Analog output)

Q701
8-BT-94GK (Fluorescent Tube)



PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CONNECTION	F1	F1	NP	8G	7G	6G	5G	4G	3G	2G	1G	q	p	h	i	NP
PIN NO.	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
CONNECTION	NP	NP	NP	NP	NP	NP	NP	m	n	j	l	k	o	d	e	c
PIN NO.	33	34	35	36	37	38	39	Note: NP.....No pin 1G~8G.....Grid								
CONNECTION	g	f	b	a	NP	F2	F2	F1, F2.....Filament								

ADJUSTMENT PROCEDURES

Instruments required

Dual trace oscilloscope, Frequency counter, AF oscillator, Test disc (SONY YEDS-18), AC voltmeter, Jitter meter, and Socket P4(Part no. 25050138)

1. VCO frequency adjustment

Connect the frequency counter to terminal P108.

Turn the power switch to ON.(No load the disc.)

Adjust R154 until the frequency counter reading becomes $4322 \pm 5\text{kHz}$.

After adjustment, disconnect the frequency counter.

2. Focus offset adjustment

Load the test disc YEDS-18 on the tray and play the track 2.

Connect the oscilloscope or jitter meter to terminal P106.

(Oscilloscope)

Adjust R110 until a clear trace of waveform pattern as shown photo 1 appear on the oscilloscope.

When the amount of jitter is broad, set R110 to mechanical center.

(Jitter meter)

Adjust R110 until the jitter meter reading becomes minimum.(Less than 10ns.)

After adjustment, disconnect the oscilloscope or jitter meter.

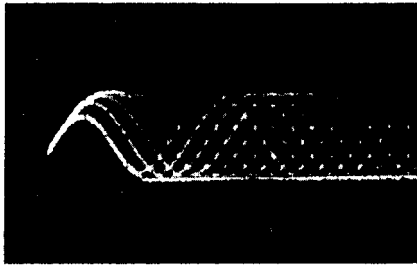
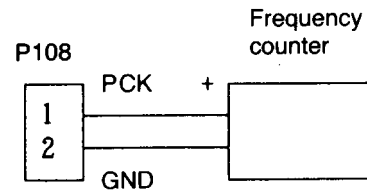
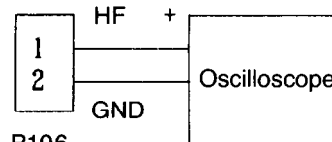
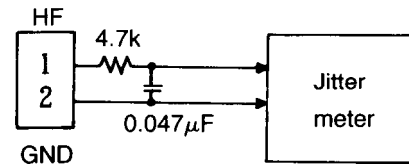


Photo 1



Oscilloscope range
Vertical : 0.5V/div.
Horizontal : 0.2 $\mu\text{s}/\text{div}$.
DC, Ground: Center



3. Tracking offset adjustment

Load the test disc YEDS-18 on the tray and play the track 2.

Turn R132 to minimum position.(Counter clockwise)

Connect the oscilloscope between pin 3 (TR) of P107 and pin 2 (GND) of P106.

Adjust R108 until the center of tracking error signal on the oscilloscope becomes GND level.

Turn R132 to the mechanical center.

After adjustment, disconnect the oscilloscope.

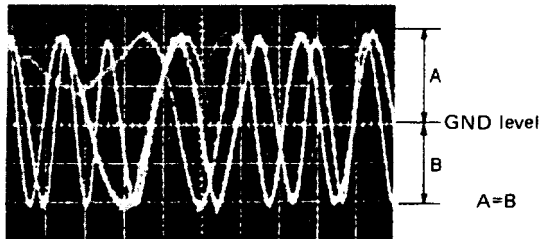
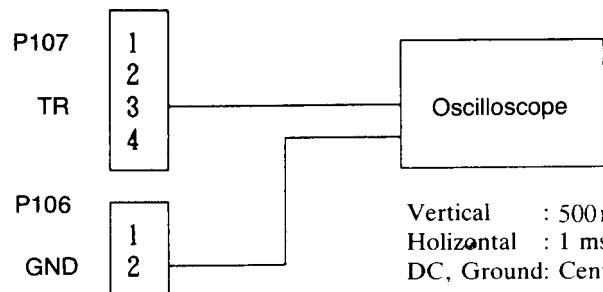


Photo 2



Vertical : 500mV/div.
Horizontal : 1 ms/div.
DC, Ground: Center

4. Focus gain adjustment

Set the output of AF oscillator to 800Hz, 1~1.5Vp-p.
 Play the track 2 of test disc.
 Connect the oscilloscope and the AF oscillator as shown below.

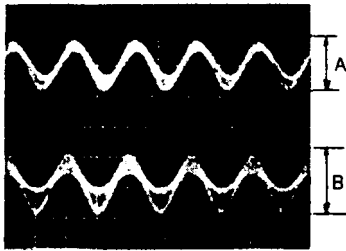
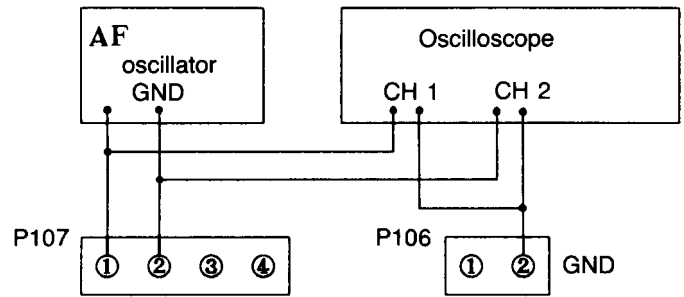


Photo 3



Vertical : 0.2V/div.
 Horizontal: 0.5 ms/div.

Adjust R122 until 800Hz components of channels 1 and 2 on oscilloscope become same level.
 After adjustment, disconnect the AF oscillator and the oscilloscope.

5. Tracking gain adjustment

Set the output of AF oscillator to 1.2kHz, 1~1.5Vp-p.
 Play the track 2 of test disc.
 Connect the oscilloscope and the AF oscillator as shown below.

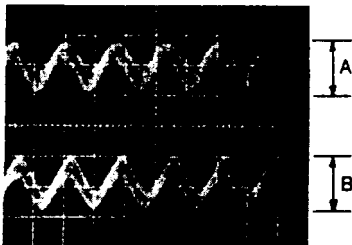
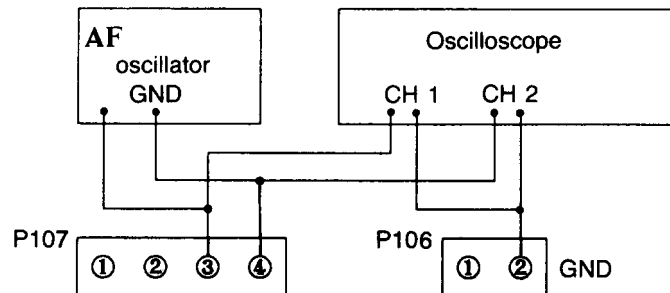


Photo 4



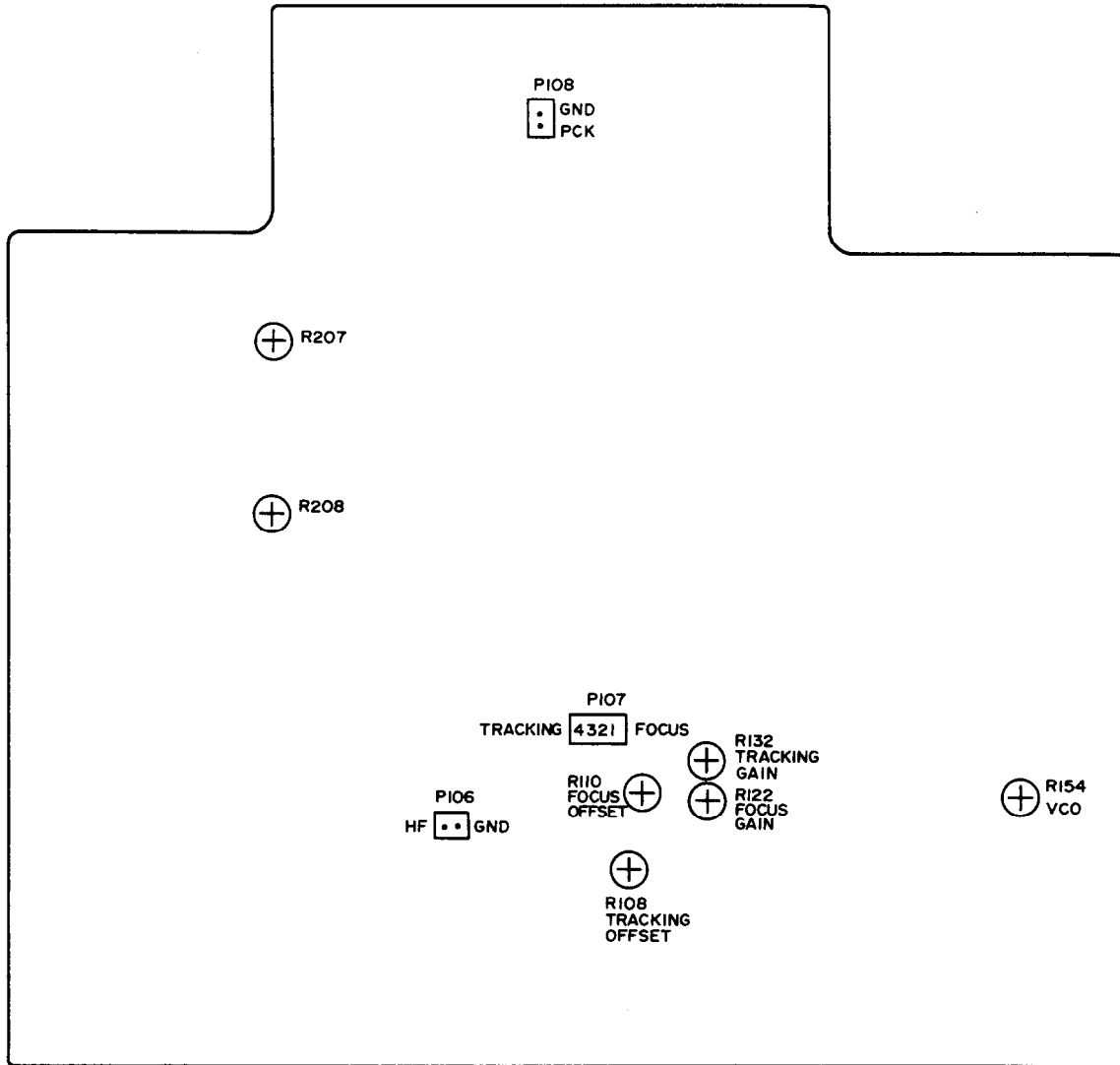
Vertical : 0.2V/div.
 Horizontal: 0.5 ms/div.

Adjust R132 until 1.2kHz components of channels 1 and 2 on oscilloscope become same level.
 After adjustment, disconnect the AF oscillator and the oscilloscope.

After adjustment, confirm that the center of tracking error signal becomes GND level.

6. Audio circuit adjustment

Connect the AC voltmeter to output terminal of left channel (right channel).
 Load the test disc and play the track 2.
 Next, play the track 17.
 Adjust R207(R208) so that the output discrepancy between track 2 and track 17 is 60 ± 0.25 dB.



PARTS LIST

MAIN CIRCUIT PC BOARD(NAAR-3835-2/2A)

CIRCUIT NO.	PART NO.	DESCRIPTION
ICs		
Q102	22240180	CXA1081S
Q104	22240263	CXA1082BS
Q105	22240034	LA6510
Q106	22240168	STA341M-L
Q108	22240095	CXD1130Q
Q109	22240178,	CXK5816SPS-15L,
	22240234 or	LC3517BS-15 or
	22240118	LC3517AS-15
* Q114	22240320	CXP50112-114Q
Q115	22240018	M51943ASL
Q116	22240321	YM3433
Q117, Q118	22240332	AD1860N
Q121	222902	NJM5532D-D
Q125	226027	HCPL2601
Q901	222780055MIT	M5F78M05L
Q902	222790053	79L05
Q904	222780085MIT	M5F78M08
Q905	222790085MIT	M5F79M08
Transistors		
Q101, Q903	2211503 or	2SA950-O or
	2211504	2SA950-Y
Q103, Q110	2213290	DTC114ES
Q107	2212600	DTA124ES
Q111, Q113	2211455	2SA1015-GR
Q112	2211255	2SC1815-GR
Q119, Q120	2212524	2SK363-GR
Q123, Q124	2211705 or	2SD655-E or
	2211706	2SD655-F
Diodes		
D101-D107	223163	1SS133
D108	224450562	MTZ5.6B
D901	22380013	RDF02M
D902	223163	1SS133
D903	224452202	MTZ22B
D904	224450512	MTZ5.1B
D905, D906	223163	1SS133
X'tal		
X101	3010112	KD6586FFB
Coil		
L101	231023	NCH-1062
Ferrite beads		
L102-L105	230906	BL02RN2-R62
L107-L110	230906	BL02RN2-R62
Filter		
L106	3030002	DSS306-55B-101M

NOTE: Change of microprocessor Q114

DESCRIPTION	PART NO.
CXP50112-128Q	22240320A
CXP50112-144Q	22240320B

CIRCUIT NO.	PART NO.	DESCRIPTION
P109	Terminal 25045259	NPJ-2PDBL128, Output
	Radiator 27160176	RAD56
	Screw 82143006	3P+6FN(BC), Pan head
QF101, QF102	Fuses 252112	\triangle ICPN15, IC protector <G>

DISPLAY CIRCUIT PC BOARD(NADIS-3836-2)

CIRCUIT NO.	PART NO.	DESCRIPTION
U701	Remocon sensor 24130003	GPIU501XS
	FL tube 212080	8-BT-94GK
S701-S713	Switches 25035548	NPS-111-S510
	Holder 27190754	FL tube

HEADPHONE AMPLIFIER PC BORAD (NAAF-3837-2/2A)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q301	IC 222887	NJM4556S
	Capacitors C303, C304 354744709	47 μ F, 16V, Elect.
L301-L303	Ferrite beads 230905	BL02RN1-R62
R301	Resistors 5104248	N09RGL20KB20F, Variable

CIRCUIT NO.	PART NO.	DESCRIPTION
P301	Jack 25045256	YKB21-5010 <D>
	25045255	YKB21-5009 <G>

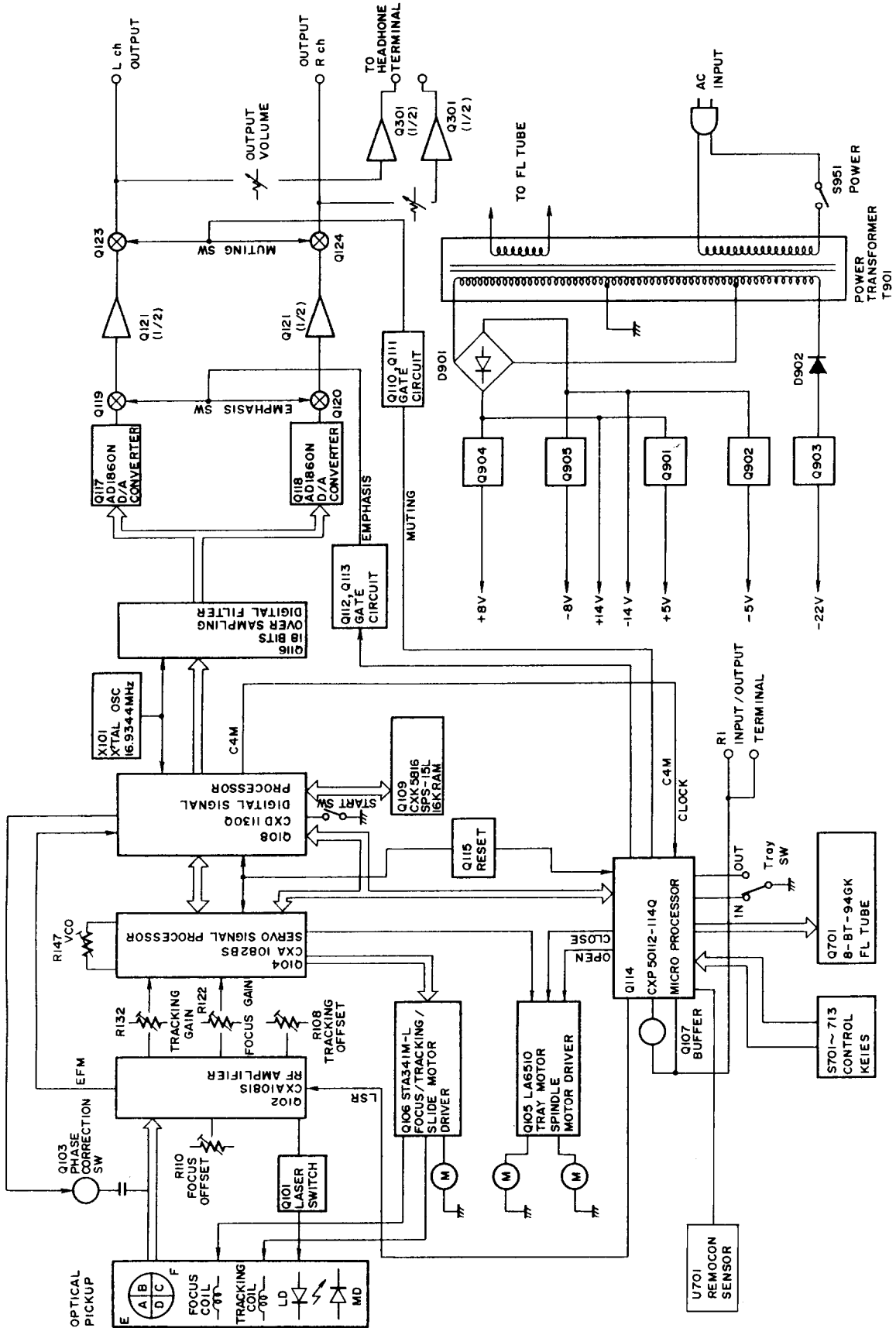
POWER SUPPLY PC BOARD(NAPS-3838-2)

CIRCUIT NO.	PART NO.	DESCRIPTION
C951	3500065A	\triangle DE7150FZ103P AC400V/125V, Capacitor IS
S951	25035558	\triangle NPS-111-L520P, Power switch

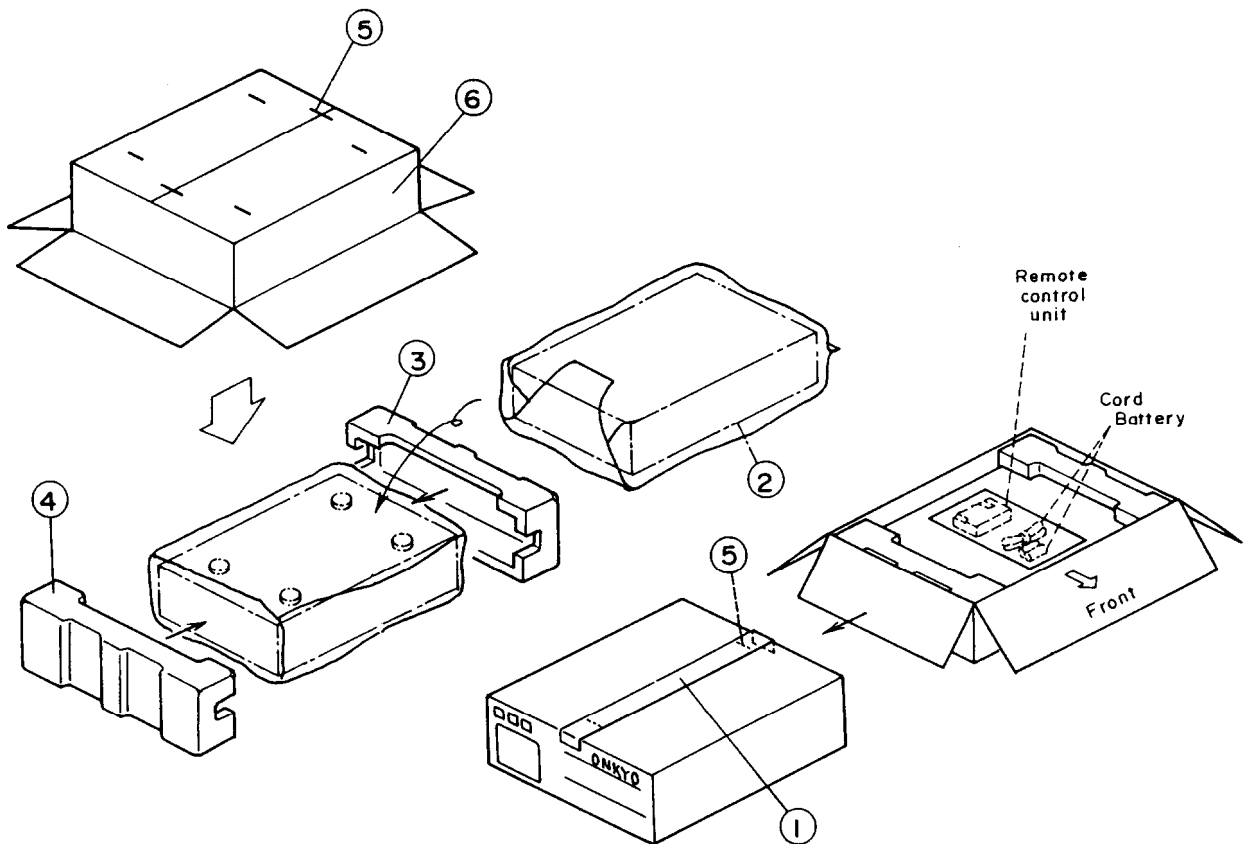
NOTE: <G>: Only 220/240V/Worldwide models
<D>: Only 120V model

NOTE: THE COMPONENTS IDENTIFIED BY MARK \triangle ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

BLOCK DIAGRAM



PACKING VIEW



REF. NO.	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
1	29110071-1	50×600mm. Dampson tape		
2	29100037	500×650mm, Poly-vinyl bag		
3	29091394	Pad R		
4	29091393	Pad L		
5	282301	Sealing hook		
6	29052044	Master carton box		
	29095505	Protection sheet, Tray panel		
	Accessory bag ass'y			
	-120V models-			
	2010098A	Connection cord		
	29341497	Instruction manual		
	29100097	350×250mm, Poly-vinyl bag		
	24140145	RC-145C, Remote control		
	3010054	UM-3, Two batteries		
	2010200	Connection cord for remote control		
	29365019	Warranty card (Only U.S.A. model)		
	29358002G	Service station list (Only U.S.A. model)		
	-220/240V models-			
	2010098A	Connection cord		
	29341499	Instruction manual		
	29100097	350×250mm, Poly-vinyl bag		
	24140145	RC-145C, Remote control		
	3010054	UM-3, Two batteries		
	2010200	Connection cord for remote control		

ONKYO CORPORATION

International Division: Onarimon Yusen Bldg., 23-5, Nishi-Shimbashi 3-chome, Minato-ku, TOKYO 105, JAPAN Tel: 03-432-6987 Fax: 03-436-6979

ONKYO U.S.A. CORPORATION

200 Williams Drive, Ramsey, N.J. 07446, U.S.A. Tel: 201-825-7950 Fax: 201-825-8150

SERVICE INFORMATION

DATE 21-05-90

SERIAL NO. 0003

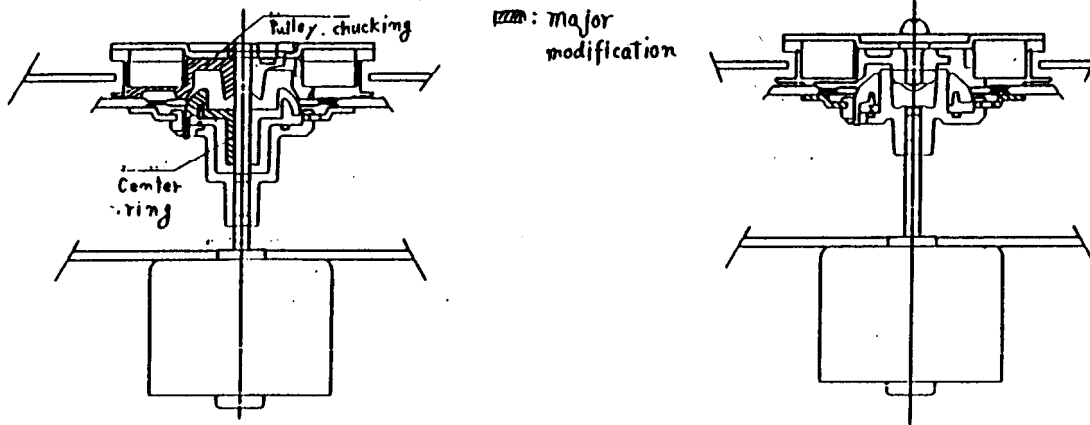
SUBJECT	Modification of chucking section
ITEM	Compact Disc Player
MODEL	DX-1400/DX-1800

The chucking form is changed as shown below.

Reason: The improvement of the eccentric accuracy.

After change

Before change



Change of parts

Page/ Ref.no.	Part name	After change		Before change	
		Description	Part no.	Description	Part no.
P5 7	Motor		24502262		24502251
13	Spindle motor ass'y		24502263		24502253
14	Leafswitch	NLF-1220	25065403	NLF-12018	25065377
15	Motor pc board		24505271		24505270
P7 11	Pickup unit	KSM-150AFM	24506958	KSM150ACM	24506958
12	Self-tapping screw	Not used		2.6TTB+6B(BC)	838426068
15	Pulley, chucking		24506959		24506877
23	Leafswitch		25065402		25065374
P9 Z1	CD Mechanism ass'y	NCD-111S	24506956	NCD-110S	24506792

Application: From May '90

ONKYO CORP.
SERVICE DIV.
M. YOKOCHI