SERVICE MANUAL

MODEL: MDT505(MDS505V/W)

P/NO : AFN74972218

SEPTEMBER , 2010

MINI HOME THEATER

SERVICE MANUAL

MODEL: MDT505 (MDS505V/W)

CAUTION
BEFORE SERVICING THE UNIT, READ THE “SAFETY PRECAUTIONS” IN THIS MANUAL.

LG

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SECTION 3 ..... ELECTRICAL
SECTION 4 ..... REPLACEMENT PARTS LIST

SECTION 1. GENERAL

SERVICING PRECAUTIONS

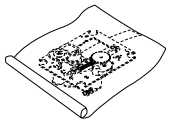
NOTES REGARDING HANDLING OF THE PICK-UP

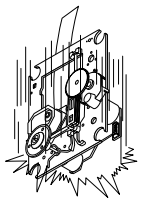
1. Notes for transport and storage

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.

2. Repair notes

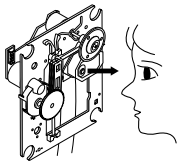
Storage in conductive bag





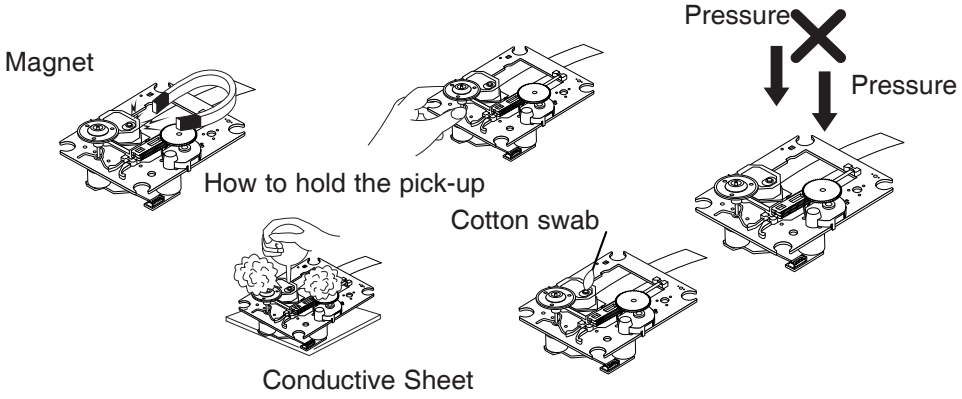
Drop impact

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 allow contact with 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 lens.



6) Never attempt to disassemble the pick-up.
   Spring has 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.

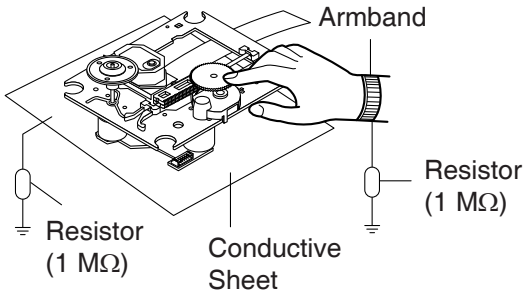
NOTES REGARDING COMPACT DISC PLAYER REPAIRS

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 (1 MΩ)
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 by installed.

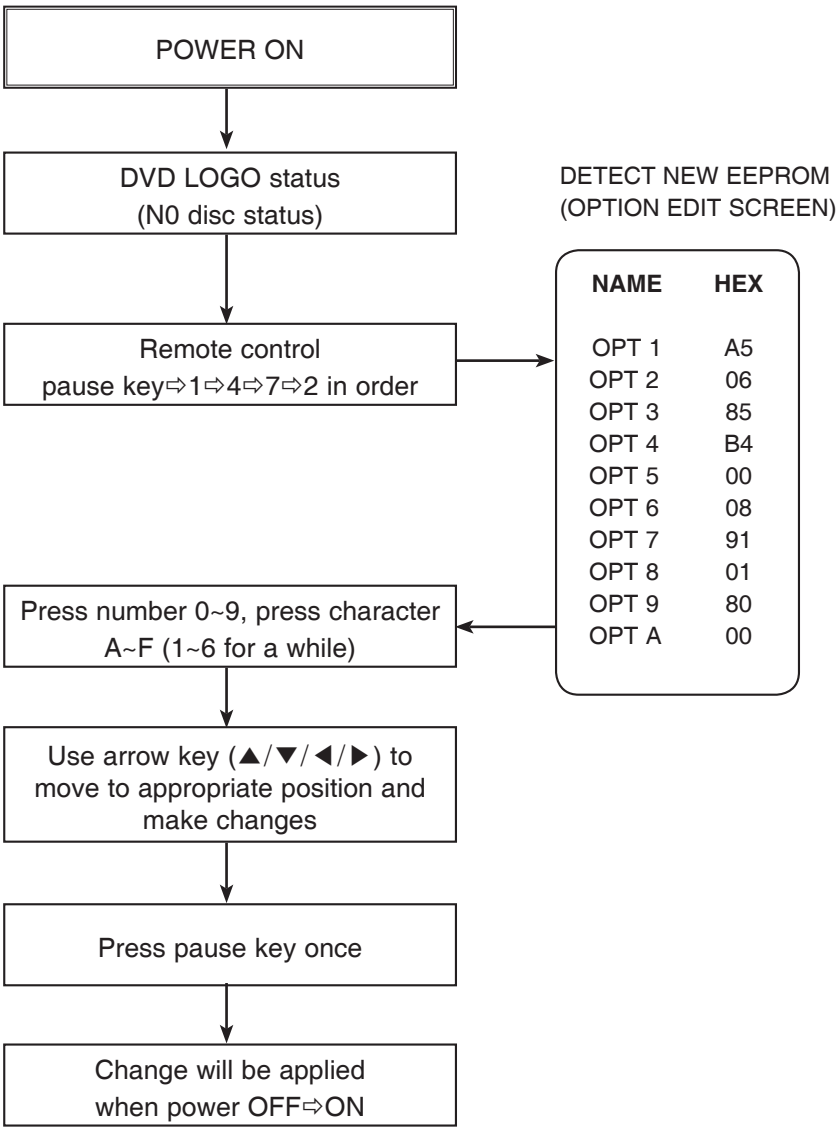
CAUTION : BE SURE NO POWER IS APPLIED TO THE CHASSIS OR CIRCUIT, AND OBSERVE ALL OTHER SAFETY PRECAUTIONS.

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

CAUTION. GRAPHIC SYMBOLS

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

SERVICE INFORMATION FOR EEPROM



HOW TO UPDATE AUDIO MICOM & DVD PROGRAMS

1. How to update AUDIO MICOM program.

[Update using CD]

1. Change the filename to download as “MDS715_(Version).HEX”. Only upper cases are permitted.
   ex) MDS715 : “MDS715_0709081.HEX”
2. Copy the file to the root folder of a CD and burn it.
3. Insert the CD to the SET, and move to the DVD function.
   Then the upgrade process will be started with the upgrade information.
4. If the upgrade process is complete, the set will be rebooted with “Complete” message.

[Update using USB]

1. Change the filename to download as “MDS715_(Version).HEX”. Only upper cases are permitted.
   ex) MDS715 : “MDS715_0709081.HEX”
2. Copy the file to the root folder of USB storage.
3. After Home-menu is displayed on Screen of SET, Put the USB into the SET.
   Then the upgrade process will be started with the upgrade information.
4. If the upgrade process is complete, the set will be rebooted with “Complete” message.

2. How to update DVD program.

[Update using CD]

1. Copy DVD program(ex: LG_MDS715LD1_Version.Rom) to Root folder of CD, and burn it.
   ex) P:LG_MDS715LD1_0911180.Rom
2. Insert the CD to the SET, then after a while the CD tray will be opened with upgrade information on the screen.
3. Remove the CD, and press “PLAY” key in remote controller.
4. Remove and reconnect the power cable when it changes to logo screen from upgrade information.
   Then the upgrade process is completed.

[Update using USB]

1. Copy DVD program(ex: LG_MDS715LD1_Version.Rom) to Root folder of the formatted USB and burn it.
   ex) P:\LG_MDS715LD1_0911180.Rom
2. After Home-menu is displayed on Screen of SET, Put the USB into the SET.
   Then the upgrade process will be started with the upgrade information.
3. Remove the USB, press "PLAY" key of the remote controller.
4. Remove and reconnect the power cable when it changes to logo screen from upgrade information.
   Then the upgrade process is completed.

SPECIFICATIONS

• GENERAL

Power supply	110~240 V, 50/60 Hz
Power consumption	Refer to main label
Dimensions (W x H x D)	273 x 333 x 339 mm without foot
Net Weight (Approx.)	5.7 kg
Operating temperature	41 °F to 95 °F (5 °C to 35 °C)
Operating humidity	5 % to 90 %
Bus Power supply (USB)	DC 5V⎓500mA

• INPUTS/ OUTPUTS

VIDEO OUT	1.0 V (p-p), 75 Ω, sync negative, RCA jack x 1
COMPONENT VIDEO OUT	(Y) 1.0 V (p-p), 75 Ω, sync negative, RCA jack x 1, (Pb)/(Pr) 0.7 V (p-p), 75 Ω, RCA jack x 2
ANALOG AUDIO IN	0.6 Vrms, 47 kΩ, RCA jack (L, R) x 1
PORT. IN	0.5 Vrms (3.5 mm stereo jack)

• TUNER

FM Tuning Range	87.5 to 108.0 MHz or 87.50 to 108.00 MHz
AM Tuning Range	522 to 1 620 kHz, 520 to 1 710 kHz or 522 to 1 710 kHz

• AMPLIFIER

Stereo mode	150 W + 150 W (4 Ω at 1 kHz)
Surround mode	
Front	150 W + 150 W (4 Ω at 1 kHz)
Center	70 W (6 Ω at 1 kHz)
Surround	70 W + 70 W (6 Ω at 1 kHz)
Subwoofer	200 W (3 Ω at 60 Hz)

• SPEAKERS

Front speaker (MDS505V)

Type	2 Way 2 speaker
Impedance	4 Ω
Rated Input Power	150 W
Max. Input power	300 W
Net Dimensions(W x H x D)	240 x 387 x 336 mm
Net Weight	5 kg

Passive Subwoofer (MDS505W)

Type	1 Way 1 speaker
Impedance	3 Ω
Rated Input Power	200 W
Max. Input power	400 W
Net Dimensions(W x H x D)	261 x 331 x 409 mm
Net Weight	6.5 kg

SECTION 2

CABINET & MAIN CHASSIS

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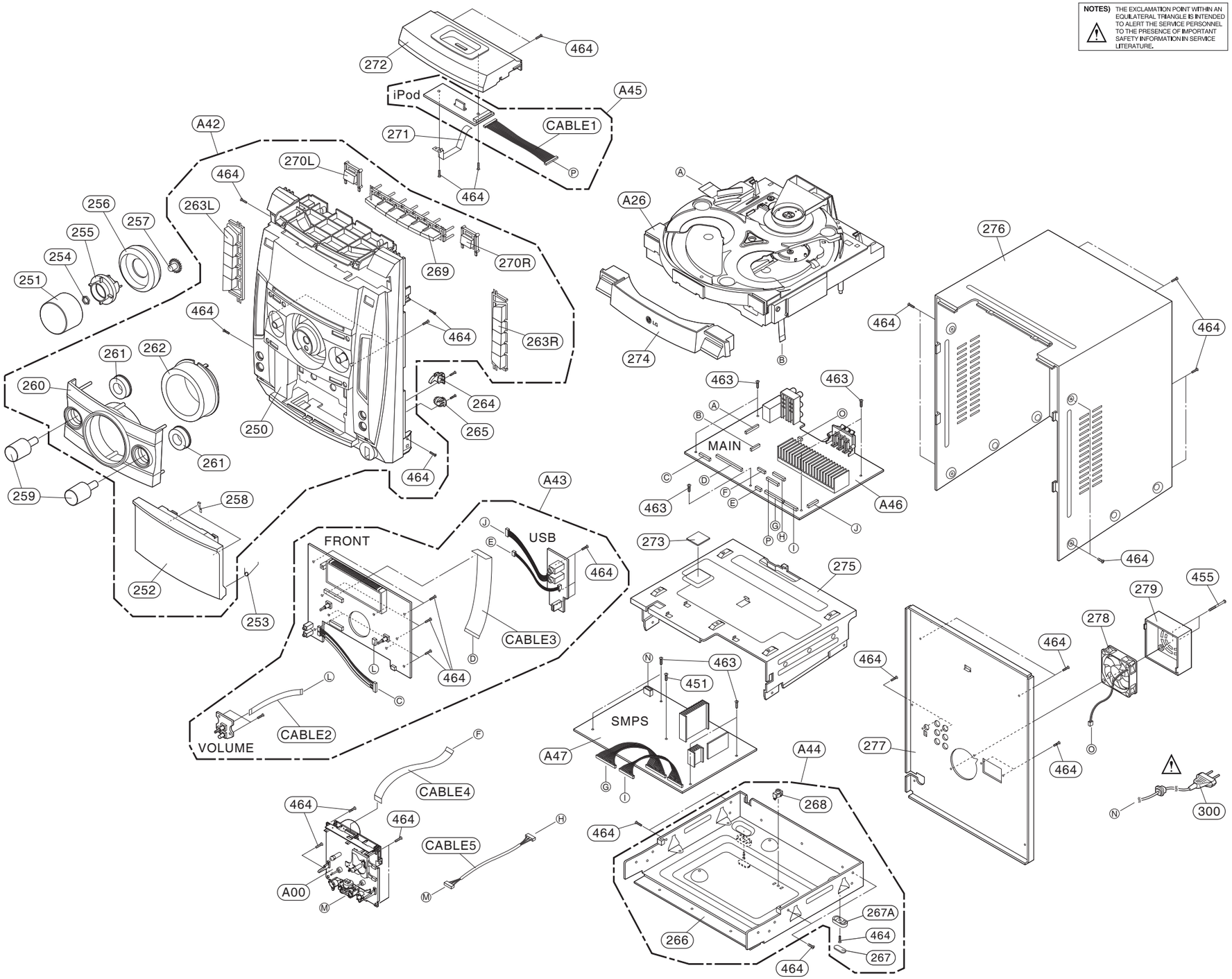
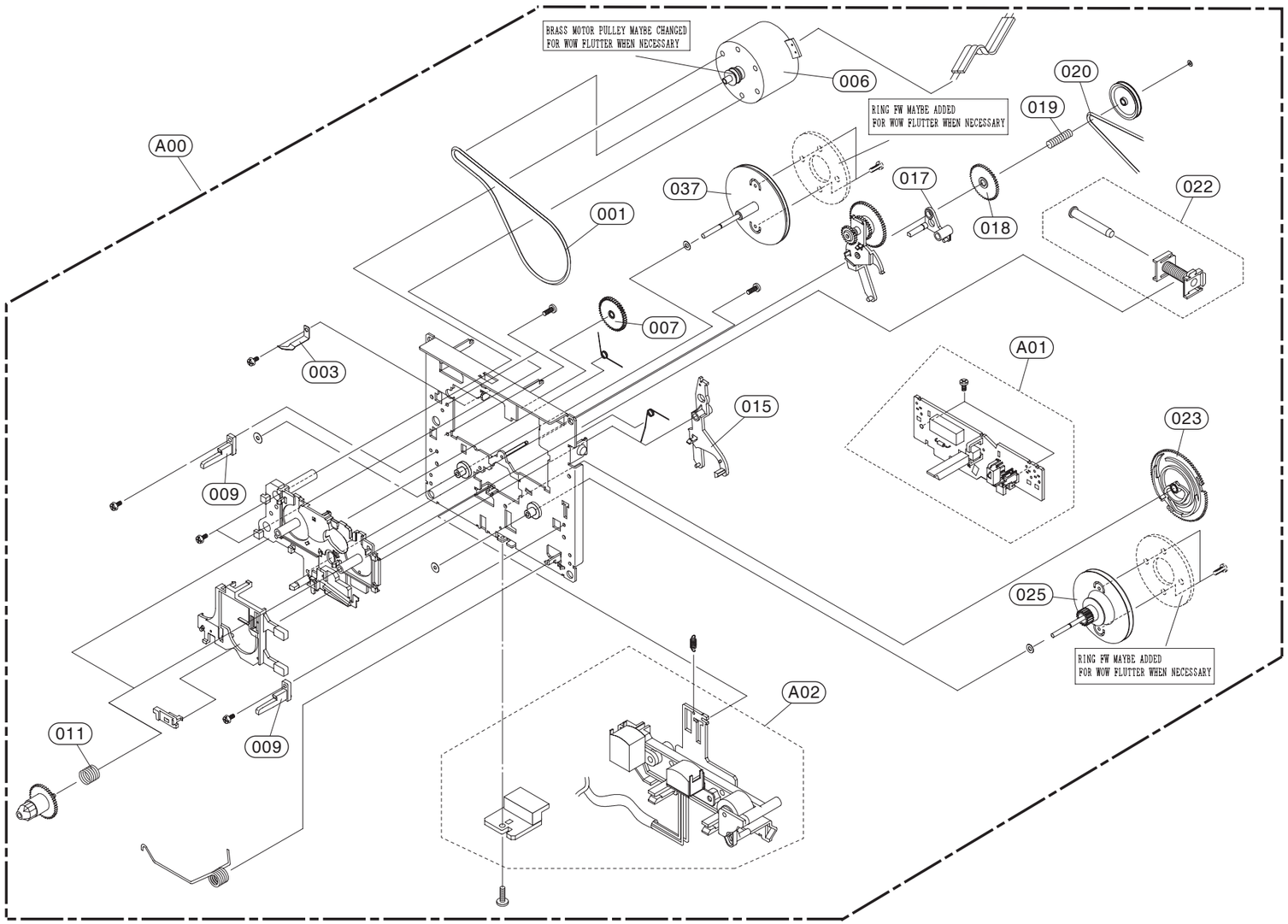
EXPLODED VIEWS

1. CABINET AND MAIN FRAME SECTION (MDT505)

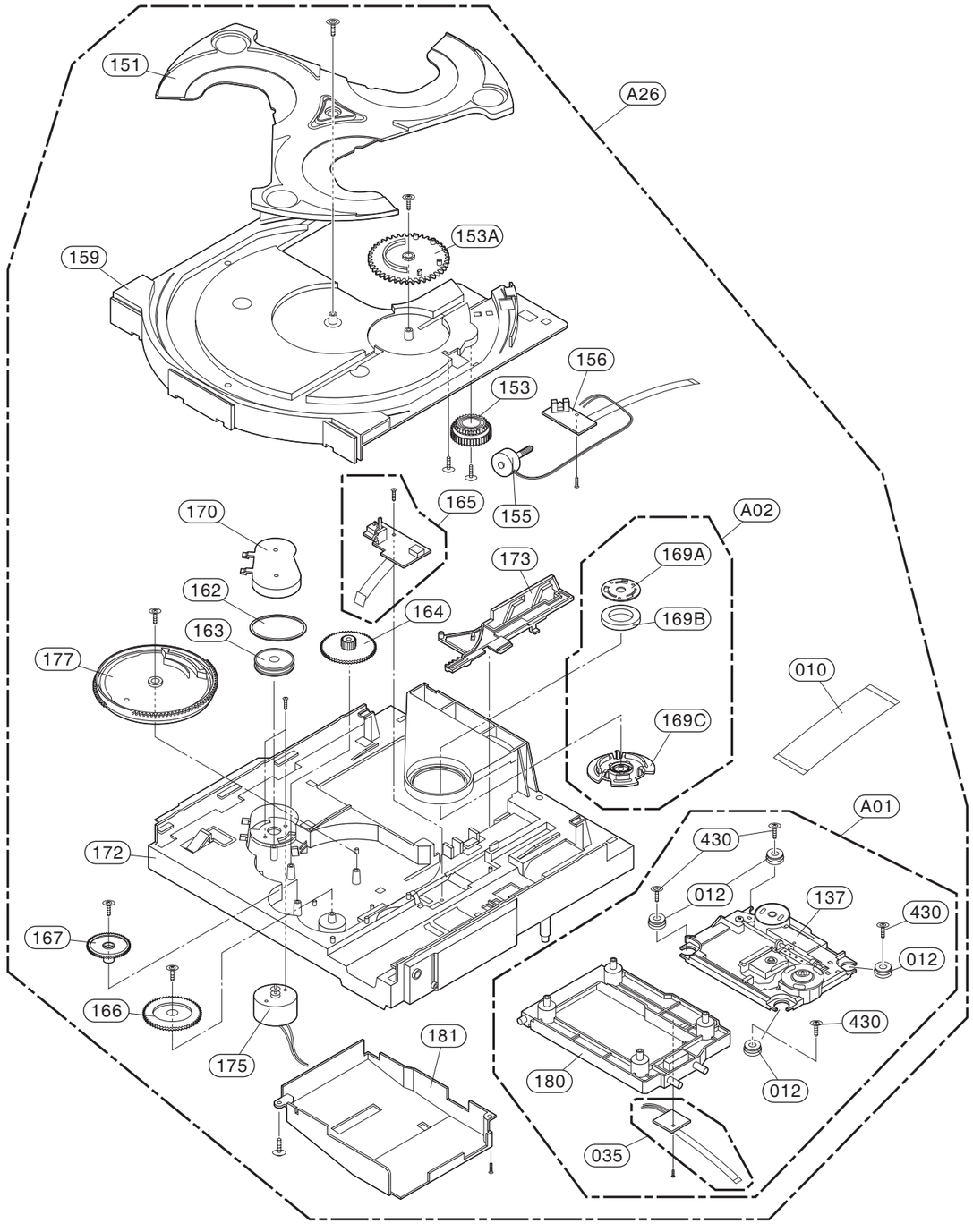
NOTES) THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.



2. TAPE DECK MECHANISM SECTION (A/R & A/S : RIGHT A/R DECK)



3. DVD DECK MECHANISM SECTION (DVM-H1723)



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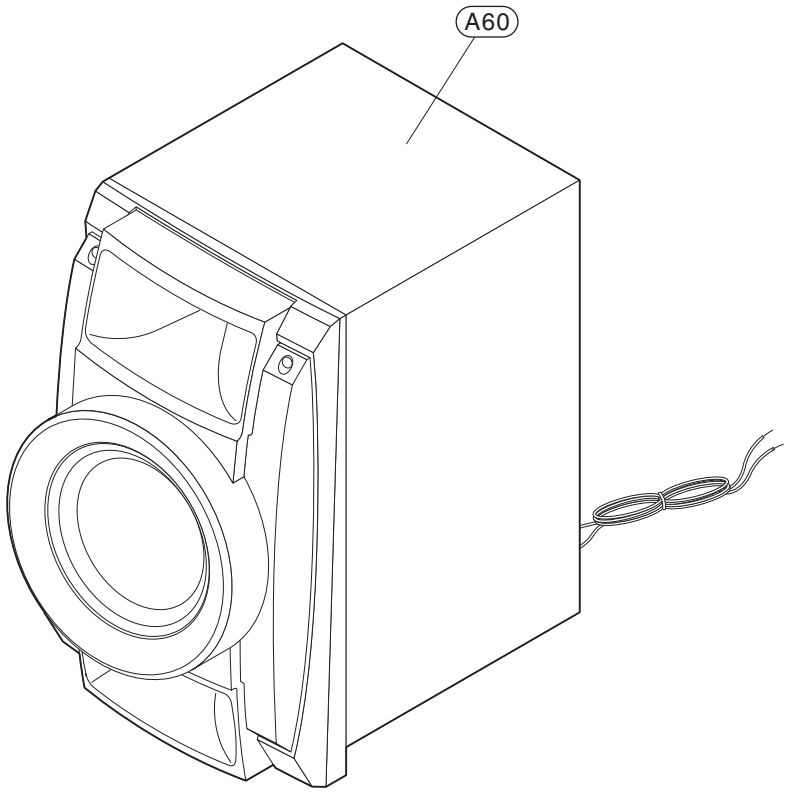
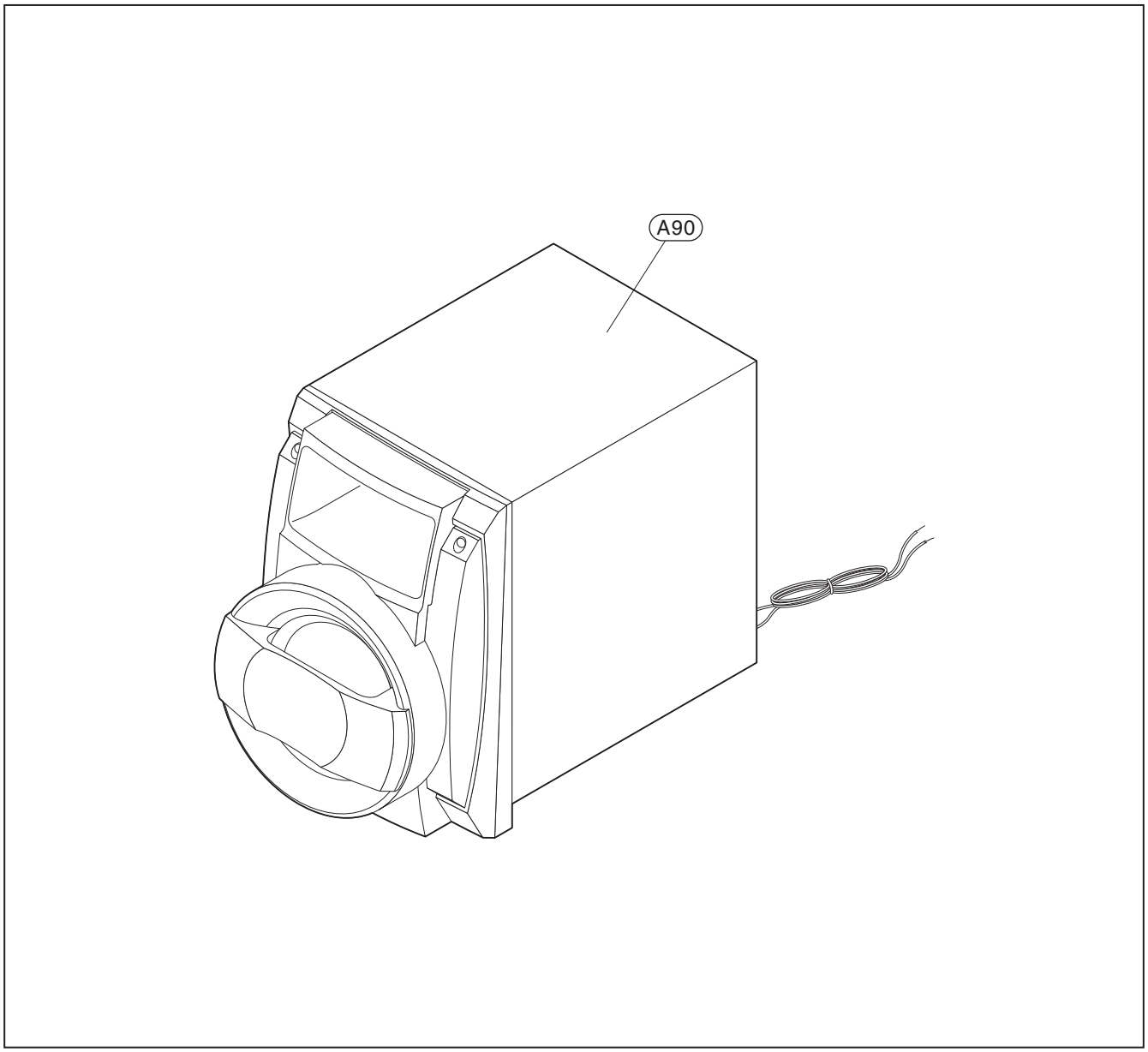
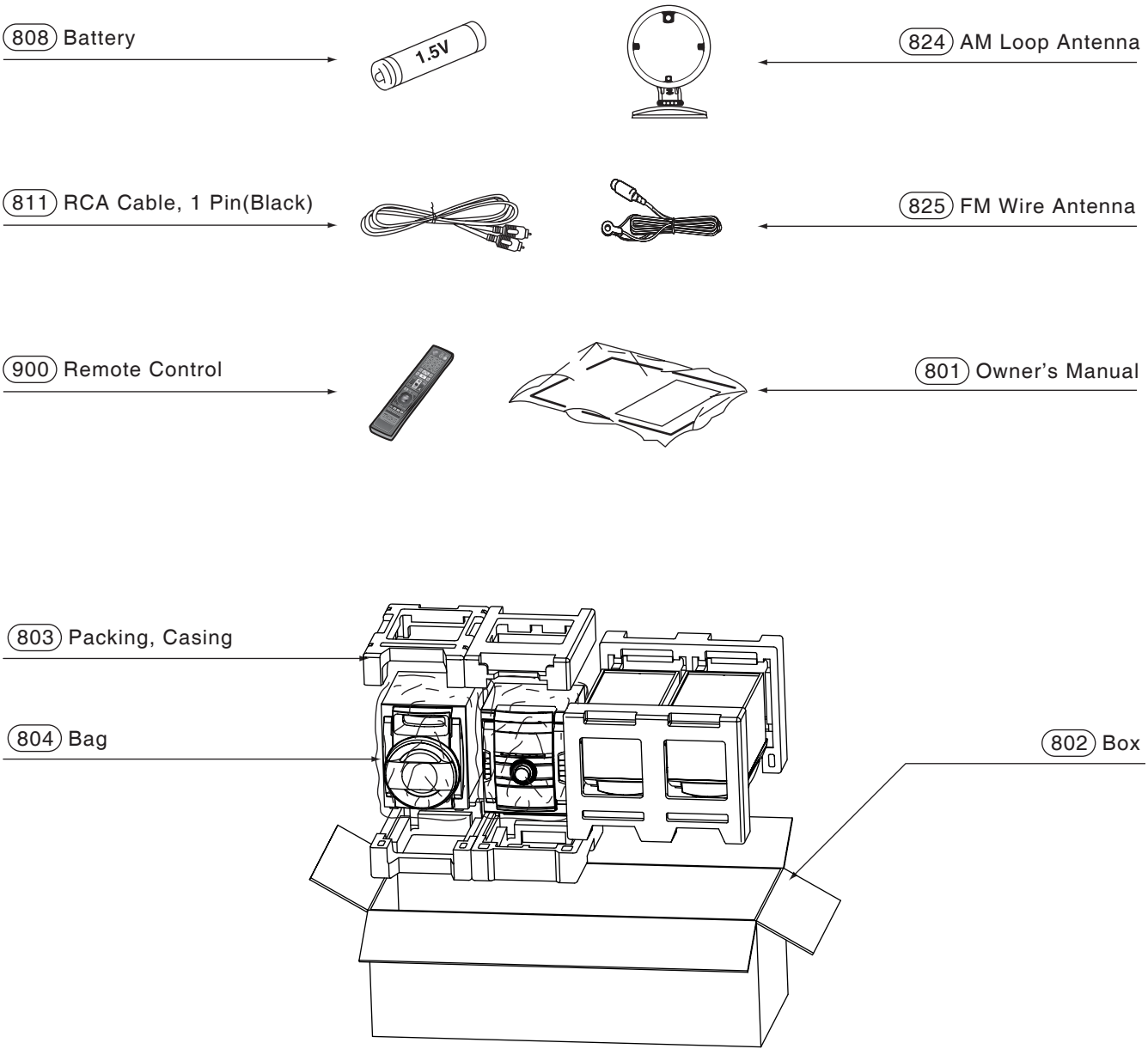
4. SPEAKER SECTION
4-1. FRONT SPEAKER (MDS505V)



4-2. PASSIVE SUBWOOFER (MDS505W)



5. PACKING ACCESSORY SECTION



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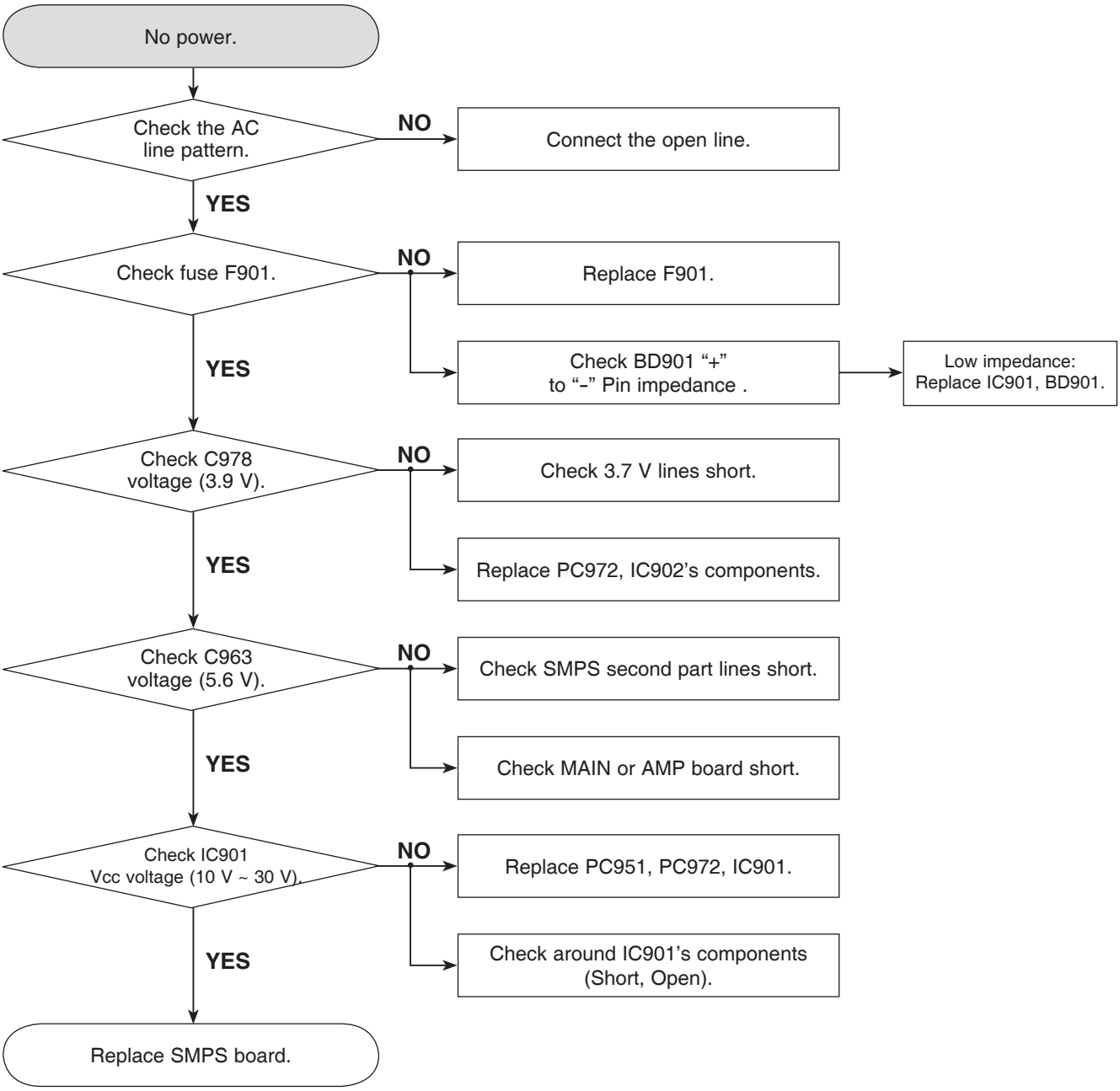
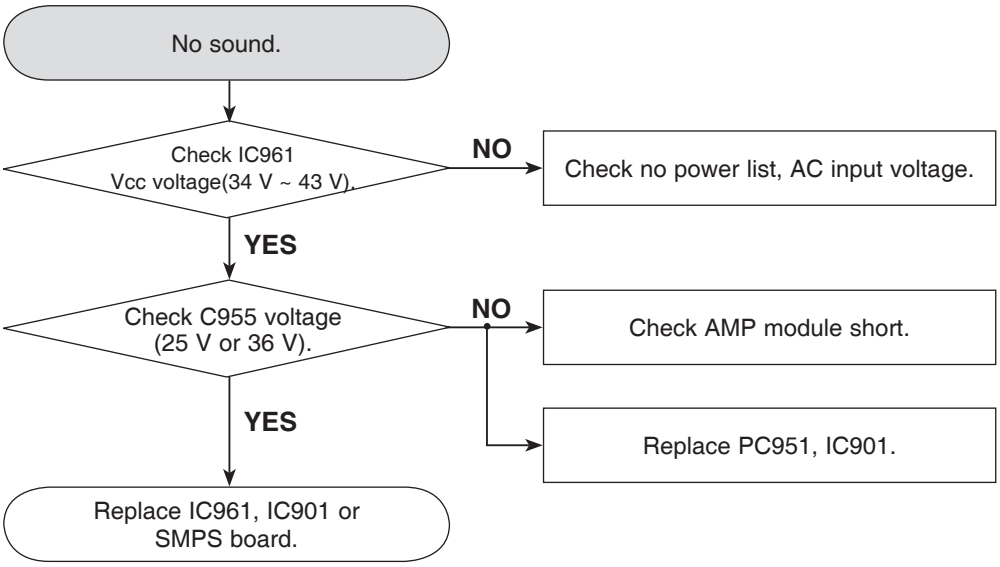
5. KARAOKE P.C.BOARD (OPTIONAL PART) 3-69

ELECTRICAL TROUBLESHOOTING GUIDE

1. SMPS BOARD

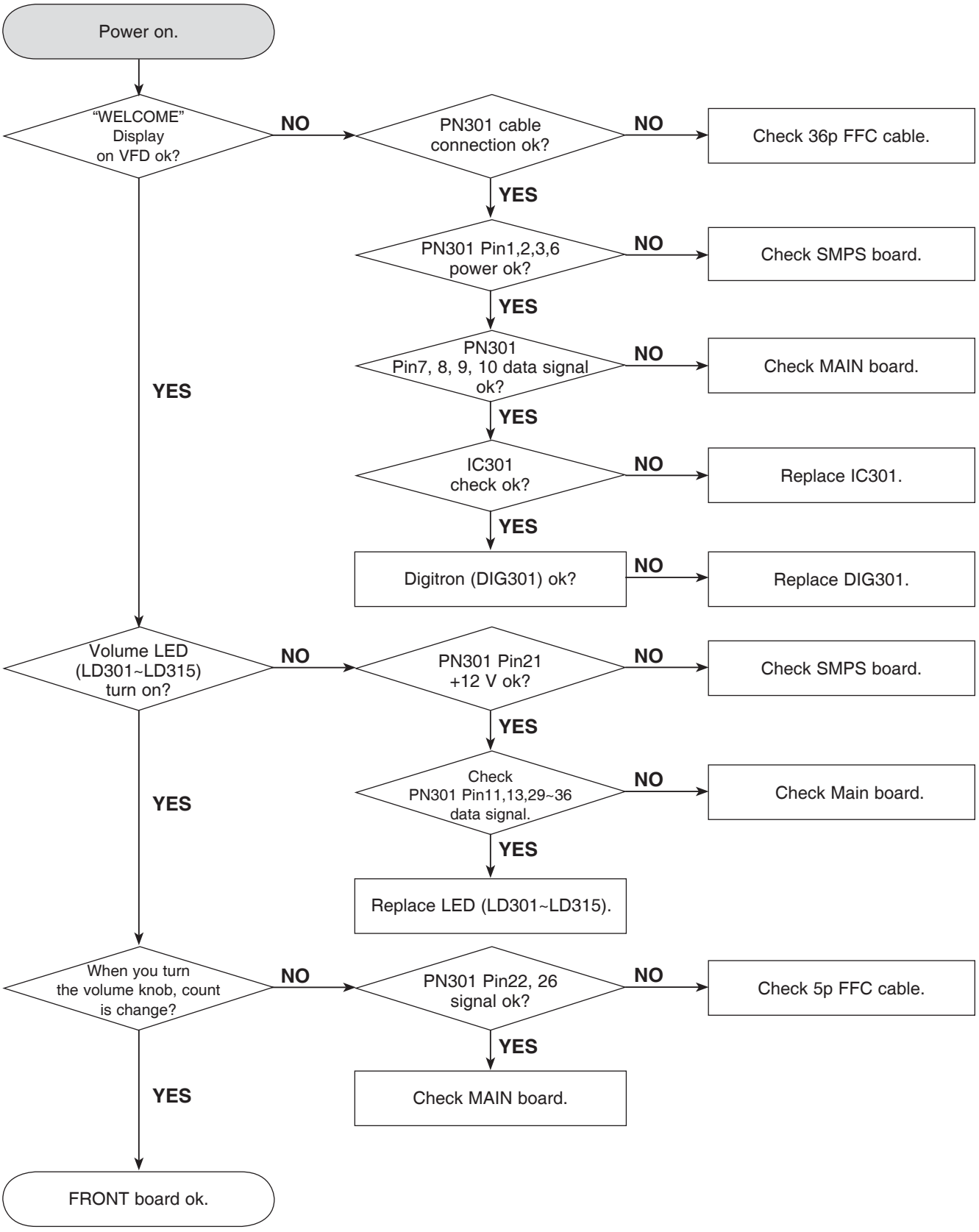


ELECTRICAL TROUBLESHOOTING GUIDE



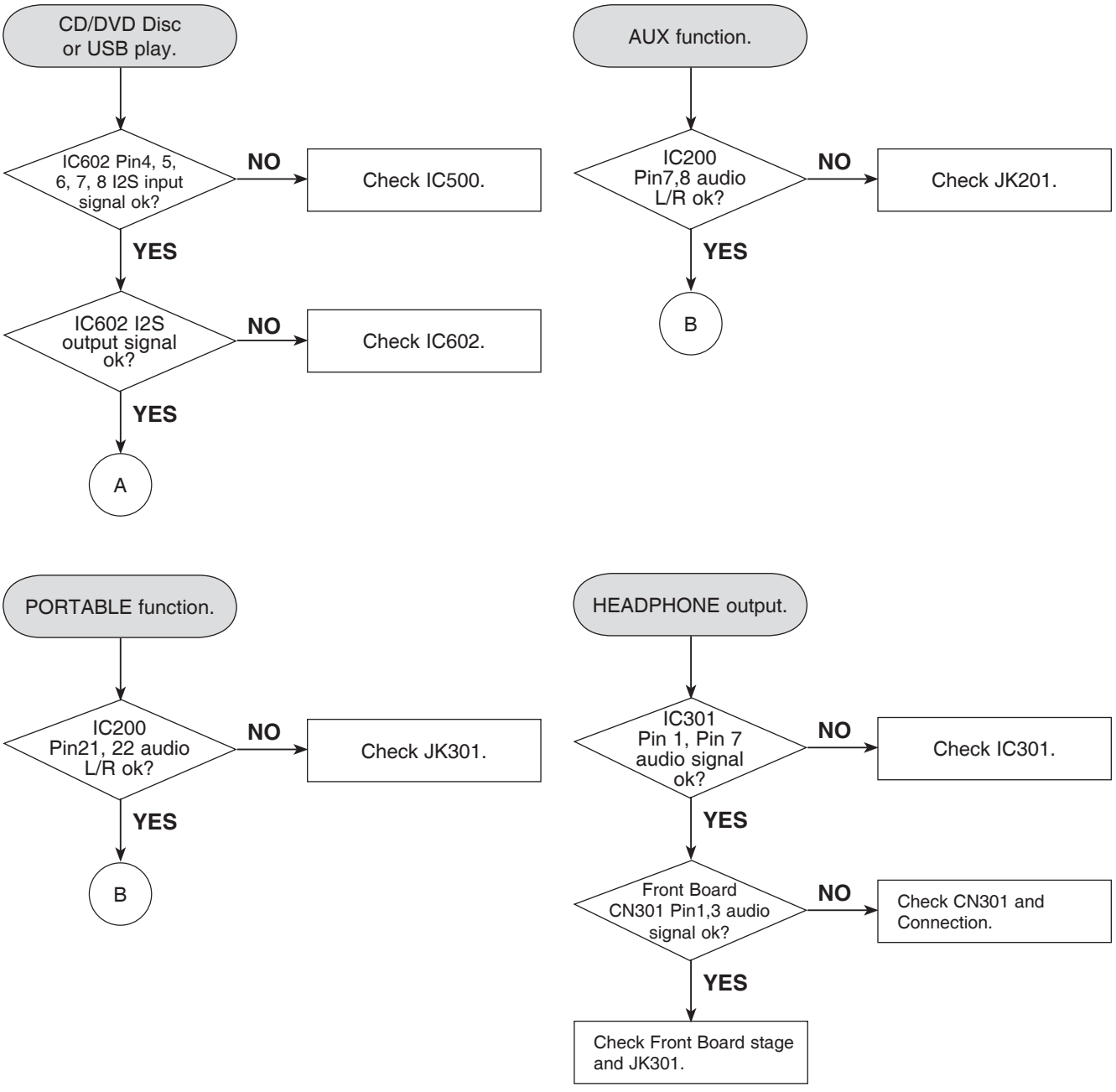
ELECTRICAL TROUBLESHOOTING GUIDE

2. FRONT BOARD

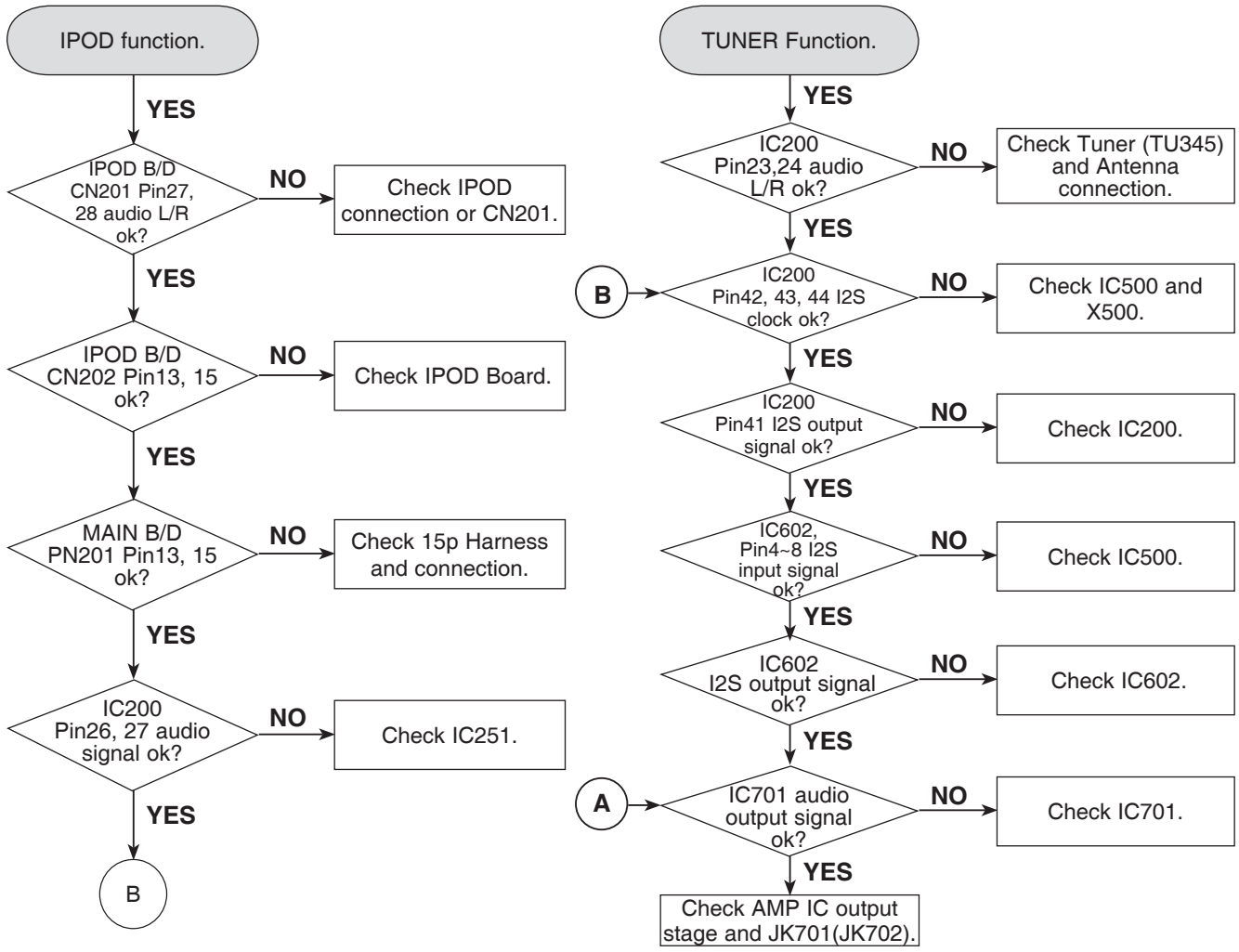


ELECTRICAL TROUBLESHOOTING GUIDE

3. NO AUDIO CHECK

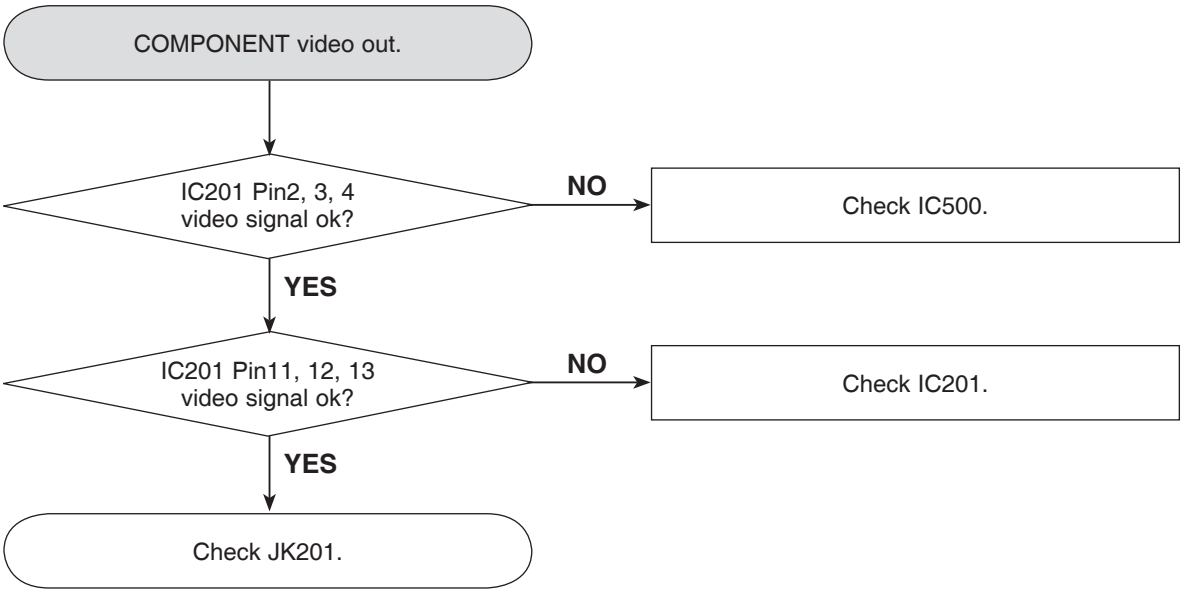


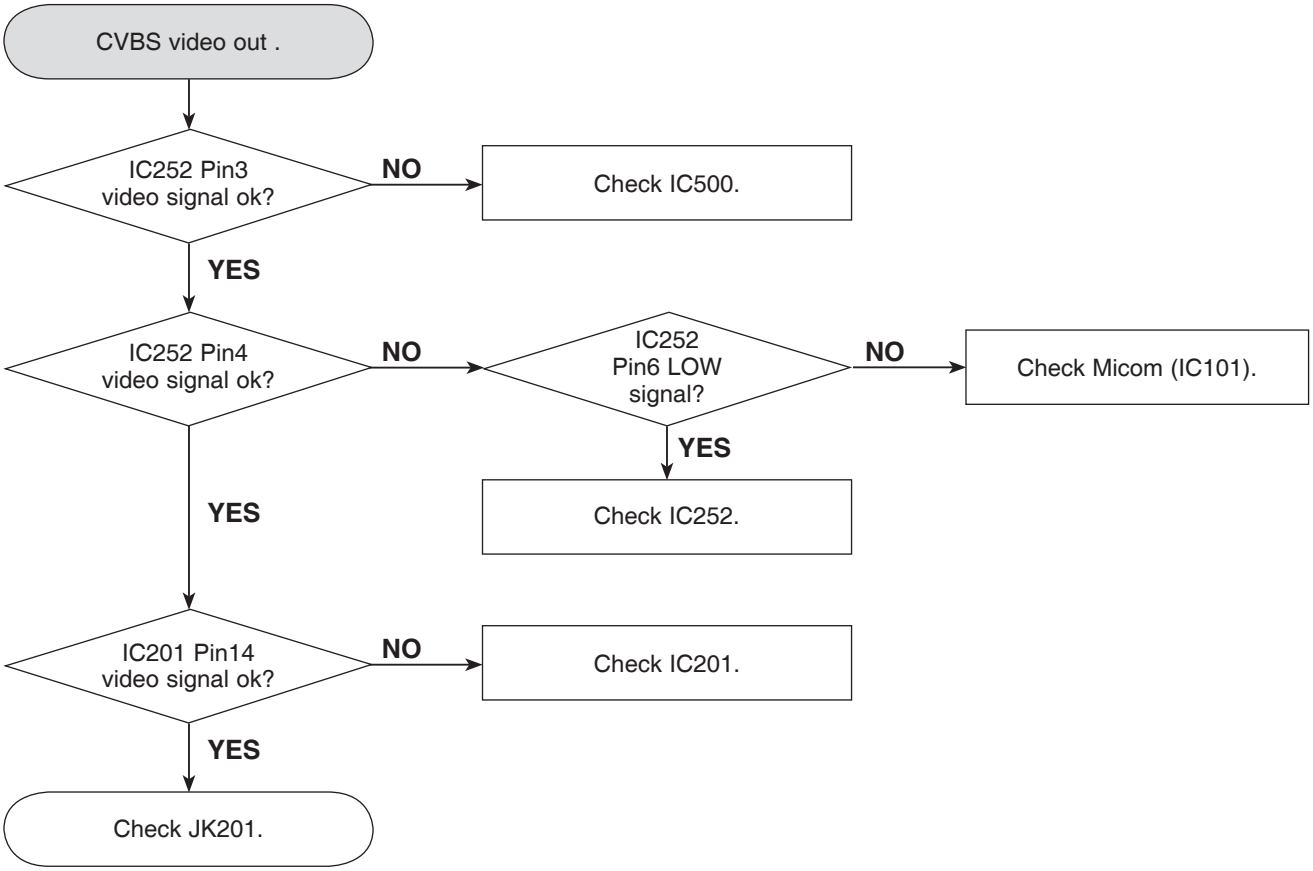
ELECTRICAL TROUBLESHOOTING GUIDE



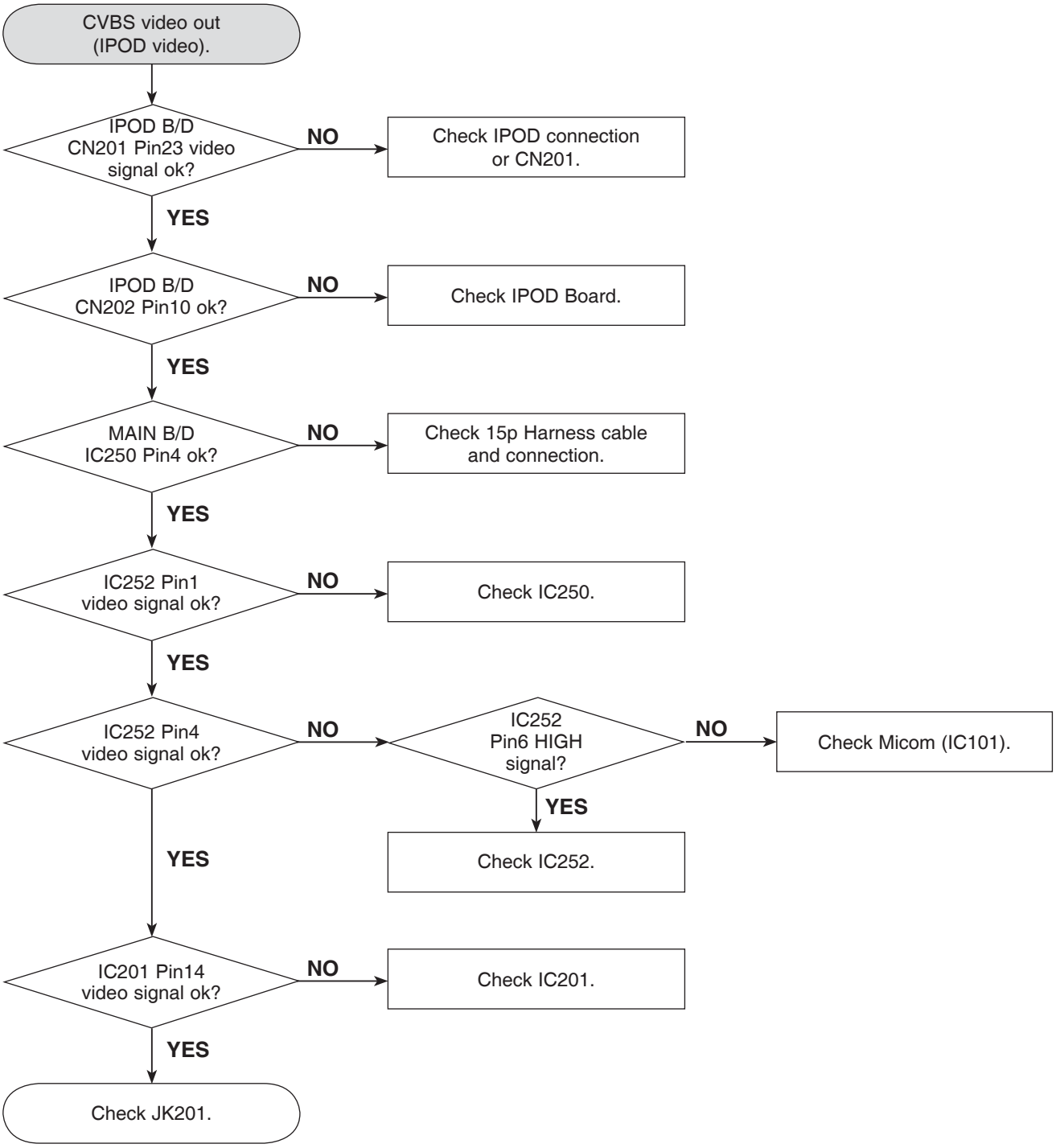
ELECTRICAL TROUBLESHOOTING GUIDE

4. NO VIDEO CHECK

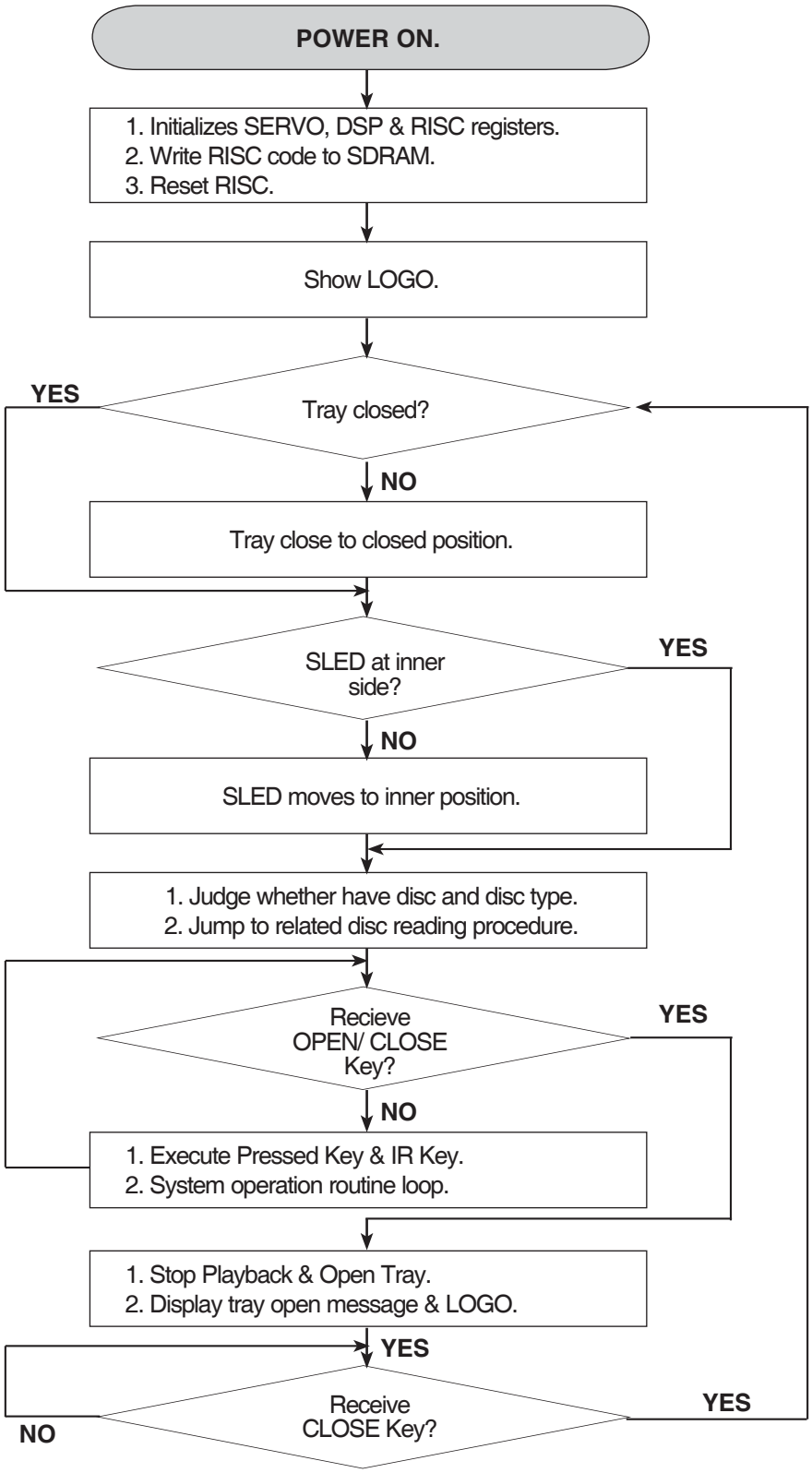




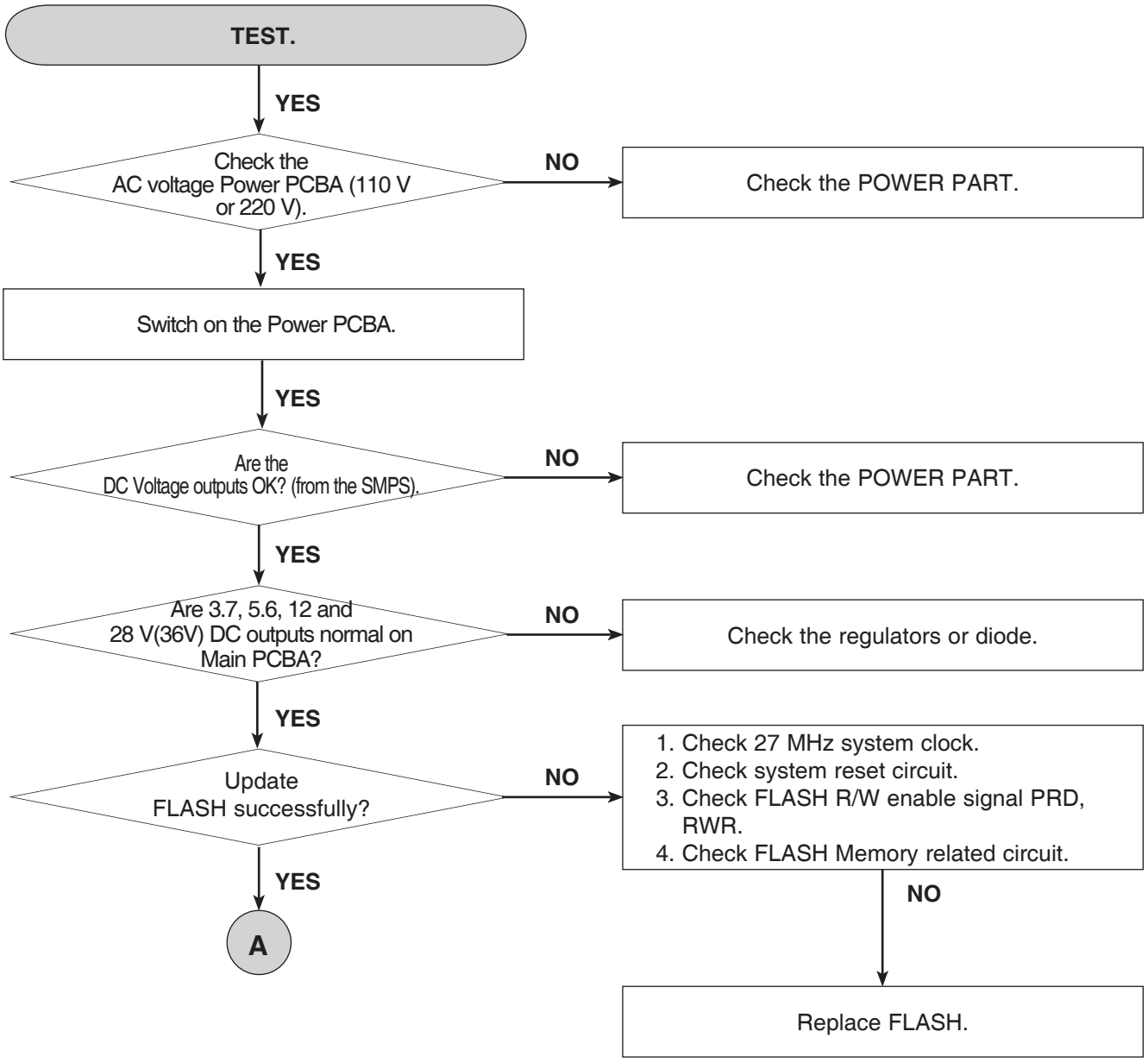
ELECTRICAL TROUBLESHOOTING GUIDE

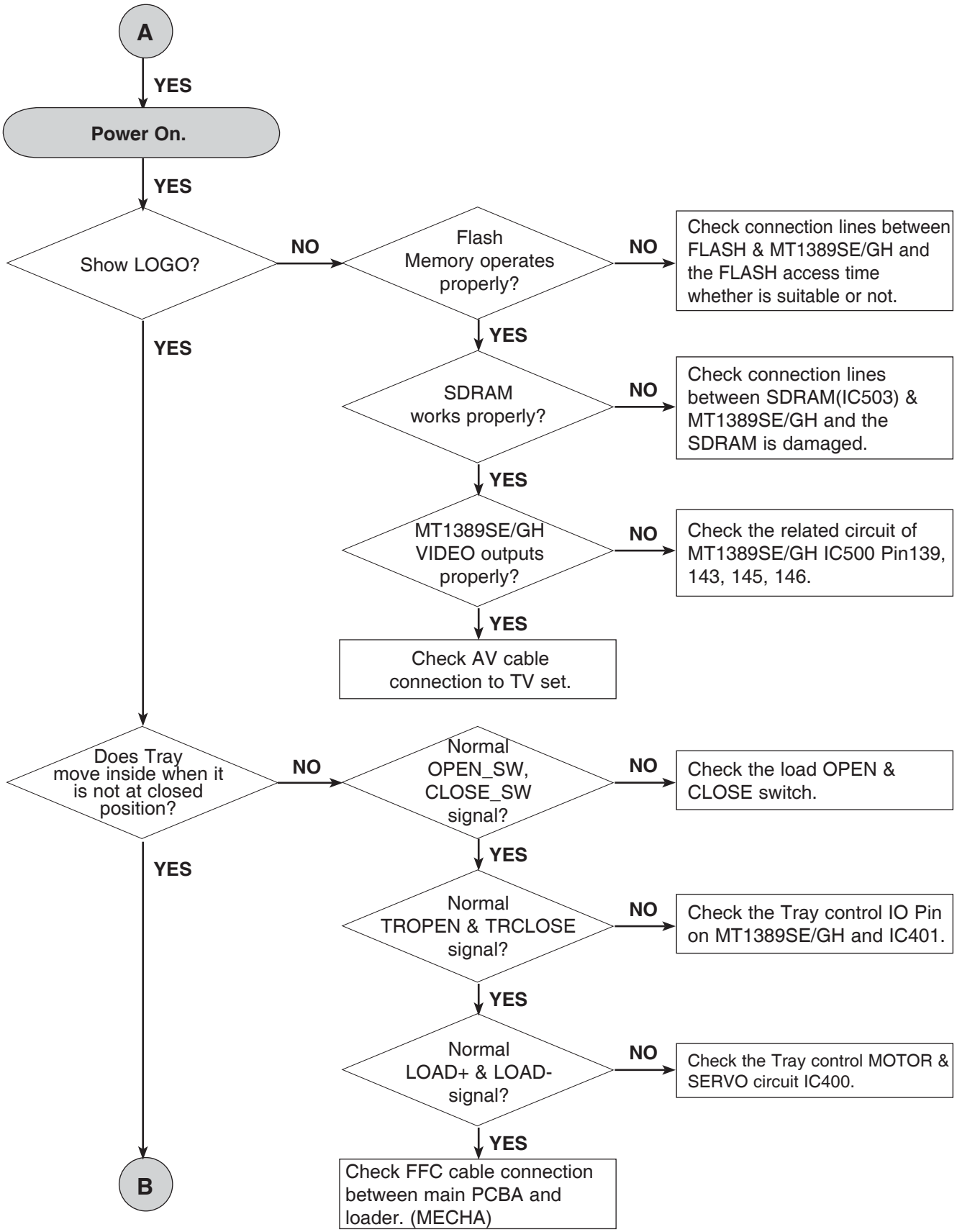


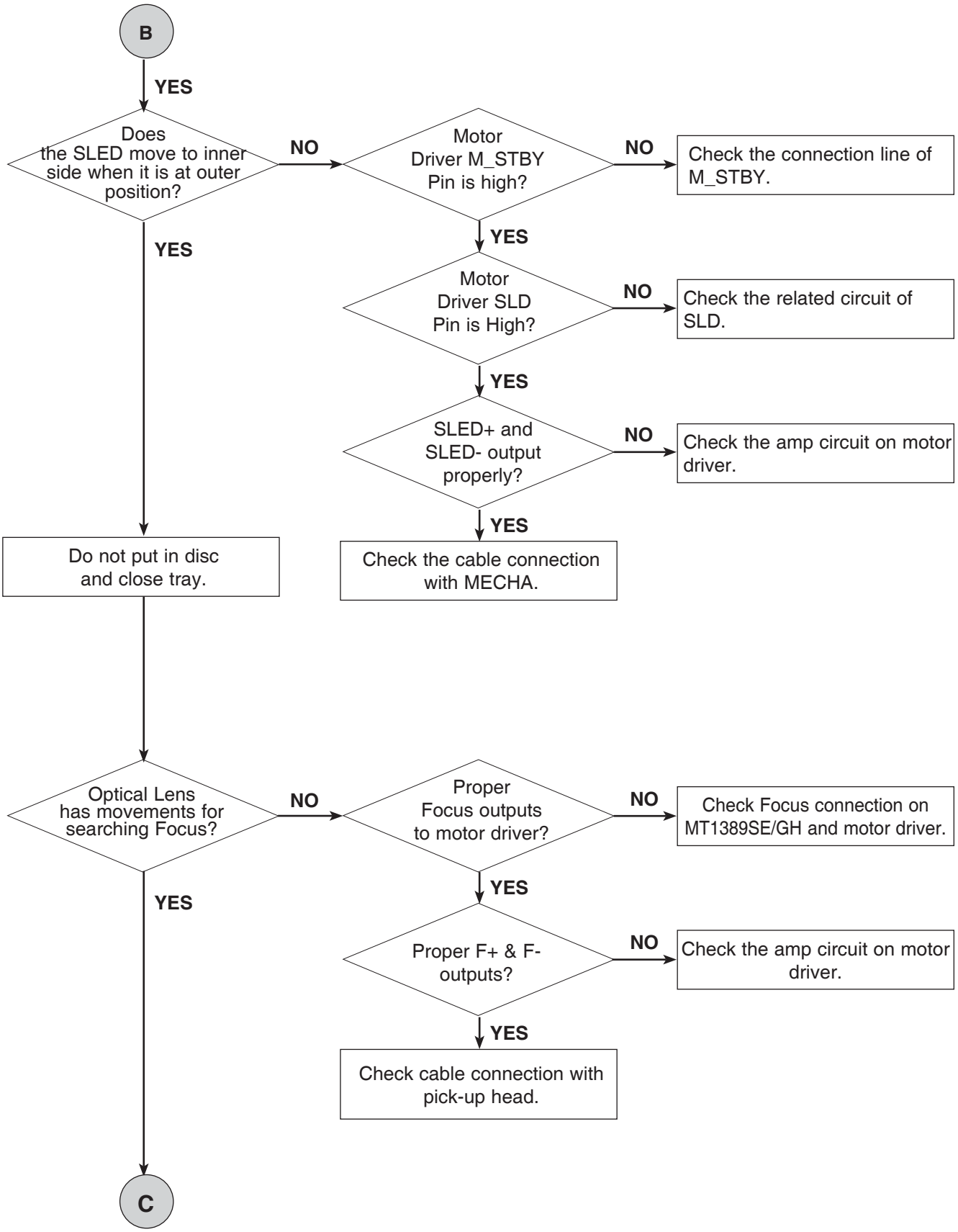
5. SYSTEM OPERATION FLOW

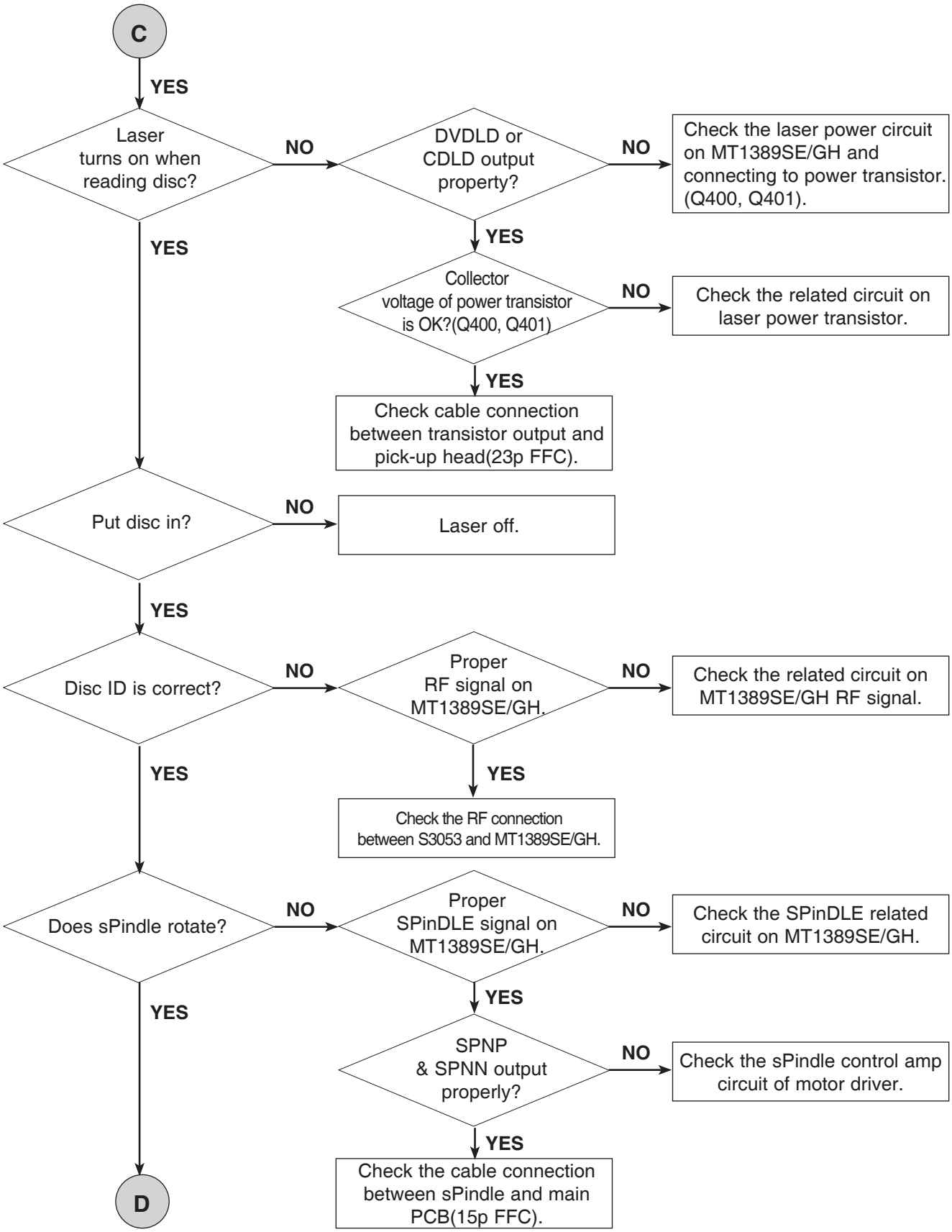


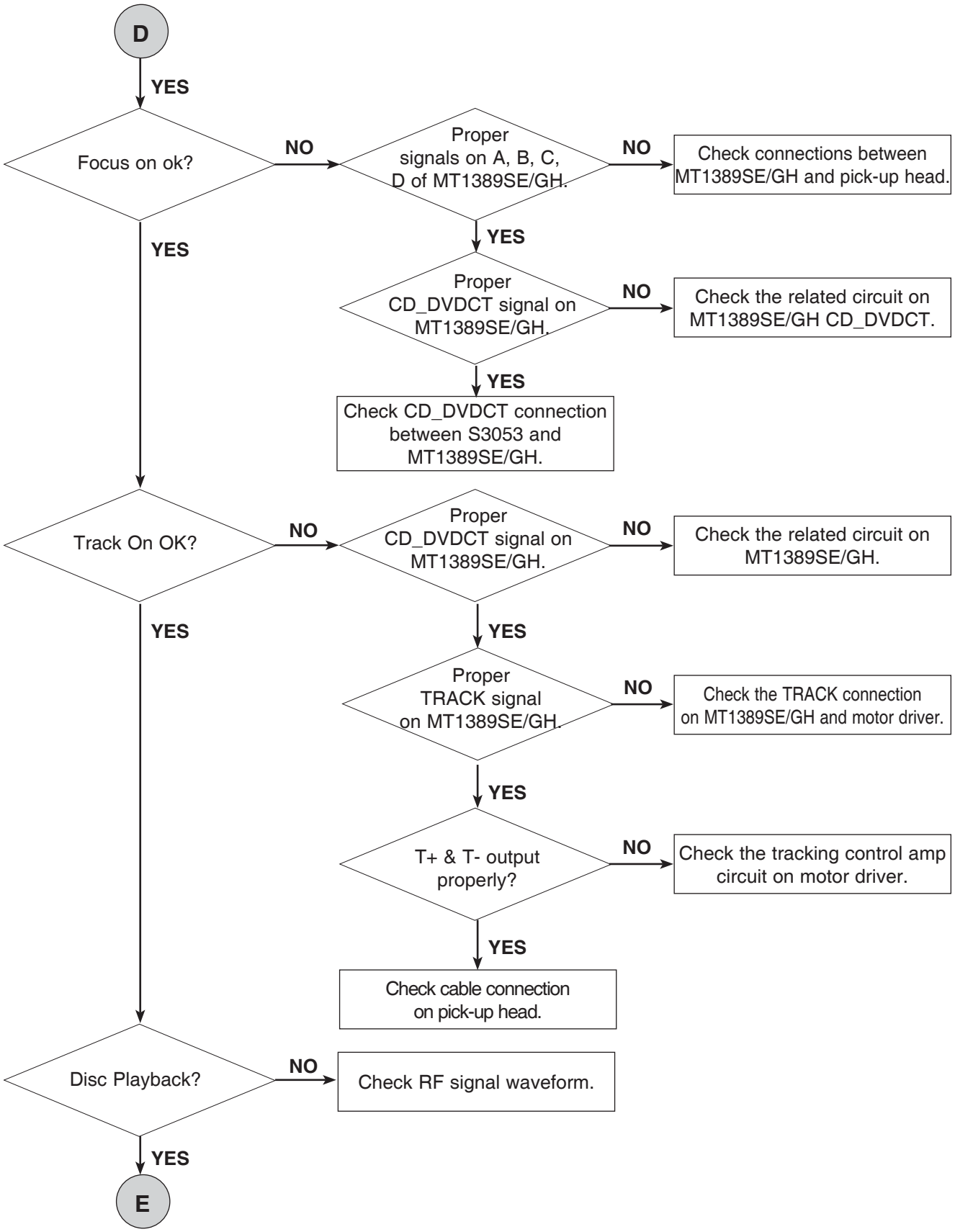
6. TEST & DEBUG FLOW

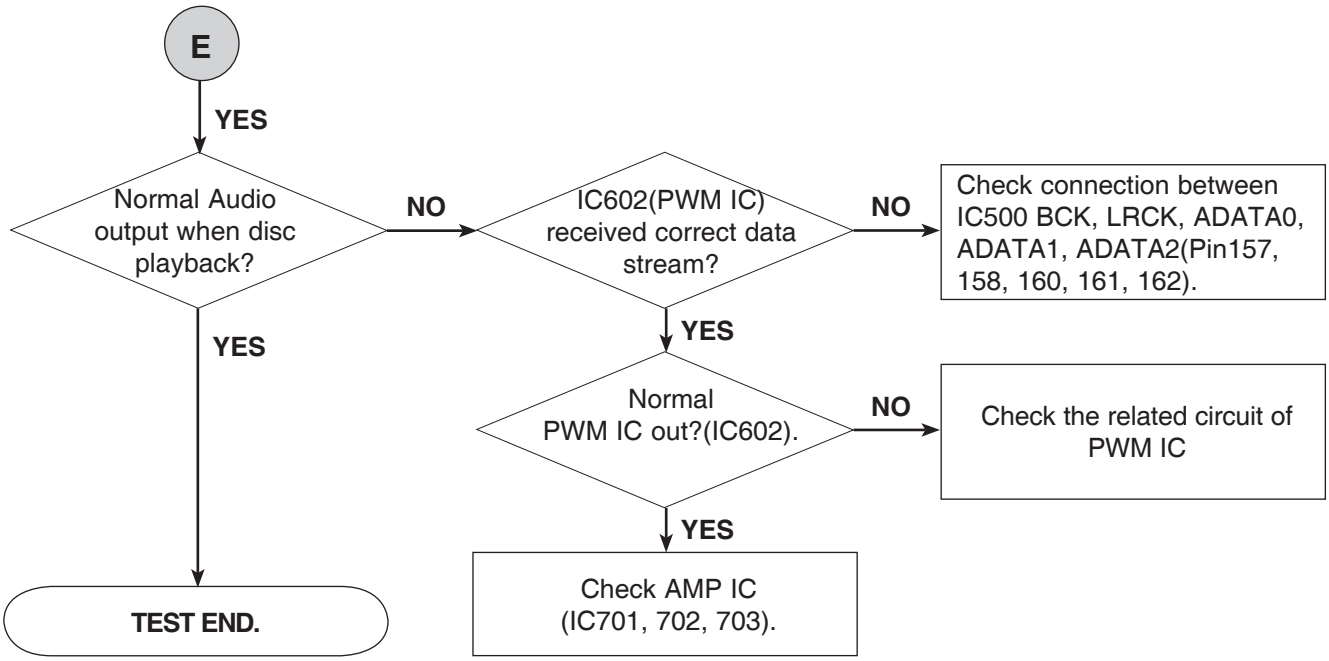








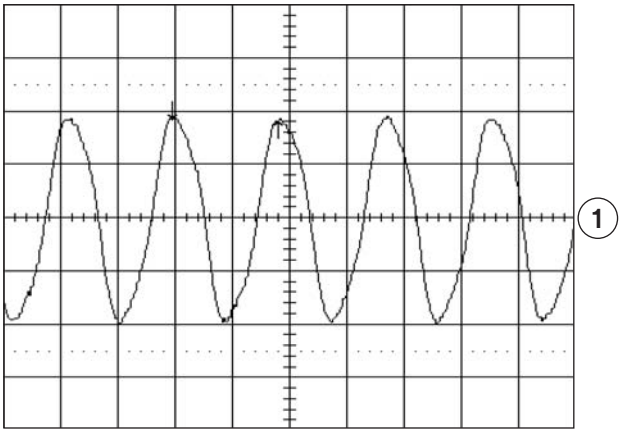




DETAILS AND WAVEFORMS ON SYSTEM TEST AND DEBUGGING

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

1) MT1389SE/GH main clock is at 27 MHz(X500)



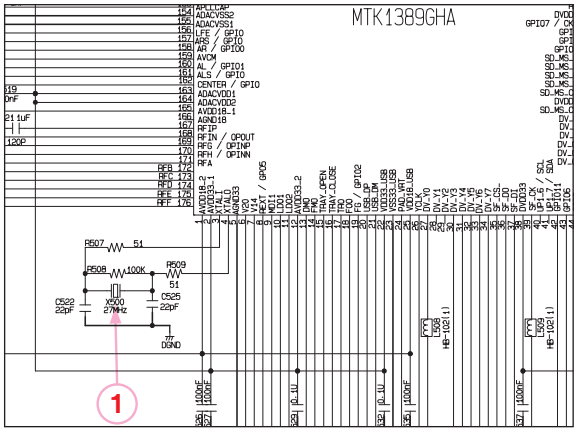


FIG 1-1

2) MT1389SE/GH reset is high active.

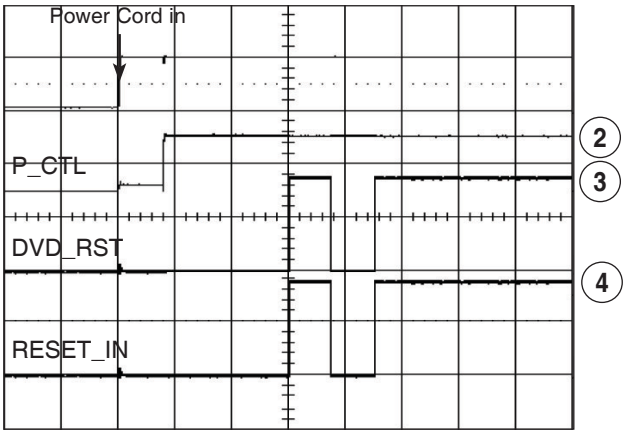
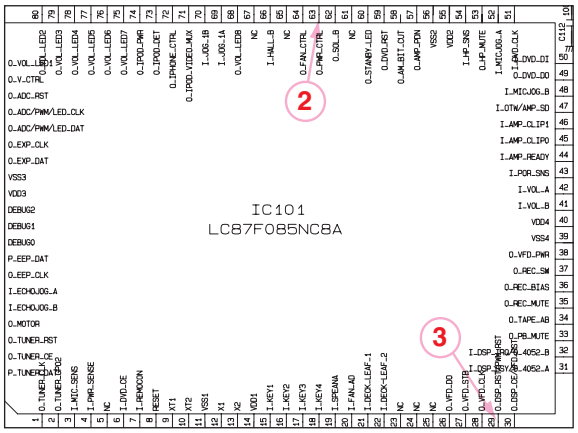
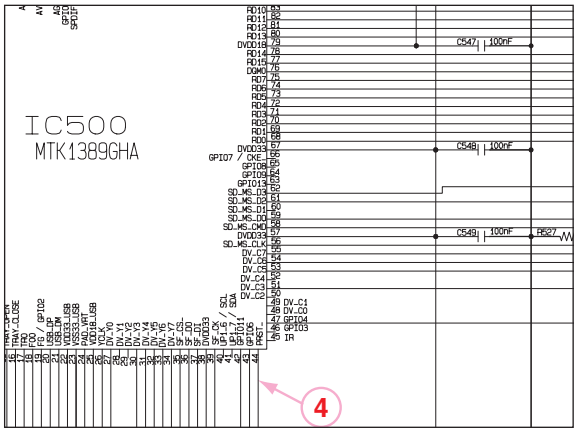
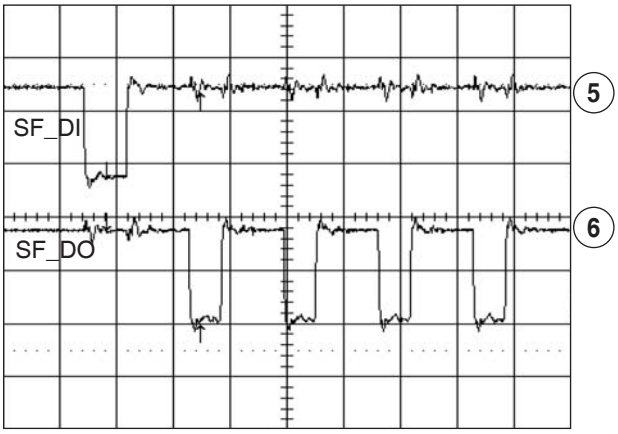


FIG 1-2





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



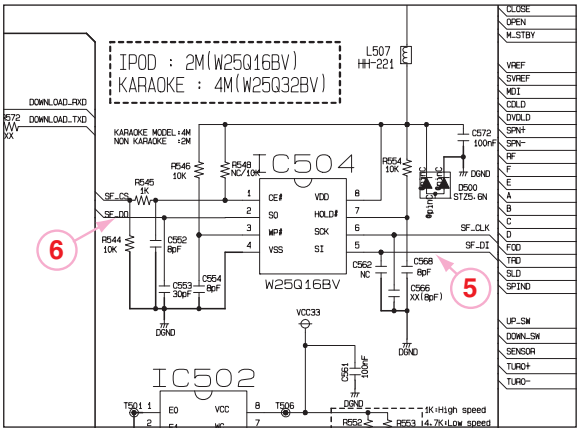
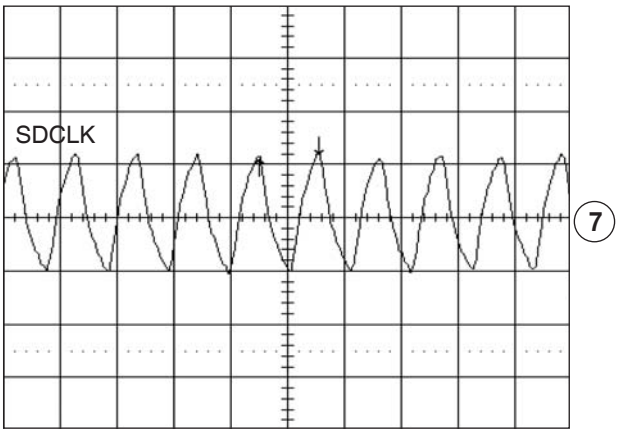


FIG 1-3

2. SDRAM CLOCK

1) MT1389SE/GH main clock is at 27 MHz(X500)

DCLK = 93 MHz, Vp-p = 2.2, Vmax = 2.7 V



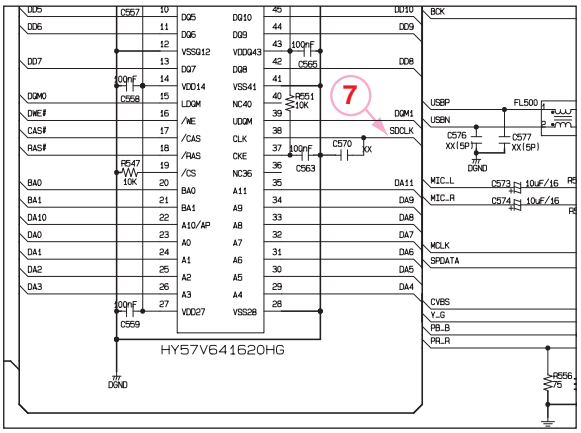
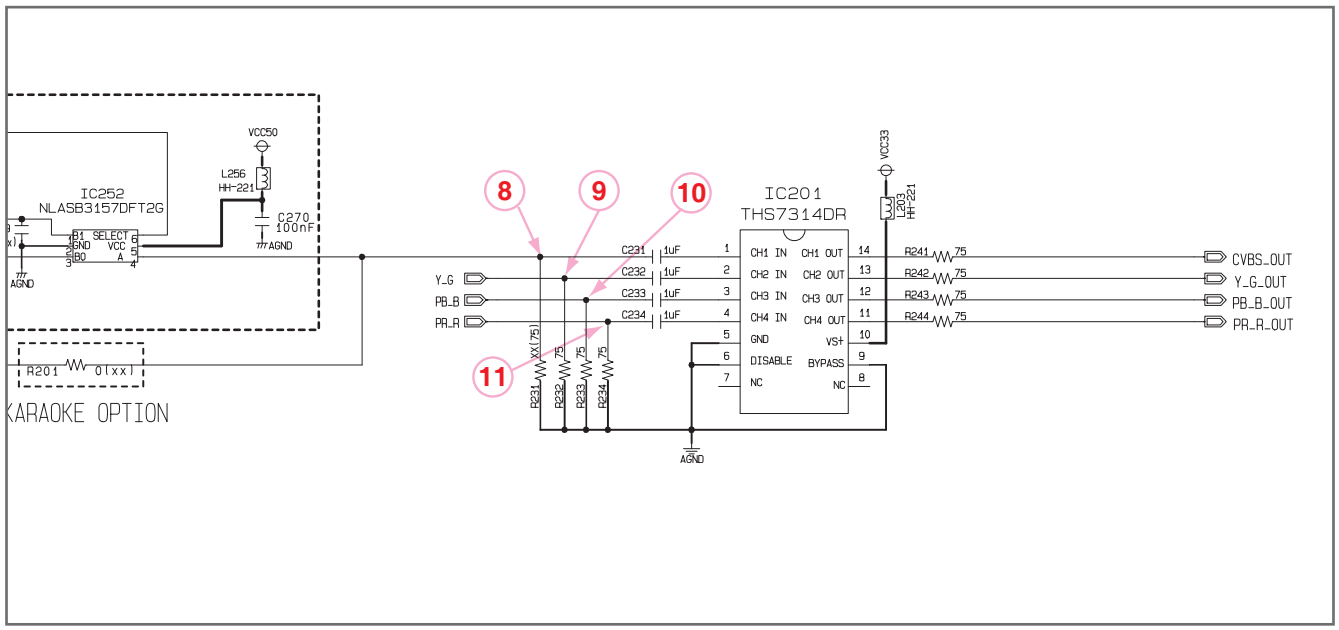
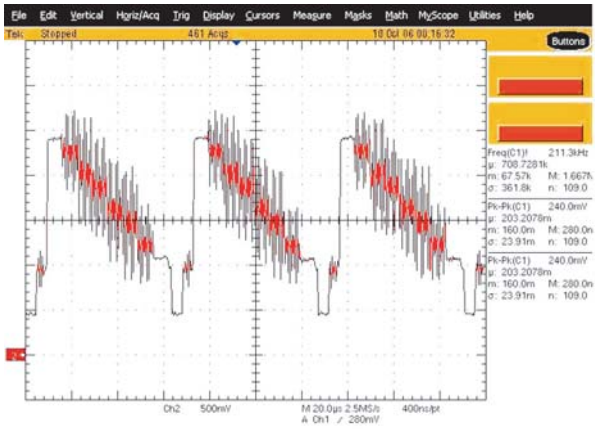


FIG 2-1

3. VIDEO PART-1 (100% FULL COLOR-BAR)

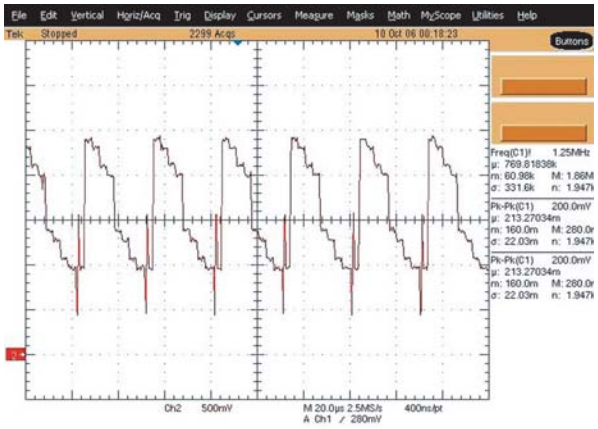


8



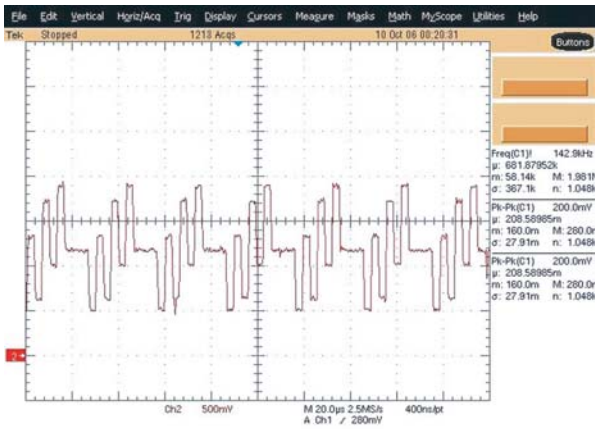
CVBS_I

9



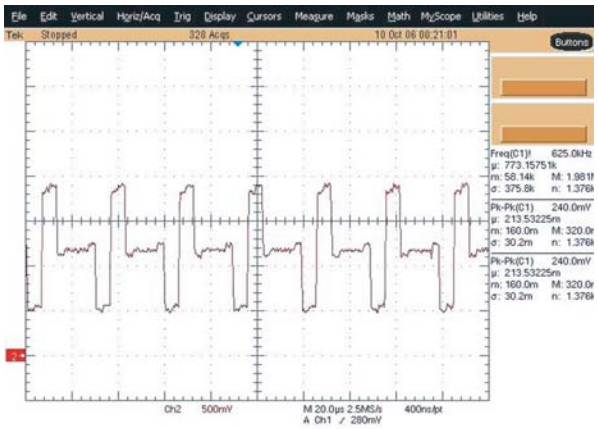
Y

10



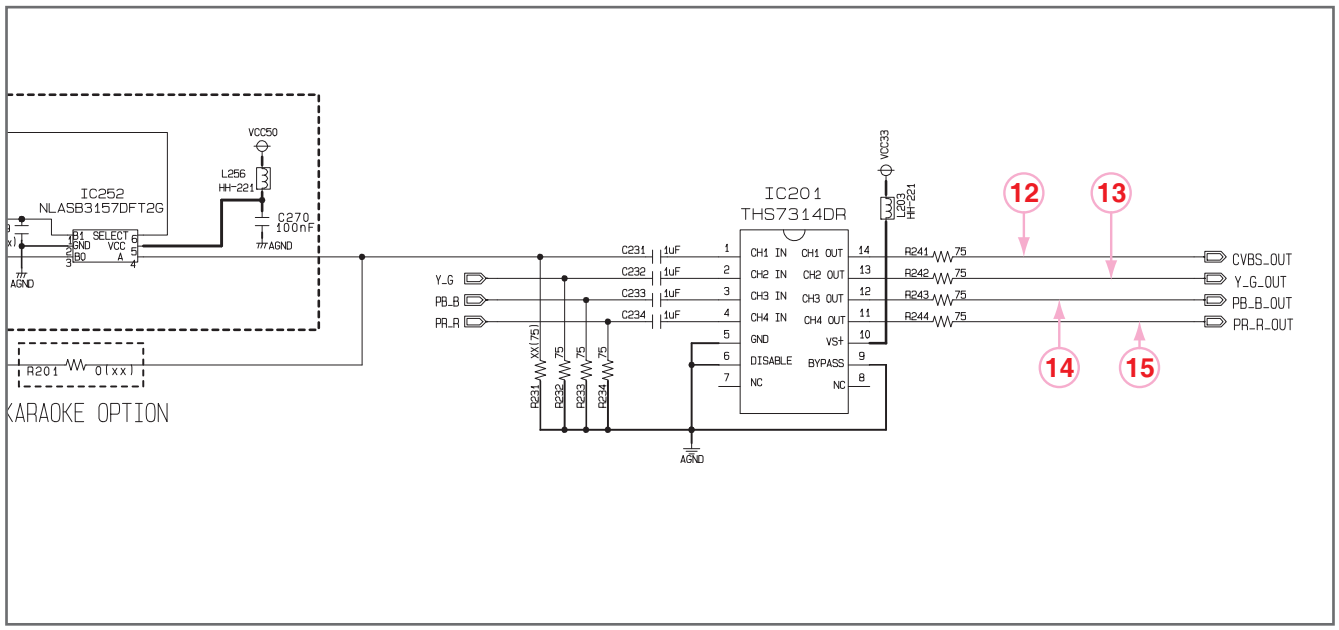
Pb

11

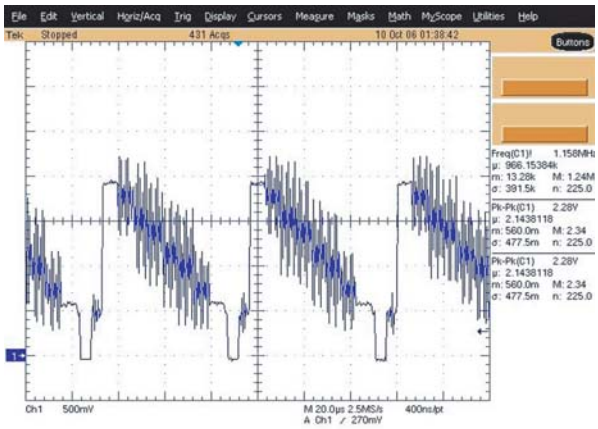


Pr

4. VIDEO PART-2 (100% FULL COLOR-BAR)

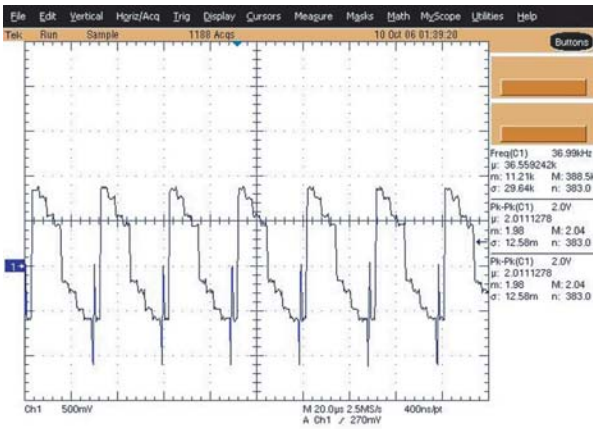


12



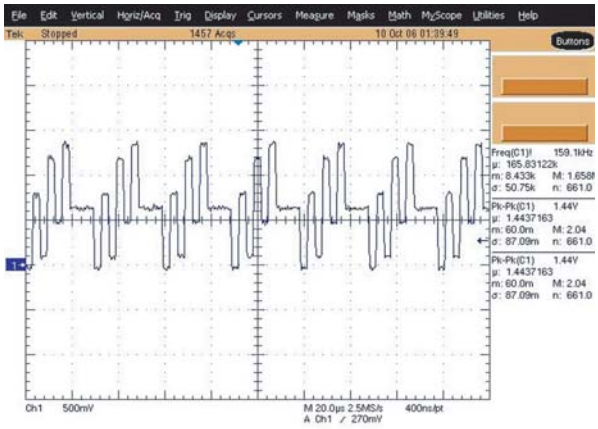
CVBS

13



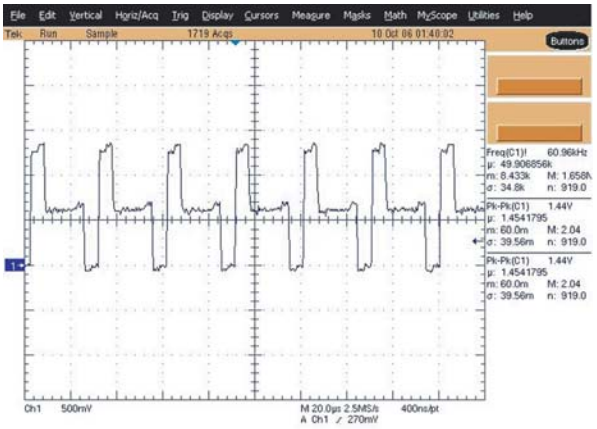
COMP_Y

14



COMP_Pb

15



COMP_Pr

5. SERVO OPEN/CLOSE SIGNAL

1) Tray open/close waveform

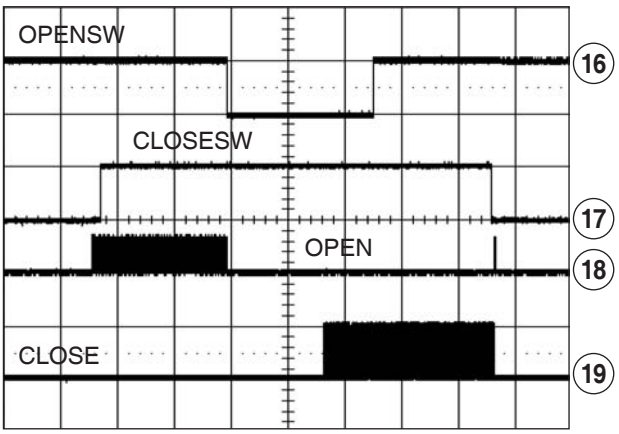


FIG 5-1

2) Tray close waveform

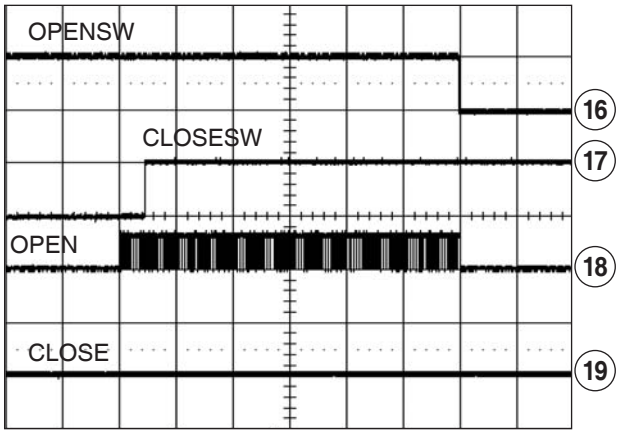


FIG 5-2

3) Tray open waveform

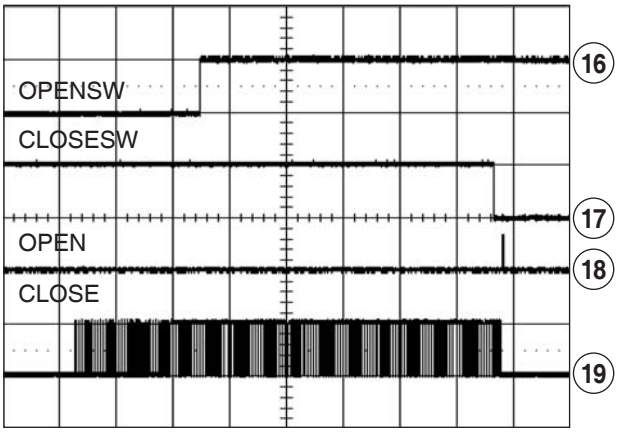
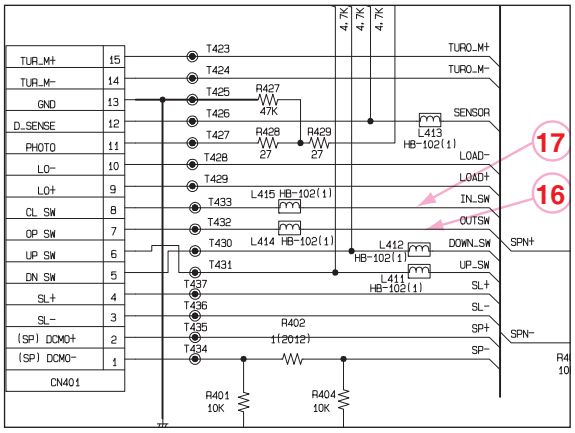
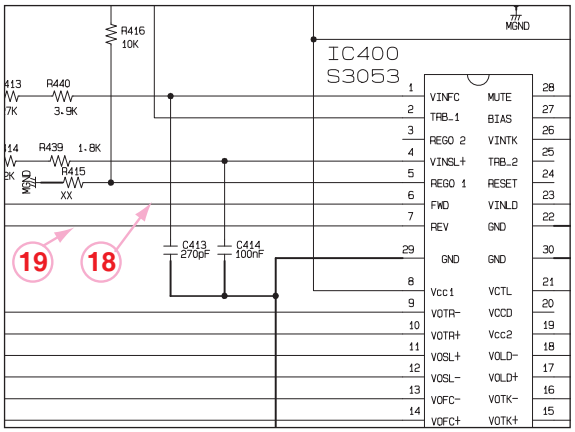


FIG 5-3





6. SLED CONTROL RELATED SIGNAL (NO DISC CONDITION)

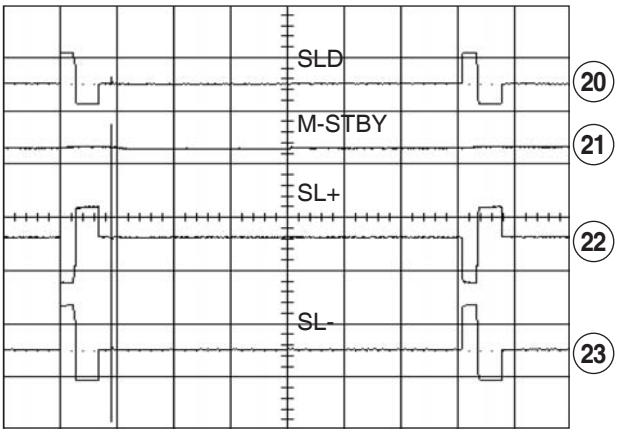
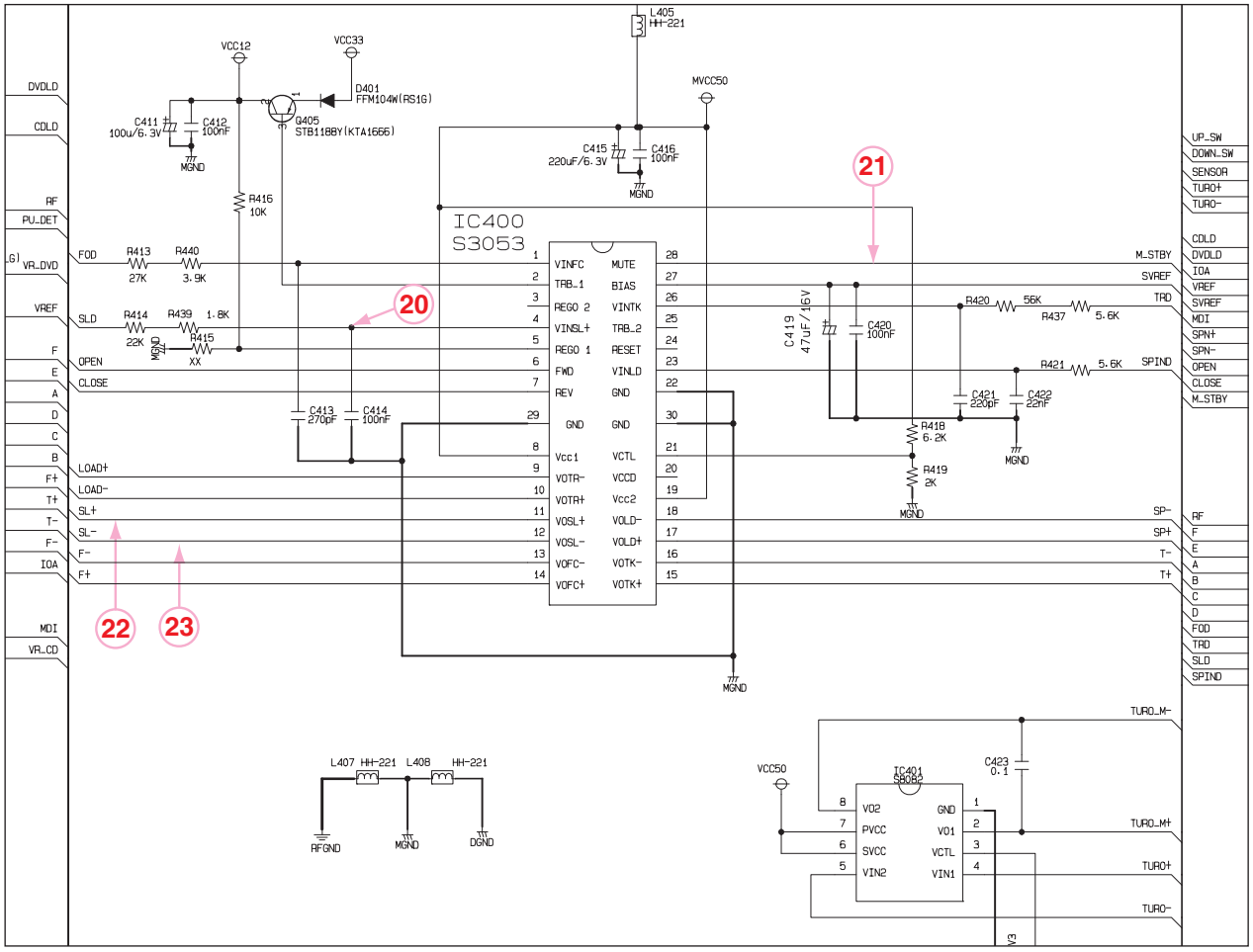


FIG 6-1



7. LENS CONTROL RELATED SIGNAL(NO DISC CONDITION)

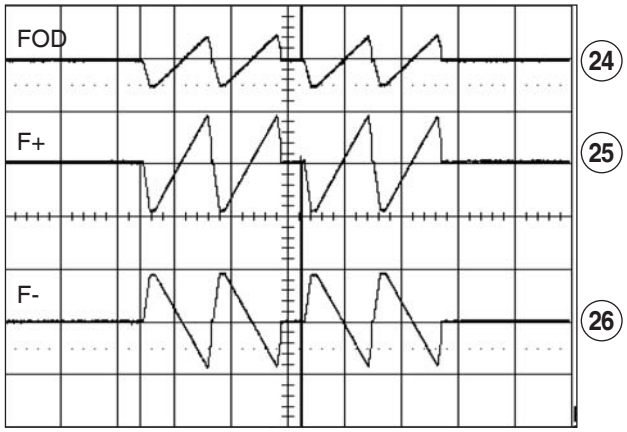
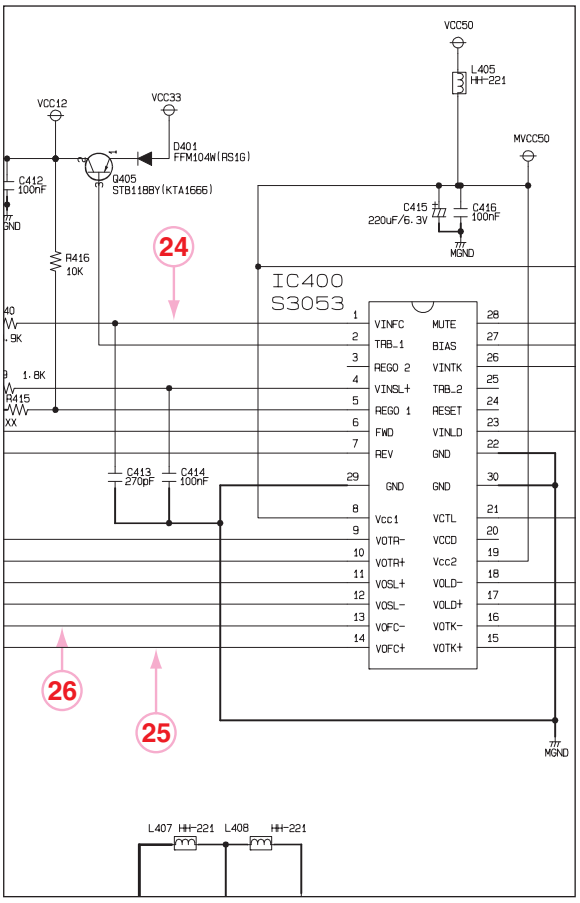


FIG 7-1



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

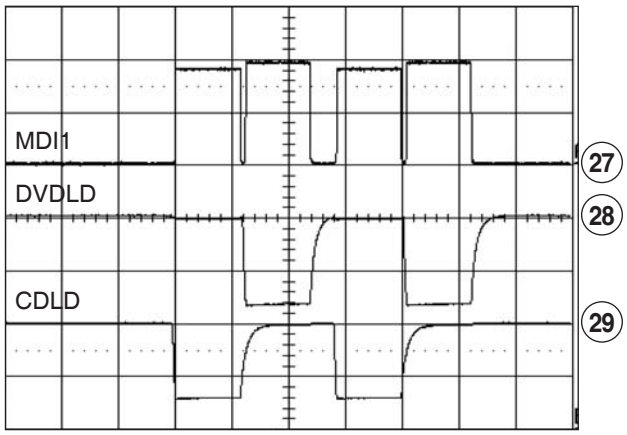
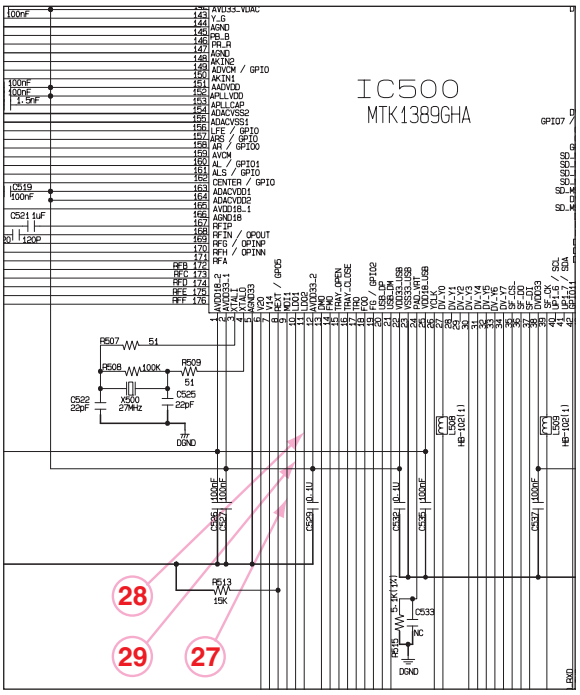


FIG 8-1



9. DISC TYPE JUDGEMENT WAVEFORMS

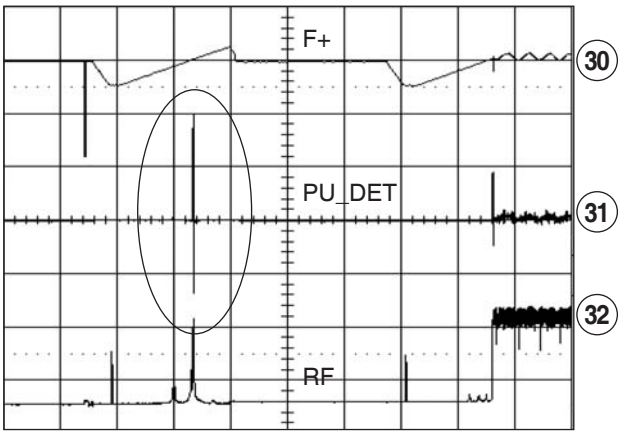
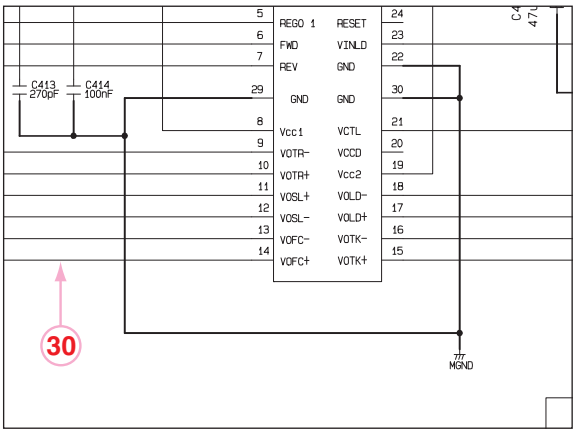


FIG 9-1 (DVD)



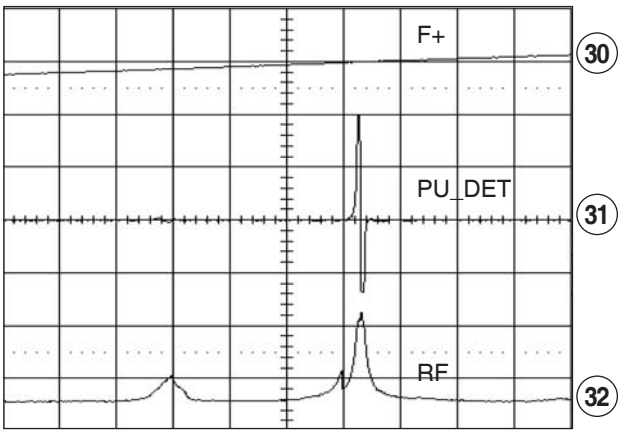
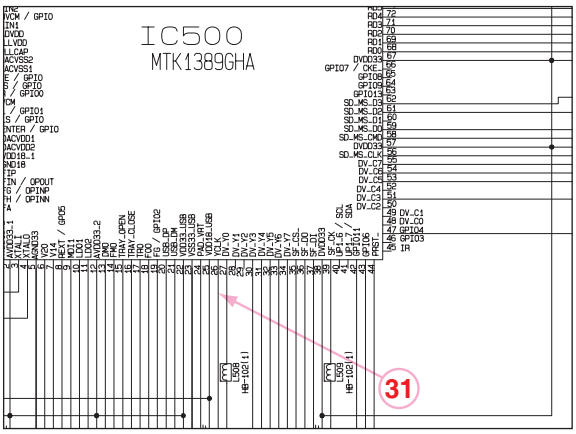
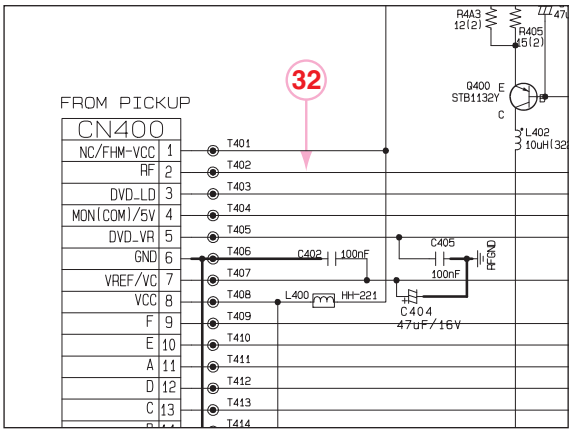


FIG 9-2 (DVD)

31 : This signal can see using special debug program





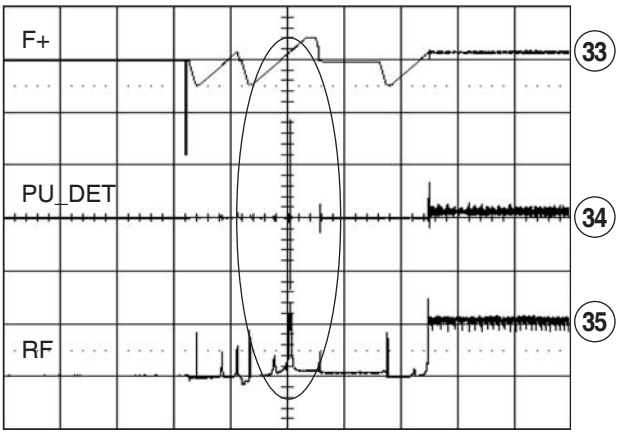
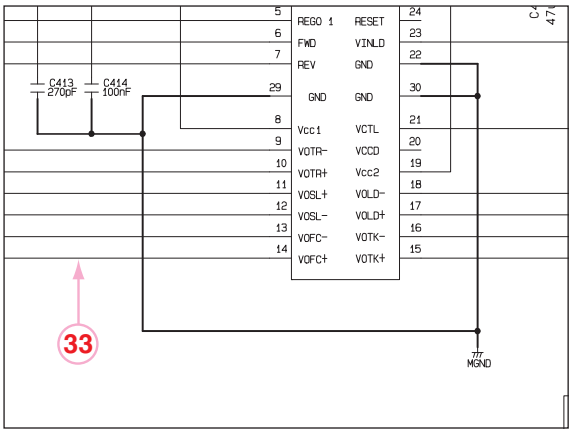


FIG 9-3 (CD)



34 : This signal can see using special debug program

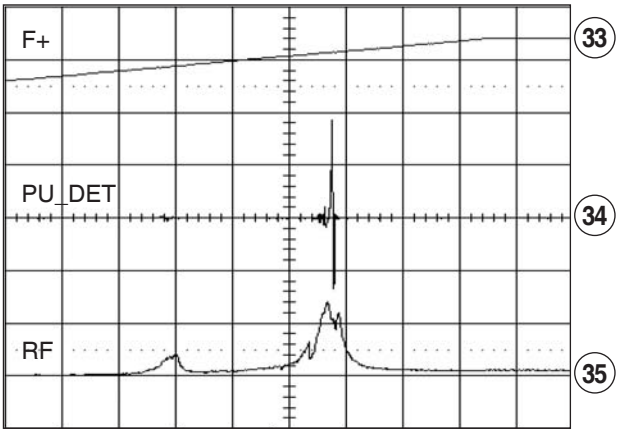
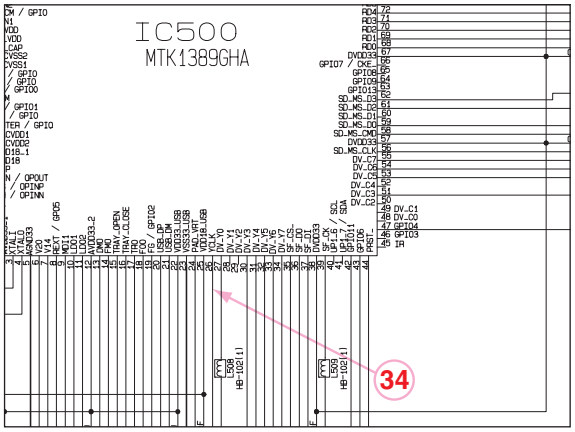
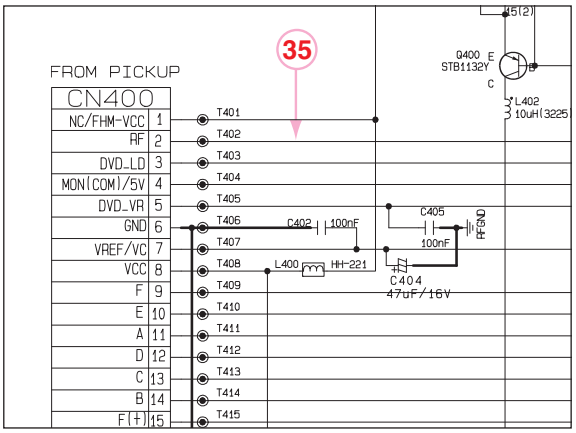


FIG 9-4 (CD)





10. FOCUS ON WAVEFORMS

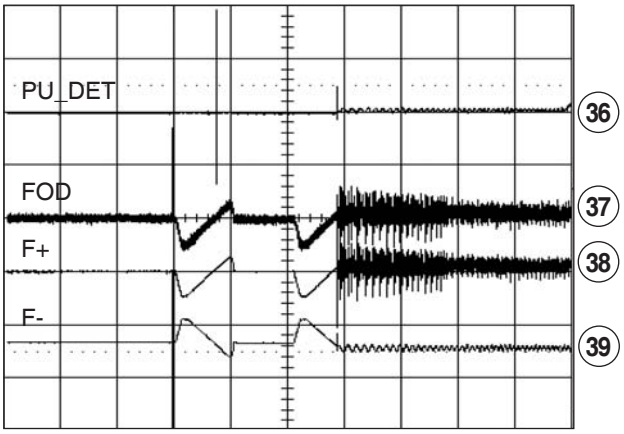
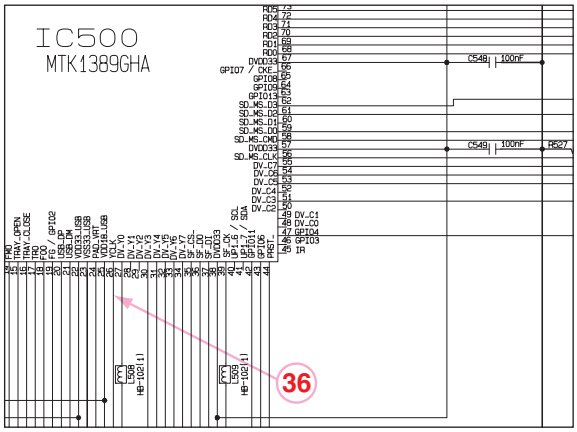


FIG 10-1 (DVD)

36 : This signal can see using special debug program



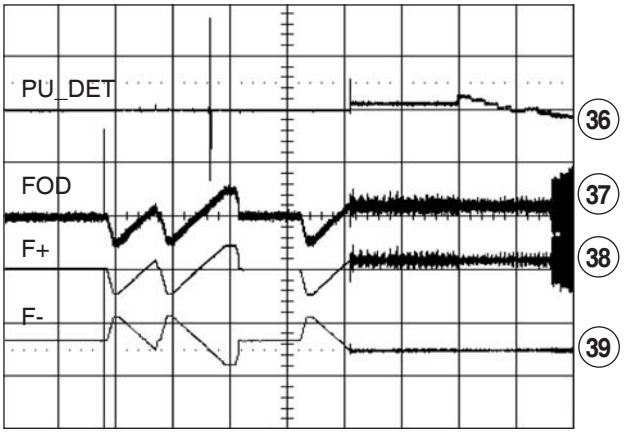
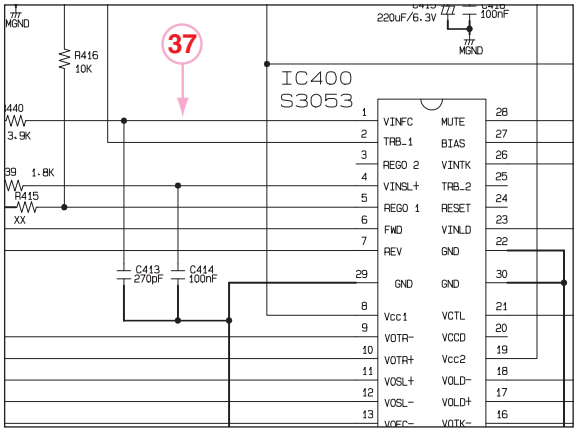
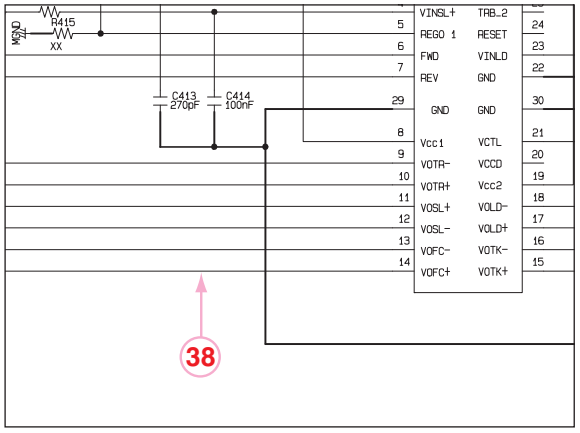
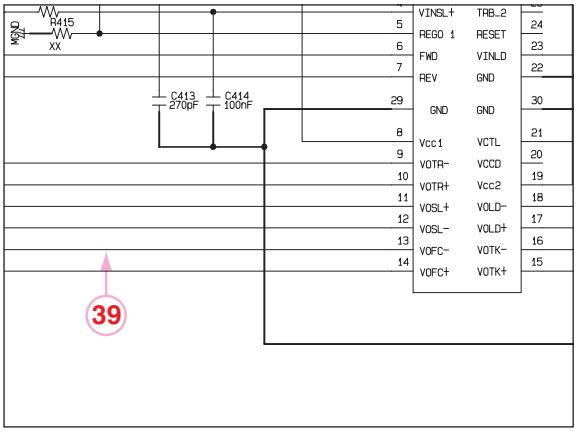


FIG 10-2 (CD)







11. SPINDLE CONTROL WAVEFORMS (NO DISC CONDITION)

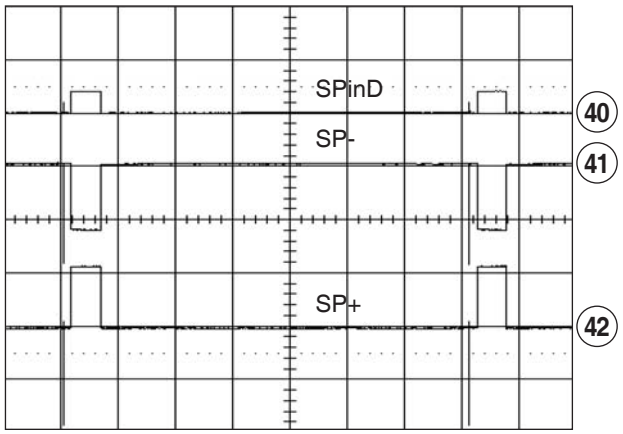
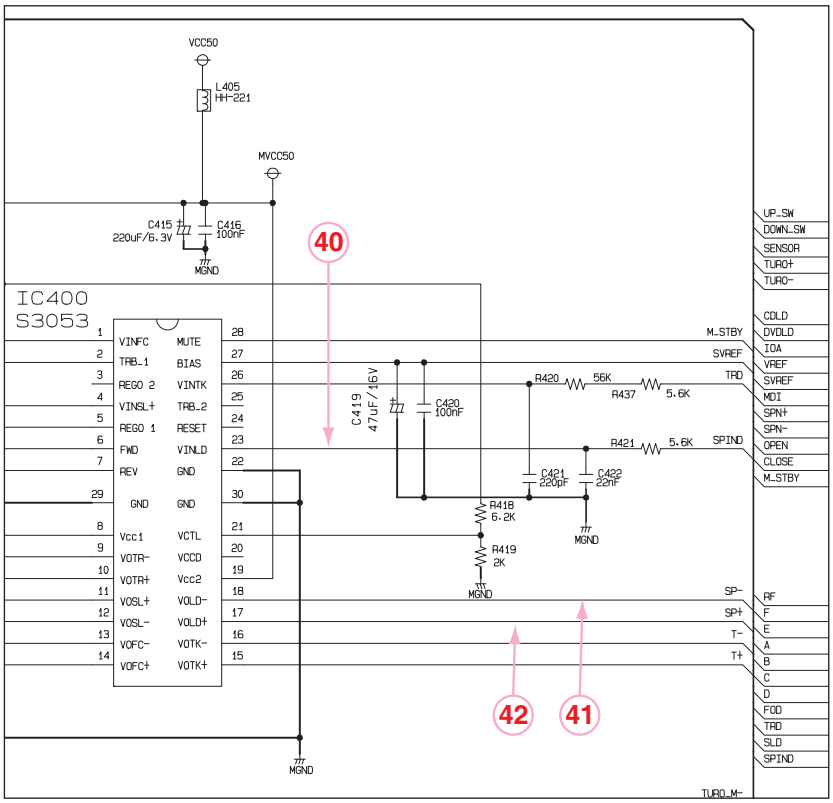


FIG 11-1



12. TRACKING CONTROL RELATED SIGNAL(System checking)

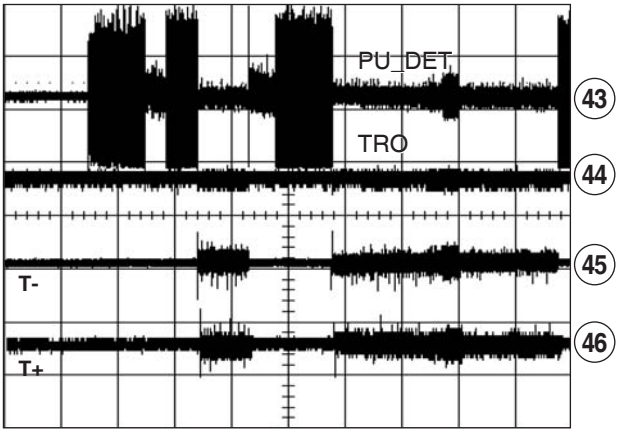
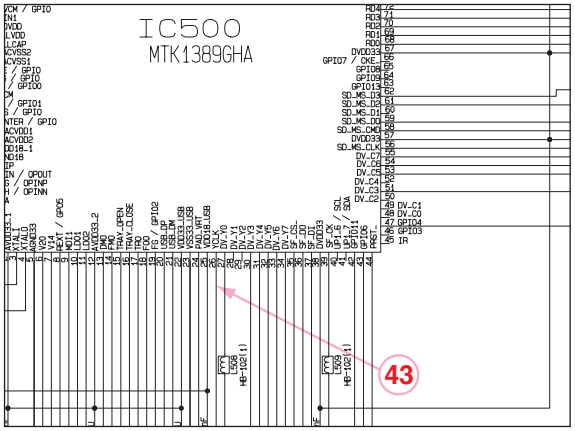


FIG 12-1(DVD)

43 : This signal can see using special debug program



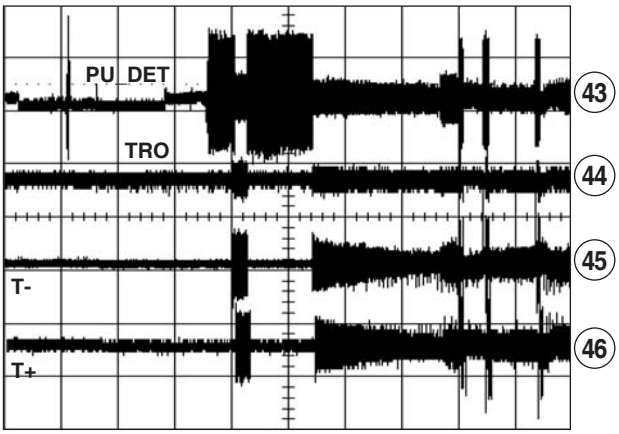
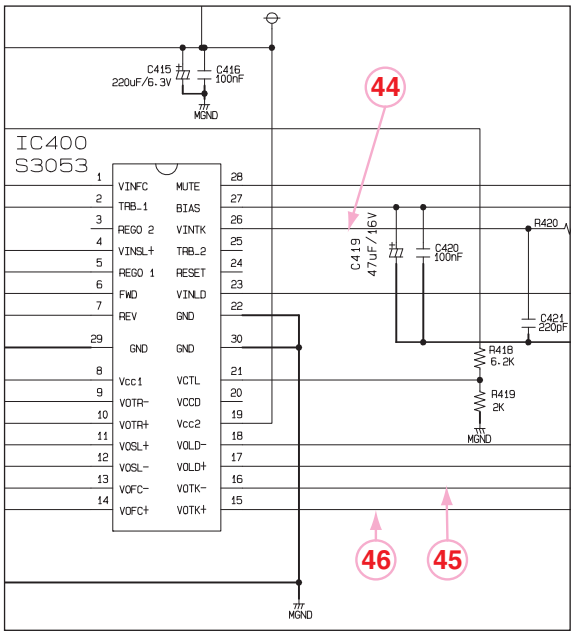
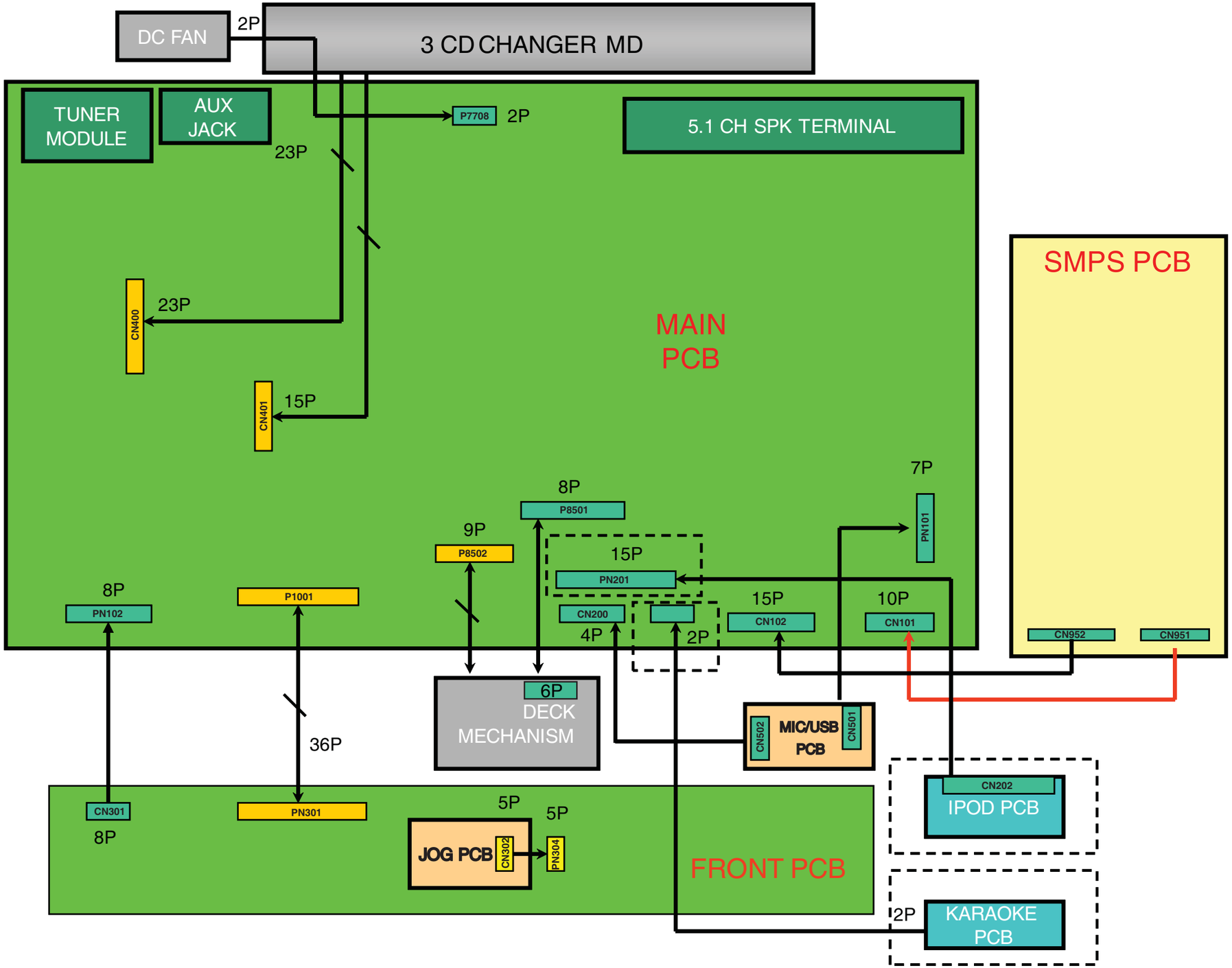


FIG 12-2(CD)

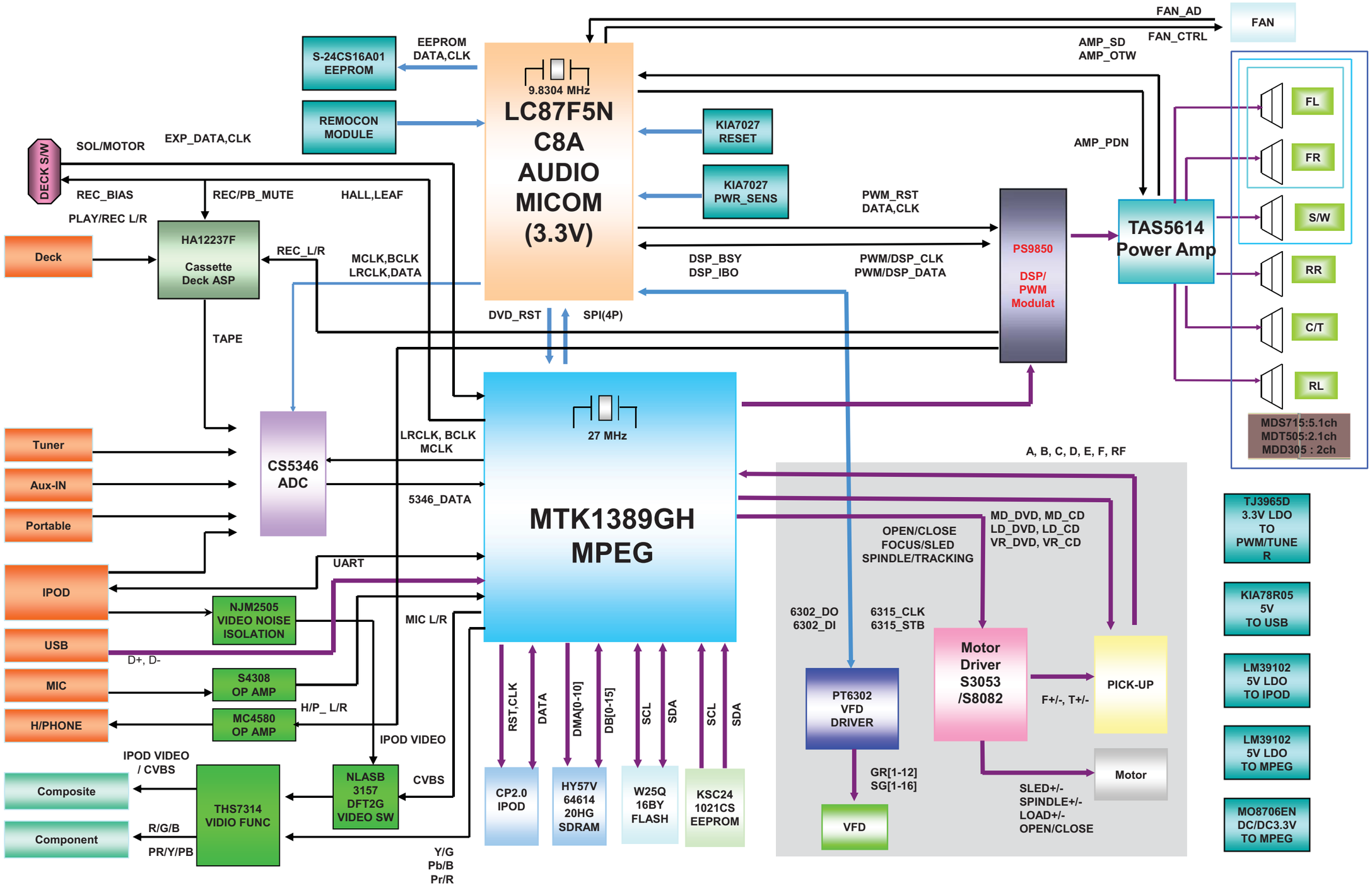


MEMO

WIRING DIAGRAM



BLOCK DIAGRAMS

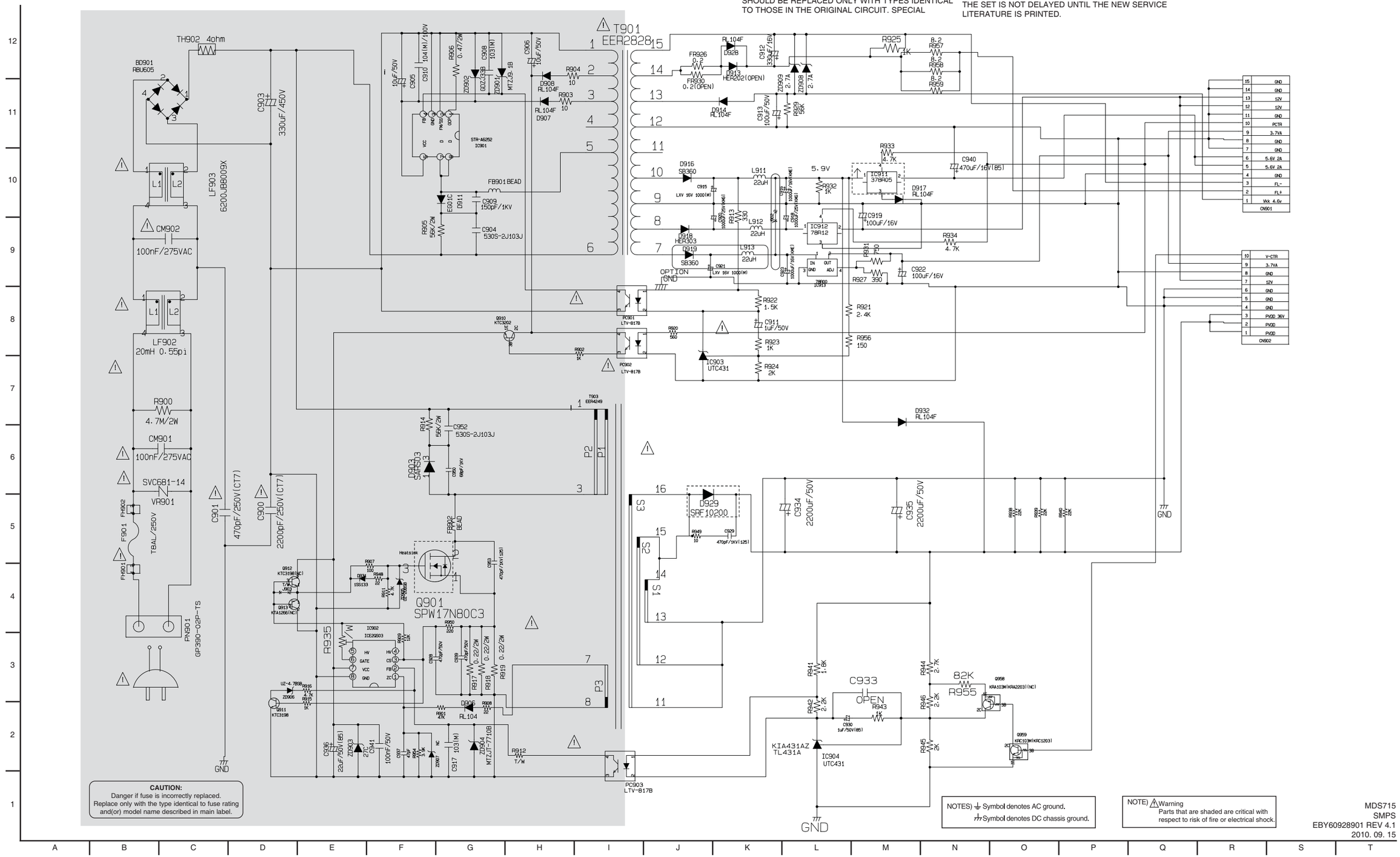


CIRCUIT DIAGRAMS
1. SMPS - POWER CIRCUIT DIAGRAM

IMPORTANT SAFETY NOTICE

WHEN SERVICING THIS CHASSIS, UNDER NO CIRCUMSTANCES SHOULD THE ORIGINAL DESIGN BE MODIFIED OR ALTERED WITHOUT PERMISSION FROM THE LG CORPORATION. ALL COMPONENTS SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL CIRCUIT. SPECIAL COMPONENTS ARE SHADED ON THE SCHEMATIC FOR EASY IDENTIFICATION.
THIS CIRCUIT DIAGRAM MAY OCCASIONALLY DIFFER FROM THE ACTUAL CIRCUIT USED. THIS WAY, IMPLEMENTATION OF THE LATEST SAFETY AND PERFORMANCE IMPROVEMENT CHANGES INTO THE SET IS NOT DELAYED UNTIL THE NEW SERVICE LITERATURE IS PRINTED.

NOTE :
1. Shaded(▥) parts are critical for safety. Replace only with specified part number.
2. Voltages are DC-measured with a digital voltmeter during Play mode.



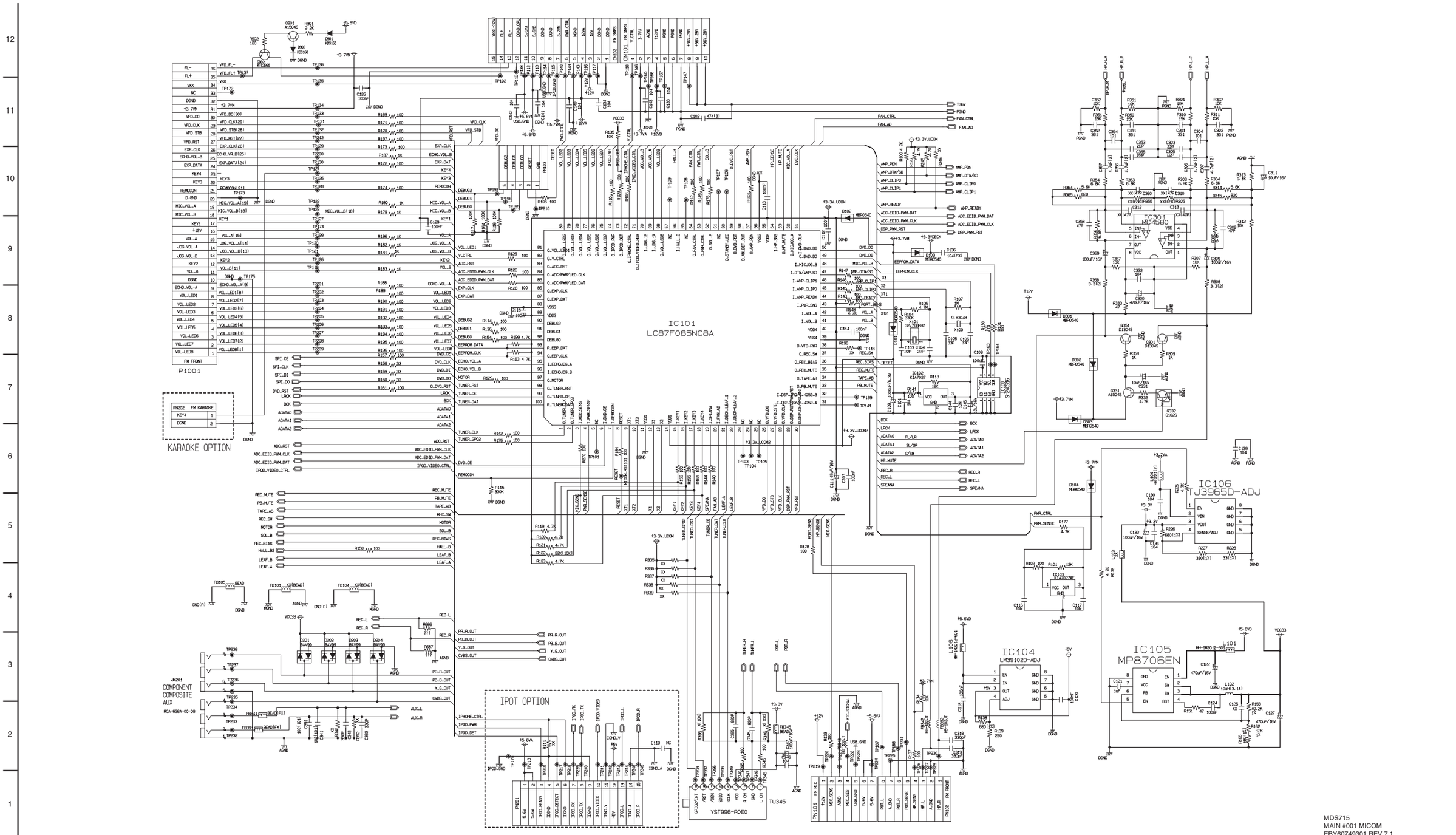
CAUTION:
Danger if fuse is incorrectly replaced.
Replace only with the type identical to fuse rating and(or) model name described in main label.

NOTES) ⏚ Symbol denotes AC ground.
⏚ Symbol denotes DC chassis ground.

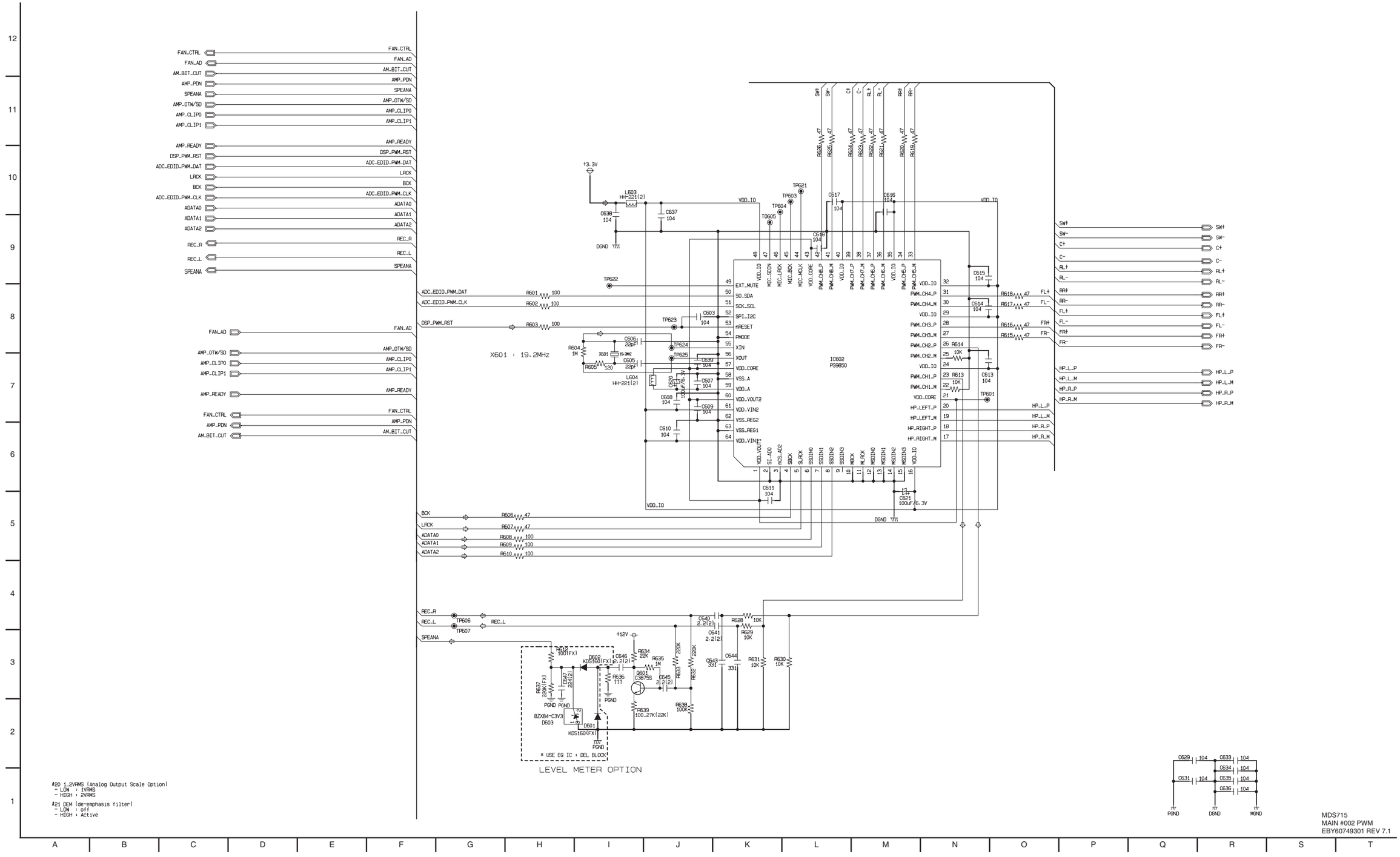
NOTE) ⚠ Warning
Parts that are shaded are critical with respect to risk of fire or electrical shock.

MDS715
SMPS
EBY60928901 REV 4.1
2010. 09. 15

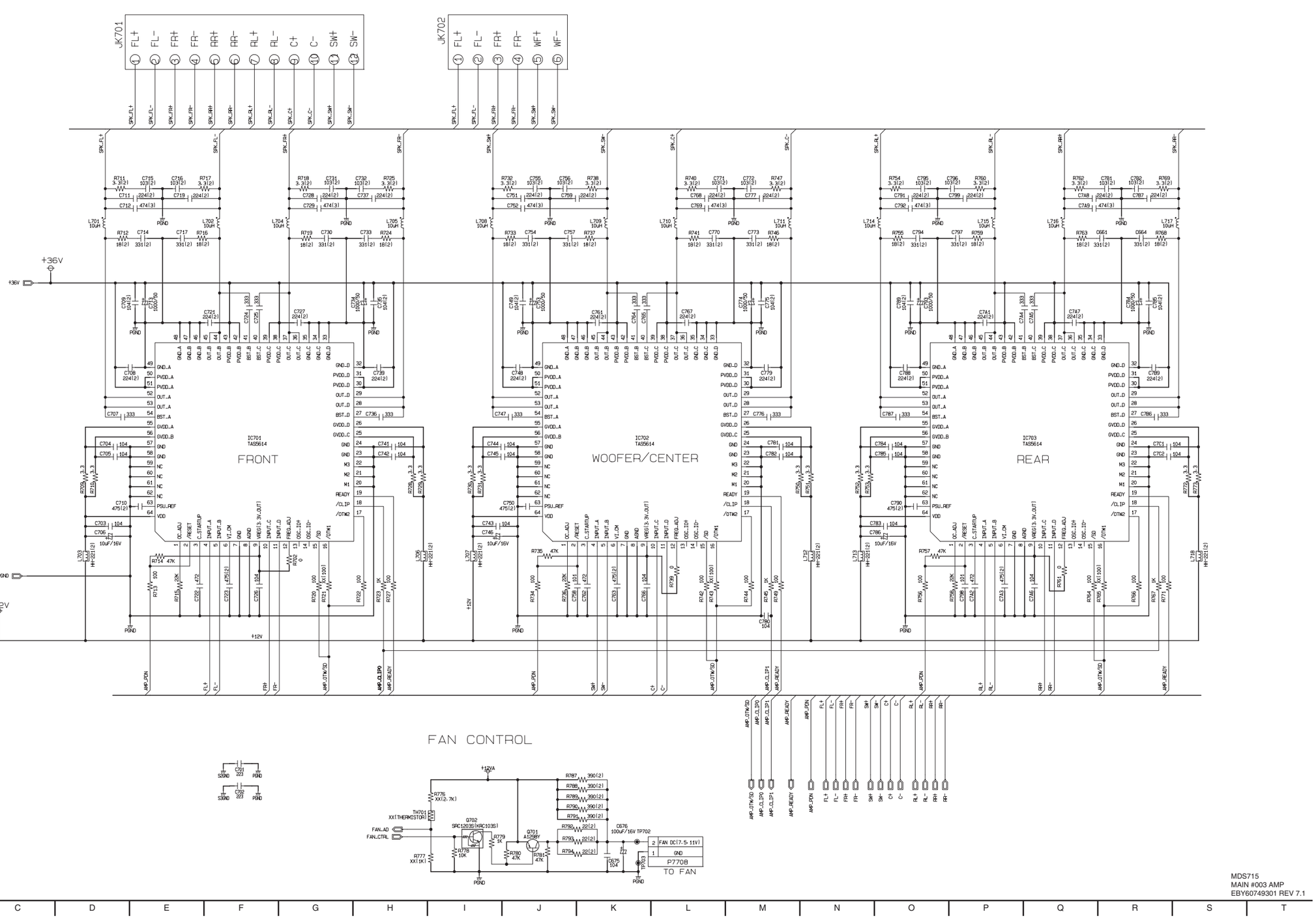
2. MAIN - MICOM CIRCUIT DIAGRAM



3. MAIN - PWM CIRCUIT DIAGRAM

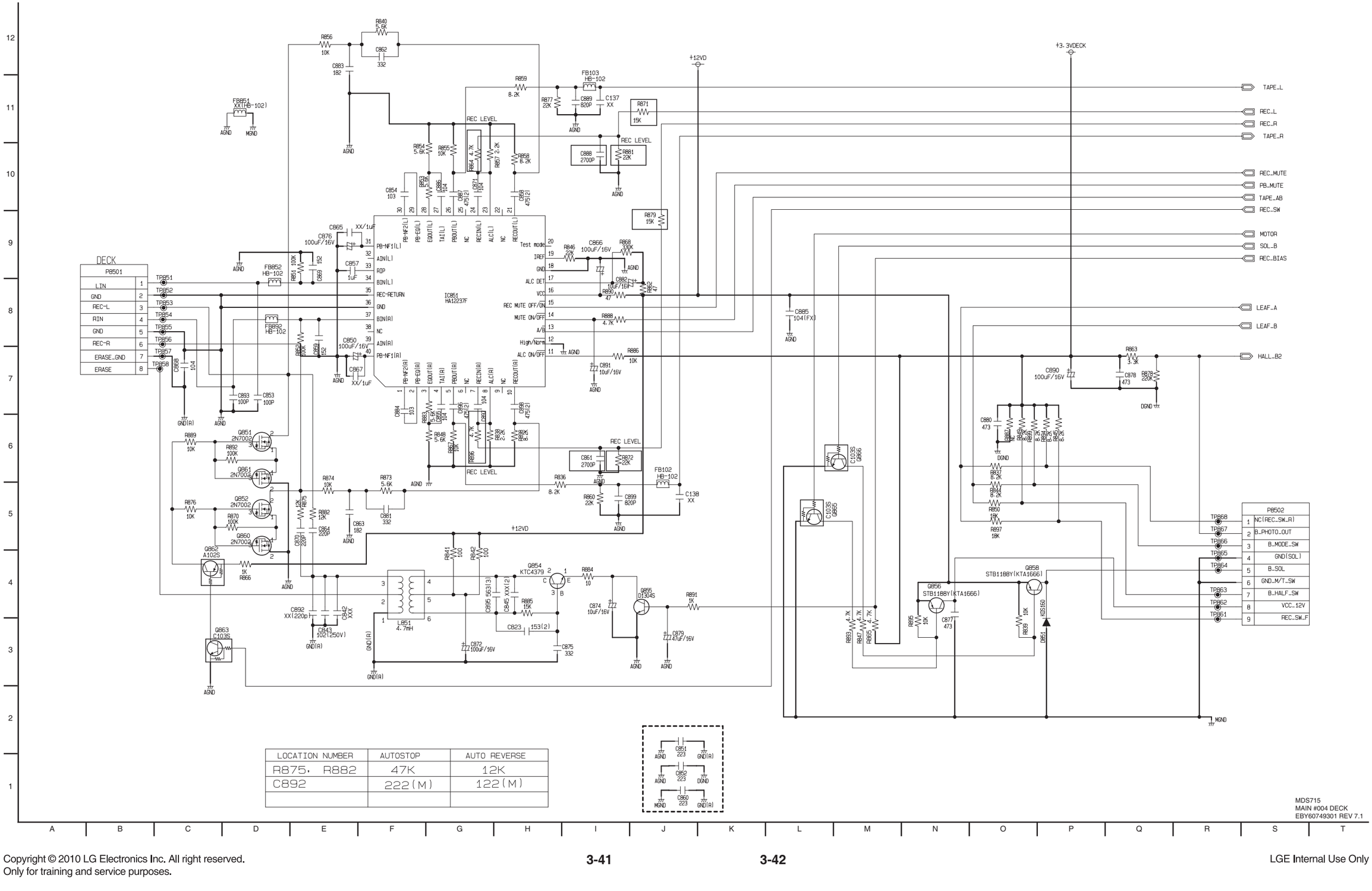


4. MAIN - AMP CIRCUIT DIAGRAM



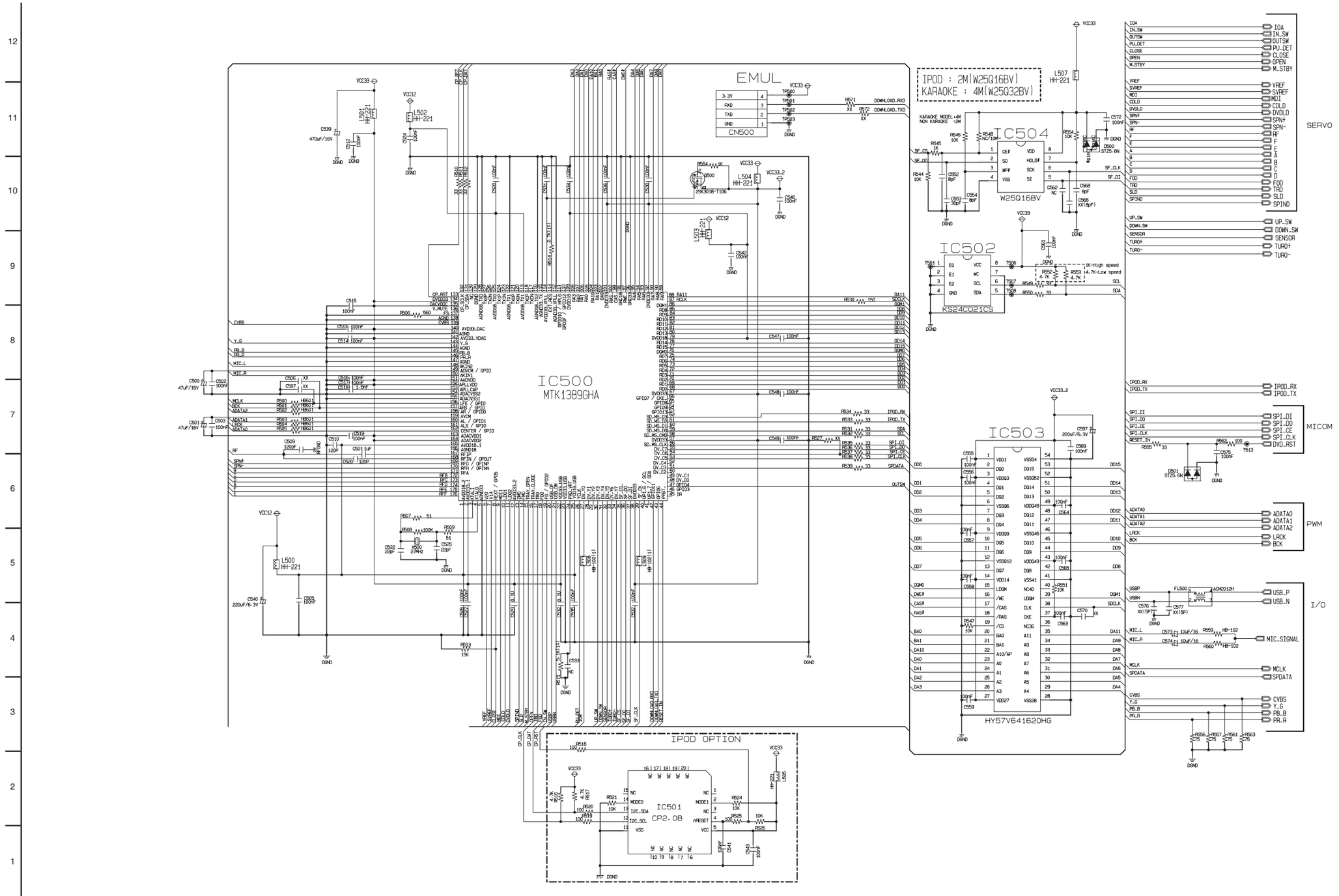
MDS715
MAIN #003 AMP
EBY60749301 REV 7.1

5. MAIN - DECK CIRCUIT DIAGRAM



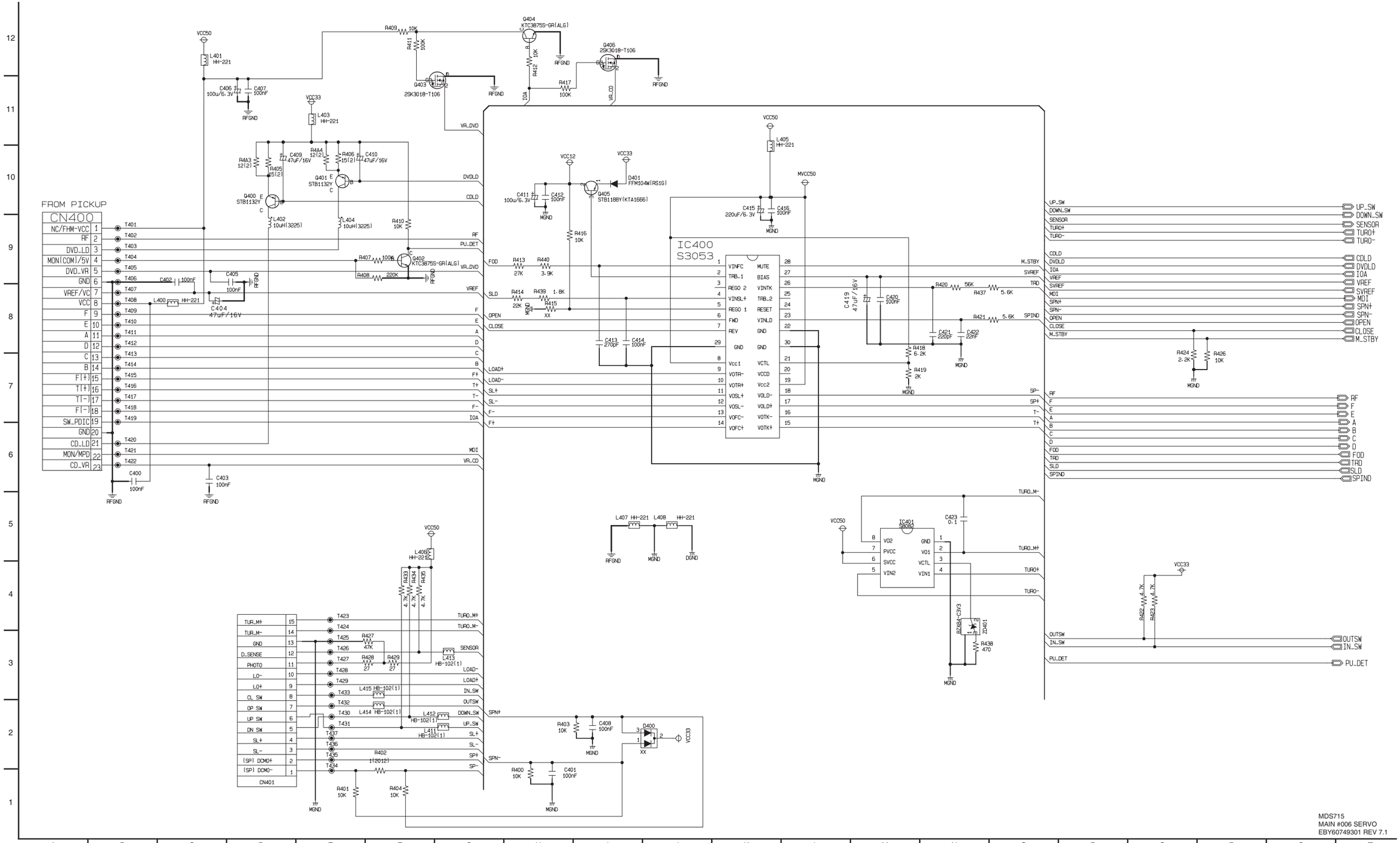
LOCATION NUMBER	AUTOSTOP	AUTO REVERSE
R875, R882	47K	12K
C892	222(M)	122(M)

6. MAIN - MPEG CIRCUIT DIAGRAM

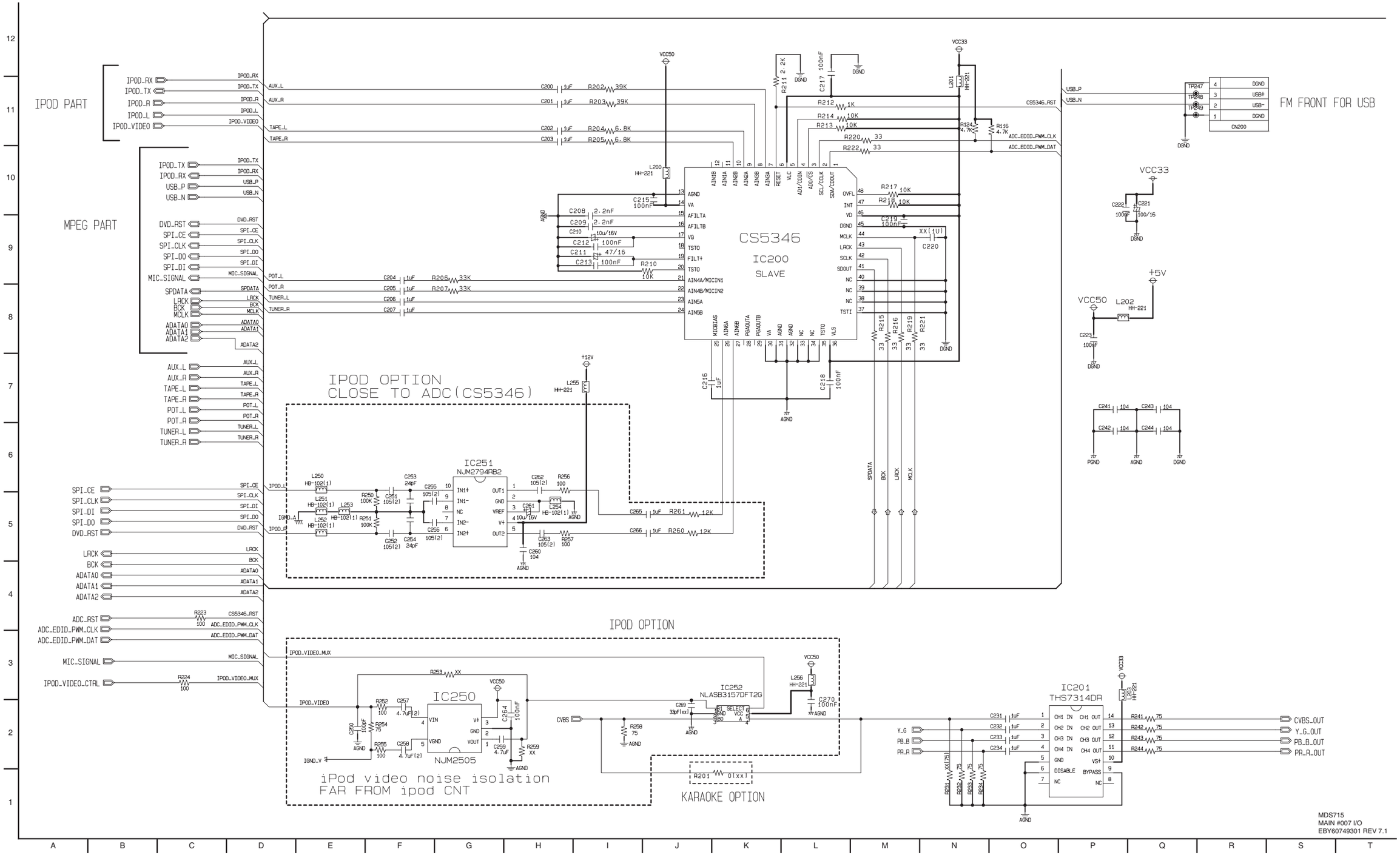


MDS715
MAIN #005 MPEG
EBY60749301 REV 7.1

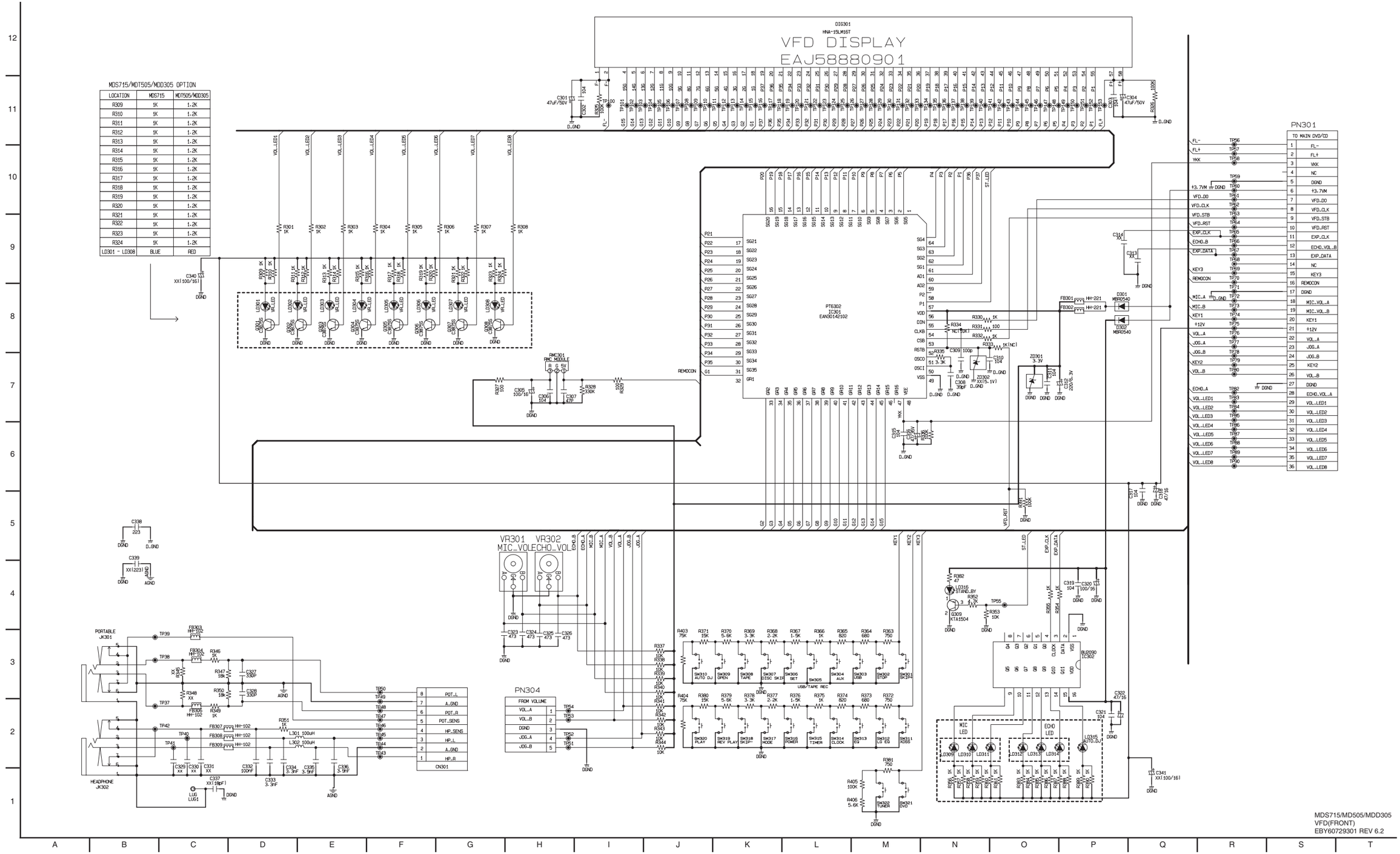
7. MAIN - SERVO CIRCUIT DIAGRAM



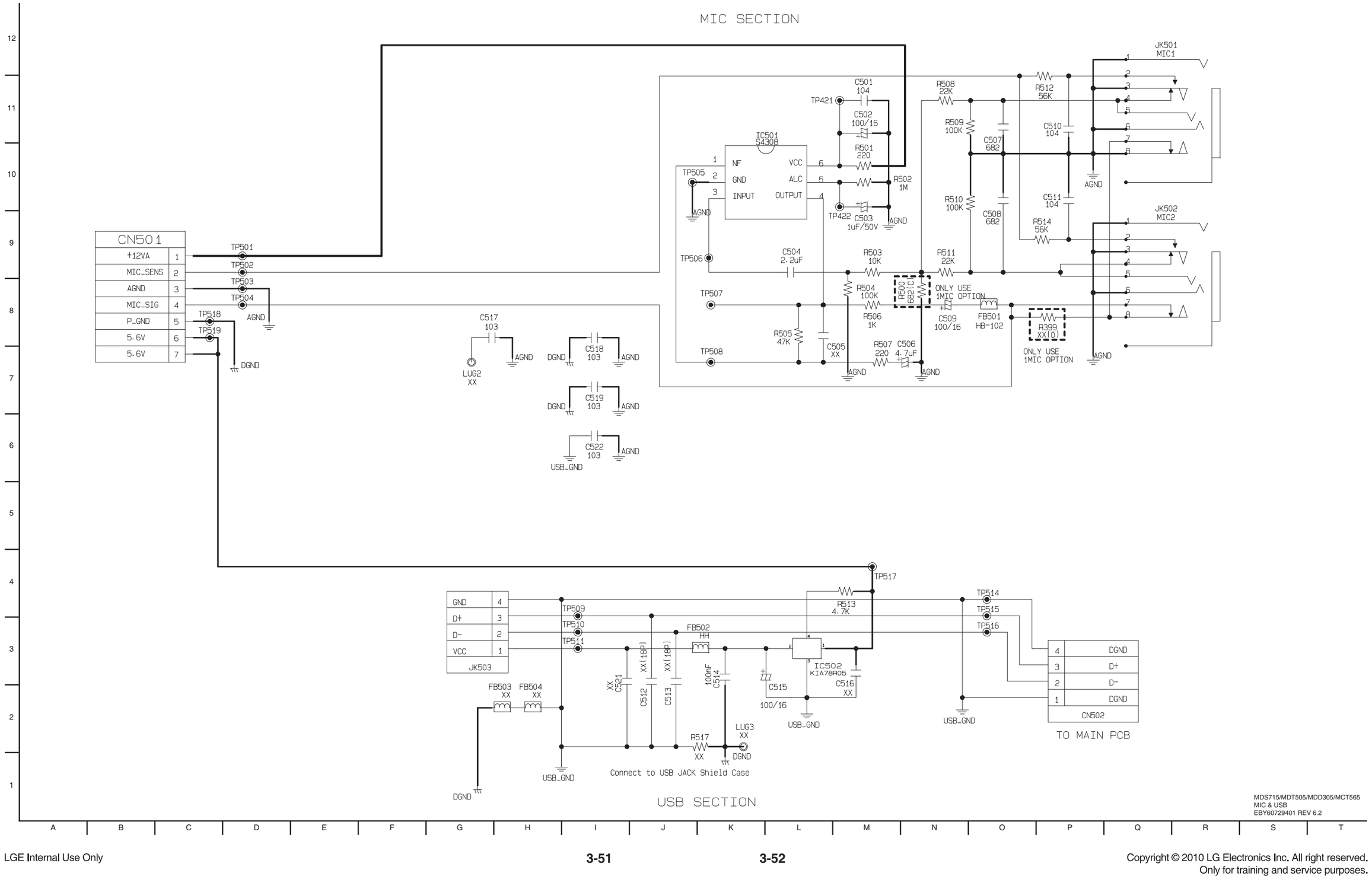
8. MAIN - I/O CIRCUIT DIAGRAM



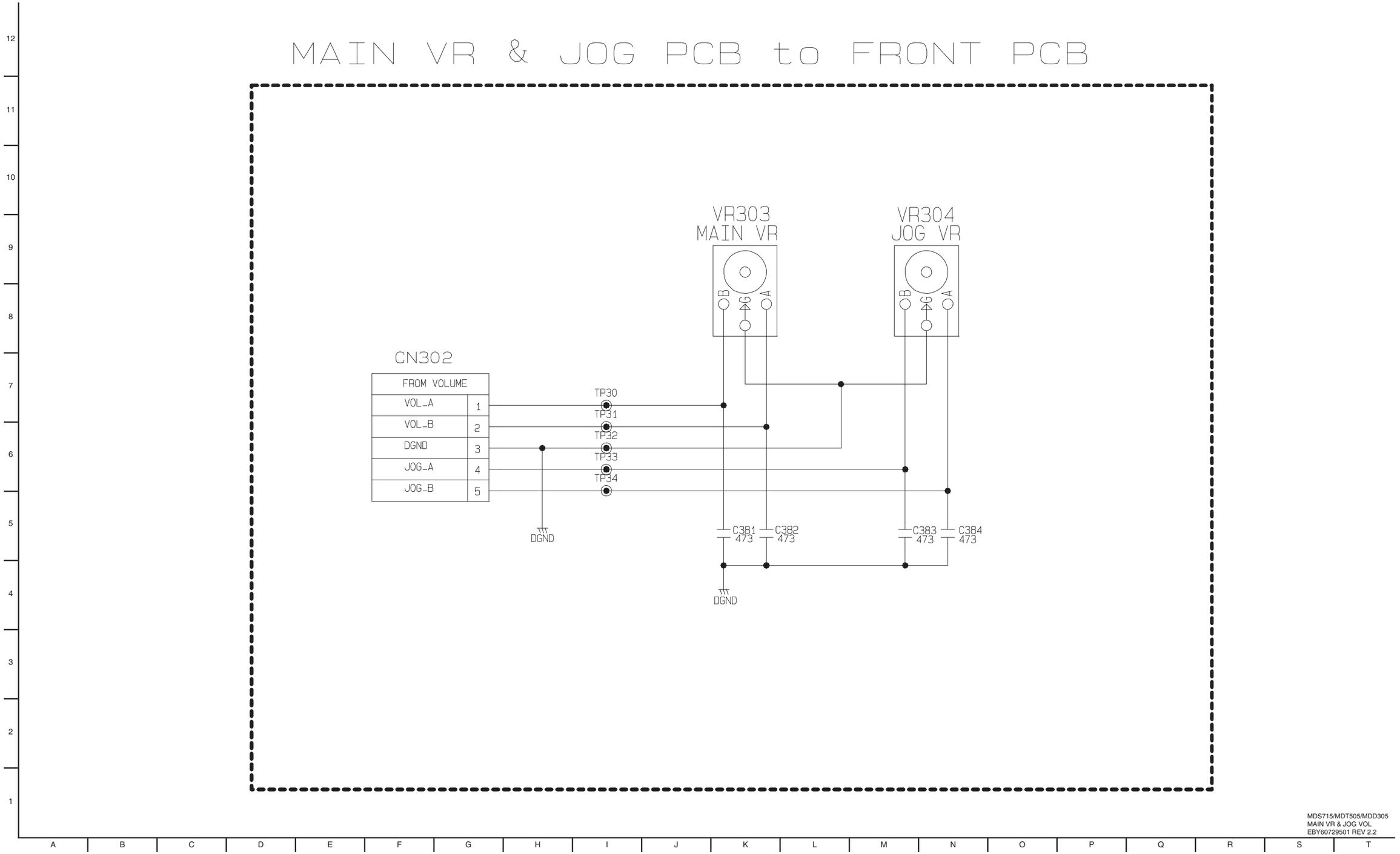
9. VFD CIRCUIT DIAGRAM



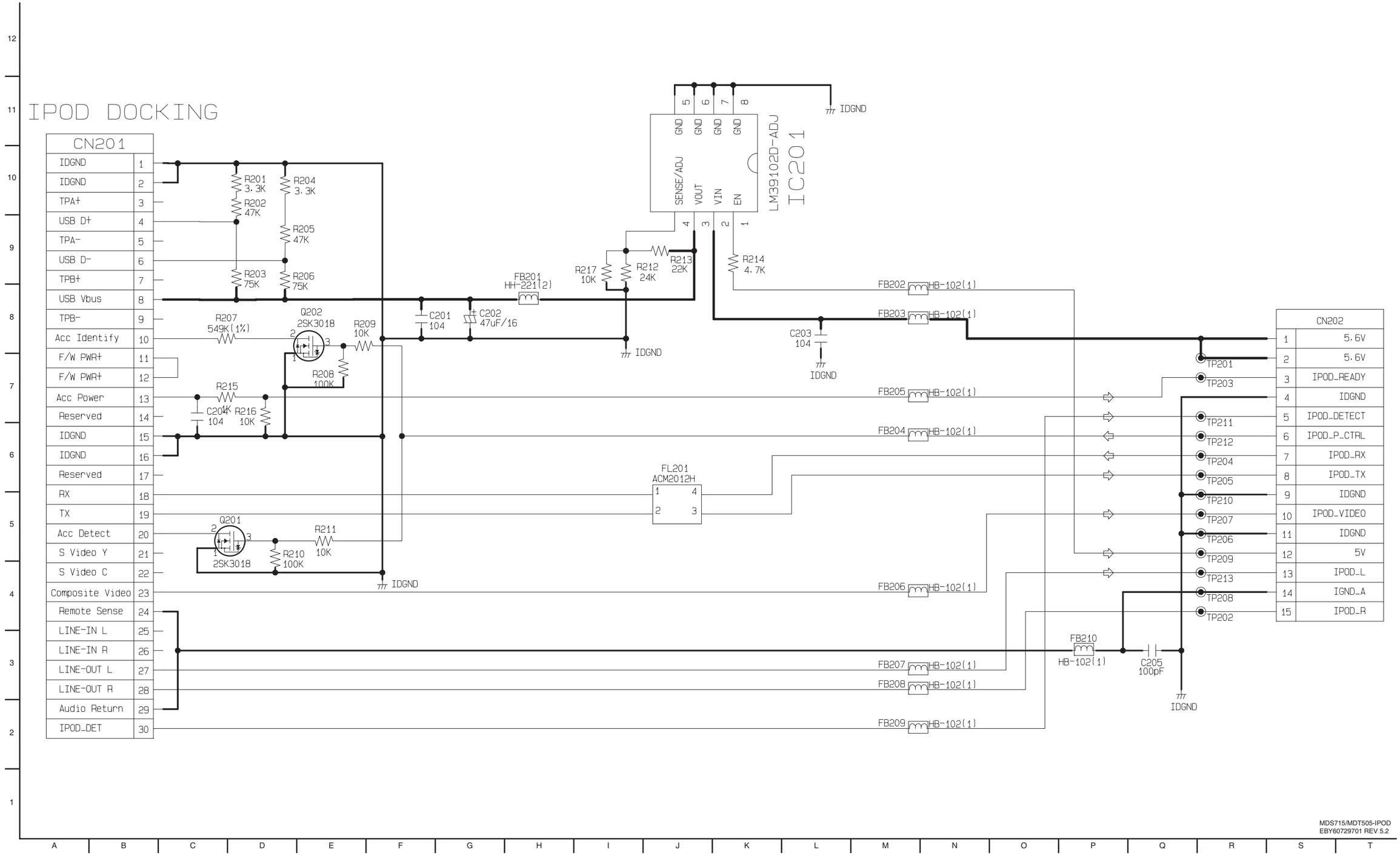
10. MIC & USB CIRCUIT DIAGRAM



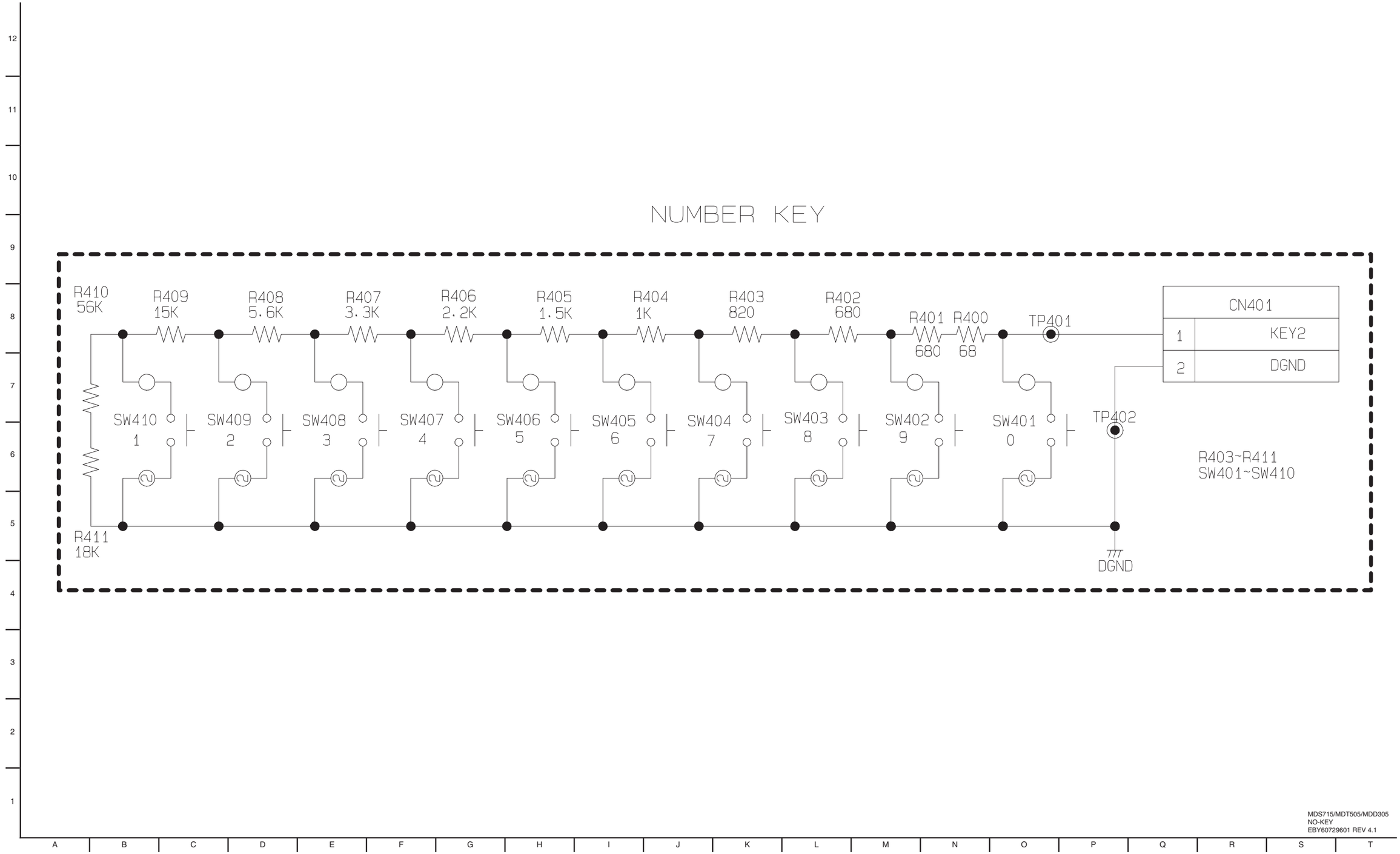
11. VOLUME CIRCUIT DIAGRAM



12. IPOD CIRCUIT DIAGRAM (OPTIONAL PART)



13. KARAOKE CIRCUIT DIAGRAM (OPTIONAL PART)



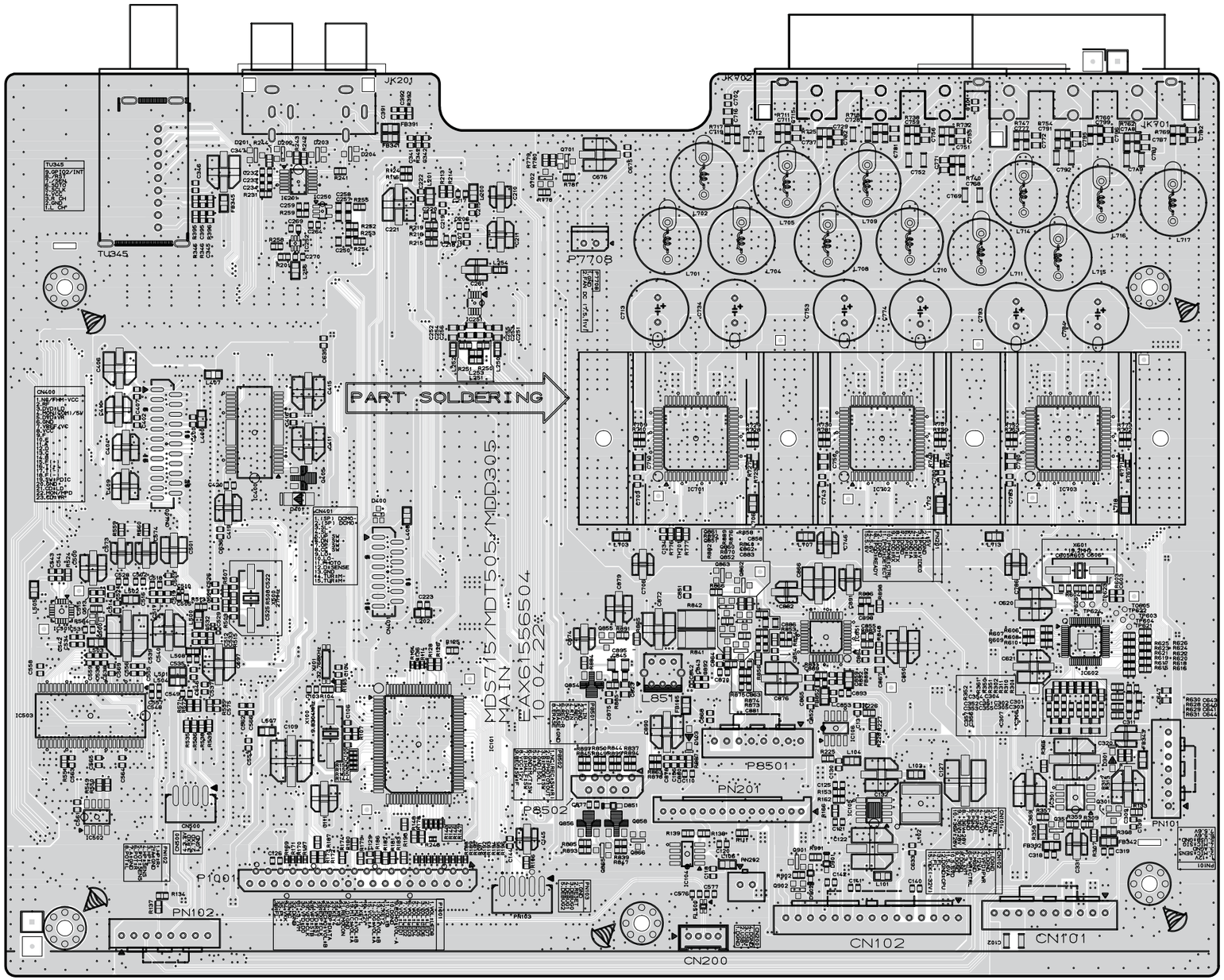
CIRCUIT VOLTAGE CHART

NO.	IC Symbol	NAME/TYPE	SPEC.	VOLTAGE
1	IC101 MICOM	LC87F5NC8A VDD: 14,40,55,89	VDD: +3.0 ~ +5.5V	VDD 14 PIN: +3.28V 40,55,89 PIN : +3.28V
2	IC200 ADC IC	CS5346-CQZR LVC:5 VLS:36 VD:46 VA:14 GND: 13, 31, 32	VLS,VD,VLC: 1.71~5.25V VA:3.1~5.25V	VLS,VD,VLC:3.35V VA:5.2V
3	IC400 MOTOR DRIVE	S3053 VCC:8,19	VCC: +4.3 ~ 13.2V	VCC:+4.98V
4	IC503 SDRAM	EM638165TS-6G VDD: 1,3,9,14,27,43,49	VDD: +3 ~ +3.6V	VCC: +3.33V
5	IC504 FLASH	MX25L1605DM21-12G VDD:8	VDD: +2.7 ~ +3.6V	VDD: +3.31V
6	IC602 PWM	PS9850 VDD : 1,16,21,24,29,32,35,40, 43,48,57,59,60,61,64	IOVDD : +2.97V ~ +3.63V	IOVDD : +3.28V

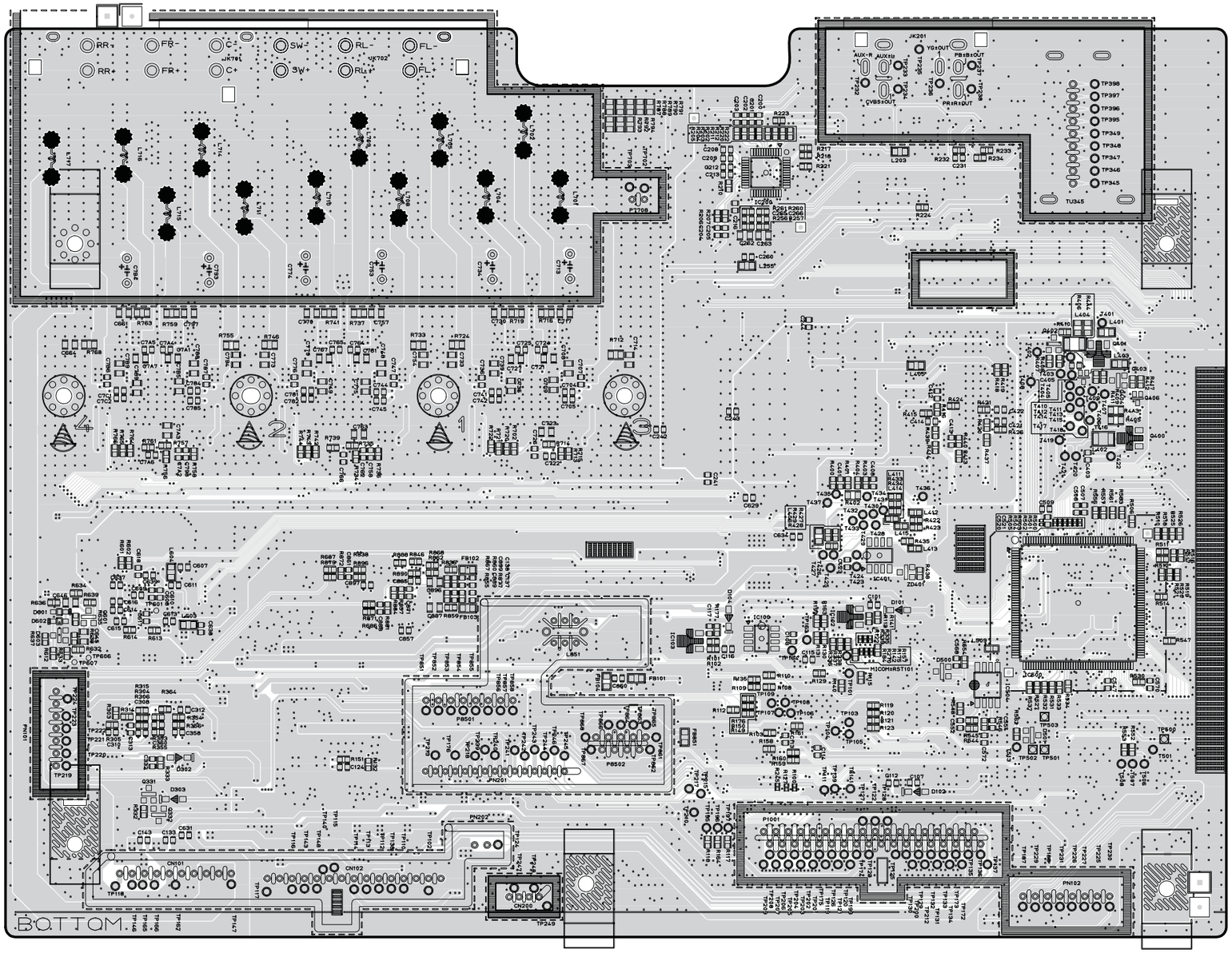
NO.	LOCA. NO.	Capacity	Spec.(V)	100V - 10%	240V/50Hz+10%
				Voltage(V)	Voltage(V)
1	BD901		600	127.3	373.3
2	C901	150 uF	450	127.3	373.3
3	C902	150 uF	450	127.3	373.3
4	C909	4.7 uF	50	19.6	19.6
5	C910	22 uF	50	22.0	22.0
6	C913	22 uF	50	22.2	22.2
7	C952	470 uF	50	43.1	43.1
8	C955	470 uF	50	43.1	43.1
9	C961	470 uF	50	43.1	43.1
10	C963	1000 uF	10	7.32	7.32
11	C965	47 uF	50	38.6	38.6
12	C966	1000 uF	25	12.6	12.6
13	C967	100 uF	10	4.96	4.96
14	C971	1000 uF	10	3.92	3.92
15	C978	220 uF	10	3.92	3.92
16	C979	220 uF	10	5.8	5.8
17	D901		600	251.0	474.0
18	D906		400	44.0	86.0
19	D907		400	77.2	178.0
20	D910		400	84.4	195.0
21	D951		200	95.2	181.0
22	D961		40	44.4	44.4
23	D962		60	57.6	57.6
24	D963		400	404.0	404.0
25	D964		400	60.0	60.0
26	D971		60	14.6	34.4
27	IC901		32	19	19
28	IC902		32	20.8	20.8
29	IC961		43	42.2	42.2
30	Q901		600	301.0	540.0

PRINTED CIRCUIT BOARD DIAGRAMS

1. MAIN P.C.BOARD
(TOP VIEW)

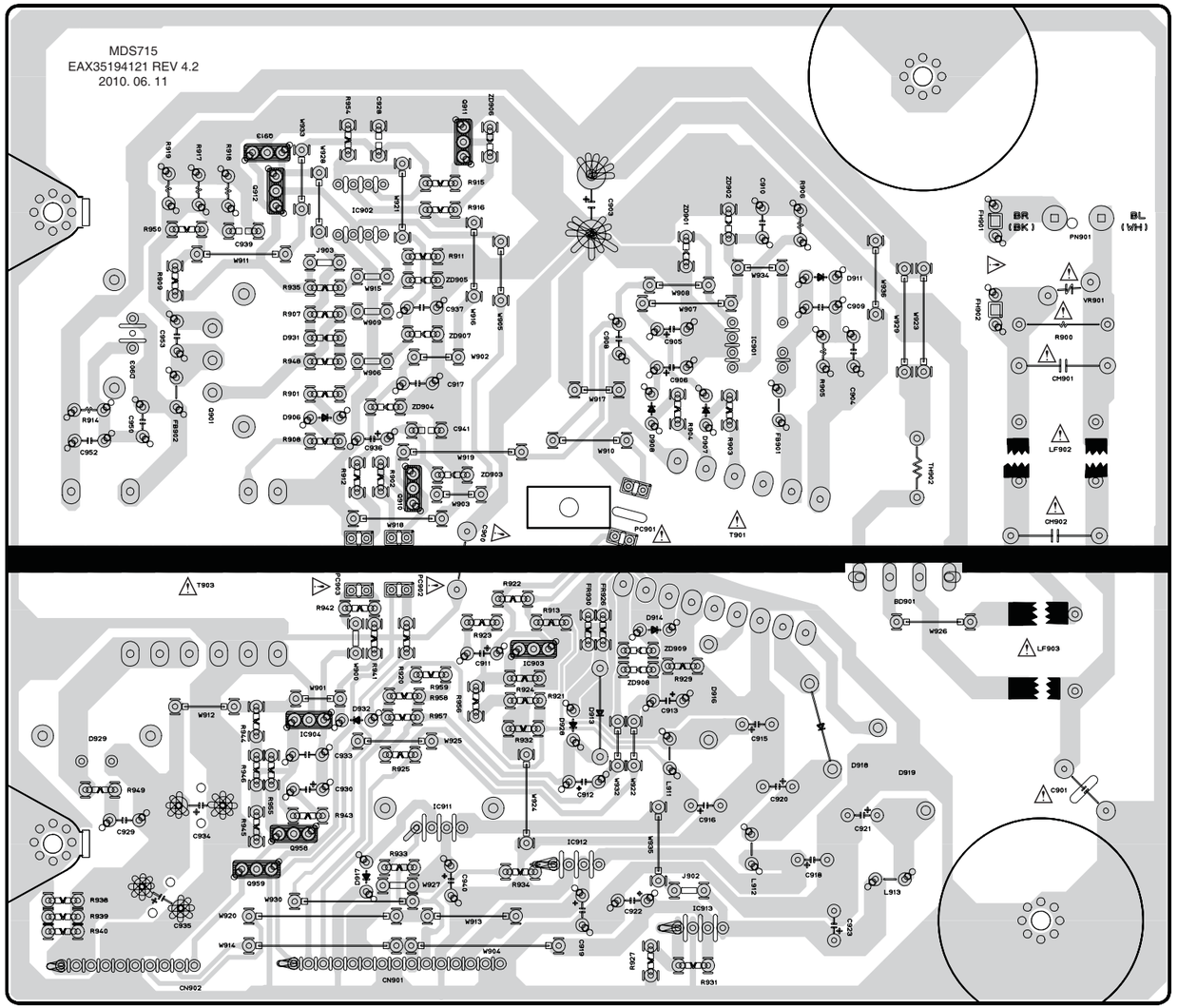


MAIN P.C.BOARD
(BOTTOM VIEW)

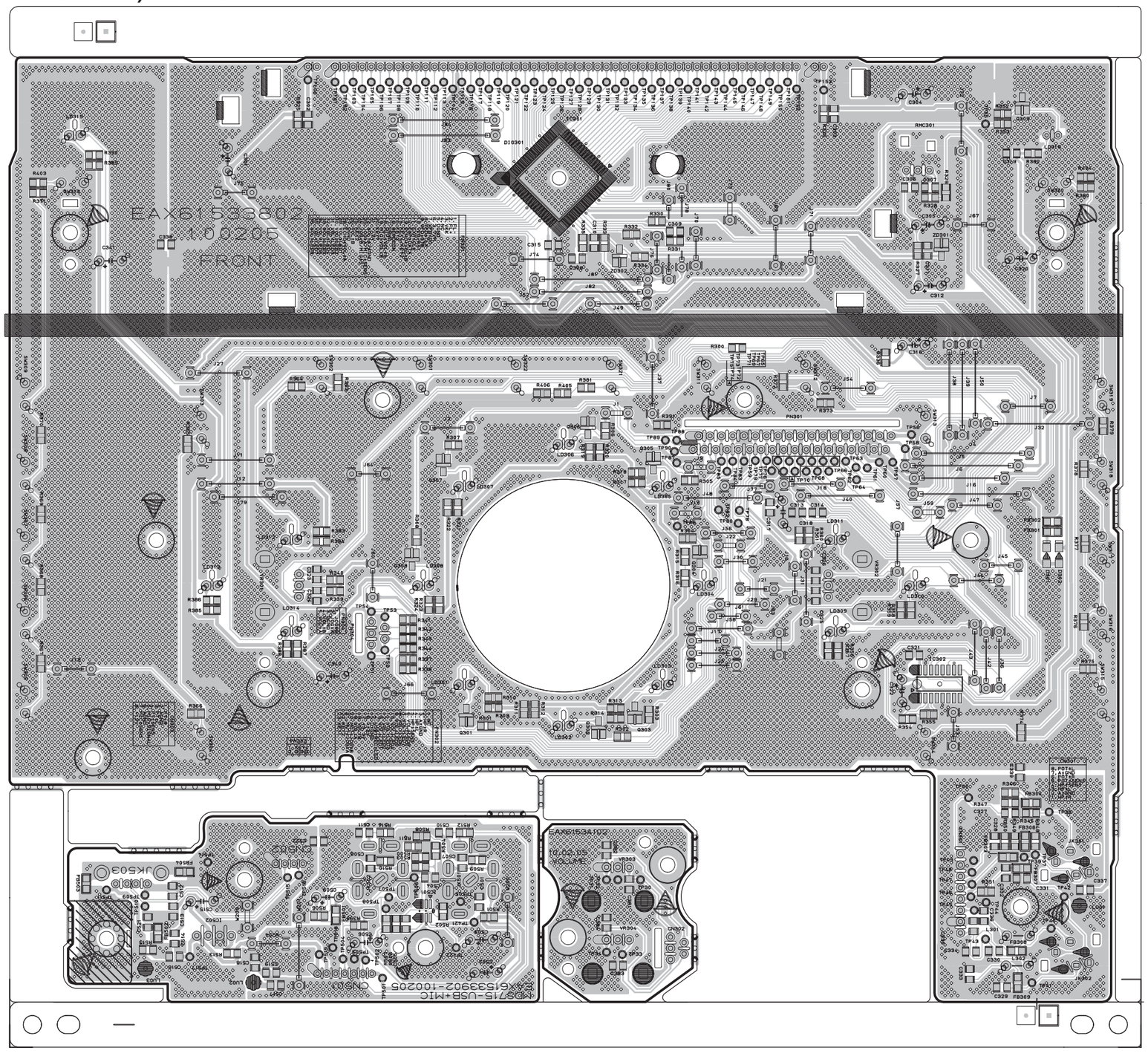


2. SMPS P.C.BOARD

NOTE) Warning
⚠ Parts that are critical with respect to risk of fire or electrical shock.

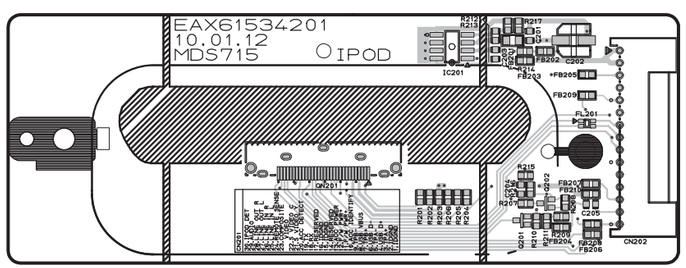


3. FRONT(VFD / USB & MIC / VOLUME) P.C.BOARD

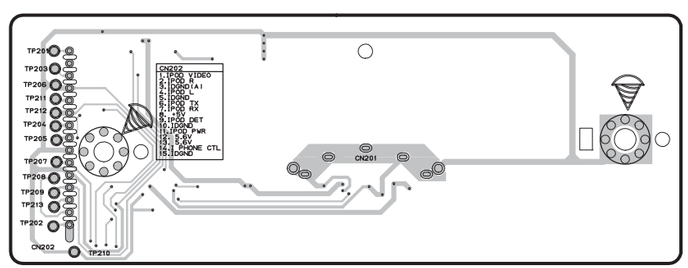


4. IPOD P.C.BOARD (OPTIONAL PART)

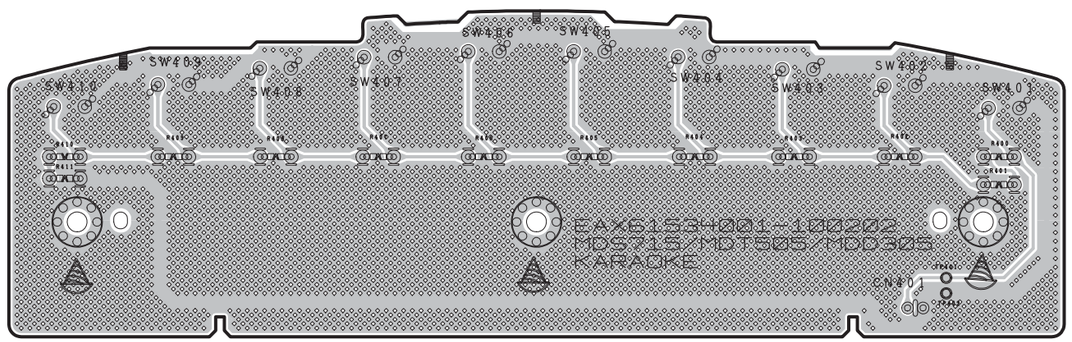
(TOP VIEW)



(BOTTOM VIEW)



5. KARAOKE P.C.BOARD (OPTIONAL PART)



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