

HCD-VF1

SERVICE MANUAL

*AEP Model
E Model*



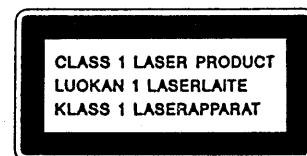
This set is the tuner CD player section in LBT-VF3

Model Name Using Similar Mechanism	HCD-H70
CD Mechanism Type	CDM13B-5BD3
Optical Pick-Up Block Type	BU-5BD3

SPECIFICATIONS

Tuner section	
System	FM stereo FM/AM superheterodyne tuner
FM tuner section	
Tuning range	87.5 to 108 MHz
Antenna	75 ohms unbalanced
Intermediate frequency	10.7 MHz
AM tuner section	
Tuning range	531 to 1,602 kHz (at 9 kHz interval) 530 to 1,710 kHz (at 10 kHz interval)
Antenna	AM loop antenna External antenna terminal
Intermediate frequency	450 kHz
CD player section	
Frequency response	2 Hz to 20 kHz ± 1 dB
Signal-to-noise ratio	More than 110 dB
Dynamic range	More than 100 dB
Harmonic distortion	Less than 0.008%
Channel separation	More than 95 dB
DIGITAL OUTPUT (OPTICAL) (Optical output connector)	Wave length 660 nm output level -18 dBm
General	
Power requirements	220-230 V AC, 50/60 Hz (South-east Asian AEP, German model) 120 V AC, 50/60 Hz (Latin American model)
Power consumption	14 W
AC outlet	2 switched, total 180 W max.
Weight	Approx. 4.1 kg
Dimensions	Approx. 355 \times 79.5 \times 296 mm (w/h/d, including projections)

This Compact Disc player is classified as a CLASS 1 LASER product.
The CLASS 1 LASER PRODUCT label is located on the rear exterior.



Design and specifications are subject to change without notice.

TUNER CD PLAYER
SONY[®]

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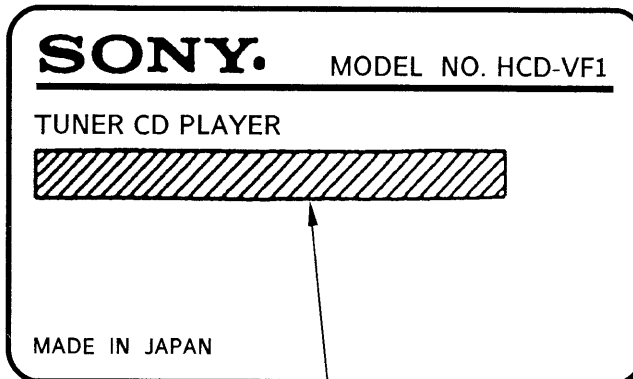
SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

MODEL IDENTIFICATION

- Specification Labels -

AEP, E MODEL

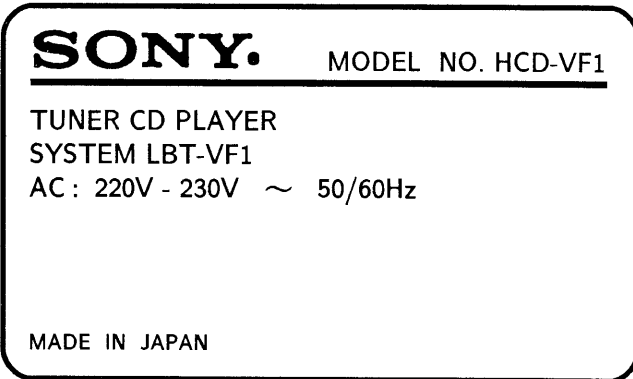


AEP Model : AC 220 - 230V ~ 50/60Hz

E(120V) Model : AC 120V ~ 14W 50/60Hz

E(220 - 230V) Model : AC 220V - 230V ~ 14W 50/60Hz

Germany MODEL



NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.

During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.

The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe more than 30cm away from the objective lens.

SECTION 1 GENERAL

This section is extracted from instruction manual.

1-1. LOCATION OF CONTROLS

Location of Controls

CD player section
When you press the ►|| button, HCD-VF1 works as a CD player.

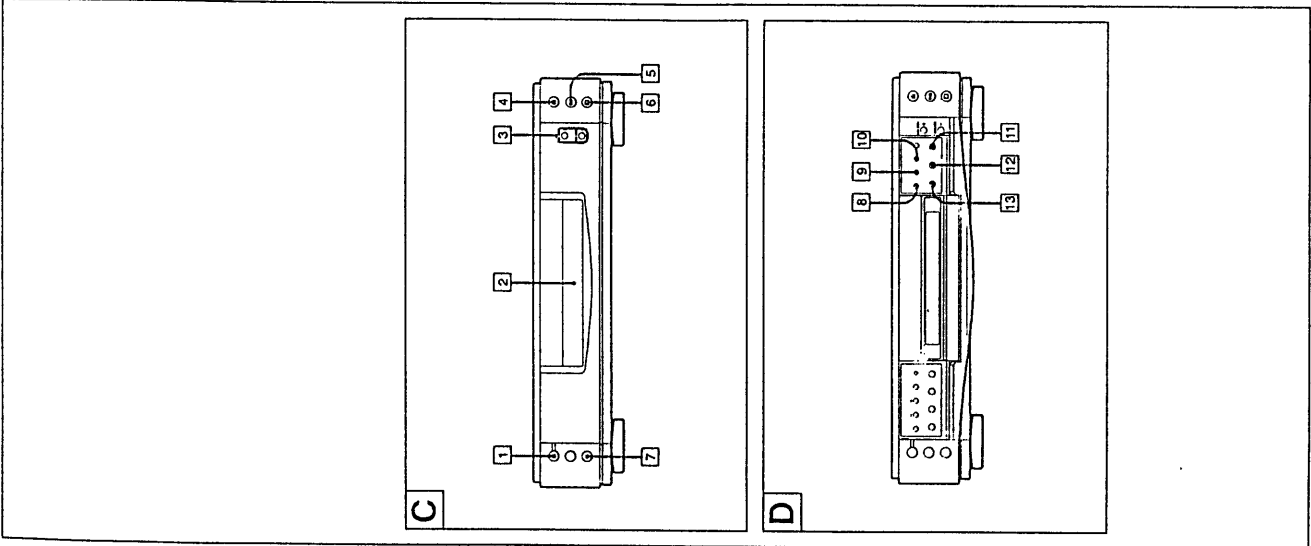
With the door closed (Fig. C)

- 1 OPEN button
- 2 Display
- 3 ►|| (AMS*/manual search) and ◀▶ (AMS*/RMS** in shuffle mode)/manual search buttons (70, 72, 74, 78)
- 4 ▲ (Open/Close) button (66)
- 5 ►|| (Play/Pause) button (66)
- 6 ■ (Stop) button (66)
- 7 SYSTEM POWER button (18, 62)

With the door opened (Fig. D)

- 8 CHECK button (80)
- 9 CLEAR button (80)
- 10 TIME button (68)
- 11 PROGRAM button (78)
- 12 SHUFFLE button (74)
- 13 CONTINUE button (74, 78)

* AMS is the abbreviation of Automatic Music Sensor.
** RMS is the abbreviation of Random Music Sensor.
(RMS functions only in shuffle mode.)



Location of Controls

Refer to the pages indicated in parenthesis for details.

Tuner CD Player (HCD-VF1)

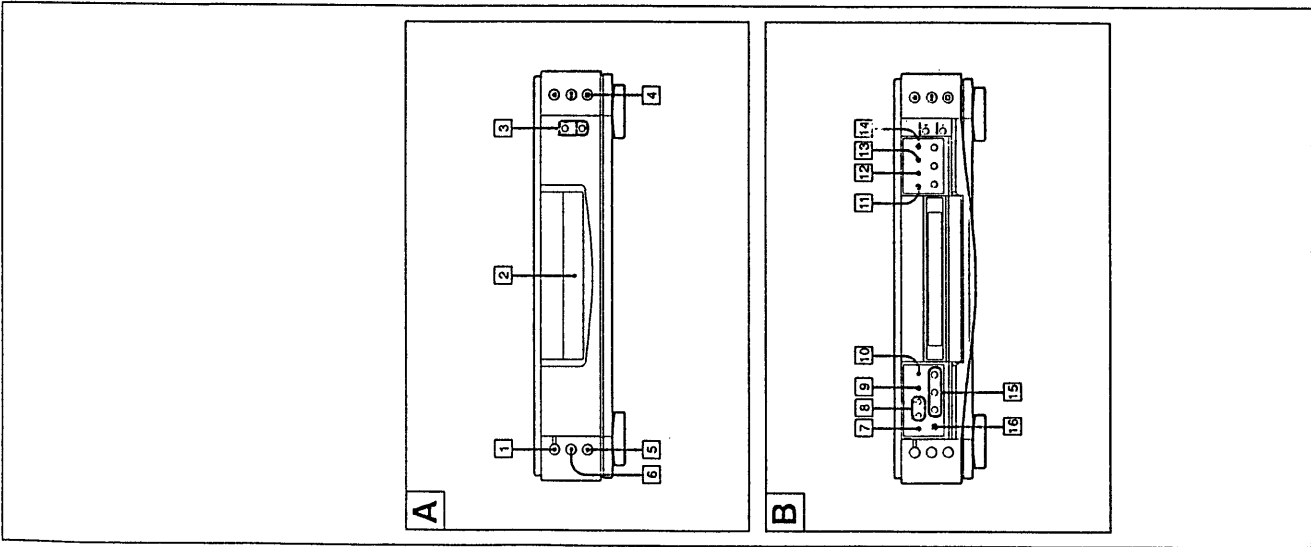
Tuner section
When you press the BAND button, HCD-VF1 works as a tuner.

With the door closed (Fig. A)

- 1 OPEN button
- 2 Display
- 3 + and - buttons (24, 26, 28, 30)
- 4 TUNING/PRESET button (24, 28)
- 5 SYSTEM POWER button (18, 62)
- 6 BAND button (24)

With the door opened (Fig. B)

- 7 CONTROL/CHECK/CLEAR button (62, 64)
 - 8 -/+ buttons (56, 60, 62)
 - 9 NEXT button (56, 62)
 - 10 CLOCK button (56)
 - 11 MEMORY button (26)
 - 12 CHARACTER button (30)
 - 13 SHIFT button (26, 28)
 - 14 STEREO/MONO button (24), ENTER button (26)
- This button works as the ENTER button in memory mode. In other modes, it works as the STEREO/MONO button.
15 Numeric buttons for the timer setting (60, 62, 64)
16 SLEEP button (58)



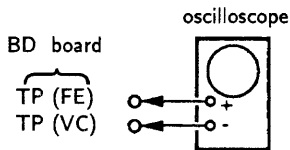
SECTION 2 ELECTRICAL ADJUSTMENTS

CD SECTION

Note :

1. CD Block basically constructed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use the oscilloscope with more than $10M\Omega$ impedance.
4. Clean an object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.

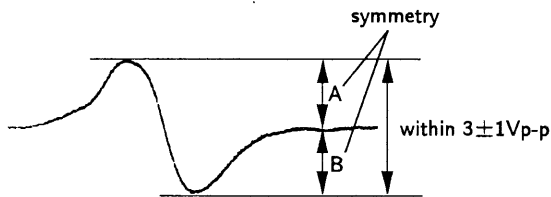
S-Curve Check



Procedure :

1. Connect oscilloscope to test point TP (FE) on BD board.
2. Connect between test point TP (FEI) and TP (VC) by lead wire.
3. Turned Power switch on and actuate the focus search. (actuate the focus search when disc table is moving in and out.)
4. Check the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within $3\pm 1V_{p-p}$.

S-curve waveform

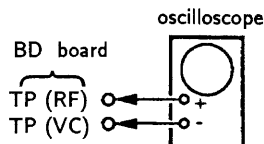


5. After check, remove the lead wire connected in step 2.

Note :

- Try to measure several times to make sure that the ratio of A : B or B : A is more than 10 : 7.
- Take sweep time as long as possible and light up the brightness to obtain best waveform.

RF Level Check



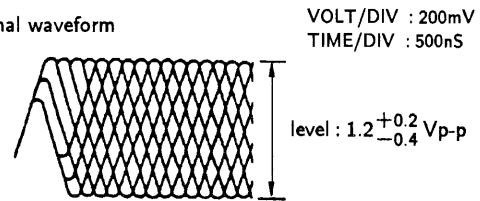
Procedure :

1. Connect oscilloscope to test point TP (RF) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

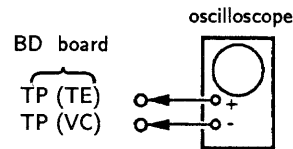
Note :

Clear RF signal waveform means that the shape “◇” can be clearly distinguished at the center of the waveform.

RF signal waveform



E-F Balance Check



Procedure :

1. Connect test point TP (ADJ) to ground and TP (TEI) to TP (VC) with lead wire.
2. Connect oscilloscope to test point TP (TE) on BD board.
3. Turn Power switch on.
4. Put disc (YEDS-18) in and playback.
5. Confirm that the oscilloscope waveform is symmetrical on the top and bottom in relation to 0V, and check this level.

Traverse oscilloscope

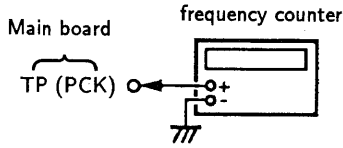


6. Remove the lead wire connected in step 1.

RF PLL Free-run Frequency Check

Procedure :

1. Connect frequency counter to test point (PCK) with lead wire.



2. Turn Power switch on.
3. Confirm that reading on frequency counter is 4.3218 MHz.

Focus/Tracking Gain

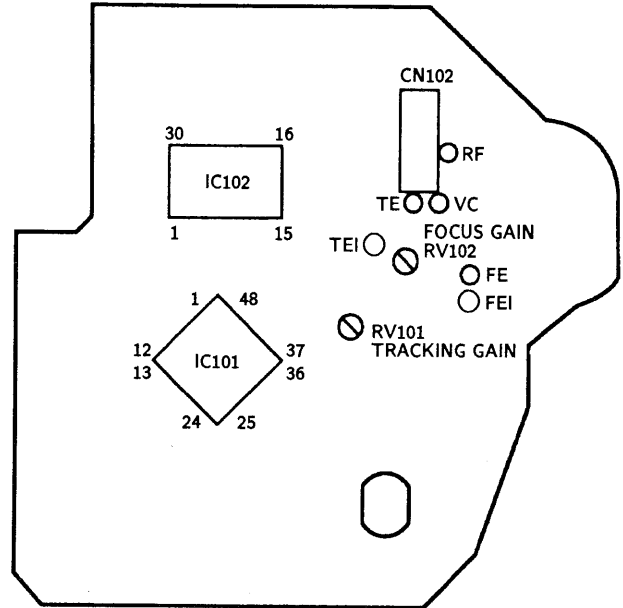
This gain has a margin, so even if it is slightly off. There is no problem.

Therefore, do not perform, this adjustment.

Please note that it should be fixed to mechanical center position when you moved and do not know original position.

[BD BOARD]

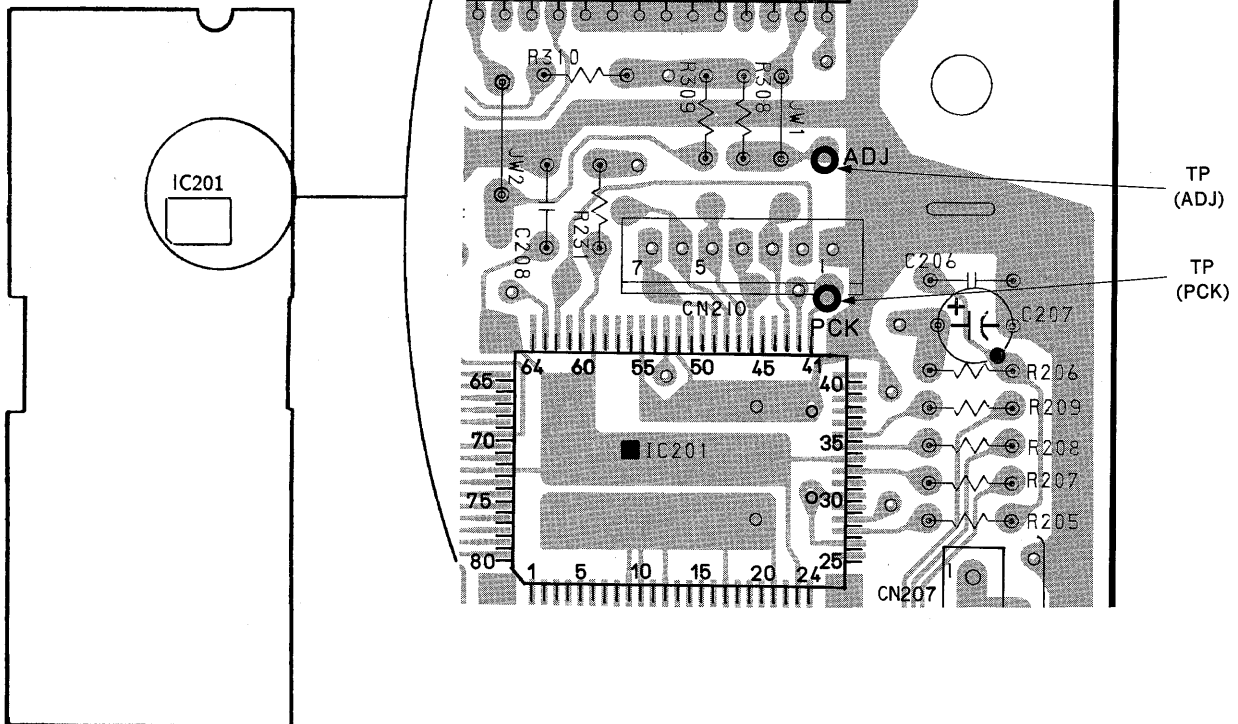
- Conductor side -



Adjustment Location :

[CD MAIN BOARD]

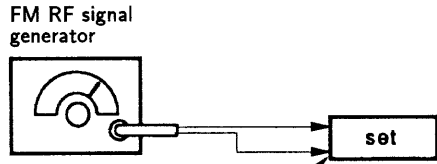
- Conductor side -



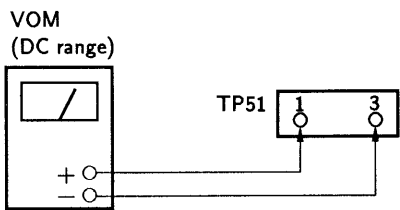
TUNER SECTION

FM SECTION ADJUSTMENTS

Setting :



Carrier frequency : 98MHz
Modulation : 1kHz, 40kHz deviation



FM Discriminator Alignment (NULL Check)

Band : FM

Procedure :

1. Supply a 1mV (60dB μ) 98MHz signal from the ANTENNA terminal.
2. Tune the set to 98MHz.
3. Adjust IFT51 for 0V reading on the VOM.

Note : FM tuned indication lighting level adjustment should be made after FM discriminator alignment.

FM Tuned Indication Lighting Level Adjustment

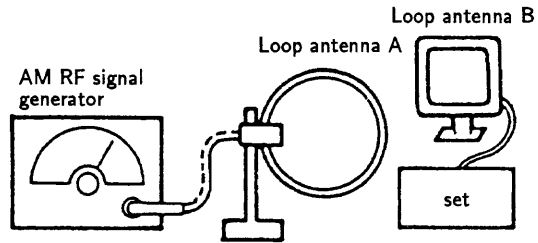
Band : FM

Procedure :

1. Supply a 22.5 μ V (27dB μ)(AEP, E) or 12.5 μ V (22dB μ) (Germany) 98MHz signal from the ANTENNA terminal.
2. Tune the set to 98MHz.
3. Adjust RV52 so that the **TUNED** light up.

AM SECTION ADJUSTMENTS

Setting :



30% amplitude modulation by 400Hz signal

MW(AM) Tuned Indication Lighting Level Adjustment

Band : MW or AM

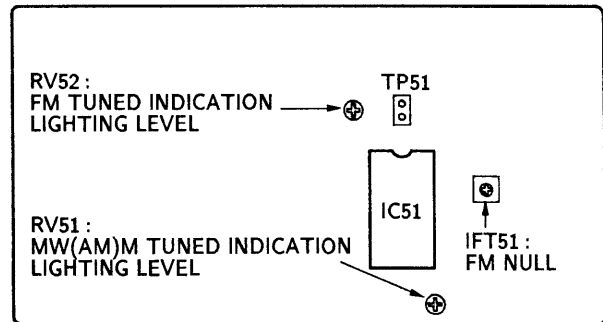
Procedure :

1. Set loop antenna A so that the loop antenna B input level becomes 0.25mV(48dB μ).
2. Tune the set to 1,404kHz.
3. Adjust the RV51 so that the **TUNED** light up.

Adjustment Location :

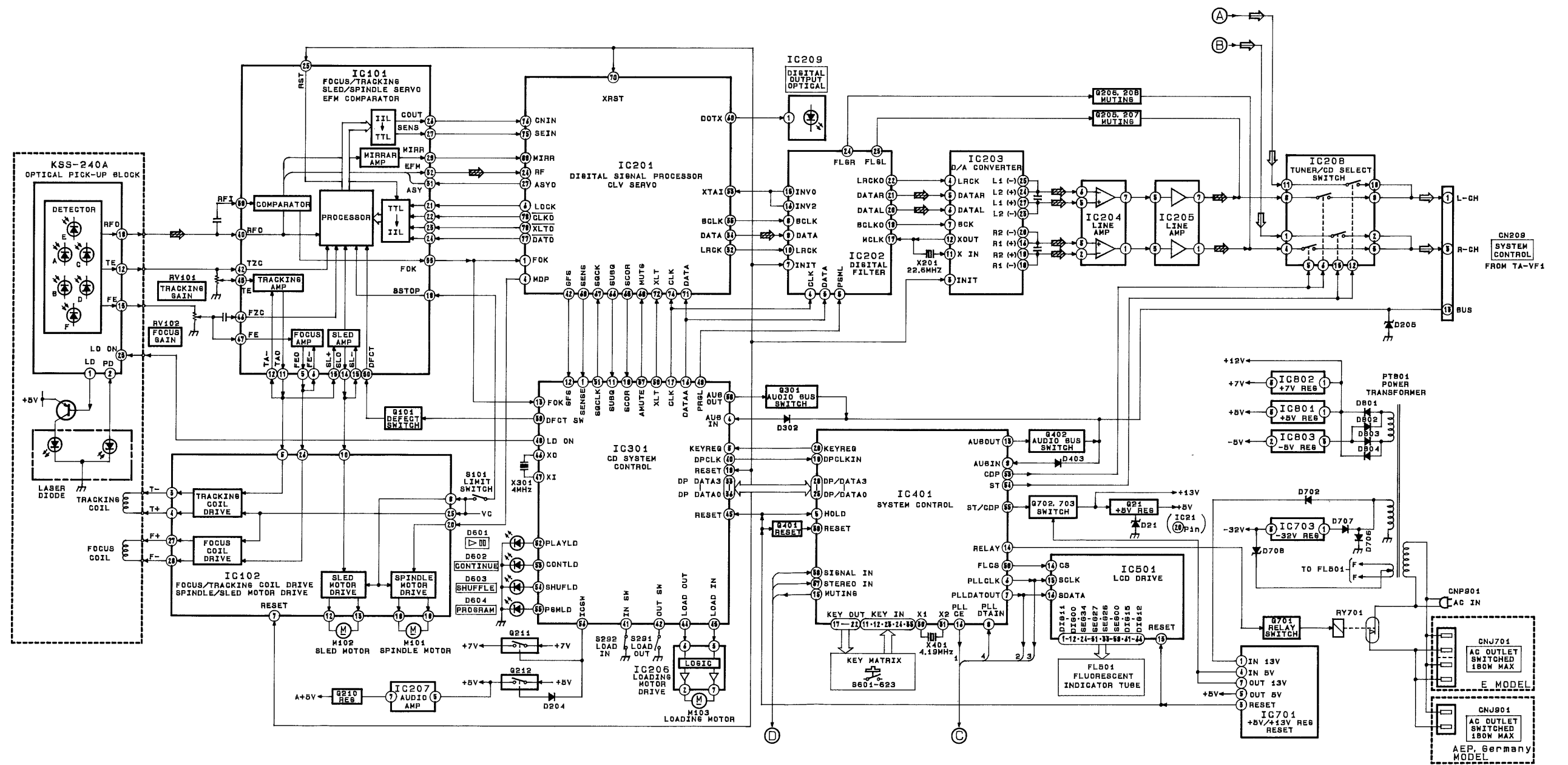
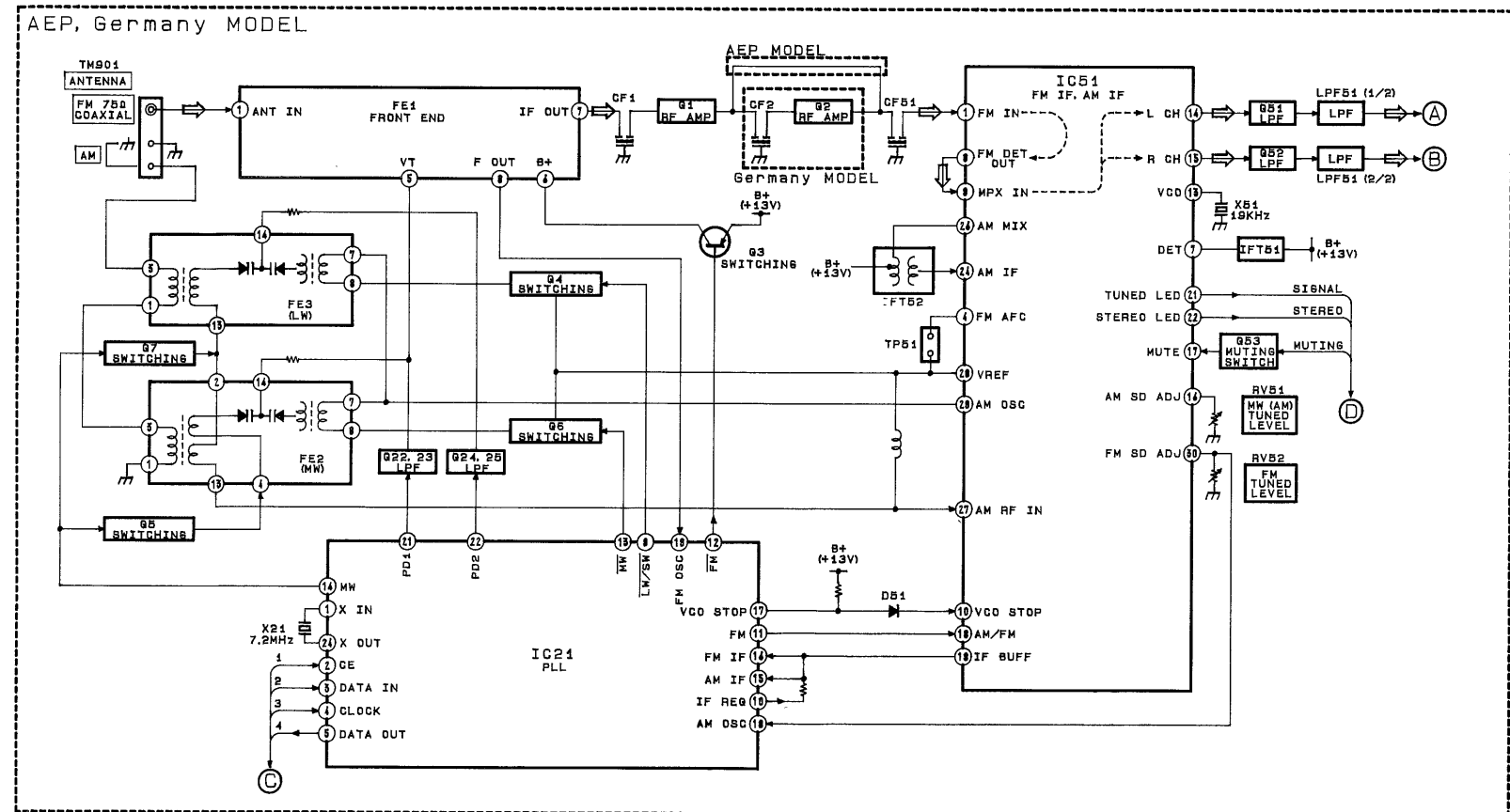
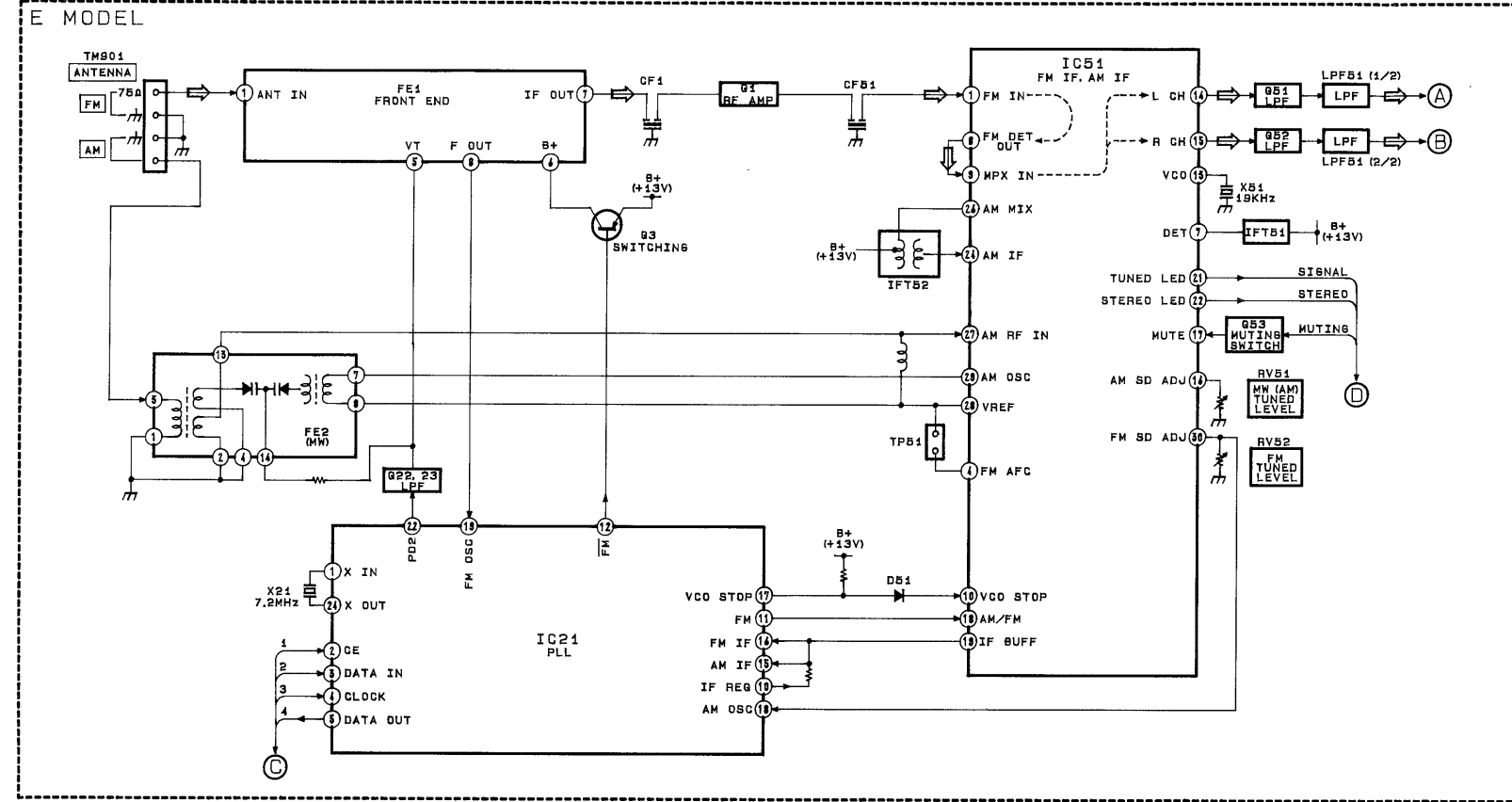
【TUNER BOARD】

- Component side -

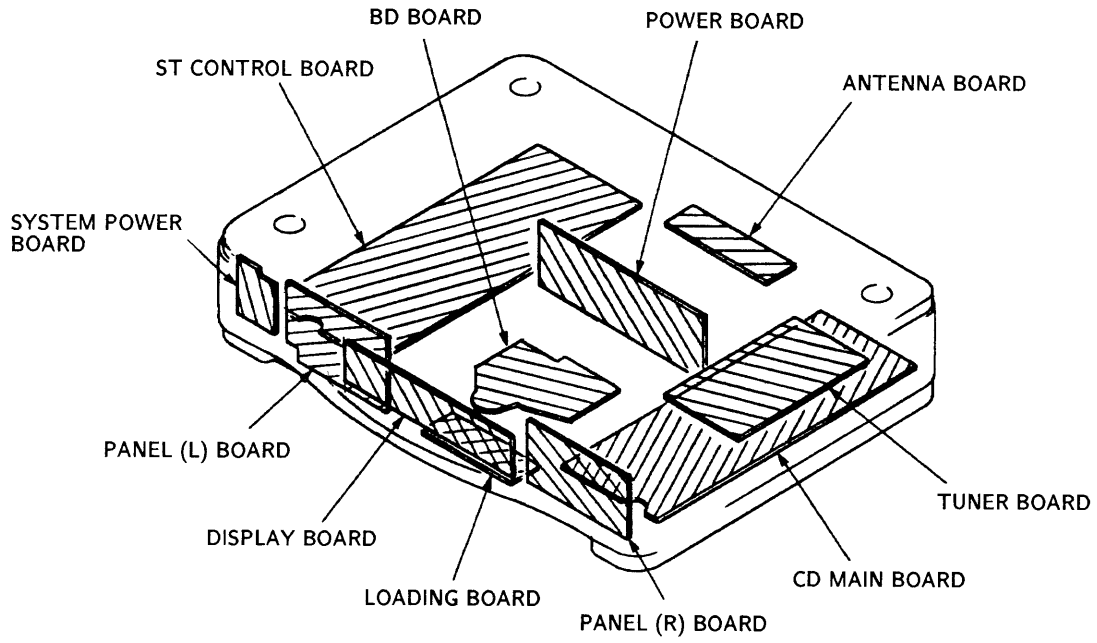


SECTION 3 DIAGRAMS

3-1. BLOCK DIAGRAM



3-2. CIRCUIT BOARDS LOCATION



• Semiconductor Location 3-3. PRINTED WIRING BOARDS—TUNER SECTION—• Refer to page 19 for Semiconductor Lead Layouts.

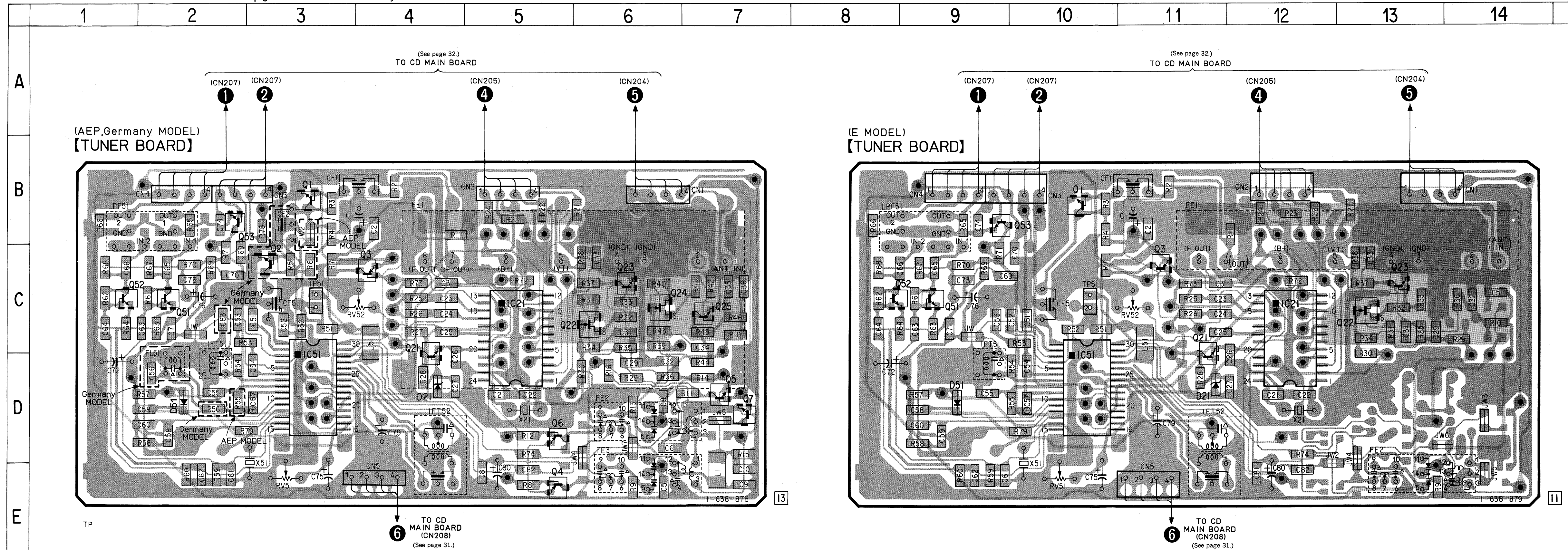
AEP, Germany model

Ref. No.	Location
D21	D-4
D51	D-2
IC21	C-5
IC51	D-3
Q1	B-3
Q2	C-3
Q3	C-4
Q4	E-5
Q5	D-7
Q6	D-5
Q7	D-7
Q21	C-4
Q22	C-6
Q23	C-6
Q24	C-6
Q25	C-7
Q51	C-2
Q52	C-1
Q53	B-2

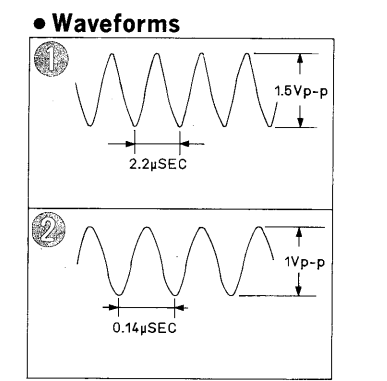
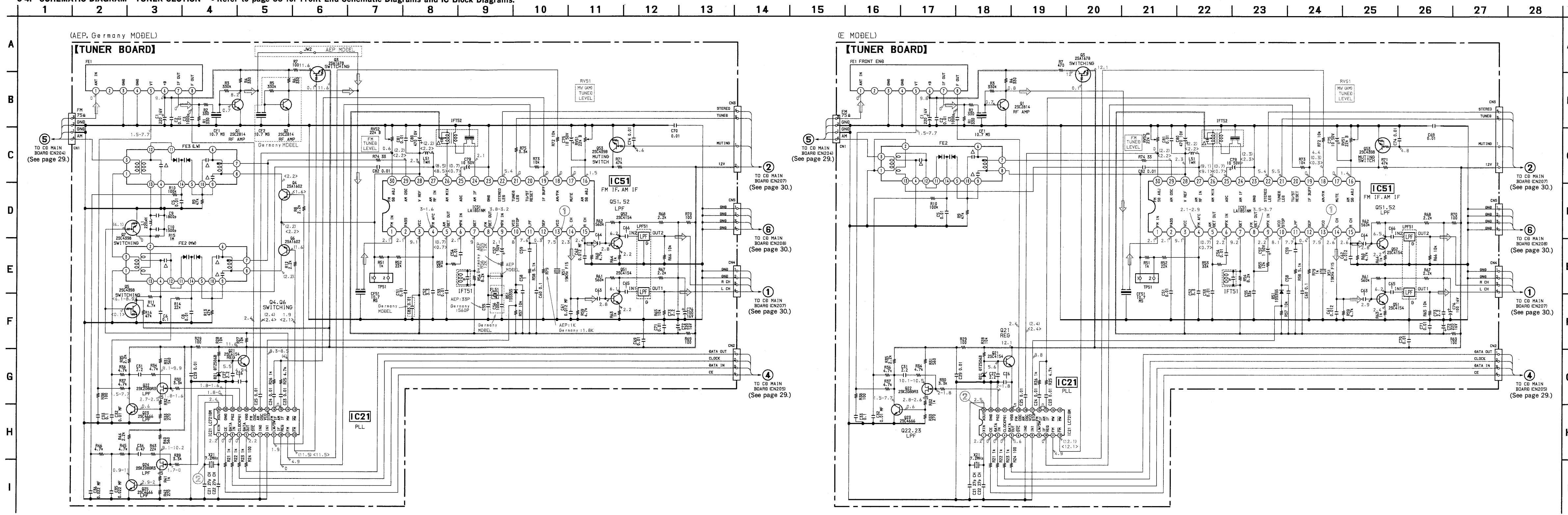
E model

Ref. No.	Location
D21	D-11
D51	D-9
IC21	C-12
IC51	D-10
Q1	B-10
Q3	C-11
Q21	C-11
Q22	C-13
Q23	C-13
Q51	C-9
Q52	C-8
Q53	B-9

- Note:
- : parts extracted from the component side.
 - : parts mounted on the conductor side.
 - ◻ : Through hole.
 - ◼ : Pattern on the side which is seen.
 - (with dot) : Pattern of the rear side.



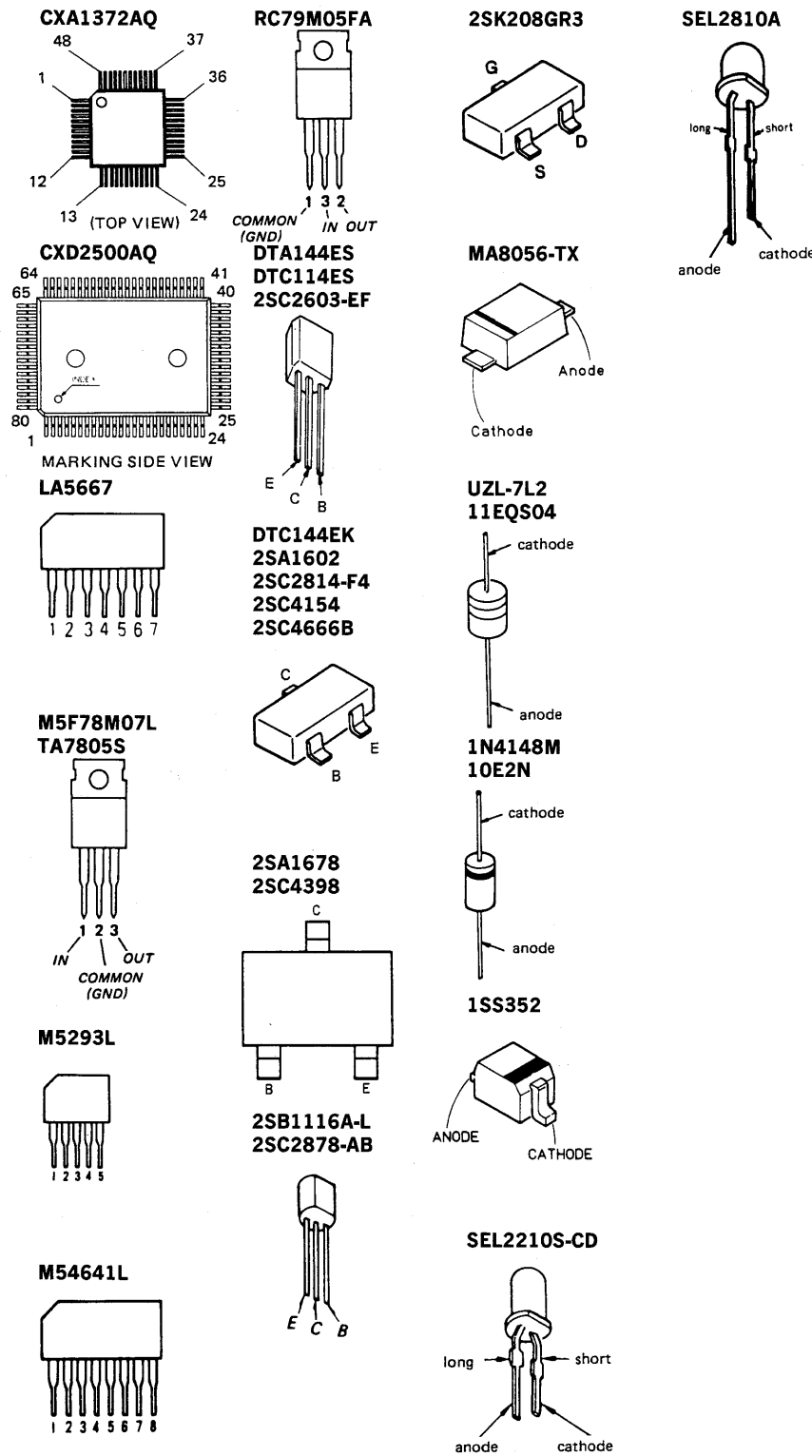
3-4. SCHEMATIC DIAGRAM—TUNER SECTION— Refer to page 33 for Front End Schematic Diagrams and IC Block Diagrams.



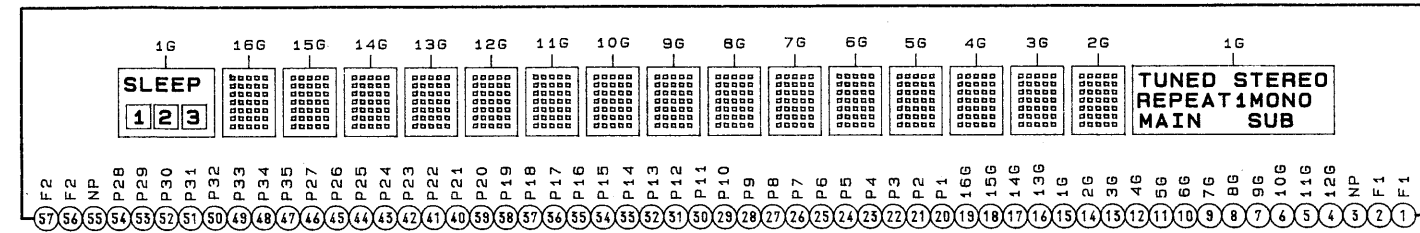
Note:

- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F} \times 10^{-6}$ or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- Δ : internal component.
- \square : B+ Line
- \square : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark : FM
- () : MW
- < > : LW
- Voltages are taken with a VOM (input Impedance $10\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- \Rightarrow : FM

3-5. SEMICONDUCTOR LEAD LAYOUTS

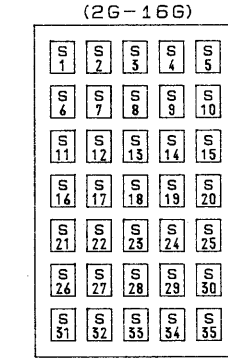


FL501 FLUORESCENT INDICATOR TUBE



ANODE CONNECTION

	16G - 2G	1G
P1	S1	-
P2	S2	-
P3	S3	-
P4	S4	-
P5	S5	-
P6	S6	-
P7	S7	-
P8	S8	-
P9	S9	-
P10	S10	-
P11	S11	-
P12	S12	-
P13	S13	-
P14	S14	-
P15	S15	-
P16	S16	-
P17	S17	-
P18	S18	-
P19	S19	-
P20	S20	-
P21	S21	-
P22	S22	-
P23	S23	-
P24	S24	-
P25	S25	SLEEP
P26	S26	1
P27	S27	2
P28	S28	3
P29	S29	TUNED
P30	S30	STEREO
P31	S31	REPEAT
P32	S32	1
P33	S33	MONO
P34	S34	MAIN
P35	S35	SUB

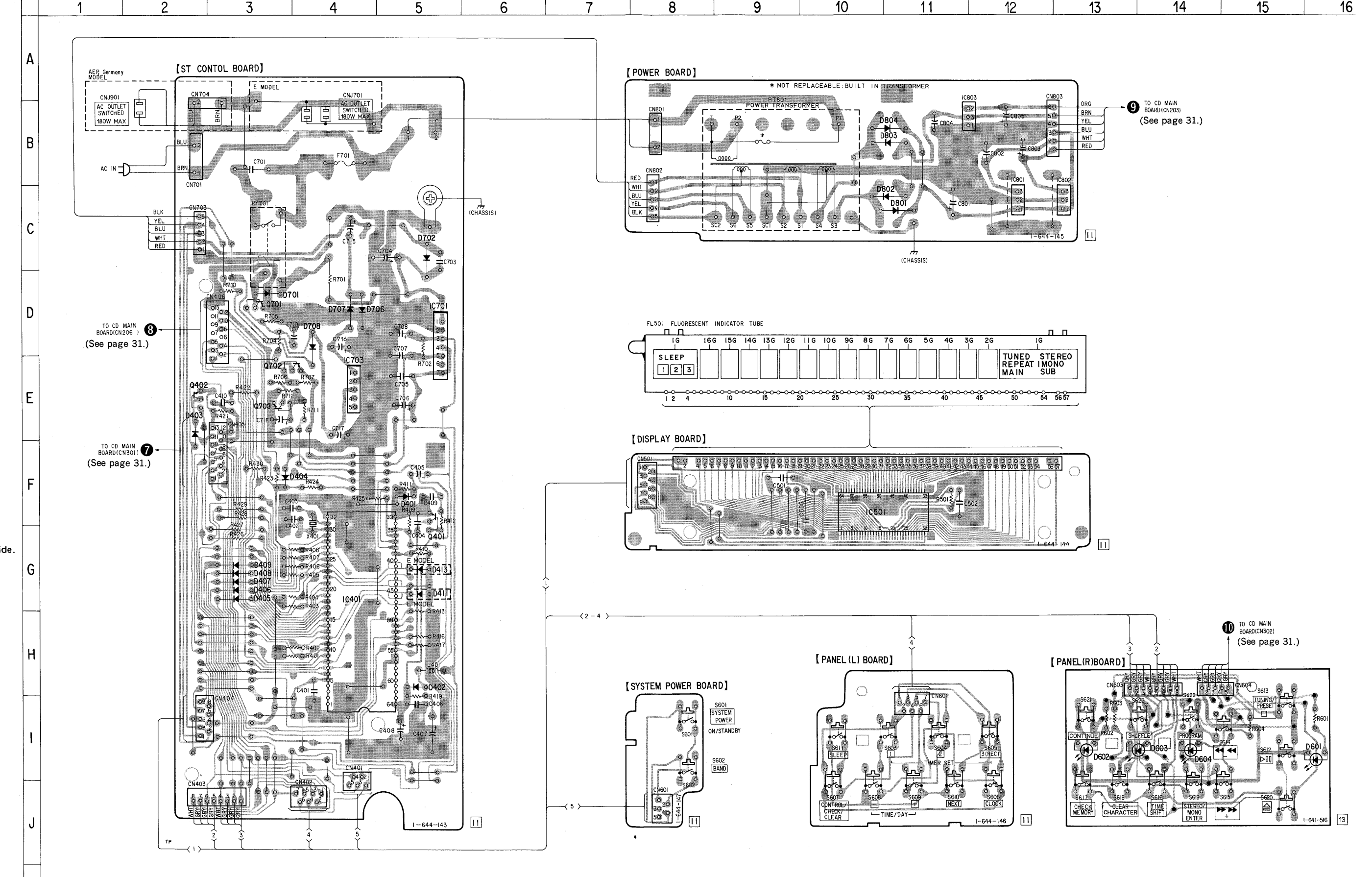


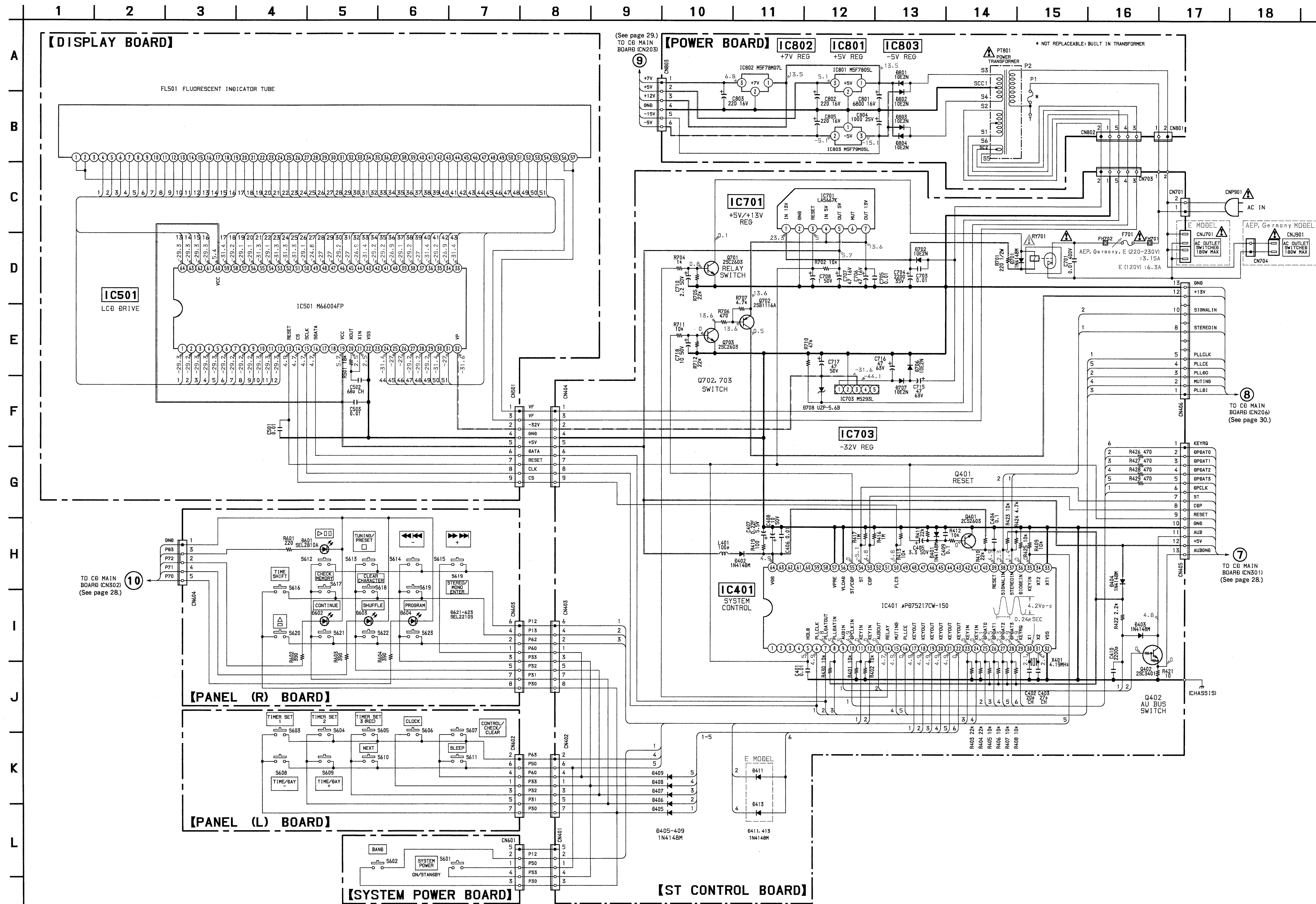
Note:
 ○ : parts extracted from the component side.
 ● : Through hole.
 ▨ : Pattern on the side which is seen.
 ▩ : Pattern of the rear side.

• Semiconductor Location

Ref. No.	Location
D401	F-5
D402	H-5
D403	E-2
D404	F-3
D405	G-3
D406	G-3
D407	G-3
D408	G-3
D409	G-3
D411	G-5
D413	G-5
D601	I-16
D602	I-13
D603	I-14
D604	I-14
D701	D-3
D702	C-5
D706	D-4
D707	D-4
D708	D-4
D801	C-11
D802	C-11
D803	B-11
D804	B-11
IC401	G-4
IC501	F-10
IC701	D-5
IC703	E-4
IC801	C-12
IC802	C-13
IC803	B-12
Q401	F-15
Q402	E-2
Q701	D-3
Q702	E-3
Q703	E-3

3-6. PRINTED WIRING BOARDS—DISPLAY/SYSTEM CONTROL/POWER SECTION—



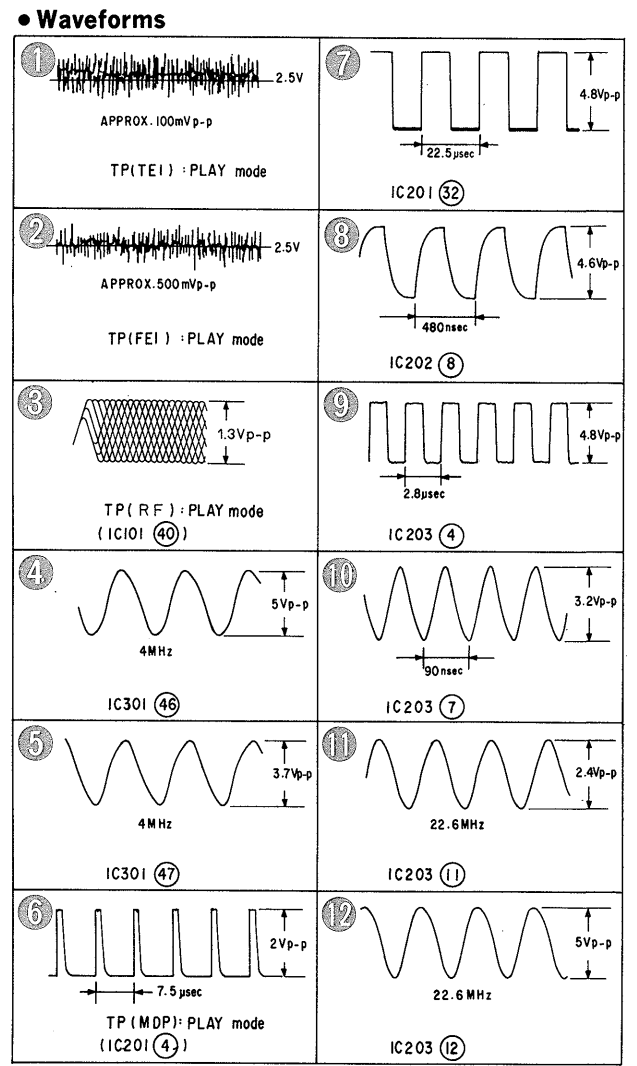
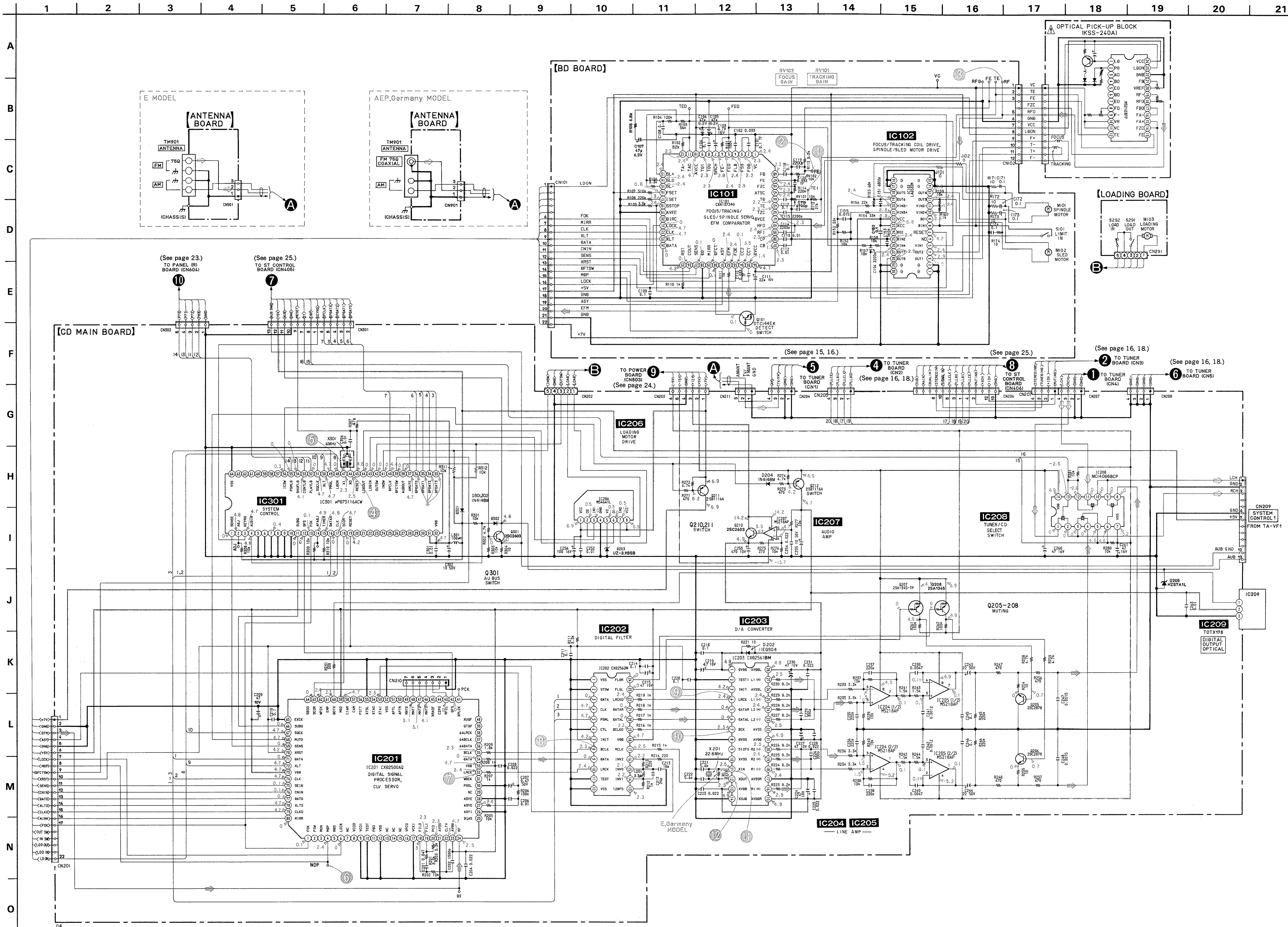


Note:

- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.

Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

- : B+ Line
- ⊖ : B- Line
- : Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark : CD STOP
- : Voltages are taken with a VOM (Input Impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.



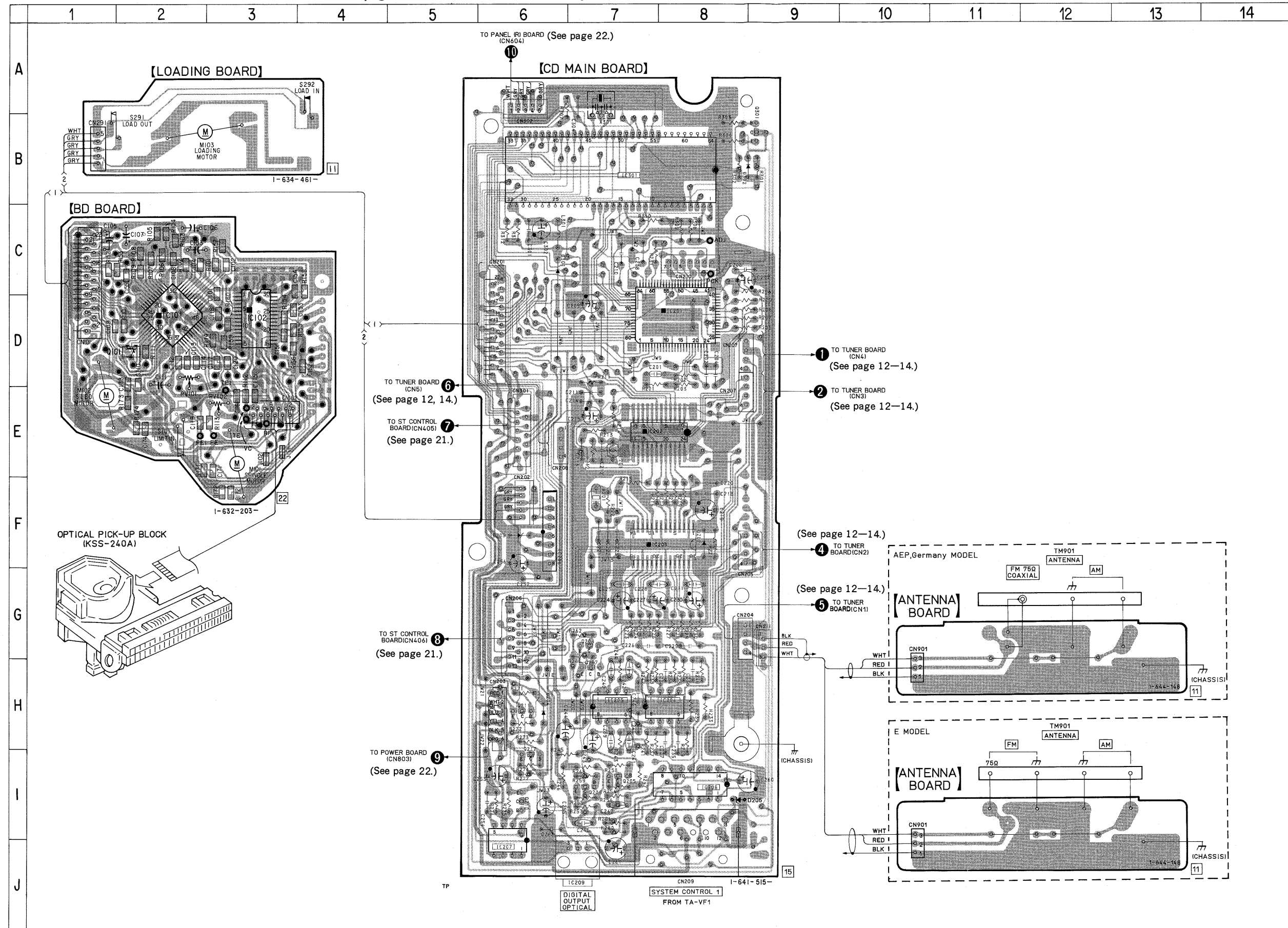
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- Δ : internal component.

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○ : B+ Line
 ○ : B- Line
 ○ : Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
 ○ : Voltages are taken with a VOM (Input Impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
 ○ : Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
 ○ : Circled numbers refer to waveforms.
 ○ : Signal path.
 ○ : FM
 ○ : CD

3-9. PRINTED WIRING BOARDS—CD SECTION • Refer to page 19 for Semiconductor Lead Layouts.



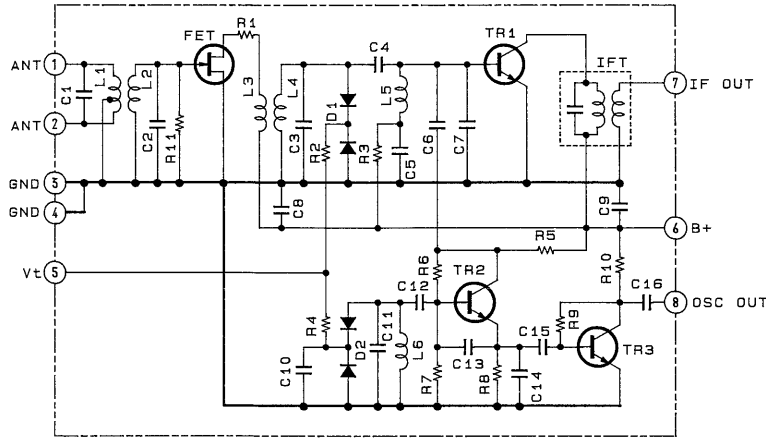
• Semiconductor Location

Ref. No.	Location
D202	F-8
D203	F-6
D204	H-6
D205	I-8
D301	C-6
D302	B-8
IC101	D-2
IC102	D-3
IC201	D-8
IC202	E-7
IC203	F-7
IC204	H-8
IC205	H-7
IC206	F-6
IC207	J-6
IC208	I-8
IC209	J-7
IC301	B-7
Q101	D-2
Q205	I-7
Q206	I-7
Q207	H-7
Q208	G-7
Q210	I-6
Q211	H-6
Q212	I-6
Q301	B-9

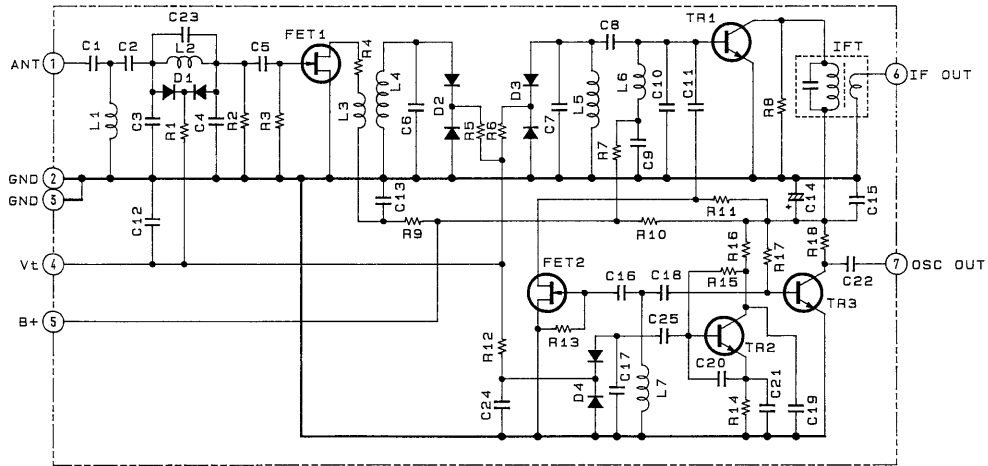
Note:

- : parts extracted from the component side.
- : parts mounted on the conductor side.
- : Through hole.
- ▨ : Pattern on the side which is seen.
- ▨ : Pattern of the rear side.

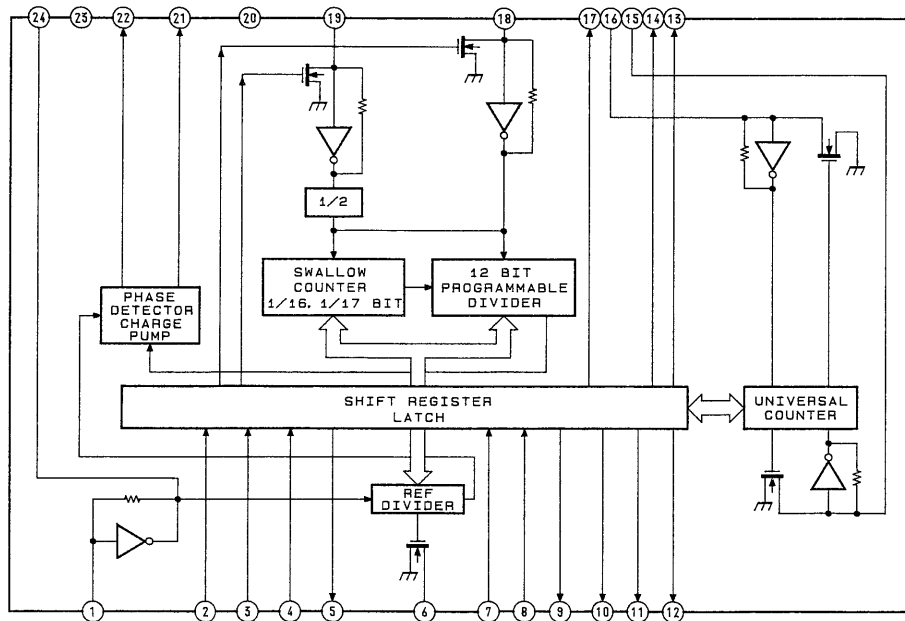
• Front End Schematic Diagrams
FE1 (AEP, E model)



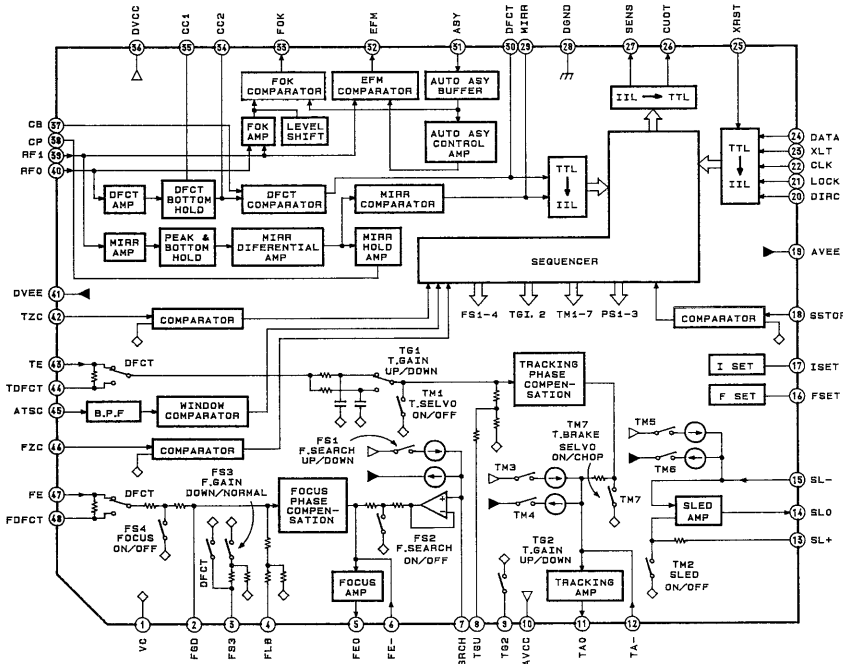
FE1 (E model)



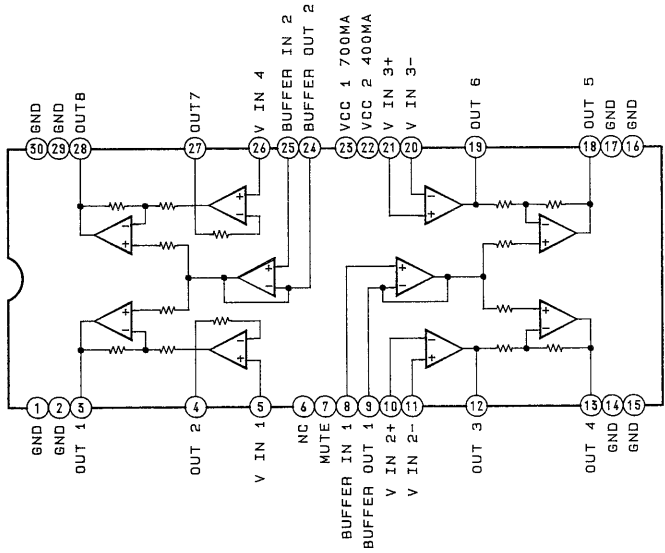
• IC Block Diagram
IC21 LC7218M



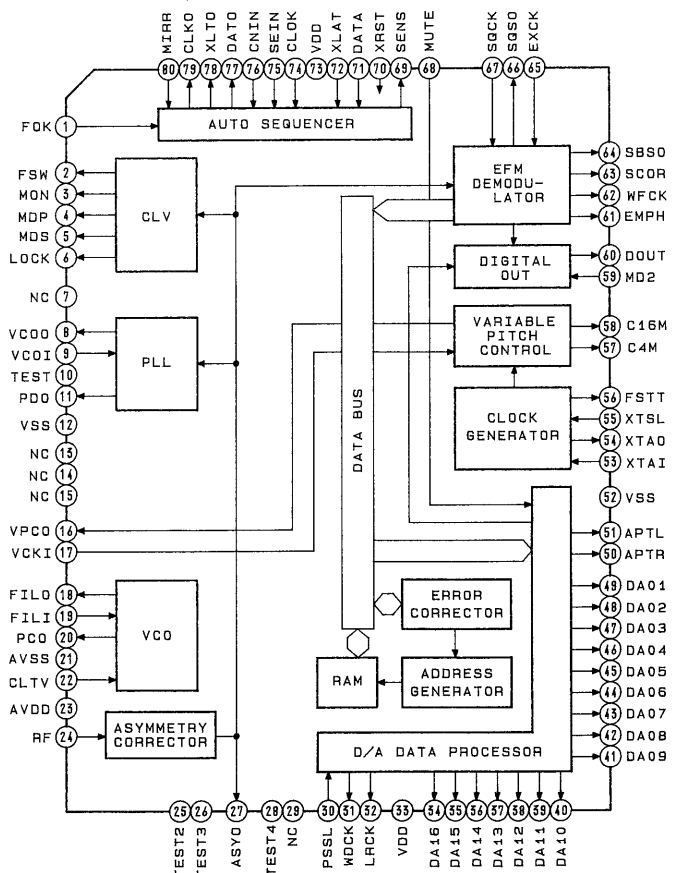
IC101 CXA1372AQ



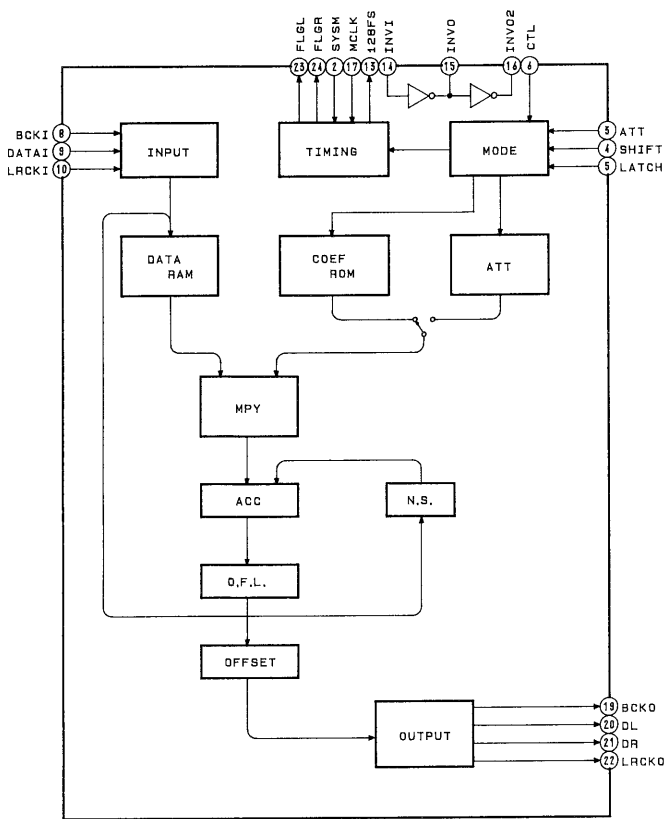
IC102 LA6532M



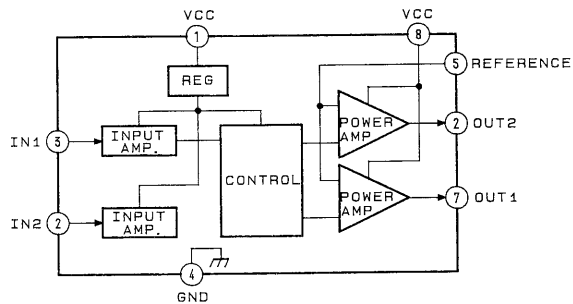
IC201 CXD2500AQ



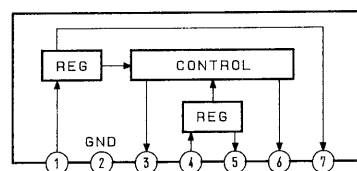
IC202 CXD2560M



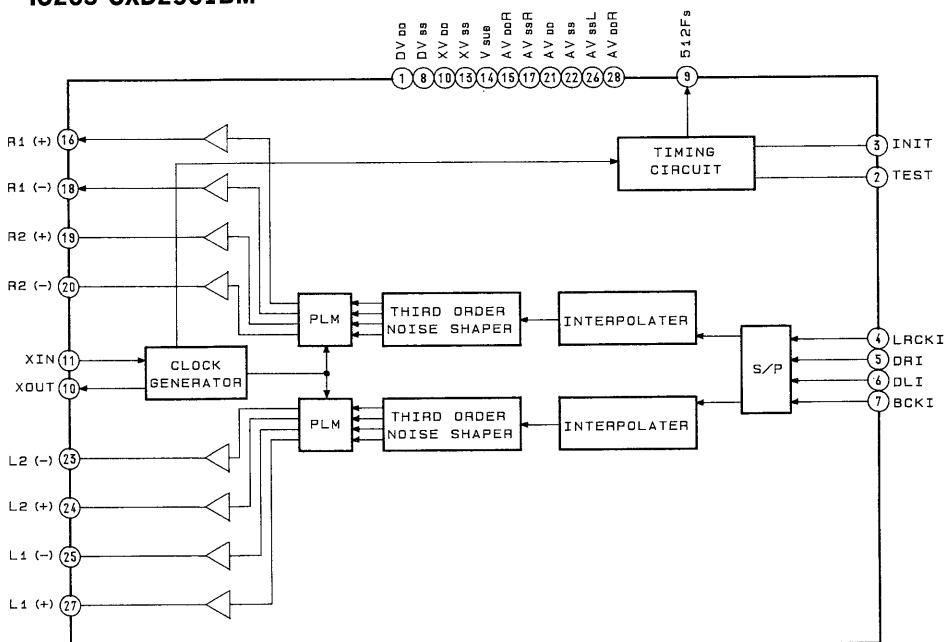
IC206 M54641L



IC701 LA5667



IC203 CXD2561BM



SECTION 4 EXPLODED VIEWS

NOTE:



- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- -XX, -X mean standardized parts, so they may have some differences from the original one.

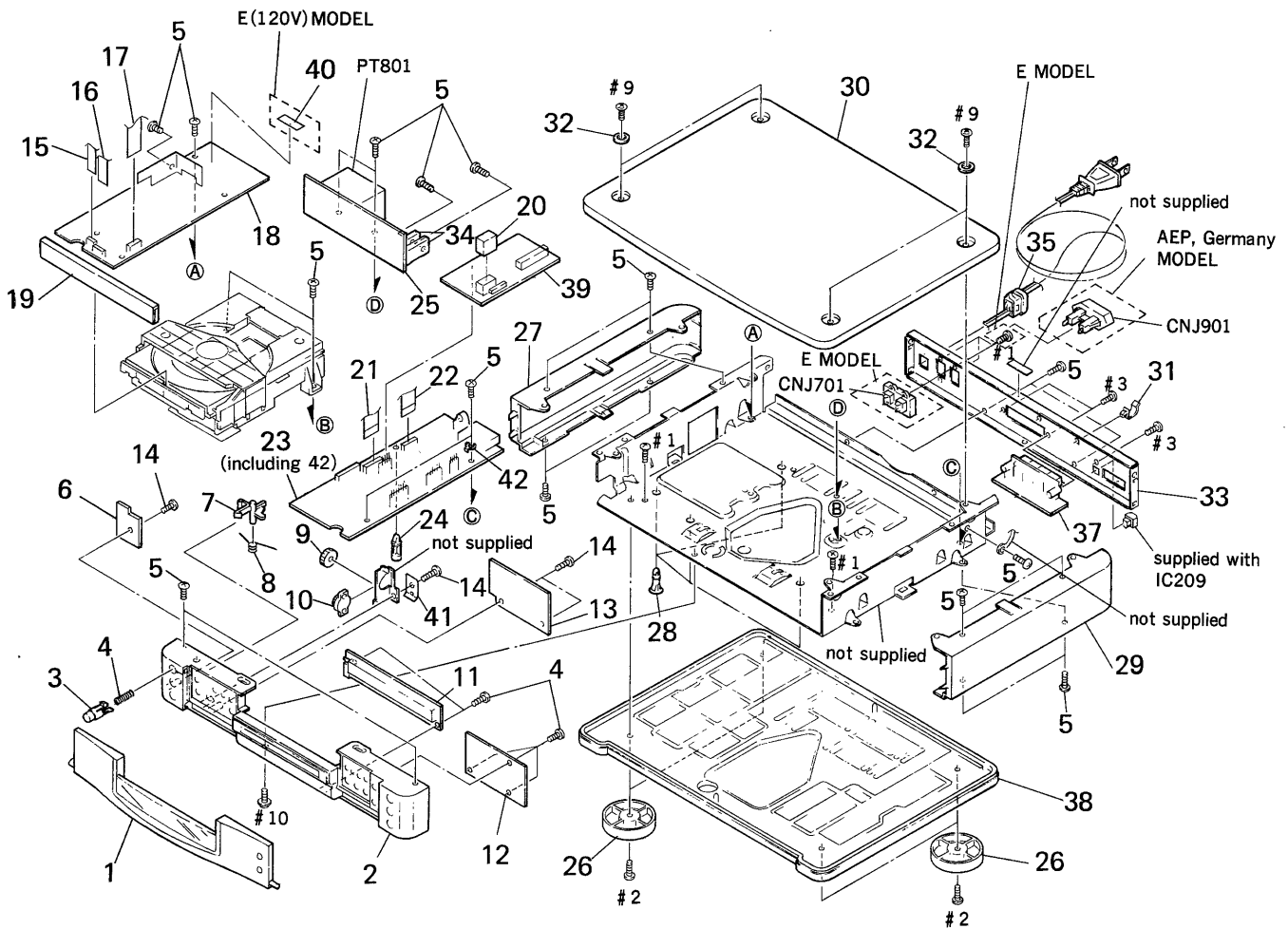
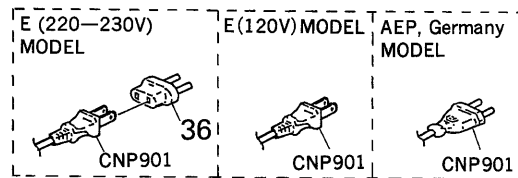
- Color Indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE) . . (RED)

Parts Color Cabinet's Color

- Hardware (# mark) list is given in the last of this parts list.

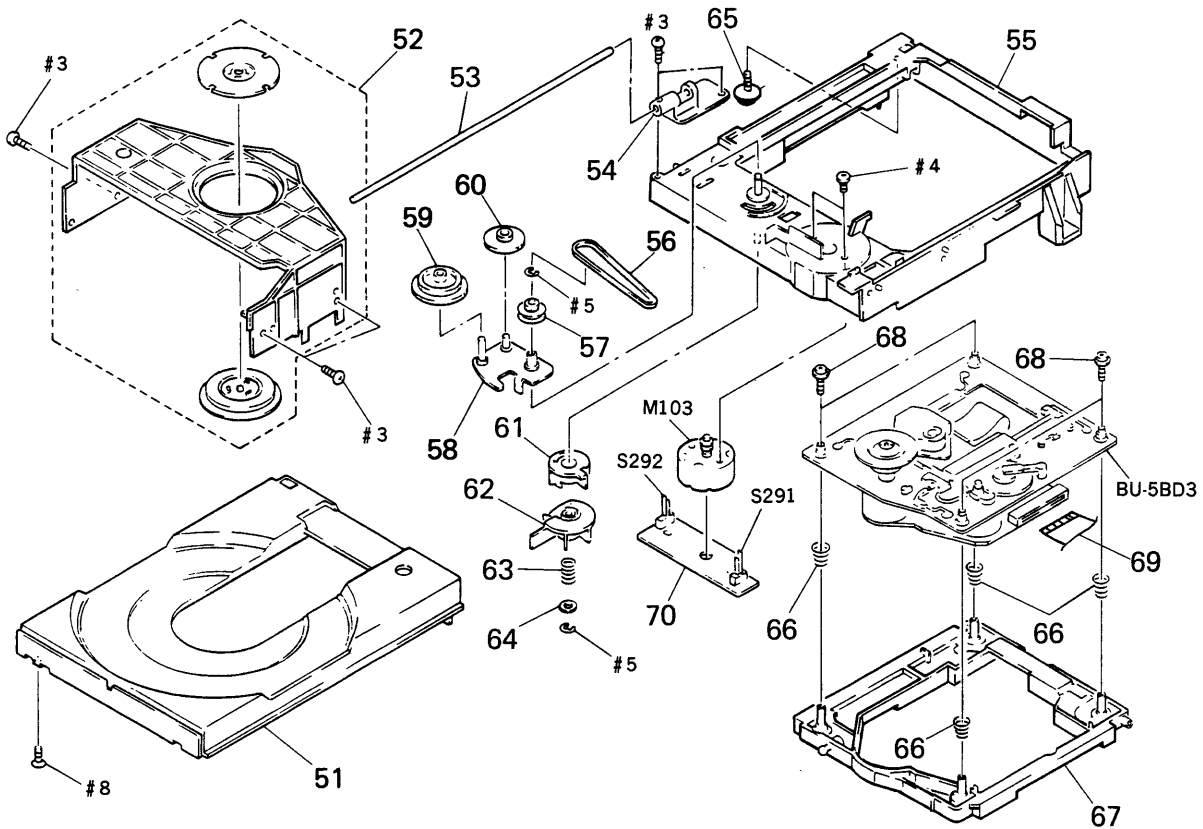
The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

4-1. CHASSIS SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	X-4941-995-1	LID (CDP) ASSY		* 28	3-704-198-21	SUPPORT, PC	
2	X-4942-727-1	PANEL ASSY, FRONT		29	4-948-054-01	PLATE (B) (R), SIDE	
3	4-948-111-01	BUTTON (OPEN)		* 30	4-948-022-21	COVER (UPPER)	
4	4-948-750-01	SPRING, COMPRESSION		* 31	4-949-235-01	HOOK	
5	3-375-580-11	SCREW (NATEC BVTT) (M3X8)		32	4-928-025-51	ESCUTCHEON (TOP)	
* 6	1-644-147-11	SYSTEM POWER BOARD		* 33	4-947-627-21	PANEL, BACK (AEP)	
7	4-948-110-01	HOOK		* 33	4-947-627-31	PANEL, BACK (Germany)	
8	4-948-112-01	SPRING, TORSION		* 33	4-947-627-51	PANEL, BACK (E:120V)	
9	4-948-109-01	GEAR		* 33	4-947-627-61	PANEL, BACK (E:220-230V)	
10	3-319-224-01	DAMPER, SMALL		* 34	3-309-144-21	HEAT SINK	
* 11	1-644-144-11	DISPLAY BOARD		35	3-703-244-11	BUSHING (2104), CORD (AEP, Germany)	
* 12	1-641-516-13	PANEL (R) BOARD		35	3-703-571-00	BUSHING (S) (4516), CORD (E)	
* 13	1-644-146-11	PANEL (L) BOARD		△36	1-569-007-11	ADAPTER, CONVERSION 2P (E:220-230V)	
14	4-928-635-01	SCREW, +BV (2.6X8) TAPPING		* 37	1-644-148-11	ANTENNA BOARD	
15	1-575-730-31	WIRE, FLAT TYPE (5 CORE)		38	4-948-021-01	COVER (LOWER) (TA)	
16	1-590-032-31	WIRE, FLAT TYPE (7 CORE)		* 39	A-4303-343-A	TCB001 (TUNER) BOARD, COMPLETE (AEP)	
17	1-690-588-31	WIRE, FLAT TYPE (9 CORE)		* 39	A-4303-344-A	TCB001 (TUNER) BOARD, COMPLETE (Germany)	
* 18	A-4347-918-A	ST CONTROL BOARD, COMPLETE (E)		* 39	A-4303-416-A	TCB001 (TUNER) BOARD, COMPLETE (E)	
* 18	A-4347-921-A	ST CONTROL BOARD, COMPLETE (Germany)		40	4-949-520-22	LABEL (B) (T.L.), FUSE RATING (E:120V)	
* 18	A-4347-926-A	ST CONTROL BOARD, COMPLETE (AEP)		41	4-950-581-01	SPRING, GROUND	
19	X-4941-994-1	PANEL ASSY, LOADING		* 42	4-942-204-01	PLATE, GROUND	
* 20	3-348-833-01	CUSHION, RUBBER		△CNJ701	1-540-041-11	OUTLET, AC (NONPOLAR) (2P) (E)	
21	1-690-590-31	WIRE, FLAT TYPE (13 CORE)		△CNJ901	1-526-794-11	OUTLET, AC (AEP, Germany)	
22	1-690-589-31	WIRE, FLAT TYPE (13 CORE)		△CNP901	1-575-651-11	CORD, POWER (AEP, Germany)	
* 23	A-4347-920-A	CD MAIN BOARD, COMPLETE (E)		△CNP901	1-575-653-11	CORD, POWER (E)	
* 23	A-4347-925-A	CD MAIN BOARD, COMPLETE (Germany)		△PT801	1-450-948-11	TRANSFORMER, POWER (AEP, E:220-230V, Germany)	
* 23	A-4347-932-A	CD MAIN BOARD, COMPLETE (AEP)		△PT801	1-450-949-11	TRANSFORMER, POWER (E:120V)	
* 24	4-944-316-21	HOLDER, PC BOARD					
* 25	1-644-145-11	POWER BOARD					
26	4-948-027-01	FOOT (DIA. 50)					
27	4-948-053-01	PLATE (B) (L), SIDE					

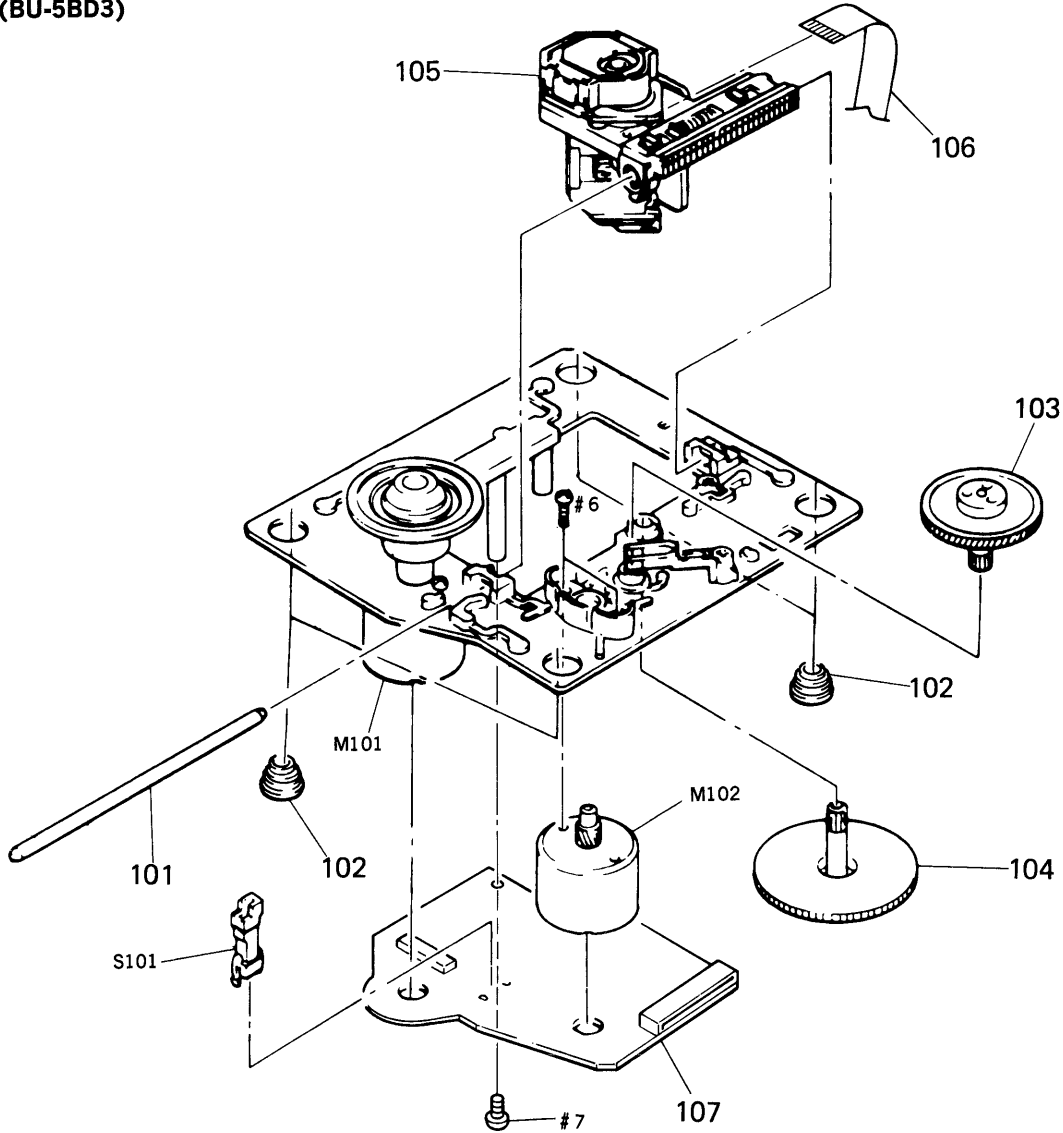
4-2. CD MECHANISM SECTION
(CDM13B-5BD3)



Ref. No.	Part No.	Description	Remark
51	4-944-012-01	TABLE, DISC	
52	A-4604-752-A	HOLDER (MG) ASSY	
53	4-929-764-01	SHAFT (TABLE GUIDE)	
54	4-944-006-01	BEARING	
55	X-4941-462-1	CHASSIS (MD) ASSY	
56	4-927-649-01	BELT	
57	4-929-724-01	PULLEY (B)	
58	X-4929-703-1	ARM ASSY, SWING	
59	4-927-620-01	GEAR (P)	
60	4-927-628-01	GEAR (C)	
61	4-929-727-01	CAM (A)	
62	4-929-729-01	CAM (B)	

Ref. No.	Part No.	Description	Remark
63	3-659-338-00	SPRING, COMPRESSION	
64	4-927-654-01	WASHER (LIMITER)	
* 65	4-917-583-21	BRACKET, YOKE	
66	4-917-541-01	SPRING (B)	
67	4-929-747-01	HOLDER (BU)	
68	4-933-134-01	SCREW (+PTPHW M2. 6X6)	
69	1-690-732-11	WIRE (FLAT TYPE) (22 CORE) (E:220-230V)	
69	1-690-941-11	WIRE (FLAT TYPE) (AEP, E:120V, Germany)	
* 70	1-634-461-11	LOADING BOARD	
M103	A-4608-362-A	MOTOR (L) ASSY	
S291	1-571-924-11	SWITCH, LEAF (LOAD OUT)	
S292	1-571-924-11	SWITCH, LEAF (LOAD IN)	

4-3. OPTICAL PICK-UP BLOCK SECTION
(BU-5BD3)



Note: The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	4-917-565-01	SHAFT, SLED		106	1-575-001-11	WIRE, FLAT TYPE (12 CORE) (AEP)	
102	4-933-126-01	INSULATOR (A)		* 107	A-4617-371-A	BD BOARD, COMPLETE	
103	4-917-567-01	GEAR (M) (AEP)		M101	X-4917-523-3	MOTOR ASSY (SPINDLE)	
104	4-917-564-01	GEAR (P), FLATNESS		M102	X-4917-504-1	MOTOR ASSY (SLED)	
\triangle 105	8-848-144-11	DEVICE, OPTICAL KSS-240A		S101	1-572-085-11	SWITCH, LEAF (LIMIT IN)	

SECTION 5
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
In each case, u: μ , for example:
uA.: μ A. uPA.: μ PA.
uPB.: μ PB. uPC.: μ PC. uPD.: μ PD.
- CAPACITORS
uF: μ F
- COILS
uH: μ H

The components identified by mark Δ or dotted line with mark. Δ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	1-644-148-11	ANTENNA BOARD *****					
		< CONNECTOR >					
* CN901	1-564-506-11	PLUG, CONNECTOR 3P					
		< TERMINAL >					
* TM901	1-537-138-31	TERMINAL BOARD (ANT) (AEP, Germany)					
TM901	1-537-238-21	TERMINAL BOARD (E)					

*	A-4617-371-A	BD BOARD, COMPLETE *****					
		< CAPACITOR >					
C101	1-163-038-00	CERAMIC CHIP 0.1uF	25V	C151	1-163-019-00	CERAMIC CHIP 0.0068uF 10%	50V
C102	1-163-989-11	CERAMIC CHIP 0.033uF	10% 25V	C152	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C103	1-126-163-11	ELECT 4.7uF	20% 50V	C153	1-163-006-11	CERAMIC CHIP 560PF	10% 50V
C104	1-163-038-00	CERAMIC CHIP 0.1uF	25V	C154	1-164-161-11	CERAMIC CHIP 0.0022uF	10% 100V
C105	1-126-154-11	ELECT 47uF	20% 6.3V	C155	1-163-023-00	CERAMIC CHIP 0.015uF	5% 50V
C106	1-126-154-11	ELECT 47uF	20% 6.3V	C171	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C107	1-126-154-11	ELECT 47uF	20% 6.3V	C172	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C108	1-163-038-00	CERAMIC CHIP 0.1uF	25V	C173	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C109	1-163-038-00	CERAMIC CHIP 0.1uF	25V	C174	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C110	1-163-989-11	CERAMIC CHIP 0.033uF	10% 25V			< CONNECTOR >	
C111	1-131-367-00	TANTALUM 22uF	10% 20V	CN101	1-568-796-11	SOCKET, CONNECTOR 22P	
C112	1-164-232-11	CERAMIC CHIP 0.01uF	50V	CN102	1-568-795-11	SOCKET, CONNECTOR 12P	
C113	1-164-232-11	CERAMIC CHIP 0.01uF	50V			< IC >	
C114	1-164-161-11	CERAMIC CHIP 0.0022uF	10% 100V	IC101	8-752-053-73	IC CXA1372AQ	
C115	1-164-161-11	CERAMIC CHIP 0.0022uF	10% 100V	IC102	8-759-822-36	IC LA6532M	
C116	1-163-017-00	CERAMIC CHIP 0.0047uF	5% 50V			< JUMPER >	
C117	1-163-038-00	CERAMIC CHIP 0.1uF	25V	J101	1-216-295-00	METAL CHIP 0 5%	1/10W
C118	1-163-038-00	CERAMIC CHIP 0.1uF	25V	J102	1-216-295-00	METAL CHIP 0 5%	1/10W
C119	1-164-161-11	CERAMIC CHIP 0.0022uF	10% 100V			< TRANSISTOR >	
C120	1-163-989-11	CERAMIC CHIP 0.033uF	10% 25V	Q101	8-729-901-01	TRANSISTOR DTC144EK	
						< RESISTOR >	
				R101	1-216-097-00	METAL CHIP 100K 5%	1/10W
				R102	1-216-095-00	METAL CHIP 82K 5%	1/10W
				R103	1-216-091-00	METAL CHIP 56K 5%	1/10W
				R104	1-216-099-00	METAL CHIP 120K 5%	1/10W
				R105	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
				R106	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
				R107	1-216-114-00	METAL GLAZE 510K 5%	1/10W
				R108	1-216-105-00	METAL CHIP 220K 5%	1/10W
				R109	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
				R110	1-216-049-00	METAL CHIP 1K 5%	1/10W

BD

MAIN

Ref. No.	Part No.	Description	Remark		
R111	1-216-049-00	METAL CHIP	1K	5%	1/10W
R112	1-216-083-00	METAL CHIP	27K	5%	1/10W
R113	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R114	1-216-105-00	METAL CHIP	220K	5%	1/10W
R152	1-216-073-00	METAL CHIP	10K	5%	1/10W
R153	1-216-085-00	METAL CHIP	33K	5%	1/10W
R154	1-216-085-00	METAL CHIP	33K	5%	1/10W
R155	1-216-093-00	METAL CHIP	68K	5%	1/10W
R156	1-216-081-00	METAL CHIP	22K	5%	1/10W
R157	1-216-079-00	METAL CHIP	18K	5%	1/10W
R158	1-216-079-00	METAL CHIP	18K	5%	1/10W
R159	1-216-079-00	METAL CHIP	18K	5%	1/10W
R160	1-216-049-00	METAL CHIP	1K	5%	1/10W
R171	1-216-001-00	METAL CHIP	10	5%	1/10W
R172	1-216-001-00	METAL CHIP	10	5%	1/10W
R173	1-216-001-00	METAL CHIP	10	5%	1/10W
R174	1-216-001-00	METAL CHIP	10	5%	1/10W
< VARIABLE RESISTOR >					
RV101	1-241-630-11	RES, ADJ, CARBON 10K (TRACKING GAIN)			
RV102	1-241-630-11	RES, ADJ, CARBON 10K (FOCUS GAIN)			
< SWITCH >					
S101	1-572-085-11	SWITCH, LEAF (LIMIT IN)			

*	A-4347-920-A	CD MAIN BOARD, COMPLETE (E)			
*	A-4347-925-A	CD MAIN BOARD, COMPLETE (Germany)			
*	A-4347-932-A	CD MAIN BOARD, COMPLETE (AEP)			

	4-870-539-00	PLATE, GROUND (AEP)			
*	4-942-204-01	PLATE, GROUND			
< CAPACITOR >					
C201	1-130-491-00	MYLAR	0.047uF	5%	50V
C202	1-161-374-11	CERAMIC	0.0015uF	20%	50V
C204	1-161-494-00	CERAMIC	0.022uF		25V
C206	1-162-306-11	CERAMIC	0.01uF	20%	16V
C207	1-124-465-00	ELECT	0.47uF	20%	50V
C208	1-161-494-00	CERAMIC	0.022uF		25V
C209	1-124-589-11	ELECT	47uF	20%	16V
C210	1-164-159-11	CERAMIC	0.1uF		50V
C211	1-164-159-11	CERAMIC	0.1uF		50V
C212	1-162-208-31	CERAMIC	24PF	5%	50V
C213	1-162-205-31	CERAMIC	18PF	5%	50V
C214	1-164-159-11	CERAMIC	0.1uF		50V
C215	1-124-589-11	ELECT	47uF	20%	16V
C218	1-164-159-11	CERAMIC	0.1uF		50V

Ref. No.	Part No.	Description	Remark		
C219	1-124-589-11	ELECT	47uF	20%	16V
C220	1-164-159-11	CERAMIC	0.1uF		50V
C221	1-162-196-31	CERAMIC	5.6PF	10%	50V
C222	1-162-196-31	CERAMIC	5.6PF	10%	50V
C223	1-161-494-00	CERAMIC	0.022uF		25V
C224	1-124-589-11	ELECT	47uF	20%	16V
C225	1-161-494-00	CERAMIC	0.022uF		25V
C226	1-162-289-31	CERAMIC	390PF	10%	50V
C227	1-124-589-11	ELECT	47uF	20%	16V
C228	1-161-494-00	CERAMIC	0.022uF		25V
C229	1-162-289-31	CERAMIC	390PF	10%	50V
C230	1-124-589-11	ELECT	47uF	20%	16V
C231	1-161-494-00	CERAMIC	0.022uF		25V
C235	1-162-286-31	CERAMIC	220PF	10%	50V
C236	1-162-286-31	CERAMIC	220PF	10%	50V
C237	1-162-286-31	CERAMIC	220PF	10%	50V
C238	1-162-286-31	CERAMIC	220PF	10%	50V
C239	1-106-359-00	MYLAR	4700PF	5%	200V
C240	1-106-359-00	MYLAR	4700PF	5%	200V
C241	1-130-472-00	MYLAR	0.0012uF	5%	50V
C242	1-130-472-00	MYLAR	0.0012uF	5%	50V
C243	1-124-916-11	ELECT	22uF	20%	63V
C244	1-124-916-11	ELECT	22uF	20%	63V
C245	1-164-159-11	CERAMIC	0.1uF		50V
C246	1-164-159-11	CERAMIC	0.1uF		50V
C247	1-106-347-00	MYLAR	1500PF	5%	200V
C248	1-106-347-00	MYLAR	1500PF	5%	200V
C252	1-162-306-11	CERAMIC	0.01uF	20%	16V
C253	1-124-997-11	ELECT	470uF	20%	10V
C254	1-161-494-00	CERAMIC	0.022uF		25V
C255	1-126-059-11	ELECT	10uF	20%	50V
C256	1-126-023-11	ELECT	100uF	20%	16V
C260	1-126-022-11	ELECT	47uF	20%	16V
C261	1-126-022-11	ELECT	47uF	20%	16V
C263	1-162-306-11	CERAMIC	0.01uF	20%	16V
C301	1-162-306-11	CERAMIC	0.01uF	20%	16V
C302	1-126-059-11	ELECT	10uF	20%	50V
C304	1-162-306-11	CERAMIC	0.01uF	20%	16V
< CONNECTOR >					
* CN201	1-568-822-11	SOCKET, CONNECTOR 22P			
* CN202	1-564-339-00	PIN, CONNECTOR 5P			
* CN203	1-564-509-11	PLUG, CONNECTOR 6P			
* CN204	1-691-007-11	CONNECTOR (PC BOARD) (PLUG) 4P			
* CN205	1-691-007-11	CONNECTOR (PC BOARD) (PLUG) 4P			
* CN206	1-568-832-11	SOCKET, CONNECTOR 13P			
* CN207	1-691-007-11	CONNECTOR (PC BOARD) (PLUG) 4P			
* CN208	1-691-007-11	CONNECTOR (PC BOARD) (PLUG) 4P			

MAIN

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* CN209	1-691-004-11	PLUG, CONNECTOR (PC BOARD) 13P		R212	1-249-417-11	CARBON	1K 5% 1/4W
* CN210	1-564-709-11	PIN, CONNECTOR (SMALL TYPE) 7P		R213	1-249-409-11	CARBON	220 5% 1/4W
* CN211	1-564-506-11	PLUG, CONNECTOR 3P		R214	1-249-409-11	CARBON	220 5% 1/4W
* CN301	1-568-832-11	SOCKET, CONNECTOR 13P		R215	1-249-417-11	CARBON	1K 5% 1/4W
* CN302	1-564-339-00	PIN, CONNECTOR 5P		R216	1-249-417-11	CARBON	1K 5% 1/4W
< DIODE >				R217	1-249-417-11	CARBON	1K 5% 1/4W
D202	8-719-210-21	DIODE 11EQS04		R218	1-249-417-11	CARBON	1K 5% 1/4W
D203	8-719-010-26	DIODE UZ-3.9BSB		R219	1-249-417-11	CARBON	1K 5% 1/4W
D204	8-719-987-63	DIODE 1N4148M		R221	1-249-393-11	CARBON	10 5% 1/4W
D205	8-719-000-78	DIODE UZL-7L2		R222	1-247-903-00	CARBON	1M 5% 1/4W (E, Germany)
D301	8-719-987-63	DIODE 1N4148M		R223	1-249-428-11	CARBON	8.2K 5% 1/4W
D302	8-719-987-63	DIODE 1N4148M		R224	1-249-428-11	CARBON	8.2K 5% 1/4W
< IC >				R225	1-249-428-11	CARBON	8.2K 5% 1/4W
IC201	8-752-337-26	IC CXD2500AQ		R226	1-249-428-11	CARBON	8.2K 5% 1/4W
IC202	8-752-342-65	IC CXD2560M		R227	1-249-428-11	CARBON	8.2K 5% 1/4W
IC203	8-752-351-19	IC CXD2561BM		R228	1-249-428-11	CARBON	8.2K 5% 1/4W
IC204	8-759-634-51	IC M5218AP		R229	1-249-428-11	CARBON	8.2K 5% 1/4W
IC205	8-759-634-51	IC M5218AP		R230	1-249-428-11	CARBON	8.2K 5% 1/4W
IC206	8-759-633-65	IC M54641L		R231	1-249-411-11	CARBON	330 5% 1/4W
IC207	8-759-634-51	IC M5218AP		R233	1-249-423-11	CARBON	3.3K 5% 1/4W
IC208	8-759-000-49	IC MC14066BCP		R234	1-249-423-11	CARBON	3.3K 5% 1/4W
IC209	8-749-923-04	IC TOTX178 (DIGITAL OUTPUT)		R235	1-249-423-11	CARBON	3.3K 5% 1/4W
IC301	8-759-061-80	IC uPD75116CW-210		R236	1-249-423-11	CARBON	3.3K 5% 1/4W
< COIL >				R237	1-249-429-11	CARBON	10K 5% 1/4W
L201	1-408-403-00	INDUCTOR 3.3uH		R238	1-249-429-11	CARBON	10K 5% 1/4W
L301	1-410-521-11	INDUCTOR 100uH		R239	1-249-429-11	CARBON	10K 5% 1/4W
< TRANSISTOR >				R240	1-249-429-11	CARBON	10K 5% 1/4W
Q205	8-729-231-55	TRANSISTOR 2SC2878-AB		R241	1-249-419-11	CARBON	1.5K 5% 1/4W
Q206	8-729-231-55	TRANSISTOR 2SC2878-AB		R242	1-249-419-11	CARBON	1.5K 5% 1/4W
Q207	8-729-900-65	TRANSISTOR DTA144ES		R243	1-249-419-11	CARBON	1.5K 5% 1/4W
Q208	8-729-900-65	TRANSISTOR DTA144ES		R244	1-249-419-11	CARBON	1.5K 5% 1/4W
Q210	8-729-620-05	TRANSISTOR 2SC2603-EF		R245	1-247-887-00	CARBON	220K 5% 1/4W
Q211	8-729-140-04	TRANSISTOR 2SB1116A-L		R246	1-247-887-00	CARBON	220K 5% 1/4W
Q212	8-729-140-04	TRANSISTOR 2SB1116A-L		R247	1-249-413-11	CARBON	470 5% 1/4W
Q301	8-729-620-05	TRANSISTOR 2SC2603-EF		R248	1-249-413-11	CARBON	470 5% 1/4W
< RESISTOR >				R254	1-249-393-11	CARBON	10 5% 1/4W
R201	1-249-423-11	CARBON	3.3K 5% 1/4W	R255	1-249-393-11	CARBON	10 5% 1/4W
R202	1-249-429-11	CARBON	10K 5% 1/4W	R256	1-249-413-11	CARBON	470 5% 1/4W
R203	1-249-423-11	CARBON	3.3K 5% 1/4W	R257	1-249-413-11	CARBON	470 5% 1/4W
R205	1-249-429-11	CARBON	10K 5% 1/4W	R258	1-249-425-11	CARBON	4.7K 5% 1/4W
R206	1-249-441-11	CARBON	100K 5% 1/4W	R259	1-249-425-11	CARBON	4.7K 5% 1/4W
R207	1-249-417-11	CARBON	1K 5% 1/4W	R261	1-249-441-11	CARBON	100K 5% 1/4W
R208	1-249-417-11	CARBON	1K 5% 1/4W	R262	1-249-441-11	CARBON	100K 5% 1/4W
R209	1-249-420-11	CARBON	1.8K 5% 1/4W	R271	1-249-413-11	CARBON	470 5% 1/4W
R211	1-249-423-11	CARBON	3.3K 5% 1/4W	R272	1-249-425-11	CARBON	4.7K 5% 1/4W
				R273	1-249-413-11	CARBON	470 5% 1/4W
				R274	1-249-425-11	CARBON	4.7K 5% 1/4W
				R275	1-249-410-11	CARBON	270 5% 1/4W
				R276	1-249-429-11	CARBON	10K 5% 1/4W

MAIN

DISPLAY

LOADING

PANEL (L)

PANEL (R)

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R277	1-249-429-11	CARBON	10K 5% 1/4W			< SWITCH >	
R280	1-249-429-11	CARBON	10K 5% 1/4W				
R281	1-249-429-11	CARBON	10K 5% 1/4W	S291	1-571-924-11	SWITCH, LEAF (LOAD OUT)	
R301	1-249-429-11	CARBON	10K 5% 1/4W	S292	1-571-924-11	SWITCH, LEAF (LOAD IN)	
R302	1-249-425-11	CARBON	4.7K 5% 1/4W			*****	
R303	1-249-429-11	CARBON	10K 5% 1/4W				
R304	1-249-393-11	CARBON	10 5% 1/4W	*	1-644-146-11	PANEL (L) BOARD	
R307	1-249-437-11	CARBON	47K 5% 1/4W			*****	
R308	1-249-429-11	CARBON	10K 5% 1/4W			< CONNECTOR >	
R309	1-249-429-11	CARBON	10K 5% 1/4W	* CN602	1-568-850-11	SOCKET, CONNECTOR 7P	
R310	1-249-429-11	CARBON	10K 5% 1/4W			< SWITCH >	
R311	1-249-429-11	CARBON	10K 5% 1/4W				
R312	1-249-429-11	CARBON	10K 5% 1/4W				
		< VIBRATOR >		S603	1-554-303-21	SWITCH, TACTILE (TIMER SET 1)	
X201	1-567-965-11	VIBRATOR, CRYSTAL (22.5792MHz)		S604	1-554-303-21	SWITCH, TACTILE (TIMER SET 2)	
X301	1-577-358-21	VIBRATOR, CERAMIC (4MHz)		S605	1-554-303-21	SWITCH, TACTILE (TIMER SET 3(REC))	
		*****		S606	1-554-303-21	SWITCH, TACTILE (CLOCK)	
*	1-644-144-11	DISPLAY BOARD		S607	1-554-303-21	SWITCH, TACTILE (CONTROL/CHECK/CLEAR)	
		*****		S608	1-554-303-21	SWITCH, TACTILE (TIME/DAY -)	
		< CAPACITOR >		S609	1-554-303-21	SWITCH, TACTILE (TIME/DAY +)	
C501	1-161-379-00	CERAMIC	0.01uF 20% 25V	S610	1-554-303-21	SWITCH, TACTILE (NEXT)	
C502	1-164-812-11	CERAMIC	68PF 5% 50V	S611	1-554-303-21	SWITCH, TACTILE (SLEEP)	
C503	1-161-379-00	CERAMIC	0.01uF 20% 25V			*****	
		< CONNECTOR >		*	1-641-516-13	PANEL (R) BOARD	
* CN501	1-568-852-11	SOCKET, CONNECTOR 9P				*****	
		< INDICATOR TUBE >				< CONNECTOR >	
FL501	1-519-700-11	INDICATOR TUBE, FLUORESCENT		CN603	1-564-501-11	PIN, CONNECTOR 8P	
		< IC >		* CN604	1-564-498-11	PIN, CONNECTOR 5P	
IC501	8-759-045-48	IC M66004M1FP				< DIODE >	
		< RESISTOR >		D601	8-719-301-49	LED SEL2810A (▶▶)	
R501	1-249-432-11	CARBON	18K 5% 1/4W	D602	8-719-301-37	LED SEL2210S-CD (CONTINUE)	
		*****		D603	8-719-301-37	LED SEL2210S-CD (SHUFFLE)	
*	1-634-461-11	LOADING BOARD		D604	8-719-301-37	LED SEL2210S-CD (PROGRAM)	
		*****				< RESISTOR >	
		< CONNECTOR >		R601	1-249-409-11	CARBON	220 5% 1/4W
* CN291	1-564-498-11	PIN, CONNECTOR 5P		R602	1-249-412-11	CARBON	390 5% 1/4W
				R603	1-249-412-11	CARBON	390 5% 1/4W
				R604	1-249-412-11	CARBON	390 5% 1/4W
						< SWITCH >	
				S612	1-554-303-21	SWITCH, TACTILE (▶▶)	
				S613	1-554-303-21	SWITCH, TACTILE (TUNING/PRESET)	
				S614	1-554-303-21	SWITCH, TACTILE (◀◀ ▶▶ /-)	
				S615	1-554-303-21	SWITCH, TACTILE (▶▶ ▶▶ /+)	

PANEL (R)

POWER

ST CONTROL

Ref. No.	Part No.	Description	Remark
S616	1-554-303-21	SWITCH, TACTILE (TIME SHIFT)	
S617	1-554-303-21	SWITCH, TACTILE (CHECK/MEMORY)	
S618	1-554-303-21	SWITCH, TACTILE (CLEAR/CHARACTER)	
S619	1-554-303-21	SWITCH, TACTILE (STEREO/MONO ENTER)	
S620	1-554-303-21	SWITCH, TACTILE (台)	
S621	1-554-303-21	SWITCH, TACTILE (CONTINUE)	
S622	1-554-303-21	SWITCH, TACTILE (SHUFFLE)	
S623	1-554-303-21	SWITCH, TACTILE (PROGRAM)	

*	1-644-145-11	POWER BOARD	

*	3-309-144-21	HEAT SINK	
< CAPACITOR >			
C801	1-126-017-11	ELECT 6800uF 20% 16V	
C802	1-126-024-11	ELECT 220uF 20% 16V	
C803	1-126-024-11	ELECT 220uF 20% 16V	
C804	1-126-027-11	ELECT 1000uF 20% 25V	
C805	1-126-024-11	ELECT 220uF 20% 16V	
< CONNECTOR >			
* CN801	1-564-321-00	PIN, CONNECTOR 2P	
* CN802	1-564-508-11	PLUG, CONNECTOR 5P	
* CN803	1-564-509-11	PLUG, CONNECTOR 6P	
< DIODE >			
D801	8-719-200-77	DIODE 10E2N	
D802	8-719-200-77	DIODE 10E2N	
D803	8-719-200-77	DIODE 10E2N	
D804	8-719-200-77	DIODE 10E2N	
< IC >			
IC801	8-759-231-53	IC TA7805S	
IC802	8-759-605-00	IC M5F78M07L	
IC803	8-759-982-52	IC RC79M05FA	

*	A-4347-918-A	ST CONTROL BOARD, COMPLETE (E)	
*	A-4347-921-A	ST CONTROL BOARD, COMPLETE (Germany)	
*	A-4347-926-A	ST CONTROL BOARD, COMPLETE (AEP)	

*	4-933-656-01	PLATE (ANT), GROUND	
*	4-948-457-01	HOLDER (CD), FL	

Ref. No.	Part No.	Description	Remark
< CAPACITOR >			
C401	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C402	1-162-206-31	CERAMIC 20PF 5% 50V	
C403	1-102-961-00	CERAMIC 27PF 5% 50V	
C404	1-164-159-11	CERAMIC 0.1uF 50V	
C405	1-126-162-11	ELECT 3.3uF 20% 50V	
C406	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C407	1-125-486-11	DOUBLE LAYERS 0.22F 5.5V	
C408	1-126-059-11	ELECT 10uF 20% 50V	
C409	1-164-159-11	CERAMIC 0.1uF 50V	
C410	1-161-375-00	CERAMIC 0.0022uF 20% 50V	
C701	1-161-744-00	CERAMIC 0.01uF 400V	
C703	1-164-096-11	CERAMIC 0.01uF 50V	
C704	1-126-041-11	ELECT 2200uF 20% 35V	
C705	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C706	1-126-022-11	ELECT 47uF 20% 16V	
C707	1-126-022-11	ELECT 47uF 20% 16V	
C708	1-126-301-11	ELECT 1uF 20% 50V	
C710	1-126-161-11	ELECT 2.2uF 20% 50V	
C715	1-124-918-11	ELECT 47uF 20% 63V	
C716	1-124-918-11	ELECT 47uF 20% 63V	
C717	1-124-910-11	ELECT 47uF 20% 50V	
C718	1-126-059-11	ELECT 10uF 20% 50V	
< CONNECTOR >			
* CN401	1-568-824-11	SOCKET, CONNECTOR 5P	
* CN402	1-568-826-11	SOCKET, CONNECTOR 7P	
* CN403	1-564-342-11	PIN, CONNECTOR 8P	
* CN404	1-568-828-11	SOCKET, CONNECTOR 9P	
* CN405	1-568-832-11	SOCKET, CONNECTOR 13P	
* CN406	1-568-832-11	SOCKET, CONNECTOR 13P	
* CN701	1-564-321-00	PIN, CONNECTOR 2P	
* CN703	1-564-508-11	PLUG, CONNECTOR 5P	
< DIODE >			
D401	8-719-987-63	DIODE 1N4148M	
D402	8-719-987-63	DIODE 1N4148M	
D403	8-719-987-63	DIODE 1N4148M	
D404	8-719-987-63	DIODE 1N4148M	
D405	8-719-987-63	DIODE 1N4148M	
D406	8-719-987-63	DIODE 1N4148M	
D407	8-719-987-63	DIODE 1N4148M	
D408	8-719-987-63	DIODE 1N4148M	
D409	8-719-987-63	DIODE 1N4148M	
D411	8-719-987-63	DIODE 1N4148M (E)	
D413	8-719-987-63	DIODE 1N4148M	
D701	8-719-987-63	DIODE 1N4148M	

ST CONTROL

SYSTEM POWER

TCB001

Ref. No.	Part No.	Description	Remark
D702	8-719-200-77	DIODE 10E2N	
D706	8-719-200-77	DIODE 10E2N	
D707	8-719-200-77	DIODE 10E2N	
D708	8-719-014-66	DIODE UZP-5.6B	
< FUSE >			
△F701	1-532-237-00	FUSE, TIME-LAG (BET) (3.15A) (AEP, E:220-230V, Germany)	
△F701	1-532-325-00	FUSE, TIME-LAG (6.3A) (E:120V)	
< HOLDER >			
* FH701	1-533-213-31	HOLDER, FUSE	
* FH702	1-533-213-31	HOLDER, FUSE	
< IC >			
IC401	8-759-073-73	IC uPD75217CW-150	
IC701	8-759-820-09	IC LA5667	
IC703	8-759-633-42	IC M5293L	
< COIL >			
L401	1-410-521-11	INDUCTOR 100uH	
< TRANSISTOR >			
Q401	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q402	8-729-900-80	TRANSISTOR DTC114ES	
Q701	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q702	8-729-140-04	TRANSISTOR 2SB1116A-L	
Q703	8-729-620-05	TRANSISTOR 2SC2603-EF	
< RESISTOR >			
R401	1-249-429-11	CARBON 10K 5% 1/4W	
R402	1-249-429-11	CARBON 10K 5% 1/4W	
R403	1-249-433-11	CARBON 22K 5% 1/4W	
R404	1-249-433-11	CARBON 22K 5% 1/4W	
R405	1-249-429-11	CARBON 10K 5% 1/4W	
R406	1-249-429-11	CARBON 10K 5% 1/4W	
R407	1-249-429-11	CARBON 10K 5% 1/4W	
R408	1-249-429-11	CARBON 10K 5% 1/4W	
R409	1-249-429-11	CARBON 10K 5% 1/4W	
R410	1-249-433-11	CARBON 22K 5% 1/4W	
R411	1-249-433-11	CARBON 22K 5% 1/4W	
R412	1-249-429-11	CARBON 10K 5% 1/4W	
R413	1-249-429-11	CARBON 10K 5% 1/4W	
R414	1-249-429-11	CARBON 10K 5% 1/4W	
R415	1-249-429-11	CARBON 10K 5% 1/4W	
R416	1-247-903-00	CARBON 1M 5% 1/4W	
R417	1-247-903-00	CARBON 1M 5% 1/4W	
R418	1-249-429-11	CARBON 10K 5% 1/4W	
R419	1-249-405-11	CARBON 100 5% 1/4W	

Ref. No.	Part No.	Description	Remark
R421	1-249-393-11	CARBON 10 5% 1/4W	
R422	1-249-421-11	CARBON 2.2K 5% 1/4W	
R423	1-249-429-11	CARBON 10K 5% 1/4W	
R424	1-249-425-11	CARBON 4.7K 5% 1/4W	
R425	1-249-429-11	CARBON 10K 5% 1/4W	
R426	1-249-413-11	CARBON 470 5% 1/4W	
R427	1-249-413-11	CARBON 470 5% 1/4W	
R428	1-249-413-11	CARBON 470 5% 1/4W	
R429	1-249-413-11	CARBON 470 5% 1/4W	
R430	1-249-429-11	CARBON 10K 5% 1/4W	
R701	1-247-743-11	CARBON 220 5% 1/2W	
R702	1-249-429-11	CARBON 10K 5% 1/4W	
R704	1-249-417-11	CARBON 1K 5% 1/4W	
R705	1-249-433-11	CARBON 22K 5% 1/4W	
R706	1-249-413-11	CARBON 470 5% 1/4W	
R707	1-249-425-11	CARBON 4.7K 5% 1/4W	
R710	1-249-437-11	CARBON 47K 5% 1/4W	
R711	1-249-429-11	CARBON 10K 5% 1/4W	
R712	1-249-433-11	CARBON 22K 5% 1/4W	
< RELAY >			
RY701	1-515-720-11	RELAY	
< VIBRATOR >			
X401	1-577-621-11	VIBRATOR, CRYSTAL (4.19MHz)	

*	1-644-147-11	SYSTEM POWER BOARD	

< CONNECTOR >			
* CN601	1-568-848-11	SOCKET, CONNECTOR 5P	
< SWITCH >			
S601	1-554-303-21	SWITCH, TACTILE (SYSTEM POWER)	
S602	1-554-303-21	SWITCH, TACTILE (BAND)	

*	A-4303-343-A	TCB001 (TUNER) BOARD, COMPLETE (AEP)	
*	A-4303-344-A	TCB001 (TUNER) BOARD, COMPLETE (Germany)	
*	A-4303-416-A	TCB001 (TUNER) BOARD, COMPLETE (E)	

< CAPACITOR >			
C1	1-124-120-11	ELECT 220uF 20% 25V	
C2	1-163-031-11	CERAMIC CHIP 0.01uF 50V	
C3	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C5	1-163-031-11	CERAMIC CHIP 0.01uF 50V	

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

TCB001

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
C6	1-163-038-00	CERAMIC CHIP	0.1uF		25V (AEP, Germany)	C72	1-124-120-11	ELECT	220uF	20%	25V
C8	1-163-031-11	CERAMIC CHIP	0.01uF		50V (AEP, Germany)	C73	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C9	1-163-012-00	CERAMIC CHIP	1800PF		(AEP, Germany)	C74	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C10	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V (AEP, Germany)	C75	1-126-157-11	ELECT	10uF	20%	16V
C21	1-163-237-11	CERAMIC CHIP	27PF	5%	50V	C76	1-126-101-11	ELECT	100uF	20%	16V
C22	1-163-237-11	CERAMIC CHIP	27PF	5%	50V	C79	1-126-157-11	ELECT	10uF	20%	16V
C23	1-163-031-11	CERAMIC CHIP	0.01uF		50V	C80	1-124-472-11	ELECT	470uF	20%	10V
C24	1-163-031-11	CERAMIC CHIP	0.01uF		50V	C81	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C25	1-163-031-11	CERAMIC CHIP	0.01uF		50V	C82	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C26	1-164-346-11	CERAMIC CHIP	1.0uF		16V	C83	1-163-031-11	CERAMIC CHIP	0.01uF		50V (Germany)
C27	1-164-505-11	CERAMIC CHIP	2.2uF		16V	< FILTER >					
C29	1-163-031-11	CERAMIC CHIP	0.01uF		50V	CF1	1-567-389-11	FILTER, CERAMIC (E)			
C31	1-164-505-11	CERAMIC CHIP	2.2uF		16V	CF1	1-579-675-11	FILTER, CERAMIC (AEP, Germany)			
C32	1-163-031-11	CERAMIC CHIP	0.01uF		50V	CF2	1-579-675-11	FILTER, CERAMIC (Germany)			
C33	1-163-038-00	CERAMIC CHIP	0.1uF		25V	CF51	1-567-389-11	FILTER, CERAMIC (E)			
C34	1-164-005-11	CERAMIC CHIP	0.47uF		25V (AEP, Germany)	CF51	1-579-675-11	FILTER, CERAMIC (AEP, Germany)			
C35	1-163-033-00	CERAMIC CHIP	0.022uF		50V (AEP, Germany)	< CONNECTOR >					
C36	1-163-033-00	CERAMIC CHIP	0.022uF		50V (AEP, Germany)	CN1	1-573-105-11	CONNECTOR, PC BOARD (RECEPTACLE)			
C51	1-163-031-11	CERAMIC CHIP	0.01uF		50V	CN2	1-573-105-11	CONNECTOR, PC BOARD (RECEPTACLE)			
C52	1-126-162-11	ELECT	3.3uF	20%	50V	CN3	1-573-105-11	CONNECTOR, PC BOARD (RECEPTACLE)			
C53	1-163-031-11	CERAMIC CHIP	0.01uF		50V	CN4	1-573-105-11	CONNECTOR, PC BOARD (RECEPTACLE)			
C54	1-163-031-11	CERAMIC CHIP	0.01uF		50V	CN5	1-573-105-11	CONNECTOR, PC BOARD (RECEPTACLE)			
C55	1-163-105-00	CERAMIC CHIP	33PF	5%	50V (AEP, E)	< DIODE >					
C55	1-163-135-00	CERAMIC CHIP	560PF	5%	50V (Germany)	D21	8-719-422-46	DIODE MA8056-TX			
C56	1-163-117-00	CERAMIC CHIP	100PF	5%	50V (Germany)	D51	8-719-016-74	DIODE 1SS352			
C57	1-164-346-11	CERAMIC CHIP	1.0uF		16V	< FRONTEND >					
C58	1-164-346-11	CERAMIC CHIP	1.0uF		16V	FE1	1-463-957-11	FRONTEND (FM 4 GANG) (Germany)			
C59	1-164-346-11	CERAMIC CHIP	1.0uF		16V	FE1	1-465-673-11	FRONTEND (2 BAND) (AEP, E)			
C60	1-163-038-00	CERAMIC CHIP	0.1uF		25V	FE2	1-239-030-11	ENCAPSULATED COMPONENT (MW) (AEP, Germany)			
C61	1-163-022-00	CERAMIC CHIP	0.012uF	10%	50V	FE2	1-239-031-11	ENCAPSULATED COMPONENT (E)			
C62	1-163-022-00	CERAMIC CHIP	0.012uF	10%	50V	FE3	1-239-049-11	ENCAPSULATED COMPONENT (LW) (AEP, Germany)			
C63	1-164-346-11	CERAMIC CHIP	1.0uF		16V	< FILTER >					
C64	1-164-346-11	CERAMIC CHIP	1.0uF		16V	FL51	1-239-029-11	ENCAPSULATED COMPONENT (Germany)			
C65	1-164-346-11	CERAMIC CHIP	1.0uF		16V	< IC >					
C66	1-164-346-11	CERAMIC CHIP	1.0uF		16V	IC21	8-759-821-43	IC LC7218M			
C69	1-163-031-11	CERAMIC CHIP	0.01uF		50V	IC51	8-759-823-68	IC LA1851NM			
C70	1-163-031-11	CERAMIC CHIP	0.01uF		50V						
C71	1-163-031-11	CERAMIC CHIP	0.01uF		50V						

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
		< IFT >					
IFT51	1-404-954-11	TRANSFORMER, DISCRIMINATOR		R8	1-216-057-00	METAL CHIP 2.2K 5% 1/10W (AEP, Germany)	
IFT52	1-404-713-11	TRANSFORMER, IF		R9	1-216-089-00	METAL CHIP 47K 5% 1/10W	
		< JUMPER RESISTOR >		R10	1-216-097-00	METAL CHIP 100K 5% 1/10W	
JW1	1-216-295-00	METAL CHIP 0 5% 1/10W		R11	1-216-065-00	METAL CHIP 4.7K 5% 1/10W (AEP, Germany)	
JW2	1-216-295-00	METAL CHIP 0 5% 1/10W(AEP, E)		R12	1-216-057-00	METAL CHIP 2.2K 5% 1/10W (AEP, Germany)	
JW4	1-216-295-00	METAL CHIP 0 5% 1/10W		R13	1-216-089-00	METAL CHIP 47K 5% 1/10W (AEP, Germany)	
JW5	1-216-295-00	METAL CHIP 0 5% 1/10W		R14	1-216-081-00	METAL CHIP 22K 5% 1/10W (AEP, Germany)	
JW6	1-216-295-00	METAL CHIP 0 5% 1/10W(E)					
JW7	1-216-295-00	METAL CHIP 0 5% 1/10W(AEP, Germany)		R15	1-216-121-00	METAL CHIP 1M 5% 1/10W (AEP, Germany)	
		< COIL >		R16	1-216-089-00	METAL CHIP 47K 5% 1/10W (AEP, Germany)	
L1	1-408-793-21	INDUCTOR CHIP 220uH (AEP, Germany)					
L51	1-408-798-00	CHIP INDUCTOR		R21	1-216-049-00	METAL CHIP 1K 5% 1/10W	
		< FILTER >		R22	1-216-049-00	METAL CHIP 1K 5% 1/10W	
LPF51	1-235-221-00	FILTER, LOW PASS		R23	1-216-049-00	METAL CHIP 1K 5% 1/10W	
		< TRANSISTOR >		R24	1-216-025-00	METAL CHIP 100 5% 1/10W	
Q1	8-729-804-72	TRANSISTOR 2SC2814-F4		R25	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
Q2	8-729-804-72	TRANSISTOR 2SC2814-F4 (Germany)		R26	1-216-049-00	METAL CHIP 1K 5% 1/10W	
Q3	8-729-810-16	TRANSISTOR 2SA1678		R27	1-216-073-00	METAL CHIP 10K 5% 1/10W (AEP, Germany)	
Q4	8-729-602-36	TRANSISTOR 2SA1602 (AEP, Germany)		R28	1-216-073-00	METAL CHIP 10K 5% 1/10W	
Q5	8-729-810-28	TRANSISTOR 2SC4398 (AEP, Germany)		R29	1-216-025-00	METAL CHIP 100 5% 1/10W	
Q6	8-729-602-36	TRANSISTOR 2SA1602 (AEP, Germany)		R30	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
Q7	8-729-810-28	TRANSISTOR 2SC4398 (AEP, Germany)		R31	1-216-043-00	METAL CHIP 560 5% 1/10W	
Q21	8-729-602-21	TRANSISTOR 2SC4154		R32	1-216-049-00	METAL CHIP 1K 5% 1/10W	
Q22	8-729-232-69	TRANSISTOR 2SK208GR3		R33	1-216-035-00	METAL CHIP 270 5% 1/10W	
Q23	8-729-232-59	TRANSISTOR 2SC4666B		R34	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
Q24	8-729-232-69	TRANSISTOR 2SK208GR3 (AEP, Germany)		R35	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
Q25	8-729-232-59	TRANSISTOR 2SC4666B (AEP, Germany)		R36	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
Q51	8-729-602-21	TRANSISTOR 2SC4154		R37	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
Q52	8-729-602-21	TRANSISTOR 2SC4154		R38	1-216-025-00	METAL CHIP 100 5% 1/10W	
Q53	8-729-810-28	TRANSISTOR 2SC4398					
		< RESISTOR >		R39	1-216-061-00	METAL CHIP 3.3K 5% 1/10W (AEP, Germany)	
R1	1-216-037-00	METAL CHIP 330 5% 1/10W		R40	1-216-043-00	METAL CHIP 560 5% 1/10W(AEP, E)	
R2	1-216-037-00	METAL CHIP 330 5% 1/10W		R41	1-216-049-00	METAL CHIP 1K 5% 1/10W (AEP, Germany)	
R3	1-216-109-00	METAL CHIP 330K 5% 1/10W					
R4	1-216-037-00	METAL CHIP 330 5% 1/10W		R42	1-216-035-00	METAL CHIP 270 5% 1/10W (AEP, Germany)	
R5	1-216-109-00	METAL CHIP 330K 5% 1/10W (Germany)		R43	1-216-081-00	METAL CHIP 22K 5% 1/10W (AEP, Germany)	
R6	1-216-037-00	METAL CHIP 330 5% 1/10W (Germany)					
R7	1-216-025-00	METAL CHIP 100 5% 1/10W		R44	1-216-057-00	METAL CHIP 2.2K 5% 1/10W (AEP, Germany)	
				R45	1-216-065-00	METAL CHIP 4.7K 5% 1/10W (AEP, Germany)	

Ref. No.	Part No.	Description	Remark		
R46	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (AEP, Germany)
R47	1-216-025-00	METAL CHIP	100	5%	1/10W
R51	1-216-049-00	METAL CHIP	1K	5%	1/10W
R52	1-216-081-00	METAL CHIP	22K	5%	1/10W
R53	1-216-085-00	METAL CHIP	33K	5%	1/10W
R54	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R55	1-216-075-00	METAL CHIP	12K	5%	1/10W (AEP, Germany)
R56	1-216-075-00	METAL CHIP	12K	5%	1/10W (Germany)
R57	1-216-073-00	METAL CHIP	10K	5%	1/10W
R58	1-216-066-00	METAL CHIP	5.1K	5%	1/10W
R59	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R60	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R61	1-216-115-00	METAL CHIP	560K	5%	1/10W
R62	1-216-115-00	METAL CHIP	560K	5%	1/10W
R63	1-216-049-00	METAL CHIP	1K	5%	1/10W
R64	1-216-049-00	METAL CHIP	1K	5%	1/10W
R65	1-216-073-00	METAL CHIP	10K	5%	1/10W
R66	1-216-073-00	METAL CHIP	10K	5%	1/10W
R67	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R68	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R69	1-216-025-00	METAL CHIP	100	5%	1/10W
R70	1-216-025-00	METAL CHIP	100	5%	1/10W
R71	1-216-089-00	METAL CHIP	47K	5%	1/10W
R72	1-216-073-00	METAL CHIP	10K	5%	1/10W
R73	1-216-073-00	METAL CHIP	10K	5%	1/10W
R74	1-216-013-00	METAL CHIP	33	5%	1/10W
R75	1-216-061-00	METAL CHIP	3.3K	5%	1/10W (Germany)
R79	1-216-055-00	METAL CHIP	1.8K	5%	1/10W (Germany)
R79	1-216-049-00	METAL CHIP	1K	5%	1/10W (AEP, E)
< VARIABLE RESISTOR >					
RV51	1-238-601-11	RES, ADJ, CARBON 22K (MW TUNED LEVEL)			
RV52	1-238-601-11	RES, ADJ, CARBON 22K (FM TUNED LEVEL)			
< TEST PIN >					
* TP51	1-564-336-00	PIN, CONNECTOR 2P			
< VIBRATOR >					
X21	1-577-126-11	VIBRATOR, CRYSTAL (7.2MHz)			
X51	1-577-075-11	OSCILLATOR, CERAMIC (19KHz)			

Ref. No.	Part No.	Description	Remark
MISCELLANEOUS *****			
15	1-575-730-31	WIRE, FLAT TYPE (5 CORE)	
16	1-590-032-31	WIRE, FLAT TYPE (7 CORE)	
17	1-690-588-31	WIRE, FLAT TYPE (9 CORE)	
21	1-690-590-31	WIRE, FLAT TYPE (13 CORE)	
22	1-690-589-31	WIRE, FLAT TYPE (13 CORE)	
△36	1-569-007-11	ADAPTER, CONVERSION 2P (E:220-230V)	
69	1-690-732-11	WIRE (FLAT TYPE) (22 CORE) (E:220-230V)	
69	1-690-941-11	WIRE (FLAT TYPE) (AEP, E:120V, Germany)	
△105	8-848-144-11	DEVICE, OPTICAL KSS-240A	
106	1-575-001-11	WIRE, FLAT TYPE (12 CORE) (AEP)	
△CNPJ701	1-540-041-11	OUTLET, AC (NONPOLAR) (2P) (E)	
△CNPJ901	1-526-794-11	OUTLET, AC (AEP, Germany)	
△CNP901	1-575-651-11	CORD, POWER (AEP, Germany)	
△CNP901	1-575-653-11	CORD, POWER (E)	
M101	X-4917-523-3	MOTOR ASSY (SPINDLE)	
M102	X-4917-504-1	MOTOR ASSY (SLED)	
M103	A-4608-362-A	MOTOR (L) ASSY	
△PT801	1-450-948-11	TRANSFORMER, POWER (AEP, E:220-230V, Germany)	
△PT801	1-450-949-11	TRANSFORMER, POWER (E:120V)	

ACCESSORIES & PACKING MATERIALS *****			
	1-501-369-11	ANTENNA (AEP)	
	1-501-374-11	ANTENNA, LOOP (AEP, Germany)	
*	4-948-202-01	CUSHION	
*	4-952-536-01	INDIVIDUAL CARTON (AEP, Germany)	

The components identified by mark △ or dotted line with mark. △ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
		***** HARDWARE LIST *****	
#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#2	7-682-551-09	SCREW +BVTT 3X14 (S)	
#3	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#4	7-621-775-10	SCREW +B 2. 6X4	
#5	7-624-105-04	STOP RING 2. 3, TYPE -E	
#6	7-621-255-15	SCREW +P 2X3	
#7	7-685-134-19	SCREW +BTP 2. 6X8 TYPE2 N-S (AEP)	
#8	7-685-234-19	SCREW +KTP 2. 6X8 TYPE2NON-SLIT	
#9	7-682-549-04	SCREW (M3X10), S TITE, + BTT	
#10	7-685-870-01	SCREW +BVTT 3X5 (S)	

