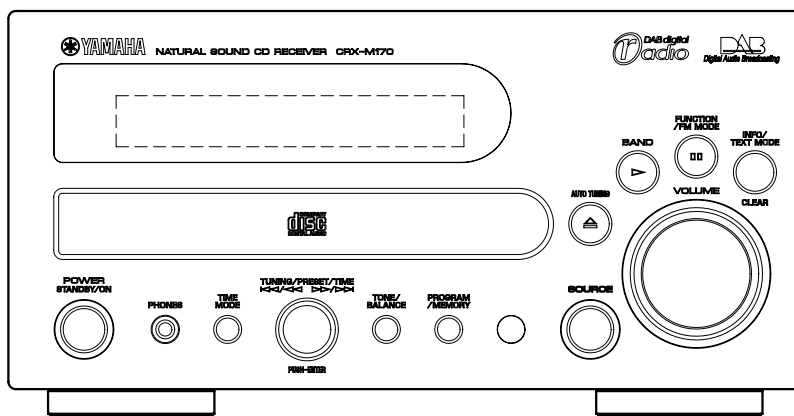
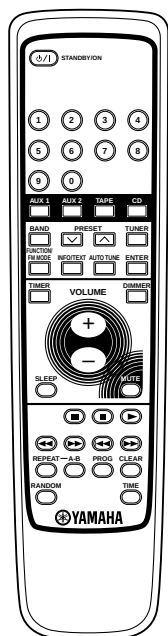


CD/DAB RECEIVER

CRX-M170

SERVICE MANUAL



IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that all service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

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This Service Manual uses recycled paper.

100975

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YAMAHA

YAMAHA CORPORATION
P.O.Box 1, Hamamatsu, Japan

01.01 '05.09

CRX-M170

■ TO SERVICE PERSONNEL

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

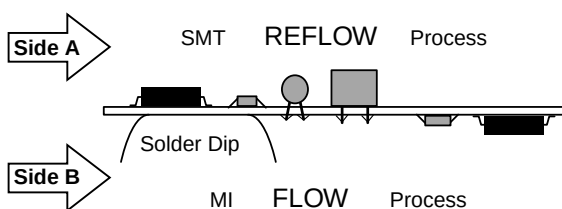
Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

About Lead Free Solder

The P.C.B.s installed in this unit are soldered using the following solder.

	SIDE A	SIDE B
MAIN P.C.B.	Lead Free Solder	Lead Free Solder
POWER P.C.B.	—	Lead Free Solder



Among some types of lead free solder currently available, it is recommended to use one of the following types for the repair work.

- Sn + Ag + Cu (tin + silver + copper)
- Sn + Cu (tin + copper)
- Sn + Zn + Bi (tin + zinc + bismuth)

Caution:

1. As the melting point temperature of the lead free solder is about 30°C to 40°C (50°F to 70°F) higher than that of the lead solder, be sure to use a soldering iron suitable to each solder.
2. If lead solder must be used, be sure to remove lead free solder from each terminal section of the parts to be replaced and from the area around it completely before soldering, or make sure that the lead free solder and lead solder melt together fully.

WARNING: Laser Safety

This product contains a laser beam component. This component may emit invisible, as well as visible radiation, which may cause eye damage. To protect your eyes and skin from laser radiation, the following precautions must be used during servicing of the unit.

- 1) When testing and/or repairing any component within the product, keep your eyes and skin more than 30 cm away from the laser pick-up unit at all times. Do not stare at the laser beam at any time.
- 2) Do not attempt to readjust, disassemble or repair the laser pick-up, unless noted elsewhere in this manual.
- 3) CAUTION : Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Laser Emitting conditions:

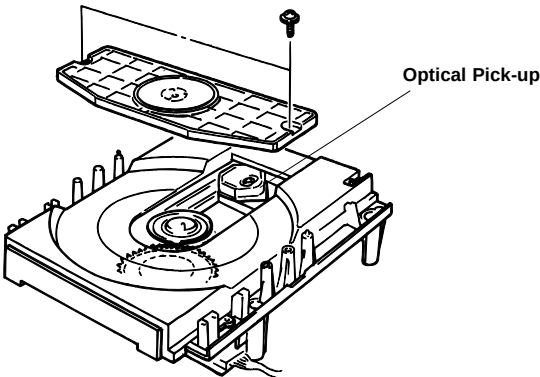
- 1) When the Top Cover is removed, and the "STANDBY/ON" SW is turned to the "ON" position, the laser component will emit a beam for several seconds to detect if a disc is present. During this time (5-10 sec.) the laser may radiate through the lens of the laser pick-up unit. Do not attempt any servicing during this period!
If no disc is detected, the laser will stop emitting the beam. When a disc is set, you will not be exposed to any laser emissions.
- 2) The laser power level can be adjusted with the VR on the pick-up PWB. However, this level has been set by the factory prior to shipping from the factory. Do not adjust this laser level control unless instruction is provided elsewhere in this manual. Adjustment of this control can increase the laser emission level from the device.

Laser Diode Properties

- Material : GaAlAs
- Wavelength : 789 nm
- Emission Duration : Continuous
- Laser Output : max. 44.6 μW*

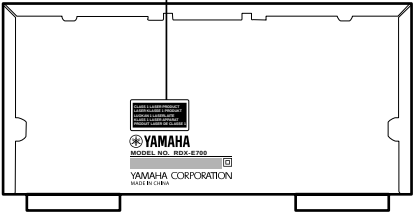
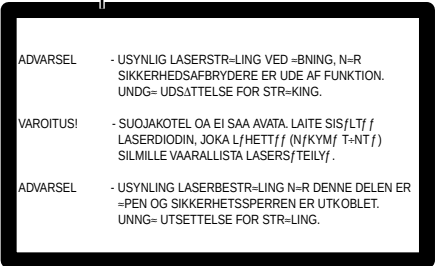
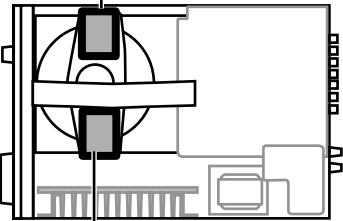
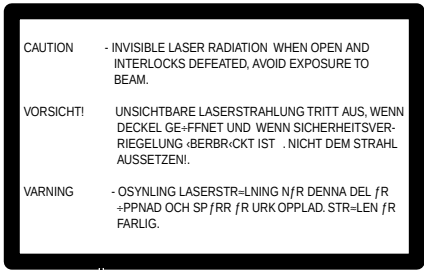
* This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.

When checking the laser diode emission, keep your eyes more than 30 cm away from the objective lens.



VARO! : AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASER-SÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

VARNING! : OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.



■ PREVENTION OF ELECTRO STATIC DISCHARGE

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

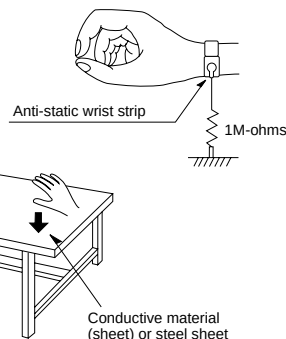
1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static (ESD protected)" can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

Grounding for electrostatic breakdown prevention

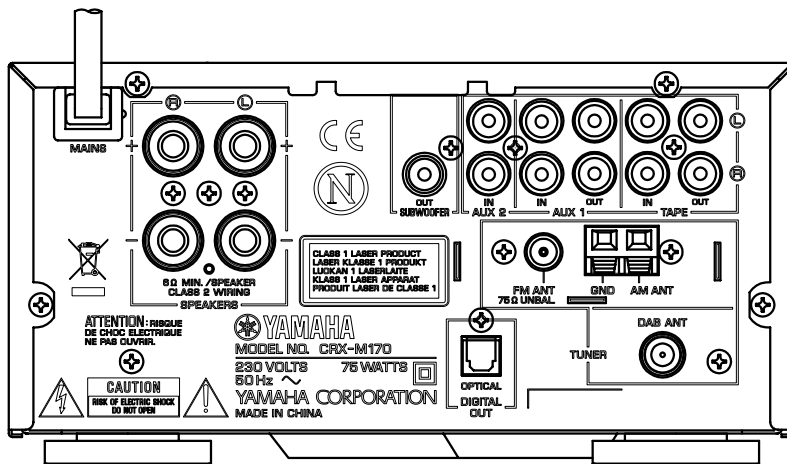
1. Human body grounding.
Use the antistatic wrist strap to discharge the static electricity from your body.
2. Work table grounding.
Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed and ground the sheet.



Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So take care not to let your clothes touch the optical pickup.

■ REAR PANEL



SPECIFICATIONS

AUDIO SECTION

Minimum RMS Output Power Per Channel	
1 kHz, 0.1% THD, 6 ohms	25 W + 25 W
Input Sensitivity/Impedance	
Tape, AUX 1, AUX 2	300 mV/47 k-ohms
Output Level	
REC OUT	280 mV
SUB WOOFER (50Hz)	2.0 V
Headphone Jack Rated Output	
CD, etc. (32 ohms)	1.0 V
Frequency Response	
CD, etc (20Hz to 20kHz)	±0.5 dB
Total Harmonic Distortion	
CD, etc. 1 kHz	0.03%
Signal to Noise Ratio (IHF-A-Network)	
CD, etc. (300 mV, Input Shorted)	98 dB
Tone Control Characteristics	
BASS Boost/cut	±10 dB (100 Hz)
TREBLE Boost/cut	±10 dB (10 kHz)

FM SECTION

Tuning Range (50 kHz steps)	87.50 to 108.00 MHz
Signal to Noise Ratio (Mono)	65 dB
Sensitivity (S/N 30 dB)	1.0 µV/m

AM SECTION

Tuning Range (9 kHz steps)	531 to 1629kHz
Signal to Noise Ratio	35 dB
Sensitivity	600 µV/m

DAB SECTION

Tuning Range (BAND III)	174 MHz to 240 MHz
Input	50 ohms (nominal)
Sensitivity	— 96 dBm
Selectivity	35 dB typ.
Audio Out	Stereo, 2.0 Vp-p
Digital Out	24 bit/48 kHz resolution

CD PLAYER SECTION

Signal to Noise Ratio	90 dB
Total Harmonic Distortion	0.007%
Separation	90 dB

GENERAL

Power Supply	AC 230V, 50 Hz
Power Consumption	75 W
Standby Power Consumption	0.9 W
Dimensions (W x H x D)	215 x 110 x 359 mm (8-7/16" x 4-5/16" x 14-1/8")
Weight	4.4 kg (9 lbs. 11 oz)
Finish	Silver color
Accessories	AM loop antenna x 1 Indoor FM antenna x 1 Indoor DAB antenna x 1 Remote Control x 1 Battery (size "AAA", "R03", "UM-4") x 2

* Specifications subject to change without notice.

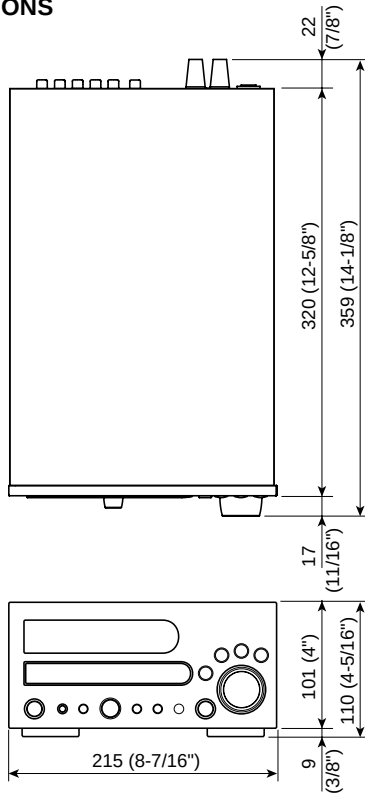
B British model



Digital Audio Broadcasting

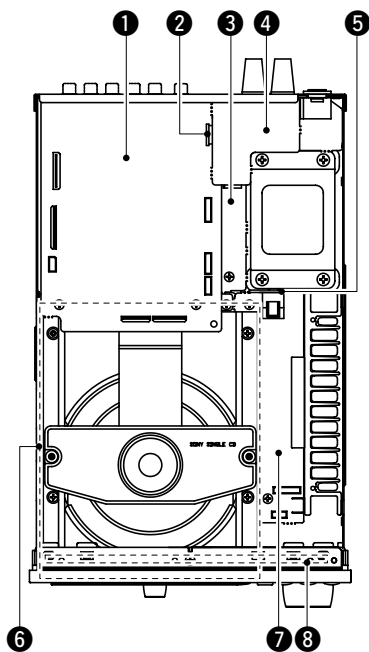
DAB (Digital Audio Broadcasting), also known as digital radio, is a new way of radio broadcasting. DAB is broadcast using digital signals instead of analog signals, resulting in near CD-quality sound. Analog signals (i.e. AM/FM) are susceptible to interference (i.e. distortion and noise) caused by electrical equipment, weather conditions, tall buildings, mountains, etc.; digital signals are not. Thus, with DAB, there is virtually interference-free reception and no hiss or crackle.

DIMENSIONS



Unit : mm (inch)

INTERNAL VIEW



- ① MAIN P.C.B.
- ② POWER (6) P.C.B.
- ③ POWER (1) P.C.B.
- ④ POWER (4) P.C.B.
- ⑤ POWER (5) P.C.B.
- ⑥ CD MECHANISM UNIT
- ⑦ POWER (2) P.C.B.
- ⑧ POWER (3) P.C.B.

DISASSEMBLY PROCEDURES

- Remove parts in disassembly order as numbered.
- Disconnect the power cable from the AC outlet.

1. Removal of Top Cover

- a. Remove 2 screws (①) and 4 screws (②). (Fig. 1)
- b. Slide the Top Cover rearward to remove it. (Fig. 1)

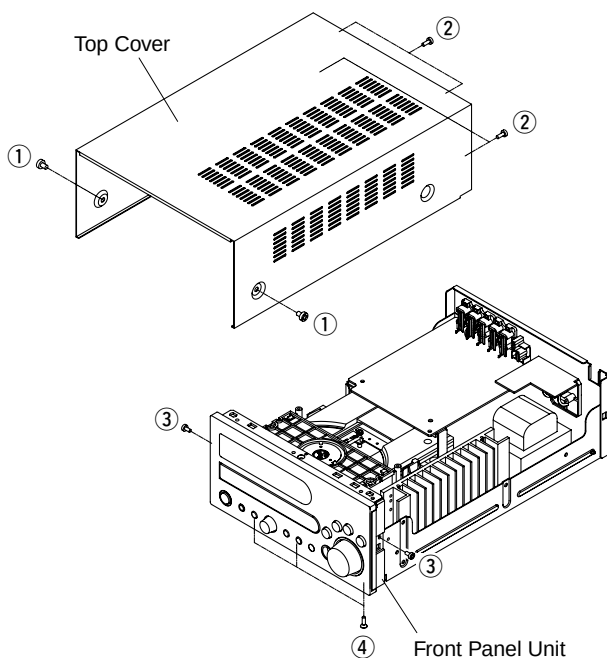


Fig. 1

2. Removal of Front Panel Unit

- a. Disconnect the connectors (WF14 and CN16). (Fig. 2)
- b. Remove 2 screws (③) and 3 screws (④), and then remove the Front Panel Unit. (Fig. 1)

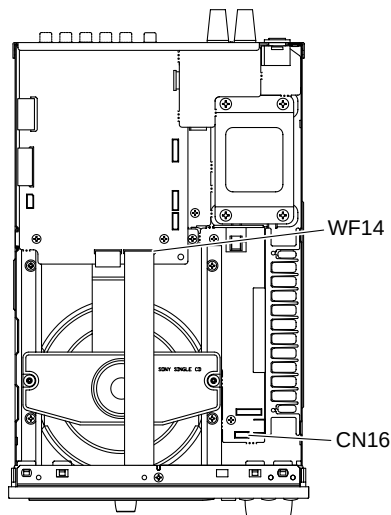


Fig. 2

3. Removal of Rear Panel and Tuner Module

- Remove the Cord Stopper. (Fig. 3)
- Remove 8 screws (⑤), 2 screws (⑥), 1 screw (⑦) and 4 screws (⑧). (Fig. 3)
- Remove the Rear Panel. (Fig. 3)
- Disconnect the connector (WF20). (Fig. 4)
- Remove the Tuner Module. (Fig. 3)

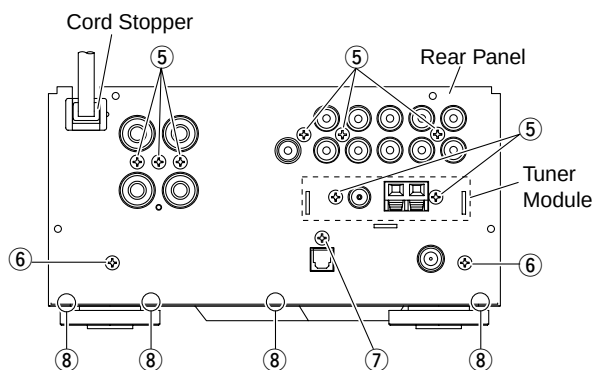


Fig. 3

4. Removal of Main, Power (4) and Power (6) P.C.B.s

- Remove the Rear Panel.
- Disconnect the connectors (WF12, WF15, CN10, CN11, CN13, CN18 and CN19). (Fig. 4)
- Remove 2 screws (⑨) and then remove the Main, Power (4) and Power (6) P.C.B.s. (Fig. 4)

5. Removal of CD Mechanism Unit

- Remove the Front Panel Unit.
- Disconnect the connectors (WF12, CN10 and CN11). (Fig. 4)
- Remove 4 screws (⑩). (Fig. 4)
- Remove the CD Mechanism Unit. (Fig. 4)

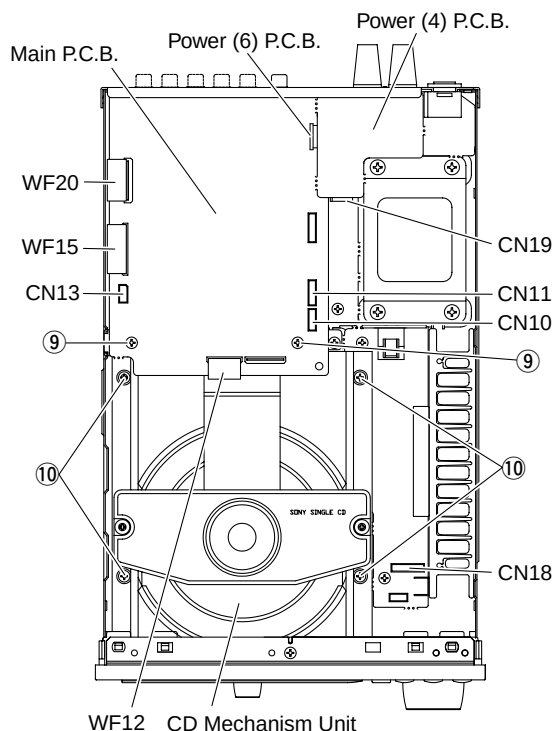


Fig. 4

6. Removal of Tray Unit

- Remove 2 screws (⑪) and then remove the Chucking Unit. (Fig. 5)
- Remove 1 hook and then remove the Stopper Pin. (Fig. 5)
- Rotate the Drive Gear and then open the Tray Unit. (Fig. 5)
- Detach the Stoppers on both sides and then pull out the Tray. (Fig. 5)

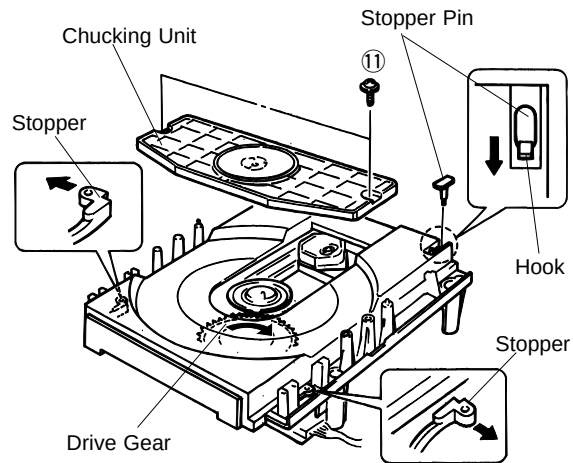


Fig. 5

7. Removal of Pick-up Head

- Remove 2 screws (⑫). (Fig. 6)
- Remove a pick-up cable. (Fig. 6)
- Remove 4 screws (⑬) and then remove the Drive Unit. (Fig. 6)
- Remove the gear A. (Fig. 7)
- Pull out the Sled Shaft. (Fig. 7)
- Remove the Pick-up Head.

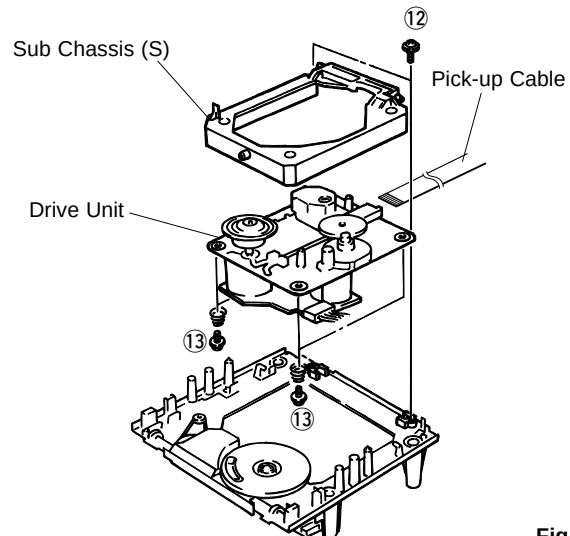


Fig. 6

Check that the disc table height is as specified below.

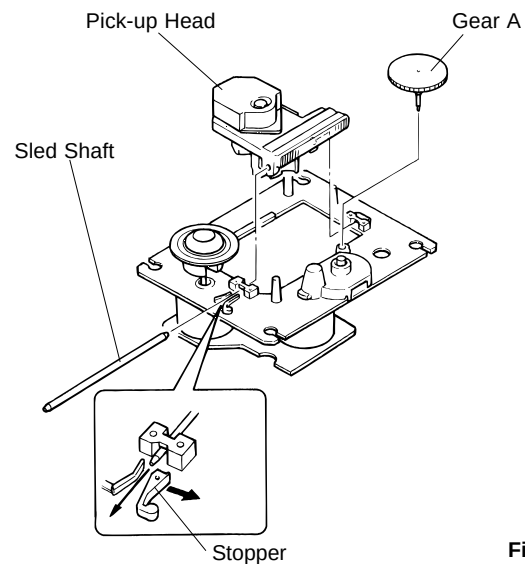
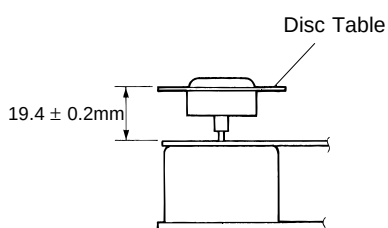
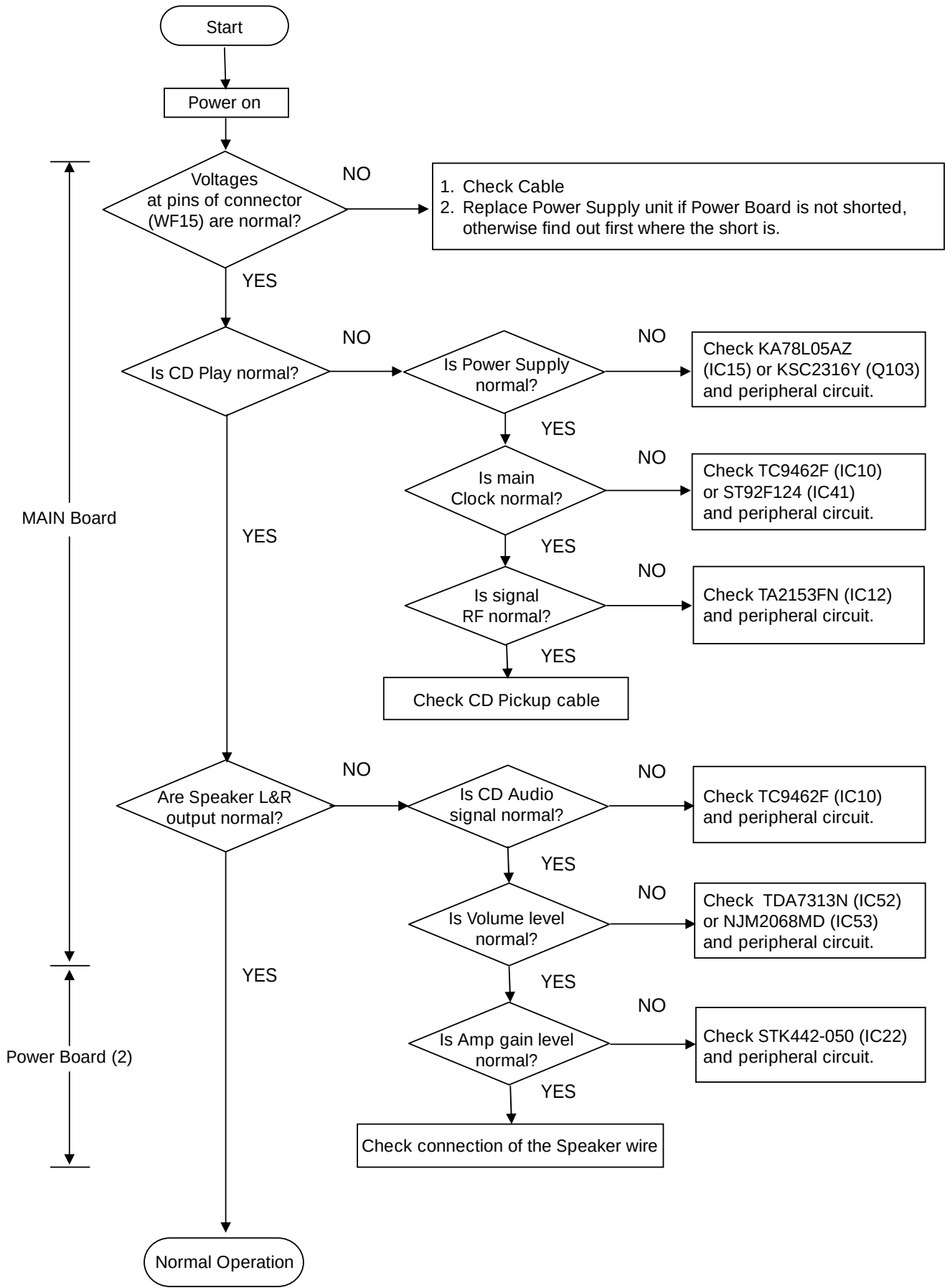
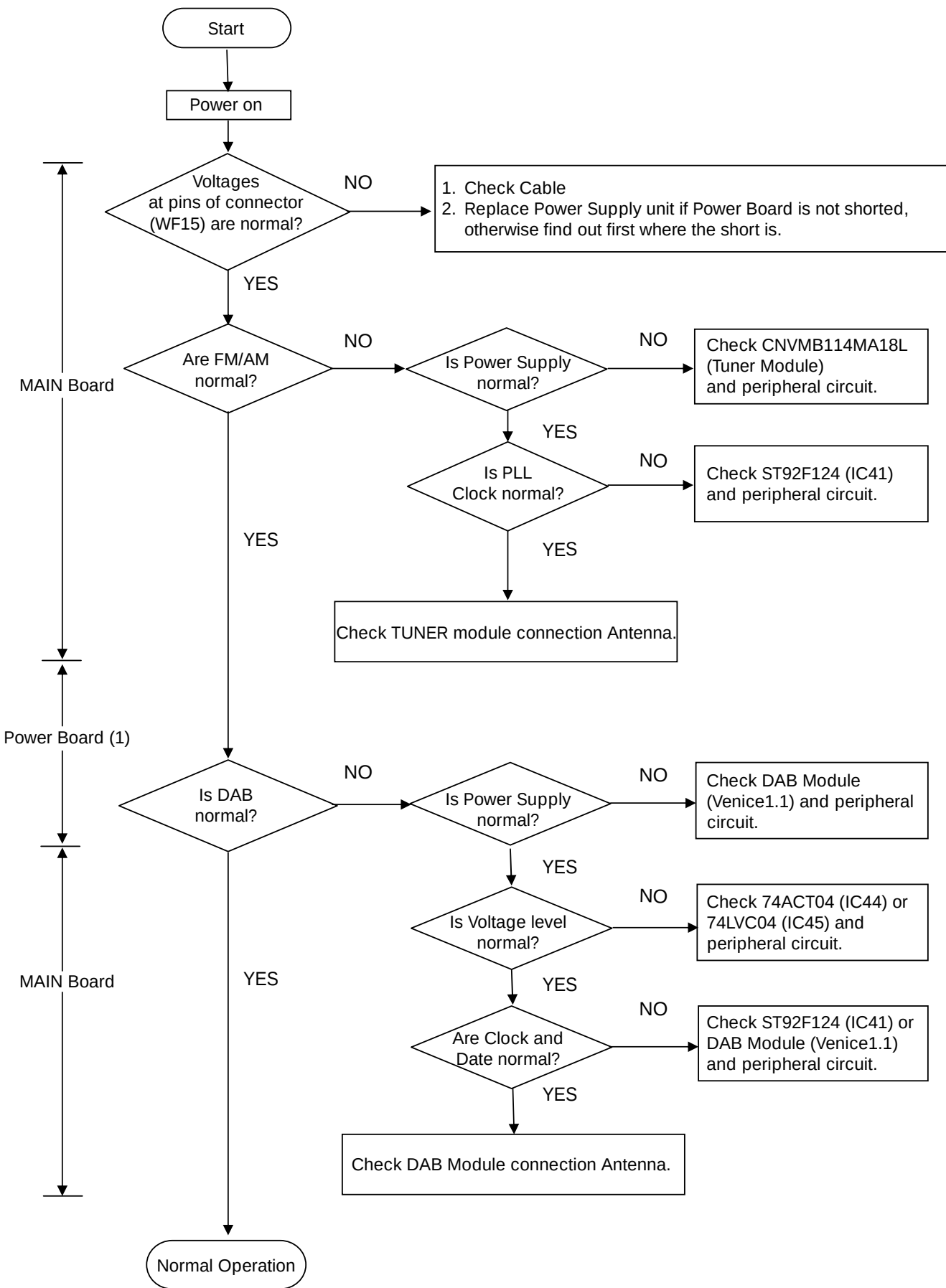


Fig. 7

■ MAINTENANCE FLOW CHART (CD)

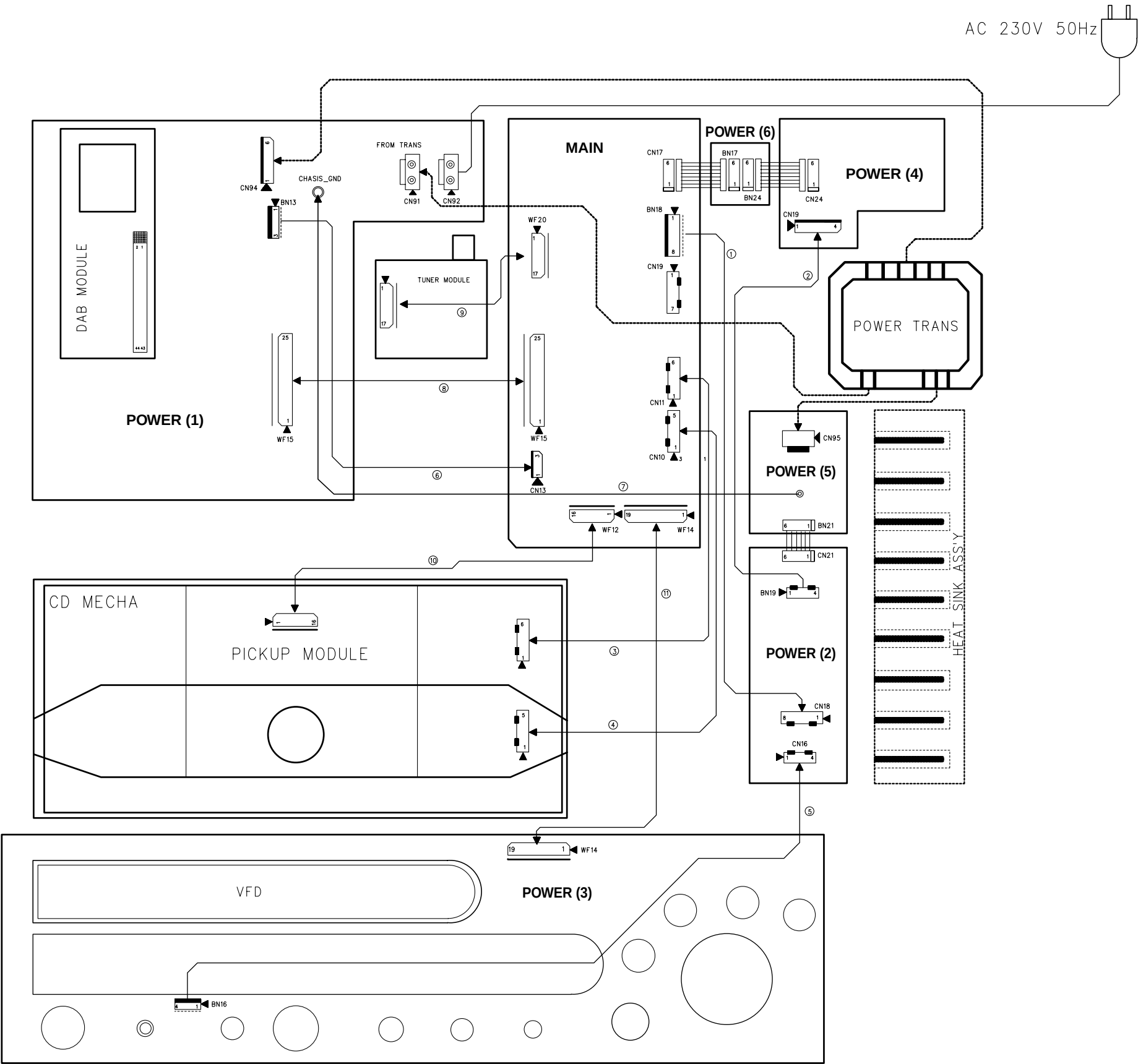


■ MAINTENANCE FLOW CHART (TUNER)



CRX-M170

WIRING DIAGRAM



* WIRE ASS'Y				
NO	B'D	REF.	SPEC	COMMENT
1	MAIN	BN18	8P, 2.0PITCH, 300MM, SHIELD	
2	AMP	BN19	4P, 2.5PITCH, 200MM, AWG#22	
3	CD MECHA	-	6P, 2.0PITCH, 250MM	
4	CD MECHA	-	5P, 2.0PITCH, 250MM, AWG#26	
5	FRONT	BN16	4P, 2.0PITCH, 160MM, SHIELD	
6	POWER	BN13	3P, 2.5PITCH, 180MM	
7	AMP	JW21	1P, 200MM, AWG#18	

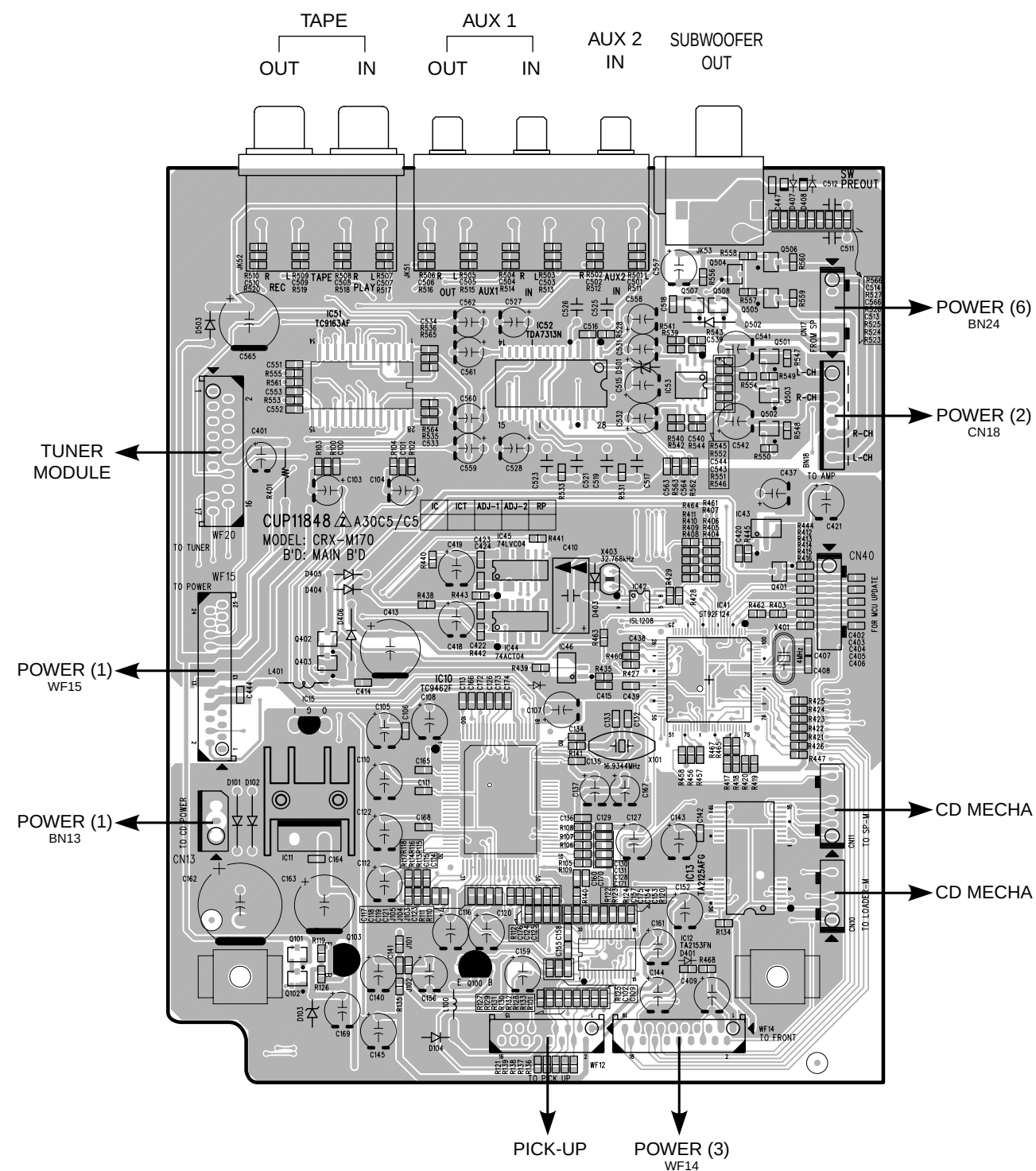
* CARD CABLE			
8	POWER	WF15	25P, 1.0PITCH, 130MM, B TYPE
9	TUNER	WF20	17P, 1.25PITCH, 60MM, B TYPE
10	CD PICKUP	WF12	16P, 1.0PITCH, 150MM, A TYPE
11	FRONT	WF14	19P, 1.0PITCH, 180MM, B TYPE

■ PRINTED CIRCUIT BOARD

FOR INFORMATION ONLY (NO REPLACEMENT COMPONENT PARTS WILL BE AVAILABLE)

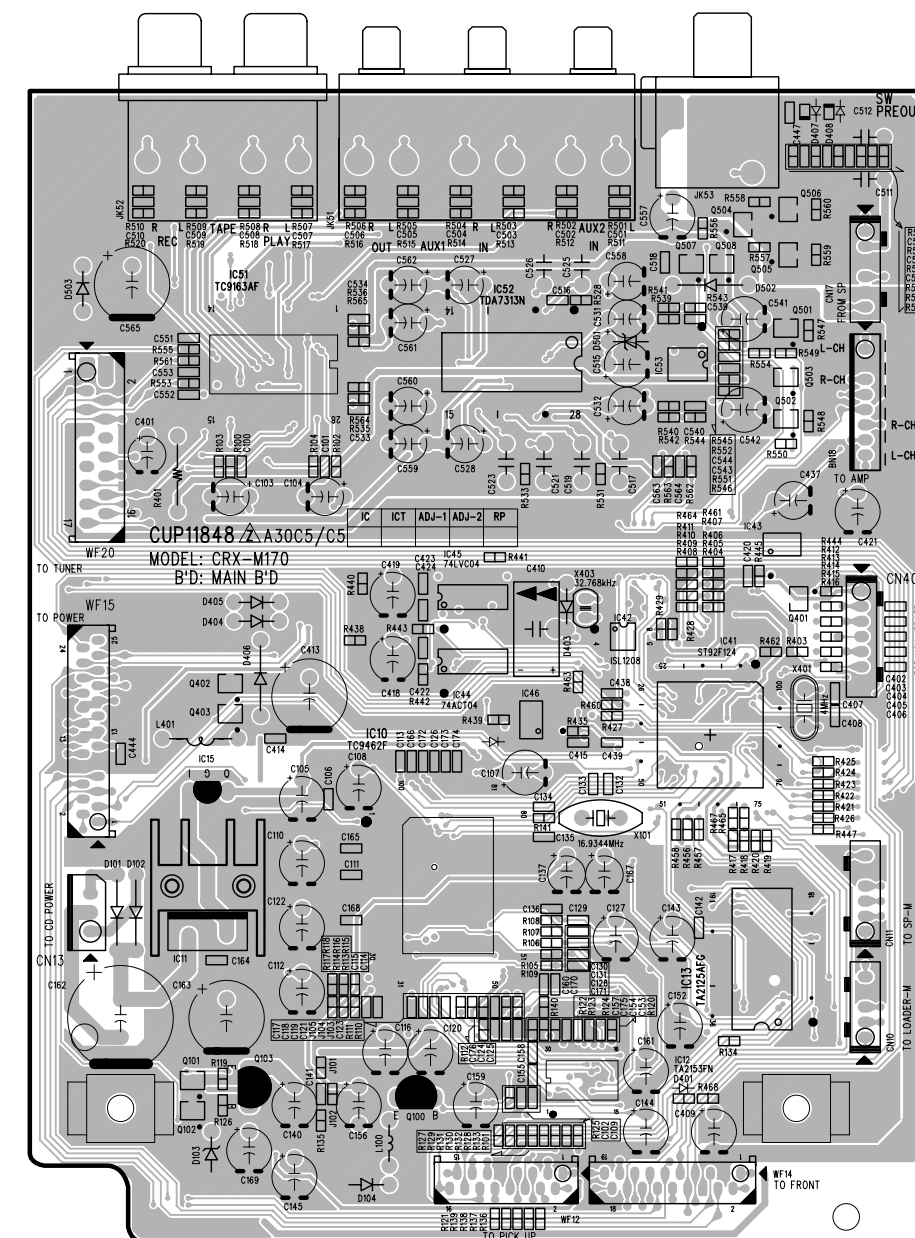
MAIN P.C.B.

(Side A) Lead Free Solder Used



MAIN P.C.B.

(Side B) Lead Free Solder Used



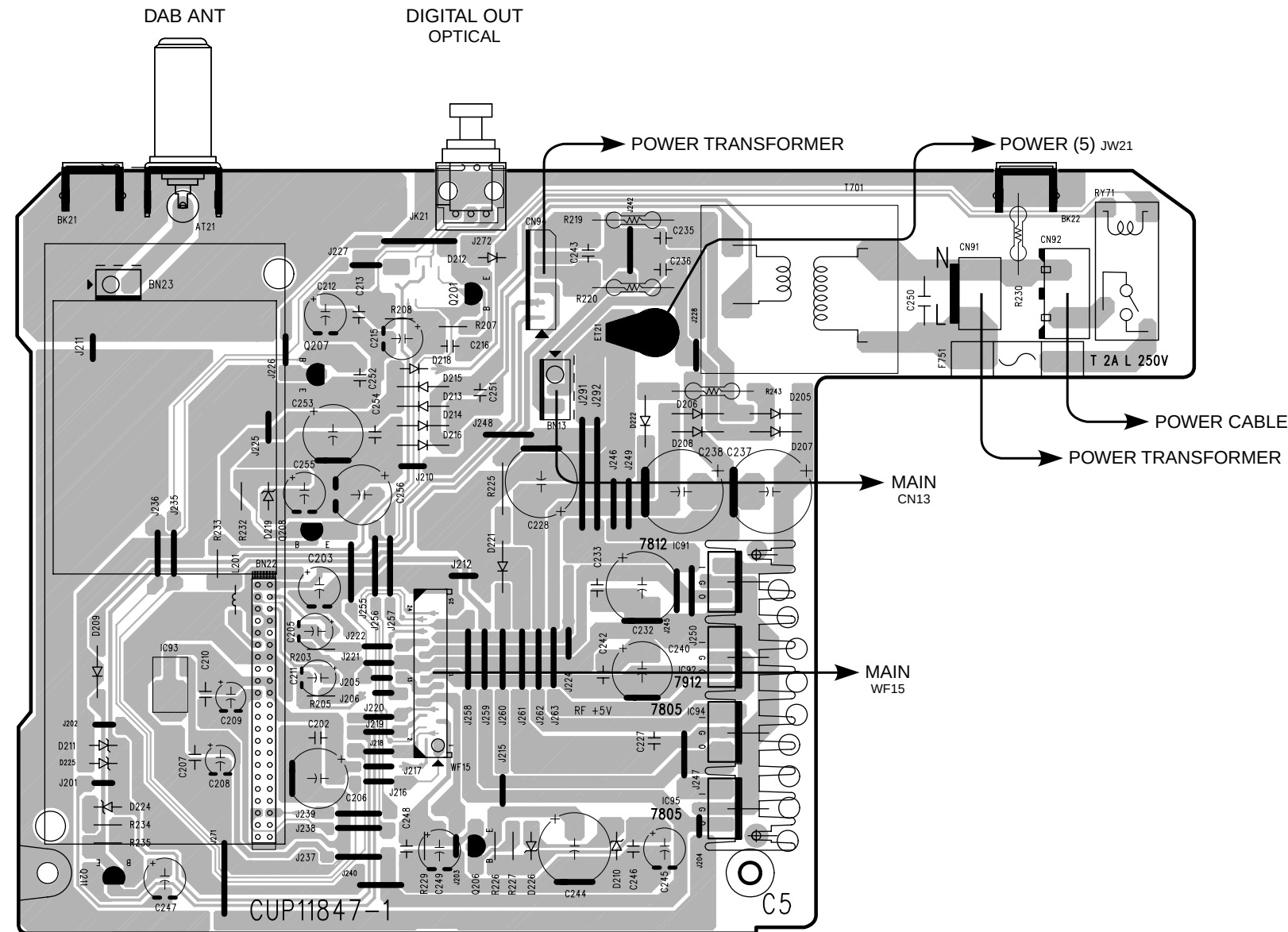
CRX-M170

■ PRINTED CIRCUIT BOARD

FOR INFORMATION ONLY (NO REPLACEMENT COMPONENT PARTS WILL BE AVAILABLE)

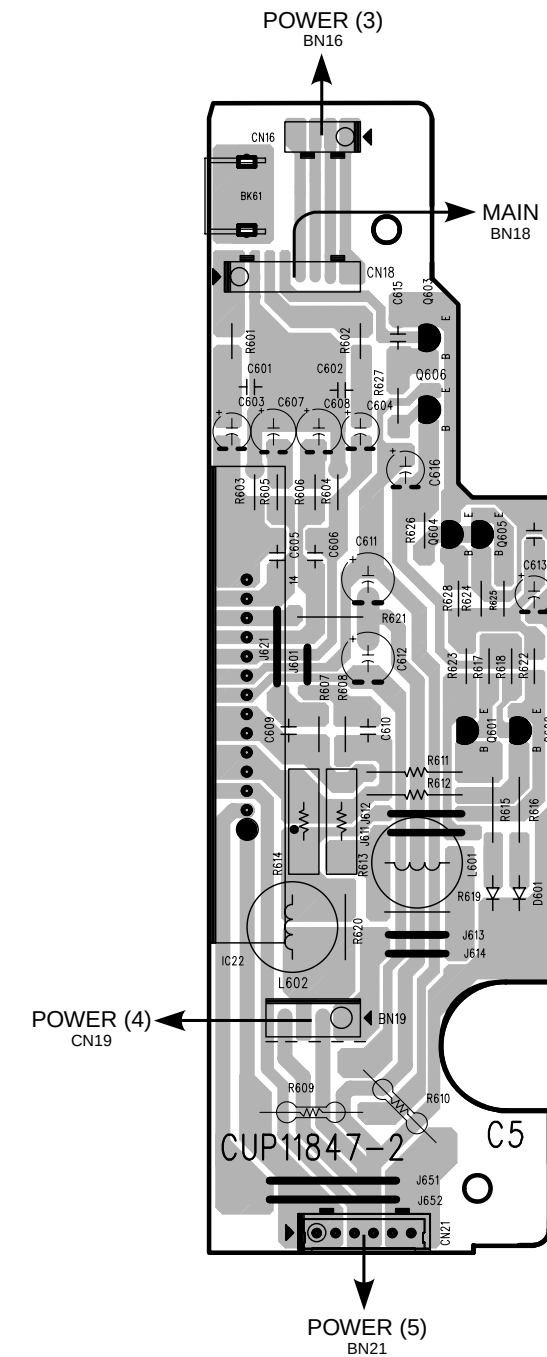
POWER (1) P.C.B.

(Side A)



POWER (2) P.C.B.

(Side A)



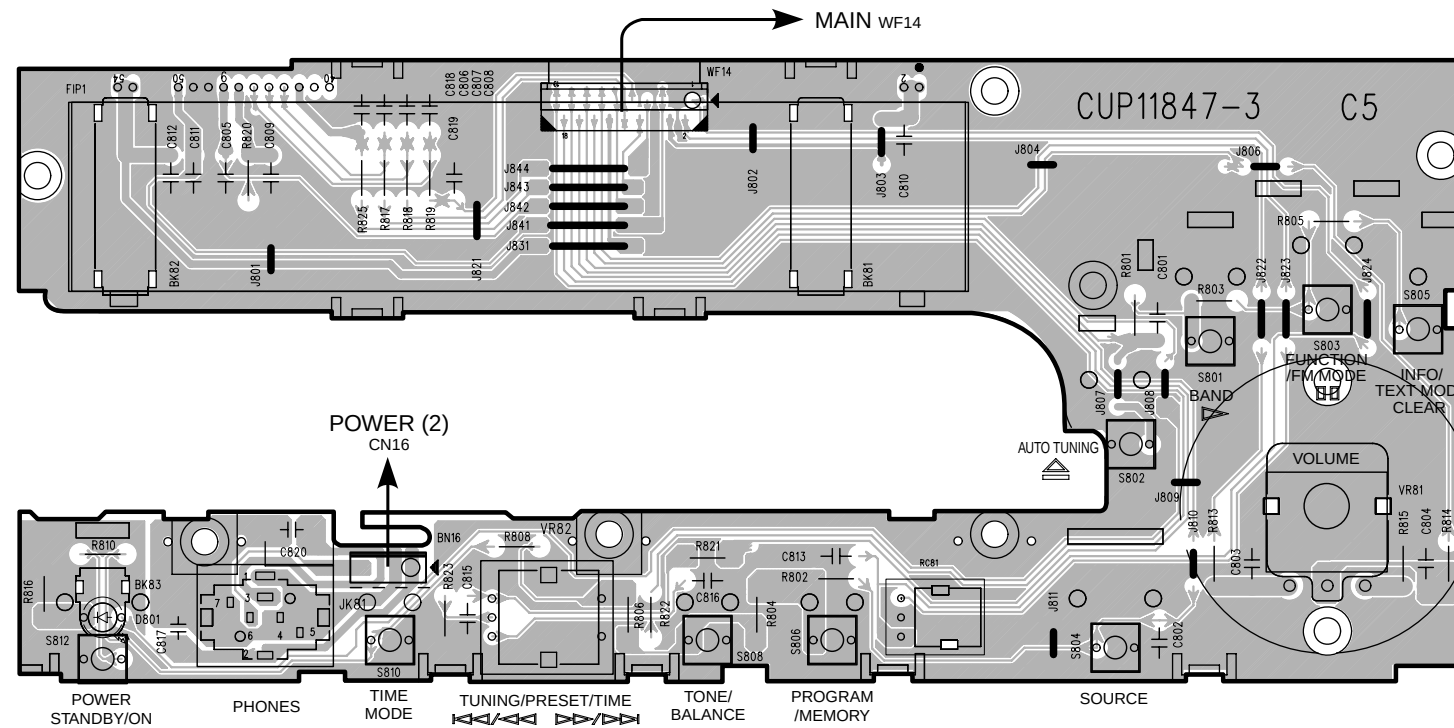
■ PRINTED CIRCUIT BOARD

FOR INFORMATION ONLY (NO REPLACEMENT COMPONENT PARTS WILL BE AVAILABLE)

A

POWER (3) P.C.B.

(Side A)



B

C

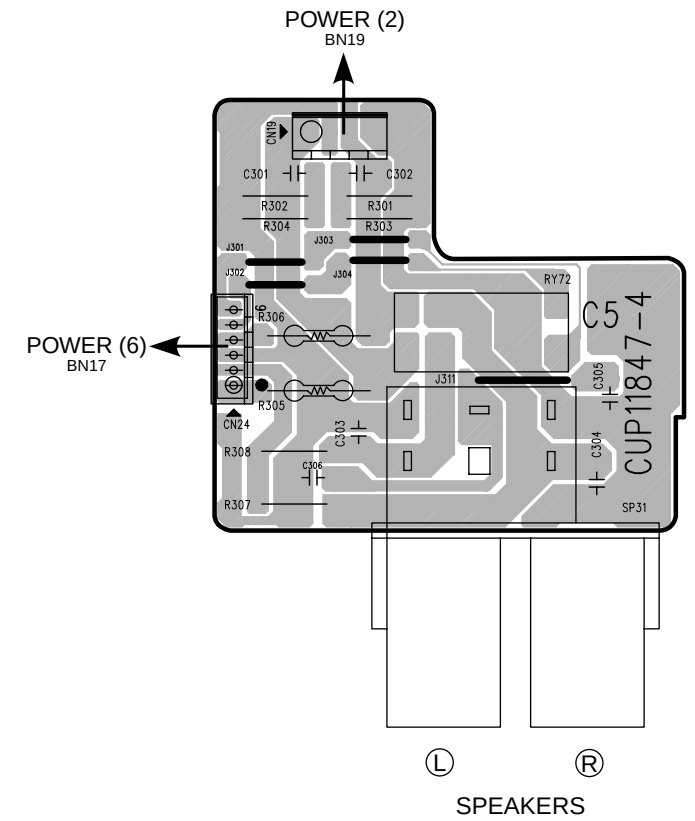
D

E

F

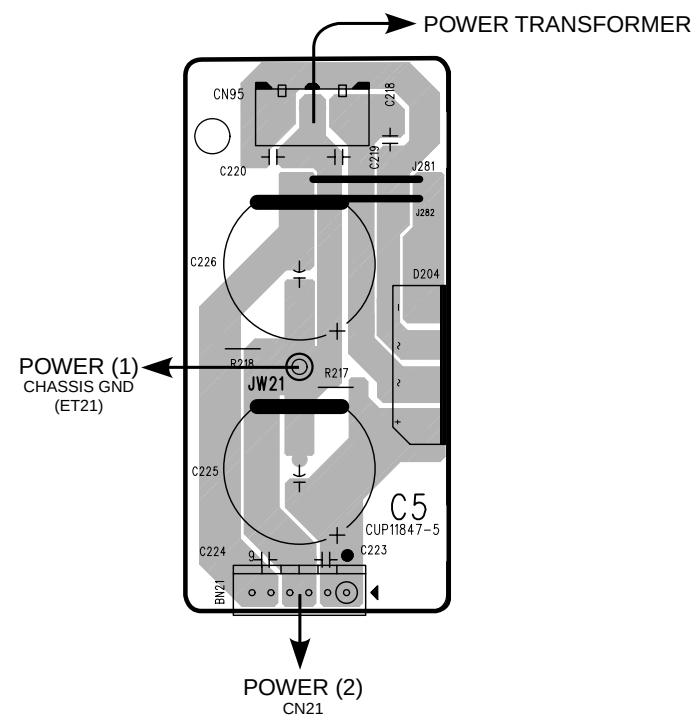
POWER (4) P.C.B.

(Side A)



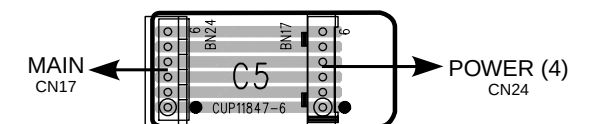
POWER (5) P.C.B.

(Side A)

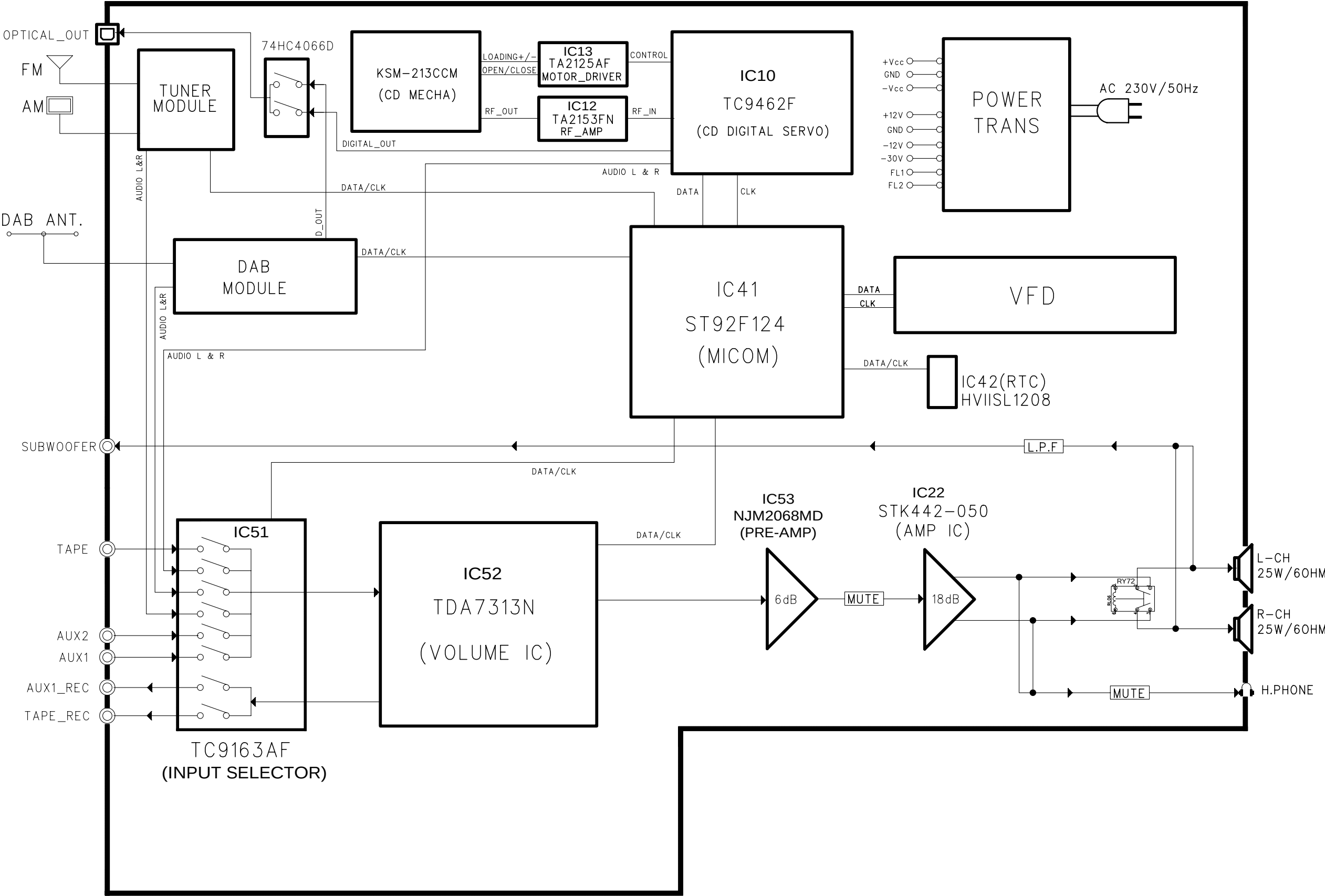


POWER (6) P.C.B.

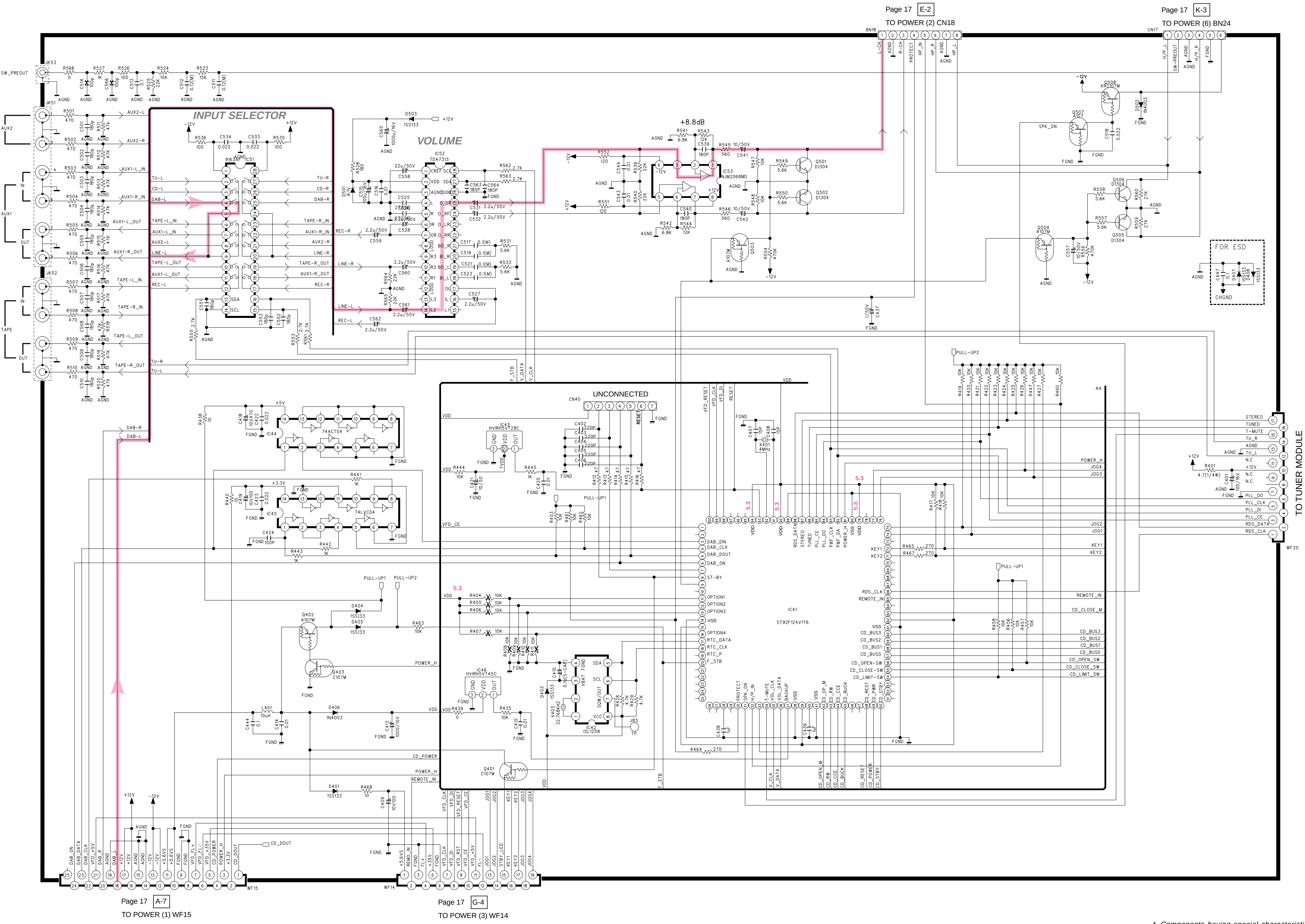
(Side A)



■ BLOCK DIAGRAM



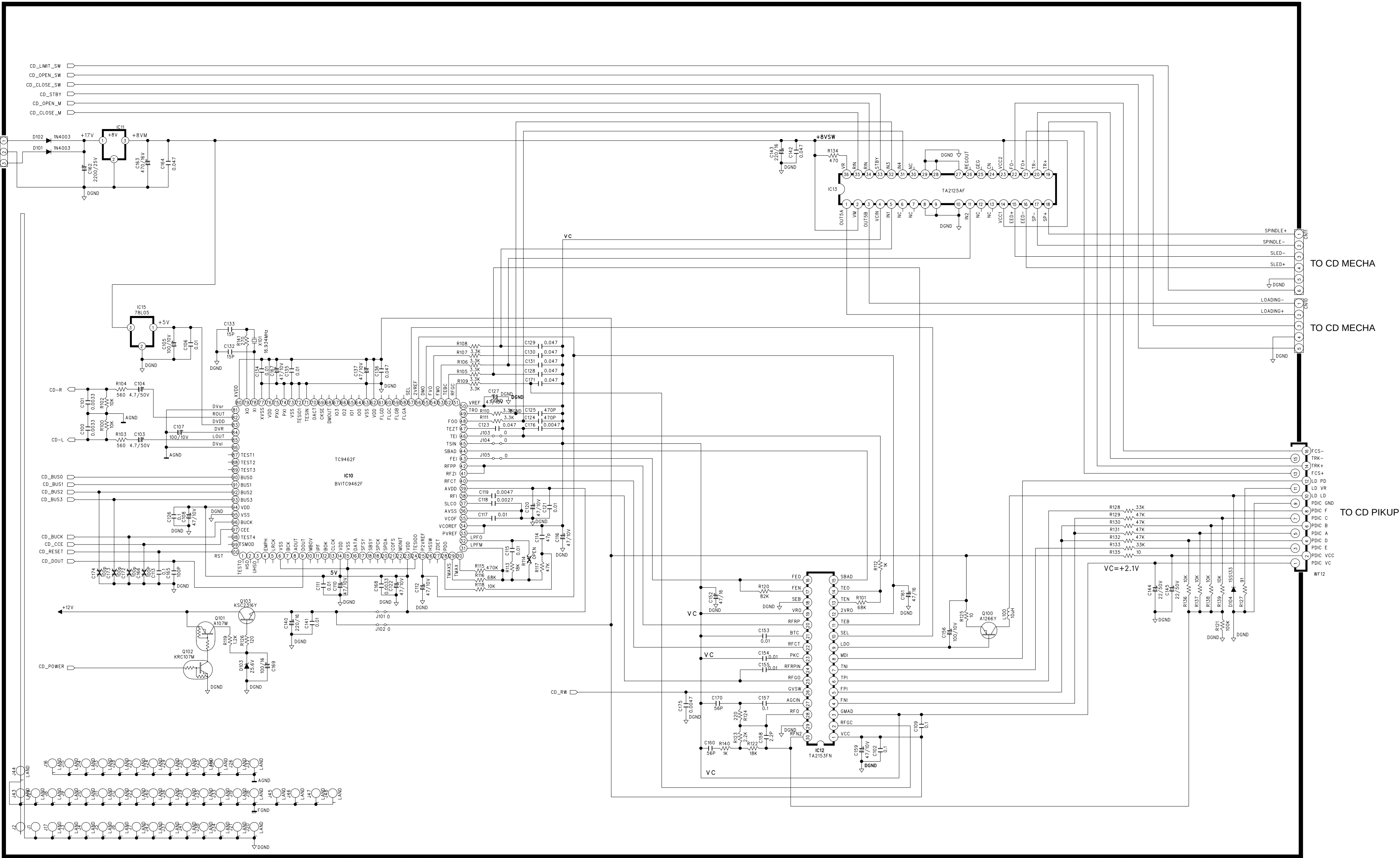
■ SCHEMATIC DIAGRAM (MAIN 1/2) FOR INFORMATION ONLY (NO REPLACEMENT COMPONENT PARTS WILL BE AVAILABLE)



* Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

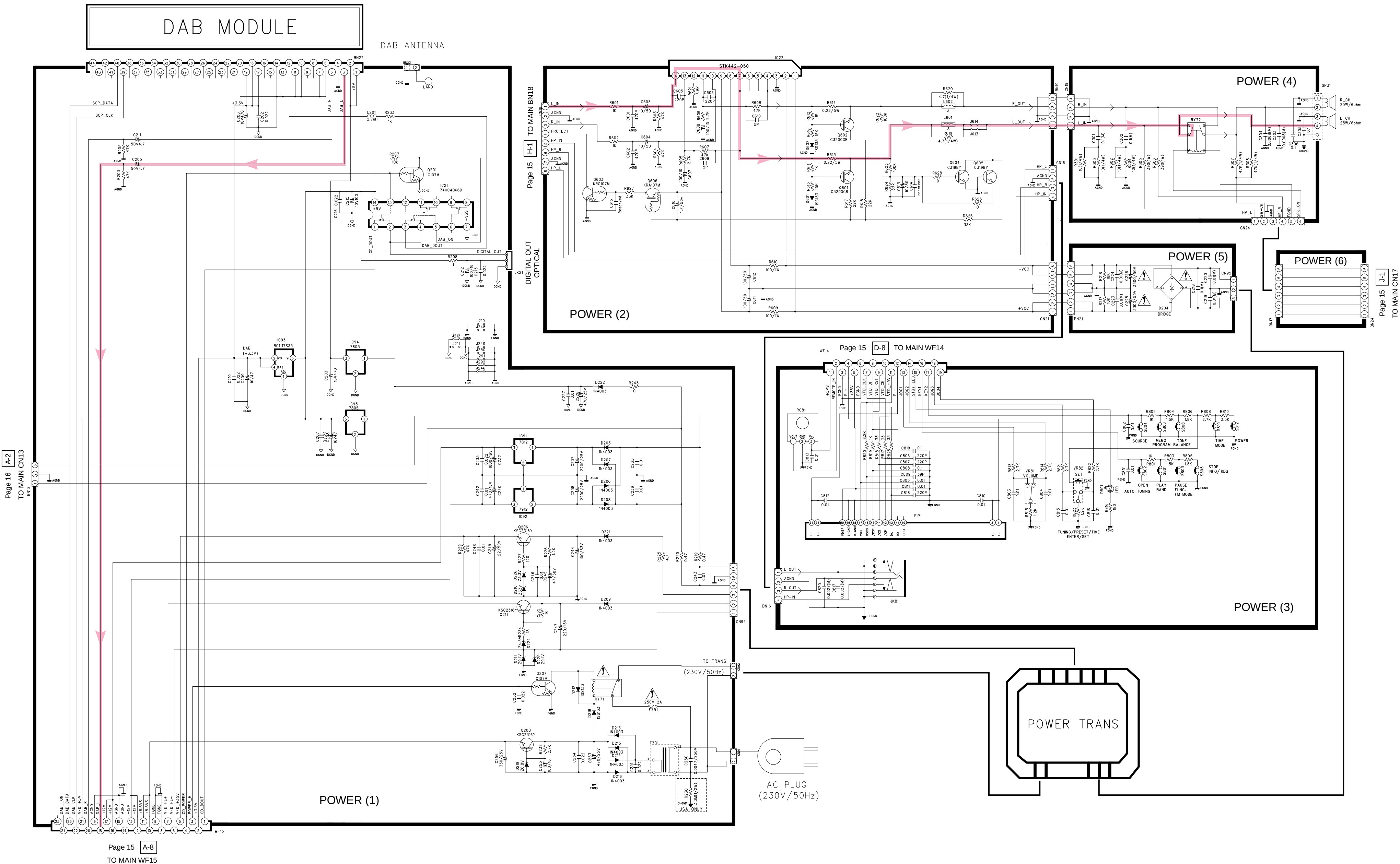
■ SCHEMATIC DIAGRAM (MAIN 2/2) FOR INFORMATION ONLY (NO REPLACEMENT COMPONENT PARTS WILL BE AVAILABLE)

Page 17 A-5
TO POWER (1) BN13



* Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

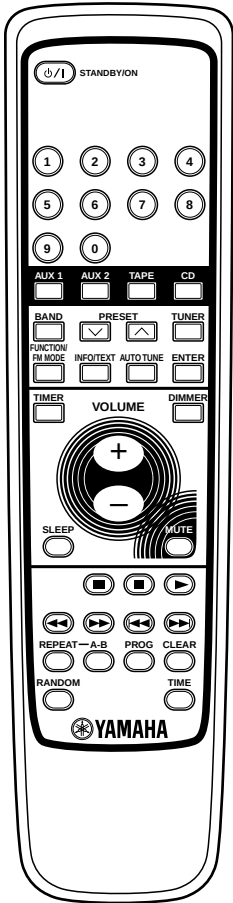
■ SCHEMATIC DIAGRAM (POWER) FOR INFORMATION ONLY (NO REPLACEMENT COMPONENT PARTS WILL BE AVAILABLE)



* Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.
* Schematic diagram is subject to change without notice.

REMOTE CONTROL

MEMO



REMOTE CODE

No.	Function	Key	Key Code	
			Custom Code	Key Code
1	POWER section	POWER/STANDBY/ON	78	0F
2		SLEEP	78	4F
3		TIMER	78	A0
4	TUNER section	BAND	78	B6
5		PRESET CALL DOWN	78	1C
6		PRESET CALL UP	78	1B
7		AUTO TUNE	78	B1
8		FUNCTION/FM MODE	78	A8
9		INFO/TEXT	78	81
10		ENTER	78	C1
11	CD section	TIME	7C	A7
12		REPEAT	7C	A3
13		A-B REPEAT	7C	A4
14		PROGRAM	7C	A0
15		CLEAR	7C	B7
16		RANDOM	7C	A1
17		SEARCH -	7C	86
18		SEARCH +	7C	87
19		SKIP -	7C	B9
20		SKIP +	7C	BA
21		STOP	7C	85
22		PAUSE	7C	83
23		PLAY	7C	82
24	AMP section	TUNER	78	4B
25		CD	78	4A
26		AUX1	78	57
27		AUX2	78	DE
28		TAPE	78	41
29		VOLUME DOWN	78	1F
30		VOLUME UP	78	1E
31		MUTE	78	9C
32		DIMMER	7C	A9
33	TUNER NUMERIC KEY (0-9)	0	78	10
34		1	78	11
35		2	78	12
36		3	78	13
37		4	78	14
38		5	78	15
39		6	78	16
40		7	78	17
41		8	78	18
42		9	78	19
43	CD NUMERIC KEY (0-9)	0	7C	93
44		1	7C	94
45		2	7C	95
46		3	7C	96
47		4	7C	97
48		5	7C	98
49		6	7C	99
50		7	7C	9A
51		8	7C	9B
52		9	7C	9C

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EXPLODED VIEW

A

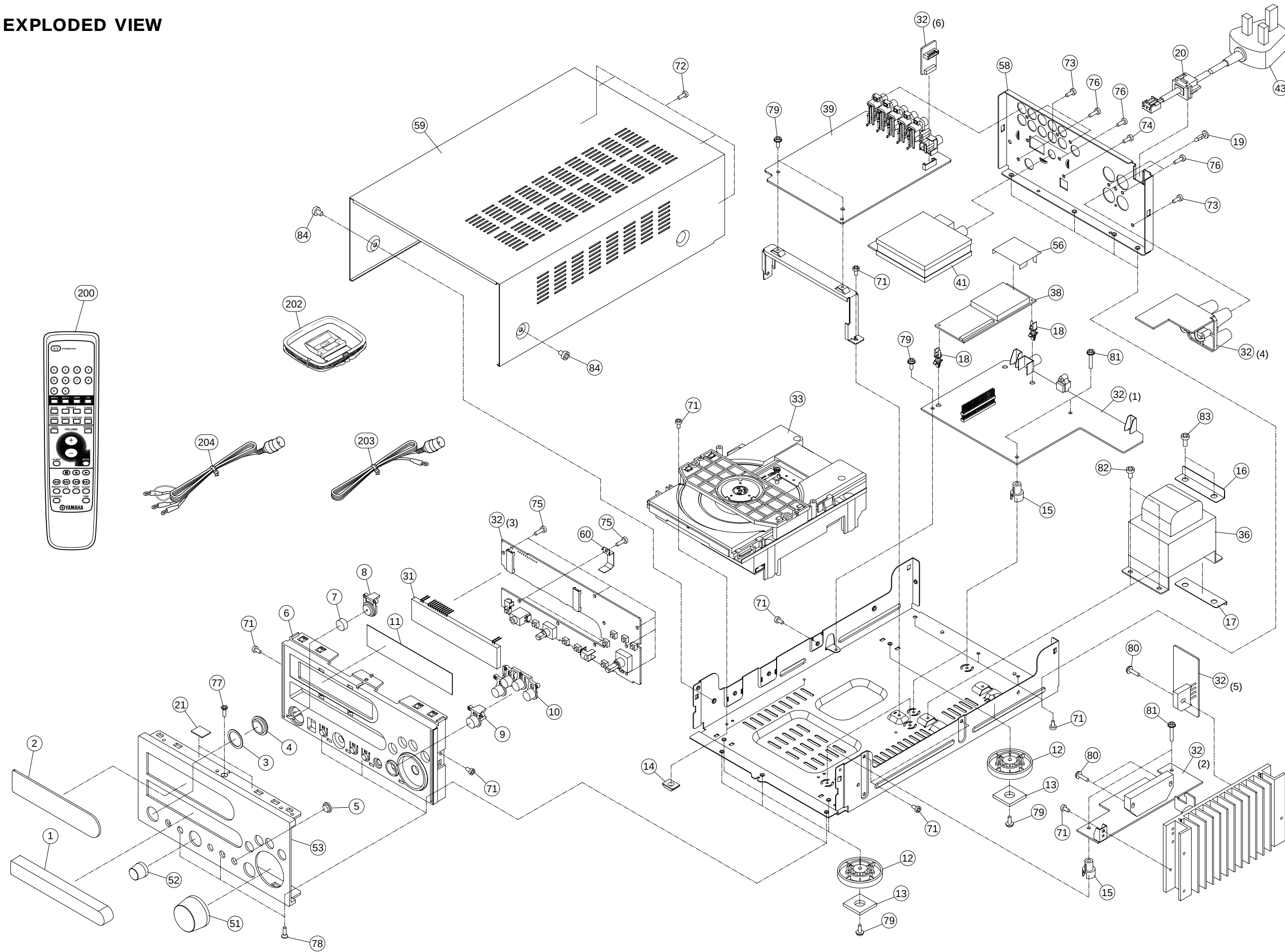
B

C

D

E

F



MECHANICAL PARTS

Ref. No.	Part No.	Description	Remarks	Markets
* 1	AAX73450	TRAY LID (ORNAMENT DOOR)	CGR1A386M7ZG5	
* 2	AAX73220	FIP WINDOW	CGU1A381Z	
* 3	AAX73270	LED COVER	CGX1A373	
* 4	AAX73610	POWER INDICATOR	CGL1A241	
* 5	AAX73260	IR WINDOW	CGU1A382	
* 6	AAX73390	SUB PANEL	CGW1A412M7G5	
* 7	AAX73600	POWER CAP	CBC1A153M7G5	
* 8	AAX73480	KNOB/POWER	CBT1A1003	
* 9	AAX73470	KNOB/SOURCE	CBT1A1004M7G5	
* 10	AAX73460	KNOB/OPEN	CBT1A1002M7ZG5	
* 11	AAX73230	FIP FILTER	CMZ1A104	
* 12	AAX73690	FOOT	CKL2A055H45	
* 13	AAX73370	CUSHION/FOOT	KHG1A050Y	
* 14	AAX73640	RUBBER	CHG1A113	
* 15	AAX73300	PCB HOLDER	CHE1A030	
* 16	AAX73400	SHEET/HIGH	CGX1A361	
* 17	AAX73410	SHEET/LOW	CGX1A362	
* 18	AAX73280	PCB SUPPORT	CMH1A226	
* 19	AAX73680	LOCKER	CRE1A037	
* 20	AAX73380	CORD STOPPER	KHR1A028	
* 21	AAX73650	RUBBER	CHG1A316	
* 31	AAX73210	FIP	HFLHCA-17SM03T	
* 32	AAX73290	P.C.B. ASS'Y	COP11847B	
* 33	AAX73190	CD MECHANISM UNIT	CJDKSL2130CCM	
* 36	AAX73710	POWER TRANSFORMER	CLT5P040ZE	
* 38	AAX73200	DAB MODULE	HNVS2020VENICE	
* 39	AAX73310	P.C.B. ASS'Y	COP11848B	
* 41	AAX73420	TUNER MODULE (EUR)	CNVMB114MA18L	
* 43	AAX73700	POWER CABLE	CJA2E045ZA	
* 51	AAX73630	VOLUME KNOB ASS'Y	CGK1A116ZA	
* 52	AAX73430	TUNING KNOB ASS'Y	CGK1A115ZA	
* 53	AAX73620	FRONT PANEL (AL)	CKM1A167ZC54	
* 56	AAX73350	EARTH PLATE	CMC1A253	
* 58	AAX73660	REAR PANEL	CKF3A282S	
* 59	AAX73440	TOP COVER	CKC1B156S35	
* 60	AAX73360	EARTH PLATE	CMC1A280	
* 71	AAX73490	BIND HEAD B-TIGHT SCREW	3x6 MFZN2W3	CTB3+6J
* 72	AAX73500	BIND HEAD B-TIGHT SCREW	3x8 MFC2	CTB3+8JFC
* 73	AAX73510	BIND HEAD B-TIGHT SCREW	3x8 MFZN2B3	CTB3+8JFZ
* 74	AAX73560	BIND HEAD P-TIGHT SCREW	3x8 MFZN2B3	CTB3+8GFZ
* 75	AAX73540	BIND HEAD P-TIGHT SCREW	3x10 MFZN2W3	CTB3+10G
* 76	AAX73550	BIND HEAD P-TIGHT SCREW	3x10 MFZN2B3	CTB3+10GFZ
* 77	AAX73520	FLAT HEAD B-TIGHT SCREW	3x8 MFZN2W3	CTS3+8G
* 78	AAX73530	FLAT HEAD B-TIGHT SCREW	3x8 MFC2	CTS3+8JFC
* 79	AAX73340	PW HEAD B-TIGHT SCREW	3x8 MFZN2W3	CTW3+8J
* 80	AAX73320	PW HEAD B-TIGHT SCREW	3x12 MFZN2W3	CTW3+12J
* 81	AAX73330	PW HEAD B-TIGHT SCREW	3x18 MFZN2W3	CTW3+18J
* 82	AAX73570	BIND HEAD SCREW	4x6 MFZN2W3	CTB4+6F
* 83	AAX73590	BIND HEAD SCREW	4x8 MFZN2W3	CTB4+8F
* 84	AAX73580	BIND HEAD SCREW	4x6 MFC2	CTB4+6FFC
ACCESSORIES				
* 200	AAX73670	REMOTE CONTROL	CARTCRXM170	
* 202	AAX73180	AM LOOP ANTENNA	CSA1A020Z	
* 203	AAX73240	INDOOR FM ANTENNA	CSA1A018Z	
* 204	AAX73250	INDOOR DAB ANTENNA BATTERY,MANGANESE	CSA272	

* New Parts

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