



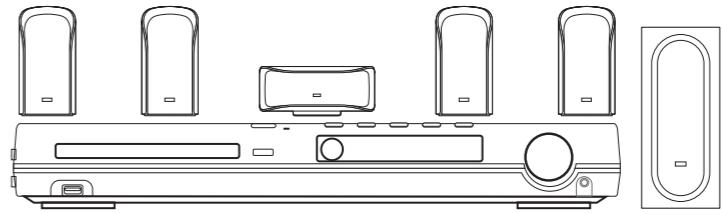
SERVICE MANUAL

DVD/CD RECEIVER SERVICE MANUAL



LG Electronics Inc.

MODEL : LH-T552SB LHS-55SBC, LHS-55SBS, LHS-55SBW



**MODEL : LH-T552SB
LHS-55SBC, LHS-55SBS,
LHS-55SBW**

LG Electronics Inc.

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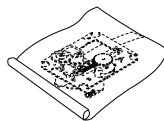
SECTION 1. GENERAL

SERVICING PRECAUTIONS NOTES REGARDING HANDLING OF THE PICK-UP

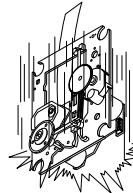
1. Notes for transport and storage

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

Storage in conductive bag

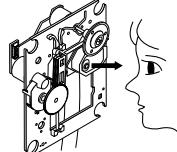


Drop impact



2. Repair notes

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

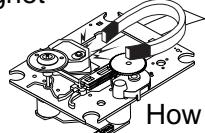


NEVER look directly at the laser beam, and don't let contact fingers or other exposed skin.

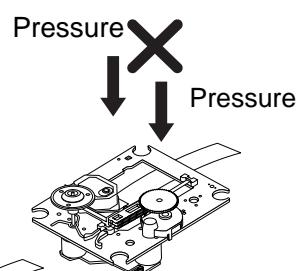
5) Cleaning the lens surface

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

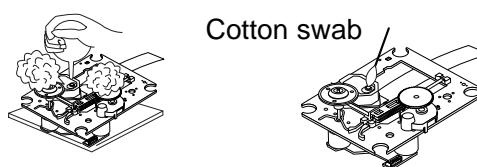
Magnet



How to hold the pick-up



Cotton swab



Conductive Sheet

6) Never attempt to disassemble the pick-up.

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

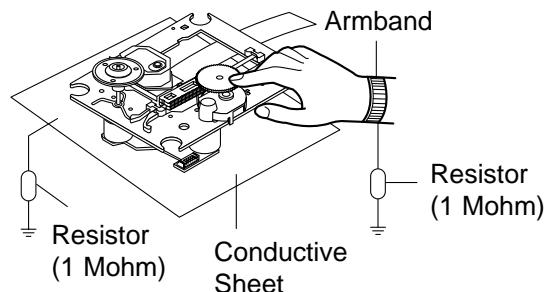
NOTES REGARDING COMPACT DISC PLAYER REPAIRS

1. Preparations

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

2. Notes for repair

- 1) Before replacing a component part, first disconnect the power supply lead wire from the unit
- 2) All equipment, measuring instruments and tools must be grounded.
- 3) The workbench should be covered with a conductive sheet and grounded.
When removing the laser pick-up from its conductive bag, do not place the pick-up on the bag. (This is because there is the possibility of damage by static electricity.)
- 4) To prevent AC leakage, the metal part of the soldering iron should be grounded.
- 5) Workers should be grounded by an armband ($1M\ \Omega$)
- 6) Care should be taken not to permit the laser pick-up to come in contact with clothing, in order to prevent static electricity changes in the clothing to escape from the armband.
- 7) The laser beam from the pick-up should NEVER be directly facing the eyes or bare skin.



ESD PRECAUTIONS

Electrostatically Sensitive Devices (ESD)

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

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

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

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

CAUTION. GRAPHIC SYMBOLS

	THE LIGHTNING FLASH WITH A PROWHEAD SYMBOL, WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.
	THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

SPECIFICATIONS

GENERAL

Power supply	Refer to main label
Power consumption	Refer to main label
Weight	3.9 kg
External dimensions (W x H x D)	430 x 54 x 350 mm
Operating conditions Temperature:	5°C to 35°C, Operation status: Horizontal
Operating humidity	5% to 85%

CD/DVD

Laser	Semiconductor laser, wavelength 650 nm
Signal system	PAL 625/50, NTSC 525/60
Frequency response (audio)	200 Hz to 20 kHz
Signal-to-noise ratio (audio)	More than 75 dB (1 kHz, NOP, 20 kHz LPF/A-Filter)
Dynamic range (audio)	More than 70 dB
Harmonic distortion (audio)	0.5 % (1 kHz, at 12W position) (20 kHz LPF/A-Filter)

VIDEO

Video input	1.0 V (p-p), 75 Ω, negative sync., RCA jack x 1
Video output	1.0 V (p-p), 75 Ω, negative sync., RCA jack x 1
S-video output	(Y) 1.0 V (p-p), 75 Ω, negative sync., Mini DIN 4-pin x 1 (C) 0.3 V (p-p), 75 Ω
Component Video output	(Y) 1.0 V (p-p), 75 Ω, negative sync., RCA jack x 1 (Pb)/(Pr) 0.7 V (p-p), 75 Ω, RCA jack x 1

TUNER

FM

Tuning Range	87.5 - 108.0 MHz or 65.0 - 74.0 MHz, 87.5 - 108.0 MHz
Intermediate Frequency	10.7 MHz
Signal-to Noise Ratio	60 dB (Mono)
Frequency Response	140 - 10,000 Hz

AM [MW]

Tuning Range	522 - 1,620 kHz or 520 - 1,720 kHz
Intermediate Frequency	450 kHz

AMPLIFIER

Stereo mode	70W + 70W (8Ω at 1 kHz, THD 10 %)
Surround mode	Front: 70W + 70W (THD 10 %)
(* Depending on the sound mode settings and the source, there may be no sound output.)	Center*: 70W
Input	Surround*: 70W + 70W (8Ω at 1 kHz, THD 10 %)
Outputs	Subwoofer*: 150W (4Ω at 30 Hz, THD 10 %) AV IN S-VIDEO, MONITOR, PHONES: (32 Ω, 10.V)

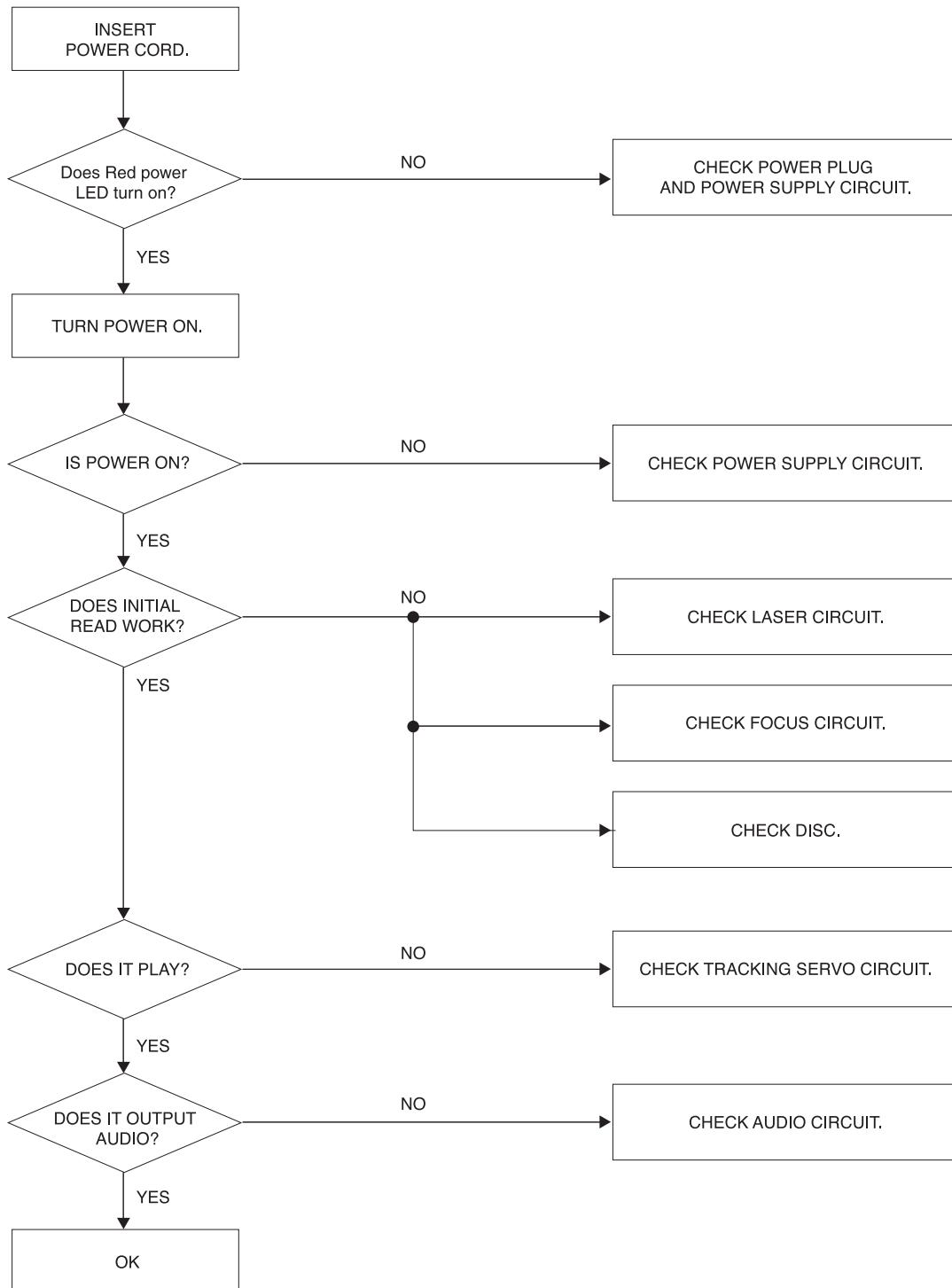
SPEAKERS

Type	Front Speaker	Center Speaker	Subwoofer
Impedance	1 Way 1 Speaker	1 Way 1 Speaker	1 Way 1 Speaker
Frequency Response	8 Ω	8 Ω	4 Ω
Sound Pressure Level	110 - 20,000 Hz	110 - 20,000 Hz	40 - 1,500 Hz
Rated Input Power	82 dB/W (1m)	82 dB/W (1m)	82 dB/W (1m)
Max. Input Power	70W	70W	150W
Net Dimensions	140x222x153 mm	140W	300W
Net Weight	1.0 kg	300x116x91 mm	195x402x360 mm
	0.95 kg	1.0 kg	5.6 kg

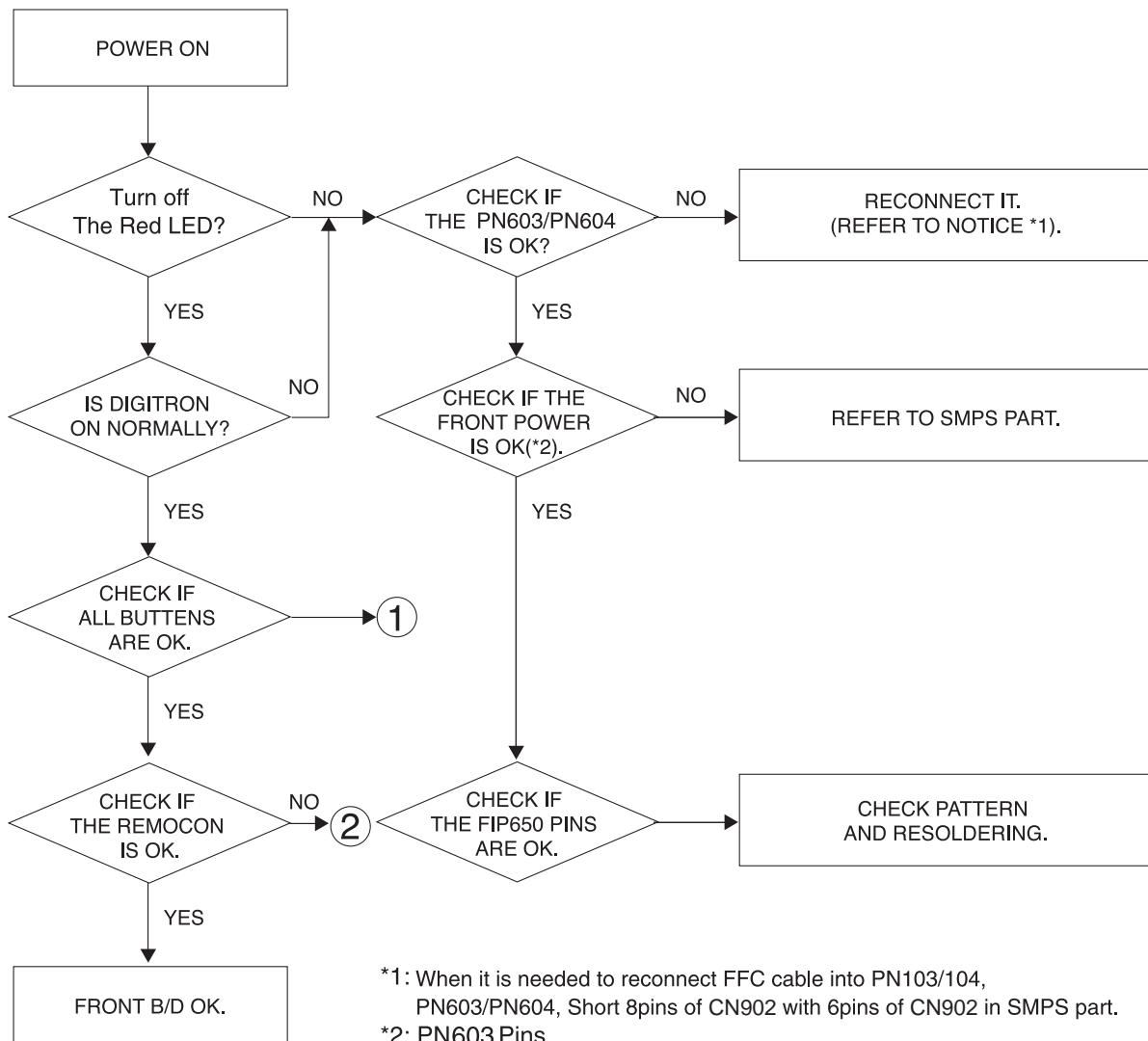
SECTION 2. AUDIO PART

AUDIO TROUBLESHOOTING GUIDE

1. POWER SUPPLY CIRCUIT



2. FRONT CIRCUIT (1/2)

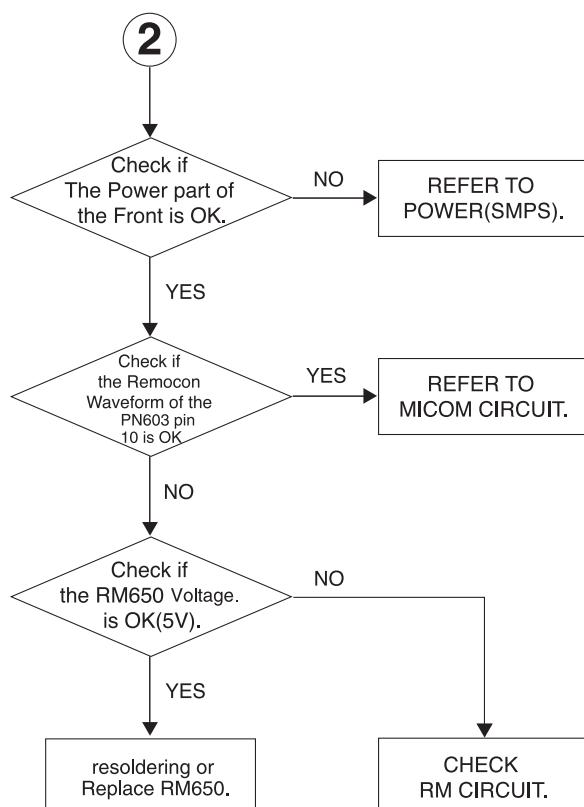
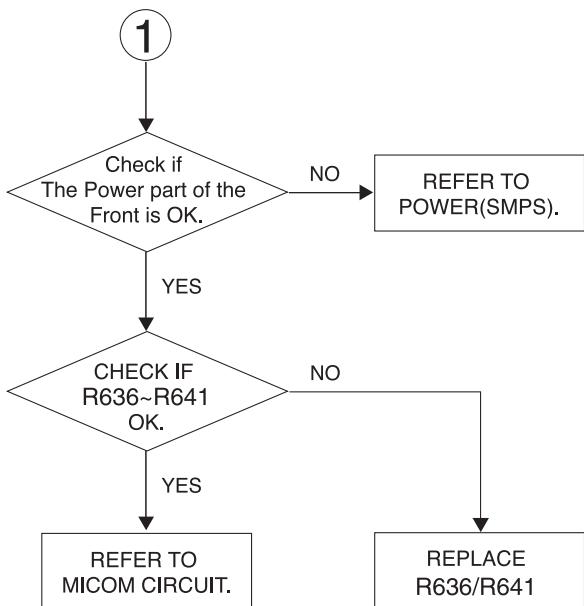


*1: When it is needed to reconnect FFC cable into PN103/104,
PN603/PN604, Short 8pins of CN902 with 6pins of CN902 in SMPS part.

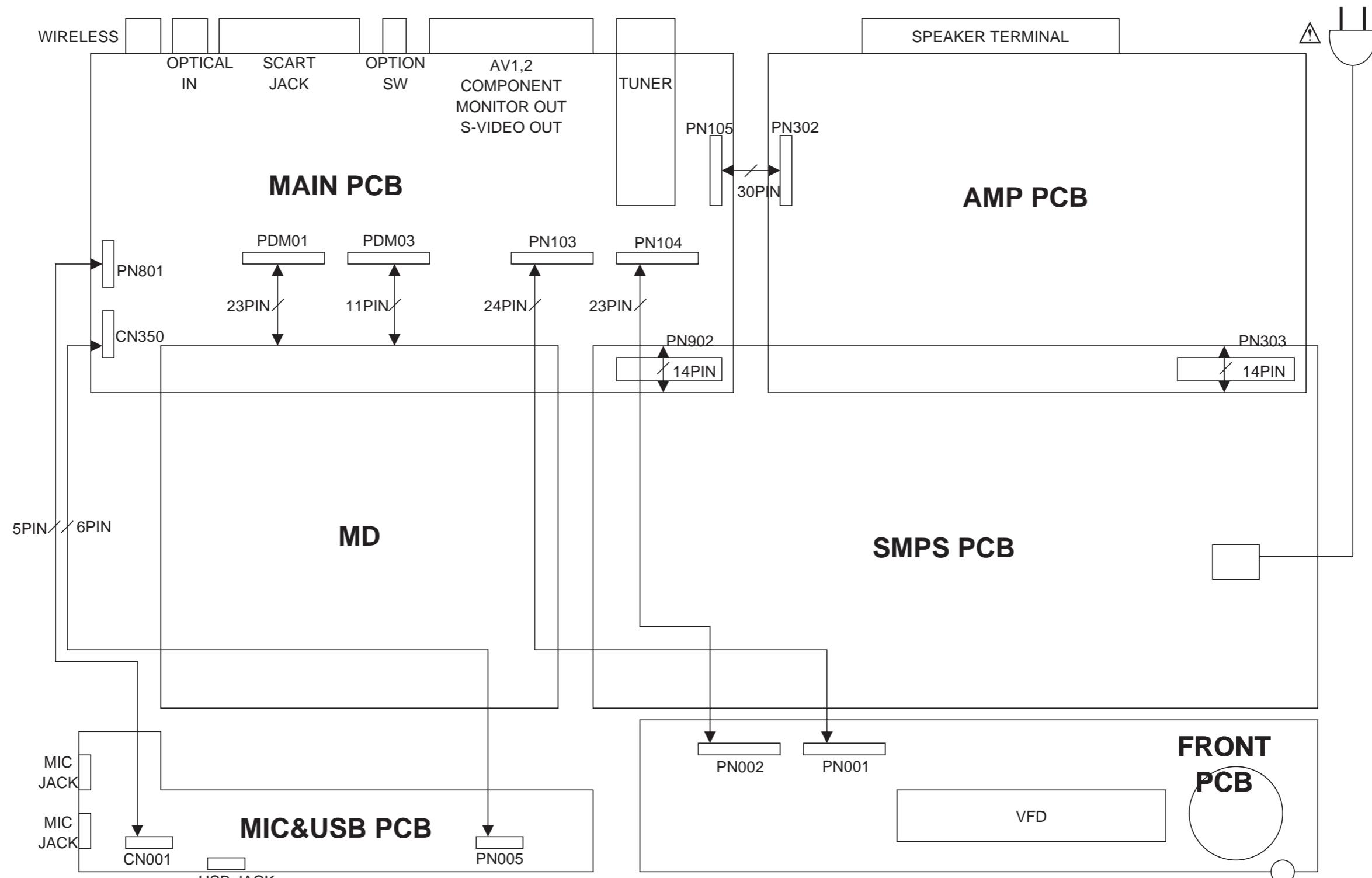
*2: PN603 Pins.

PIN1	:	-32.4	VKK
PIN3	:	-27.5	FL-
PIN4	:	-23.7	FL+
PIN9	:	+5.0	

3. FRONT CIRCUIT (2/2)

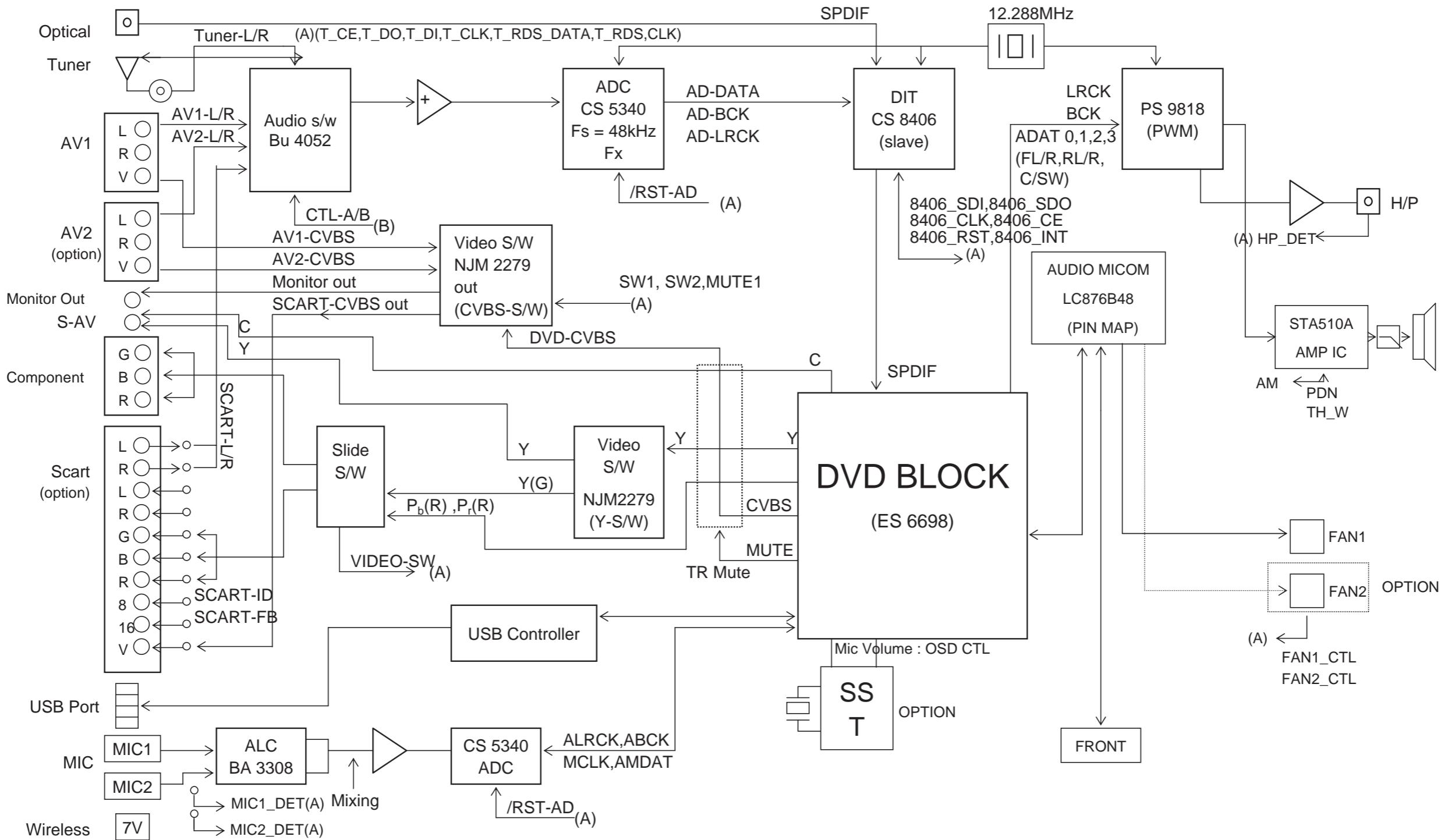


WIRING DIAGRAM



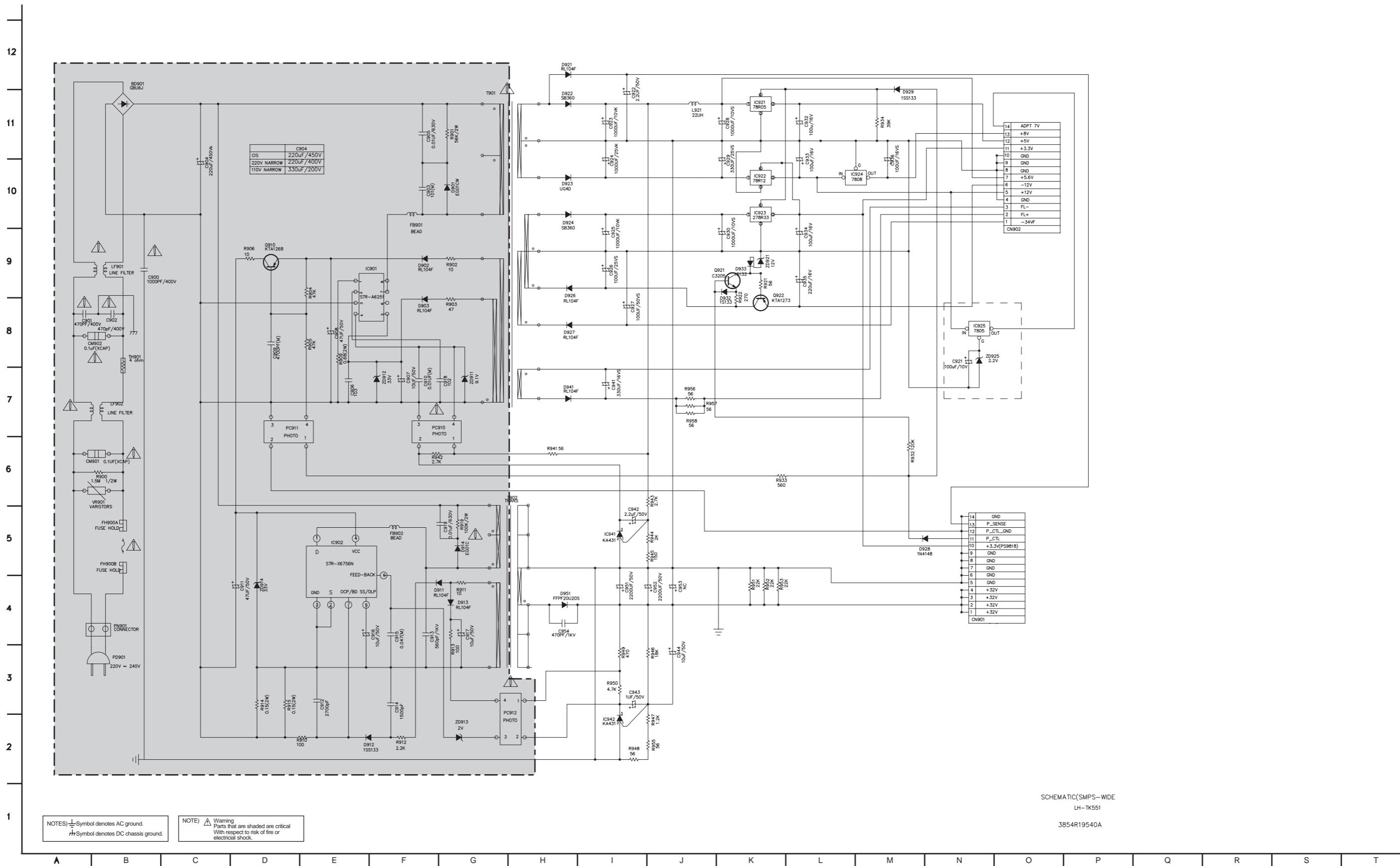
NOTES) Warning
Parts that are shaded are critical
With respect to risk of fire or
electrical shock.

BLOCK DIAGRAM

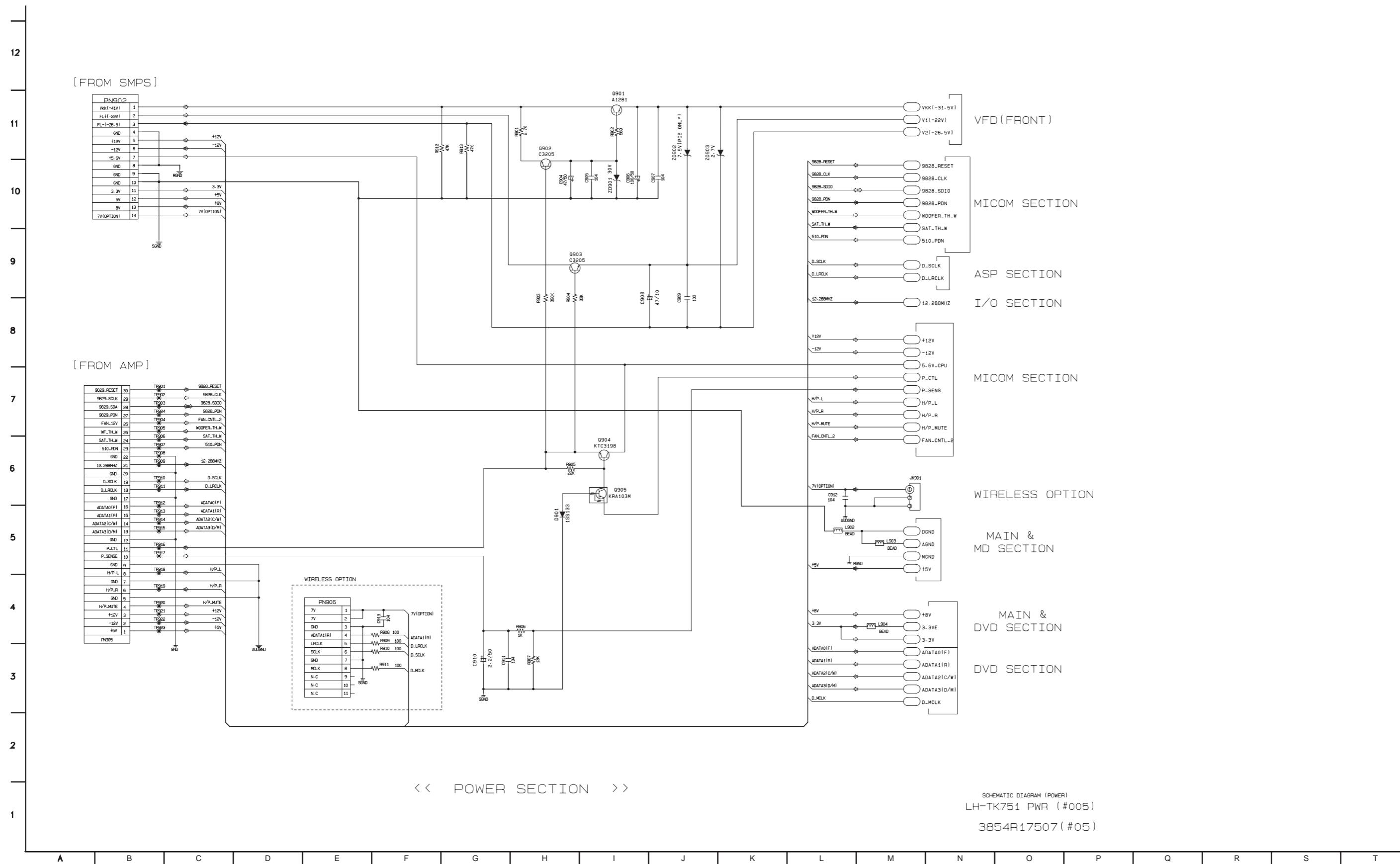


SCHEMATIC DIAGRAMS

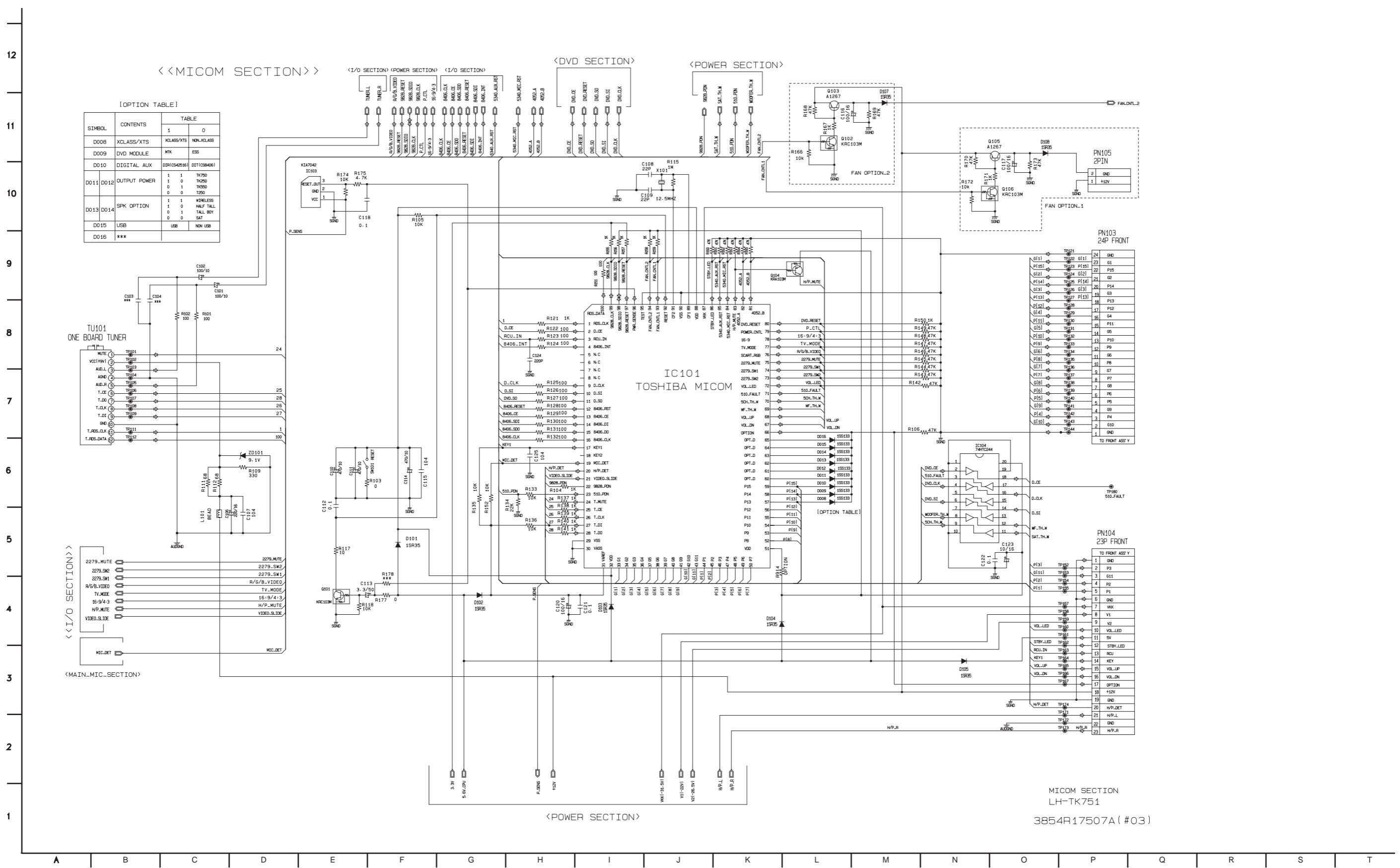
1. POWER SCHEMATIC DIAGRAM_1



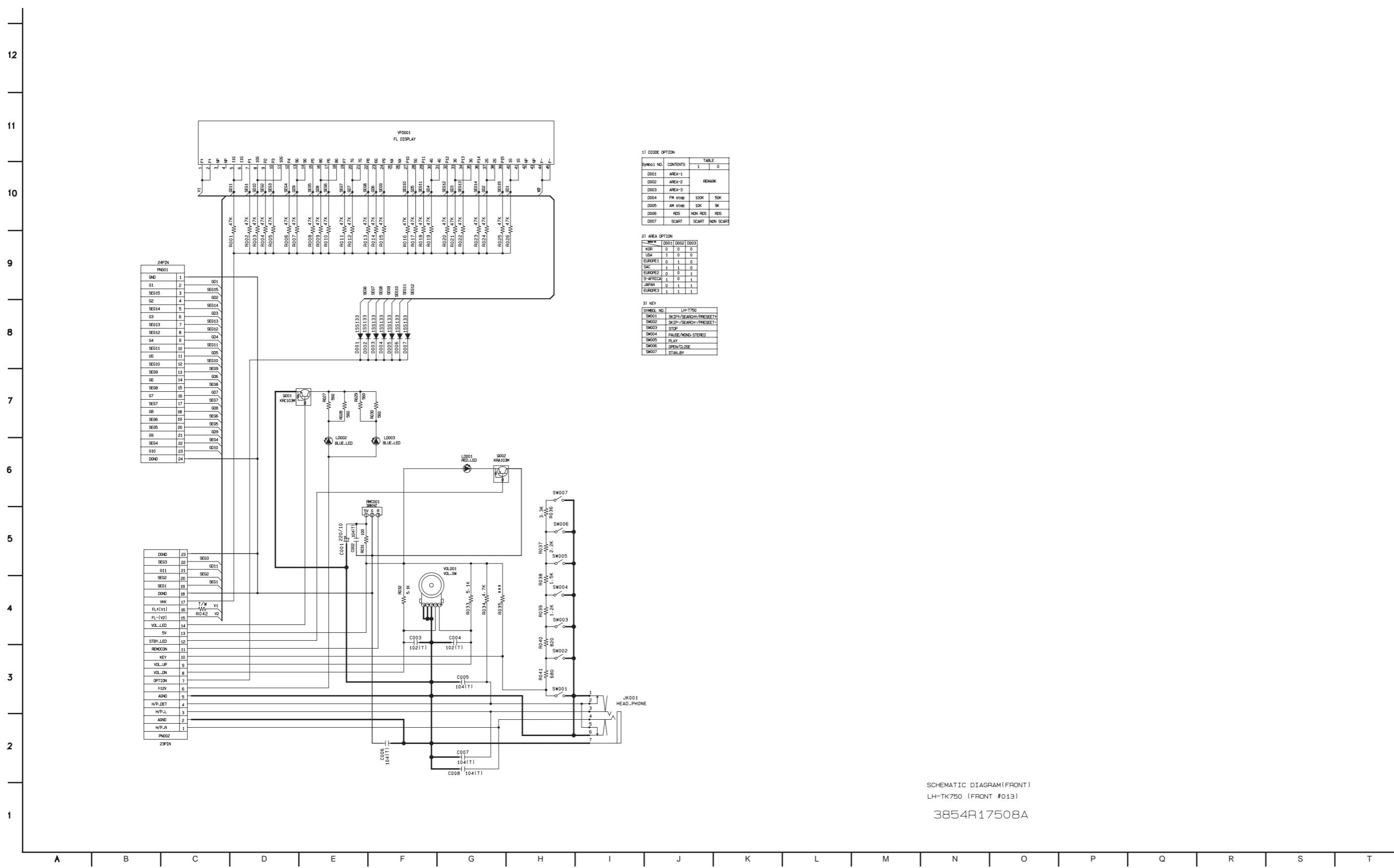
2. POWER SCHEMATIC DIAGRAM_2



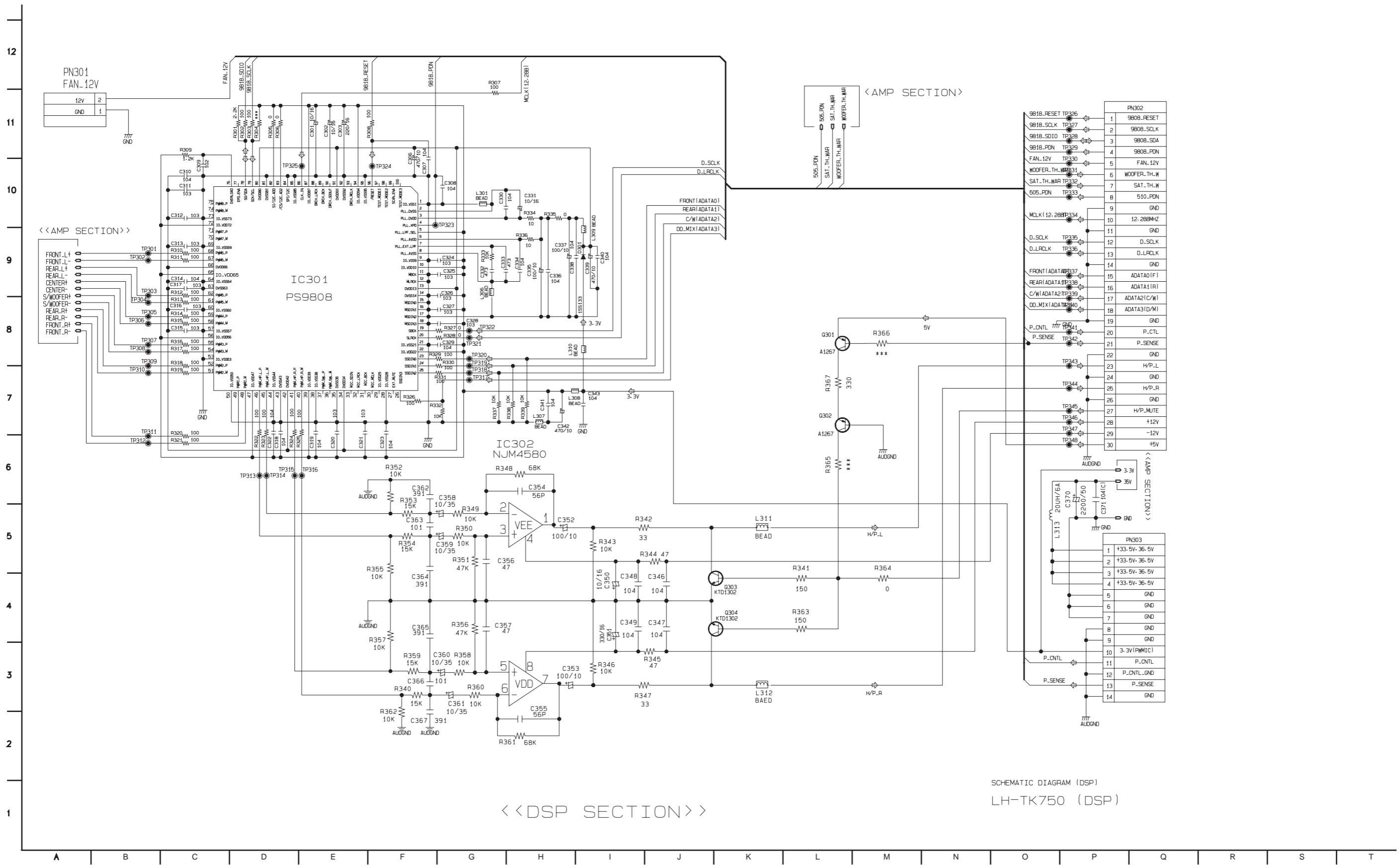
3. MICOM SCHEMATIC DIAGRAM



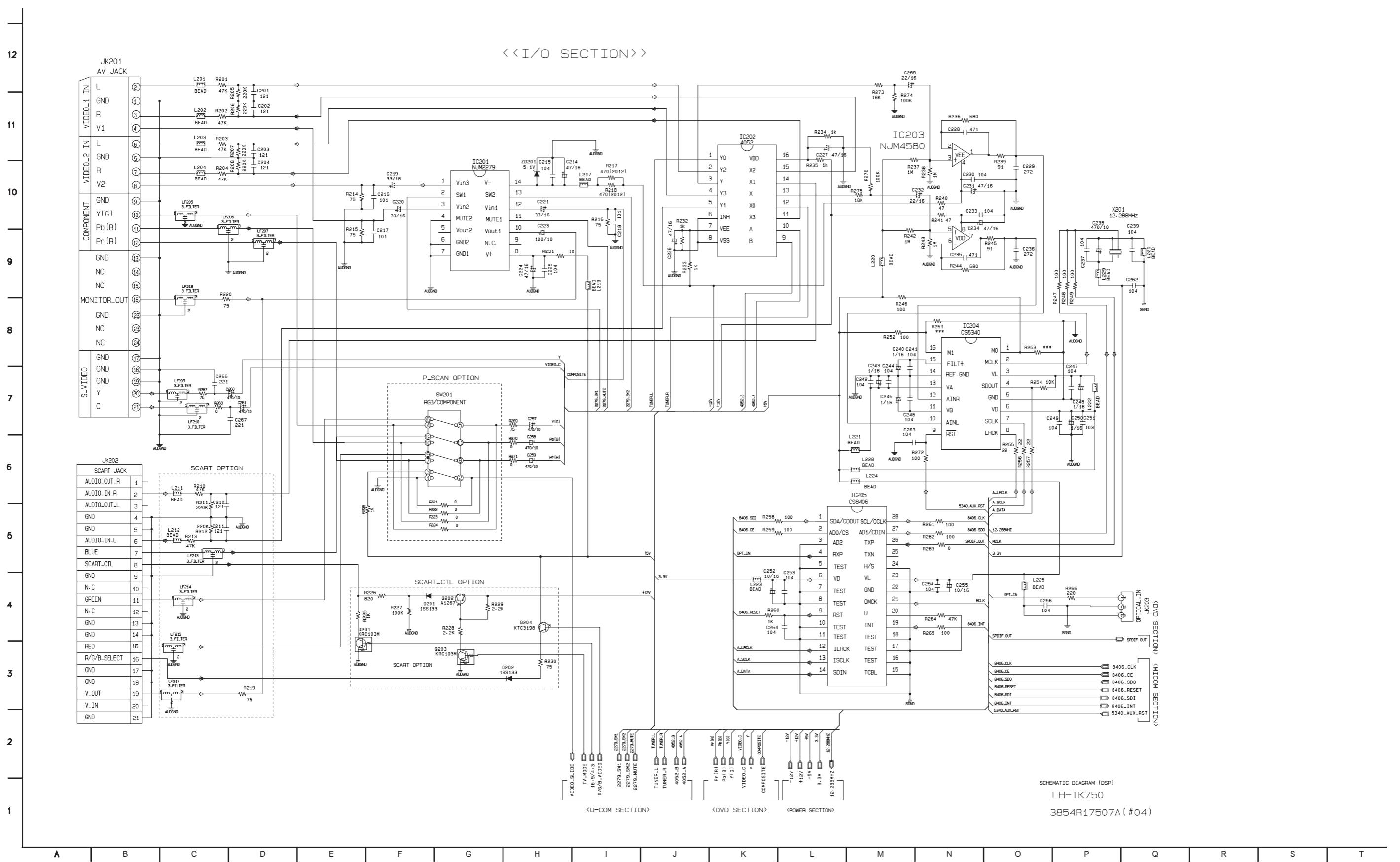
4. FRONT SCHEMATIC DIAGRAM



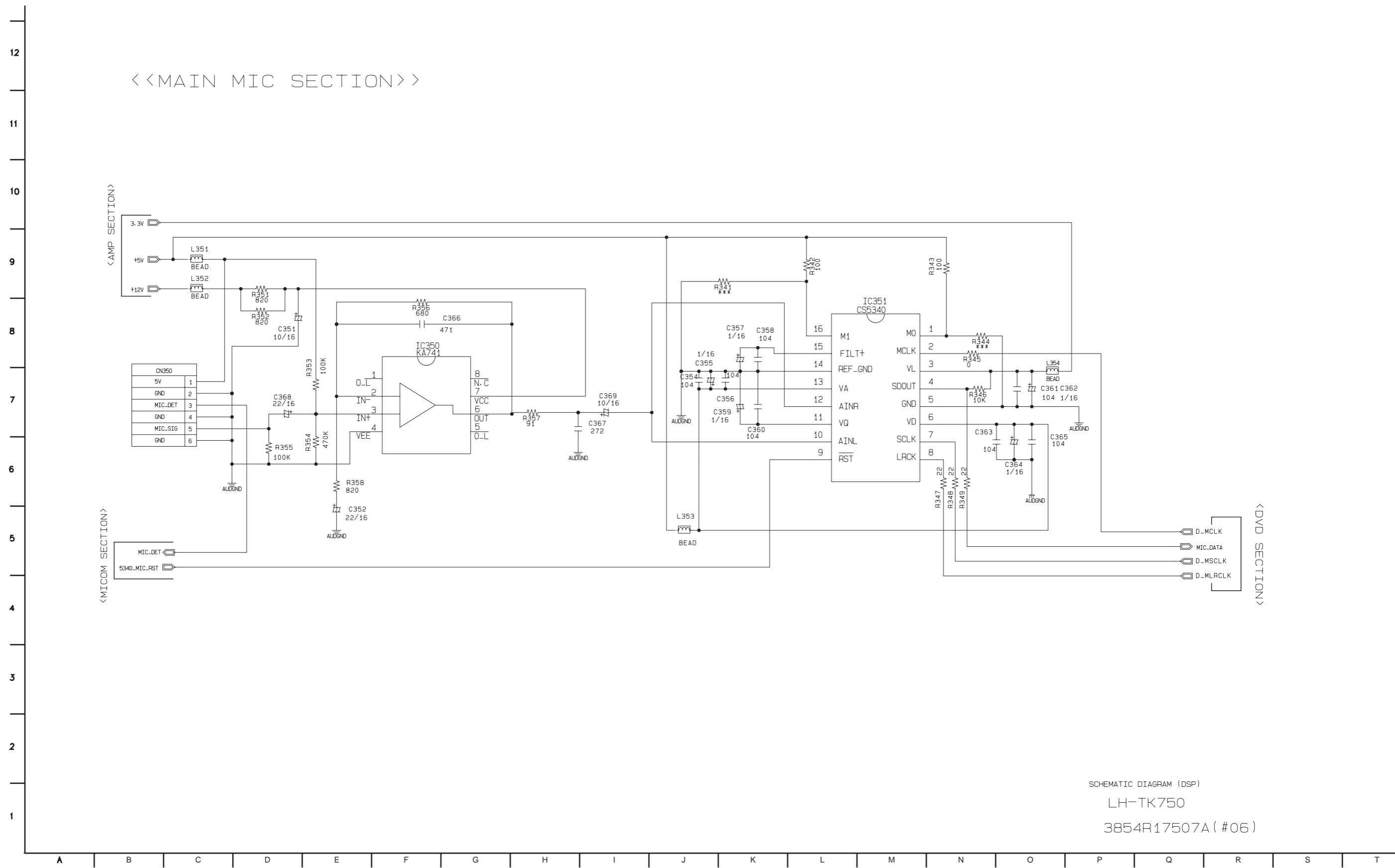
5. DSP& SCHEMATIC DIAGRAM



6. I/O SCHEMATIC DIAGRAM

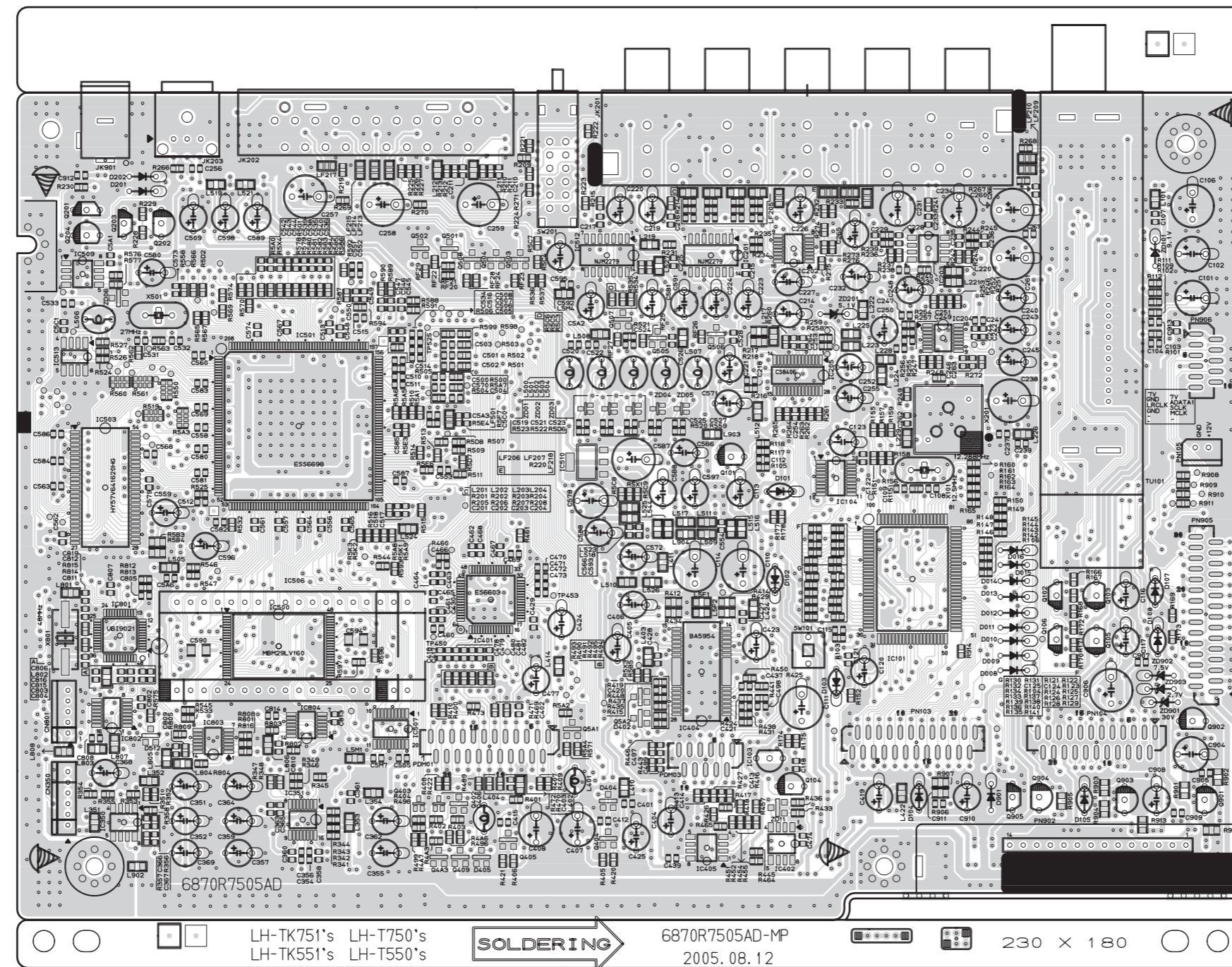


7. MAIN MIC SCHEMATIC DIAGRAM

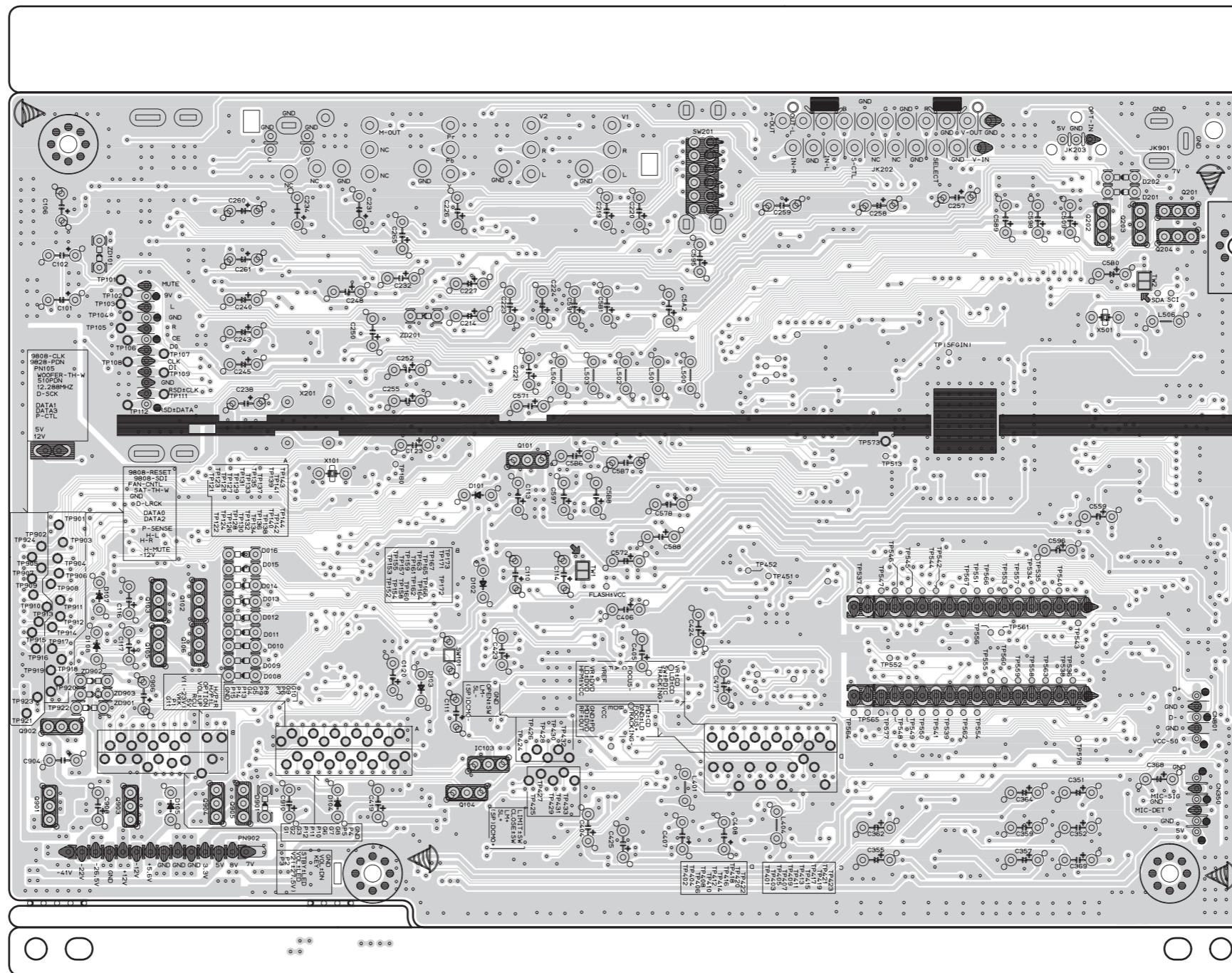


PRINTED CIRCUIT BOARD DIAGRAMS

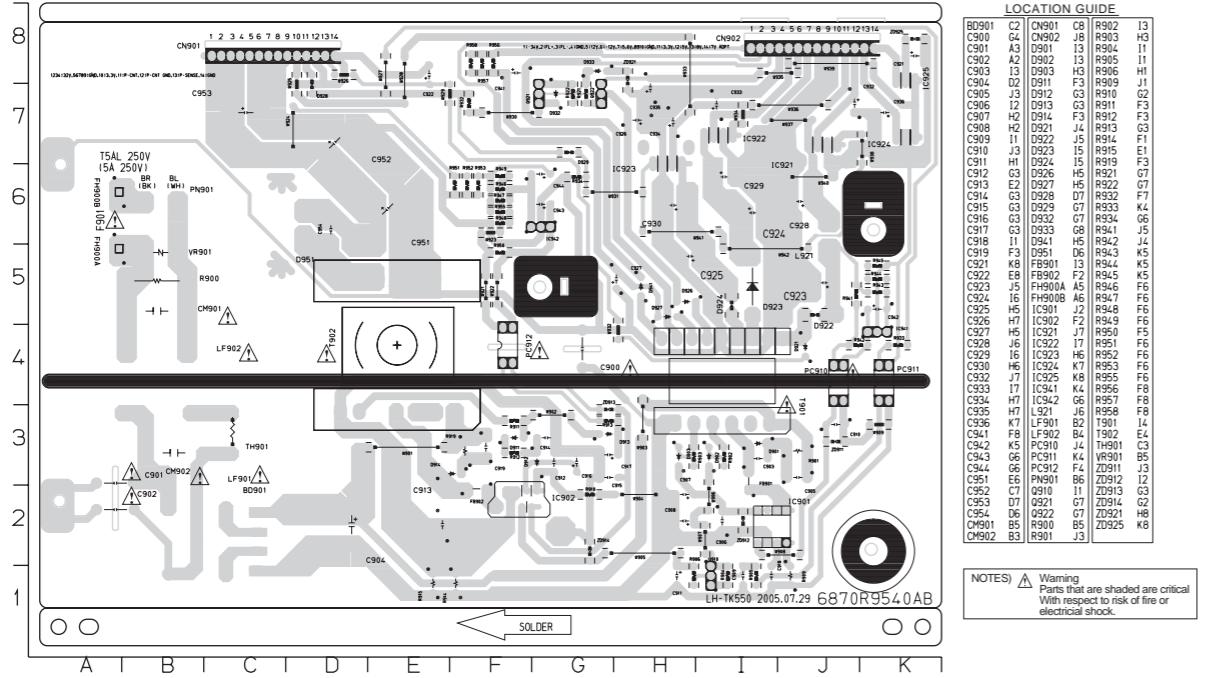
1. MAIN/DVD P.C. BOARD DIAGRAM (TOP VIEW)



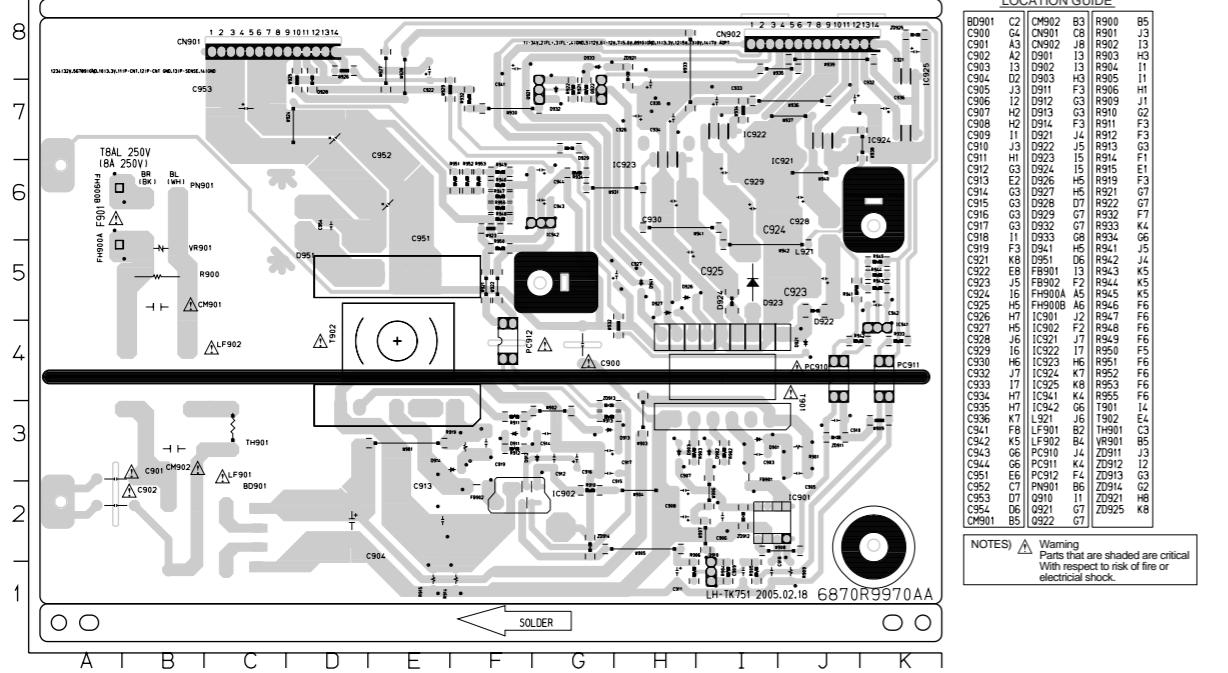
2. MAIN/DVD P.C. BOARD DIAGRAM (BOTTOM VIEW)



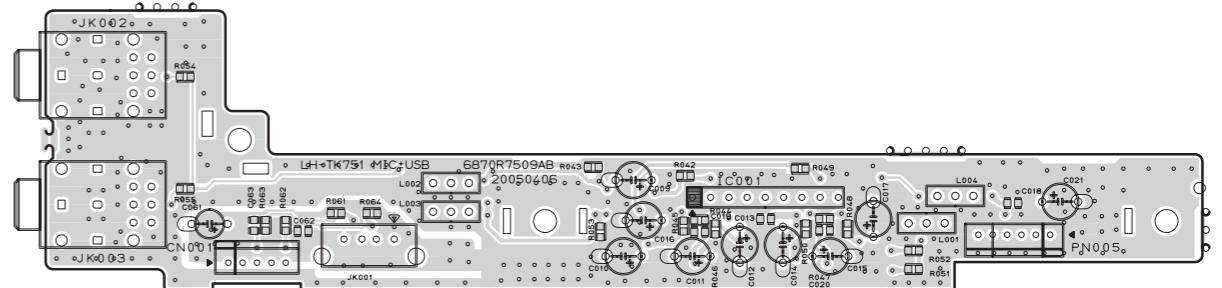
4. SMPS P.C. BOARD (5 TOOL)



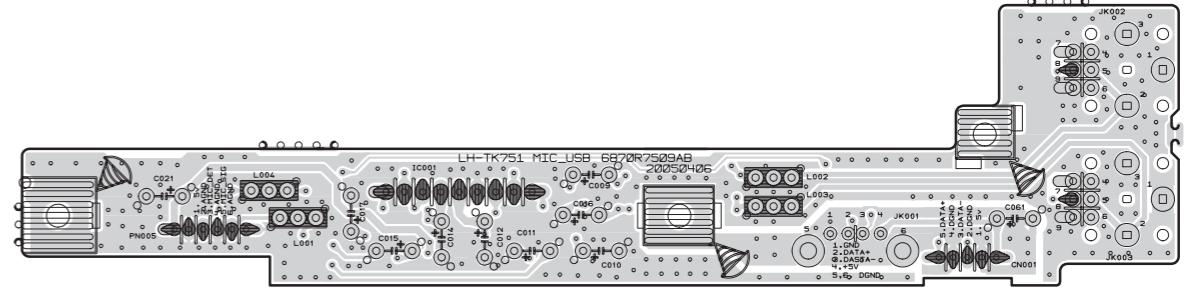
(7 TOOL)



5. JACK P.C. BOARD (TOP VIEW)

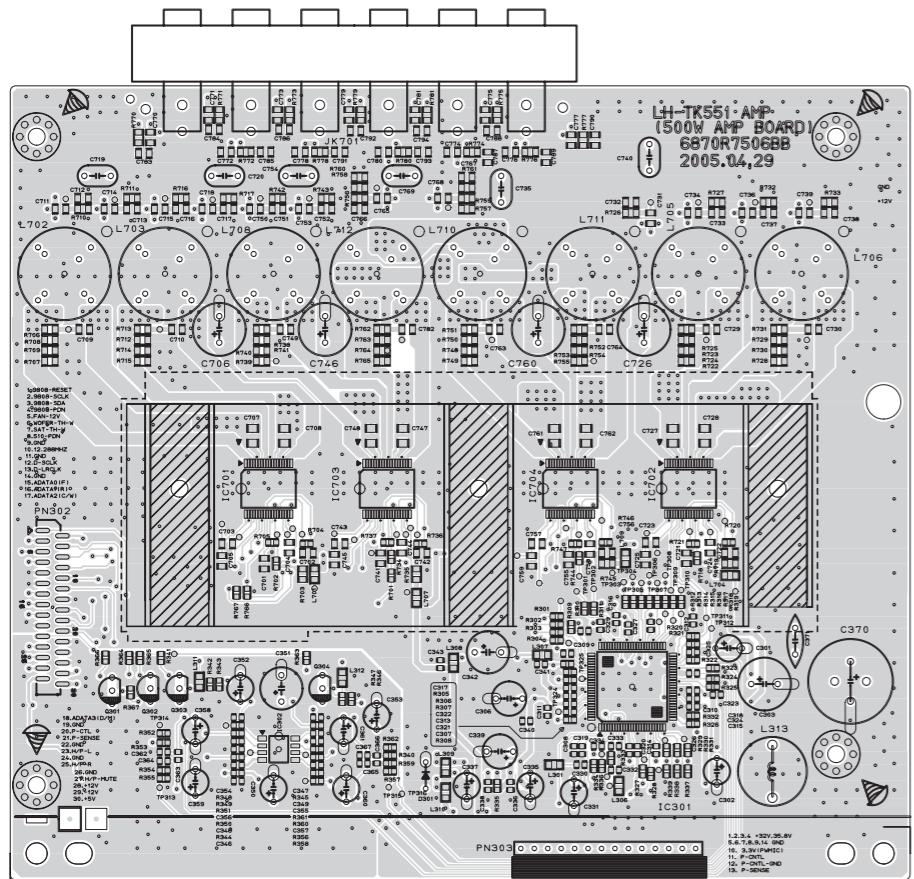


(BOTTOM VIEW)

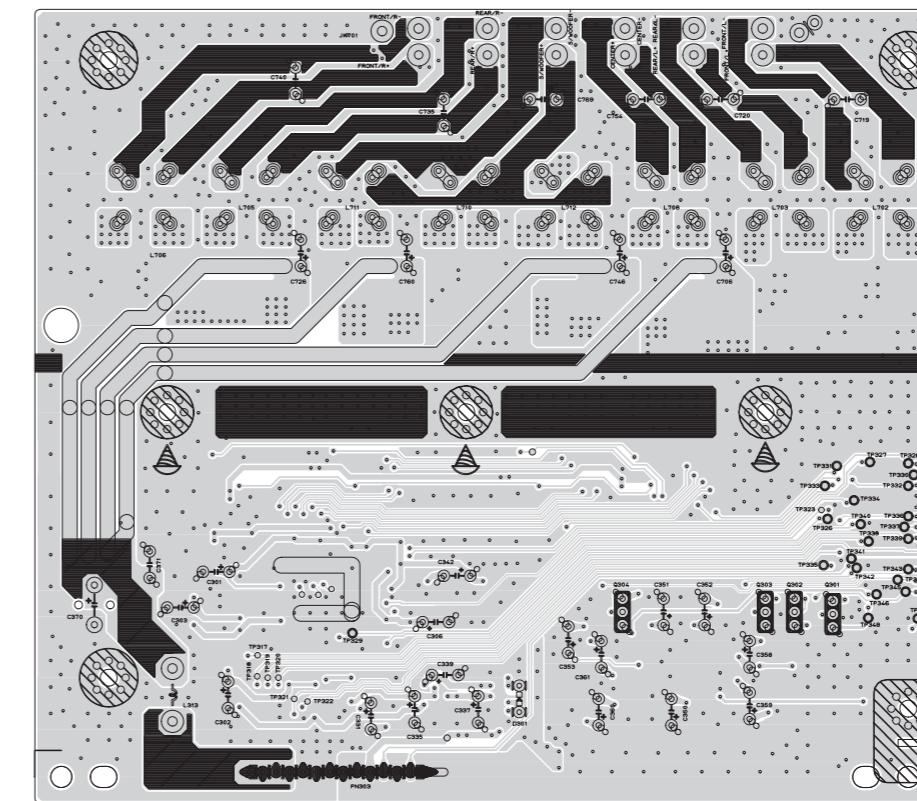


6. AMP P.C. BOARD

(TOP VIEW)



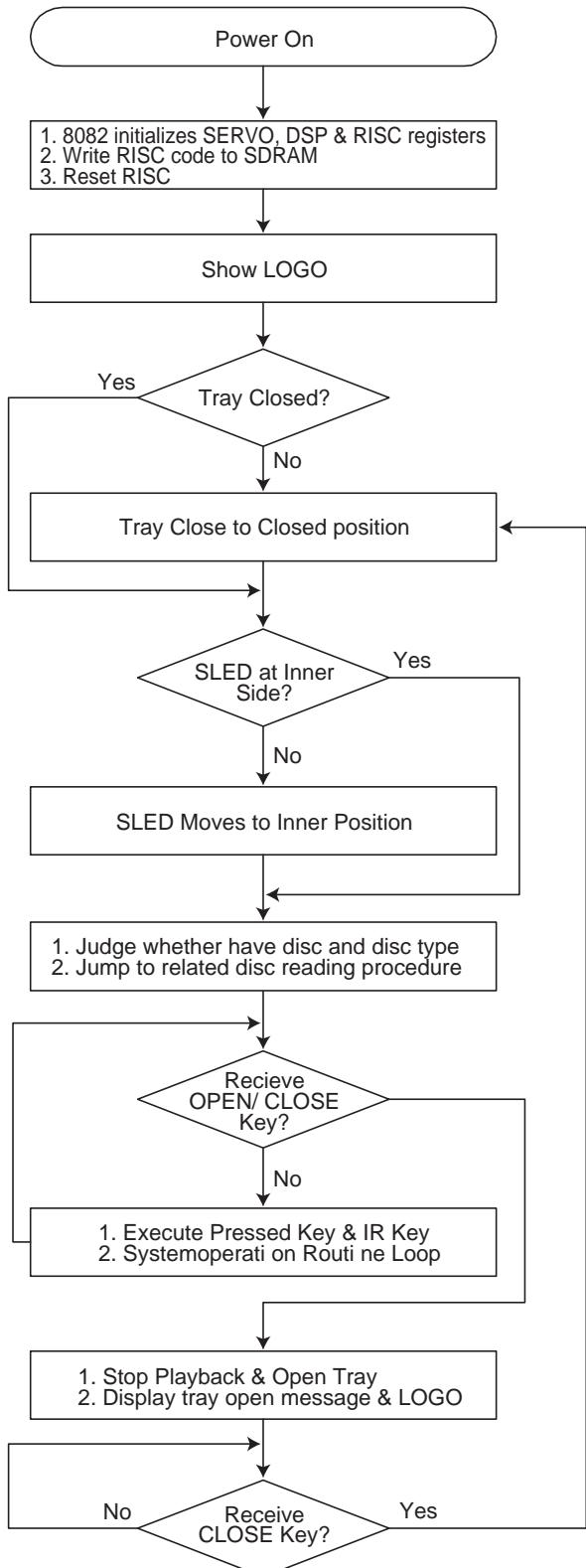
(BOTTOM VIEW)



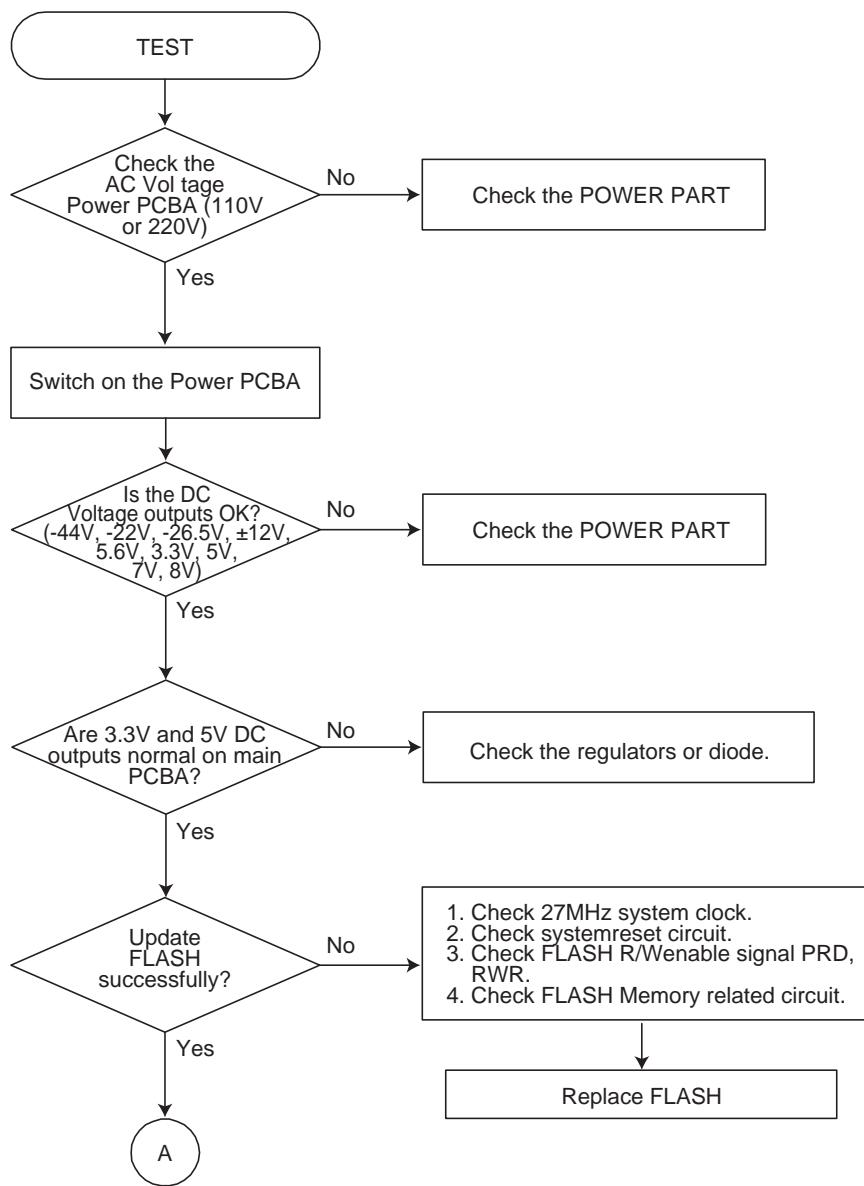
SECTION 3. DVD & AMP PART

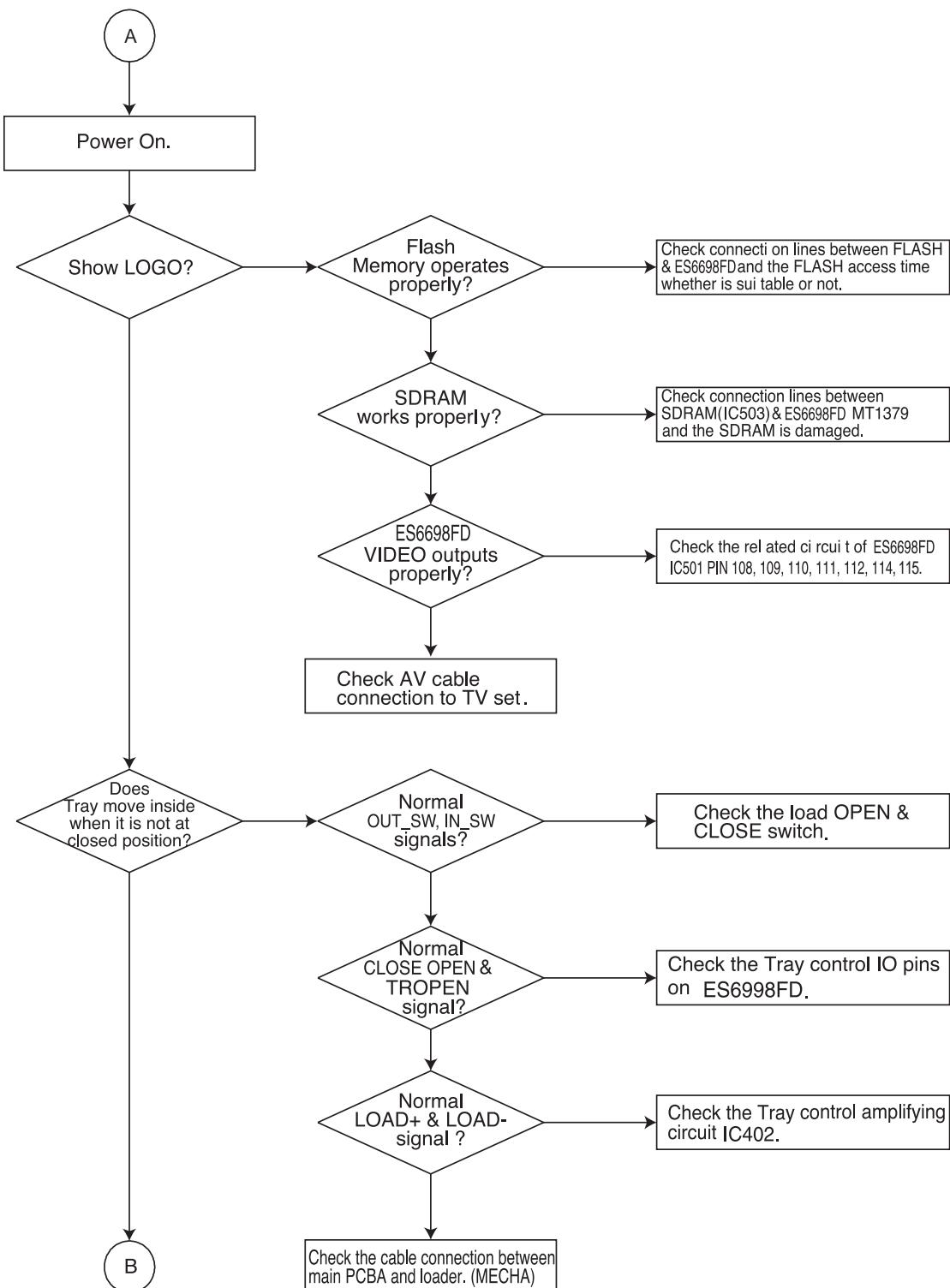
ELECTRICAL TROUBLESHOOTING GUIDE

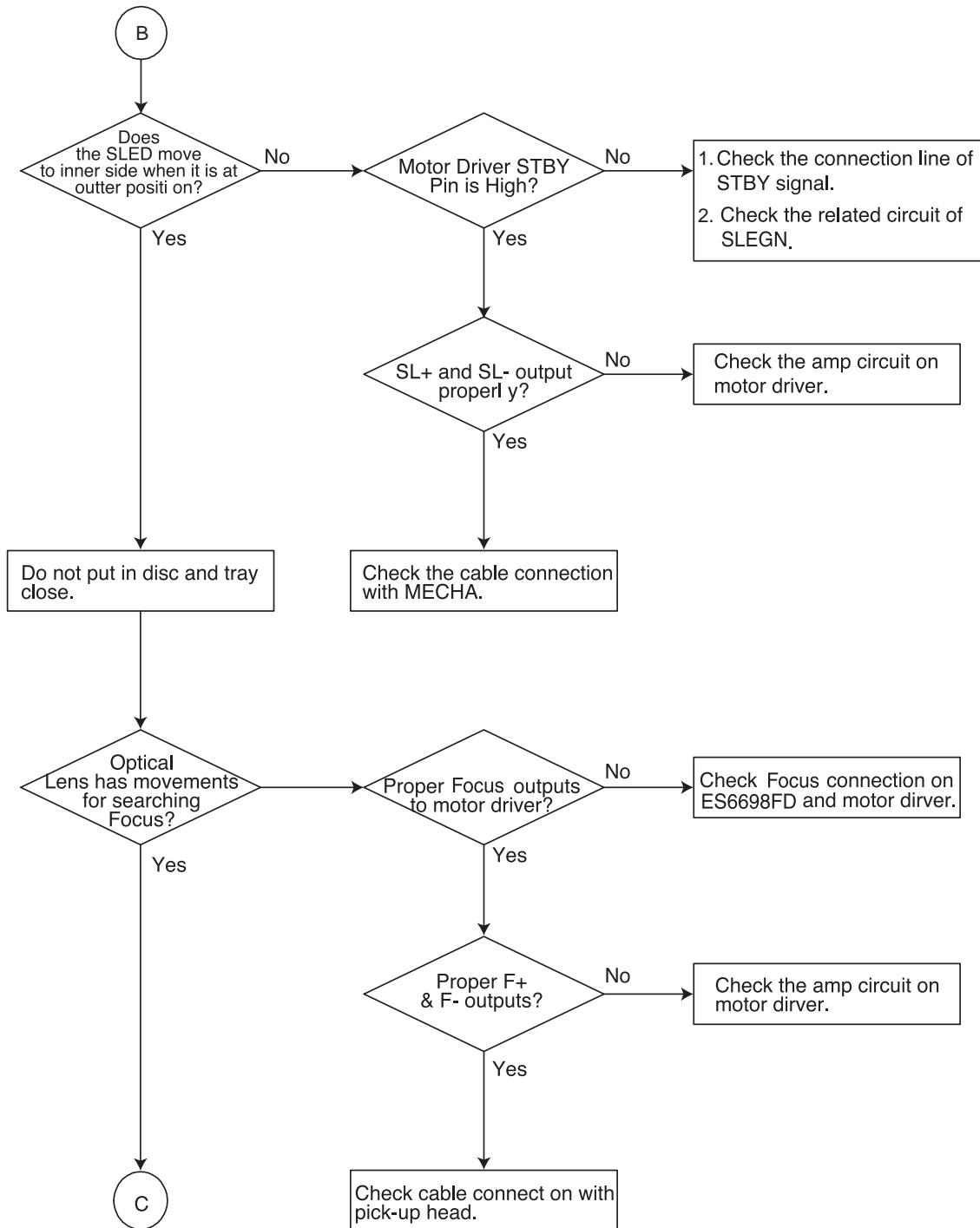
1. System operation flow

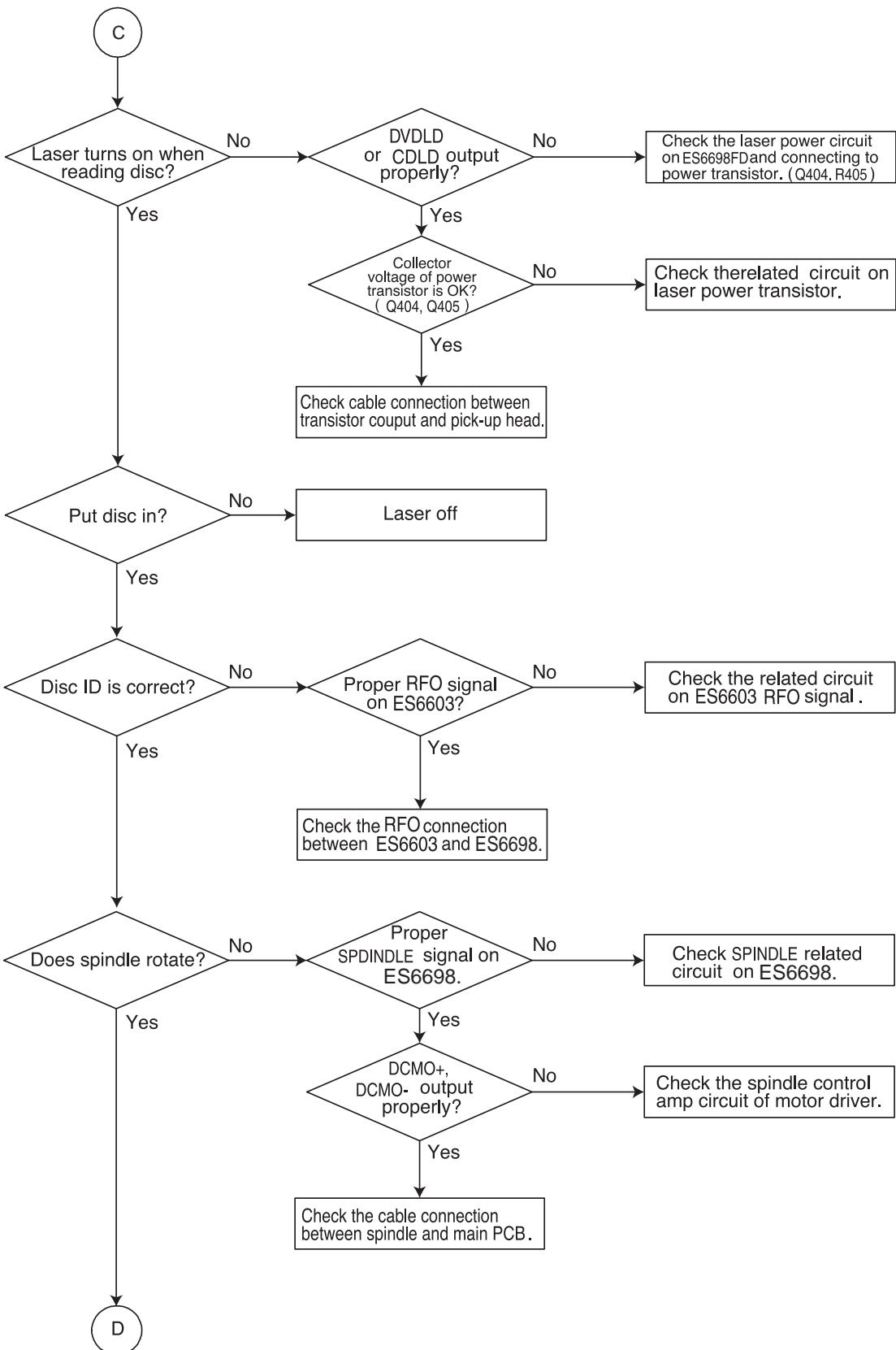


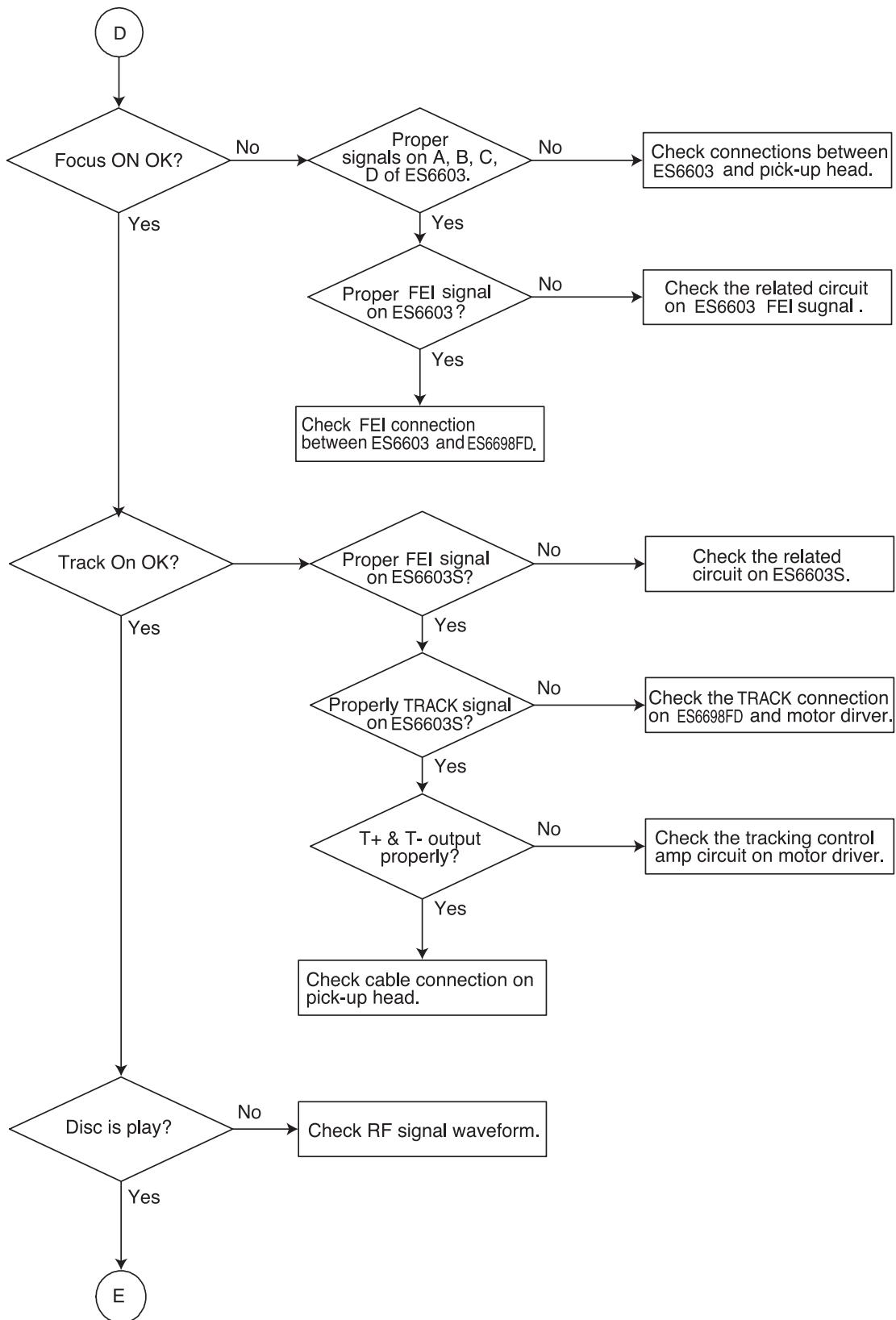
2. Test & debug flow

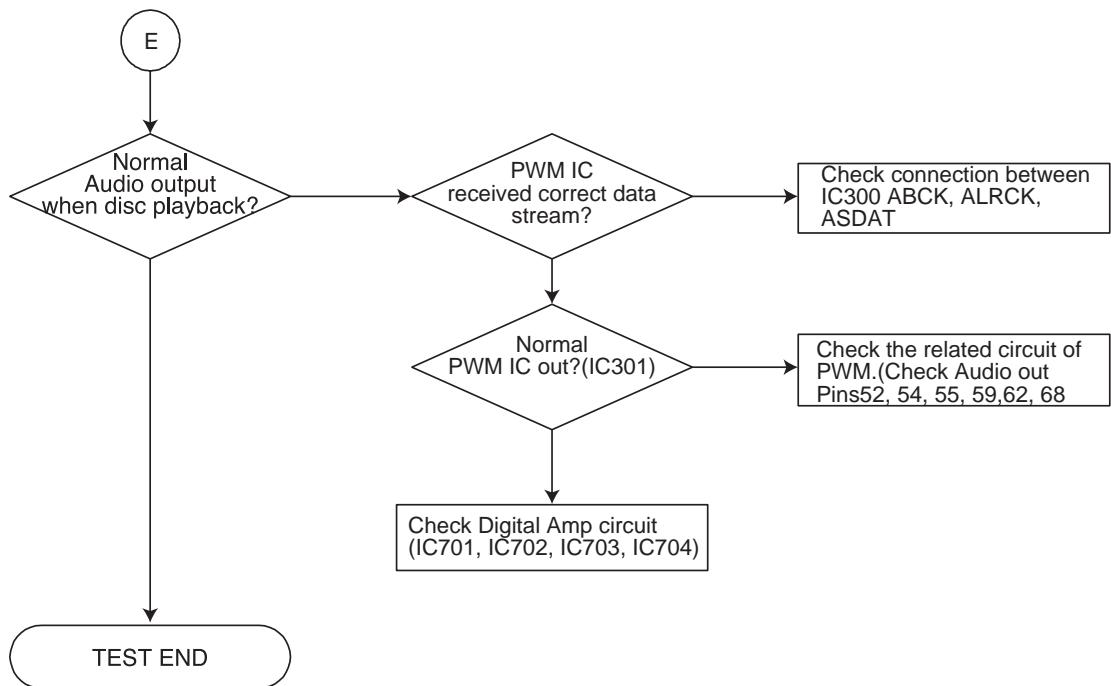




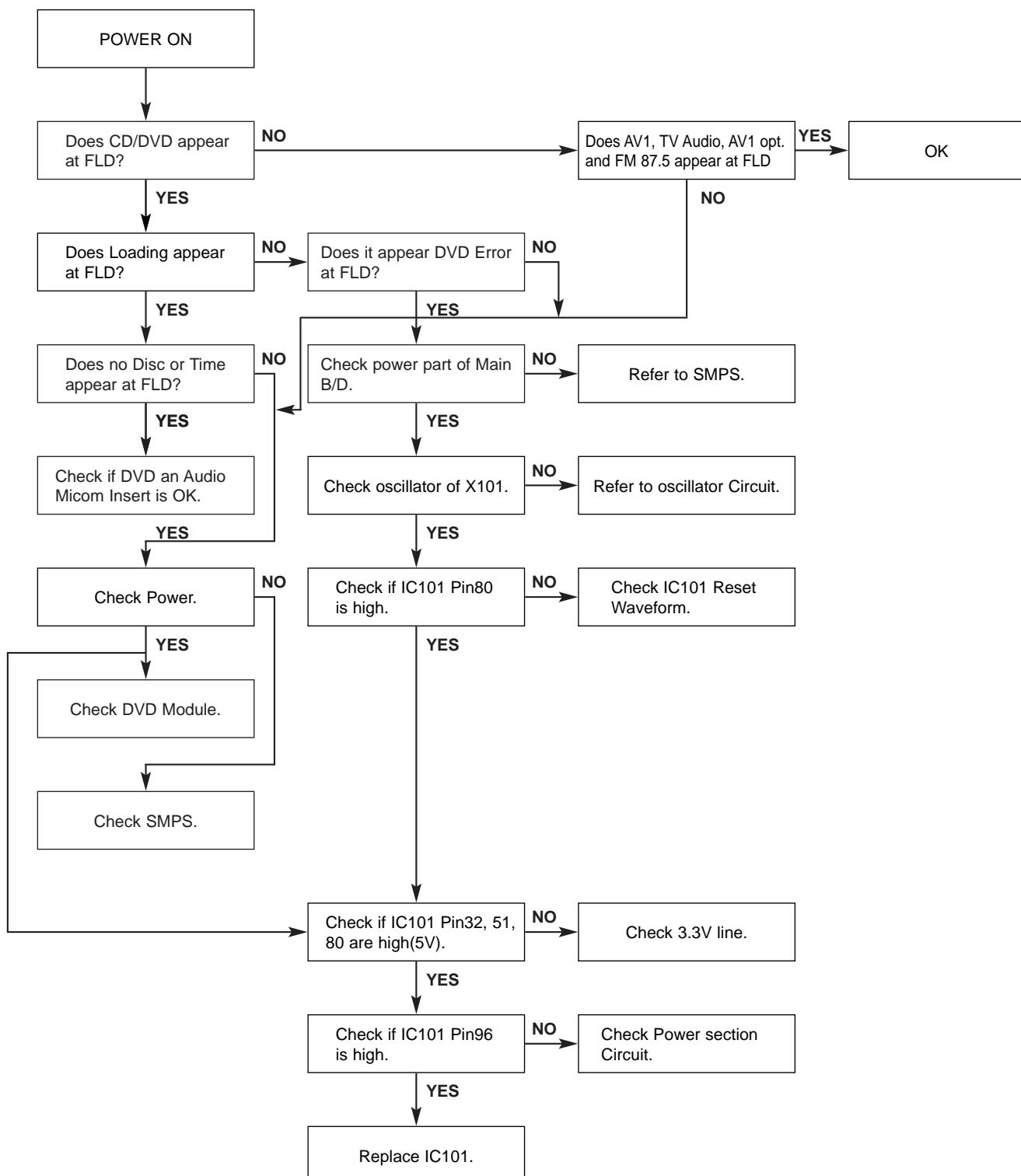








3. AUDIO µ-COM Circuit(DVD & AMP)



DETAILS AND WAVEFORMS ON SYSTEM TEST AND DEBUGGING

1. SYSTEM 27MHz CLOCK,RESET,FLASH R/W SIGNAL

1) ES6698FD main clock is at 27MHz(X501)

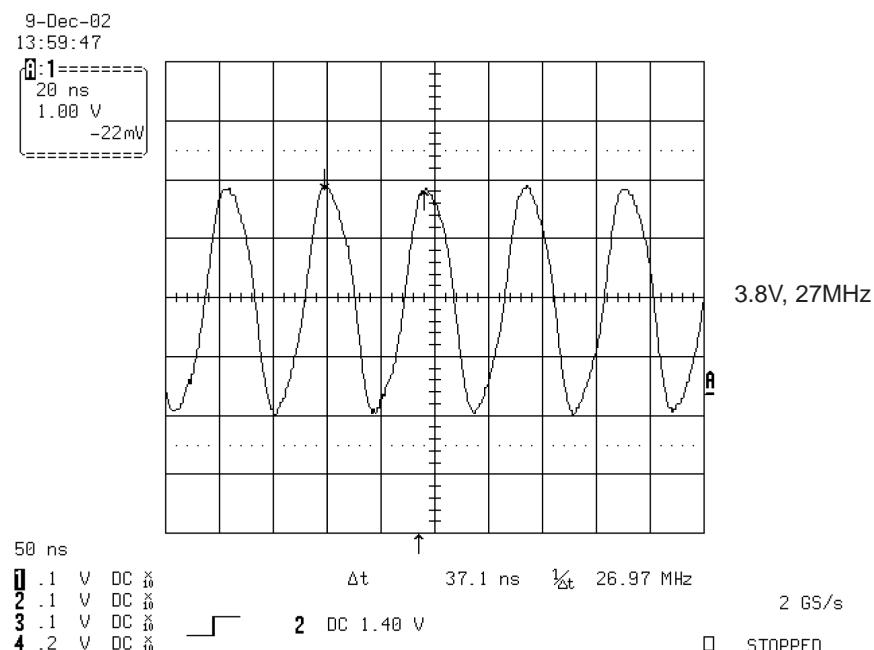


FIG 1-1

2) ES6698FD reset is high active.

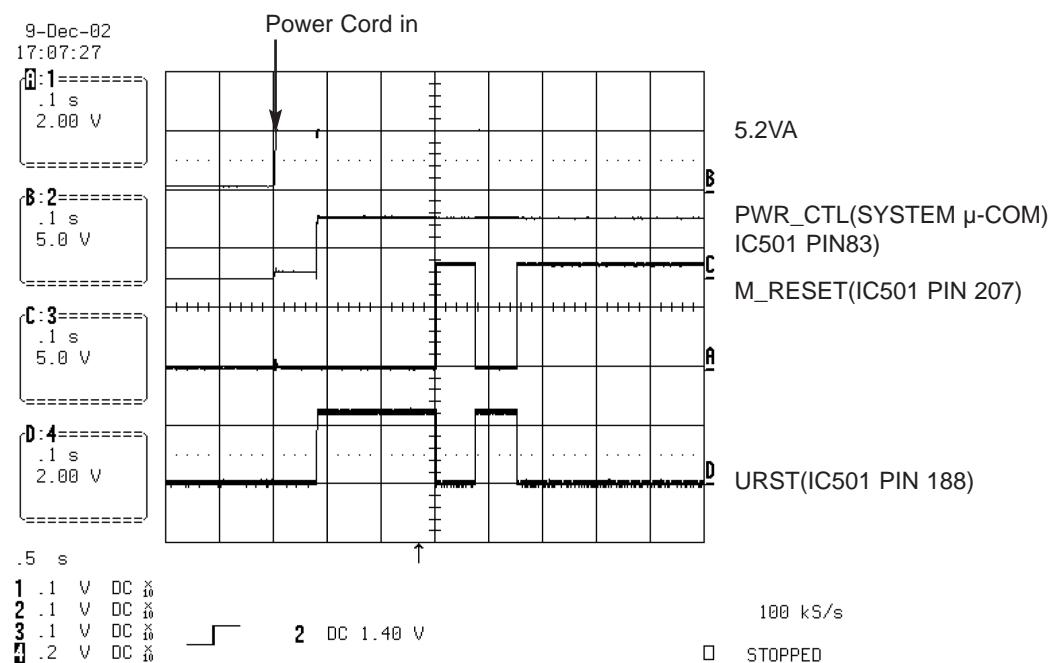


FIG 1-2

4) Flash R/W enable signal during download(Downloading)

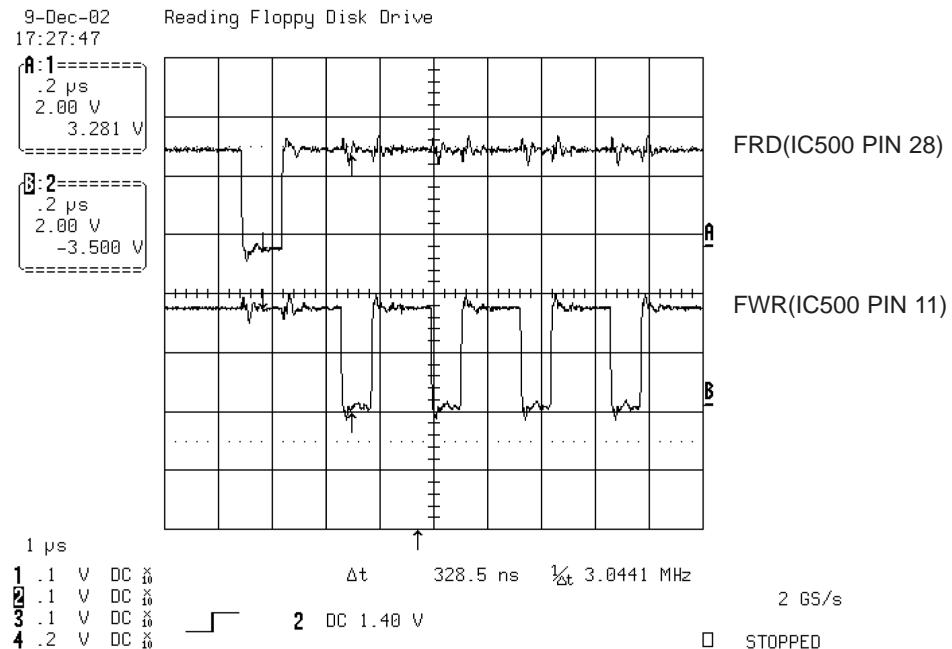


FIG 1-4

2. SDRAM CLOCK

1) ES6698FD main clock is at 27MHz(X501)

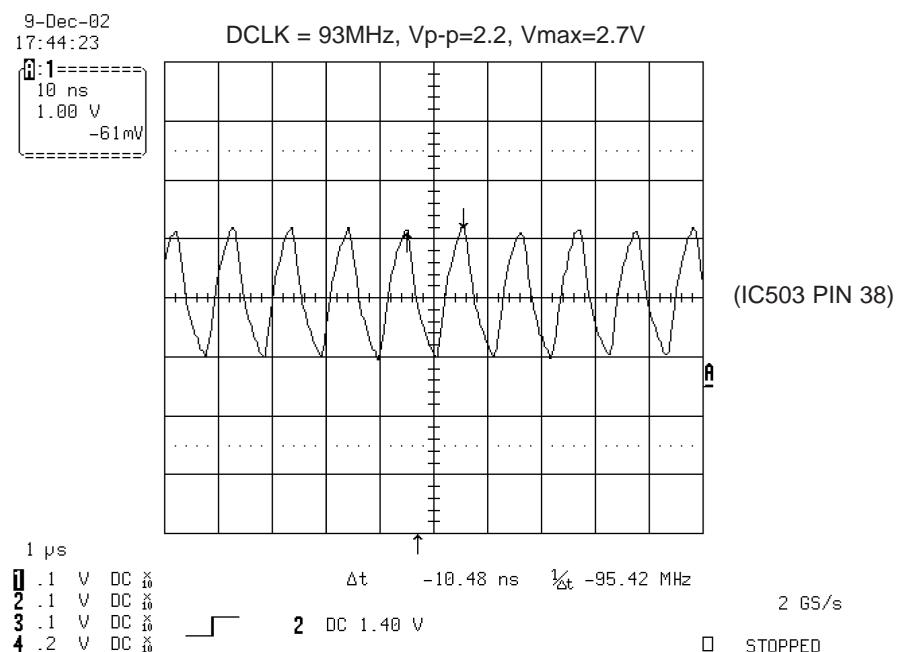


FIG 2-1

3. TRAY OPEN/CLOSE SIGNAL

1) Tray open/close waveform

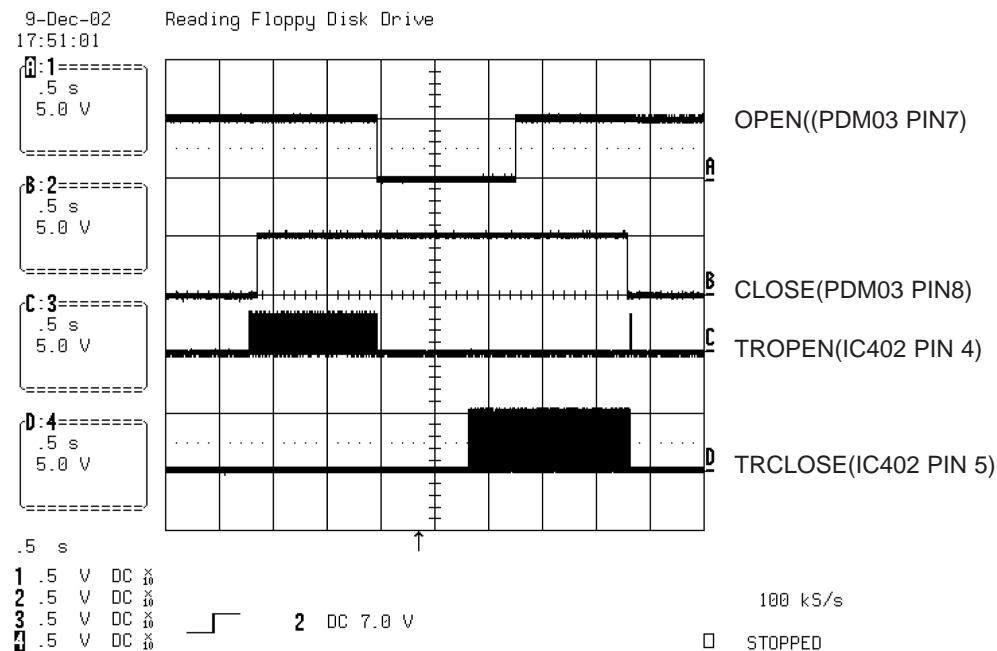


FIG 3-1

2) Tray close waveform

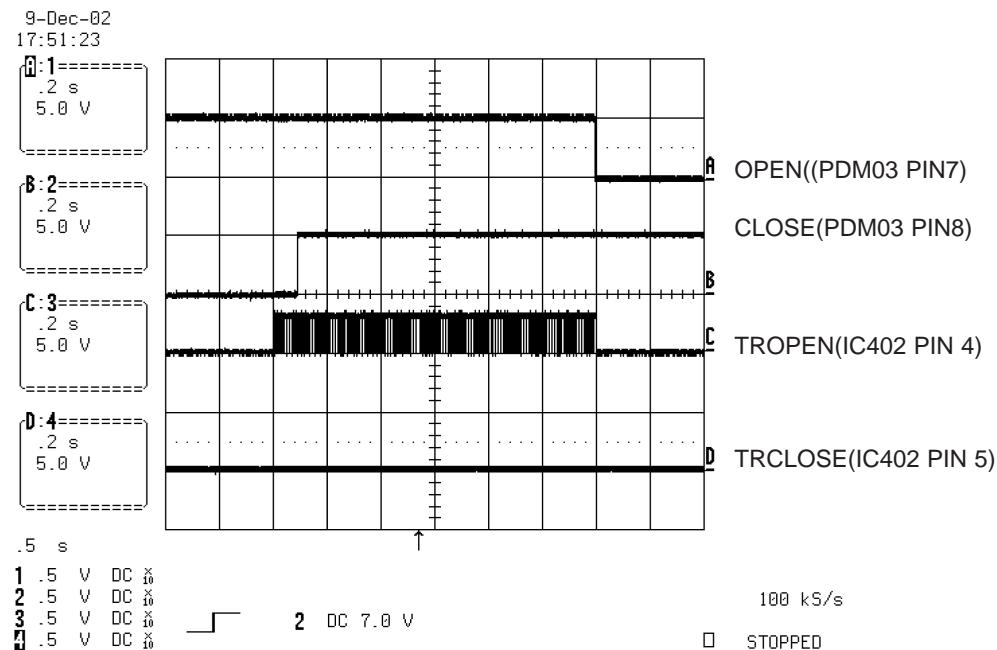


FIG 3-2

3) Tray open waveform

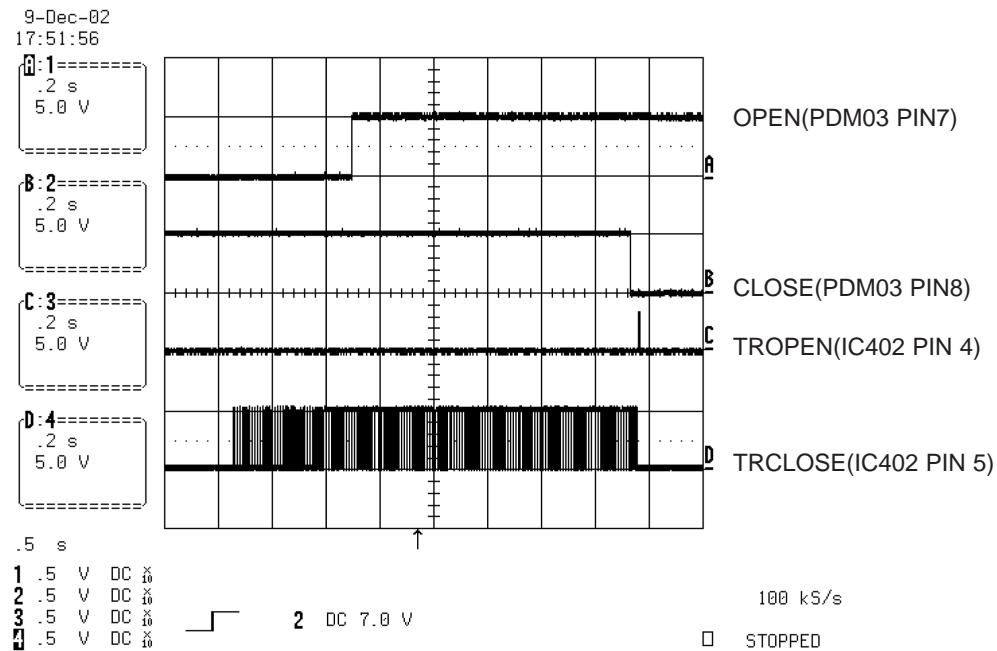


FIG 3-3

4. SLED CONTROL RELATED SIGNAL (NO DISC CONDITION)

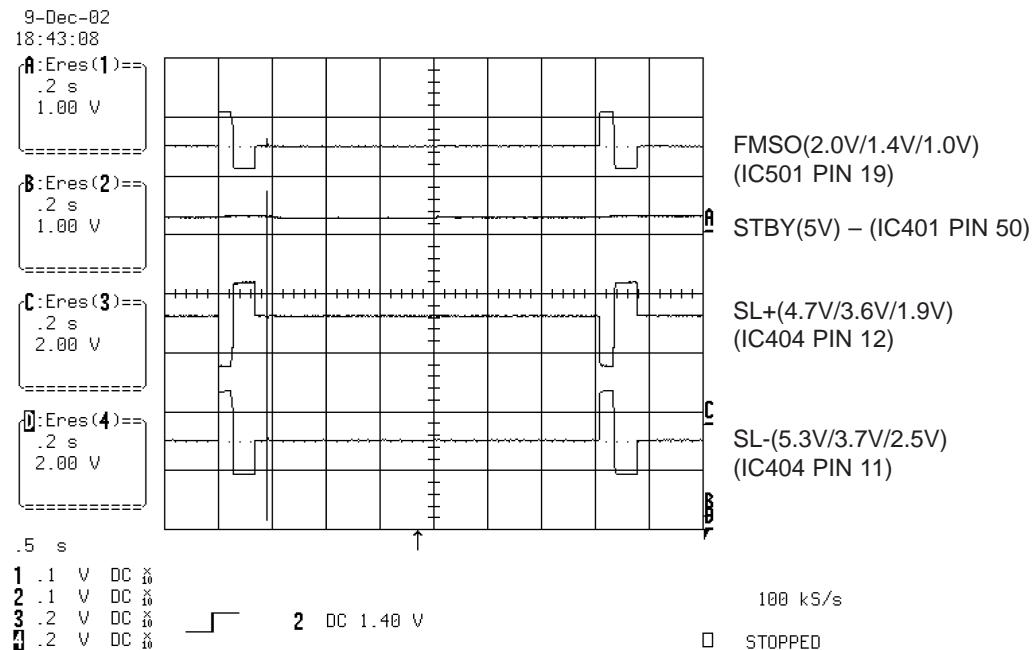


FIG 4-1

5. LENS CONTROL RELATED SIGNAL(NO DISC CONDITION)

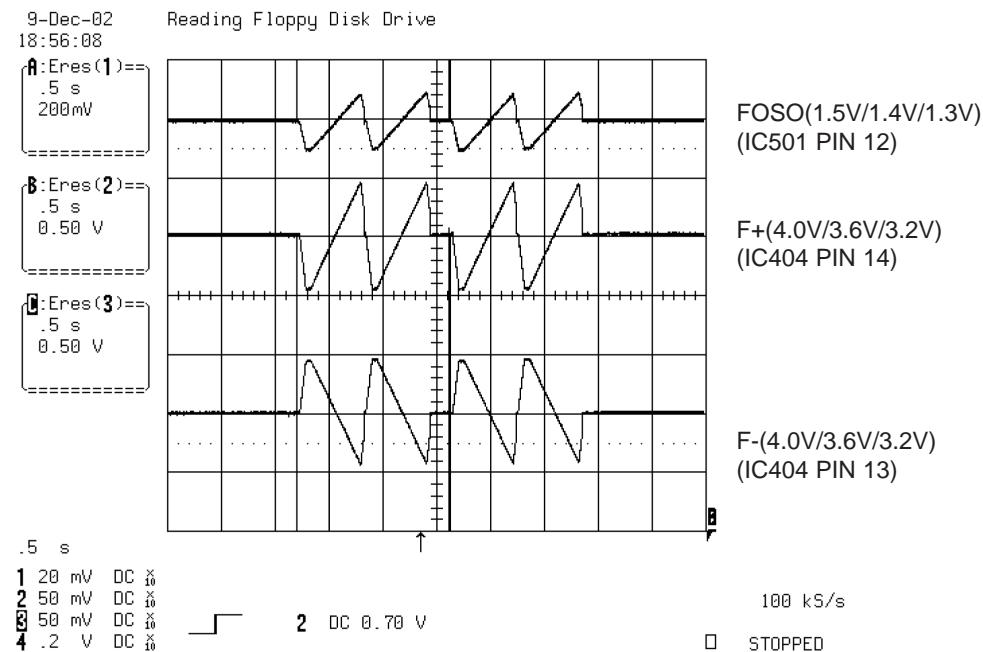


FIG 5-1

6. LASER POWER CONTROL RELATED SIGNAL(NO DISC CONDITION)

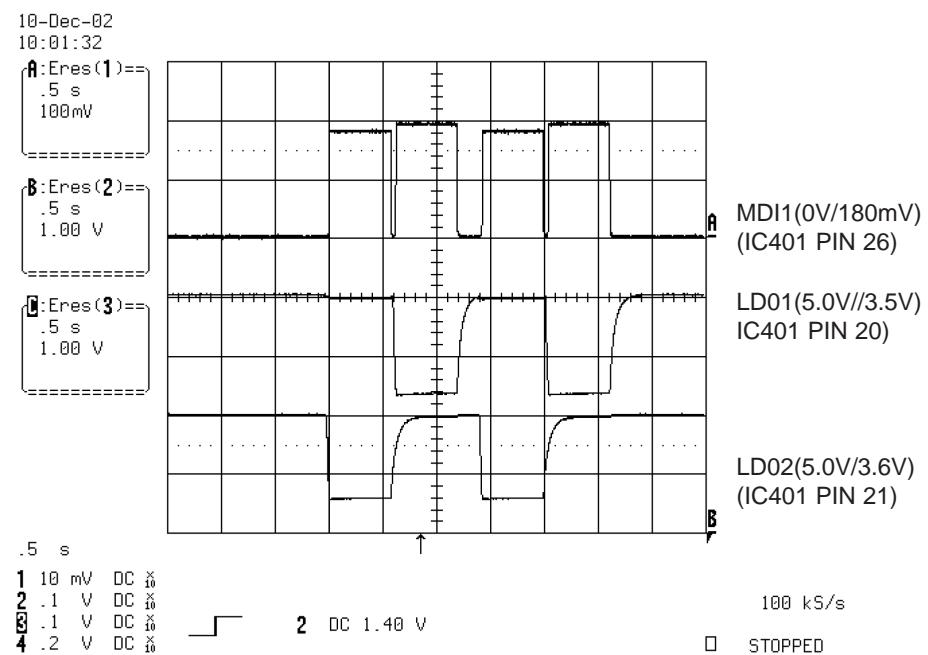


FIG 6-1

7. DISC TYPE JUDGEMENT WAVEFORMS

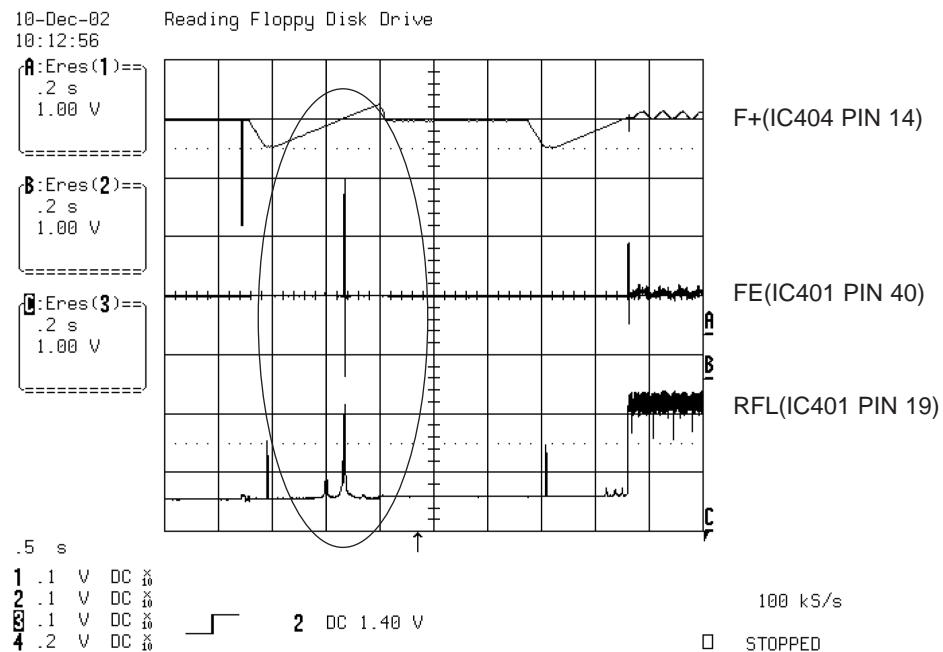


FIG 7-1 (DVD)

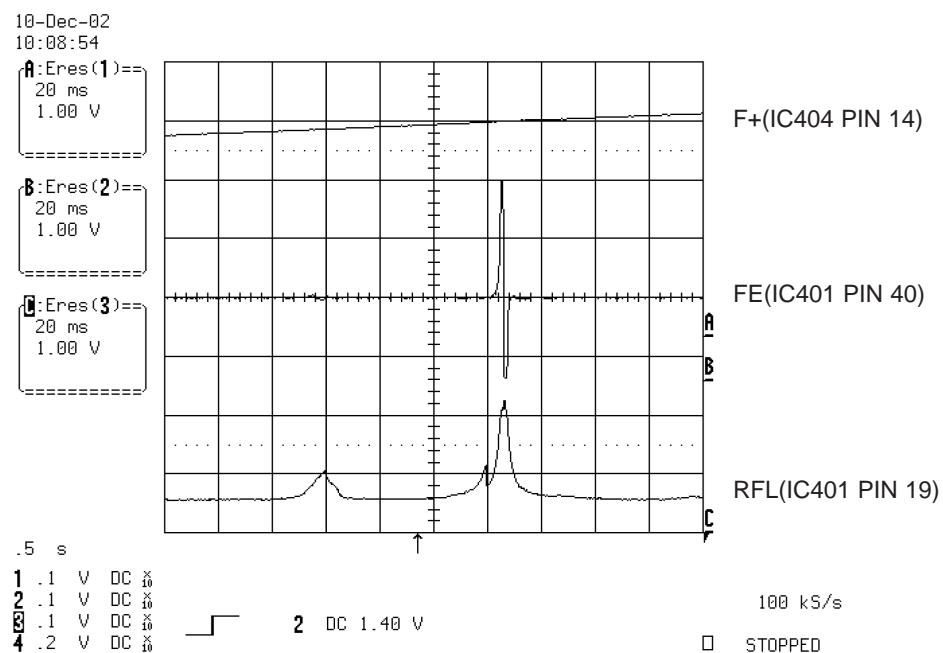


FIG 7-2 (DVD)

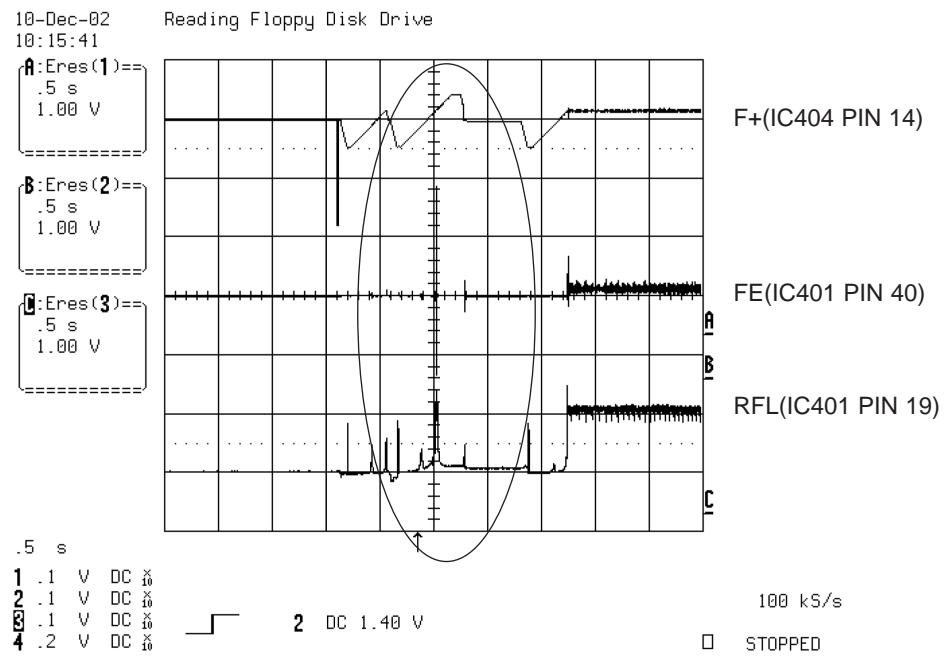


FIG 7-3 (CD)

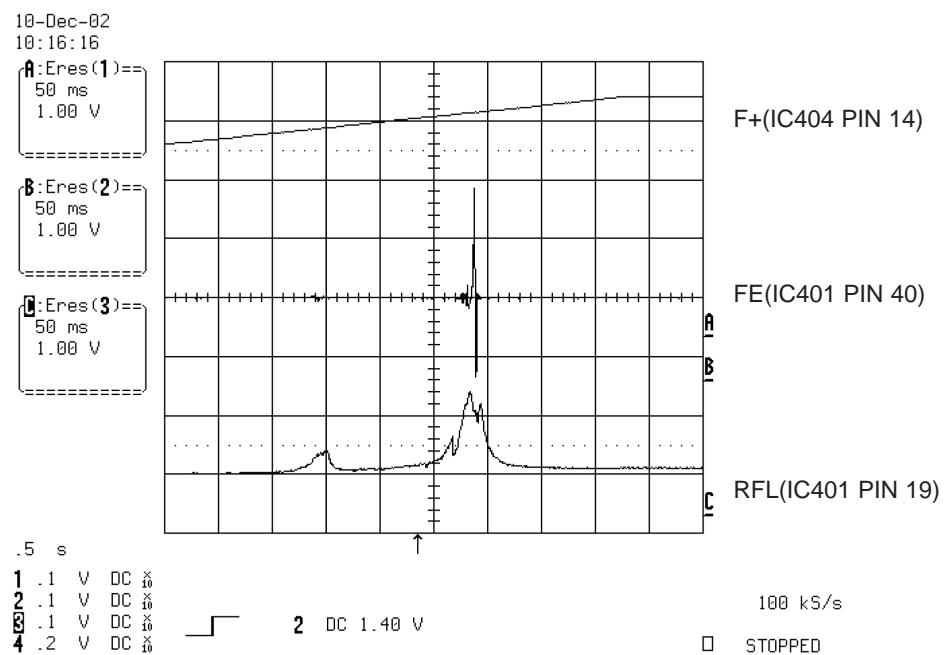


FIG 7-4 (CD)

8. FOCUS ON WAVEFORMS

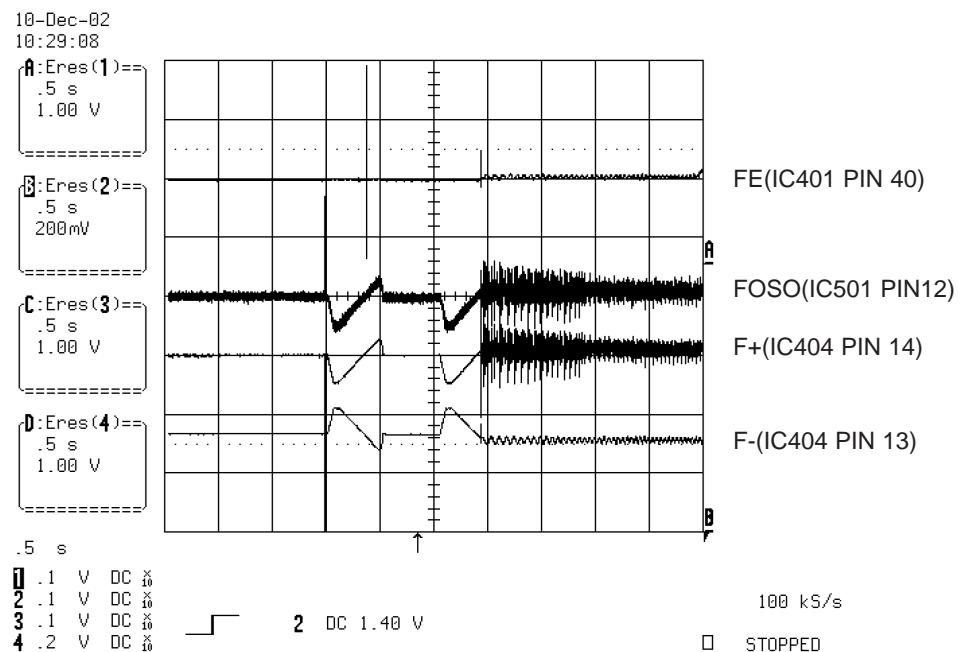


FIG 8-1 (DVD)

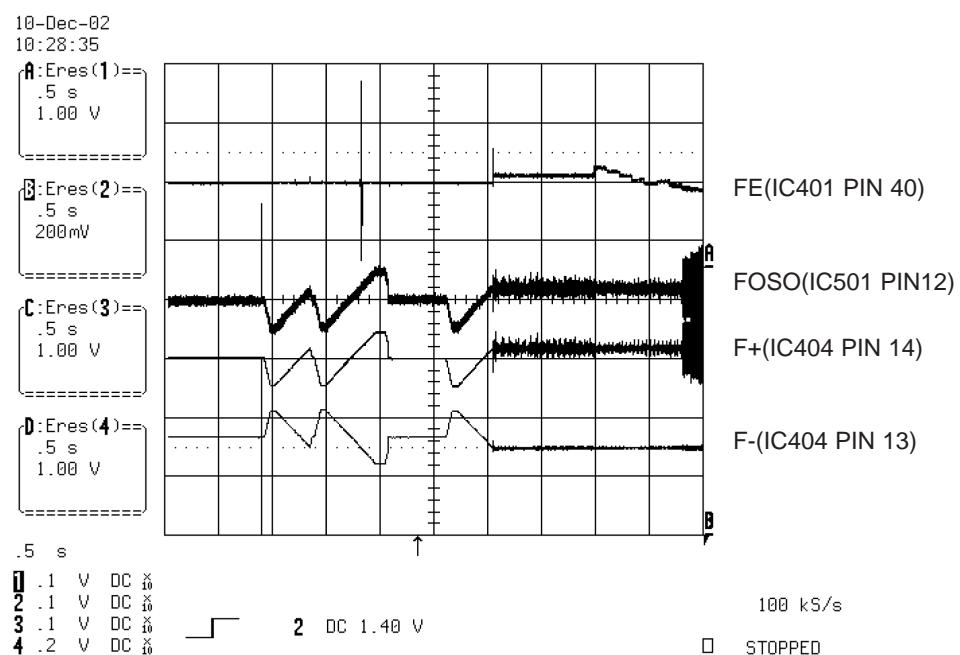


FIG 8-2 (CD)

9. SPINDLE CONTROL WAVEFORMS (NO DISC CONDITION)

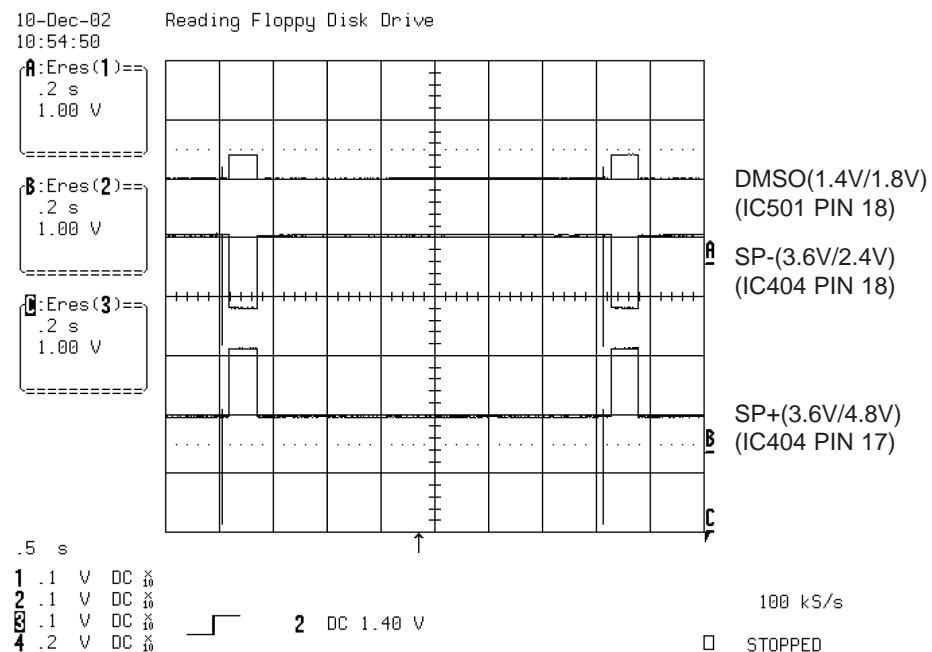


FIG 9-1

10. TRACKING CONTROL RELATED SIGNAL(System checking)

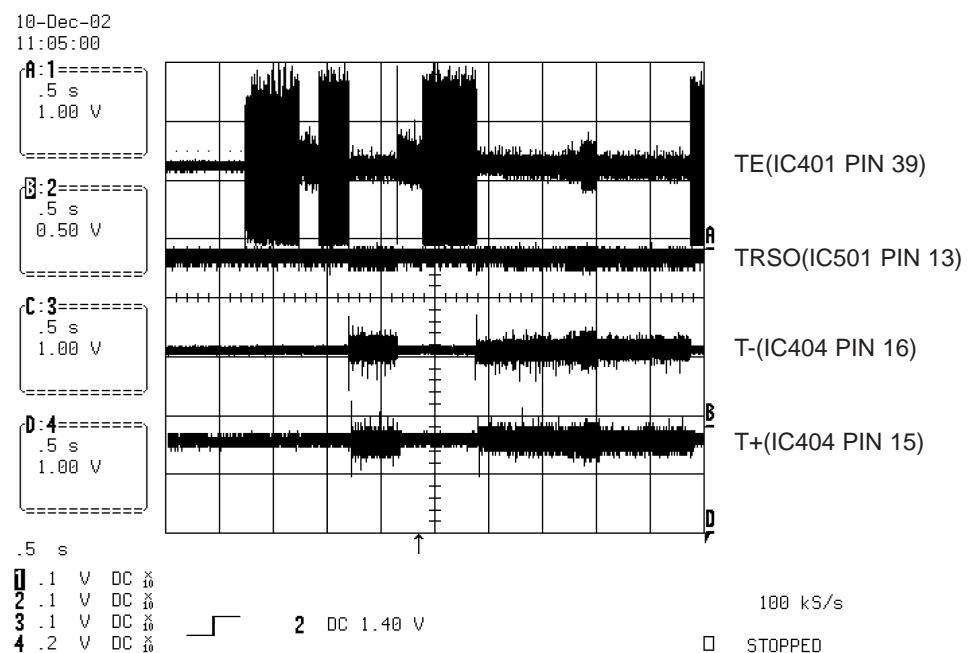


FIG 10-1(DVD)

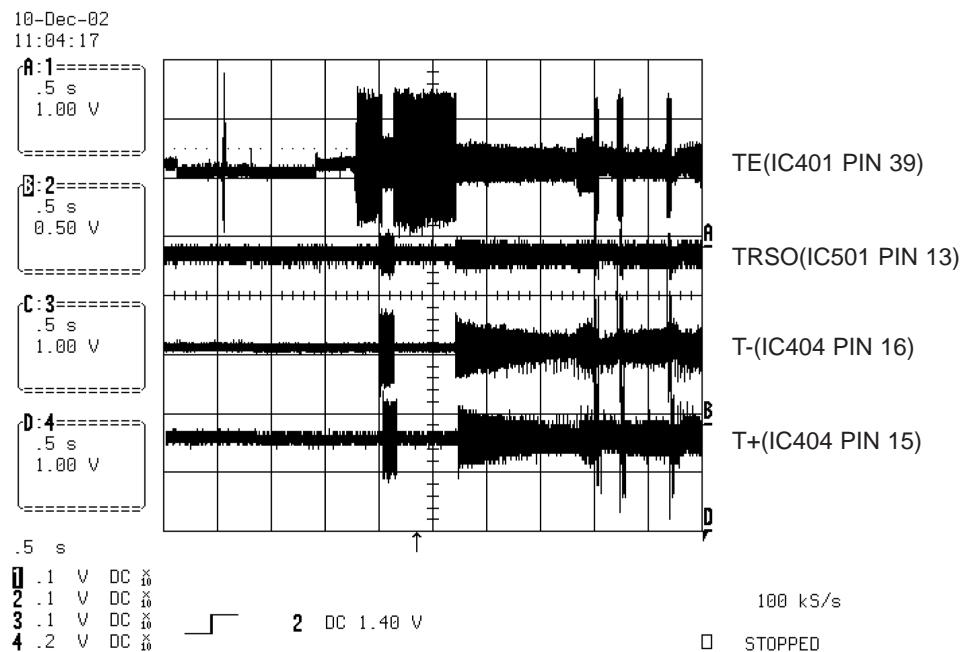


FIG 10-2(CD)

11. RF WAVEFORM

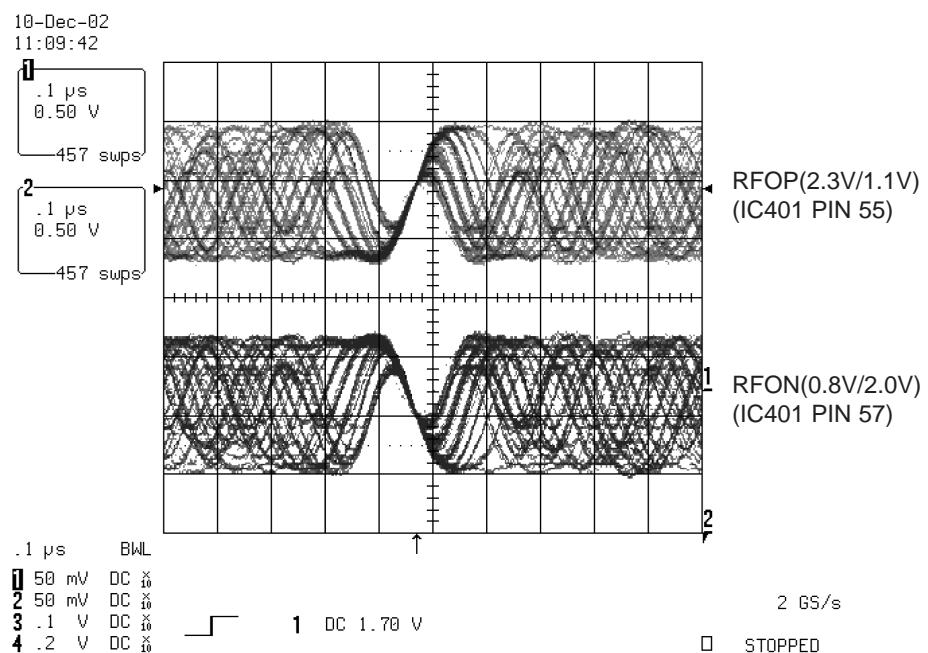


FIG 11-1

12. ES6698FD VIDEO OUTPUT WAVEFORMS

1) Full colorbar signal(COMPOSIT)

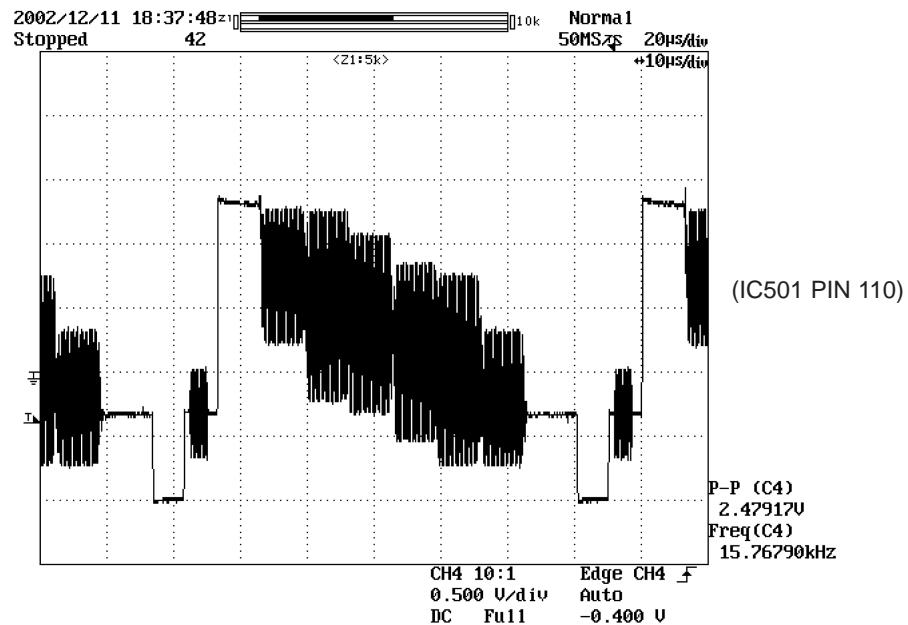


FIG 12-1

2) Y

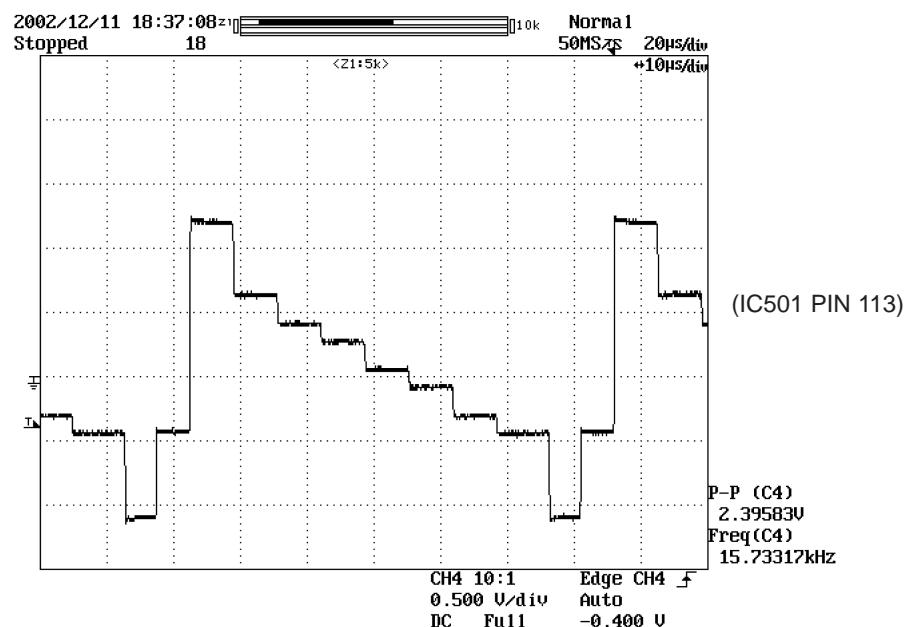


FIG 12-2

13. AUDIO OUTPUT FROM PWM IC

1) Audio L/R

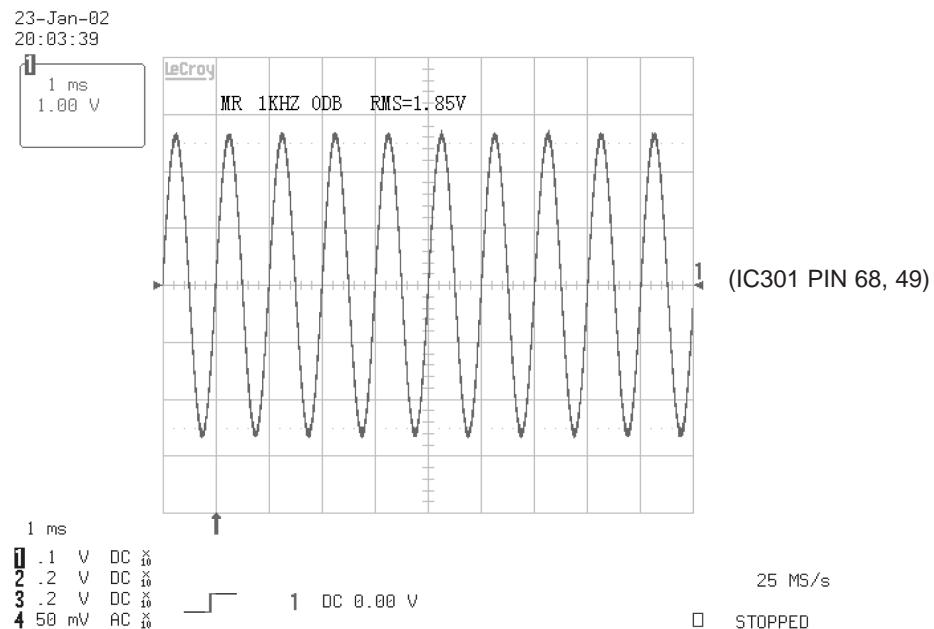


FIG 13-1

2) Audio related Signal

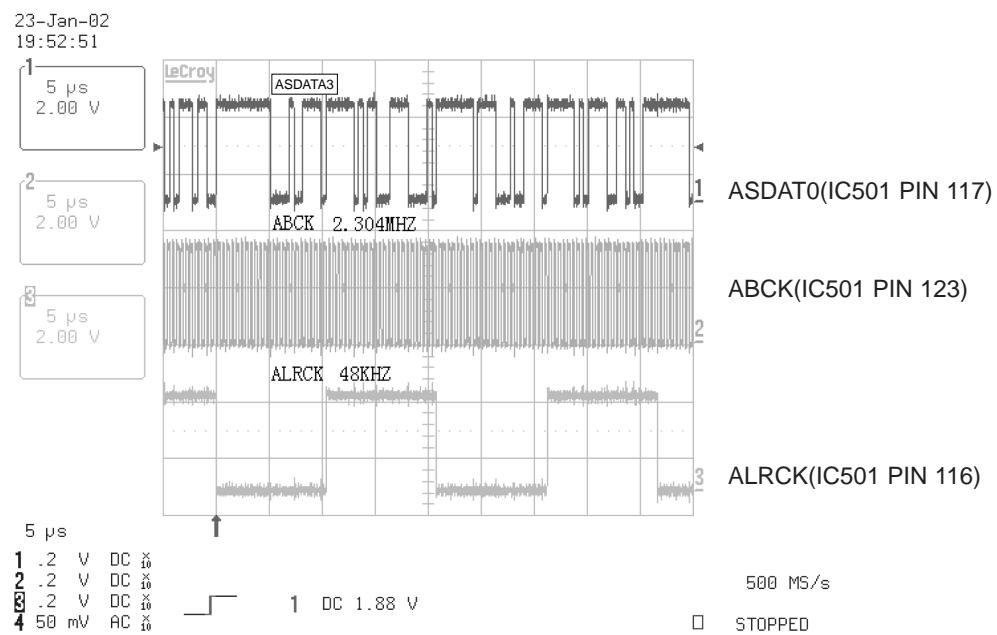
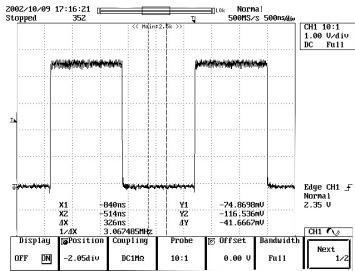


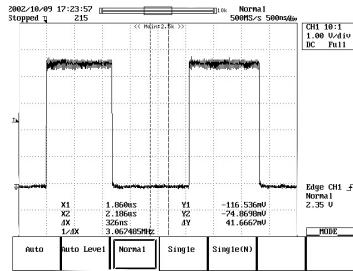
FIG 13-2

14. DVD & AMP WAVEFORMS

1)



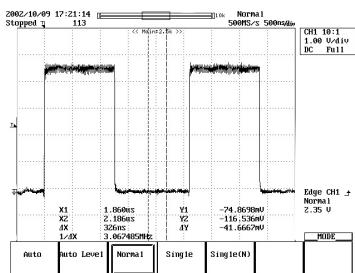
2)



- R310 → TP301
or
R311 TP302

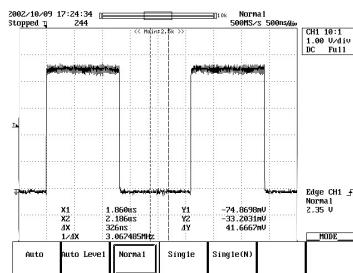
- R320 → TP311
or
R321 TP312

3)



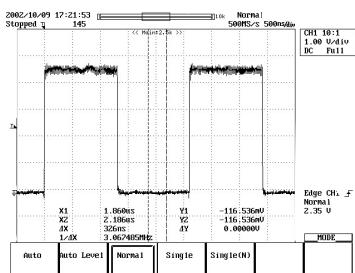
- R312 → TP303
or
R313 TP304

4)



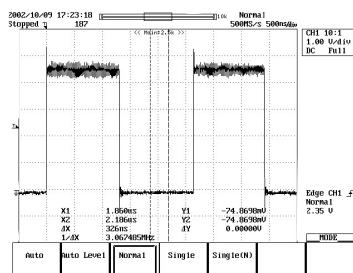
- R318 → TP307
or
R319 TP308

5)



- R314 → TP305
or
R315 TP304

6)

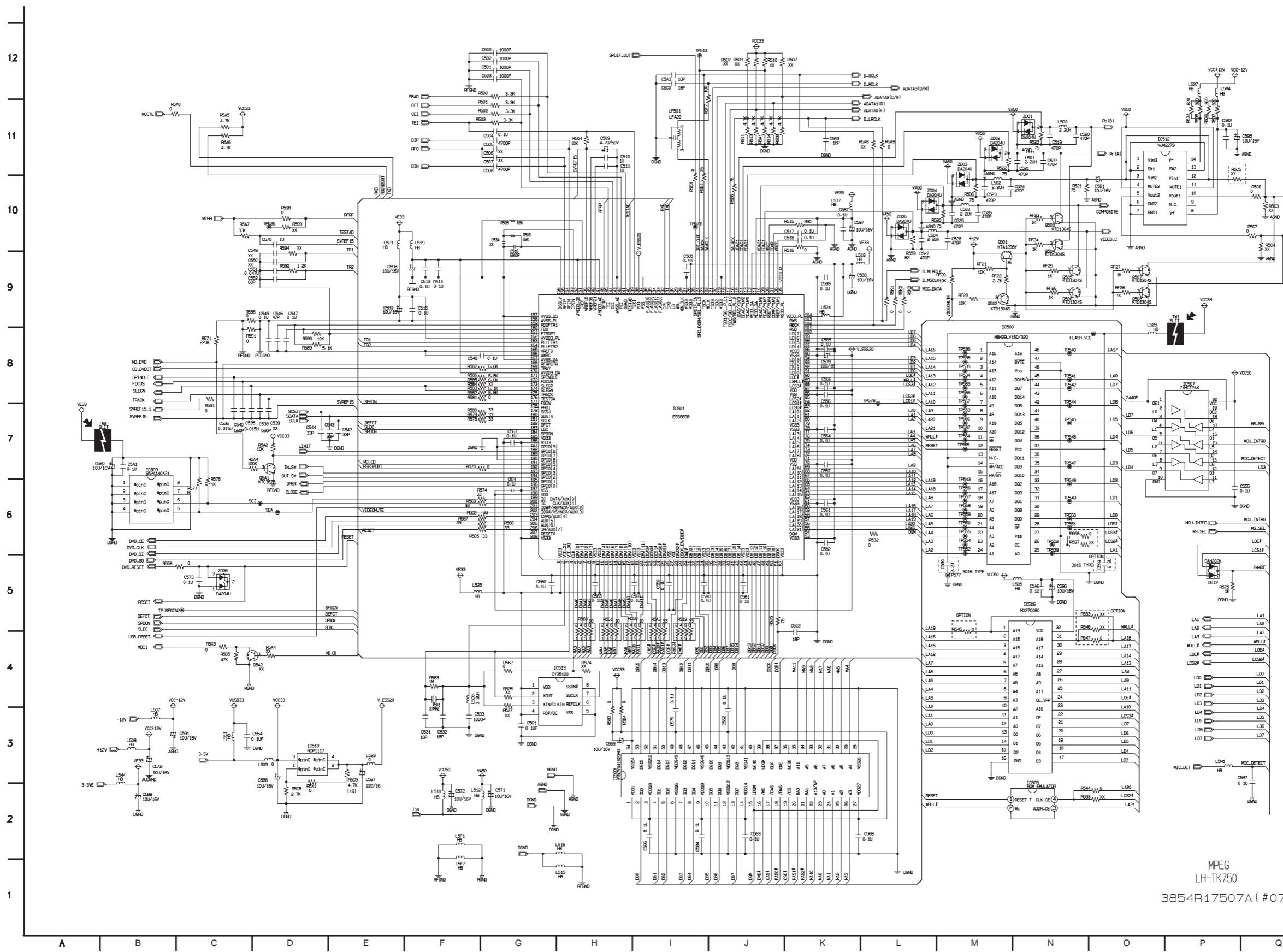


- R318 → TP309
or
R319 TP310

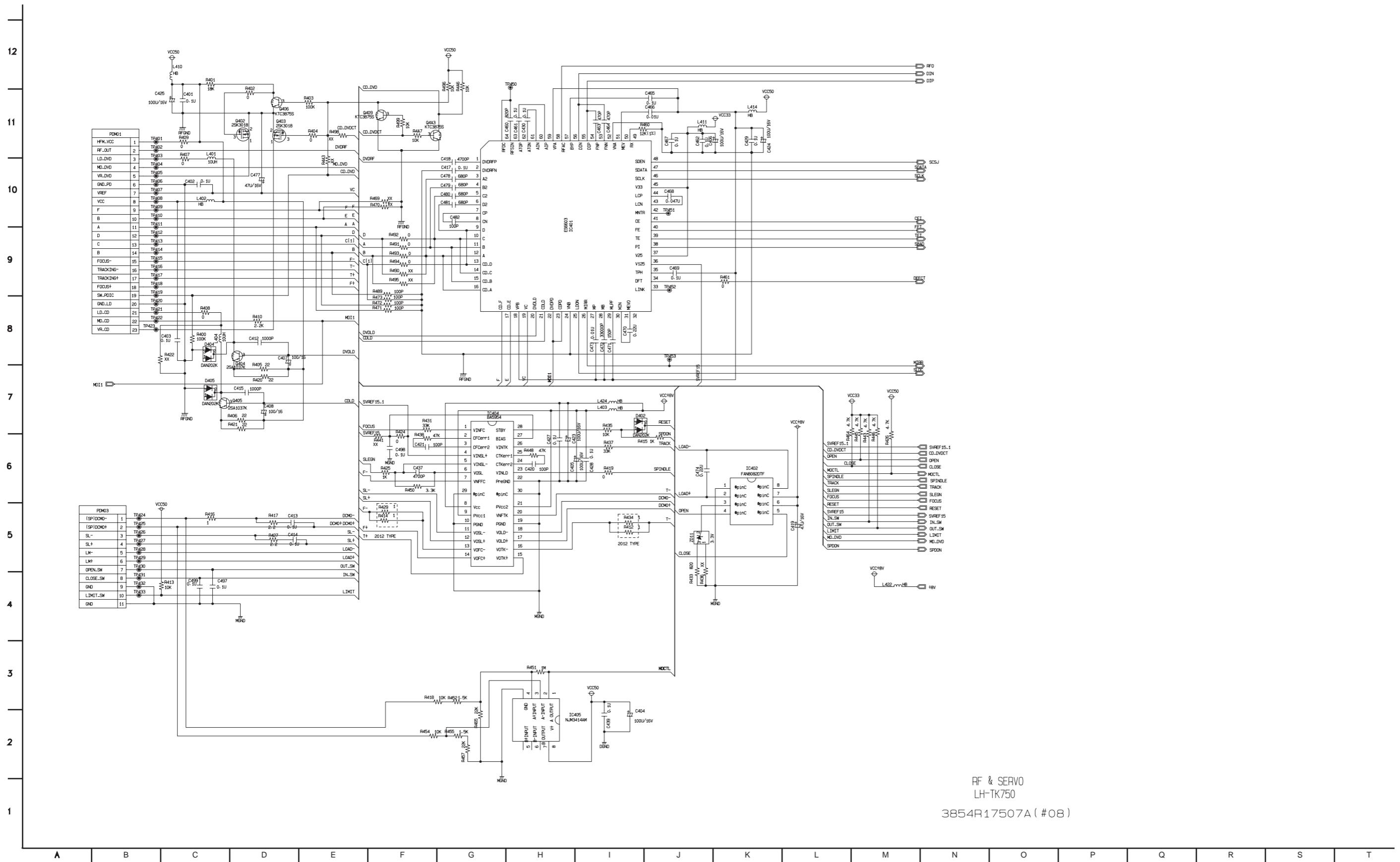
MEMO

DVD PART SCHEMATIC DIAGRAMS

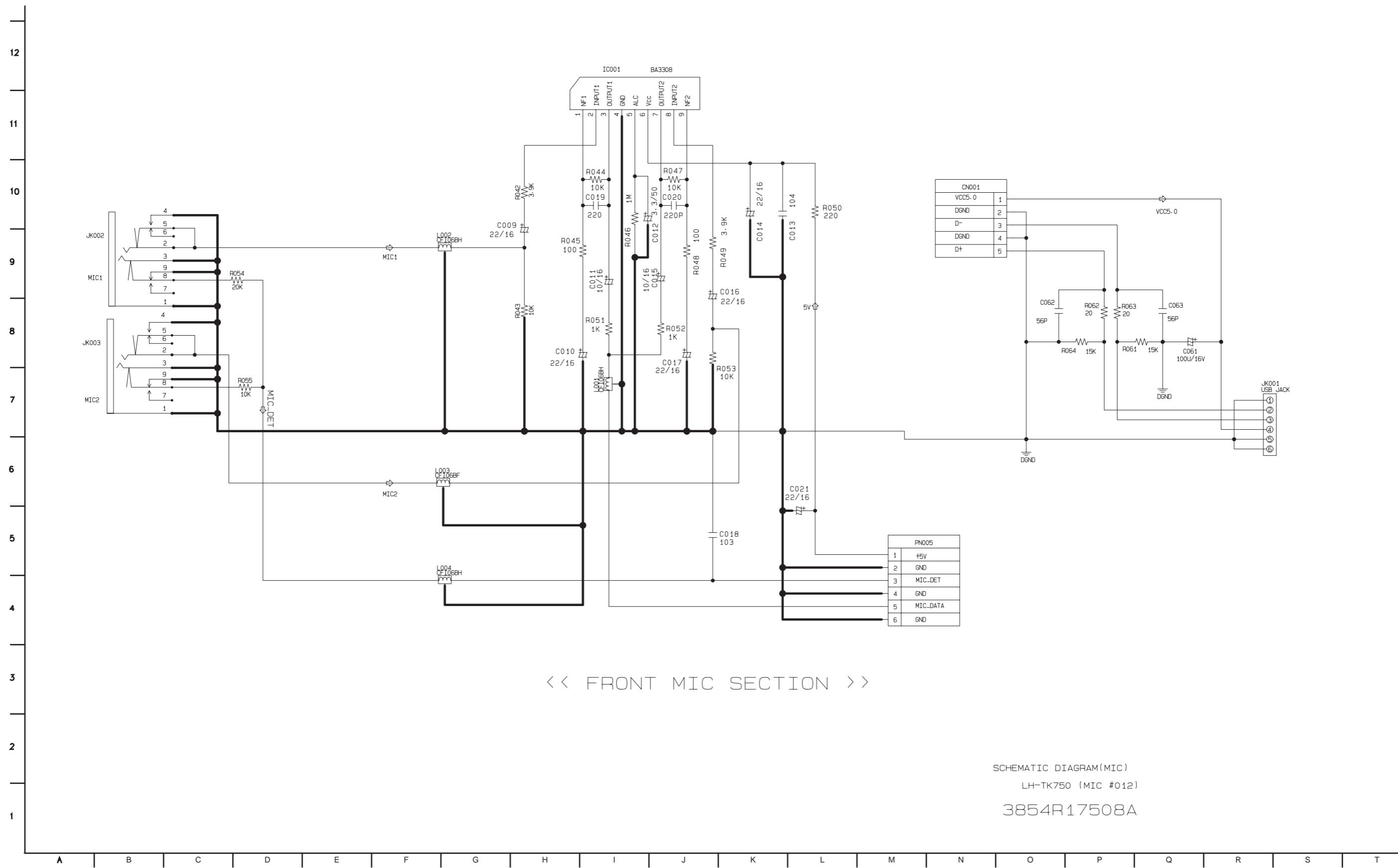
1. DVD MPEG & DSP SCHEMATIC DIAGRAM



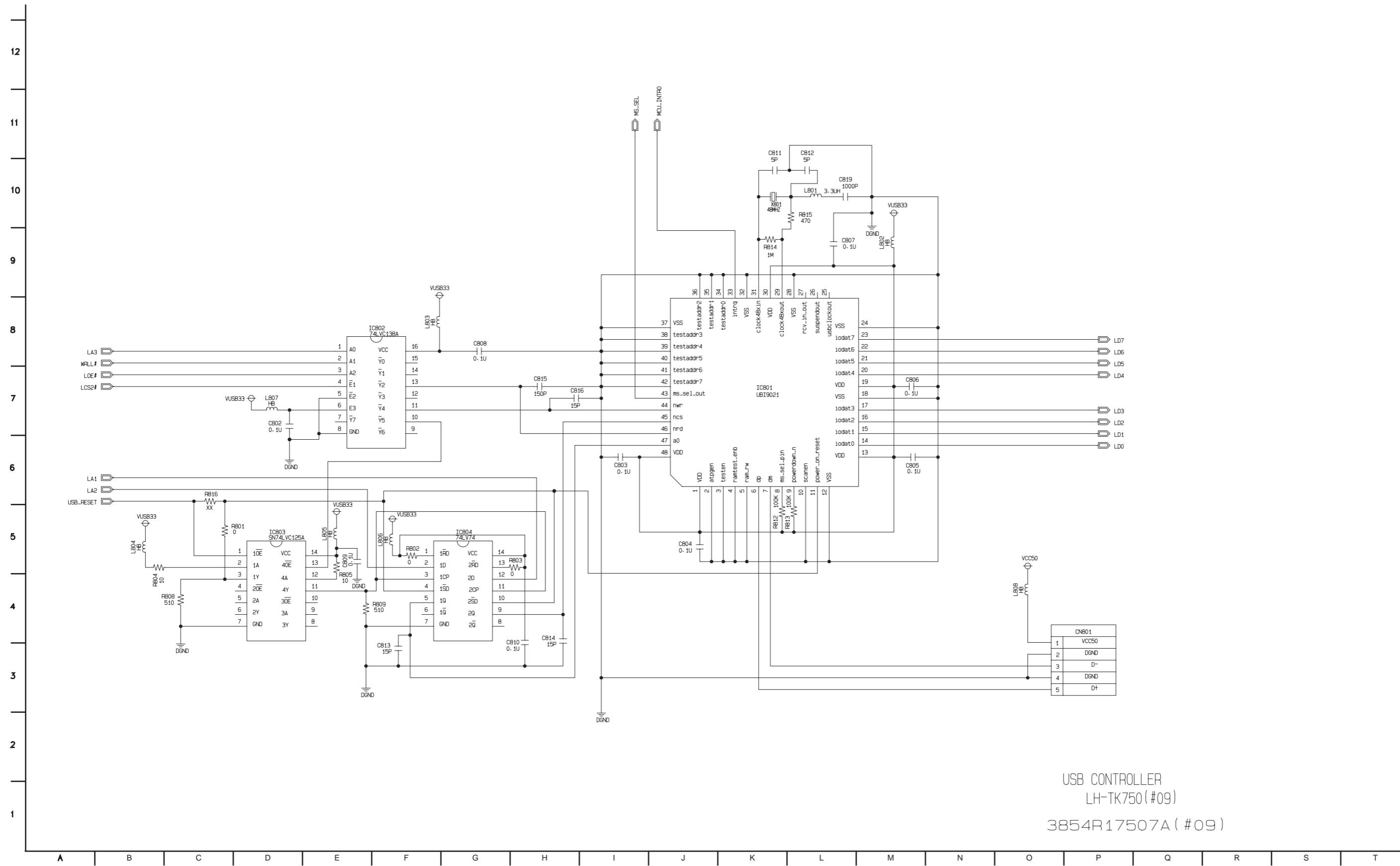
2. RF & SERVO SCHEMATIC DIAGRAM



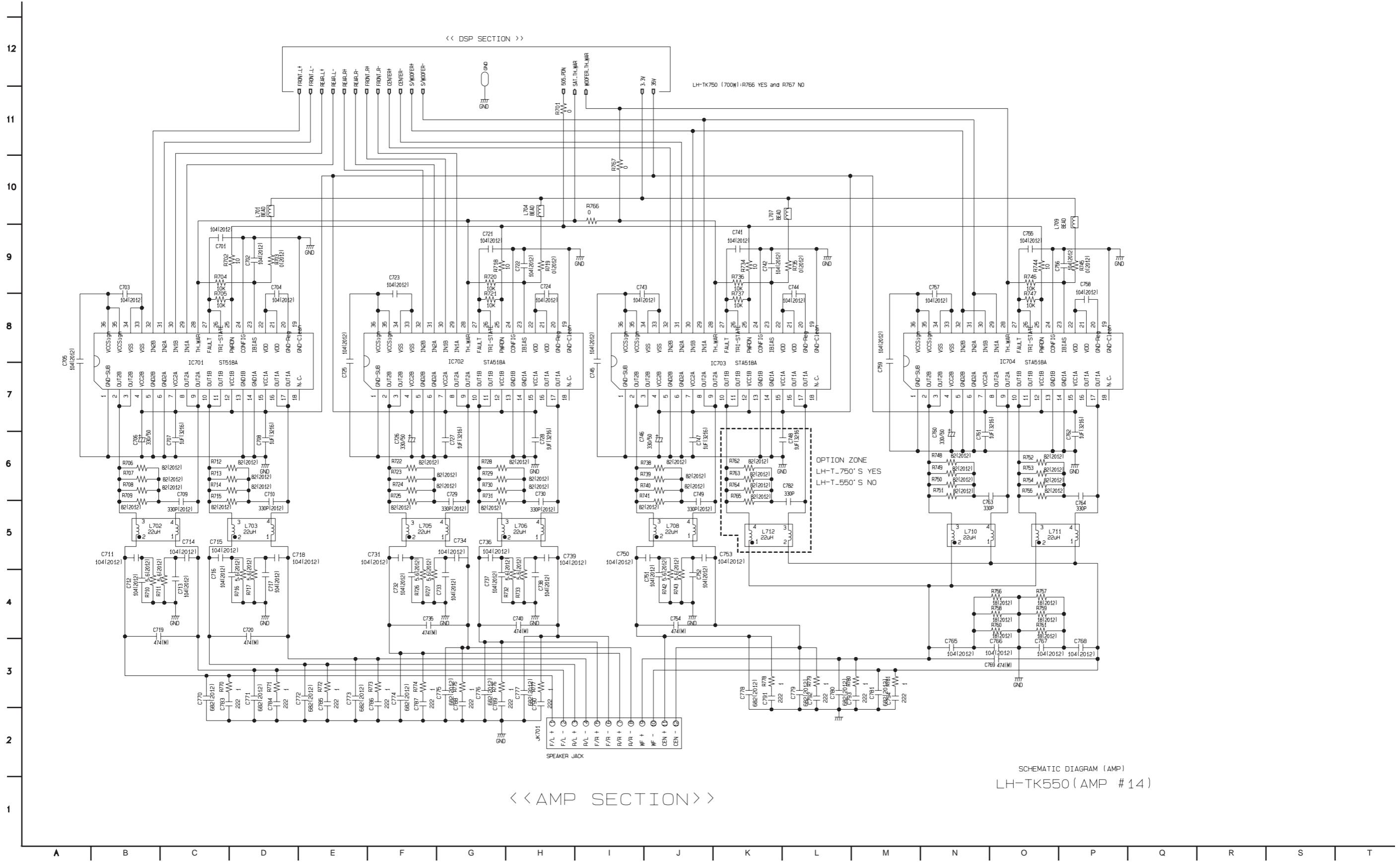
3. FRONT MIC SCHEMATIC DIAGRAM



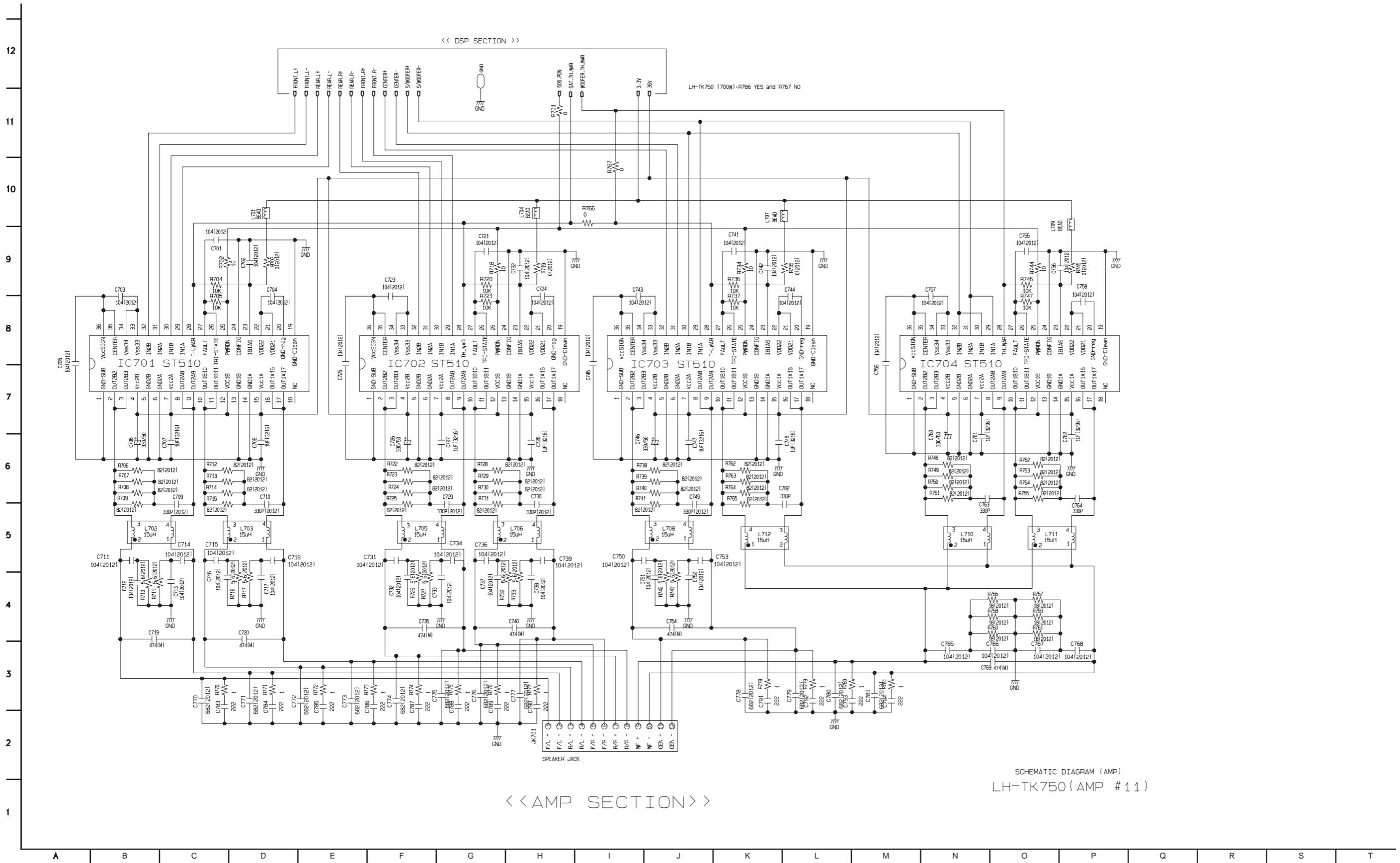
4. USB CONTROLLER SCHEMATIC DIAGRAM



5. AMP SCHEMATIC DIAGRAM (5TOOL)



6. AMP SCHEMATIC DIAGRAM (7TOOL)

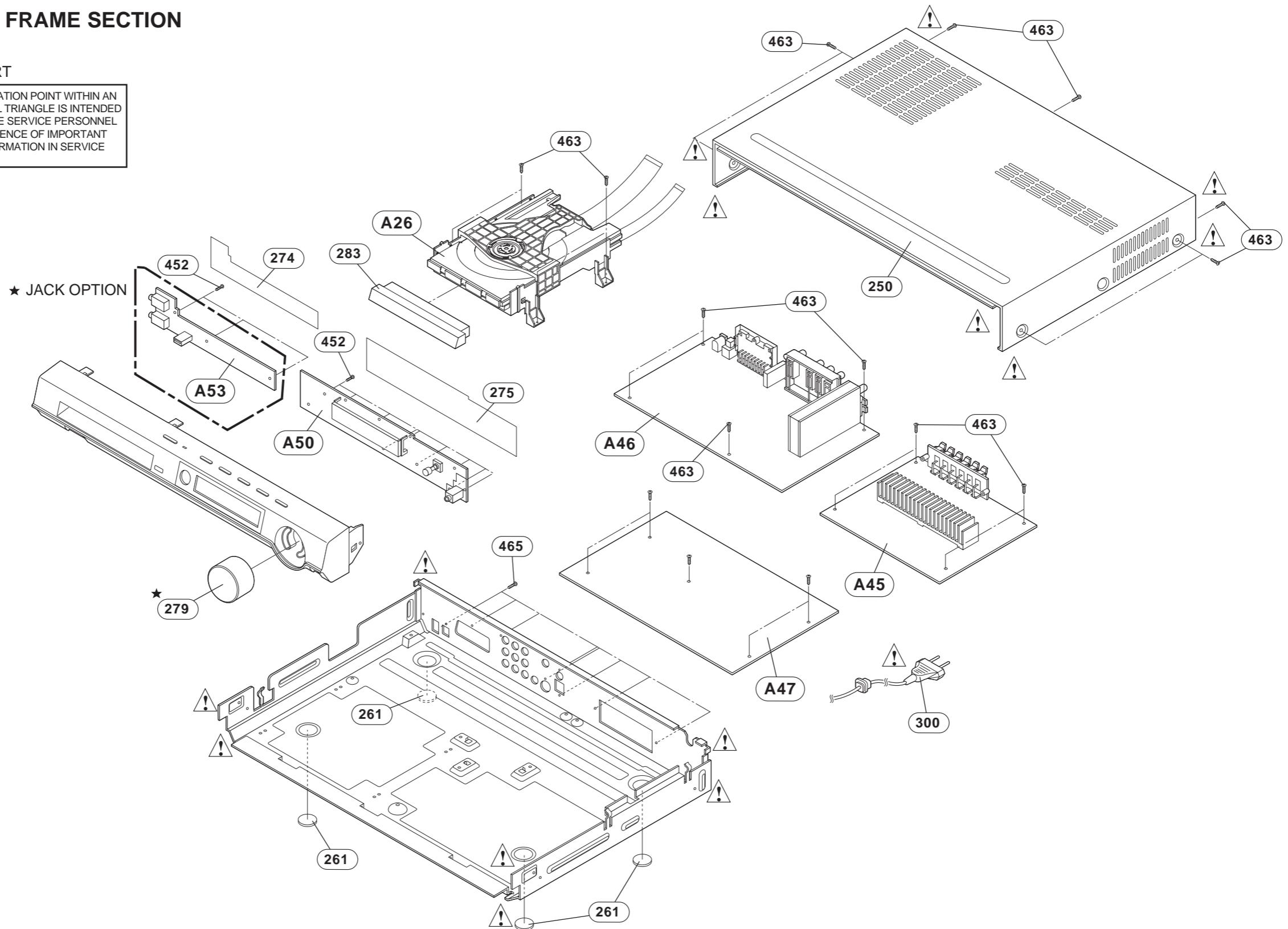


SECTION 4. EXPLODED VIEWS

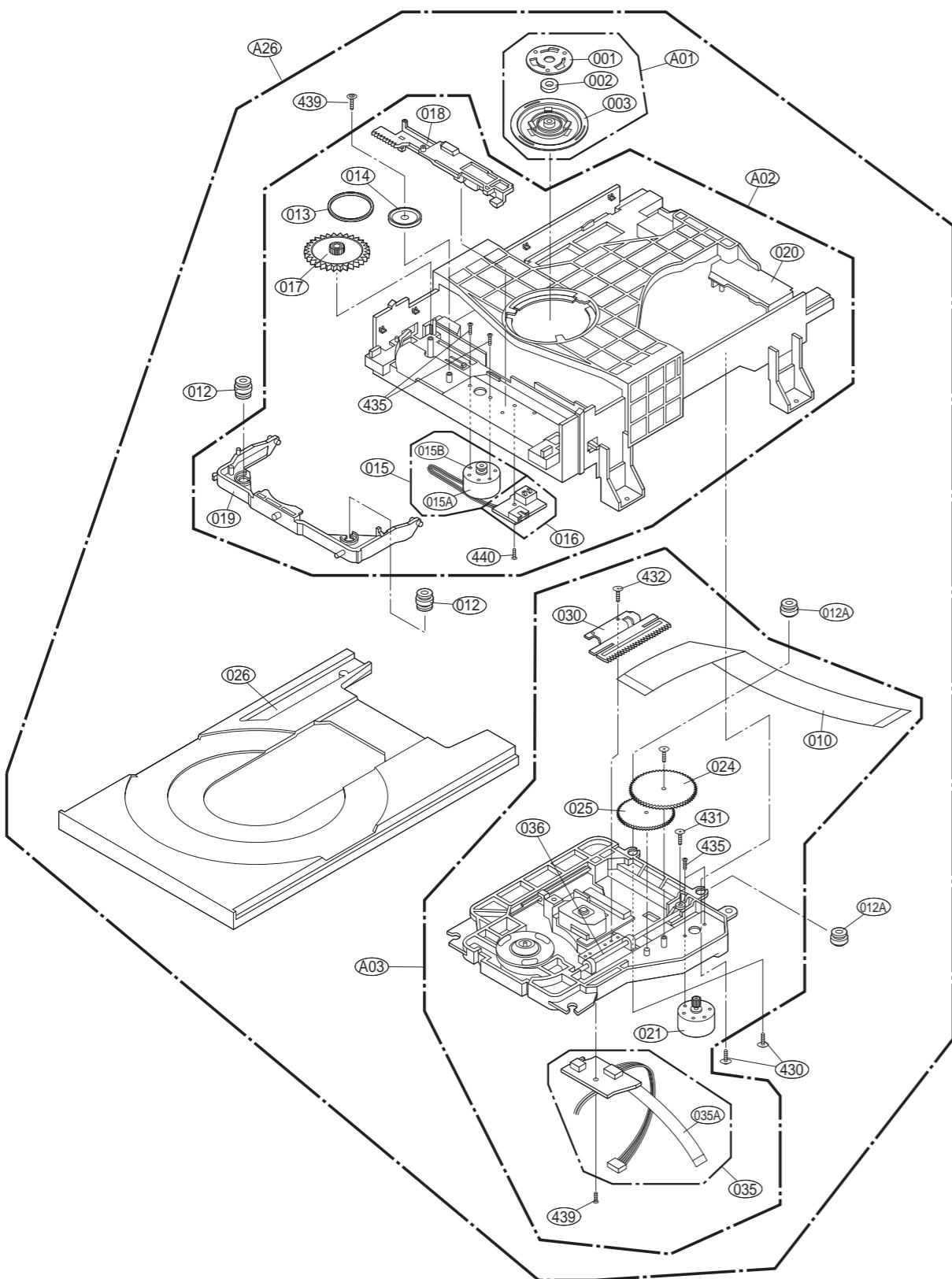
• CABINET AND MAIN FRAME SECTION

★ OPTIONAL PART

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



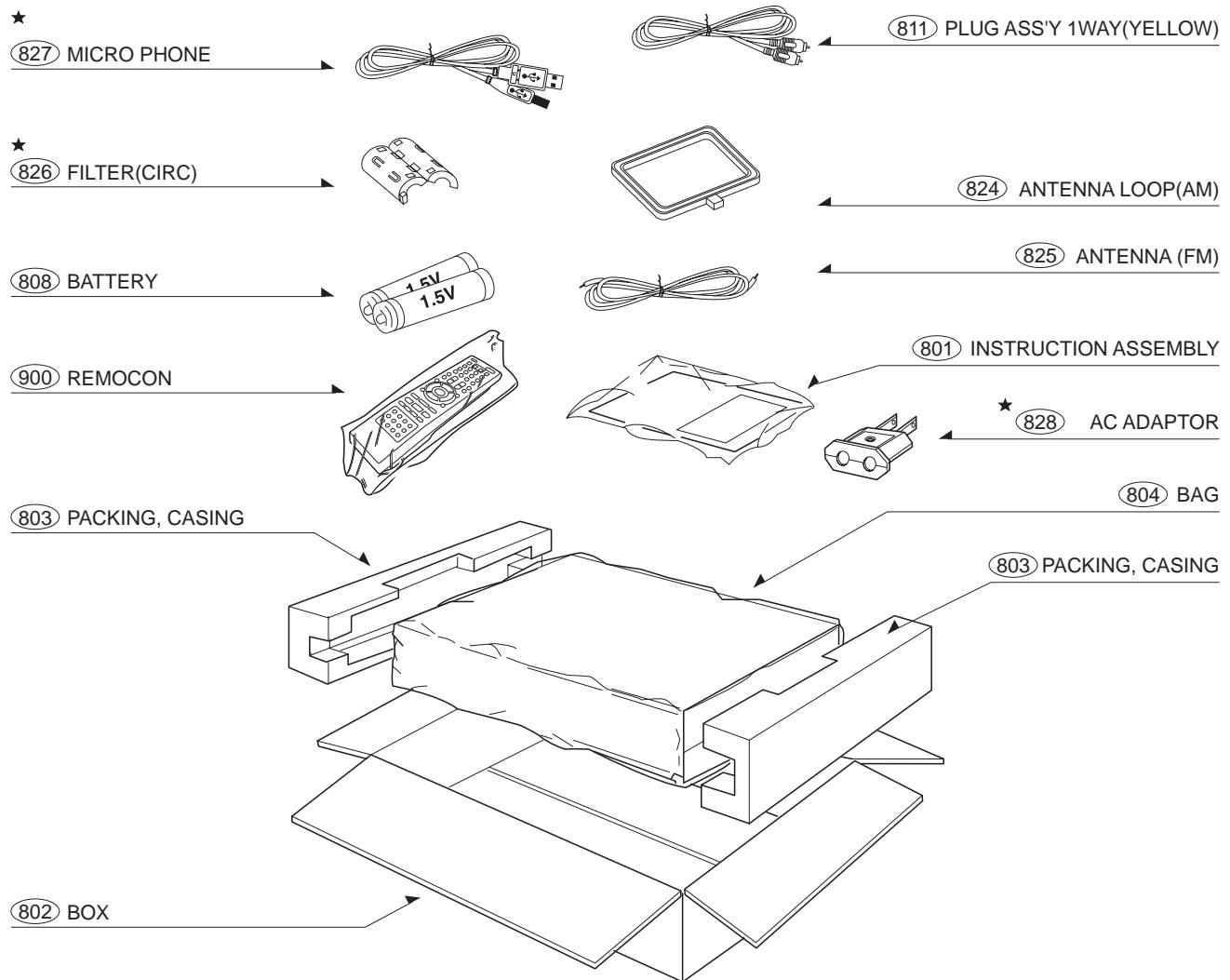
• DECK MECHANISM EXPLODED VIEW



NSP : Non SVC Parts				
LOCA. NO.	PART NO.	DESCRIPTION	SPECIFICATION	REMARKS
A26	6721RJ0870E	DECK ASSEMBLY,AUDIO	HOME THEATER LH-TK750/550/250	
A01	4861R-0016B	CLAMP ASSEMBLY	DISC DP7 - SH	
A02	3041R-T001A	BASE ASSEMBLY	MAIN DP-9T-ESS	
A03	3041R-T001B	BASE ASSEMBLY	SLED DP-9T-DI -ESS-SAMSUNG	
001	3300R-0547A	PLATE	CLAMP	NSP
002	5016H-1016B	MAGNET	CLAMP(LDM-R608,10*5,1*1.5T)	NSP
003	4860R-0021A	CLAMP	UPPER DP7	NSP
010	6850R-JW14B	CABLE,FLAT	P=1.0 FFC UL2896(0.035X0.7) 23	
012	5040R-0083A	RUBBER	DVD DP-6, DP-8 FRONT RIGHT 20	
012A	5040R-0110A	RUBBER	DVD REAR DP8 RIGHT 20 OTHER BL	
013	4400R-0006B	BELT	DECK/MECHA DP2-5, DP7C,DP7A OT	
014	4470R-0154A	GEAR	DECK/MECHA DP8 PULLEY MOLD	
015	4681R-A015A	MOTOR ASSEMBLY	DECK/MECHA LOADING DP-9 SH	
015A	4680R-E008A	MOTOR(MECH)	FEEDING RF-300EA-1D390 MABUCHI	NSP
015B	4560R-0008A	PULLEY	MOTOR	
016	6871R-9294A	PWB(PCB) ASSEMBLY,TOTAL	DP-9C LOADING	
017	4470R-0176A	GEAR	DVD DP-9 LOADING MOLD	
018	4974R-0067A	GUIDE	DVD DP-9C UP/DOWN MOLD	
019	3210R-M008A	FRAME	DP-9C UP/DOWN MOLD	
020	3040R-M066A	BASE	MAIN DP-9T MOLD	NSP
021	4681R-B009B	MOTOR ASSEMBLY	DECK/MECHA DP9 FEEDING	
024	4470R-0179A	GEAR	DVD DP-9 PINION MOLD	
025	4470R-0178A	GEAR	DVD DP-9 MIDDLE MOLD	
026	3390R-0033A	TRAY	DVD DP-9T(9T-SLIM) DISK MOLD	
030	4470R-0180A	GEAR	DVD DP-9 RACK MOLD	
035	6871R-9295B	PWB(PCB) ASSEMBLY,TOTAL	DP-9T FEEDING	
035A	6850R-GK22Y	CABLE,FLAT	P=1.0 FFC UL2896(0.05X0.65) 11	
036	4370R-0136A	SHAFT	DVD PU, DR-02 SUS-420J2 OTHER	
430	1SZZR-0064B	SCREW,DRAWING	+ 1 D1.7 L7.0 SWCH18A/BZN DP8	
431	1SZZR-0062A	SCREW,DRAWING	+ 1 D1.7 L4.5 SWCH18A/NI DP8 P	
432	1SZZR-0072A	SCREW,DRAWING	+ 1 D1.7 L4.5 SWRCH18A/FZY DP8	
435	1SZZR-0011A	SCREW,DRAWING	MACHINE	
439	1SZZR-0075A	SCREW,DRAWING	+ 1 D1.7 L10.0 SWRCH18A/FZW DP	
440	1SZZH-1007B	SCREW,DRAWING	+ D2.0 6MM SWRCH16A/ZNBK 4MM 1	

• Packing Accessory Section

★ OPTIONAL PART

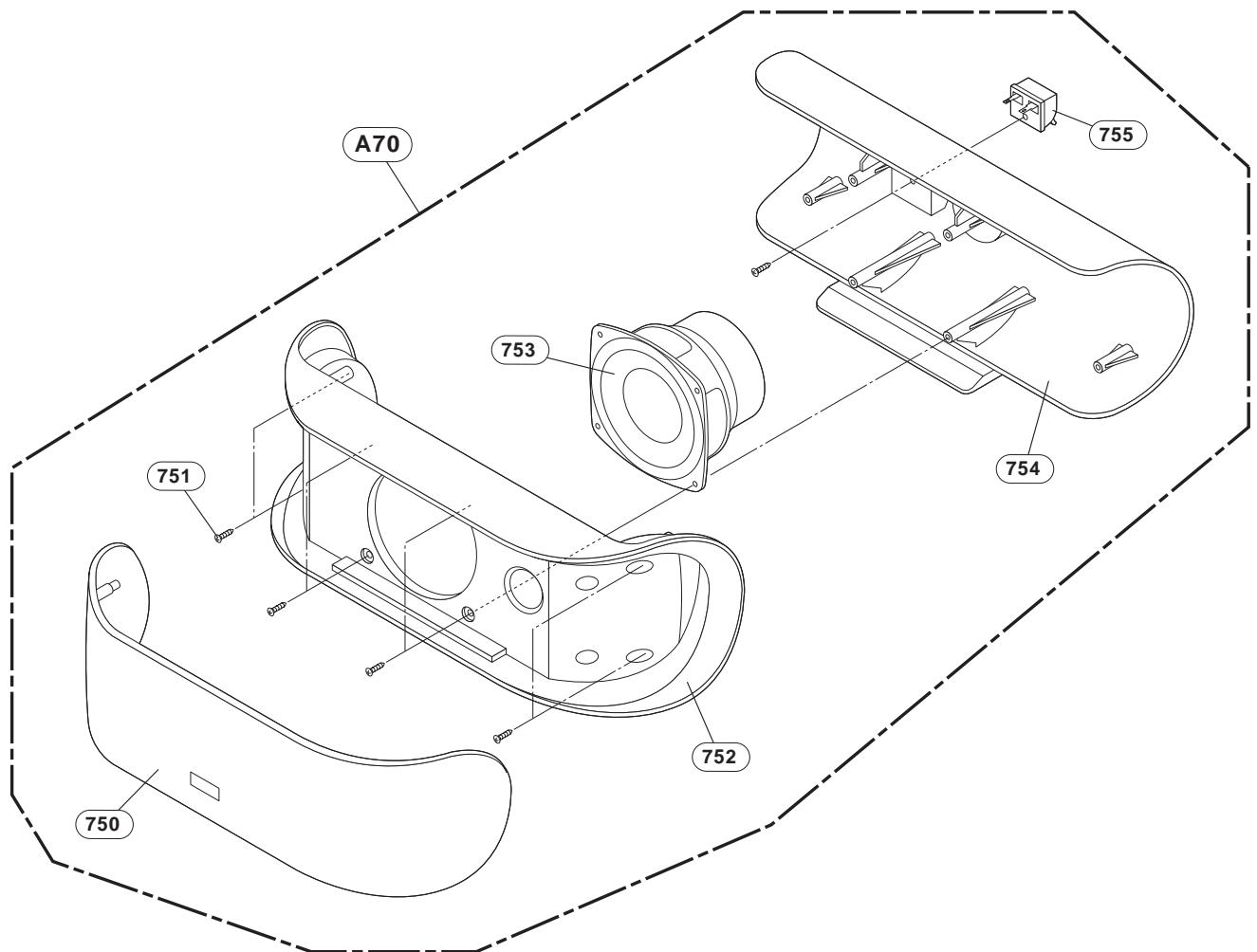


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SECTION 5. SPEAKER SECTION

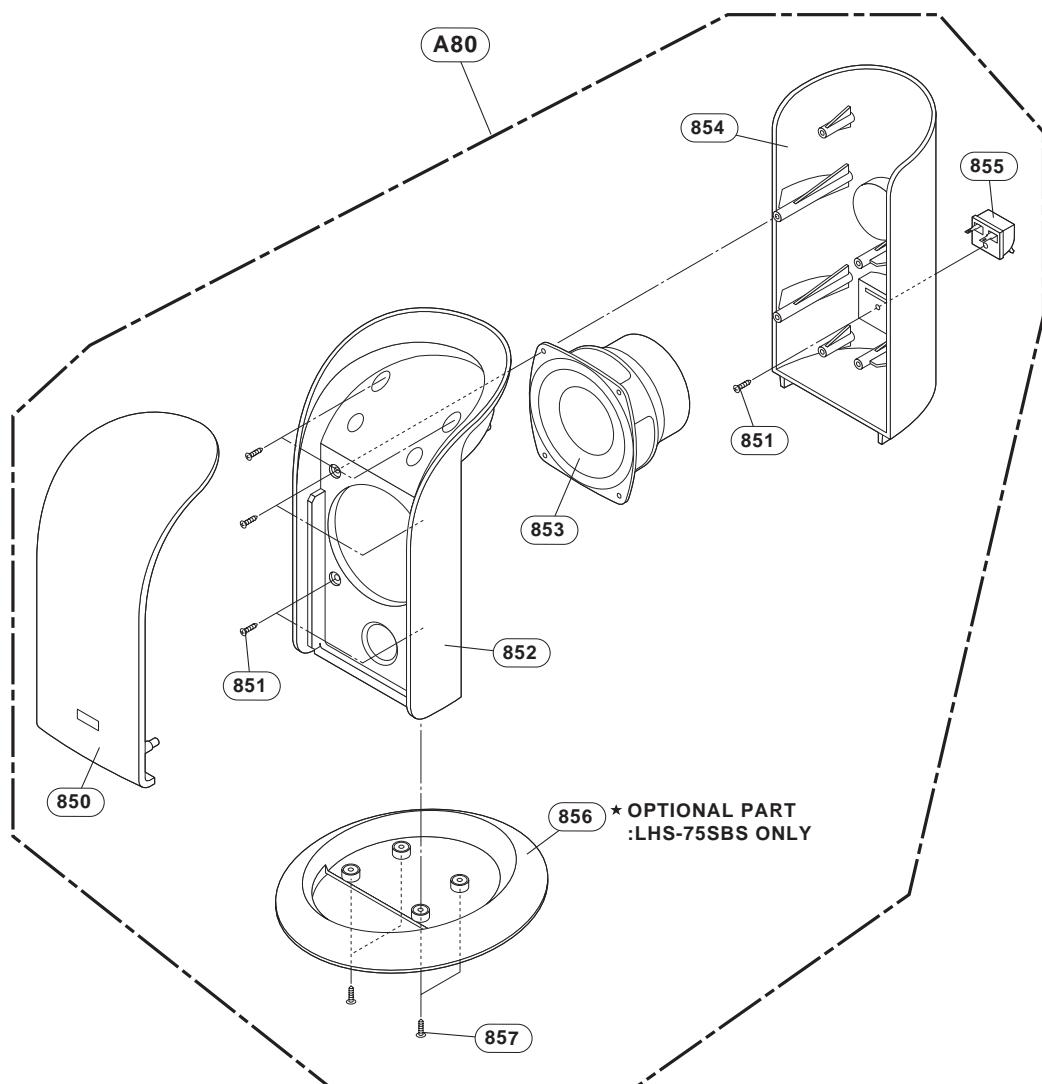
• CENTER SPEAKER

MODEL : LHS-55SBC



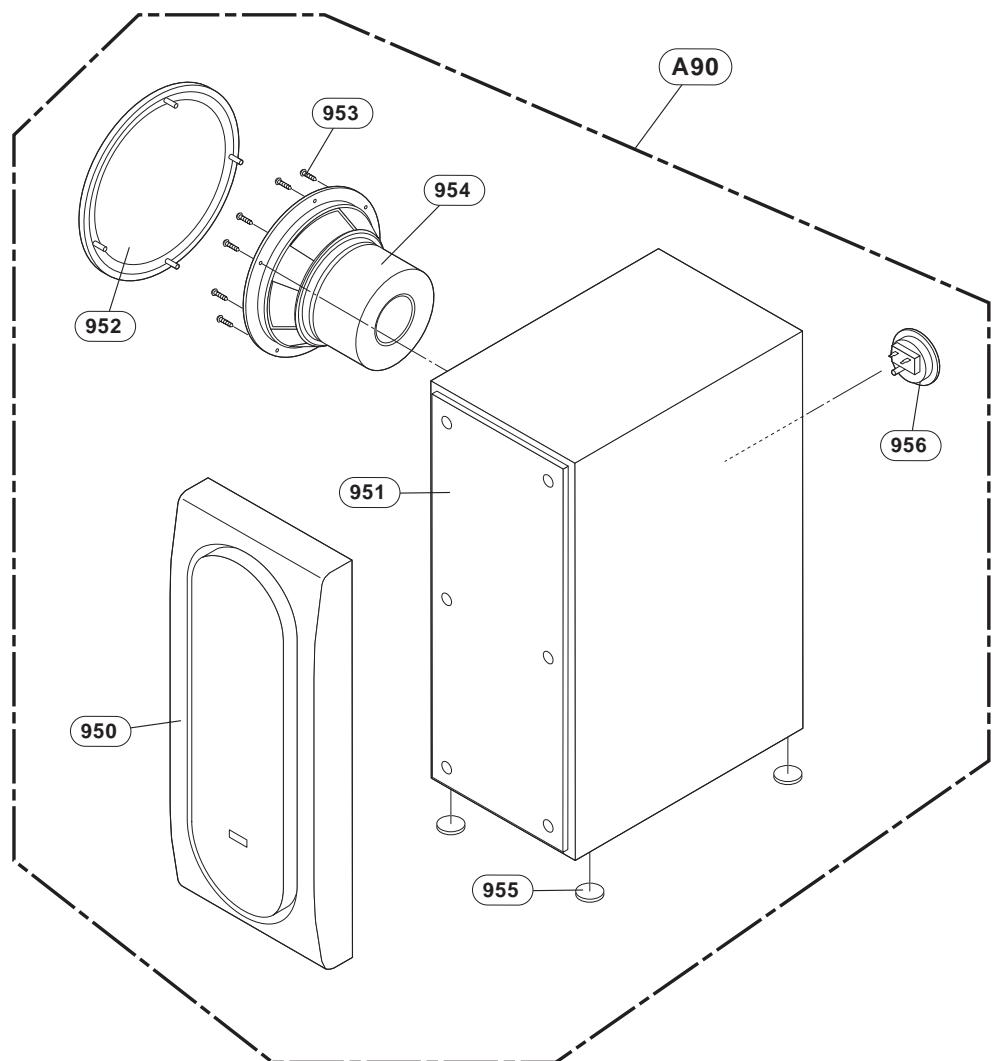
• FRONT/REAR SPEAKER

MODEL : LHS-55SBS



• SUB WOOFER SPEAKER

MODEL : LHS-55SBW



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