

SERVICE MANUAL

MD / CD
STEREO SYSTEM

BASIC TAPE MECHANISM : TN-21ZSC-2003
BASIC CD MECHANISM : DA11T3C
BASIC MD MECHANISM : AZG-4 A

SYSTEM	SPEAKER	REMOTE CONTROLLER
LCX-MD211	SX-MD210	RC-AAT11

- This Service Manual contains the additional information "TEST MODE", "ADJUSTMENT", "IC BLOCK DIAGRAM", "IC DESCRIPTION", "LCD DISPLAY" and "VOLTAGE" for the model LCX-MD211(EZ). If requiring the other information, see Service Manual of LCX-MD211(EZ), (S/M code No.09-007-429-4R2).

TEST MODE

CD TEST MODE

1-1 How to activate CD Test Mode

Insert the AC plug while pressing the "CD function" button.
Test mode will be activated and [CD TEST] will be appeared in the LCD display.

Note: Test mode can not be activated when CD door switch is opened.

1-2 CD Test Mode Functions

Mode	Function	Display	Operation	Content
Start Mode	Activate CD Test Mode	CD TEST		
Search Mode	s	SEARCH	Continuous Focus Search (Pickup lens repeat full swing) * Note 1	<ul style="list-style-type: none"> • APC circuit check • Laser current measurement • Focus error waveform check
Play Mode	E	PLAY	<ul style="list-style-type: none"> • Normal Playback • When TOC READ is unavailable, continuous Focus Search (Same as Search Mode Operation) 	<ul style="list-style-type: none"> • Focus servo • Tracking servo • CLV servo • Sled servo
Traverse Mode	Tuner Function Button	TRAVERS	Playback pause status	Tracking servo OFF
Sled Mode	g f	SLED IN SLED OUT	<ul style="list-style-type: none"> • Shift to the internal circumference of pickup • Shift to the external circumference of pickup 	<ul style="list-style-type: none"> • Sled servo • Mecha operation check

* Note 1: There are cases when CD cannot be operated owing to the protection circuit being operated when heat builds up in the driver IC if the focus search is operated continually for more than 10 minutes. In this case, the power supply should be switched off for ten minutes until heat has been reduced and then re-start.

1-3 How to cancel CD Test Mode

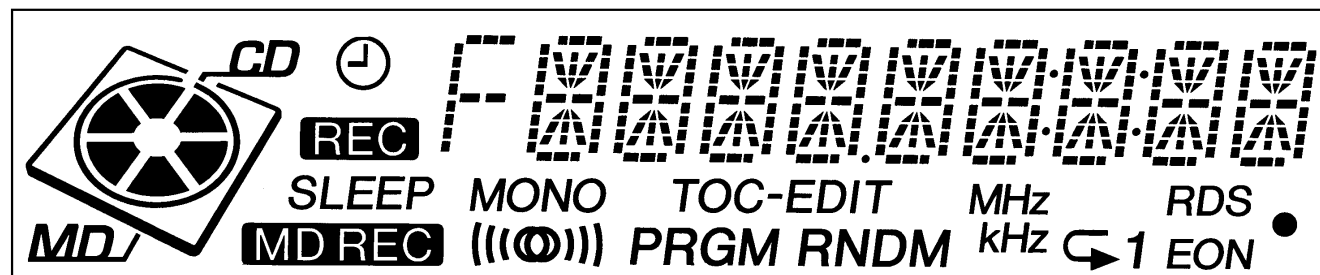
Either one of the following operations will cancel the CD test mode.

- Open the CD door switch.
- Press "POWER" button.
- Disconnect the AC plug.

LCD TEST MODE

1-1 How to activate LCD Test Mode

Insert the AC plug while pressing the "DISPLAY" button.
LCD display is fully illuminated and then all segments are lit on and off every one second.



1-2 How to cancel LCD Test Mode

LCD test mode will cancel by press "POWER" button or disconnect the plug.

MD TEST MODE

1-1 How to start up MD Test Mode

Insert the AC plug while pressing the "MD function" button.

After the MD test mode has started up, [MD TEST] message appears and the test mode becomes operatable.

Note: • Disconnect the AC plug immediately if any mechanism abnormalities.
 • Playback and recording are not possible during the test mode.

1-2 How to cancel MD Test Mode

1) Press the "MD EJECT" button and remove the disc.

2) Disconnect the AC plug or press "POWER" button.

1-3 Operation Check Mode

1) Checks after the test mode has started up.

The following playback audio circuits can be checked.

- Enable circuit to check ----- DAC, LINEAMP, HEADPHONE AMP
- Output level ----- 1KHz, -24dB

2) Switch status check

ON/OFF statuses of main unit and mechanism switches can be checked on display.

Switch name	Switch state	Indication on Display	Usalde disc
REC PROTECT	When the write-protection tab of disc is stopped.	TOC – EDIT	Record/playback disc
REFRECT	When the high reflection disc (CD) is used.	MD REC	Playback only disc
INNER	When the pickup is the positioned at the innermost track (when the LIMIT SW is ON).	MONO	_____

1-4 How to switch to Servo Standby Mode

When the test mode has been established, the mode changes to the servo standby mode by pressing "s" button (Indication on display : ALL SVOFF).

The various check modes can be entered from this mode.

Pressing the "s" button during each operation returns to [ALL SVOFF] .

1-5 Checking Sled Operation

1) When "g" button is pressed in the [ALL SVOFF] state, pickup moves in the outer direction. [T SLEDFWD] is displayed.

2) When "g" button is pressed in the [ALL SVOFF] state, pickup moves in the inner direction. [T SLEDRVS] is displayed.

1-6 Checking Laser Power

1) The laser power is switched each time the "EDIT" button is pressed in the "ALL SVOFF" state. Laser power output is changed as OFF→LASER READ→LASER 1/2→LASER WRITE→OFF order and indication on the display is follows;

Mode	Indication on display
OFF	ALL SVOFF
LASER READ	LA READ
LASER 1/2 WRITE	LA 1/2
LASER WRITE	LA WRITE

2) Press "s" button to return the display to [ALL SVOFF] after checking.

1-7 Checking OWH (Over Write Head) Operation

The operation of OWH can be checked by pressing following buttons in the loading status.

"MD EJECT" button-----OWH UP

"SYNCHRO REC" button-----OWH DOWN

* Note: Do not down OWH when using the high reflection disc (CD).

1-8 Checking Servo Operation

• Checking the focus search and spindle kick 1

1) When "E" button is pressed in the [ALL SVOFF] state without disc, focus search and spindle kick are executed continuously. [FOCUS SCH] is displayed.

2) Press "s" button to display [ALL SVOFF] after checking

• Checking the focus search and spindle kick 2

1) When "TUNER function" button is pressed in the "ALL SVOFF" state regardless disc existence, focus search and spindle kick are executed continuously. [FOCUS CHK] is displayed and S curve can be checked if disc is loaded.

2) Press "s" button to display [ALL SVOFF] after checking.

• Checking Focus Servo

1) Insert a test disc.

2) Move pickup to center track by pressing "g" or "E" buttons.

3) Press "JOG MODE" button to set the servo mode according to the inserted disc as follows;

• MO disc (MO)-----Indication on display [SEL GRV] .

• PIT disc (CD)-----Indication on display [SEL PIT] .

4) Press "E" button.

If focus servo is operating normally, the message [FOCUS ON] is displayed after [FOCUS SCH] .

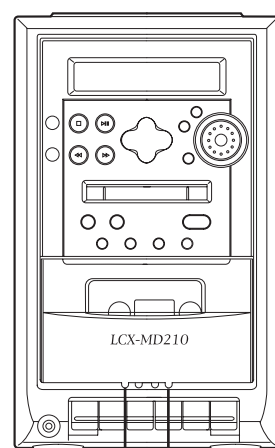
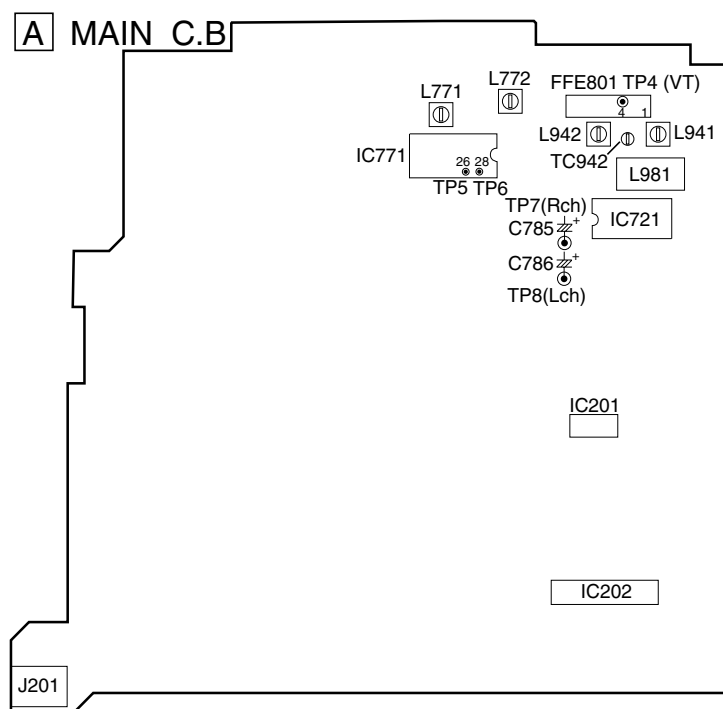
5) Press "s" button to display [ALL SVOFF] after checking.

• Checking all Servos are turned on.

1) Tracking and sled servos are turned on and all servos work when "ENTER" button is pressed in the [FOCUS ON!] state. [ALL SV ON] is displayed if all servos are normal.

2) Press "s" button to display [ALL SVOFF] after checking.

ADJUSTMENT <TUNER / DECK>



HEAD AZIMUTH
ADJUSTMENT SCREW

< TUNER SECTION >

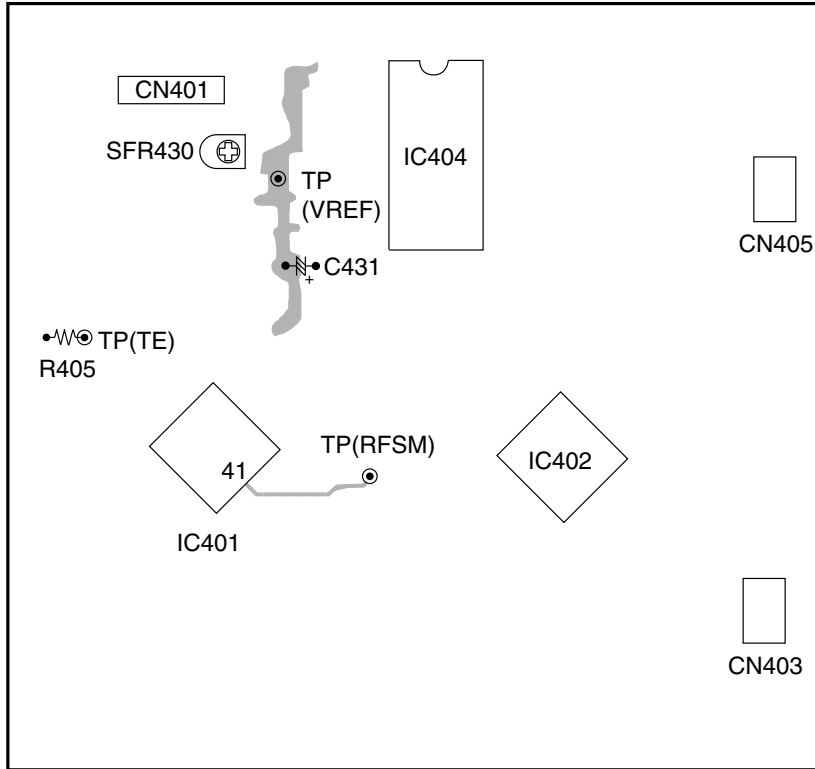
1. MW VT Check
 - Settings : • Test point : TP4 (VT)
 - Method : Set to MW 1602kHz and check that the test point is less than 5.6V.
2. MW Tracking Adjustment
 - Settings : • Test point : TP7 (RCH), TP8 (LCH)
 - Adjustment location : L981
 - Method : Set to MW 999kHz and adjust L981 so that the test point becomes maximum.
3. AM IF Adjustment
 - Settings : • Test point : TP7 (RCH), TP8 (LCH)
 - Adjustment location :
 - L772 450kHz
4. LW VT Adjustment
 - Settings : • Test point : TP4 (VT)
 - Adjustment location : L942
 - Method : Set to LW 153kHz and adjust L942 so that the test point becomes $1.3V \pm 0.05V$.
5. LW Tracking Adjustment
 - Settings : • Test point : TP7 (RCH), TP8 (LCH)
 - Adjustment location :
 - L941 153kHz
 - TC942 285kHz
 - Method : Set up TC942 to center before adjustment. The level at 153kHz is adjusted to maximum by L941. Then the level at 285kHz is adjusted to maximum by TC942.
6. FM VT Check
 - Settings : • Test point : TP4 (VT)
 - Method : Set to FM 108MHz and check that the test point is less than 8.2V. Then set to FM 87.5MHz and check that the test point is more than 1.5V.

7. FM Tracking Check
 - Settings : • Test point : TP7 (RCH), TP8 (LCH)
 - Method : Set to FM 98MHz and check that the test point is less than 18dB.
8. DC Balance / Mono Distortion Adjustment
 - Settings : • Test point : TP5, TP6 (DC balance)
 - TP7 (RCH), TP8(LCH)(Distortion)
 - Adjustment location : L771
 - Input level : 54dB
 - Method : Set to FM 98MHz and adjust L771 so that the voltage between TP3 and TP4 becomes $0V \pm 0.04V$. Next, check that the distortion is less than 1.5%.
9. FM Separation Check
 - Settings : • Test point : PHONE JACK (J201)
 - Input level : 54dB
 - Method : Set to FM 98MHz and check that the test point is more than 20dB.

< DECK SECTION >

10. Head Azimuth Adjustment
 - Settings : • Test tape : TTA-330
 - Test point : PHONE JACK (J201)
 - Adjustment location : Head azimuth adjustment screw
 - Method : 1) Connect the L positive terminal to CH1 probe (positive side) of oscilloscope and L negative terminal to CH1 probe (negative side). Connect the R positive and negative terminals to CH2 probe same condition as CH1 probe.
 - 2) Play back the 10kHz signal of the test tape.
 - 3) Adjust the head azimuth adjustment screw to become maximum waveform in the oscilloscope and same phase for CH1 and CH2.

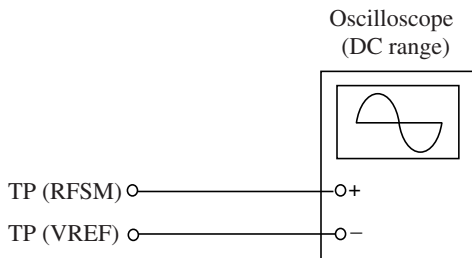
CD C.B



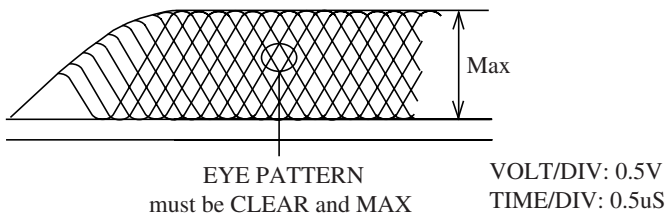
Note: • Connect a probe (10 : 1) of the oscilloscope to adjust.
 • Connect negative side of the oscilloscope to TP (VREF) for each adjustment.

1. Focus Bias Adjustment

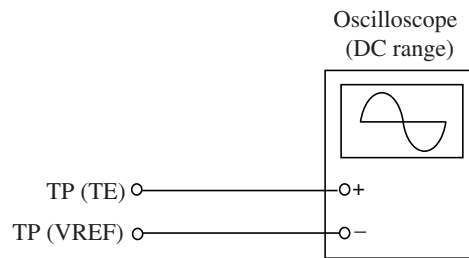
Adjust focus bias when replaing or repairing the optical block.



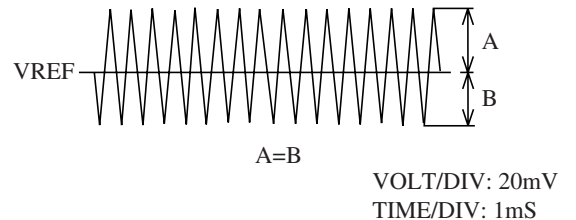
- 1) Connect an oscilloscope to the test points TP (RFSM) and TP(VREF).
- 2) Turn on the "POWER" button.
- 3) Insert the test disc TCD-782 (YEDS-18) and playack the 2nd composition.
- 4) Adjust SFR430 so that RF signal of the test point is MAX and CLEARREST.



2. Tracking Balance Adjustment



- 1) Connect an oscilloscope to the test point TP (TE) and TP (VREF).
- 2) Active the CD test mode.
- 3) Insert the test disc TCD-782 (YEDS-18) and choose traverse mode of CD test mode.
- 4) Check that the waveform of traverse is vertically symmetrical as shown below.
- 5) Cancel CD test mode after checking.



<MD>

- Perform 1~3 adjustment when display showing [NO ADJUST].

1. Temperature Compensation Adjustment

- Test point: Check on the display.
- Tool : Thermometer
- Adjustment procedure
 - 1) After MD test mode has started up, press "■" button to display [ALL SVOFF].
 - 2) Press "DISPLAY" button to display [TEMP = ◇◇].
 - 3) Press "T-BASS" button to display [T + ** C ± ##].
 - 4) Put the thermometer near the MD mechanism to measure the room temperature.
 - 5) Adjust the indication value ** using "▶" and "◀" buttons until the value is the same as room temperature.
Press "ENTER" button after adjusting.
 - 6) Press "■" button to display [ALL SVOFF] after adjusting.
 - 7) After adjustment is completed, once again set the display to [TMP + ** C ± ##] and check the value that has been calculated with the addition or subtraction of the numerical values of ## in relation to the ** value. This value is to be the same as room temperature.
NOTE: Do not perform this adjustment if it is not possible to measure the room temperature.

2. Laser Power Adjustment

- Test point: Pickup laser output
- Tool : Laser power meter
- Adjustment procedure
 - 1) Starting in the [ALL SVOFF] status, press "EDIT" button three times to change the display to [LA WRITE].
 - 2) Press "T-BASS" button once and change the display to [LASER = **].
 - 3) Measure the laser output of pickup with the laser power meter and adjust output by "▶▶" or "◀◀" buttons so that the measurement value becomes $6.8\text{mW} \pm 0.03\text{mW}$.
Press "ENTER" button after adjusting.
 - 4) Press "■" button to display [ALL SVOFF] after adjusting.
Caution: There is a possibility that pickup may be damaged if laser output exceeds 7.0mW .

3. Auto Sequence Adjustment (EFB/IVR/FOCUS AGC/TRACKING AGC adjustment)

- Test disc: MDW-60, TGYS-1

Adjustment MO disc

- 1) Insert the MDW-60 test disc.
- 2) Press "■" button to display [ALL SVOFF].
- 3) Press "JOG MODE" button to display [SEL GRV].
- 4) When pressing "MD function" button, [AUTO ADJ] is displayed and adjustment start.
After adjusting, [DONE] is displayed.
(If [FAILED] is displayed, the adjustment failed.)
- 5) Press "■" button to display [ALL SVOFF].
NOTE: 1. As there is a possibility that adjustment may not be able to adequately performed if the disc is dirty or scratched, make sure to keep the disc clean.
2. When using a MO disc, one section will be erased in order to change it to WRITE POWER, so a special disc is to be used.

Checking for IVR, EFB and focus/tracking/sled gain of MO disc

- 1) Move the pickup to the center track using "▶▶" or "◀◀" buttons.
- 2) Press "▶▶" button to display [FOCUS ON].
- 3) Press "ENTER" button to switch the mode to [ALL SV ON].
- 4) Press "■" button and "DISPLAY" button twice.

Then, confirm the values of [I ** E ◇◇] in the display are within the following range.

[**] 04~0A
[◇◇] 09~15

- 5) Press "DISPLAY" button again.

Confirm the values of [F ** T ## S △△] in the display are within the following range.

[**] 1A~45
[##] 00~03

[△△] 00~03

- 6) Press "■" button to display [ALL SVOFF].

Adjustment for PIT disc

- 1) Insert the TGYS-1 test disc.
- 2) Press "■" button to display [ALL SVOFF].
- 3) Press "JOG MODE" button to display [SEL PIT].
- 4) When pressing "MD function" button, [AUTO ADJ] is displayed and adjustment start.
After adjusting, [DONE] is displayed.
(If [failed] is displayed, the adjustment failed.)
- 5) Press "■" button to display [ALL SVOFF].

Checking IVR, EFB and focus/tracking/sled gain of PIT disc

Perform the same procedures as for MO disc and check that the display is within the range below;

[IVR].....14~19

[EFB].....09~15

[FOCUS GAIN].....1A~45

[Tracking gain].....00~3F

[Sled gain].....00~3F

4. Checking Error Rate (PIT disc)

- 1) Insert the TGYS-1 test disc.
- 2) Move the pickup to the center track using "▶▶" or "◀◀" buttons.
- 3) Press "JOG MODE" button to display [SEL PIT].
- 4) Press "▶▶" button to display [FOCUS ON].
- 5) Press "ENTER" button to switch the mode to [ALL SV ON].
Then press "DISPLAY" button twice to display [00 ** 000].
- 6) Check the value of ** is below [30] at this time.
- 7) Press "■" button to display [ALL SVOFF].

5. Checking Record/Playback Error Rate (MO disc)

- 1) Insert the MDW-60 test disc.
- 2) Move the pickup to the center track using "▶▶" or "◀◀" buttons.
- 3) Press "JOG MODE" button to display [SEL GRV].
- 4) Press "MD REC" button to display [R ANALOG].
- 5) Press "▶▶" button to display [FOCUS ON].
- 6) After displaying [ALL SV ON] by pressing "ENTER" button, press "SYNCHRO REC" button.
- 7) Recording begins after OWH has moved when "MD REC" button is pressed once again.
At this time, display will change from [ALL SV ON] to [A0600C ## S].
- 8) Press "■" button after recording has progressed for about 15 seconds, changing the display to [ALL SVOFF].
- 9) Press "MD EJECT" button to raise the OWH.
- 10) Press "▶▶" button to display [FOCUS ON].
- 11) Once [ALL SV ON] has been displayed by pressing "ENTER" button, press "DISPLAY" button to display [A **** C ## S].
After **** reaching 600, press "DISPLAY" button once again to display [00 ** 000].
Check that the value of ** is below than [20] at this time.

12) Press "■" button to display [ALL SVOFF].

6. UTOC ERASE

To be performed only when erasure is needed with disc that have already been recorded upon.

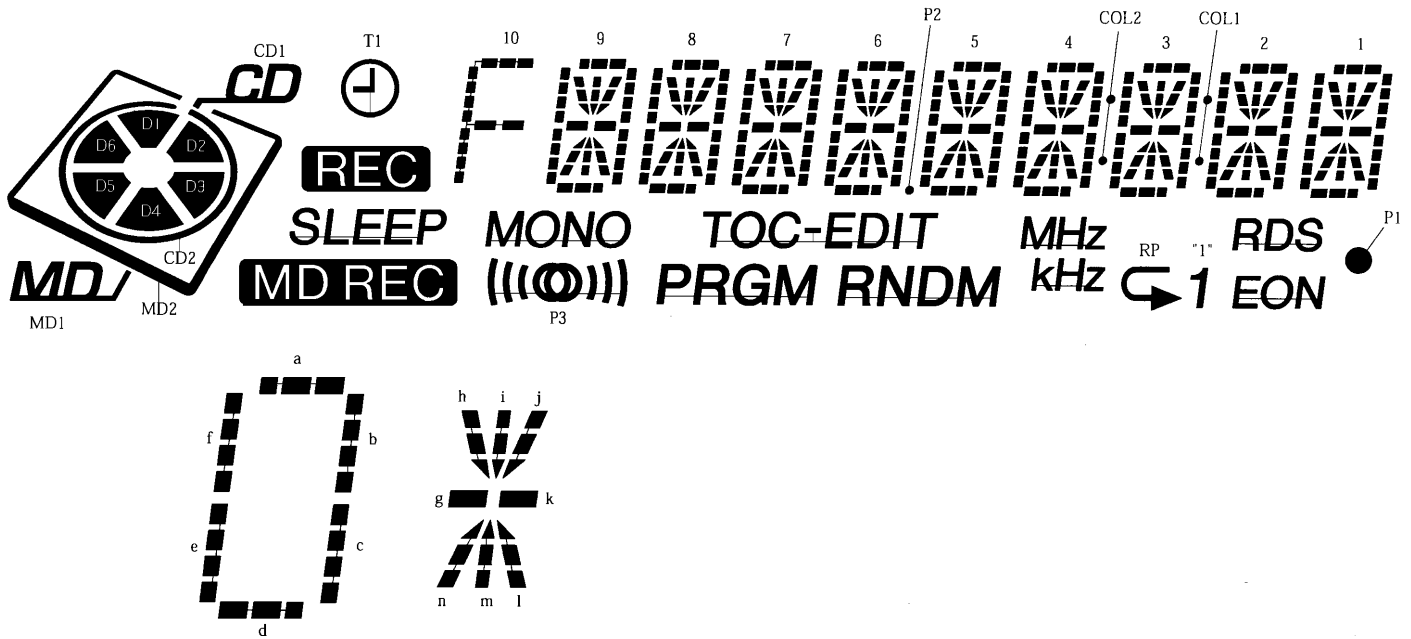
- 1) Insert the disc that is to be used to erase the UTOC.
- 2) Move the pickup to the center track using "▶▶" or "◀◀" buttons.
- 3) Press "JOG MODE" button to display [SEL GRV].
- 4) Press "MD REC" button to display [R ANALOG].
- 5) Press "▶■" button to display [FOCUS ON].
- 6) Press "ENTER" button to display [ALL SV ON].
- 7) Press "MD REC" button for more than one second continuously, [UTOC ERASE] will be displayed and UTOC erased.
- 8) Once the UTOC has been erased, [ALL SVOFF] will be displayed.

SERVICE JIG AND TOOLS

Service jigs and tools for repairing as follows;

	Usage	Parts Name	Parts No
CD	CD mecha stand	JIG, P-CD BY TORIKOSHI	SV-J00-018-010
	PU extention FFC	FFC-CABLE, 16P 1.0 250mm	87-CE1-640-010
MD	S.T.I. G-98-50	FFC, 8P-1.0	SV-J00-043-010
	S.T.I. G-98-50	FFC, 14P-1.0	SV-J00-044-010

LCD DISPLAY GRIDASSIGNMENT



ANODE CONNECTION

No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
COM 1	--	--	--	COM 1	1a	1i	1h	1f	2a	2i	2h	COL1	3a	3i	3h
COM 2	--	--	COM 2	--	1b	1j	1g	1e	2b	2j	2g	2f	3b	3j	3g
COM 3	--	COM 3	--	--	1c	1k	1n	1d	2c	2k	2n	2e	3c	3k	3n
COM 4	COM 4	--	--	--	P1	1l	1m	EON	RDS	2l	2m	2d	"1"	3l	3m

No	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
COM 1	3f	--	4a	4i	4h	4f	5a	5i	5h	5f	6a	6i	6h	6f	7a
COM 2	3e	COL2	4b	4j	4g	4e	5b	5j	5g	5e	6b	6j	6g	6e	7b
COM 3	3d	MHz	4c	4k	4n	4d	5c	5k	5n	5d	6c	6k	6n	6d	7c
COM 4	RP	kHz	--	4l	4m	--	P3	5l	5m	RNDM	P2	6l	6m	PRGM	TOC EDIT

No	31	32	33	34	35	36	37	38	39	40	41	42	43
COM 1	7i	7h	7f	8a	8i	8h	8f	9a	9i	9h	9f	MD1	D3,D6
COM 2	7j	7g	7e	8b	8j	8g	8e	9b	9j	9g	9e	T1	D2,D5
COM 3	7k	7n	7d	8c	8k	8n	8d	9c	9k	9n	9d	CD1	CD2
COM 4	7l	7m	MD REC	MONO	8l	8m	SLEEP	REC	9l	9m	10	MD2	D1,D4

IC DESCRIPTION

IC, LC877264A-EZ

Pin No.	Pin Name	I/O	Description
1	O-ARDY	O	Output ready signal for MD micro controller communication. L: Enable.
2	O-SREQ	O	Request system micro controller output for MD micro controller communication. L: Enable.
3	O-SOUT	O	Output serial data for MD micro controller communication.
4	I-SIN	I	Input serial data for MD micro controller communication.
5	I-ACLK	I	Input serial clock for MD micro controller communication.
6	I-MREQ	I	Request system micro controller output for MD micro-computer communication. L: Enable.
7	NC (SELECT)	-	Not used.
8	O-PCONT	O	Output system power control. H: ON.
9	I-HOLD	I	Detect Hold status. L: HOLD.
10	O-CLKSFT	O	Control clock shift. L: Shift.
11	I-RESET	I	Input reset.
12	XT1	I	Not used (pull up in VDD).
13	XT2	-	Not connected.
14	VSS1	-	Power supply (-) terminal.
15	CF1	I	Input terminal for ceramic oscillator (5.76MHz).
16	CF2	O	Output terminal for ceramic oscillator (5.76MHz).
17	VDD1	-	Power supply (+) terminal.
18	I-JOGA	I	Detect jog dial A.
19	I-JOGB	I	Detect jog dial B.
20	I-KEY1	I	Detect tact key AD input.
21	I-KEY2		
22	I-RDSIG	I	Input RDS signal level and AD.
23	I-CTON	I	Detect CT deck power. H: OFF, L: ON.
24	I-RDDT	I	Input RDS data.
25	I-COLOR	I	Input LCD back light initial setting.
26	I-TMBASE	I	Input reference frequency for 8Hz clock.
27	I-INIT	I	Input diode matrix initial setting.
28	I-RDCL	I	Input RDS clock.
29	I-RMC	I	Input received signal for remote controller.
30	I-CTPLAY	I	Detect CT deck play. H: PLAY.
31	I-CTREC	I	Detect CT deck record. H: REC.
32	O-TUCONT	O	Control tuner power. H: ON.
33	O-TUCE	O	Output chip enable for tuner PLL communication.
34	O-TUDI	O	Output serial data for tuner PLL communication.
35	O-TUCL	O	Output clock for tuner PLL communication.
36	I-TUDO	I	Input serial data for tuner PLL communication.
37	I-STEREO	I	Detect receiving tuner stereo. H: MONO, L: STEREO.
38	NC	-	Not connected.
39~53	S9~S23	O	Output LCD segment.
54	VDD2	-	Power supply (+) terminal.
55	VCC2	-	Power supply (-) terminal.
56~79	S24~S47	O	Output LCD segment.

Pin No.	Pin Name	I/O	Description
80	I-DOOR	I	Detect CD door. H: OPEN, L: CLOSE.
81	I-WRQ	I	Sub code Q read standby for CD LSI communication.
82	I-DRF	I	Input RF level detection.
83	COM0	O	Output COM1.
84	COM1	O	Output COM2.
85	COM2	O	Output COM3.
86	COM3	O	Output COM4.
87	O-CDCONT	O	Control CD power. H: ON.
88	I-SQOUT	I	Input sub code Q for CD LSI communication
89	VSS3	-	Power supply (-) terminal.
90	VDD3	-	Power supply (+) terminal.
91	O-RWC	O	Input/output switching control for CD LSI communication. H: Write, L: Read.
92	O-COIN	O	Output serial data for CD LSI communication.
93	O-CQCK	O	Output serial clock for CD LSI communication.
94	O-LIGHT1	O	Output LCD back light control 1.
95	O-JOGLED	O	Indicate the JOG function status. L: Volume.
96	O-SCONTM	O	Control sound processor. H: H, M: H, L: L.
97	O-SCONTL	O	Control sound processor. H: H, M: L, L: L.
98	O-MUTE	O	Output audio signal mute. H: ON.
99	O-LIGHT2	O	Output LCD back light cotrol 2.
100	O-SRST	O	Reset MD micro controller. L: Reset.

Pin No.	Pin Name	I/O	Description
1	FIN2	I	Connect to the pickup's photo diode; adding this pin to pin FIN1 generates RF signal, and subtracting it generates FE signal.
2	FIN1	I	Connect to the pickup's photo diode.
3	E	I	Connect to the pickup's photo diode; subtracting this pin from pin F generates TE signal.
4	F	I	Connect to the pickup's photo diode.
5	TB	I	Input for DC component of TE signal.
6	TE-	I	Connect to the resistor between this pin and TE pin for setting the gain of TE signal.
7	TE	O	Output for TE signal.
8	TESI	I	Input for TES (Track Error Sense) comparator, TE signal is band-passed and inputted.
9	SCI	I	Input for shock detection.
10	TH	I	For setting tracking gain time constant.
11	TA	O	TA amplifier output pin.
12	TD-	I	For constructing tracking phase compensation constant between TD and VR pins.
13	TD	O	For setting tracking phase compensation.
14	JP	I	For setting the amplifier of tracking jump signal (kick pulse).
15	TO	O	Output for tracking control signal.
16	FD	O	Output for focusing control signal.
17	FD-	I	For constructing focusing phase compensation constant between FD and FA pins.
18	FA	O	For constructing focusing phase compensation constant between FD- and FA- pins.
19	FA-	I	For constructing focusing phase compensation constant between FA and FE pins.
20	FE	O	Output for FE signal.
21	FE-	I	Connect to the gain-setting resistor of FE signal between this pin and FE pin.
22	AGND	-	GND for analog signals.
23	SP	O	Single end output of CV+ and CV- pin input signal.
24	SPI	I	Input spindle amplifier.
25	SPG	I	Connect to the gain-setting resistor during spindle 12cm mode. (Not connected)
26	SP-	I	Connect to spindle phase compensation constant together with SPD pin.
27	SPD	O	Output for spindle control signal.
28	SLEQ	I	Connect to sled phase compensation constant.
29	SLD	O	Output for sled control signal.
30	SL-	I	Input for sled-sending signal from microcontroller.
31	SL+		
32	JP-	I	Input for tracking jump signal from DSP.
33	JP+		
34	TGL	I	Input for tracking gain control signal from DSP; gain is low if TGL = "H".
35	TOFF	I	Input for tracking off control signal from DSP; off if TOFF = "H".
36	TES	O	Output TES signal to DSP.
37	HFL	O	HIGH FREQUENCY LEVEL; used to determine whether the main beam is on a pit or on a mirror.
38	SLOF	I	Input for sled servo off control.

Pin No.	Pin Name	I/O	Description
39	CV-	I	Input for CLV error signal from DSP.
40	CV+		
41	RFSM	O	Output for RF.
42	RFS-	O	For setting RF gain and 3T compensation constant together with RFSM.
43	SLC	O	SLICE LEVEL CONTROL; output for controlling the data slice level of DSP with RF waveform.
44	SLI	I	Input for controlling the data slice level of DSP.
45	DGND	-	GND for digital system.
46	FSC	O	Output pin for focus search smoothing capacitor.
47	TBC	I	(Tracking Balance Control) EF balance variable range setting pin.
48	NC	-	Not connected.
49	DEF	O	Output for disk defect detection.
50	CLK	I	Reference clock input; DSP's 4.23MHz is inputted.
51	CL	I	Clock input for micro controller command.
52	DAT	I	Data input for micro controller command.
53	CE	I	Chip-enable input for micro controller command.
54	DRF	O	Detect RF; output for RF level detection.
55	FSS	I	(Focus Search Mode) = search/+search against reference voltage switching pin. (Not connected)
56	VCC2	-	VCC pin for servo and digital systems.
57	REFI	-	For connecting pass capacitor to reference voltage.
58	VR	O	Reference voltage output.
59	LF2	-	For setting disk defect-detection time constant.
60	PHI	-	Connect to capacitor for RF signal peak hold.
61	BHI	-	Connect to capacitor for RF signal bottom hold.
62	LDD	O	Output for APC circuit.
63	LDS	I	Input for APC circuit.
64	VCC1	-	VCC pin for RF system.

IC, LC78622ED

Pin No.	Pin Name	I/O	Description
1	DEFI	I	Defect detection signal (DEF) input.
2	TAI	I	Test input. A pull-down resistor is built in. (Must be connected to 0V)
3	PDO	O	External VCO control phase comparator output.
4	VVSS	–	Internal VCO ground. (Must be connected to 0V)
5	ISET	I	PDO output current adjustment resistor connection.
6	VVDD	–	Internal VCO power supply.
7	FR	I	VCO frequency range adjustment.
8	VSS	–	Digital system ground. (Must be connected to 0V)
9	EFMO	O	Slice level control; EFM signal output.
10	EFMIN	I	Slice level control; EFM signal input.
11	T2	I	Test input. A pull-down resistor is built in. (Must be connected to 0V)
12	CLV+	O	Disc motor control output.
13	CLV–		Three-value output is also possible when specified by microprocessor command.
14	V/P	O	Rough servo/phase control automatic switching monitor output. H: Rough servo, L:phase servo.
15	HFL	I	Track detection signal input. This is a Schmitt input.
16	TES	I	Tracking error signal input. This is a Schmitt input.
17	TOFF	O	Tracking off output.
18	TGL	O	Tracking gain switching output. Increase the gain when low.
19	JP+	O	Track jump output.
20	JP–		Three-value output is also possible when specified by microprocessor command.
21	PCK	O	EFM data playback clock monitor. Outputs 4.3218 MHz when the phase is locked. (Not connected)
22	FSEQ	O	Synchronization signal detection output. Outputs a high level when the synchronization signal detected from the EFM signal and the internally generated synchronization signal agree. (Not connected)
23	VDD	–	Digital system power supply.
24	SL+	O	Sled advance + signal output.
25	SL–	O	Sled advance - signal output.
26	NC	–	Not connected.
27	PU IN	I	CD pickup inside limit switch. When inside limit input "L", when CD-RW output "H".
28	RW	O	Gain control.
29	EMPH	O	De-emphasis monitor pin. De-emphasis disc is being played back at H. (Not connected)
30	C2F	O	C2 flag output. (Not connected)
31	DOUT	O	Digital output (EIAJ format).
32	T3	I	Test input. A pull-down resistor is built in. (Must be connected to 0V)
33	T4		
34	NC	–	Not connected.
35	MUTEL	O	Left channel one-bit DAC L channel mute output. (Not connected)
36	LVDD	–	Left channel one-bit DAC L channel power supply.
37	LCHO	O	Left channel one-bit DAC L channel output.
38	LVSS	–	Left channel one-bit DAC L channel ground. (Must be connected to 0V)

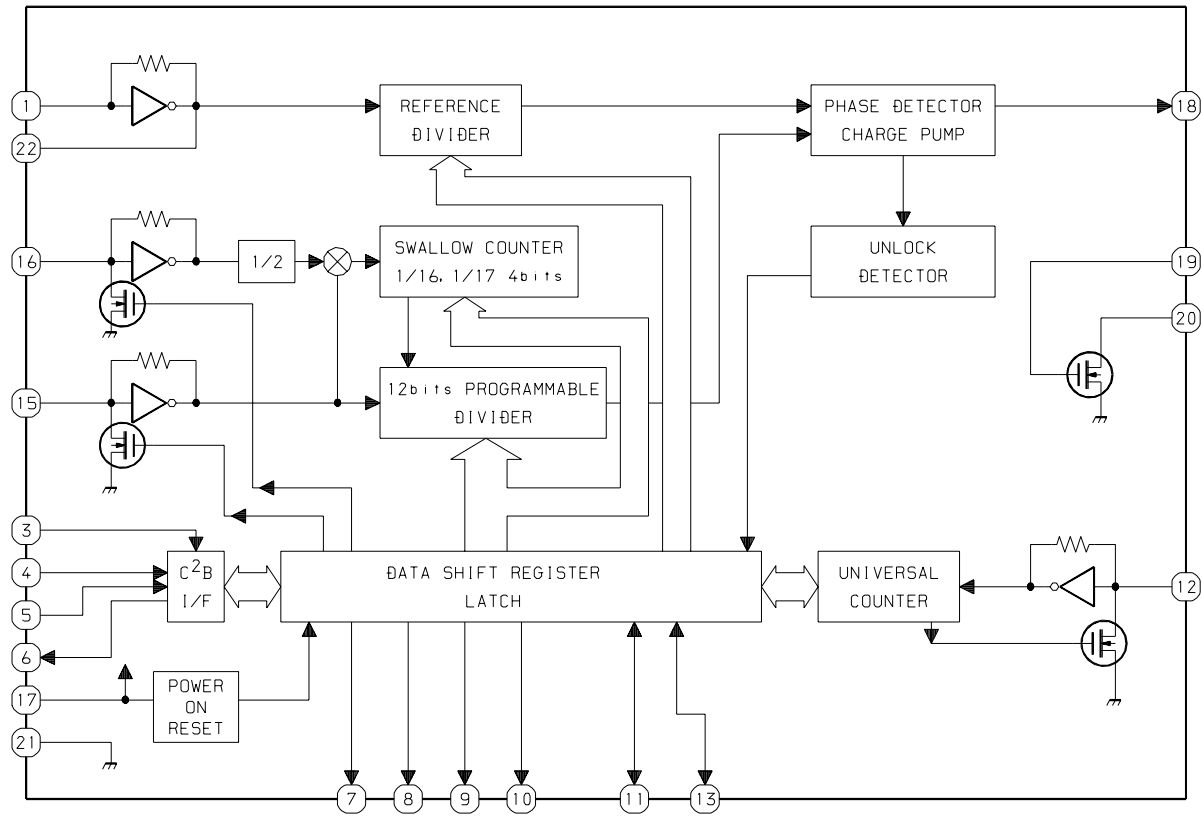
Pin No.	Pin Name	I/O	Description
39	RVSS	–	Right channel one-bit DAC R channel ground. (Must be connected to 0V)
40	RCHO	O	Right channel one-bit DAC R channel output.
41	RVDD	–	Right channel one-bit DAC R channel power supply.
42	MUTER	O	Right channel one-bit DAC R channel mute output. (Not connected)
43	XVDD	–	Crystal oscillator power supply.
44	XOUT	O	Connection for a 16.934MHz crystal oscillator element.
45	XIN	I	
46	XVSS	–	Crystal oscillator ground. (Must be connected to 0V)
47	SBSY	O	Subcode block synchronization signal output. (Not connected)
48	EFLG	O	C1, C2 single and double error correction monitor pin. (Must be connected to 0V)
49	PW	O	Subcode P, Q, R, S, T, U, V and W output. (Not connected)
50	SFSY	O	Subcode frame synchronization signal output. This signal falls when the subcode are in the standby state. (Not connected)
51	SBCK	I	Subcode readout clock input. This is a Schmitt input. (Must be connected to 0V)
52	FSX	O	Output for the 7.35 kHz synchronization signal divided from the crystal oscillator. (Not connected)
53	WRQ	O	Subcode Q output standby output.
54	RWC	I	Read/write control input. This is a Schmitt input.
55	SQOUT	O	Subcode Q output.
56	COIN	I	Command input from the control microprocessor.
57	$\overline{\text{CQCK}}$	I	Command input read clock or subcode readout input clock from SQOUT pin. This is a Schmitt input
58	$\overline{\text{RES}}$	I	Reset pin. This pin must be set low briefly after power is first applied.
59	T11	O	Test output. Leave open. (Normally outputs a low level). (Not connected)
60	16M	O	16.9344 MHz output. (Not connected)
61	4.2M	O	4.2336 MHz output.
62	T5	I	Test input. A pull-down resistor is built in. (Must be connected to 0V)
63	$\overline{\text{CS}}$	I	Chip select input. A pull-down resistor is built in. (Must be connected to 0V)
64	T1	I	Test input. No pull-down resistor. (Must be connected to 0V)

IC, LC72131D

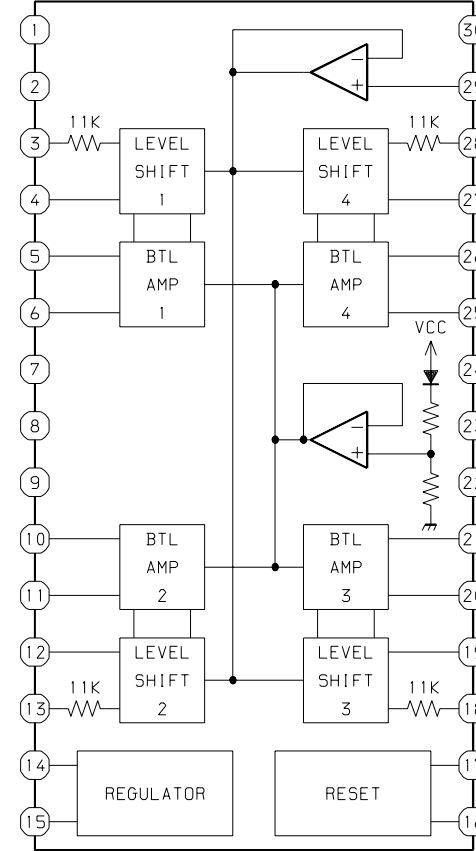
Pin No.	Pin Name	I/O	Description															
1	X IN	I	A crystal oscillator (4.5MHz) is connected to X OUT pin.															
2	NC	–	Not connected.															
3	CE	I	To enable the IC. Active "H".															
4	DI	I	Digital data input from CPU (LC877264A-EZ) when relevant key is operated. Active "H".															
5	CL	I	To clock in the data DI.															
6	DO	O	Digital data output to CPU (LC877264A-EZ).															
7	T-BASE	O	Output a reference clock signal (8Hz) for the clock.															
8	$\overline{\text{MONO}} / \text{BEAT}$	O	Output "L" when MONO / BEAT is switched.															
9	$\overline{\text{FM}} / \overline{\text{SW}}$	O	Output "L" or "H" as follows: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th colspan="2">2 BAND</th> <th colspan="3">3 BAND</th> </tr> <tr> <th>AM</th> <th>FM</th> <th>LW</th> <th>MW</th> <th>FM</th> </tr> </thead> <tbody> <tr> <td>H</td> <td>L</td> <td>H</td> <td>H</td> <td>L</td> </tr> </tbody> </table>	2 BAND		3 BAND			AM	FM	LW	MW	FM	H	L	H	H	L
2 BAND		3 BAND																
AM	FM	LW	MW	FM														
H	L	H	H	L														
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2 BAND		3 BAND																
AM	FM	LW	MW	FM														
L	L	H	L	L														
11	IF-MUTE	O	To control internal counter.															
12	IF-IN	I	General purpose counter input.															
13	$\overline{\text{TUNE}}$	I	Receives "L" when station is tuned.															
14	NC	–	Not connected.															
15	AMIN	I	Receives the AM local oscillator frequency signal.															
16	FMIN	I	Receives the FM local oscillator frequency signal.															
17	VDD	–	Supply power to IC (+5V).															
18	PD	O	PLL charge pump output.															
19	AIN	I	The MOS transistor used for PLL active low pass filter.															
20	AOUT	O																
21	VSS	–	Ground.															
22	X OUT	O	A crystal oscillator (4.5MHz) is connected to X IN pin.															

IC BLOCK DIAGRAM

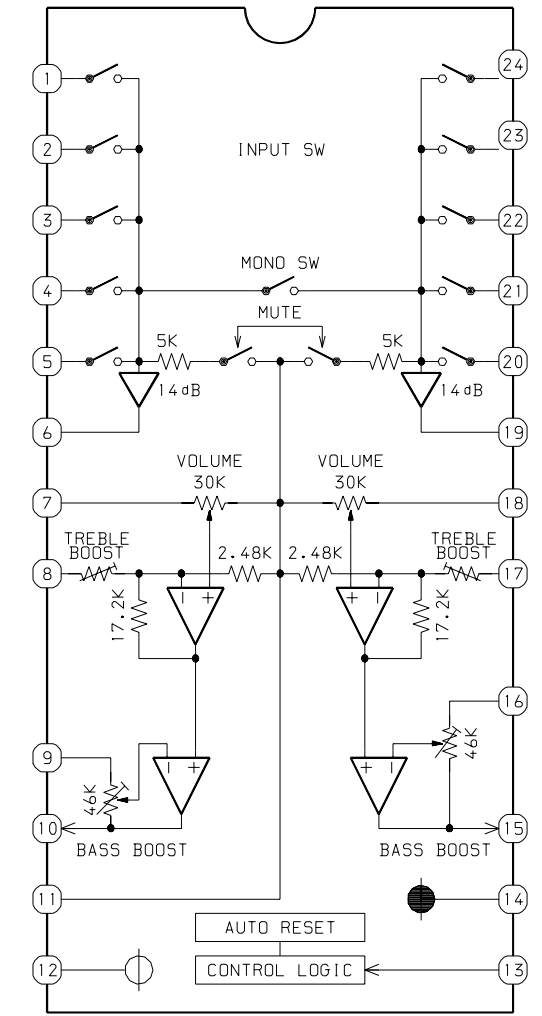
IC, LC72131D



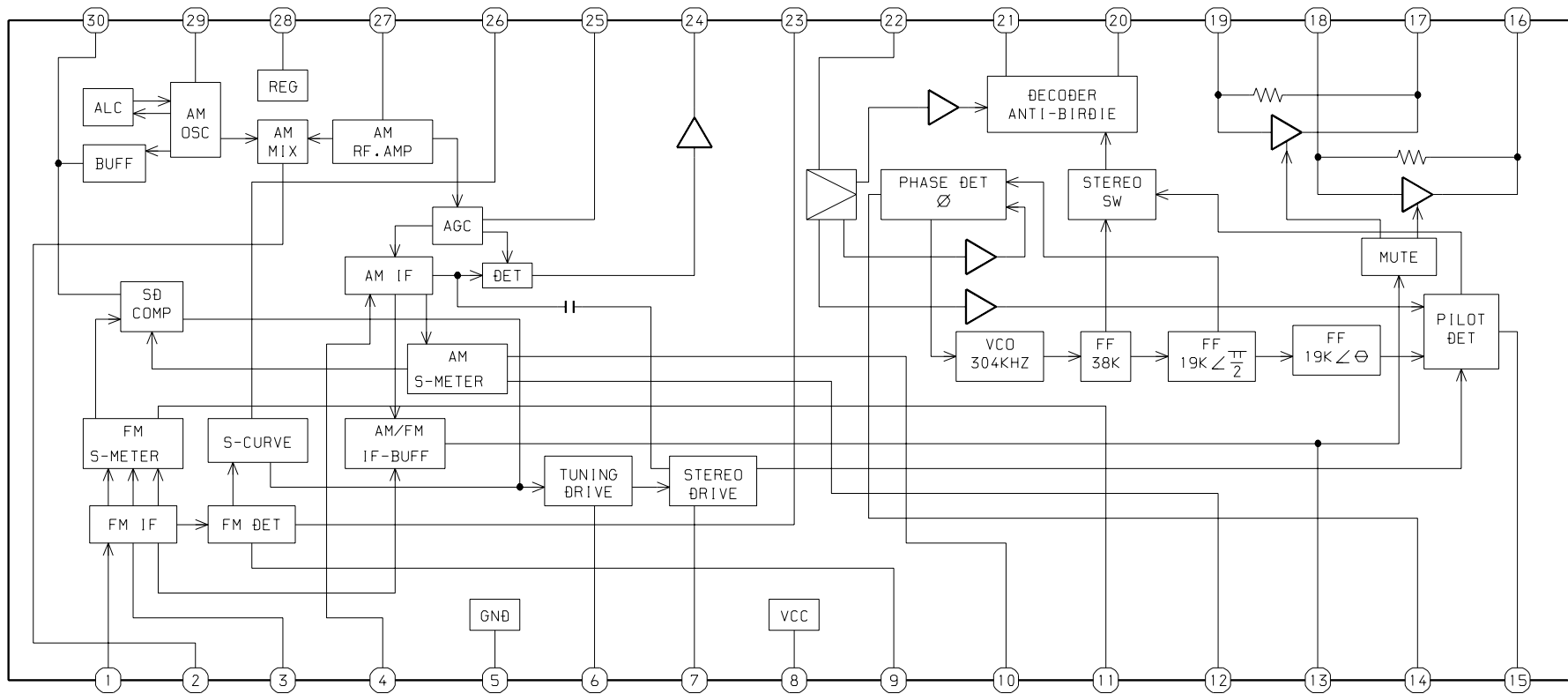
IC, LA6541D



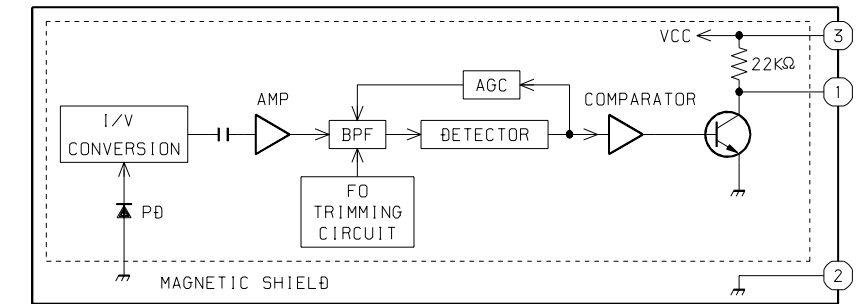
IC, M62495AFP



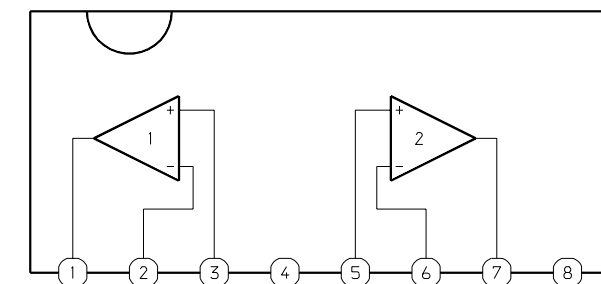
IC, LA1837NL



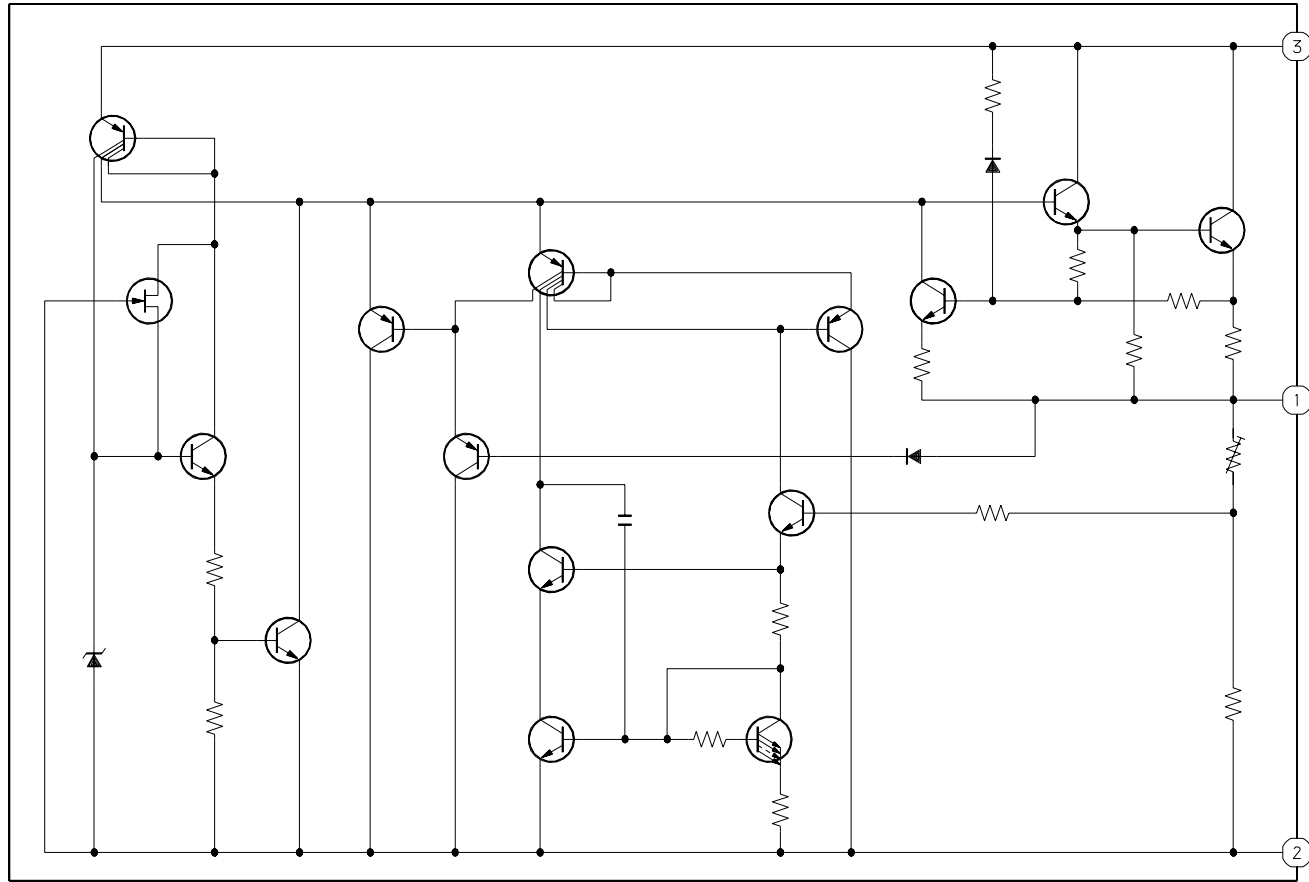
IC, RPM6938-H4



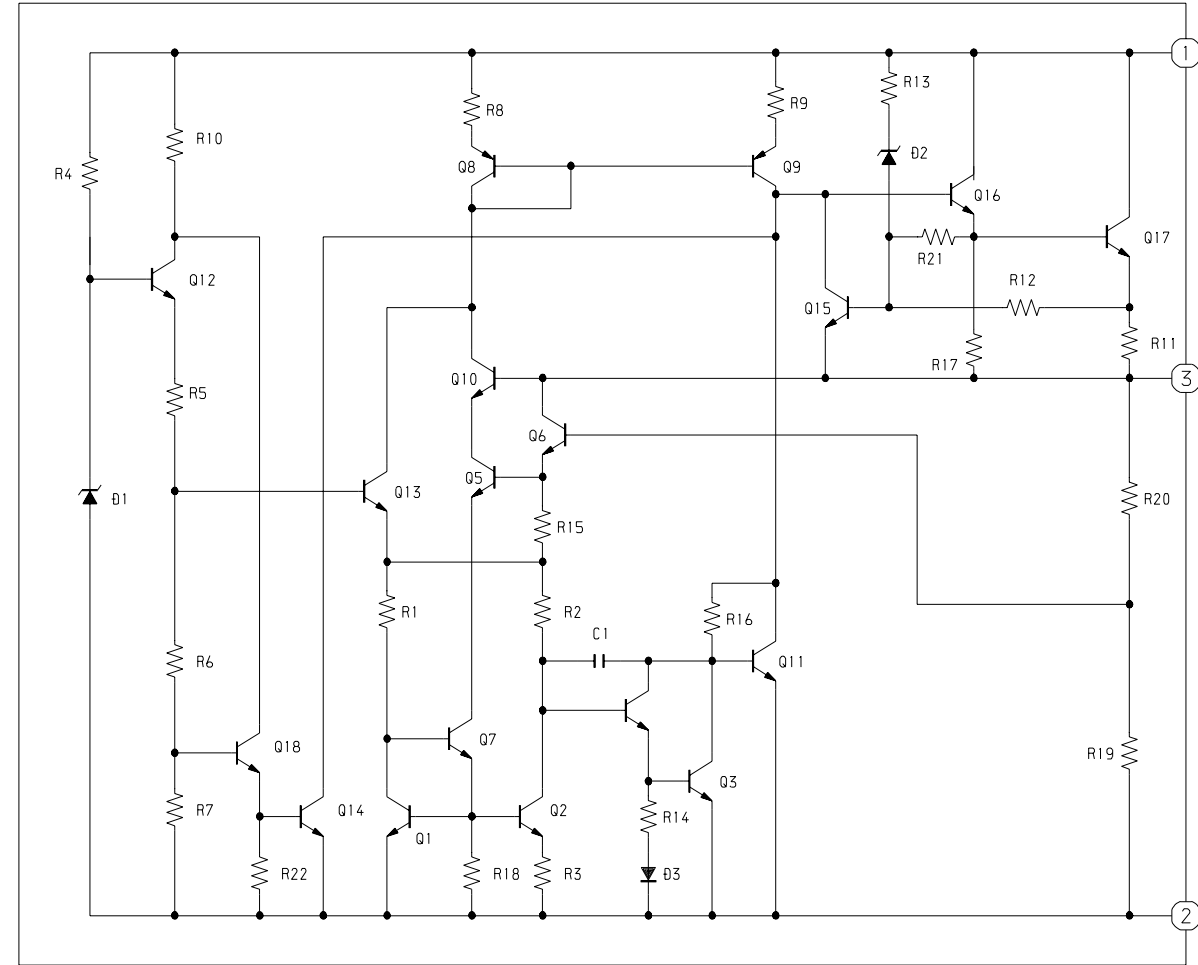
IC, BA4560N



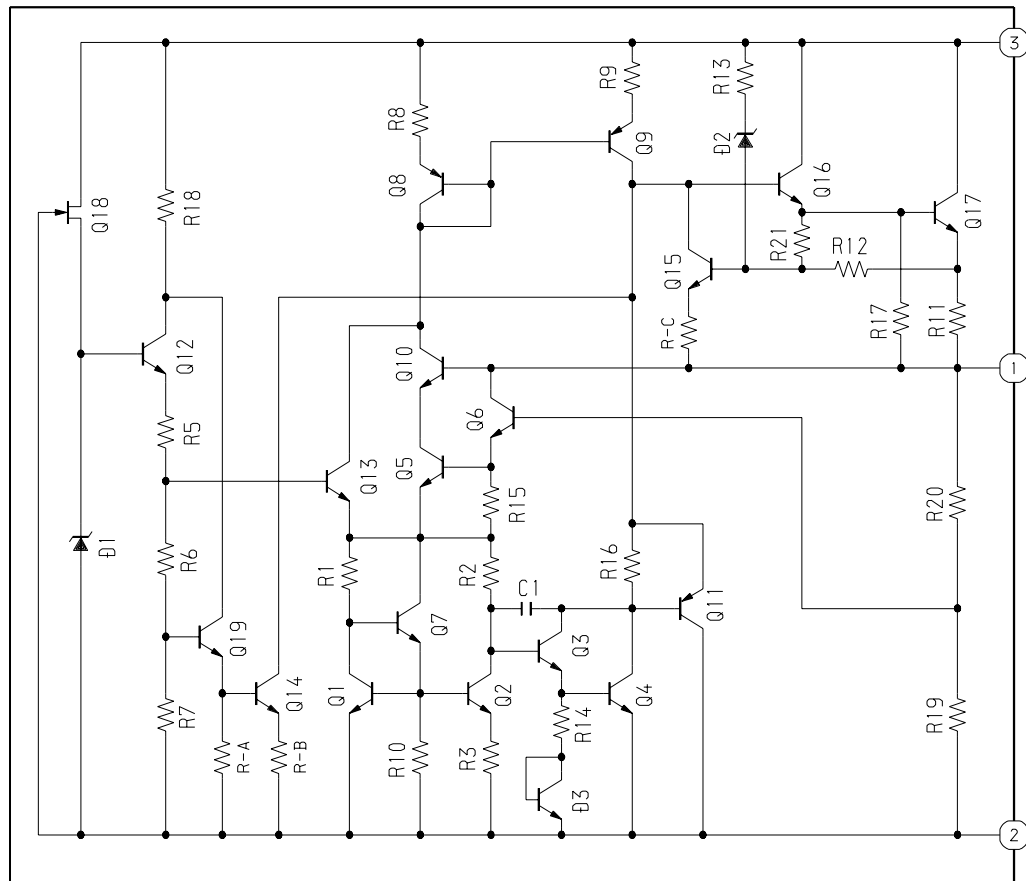
IC, NJM78L06A



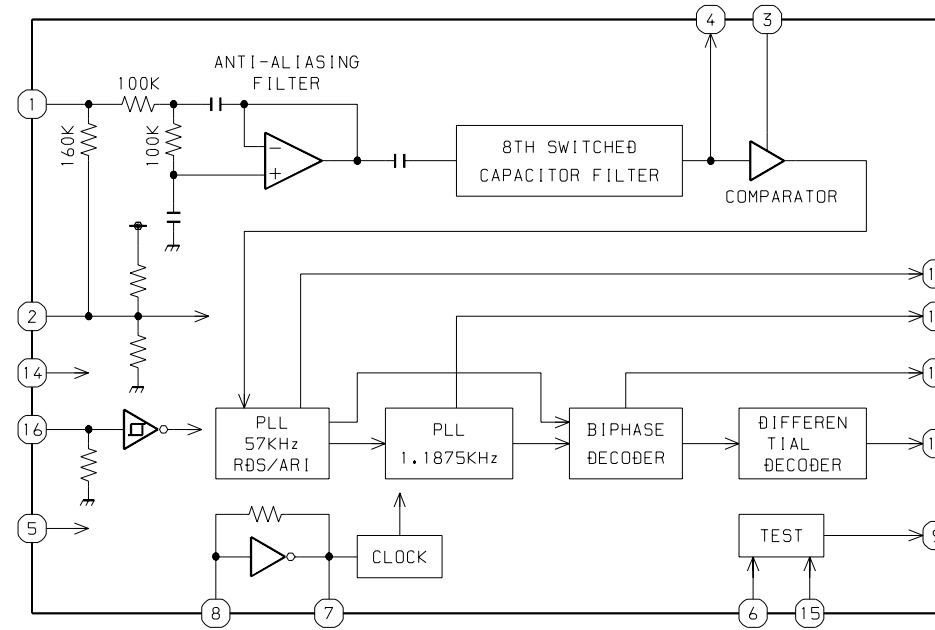
IC, BA17808T



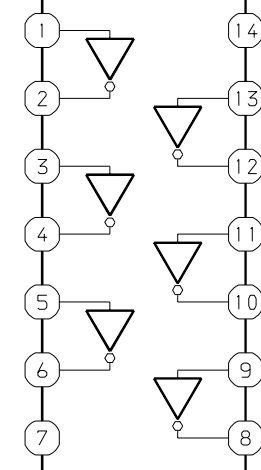
IC, NJM7806FA



IC, BU1920FS



IC, TC74HCT7007AF



VOLTAGE CHART

< CD > Test condition : CD play

IC401(LA9241ML)

Pin No.	Voltage
1	2.5
2	2.5
3	2.5
4	2.5
5	2.5
6	2.5
7	2.5
8	2.5
9	2.5
10	2.5
11	2.5
12	2.5
13	2.4
14	2.5
15	2.5
16	2.5
17	2.5
18	2.5
19	2.5
20	2.5
21	2.5
22	0
23	2.5
24	2.5
25	2.5
26	2.5
27	2.6
28	2.5
29	2.6
30	2.3
31	2.3
32	0
33	0
34	5.0
35	0
36	1.6
37	0
38	0
39	0
40	0.2

Pin No.	Voltage
41	2.3
42	2.4
43	2.6
44	2.5
45	0
46	2.5
47	2.5
48	0
49	0
50	2.5
51	4.3
52	5.1
53	0
54	4.8
55	0
56	5.0
57	2.5
58	2.5
59	2.4
60	2.4
61	2.2
62	3.7
63	0.2
64	5.0

IC402(LC78622ED)

Pin No.	Voltage
1	0
2	0
3	1.5
4	0
5	1.9
6	5.0
7	0.3
8	0
9	2.5
10	2.6
11	0
12	0.2
13	0
14	0
15	0
16	1.6
17	0
18	5.0
19	0
20	0
21	2.5
22	5.0
23	5.0
24	0
25	0
26	5.0
27	5.0
28	0
29	0
30	0
31	2.4
32	0
33	0
34	0
35	0
36	4.8
37	2.1
38	0
39	0
40	2.1

Pin No.	Voltage
41	4.8
42	0
43	5.0
44	2.1
45	2.1
46	0
47	0.1
48	0
49	0.1
50	2.5
51	0
52	2.5
53	1.6
54	0
55	0.3
56	5.1
57	4.3
58	5.0
59	0
60	2.5
61	2.4
62	0
63	0
64	0

< CD >

IC403(LA6541D)

Pin No.	Voltage
1	7.8
2	5.0
3	0
4	2.5
5	3.5
6	3.5
7	0
8	0
9	0
10	3.5
11	3.5
12	2.5
13	2.5
14	5.0
15	7.1
16	5.0
17	4.9
18	2.5
19	2.5
20	3.7
21	3.2
22	0
23	0
24	0
25	3.5
26	3.5
27	2.5
28	2.5
29	2.5
30	7.8

< TUNER > Test condition : Tuner function

IC721(LC72131D)

Pin No.	Voltage	
	AM	FM
1	2.6	2.5
2	0	0
3	0	0
4	0	0
5	0	0
6	5.2	2.4
7	2.5	2.5
8	0	8.0
9	8.0	0
10	0	0
11	0	0
12	0	0
13	7.9	2.5
14	0	0
15	2.6	0
16	0	2.6
17	5.3	5.2
18	1.0	1.0
19	1.0	1.0
20	1.3	0.9
21	0	0
22	2.6	2.5

Q771(2SA952)

E	C	B
8.0	8.0	7.3

Q773(DTC114Y)

E	C	B
0	0	3.3

IC771(LA1837N)

Pin No.	Voltage	
	AM	FM
1	3.6	3.6
2	8.0	8.0
3	3.6	3.6
4	3.6	0
5	0	0
6	7.9	2.5
7	5.7	5.6
8	8.0	8.0
9	8.0	8.0
10	1.2	1.2
11	0	0.9
12	0	0
13	0.4	0.4
14	4.1	6.9
15	4.6	6.9
16	4.3	4.3
17	4.3	4.3
18	4.3	4.3
19	4.3	4.3
20	3.3	3.3
21	3.3	3.3
22	2.8	2.9
23	3.5	3.6
24	0.7	0.3
25	0.6	0
26	3.6	3.6
27	3.6	3.6
28	3.6	3.6
29	3.6	3.6
30	2.0	2.2

< TAPE / AMP > Test condition : Tape function(tape stop)

IC103(BA4560N)

Pin No.	Voltage
1	3.3
2	3.3
3	3.3
4	0
5	3.3
6	3.3
7	3.3
8	6.7

IC201(M62495AFP)

Pin No.	Voltage
1	2.5
2	2.5
3	2.5
4	2.5
5	2.5
6	2.5
7	2.5
8	2.2
9	2.5
10	2.5
11	2.5
12	5.3
13	2.7
14	0
15	2.5
16	2.5
17	2.2
18	2.5
19	2.5
20	2.5
21	2.5
22	2.5
23	2.5
24	2.5

IC202(TA8223K)

Pin No.	Voltage
1	0
2	20.4
3	10.8
4	20.7
5	10.8
6	20.4
7	0
8	20.7
9	10.7
10	0.6
11	0
12	0
13	0
14	0.6
15	0

IC101(BA17808)

Pin No.	Voltage
1	12.8
2	8.0
3	0

IC102(NJM7806FA)

Pin No.	Voltage
1	12.8
2	5.9
3	0

IC103(NJM78L06)

Pin No.	Voltage
1	12.8
2	5.9
3	0

Q101(2SB1370E)

E	C	B
12.8	12.8	12.1

Q102(DTC114Y)

E	C	B
0	0	4.2

Q103(2SB1370E)

E	C	B
20.7	10.8	20.1

Q104(KTC3198GR)

E	C	B
10.1	20.1	10.7

Q203(2SA952)

E	C	B
20.7	20.7	20.0

Q204(KTC3198GR)

E	C	B
3.3	12.8	4.0

アイワ株式会社 〒110-8710 東京都台東区池之端1-2-11 ☎03(3827)3111 (代表)
AIWA CO.,LTD. 2-11, IKENOHATA 1-CHOME, TAITO-KU, TOKYO 110, JAPAN TEL:03 (3827) 3111