CONTENTS

SECTION I. GENERAL	
SERVICING PRECAUTIONS	1-2
• ESD PRECAUTIONS	1-4
• SPECIFICATIONS ······	1-5
SECTION 2. ELECTRICAL	
• ADJUSTMENTS	2-1
• TROUBLESHOOTING ·····	2-3
WAVEFORMS OF MAJOR CHECK POINT	2-7
BLOCK DIAGRAM ·····	2-17
SCHEMATIC DIAGRAMS	2-19
• WIRING DIAGRAM ·····	2-29
PRINTED CIRCUIT DIARGAMS	2-31
• INTERNAL BLOCK DIAGRAM OF IC's	2-42
• REPAIRS REGARDING CD MECHANISM ·····	2-50
SECTION 3. EXPLODED VIEWS	
CABINET AND MAIN FRAME SECTION	3-1
TAPE DECK MECHANISM: AUTO STOP DECK(OPTIONAL)	· 3-3
TAPE DECK MECHANISM: AUTO REVERSE DECK	· 3-5
• CD MECHANISM ·····	· 3-7
SECTION 4. SPEAKER ······	4-1
SECTION 5. REPLACEMENT PARTS LIST	· 5-1

SECTION 1. GENERAL

SERVICING PRECAUTIONS

NOTES REGARDING HANDLING OF THE PICK-UP

1. Notes for transport and storage

- 1) The pick-up should always be left in its conductive bag until immediately prior to use.
- 2) The pick-up should never be subjected to external pressure or impact.

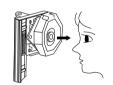




Drop impact

2. Repair notes

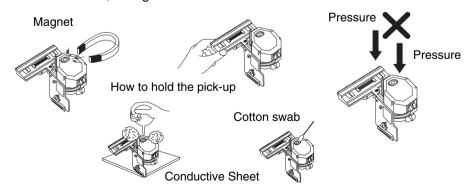
- 1) The pick-up incorporates a strong magnet, and so should never be brought close to magnetic materials.
- 2) The pick-up should always be handled correctly and carefully, taking care to avoid external pressure and impact. If it is subjected to strong pressure or impact, the result may be an operational malfunction and/or damage to the printed-circuit board.
- 3) Each and every pick-up is already individually adjusted to a high degree of precision, and for that reason the adjustment point and installation screws should absolutely never be touched.
- 4) Laser beams may damage the eyes!Absolutely never permit laser beams to enter the eyes!Also NEVER switch ON the power to the laser output part (lens, etc.) of the pick-up if it is damaged.



NEVER look directly at the laser beam, and don't let contact fingers or other exposed skin.

5) Cleaning the lens surface

If there is dust on the lens surface, the dust should be cleaned away by using an air bush (such as used for camera lens). The lens is held by a delicate spring. When cleaning the lens surface, therefore, a cotton swab should be used, taking care not to distort this.



6) Never attempt to disassemble the pick-up.

Spring by excess pressure. If the lens is extremely dirty, apply isopropyl alcohol to the cotton swab. (Do not use any other liquid cleaners, because they will damage the lens.) Take care not to use too much of this alcohol on the swab, and do not allow the alcohol to get inside the pick-up.

NOTES REGARDING COMPACT DISC PLAYER REPAIRS

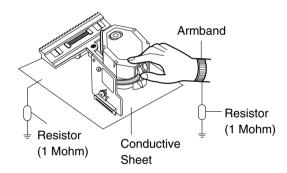
1. Preparations

- 1) Compact disc players incorporate a great many ICs as well as the pick-up (laser diode). These components are sensitive to, and easily affected by, static electricity. If such static electricity is high voltage, components can be damaged, and for that reason components should be handled with care.
- 2) The pick-up is composed of many optical components and other high-precision components. Care must be taken, therefore, to avoid repair or storage where the temperature of humidity is high, where strong magnetism is present, or where there is excessive dust.

2. Notes for repair

- 1) Before replacing a component part, first disconnect the power supply lead wire from the unit
- 2) All equipment, measuring instruments and tools must be grounded.
- 3) The workbench should be covered with a conductive sheet and grounded.

 When removing the laser pick-up from its conductive bag, do not place the pick-up on the bag. (This is because there is the possibility of damage by static electricity.)
- 4) To prevent AC leakage, the metal part of the soldering iron should be grounded.
- 5) Workers should be grounded by an armband (1M Ω)
- 6) Care should be taken not to permit the laser pick-up to come in contact with clothing, in order to prevent static electricity changes in the clothing to escape from the armband.
- 7) The laser beam from the pick-up should NEVER be directly facing the eyes or bare skin.



CLEARING MALFUNCTION

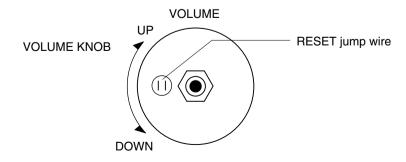
You can reset your unit to initial status if malfunction occur(button malfunction, display, etc.).

Using a pointed good conductor(such as driver), simply short the RESET jump wire on the inside of the volume knob for more than 3 seconds.

If you reset your unit, you must reenter all its settings(stations, clock, timer)

NOTE: 1. To operate the RESET jump wire, pull the volume rotary knob and release it.

2. If you wish to operate the RESET jump wire, it is necessary to unplug the power cord.



ESD PRECAUTIONS

Electrostatically Sensitive Devices (ESD)

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive Devices (ESD). Examples of typical ESD 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 static electricity.

- Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off
 any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a
 commercially available discharging wrist strap device, 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 ESD 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 ESD devices.
- 4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESD devices.
- 5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESD devices.
- 6. Do not remove a replacement ESD device from its protective package until immediately before you are ready to install it. (Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).
- 7. Immediately before removing the protective material from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will by installed.

CAUTION: BE SURE NO POWER IS APPLIED TO THE CHASSIS OR CIRCUIT, AND OBSERVE ALL OTHER SAFETY PRECAUTIONS.

8. Minimize bodily motions when handing unpackaged replacement ESD 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 sufficient to damage an ESD device).

CAUTION. GRAPHIC SYMBOLS



THE LIGHTNING FLASH WITH APROWHEAD SYMBOL. WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.



THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

SECTION 2. ELECTRICAL ADJUSTMENTS

This set has been aligned at the factory and normally will not require further adjustment. As a result, it is not recommended that any attempt is made to modificate any circuit. If any parts are replaced or if anyone tampers with the adjustment, realignment may be necessary.

IMPORTANT

- 1. Check Power-source voltage.
- 2. Set the function switch to band being aligned.
- 3. Turn volume control to minimum unless otherwise noted.
- 4. Connect low side of signal source and output indicator to chassis ground unless otherwise specified.
- 5. Keep the signal input as low as possible to avoid AGC and AC action.

TAPE DECK ADJUSTMENT

1. AZIMUTH ADJUSTMENT

Deck Mode	Test Tape	Test Point	Adjustment	Adjust for
A Deck Playback	MTT-114	Speaker Out	DECK Screw Azimuth Screw	Maximum
B Deck Playback	MTT-114	Speaker Out	Azimuth Screw	Maximum

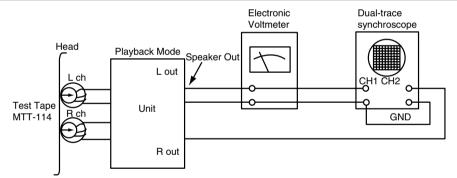


Figure 1. Azimuth Adjustment Connection Diagram

2. MOTOR SPEED ADJUSTMENT

Deck Mode	Test Tape	Test Point	Adjustment	Adjust for	Remark
Normal Speed	MTT-111	Speaker Out	VR201	3kHz ± 1%	A Deck
HI-Speed	MTT-111	Speaker Out	more than 5.4kHz		HI-Speed Dubbing Mode

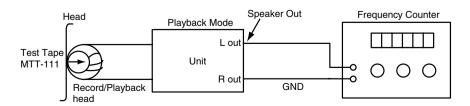


Figure 2. Motor Speed Adjustment Connection Diagram

3. RECORD BIAS ADJUSTMENT

Deck Mode	Test Tape	Test Point	Adjustment	Adjust for
Rec/Pause	Pause MTT-5511 ERASE HEAD L203		60kHz±5kHz (Auto stop)	
nec/rause	WITT-3311	WIRE(PN202)	L203	85kHz±5kHz(Auto Reverse)

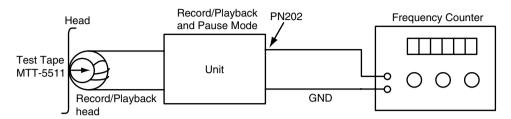


Figure 3. Record Bias Adjustment Connection Diagram

4. TUNER ADJUSTMENT

(FM)

Item	Test Point	Adjustment	Adjust for
DC Voltage	Checker IC Pin 26, 28	L106	0V±50mV

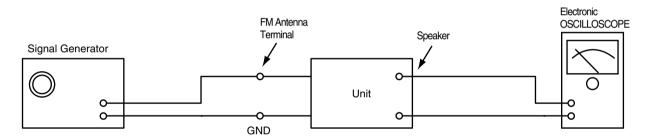
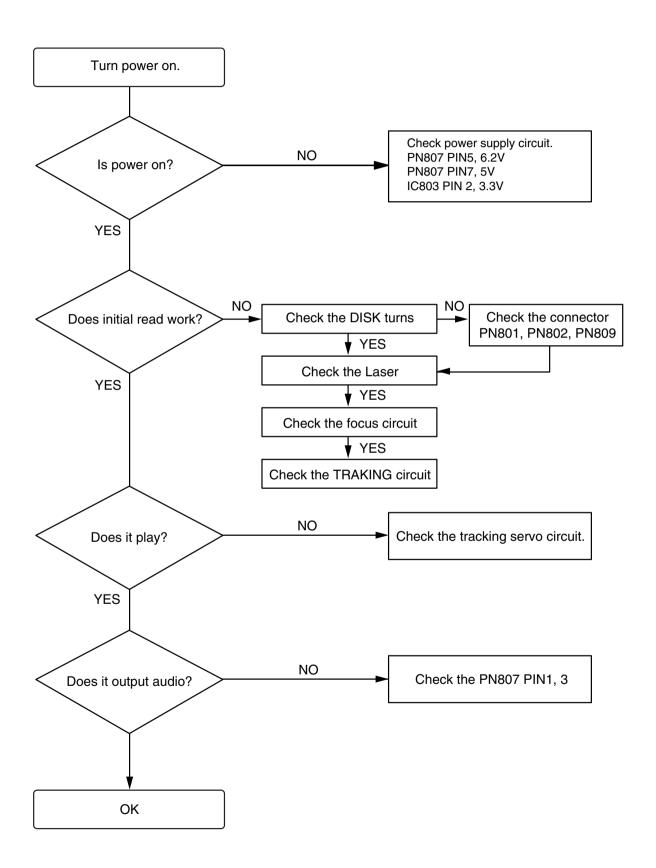
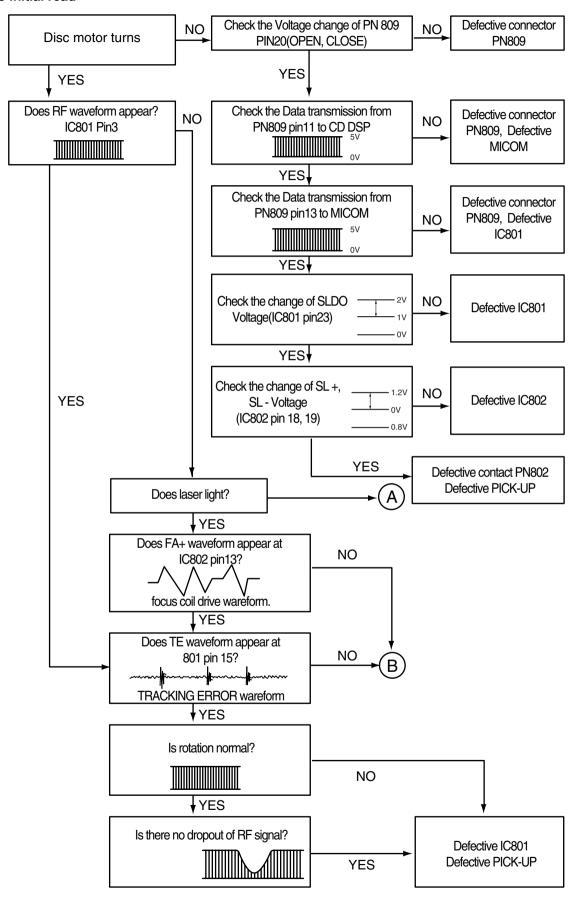


Figure 4. Tuner(S curve) Adjustment Connection Diagram

TROUBLESHOOTING

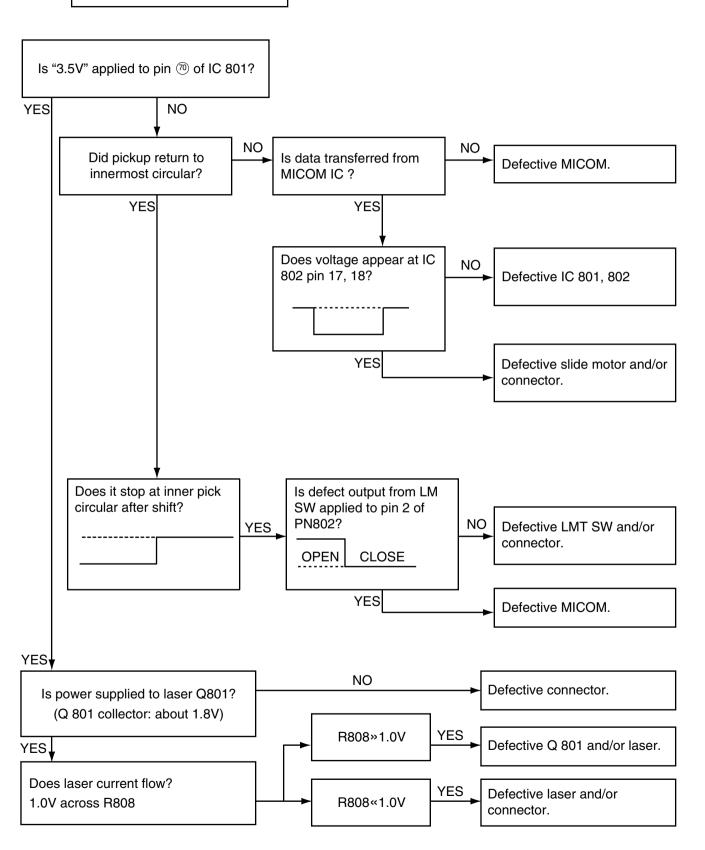


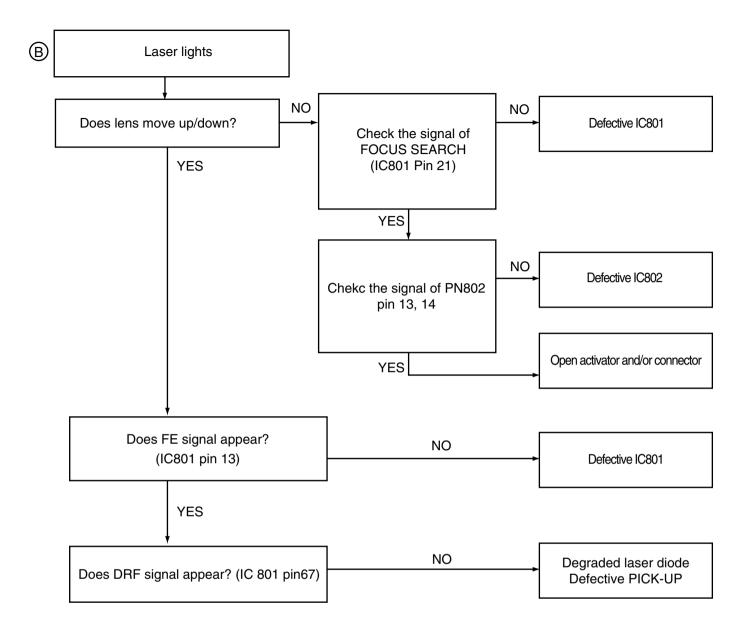
Fails to initial read





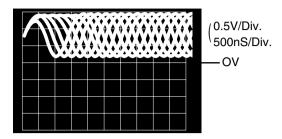
Laser does not light.



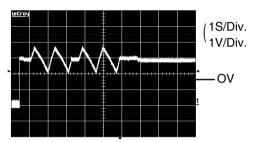


WAVEFORMS OF MAJOR CHECK POINT

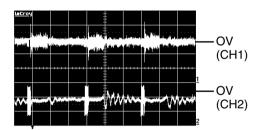
1. HF signal (RF signal) waveform (IC801 pin 3) during normal play



- 3. Focus coil drive waveform(IC802 pin13)
 - When focus search failed or there is no disc on the tray

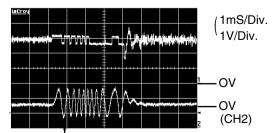


- 4. Tracking coil drive waveform and TE during track traverse
 - (1) When time division is 20mS/Div.1V/Div.



CH1: TRACKING COIL DRIVE (IC802 pin27)
CH2: TRACKING ERROR (TE: IC801 pin15)

(3) When time division is 0.5nS/div. (During backward Track Traverse)

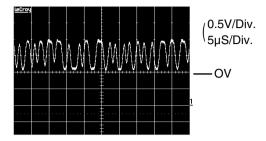


CH1: TRACKING COIL DRIVE

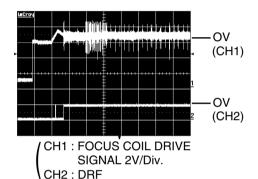
SIGNAL 2V/Div. (IC802 pin27)

CH2: TRACKING ERROR(TE: IC801 pin15) 1V/Div.

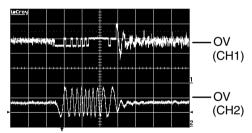
2. EFM signal (IC801 pin 3)waveform during Normal Play



• Focus coil drive waveform(FDO: IC801 pin21) and DRF(IC801 pin67) when focus search is accomplished



(2) When time division 1mS/Div, 1V/Div (During forward track traverse)



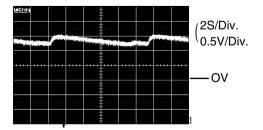
CH2: TRACKING COIL DRIVE (IC802 pin27)

SIGNAL 2V/Div.

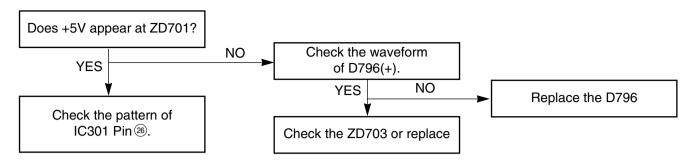
CH2: TRACKING ERROR (TE: IC801 pin15)

1V/Div.

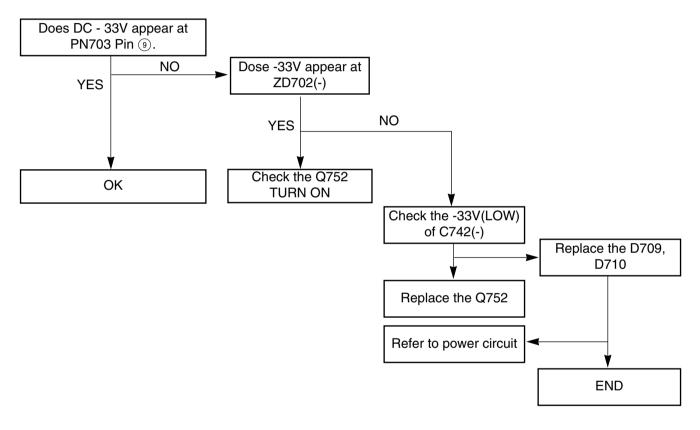
Feed motor drive waveform(IC 802 pin18)During normal play



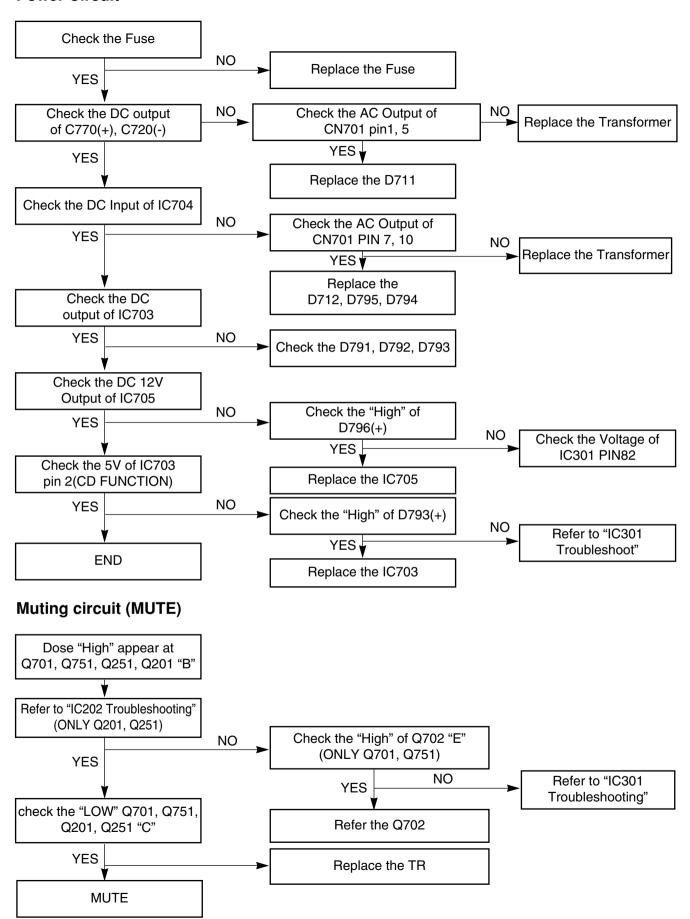
P-SENS PART



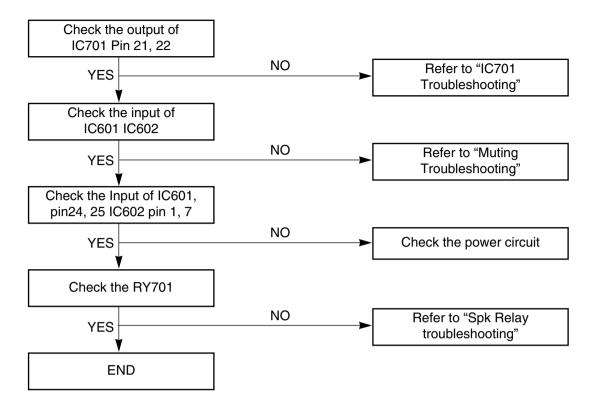
VKK PART



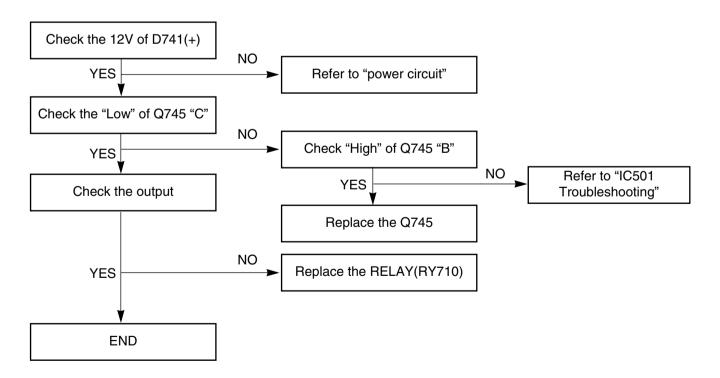
Power Circuit



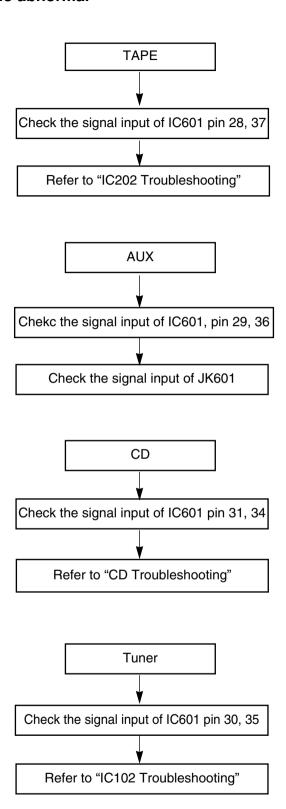
Audio abnormal



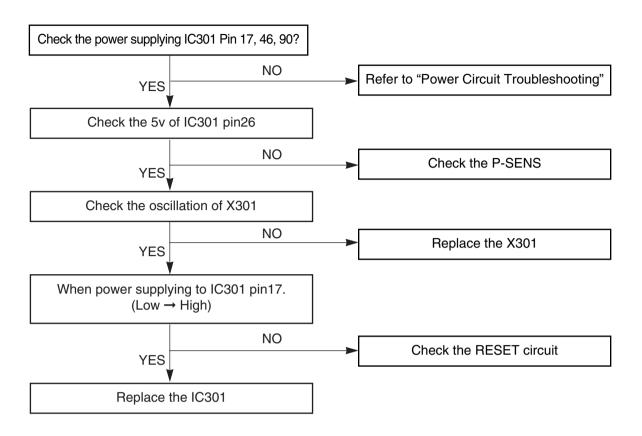
SPK Relay Troubleshooting



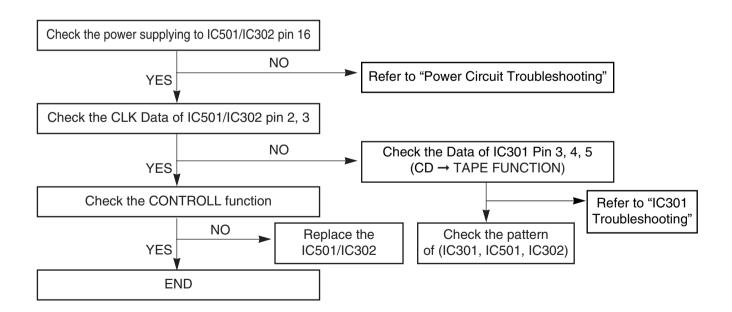
FUNCTION MODE Audio abnormal



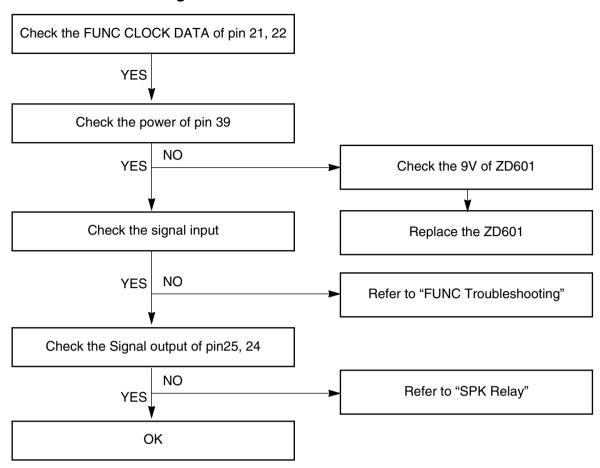
IC301 Troubleshooting



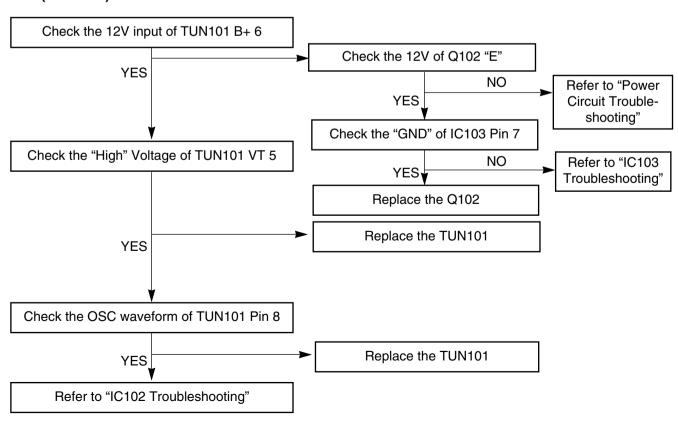
IC501, IC302 Troubleshooting



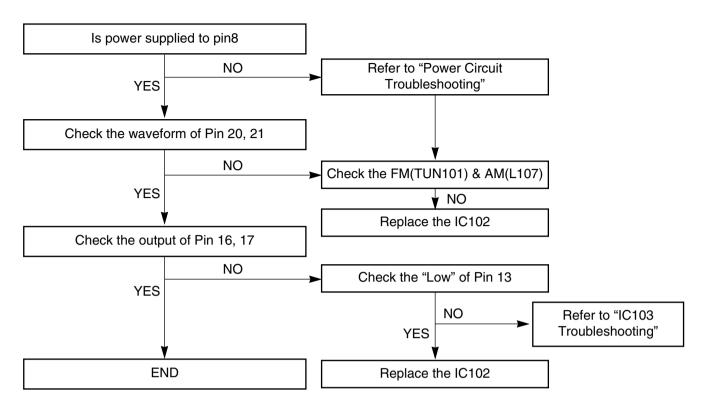
IC601 Troubleshooting



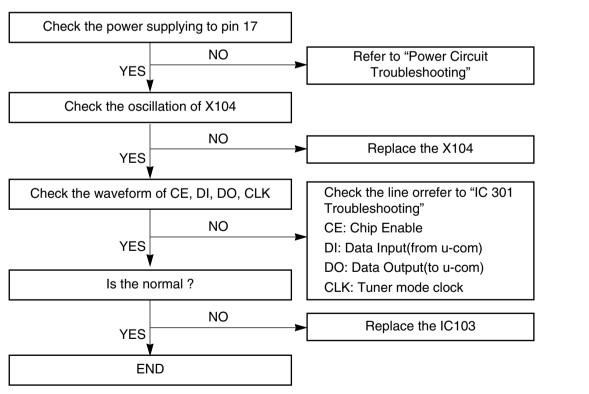
FM (TUN101)



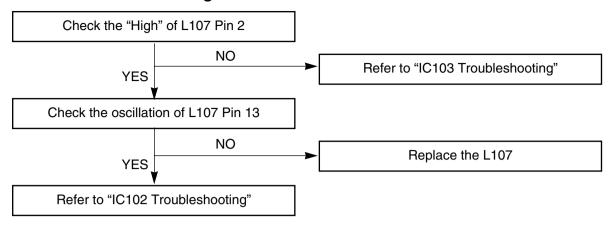
IC102 Troubleshooting



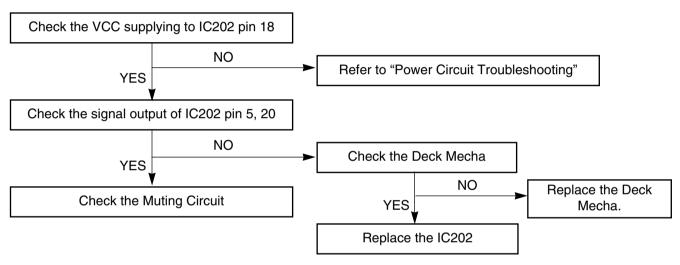
IC103 Troubleshooting



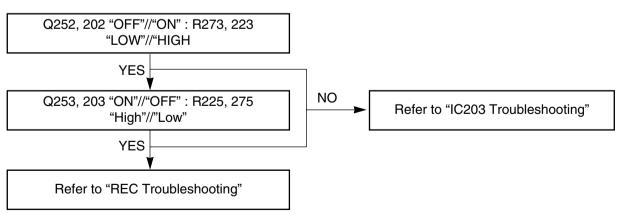
AM•COIL Troubleshooting



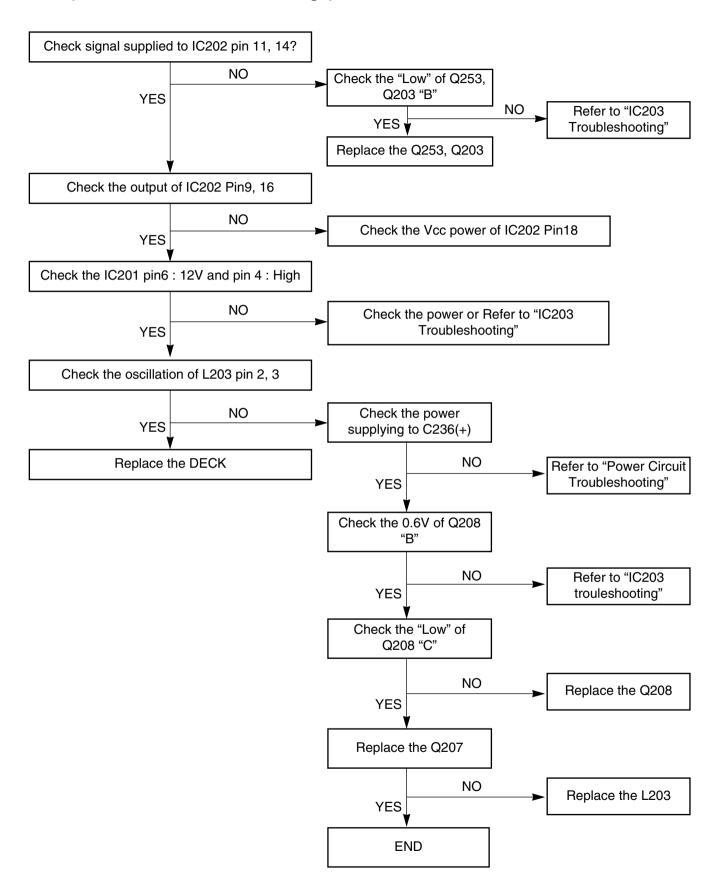
Play



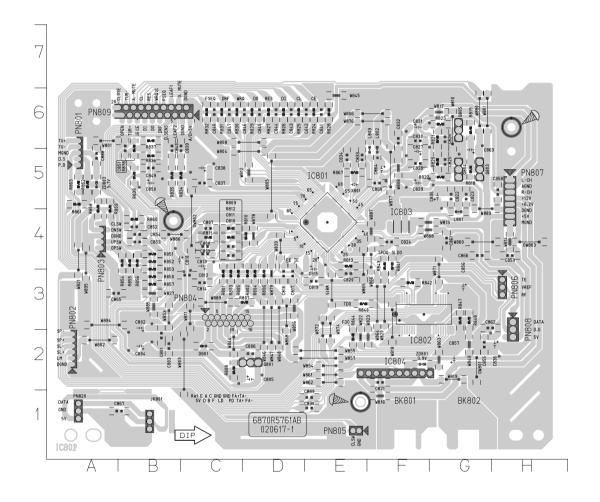
Dubbing("NORMAL or REC "//"HIGH")

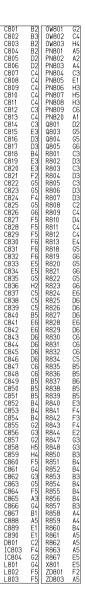


REC (Q252, Q202 ON / R273, R223 High)



• CD MAIN P.C. BOARD





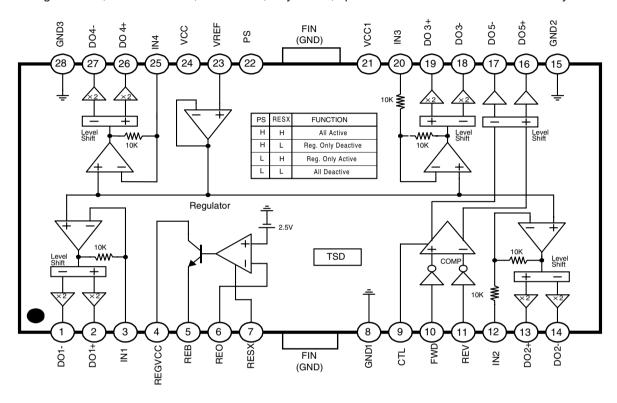
INTERNAL BLOCK DIAGRAM OF ICS

■ FAN8039BD3

5-CH Motor Diver

Description

The FAN8039BD3 is a monolithic integrated circuit suitable for a 5-CH motor driver which drives the tracking actuator, focus actuator, sled motor, tray motor, spindle motor of the DVDP/CAR-CD systems.



Pin Definitions

NO	Symbol	Description	NO	Symbol	Description
1	DO1-	CH1 Drive Output (-)	15	GND2	Power Ground1 (CH 2,3,5)
2	DO1+	CH1 Drive Output (+)	16	DO5+	CH5 Drive Output (+)
3	IN1	CH1 Drive Input	17	DO5-	CH5 Drive Output(-)
4	REGVCC	Regulator Supply Voltage	18	DO3-	CH3 Drive Output(-)
5	REB	Regulator Output	19	DO3+	CH3 Drive Output (+)
6	REO	Regulator Feedback Input	20	IN3	CH3 Drive Input
7	RESX	Regulator Reset	21	VCC1	Supply Voltage1(CH2,CH3,CH5)
8	GND1	Signal Ground	22	PS	Power Save
9	CTL	CH5 Motor Speed Control	23	VREF	Bias Voltage
10	FWD	CH5 Forward Input	24	VCC	Supply Voltage(CH1,CH4)
11	REV	CH5 Reverse Input	25	IN4	CH4 Drive Input
12	IN2	CH2 Drive Input	26	DO4+	CH4 Drive Output (+)
13	DO2+	CH2 Drive Output (+)	27	DO4-	CH4 Drive Output (-)
14	DO2-	CH2 Drive Output (-)	28	GND3	Power Ground2 (CH 1,4)

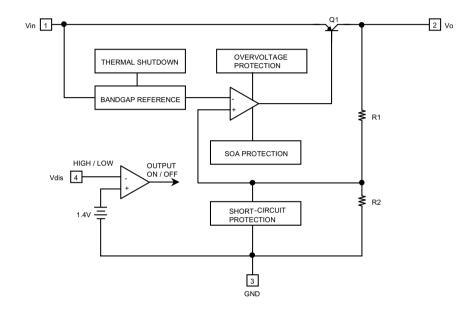
■ KA78R33

Low Dropout Voltage Regulator

Description

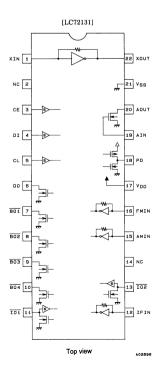
The KA78R33 is a low-dropout voltage regulator suitable for various electronic equipments. It provides constant voltage power source with TO-220 4 lead full mold package. Dropout voltage of KA78R33 is below 0.5V in full rated current(1A). This regulator has various function such as peak current protection, thermal shut down, overvoltage protection and output disable function.

Internal Block Diagram

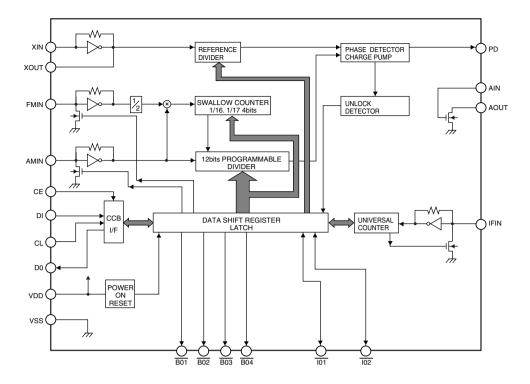


■ LC72131

AM/FM PLL Frequency Synthesizer



Block Diagram

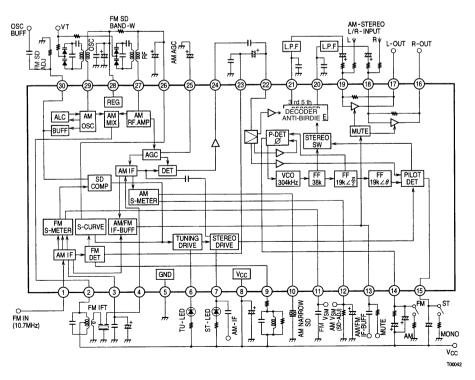


■ LA1837

Single-Chip Home stereo IC with Electronic Tuning Support

The LA1837 is a single-chip AM/FM IF and MPX IC that supports electronic tuning and was developed for use in home stereo systems. It is optimal for use in automatic station selection systems that use the SD and IF counting techniques.

Block Diagram



■ KIA 78R12 PI

4 TERMINAL LOW DROP VOLTAGE REGULATOR

The KIA78RXX Series are Low Drop Voltage Regulator suitable for various electronic equipments. It provides constant voltage power source with TO-220 4 termainal lead full molded PKG. The Regulator has multi function such as over current protection, overheat protection and ON/OFF control.

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, Io=0.5A, Ta=25°C, Note1.)

CHARACTERISTIC		SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
	KIA78R05		_	4.88	5.0	5.12	
	KIA78R06		_	5.85	6.0	6.15	
	KIA78R08		_	7.80	8.0	8.2	
Output Voltage	KIA78R09	V_{O}	_	8.78	9.0	9.22	V
	KIA78R10		_	9.75	10.0	10.25	
	KIA78R12		_	11.70	12.0	12.30	
	KIA78R15		_	14.70	15.0	15.30	
Load Regulation		Reg Load	$I_O=5mA\sim 1A$	-	0.1	2.0	%
Line Regulation		Reg Line	(Note 2)	_	0.5	2.5	%
Ripple Rejection		R∙R		45	55	-	dB
Drop Out Voltage		V_{D}	(Note 3)	_	-	0.5	V
Output ON state for control Voltage		V _{C(ON)}		2.0	-	-	V
Output ON state for control Current		$I_{C(ON)}$	$V_C=2.7V$	_	-	20	μA
Output OFF state for control Voltage		$V_{C(OFF)}$	-	_	-	0.8	V
Output OFF state for control Current		$I_{C(OFF)}$	V _C =0.4V	-	-	-0.4	mA
Quiescent Current		I_{Q}	I _O =0	_	_	10	mA

Note1) V_{IN} of KIA78R05=7V

Note2) V_{IN} of KIA78R05=6~12V

Note3) At V_{IN} =0.95 V_{O}

" KIA78R06=8V " KIA78R08=10V " KIA78R00-15V

" KIA78R10=15V " KIA78R10=16V " KIA78R12=18V

" KIA78R12=18V " KIA78R15=21V " KIA78R06=7~15V

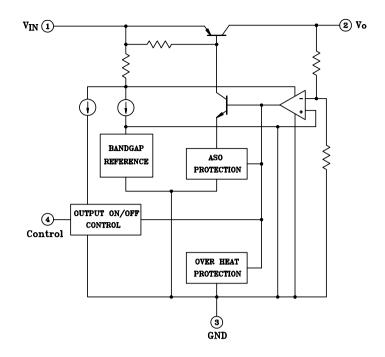
" KIA78R08=9~25V

" KIA78R09=10~25V" KIA78R10=11~26V

" KIA78R12=13∼29V

" KIA78R15=16∼32V

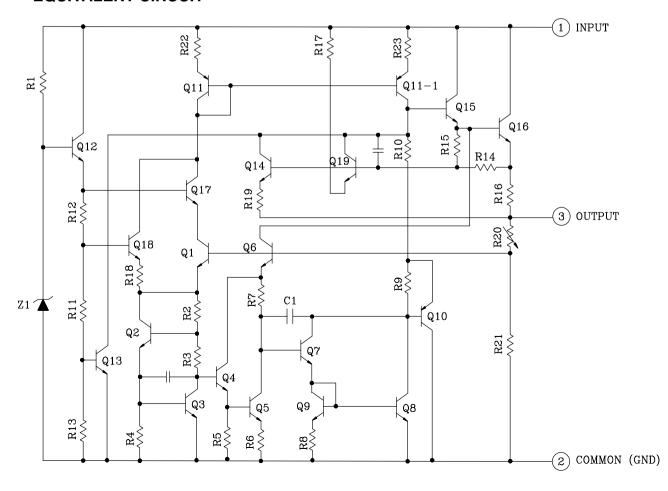
Block Diagram



■ KIA7805AP/API

THREE TERMINAL POSITIVE VOLTAGE REGULATORS 5V, 6V, 8V, 9V, 10V, 12, 15V, 18V, 24V.

EQUIVALENT CIRCUIT

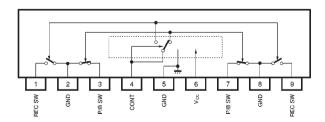


KIA7805AP/API ELECTRICAL CHARACTERISTICS (V_{IN}=10V, I_{OUT}=500mA, $0^{\circ} \le T_{j} \le 125^{\circ}$)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	ТҮР.	MAX.	UNIT	
Output Voltage	$ m V_{OUT}$	1	T_j =25°C, I_{OUT} =100mA		4.8	5.0	5.2	V	
Look Down Late	D 1'	1		$7.0V\!\leq\!V_{IN}\!\leq\!25V$	=	3	100		
Input Regulation	Reg line	1	T _j =25℃	$8.0V\!\leq\!V_{IN}\!\leq\!12V$	-	1	50	mV	
Land Danidation	D 1 1	1	T -95°0	$5\text{mA} \leq I_{\text{OUT}} \leq 1.4\text{A}$	=	15	100		
Load Regulation	Reg load	1	T _j =25℃	$250\text{mA} \le I_{\text{OUT}} \le 750\text{mA}$	=	5	50	mV	
Output Voltage	$ m V_{OUT}$	1	$7.0V \le V_{IN} \le 20V$ $5.0mA \le I_{OUT} \le 1.0A, Po \le 15W$		4.75	_	5.25	V	
Quiescent Current	$ m I_B$	1	T _j =25℃, I _{OUT} =5mA		_	4.2	8.0	mA	
Quiescent Current Change	$\Delta I_{ m B}$	1	$7.0V\!\leq\!V_{IN}\!\leq\!25V$		_	_	1.3	mA	
Output Noise Voltage	$ m V_{NO}$	1	Ta=25℃, 10Hz≤f≤100kHz I _{OUT} =50mA		_	50	_	$\mu m V_{rms}$	
Ripple Rejection Ratio	RR	1	$ \begin{array}{ll} f{=}120Hz, & 8.0V \! \le \! V_{IN} \! \le \! 18V, \\ I_{OUT}{=}50mA, & T_{j}{=}25 ^{\circ}\! C \end{array} $		62	78	_	dB	
Dropout Voltage	$ m V_D$	1	I _{OUT} =1.0A, T _j =25℃		_	2.0	_	V	
Short Circuit Current Limit	$ m I_{SC}$	1	$T_j=25$ °C		_	1.6	_	A	
Average Temperature Coefficient of Output Voltage	TC_{VO}	1	$I_{OUT}=5mA$, $0^{\circ}C \leq T_{j} \leq 125^{\circ}C$		_	-0.6	_	mV/℃	

■ BA3126N

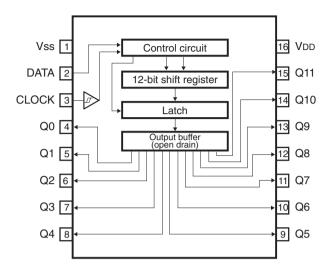
2-channel head switch for radio cassette recorders



■ BU2090F

12-bit, Serial IN, Parallel OUT driver

Block diagram

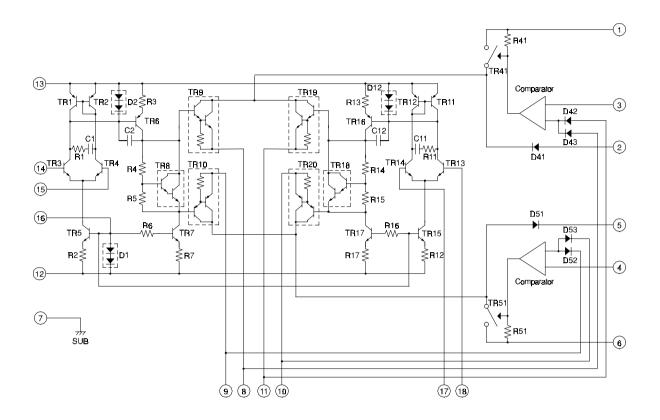


PIN DESCRIPTION

Pin No.		Pin name	Function	
BU2090/F/FS	BU2092/F	BU2092/FV	T iii riaine	i dilodon
1	1	1	Vss	GND
2	2	2	DATA	Serial data input
3	3	3	CLOCK	Data shift clock input
-	4	4	LCK	Data latch clock input
4	5	5	Q0	parallel data output
5	6	6	Q1	parallel data output
6	7	7	Q2	parallel data output
7	8	8	Q3	parallel data output
8	9	9	Q4	parallel data output
9	10	10	Q5	parallel data output
10	11	11	Q6	parallel data output
-	-	12	N.C.	Not connected
-	-	13	N.C.	Not connected
11	12	14	Q7	parallel data output
12	13	15	Q8	parallel data output
13	14	16	Q9	parallel data output
14	15	17	Q10	parallel data output
15	16	18	Q11	parallel data output
-	17	19	ŌĒ	Output Enable
16	18	20	V _{DD}	Power supply

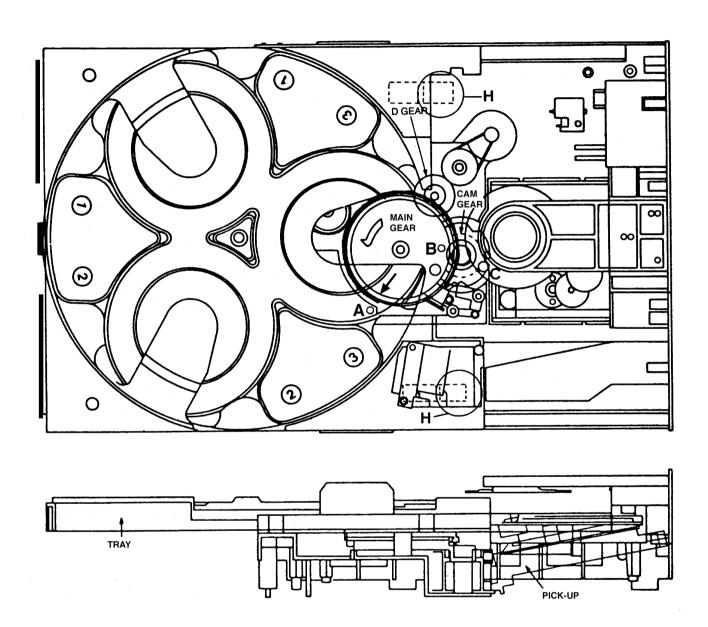
■ STK 412-040

Block diagram



REPAIRS REGARDING CD MECHANISM

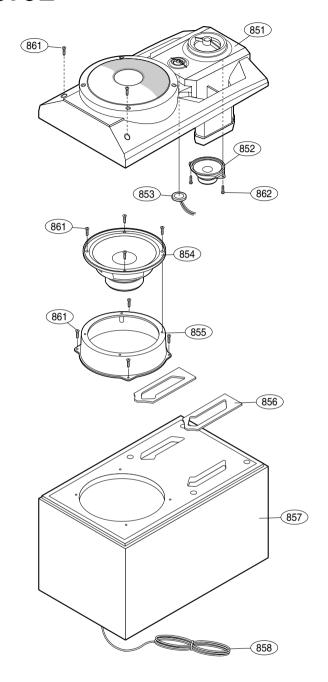
IMPROVED METHOD - WHEN THE TRAY GEARS WERE DISTORTED



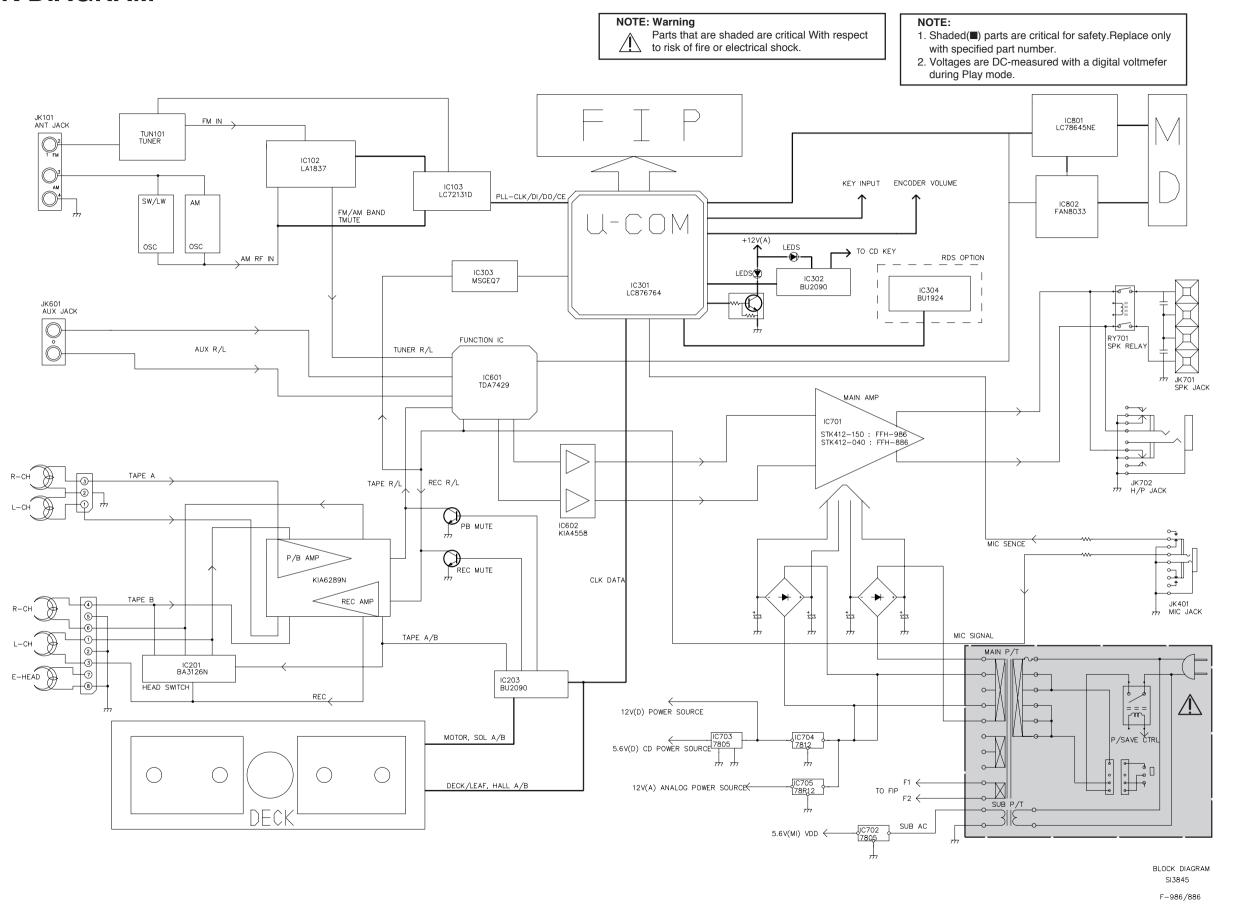
- 1. How to open the tray.
 In case of not suppling power push two hooks (H) of the base, and them open the tray.
- 2. How to improve the distorted gears.
 - (1) Do the hole "C" of the cam gear to face forward the pick-up so the pick-up is down like figure.
 - (2) Do the hole "B" of main gear to face forward pick-up, too.
 - (3) Set the last part of main gear to point "A".
 - (4) Push the tray to end.

SECTION 4. SPEAKER SECTION

MODEL: FE-979E



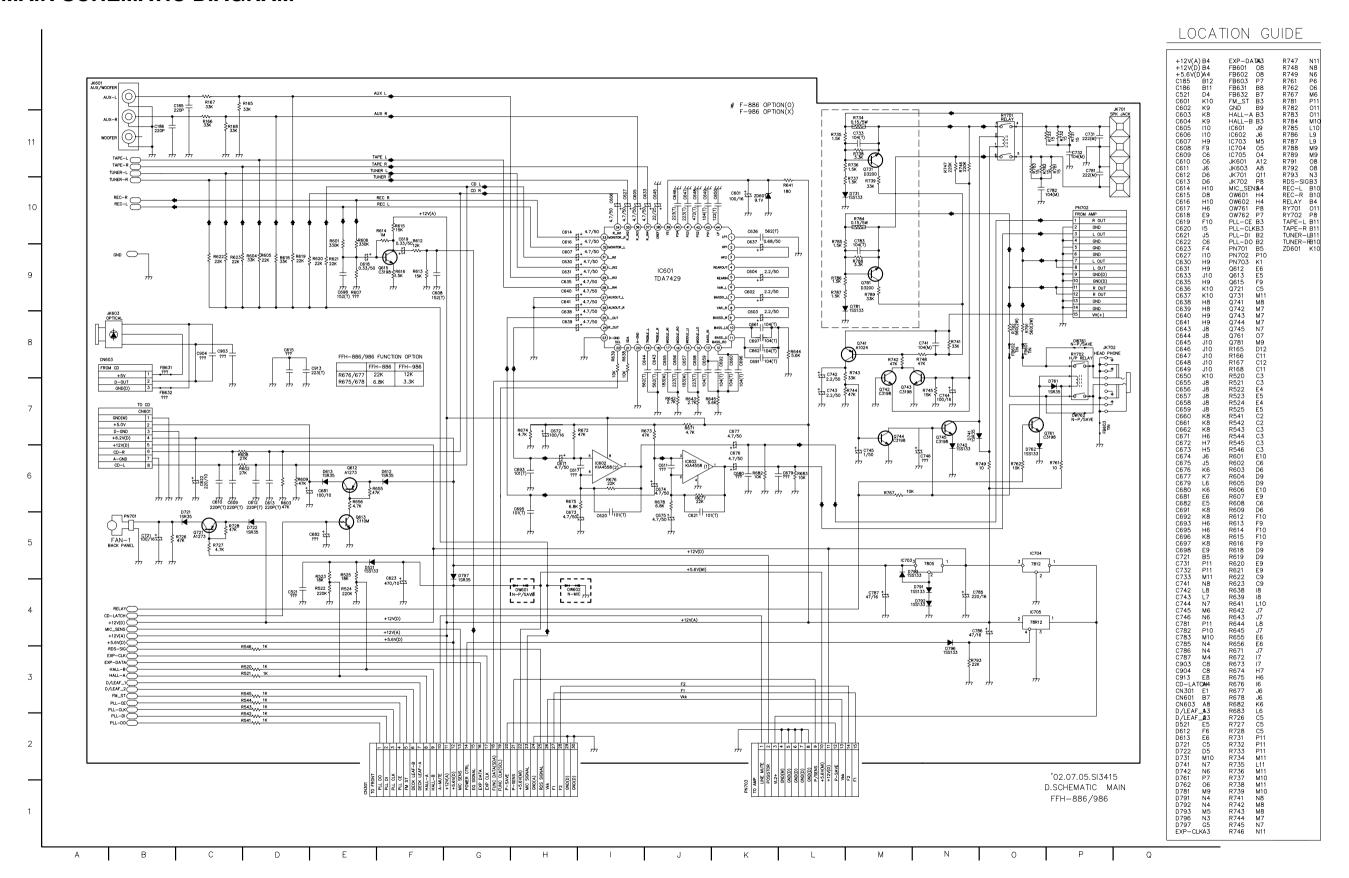
BLOCK DIAGRAM



2-17

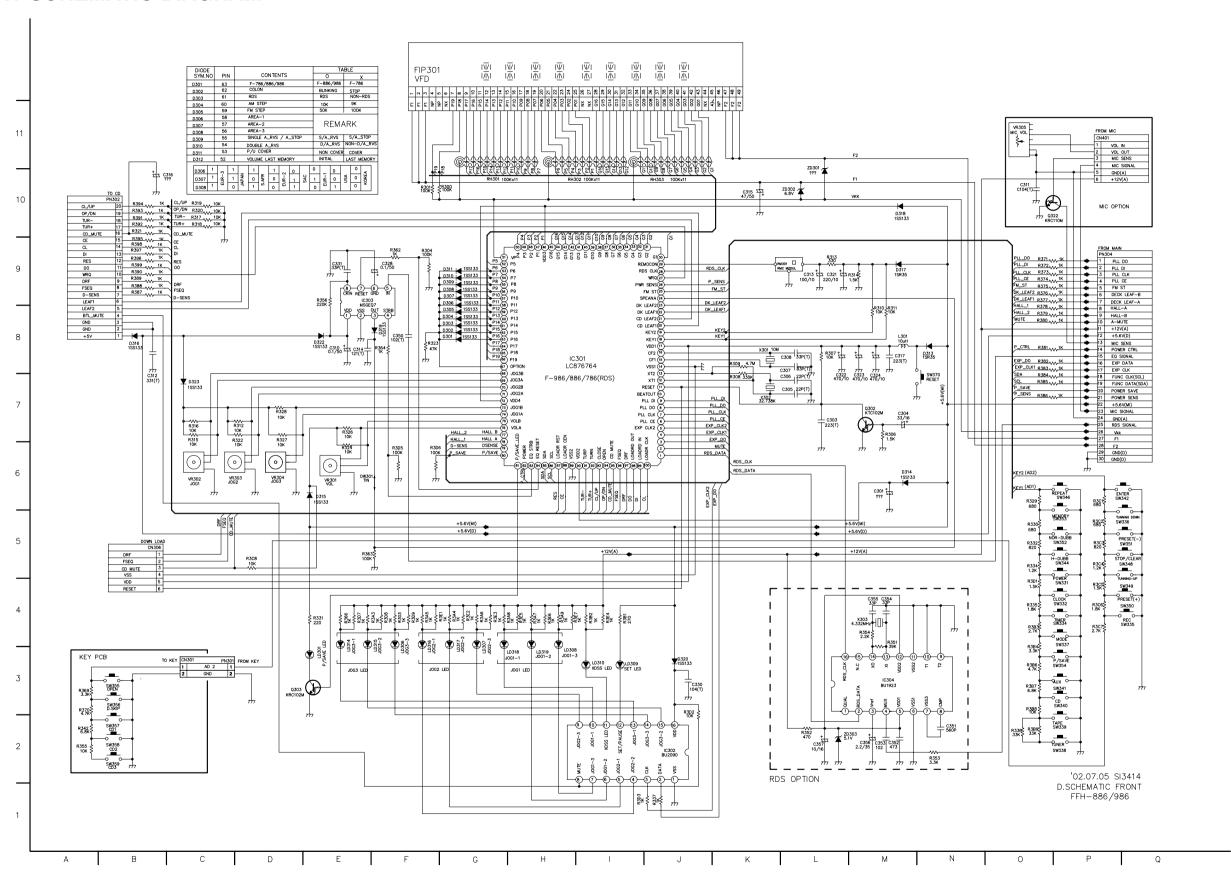
SCHEMATIC DIAGRAMS

MAIN SCHEMATIC DIAGRAM

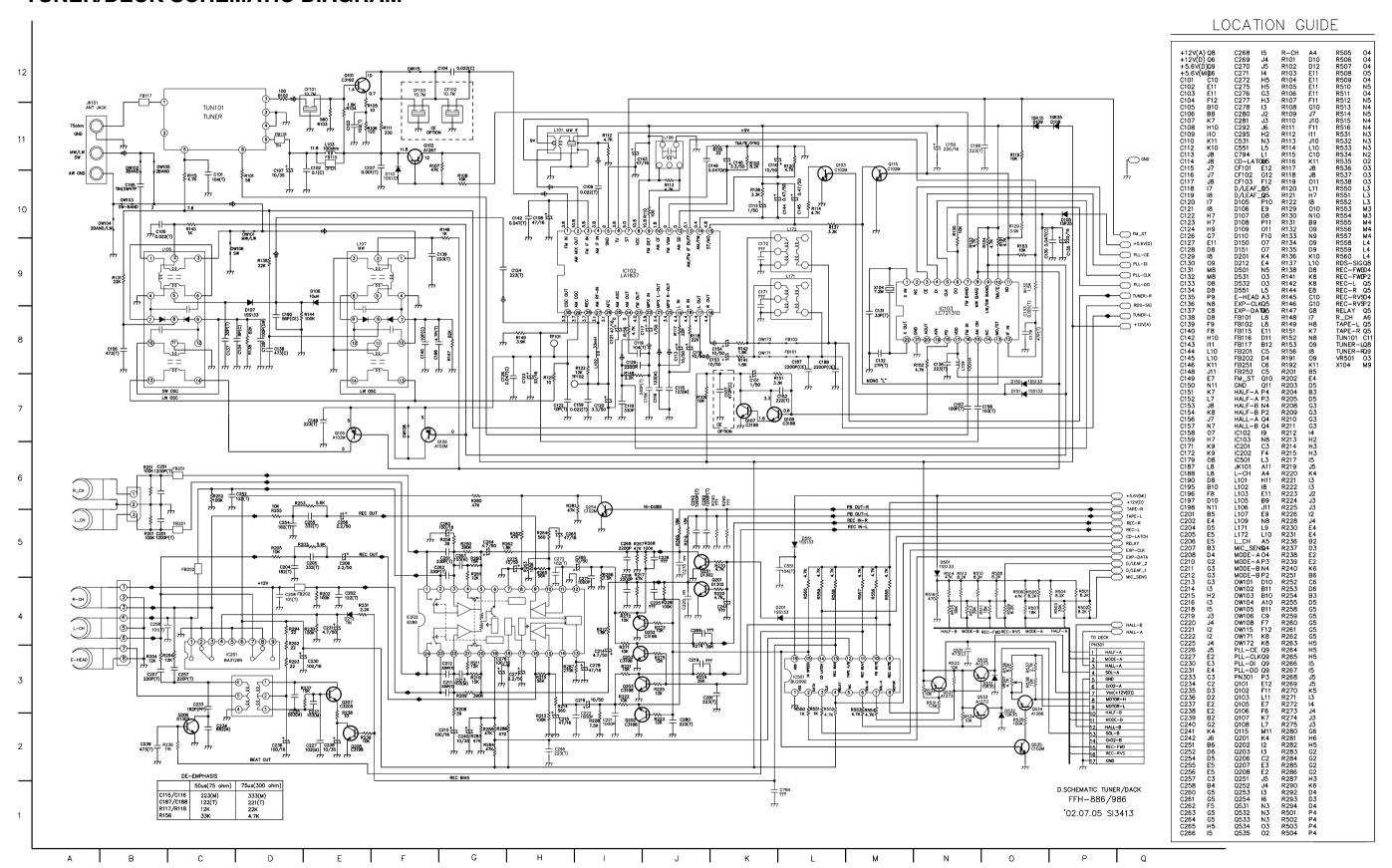


2-19 2-20

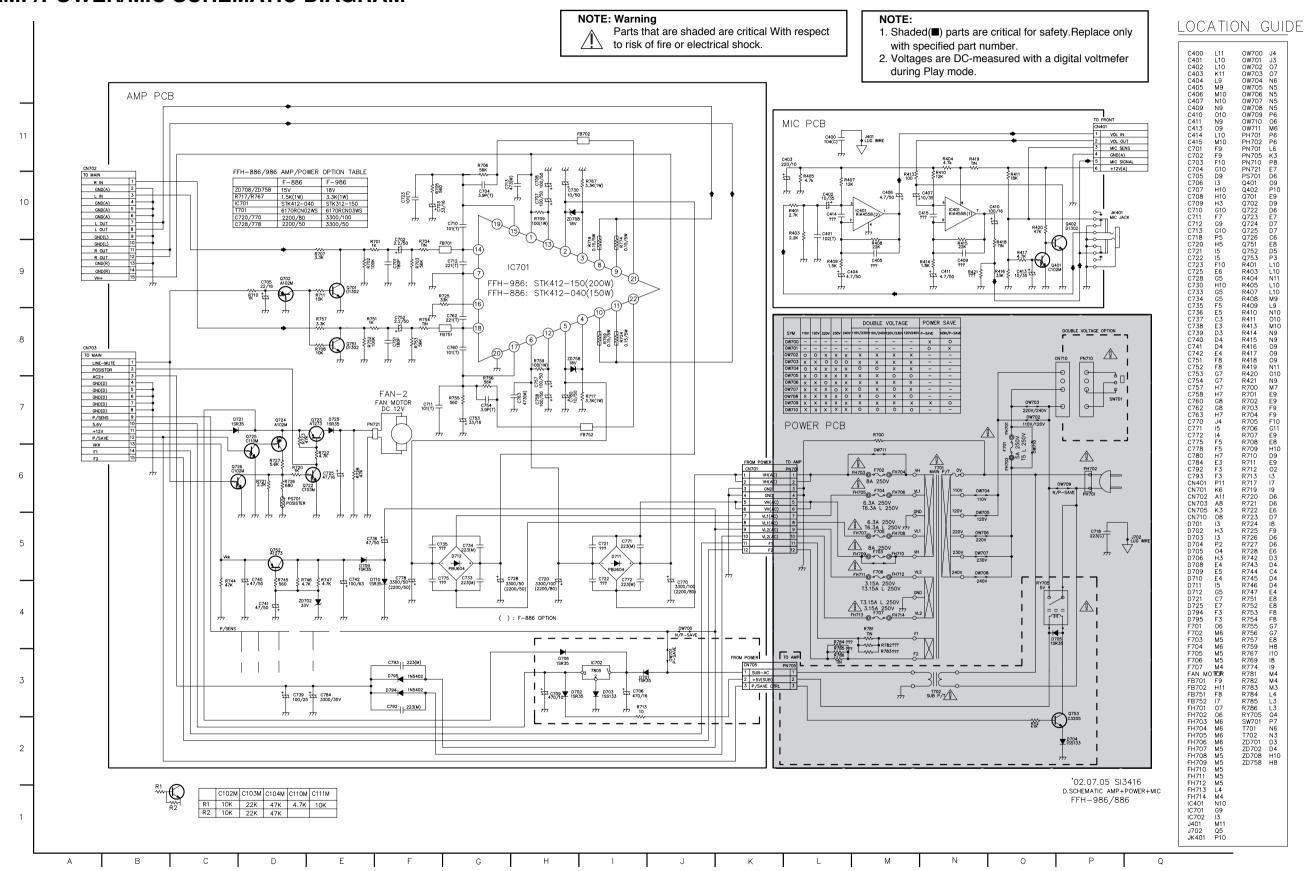
FRONT SCHEMATIC DIAGRAM



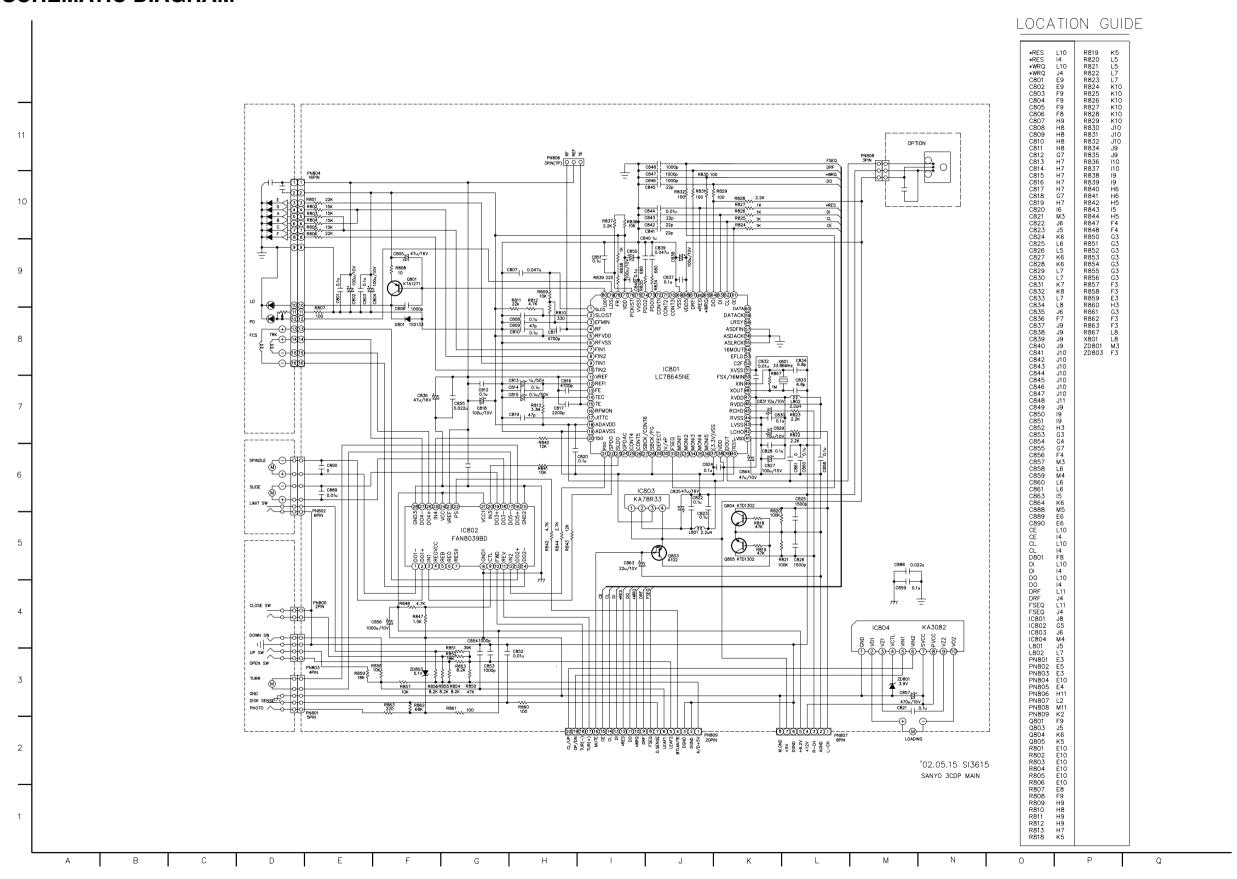
TUNER/DECK SCHEMATIC DIAGRAM



AMP/POWER/MIC SCHEMATIC DIAGRAM



· CDP SCHEMATIC DIAGRAM



WIRING DIAGRAM

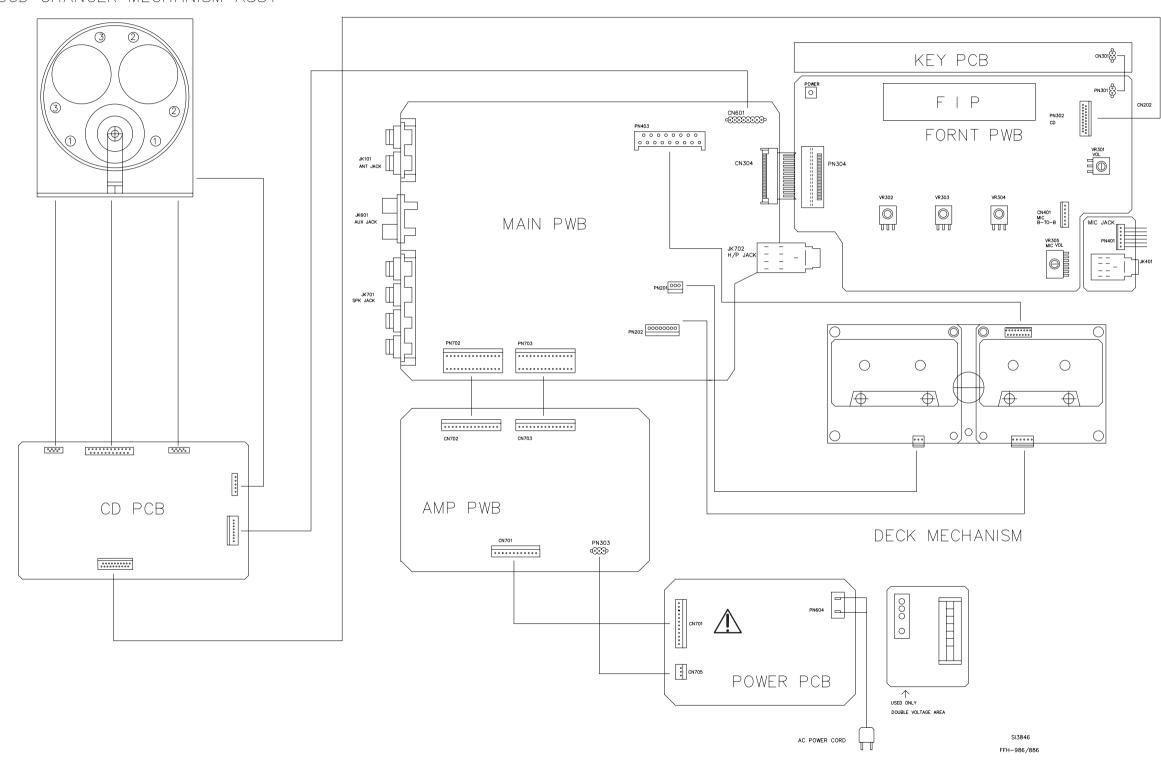
NOTE: Warning

Parts that are shaded are critical With respect to risk of fire or electrical shock.

NOTE:

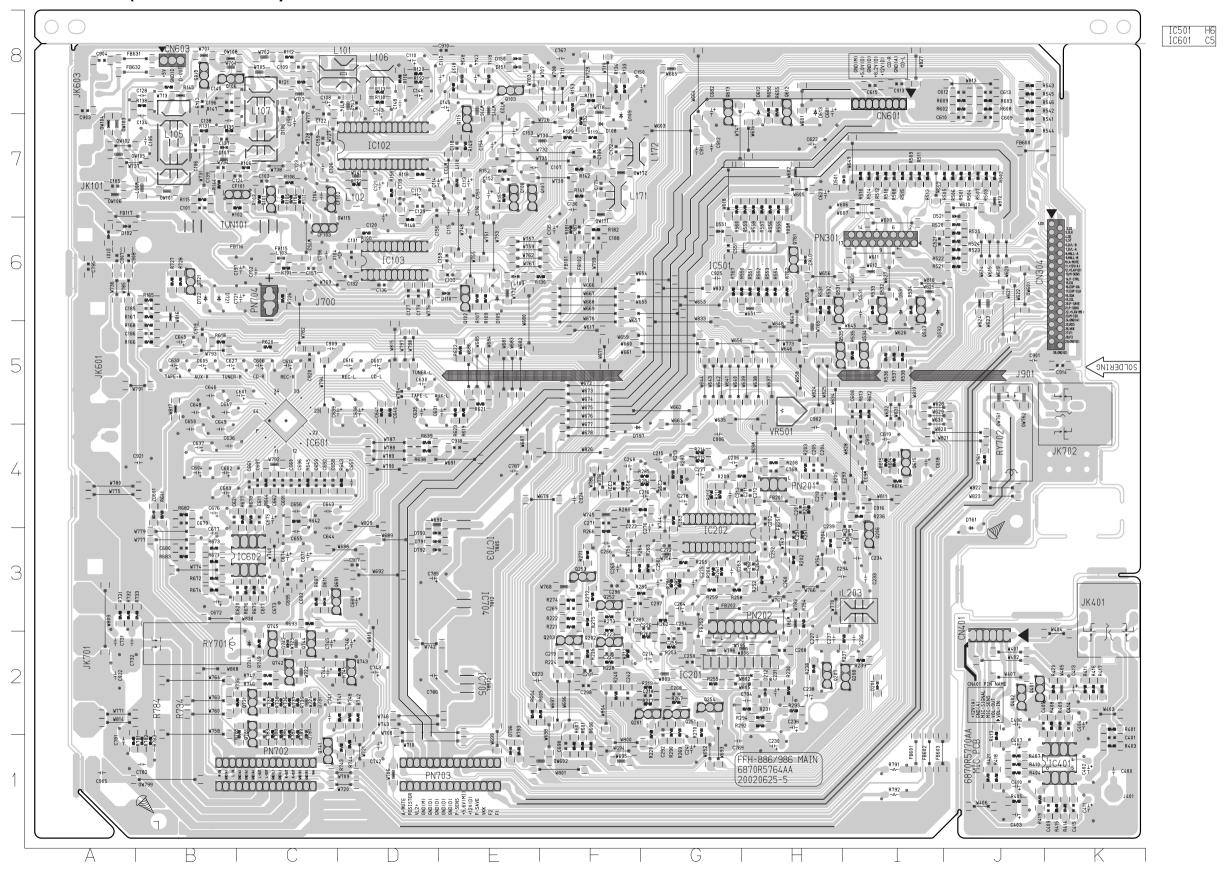
- 1. Shaded(■) parts are critical for safety.Replace only with specified part number.
- Voltages are DC-measured with a digital voltmefer during Play mode.

3CD CHANGER MECHANISM ASSY



PRINTED CIRCUIT DIAGRAMS

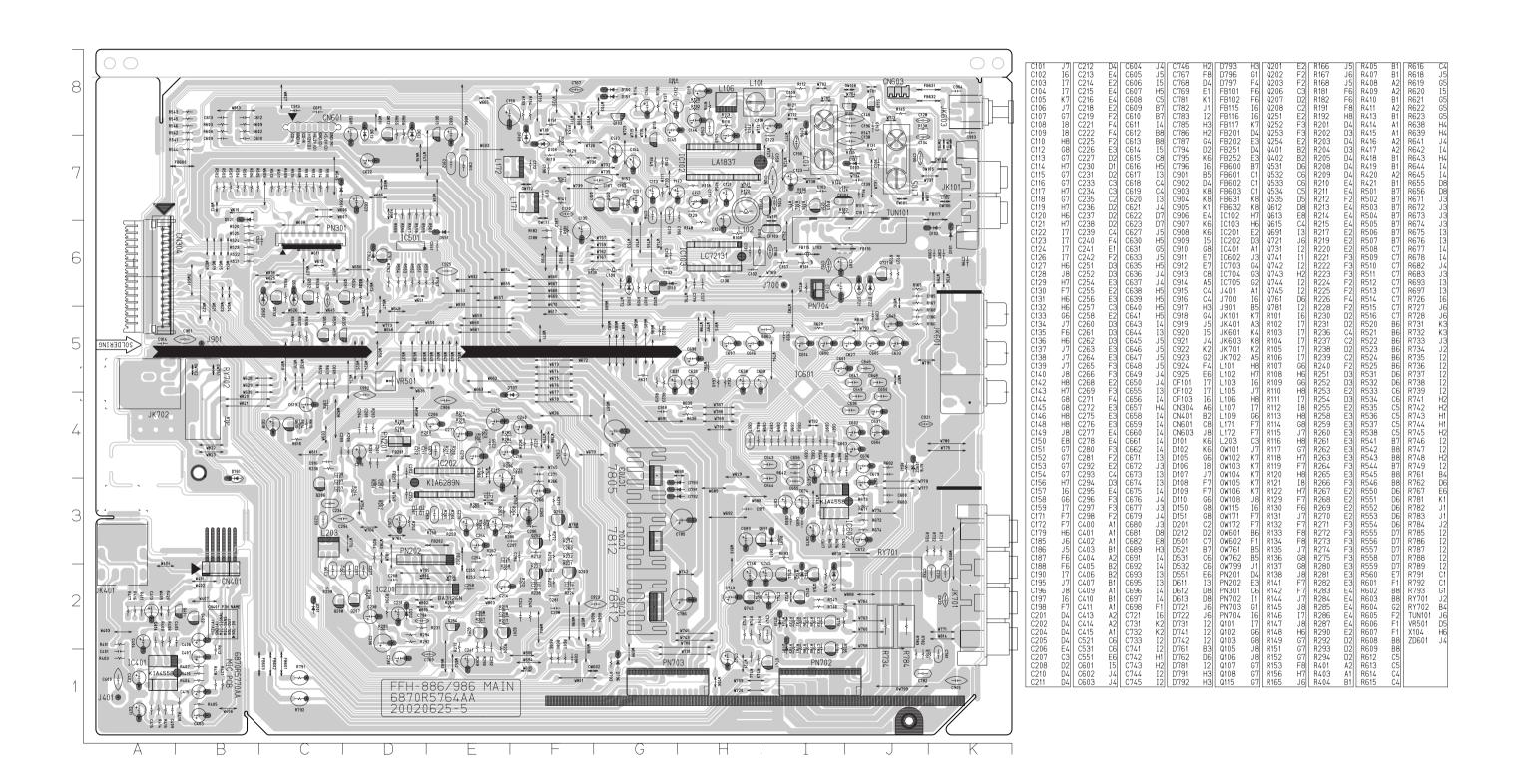
• MAIN P.C. BOARD (SOLDER SIDE)



2-31

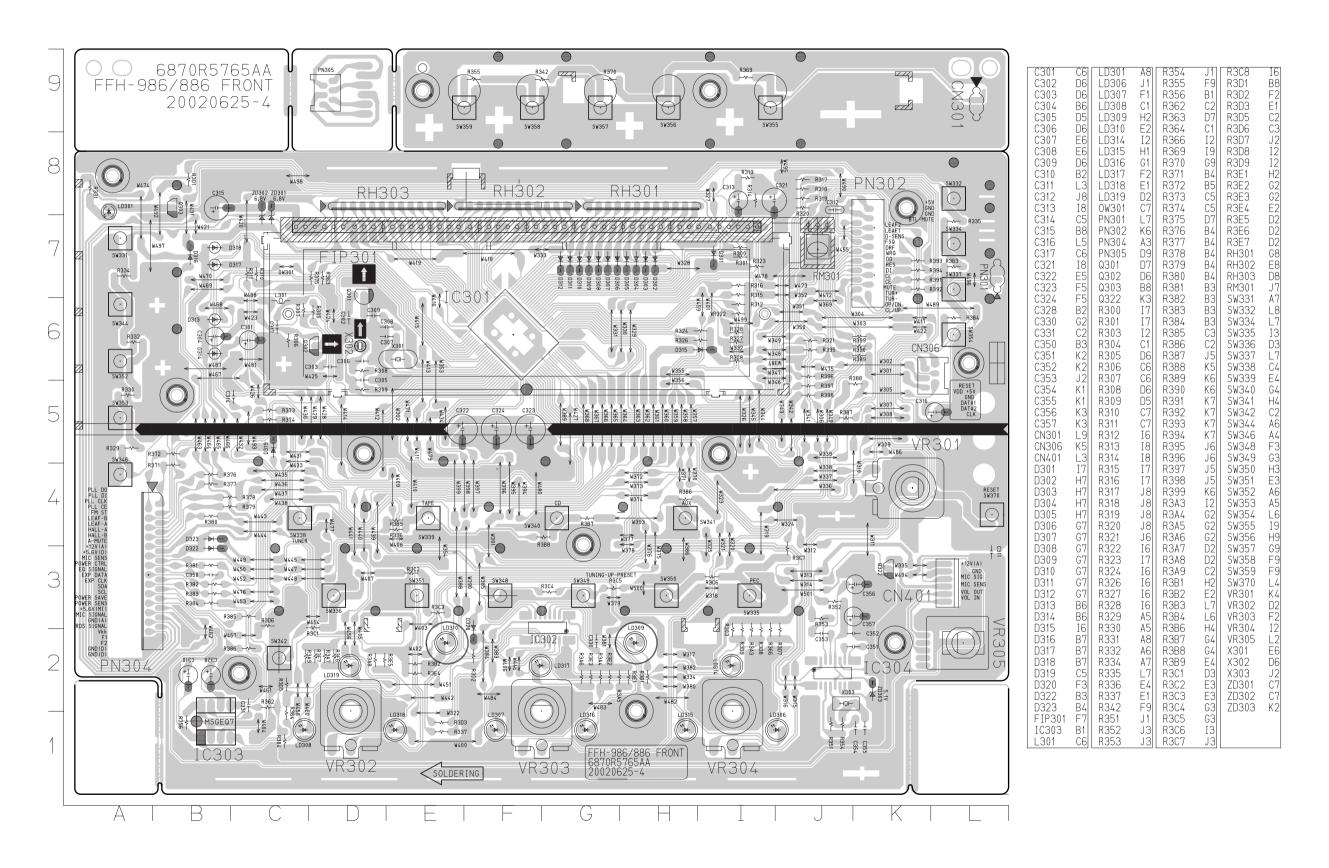
2-32

• MAIN P.C. BOARD (COMPONENT SIDE)



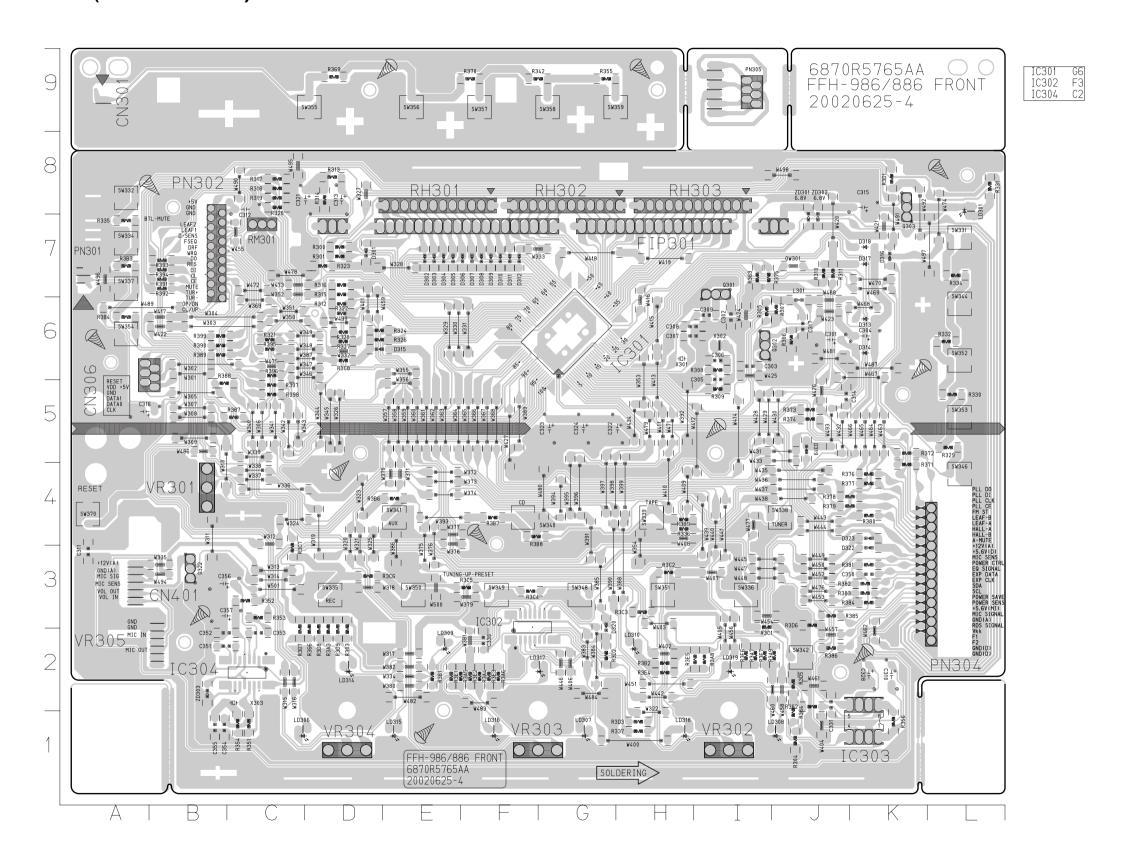
2-33 2-34

• FRONT P.C. BOARD(COMPONENT SIDE)



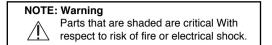
2-35 2-36

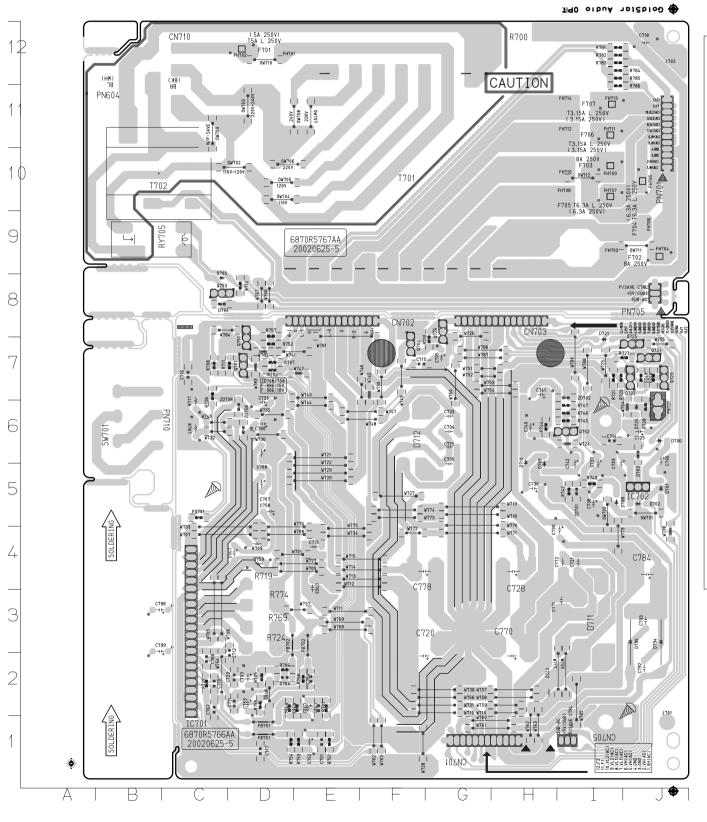
• FRONT P.C. BOARD(SOLDER SIDE)



2-37 2-38

AMP & POWER P.C. BOARD



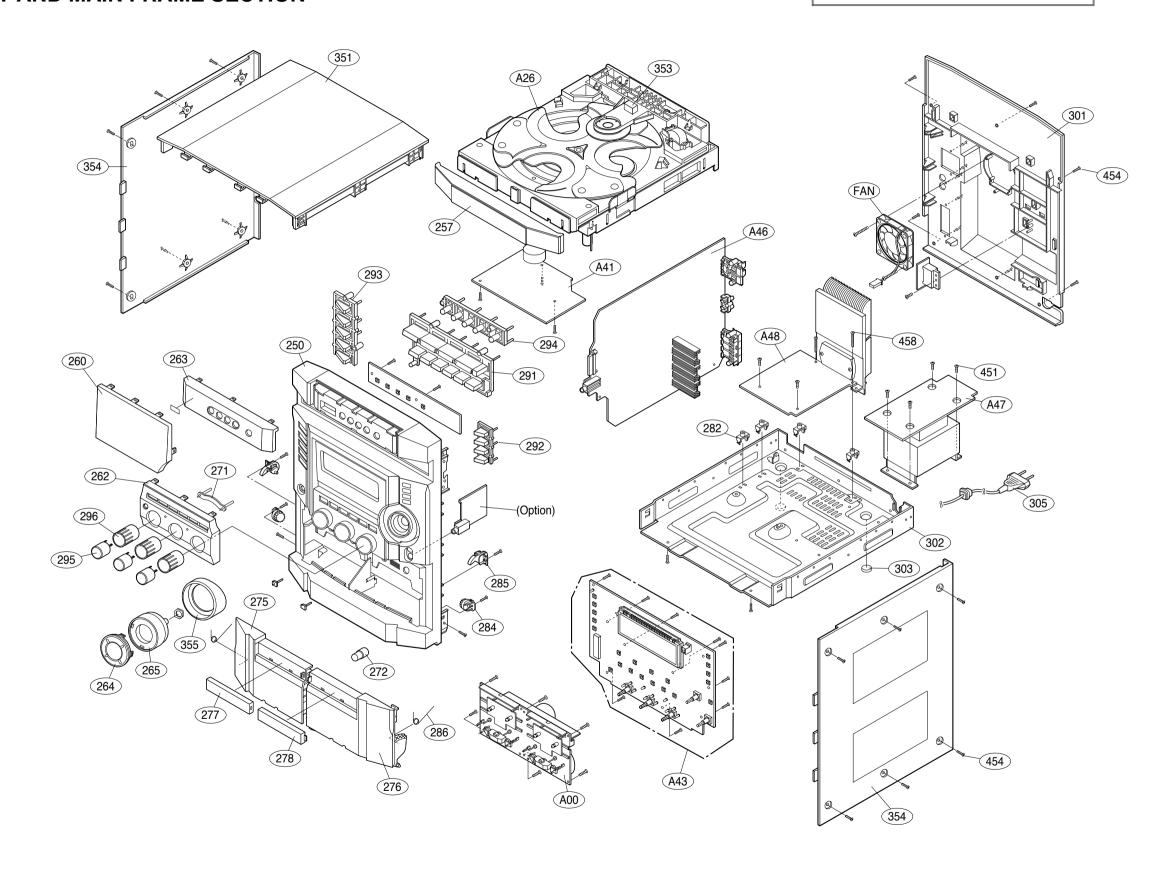


2-39 2-40

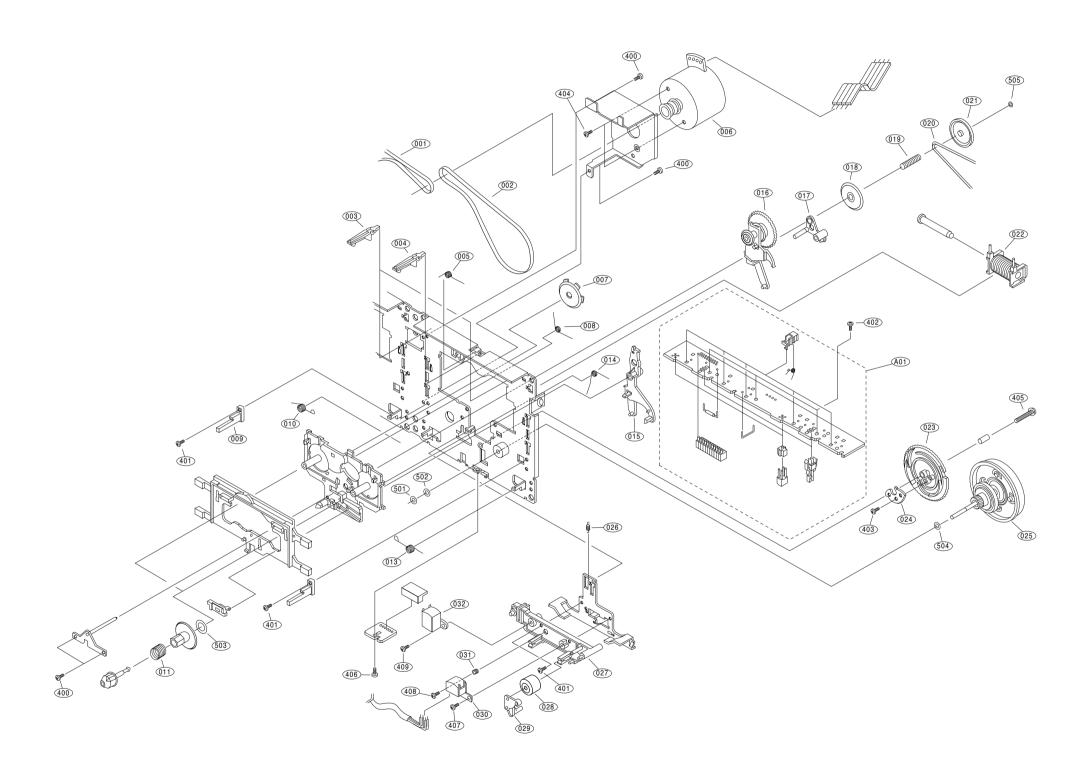
SECTION 3. EXPLODED VIEWS

• CABINET AND MAIN FRAME SECTION

NOTE) Refer to "SECTION 5 REPLACEMENT PARTS LIST" in order to look for the part number of each part.

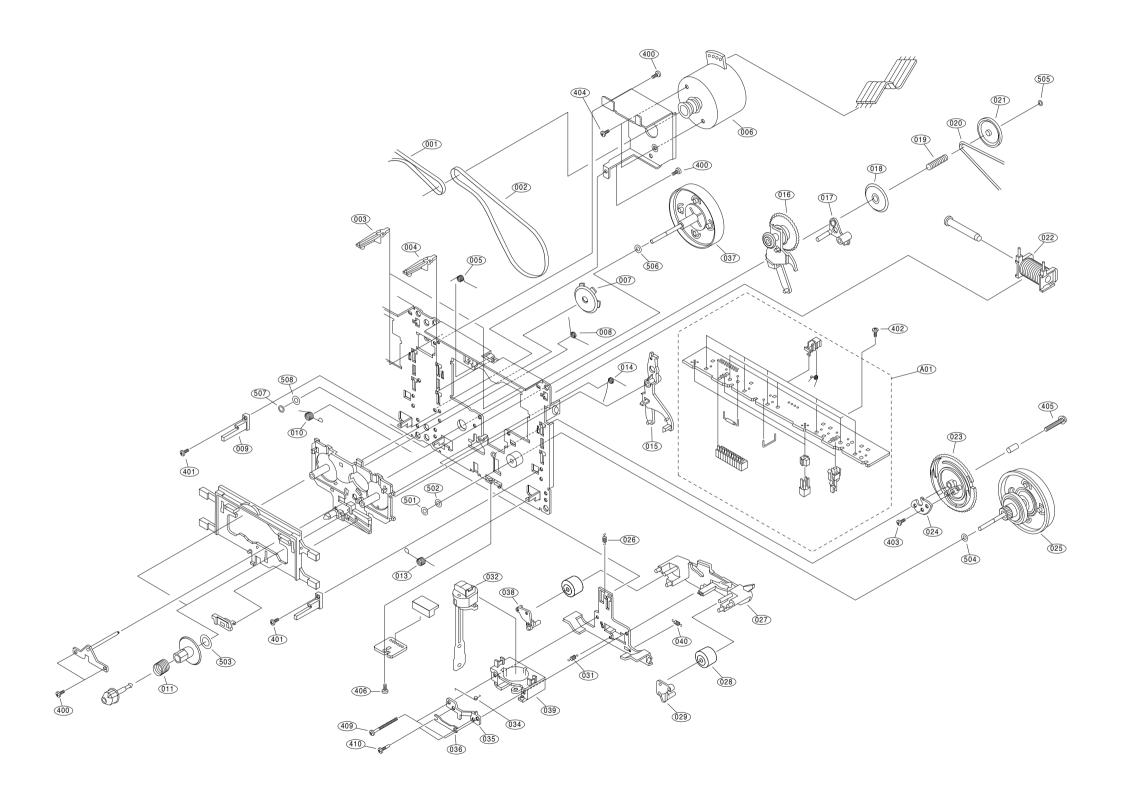


• TAPE DECK MECHANISM: AUTO STOP DECK(OPTIONAL)



3-3 3-4

• TAPE DECK MECHANISM: AUTO REVERSE DECK



3-5 3-6

• CD MECHANISM

