

Service Manual

Tuner/Compact Disc Player

COMPACT
disc
 DIGITAL AUDIO


Tuner/Compact Disc Player

SL-CH700

Colour

(K) Black Type

Areas

Suffix for Model No.	Area	Colour
(E)	Continental Europe, Great Britain.	(K)
(EG)	Germany and Italy.	
(GC)	Asia, Latin America, Middle Near East and Africa.	
(GN)	Oceania.	

RX-DT55 TRAVERSE DECK SERIES (S0DD110)

Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.

SPECIFICATIONS

■ FM TUNER SECTION

Frequency range	87.50~108.00 MHz (0.05 MHz step)
Sensitivity	1.5 μ V (IHF, usable)
S/N 30 dB	1.5 μ V (75 Ω)
S/N 26 dB	1.3 μ V (75 Ω)
S/N 20 dB	1.2 μ V (75 Ω)
IHF 46 dB stereo quieting sensitivity	28 μ V (75 Ω)
Total harmonic distortion	
MONO	0.2%
STEREO	0.3%
S/N	
MONO	60 dB (74 dB, IHF)
STEREO	58 dB (70 dB, IHF)
Frequency response 20 Hz~15 kHz	+0.5~-2.0 dB
Alternate channel selectivity $\pm$ 400 kHz	70 dB
Stereo separation 1 kHz	35 dB
Channel balance 250 Hz~6300 kHz	$\pm$ 1.5 dB
Limiting point	1.2 μ V
Band width	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	75 Ω (unbalanced)

■ MW/LW TUNER SECTION

Frequency range	
MW: for (E) (EG) (GN) area;	522~1611 kHz (9 kHz step)
: for (GC) area;	530~1620 kHz (10 kHz step)
LW: for (E) (EG) (GN) area;	531~1602 kHz (9 kHz step)
: for (GC) area;	530~1600 kHz (10 kHz step)
Sensitivity (S/N 20 dB)	
MW	20 μ V, 330 μ V/m
LW	50 μ V
Selectivity ($\pm$ 9 kHz)	
MW (at 999 kHz)	50 dB
LW (at 216 kHz)	50 dB

■ CD PLAYER SECTION

Pick up	
Beam source	780 nm Semiconductor laser
Type	1 beam
Spindle motor	DC motor

■ GENERAL

Power consumption	14 W
Dimensions (W×H×D)	215.4×83.2×290 mm
Weight	2.0 kg

Notes:

- Specifications are subject to change without notice.
- Weight and dimensions are approximate.
- Total harmonic distortion is measured by the digital spectrum analyzer.

System	Tuner/CD player	Sound Processor	Amplifier	Cassette Deck	Speakers
SC-CH700	SL-CH700	SH-CH700	SU-CH700	RS-CH700	*SB-CH700

*(E), (EG) areas...Made in PAES

Technics

■ CONTENTS

	Page
HANDLING PRECAUTIONS FOR TRAVERSE DECK	2
PRECAUTION OF LASER DIODE	2, 3
LOCATION OF CONTROLS	3
DISASSEMBLY INSTRUCTIONS	4~11
MEASUREMENTS AND ADJUSTMENTS	12~14
DESCRIPTION OF FL PANEL	15
SCHEMATIC DIAGRAM (Servo circuit)	16~18
SCHEMATIC DIAGRAM (Operation/Main/Loading Motor circuit)	19~21

	Page
SCHEMATIC DIAGRAM (Tuner circuit)	22~24
PRINTED CIRCUIT BOARDS	25~27
WIRING CONNECTION DIAGRAM	28
BLOCK DIAGRAM	29~32
TROUBLESHOOTING GUIDE	33, 34
FUNCTION OF IC TERMINALS	35~39
REPLACEMENT PARTS LIST	40~44, 46
CABINET PARTS LOCATION	45, 46

■ HANDLING PRECAUTIONS FOR TRAVERSE DECK

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.

So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

● Handling of traverse deck (optical pickup)

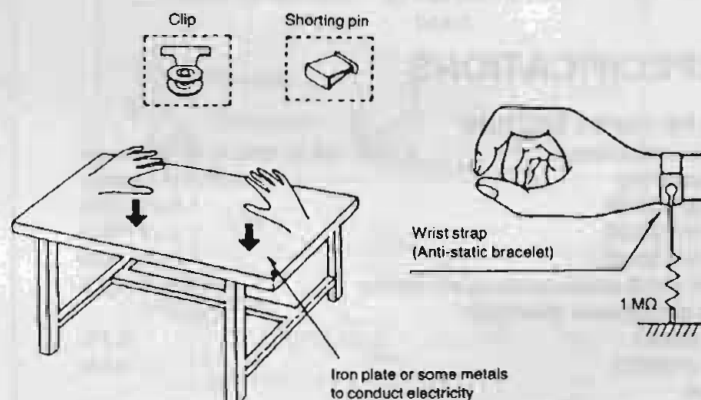
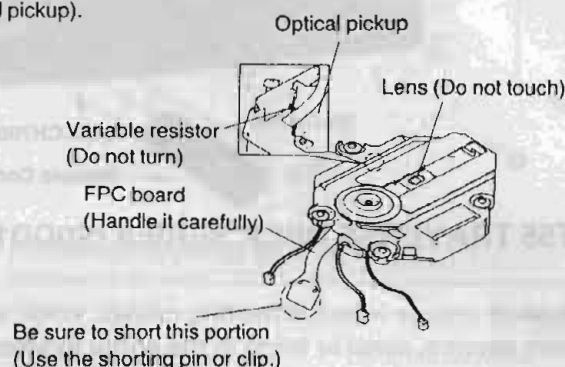
1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board (FPC board). When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

● Grounding for electrostatic breakdown prevention

1. Human body grounding
Use the anti-static 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 traverse deck (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 traverse deck (optical pickup).



■ PRECAUTION OF LASER DIODE

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pick up lens.

Wave length: 780 nm

Maximum output radiation power from pick up: 100 μ W/VDE

Laser radiation from the pick up lens is safety level, but be sure the followings:

1. Do not disassemble the optical pick up unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pick up lens for a long time.

ACHTUNG: Dieses produkt enthält eine laserdiode. Im eingeschalteten zustand wird unsichtbare laserstrahlung von der lasereinheit abgestrahlt.

Wellenlänge: 780 nm

Maximale strahlungsleistung der lasereinheit: 100 μ W/VDE

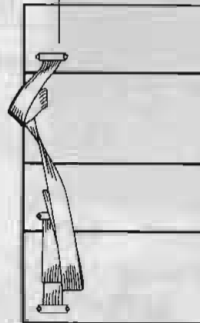
Die strahlung an der lasereinheit ist ungefährlich, wenn folgende punkte beachtet werden:

1. Die lasereinheit nicht zerlegen, da die strahlung an der freigelegten laserdiode gefährlich ist.
2. Den werkseitig justierten einstellregler der lasereinheit nicht verstellen.
3. Nicht mit optischen instrumenten in die fokussierlinse blicken.
4. Nicht über längere zeit in die fokussierlinse blicken.

ADVARSEL: I dette apparat anvendes laser

CLASS 1
LASER PRODUCT

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT



CD player/tuner
(SL-CH700)

Amplifier
(SU-CH700)

Sound processor
(SH-CH700)

Cassette deck
(RS-CH700)

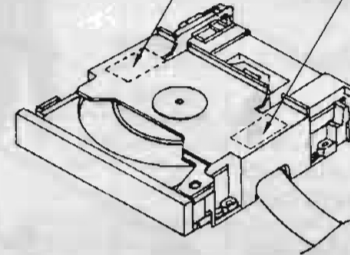
ADVARSEL: USYNLIG LASERSTRÅLING
VED ÅBNING, NÅR SIKKERHEDSAF-
BRYDERE ER UDE AF FUNKTION.
UNDGÅ UDSÆTTELSE FOR STRÅLING.

VARO! Avattaessa ja
suojalukitus
ohitettaessa olet
alttiina näkymättömälle
lasersäteilylle.
Älä katso säteeseen.

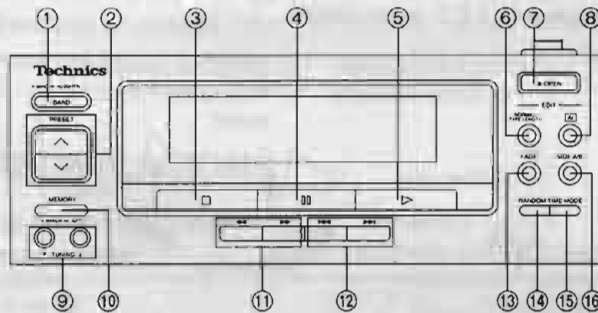
VORSICHT-Unsichtbare
Laserstrahlung, wenn
Abdeckung geöffnet.
Nicht dem Strahl
aussetzen. NOL50021

DANGER-Invisible
laser radiation when
open.
AVOID DIRECT EX-
POSURE TO BEAM.

WARNING! Osynlig
laserstråling når
denna del är öppnad
och spårnen är
urkopplad.
Betrakta ej strålen.

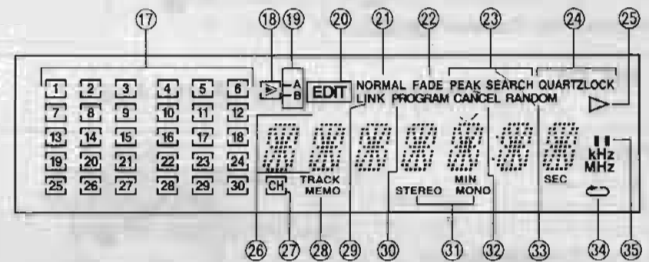


LOCATION OF CONTROLS



Compact disc player/tuner section

- ① Band select button (BAND, -BAND -ALLOCATION)
- ② Preset tuning buttons (▼ PRESET ▲)
- ③ Stop button (■)
- ④ Pause button (⏸)
- ⑤ Play button (▶)
- ⑥ Normal/tape length edit button (NORMAL/TAPE LENGTH)
- ⑦ Disc tray open/close button (▲ OPEN/CLOSE)
- ⑧ AI edit button (AI)
- ⑨ Tuning buttons (▼ TUNING ▲)
- ⑩ Preset memory button (MEMORY, -MANUAL -AUTO)
- ⑪ Search buttons (◀◀, ▶▶)
- ⑫ Skip buttons (◀◀, ▶▶)
- ⑬ Fade-in edit button (FADE)
- ⑭ Random button (RANDOM)
- ⑮ Time mode select button (TIME MODE)
- ⑯ Tape-side select button (SIDE A/B)



Display section

- ⑰ Matrix display (1 ~ 30)
- ⑱ Over indicator (⏹)
- ⑲ Tape side indicator (-A, -B)
- ⑳ Compact disc edit recording indicator (EDIT)
- ㉑ Normal edit indicator (NORMAL)
- ㉒ Fade edit indicator (FADE)
- ㉓ Peak search indicator (PEAK SEARCH)
- ㉔ Quartz lock indicator (QUARTZ LOCK)
- ㉕ Play indicator (▶)
- ㉖ Multi display
- ㉗ Channel indicator (CH)
- ㉘ Memory indicator (MEMO)
- ㉙ Link indicator (LINK)
- ㉚ Program indicator (PROGRAM)
- ㉛ FM stereo indicator (STEREO, MONO)
- ㉜ Cancel indicator (CANCEL)
- ㉝ Random indicator (RANDOM)
- ㉞ Repeat play indicator (↺)
- ㉟ Pause indicator (⏸)

Note: Refer to the service manual for Model No. SU-CH700, Order No. AD9202022C8 for information on ACCESSORIES, CONNECTIONS and PACKAGING.

DISASSEMBLY INSTRUCTIONS

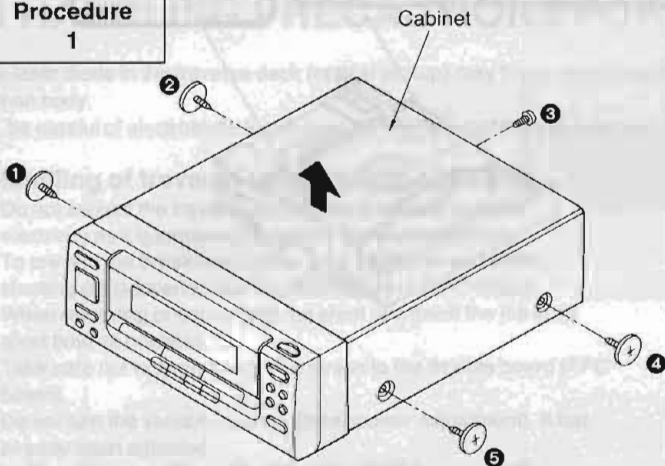
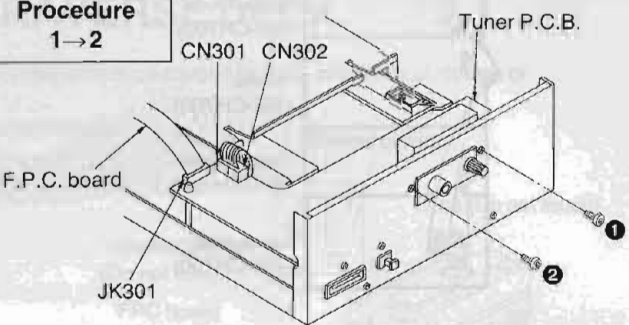
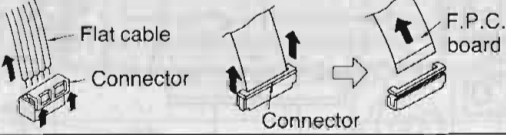
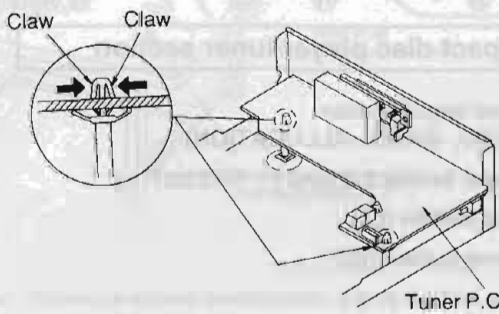
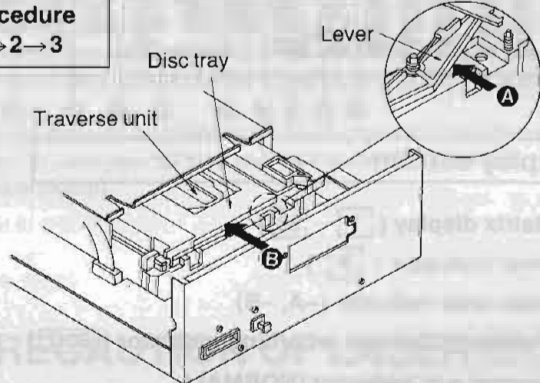
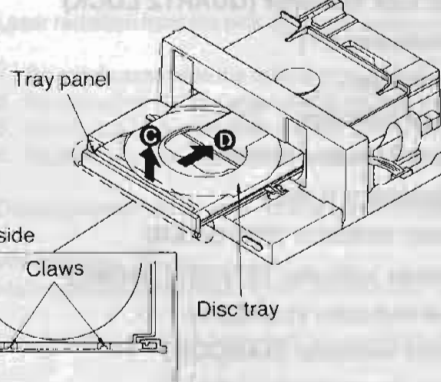
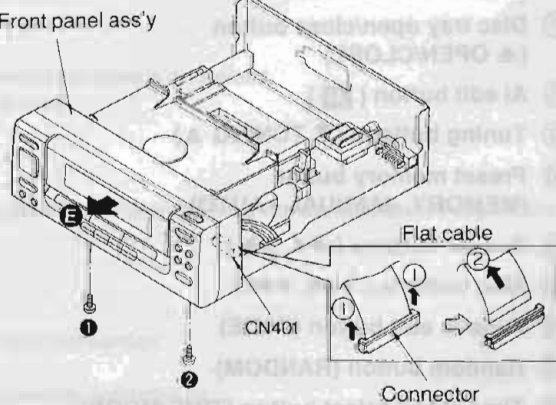
Warning: This product uses a laser diode. Refer to caution statements on page 2.

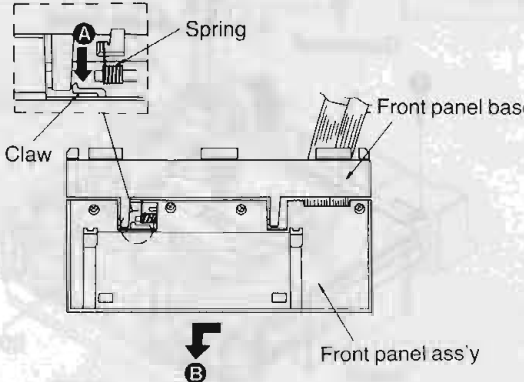
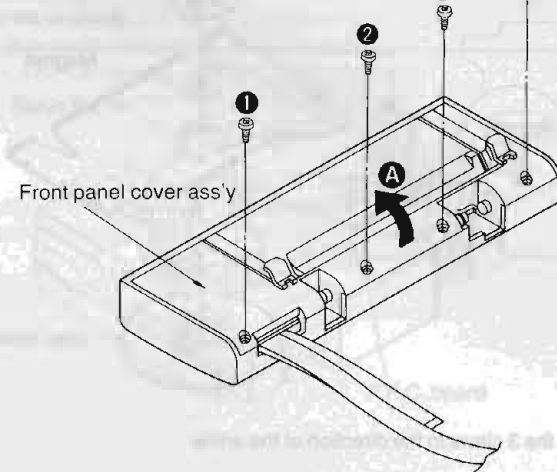
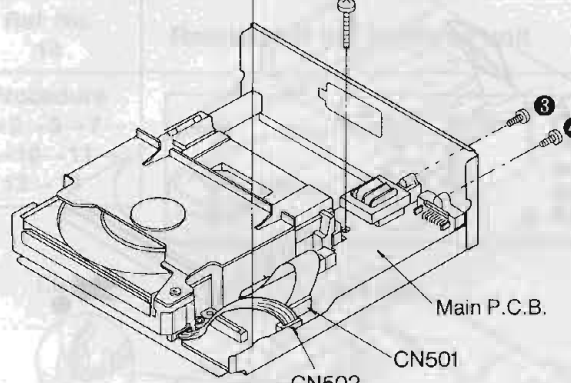
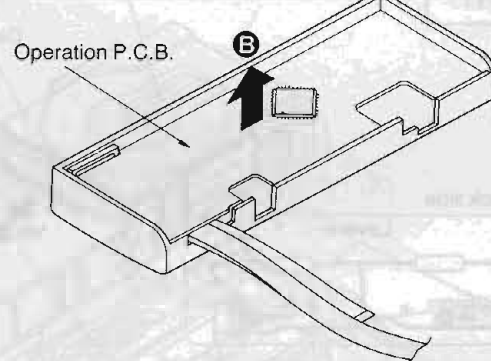
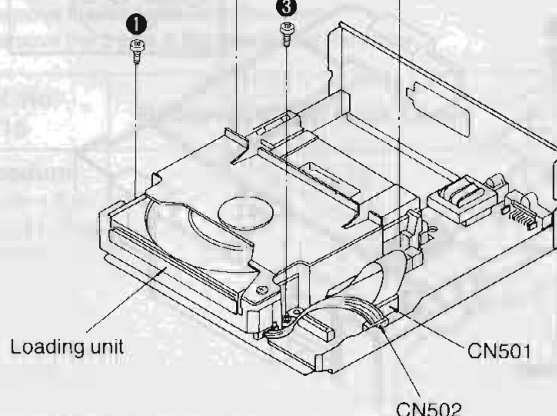
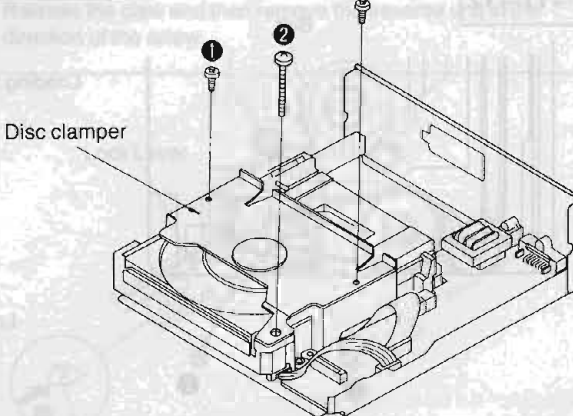
ACHTUNG: •Die lasereinheit nicht zerlegen.

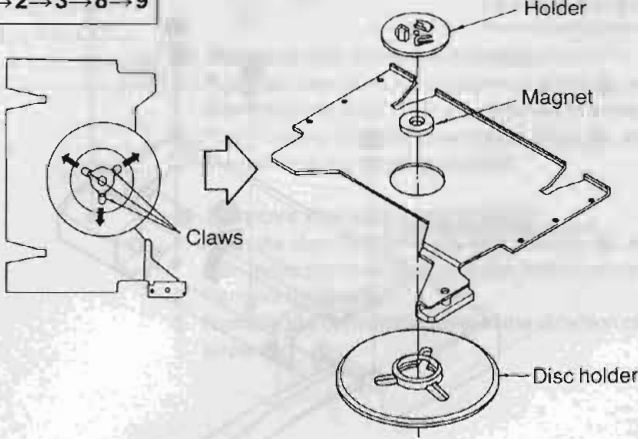
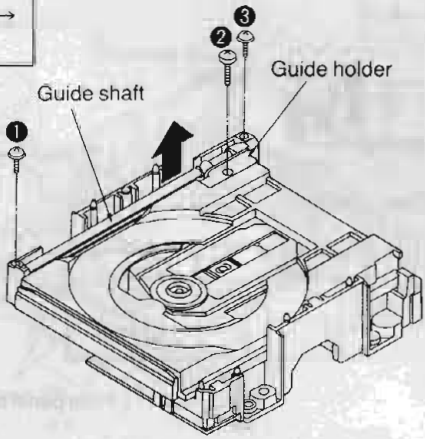
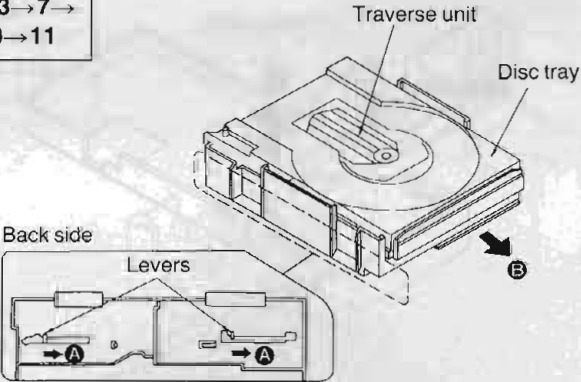
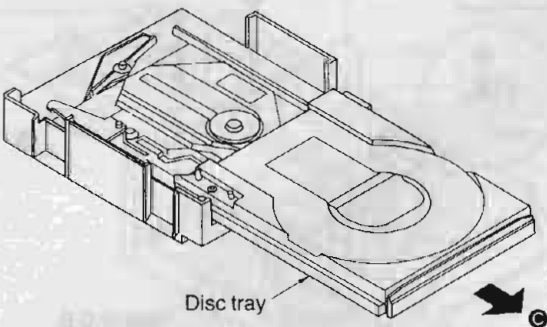
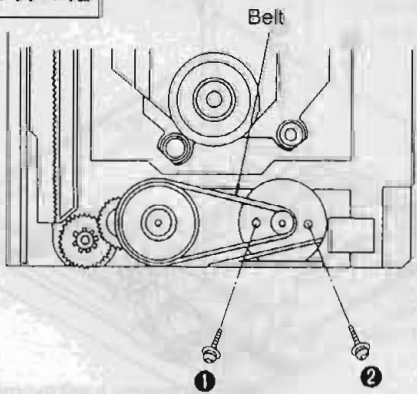
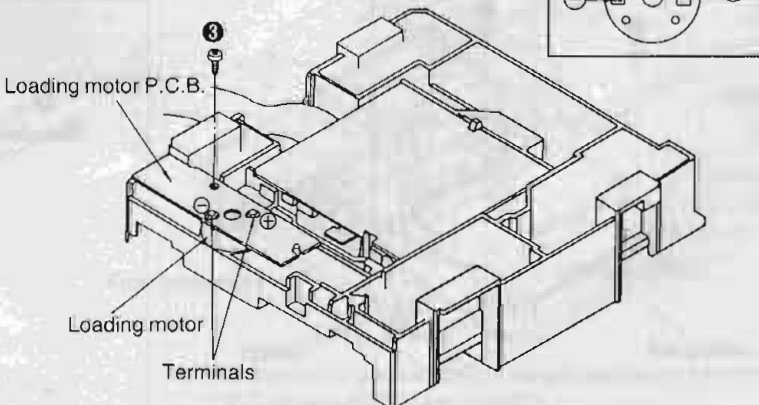
•Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

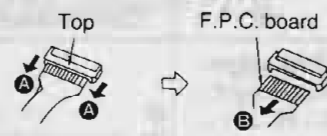
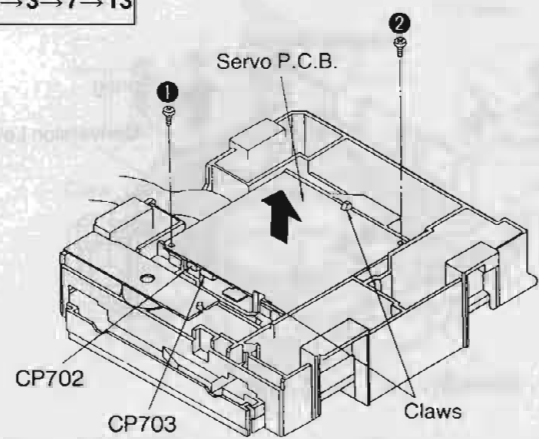
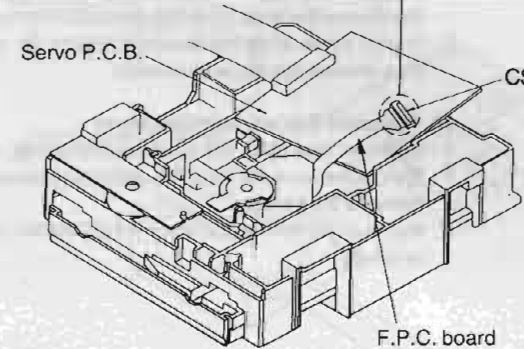
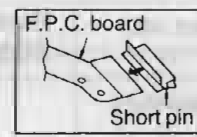
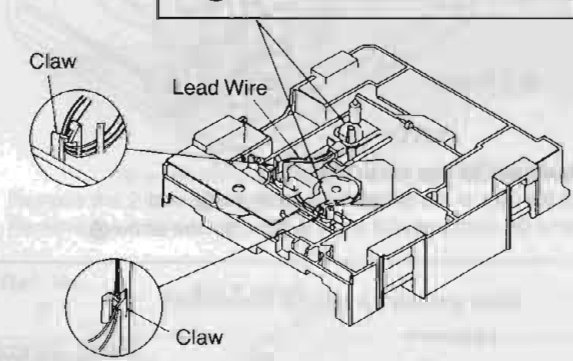
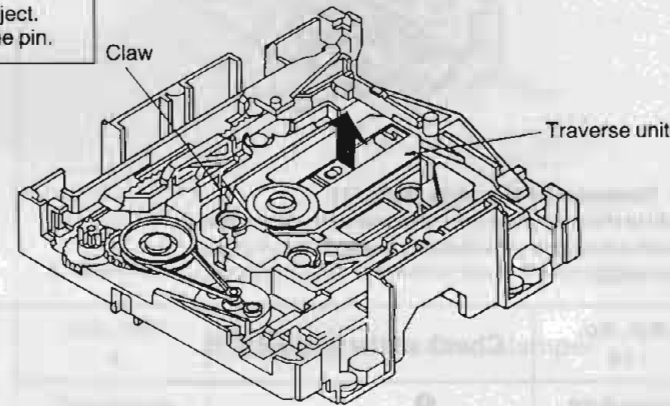
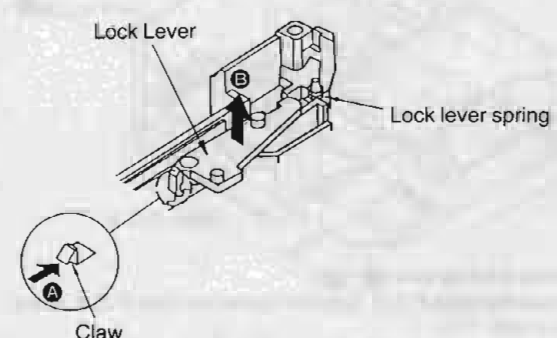
"ATTENTION SERVICER"

Some chassis components may have sharp edges. Be careful when disassembling and servicing.

Ref. No. 1	Removal of the Cabinet	Ref. No. 2	Removal of the Tuner P.C.B.
Procedure 1	 •Remove the 5 screws (1~5).	Procedure 1→2	 1. Remove the 2 screws (1, 2). 2. Remove the flat cable (CN301, 302). 3. Remove the F.P.C. board (JK301). 1. Lift up the connector. 2. Pull out the flat cable.   4. Push the 2 claws in the direction of the arrow.
Ref. No. 3	Removal of the Front Panel Ass'y		
Procedure 1→2→3	 1. Push the lever in the direction of arrow A until the traverse unit goes down and then push the disc tray in the direction of the arrow B.  2. Remove the 2 claws and then remove the tray panel in the direction of the arrow C. 3. Push the disc tray in the direction of the arrow D to insert it in the unit again.		 4. Remove the connector (CN401). 5. Remove the 2 screws (1, 2). 6. Remove the front panel ass'y in the direction of the arrow E.

Ref. No. 4	Removal of the Front Panel Ass'y and Front Panel Base	Ref. No. 5	Removal of the Operation P.C.B.
Procedure 1→2→3→4	Procedure 1→2→3→4→5		
	 1. Remove the spring. 2. Push the claw in the direction of the arrow A and remove the front panel ass'y in the direction of the arrow B.		 1. Remove the 4 screws (1~4). 2. Remove the front panel cover ass'y in the direction of the arrow A.
Ref. No. 6	Removal of the Main P.C.B.		
Procedure 1→2→3→6	Procedure 1→2→3→6		
	 1. Remove the 2 connectors (CN501, CN502). 2. Remove the 4 screws (1~4).		 3. Remove the operation P.C.B. in the direction of the arrow B.
Ref. No. 7	Removal of the Loading unit	Ref. No. 8	Removal of the Disc clamber
Procedure 1→2→3→7	Procedure 1→2→3→7	Procedure 1→2→3→8	Procedure 1→2→3→8
	 1. Remove the 2 connectors (CN501, CN502). 2. Remove the 4 screws (1~4).		 • Remove the 3 screws (1~3).

Ref. No. 9	Removal of the Magnet, Disc Holder and Holder	Ref. No. 10	Removal of the Guide shaft and Guide holder
Procedure 1→2→3→8→9	 •Push the 3 claws in the direction of the arrow.	Procedure 1→2→3→7→ 8→10	 1. Remove the 3 screws (1~3). 2. Remove the guide shaft and guide holder in the direction of the arrow.
Ref. No. 11	Removal of the Disc tray		
Procedure 1→2→3→7→ 8→10→11	 1. Push the 2 levers in the direction of the arrow A until the traverse unit goes down and the disc tray slightly in the direction of the arrow B.		 3. Remove the disc tray in the direction of the arrow C.
Ref. No. 12	Removal of the Loading motor P.C.B. and Loading motor		
Procedure 1→2→3→7→ 8→10→11→12	 1. Remove the belt. 2. Remove the 2 screws (1, 2).		 3. Remove the screw (3). 4. Unsolder the 2 terminals of loading motor.

Ref. No. 13	Removal of the Servo P.C.B.	•Removal of the F.P.C. board Push the top of the connector in the direction of the arrow A, and then Pull Out the flat cable in the direction of the arrow B. 
Procedure 1→2→3→7→13	 1. Remove the 2 screws (1, 2). 2. Remove the 2 claws. 3. Remove the servo P.C.B. in the direction of the arrow. 4. Remove the 2 connectors (CP702, CP703). 5. Remove the F.P.C. Board (CS701).	 Note: Insert a short pin into the traverse unit F.P.C. board. 
Ref. No. 14	Removal of the Traverse unit	  1. Widen the boss by using a regular screwdriver or similar object. 2. Pull out the pin. 1. Remove the lead wire from the claws. 2. Remove the 2 pins in the direction of the arrow. 3. Release the claw and then remove the traverse unit in the direction of the arrow.
Ref. No. 15	Removal of the Lock Lever	 1. Remove the lock lever spring. 2. Remove the claw in the direction of the arrow A and then remove the lock lever in the direction of the arrow B.

Ref. No. 16	Removal of the Traverse chassis and Conversion Lever	Remove the traverse chassis. 1. Push the claw (A) in the direction of arrow A, and then move the lever (1) in the direction of arrow B. 2. Push 2 claws (B) in the direction of arrow C, and then remove the traverse chassis. Remove the conversion lever 1. Push the claw (A) in the direction of arrow A, and then move the lever (1) in the direction of arrow B. 2. Remove the spring. 3. Remove the conversion lever in the direction of arrow D.
Ref. No. 17	Removal of the Slide plate (1) and Slide plate (2)	Removal of the slide plate (1) • Move the slide plate (1) in the direction of the arrow A, and remove the slide plate (1) in the direction of the arrow B. Removal of the slide plate (2) • Push the claw in the direction of the arrow C, and remove the slide plate (2) in the direction of the arrow D.
Ref. No. 18	Check of the Main P.C.B.	1. Remove the 4 screws (1~4). 2. Remove the main P.C.B. and then stand the main P.C.B. at the side of unit. 3. Reinstall the tuner P.C.B. to the unit. 4. Reinstall the front panel ass'y to the unit and then connect the F.P.C. Board (JK301), and (CN401). 5. Connect the connector (CN301/302). 6. When checking the soldered surface of the main P.C.B., do as shown in the figure above.

Ref. No. 19	Check of the Operation P.C.B. and Servo P.C.B.
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Procedure
1→2→3→4→
5→19

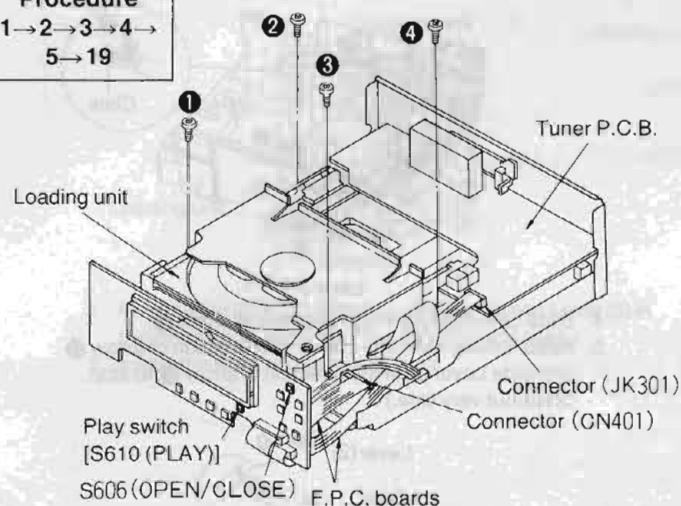


Fig. 1

1. Connect the F.P.C. boards to connector (CN401) and (JK301).
2. Remove the 4 screws (1~4).
3. Place the Loading unit as shown in Fig. 2.

Note:

Make sure not to damage the F.P.C. Boards.

To play a disc

1. Push the S606 (OPEN/CLOSE) switch so that the loading unit comes up.
2. Playing the test disc on the tray. Then, push the S606 (OPEN/CLOSE) switch to set the test disc.
3. Push the S610 (PLAY) switch to start the test disc play.

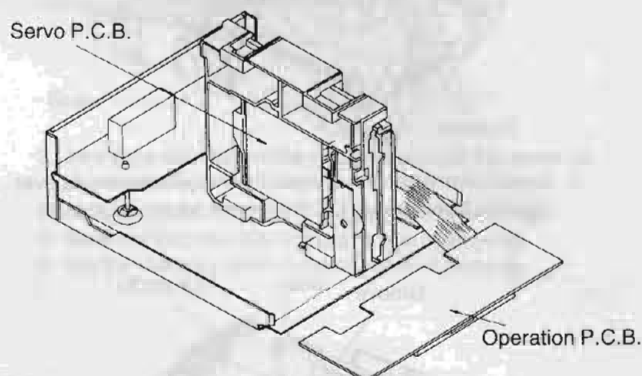
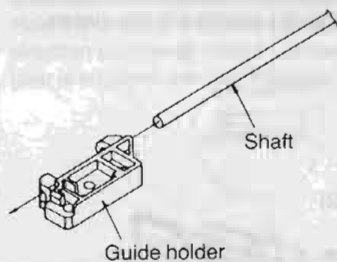


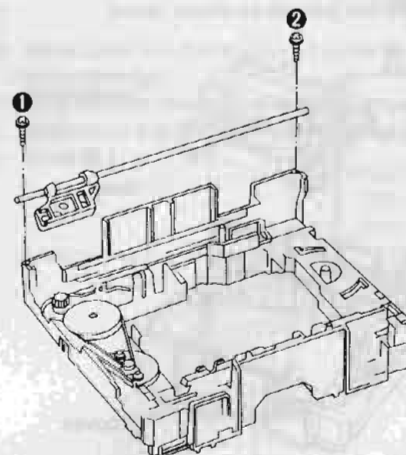
Fig. 2

4. When checking the solder surface of the operation P.C.B. and servo P.C.B., do as shown in Fig. 2.

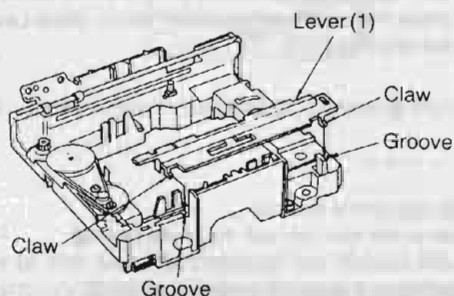
■ INSTALLING OF SHAFT



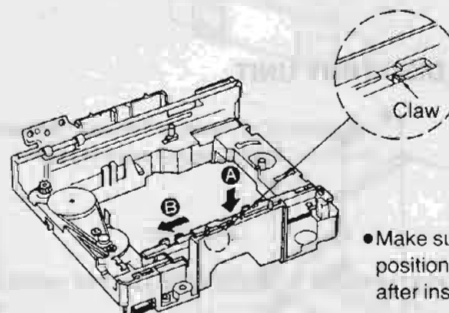
1. Insert the shaft into the guide holder.
2. Install the shaft on the chassis with the 2 screws (1, 2).



■ CD UNIT ASSEMBLY

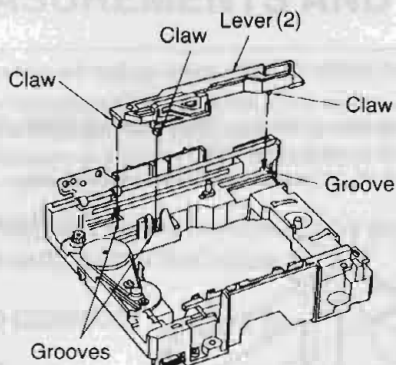


1. Install Lever (1) on the chassis by fitting the claws of Lever (1) in the two grooves of the chassis.

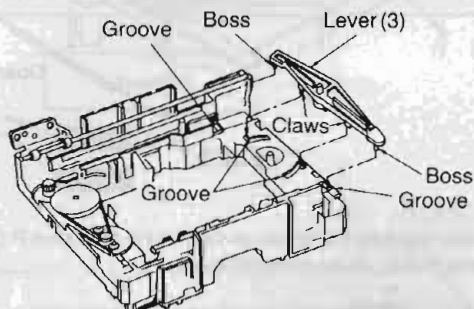


2. Slide Lever (1) in the direction of arrow B while keeping it held down lightly in the direction of arrow A.

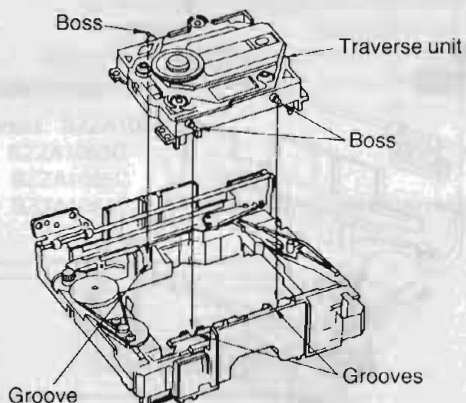
● Make sure that the claw is positioned as shown above after installing Lever (1).



3. Install Lever (2) on the chassis by fitting the claws of Lever (2) in the three grooves of the chassis as shown above.

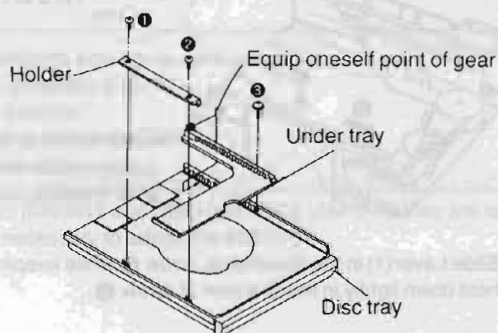


6. Install Lever (3) on the chassis by fitting the two claws of Lever (3) in the two grooves of the chassis and the two bosses in the two grooves as shown above.

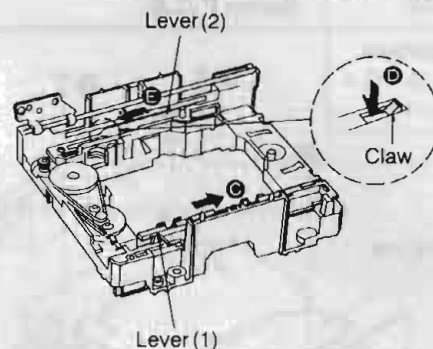


9. Install the traverse unit on the chassis by fitting the three bosses of the traverse unit in the three grooves of the chassis.

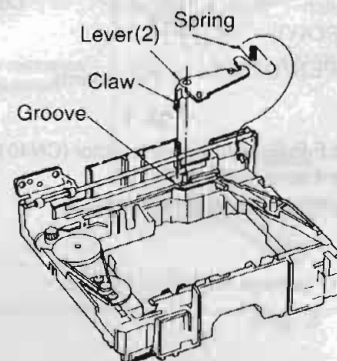
■ INSTALLING DISC TRAY UNIT



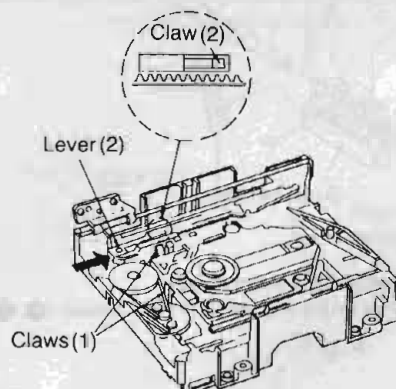
1. Install the under tray on the disc tray.
2. Install the holder on the disc tray with the two screws ① and ②.
3. Install the under tray on the disc tray with the screw ③. Make sure that the under tray moves smoothly after installing the disc tray unit.



4. Slide Lever (2) fully in the direction of arrow ㉞.
5. Keep holding down the claw in the direction of arrow ㉟ and slide Lever (2) in the direction of arrow ㊸ to stop. (Slide but very little.)

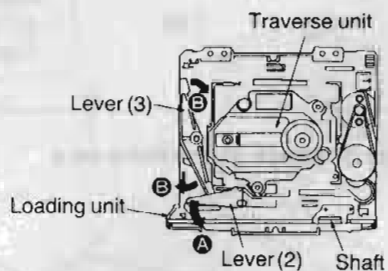


7. Install Lever (2) on the chassis by fitting the claw of Lever (2) in the groove of the chassis.
8. Install the spring on Lever (2) and the chassis.

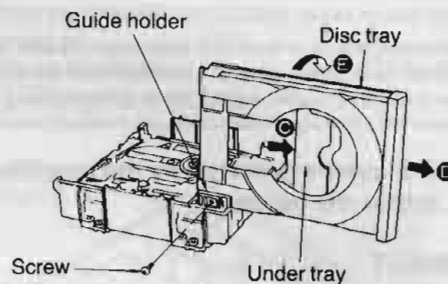


10. Make sure that the traverse unit is engaged with the two claws (1).
11. Slide Lever (2) in the direction of the arrow. Be sure to check if claw (2) is set as shown above. [Slide Lever (2) but very little.]

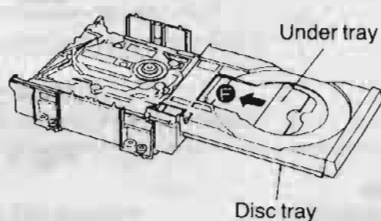
■ INSTALLING DISC TRAY



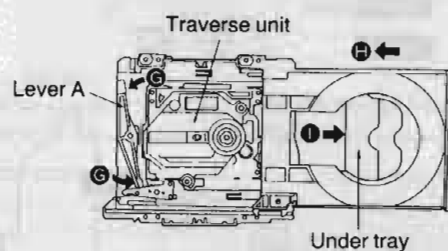
1. Move Lever (2) in the direction of arrow A and Lever (3) in the direction of arrow B. (The traverse unit rises.)
2. Install the shaft on the loading unit.



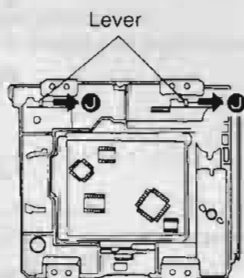
3. Install the disc tray on the guide holder with the screw as shown above.
4. Slide the under tray fully in the direction of arrow C.
5. Slide the disc tray fully in the direction of arrow D.
6. Lay the disc tray down in the direction of arrow E.



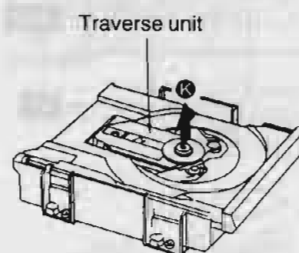
7. Slide the under tray in the direction of arrow F.
8. Hold the disc tray and slide the under tray fully in the direction of arrow G. (Slide but very little and the loading gear is engaged with disc tray gear.)



9. Move Lever A in the direction of arrow G. (The traverse unit is lowered.)
10. Slide the disc tray in the direction of arrow H. (Make sure that the under tray is moved in the direction of arrow I.)



11. Slide the lever in the direction of arrow J and check if the traverse unit rises in the direction of arrow K.



Note:

Refer to the service manual for Model No. SU-CH700, Order No. AD9202022C8 for information on ACCESSORIES, CONNECTIONS and PACKAGING.

MEASUREMENTS AND ADJUSTMENTS

Caution:

- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pickup lens. Avoid exposure to the laser beam, especially when performing adjustments.

• This TUNER/CD player is powered by the amplifier (SU-CH700). To adjust or check operations as a separate unit, follow the below.

HOW TO CONNECT

TUNER

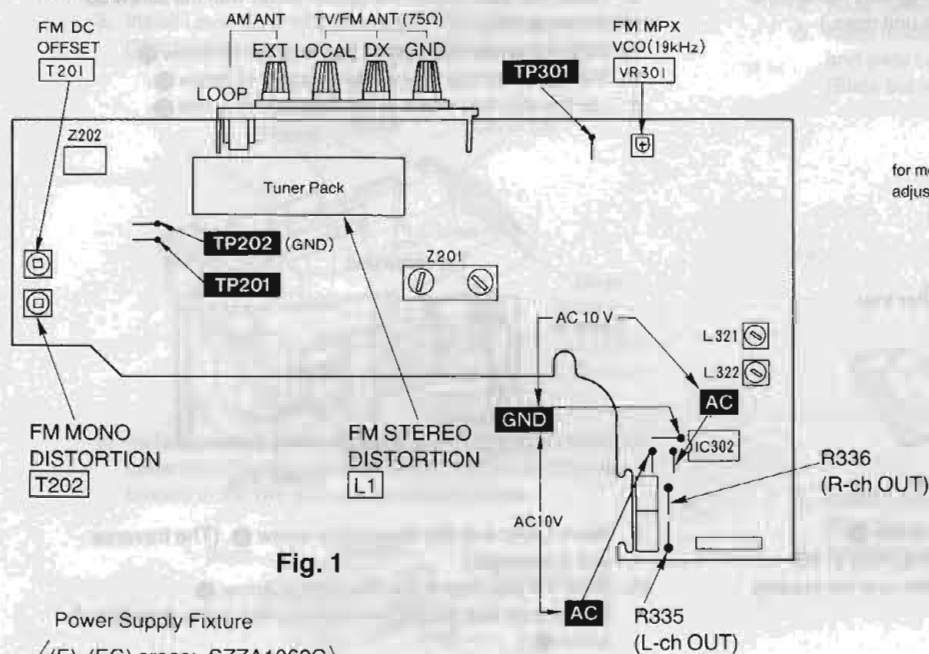


Fig. 1

Power Supply Fixture

- (E), (EG) areas: SZZA1062C
- (EB) area: SZZA1063C
- (GC) area: SZZA1065C
- (GN) area: SZZA1064C
- (EB) area: Great Britain only

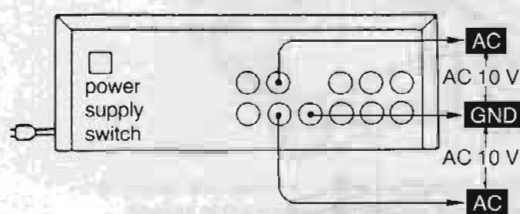


Fig. 2

CD

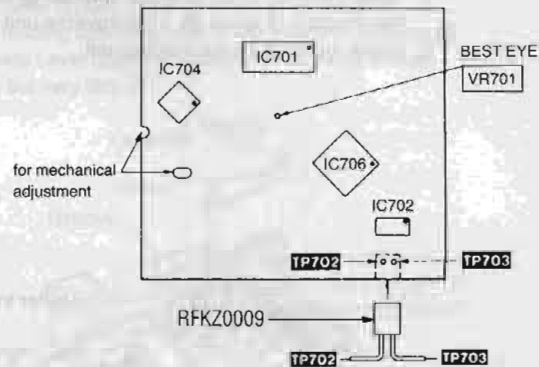


Fig. 3

Mechanical adjustment screw

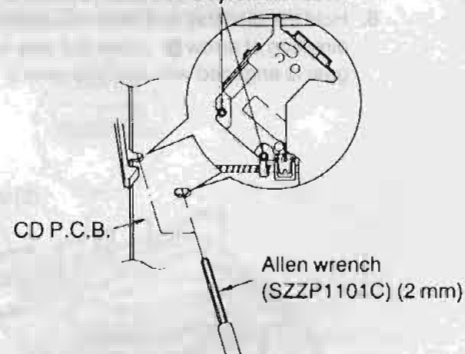


Fig. 4

FM ADJUSTMENT

Control positions and equipment used

- FM signal generator (FM-SG)
- Distortion analyser
- DC electronic voltmeter (EVM)
- Stereo modulator
- Frequency counter
- Choke coil (100 μH)
- Resistor (100 kΩ)

Note: For Z201 (AM ANT and OSC coil), Z202 (AM-IFT), they are supplied as adjusted parts. So, do not turn the cores of the parts. If is not necessary to adjust the AM circuit.

FM OFFSET VOLTAGE AND MONO DISTORTION ADJUSTMENT

1. Test equipment connection is shown in figure 1, 5.
2. Set the unit to "FM" mode.
3. Set the radio frequency display and signal generator to 100.10 ± 0.001 MHz.
4. Adjust the core of **T201** so that the voltage measured in signal mode is **0 mV (0 ± 20 mV)** in 300 mV range.
5. Adjust **T202** so that the distortion factor of L-ch and R-ch is minimized.
6. Repeat steps 4 and 5.

Note: The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION

Modulation 100%
 Modulation frequency 1 kHz
 Output level 66 dB

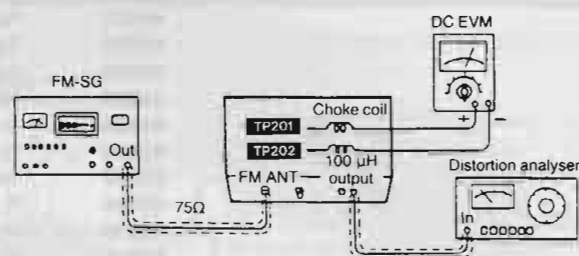


Fig. 5

FM MPX VCO ADJUSTMENT

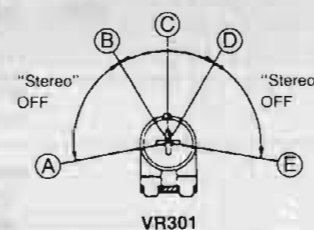
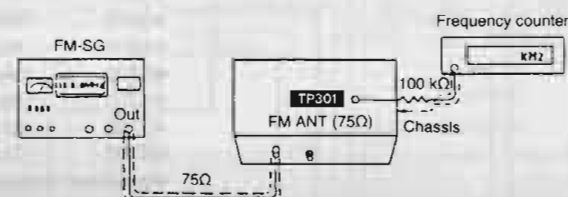
1. Test equipment connection is shown in figure 1, 6.
2. Set the unit to "stereo" position.
3. Set the radio frequency display and signal generator to 83 ± 0.005 MHz.
4. Adjust **VR301** for $19 \text{ kHz} \pm 30 \text{ Hz}$ on frequency counter reading.

USING ALTERNATE SYSTEM

1. Receive the stereo broadcast.
2. Adjust **VR301** until stereo indicator lights up. Fix the arm of **VR301** as shown in figure.

FM SIGNAL GENERATOR CONDITION

Modulation 100%
 Modulation frequency 0 kHz
 Output level 66 dB



- (A)–(B),
 (D)–(E) "Stereo" OFF position
 (B)–(D) "Stereo" ON position
 (Indicator lighting)
 (C) Adjust point of pilot circuit

Fig. 6

FM STEREO DISTORTION ADJUSTMENT (EG only)

1. Test equipment connection is shown in figure.
2. Set the unit to "FM" mode.
3. Set the radio frequency display and signal generator to 100.10 ± 0.001 MHz.
4. Adjust **L1** so that the distortion factor of L-CH is minimized.
5. Make sure that the distortion factors of L-CH and R-CH are nearly the same with each other to minimum.

Notes:

1. The adjusting screwdriver used should be made of resin.
2. **L1** should be rotated no more 1/4 turn (90 deg.) on either side.

FM SIGNAL GENERATOR CONDITION

Modulation Stereo "L" mode or "R" mode 45%, Pilot 10%
 Modulation frequency 1 kHz (Pilot 19 kHz)
 Output level 66 dB

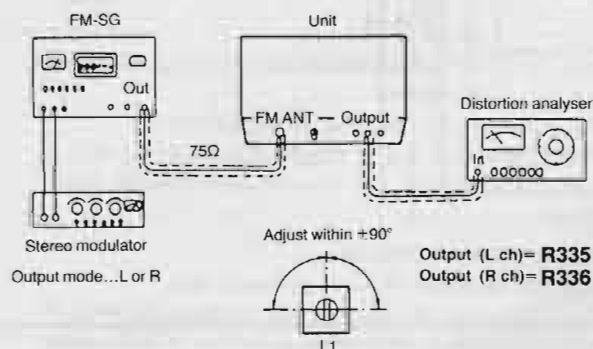


Fig. 7

CD ADJUSTMENT

Caution:

- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- Avoid exposure to the laser beam, especially when performing adjustments.

Measuring Instruments and Special Tools

- Test disc
 1. Playability test disc (SZZP1054C)
 2. Uneven test disc (SZZP1056C)
- Allen wrench (M2.0) (SZZP1101C)
- Oscilloscope
- Connector (RFKZ0009)

(1) MECHANICAL ADJUSTMENT

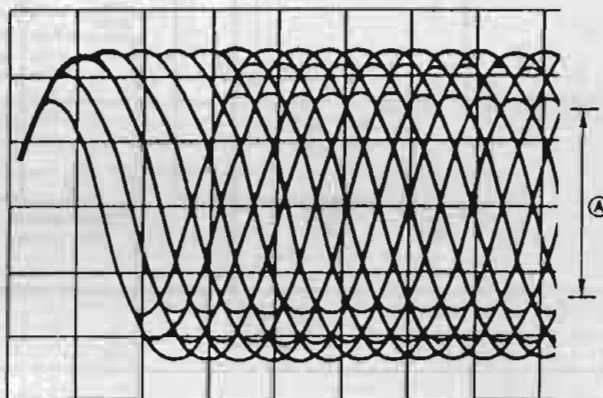
- When the traverse deck is replaced, making adjustments is not necessary. (The traverse deck ass'y is already adjusted.)
- Make adjustments to improve playability when the traverse deck has not been replaced. Make the electrical adjustments first.

1. Connect the oscilloscope's CH. 1 probe across **TP702** (+) and **TP703** (V-REF) on the Servo P.C.B.

Oscilloscope setting:

VOLT 200 mV
 SWEEP 0.5 μ sec
 Input coupling AC

2. Switch the player power **ON**, and play track **19** on the test disc (SZZP1056C).
3. Leave the player in Play mode and place it as shown in the figure on the right.
4. Alternately adjust the two mechanical adjusting screws with the 2.0 mm allen wrench (SZZP1101C) until the RF signal amplitude variation on the oscilloscope is minimized. (Shown in Fig. 4)
5. After completing the adjustment, lock the **mechanical adjustments** with lock paint (RZZOL01).

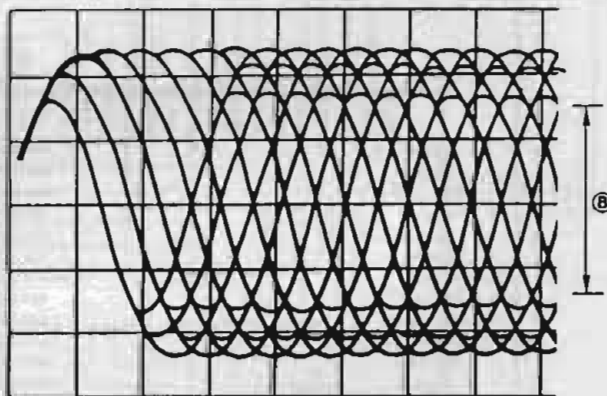
**(A)** Minimize the variation of amplitude.**(2) BEST EYE (PD BALANCE) ADJUSTMENT**

1. Connect the oscilloscope's CH. 1 probe across **TP702** (+) and **TP703** (V-REF) on the Servo P.C.B.

Oscilloscope setting:

VOLT 200 mV
 SWEEP 0.5 μ sec
 Input coupling AC

2. Switch the player power **ON**, and play the 1 kHz (track 1) on test disc (SZZP1054C).
3. Adjust **VR701** until the RF signal eye pattern amplitude is maximized.

**(B)** Maximize the amplitude**(3) CHECK OF PLAY OPERATION AFTER ADJUSTMENT*****Checking Skip Search**

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

***Checking Manual Search**

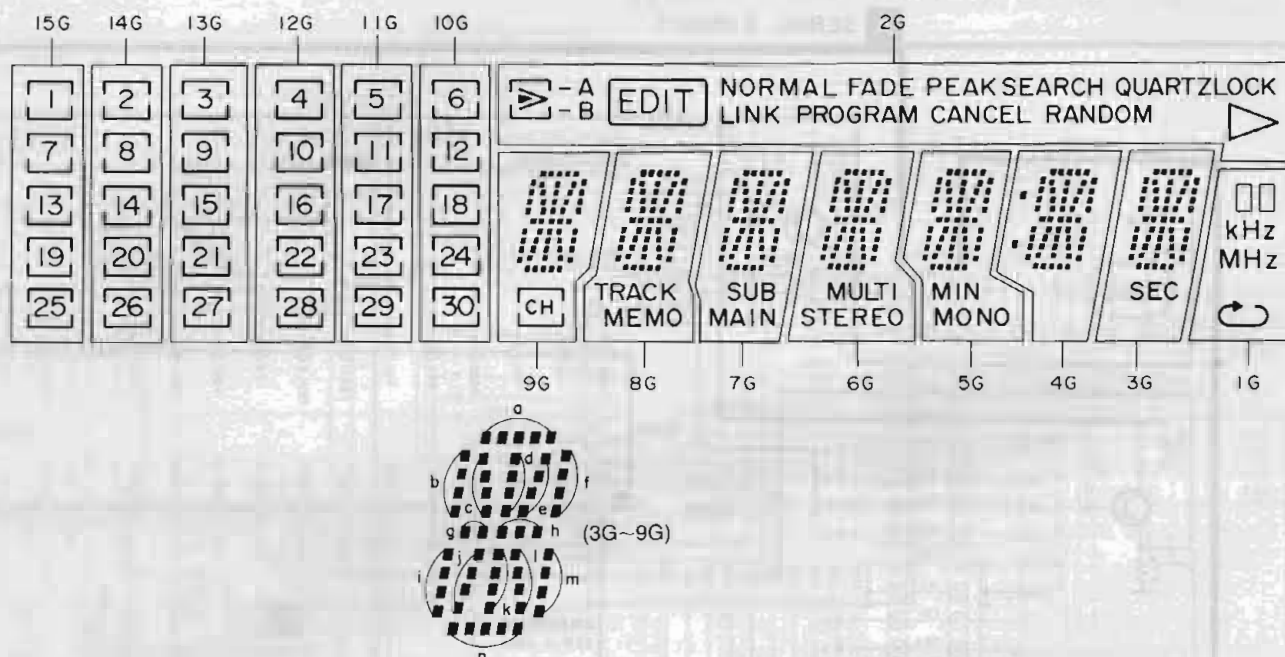
1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

***Checking Playability**

1. Play the 0.7 mm black dot and the 0.7 mm wedge on the test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc and verify that no sound skip or noise occurs.

■ DESCRIPTION OF FL PANEL [FL601 (RSL0111-F)]

- Grid assignment



- **Pin connection**

Pin No.	3 9	3 8	3 7	3 6	3 5	3 4	3 3	3 2	3 1	3 0	2 9	2 8	2 7	2 6	2 5	2 4	2 3	2 2	2 1	2 0	1 9	1 8	1 7	1 6	1 5	1 4	1 3	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
Connection	F 1	F 1	N P	N P	5 G	4 G	3 G	2 G	1 G	1 G	9 G	8 G	7 G	6 G	5 G	4 G	3 G	2 G	1 G	P 1	P 2	P 3	P 4	P 5	P 6	P 7	P 8	P 9	P 10	P 11	P 12	P 13	P 14	P 15	P 16	N P	N P	F 2	F 2

- **Anode connection**

	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	(1)	(2)	(3)	(4)	(5)	(6)	a	a	a	a	a	a	a	]	—
P2	1	2	3	4	5	6	b	b	b	b	b	b	b	▲	—
P3	(1)	(2)	(3)	(4)	(5)	(6)	c	c	c	c	c	c	c	]	—
P4	(7)	(8)	(9)	(10)	(11)	(12)	d	d	d	d	d	d	d	—A	—
P5	7	8	9	10	11	12	e	e	e	e	e	e	e	—B	—
P6	(7)	(8)	(9)	(10)	(11)	(12)	f	f	f	f	f	f	f	EDIT	—
P7	(13)	(14)	(15)	(16)	(17)	(18)	g	g	g	g	g	g	g	LINK	—
P8	13	14	15	16	17	18	h	h	h	h	h	h	h	NORMAL	—
P9	(13)	(14)	(15)	(16)	(17)	(18)	i	i	i	i	i	i	i	FADE	—
P10	(19)	(20)	(21)	(22)	(23)	(24)	j	j	j	j	j	j	j	PEAK	—
P11	19	20	21	22	23	24	k	k	k	k	k	k	k	SEARCH	—
P12	(19)	(20)	(21)	(22)	(23)	(24)	l	l	l	l	l	l	l	PROGRAM	—
P13	(25)	(26)	(27)	(28)	(29)	(30)	m	m	m	m	m	m	m	CANCEL	□□
P14	25	26	27	28	29	30	n	n	n	n	n	n	n	RANDOM	KHz
P15	(25)	(26)	(27)	(28)	(29)	(30)	CH	TRACK	SUB	MULTI	MIN	□(上)	SEC	QUARTZLOCK	MHz
P16	—	—	—	—	—	—	□	MEMO	MAIN	STEREO	MONO	□(下)	—	▷	↺



0 | 11 | 12 | 13 | 14

Notes:

- S601 : Random switch
- S602 : Tape side A/B selector switch
- S603 : Fade switch
- S604 : Normal/Tape length switch
- S605 : AI switch
- S606 : Disc tray OPEN/CLOSE switch
- S607 : Time mode selector switch
- S608 : F. skip switch
- S609 : R. skip switch
- S610 : Play switch
- S611 : Pause switch
- S612 : Stop switch
- S613 : F. search switch
- S614 : R. search switch
- S615 : Tuning UP switch
- S616 : Tuning DOWN switch
- S617 : Preset UP switch
- S618 : Preset DOWN switch
- S619 : Band selector switch
- S620 : Memory switch
- S701 : Rest switch
- S790 : Disc tray CLOSE detection switch
- S791 : Disc tray OPEN detection switch

●Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

 : MUTING voltage

No mark: (Operation/Main/Loading Motor circuit) Standard Play

No mark: (CD circuit) stop

●Important safety notice

Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

●**This schematic diagram may be modified at any time with the development of new technology.**

— : Positive voltage line

--- : Negative voltage line

~~~~~ : CD signal line

**Caution!**

IC and LSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum coil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

To **E** MAIN  
CIRCUIT (CN501)  
(Page 20)

### ■ SCHEMATIC DIAGRAM (Operation/Main/Loading Motor circuit) (Parts list on page 10)

## A



C

D

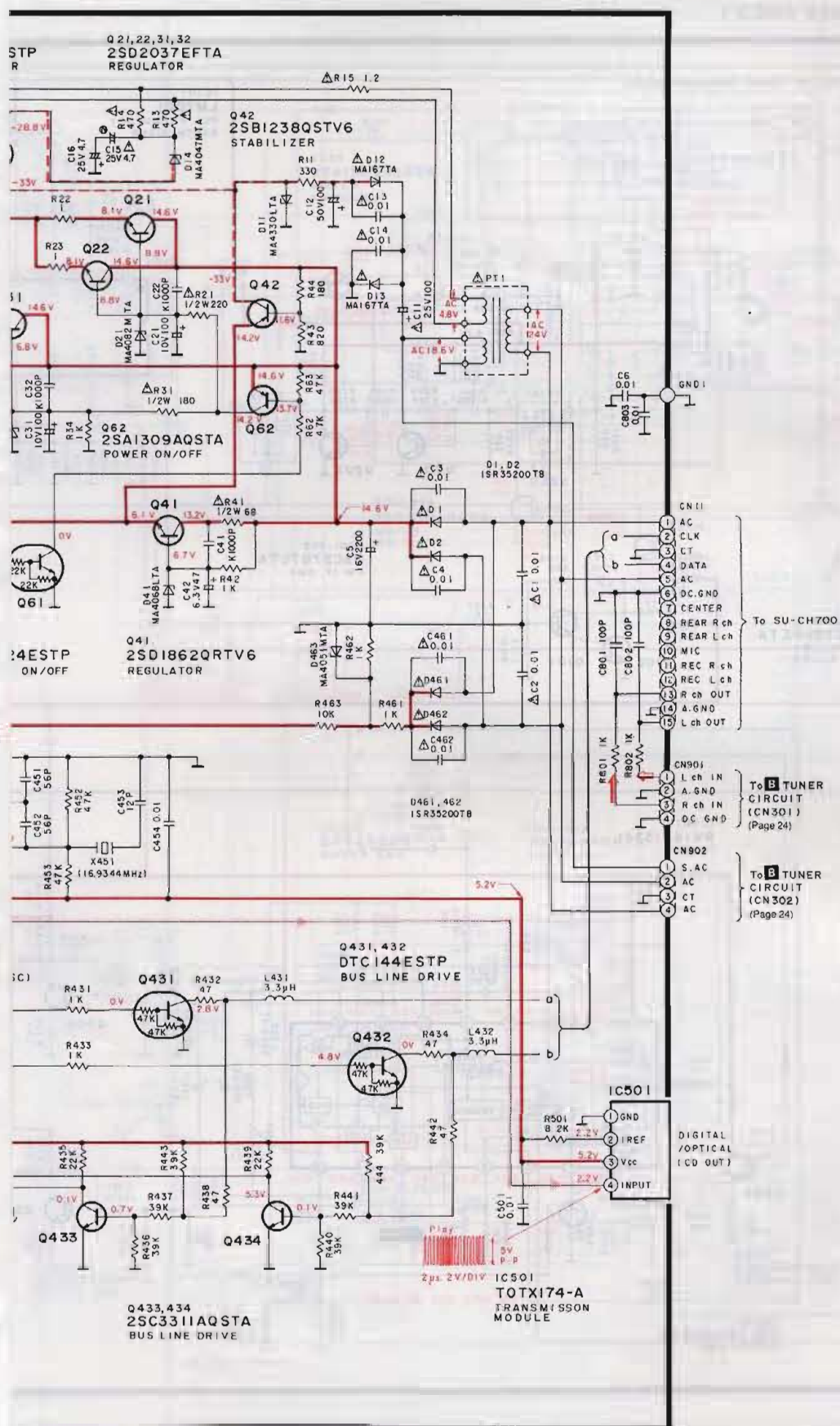
E

F



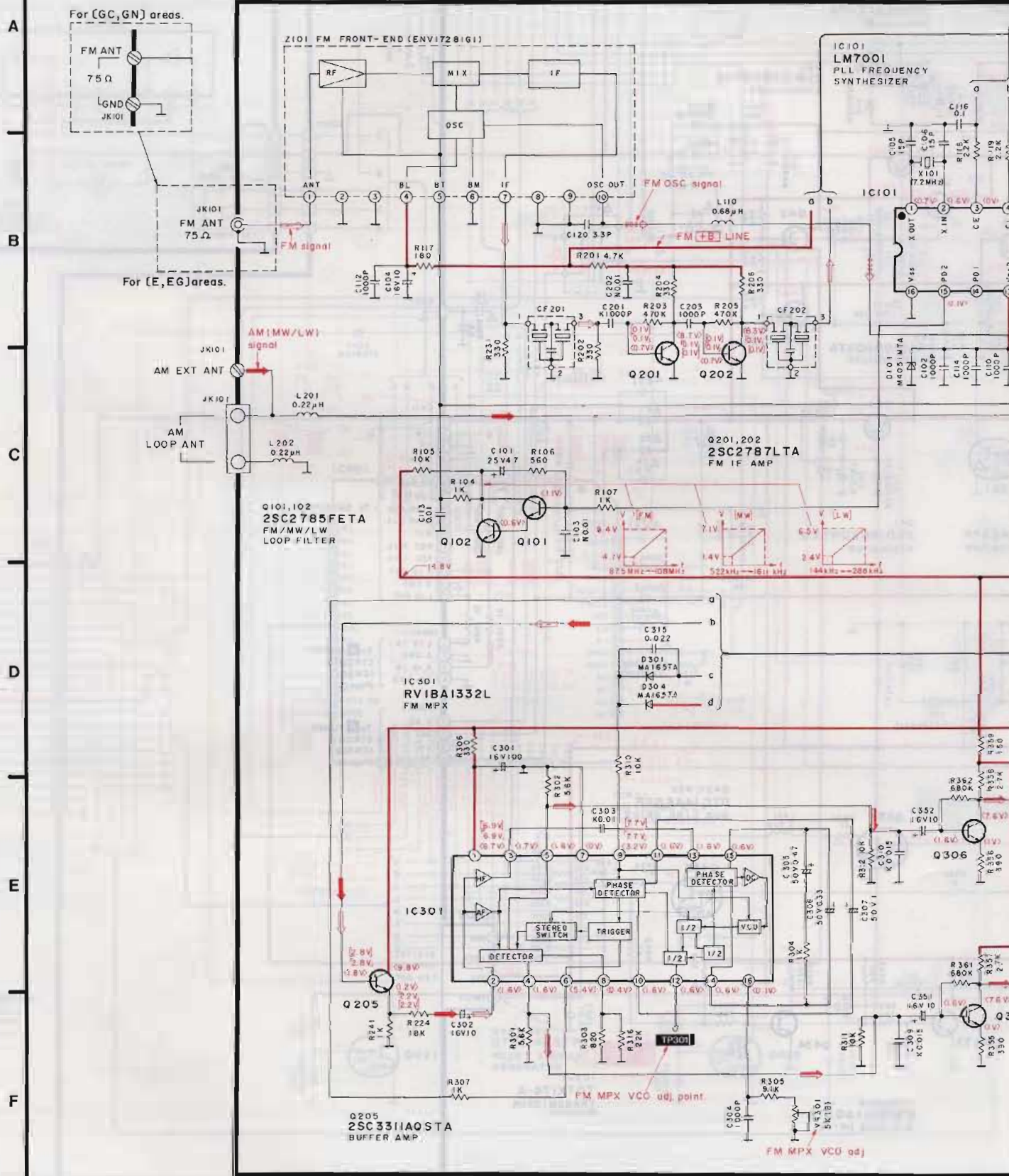
### ■ MAIN CIRCUIT

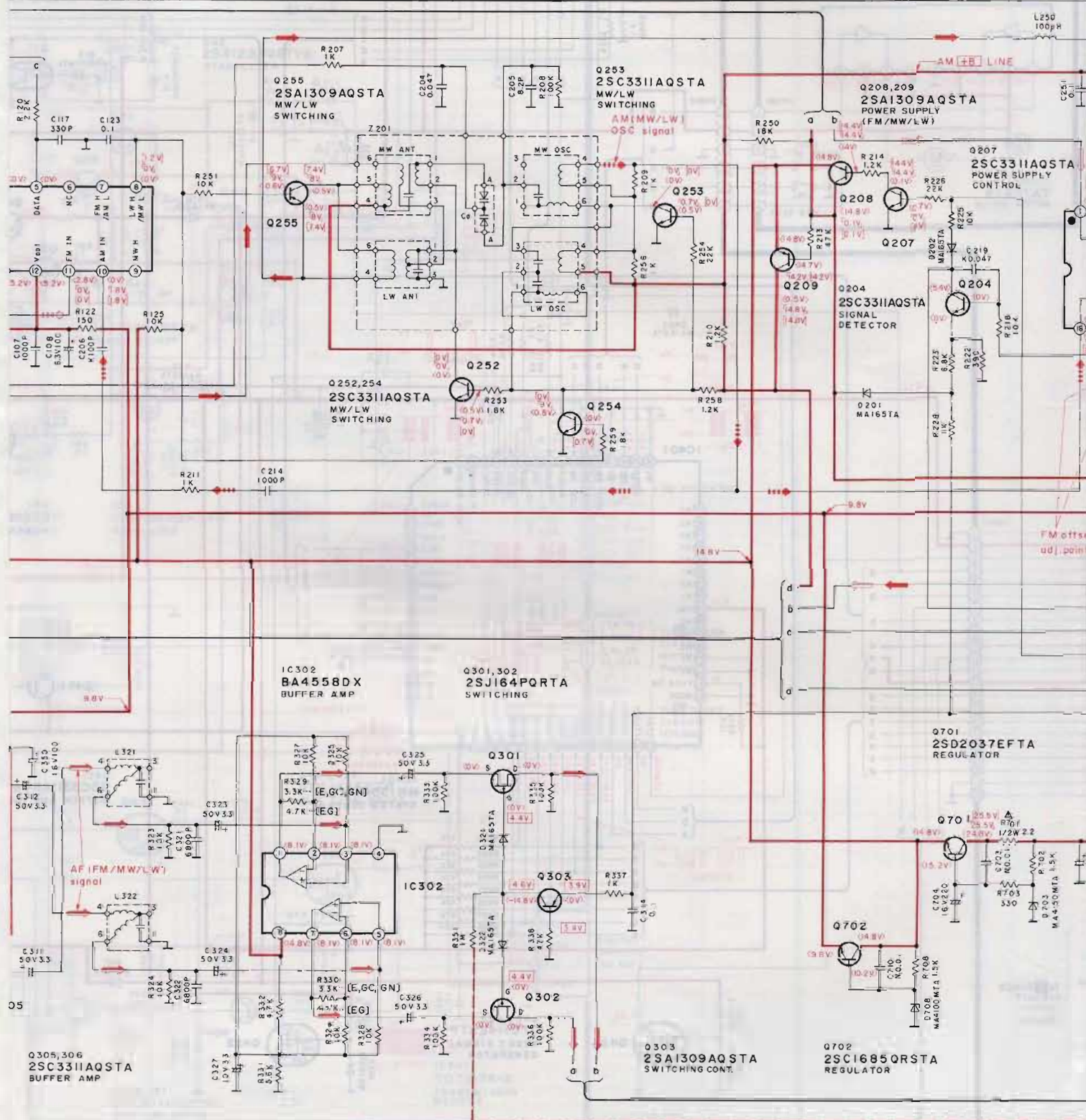


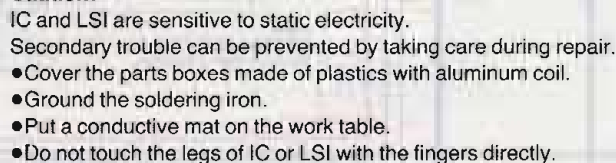


# **SCHEMATIC DIAGRAM (Tuner circuit)** (Parts list on pages 40~44)

## **B TUNER CIRCUIT**

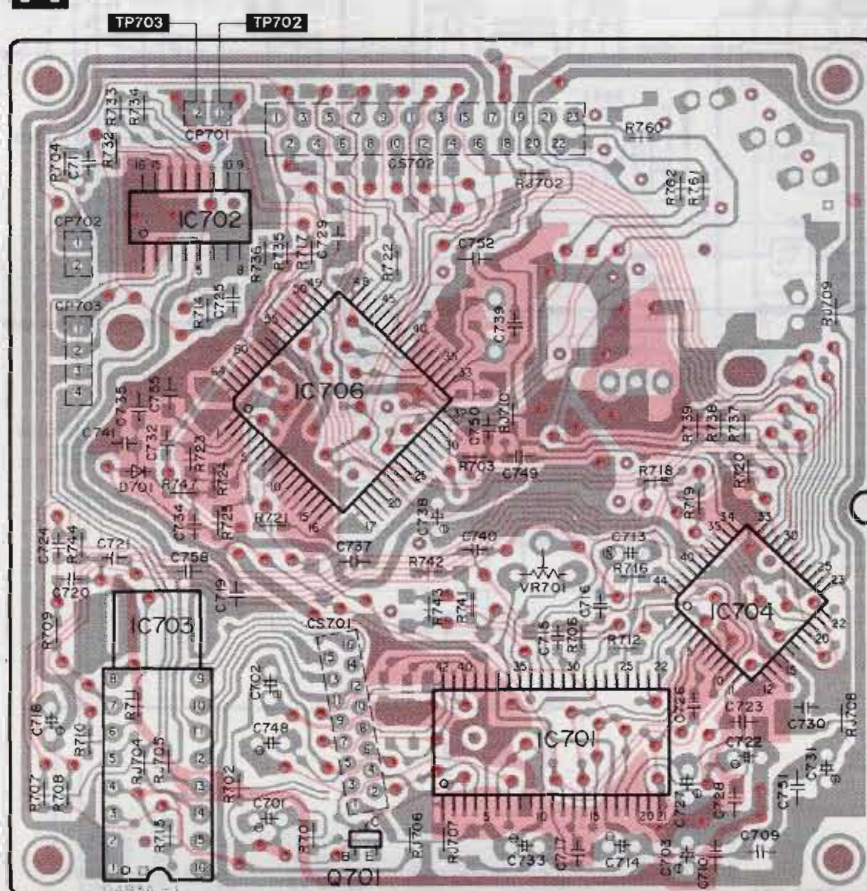




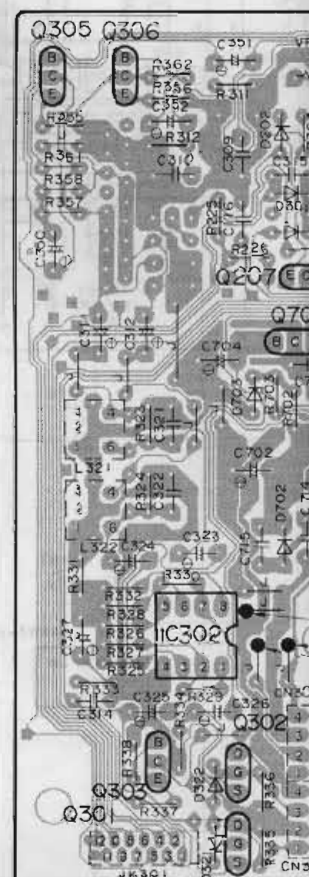


# PRINTED CIRCUIT BOARDS (Parts list on pages 40~44)

## A SERVO P.C.B.



## B TUNER P.C.B.

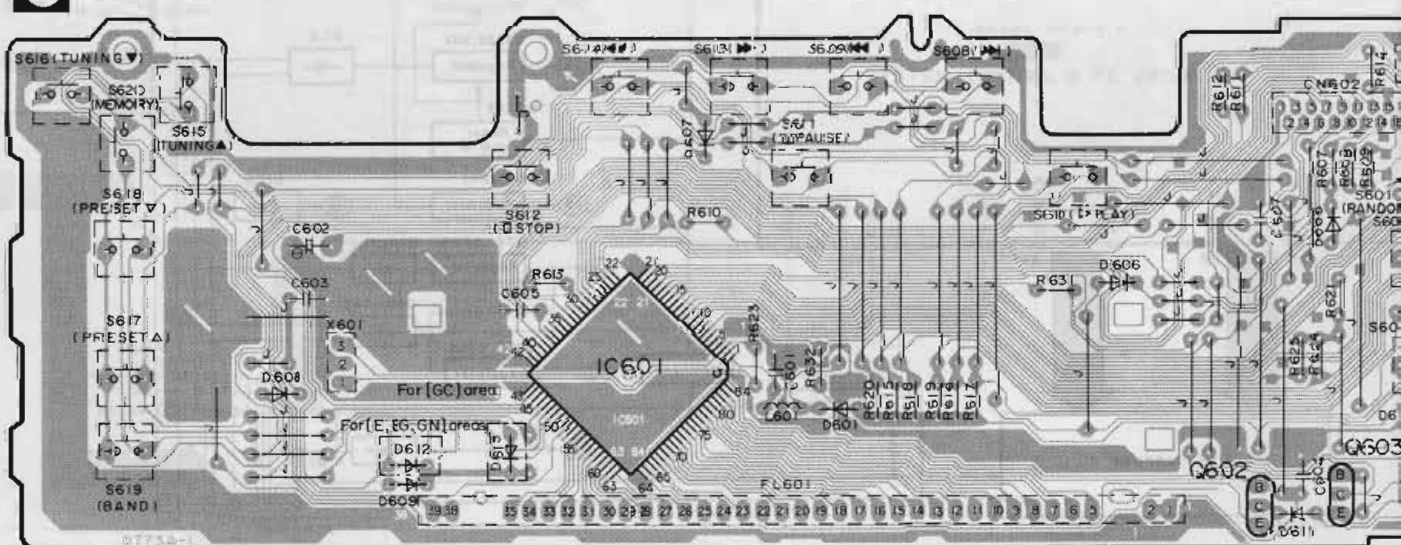


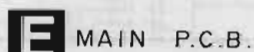
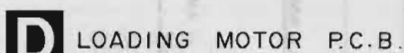
### Notes:

- The circuit shown in ( ) on the conductor indicates printed circuit on the back side of the printed circuit board.
- The circuit shown in ( ) on the conductor indicates printed circuit on the front side of the printed circuit board.
- The symbols (●) shown in the circuit board indicates connection points between conductors on the front side and back side of the circuit board.

• This circuit board diagram may be modified at any time with the development of new technology.

## C OPERATION P.C.B.





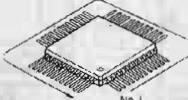
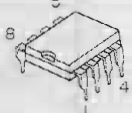
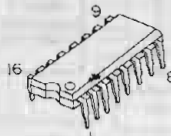
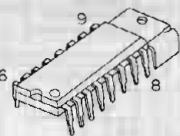
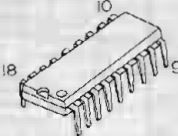
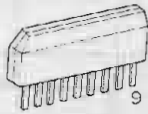
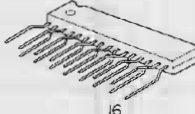
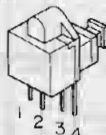
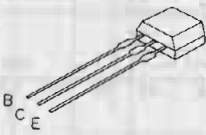
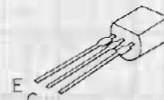
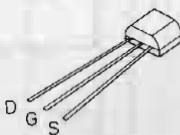
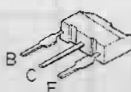
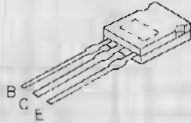
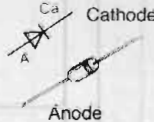
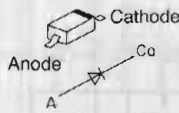
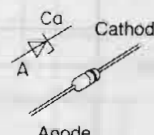
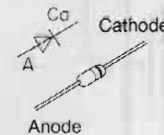
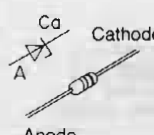
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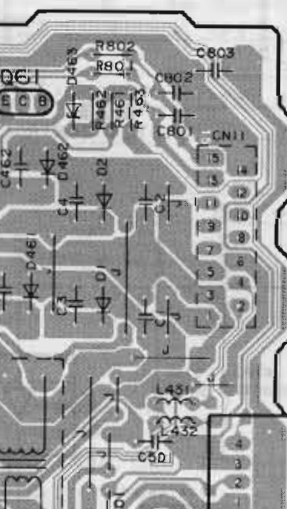
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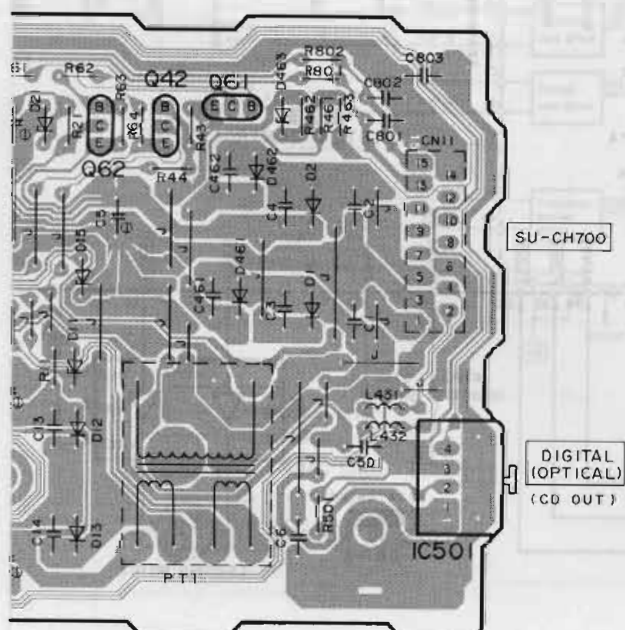
•Terminal guide of IC's, transistors and diodes

|                                                                                                           |                                                                                                                                                                  |                                                                                                              |                                                                                                                              |                                                                                                                            |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|--------|--------|------------|--------|--------------|--------|--------------------------------------------------------------------------------------------------------|
| <br>No 1                 | <table><tr><td>TCA0372DM2R</td><td>16 Pin</td></tr><tr><td>AN8800SCE2</td><td>42 Pin</td></tr></table>                                                           | TCA0372DM2R                                                                                                  | 16 Pin                                                                                                                       | AN8800SCE2                                                                                                                 | 42 Pin | <br>No 1 | <table><tr><td>MN6650A</td><td>44 Pin</td></tr><tr><td>MN6626</td><td>64 Pin</td></tr><tr><td>MN1554PKL1</td><td>64 Pin</td></tr><tr><td>MND2417PLD-1</td><td>84 Pin</td></tr></table> | MN6650A | 44 Pin | MN6626 | 64 Pin | MN1554PKL1 | 64 Pin | MND2417PLD-1 | 84 Pin | BA4558DX<br><br>8 4 |
| TCA0372DM2R                                                                                               | 16 Pin                                                                                                                                                           |                                                                                                              |                                                                                                                              |                                                                                                                            |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
| AN8800SCE2                                                                                                | 42 Pin                                                                                                                                                           |                                                                                                              |                                                                                                                              |                                                                                                                            |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
| MN6650A                                                                                                   | 44 Pin                                                                                                                                                           |                                                                                                              |                                                                                                                              |                                                                                                                            |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
| MN6626                                                                                                    | 64 Pin                                                                                                                                                           |                                                                                                              |                                                                                                                              |                                                                                                                            |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
| MN1554PKL1                                                                                                | 64 Pin                                                                                                                                                           |                                                                                                              |                                                                                                                              |                                                                                                                            |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
| MND2417PLD-1                                                                                              | 84 Pin                                                                                                                                                           |                                                                                                              |                                                                                                                              |                                                                                                                            |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
| LM7001<br><br>9 16 8     | AN8377N<br><br>9 16 8                                                           | AN7273W<br><br>10 18 9     | TA7291S<br><br>9                          | RV1BA1332L<br><br>16                    |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
| T0TX174-A<br><br>1 2 3 4 | DTC114ESTP<br>DTC124ESTP<br>DTC114YSTP<br>DTC144ESTP<br>DTC123ESTP<br><br>B C E |                                                                                                              | 2SC1685QRSTA<br>2SC3940AQSTA<br><br>E C B | 2SJ40CTA<br><br>D G S                   |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
| <br>E C B              | 2SA1309AQSTA<br>2SC2785FETA<br>2SC2787LTA<br>2SC2787LKTA<br>2SC3311AQSTA                                                                                         |                                                                                                              | 2SB1238QSTV6<br>2SD1862QRTV6<br><br>B C E | 2SD2037EFTA<br><br>B C E              |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
|                                                                                                           |                                                                                                                                                                  | <br>Ca Cathode<br>A Anode | MA165TA<br>MA167TA<br>MA185TA<br>1SR35200TB                                                                                  | MA110TW<br><br>Cathode<br>Anode A Ca  |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
|                                                                                                           |                                                                                                                                                                  | <br>Ca Cathode<br>A Anode | MA4100MTA<br>MA4270MTA<br>MA4150MTA<br>MA4330LTA<br>MA4270HTA                                                                | 1SS291TA<br><br>Ca Cathode<br>A Anode |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |
|                                                                                                           |                                                                                                                                                                  | <br>Ca Cathode<br>A Anode | MA4047MTA<br>MA4051MTA<br>MA4062HTA<br>MA4068LTA<br>MA4082MTA                                                                |                                                                                                                            |        |                                                                                            |                                                                                                                                                                                        |         |        |        |        |            |        |              |        |                                                                                                        |

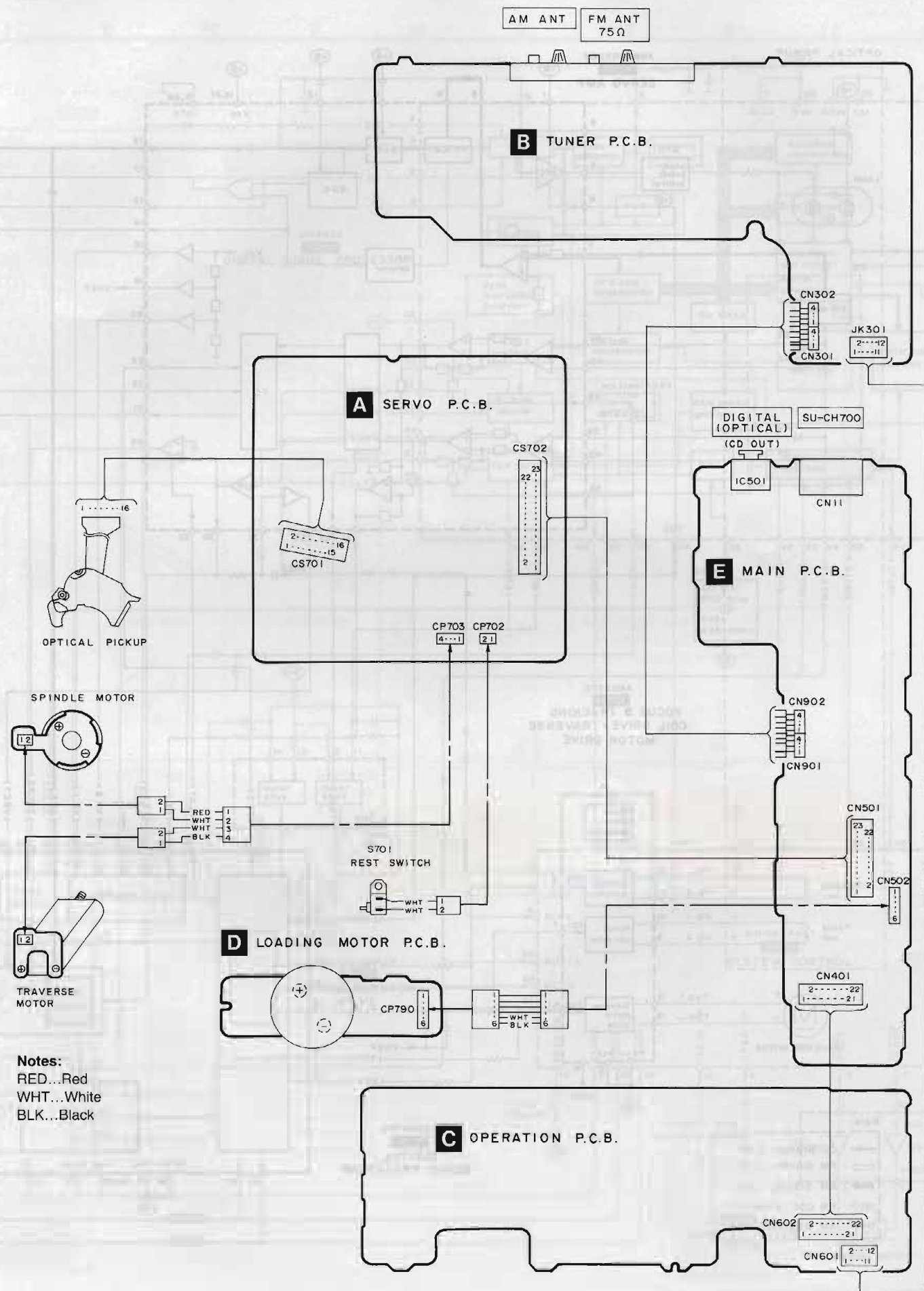


SU-CH700

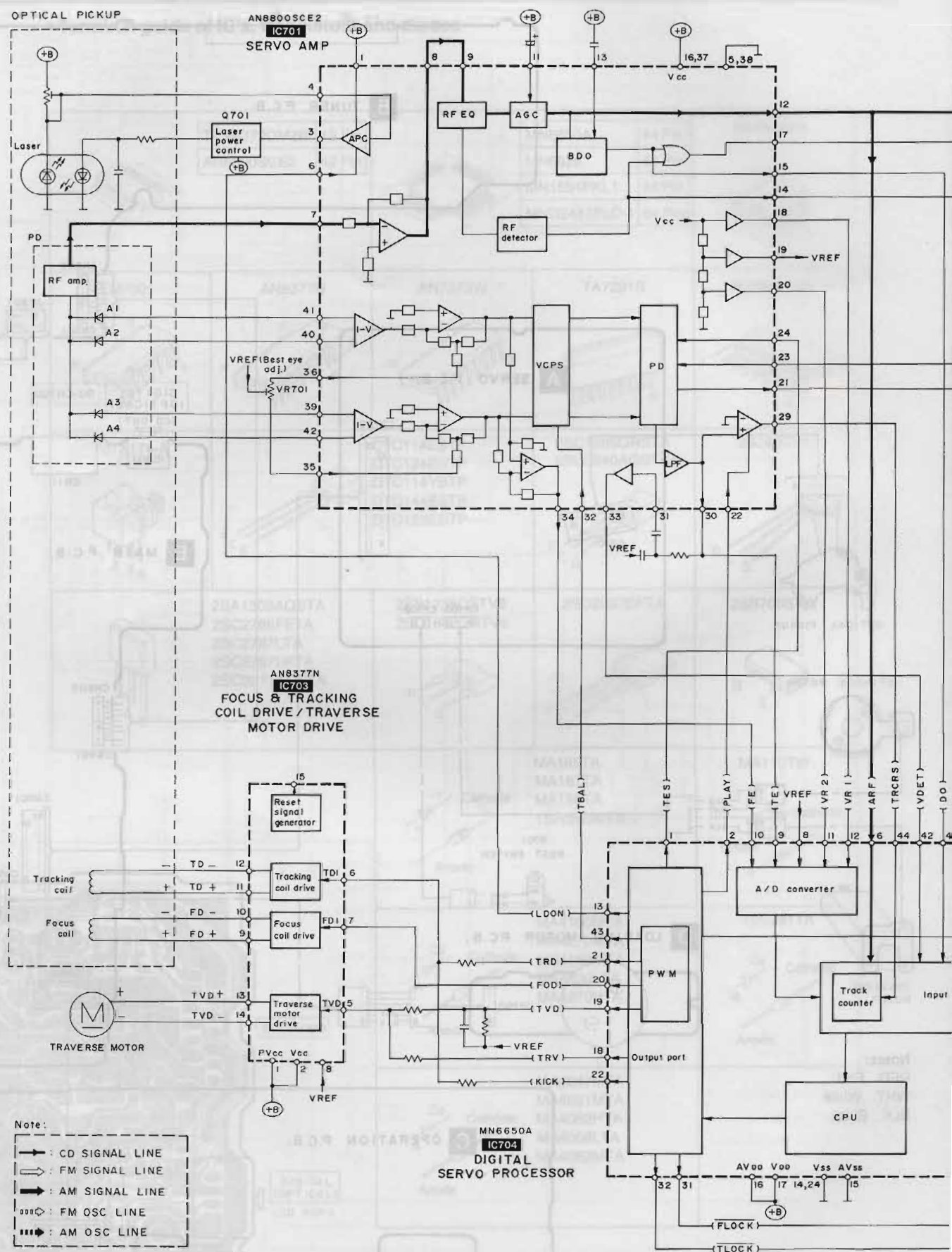
DIGITAL (OPTICAL) (CD OUT)



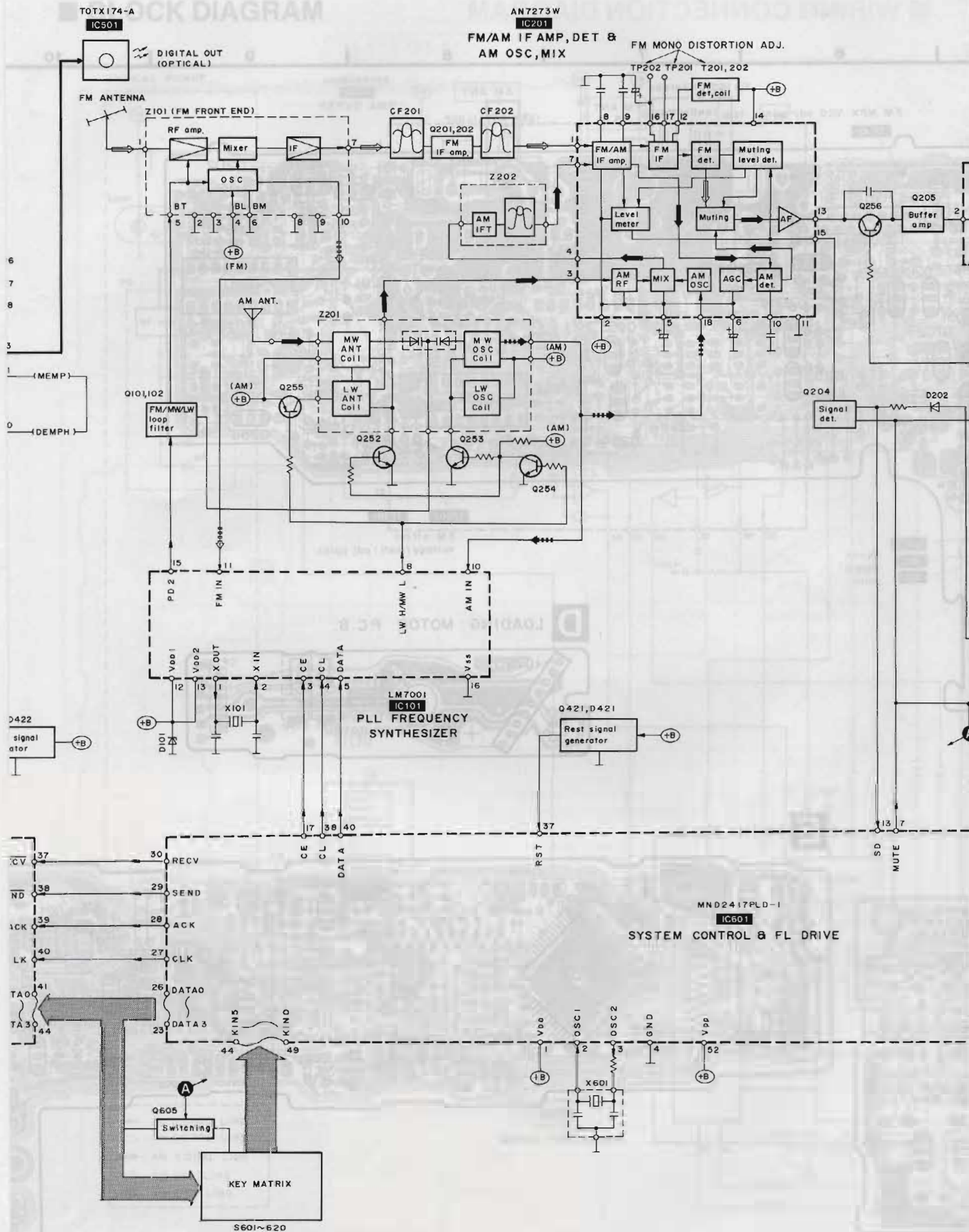
# WIRING CONNECTION DIAGRAM

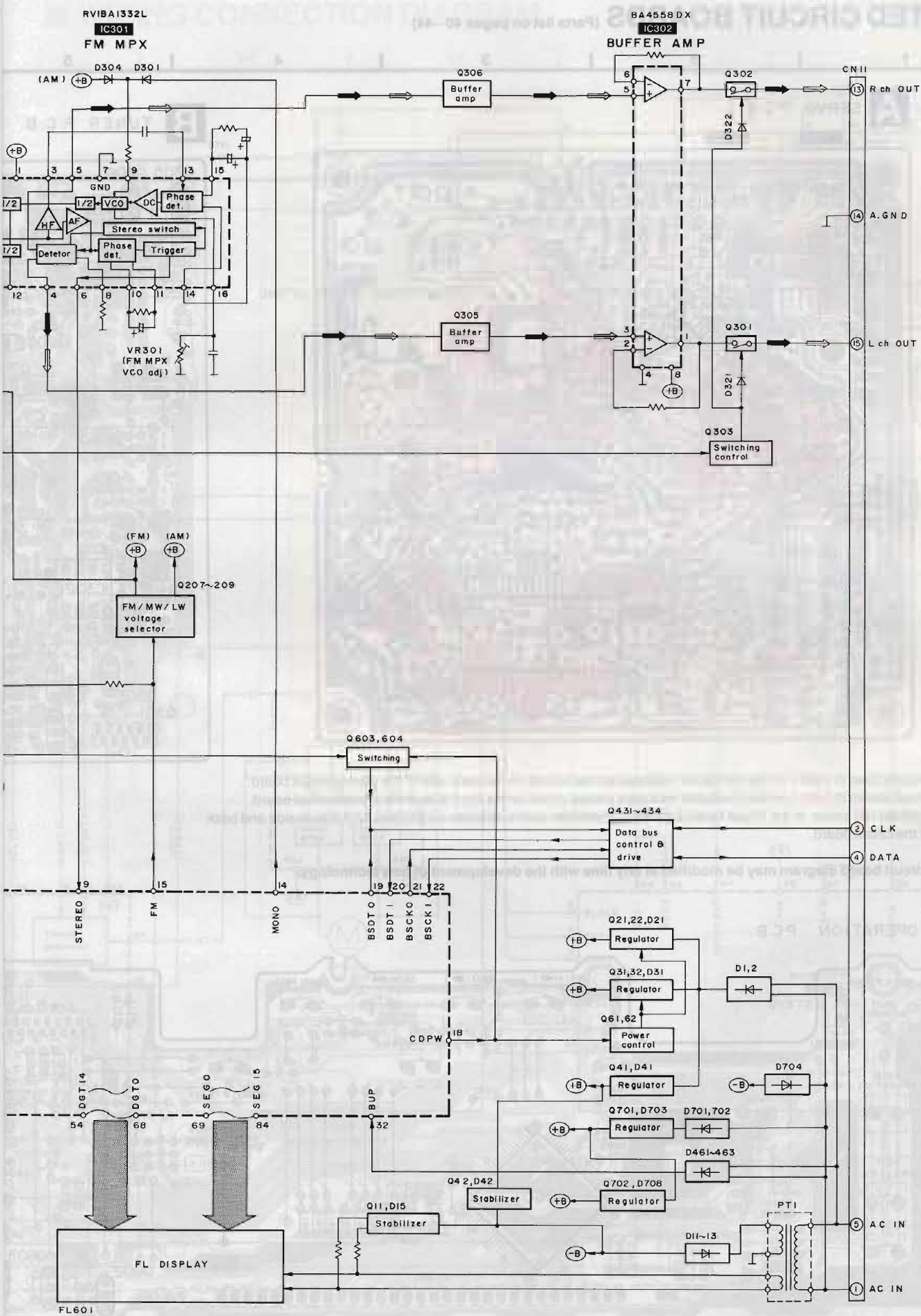


# BLOCK DIAGRAM











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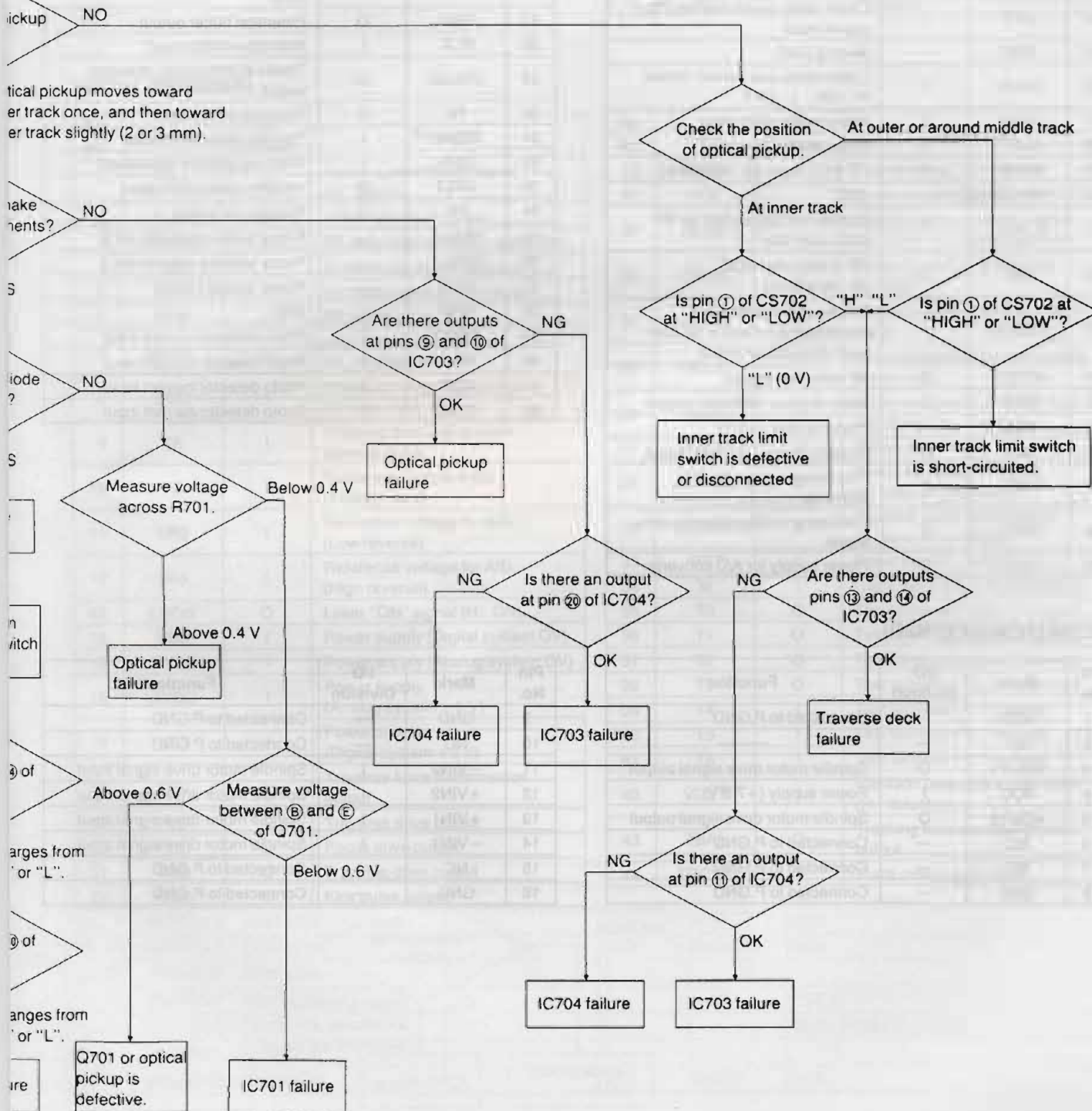
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## ■ FUNCTION OF IC TERMINALS

### ●IC701 (AN8800SCE2)

| Pin No. | Mark   | I/O Division | Function                                                                                                               |
|---------|--------|--------------|------------------------------------------------------------------------------------------------------------------------|
| 1       | LDG    | I            | Loop gain switch for auto power control<br>VCC: NORMAL<br>OPEN: +20 dB<br>This machine for "NORMAL"                    |
| 2       | LDP    | I            | Monitor PD polequality switch for auto power control<br>OPEN: P sub PD<br>GND: N sub PD<br>This machine for "P sub PD" |
| 3       | LD     | O            | Laser diode control output                                                                                             |
| 4       | LPD    | I            | Laser diode power monitor PD signal input                                                                              |
| 5       | GND    | —            | Analog GND                                                                                                             |
| 6       | LDON   | I            | Laser diode auto power control<br>H: ON L: OFF                                                                         |
| 7       | AMPI   | I            | Reverse amplifier input                                                                                                |
| 8       | AMPO   | O            | Reverse amplifier output                                                                                               |
| 9       | RF IN  | I            | RF AGC input (H: light level)                                                                                          |
| 10      | RF EQ  | —            | GND                                                                                                                    |
| 11      | C.AGC  | —            | Condenser connection for RF AGC loop filter                                                                            |
| 12      | ARF    | O            | RF output after AGC<br>(H: light level)                                                                                |
| 13      | C.SBDO | —            | Low level detected wave condenser connection for dark level drop-out detection                                         |
| 14      | RFDET  | O            | RF detection output                                                                                                    |
| 15      | BDO    | O            | Black dropout detection output                                                                                         |
| 16      | VCC    | —            | Power supply (+5 V)                                                                                                    |
| 17      | SDO    | O            | System dropout detection output                                                                                        |
| 18      | VAD+   | O            | Plus power supply for A/D converter                                                                                    |
| 19      | VREF   | O            | Reference voltage of servo error signal                                                                                |
| 20      | VAD-   | O            | Power supply for A/D converter                                                                                         |

| Pin No. | Mark   | I/O Division | Function                                                  |
|---------|--------|--------------|-----------------------------------------------------------|
| 21      | OFTR   | O            | Off track detection output                                |
| 22      | PLAY   | I            | "Play" signal input<br>(H: ON, L: OFF)                    |
| 23      | WVEL   | I            | High speed input<br>(H: high speed L: normal)             |
| 24      | TES    | I            | Tracking error shunt signal input<br>(H: shunt L: output) |
| 25      | PTO    | O            | Traverse speed detection signal output                    |
| 26      | PTI    | I            | Traverse speed detection signal input                     |
| 27      | PBO    | O            | Potential buffer output                                   |
| 28      | POT    | I            | Potential buffer input                                    |
| 29      | CROSS  | O            | Tracking error cross detection output                     |
| 30      | TE     | O            | Tracking error output                                     |
| 31      | TEBAL  | I            | Tremble detection output                                  |
| 32      | TBAL   | I            | Tracking balance adjustment                               |
| 33      | VDET   | O            | Vibration detection output                                |
| 34      | FE     | O            | Focus error output                                        |
| 35      | FBAL 2 | —            | Focus balance adjustment 2                                |
| 36      | FBAL 1 | —            | Focus balance adjustment 1                                |
| 37      | VCC    | —            | Power supply (+5 V)                                       |
| 38      | GND    | —            | GND                                                       |
| 39      | PDBD   | I            | Photo detector current input                              |
| 40      | PDA    | I            | Photo detector current input                              |
| 41      | PDB    | I            | Photo detector current input                              |
| 42      | PDAD   | I            | Photo detector current input                              |

### ●IC702 (TCA0372DM2R)

| Pin No. | Mark  | I/O Division | Function                          |
|---------|-------|--------------|-----------------------------------|
| 1       | GND   | —            | Connected to P.GND                |
| 2       | NC    | —            | —                                 |
| 3       | VOUT1 | O            | Spindle motor drive signal output |
| 4       | VCC   | I            | Power supply (+7.5 V)             |
| 5       | VOUT2 | O            | Spindle motor drive signal output |
| 6       | NC    | —            | Connected to P.GND                |
| 7       | NC    | —            | Connected to P.GND                |
| 8       | GND   | —            | Connected to P.GND                |

| Pin No. | Mark  | I/O Division | Function                         |
|---------|-------|--------------|----------------------------------|
| 9       | GND   | —            | Connected to P.GND               |
| 10      | NC    | —            | Connected to P.GND               |
| 11      | -VIN2 | I            | Spindle motor drive signal input |
| 12      | +VIN2 | I            | Spindle motor drive signal input |
| 13      | +VIN1 | I            | Spindle motor drive signal input |
| 14      | -VIN1 | I            | Spindle motor drive signal input |
| 15      | NC    | —            | Connected to P.GND               |
| 16      | GND   | —            | Connected to P.GND               |

## ●IC703 (AN8377N)

| Pin No. | Mark | I/O Division | Function                                |
|---------|------|--------------|-----------------------------------------|
| 1       | PVCC | I            | Driver power supply (+5 V)              |
| 2       | VCC  | I            | Power supply (+5 V)                     |
| 3       | TB   | O            | External transistor base driving output |
| 4       | VMON | O            | Voltage (+5 V) output                   |
| 5       | TVDI | I            | Traverse error signal input             |
| 6       | TDI  | I            | Tracking error signal input             |
| 7       | FDI  | I            | Focus error signal input                |
| 8       | VREF | I            | Reference voltage input                 |

| Pin No. | Mark | I/O Division | Function                                |
|---------|------|--------------|-----------------------------------------|
| 9       | FD+  | O            | Non-inverting output of focus driver    |
| 10      | FD-  | O            | Inverting output of focus driver        |
| 11      | TD+  | O            | Non-inverting output of tracking driver |
| 12      | TD-  | O            | Inverting output of tracking driver     |
| 13      | TVD+ | O            | Non-inverting output of traverse driver |
| 14      | TVD- | O            | Inverting output of traverse driver     |
| 15      | /RST | O            | Reset signal output                     |
| 16      | PC   | I            | PC input                                |

## ●IC704 (MN6650A)

| Pin No. | Mark   | I/O Division | Function                                     |
|---------|--------|--------------|----------------------------------------------|
| 1       | TES    | O            | Tracking error shunt signal (H: Shunt)       |
| 2       | PLAY   | O            | "Play" signal (H: play)                      |
| 3       | /RFDET | I            | RF detection signal (L: detection)           |
| 4       | DO     | I            | Dropout signal (H: dropout)                  |
| 5       | OFT    | I            | Off track signal (H: off track)              |
| 6       | ARF    | I            | RF signal input                              |
| 7       | WVEL   | O            | High speed status signal (H: high speed)     |
| 8       | PBO    | I            | Potension buffer signal input (Analog input) |
| 9       | TE     | I            | Tracking error signal input (Analog input)   |
| 10      | FE     | I            | Focus error signal input (Analog input)      |
| 11      | VR2    | I            | Reference voltage for A/D (Low reverse)      |
| 12      | VR1    | I            | Reference voltage for A/D (High reverse)     |
| 13      | LDON   | O            | Laser "ON" signal (H: ON)                    |
| 14      | VSS    | I            | Power supply (Digital system OV)             |
| 15      | AVSS   | I            | Power supply (Analog system OV)              |
| 16      | AVDD   | I            | Power supply (Analog system +5 V)            |
| 17      | VDD    | I            | Power supply (Digital system +5 V)           |
| 18      | TRV    | O            | Traverse force transmission output           |
| 19      | TVD    | O            | Traverse drive output                        |
| 20      | FOD    | O            | Focus drive output                           |
| 21      | TRD    | O            | Tracking drive output                        |
| 22      | KICK   | O            | Kick pulse output                            |

| Pin No. | Mark   | I/O Division | Function                                               |
|---------|--------|--------------|--------------------------------------------------------|
| 23      | /TEST  | I            | Test terminal ("L", normal)                            |
| 24      | VSS    | I            | Power supply (Digital system OV)                       |
| 25      | CLVS   | I            | Spindle servo condition signal (H: CLV L: Rough servo) |
| 26      | /TRON  | O            | Tracking servo "ON" signal (L: ON)                     |
| 27      | MDATA  | I            | Micro computer command data input                      |
| 28      | MCLK   | I            | Micro computer command clock signal input              |
| 29      | MLD    | I            | Micro computer command load signal input (L: load)     |
| 30      | SENSE  | O            | Sense signal input                                     |
| 31      | /FLOCK | O            | Focus servo pull-in signal (L: take-in condition)      |
| 32      | /TLOCK | O            | Tracking servo pull-in signal (L: take-in condition)   |
| 33      | /RST   | I            | Reset input (L: reset)                                 |
| 34      | XI     | I            | Clock input (fXI=16.9344 MHz)                          |
| 35      | T0     | O            | Test terminal ("Open", normal)                         |
| 36      | T1     | O            | Test terminal ("Open", normal)                         |
| 37      | T2     | O            | Test terminal ("Open", normal)                         |
| 38      | T3     | O            | Test terminal ("Open", normal)                         |
| 39      | T4     | I            | Test terminal ("L", normal)                            |
| 40      | T5     | I            | Test terminal ("L", normal)                            |
| 41      | T6     | I            | Test terminal ("L", normal)                            |
| 42      | VDET   | I            | Vibration detection signal input (H: detection)        |
| 43      | TBAL   | O            | Tracking balance adjustment output                     |
| 44      | TRCRS  | I            | Track cross signal input                               |

## •IC706 (MN6626)

| Pin No. | Mark   | I/O Division | Function                                                             |
|---------|--------|--------------|----------------------------------------------------------------------|
| 1       | AVSS   | I            | GND for DSL, PLL circuit (OV)                                        |
| 2       | IREF   | I            | Reference electric current input                                     |
| 3       | ARF    | I            | RF signal input                                                      |
| 4       | DRF    | I            | DSL bias                                                             |
| 5       | DSLIF  | O            | DSL loop filter                                                      |
| 6       | PLLF   | —            | PLL loop filter                                                      |
| 7       | AVDD   | I            | Power supply for DSL, PLL                                            |
| 8       | RSEL   | I            | RF signal quality decision terminal                                  |
| 9       | TBUS7  | O            | Test terminal (normal: Open)                                         |
| 16      | TBUS0  |              |                                                                      |
| 17      | FLAG   | O            | Error/frag output                                                    |
| 18      | IPFLAG | O            | Interpolation flag                                                   |
| 19      | FCLK   | O            | Crystal frame clock                                                  |
| 20      | BYTCK  | O            | Byte clock                                                           |
| 21      | WDCK   | O            | Word clock                                                           |
| 22      | /RST   | I            | Reset input                                                          |
| 23      | TX     | O            | Digital audio interface output                                       |
| 24      | LDG    | O            | Lch deglitch signal                                                  |
| 25      | RDG    | O            | Rch deglitch signal                                                  |
| 26      | SRDATA | O            | Serial data signal (To GND)                                          |
| 27      | SCK    | O            | Bit clock for SRDATA (To GND)                                        |
| 28      | LRCK   | O            | L, R discrimination signal (To GND)                                  |
| 29      | XCK    | O            | Crystal oscillator clock output                                      |
| 30      | PMCK   | O            | $\frac{1}{192}$ divided frequency clock signal of crystal oscillator |
| 31      | CSEL   | I            | Test terminal (normal: L)                                            |
| 32      | PSEL   | I            | Test terminal (normal: L)                                            |
| 33      | X1     | —            | Crystal oscillator circuit input                                     |
| 34      | X2     | —            | Crystal oscillator circuit output                                    |
| 35      | VSS    | I            | Power supply (OV)                                                    |
| 36      | SUBQ   | O            | Sub-code Q-code output                                               |
| 37      | SQCK   | I            | External clock for sub-code Q resistor                               |
| 38      | /CLDCK | O            | Sub-code frame clock signal                                          |
| 39      | BLKCK  | O            | Sub-code block clock signal                                          |
| 40      | DEMPH  | O            | De-emphasis ON signal                                                |
| 41      | MEMP   | I            | Emphasis signal input (For digital audio interface)                  |
| 42      | MLD    | I            | Micro computer command load signal input (L: load)                   |

| Pin No. | Mark  | I/O Division | Function                                                                                                                                                                             |
|---------|-------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 43      | MCLK  | I            | Micro computer command clock signal input                                                                                                                                            |
| 44      | MDATA | I            | Micro computer command data input                                                                                                                                                    |
| 45      | DMUTE | I            | Muting input                                                                                                                                                                         |
| 46      | SMCK  | O            | MSEL = $\frac{1}{2}$ divided frequency clock signal of crystal oscillator when "H" level<br>MSEL = $\frac{1}{4}$ divided frequency clock signal of crystal oscillator when "L" level |
| 47      | STAT  | O            | Status signal                                                                                                                                                                        |
| 48      | CRC   | O            | Sub-code CRC check result (H: OK, L: NG)                                                                                                                                             |
| 49      | SUBC  | O            | Sub-code serial output data                                                                                                                                                          |
| 50      | SBCK  | I            | Clock input for sub-code serial output                                                                                                                                               |
| 51      | /TRON | I            | Tracking servo ON signal                                                                                                                                                             |
| 52      | CLVS  | O            | Spindle servo phase synchronization condition signal (H: CLV L: rough servo)                                                                                                         |
| 53      | PC    | O            | Spindle motor ON signal (L: ON)                                                                                                                                                      |
| 54      | ECM   | O            | Spindle motor drive signal (Force mode output)                                                                                                                                       |
| 55      | ECS   | O            | Spindle motor drive signal (Servo error signal output)                                                                                                                               |
| 56      | VDD   | I            | Power supply (+5 V)                                                                                                                                                                  |
| 57      | /TEST | I            | Test terminal (normal: H)                                                                                                                                                            |
| 58      | SSEL  | I            | SUBQ terminal Output mode switch terminal (H: Q code buffer mode)                                                                                                                    |
| 59      | MSEL  | I            | SMCK terminal output frequency switch terminal                                                                                                                                       |
| 60      | RESY  | O            | Resynchronization signal of frame synchronization (H: synchronization, L: not)                                                                                                       |
| 61      | DO    | I            | Drop-out signal (H: drop-out)                                                                                                                                                        |
| 62      | EFM   | O            | EFM signal output                                                                                                                                                                    |
| 63      | PCK   | O            | PLL extract clock output                                                                                                                                                             |
| 64      | PDO   | —            | Phase comparison signal of EFM signal and PCK signal                                                                                                                                 |

## ●IC401 (MN1554PKL1)

| Pin No. | Mark       | I/O Division | Function                                                                                   |
|---------|------------|--------------|--------------------------------------------------------------------------------------------|
| 1       | MUTE RELAY | —            | (Not used, open)                                                                           |
| 2       | /PLUNGER   | —            | (Not used, open)                                                                           |
| 3       | /SYNC      | O            | (Not used, open)                                                                           |
| 4       | /SIRQ      | I            | Not used (connected to +5 V)                                                               |
| 5       | BLKCK      | I            | Sub-code block (Q data) clock input (75 Hz)                                                |
| 6       | SQCK       | I            | Sub-code block (Q data) clock input (7.35 kHz)                                             |
| 7       | SBO        | I            | (Not used, open)                                                                           |
| 8       | SUBQ       | I            | Sub-code (Q data) input                                                                    |
| 9       | RESET      | I            | Reset signal input                                                                         |
| 10      | CLOSE SW   | I            | Loading switch close detection terminal                                                    |
| 11      | OPEN SW    | I            | Loading switch open detection terminal                                                     |
| 12      | REST SW    | I            | Rest switch detection terminal                                                             |
| 13      | NC         | —            | Not used connected to GND                                                                  |
| 14      | /CLOSE     | O            | Loading motor "Close" command                                                              |
| 15      | /OPEN      | O            | Loading motor "Open" command                                                               |
| 16      | NC         | O            | Not used connected to GND                                                                  |
| 17      | NC         | O            | Muting control (Not used, open)                                                            |
| 18      | NC         | O            | Traverse servo control (Not used, open)                                                    |
| 19      | NC         | —            | (Not used, open)                                                                           |
| 20      | NC         | O            | Traverse "Reverse" command signal (Not used, open)                                         |
| 21      | NC         | O            | Traverse "Forward" command signal (Not used, open)                                         |
| 22      | NC         | O            | Optical servo IC control signal [KICKR: Kick direction (reverse) command] (Not used, open) |
| 23      | NC         | O            | Optical servo IC control signal [KICKF: Kick direction (forward) command] (Not used, open) |
| 24      | NC         | O            | Optical servo IC control (TRON: Tracking servo) (Not used, open)                           |
| 25      | VDD        | I            | Power supply (connected to +5 V)                                                           |
| 26      | NC         | O            | (Not used, open)                                                                           |
| 27      | NC         | O            | (Not used, open)                                                                           |

| Pin No.  | Mark           | I/O Division | Function                                                             |
|----------|----------------|--------------|----------------------------------------------------------------------|
| 28       | NC             | O            | Optical servo IC control signal (FOON: Focus servo) (Not used, open) |
| 29       | NC             | I            | (Not used, connected to GND)                                         |
| 30       | NC             | I            | (Not used, connected to GND)                                         |
| 31       | FUTA SW        | I            | (Not used, connected to R412)                                        |
| 32       | MODE           | I            | (Not used, connected to GND)                                         |
| 33       | STAT           | I            | Processing status input from signal processing LSI                   |
| 34       | /TLOCK         | I            | TOC reading control (ON at "L")                                      |
| 35       | /FLOCK         | I            | Optical servo condition (focus) input                                |
| 36       | SENSE          | I            | Optical servo condition (track cross) input                          |
| 37       | /RECV          | I            | Data receipt command signal                                          |
| 38       | /SEND          | I            | Data transmission command signal                                     |
| 39       | ACK            | I            | Data discrimination signal                                           |
| 40       | CLK            | I            | Data lock signal                                                     |
| 41<br>44 | DATA0<br>DATA3 | I            | Key scan signal                                                      |
| 45<br>52 | NC             | I            | (Not used, open)                                                     |
| 53       | OSC2           | I            | Clock terminal                                                       |
| 54       | OSC1           | I            | Clock input                                                          |
| 55       | X1             | I            | Optical servo condition input (Not used, connected to GND)           |
| 56       | X0             | O            | (Not used, open)                                                     |
| 57       | GND            | I            | (Not used, connected to GND)                                         |
| 58       | DMUTE          | O            | Muting control                                                       |
| 59       | MDATA          | O            | Command data output                                                  |
| 60       | MCLK           | O            | Data clock output (command clock signal)                             |
| 61       | /MLD           | O            | Data output (command load signal)                                    |
| 62       | D. OUT         | O            | Optical output control signal (Not used, open)                       |
| 63       | EMPH           | O            | Emphasis signal output (Not used, open)                              |
| 64       | SERVO RST      | I            | Reset signal input                                                   |

## ■ IC601 (MND2417PLD-1)

| Pin No. | Terminal name | I/O Division | Function                                                    |
|---------|---------------|--------------|-------------------------------------------------------------|
| 1       | VDD           | I            | Power supply (+5 V)                                         |
| 2       | OSC1          | O            | Crystal oscillator (4 MHz)                                  |
| 3       | OSC2          | I            |                                                             |
| 4       | GND           | I            | GND                                                         |
| 5, 6    | NC            | I/O          | Not used                                                    |
| 7       | MUTE          | O            | Muting (TUNER) signal output                                |
| 8       | TNPW          | O            | Power down (TUNER) control signal output                    |
| 9       | STEREO        | I            | FM STEREO DET signal input                                  |
| 10      | MULTI         | I            | TV MULTI DET signal input                                   |
| 11, 12  | MAIN SUB      | O            | TV MULTI DET mood signal output                             |
| 13      | SD            | I            | Receiving (TUNER) signal input                              |
| 14      | MONO          | O            | FM MONO control signal output                               |
| 15      | FM            | O            | FM BAND control signal output                               |
| 16      | TV            | O            | TV BAND control signal output                               |
| 17      | CE            | O            | Serial data output                                          |
| 18      | CD PW         | O            | CD POWER ON control signal output                           |
| 19      | BSDT0         | O            | DATA BUS output                                             |
| 20      | BSDT1         | I            | DATA BUS input                                              |
| 21      | BSCK0         | O            | Clock signal output                                         |
| 22      | BSCK1         | I            | Clock signal input                                          |
| 23      | DATA3         | I/O          | KEY control signal and mechanism control signal data output |
| 24      | DATA2         | I/O          | KEY control signal and CD control signal data output        |
| 25      | DATA1         | I/O          | KEY control signal and CD control signal data output        |
| 26      | DATA 0        | I/O          | KEY control signal and mechanism control signal data output |

| Pin No.              | Terminal name          | I/O Division | Function                                        |
|----------------------|------------------------|--------------|-------------------------------------------------|
| 27                   | CLK                    | I/O          | Clock signal output                             |
| 28                   | ACK                    | I/O          | Acknowledge clock signal output (mechanism)     |
| 29                   | SEND                   | O            | Mechanism request data output (send request)    |
| 30                   | RECV                   | O            | Mechanism request data output (receipt request) |
| 31                   | NC                     | —            | Not used                                        |
| 32                   | BUP                    | I            | Power supply detection signal input             |
| 33<br>34<br>35<br>36 | NC<br>LDAI<br>NC<br>NC | —            | Not used                                        |
| 37                   | RST                    | I            | Reset signal input                              |
| 38                   | CL                     | O            | Serial clock output                             |
| 39                   | NC                     | —            | Not used                                        |
| 40                   | DATA                   | O            | Serial data output                              |
| 41<br>?<br>43        | NC                     | —            | Not used                                        |
| 44<br>?<br>49        | KIN5<br>?<br>KIN0      | I            | KEY control signal input                        |
| 50                   | CM                     | I            | Not used (connect to GND)                       |
| 51                   | NC                     | —            | Not used                                        |
| 52                   | VPP                    | I            | Pull up voltage input                           |
| 53                   | NC                     | —            | Not used                                        |
| 54<br>?<br>68        | DGT14<br>?<br>DGT0     | O            | Digit signal output for FL                      |
| 69<br>?<br>84        | SEG0<br>?<br>SEG15     | O            | Segment signal output for FL                    |

# REPLACEMENT PARTS LIST

## Notes : \* Important safety notice:

Components identified by  $\triangle$  mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

\* The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.) Parts without these indications can be used for all areas.

\* Warning: This product uses a diode. Refer to caution statements on page 2.

| Ref. No.  | Part No.     | Part Name & Description       | Remarks | Ref. No.  | Part No.     | Part Name & Description   | Remarks     |
|-----------|--------------|-------------------------------|---------|-----------|--------------|---------------------------|-------------|
|           |              | INTEGRATED CIRCUIT(S)         |         | Q603      | 2SC3311A-Q   | TRANSISTOR                |             |
|           |              |                               |         | Q604      | DTC144ESTP   | TRANSISTOR                |             |
|           |              |                               |         | Q605      | DTC114YSTP   | TRANSISTOR                |             |
| IC101     | LM7001       | I. C. PLL FREQ. SYNTHESIZER   |         | Q701      | 2SD2037EFTA  | TRANSISTOR                |             |
| IC201     | AN7273W      | I. C. FM/AM IF/DET/MIX        |         | Q702      | 2SC1685QRSTA | TRANSISTOR                |             |
| IC301     | RV1BA1332L   | I. C. FM MPX                  |         |           |              | TRANSISTOR(S)             |             |
| IC302     | BA4558DX     | I. C. BUFFER AMP              |         |           |              | (SERVO SCHEMATIC DIAGRAM) |             |
| IC401     | MN1554PKL1   | I. C. SYSTEM CONTROL          |         |           |              |                           |             |
| IC501     | TOTX174-A    | I. C. T. MODULE               |         |           |              |                           |             |
| IC601     | MND2417PLD-1 | I. C. SYSTEM CONT. /FL. DRIVE |         | Q701      | 2SB709S      | TRANSISTOR                |             |
| IC790     | TA7291S      | I. C. MOTOR DRIVE             |         |           |              | DIODE(S)                  |             |
|           |              | INTEGRATED CIRCUIT(S)         |         |           |              |                           |             |
|           |              | (SERVO SCHEMATIC DIAGRAM)     |         | D1, 2     | 1SR35200TB   | DIODE                     | $\triangle$ |
|           |              |                               |         | D11       | MA4330L      | DIODE                     |             |
| IC701     | AN8800SCE2   | I. C. SERVO. AMP.             |         | D12, 13   | MA167        | DIODE                     | $\triangle$ |
| IC702     | TCA0372DM2R  | I. C. SPINDLE MOTOR DRIVE     |         | D14       | MA4047MTA    | DIODE                     |             |
| IC703     | AN8377N      | I. C. TRAVERSE MOTOR/DRIVE    |         | D15       | MA4270       | DIODE                     |             |
| IC704     | MN6650       | I. C. DIGITAL SERVO PRO.      |         | D21       | MA4082MTA    | DIODE                     |             |
| IC706     | MN6626       | I. C. DIGITAL SIGNAL PRO.     |         | D31       | MA4062-H     | DIODE                     |             |
|           |              | TRANSISTOR(S)                 |         | D32       | MA185TA      | DIODE                     |             |
|           |              |                               |         | D33       | MA165        | DIODE                     |             |
|           |              |                               |         | D41       | MA4068L      | DIODE                     |             |
| Q11       | DTC143TSTP   | TRANSISTOR                    |         | D42       | MA165        | DIODE                     |             |
| Q21, 22   | 2SD2037EFTA  | TRANSISTOR                    |         | D101      | MA4051MTA    | DIODE                     |             |
| Q31, 32   | 2SD2037EFTA  | TRANSISTOR                    |         | D201, 202 | MA165        | DIODE                     |             |
| Q41       | 2SD1862QRTV6 | TRANSISTOR                    |         | D301      | MA165        | DIODE                     |             |
| Q42       | 2SB1238QSTV6 | TRANSISTOR                    |         | D304      | MA165        | DIODE                     |             |
| Q61       | DTC124EST    | TRANSISTOR                    |         | D321, 322 | MA165        | DIODE                     |             |
| Q62       | 2SA1309A-R   | TRANSISTOR                    |         | D421-423  | MA165        | DIODE                     |             |
| Q101, 102 | 2SC2785FE    | TRANSISTOR                    |         | D461, 462 | 1SR35200TB   | DIODE                     | $\triangle$ |
| Q201, 202 | 2SC2787L     | TRANSISTOR                    |         | D463      | MA4051MTA    | DIODE                     |             |
| Q204, 205 | 2SC3311A-Q   | TRANSISTOR                    |         | D601      | 1SS291TA     | DIODE                     |             |
| Q207      | 2SC3311A-Q   | TRANSISTOR                    |         | D605-609  | MA165        | DIODE                     |             |
| Q208, 209 | 2SA1309A-R   | TRANSISTOR                    |         | D610, 611 | 1SS291TA     | DIODE                     |             |
| Q252-254  | 2SC3311A-Q   | TRANSISTOR                    |         | D612      | MA165        | DIODE                     | (E, EG, GN) |
| Q255      | 2SA1309A-R   | TRANSISTOR                    |         | D613      | MA165        | DIODE                     | (GC)        |
| Q256      | 2SC3311A-Q   | TRANSISTOR                    |         | D701, 702 | 1SR35200TB   | DIODE                     | $\triangle$ |
| Q301, 302 | 2SJ164PQRTA  | TRANSISTOR                    |         | D703      | MA4150M      | DIODE                     |             |
| Q303      | 2SA1309A-R   | TRANSISTOR                    |         | D704      | MA165        | DIODE                     | $\triangle$ |
| Q305, 306 | 2SC3311A-Q   | TRANSISTOR                    |         | D708      | MA4100MTA    | DIODE                     |             |
| Q421, 422 | DTC114ESTP   | TRANSISTOR                    |         |           |              | DIODE(S)                  |             |
| Q431, 432 | DTC144ESTP   | TRANSISTOR                    |         |           |              | (SERVO SCHEMATIC DIAGRAM) |             |
| Q433, 434 | 2SC3311A-Q   | TRANSISTOR                    |         |           |              |                           |             |
| Q451      | 2SC3311AR    | TRANSISTOR                    |         |           |              |                           |             |
| Q602      | DTC114ESTP   | TRANSISTOR                    |         | D701      | MA110TW      | DIODE                     |             |

| Ref. No.  | Part No.     | Part Name & Description   | Remarks | Ref. No.   | Part No.     | Part Name & Description    | Remarks  |
|-----------|--------------|---------------------------|---------|------------|--------------|----------------------------|----------|
|           |              | VARIABLE RESISTOR(S)      |         | S604       | EVQ21405R    | S. W. NORMAL/TAPE LENGTH   |          |
|           |              |                           |         | S605       | EVQ21405R    | S. W. AI                   |          |
| VR301     | EVNDXAA00B53 | V. R. FM MPX VCO ADJ.     |         | S606       | EVQ21405R    | S. W. OPEN/CLOSE           |          |
|           |              | VARIABLE RESISTOR(S)      |         | S607       | EVQ21405R    | S. W. TIME MODE            |          |
|           |              | (SERVO SCHEMATIC DIAGRAM) |         | S608       | EVQ21405R    | S. W. F. SKIP              |          |
|           |              |                           |         | S609       | EVQ21405R    | S. W. R. SKIP              |          |
| VR701     | EVNDXAA00B14 | V. R. BEST EYE ADJ.       |         | S610       | EVQ21405R    | S. W. PALY                 |          |
|           |              | COMPONENT COMBINATION(S)  |         | S611       | EVQ21405R    | S. W. PAUSE                |          |
|           |              |                           |         | S612       | EVQ21405R    | S. W. STOP                 |          |
| Z101      | ENV17281G1   | FM FRONT END              |         | S613       | EVQ21405R    | S. W. F. SEARCH            |          |
| Z201      | RLA6Z002M-T  | COMPONENT COMBINATION     |         | S614       | EVQ21405R    | S. W. R. SEARCH            |          |
| Z202      | RL12Z003M-T  | COMPONENT COMBINATION     |         | S615       | EVQ21405R    | S. W. TUNING UP            |          |
|           |              | COIL(S)                   |         | S616       | EVQ21405R    | S. W. TUNING DOWN          |          |
|           |              |                           |         | S617       | EVQ21405R    | S. W. PRESET UP            |          |
| L110      | RLQZPR68KT-Y | COIL                      |         | S618       | EVQ21405R    | S. W. PRESET DOWN          |          |
| L201, 202 | ELEPLR22MA   | COIL                      |         | S619       | EVQ21405R    | S. W. BAND                 |          |
| L250      | RLQZP101KT-Y | COIL                      |         | S620       | EVQ21405R    | S. W. MEMORY               |          |
| L321, 322 | RLM2B003M-K  | COIL                      |         | S790       | RSH1A005     | S. W. LOADING CLOSE DETECT |          |
| L324      | SLM1B10M-1M  | COIL                      |         | S791       | RSH1A005     | S. W. LOADING OPEN DETECT  |          |
| L431, 432 | RLQZP3R3KT-Y | COIL                      |         |            |              | SWITCH(ES)                 |          |
| L601      | ELEXT101KA9  | COIL                      |         |            |              | (SERVO SCHEMATIC DIAGRAM)  |          |
|           |              | TRANSFORMER(S)            |         |            |              |                            |          |
|           |              |                           |         | S701       | SSHD5-E      | S. W. REST                 |          |
| PT1       | RTP114G001AX | POWER TRANSFORMER         | △       |            |              | CONNECTOR(S)               |          |
| T201      | RL14B002M-Z  | TRANSFORMER               |         |            |              |                            |          |
| T202      | RL14B003M-Z  | TRANSFORMER               |         | CN11       | RJT055K015-1 | CONNECTOR(15P)             |          |
|           |              | FILTER(S)                 |         | CN301, 302 | RJS1A6604    | SOCKET(4P)                 |          |
|           |              |                           |         | CN401      | RJS22Q11ZA   | SOCKET(22P)                |          |
| CF201     | RLFFETNGA01L | CERAMIC FILTER            |         | CN501      | RJS1A6823    | SOCKET(23P)                |          |
| CF202     | RLFFETNGA02L | CERAMIC FILTER            |         | CN502      | RJS1A6606    | SOCKET(6P)                 |          |
|           |              | OSCILLATOR(S)             |         | CN601      | RJS12Q11ZA   | SOCKET(12P)                |          |
|           |              |                           |         | CN602      | RJS22Q11ZA   | SOCKET(22P)                |          |
| X101      | SVQ49U722-S  | OSCILLATOR                |         | CN901, 902 | RJS1A6604    | SOCKET(4P)                 |          |
| X451      | SVQAT169T-S  | OSCILLATOR                |         | CP790      | RJP6G17ZA    | CONNECTOR(6P)              |          |
| X601      | EFOGC4234T4  | OSCILLATOR                |         |            |              | CONNECTOR(S)               |          |
|           |              | DISPLAY TUBE              |         |            |              | (SERVO SCHEMATIC DIAGRAM)  |          |
|           |              |                           |         |            |              |                            |          |
| FL601     | RS10111-F    | DISPLAY TUBE              | △       | CP701      | RJP2G17ZA    | CONNECTOR(2P)              |          |
|           |              | SWITCH(ES)                |         | CP702      | RJP2G17ZA    | CONNECTOR(2P)              |          |
|           |              |                           |         | CP703      | RJP4G17ZA    | CONNECTOR(4P)              |          |
| S601      | EVQ21405R    | S. W. RANDOM              |         | CS701      | RJU035T016-1 | SOCKET(16P)                |          |
| S602      | EVQ21405R    | S. W. SIDE A/B            |         | CS702      | RJS1A6723-1Q | SOCKET(23P)                |          |
| S603      | EVQ21405R    | S. W. FADE                |         |            |              | JACK(S)                    |          |
|           |              |                           |         |            |              |                            |          |
|           |              |                           |         | JK101      | RJH4202M     | ANTENNA TERMINAL           | (E, EG)  |
|           |              |                           |         | JK101      | RJH4405-1M   | ANTENNA TERMINAL           | (GC, GN) |
|           |              |                           |         | JK301      | RJS12Q11ZA   | SOCKET(12P)                |          |

Notes : \* Capacity values are in microfarads ( $\mu\text{F}$ ) unless specified otherwise, P=Pico-farads (pF) F-Farads (F)  
 \* Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

| Ref. No. | Part No.     | Values & Remarks  | Ref. No.  | Part No.    | Values & Remarks      | Ref. No.  | Part No.     | Values & Remarks        |
|----------|--------------|-------------------|-----------|-------------|-----------------------|-----------|--------------|-------------------------|
|          |              | RESISTORS         | R228      | ERDS2TJ102  | 1/4W 1K               | R433      | ERDS2TJ102   | 1/4W 1K                 |
|          |              |                   | R231      | ERDS2TJ331  | 1/4W 330              | R434      | ERDS2TJ470   | 1/4W 47                 |
|          |              |                   | R232      | ERDS2TJ103  | 1/4W 10K              | R435      | ERDS2TJ223   | 1/4W 22K                |
| R11      | ERDS2TJ331   | 1/4W 330          | R240      | ERDS2TJ184T | 1/4W 180K             | R436, 437 | ERDS2TJ393   | 1/4W 39K                |
| R13, 14  | ERDS2TJ471   | 1/4W 470 $\Delta$ | R241      | ERDS2TJ102  | 1/4W 1K               | R438      | ERDS2TJ470   | 1/4W 47                 |
| R15      | ERDS2TJ1R2   | 1/4W 1.2 $\Delta$ | R242      | ERDS2TJ563  | 1/4W 56K              | R439      | ERDS2TJ223   | 1/4W 22K                |
| R21      | ERDS1FVJ221T | 1/2W 220 $\Delta$ | R250      | ERDS2TJ183T | 1/4W 18K              | R440, 441 | ERDS2TJ393   | 1/4W 39K                |
| R22, 23  | ERDS2TJ1R0   | 1/4W 1.0          | R251      | ERDS2TJ103  | 1/4W 10K              | R442      | ERDS2TJ470   | 1/4W 47                 |
| R31      | ERDS1FVJ181T | 1/2W 180 $\Delta$ | R252      | ERDS2TJ222  | 1/4W 2.2K             | R443, 444 | ERDS2TJ393   | 1/4W 39K                |
| R32, 33  | ERDS2TJ1R0   | 1/4W 1.0          | R253      | ERDS2TJ182  | 1/4W 1.8K             | R451      | ERDS2TJ151   | 1/4W 150                |
| R34      | ERDS2TJ102   | 1/4W 1K           | R254      | ERDS2TJ223  | 1/4W 22K              | R452, 453 | ERDS2TJ473   | 1/4W 47K                |
| R41      | ERDS1FVJ680T | 1/2W 68 $\Delta$  | R256      | ERDS2TJ102  | 1/4W 1K               | R461, 462 | ERDS2TJ102   | 1/4W 1K                 |
| R42      | ERDS2TJ102   | 1/4W 1K           | R258      | ERDS2TJ122  | 1/4W 1.2K             | R463      | ERDS2TJ103   | 1/4W 10K                |
| R43      | ERDS2TJ821   | 1/4W 820          | R259      | ERDS2TJ183T | 1/4W 18K              | R501      | ERDS2TJ822   | 1/4W 8.2K               |
| R44      | ERDS2TJ181T  | 1/4W 180          | R260      | ERDS2TJ104  | 1/4W 100K             | R504, 505 | ERDS2TJ102   | 1/4W 1K                 |
| R61      | ERDS2TJ102   | 1/4W 1K           | R261      | ERDS2TJ152  | 1/4W 1.5K             | R607-614  | ERDS2TJ332   | 1/4W 3.3K               |
| R62      | ERDS2TJ472   | 1/4W 4.7K         | R301, 302 | ERDS2TJ562  | 1/4W 5.6K             | R615-620  | ERDS2TJ473   | 1/4W 47K                |
| R63, 64  | ERDS2TJ473   | 1/4W 47K          | R303      | ERDS2TJ821  | 1/4W 820              | R621      | ERDS2TJ393   | 1/4W 39K                |
| R104     | ERDS2TJ102   | 1/4W 1K           | R304      | ERDS2TJ102  | 1/4W 1K               | R622      | ERDS2TJ562   | 1/4W 5.6K               |
| R105     | ERDS2TJ103   | 1/4W 10K          | R305      | ERDS2TJ912T | 1/4W 9.1K             | R623      | ERDS2TJ102   | 1/4W 1K                 |
| R106     | ERDS2TJ561   | 1/4W 560          | R306      | ERDS2TJ331  | 1/4W 330              | R624      | ERDS2TJ472   | 1/4W 4.7K               |
| R107     | ERDS2TJ102   | 1/4W 1K           | R307      | ERDS2TJ102  | 1/4W 1K               | R625      | ERDS2TJ103   | 1/4W 10K                |
| R117     | ERDS2TJ181T  | 1/4W 180          | R310-312  | ERDS2TJ103  | 1/4W 10K              | R631, 632 | ERDS2TJ103   | 1/4W 10K                |
| R118-120 | ERDS2TJ222   | 1/4W 2.2K         | R316      | ERDS2TJ223  | 1/4W 22K              | R701      | ERDS1FVJ2R2T | 1/2W 2.2 $\Delta$       |
| R122     | ERDS2TJ151   | 1/4W 150          | R323-328  | ERDS2TJ103  | 1/4W 10K              | R702      | ERDS2TJ152   | 1/4W 1.5K               |
| R125     | ERDS2TJ103   | 1/4W 10K          | R329      | ERDS2TJ332  | 1/4W 3.3K (E, GC, GN) | R703      | ERDS2TJ331   | 1/4W 330                |
| R201     | ERDS2TJ472   | 1/4W 4.7K         | R329      | ERDS2TJ472T | 1/4W 4.7K (EG)        | R708      | ERDS2TJ152   | 1/4W 1.5K               |
| R202     | ERDS2TJ331   | 1/4W 330          | R330      | ERDS2TJ332  | 1/4W 3.3K (E, GC, GN) | R801, 802 | ERDS2TJ102   | 1/4W 1K                 |
| R203     | ERDS2TJ474   | 1/4W 470K         | R330      | ERDS2TJ472T | 1/4W 4.7K (EG)        |           |              | RESISTORS               |
| R204     | ERDS2TJ331   | 1/4W 330          | R331      | ERDS2TJ562  | 1/4W 5.6K             |           |              | SERVO SCHEMATIC DIAGRAM |
| R205     | ERDS2TJ474   | 1/4W 470K         | R332      | ERDS2TJ472  | 1/4W 4.7K             |           |              |                         |
| R206     | ERDS2TJ331   | 1/4W 330          | R333-336  | ERDS2TJ104  | 1/4W 100K             |           |              |                         |
| R207     | ERDS2TJ102   | 1/4W 1K           | R337      | ERDS2TJ102  | 1/4W 1K               | R701      | ERJ6GEYJ100  | 1/10W 10                |
| R208     | ERDS2TJ104   | 1/4W 100K         | R338      | ERDS2TJ473  | 1/4W 47K              | R702      | ERJ6GEYJ471V | 1/10W 470               |
| R209     | ERDS2TJ102   | 1/4W 1K           | R351      | ERDS2TJ105T | 1/4W 1M               | R703      | ERJ6GEYJ102A | 1/10W 1K                |
| R210     | ERDS2TJ122   | 1/4W 1.2K         | R355, 356 | ERDS2TJ391  | 1/4W 390              | R704      | ERJ6GEYJ103V | 1/10W 10K               |
| R211     | ERDS2TJ102   | 1/4W 1K           | R357, 358 | ERDS2TJ272T | 1/4W 2.7K             | R706      | ERJ6GEYJ473V | 1/10W 47K               |
| R213     | ERDS2TJ473   | 1/4W 47K          | R359      | ERDS2TJ151  | 1/4W 150              | R707      | ERJ6GEYJ222V | 1/10W 2.2K              |
| R214     | ERDS2TJ122   | 1/4W 1.2K         | R361, 362 | ERDS2TJ684  | 1/4W 680K             | R708      | ERJ6GEYJ683V | 1/10W 68K               |
| R217     | ERDS2TJ332   | 1/4W 3.3K         | R401-408  | ERDS2TJ473  | 1/4W 47K              | R709      | ERJ6GEYJ122V | 1/10W 1.2K              |
| R218     | ERDS2TJ103   | 1/4W 10K          | R411      | ERDS2TJ472  | 1/4W 4.7K             | R710      | ERJ6GEYJ182V | 1/10W 1.8K              |
| R219     | ERDS2TJ561   | 1/4W 560          | R412      | ERDS2TJ103  | 1/4W 10K              | R711      | ERJ6GEYJ473V | 1/10W 47K               |
| R220     | ERDS2TJ822   | 1/4W 8.2K         | R413      | ERDS2TJ105T | 1/4W 1M               | R712      | ERJ6GEYJ471V | 1/10W 470               |
| R221     | ERDS2TJ271   | 1/4W 270          | R414      | ERDS2TJ472  | 1/4W 4.7K             | R714      | ERJ6GEYJ473V | 1/10W 47K               |
| R222     | ERDS2TJ391   | 1/4W 390          | R415      | ERDS2TJ102  | 1/4W 1K               | R715      | ERJ6GEYJ223V | 1/10W 22K               |
| R223     | ERDS2TJ682T  | 1/4W 6.8K         | R416      | ERDS2TJ472  | 1/4W 4.7K             | R716      | ERJ6GEYJ104V | 1/10W 100K              |
| R224     | ERDS2TJ183T  | 1/4W 18K          | R421      | ERDS2TJ472  | 1/4W 4.7K             | R717      | ERJ6GEYJ682V | 1/10W 6.8K              |
| R225     | ERDS2TJ103   | 1/4W 10K          | R431      | ERDS2TJ102  | 1/4W 1K               | R718      | ERJ6GEYJ223V | 1/10W 22K               |
| R226     | ERDS2TJ223   | 1/4W 22K          | R432      | ERDS2TJ470  | 1/4W 47               | R719      | ERJ6GEYJ123V | 1/10W 12K               |

| Ref. No. | Part No.     | Values & Remarks        | Ref. No.  | Part No.     | Values & Remarks | Ref. No.  | Part No.     | Values & Remarks        |
|----------|--------------|-------------------------|-----------|--------------|------------------|-----------|--------------|-------------------------|
| R720     | ERJ6GEYJ273V | 1/10W 27K               | C41       | ECBT1H102KB5 | 50V 1000P        | C330      | ECBT1H471KB5 | 50V 470P                |
| R721     | ERJ6GEYJ823  | 1/10W 82K               | C42       | ECEA0JKA470B | 6.3V 47U         | C350      | ECEA1CKA101B | 16V 100U                |
| R722     | ERJ6GEYJ561V | 1/10W 560               | C101      | ECEA1EKA4R7B | 25V 4.7U         | C351, 352 | ECEA1CKA100B | 16V 10U                 |
| R723     | ERJ6GEYJ104V | 1/10W 100K              | C102      | ECBT1H102KB5 | 50V 1000P        | C401      | ECBT1H104ZF5 | 50V 0.1U                |
| R724     | ERJ6GEYJ104V | 1/10W 100K              | C103      | ECBT1C103NS5 | 16V 0.01U        | C421      | ECEA1HKA2R2B | 50V 2.2U                |
| R725     | ERJ6GEYJ471V | 1/10W 470               | C104      | ECEA1CKA100B | 16V 10U          | C422      | ECBT1E103ZF  | 25V 0.01U               |
| R732     | ERJ6GEYJ562V | 1/10W 5.6K              | C105, 106 | ECBT1H150JC5 | 50V 15P          | C423      | ECEA1HKA2R2B | 50V 2.2U                |
| R733     | ERJ6GEYJ332V | 1/10W 3.3K              | C107      | ECBT1H102KB5 | 50V 1000P        | C451, 452 | ECBT1H560J5  | 50V 56P                 |
| R734     | ERJ6GEYJ562V | 1/10W 5.6K              | C108      | ECEA0JKA101B | 6.3V 100U        | C453      | ECBT1H120J5  | 50V 12P                 |
| R735     | ERJ6GEYJ222V | 1/10W 2.2K              | C110      | ECBT1H102KB5 | 50V 1000P        | C454      | ECBT1C103NS5 | 16V 0.01U               |
| R736     | ERJ6GEYJ682V | 1/10W 6.8K              | C112      | ECBT1H102KB5 | 50V 1000P        | C461, 462 | ECKR1H103ZF5 | 50V 0.01U $\Delta$      |
| R737     | ERJ6GEYJ562V | 1/10W 5.6K              | C113      | ECBT1C103NS5 | 16V 0.01U        | C501      | ECBT1E103ZF  | 25V 0.01U               |
| R738     | ERJ6GEYJ562V | 1/10W 5.6K              | C114      | ECBT1H102KB5 | 50V 1000P        | C503      | ECBT1H102KB5 | 50V 1000P               |
| R739     | ERJ6GEYJ562V | 1/10W 5.6K              | C116      | ECBT1H104ZF5 | 50V 0.1U         | C601      | ECBT1H104ZF5 | 50V 0.1U                |
| R741     | ERJ6GEYJ102A | 1/10W 1K                | C117      | ECBT1H331KB5 | 50V 330P         | C602      | ECEA0JU102   | 6.3V 1000U              |
| R742     | ERJ6GEYJ102A | 1/10W 1K                | C120      | ECBT1H3R3KC5 | 50V 3.3P         | C603      | ECBT1H102KB5 | 50V 1000P $\Delta$      |
| R743     | ERJ6GEYJ102A | 1/10W 1K                | C123      | ECBT1H104ZF5 | 50V 0.1U         | C604      | ECBT1H104ZF5 | 50V 0.1U $\Delta$       |
| R744     | ERJ6GEYJ393V | 1/10W 39K               | C201      | ECBT1H102KB5 | 50V 1000P        | C605      | ECBT1H104ZF5 | 50V 0.1U                |
| R747     | ERJ6GEYJ473V | 1/10W 47K               | C202      | ECBT1C103NS5 | 16V 0.01U        | C607      | ECBT1H102KB5 | 50V 1000P               |
| R760     | ERJ6GEYJ561V | 1/10W 560               | C203      | ECBT1H102KB5 | 50V 1000P        | C702      | ECA1VM471B   | 35V 470U                |
| R761     | ERJ6GEYJ561V | 1/10W 560               | C204      | ECBT1H473ZF5 | 50V 0.047U       | C703      | ECBT1C103NS5 | 16V 0.01U               |
| R762     | ERJ6GEYJ561V | 1/10W 560               | C205      | ECBT1H8R2KC5 | 50V 8.2P         | C704      | ECA1CM221B   | 16V 220U                |
|          |              |                         | C206      | ECBT1H101KB5 | 50V 100P         | C709      | ECEA1HKA3R3B | 50V 3.3U                |
|          |              | CHIP JUMPERS            | C208      | ECBT1H150JC5 | 50V 15P          | C710      | ECBT1C103NS5 | 16V 0.01U               |
|          |              | SERVO SCHEMATIC DIAGRAM | C209      | ECEA0JKA101B | 6.3V 100U        | C712      | ECEA1CU331   | 16V 330U $\Delta$       |
|          |              |                         | C210      | ECEA1HKA3R3B | 50V 3.3U         | C714, 715 | ECKR1H103ZF5 | 50V 0.01U $\Delta$      |
| J702     | ERJ6GEYOR00A | 1/10W 0                 | C211      | ECFR1E103KR  | 25V 0.01U        | C790      | ECA1AKF820E  | 10V 82U                 |
| J704     | ERJ6GEYOR00A | 1/10W 0                 | C212      | ECBT1C103NS5 | 16V 0.01U        | C801, 802 | ECBT1H101KB5 | 50V 100P                |
| J705     | ERJ6GEYOR00A | 1/10W 0                 | C213      | ECBT1E223ZF  | 25V 0.022U       | C803      | ECBT1E103ZF  | 25V 0.01U               |
| J706     | ERJ6GEYOR00A | 1/10W 0                 | C214      | ECBT1H102KB5 | 50V 1000P        |           |              |                         |
| J707     | ERJ6GEYOR00A | 1/10W 0                 | C215      | ECBT1H101KB5 | 50V 100P         |           |              | CAPACITORS              |
| J708     | ERJ6GEYOR00A | 1/10W 0                 | C216      | ECEA1HKA010B | 50V 1U           |           |              | SERVO SCHEMATIC DIAGRAM |
| J709     | ERJ6GEYOR00A | 1/10W 0                 | C217      | ECEA1CKA100B | 16V 10U          |           |              |                         |
| J710     | ERJ6GEYOR00A | 1/10W 0                 | C218      | ECBT1C103NS5 | 16V 0.01U        | C701      | ECEA0JKA220  | 6.3V 22U                |
|          |              |                         | C219      | ECFR1E473KR  | 25V 0.047U       | C702      | ECEA0JKS470  | 6.3V 47U                |
|          |              | CAPACITORS              | C220      | ECBT1C103NS5 | 16V 0.01U        | C703      | ECEA0JKS1011 | 6.3V 100U               |
|          |              |                         | C230      | ECFR1E153KR  | 25V 0.015U       | C709      | ECUZ1C224KBM | 16V 0.22U               |
| C1, 2    | ECBT1E103ZF  | 25V 0.01U $\Delta$      | C251      | ECBT1H104ZF5 | 50V 0.1U         | C710      | ECUZ1C104MBM | 16V 0.1U                |
| C3, 4    | ECKR1H103ZF5 | 50V 0.01U $\Delta$      | C301      | ECEA1CKA101B | 16V 100U         | C711      | ECUW1E103MBN | 25V 0.01U               |
| C5       | ECA1CM222B   | 16V 2200U               | C302      | ECEA1CKA100B | 16V 10U          | C713      | ECEA1CSN4R7I | 16V 4.7U $\Delta$       |
| C6       | ECBT1E103ZF  | 25V 0.01U               | C303      | ECFR1E103KR  | 25V 0.01U        | C714      | ECEA1HKS010  | 50V 1U                  |
| C11      | ECA1EM101B   | 25V 100U $\Delta$       | C304      | ECQG1H102KZT | 50V 1000P        | C715      | ECUE1H472KBN | 50V 4700P               |
| C12      | ECEA1HU101   | 50V 100U                | C305      | ECEA1HKA4R7B | 50V 0.47U        | C716      | ECUE1C473KBN | 16V 0.047U              |
| C13, 14  | ECBT1E103ZF  | 25V 0.01U $\Delta$      | C306      | ECEA1HKA3R3B | 50V 0.33U        | C717      | ECUE1H681KBN | 50V 680P                |
| C15      | ECEA1EN4R7S  | 25V 4.7U $\Delta$       | C307      | ECEA1HKA010B | 50V 1U           | C718      | ECEA1AKS1011 | 10V 100U                |
| C16      | ECEA1EKA4R7B | 25V 4.7U                | C309, 310 | ECFR1E153KR  | 25V 0.015U       | C719      | ECUW1E103MBN | 25V 0.01U               |
| C21      | ECEA1AKA101B | 10V 100U                | C311, 312 | ECEA1HKA3R3B | 50V 3.3U         | C720      | ECUE1E153MBN | 25V 0.015U              |
| C22      | ECBT1H102KB5 | 50V 1000P               | C314      | ECBT1H104ZF5 | 50V 0.1U         | C721      | ECUW1E103MBN | 25V 0.01U               |
| C23      | ECEA1AKA221Q | 10V 220U                | C315      | ECBT1E223ZF  | 25V 0.022U       | C722      | ECEA0JKS470  | 6.3V 47U                |
| C31      | ECEA1AKA101B | 10V 100U                | C321, 322 | ECFR1E682KR  | 25V 6800P        | C723      | ECUZ1C104MBM | 16V 0.1U                |
| C32      | ECBT1H102KB5 | 50V 1000P               | C323-326  | ECEA1HKA3R3B | 50V 3.3U         | C724      | ECUW1E333MBN | 25V 0.033U              |
| C33      | ECEA0JKA221B | 6.3V 220U               | C327      | ECEA1AKA330B | 10V 33U          | C725      | ECUW1E103MBN | 25V 0.01U               |

