

SERVICE MANUAL

COMPACT DISC PLAYER

BASIC CD MECHANISM: DA23L

- This Service Manual is the "Revision Publishing" and replaces "Simple Manual" of XP-R210<AHA>, (S/M Code No. 09-005-426-3T4).

SPECIFICATIONS

Tracking system	3-beam laser	Maximum outside dimensions	128 (W) x 31.2 (H) x 129.5 (D) mm (excluding projecting parts and controls) (5 1/8 x 1 1/4 x 5 1/8 in.)
Laser pickup	Semiconductor laser	Weight	Approx. 225 g (7.9 oz.) excluding batteries
D/A conversion	4-times oversampling digital filter + 1-bit DAC	AC Adaptor	
Frequency Response	20 – 20,000 Hz (47 K ohms)	Rated input	For the customer in Argentina AC -D603HA: 230 V AC, 50 Hz For the customer except in Argentina AC-D603 HR: 115/230 V AC, switchable, 50/60 Hz
Output	PHONES/LINE OUT jack (stereo mini-jack)		
Frequency range	AM: 530/531 kHz - 1,710/ 1,602 kHz (10 kHz/9 kHz steps) FM: 87.5 - 108 MHz		
Maximum output	12 mW + 12 mW (16 ohms at 1 kHz) 500 mV (47 k ohms at 1 kHz)		
Power supply	DC 3 V using two LR6 (size AA) alkaline batteries DC 2.4 V using two commercially available (Ni-Cd 1.2 V 700 mAh) rechargeable batteries AC house current using the supplied AC adaptor		

• Design and specifications are subject to change without notice.

ACCESSORIES / PACKAGE LIST

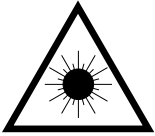
REF. NO.	PART NO.	KANRI NO.	DESCRIPTION
1	8A-HC1-931-010		IB, LH (E) S
1	8A-HC1-932-010		IB, LH (S) S
1	8A-HC1-933-010		IB, LH (P) S
2	87-B30-265-010		HEADPHONE, HP-M043
3	87-B30-287-010		AC ADAPTOR, AC-D603HANC

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs 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.



- Caution: Invisible laser radiation when open and interlocks defeated avoid exposure to beam.
- Advarsel: Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

VAROITUS!

Laiteen Käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyt-täjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

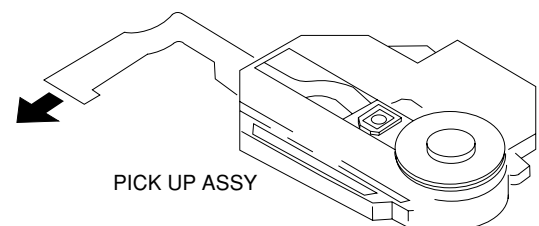
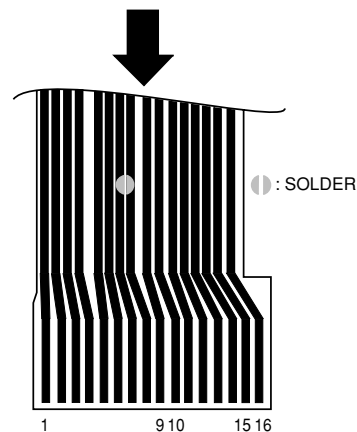
WARNING!

Om apparaten används på annat sätt än vad som specificeras i denna bruksanvisning, kan användaren utsättas för osynlig laserstråling, som överskrider gränsen för laserklass 1.

Precaution to replace Optical block (SF-P200)

Body or clothes electrostatic potential could ruin laser diode in the optical block. Be sure ground body and workbench, and use care the clothes do not touch the diode.

- 1) After the connection, remove solder shown in the right figure.



CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

ATTENTION

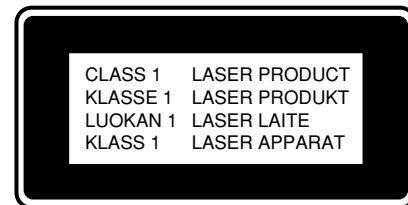
L'utilisation de commandes, réglages ou procédures autres que ceux spécifiés peut entraîner une dangereuse exposition aux radiations.

ADVARSEL!

Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

This Compact Disc player is classified as a CLASS 1 LASER product.

The CLASS 1 LASER PRODUCT label is located on the rear exterior.



ELECTRICAL MAIN PARTS LIST

REF. NO.	PART NO.	KANRI NO.	DESCRIPTION	REF. NO.	PART NO.	KANRI NO.	DESCRIPTION
IC				C212	87-012-188-080		C-CAP,U 47P-50 CH
	87-A21-082-040		C-IC,BA6655AFV	C213	87-A10-047-080		C-CAP,U 1-10 Z F
	8A-HC1-605-010		C-IC,MN101C439-AB1	C214	87-010-831-080		C-CAP,U,0.1-16F
	87-A21-446-010		C-IC,MN662782RPT1	C215	87-A11-063-080		C-CAP,S 4.7-10 Z F
	87-A21-561-040		C-IC,MSM51V17400D-SJ	C216	87-A11-063-080		C-CAP,S 4.7-10 Z F
	87-A21-578-040		C-IC,AN8838NSB	C217	87-010-831-080		C-CAP,U,0.1-16F
	87-A21-543-040		C-IC,NJU7012	C301	87-016-426-080		C-CAP,E 47-4 5.5N
	87-A21-521-040		C-IC,BH6517FS	C302	87-012-286-080		C-CAP,U 0.01-25 K B
	87-A21-085-040		C-IC,TA2120FN	C303	87-012-286-080		C-CAP,U 0.01-25 K B
	87-A21-558-040		C-IC,LA1827V-TLM	C304	87-010-831-080		C-CAP,U,0.1-16F
	87-A20-124-080		IC, TK11823	C305	87-012-286-080		C-CAP,U 0.01-25 K B
	87-A21-559-040		C-IC,LC72121V-D-TLM	C306	87-012-286-080		C-CAP,U 0.01-25 K B
	8A-HC1-604-010		C-IC,UPD789405-AGK-A12-9EU	C307	87-012-286-080		CAP, U 0.01-25
	87-A21-030-040		C-IC,S-93C46AMFN	C309	87-016-430-080		C-CAP,E 100-6.3 5.5N
				C310	87-012-286-080		CAP, U 0.01-25
TRANSISTOR				C311	87-012-274-080		CHIP CAP,U 1000P-50B
	87-026-608-080		C-TR,DTC 123 JK	C401	87-016-430-080		C-CAP,E 100-6.3 5.5N
	87-A30-075-080		C-TR,2SA1235F	C402	87-010-831-080		C-CAP,U,0.1-16F
	89-211-323-080		C-TR,2SB1132R	C403	87-016-085-080		CAP,E 1000-6.3PF
	89-416-643-080		C-TR,2SD1664R	C404	87-010-831-080		C-CAP,U,0.1-16F
	87-A30-076-080		C-TR,2SC3052F	C405	87-A10-260-080		C-CAP,U 0.1-16 K B
	89-113-695-680		C-TR,2SA1369G/H	C406	87-012-273-080		C-CAP,U 820P-50 B
	87-A30-332-040		C-TR,CPH3106	C407	87-010-787-080		CAP, U 0.022-25
	87-A30-333-040		C-TR,CPH3206	C408	87-A10-260-080		C-CAP,U 0.1-16 K B
	87-A30-378-040		C-TR,UMG4N	C409	87-A10-827-080		C-CAP,U 0.47-6.3 K B
	87-026-210-040		C-TR,DTC144EK	C410	87-012-286-080		CAP, U 0.01-25
	87-A30-246-040		C-TR,2SA1037AK	C411	87-010-831-080		C-CAP,U,0.1-16F
	87-A30-336-040		C-TR,UMH4N	C412	87-016-429-080		C-CAP,E 100-4 5.5N
	87-026-233-080		TR,DTA114TK-TP	C413	87-010-831-080		C-CAP,U,0.1-16F
	87-026-239-080		TR,DTC114TK (0.2W)	C415	87-010-831-080		C-CAP,U,0.1-16F
	87-A30-377-040		C-TR,2SB815B7	C420	87-010-831-080		C-CAP,U,0.1-16F
	89-324-121-080		C-TR,2SC2412K	C422	87-010-831-080		C-CAP,U,0.1-16F
	87-026-235-080		CHIP-TR,DTC114EK	C423	87-010-831-080		C-CAP,U,0.1-16F
	87-A30-328-040		C-TR,IMX9	C424	87-012-195-080		C-CAP,U 100P-50 J CH
	87-026-210-080		CHIP-TR,DTC144EK	C425	87-012-195-080		C-CAP,U 100P-50 J CH
	89-113-625-080		TR,2SA1362GR(120MHZ,0.	C451	87-010-831-080		C-CAP,U,0.1-16F
	87-026-297-080		TR,DTA144TK	C502	87-010-831-080		C-CAP,U,0.1-16F
	89-324-123-080		C-TR,2SC2412K S	C504	87-010-831-080		C-CAP,U 0.1-16F
	89-327-143-080		TR,2SC2714 (0.1W)	C505	87-A11-228-080		C-CAP,U 0.027-25 K B
	89-503-025-080		CHIP FET,2SK302 GR	C506	87-012-199-080		CAP 220P
				C507	87-012-193-080		C-CAP,U 82P-50 CH
				C508	87-012-193-080		C-CAP,U 82P-50 CH
				C509	87-012-193-080		C-CAP,U 82P-50 CH
				C510	87-016-429-080		C-CAP,E 100-4 M WX
				C511	87-010-831-080		C-CAP,U 0.1-16F
DIODE				C512	87-016-426-080		C-CAP,E 47-4 5.5N
	87-A40-614-040		C-DIODE,SFPB-72	C513	87-010-831-080		C-CAP,U 0.1-16F
	87-A40-469-080		C-DIODE,HSM2838CTR	C514	87-A11-228-080		C-CAP,U 0.027-25 K B
	87-A40-592-040		C-ZENER,HZM11NB2	C515	87-A11-228-080		C-CAP,U 0.027-25 K B
	87-A40-469-040		C-DIODE,HSM2838CTR	C516	87-A10-260-080		C-CAP,U 0.1-16 K B
	87-A40-590-040		C-DIODE,HRW0202A	C518	87-012-176-080		CAP 15P
	87-020-331-080		CHIP-DIODE,DAN202K	C520	87-016-426-080		C-CAP,E 47-4 5.5N
	87-017-520-080		C-DIODE,SFPB52	C521	87-012-274-080		CHIP CAP,U 1000P-50B
				C522	87-A10-047-080		C-CAP,U 1-10 Z F
				C523	87-A10-047-080		C-CAP,U 1-10 Z F
MAIN C.B				C524	87-012-172-080		CAPACITOR CHIP U 10P CH
C101	87-012-286-080		CAP, U 0.01-25	C601	87-016-429-080		C-CAP,E 100-4 5.5N
C102	87-A11-031-080		C-CAP,E 100-16 M WX	C602	87-012-286-080		CAP, U 0.01-25
C103	87-012-286-080		CAP, U 0.01-25	C603	87-010-831-080		C-CAP,U,0.1-16F
C104	87-016-367-080		C-CAP,E 47-6.3	C604	87-010-831-080		C-CAP,U,0.1-16F
C201	87-016-431-080		C-CAP,E 220-4 5.5N	C609	87-010-831-080		C-CAP,U,0.1-16F
C202	87-012-274-080		CHIP CAP,U 1000P-50B	C610	87-A10-047-080		C-CAP,U 1-10 Z F
C203	87-012-286-080		CAP, U 0.01-25	C611	87-A10-047-080		C-CAP,U 1-10 Z F
C204	87-016-430-080		C-CAP,E 100-6.3 5.5N	C612	87-010-831-080		C-CAP,U,0.1-16F
C205	83-HC3-635-080		C-CAP,E 220-6.3 WF	C701	87-016-429-080		C-CAP,E 100-4 5.5N
C206	87-A12-159-080		C-CAP, 10-6.3 K B GRM42-6	C702	87-012-274-080		CHIP CAP,U 1000P-50B
C207	87-010-831-080		C-CAP,U,0.1-16F	C703	87-012-274-080		CHIP CAP,U 1000P-50B
C208	87-010-831-080		C-CAP,U,0.1-16F	C706	87-010-831-080		C-CAP,U,0.1-16F
C209	87-012-172-080		CAPACITOR CHIP U 10P CH	C707	87-A10-047-080		C-CAP,U 1-10 Z F
C210	87-012-195-080		C-CAP,U 100P-50CH	C708	87-A10-047-080		C-CAP,U 1-10 Z F
C211	87-A10-047-080		C-CAP,U 1-10 Z F				

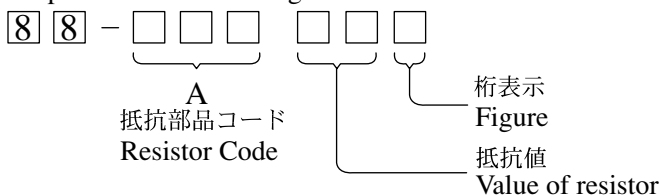
REF. NO.	PART NO.	KANRI NO.	DESCRIPTION	REF. NO.	PART NO.	KANRI NO.	DESCRIPTION
C709	87-A10-047-080		C-CAP,U 1-10 Z F	C827	87-A11-061-080		C-CAP,S 2.2-10 K B
C710	87-016-421-080		C-CAP,E 10-16 5.5N	C828	87-012-286-080		CAP, U 0.01-25
C711	87-016-429-080		C-CAP,E 100-4 5.5N	C829	87-012-274-080		CHIP CAP,U 1000P-50B
C712	87-A10-353-080		C-CAP,U0.22-10KB	C831	87-012-274-080		CHIP CAP,U 1000P-50B
C713	87-010-831-080		C-CAP,U,0.1-16F	C833	87-A11-241-080		C-CAP,TN 22-6.3 M F93 A
C714	87-A11-062-080		C-CAP,S 2.2-16 Z F	C834	87-012-274-080		CHIP CAP,U 1000P-50B
C715	87-016-421-080		C-CAP,E 10-16 5.5N	C836	87-012-286-080		CAP, U 0.01-25
C716	87-010-831-080		C-CAP,U,0.1-16F	C838	87-010-829-080		CAP, U 0.047-16
C717	87-010-831-080		C-CAP,U,0.1-16F	C841	87-012-286-080		CAP, U 0.01-25
C718	87-016-431-080		C-CAP,E 220-4 5.5N	C842	87-012-273-080		C-CAP,U 820P-50 B
C719	87-016-431-080		C-CAP,E 220-4 5.5N	C843	87-012-286-080		CAP, U 0.01-25
C720	87-012-274-080		CHIP CAP,U 1000P-50B	C844	87-A11-063-080		C-CAP,S 4.7-10 Z F
C721	87-012-274-080		CHIP CAP,U 1000P-50B	C845	87-012-274-080		CHIP CAP,U 1000P-50B
CN301	87-A60-792-080		C-CONN,30P V 30FLT-SM1TB	C846	87-A11-063-080		C-CAP,S 4.7-10 Z F
CN501	87-009-214-080		CONN,16P 52207-1690	C847	87-012-286-080		CAP, U 0.01-25
CN601	87-099-522-080		CONN,6P ZH-SM3 V W	C848	87-012-286-080		CAP, U 0.01-25
FB701	83-XM1-617-080		C-COIL,BK2125HM601	C849	87-A10-047-080		C-CAP,U 1-10 Z F
FB702	83-XM1-617-080		C-COIL,BK2125HM601	C850	87-A10-047-080		C-CAP,U 1-10 Z F
FB703	83-XM1-617-080		C-COIL,BK2125HM601	C851	87-012-282-080		CAP, U 4700P-50
FB704	83-XM1-617-080		C-COIL,BK2125HM601	C852	87-012-282-080		CAP, U 4700P-50
J101	87-A60-421-010		JACK,DC HEC3600 BLK 6	C853	87-012-170-080		C-CAP,U 8P-50 CH
J701	85-HC5-616-010		JACK,3.5 ST W/R GRN	C854	87-012-167-080		C-CAP,U 5P-50 CH
L201	88-HC4-615-040		C-COIL,39UH 7006-2M	C855	87-012-337-080		C-CAP,U 56P-50 CH
L301	87-A50-367-080		C-COIL, 10UH LQG21F	C856	87-A11-063-080		C-CAP,S 4.7-10 Z F
L302	87-A50-367-080		C-COIL, 10UH LQG21F	C857	87-012-286-080		CAP, U 0.01-25
L401	87-A50-556-080		C-COIL, 47UH K LQH3C	C858	87-A11-061-080		C-CAP,S 2.2-10 K B
L402	87-A50-440-080		C-COIL, 100UH K LQH3C34	C859	87-012-286-080		CAP, U 0.01-25
L501	87-A50-367-080		C-COIL, 10UH LQG21F	C861	87-A11-063-080		C-CAP,S 4.7-10 Z F
L502	87-A50-367-080		C-COIL, 10UH LQG21F	C862	87-A11-061-080		C-CAP,S 2.2-10 K B
L601	87-A50-367-080		C-COIL,10UH LQG21F	C899	87-012-286-080		C-CAP,S 2.2-10 K B
L610	87-005-843-080		C-COIL,470UH K LQH3C	C901	87-012-274-080		CHIP CAP,U 1000P-50B
R222	87-022-246-080		C-RES,U 20K-1/16W F	C903	87-012-286-080		CAP, U 0.01-25
R224	87-022-239-080		C-RES,U 10K-1/16WF	C904	87-012-274-080		CHIP CAP,U 1000P-50B
S101	87-A91-622-010		SW,MICRO PV1102	C905	87-012-274-080		CHIP CAP,U 1000P-50B
S302	87-A90-494-080		C-SW,SL 1-1-3 SSSS81	C906	87-012-174-080		CAP CHIP CERA SS 12P CHJ
S303	87-A90-494-080		C-SW,SL 1-1-3 SSSS81	C907	87-012-176-080		CAP 15P
TC208	87-A91-185-080		C-TRIMMER,CER 30P TZC03	C908	87-A11-063-080		C-CAP,S 4.7-10 Z F
VR701	87-A91-145-080		C-VR,RTRY 30KCX2 H RK14J12R	C909	87-012-286-080		CAP, U 0.01-25
X301	87-A70-255-080		C-VIB,4.19MHZ CSTRC0419MG03	C910	87-012-286-080		CAP, U 0.01-25
X401	87-A70-201-080		C-VIB,CER 16.93MHZ CSTCV-MXJ0C	C911	87-012-286-080		CAP, U 0.01-25
LID C.B				C912	87-012-188-080		C-CAP,U 47P-50 CH
ANT801	8Z-HC1-610-010		ANT,BAR-ANTENNA	C913	87-012-286-080		CAP, U 0.01-25
BPF801	87-008-406-080		BPF GFMB1	C914	87-A11-158-080		C-CAP,TN 4.7-16 M A F93
C800	87-012-195-080		C-CAP,U 100P-50CH	C915	87-012-275-080		C-CAP,U,1000P-50 K B GRM
C801	87-012-286-080		C-CAP,U 0.01-25	C916	87-A11-063-080		C-CAP,S 4.7-10 Z F
C802	87-012-176-080		CAP 15P	C918	87-A11-063-080		C-CAP,S 4.7-10 Z F
C804	87-012-335-080		C-CAP,U 270P-50 SL	C935	87-012-274-080		CHIP CAP,U 1000P-50B
C805	87-012-199-080		CAP 220P	C936	87-012-274-080		CHIP CAP,U 1000P-50B
C806	87-010-831-080		C-CAP,U,0.1-16F	C937	87-012-274-080		CHIP CAP,U 1000P-50B
C807	87-012-286-080		C-CAP,U,0.01-25 K B	C941	87-A11-063-080		C-CAP,S 4.7-10 Z F
C808	87-012-274-080		C-CAP,U 1000P-50 K B	C942	87-012-286-080		CAP, U 0.01-25
C809	87-012-176-080		CAP 15P	C943	87-012-286-080		CAP, U 0.01-25
C810	87-012-176-080		C-CAP,U 15P-50J CH	C944	87-012-286-080		CAP, U 0.01-25
C811	87-012-184-080		C-CAP,U 33P-50 CH	C945	87-012-286-080		CAP, U 0.01-25
C812	87-012-176-080		CAP 15P	C946	87-012-286-080		CAP, U 0.01-25
C813	87-012-186-080		C-CAP,U 39P-50 CH	C947	87-A11-063-080		C-CAP,S 4.7-10 Z F
C814	87-012-274-080		CHIP CAP,U 1000P-50B	C948	87-012-286-080		CAP, U 0.01-25
C815	87-012-162-080		C-CAP,U 1P-50 CK	CF801	87-A91-352-080		C-FLTR,SFECV 10.7MS2-A
C816	87-012-286-080		CAP, U 0.01-25	CF802	87-A91-352-080		C-FLTR,SFECV 10.7MS2-A
C817	87-012-274-080		C-CAP,U 1000P-50 K B	CF803	87-A90-456-080		C-FLTR,PFWCC 450J3
C818	87-012-286-080		CAP, U 0.01-25	CF804	8Z-HC1-612-080		C-FLTR,CDACV 10.7MG83-A
C819	87-012-286-080		CAP, U 0.01-25	D802	87-A40-517-040		C-VARI-CAP,SVC208
C821	87-012-286-080		CAP, U 0.01-25	D803	87-A40-517-040		C-VARI-CAP,SVC208
C822	87-A10-707-080		C-CAP,U 0.47U-16 F Z	D804	87-A40-462-040		C-VARI-CAP,SVC347(S)
C823	87-A10-707-080		C-CAP,U 0.47U-16 F Z	IFT803	87-005-788-080		C-IFT,AM (450K)
C824	87-012-278-080		C-CAP,U 2200P-50 B	L801	8A-HC1-613-010		COIL,FM OSC-AHC1
C825	87-A10-025-080		C-CAP,U 0.22-16Z F	L802	8A-HC1-612-010		COIL,FM RF-AHC1
C826	87-A10-707-080		C-CAP,U 0.47U-16 F Z	L804	87-003-247-080		C-COIL,100UH
				L805	87-A50-037-080		C-COIL,D-D 5CDLU
				L807	87-A50-536-080		C-COIL,10UH K LQH3C24

REF. NO.	PART NO.	KANRI NO.	DESCRIPTION	REF. NO.	PART NO.	KANRI NO.	DESCRIPTION
L808	87-A50-536-080		C-COIL,10UH K LQH3C24	SW909	87-A91-668-080		C-SW,TACT EVQ-PQH-B55
L901	87-A50-536-080		C-COIL,10UH K LQH3C24	SW910	87-A91-668-080		C-SW,TACT EVQ-PQH-B55
L902	87-A50-536-080		C-COIL,10UH K LQH3C24	SW911	87-A91-668-080		C-SW,TACT EVQ-PQH-B55
LCD901	8A-HC1-610-010		LCD,AHC-1	SW920	87-036-379-180		C-SW,SL1-1-2 SS350
LED902	87-A91-327-040		C-LED,SEC1703C GRN	TC801	87-A91-185-080		C-TRIMMER,CER 30P TZC03
LED903	87-A91-328-040		C-LED,SEC1803C ORN	X801	87-A70-259-010		VIB,XTAL 4.5MHZ CSA-309
LED904	87-A91-326-040		C-LED,SEC1603C RED	X901	87-A70-255-080		C-VIB,4.19MHZ CSTRC0419MG03
SW901	87-A91-668-080		C-SW,TACT EVQ-PQH-B55				
SW902	87-A91-668-080		C-SW,TACT EVQ-PQH-B55				
SW903	87-A91-668-080		C-SW,TACT EVQ-PQH-B55				
SW904	87-A91-668-080		C-SW,TACT EVQ-PQH-B55				
SW905	87-A91-668-080		C-SW,TACT EVQ-PQH-B55				
SW906	87-A91-668-080		C-SW,TACT EVQ-PQH-B55				
SW907	87-A91-668-080		C-SW,TACT EVQ-PQH-B55				
SW908	87-A91-668-080		C-SW,TACT EVQ-PQH-B55				

○チップ抵抗部品コード/CHIP RESISTOR PART CODE

チップ抵抗部品コードの成り立ち

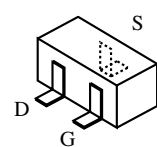
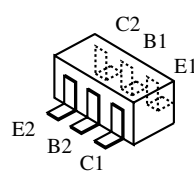
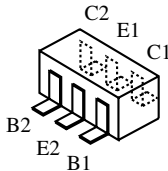
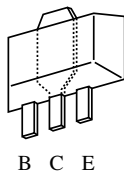
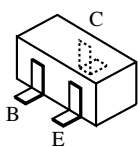
Chip Resistor Part Coding



チップ抵抗
Chip resistor

容量 Wattage	種類 Type	許容誤差 Tolerance	記号 Symbol	寸法/Dimensions (mm)			抵抗コード : A Resistor Code : A	
				外形/Form	L	W		t
1/16W	1005	± 5%	CJ		1.0	0.5	0.35	104
1/16W	1608	± 5%	CJ		1.6	0.8	0.45	108
1/10W	2125	± 5%	CJ		2	1.25	0.45	118
1/8W	3216	± 5%	CJ		3.2	1.6	0.55	128

TRANSISTOR ILLUSTRATION

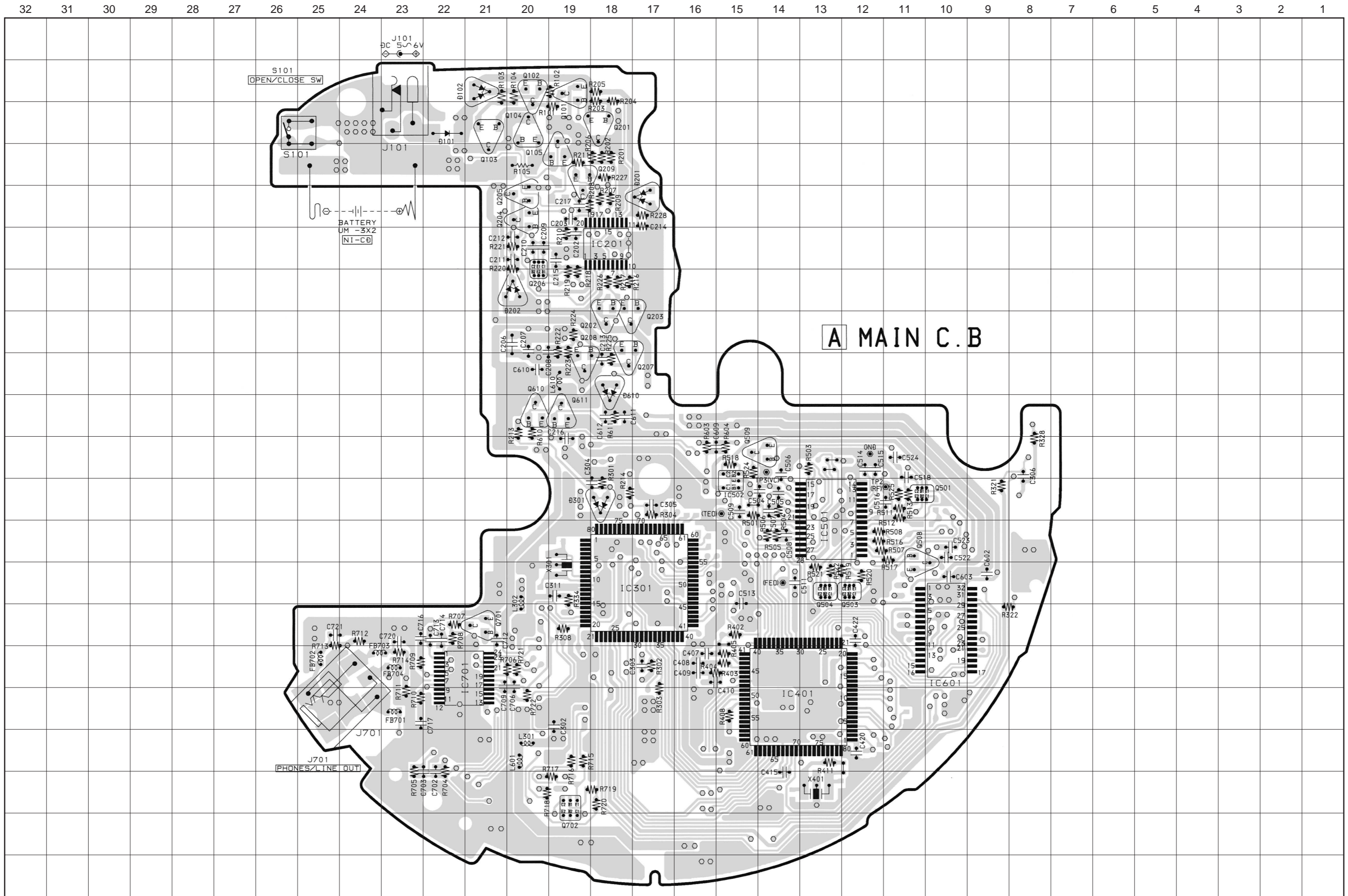


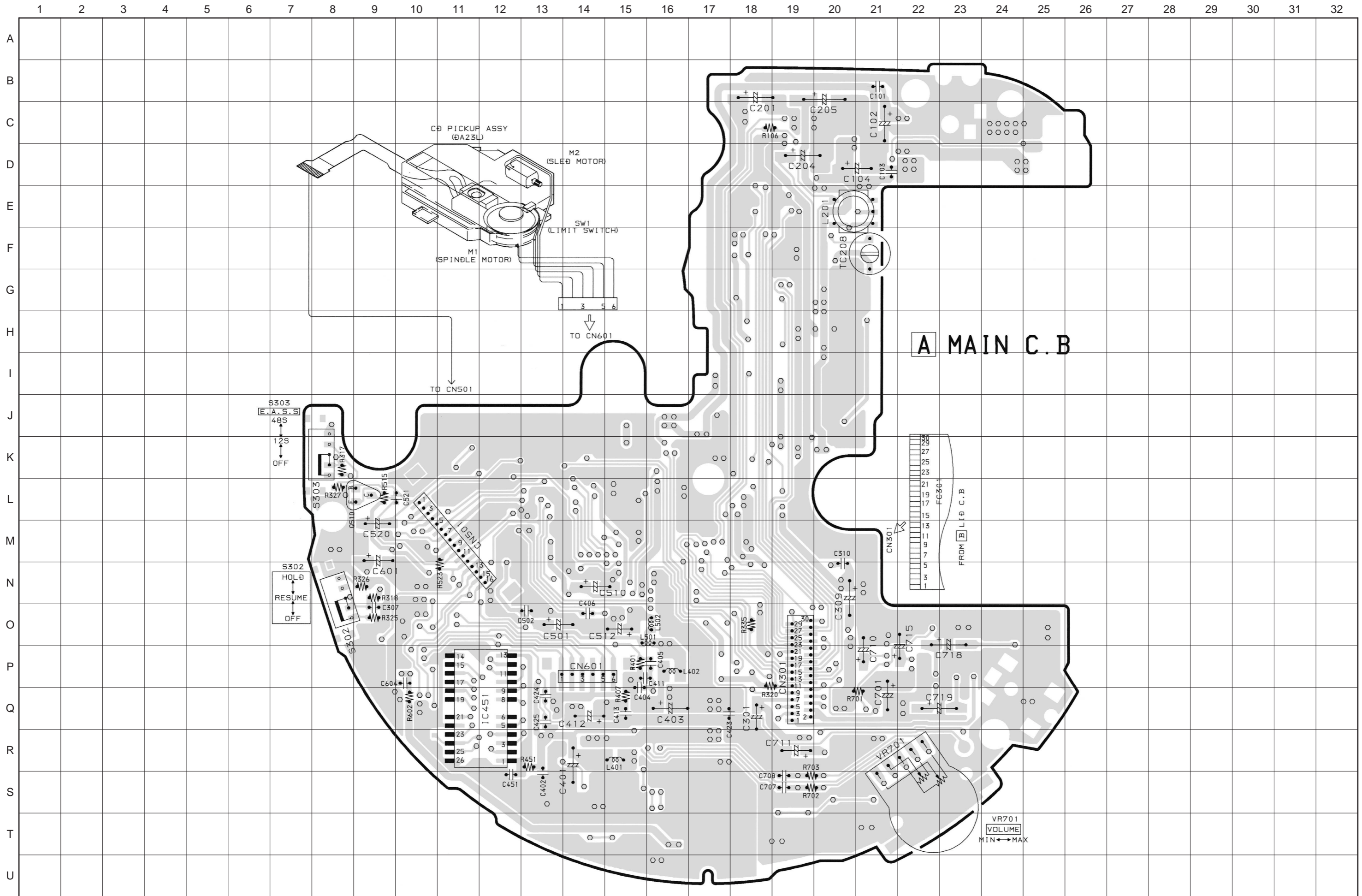
2SA1037AK	CPH3206	2SA1369
2SA1235F	DTA114TK	2SB1132
2SA1362GR	DTA114TK-TP	2SD1664
2SC2412K	DTC114EK	
2SC2412K S	DTC114TK	
2SC2714	DTC123JK	
2SC3052F		
CPH3106		

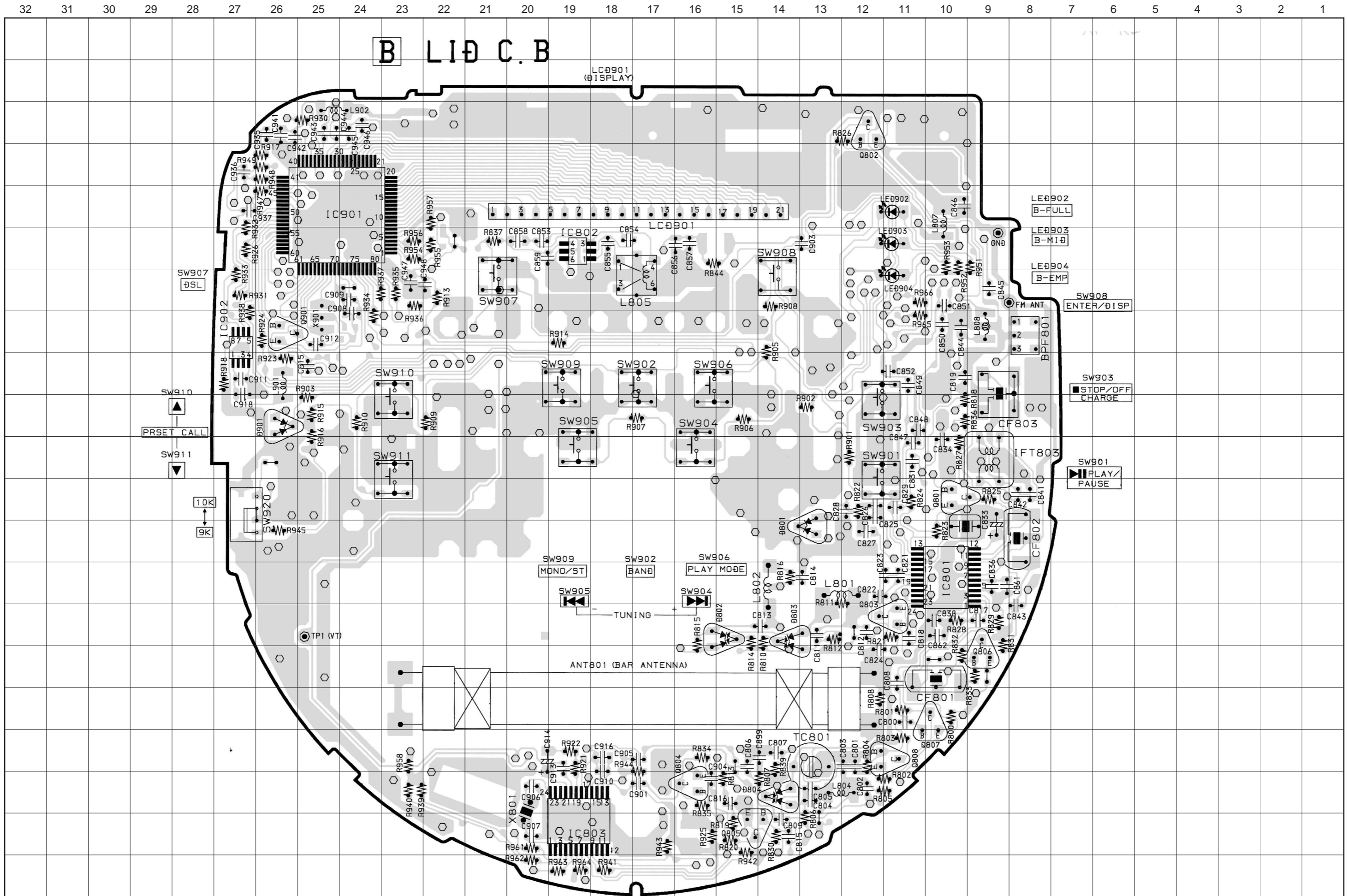
UMG4N

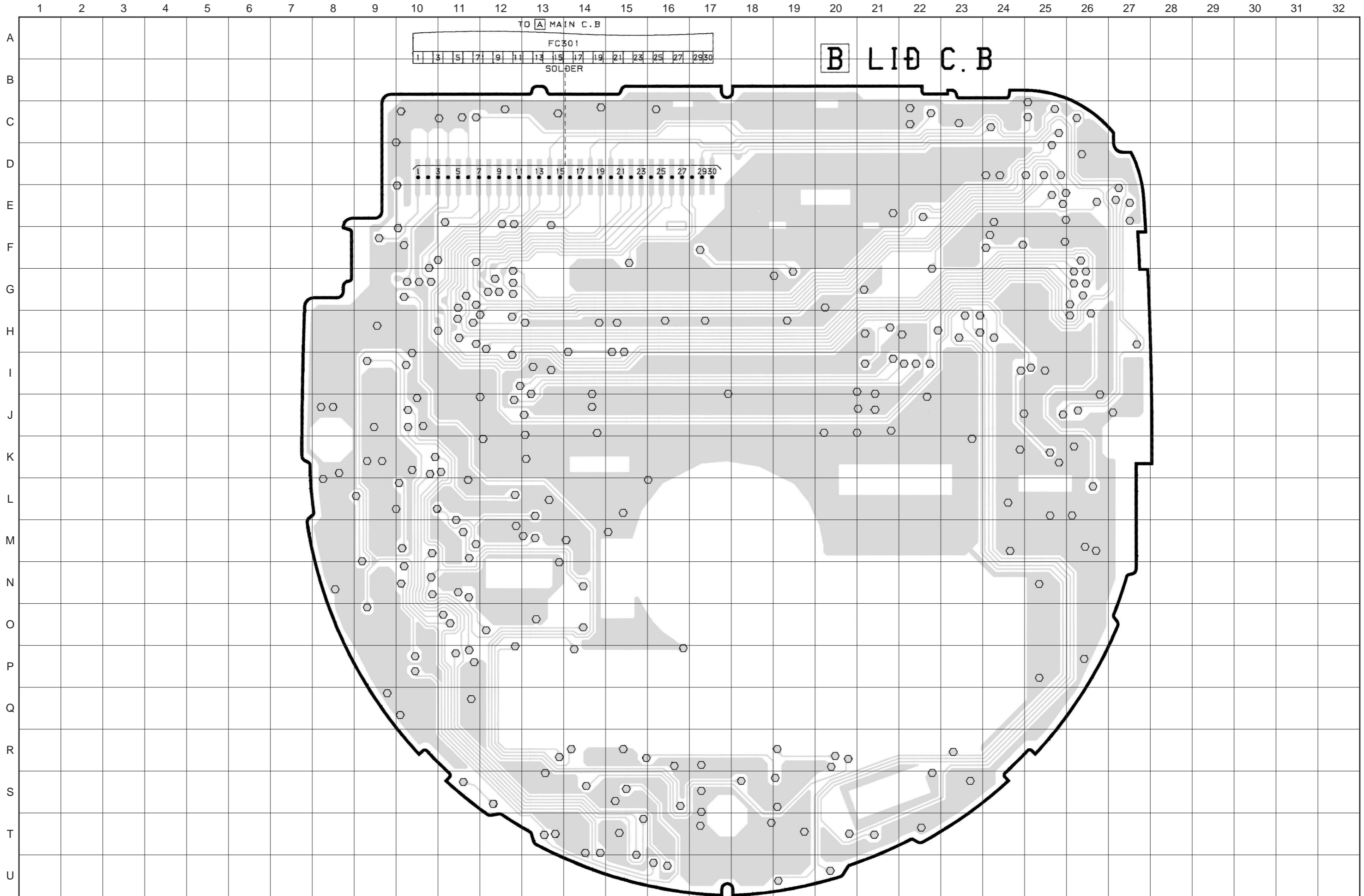
UMH4N
IMX9

2SK302GR



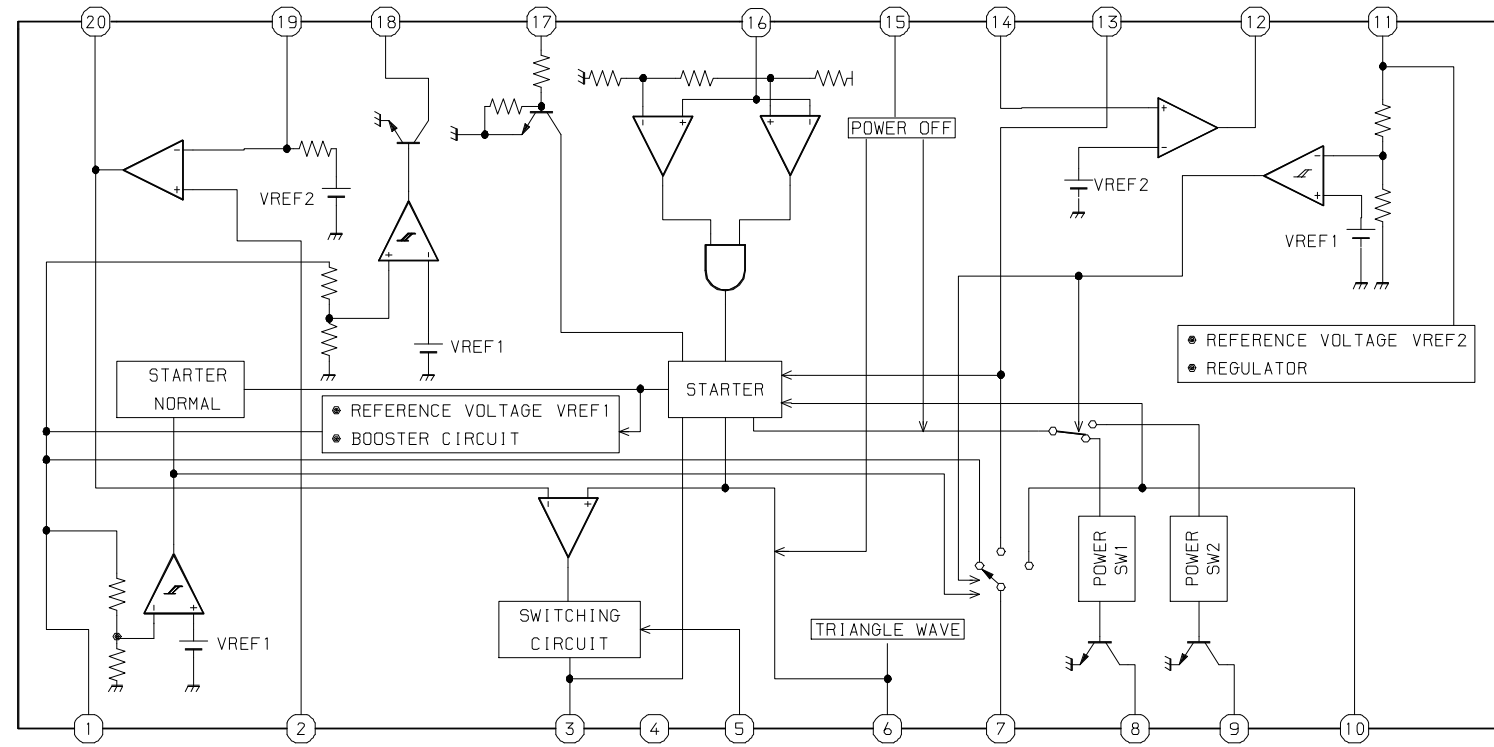




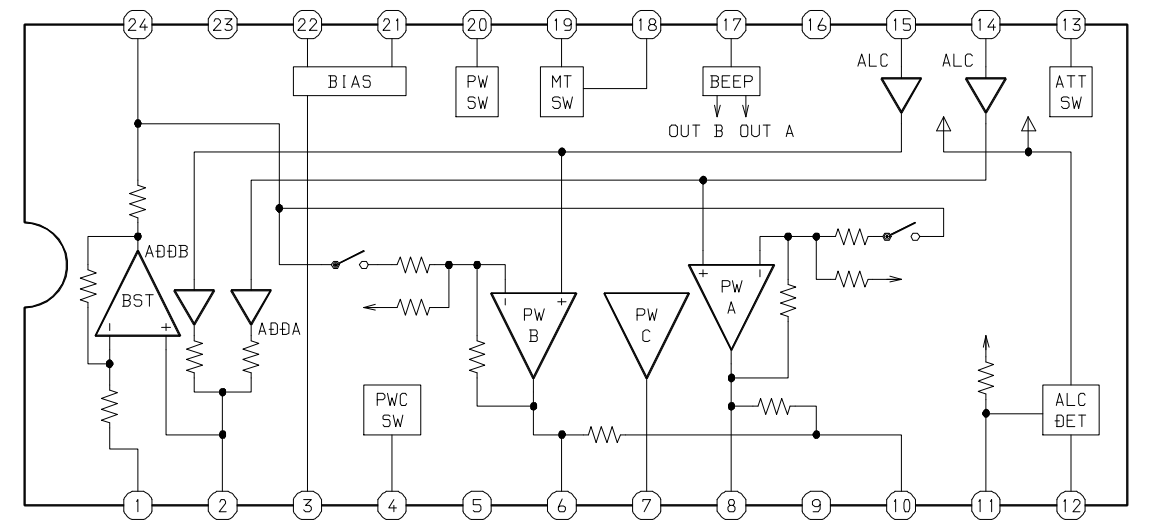


IC BLOCK DIAGRAM

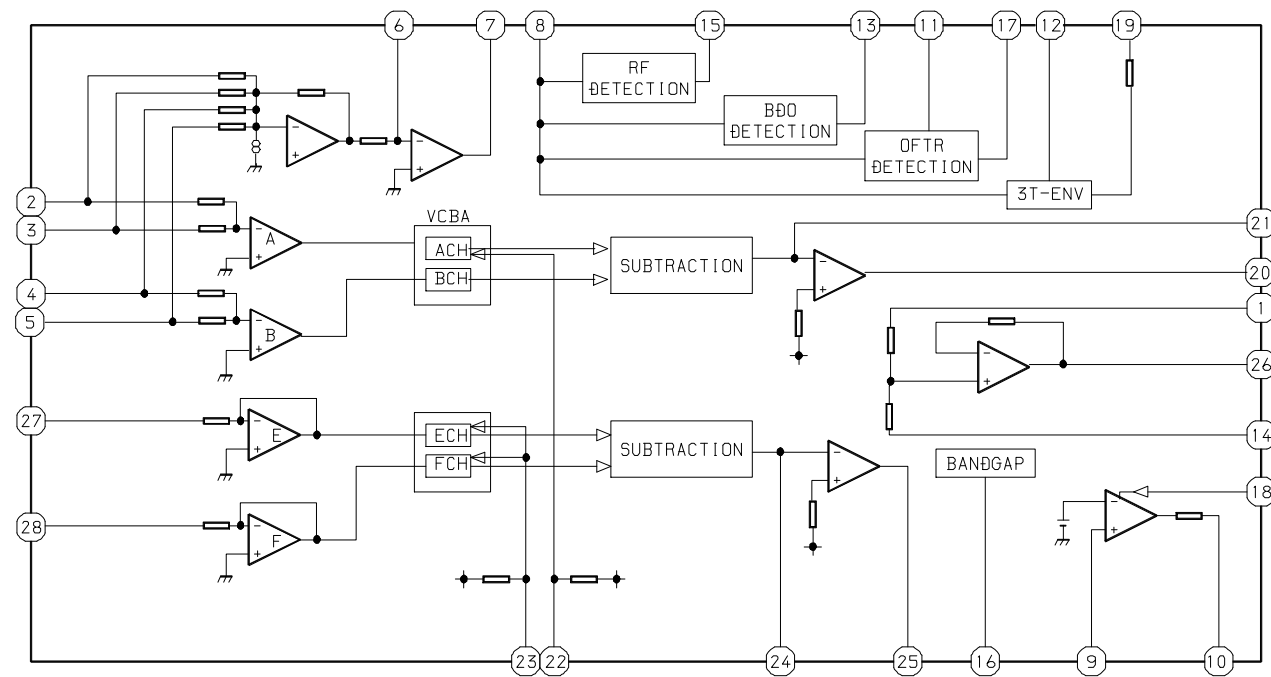
BA6655AFV



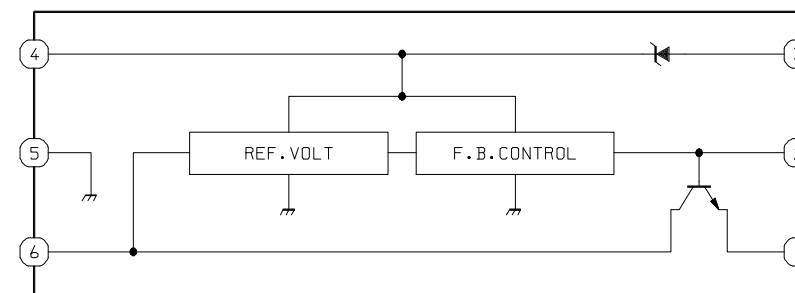
IC, TA2120FN



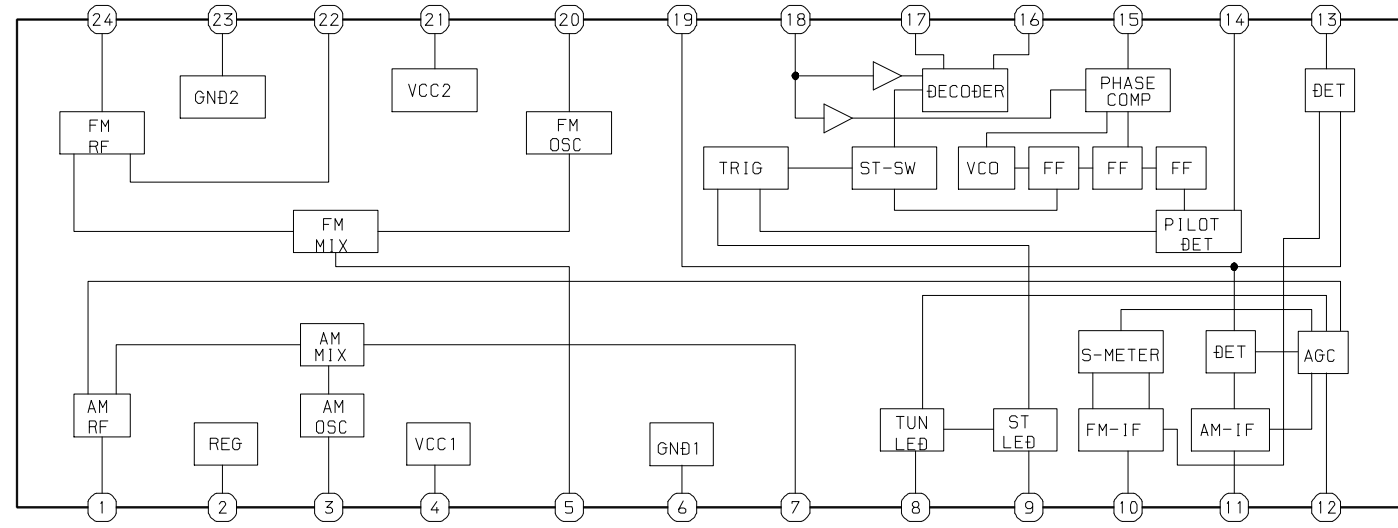
AN8838SB



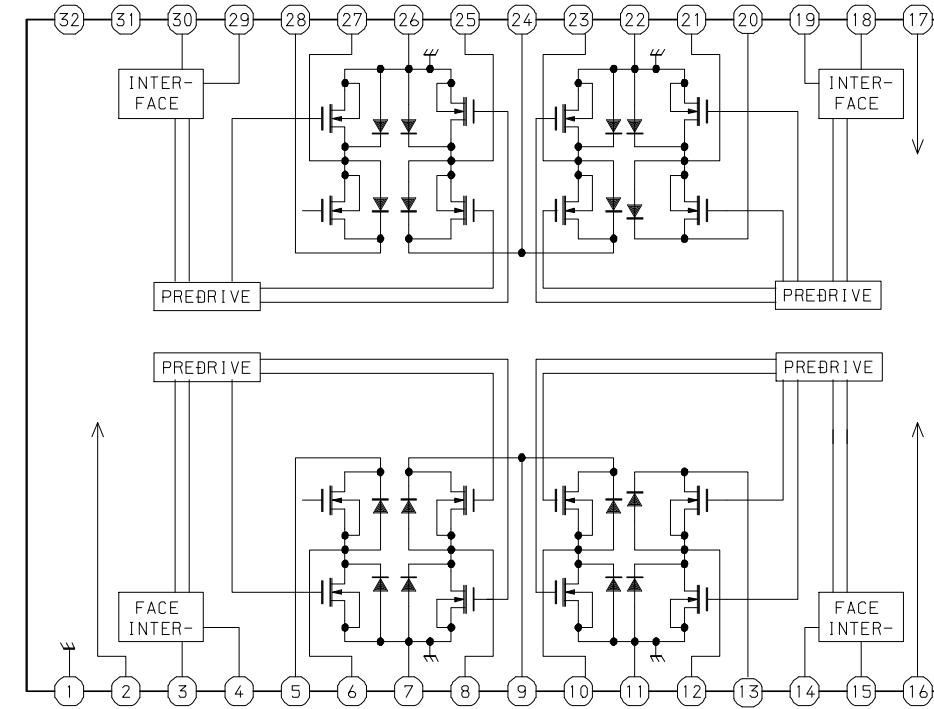
TK11823



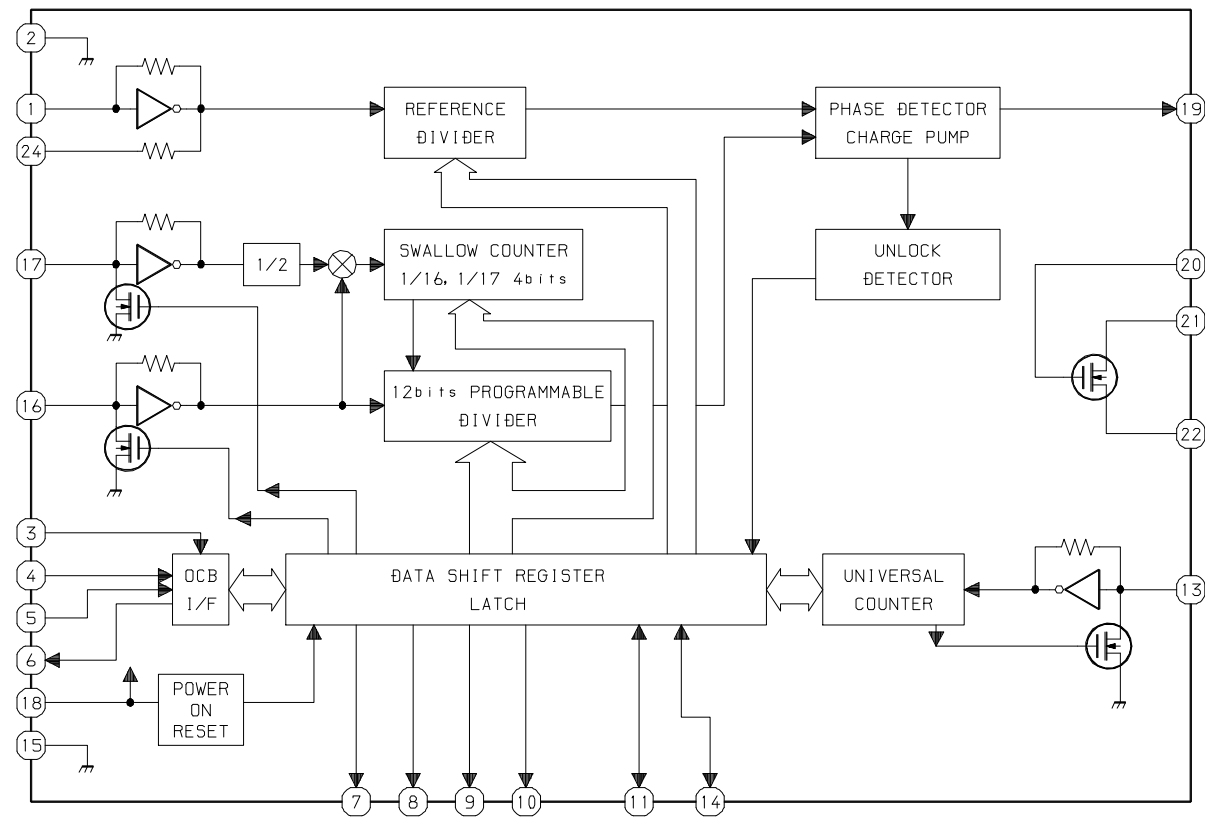
IC, LA1827M-TLM



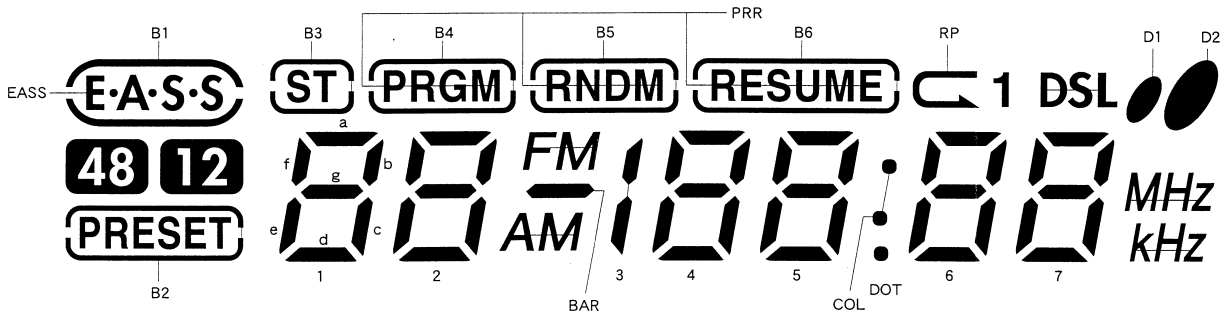
BH6517F5



LC72121V-D-TLM



LCD DIAGRAM

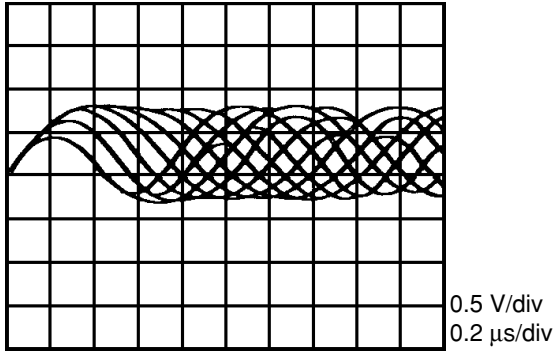


No	1	2	3	4	5	6	7	8	9	10	11
COM0	COM0	---	---	---	PRR	ST	B3	1a	B4	2a	B5
COM1	---	COM1	---	---	EASS	B1	1f	1b	2f	2b	FM
COM2	---	---	COM2	---	48	12	1e	1g	2e	2g	BAR
COM3	---	---	---	COM3	PRESET	B2	1d	1c	2d	2c	AM

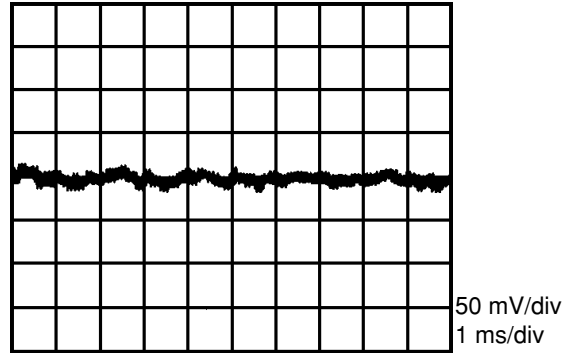
No	12	13	14	15	16	17	18	19	20	21
COM0	3	4a	B6	5a	RP	---	6a	DSL	7a	D1
COM1	4f	4b	5f	5b	1	6f	6b	7f	7b	D2
COM2	4e	4g	5e	5g	COL	6e	6g	7e	7g	MHz
COM3	4d	4c	5d	5c	DOT	6d	6c	7d	7c	kHz

WAVEFORM

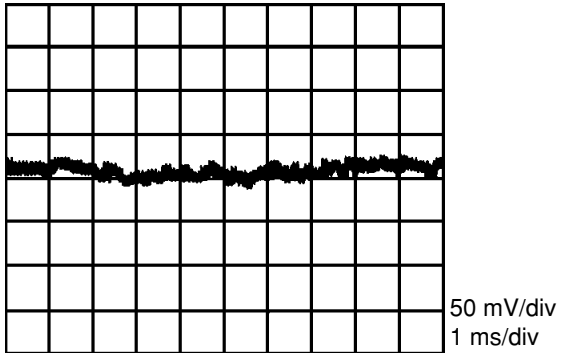
① IC501 PIN 7 (RF)



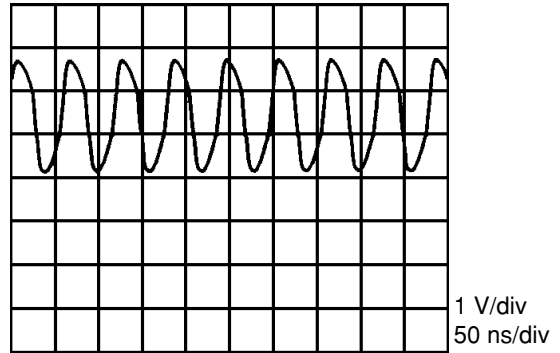
③ IC501 PIN 20 (FEOUT)



② IC501 PIN 25 (TEOUT)



④ IC301 PIN 10 (OSC1)



IC DISCRPTION

IC,MN101C439-AB1

Pin No.	Pin Name	I/O	Description
1 ~ 4	NC	-	Not connected.
5 ~ 7	VLC3 ~ 1	-	LCD Voltage divider resistor3 ~ 1 (Not used.)
8	VDD	-	Micro-computer power voltage (2.8 V).
9	OSC2	O	Main clock oscillator (4.2336 MHz).
10	OSC1	I	Main clock oscillator (4.2336 MHz).
11	VSS	-	Micro-computer GND.
12	XI	I	Sub clock input GND (Not used).
13	XO	O	Sub clock output (Not used).
14	MMOD	I	Memory mode switch input (Single chip mode).
15	VREF-	-	A/D converter GND.
16	K-FUNC	I	Function key input.
17	AN1	I	Connected to GND.
18	AC IN	I	AC adaptor detection terminal.
19	VD IN	I	Battery voltage measuring terminal.
20	K-RMC	I	Wired remote control input terminal.
21	SWD0	I	Digital out "ON/OFF" input (Not used).
22	SWEASS	I	EASS mode. SW input terminal.
23	SWR/H	I	RESUME/HOLD SW input terminal.
24	VREF+	-	Connected to VDD.
25	SWIL	I	Limit SW input.
26	PC	I	CD servo driver power OFF output. "L" power OFF.
27	CD-RW	O	CD-RW PLAYBACK gain up seletion output. "H" = Gain up.
28	$\overline{\text{CD-RW}}$	O	CD-RW PLAYBACK gain up seletion output. "L" = Gain up.
29	SUBQ	I	DSP sub-code Q input.
30	SQCK	O	DSP sub-code clock output.
31	BEEP	O	Buzzer output for headphone.
32	$\overline{\text{RST}}$	-	Micro-computer reser input.
33	NRST	O	DSP RESET output.
34	STAT	I	DSP STAT input.
35	MLD	O	DSP MLD output.
36	MDATA	O	DSP MDATA output.
37	MCLK	O	DSP BLKCK input.
38	BLKCK	I	DSP BLKCK input.
39	RSENSOR	I	Connected to GND.
40	CDCONT	I	CD/Tuner mode input.
41	IRQ3	I	Not connected.
42	$\overline{\text{PU-ON}}$	O	H/A power down output.
43	$\overline{\text{EASSON}}$	O	Gain up in EASS selection output. EASS on = "L"
44	DSL2	O	Not used.
45	DSL1	O	Not used.

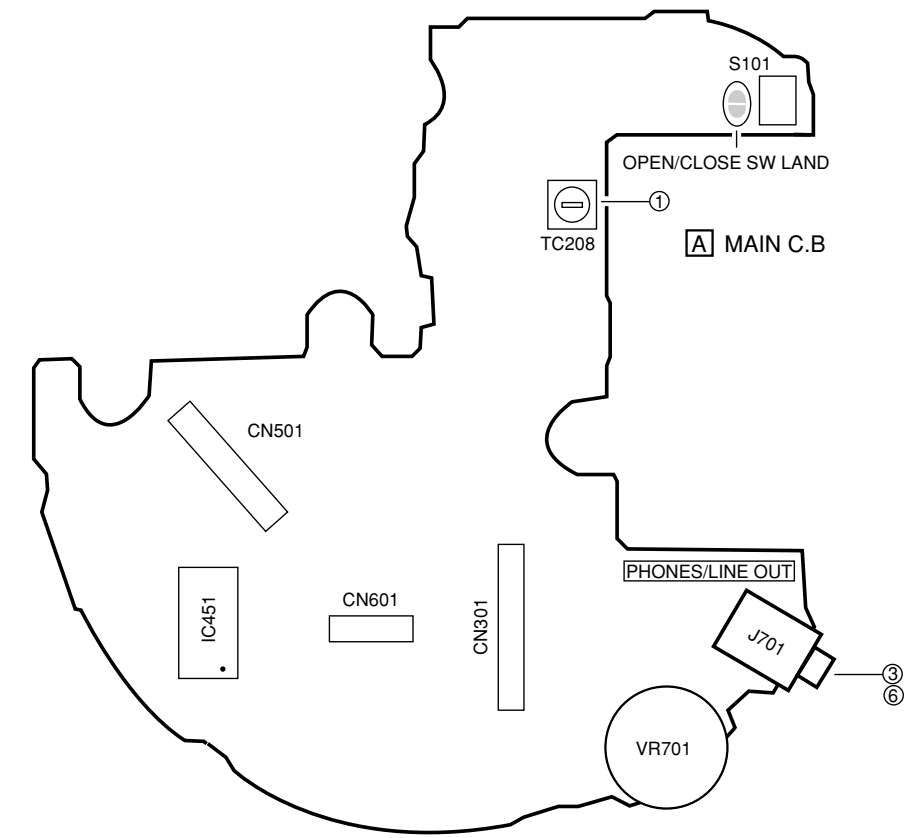
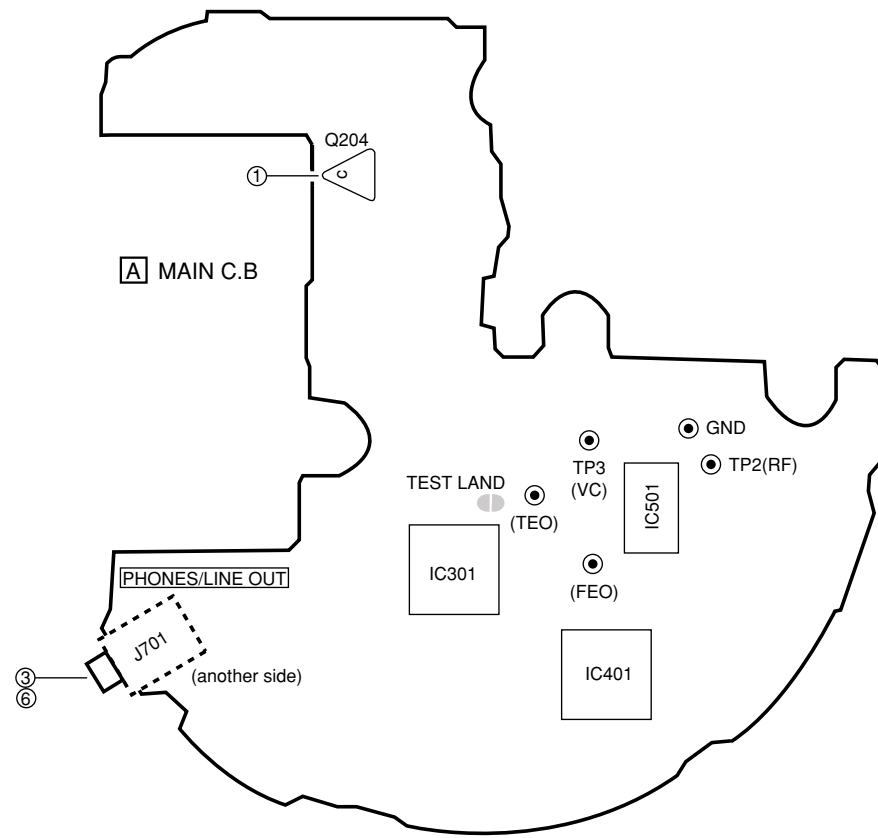
Pin No.	Pin Name	I/O	Description
46	MUTE	O	Audio mute output.
47	STANDBY	O	Not used.
48	LCDRDO	O	Wired LCD remote control output.
49	P-OFF	O	Not used.
50	DSCHRG	O	Electric discharge output.
51	CHRG	O	Electric charge output.
52	DISP-DATA	O	LCD display data output.
53	DISP-CLK	O	LCD display data clock output.
54	DISP-CS	O	LCD display data chip selection output.
55	SEG25	O	Not used.
56	SWCL	I	Cover OPEN/CLOSE detection SW input.
57	EL-ON	O	EL back light control output.
58	SPCON	O	Spindle PWM control output.
59	CAR-LED	O	CAR-KIT model button LED light on output, "H" = Light ON
60	E-MODE	I	Control spindle shaft votation (EASS only), "L" = Control spindle shaft votation mode.
61	TEST	I	Test input.
62	M1/NM2	O	Not used.
63	K-PLAY	I	PLAY Key input terminal.
64	K-STOP	I	STOP Key input terminal.
65	BEEP-ON	I	BEEP ON/OFF. "H" = ON.
66 ~ 70	NC	O	Not connected.
71	SON	O	CD system power control output.
72 ~ 80	SEG8 ~ 0	O	Not connected.

Pin No.	Pin Name	I/O	Description
1	VDD	-	+3 V power supply.
2	BIAS	-	LCD driver power supply.
3 ~ 5	VLC0 ~ 2	-	LCD driver power voltage.
6	VSS1	-	GND.
7 ~ 10	COM0 ~ 3	O	LCD common output.
11 ~ 27	SEG0 ~ 16	O	LCD segment output.
28 ~ 30	NC	-	Not connected.
31	DSL1	O	“H” when DSL1 output.
32	DSL2	O	“H” when DSL2 output.
33	STBY	O	“H” when STBY output.
34	BEEP-ON	O	“H” output when CD BEEP is “ON”.
35	CS	O	E ² P-ROM chip select.
36	B-FULL	O	“L” when “battery level LED-FULL” is illuminated.
37	B-MID	O	“L” when “battery level LED-MID” is illuminated.
38	B-EMP	O	“L” when “battery level LED-EMP” is illuminated.
39	AVDD	-	AD converter analogue power.
40	AVREF	-	AD converter reference power.
41	K-PSB	I	PLAY, STOP, BAND keys input.
42	K-FUNC1	I	KEY input 1.
43	K-FUNC2	I	KEY input 2.
44	BATT-LEVEL	I	BATT level input for battery level indication.
45	HOLD/OFF	I	“L” input when in HOLD mode.
46	REMO-IN	I	Remote control AD figure input.
47	TU-SEL	I	Japan or oversea settings input. “H” = Japan, “L” = oversea.
48	AVSS	-	GND for AD converter.
49	DATA-IN	I	E ² P ROM data input.
50	DATA-OUT	O	E ² P ROM data output.
51	DISP-CS	I	Chip selection input for CD indication data.
52	SK	O	E ² P ROM clock output.
53	BEEP	O	BEEP output (it is fixed due to square-wave output.
54	DISP-DATA	I	CD detection data input.
55	NC	O	Not connected.
56	DISP-CLK	I	Clock input for CD detection data.
57	AM-STEP	I	AM STEP (9K/10K) switch input.
58	K-PLAY	O	“H” output when PLAY key is pressed.
59	K-STOP	O	“H” output when STOP key is pressed.
60	K-OP/CL	I	Cover detection. “L” input when the cover is OPEN.
61	CD-CONT	O	“L” output when CD is ON.
62	P-OFF	O	“L” output when power is off.
63	A-MUTE	O	MUTE output.

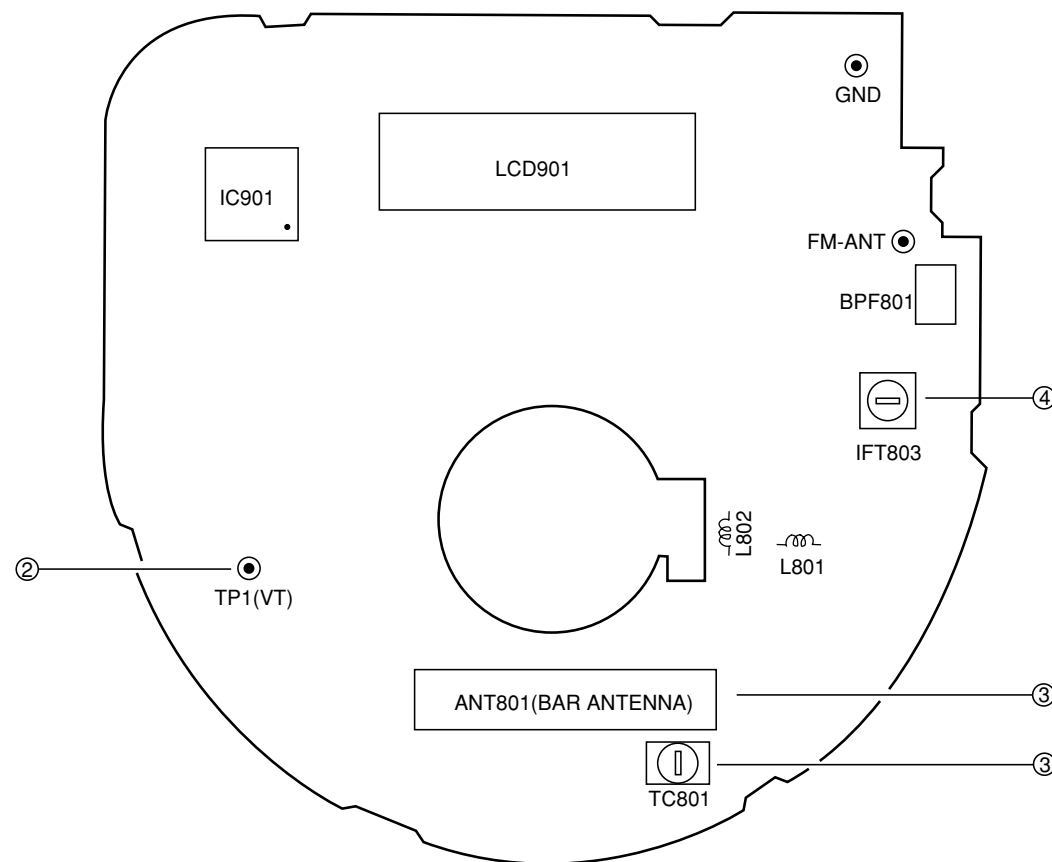
Pin No.	Pin Name	I/O	Description
64	AM-SFT	O	For “DD convertor” oscillator terminal clock shift.
65	DD-SFT	O	For “DD convertor” oscillator terminal clock shift.
66	CLK-SFT	O	“H” output when microcomputer oscillator terminal clock shift.
67	RESET	I	Reset input.
68	XTAL2	O	Connection terminal to oscillator terminal.
69	XTAL1	I	Connection terminal to oscillator terminal.
70	VSS	-	GND.
71	VDD	-	+3 V power supply.
72	XT2	-	Not connected.
73	XT1	-	Connected to GND.
74	VDD	-	Connected to VDD.
75	AC-IN	I	“H” input when AC adapter connected.
76	T-ON	O	“L” output when TUNER is ON.
77	PLL-DI	I	PLL data input.
78	PLL-CE	O	PLL chip enable.
79	PLL-CLK	O	PLL-CLK.
80	PLL-DO	O	PLL data output.

Pin No.	Pin Name	I/O	Description
1	DVDD	-	DRAM interface power (terminal No. 2 to 19).
2 ~ 3	D0 ~ 1	I/O	DRAM data input/output signal 0 ~ 1.
4	NWE	O	DRAM write enable signal.
5	NRAS	O	DRAM RAS control signal.
6 ~ 7	D2 ~ 3	I/O	DRAM data input/output signal 2 ~ 3.
8	NCAS0	O	DRAM CAS control signal 0.
9	NCAS1	O	DRAM CAS control signal 1 (when 1M or 4M x2 are used). DRAM address signal 10 (when 16M DRAM is used).
10 ~ 14	A8 ~ 4	O	DRAM address signal 8 ~ 4.
15	A9	O	DRAM address signal 9.
16 ~ 19	A0 ~ 3	O	DRAM address signal 0 ~ 3.
20	DVSS2	I	Digital circuit GND.
21	DVDD2	I	Digital circuit power.
22	SPOUT	O	Spindle motor driver signal output.
23	TRVM	O	Traverse drive output (+ polar output).
24	TRVP	O	Traverse drive output (- polar output).
25	TRM	O	Tracking drive output (+ polar output).
26	TRP	O	Tracking drive output (- polar output).
27	FOM	O	Focus drive output (+ polar output).
28	FOP	O	Focus drive output (- polar output).
29	FBAL	O	Focus balance adjustment output.
30	TBAL	O	Tracking balance adjustment output.
31	VREF	I	DA output reference voltage (FBAL, TBAL, DSLF2).
32	FE	I	Focus error signal input (analogue input).
33	TE	I	Tracking error signal input (analogue input).
34	RFENV	I	RF envelope signal input (analogue input).
35	OFT	I	Off track signal input. "H" = Off track.
36	NRFDET	I	RF detection signal input. "L" = Detected.
37	BDO	I	Drop out signal input. "H" = Drop out.
38	LDON	O	Laser ON signal output. "H" = ON.
39	ARF	I	RF signal input.
40	IREF	I	Reference current input terminal.
41	ADPVCC	I	AD reference voltage input (analogue input).
42	DSLIF	O	DSL loop filter terminal.
43	DSLIF2	O	DSL unbalanced current correction.
44	PLLIF	O	PLL loop filter terminal.
45	VCOF	O	Jitter free VCO loop filter terminal.
46	AVDD2	I	Analogue circuit power. (for DSL, PLL, VCOF, AD, DA).
47	AVSS2	I	Analogue circuit GND. (for DSL, PLL, VCOF, AD, DA).
48	OUTL	O	Lch audio output.

Pin No.	Pin Name	I/O	Description
49	AVSS1	I	Analogue circuit GND.
50	OUTR	O	Rch audio output.
51	AVDD1	I	Analogue circuit power.
52	FSEL	I	Noise filter ON/OFF switch input. "L" = ON, "H" = OFF.
53	TMOD1	I	Terminal mode switch input terminal 1, Normally set to "L".
54	TMOD2	I	Terminal mode switch input terminal 2, Normally set to "L".
55	FLAG	O	Flag signal output.
56	CLVS/IPFLAG	O	Command switch: Spindle servo phase synchronizing signal output. "H" = CLV, "L" = Rough servo. Interpolation flag signal output. "H" = Interpolation.
57	EXT0/ISRDATA	I/O	Command switch: Extension input/output port 0, SRDATA input.
58	EXT1/ILRCK	I/O	Command switch: Extension input/output port 1, LRCK input. "H" = Lch audio data, "L" = Rch audio data.
59	EXT2/IBCLK	I/O	Command switch: Extension input/output port 2, BCLK input.
60	TX	O	Digital audio interface output signal.
61	MCLK	I	Microcomputer command clock signal input. (data is latched at loading edge.)
62	MDATA	I	Microcomputer command data signal input.
63	MLD	I	Microcomputer command load signal input. "L" = Load.
64	BLKCK	O	Sub-code block clock signal fBLKCK = 75 Hz. (in normal PLAY mode) /CDTEXT SYNC signal (fDQSY = 300 Hz. (in normal PLAY mode)
65	SQCK/BCLK	I/O	Command switch: Sub-code Q resistor external clock input, SRDATA bit clock output.
66	SUBQ/LRCK	O	Command switch: Sub-code Q data output, L, R discrimination signal output. "H" = Lch audio data, "L" = Rch audio data.
67	DMUTE/SRDATA	I/O	Command switch: Muting input, "H" = MUTE. Serial data output.
68	STAT	O	Status signal (CRC, RESY, CLVS, NTTSTOP, SQOK, FLAG6, SENSE, NFLOCK NTLOCK, BSSEL, SUBQ DATA, CDTEXT DATA, SHOCK RESISTANCE READ DATA.
69	NRST	I	Reset input "L" = Reset.
70	SPPOL	O	Spindle motor drive signal output. (polar output)
71	PMCK	O	88.2 KHz clock signal output.
72	SMCK	O	4.2336 MHz clock signal output.
73	SUBC/SSYNC	O	Command switch: Sub-code serial output, Sector SYNC output.
74	SBCK/64FS	I	Command switch: Clock input for sub-code serial output, 64FS output.
75	NCLDCK	O	Sub-code frame clock signal output. (fCLDCK = 7.35 KHz)
76	NTEST	I	Test terminal normally set to "H".
77	X1	I	Quartz oscillator circuit input terminal f = 16.9344 MHz.
78	X2	O	Quartz oscillator circuit output terminal f = 16.9344 MHz.
79	DVDD1	I	Digital circuit power.
80	DVSS1	I	Digital circuit GND.



B LID C.B



The servo circuit of this model is designed to be adjustment-free and the adjustment value and disc distinction (CA-DA, CD-R and CD-RW etc.) is adjusted by within the IC. Therefore the adjustment is performed by each TOC reading. The adjustment conditions within the IC of each servo can be monitored in this test mode.

1. How to start the Test Mode

Starting method of the test mode differ depending upon the type of disc being used. This is because the adjustment values of each servo also differ depending upon the type of disc.

When using the CD-DA or CD-R

- 1) Short-circuit the test land and the OPEN/CLOSE SW land.
- 2) Insert the AC plug and install the CD-DA or CD-R disc.
- 3) Press the PLAY and STOP buttons in this sequence and read the TOC.
- 4) Press the DISPLAY/ENTER button and confirm that all LCD light up.

When using the CD-RW

- 1) Short-circuit the test land and the OPEN/CLOSE SW land.
- 2) Insert the AC plug and install the CD-RW disc.
- 3) Press the PLAY, STOP and DSL buttons in this sequence and read the TOC. The LCD display should display CD-r at this point.
- 4) Press the DISPLAY/ENTER button and confirm that all LCD light up.

Note 1) If the TOC cannot be read, press the DISPLAY/ENTER button once "Err" has appeared on the LCD, causing all the LCDs to become lit up. The following steps 2 and 3 can be confirmed even if the TOC cannot be read.

Note 2) By repeatedly pressing the DISPLAY/ENTER button, all LCD will light up and the TOC display will be repeated.

Note 3) By repeatedly pressing the DSL button, the "CD-d" and "CD-r" displays will be repeated.

When the LCD displays "CD-d," CD-DA, CD-R is selected.

When the LCD displays "CD-r," CD-RW is selected.

Note 4) The test mode is cancelled by disconnecting the AC plug and removing the soldering of short land.

2. DISC distinction (confirmation of FE waveform)

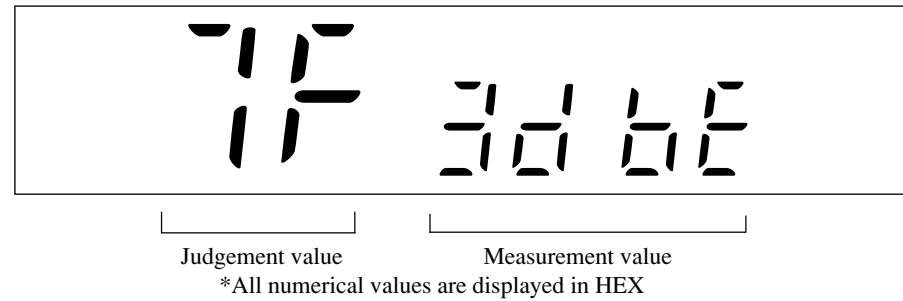
This mode is possible to perform a confirmation of the disc distinction.

Confirmation method

- 1) Press the DSL button and select "CD-d" or "CD-r" (Refer to Note 3).
- 2) Install the disc.
- 3) Press the MODE button.

The LCD will change as follows.

Example: Test disc: TCD-782, DISC type select: CD-d, Judgement value: 7F, Measurement value: 3D BE.



What disc the IC has selected can be understood according to this judgment value. The decision standard of IC is as follow.

	LCD displays "CD-d"	LCD displays "CD-r"
0 < Judgment value < 10	No disc	No disc
10 < Judgment value < 32	CD-RW	No disc
32 < Judgment value < C8	CD-DA and CD-R	CD-RW
C8 < Judgment value		CD-DA and CD-R

The state of the FE waveform can also be understood from this judgment value.

3. Confirmation of sled movement

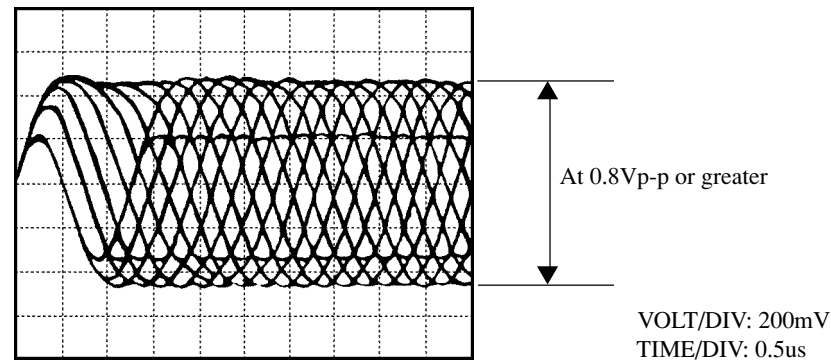
By pressing the F. SKIP or B. SKIP button continuously when all LCD light up, it is possible to transfer the pick-up to either the outer circumference or the inner circumference (the LCD is to remain all light up).

4. Confirmation of the RF level

Test point: RF and VC (Vref)

Test disc: TCD-782

Confirm that the RF waveform appears as shown below.

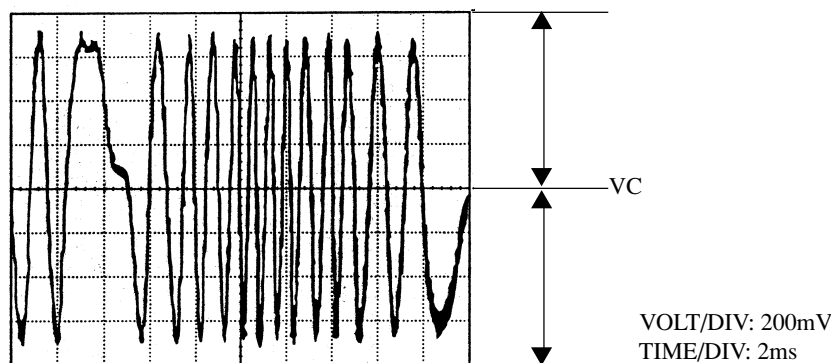


5. Confirmation of tracking balance

Test point: TE and VC (Vref)

Test disc: TCD-782

Press the DSL button while the test disc is playing and confirm that the traverse waveform is as is shown below.

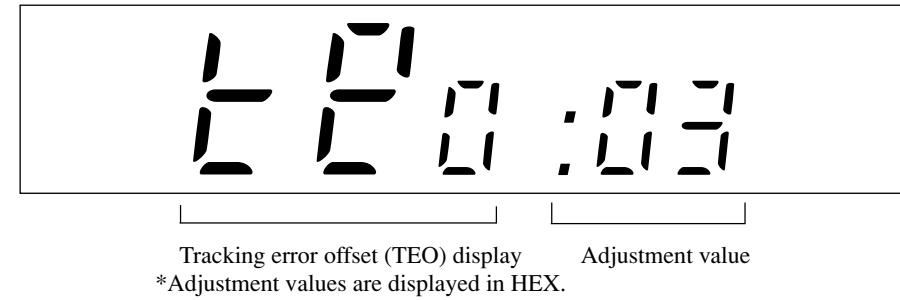


6. Confirmation of each servo

It is possible to confirm the adjustment value of each servo by repeatedly pressing the MODE button while the test disc is playing. The switchover sequence is as stated below.

Confirmation mode OFF -> Focus bias (FB) -> Tracking balance (TB) -> Tracking gain (TG) -> Tracking error offset (TEO) -> Focus gain (FG) -> Focus error offset (FEO) -> Confirmation mode OFF

Example: Tracking error offset (TEO) Adjustment value: 03



ADJUSTMENT

< TUNER SECTION >

1. DD converter clock adjustment

Settings : • Test point : Q204 Collector
• Adjustment location: TC208

Method : Set to AM603 kHz, 1404 kHz and adjust TC208 so that the test point becomes 360 kHz ± 1 kHz, 410 kHz ± 15 kHz.

2. AM VT Check

Settings : • Test point : TP1 (VT)

Method : Set to AM 531kHz and check that the test point is 1.0V ± 0.5V and set to AM 1602kHz and check the test point is 6.5V ± 1.0V.

3. AM Tracking Adjustment

Settings : • Test point : HP OUT (VOLUME MAX)

• Adjustment location :
BAR ANTENA.....603kHz
TC801.....1404kHz

* Repeat this adjustment a few times until the wave shape has the maximum amplitude.

4. AM IF Adjustment

IFT803.....999kHz

5. FM VT Adjustment(Lower side)

Settings : • Test point : TP(VT)

• Adjustment location : L801

Method : Set to FM 87.5MHz and adjust L851 so that the test point becomes 1.5 ~ 2.0V.

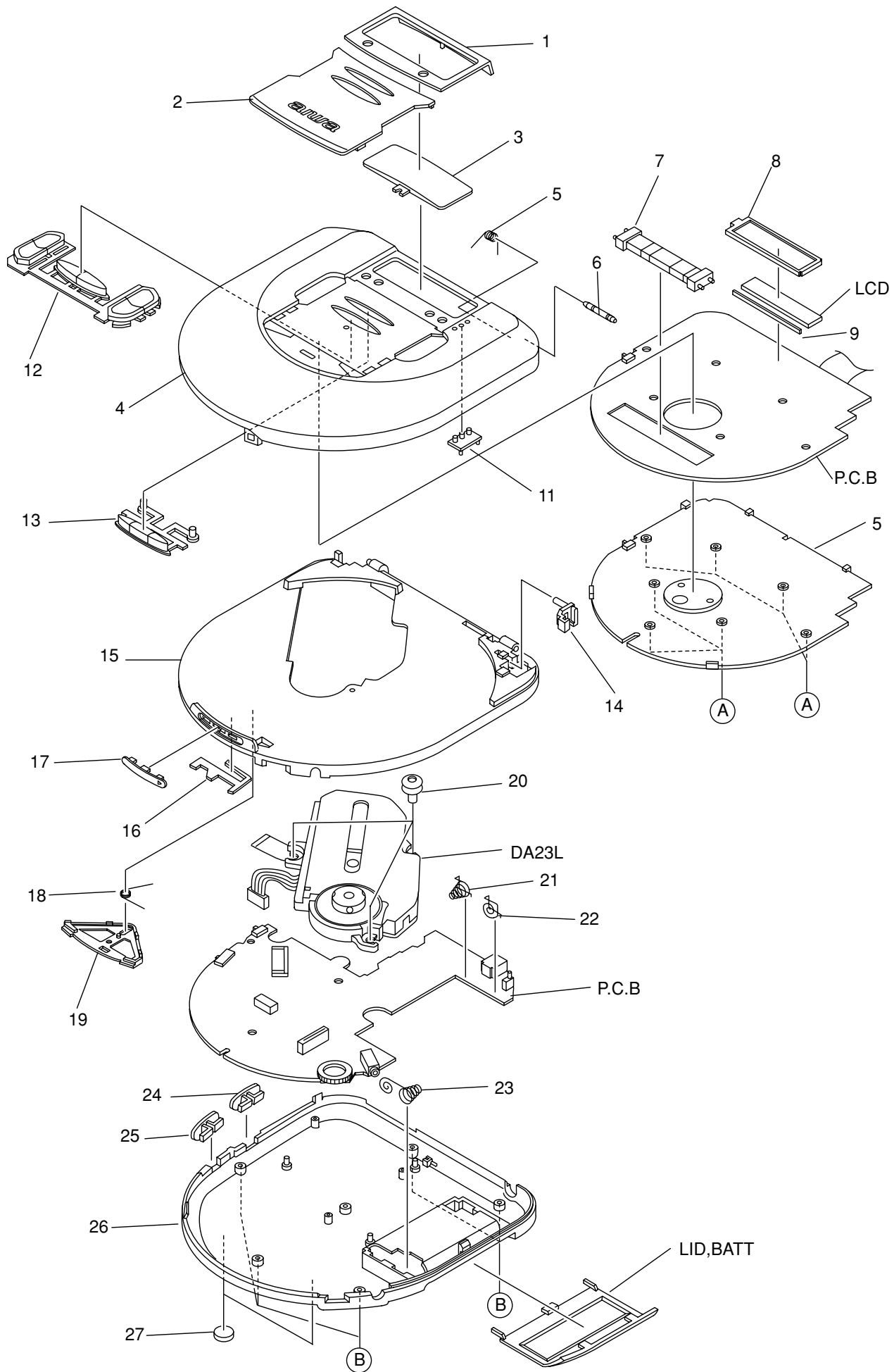
6. FM Tracking Adjustment

Settings : • Test point : HPOUT (VOLUME MAX)

• Adjustment location :
L802.....87.5MHz

* Repeat this adjustment a few times until the distortion is minimum.

MECHANICAL EXPLODED VIEW 1 / 1



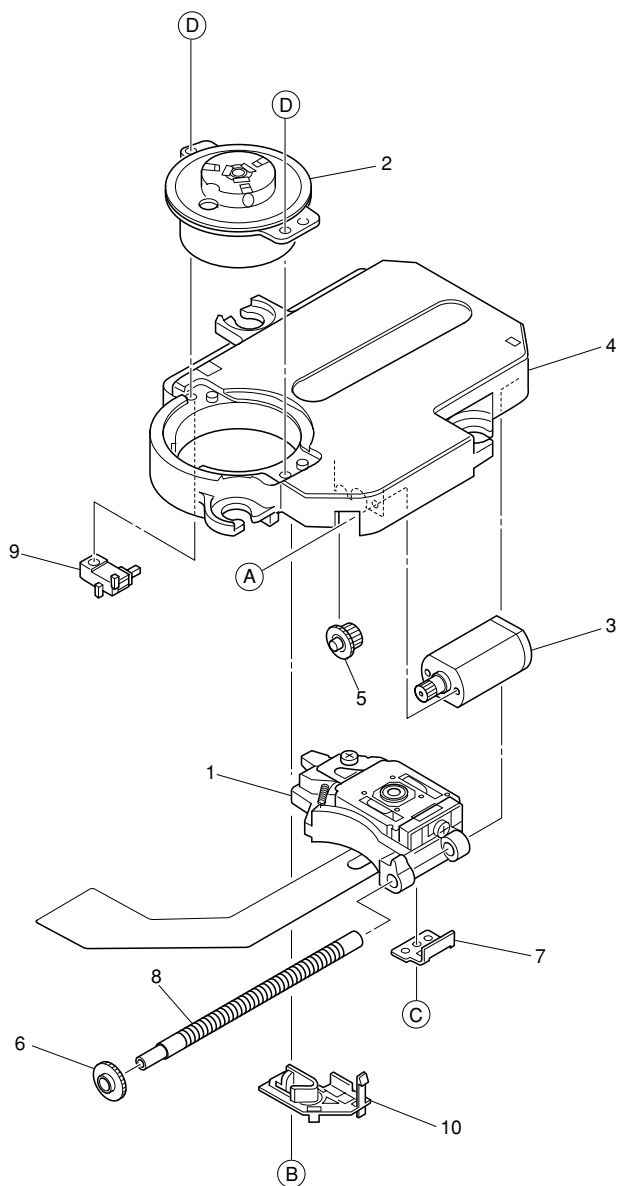
MECHANICAL PARTS LIST 1 / 1

REF. NO.	PART NO.	KANRI NO.	DESCRIPTION	REF. NO.	PART NO.	KANRI NO.	DESCRIPTION
1	8A-HC1-006-010		PANEL, DISPLAY	16	8A-HC1-203-010		LEVER, OPEN
2	8A-HC1-005-010		PANEL, LID CD	17	8A-HC1-010-010		KNOB, SL OPEN
3	8A-HC1-007-010		WINDOW, DISPLAY	18	8A-HC1-202-110		SPR-T, KNOB
4	8A-HC1-001-010		LID, CD	19	8A-HC1-204-010		HLDR, OPEN
5	8A-HC1-201-010		SPR-T, OPEN	20	8Z-HC1-225-010		DMPR, MECHA (SP)
6	85-HC6-205-110		SHAFT, LID (300) HK	21	8A-HC1-206-010		BAT-CONTACT, (-)
7	8Z-HC1-610-010		ANT, BAR-ANTENNA	22	8A-HC1-205-010		BAT-CONTACT, (+)
8	8A-HC1-207-010		PLATE, LCD	23	8Z-HC7-216-010		BAT-CONTACT, (+) (-) (SP)
9	8Z-HC1-209-010		JOINT, LCD ZHC-1	24	8A-HC1-013-010		KNOB, SL EASS
10	8A-HC1-009-010		HLDR, LID CD	25	8A-HC1-011-010		KNOB, SL HOLD
11	8A-HC1-015-010		LENS, LED	26	8A-HC1-012-010		CABI ASSY, BOTTOM
12	8A-HC1-008-010		KEY, PLAY	27	8Z-HC4-027-010		FOOT, DIA10
13	8A-HC1-014-010		KEY, BAND	A	87-067-384-010		SCREWVT1.4-3.5HL
14	8A-HC7-018-010		LEVER, OPEN	B	87-067-869-010		V+1.7-8 HL BLK
15	8A-HC1-002-010		CABI, CENTER				

COLOR NAME TABLE

Basic color symbol	Color	Basic color symbol	Color	Basic color symbol	Color
B	Black	C	Cream	D	Orange
G	Green	H	Gray	L	Blue
LT	Transparent Blue	N	Gold	P	Pink
R	Red	S	Silver	ST	Titan Silver
T	Brown	V	Violet	W	White
WT	Transparent White	Y	Yellow	YT	Transparent Yellow
LM	Metallic Blue	LL	Light Blue	GT	Transparent Green
LD	Dark Blue	DT	Transparent Orange		

CD MECHANISM EXPLODED VIEW 1 / 1



CD MECHANISM PARTS LIST 1 / 1

REF. NO.	PART NO.	KANRI NO.	DESCRIPTION
1	S0-A41-A20-600		PICKUP LASER ASSY
2	SM-10A-108-001		MOTOR ASSY SPINDLE
3	S0-M10-A10-900		MOTOR SLED ASSY
4	S2-311-A12-200		CHASSIS
5	S2-511-A23-200		GEAR MIDDLE
6	S2-511-A23-100		GEAR, SCREW
7	S2-511-A23-400		GEAR, RACK
8	S2-511-A07-900		SPINDLE SCREW
9	S4-S13-A00-200		SW, LEAF
10	S2-451-A18-100		HOLDER GEAR
A	SS-EXE-A04-000		SCR PAN PCS 1.4-2.2
B	SS-GXE-A00-300		SPECIAL SCREW
C	SS-EXE-A14-100		SPECIAL SCREW
D	SS-GXE-A00-202		SPECIAL SCREW M1.7-4.0

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