



SERVICE MANUAL

MODEL: RCT689H

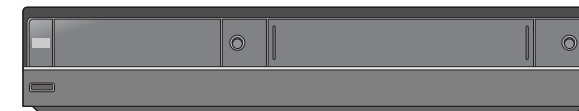
VCR+DVD RECORDER

SERVICE MANUAL

MODEL: RCT689H

CAUTION

BEFORE SERVICING THE UNIT, READ THE "SAFETY PRECAUTIONS" IN THIS MANUAL.



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SECTION 1

SUMMARY

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PRODUCT SAFETY SERVICING GUIDELINES FOR VCR+DVD RECORDER PRODUCTS

IMPORTANT SAFETY NOTICE

This manual was prepared for use only by properly trained audio-video service technicians.

When servicing this product, under no circumstances should the original design be modified or altered without permission from LG Corporation. All components should be replaced only with types identical to those in the original circuit and their physical location, wiring and lead dress must conform to original layout upon completion of repairs.

Special components are also used to prevent x-radiation, shock and fire hazard. These components are indicated by the letter "X" included in their component designators and are required to maintain safe performance. No deviations are allowed without prior approval by LG Corporation.

Circuit diagrams 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.

CAUTION : Do not attempt to modify this product in any way. Never perform customized installations without manufacturer's approval. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury.

Service work should be performed only after you are thoroughly familiar with these safety checks and servicing guidelines.

GRAPHIC SYMBOLS



The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature.



The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the service personnel to the presence of non-insulated "dangerous voltage" that may be of sufficient magnitude to constitute a risk of electric shock.



The pictorial representation of a fuse and its rating within an equilateral triangle is intended to convey to the service personnel the following fuse replacement caution notice:

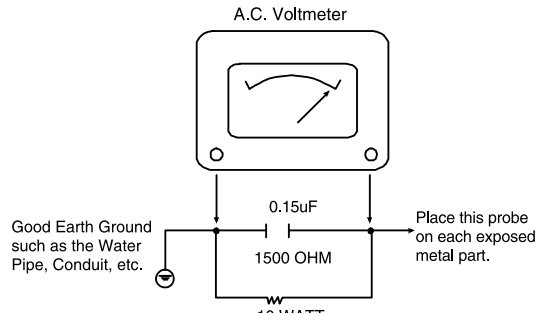
CAUTION : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

SERVICE INFORMATION

While servicing, use an isolation transformer for protection from AC line shock. After the original service problem has been corrected, make a check of the following:

FIRE AND SHOCK HAZARD

1. Be sure that all components are positioned to avoid a possibility of adjacent component shorts. This is especially important on items transported to and from the repair shop.
2. Verify that all protective devices such as insulators, barriers, covers, shields, strain reliefs, power supply cords, and other hardware have been reinstalled per the original design. Be sure that the safety purpose of the polarized line plug has not been defeated.
3. Soldering must be inspected to discover possible cold solder joints, solder splashes, or sharp solder points. Be certain to remove all loose foreign particles.
4. Check for physical evidence of damage or deterioration to parts and components, for frayed leads or damaged insulation (including the AC cord), and replace if necessary.
5. No lead or component should touch a high current device or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces must be avoided.
6. After reassembly of the set, always perform an AC leakage test on all exposed metallic parts of the cabinet (the channel selector knobs, antenna terminals, handle and screws) to be sure that set is safe to operate without danger of electrical shock. **DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST.** Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10 watt resistor, paralleled by a .15 mfd 150V AC type capacitor between a known good earth ground water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and .15 mfd capacitor. Reverse the AC plug by using a non-polarized adaptor and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75 volts RMS. This corresponds to 0.5 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



TIPS ON PROPER INSTALLATION

1. Never install any receiver in a closed-in recess, cubbyhole, or closely fitting shelf space over, or close to, a heat duct, or in the path of heated air flow.
2. Avoid conditions of high humidity such as: outdoor patio installations where dew is a factor, near steam radiators where steam leakage is a factor, etc.
3. Avoid placement where draperies may obstruct venting. The customer should also avoid the use of decorative scarves or other coverings that might obstruct ventilation.
4. Wall- and shelf-mounted installations using a commercial mounting kit must follow the factory-approved mounting instructions. A product mounted to a shelf or platform must retain its original feet (or the equivalent thickness in spacers) to provide adequate air flow across the bottom. Bolts or screws used for fasteners must not touch any parts or wiring. Perform leakage tests on customized installations.
5. Caution customers against mounting a product on a sloping shelf or in a tilted position, unless the receiver is properly secured.
6. A product on a roll-about cart should be stable in its mounting to the cart. Caution the customer on the hazards of trying to roll a cart with small casters across thresholds or deep pile carpets.
7. Caution customers against using extension cords. Explain that a forest of extensions, sprouting from a single outlet, can lead to disastrous consequences to home and family.

SERVICING PRECAUTIONS

CAUTION: Before servicing the VCR+DVD RECORDER covered by this service data and its supplements and addends, read and follow the *SAFETY PRECAUTIONS*. *NOTE:* if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publications, always follow the safety precautions.

Remember Safety First :

General Servicing Precautions

1. Always unplug the VCR+DVD RECORDER AC power cord from the AC power source before:
 - (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
 - (2) Disconnecting or reconnecting any internal electrical plug or other electrical connection.
 - (3) Connecting a test substitute in parallel with an electrolytic capacitor.
Caution : A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.
2. Do not spray chemicals on or near this VCR+DVD RECORDER or any of its assemblies.
3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cotton-tipped swab, or comparable soft applicator.
Unless specified otherwise in this service data, lubrication of contacts is not required.
4. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.
5. Do not apply AC power to this VCR+DVD RECORDER and / or any of its electrical assemblies unless all solidstate device heat sinks are correctly installed.
6. Always connect the test instrument ground lead to an appropriate ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1Mohm.

Note 1 : Accessible Conductive Parts include Metal panels, Input terminals, Earphone jacks, etc.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor chip components.

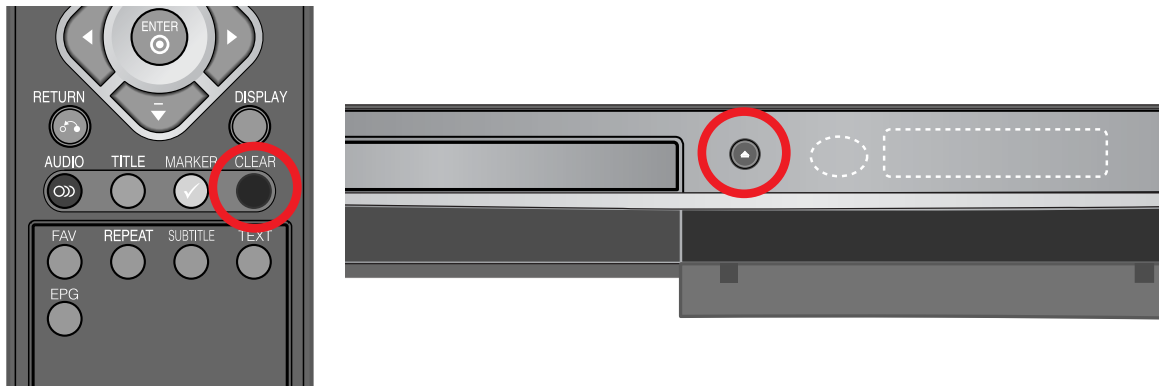
The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

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 ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate an electrical charge sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Normally 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 ES device.)

SERVICE INFORMATION FOR EEPROM IC SETTING

1. Press both "CLEAR" button on the Remocon and "▲ OPEN/CLOSE" button on the Front Panel about ±5 sec.



The picture on OSD will be as bellow :

OP1 : 0F	00000000	
OP2 : 70	00000000	071102A
OP3 : 31	00000000	
OP4 : 20	00000000	
OP5 : 0A	00000000	
OP6 : AA	00000000	
OP7 : 44	00000000	Write : OK
OP8 : 05	00000000	Exit : MP
OP9 : EC	00000000	Move : < >
OPA : 00	00000000	Edit : ▼ ▲
5		
Checksum of Option : 0x1105		
DVD read time : --- second		
CD read time : 10 sec -- > OK		

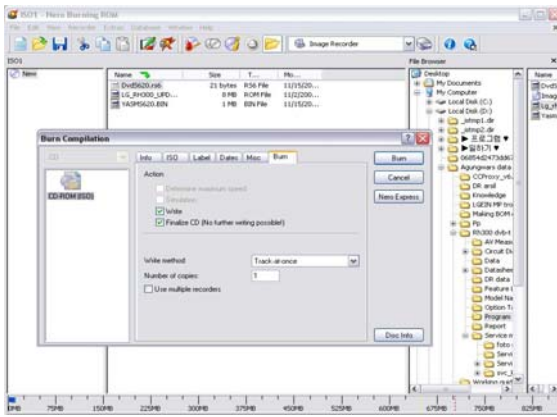


2. To MOVE from OP1 (Option 1) to another option, press < > button on the Remote Control.
3. To CHANGE the option code, press ⬆ button on the Remote Control.
4. To APPLY the option Code, after change the option press OK/Enter button on Remote Control.
5. To INITIALIZE the system, press "CLEAR" button on the R/C together with "▲ OPEN/CLOSE" on the Front Panel about ±5 sec.
Note : This process will only clear the mapping channel and not delete data on HDD.
6. To exit from the option Code menu without Initialize the system, just turn off the power and then turn on again.

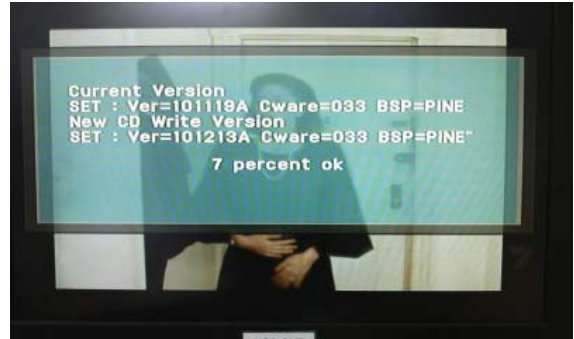
UPGRADE THE MAIN & LOADER PROGRAM

1. MAKING UPGRADE DISC MAIN SW AND LOADER SW

- 1) Do Physical format as ISO9660 or JOLIET file system
- 2) Don't care about the CD Volume label
- 3) Write Main SW file and Loader SW file on Root
 - ① Main SW file name is :
 - LG_RC600_UPDATE_PAL.ROM
 - ② Loader SW file name is :
 - DvdS620.rs6
 - YASMS620



- 5) Press "PLAY" button to update S/W and another button to cancel.
- 6) Main S/W under updated.
Do not turn off the power during updating process...!



- 7) If updating succeed, tray disc will be opened.



Take the disc and turn off the power.

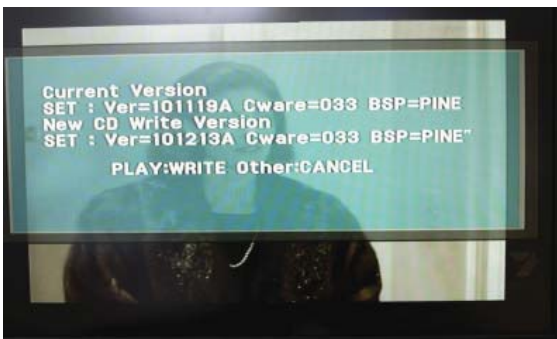
- 8) Turn on the power, and check the Main S/W Version.

2. UPGRADE MAIN S/W

- 1) Insert Upgrade DISC into the Set
- 2) Press "DVD" button on the Remocon
- 3) After Disc Reading, CD Data Inspection Process. OSD like below :



- 4) If CD Data inspection OK, there will be message on OSD as below :

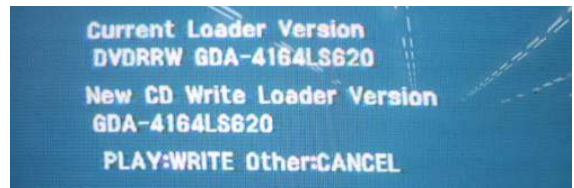


3. UPGRADE LOADER S/W

- 1) Insert Upgrade DISC into the Set
- 2) Press "DVD" button on the Remocon
- 3) After Disc Reading, CD Data Inspection Process. OSD like below :

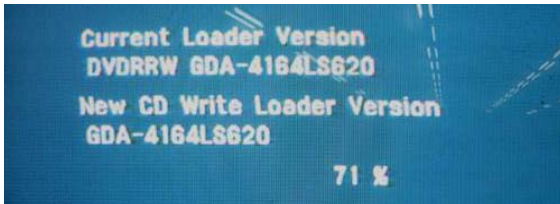


- 4) If CD Data inspection OK, there will be message on OSD as below :

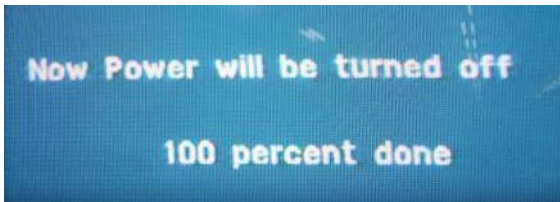


And Disc tray will be opened. Take off the disc

- 5) Press "PLAY" button to update S/W and another button to cancel.
- 6) Loader S/W under updated.
Do not turn off the power during updating process...!



If updating succeed, after completed there will be message :



Power will be automatically turn off.

- 7) Turn on the power and check the Loader S/W Version.

4. S/W VERSION INFORMATION

- 1) Press the "HOME" button on the Remocon
- 2) Select "EASY MENU" --> Select "SETUP"



- 3) Select menu 'General -> TV Aspect -> 16:9 Wide'



- 4) Press button number 1 - 3 - 9 - 7 - 1 - 3 - 9 - Enter on the Remocon
The picture on TV screen as below :



UPGRADING I/O μ -com SOFTWARE

1. MAKING UPGRADE CD

- 1) Prepare "io_micom_update.hex" File.
- 2) Make Data CD with Your Burning Tool.

2. UPGRADING SEQUENCE

- 1) Insert Your Upgrading CD.
- 2) There will be displayed Update Disc OSD and Request Pressing Play Key. Then Press Play Key!
---> If Displayed CD Data Inspection Fail Message, Loader does not Read CD Data. So, Insert Again CD or Burn Other CD(have no defect).
- 3) Progressing OSD will be displayed. And Current Version and New Version Number will be displayed after a while.
Tray will be Opened automatically. Removed Update disc.
Also, request pressing Play Key. Then Press Play Key!
- 4) Upgrading Progress will be displayed.
- 5) If Upgrading Progress Succeed, Turn Off Power automatically.
- 6) When You Turn On Power after a while, Recorder will be Start New Version Program.

*** After Upgrading Program, Turn Off Power And Re-Start Recorder.
New Program will be applied At That Time. Please Don't Forget.**



SPECIFICATIONS

• GENERAL

Power requirements	AC 200 ~ 240V, 50/60Hz
Power consumption	23W
Dimensions (approx.)	430 X 78.5 X 260mm (w x h x d) without foot
Net weight (approx.)	4.2kg
Operating temperature	5°C to 35°C
Operating humidity	5% to 90 %
Television system	PAL B/G, SECAM D/K, color system
Recording format	PAL

• RECORDING

Recording format	DVD Video Recording, DVD-VIDEO
Recordable media	DVD-RW, DVD-R, DVD+RW, DVD+R,
Recordable time	DVD (4.7GB): Approx. 1 hour (XP mode), 2 hours (SP mode), 4 hours (LP mode), 6 hours (EP mode), 14 hours (MLP mode)

Video recording format

Sampling frequency	27MHz
Compression format	MPEG2 (VBR supported)

Audio recording format

Sampling frequency	48kHz
Compression format	Dolby Digital

• PLAYBACK

Frequency response	DVD (PCM 48kHz): 8Hz to 22kHz, CD: 8Hz to 20kHz DVD (PCM 96kHz): 8Hz to 44kHz
Signal-to-noise ratio	More than 100dB (AUDIO OUT connector)
Harmonic distortion	Less than 0.008% (AUDIO OUT connector)

• INPUTS

Dynamic range	More than 95dB (AUDIO OUT connector)
ANTENNA IN	Antenna input, 75 ohms
VIDEO IN	1.0Vp-p 75 ohms, sync negative, RCA jack x 2
AUDIO IN	2.0Vrms more than 47 kohms, RCA jack (L, R) x 2
DV IN	4 pin (IEEE 1394 standard)

• OUTPUTS

VIDEO OUT	1Vp-p 75Ω, sync negative, SCART x 2
COMPONENT VIDEO OUT	(Y) 1.0V(p-p), 75Ω, sync negative, RCA jack x 1, (PB)/(PR) 0.7V(p-p), 75Ω, RCA jack x 2
Audio output (digital audio)	0.5V(p-p), 75Ω, RCA jack x 1
Audio output (optical audio)	3V(p-p), 75Ω, Optical connector x 1
Audio output (analog audio)	2.0Vrms (1kHz, 0dB), 600Ω, RCA jack (L, R) x 1 / SCART x 2

MEMO

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SECTION 2

CABINET & MAIN CHASSIS

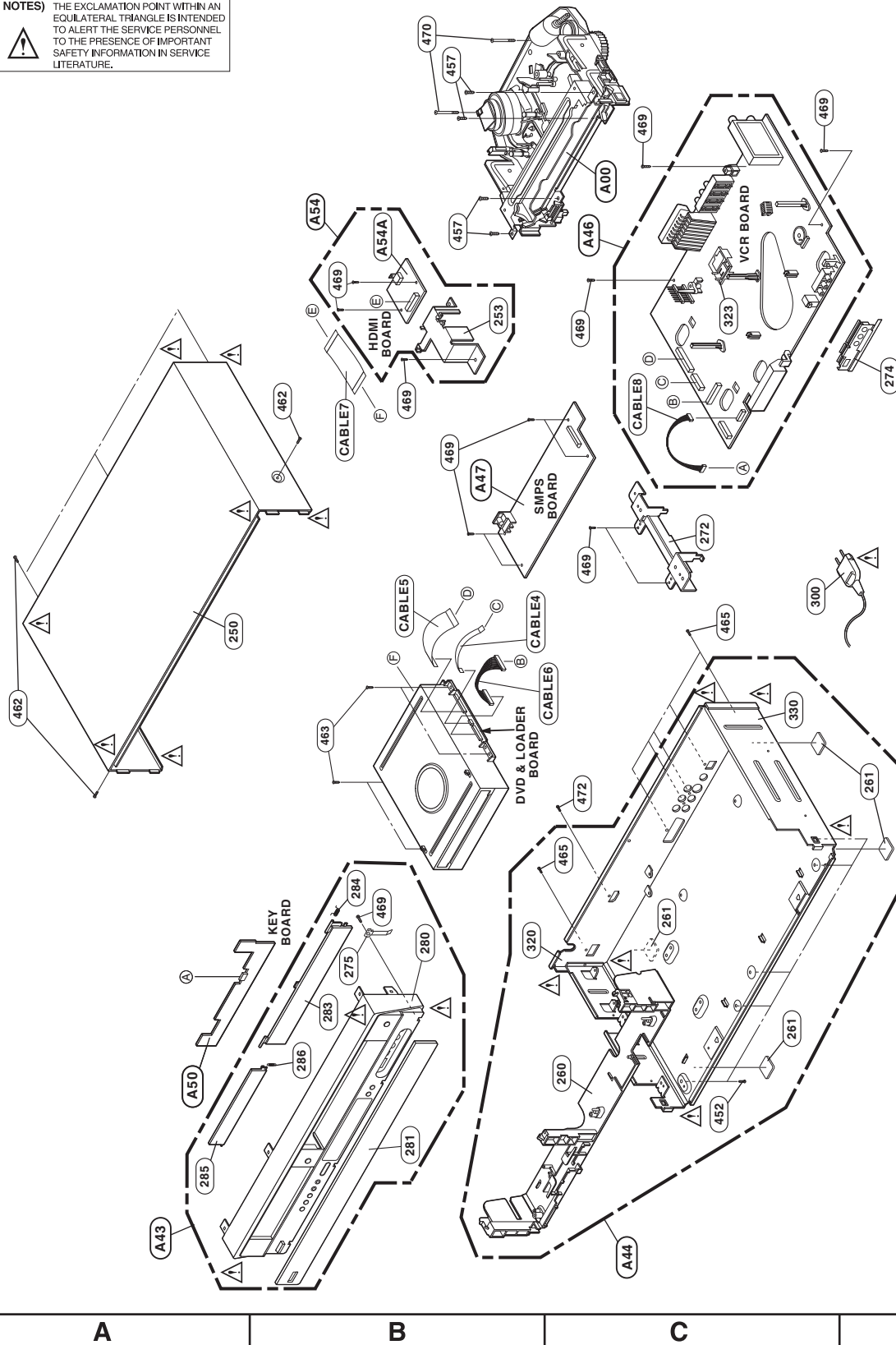
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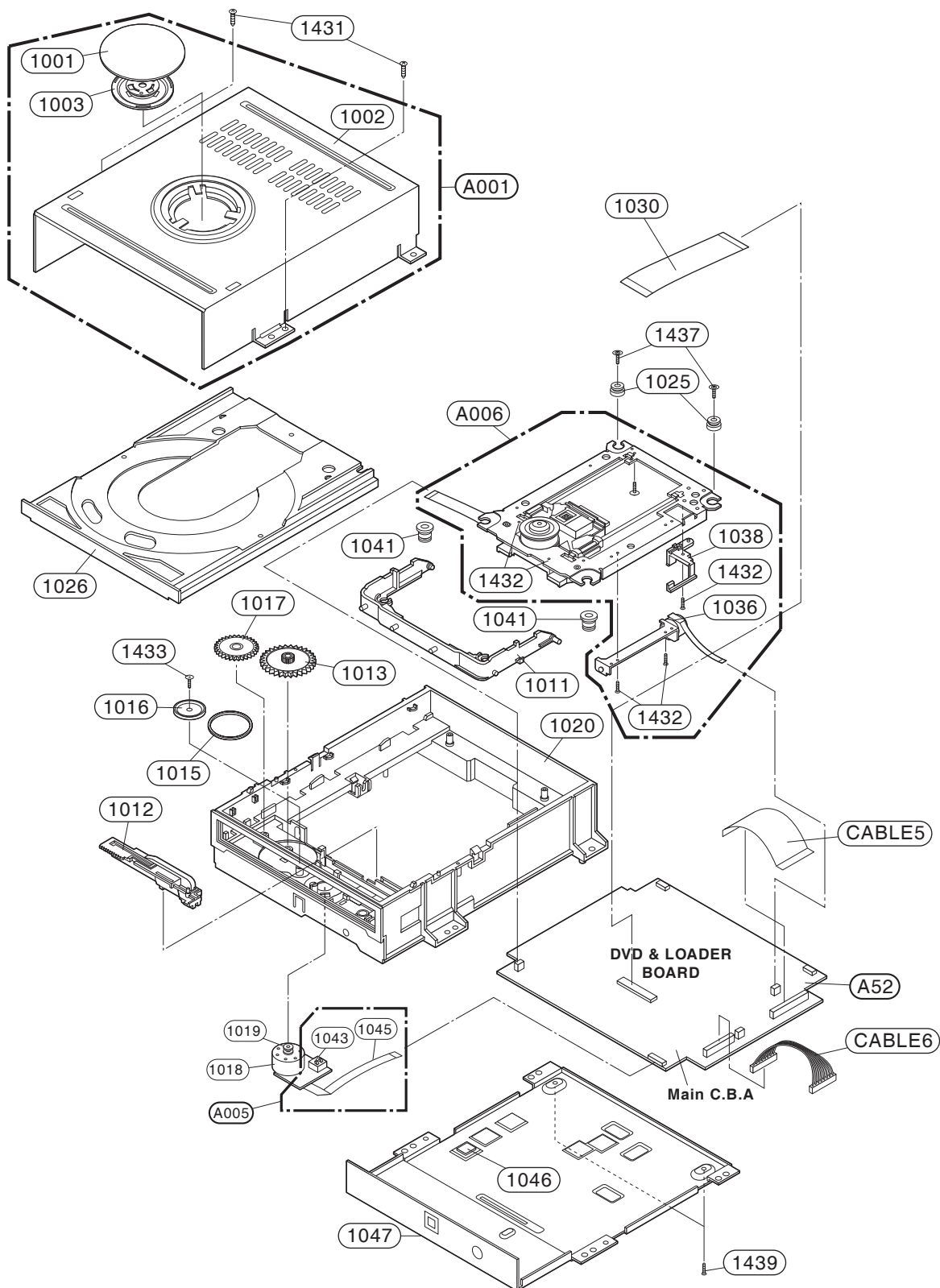
EXPLODED VIEWS

1. CABINET AND MAIN FRAME SECTION

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.

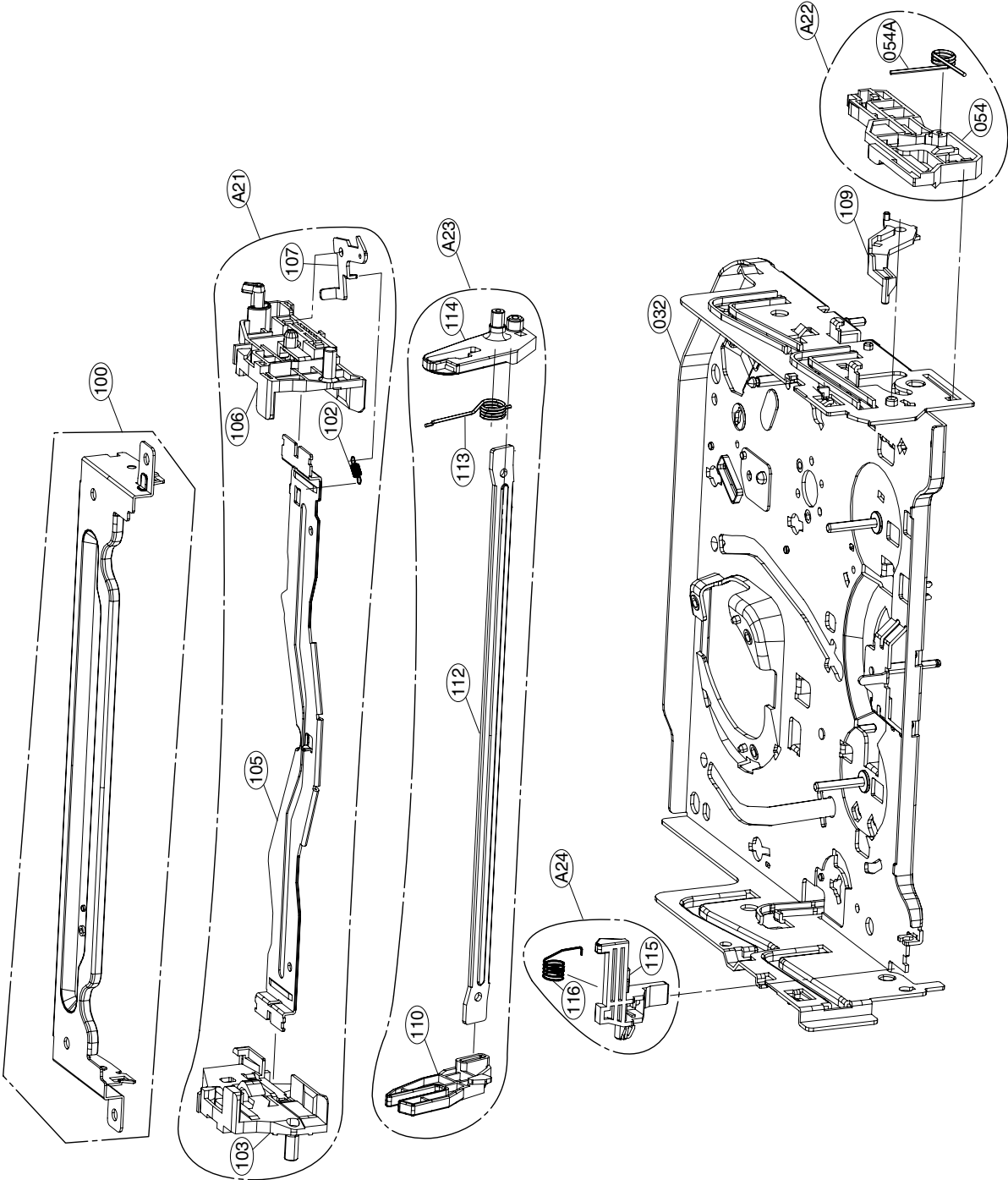


2. DECK MECHANISM SECTION [RV9(DR-11A)]



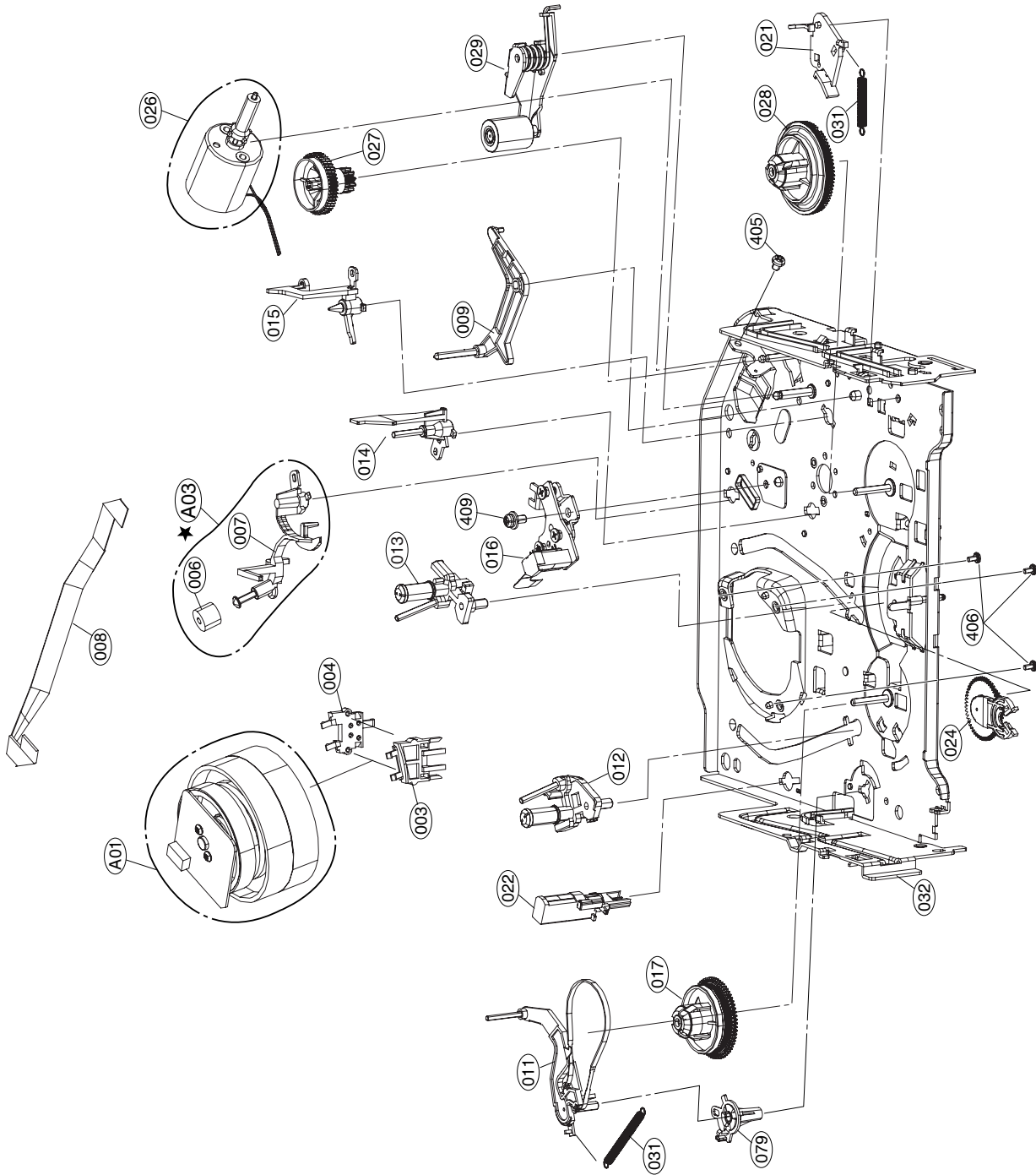
3. DECK MECHANISM SECTION (D37(N))

3-1. Front loading mechanism section

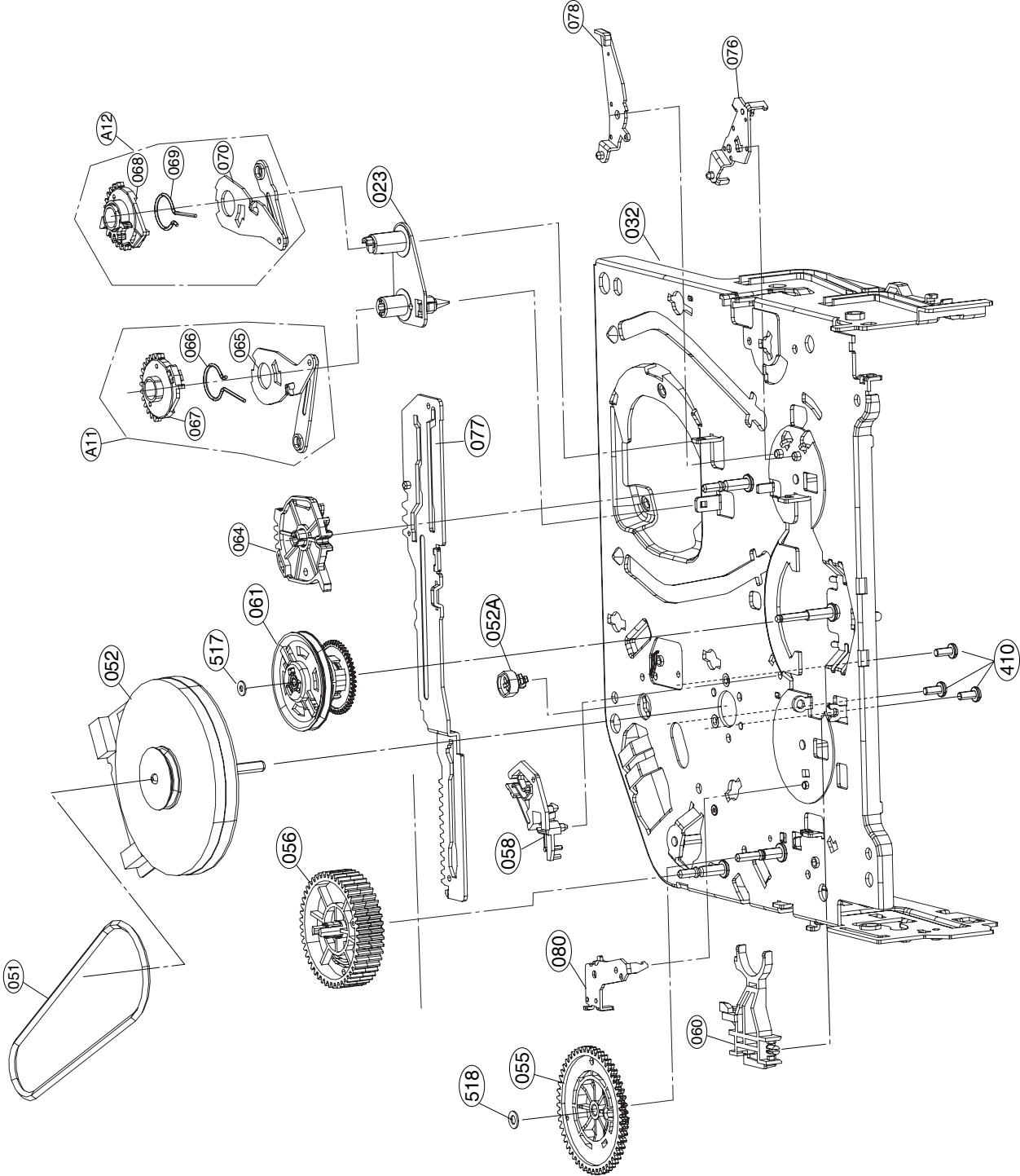


3-2. Moving mechanism section (1)

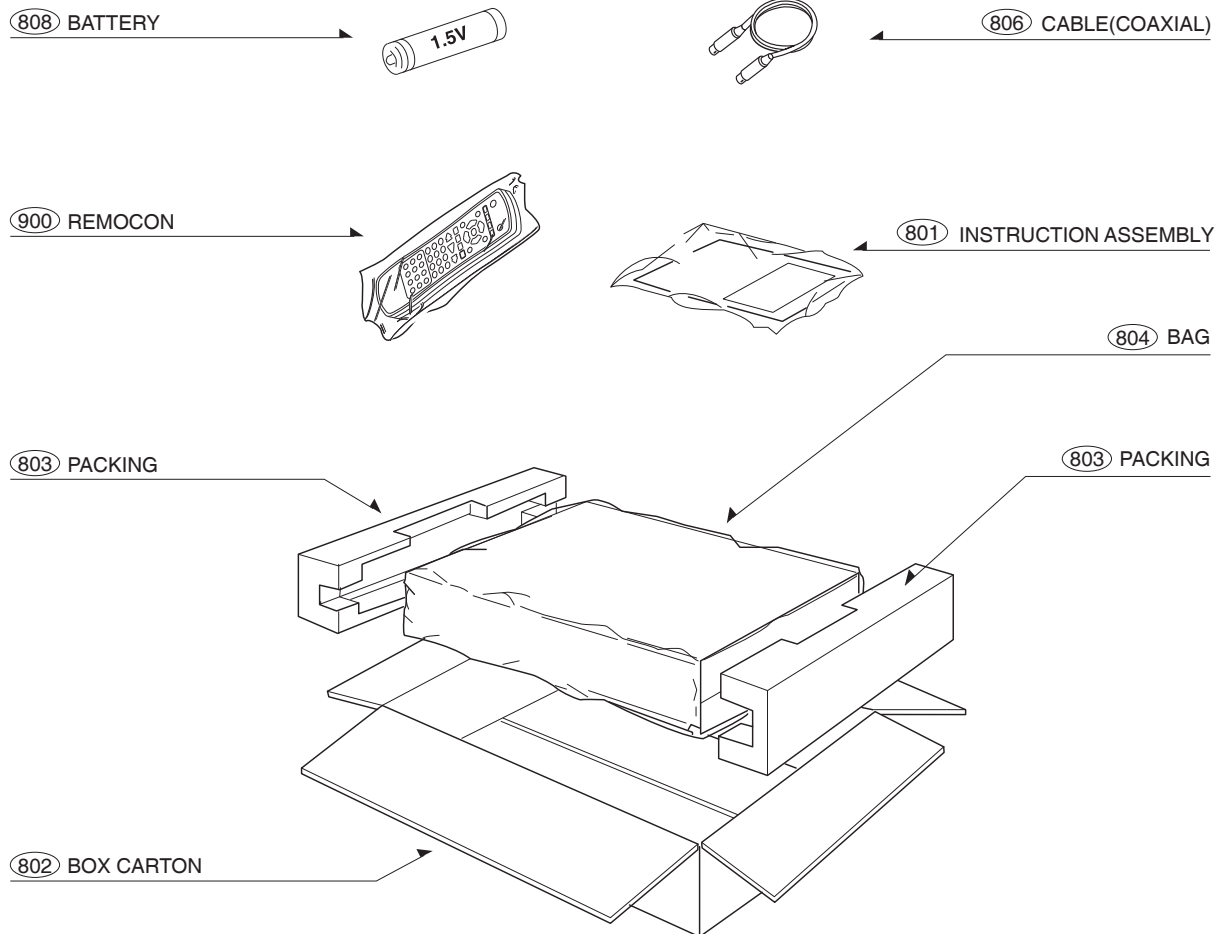
★ OPTIONAL PART



3-3. Moving mechanism section (2)



4. PACKING ACCESSORY SECTION



MEMO

A series of horizontal dotted lines for writing.

SECTION 3

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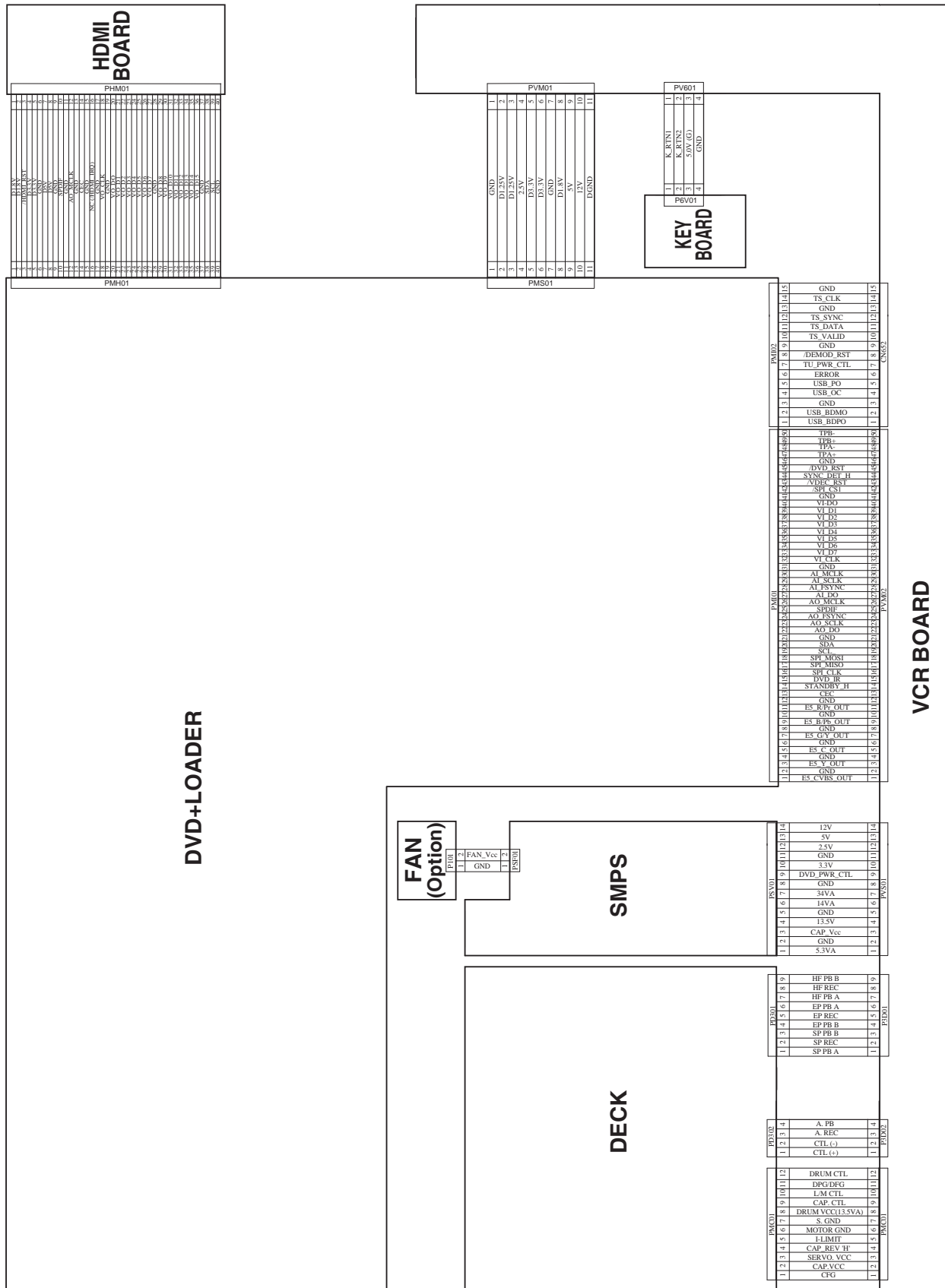
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OVERALL WIRING DIAGRAM



VCR PART

ELECTRICAL ADJUSTMENT PROCEDURES

1. SERVO ADJUSTMENT

1) PG Adjustment

<ul style="list-style-type: none"> • Test Equipment a) OSCILLOSCOPE 	b) PAL MODEL : PAL SP TEST TAPE
---	---------------------------------

• Adjustment And Specification

MODE	MEASUREMENT POINT	ADJUSTMENT POINT	SPECIFICATION
PLAY	V.Out H/SW(TP)	R/C TRK JIG KEY	$6.5 \pm 0.5H$

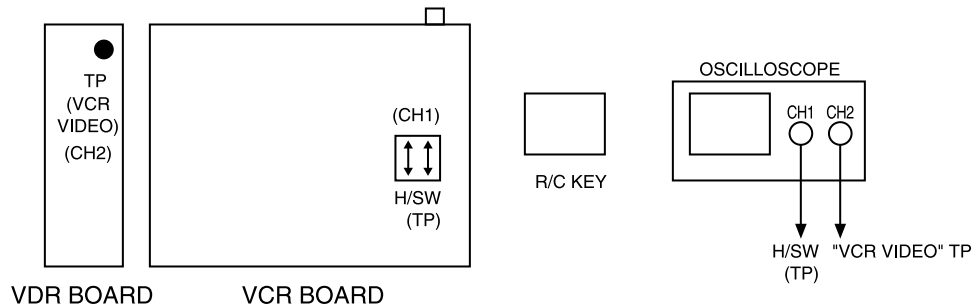
• **Adjustment Procedure**

- a) Insert the SP Test Tape and play.
- b) Connect the CH1 of the oscilloscope to the H/SW and CH2 to the "VCR VIDEO" TP for the VCR.
- c) Trigger the mixed Combo Video Signal of CH2 to the CH1 H/SW, and then check the distance (time difference), which is from the selected A(B) Head point of the H/SW signal to the starting point of the vertical synchronized signal, to $6.5H \pm 0.5H$ ($416\mu s$, $1H=64\mu s$).

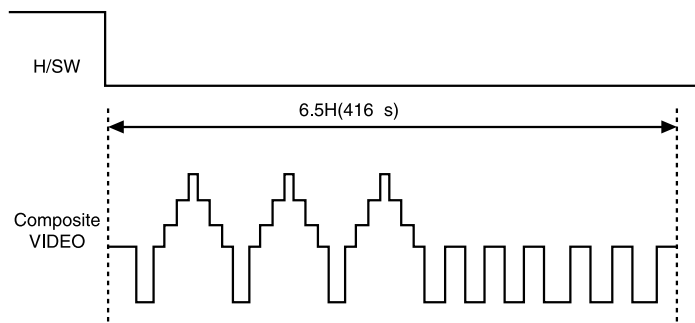
• **PG Adjustment Method**

- a-1) Playback the SP standard tape
- b-2) Wait 5 second , Press "CLEAR" at remocon + DVD loader Eject. < Digitron[- -] >
- c-3) Repeat the above step(No.b-2), then it finishes the PG adjusting automatically. < Digitron[PG] >
- d-4) Stop the playback, then it goes out of PG adjusting mode after mony the PG data.

• **CONNECTION**

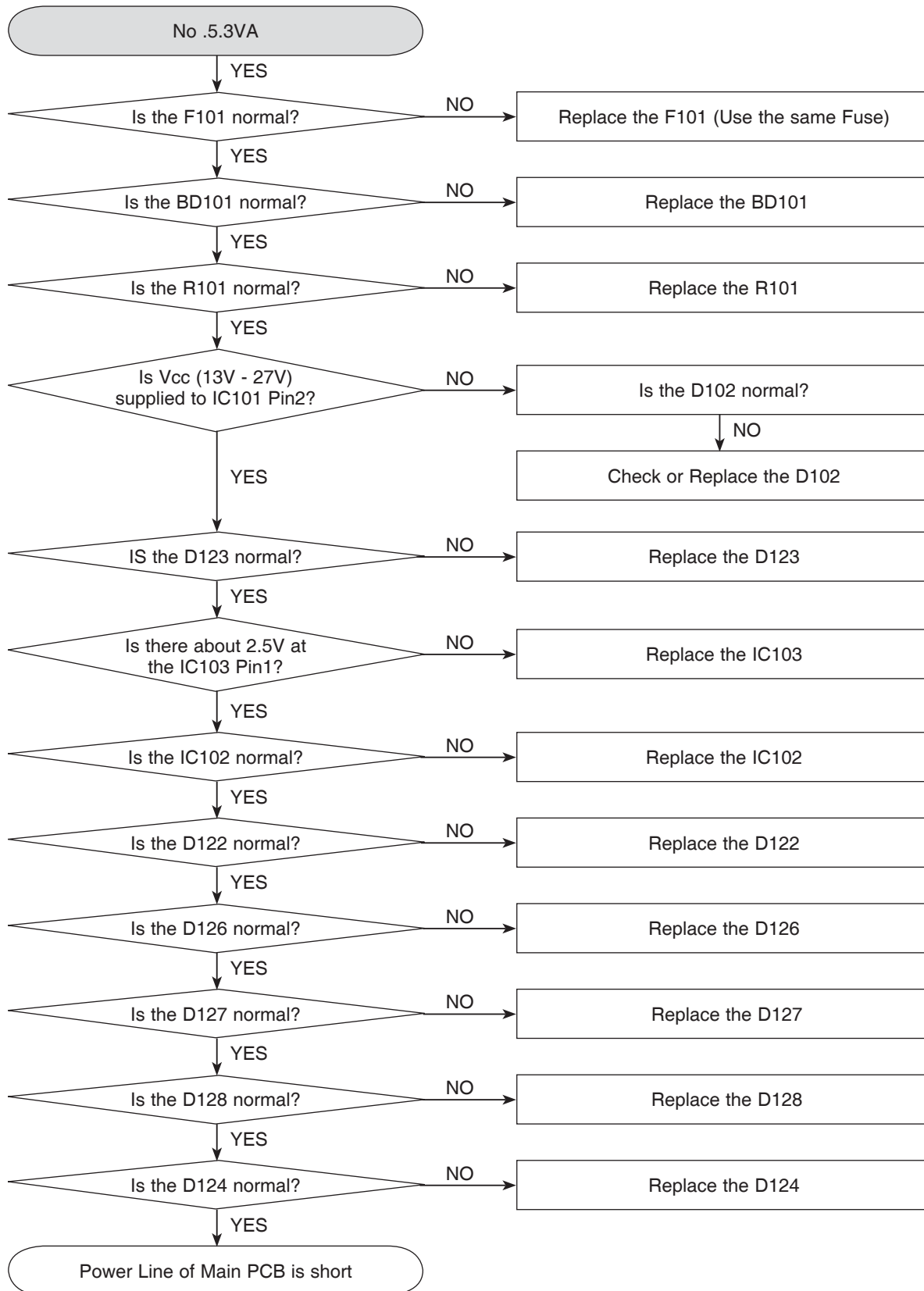


• **WAVEFORM**



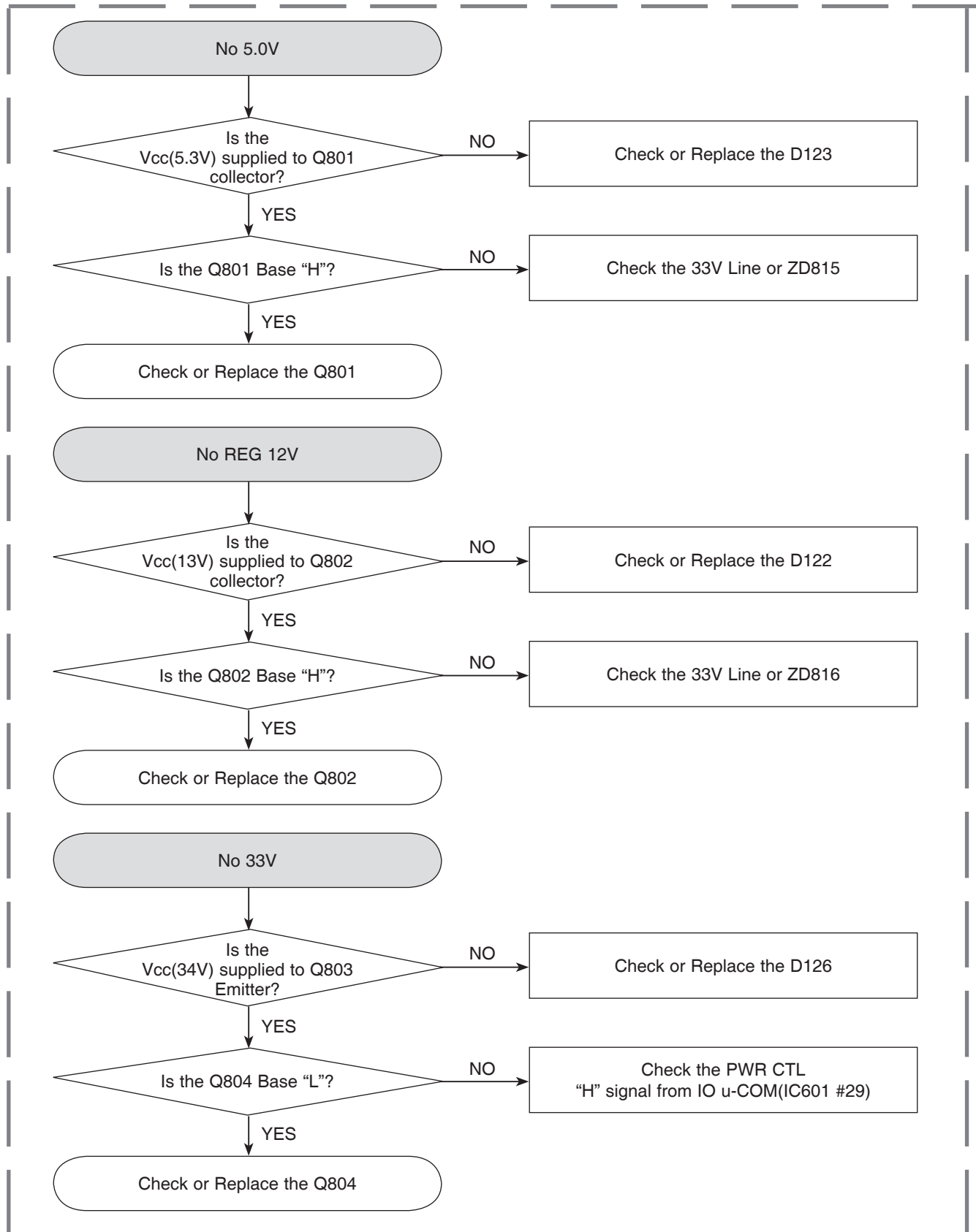
VCR ELECTRICAL TROUBLESHOOTING GUIDE

1. POWER (SMPS) CIRCUIT

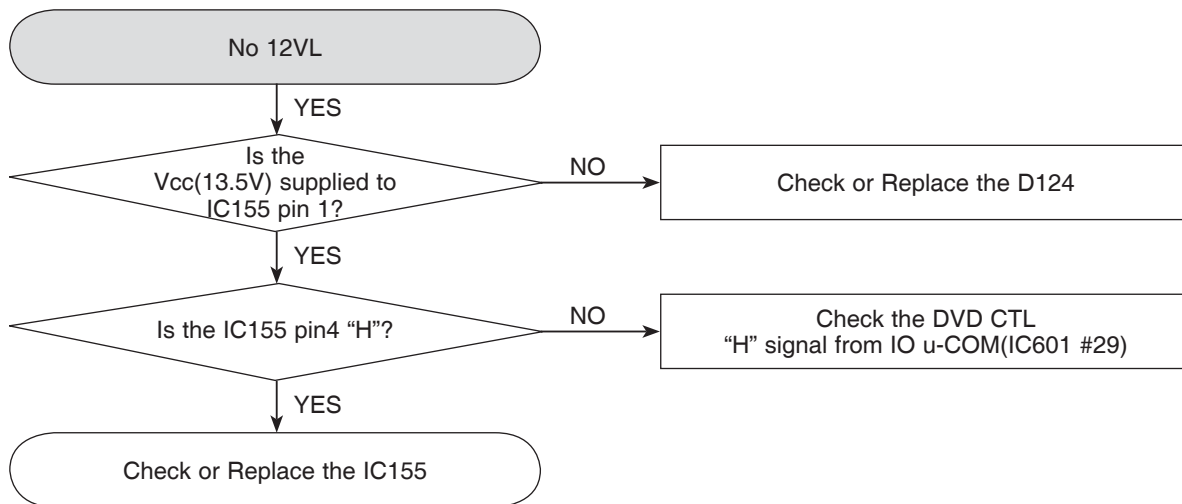
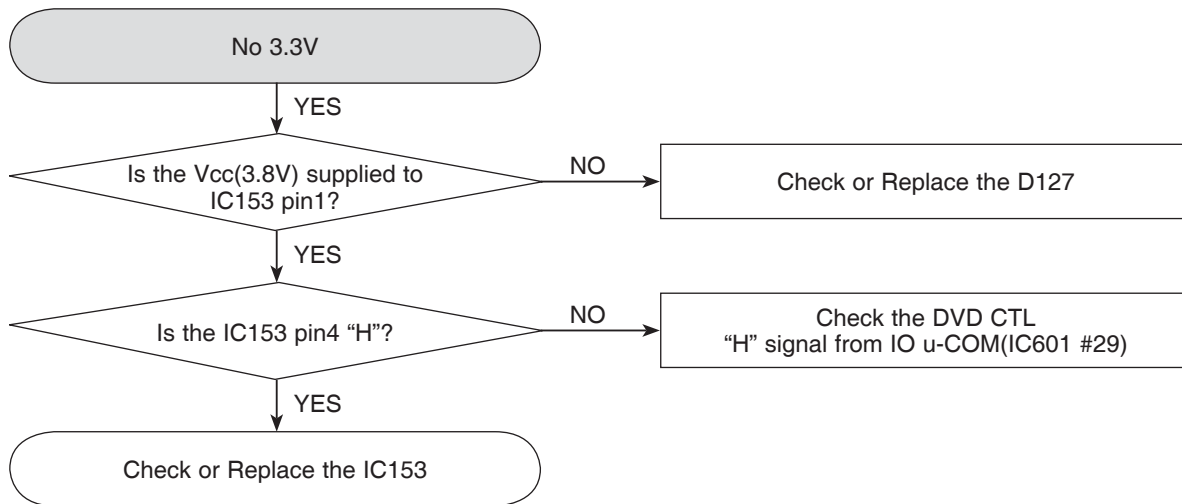
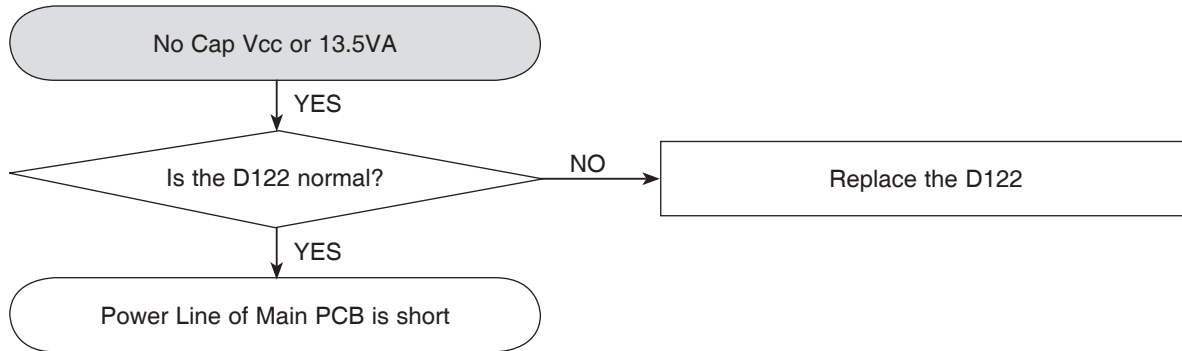


VCR ELECTRICAL TROUBLESHOOTING GUIDE

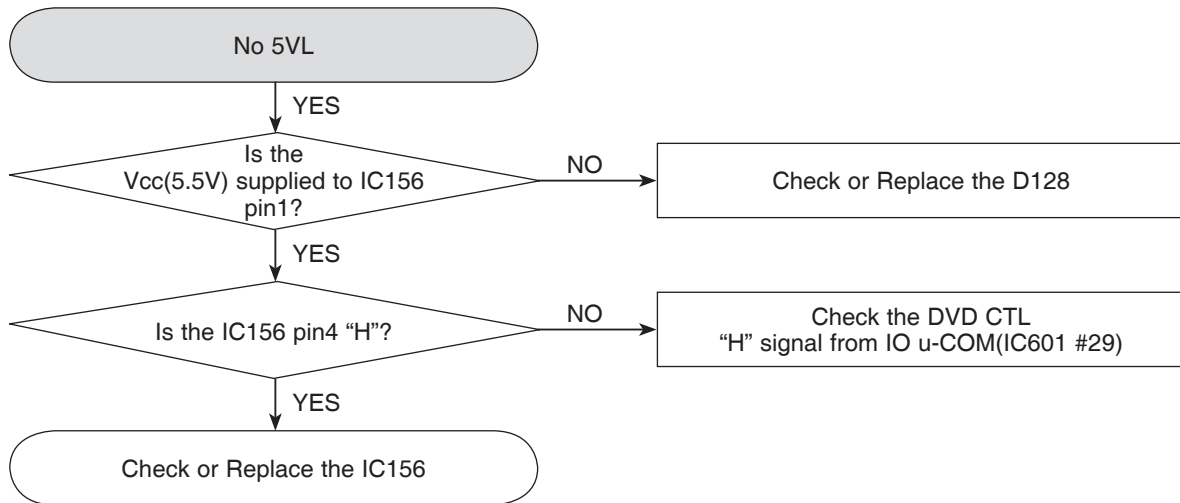
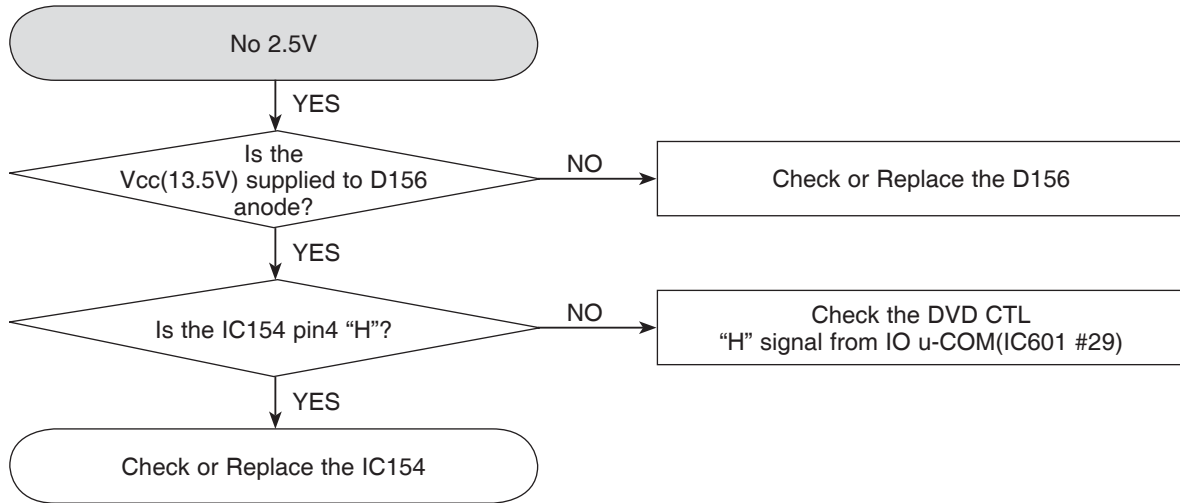
VCR MAIN



VCR ELECTRICAL TROUBLESHOOTING GUIDE



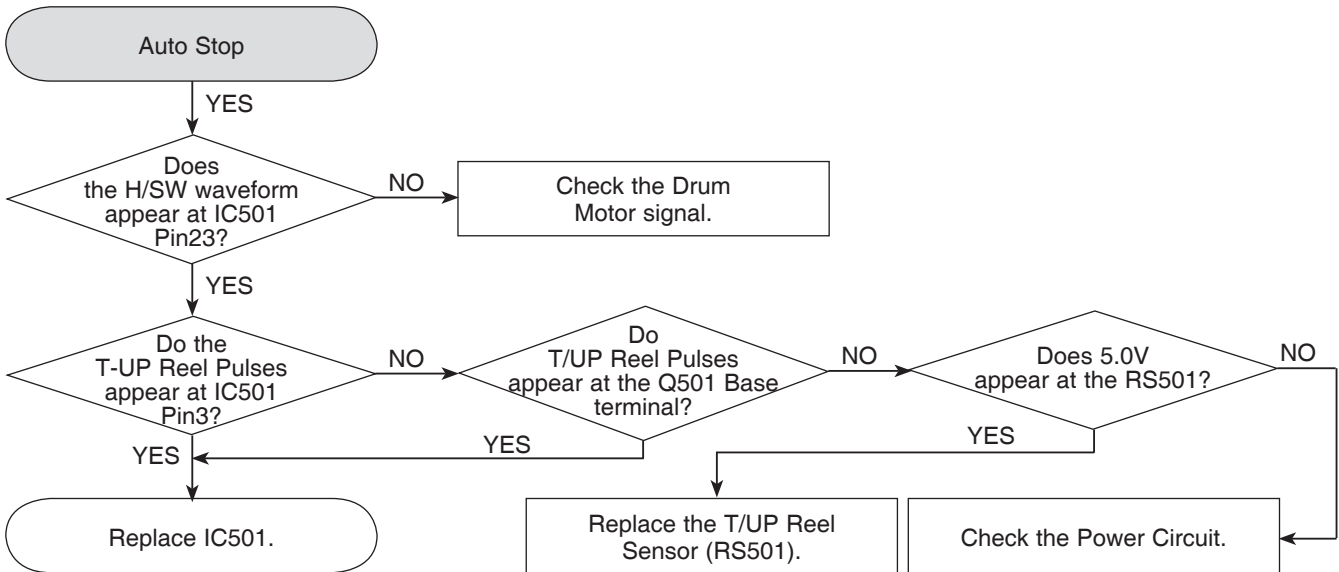
VCR ELECTRICAL TROUBLESHOOTING GUIDE



VCR ELECTRICAL TROUBLESHOOTING GUIDE

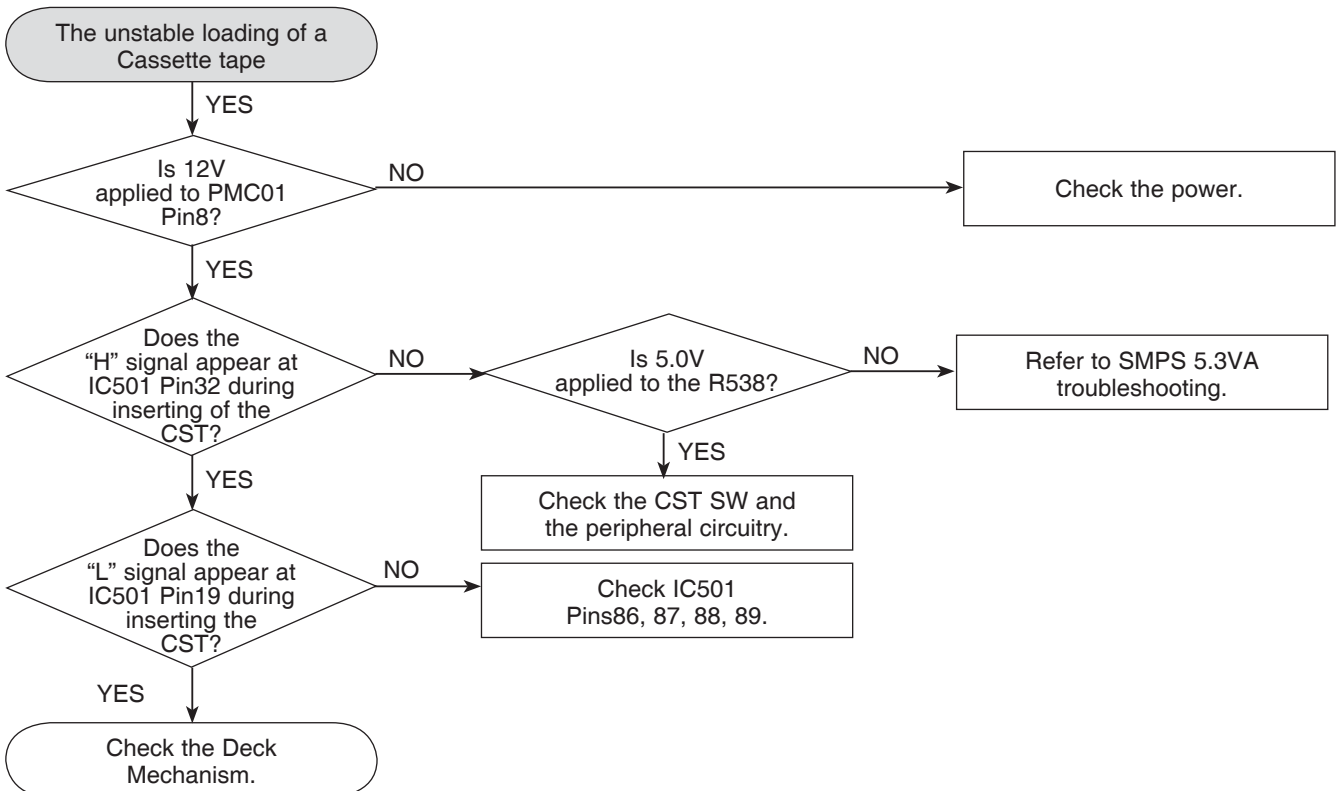
2. SYSTEM/KEY CIRCUIT

2-1. AUTO STOP



Note : Auto stop can occur because Grease or Oil has dried up

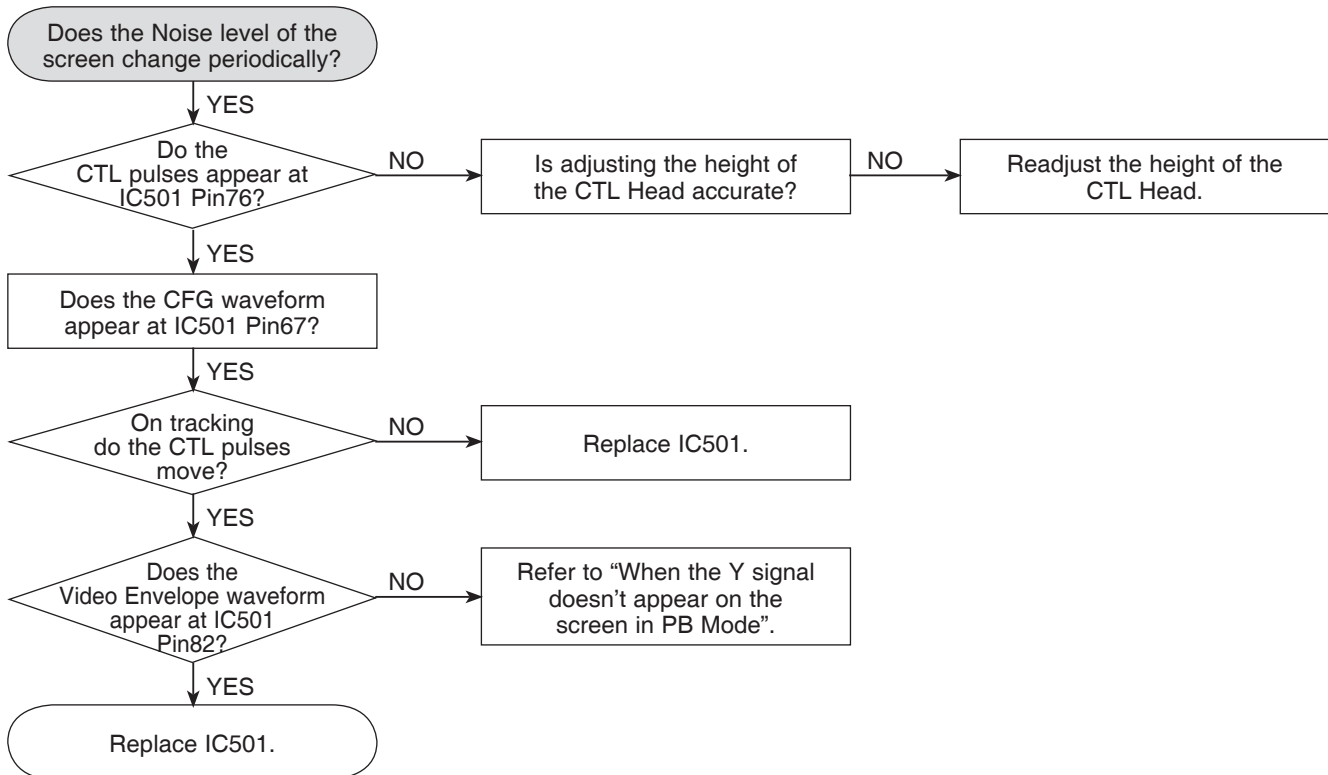
2-2. The unstable loading of a Cassette tape



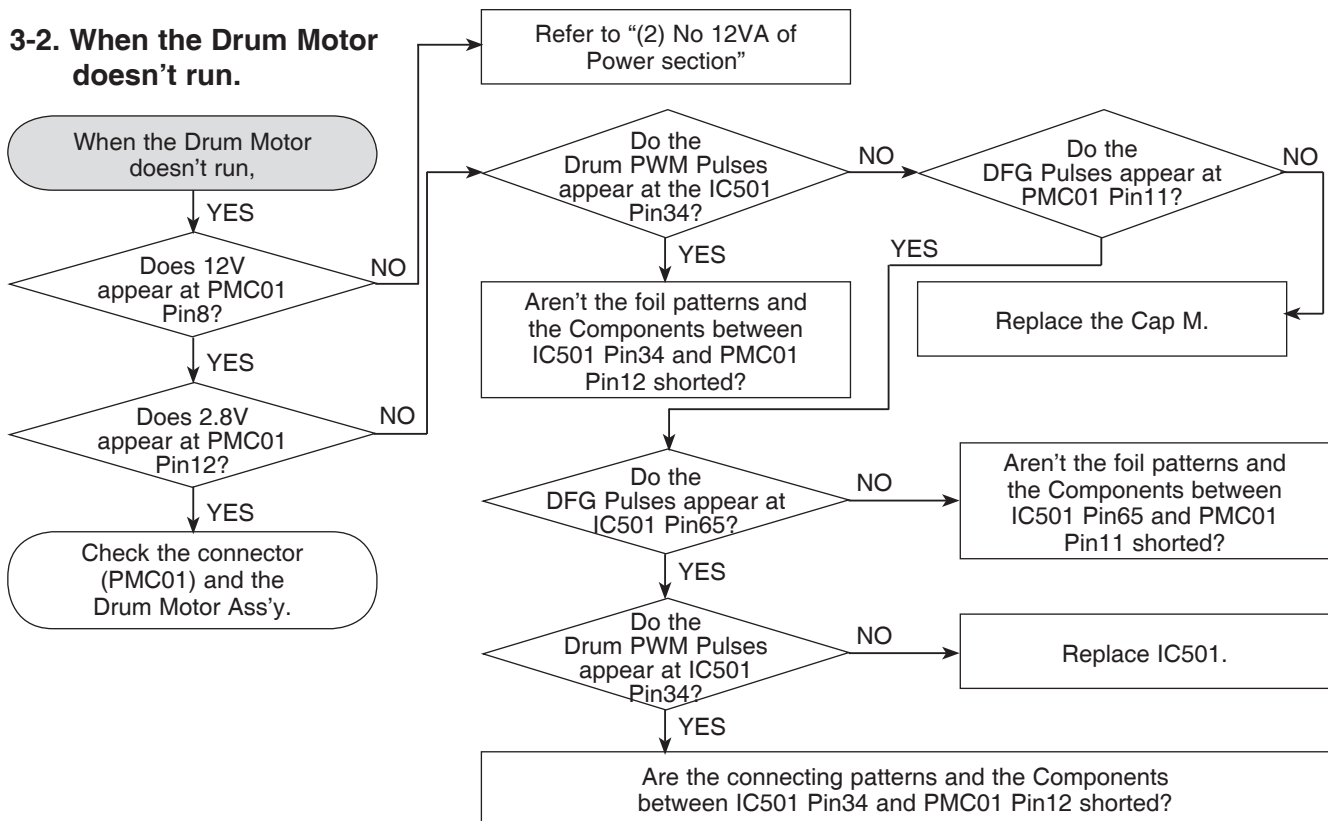
VCR ELECTRICAL TROUBLESHOOTING GUIDE

3. SERVO CIRCUIT

3-1. Unstable Video in PB MODE

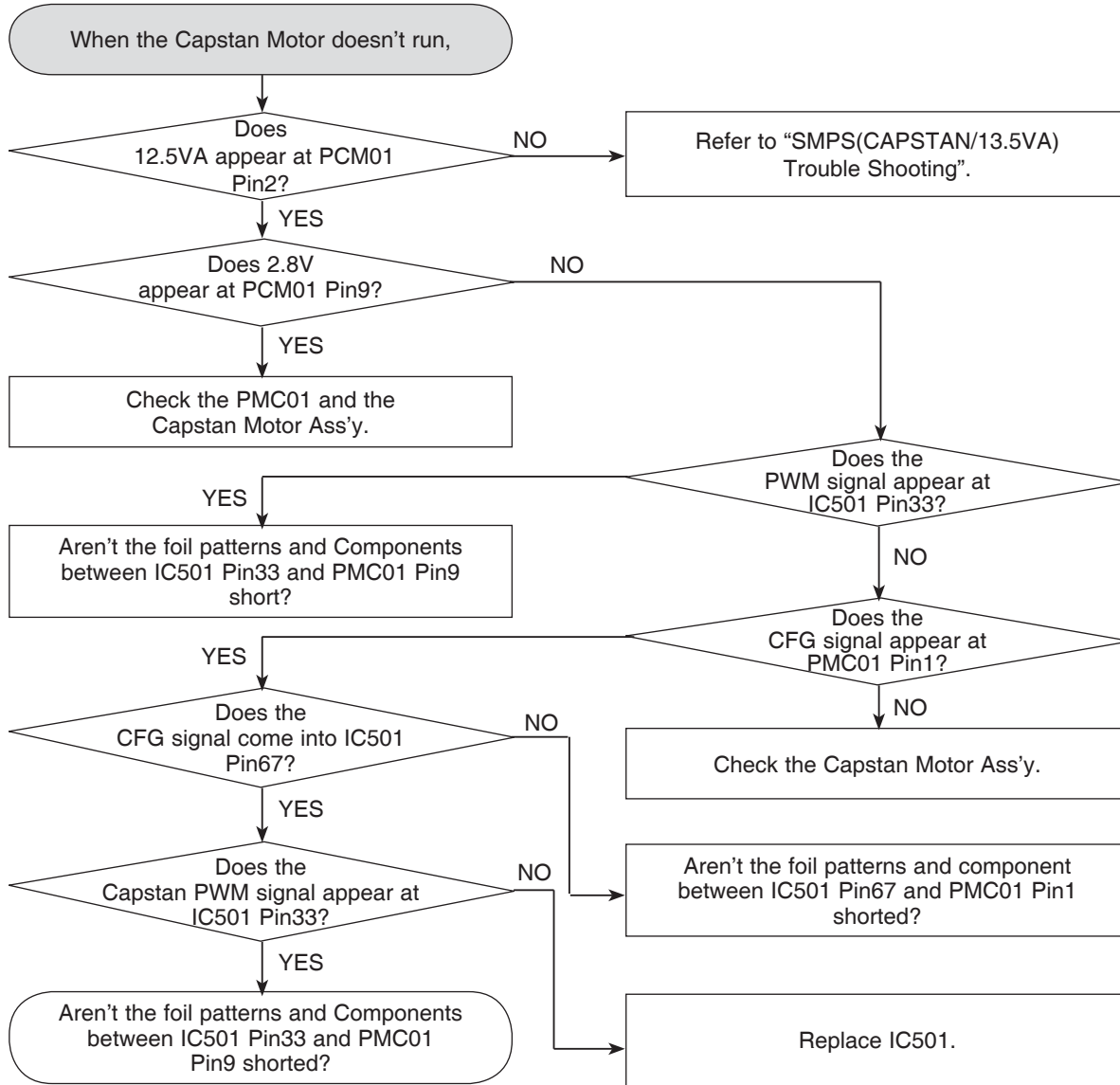


3-2. When the Drum Motor doesn't run.

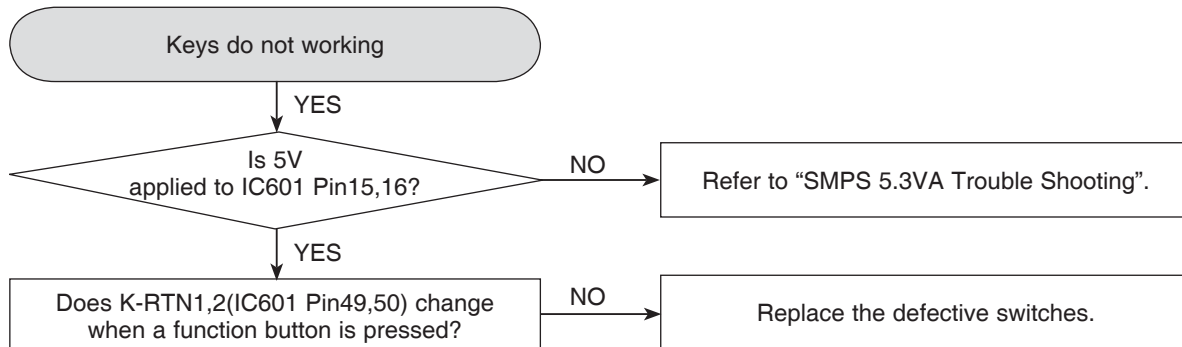


VCR ELECTRICAL TROUBLESHOOTING GUIDE

3-3. When the Capstan Motor doesn't run,



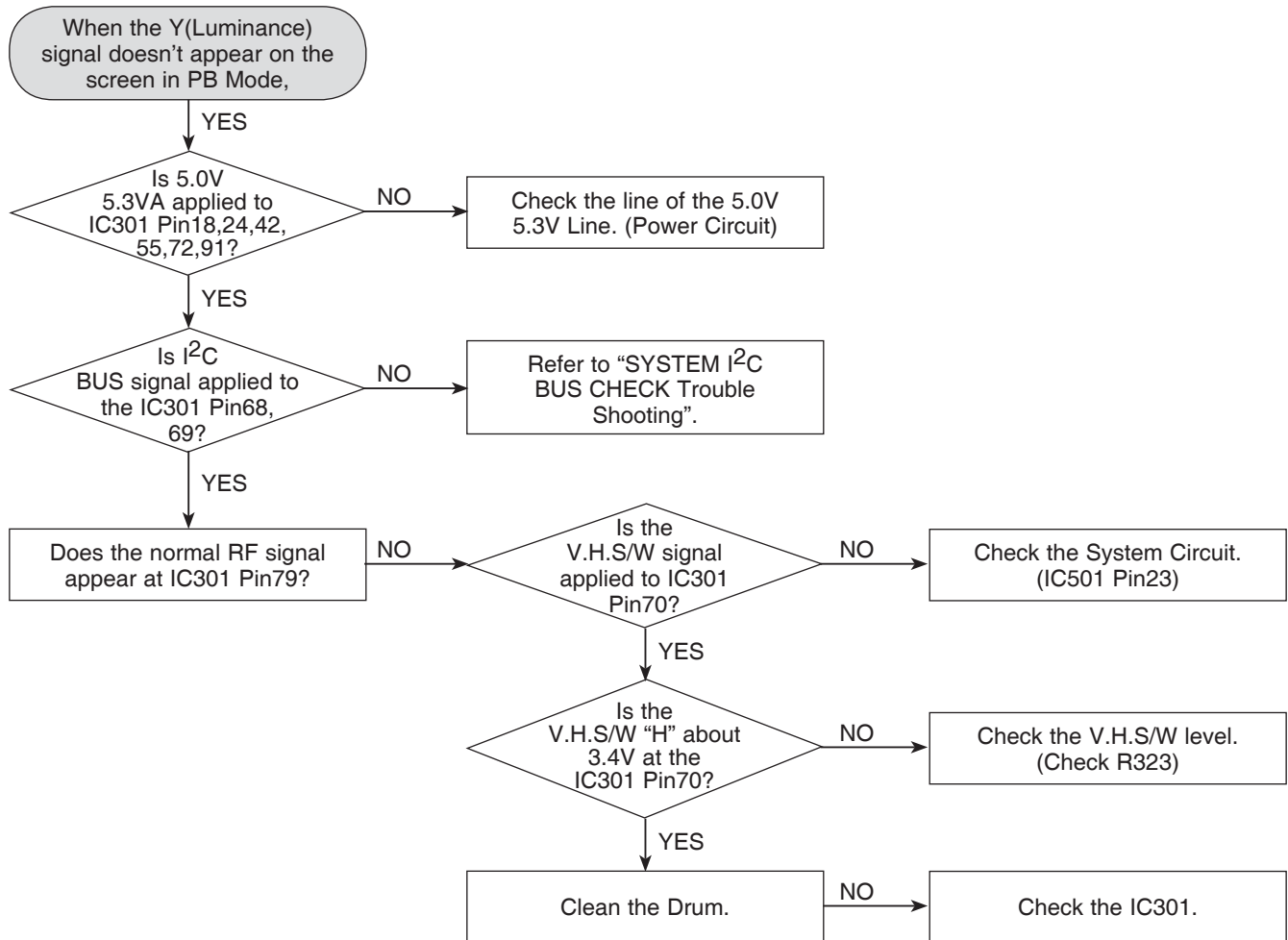
3-4. Keys do not working



VCR ELECTRICAL TROUBLESHOOTING GUIDE

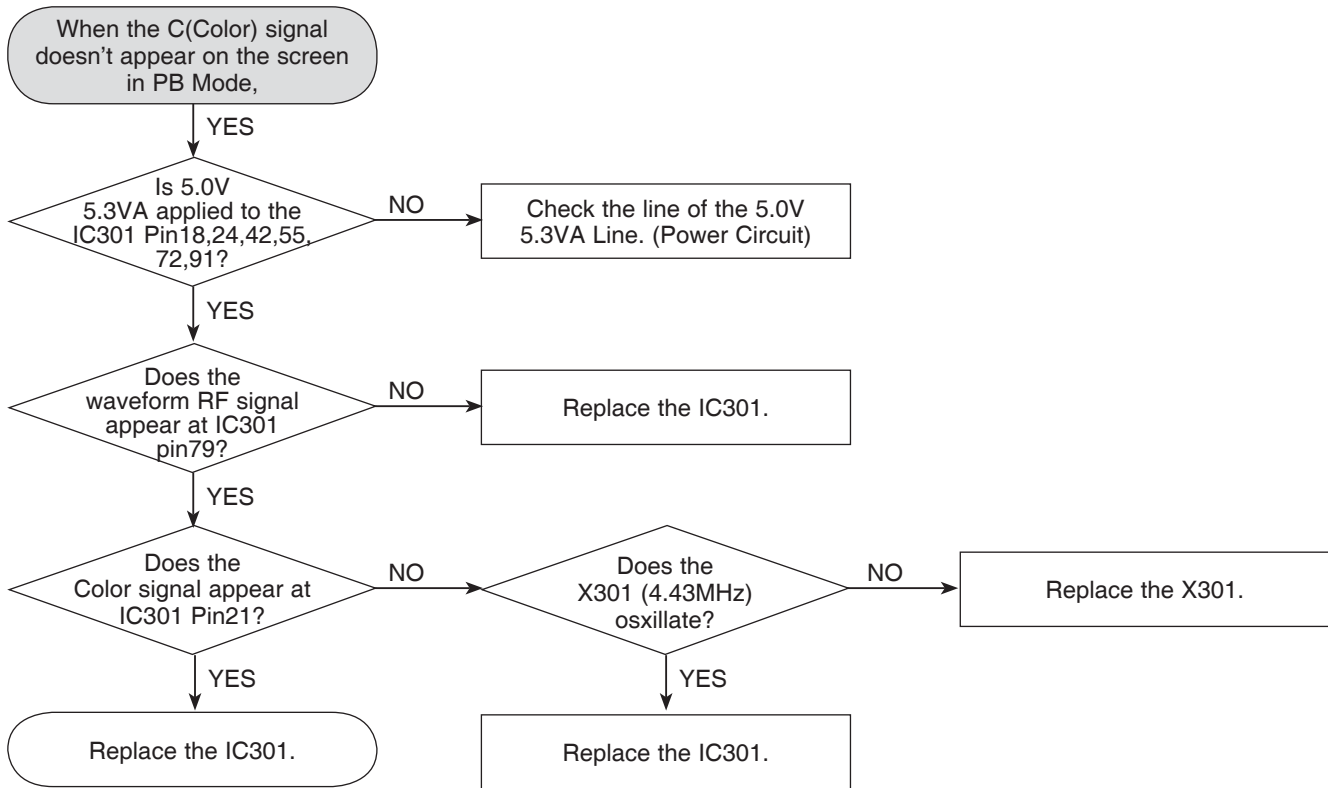
4. Y/C CIRCUIT

4-1. When the Y(Luminance) signal doesn't appear on the screen in PB Mode,



VCR ELECTRICAL TROUBLESHOOTING GUIDE

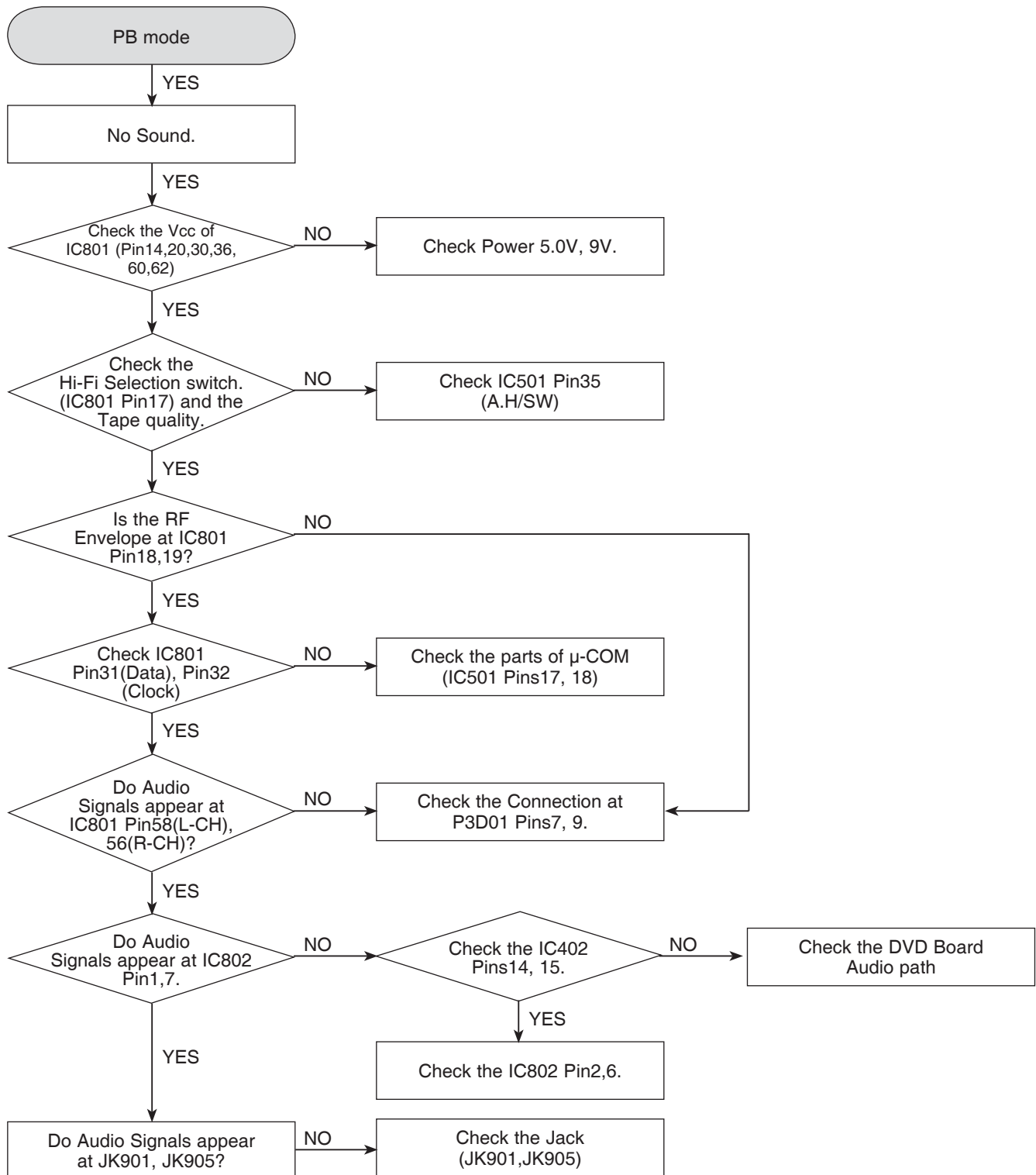
4-2. When the C(Color) signal doesn't appear on the screen in PB Mode,



VCR ELECTRICAL TROUBLESHOOTING GUIDE

5. Hi-Fi CIRCUIT

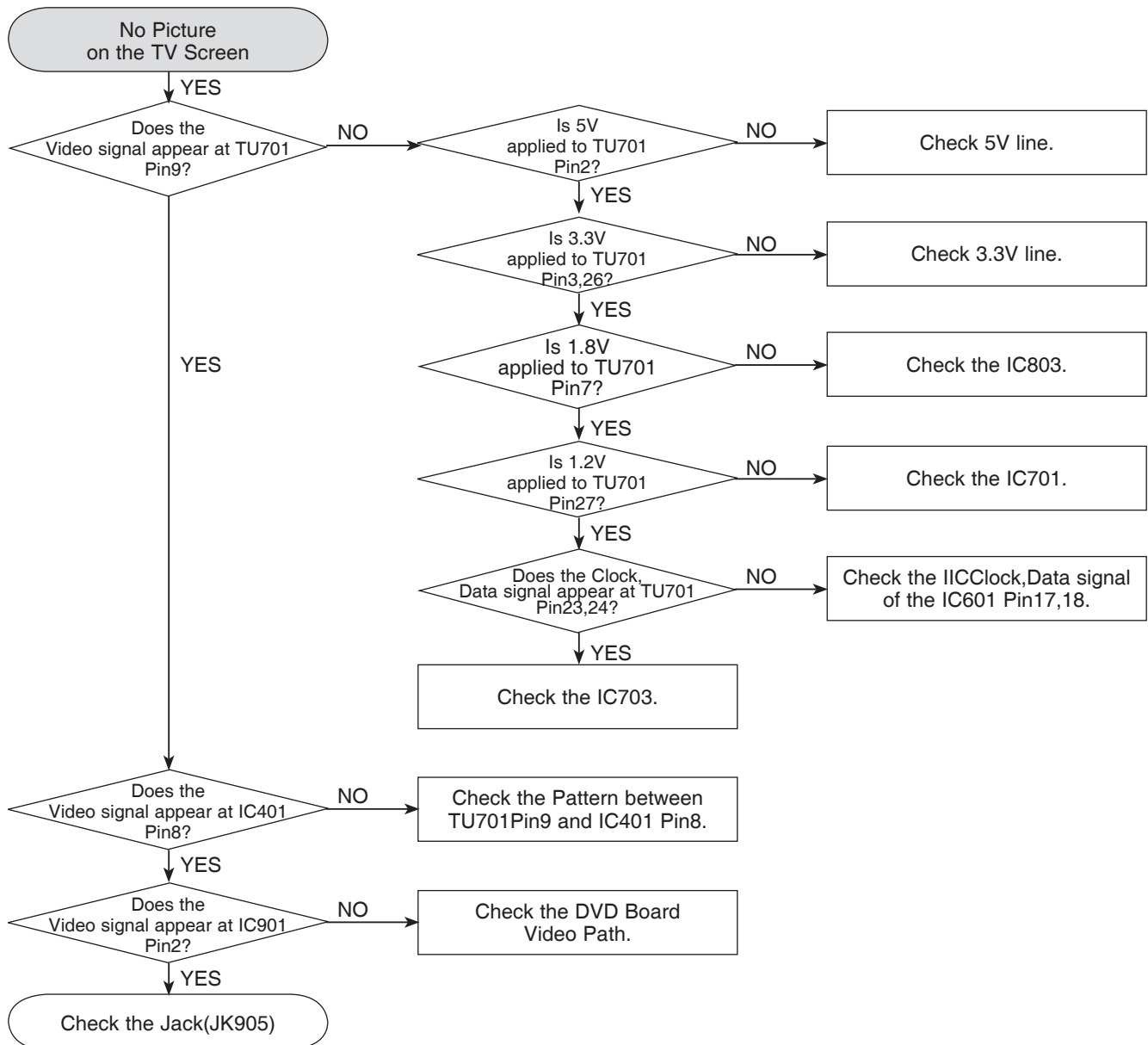
5-1. Hi-Fi Playback



VCR ELECTRICAL TROUBLESHOOTING GUIDE

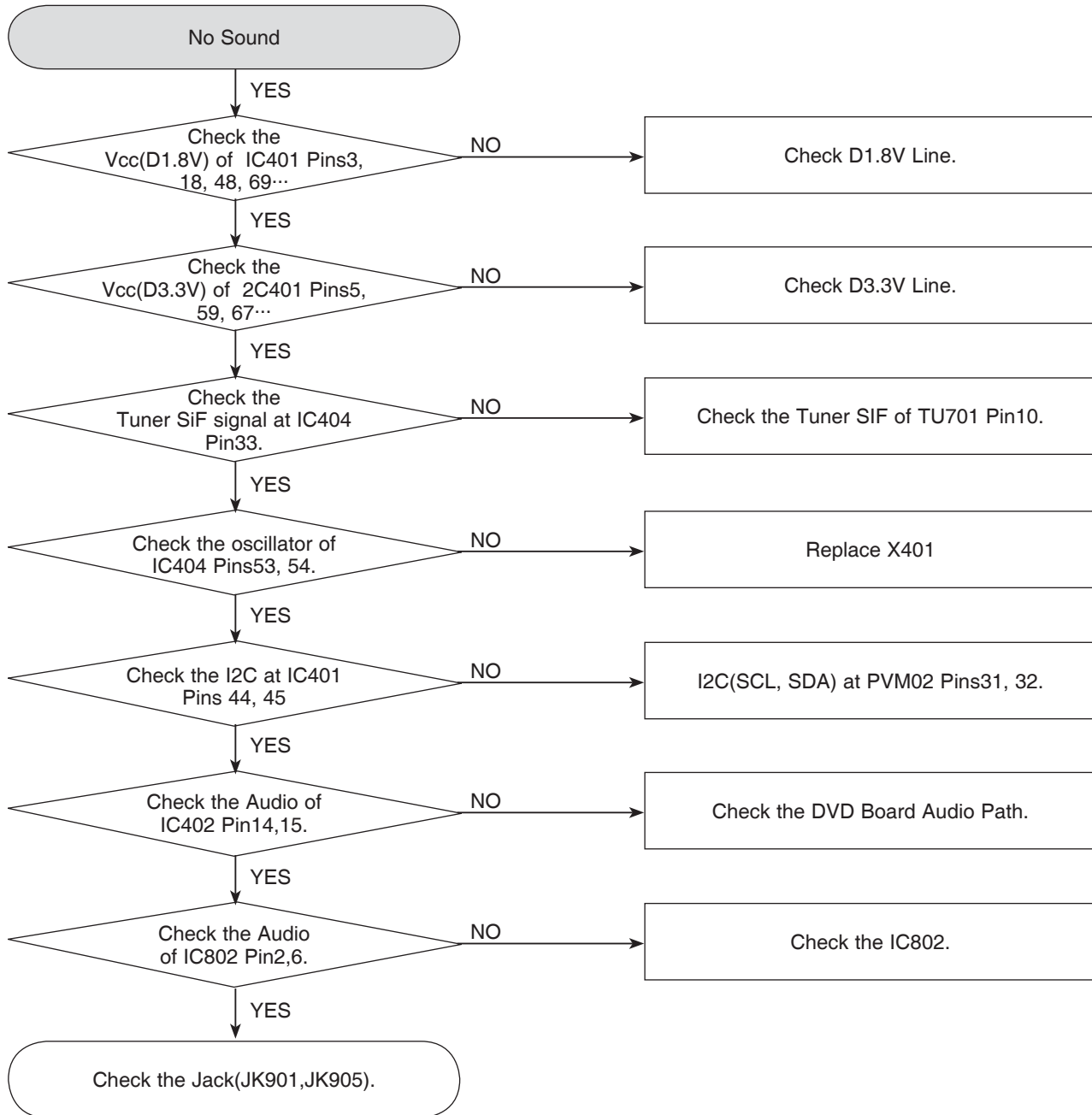
6. TUNER/IF CIRCUIT

6-1. No Picture on the TV screen



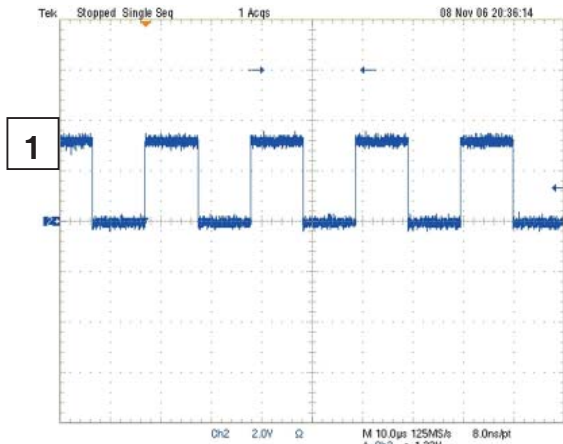
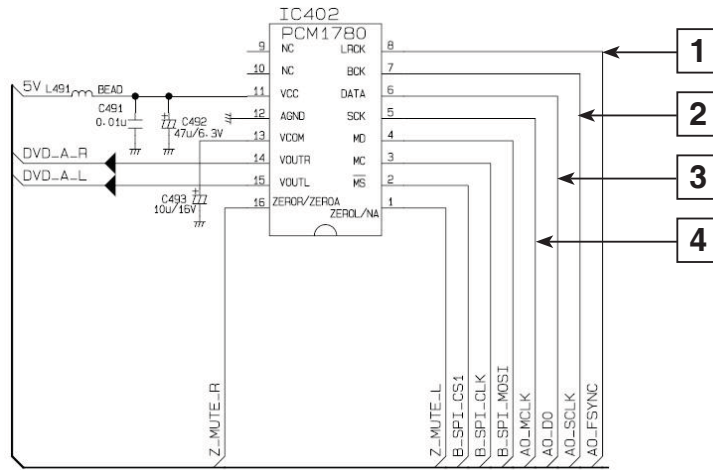
VCR ELECTRICAL TROUBLESHOOTING GUIDE

6-2. No Sound

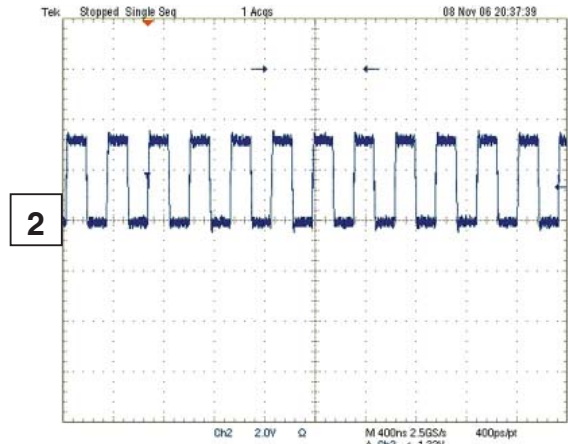


WAVEFORMS

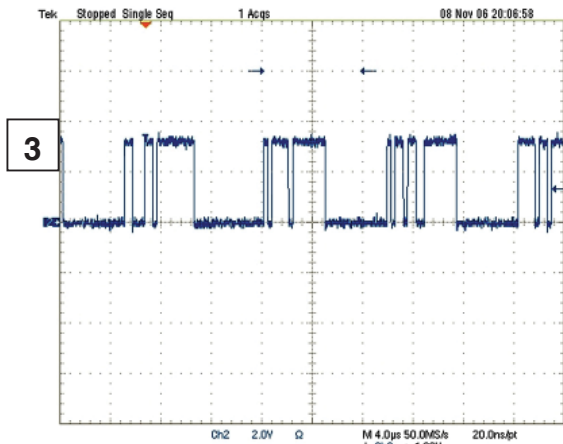
1. AUDIO BLOCK (WHEN 1kHz SIGNWAVE IS OUTPUT)



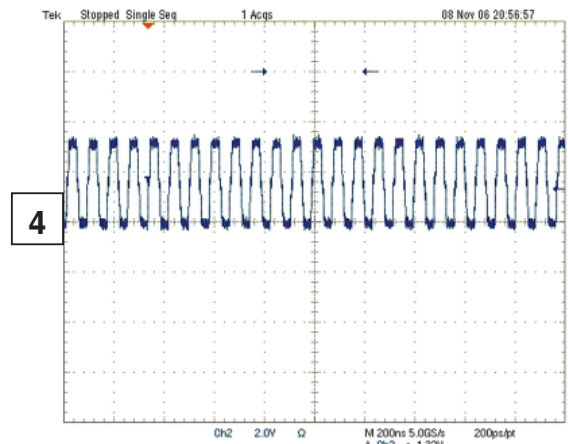
AOUT_FSYNC



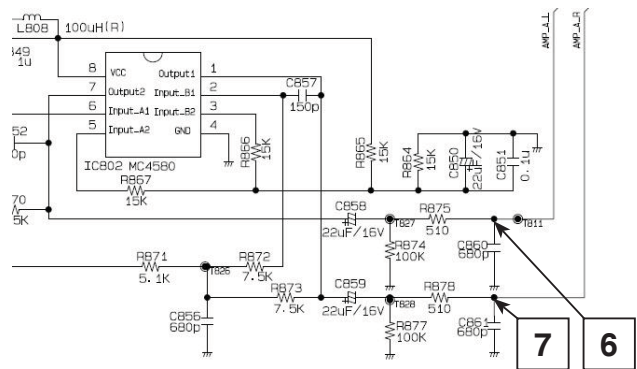
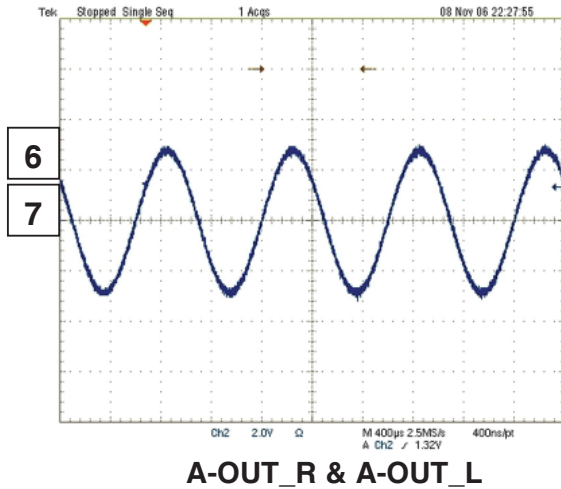
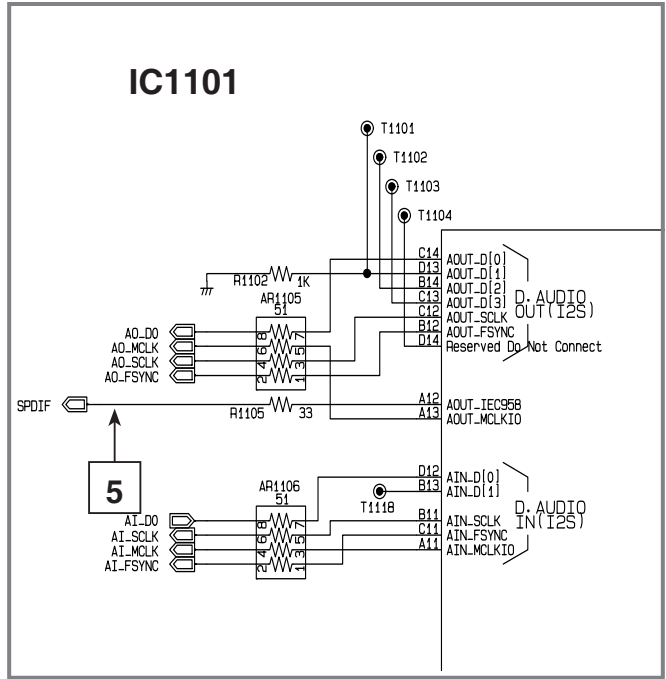
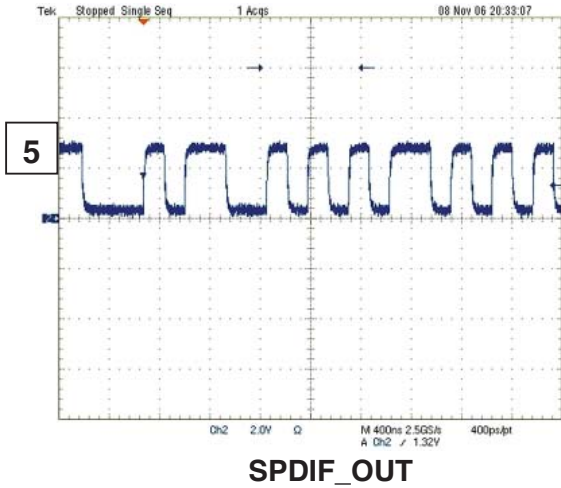
AOUT_SCLK



AOUT_D0

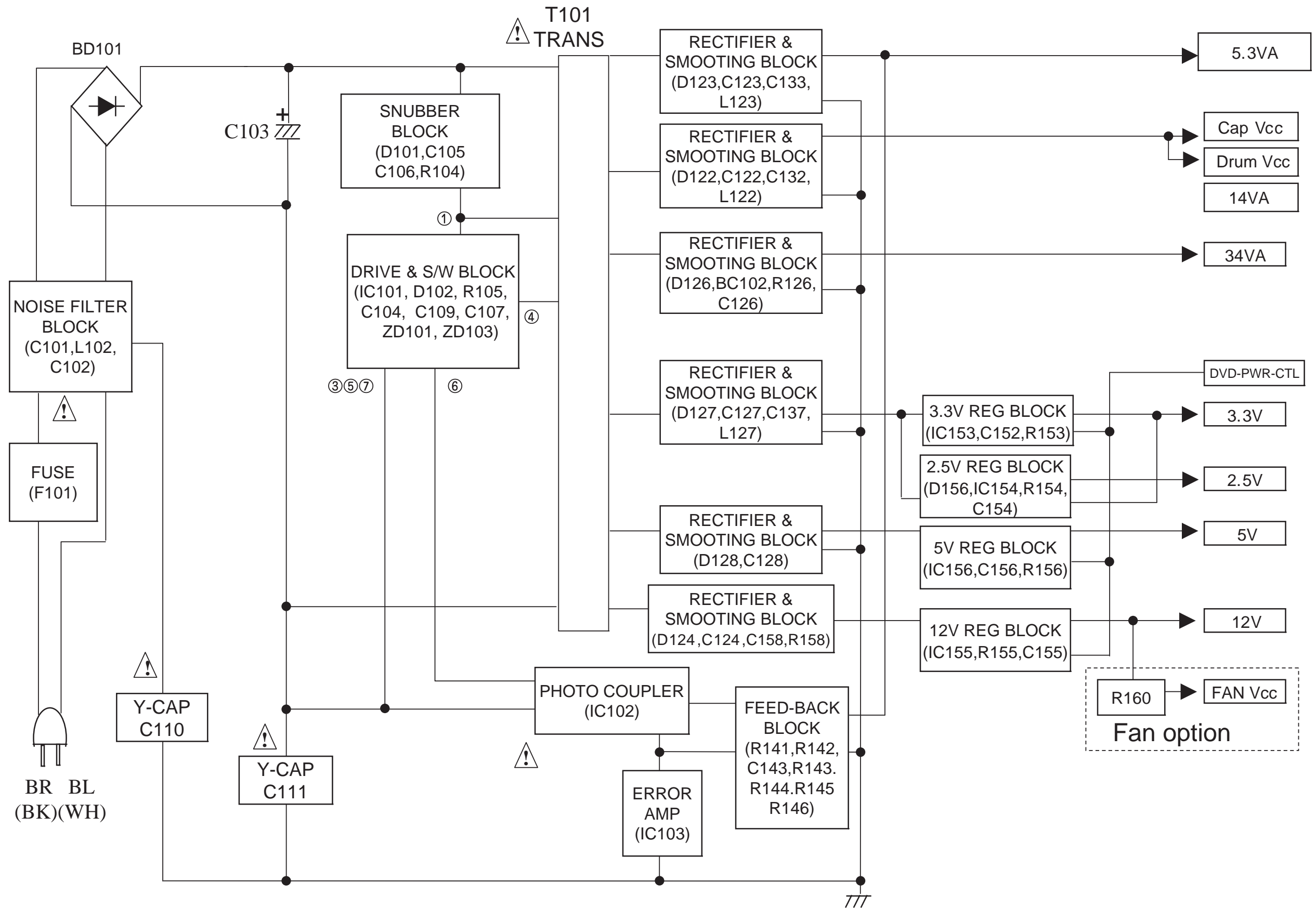


AOUT_MCLK

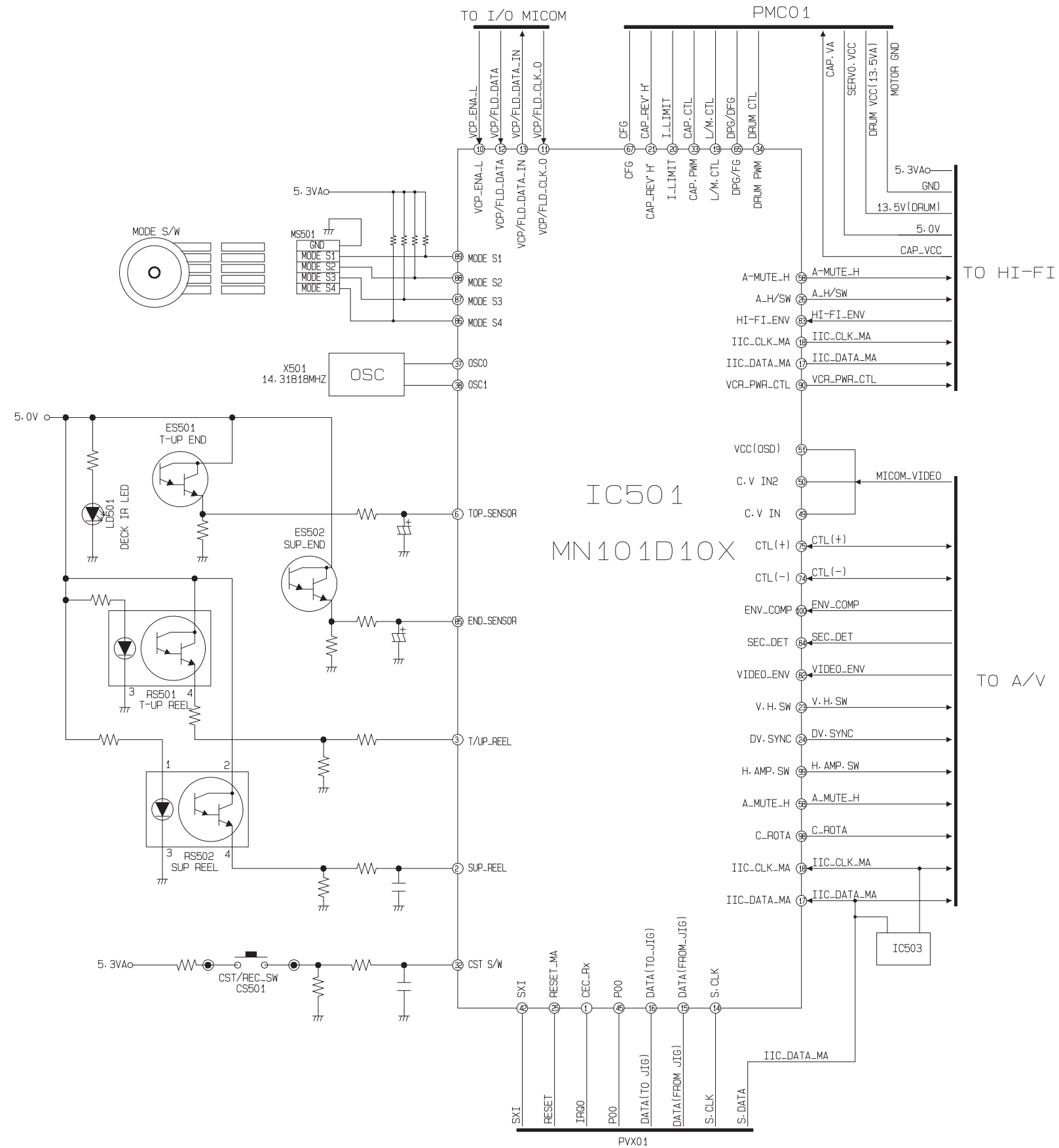


BLOCK DIAGRAMS

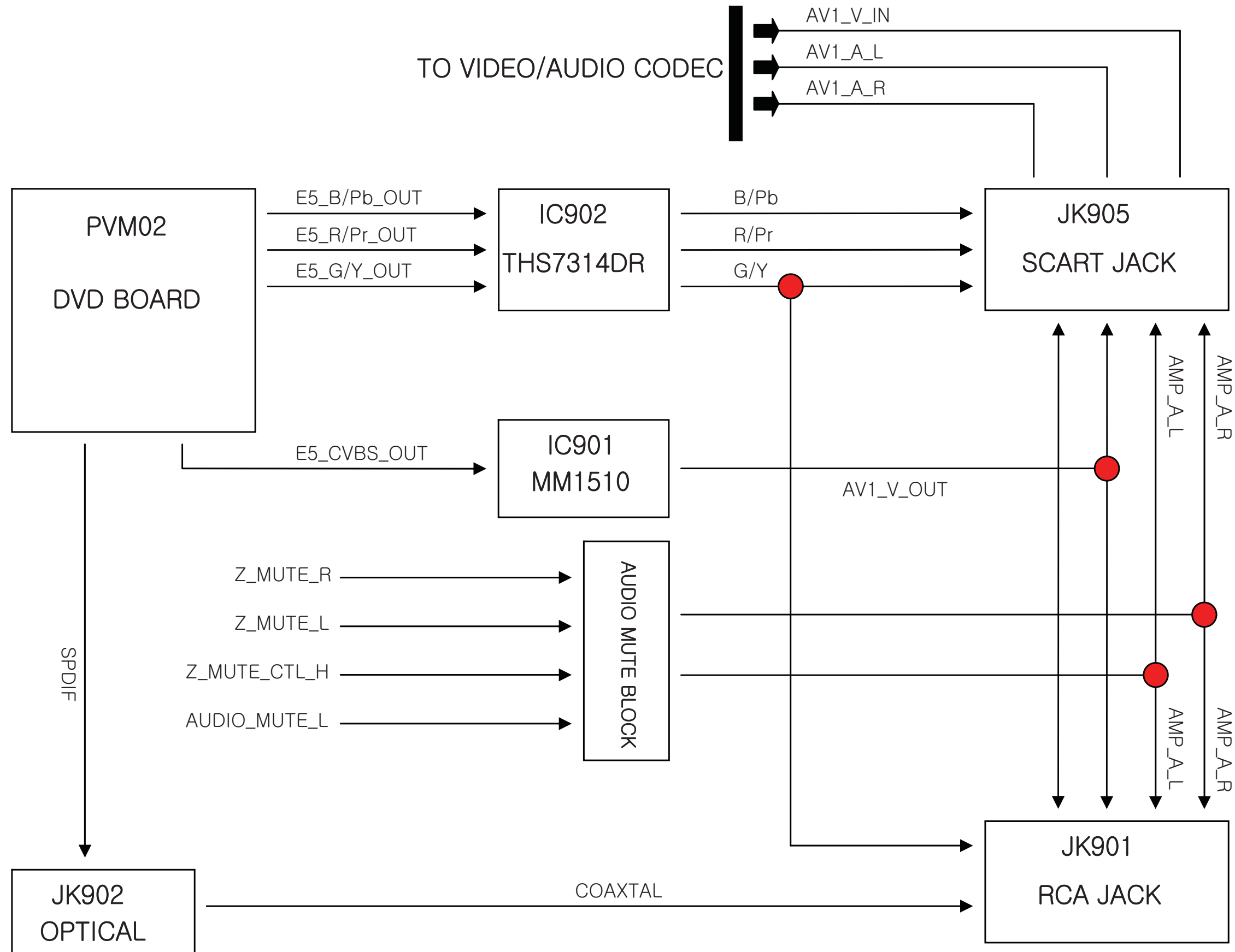
1. POWER (SMPS) BLOCK DIAGRAM



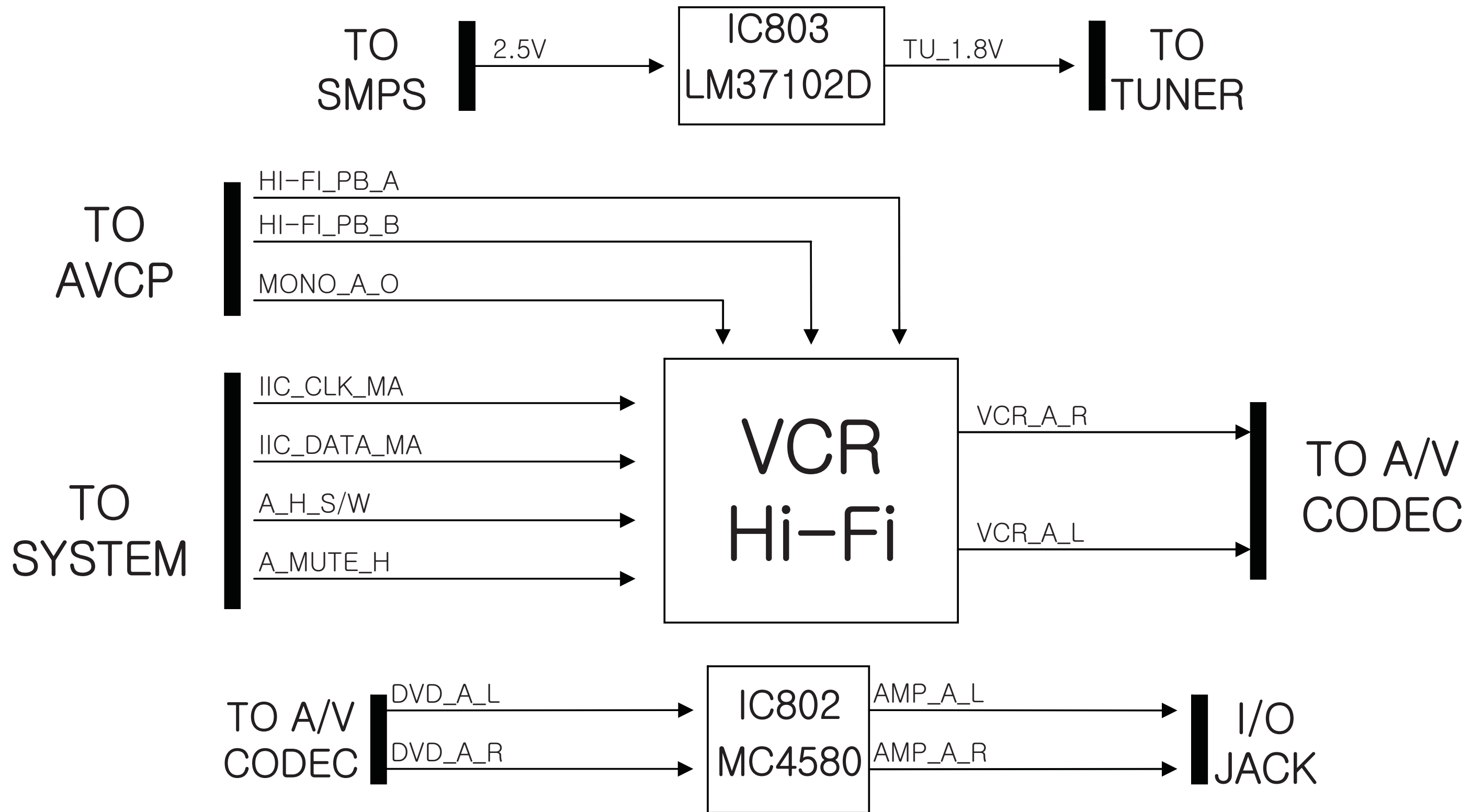
2. SYSTEM BLOCK DIAGRAM



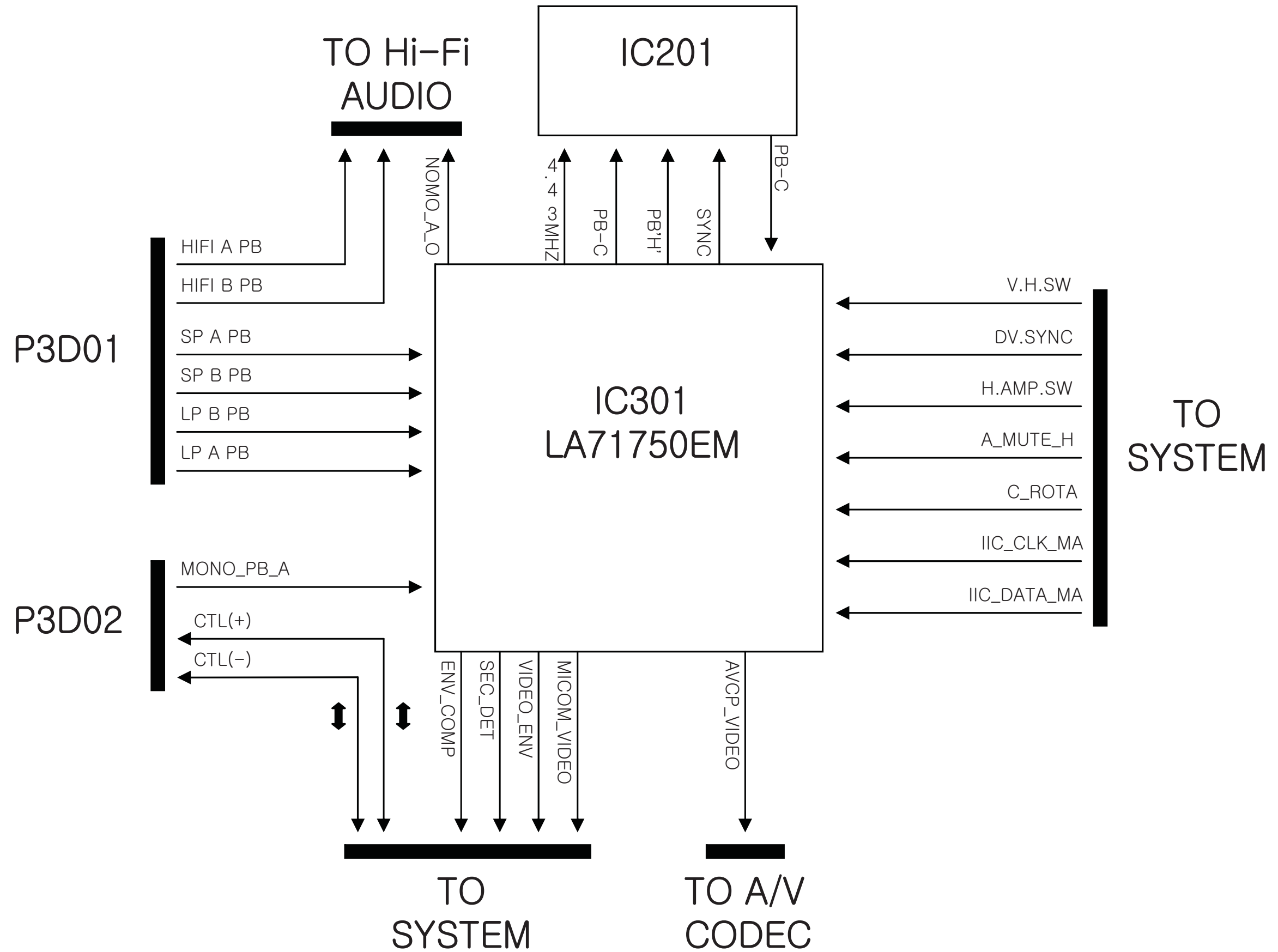
3. A/V CODEC BLOCK DIAGRAM



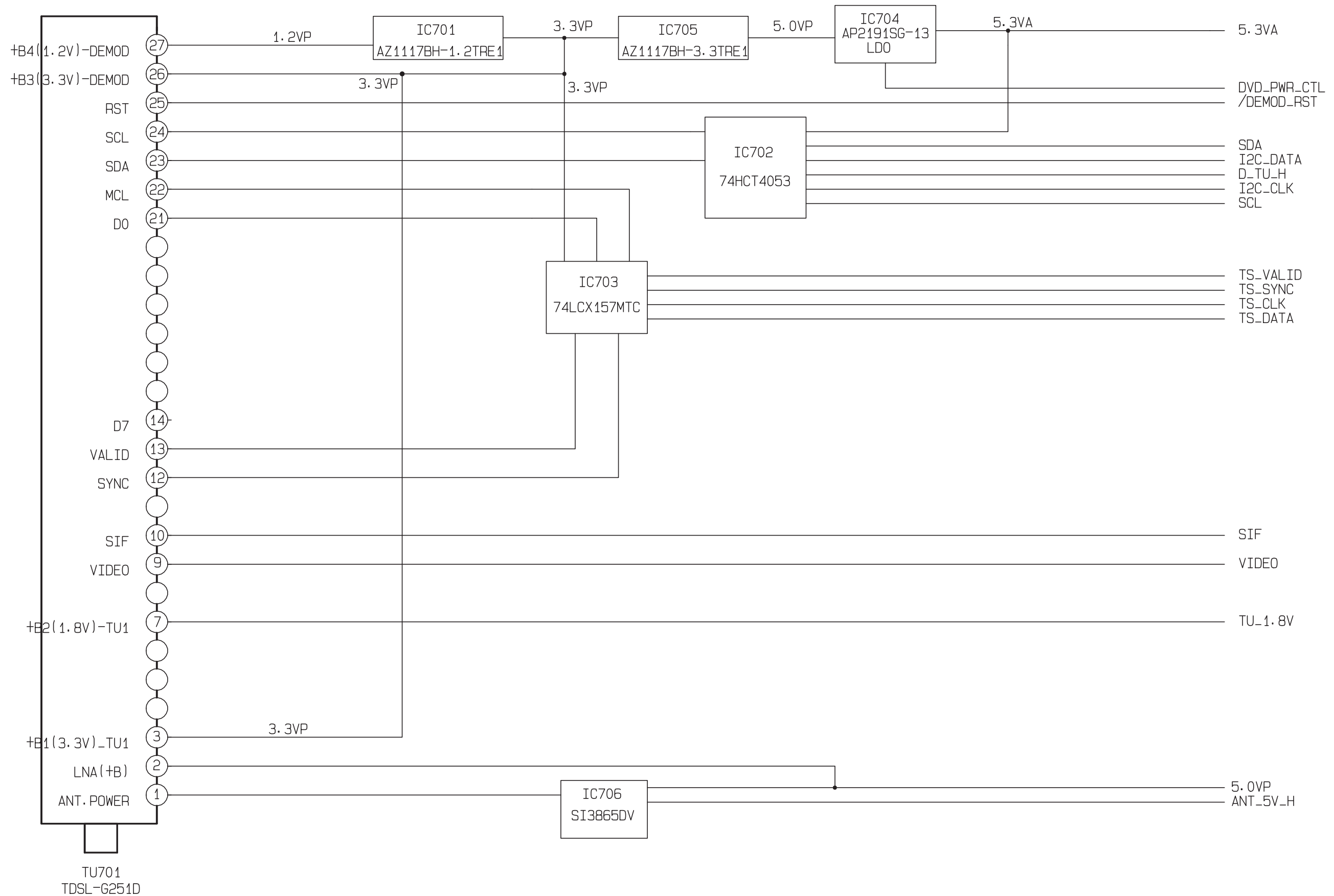
4. HI-FI BLOCK DIAGRAM



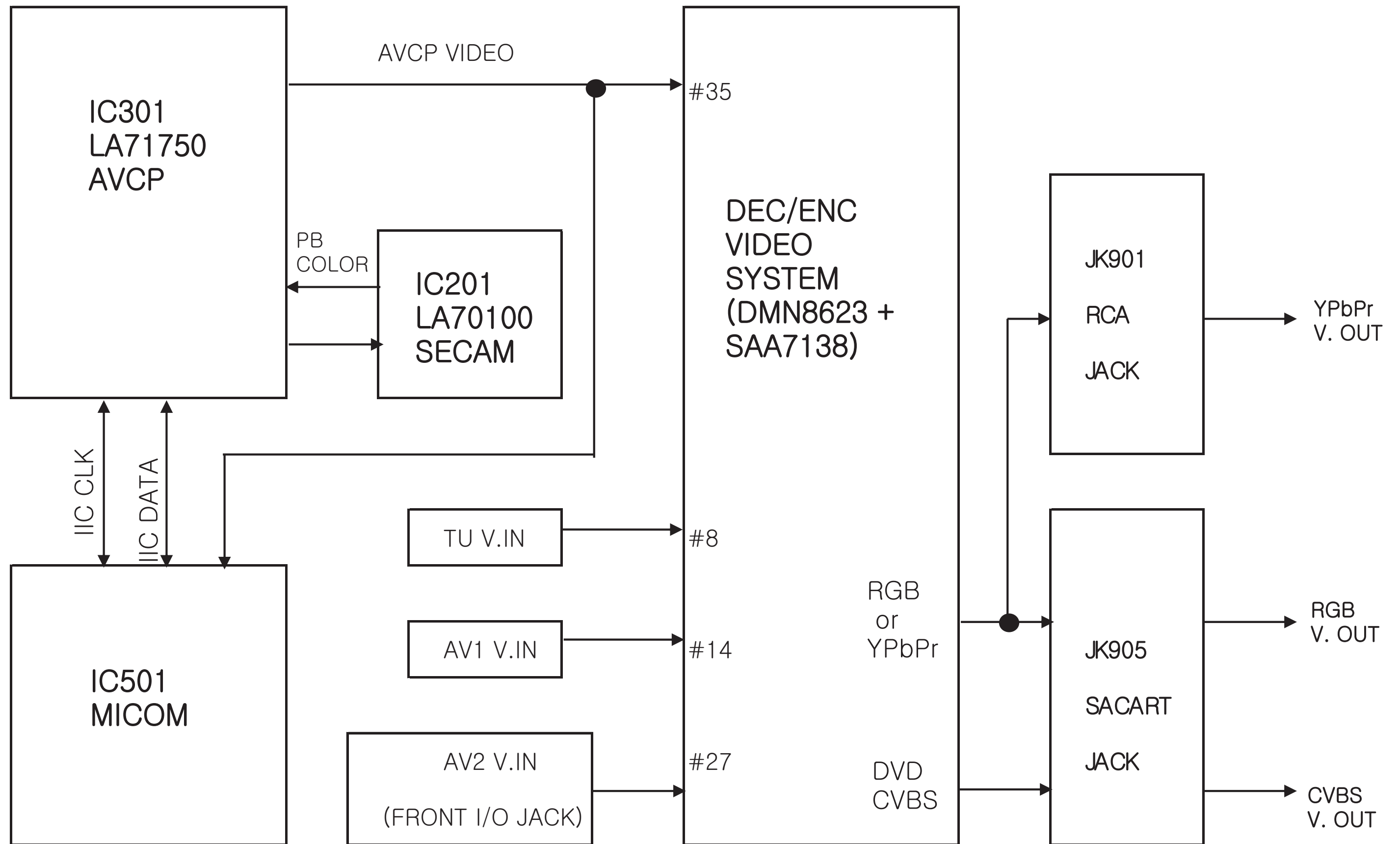
5. AVCP BLOCK DIAGRAM



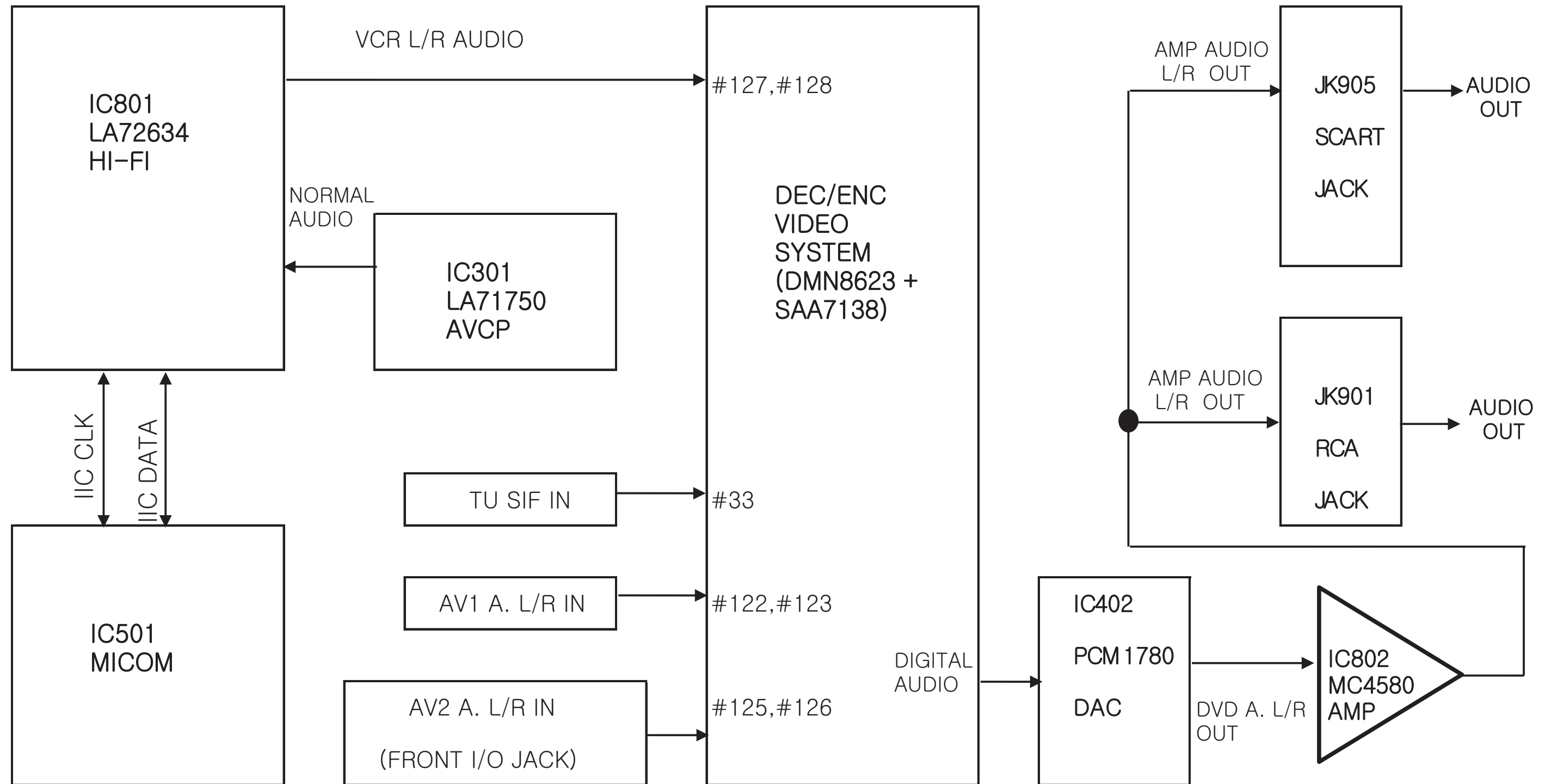
6. TUNER BLOCK DIAGRAM



7. VIDEO SIGNAL BLOCK DIAGRAM



8. AUDIO SIGNAL BLOCK DIAGRAM



CIRCUIT DIAGRAMS

1. POWER (SMPS) CIRCUIT DIAGRAM

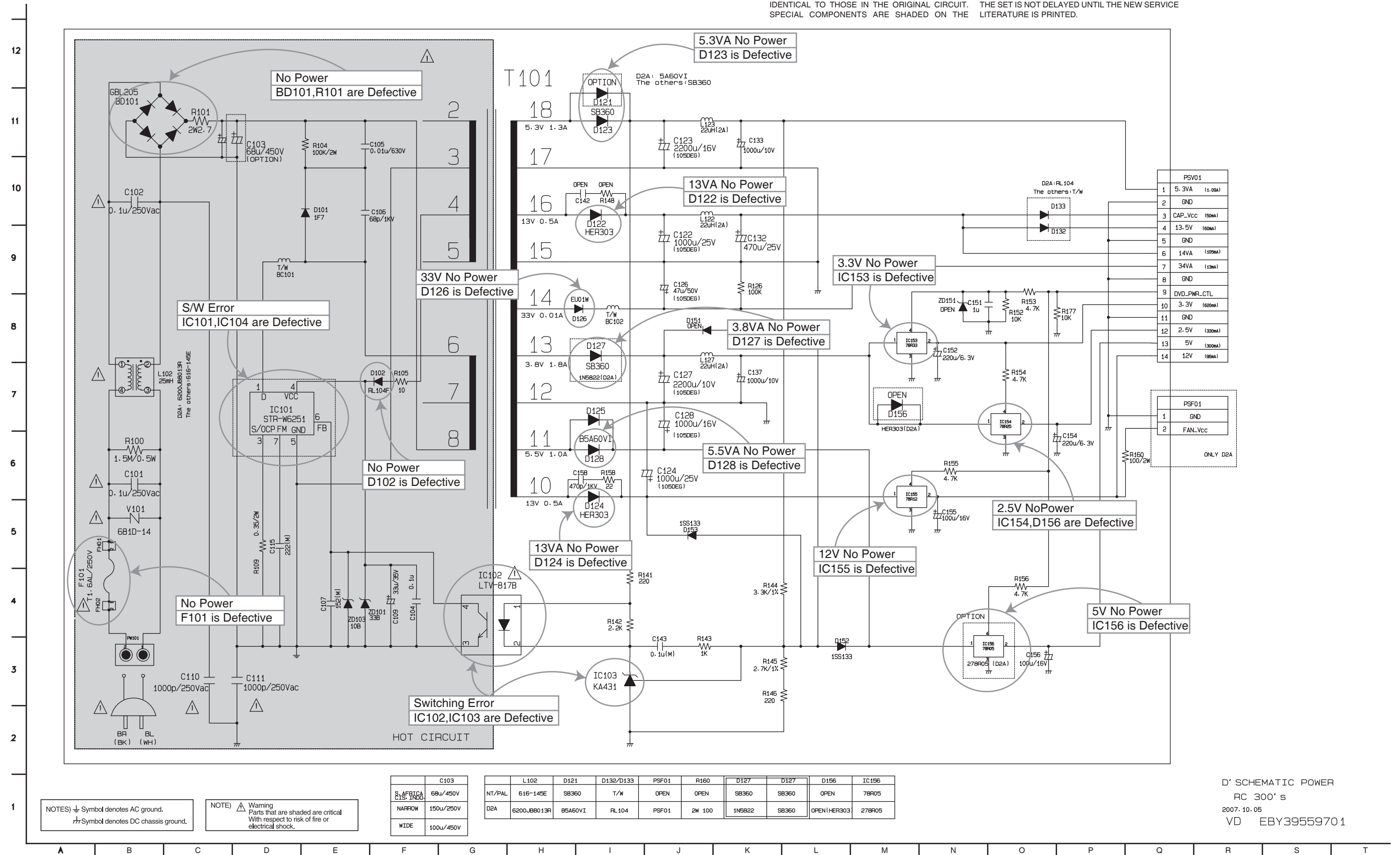
IMPORTANT SAFETY

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.

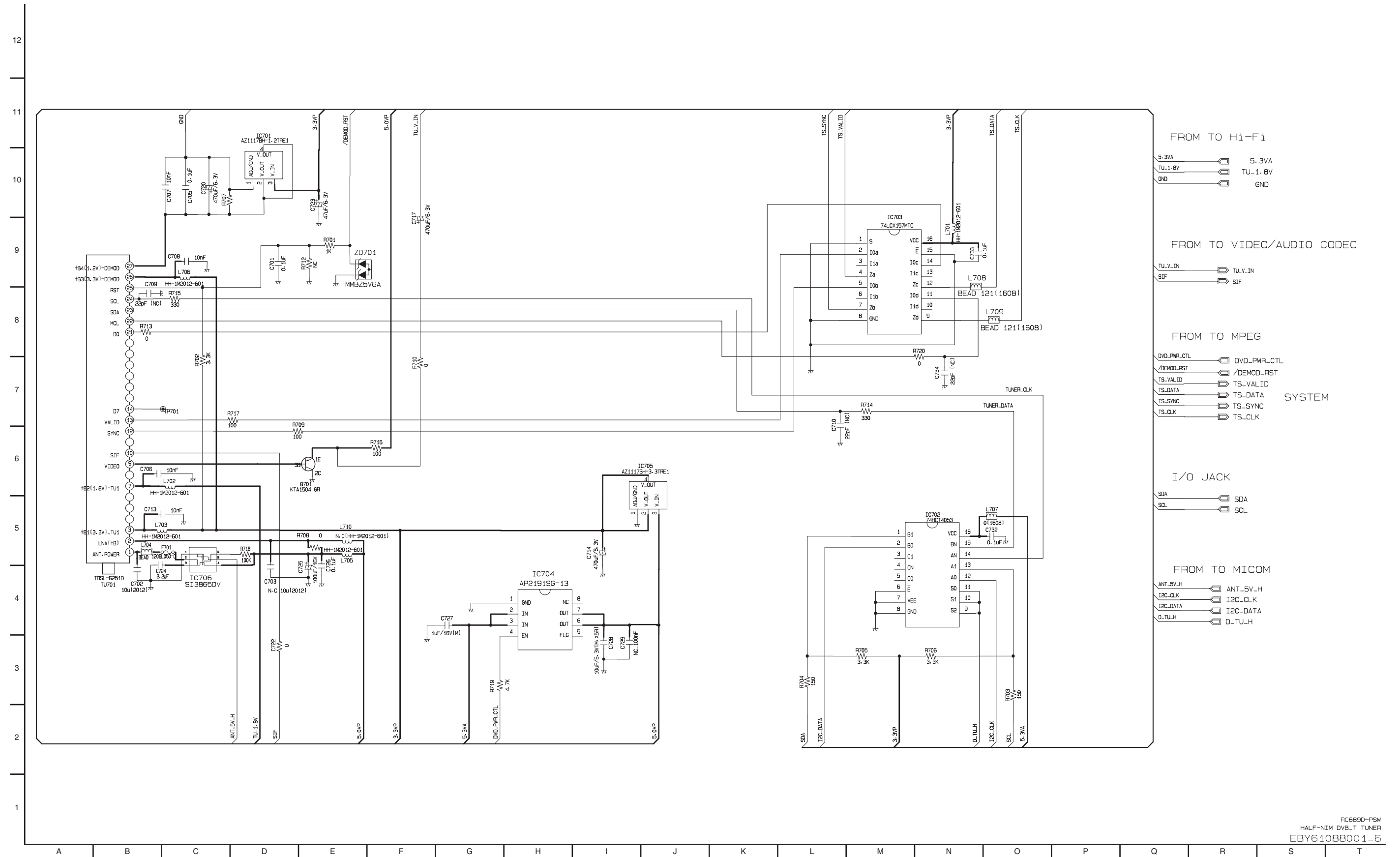
NOTE :

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.

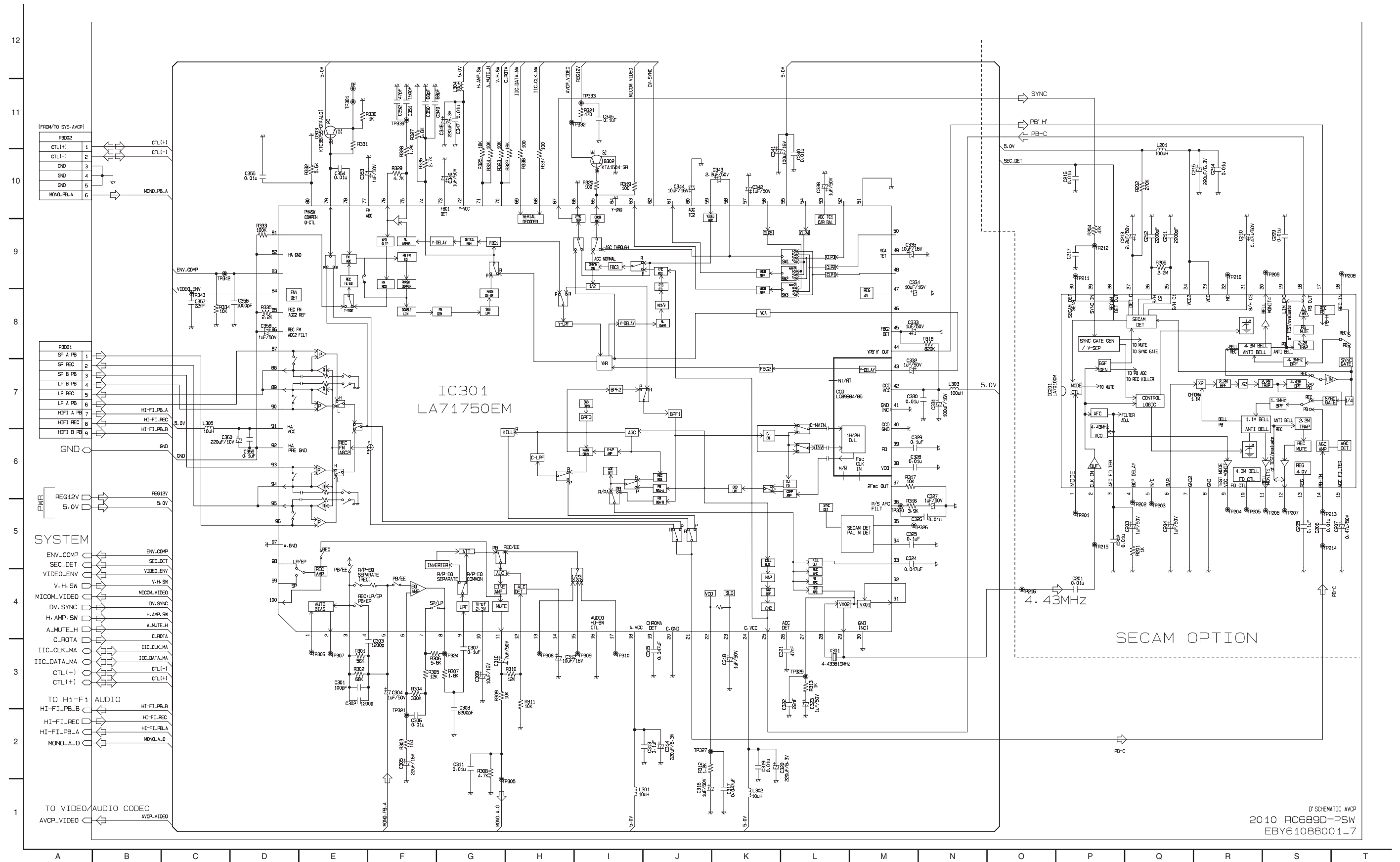


D' SCHEMATIC POWER
RC 300' s
2007. 10. 05
VD EBY39559701

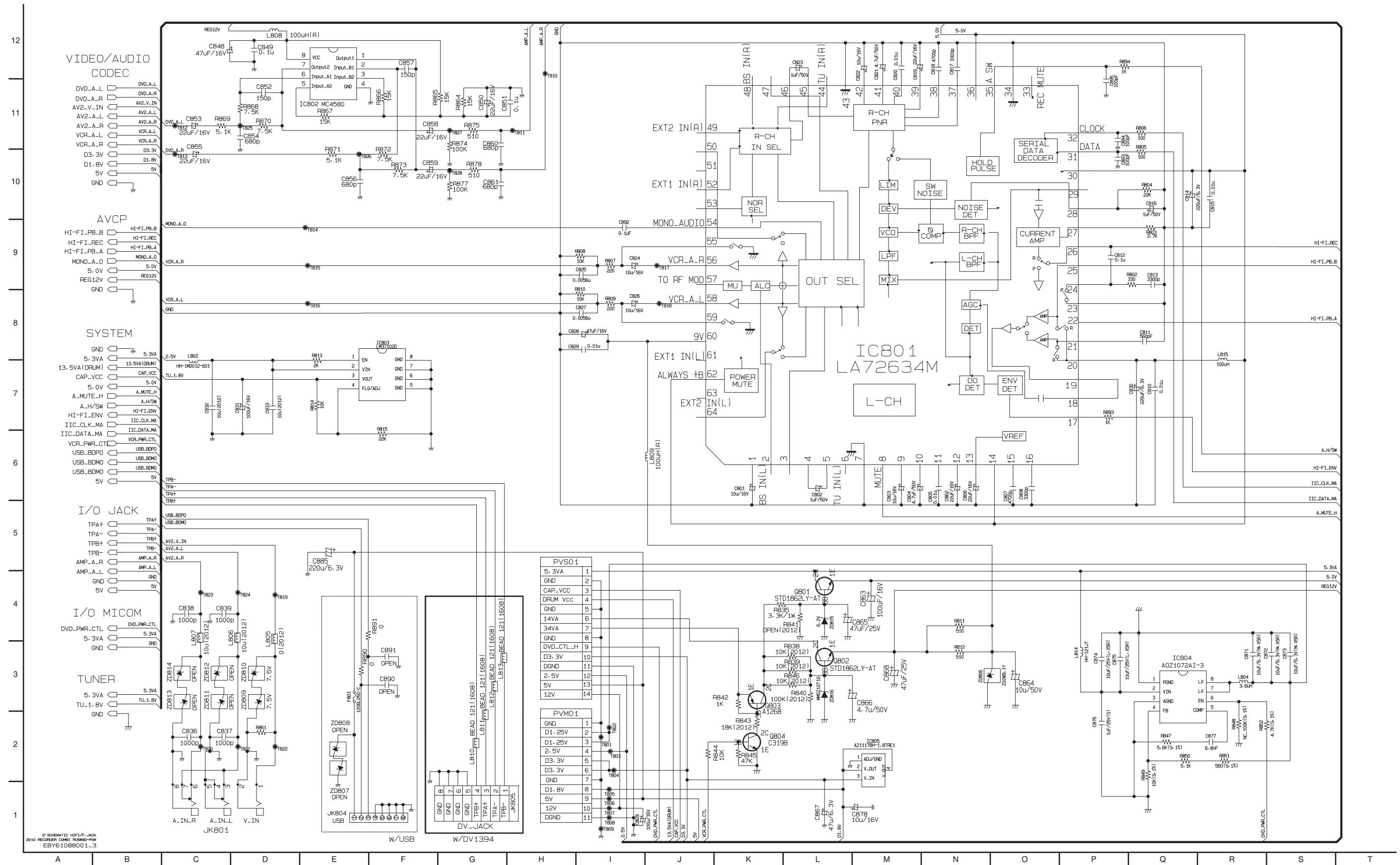
2. TUNER CIRCUIT DIAGRAM



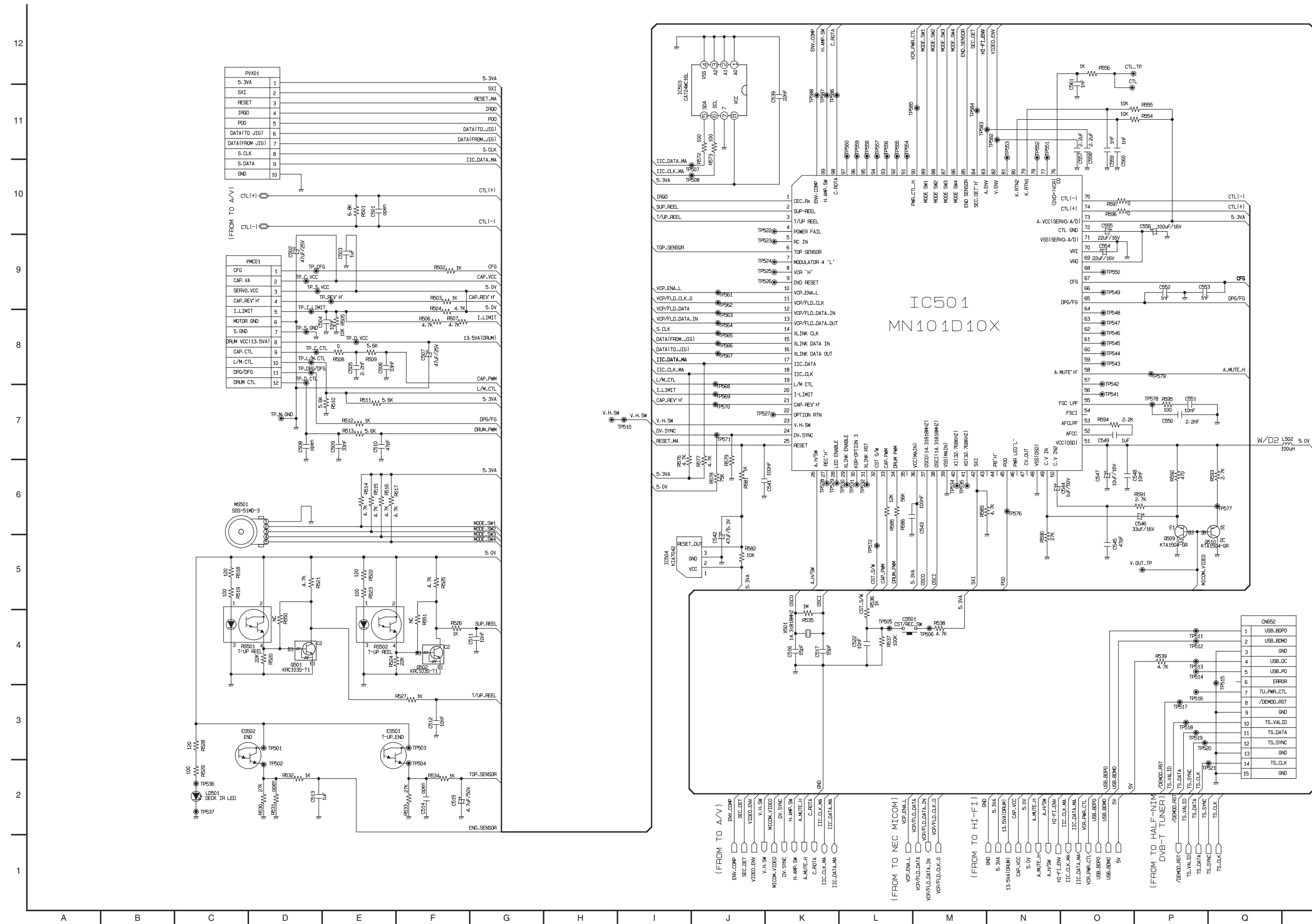
3. AVCP CIRCUIT DIAGRAM



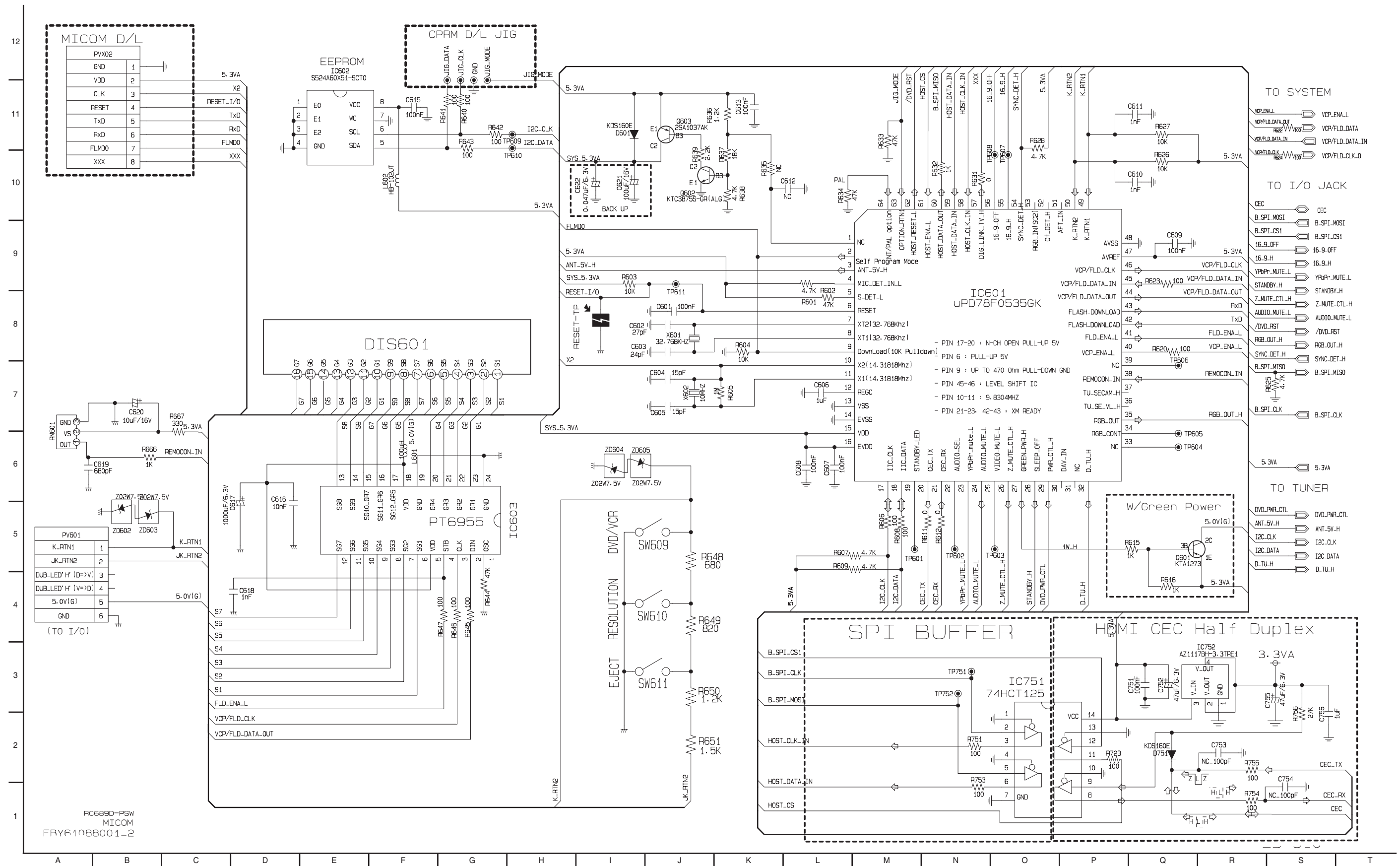
4. HI-FI CIRCUIT DIAGRAM



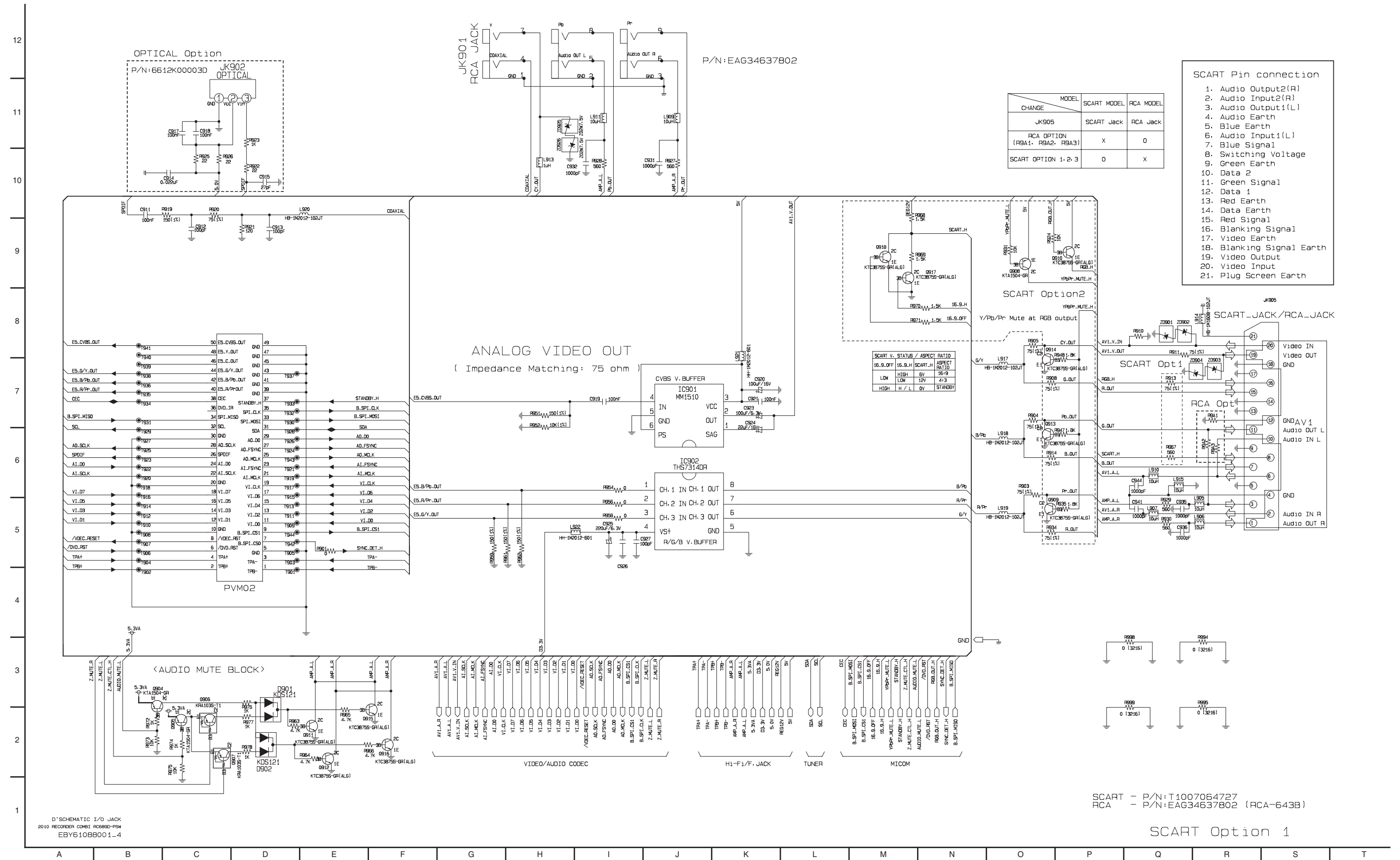
5. SYSTEM CIRCUIT DIAGRAM



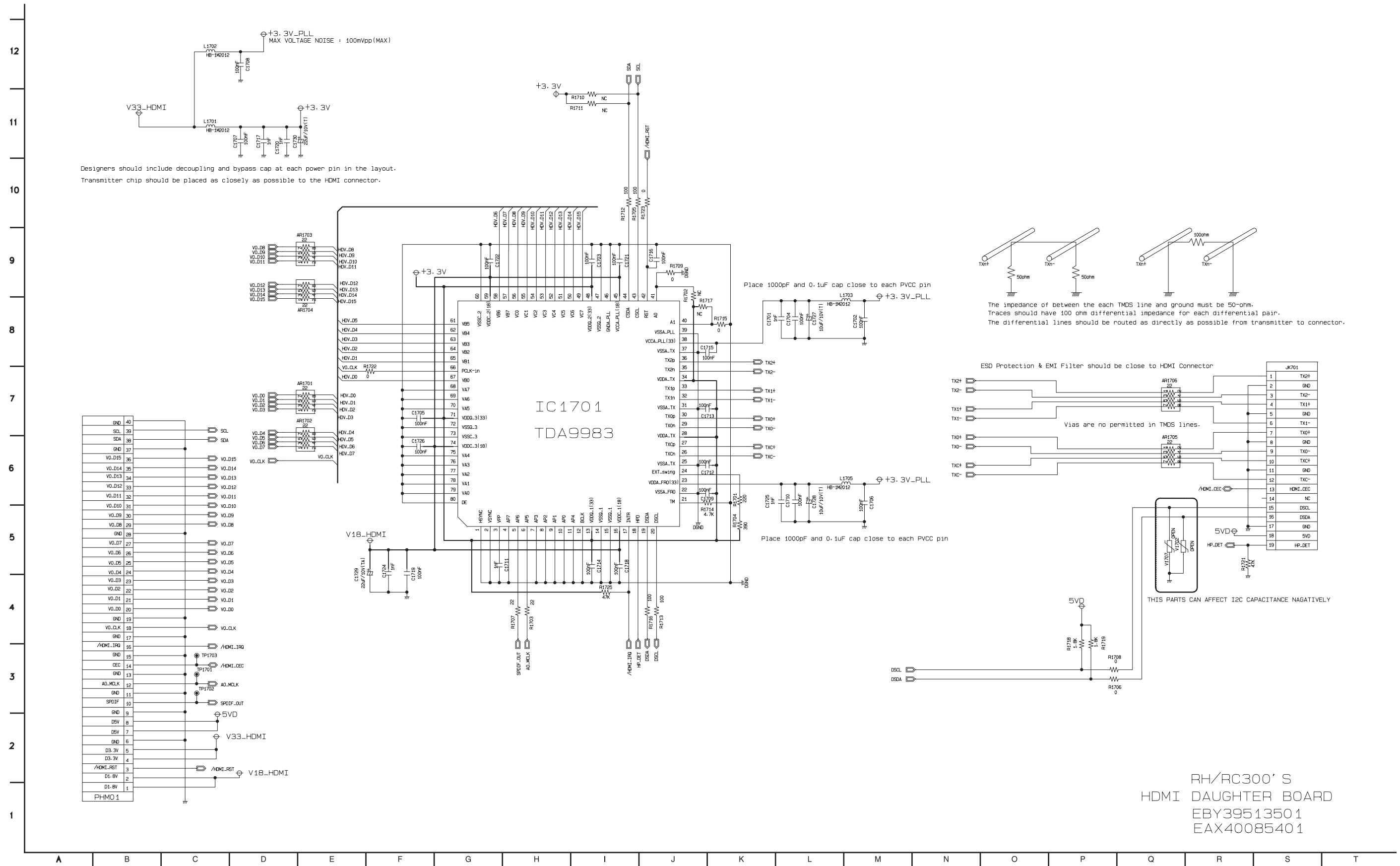
6. I/O MICOM CIRCUIT DIAGRAM



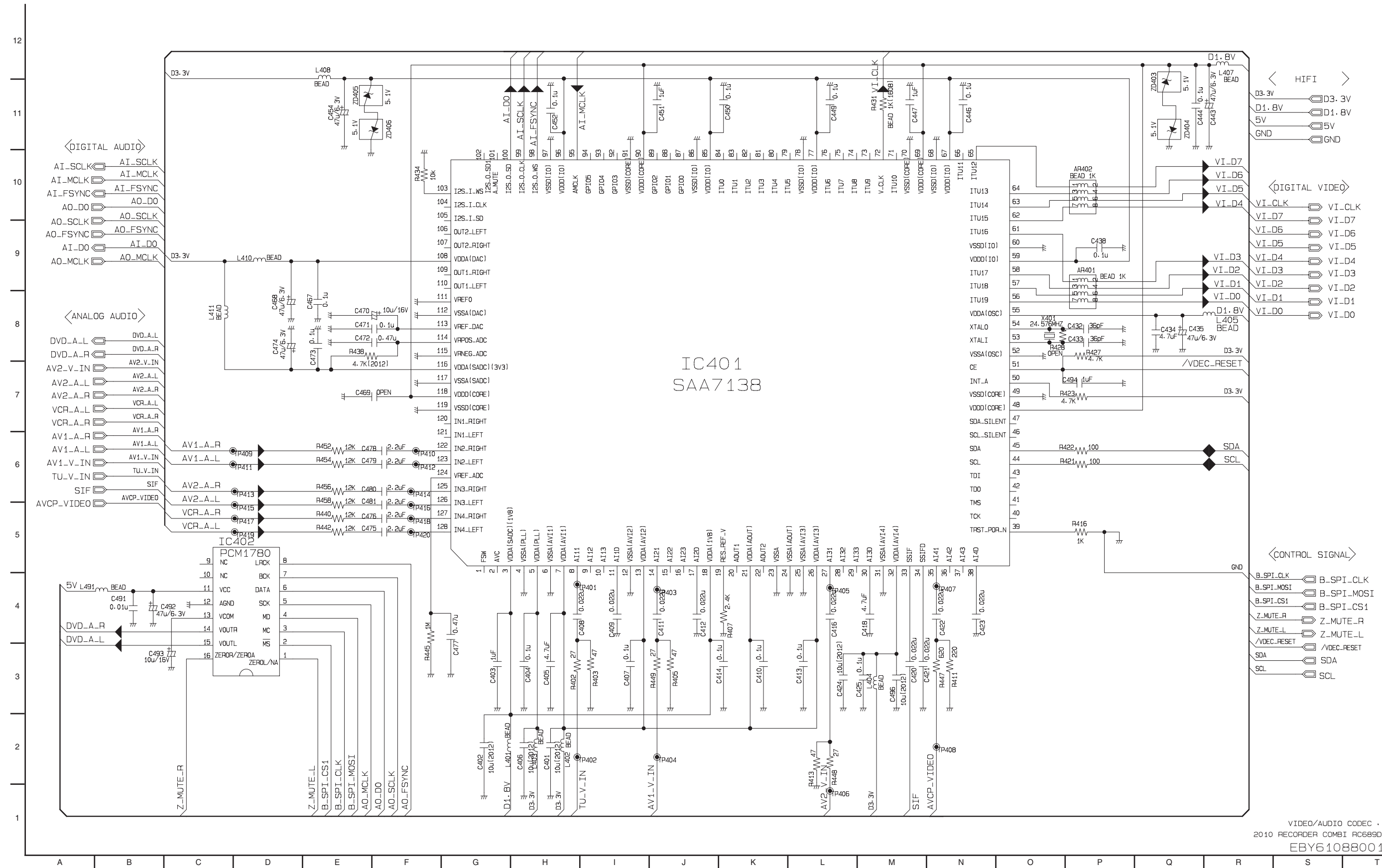
7. I/O JACK CIRCUIT DIAGRAM



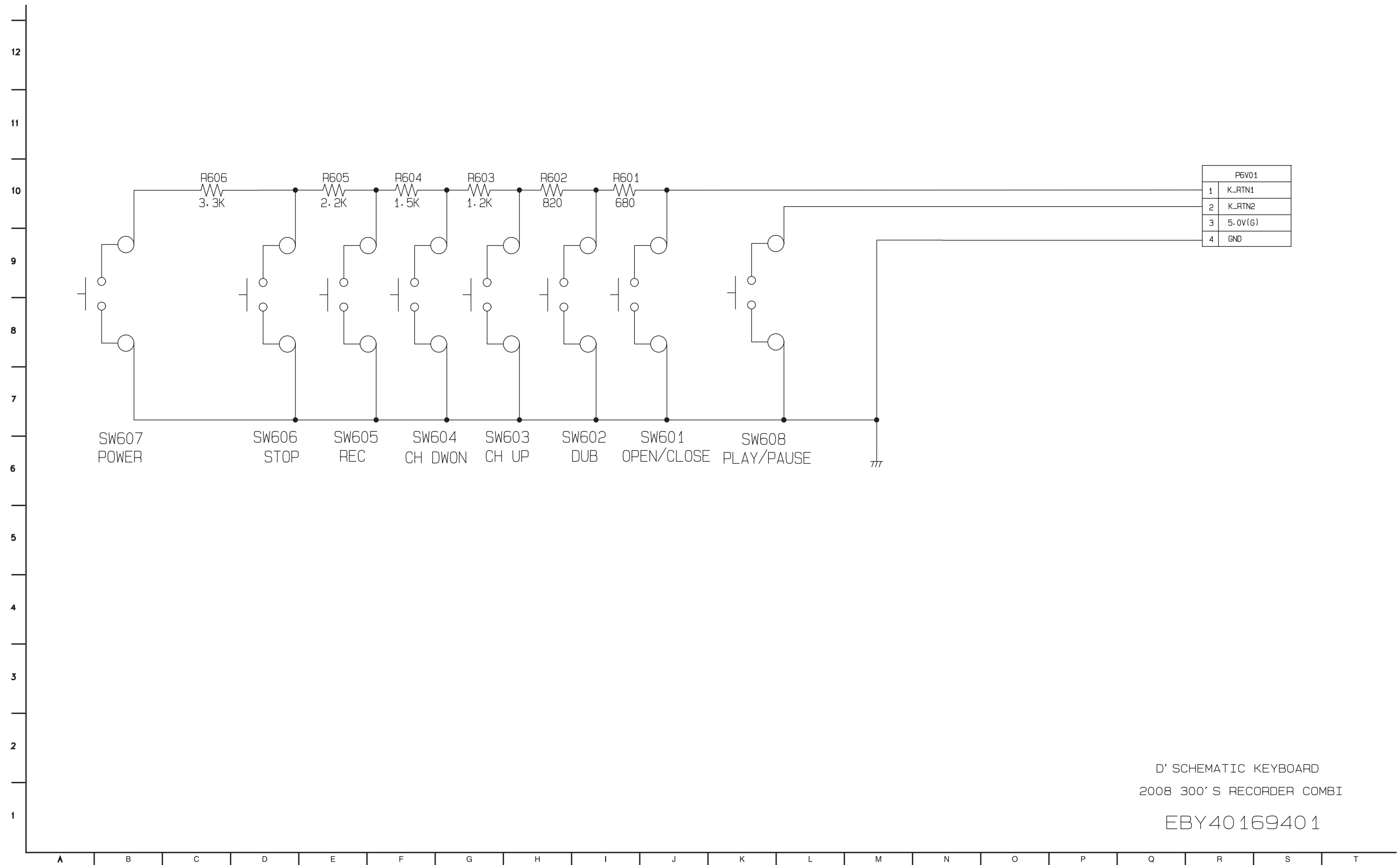
8. HDMI CIRCUIT DIAGRAM (HDMI MODEL ONLY)



9. VIDEO/AUDIO CODEC, MSP CIRCUIT DIAGRAM



10. KEY CIRCUIT DIAGRAM



D' SCHEMATIC KEYBOARD
2008 300' S RECORDER COMBI

EBY4016940 1

2. CAPACITORS

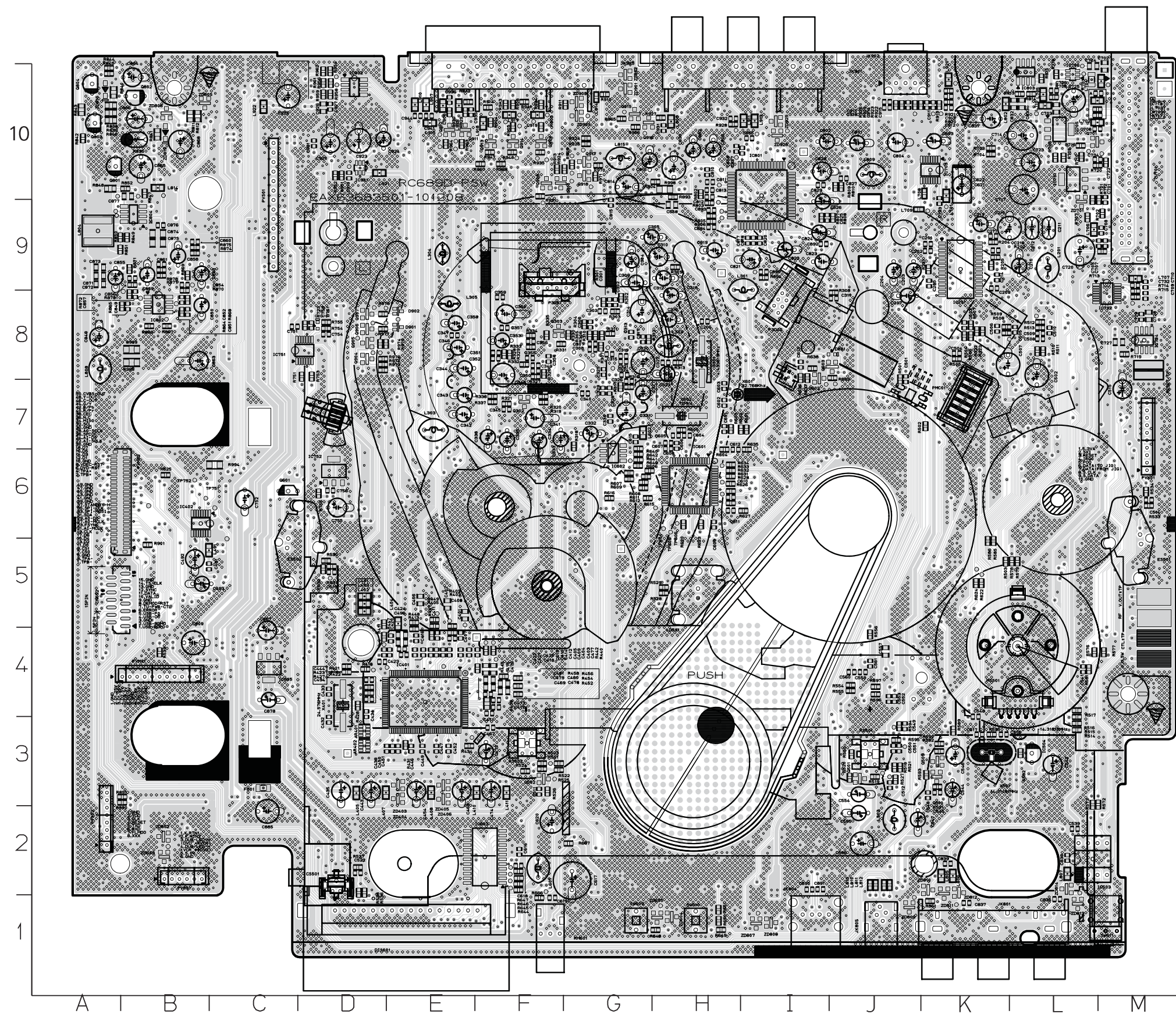
Loca No.	Spec	Power On		Playback	
		(+)	(-)	(+)	(-)
PART : SYSTEM					
C502	47uF/25V	19.60V	0.1mV	19.60V	0.1mV
C507	47uF/25V	19.55V	0.1mV	19.55V	0.1mV
C515	4.7uF/50V	4.3V	0.7mV	0.2V	0.7mV
C542	47uF/6.3V	5.32V	0.1mV	5.32V	0.1mV
C544	1uF/16V	1.5V	1.9V	1.5V	1.9V
C546	33uF/16V	1.5V	1.0V	1.5V	1.0V
C547	10uF/50V	5.02V	0.6mV	5.02V	0.6mV
C554	22uF/16V	2.6V	0.1mV	2.6V	0.1mV
C555	22uF/16V	2.595V	2.592V	2.595V	2.592V
C556	100uF/50V	2.6V	0.6mV	2.6V	0.6mV
C614	47uF/6.3V	5.33V	0.1mV	5.33V	0.1mV
C617	1,000uF/6.3V	5.07V	0.2mV	5.07V	0.2mV
C621	470uF/6.3V	5.2V	0.1mV	5.2V	0.1mV
C752	47uF/6.3V	5.26V	0.2mV	5.26V	0.2mV
C755	47uF/6.3V	3.3V	0.2mV	3.3V	0.2mV
PART : AVCP					
C304	1uF/50V	2.364V	0.2mV	2.364V	0.2mV
C305	10uF/50V	2.371V	0.4mV	2.371V	0.4mV
C309	10uF/50V	2.371V	0mV	2.371V	0mV
C310	4.7uF/50V	2.397V	0.4mV	2.397V	0.4mV
C312	22uF/16V	18.8mV	0mV	18.8mV	0mV
C314	220uF/6.3V	5.08V	0mV	5.08V	0mV
C316	1uF/50V	2.609V	0.5mV	2.609V	0.5mV
C318	1uF/50V	2.607V	0.2mV	2.607V	0.2mV
C320	220uF/6.3V	5.07V	0mV	5.07V	0mV
C323	1uF/50V	2.136V	0.4mV	2.136V	0.4mV
C327	1uF/50V	2.730V	0.5mV	2.730V	0.5mV
C331	220uF/6.3V	5.06V	0.3mV	5.06V	0.3mV
C332	1uF/50V	2.560V	2.189V	2.560V	2.189V
C333	1uF/50V	2.305V	0.3mV	2.305V	0.3mV
C334	10uF/50V	4.09V	0.2mV	4.09V	0.2mV
C335	10uF/50V	3.660V	0.2mV	3.660V	0.2mV
C338	1uF/50V	1.328V	0.3mV	1.328V	0.3mV
C341	220uF/6.3V	5.13V	0.3mV	5.13V	0.3mV
C342	1uF/50V	1.430V	0mV	1.430V	0mV
C343	2.2uF/50V	2.905V	1.945V	2.905V	1.945V
C344	10uF/50V	1.420V	0mV	1.420V	0mV
C346	1uF/50V	2.075V	0mV	2.075V	0mV
C348	220uF/6.3V	5.07V	0mV	5.07V	0mV
C353	1uF/50V	1.662V	0mV	1.662V	0mV
C358	1uF/50V	0.28V	0mV	0.28V	0mV
C360	220uF/6.3V	5.11V	0mV	5.11V	0mV
PART : AV DECODER					
C401	10uF/6.3V	3.295V	0mV	3.295V	0mV

Loca No.	Spec	Power On		Playback	
		(+)	(-)	(+)	(-)
C402	10uF/6.3V	1.809V	0mV	1.809V	0mV
C403	1uF/16V	1.808v	0mV	1.808v	0mV
C405	4.7uF/6.3V	3.295V	0mV	3.295V	0mV
C406	10uF/6.3V	3.295V	0mV	3.295V	0mV
C416	2.2uF/16V	1.25V	0mV	1.25V	0mV
C420	2.2uF/16V	2.667V	2.543V	2.667V	2.543V
C421	2.2uF/16V	1.512V	0mV	1.512V	0mV
C434	4.7uF/6.3V	1.808V	0mV	1.808V	0mV
C435	47uF/6.3V	1.809V	0.3mV	1.809V	0.3mV
C443	47uF/6.3V	1.808V	0mV	1.808V	0mV
C447	1uF/16V	1.808V	0mV	1.808V	0mV
C451	1uF/16V	1.81	0mV	1.81	0mV
C454	47uF/6.3V	3.295V	0.3mV	3.295V	0.3mV
C468	47uF/6.3V	3.295V	0.3mV	3.295V	0.3mV
C470	10uF/16V	0.5mV	0.3mV	0.5mV	0.3mV
C474	47uF/6.3V	3.295V	0.2mV	3.295V	0.2mV
C492	47uF/6.3V	4.96V	0mV	4.96V	0mV
C493	10uF/16V	2.472V	0mV	2.472V	0mV
C494	1uF/16V	3.294V	0mV	3.294V	0mV
C496	10uF/6.3V	3.295V	0mV	3.295V	0mV
PART : HI-FI/F.JACK/AMP					
C801	10uF/16V	335mV	0.6mV	335mV	0.6mV
C802	1uF/50V	2.512V	2.278V	2.512V	2.278V
C803	10uF/16V	19.5mV	0.6mV	19.5mV	0.6mV
C806	22uF/16V	2.538V	0.2mV	2.538V	0.2mV
C809	100uF/16V	11.84V	0mV	11.84V	0mV
C814	220uF/6.3V	5.12V	0mV	5.12V	0mV
C819	22uF/16V	2.536V	0.2mV	2.536V	0.2mV
C821	22uF/6.3V	-	-	-	-
C822	10uF/16V	25mV	0.4mV	25mV	0.4mV
C823	1uF/50V	2.514V	2.274V	2.514V	2.274V
C824	10uF/16V	4.25V	0.4mV	4.25V	0.4mV
C826	10uF/16V	1.905V	131.4mV	1.905V	131.4mV
C828	47uF/16V	9.35V	127.8mV	9.35V	127.8mV
C830	220uF/6.3V	5.06V	0.4mV	5.06V	0.4mV
C831	10uF/6.3V	1.797V	0.6mV	1.797V	0.6mV
C832	10uF/6.3V	2.477V	0.7mV	2.477V	0.7mV
C848	47uF/16V	14.85V	_0.4mV	14.85V	_0.4mV
C850	22uF/16V	7.50V	_0.5mV	7.50V	_0.5mV
C853	22uF/16V	7.50V	2.478V	7.50V	2.478V
C855	22uF/16V	7.50V	2.182V	7.50V	2.182V
C858	22uF/16V	7.50V	2.5mV	7.50V	2.5mV
C859	22uF/16V	7.50V	3mV	7.50V	3mV
C862	22uF/16V	2.543V	0mV	2.543V	0mV
C863	220uF/6.3V	5.21V	_0.7mV	5.21V	_0.7mV

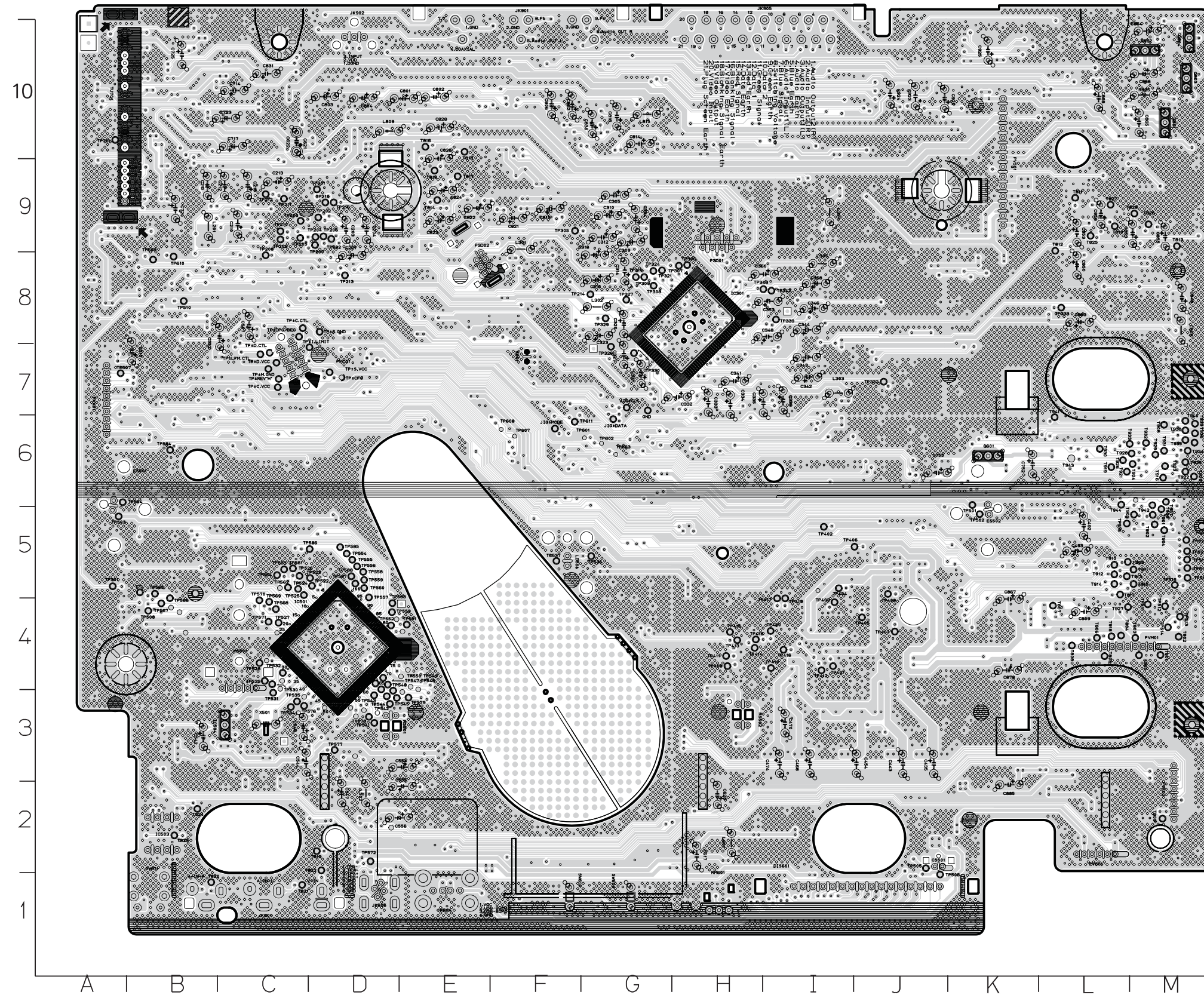
Loca No.	Spec	Power On		Playback	
		(+)	(-)	(+)	(-)
C864	10uF/50V	9.40V	_0.7mV	9.40V	_0.7mV
C867	47uF/6.3V	3.295V	0mV	3.295V	0mV
C868	10uF/50V	14.90V	_1mV	14.90V	_1mV
C871	10uF/6.3V	5.32V	_0.7mV	5.32V	_0.7mV
C872	10uF/6.3V	1.312V	_0.7mV	1.312V	_0.7mV
C875	470uF/6.3V	1.313V	_0.7mV	1.313V	_0.7mV
C878	10uF/16V	1.809V	0.2mV	1.809V	0.2mV
C885	220uF/6.3V	4.96V	_0.8mV	4.96V	_0.8mV
C888	4.7uF/6.3V	5.31V	_0.8mV	5.31V	_0.8mV
PART : JACK					
C911	100uF/50V	1.3mV	0.6mV	1.3mV	0.6mV
C917	100uF/50V	5.04V	0.6mV	5.04V	0.6mV
C918	100uF/50V	5.04V	0.5mV	5.04V	0.5mV
C919	100uF/50V	8.88V	_0.8mV	8.88V	_0.8mV
C920	100uF/6.3V	5.12V	_1.4mV	5.12V	_1.4mV
C921	100uF/50V	5.12V	_0.9mV	5.12V	_0.9mV
C923	100uF/6.3V	1.134V	0.975V	1.134V	0.975V
C924	22uF/16V	1.190v	0.972V	1.190v	0.972V
C925	220uF/6.3V	3.289V	_0.6mV	3.289V	_0.6mV
C927	100uF/50V	3.289V	_0.8mV	3.289V	_0.8mV
PART : TUNER					
C720	100uF/16V	4.95V	0.7mV	4.95V	0.7mV
C724	2.2uF/16V	380mV	0.8mV	380mV	0.8mV
C725	100uF/16V	5.10V	0.8mV	5.10V	0.8mV

PRINTED CIRCUIT BOARD DIAGRAMS

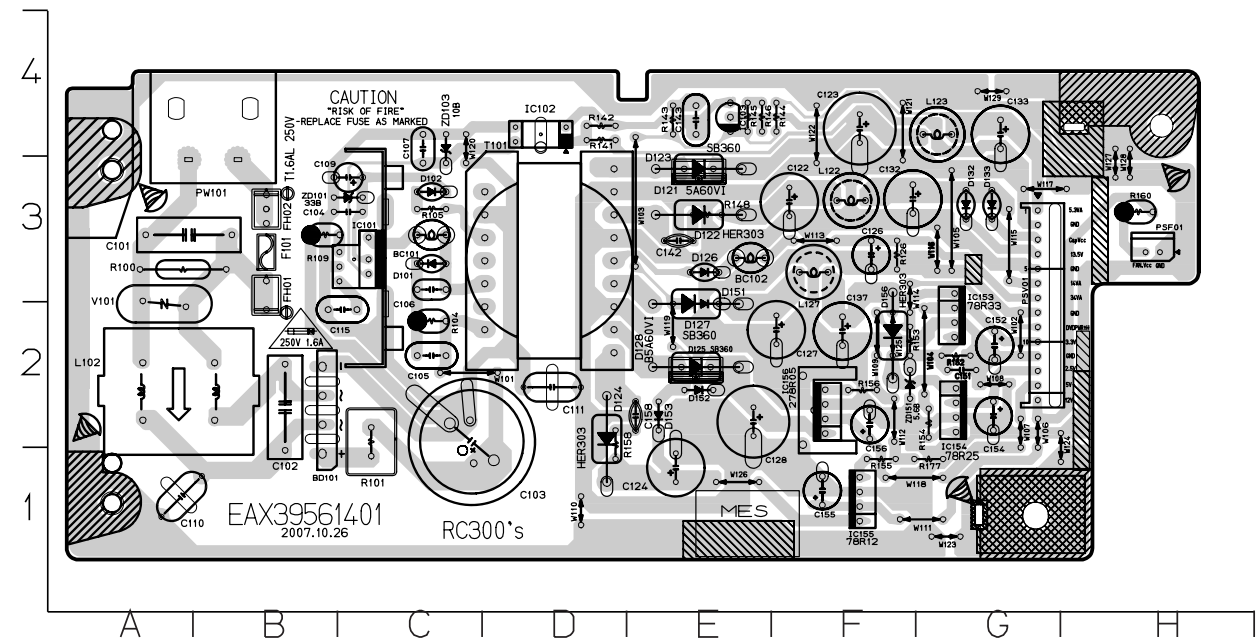
1. VCR P.C.BOARD (TOP VIEW)



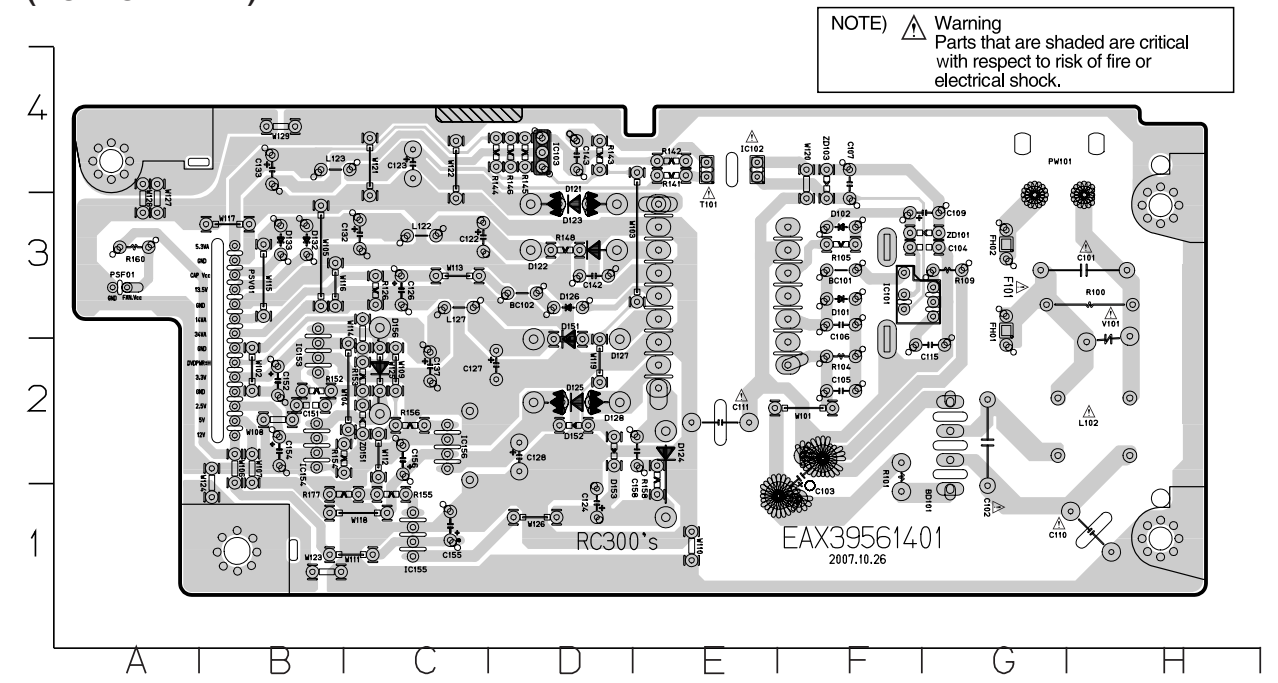
VCR P.C.BOARD
(BOTTOM VIEW)



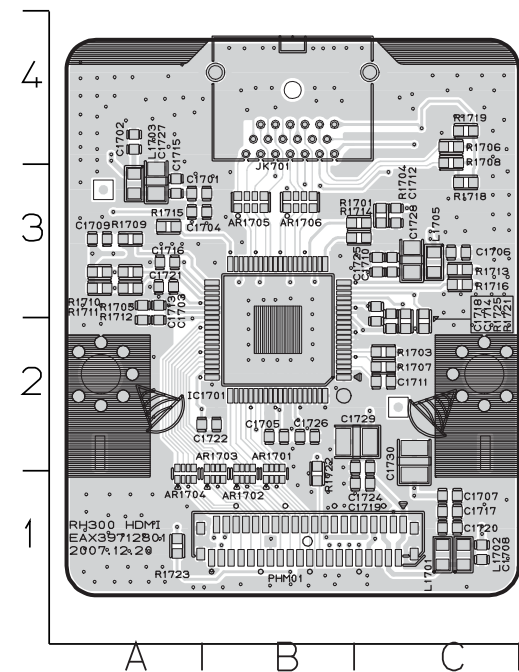
**2. SMPS P.C.BOARD
(TOP VIEW)**



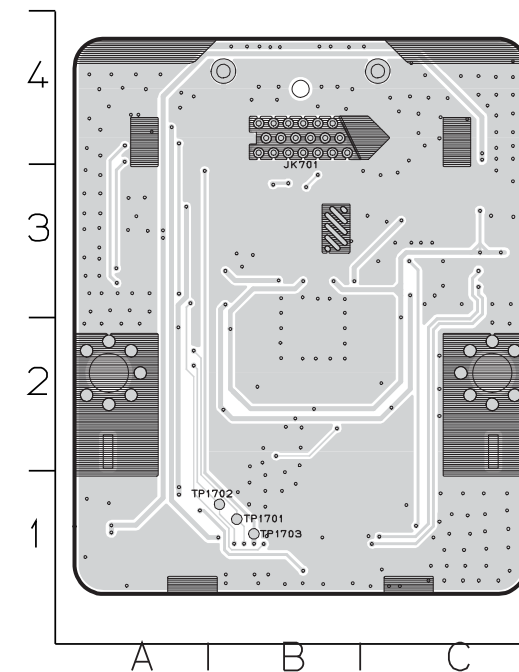
(BOTTOM VIEW)



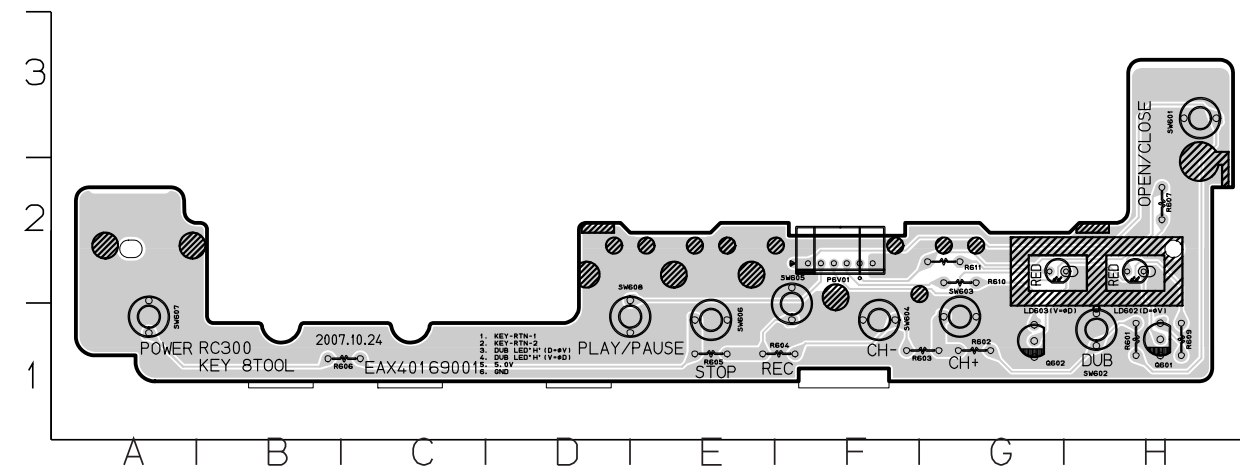
**3. HDMI P.C.BOARD
(TOP VIEW)**



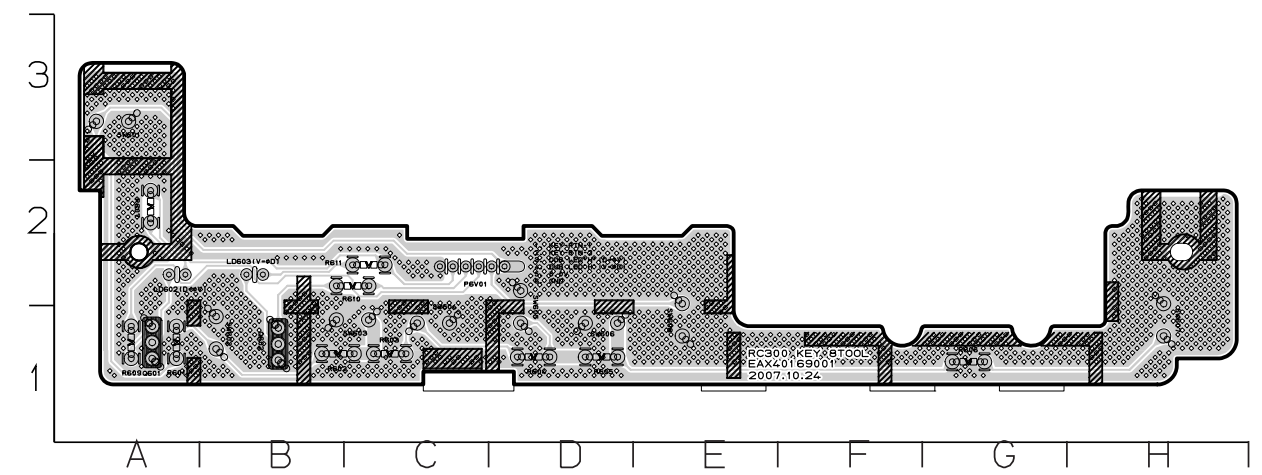
(BOTTOM VIEW)



**4. KEY P.C.BOARD
(TOP VIEW)**



(BOTTOM VIEW)



MEMO

Series of horizontal dotted lines for writing.

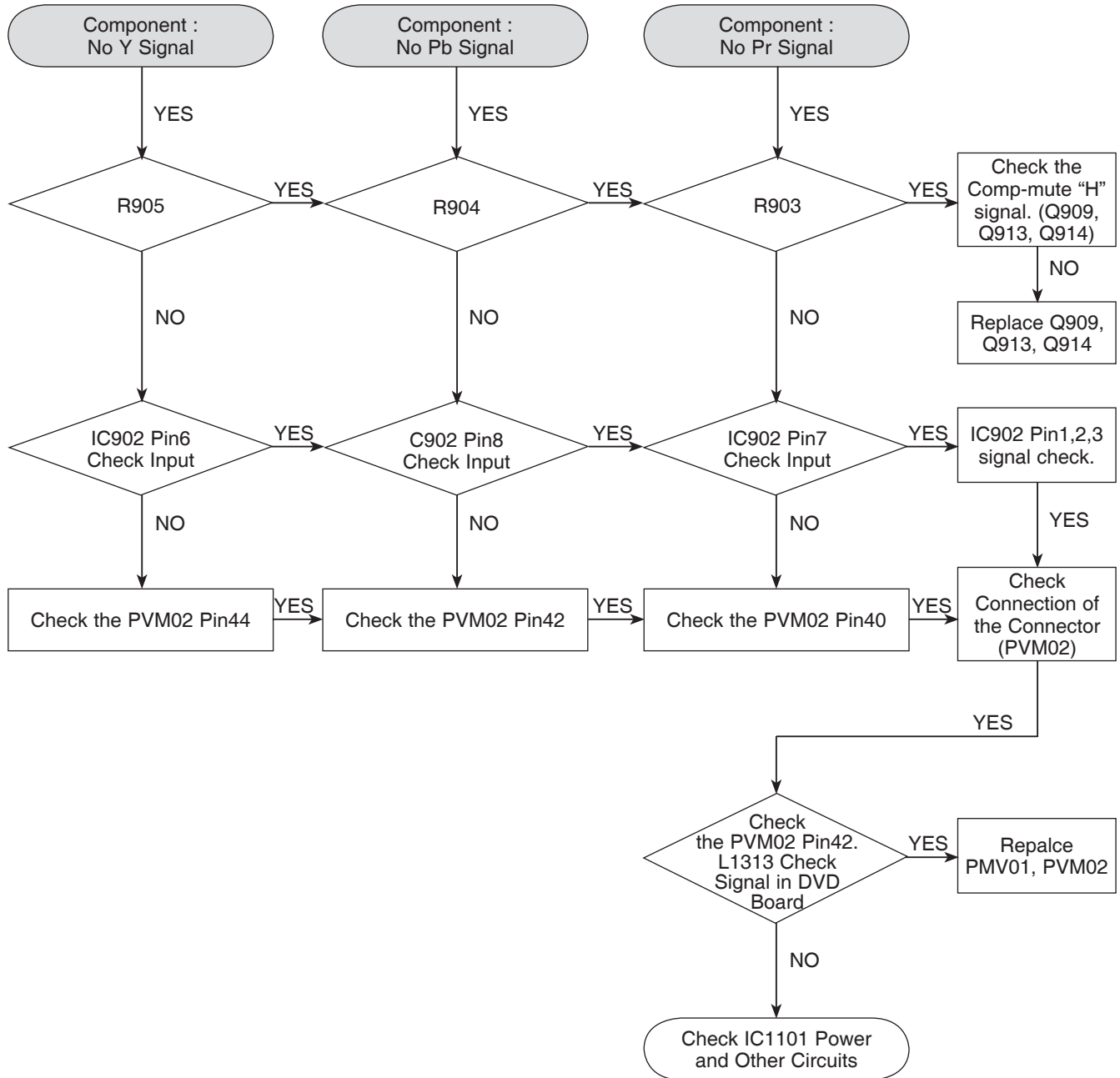
MEMO

Series of horizontal dotted lines for writing.

VDR PART

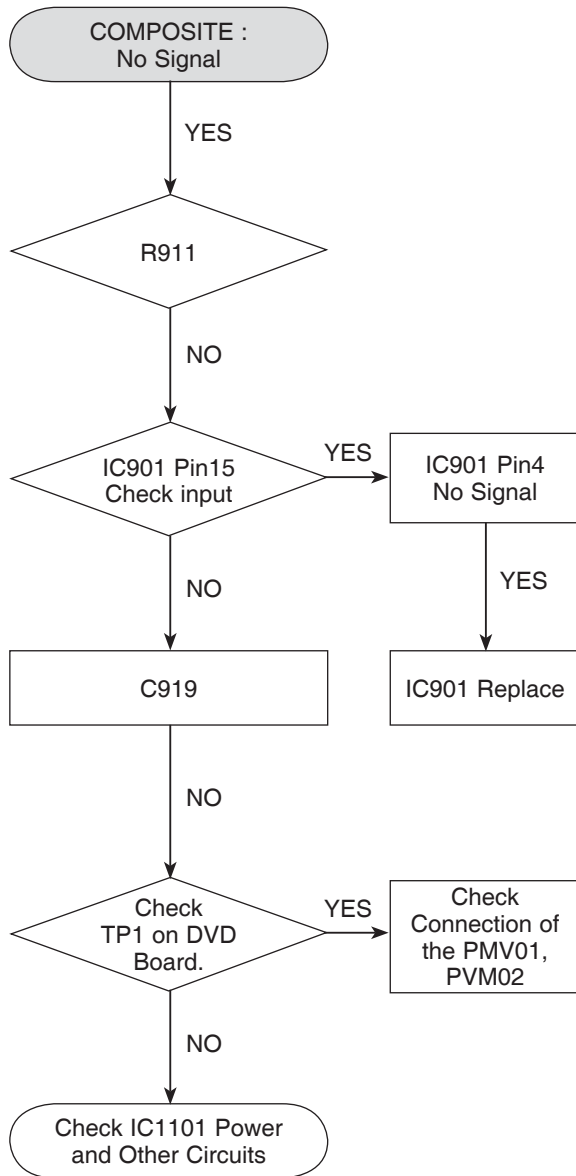
VDR ELECTRICAL TROUBLESHOOTING GUIDE

1. NO COMPONENT VIDEO SIGNAL WHEN PLAYING DISC



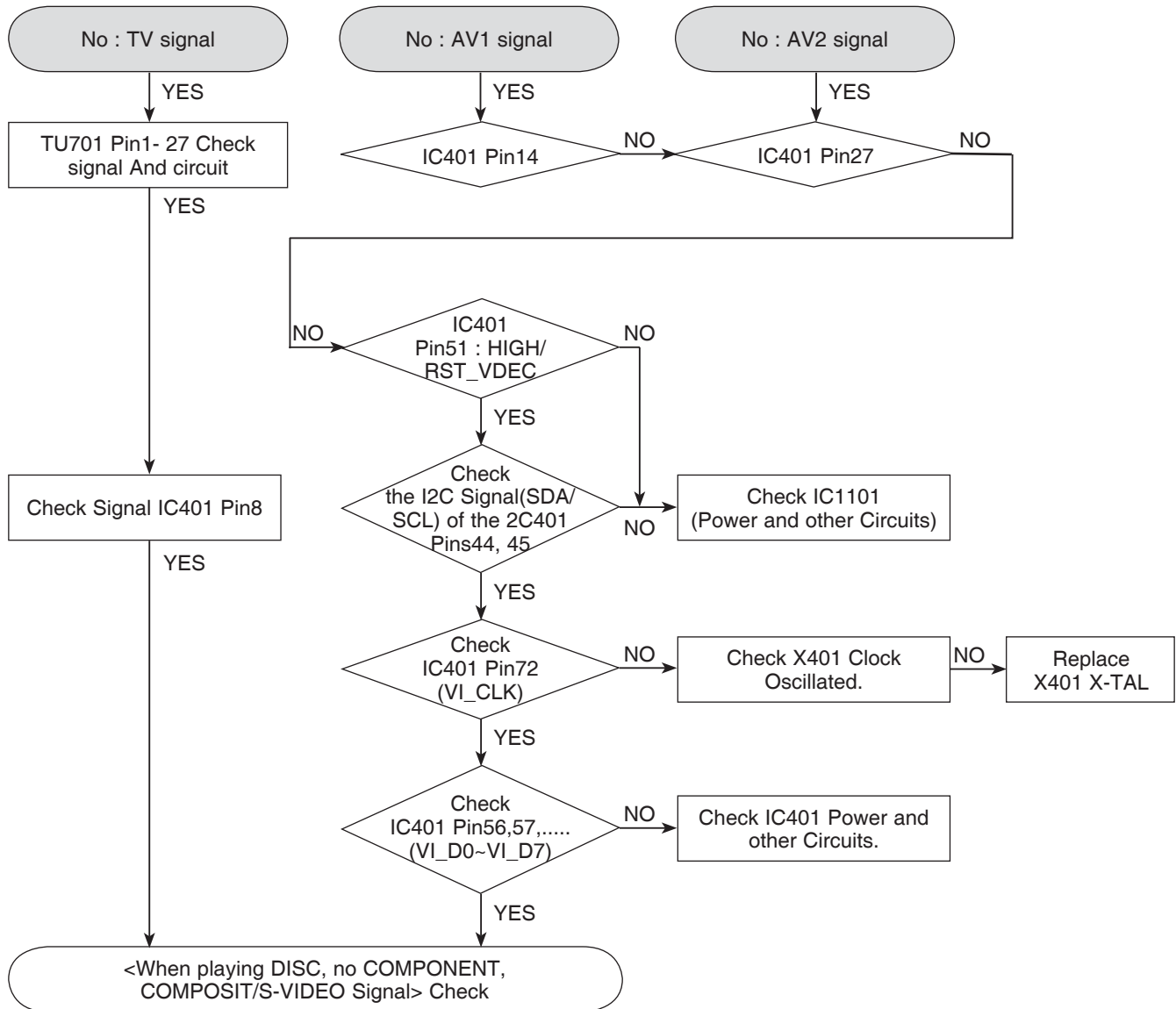
VDR ELECTRICAL TROUBLESHOOTING GUIDE

2. NO COMPOSITE SIGNAL WHEN PLAYING DISC



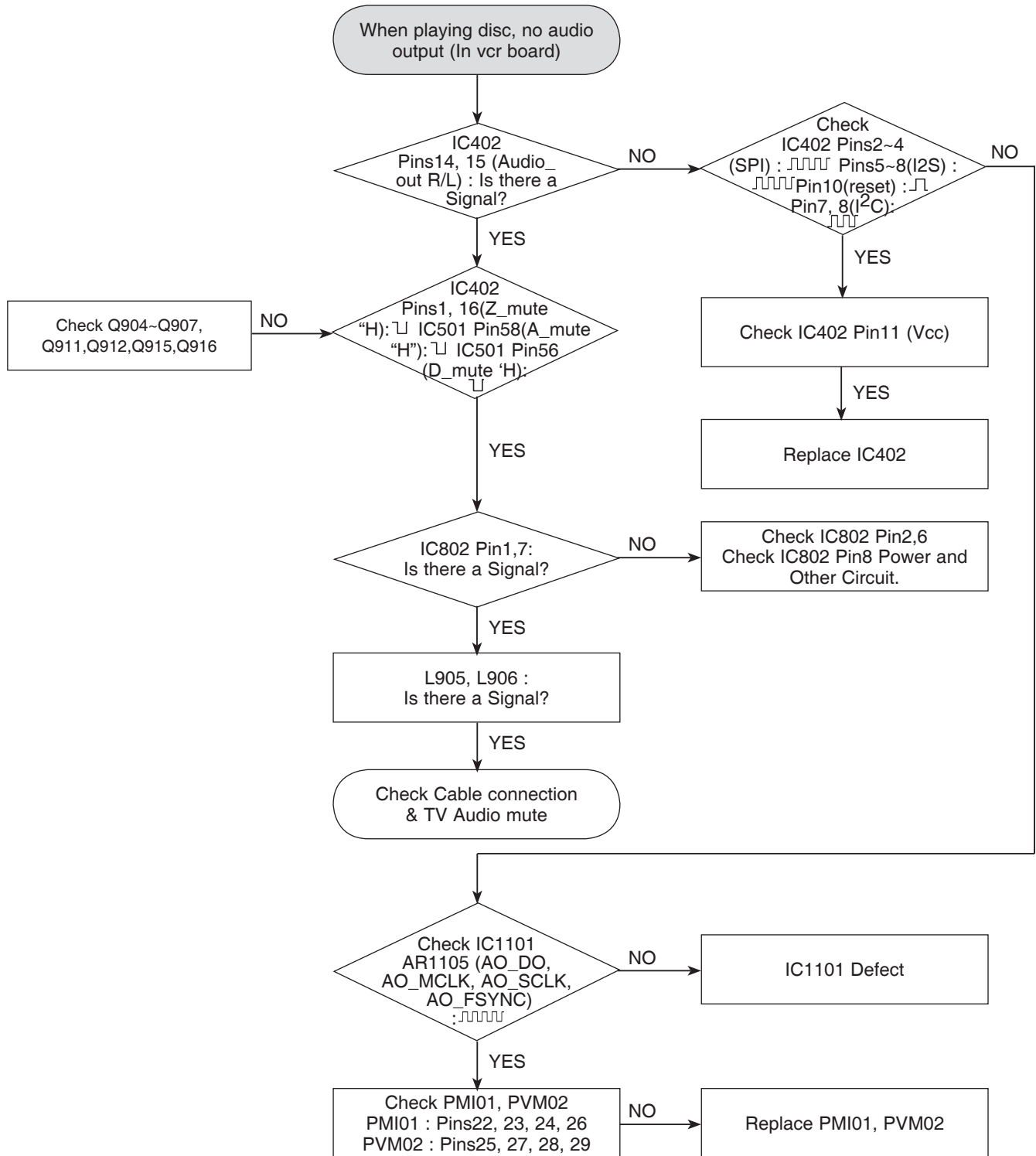
VDR ELECTRICAL TROUBLESHOOTING GUIDE

3. NO TV, EXTERNAL INPUT VIDEO SIGNAL



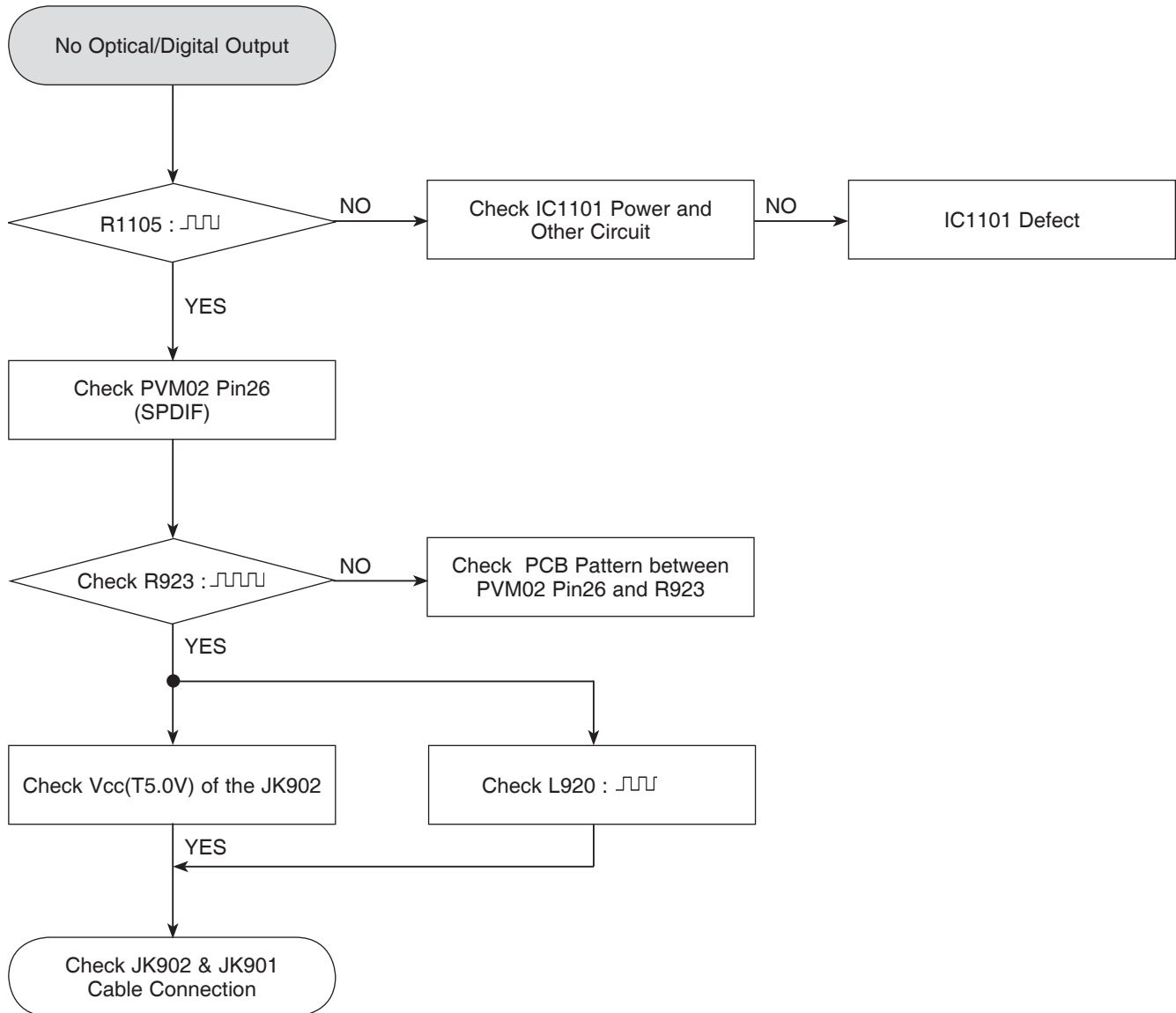
VDR ELECTRICAL TROUBLESHOOTING GUIDE

4. WHEN PLAYING DISC, NO AUDIO OUTPUT (IN VCR BOARD)



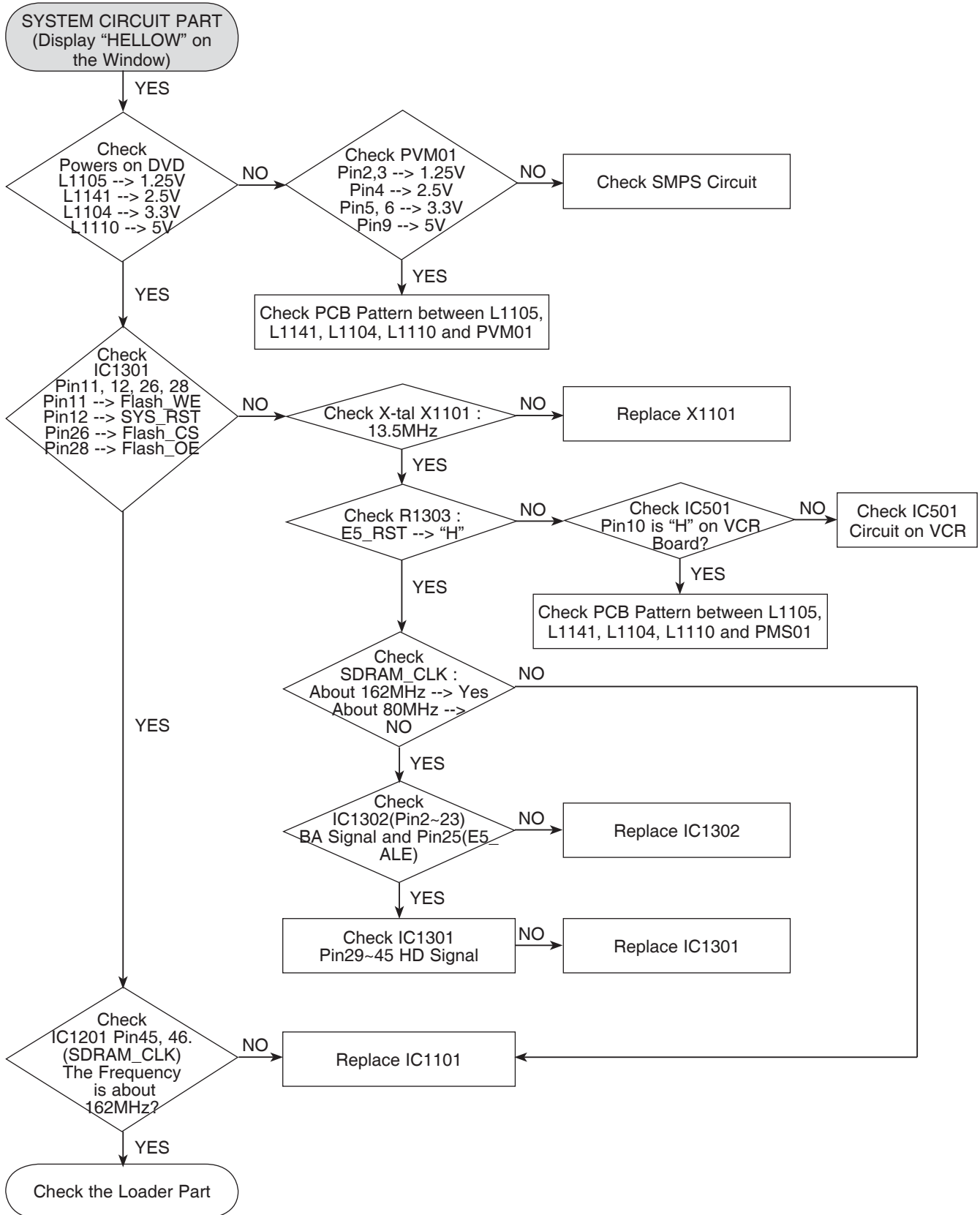
VDR ELECTRICAL TROUBLESHOOTING GUIDE

5. NO OPTICAL/DIGITAL OUTPUT



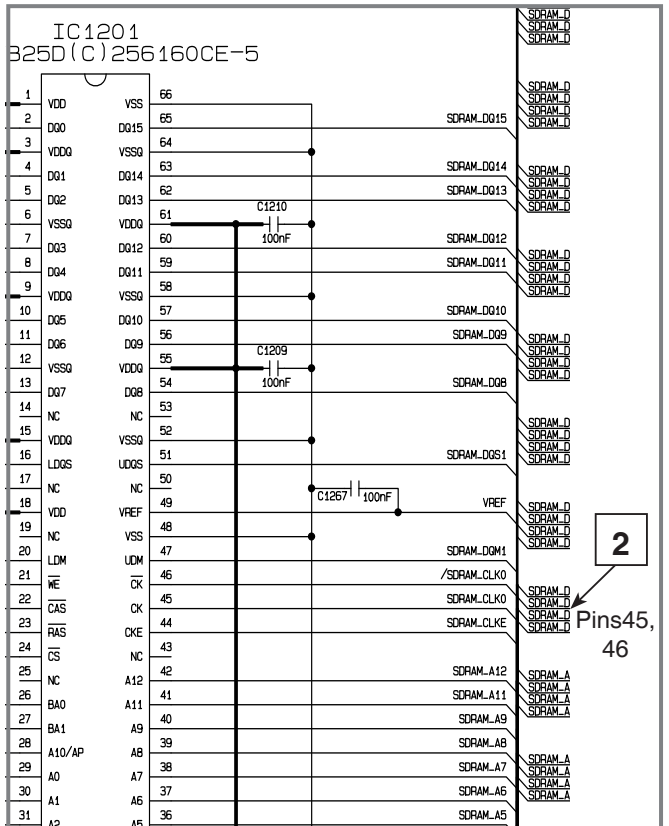
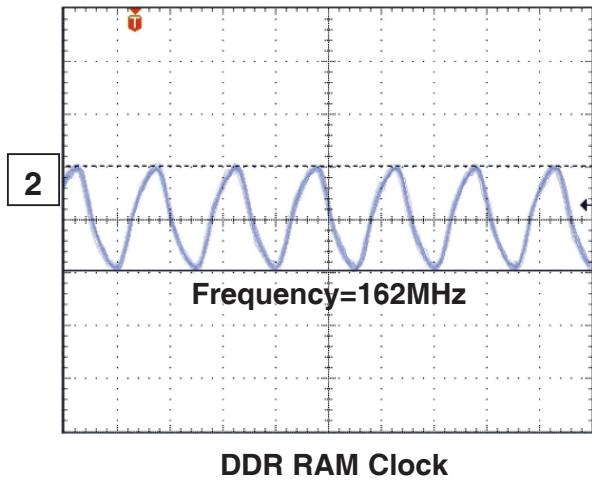
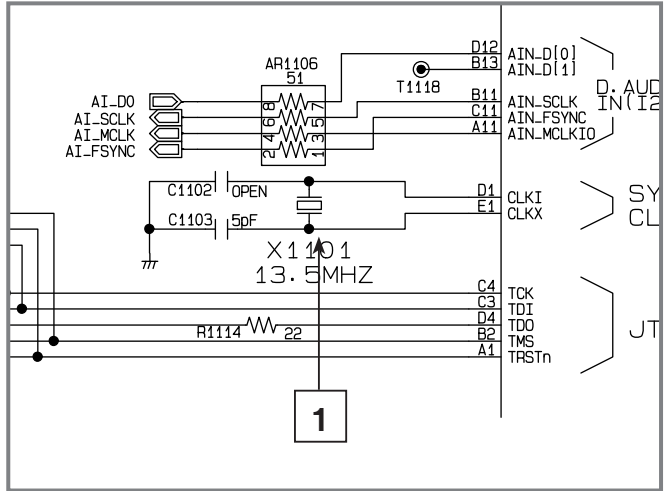
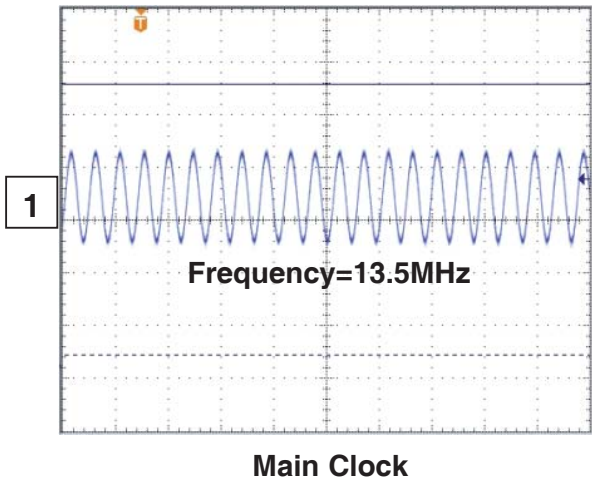
VDR ELECTRICAL TROUBLESHOOTING GUIDE

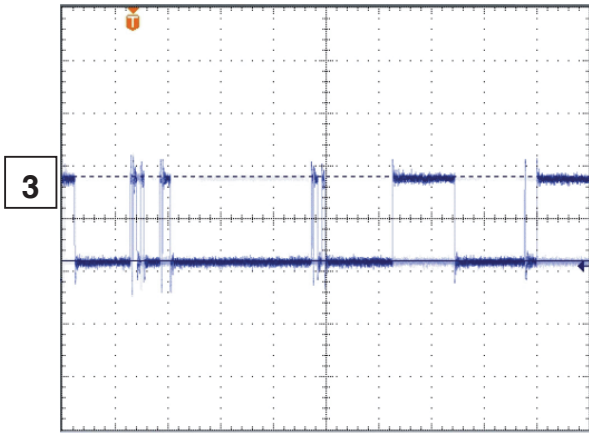
6. SYSTEM CIRCUIT PART (DISPLAY "HELLO" ON THE WINDOW)



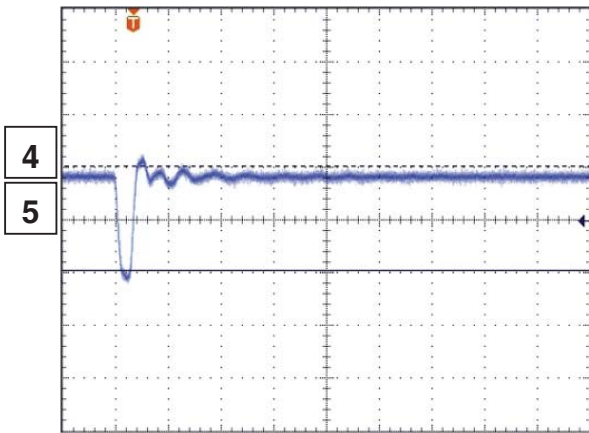
WAVEFORMS

1. SYSTEM BLOCK

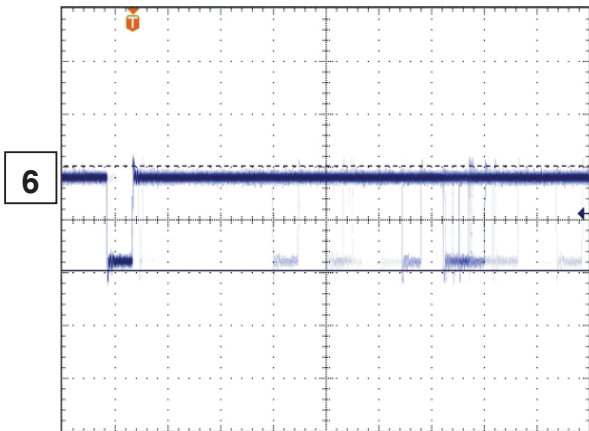




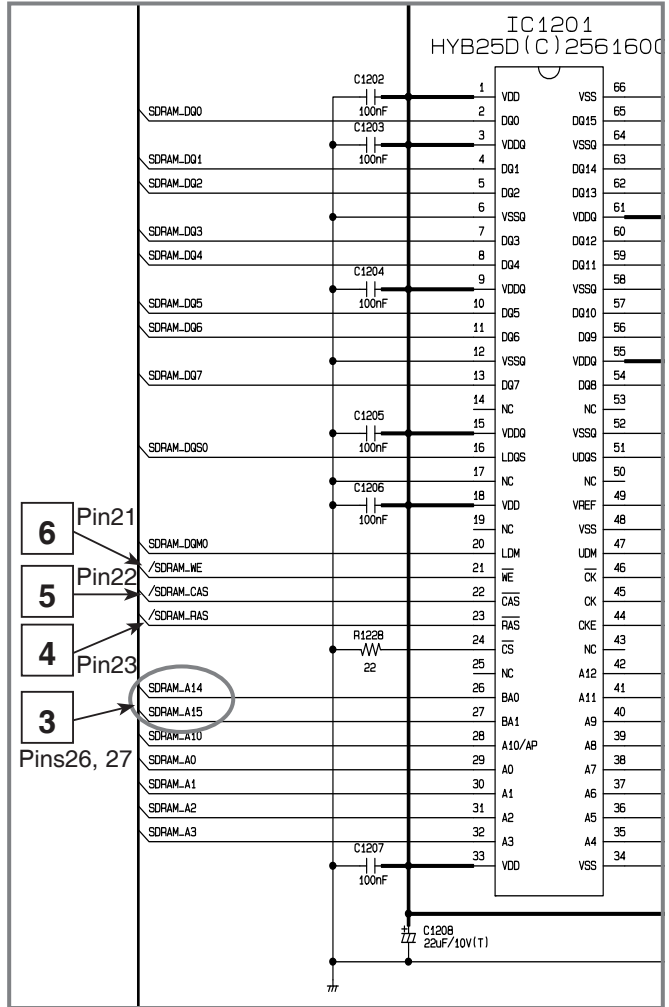
DDR Bank Address



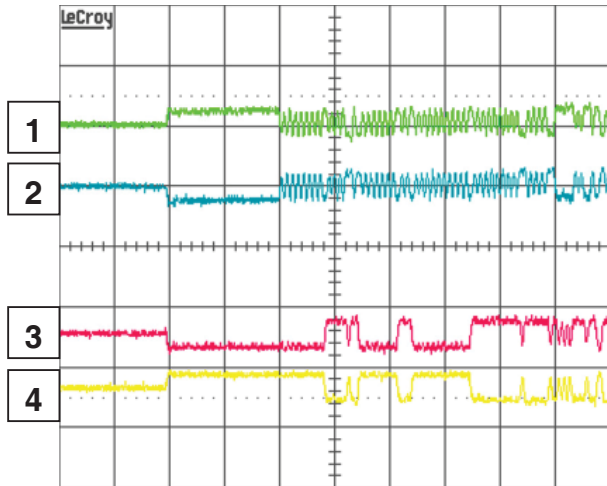
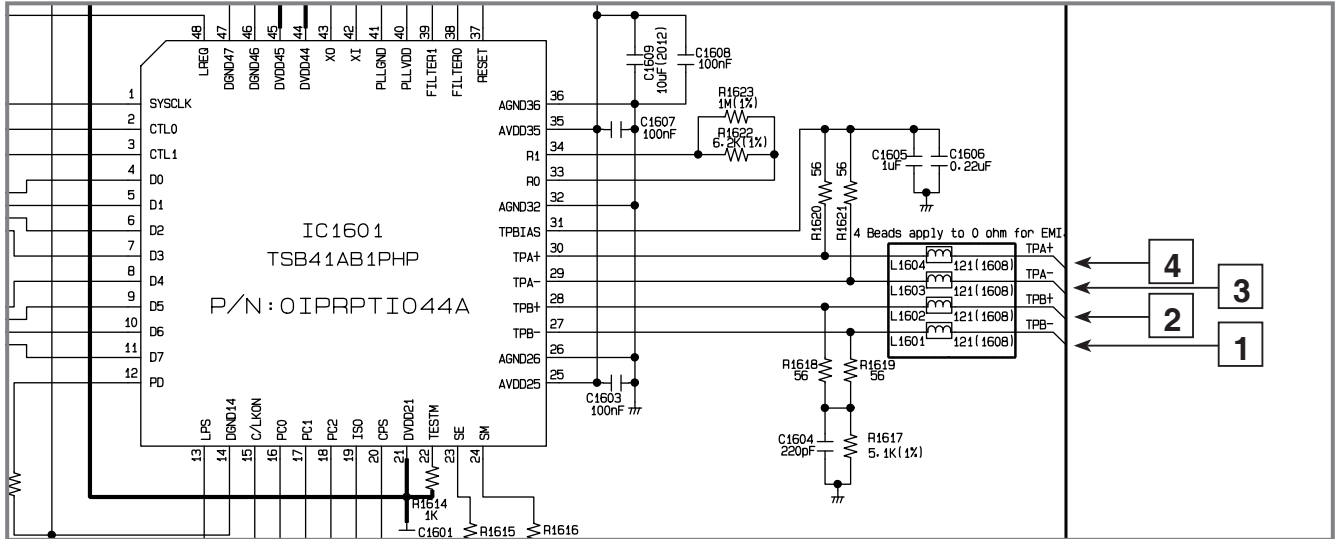
DDR RAS & CAS



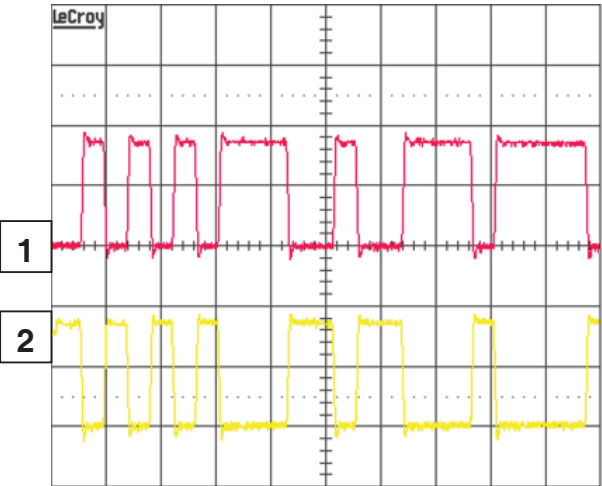
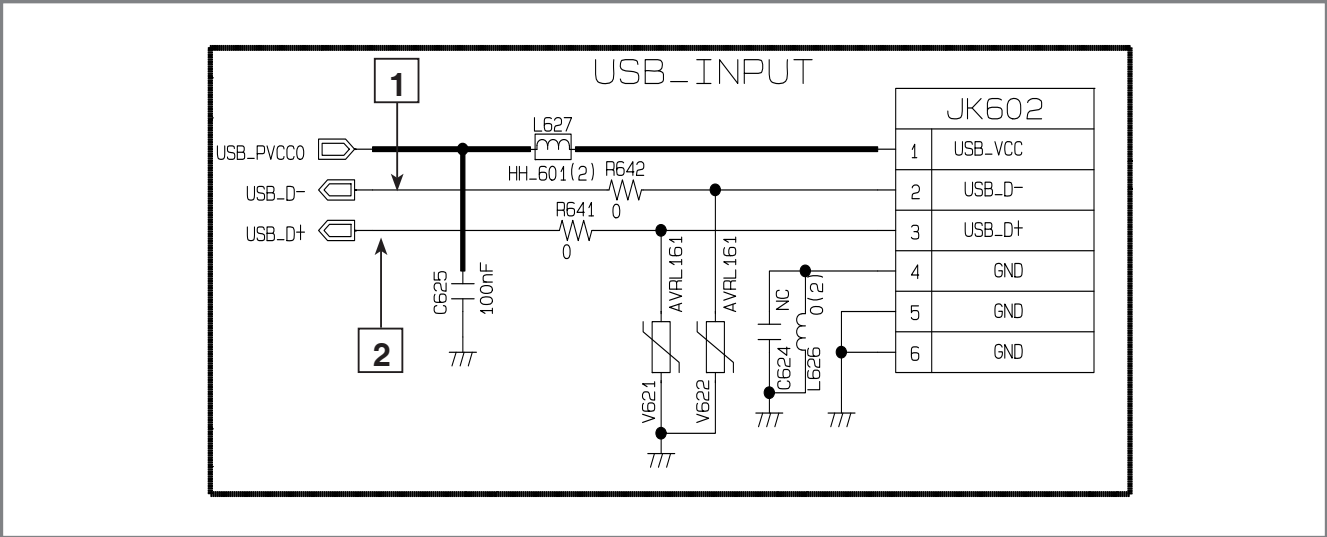
DDR Write Enable



2. DV BLOCK (TPA±, TPB±)

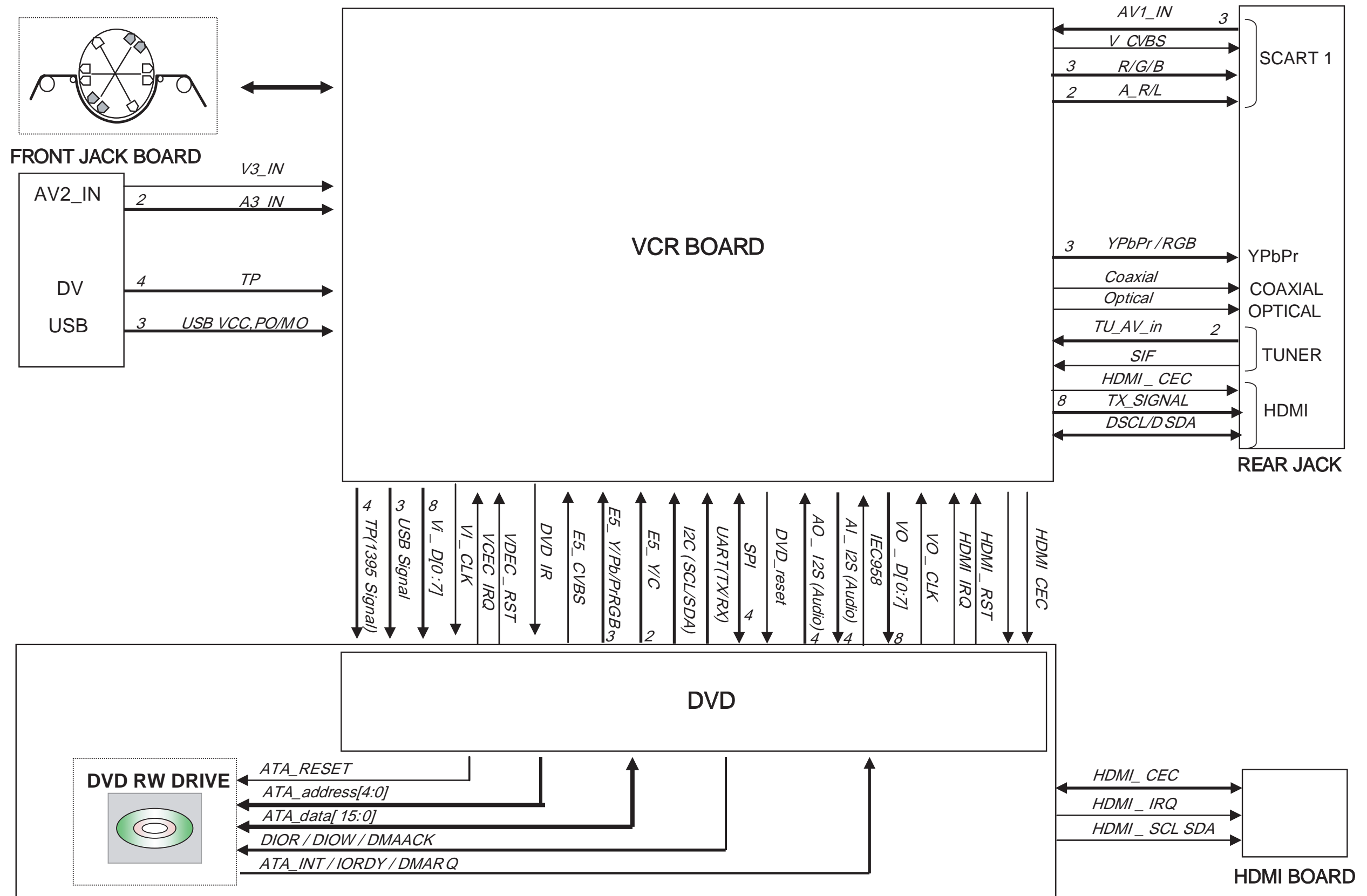


3. USB BLOCK (D±)

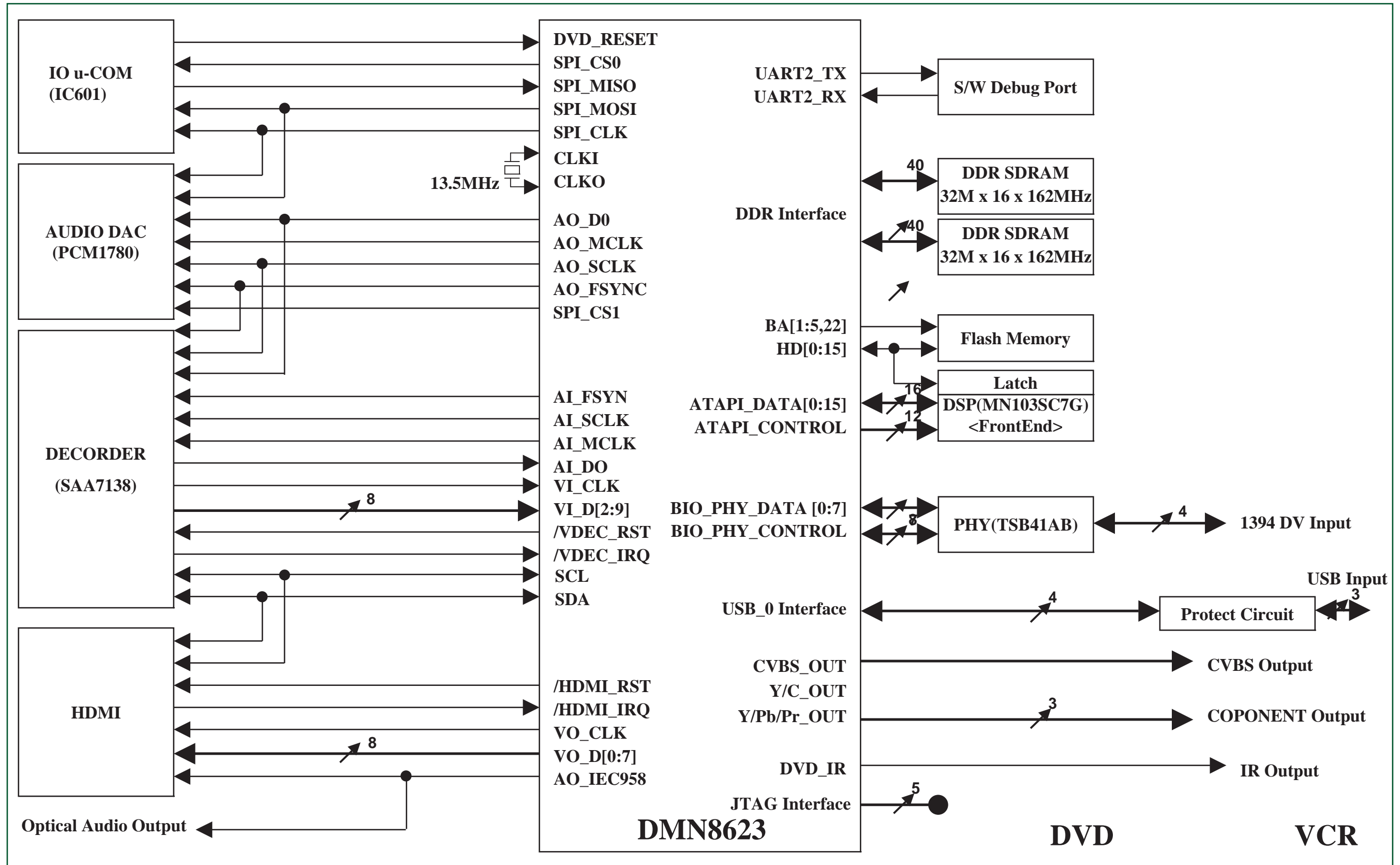


BLOCK DIAGRAMS

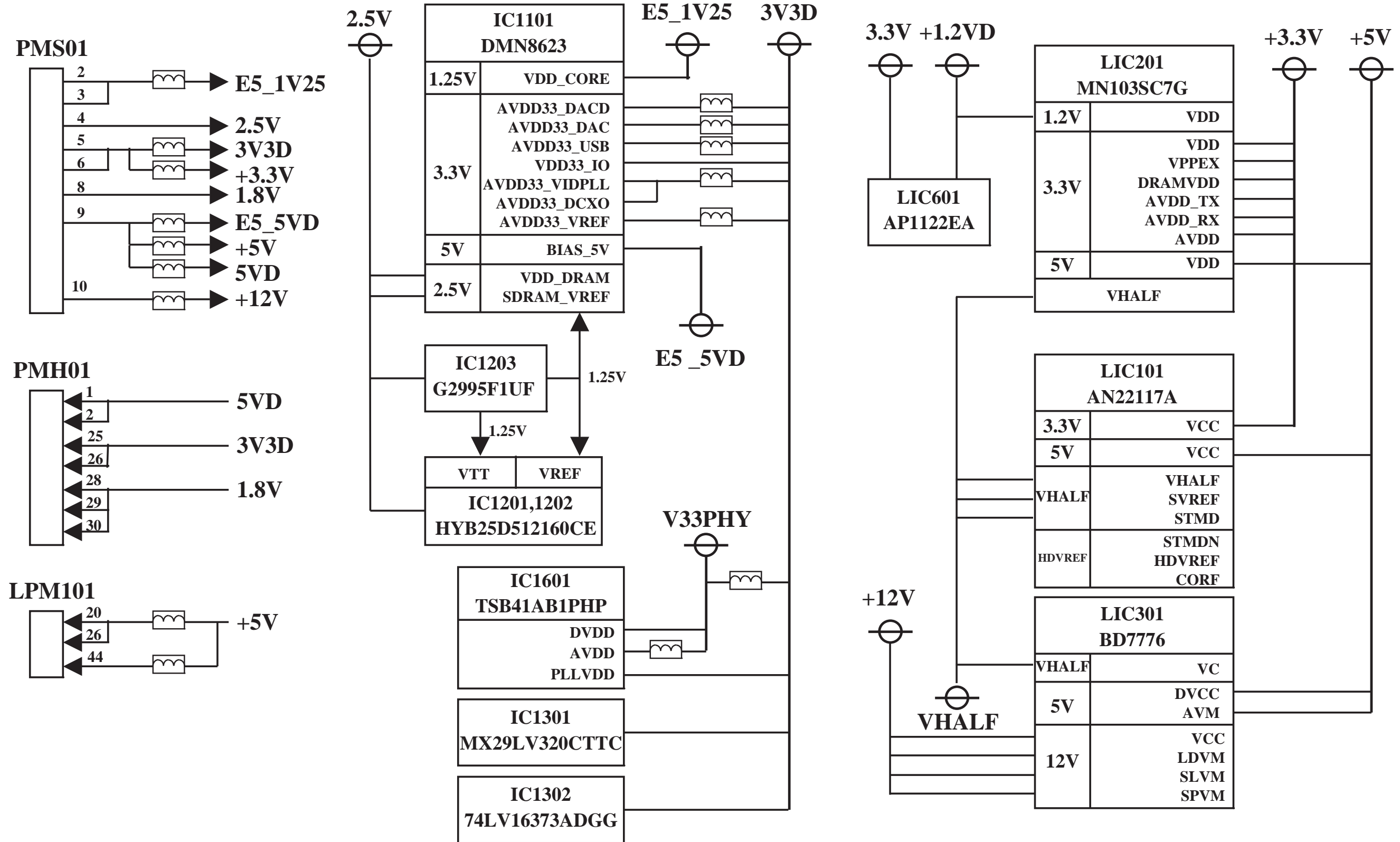
1. VDR SET TOTAL BLOCK DIAGRAM



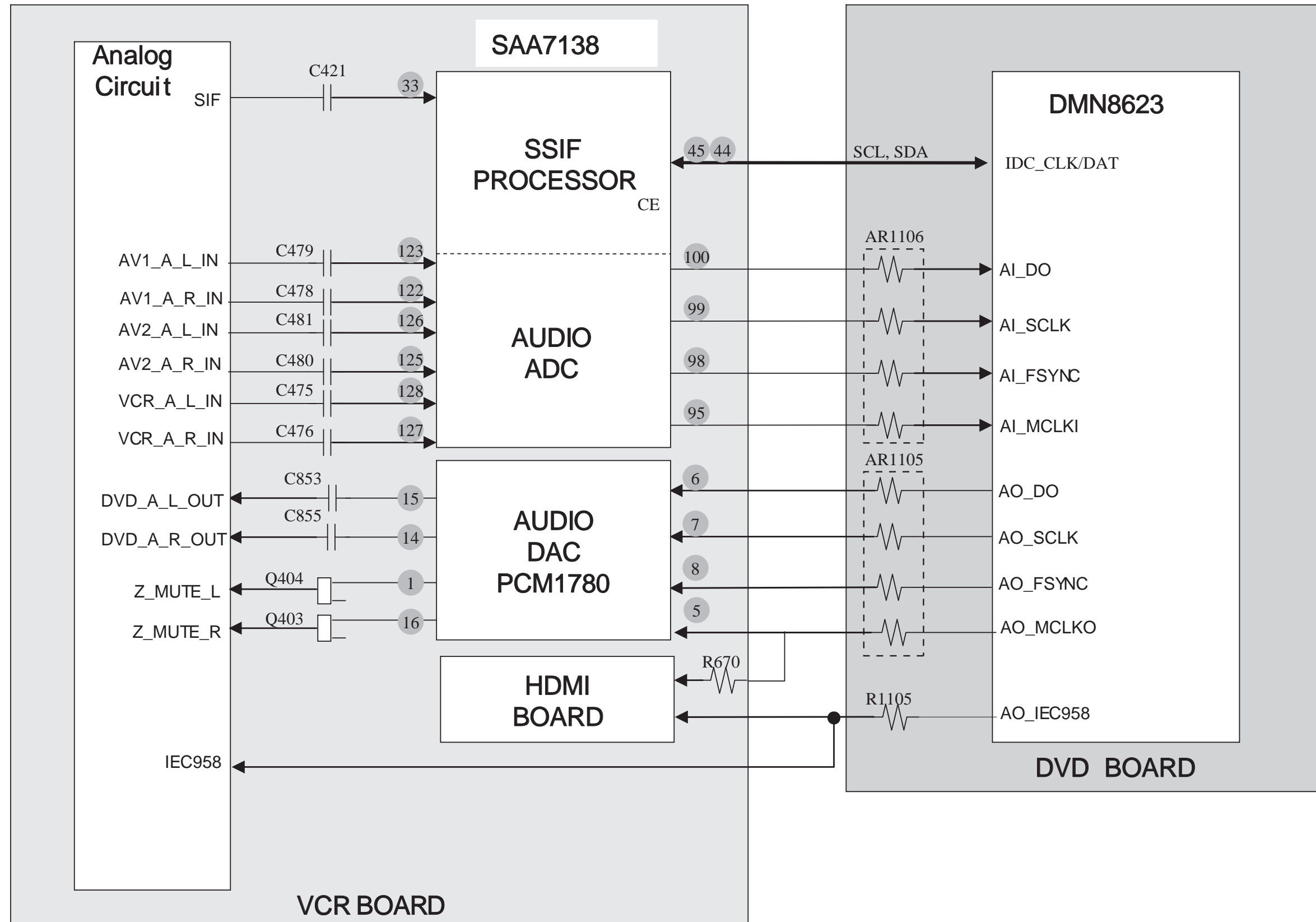
2. VDR MAIN H/W BLOCK DIAGRAM



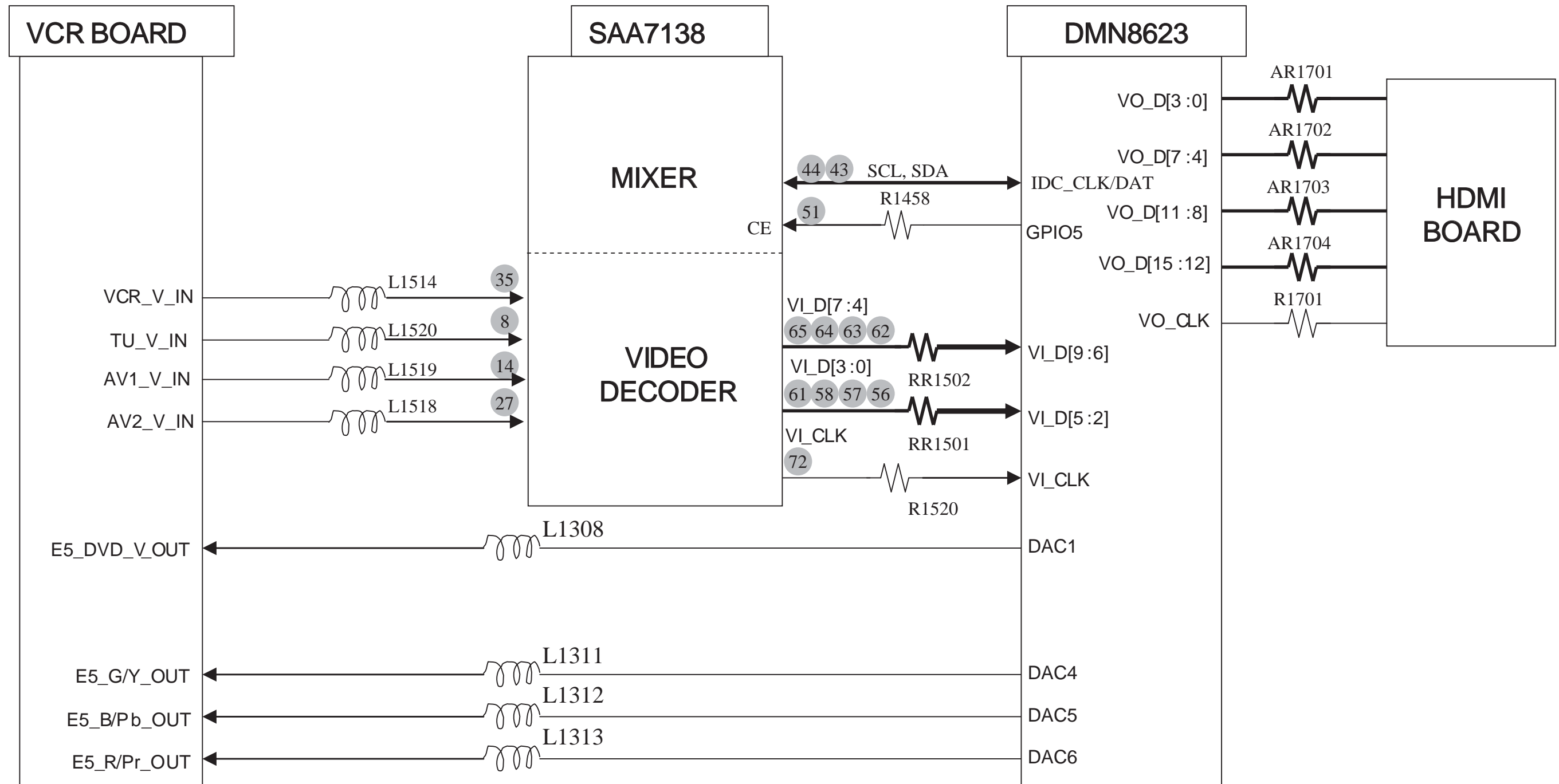
3. DVD POWER BLOCK DIAGRAM



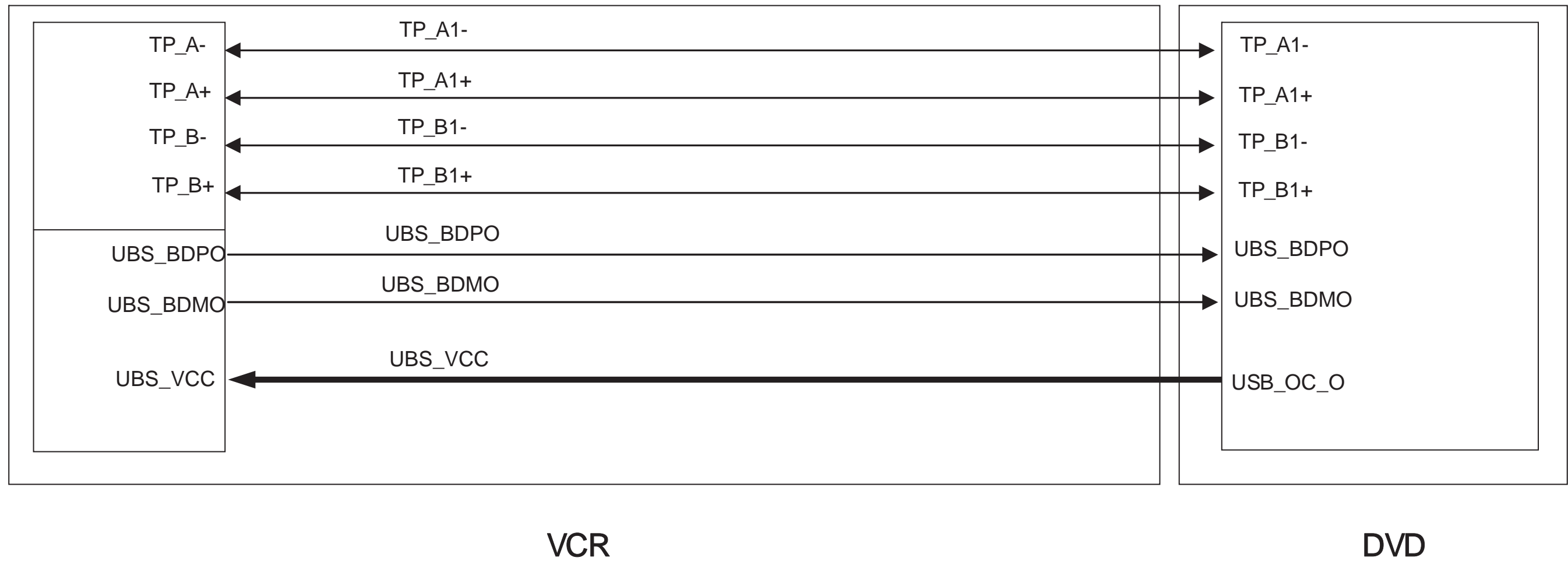
4. AUDIO IN/OUT BLOCK DIAGRAM



5. VIDEO IN/OUT BLOCK DIAGRAM

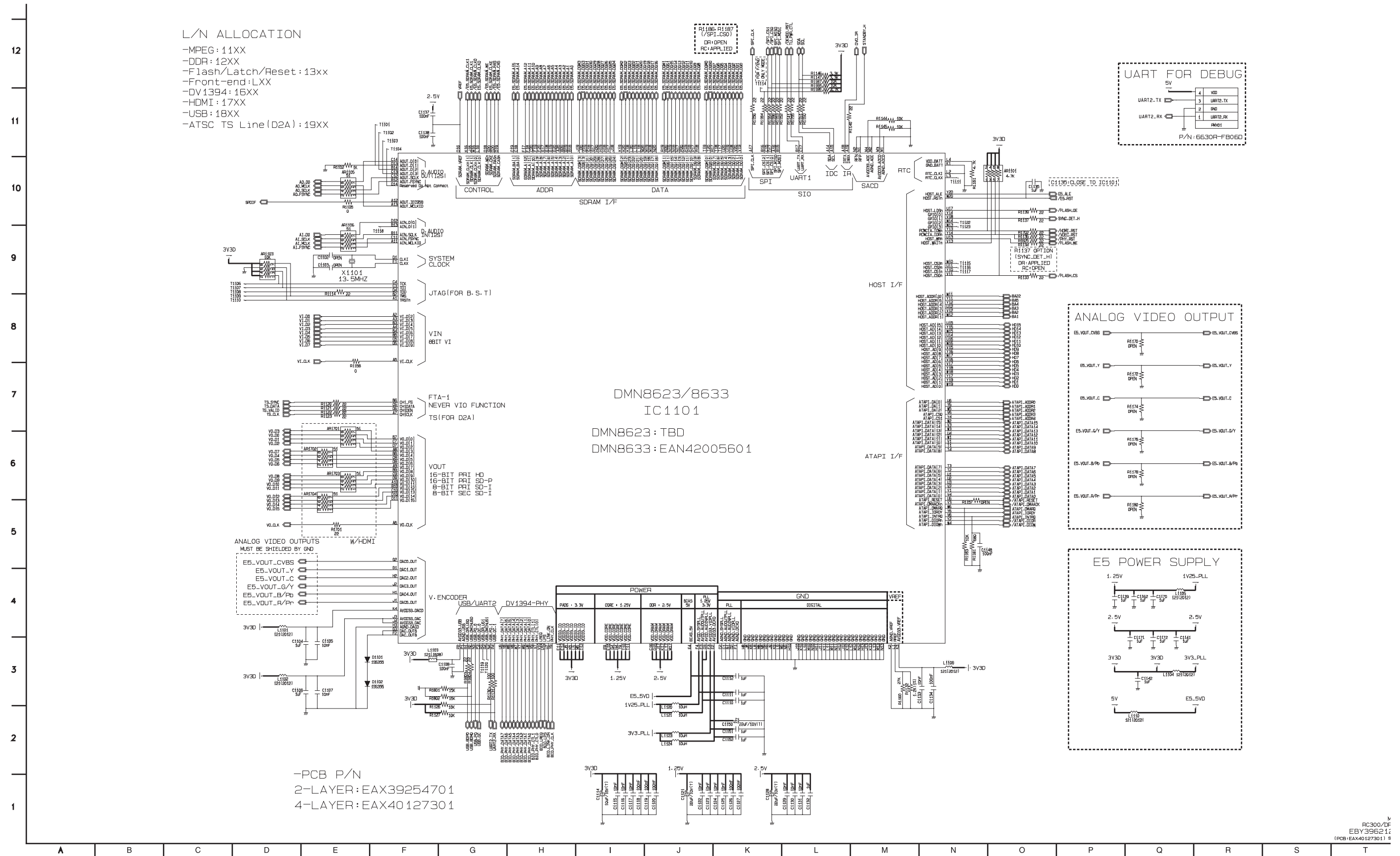


6. DV1394, USB BLOCK DIAGRAM

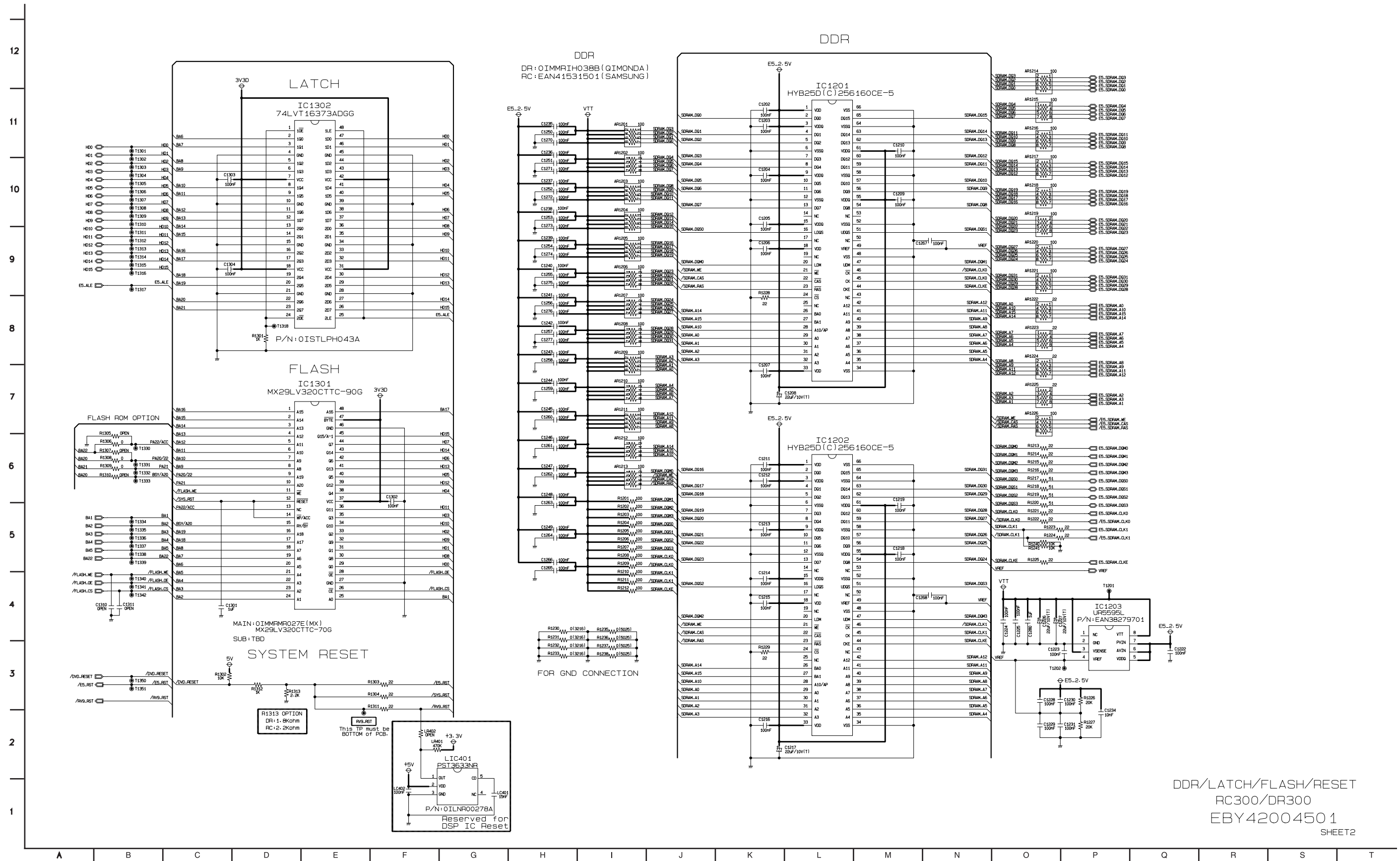


CIRCUIT DIAGRAMS

1. MPEG CIRCUIT DIAGRAM

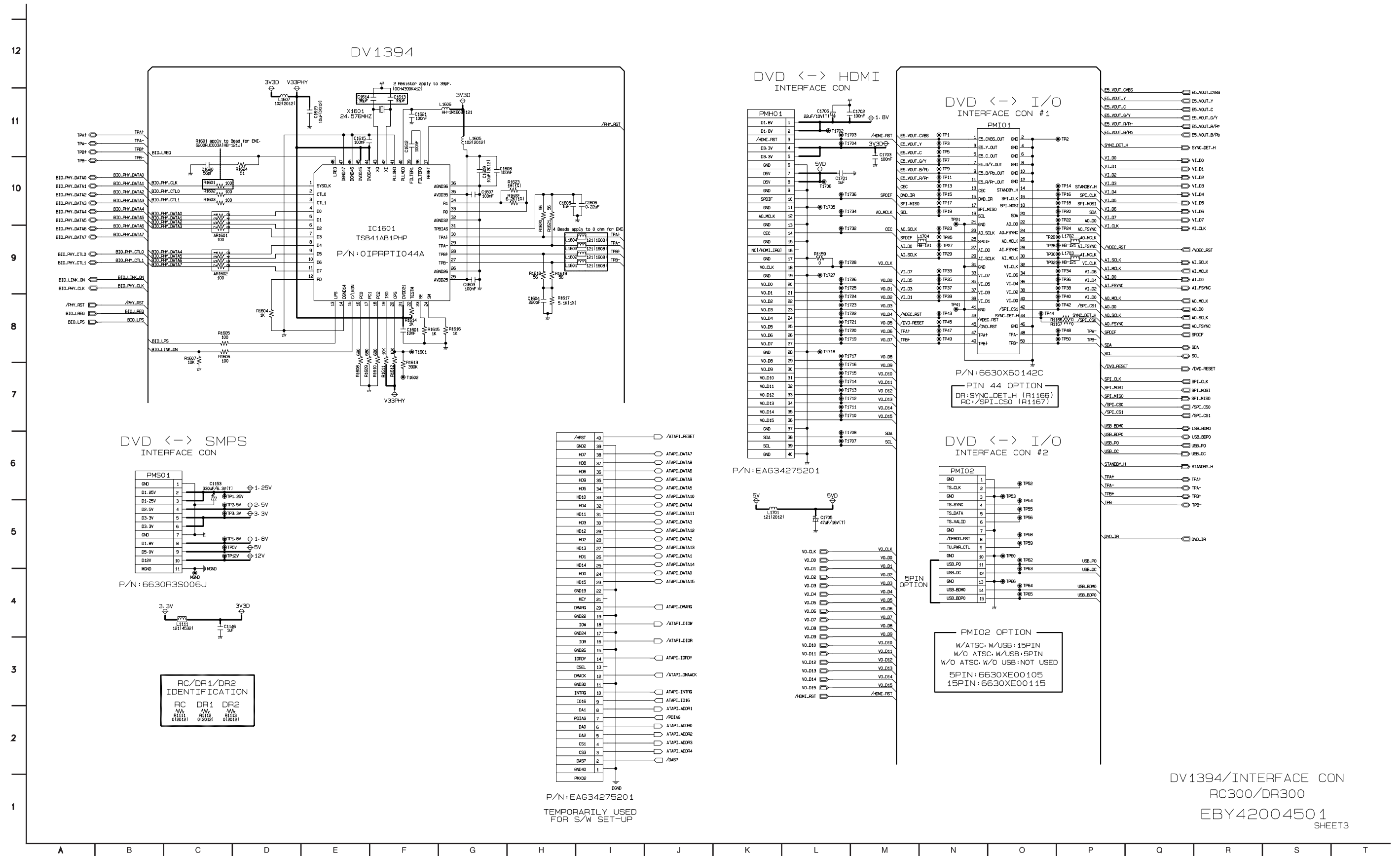


2. DDR, LATCH, FLASH, RESET CIRCUIT DIAGRAM

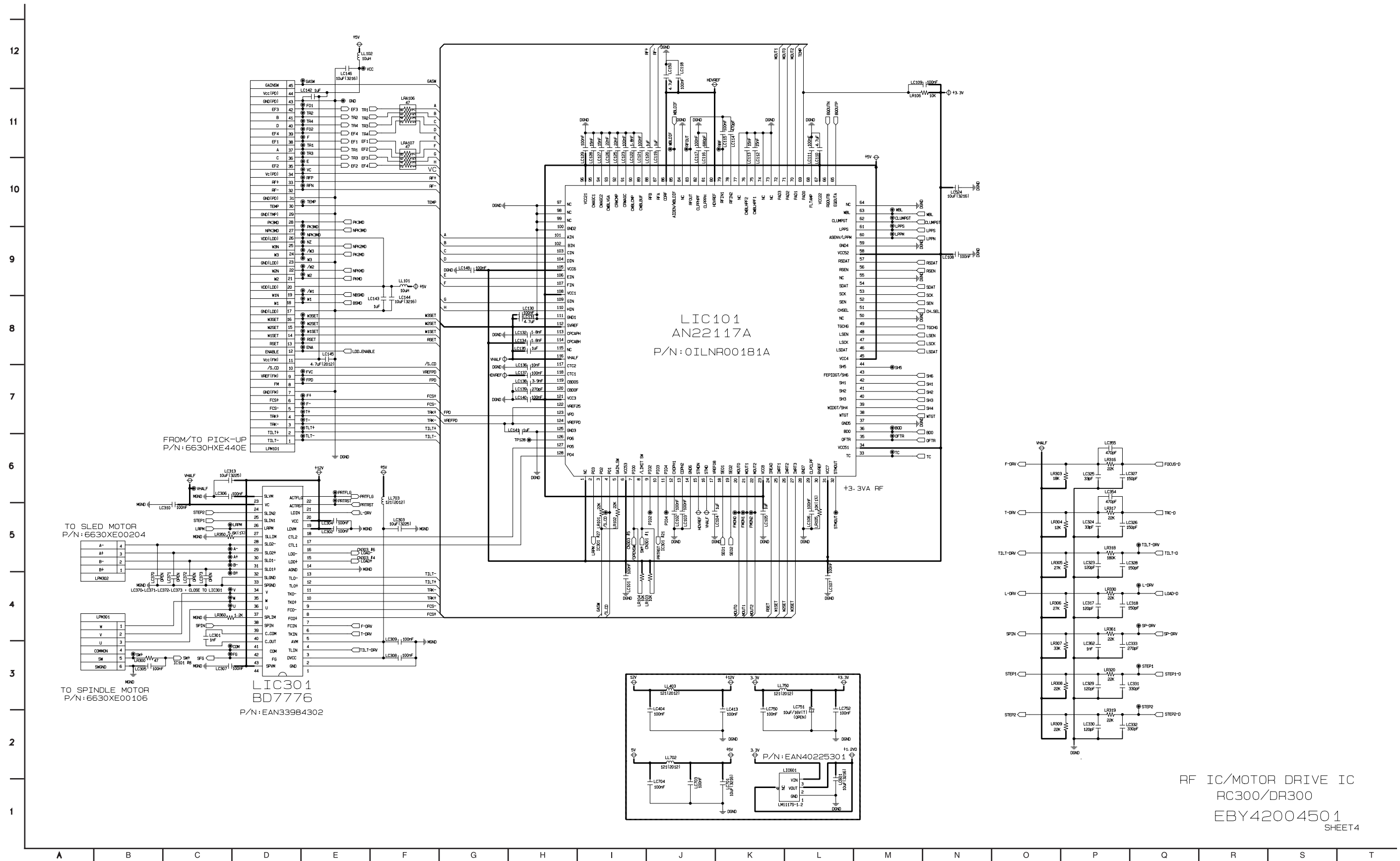


DDR/LATCH/FLASH/RESET
RC300/DR300
EBY42004501
SHEET2

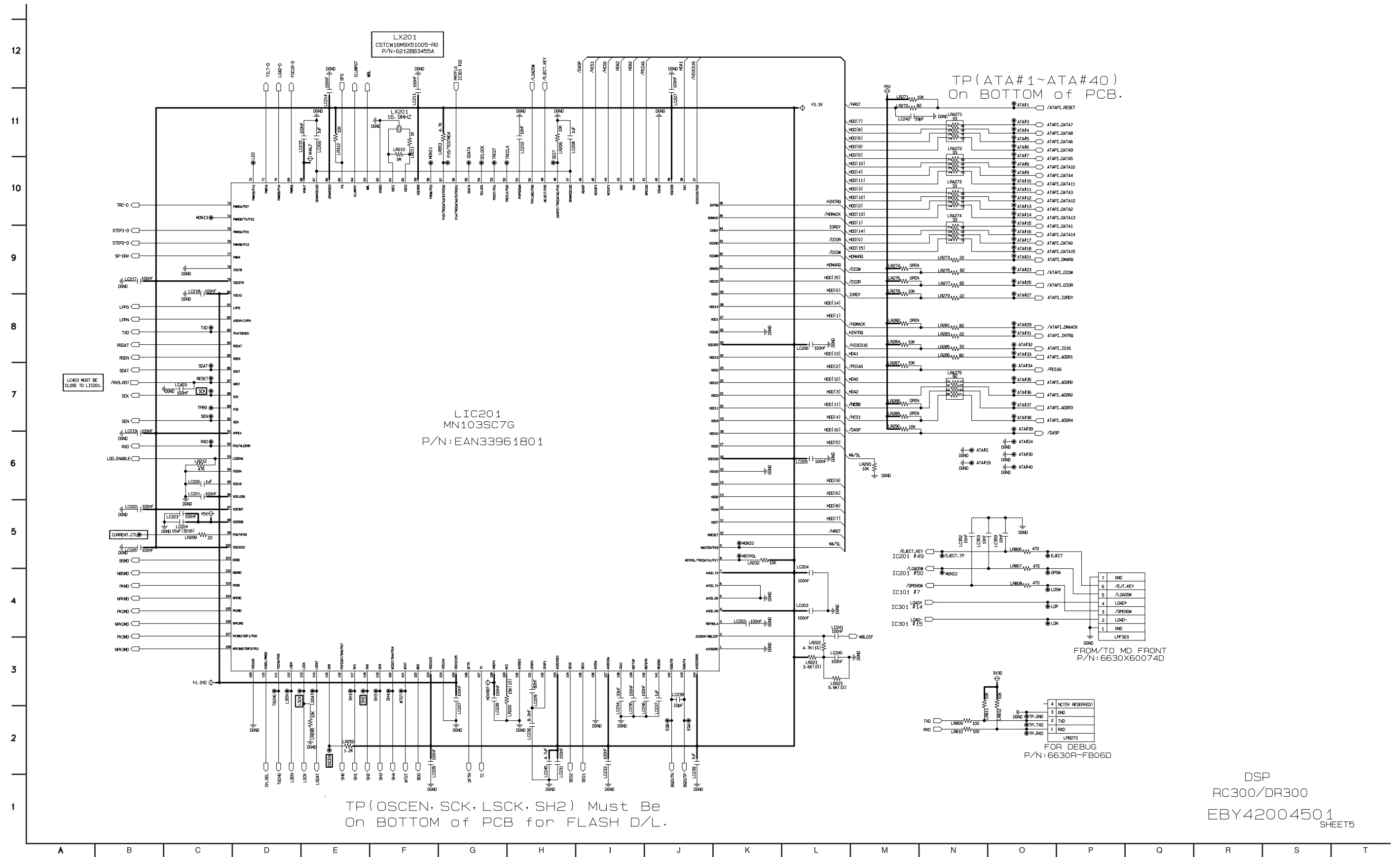
3. DV1394, INTERFACE CON CIRCUIT DIAGRAM



4. RF IC, MOTOR DRIVE IC CIRCUIT DIAGRAM

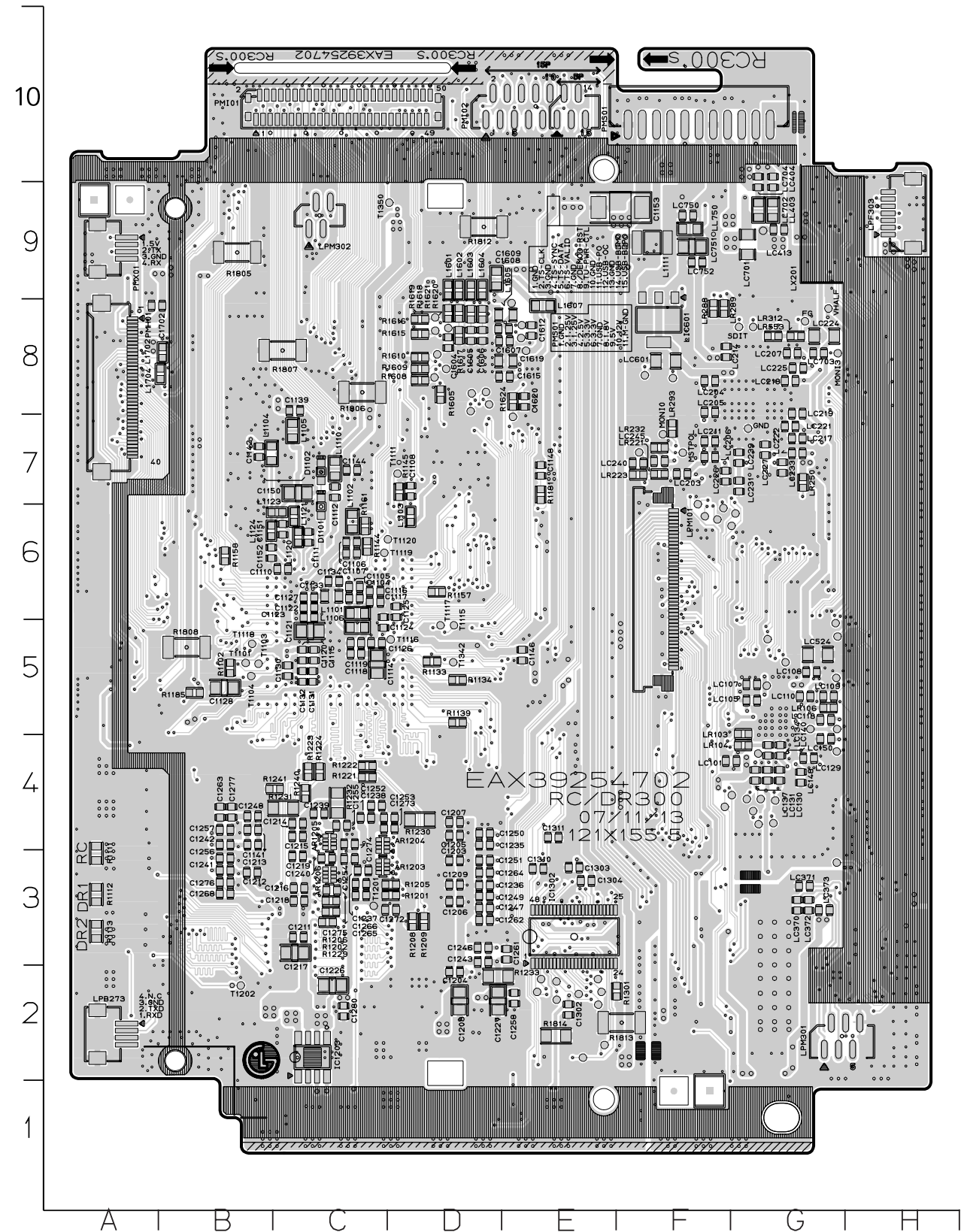


5. DSP CIRCUIT DIAGRAM

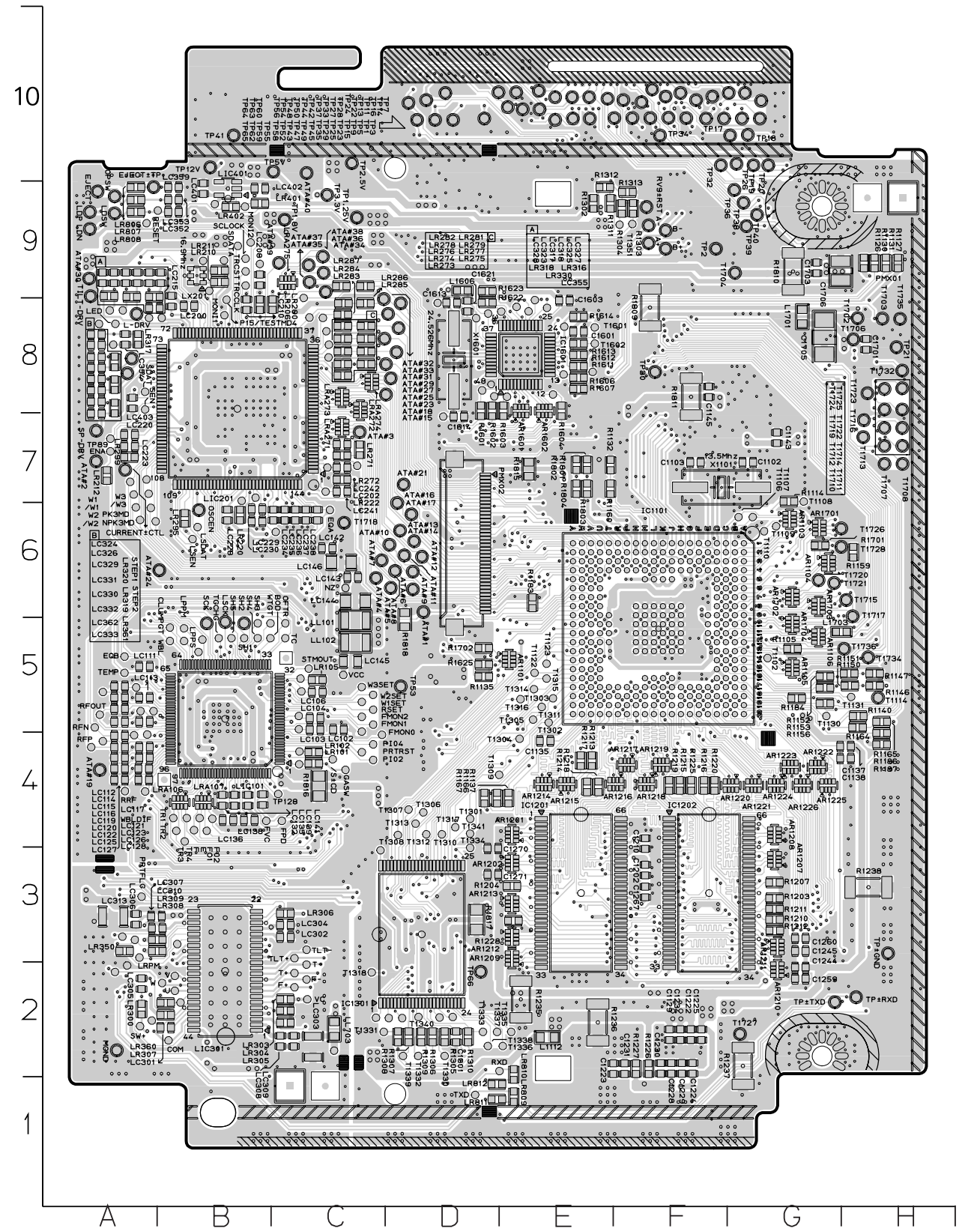


PRINTED CIRCUIT BOARD DIAGRAMS

1. VDR & LOADER P.C.BOARD (TOP VIEW)



(BOTTOM VIEW)



SECTION 4 MECHANISM OF VCR PART(D-37)

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TROUBLESHOOTING GUIDE

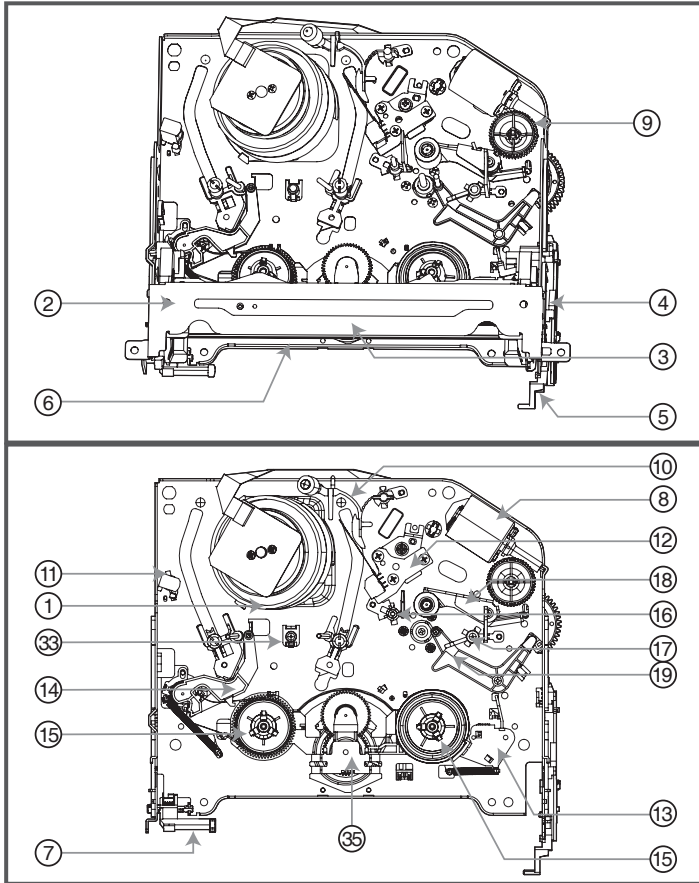
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EXPLODED VIEWS

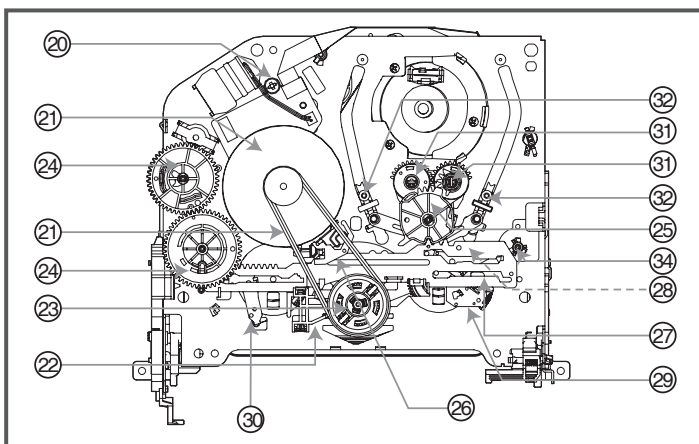
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DECK MECHANISM PARTS LOCATIONS

• Top View



• Bottom View



Starting No.	Procedure	Part	Fixing Type	Ref. Drawings	Position
	1	Drum Assembly	3 screws	A-1	T
	2	Plate Top	2 hooks	A-2	T
2	3	Holder Assembly CST	6 chasses	A-2	T
2,3	4	Gear Assembly Rack F/L	1 hook	A-2	T
2,3,4	5	Opener Door	Chassis Hole	A-2	T
2,3,4,5	6	Arm Assembly F/L	Chassis Hole	A-2	T
	7	Lever Assembly S/W	Chassis Hole, 1 hook	A-2	T
	8	Motor Assembly L/D	1 screw	A-3	T
	9	Gear Wheel	2 hooks	A-3	T
	10	Arm Assembly Cleaner	Chassis Embossing	A-3	T
	11	Head F/E	Chassis Embossing	A-3	T
	12	Base Assembly A/C Head	1 screw	A-3	T
2,3	13	Brake Assembly T	1 hook	A-4	T
2,3	14	Arm Assembly Tension	1 hook	A-4	T
2,3,13,14	15	Reel S / Reel T	Shaft	A-4	T
	16	Base Assembly P4	Chassis Embossing	A-5	T
	17	Opener Lid	Chassis Embossing	A-5	T
17	18	Arm Assembly Pinch	Shaft	A-5	T
17	19	Arm T/up	1 hook	A-5	T
	20	Supporter, capstan	Chassis Hole	A-6	B
17,18	21	Belt Capstan/Motor Capstan	3 screws	A-6	B
	22	Lever F/R	Locking Tab	A-6	B
21, 22	23	Clutch Assembly D37	Washer	A-6	B
	24	Gear Drive/Gear Cam	Washer/Hook	A-7	B
	25	Gear Sector	Hook	A-7	B
21	26	Brake Assembly Capstan	Chassis Hole	A-7	B
21,22,23, 24,25,26	27	Plate Slider	Chassis Guide	A-7	B
21,22,23, 24,25,26,27	28	Lever Tension	1 Hook	A-7	B
21,22,23, 24,25,26,27	29	Lever Spring	1 Hook	A-7	B
21,22,23, 24,25,26,27	30	Lever Brake	1 Hook	A-7	B
25	31	Gear Assembly P2/ Gear Assembly P3	Bass	A-8	B
2, 3, 14, 25, 31	32	Base Assembly P2 /Base Assembly P3	6 Chasses	A-8	B
25, 31	33	Base Loading	3 Hooks	A-8	B
2,3,14	34	Base Tension	Chassis Embossing	A-9	T
	35	Arm Assembly Idler Jog	Locking Tab	A-9	T

T:Top, B:Bottom

NOTE : When reassembling, perform the procedure in the reverse order.

- (1) When reassembling, confirm Mechanism and Mode Switch Alignment Position
- (2) When disassembling, the Parts in the "Starting No." column should be removed first."

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

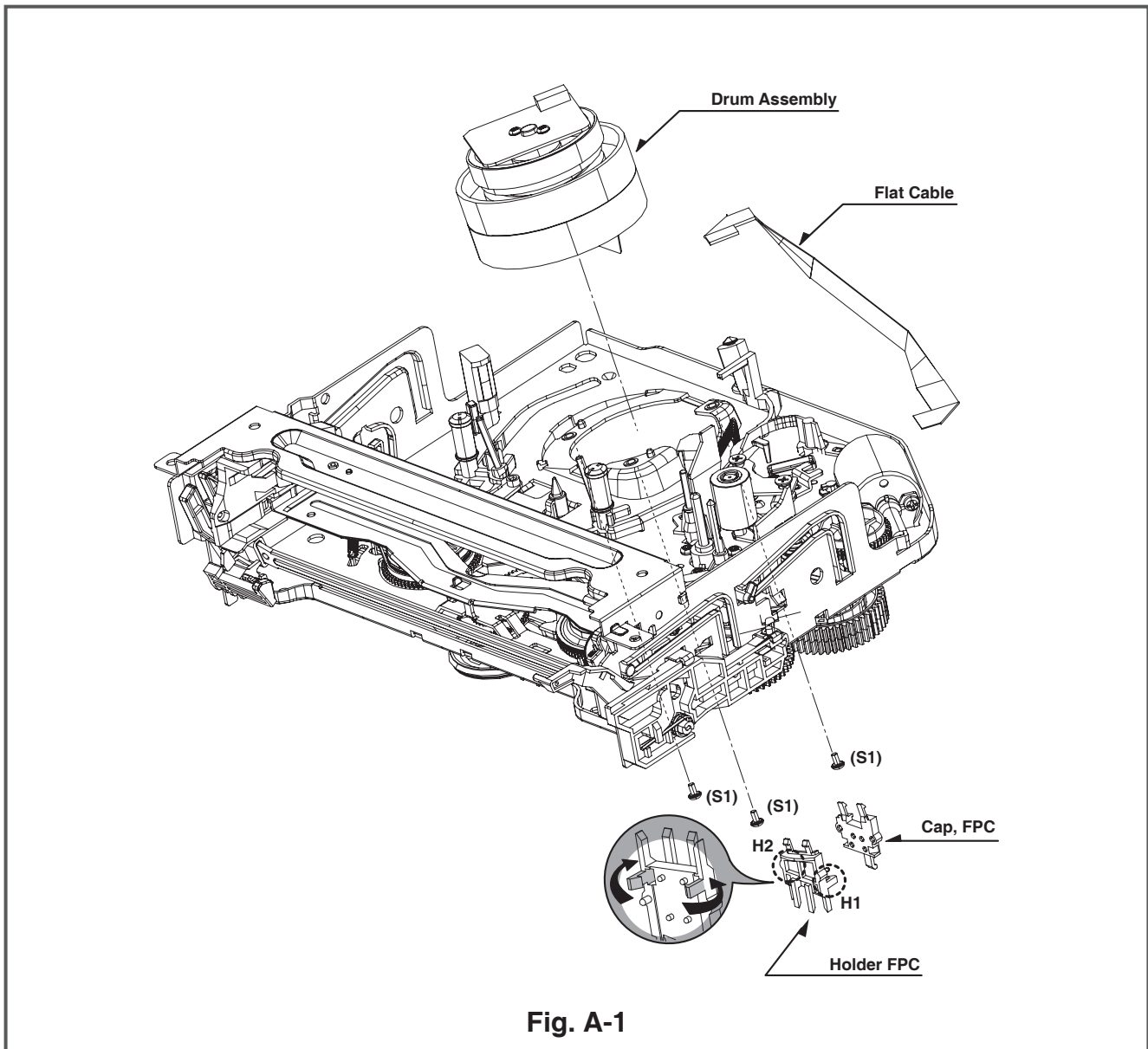
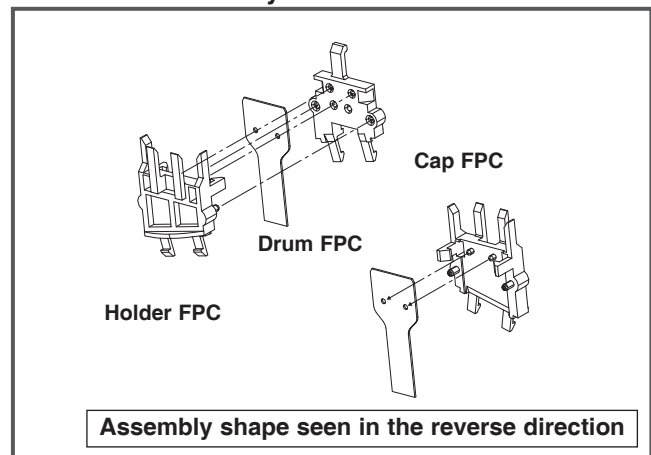


Fig. A-1

1. Disassembly of Drum Assembly (Figure A-1)

- 1) Separate the flat cable from the Drum FPC and the Capstan Motor.
- 2) Release 3 screws (S1) on the bottom side of the chassis, and separate the drum assembly.
- 3) Release the hooks (H1, H2) and separate both the holder FPC and the Cap FPC (disassemble if necessary).

Cautions in assembly of FPC



DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

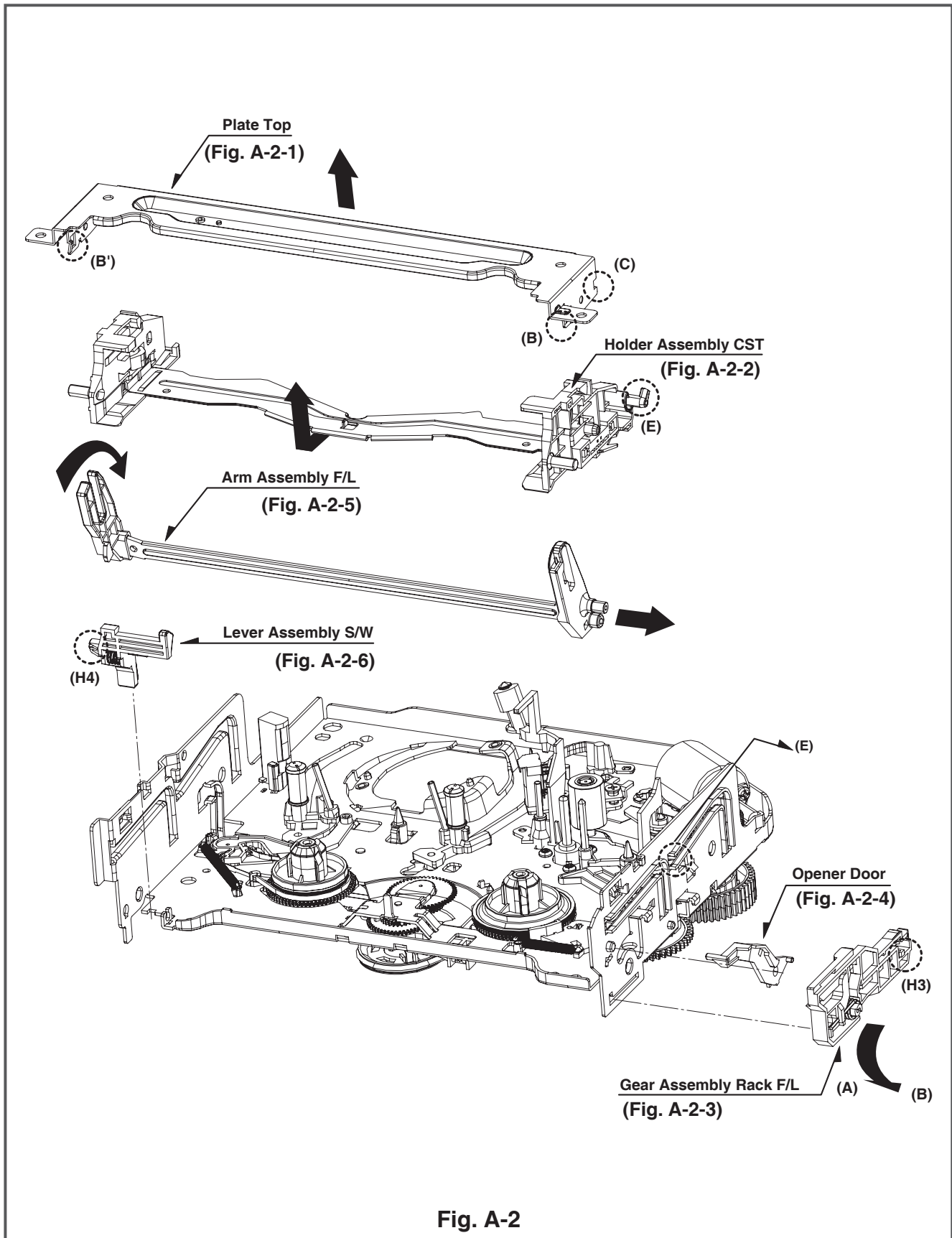


Fig. A-2

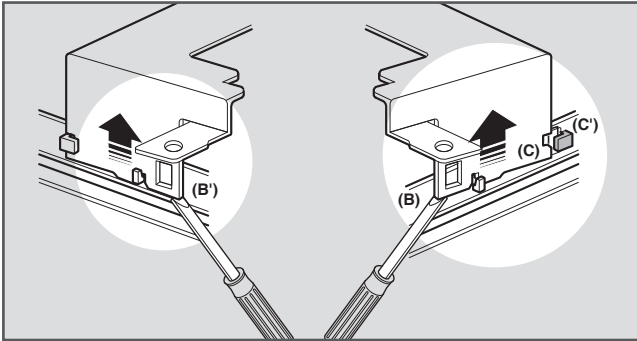
DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

2. Disassembly of Plate Top (Fig. A-2-1)

- 1) Separate the right part while leaning back the (B) part of the plate top toward the arrow direction.
- 2) Separate the left part while leaning back the (B') part of the plate top toward the arrow direction.
(Tool used: Tool such as (-) driver, auger, etc with pointed or flat end)

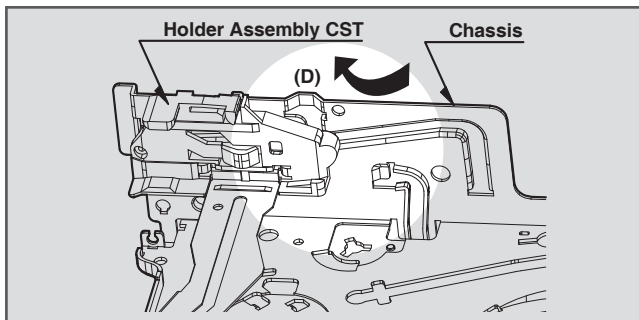
CAUTIONS

Assemble while pressing the (C), (C') part after positioning them as in drawing.



3. Holder Assembly CST (Fig. A-2-2)

- 1) First, separate the left part from the groove on the (D) part of chassis while moving the holder assembly CST toward the arrow direction.



- 2) Separate the right part from each groove of chassis.

CAUTIONS

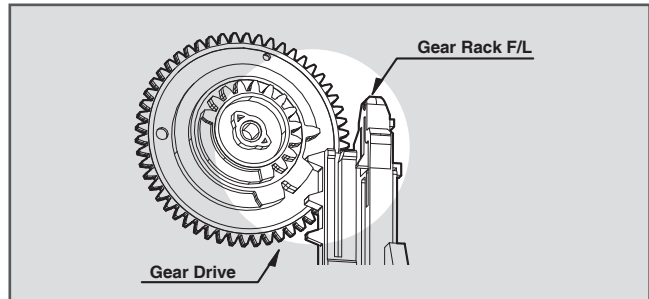
Assemble by inserting the left part after inserting the (E) part of the holder assembly CST into the groove on the (E') part of chassis.

4. Disassembly of Gear Assembly Rack F/L (Fig. A-2-3)

- 1) Separate the hook (H3) while bending hook (3) after moving the gear assembly rack F/L toward the arrow (A) direction.
- 2) Separate the gear assembly rack F/L toward the arrow (B) direction.

CAUTIONS

For re-assembly, mate the gear part of gear assembly rack F/L to the gear drive.



5. Opener Door (Fig. A-2-4)

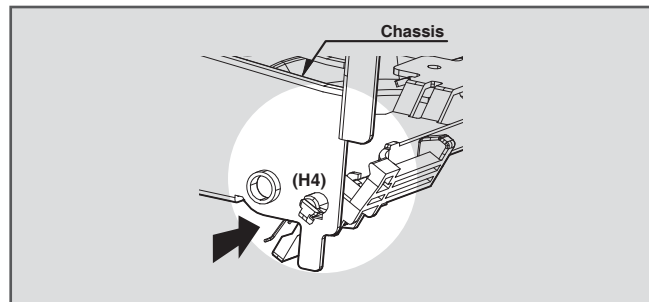
- 1) Separate the opener door from the guide hole of chassis while turning it clockwise.

6. Arm Assembly F/L (Fig. A-2-5)

- 1) First, separate the left part of the arm assembly F/L from the groove of chassis while pushing the arm assembly F/L toward the arrow direction.
- 2) Separate the right part from the groove of chassis.

7. Lever Assembly S/W (Fig. A-2-6)

- 1) Separate the lever assembly S/W while pushing it toward the arrow direction after removing the hook (4) on the left side of chassis.



DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

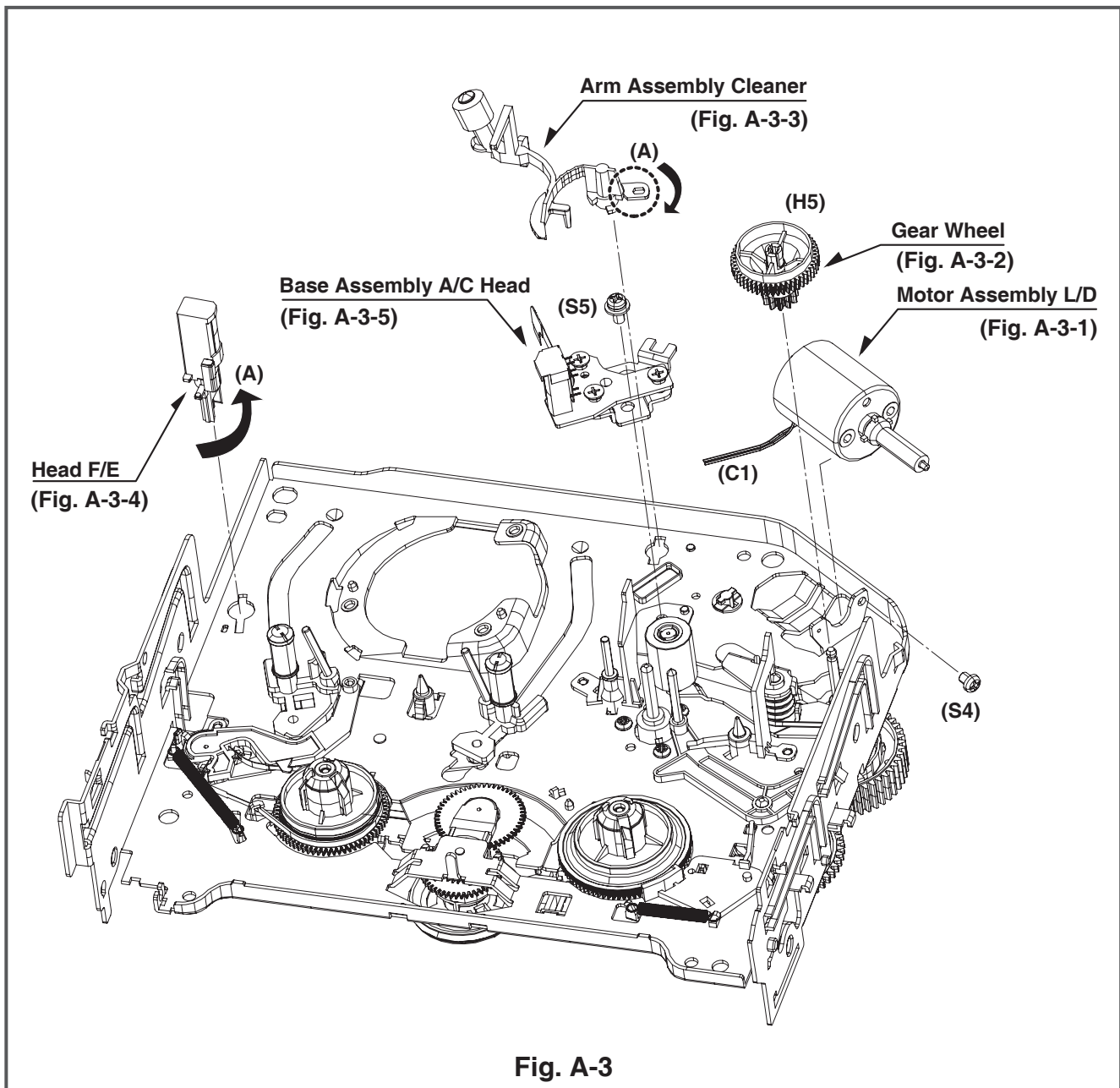


Fig. A-3

8. Motor Assembly L/D (Fig. A-3-1)

- 1) Take the connector (C1) connected to the Capstan motor PCB out.
- 2) Remove the screw (S4) from the chassis and lift motor up.

9. Gear Wheel (Fig. A-3-2)

- 1) Release the hook (H5) of the gear wheel and lift it upward.

10. Arm Assembly Cleaner (Fig. A-3-3)

- 1) Separate the (A) part of Fig. A-3-1 from the embossing of chassis, and hold it up while turning it counter-clockwise.

11. Head F/E (Fig. A-3-4)

- 1) Separate the (A) part of the head F/E from the embossing of chassis, and hold it up while turning it counter-clockwise.

12. Base Assembly A/C Head (Fig. A-3-5)

- 1) Release a screw (S5) and disassemble while holding it up.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

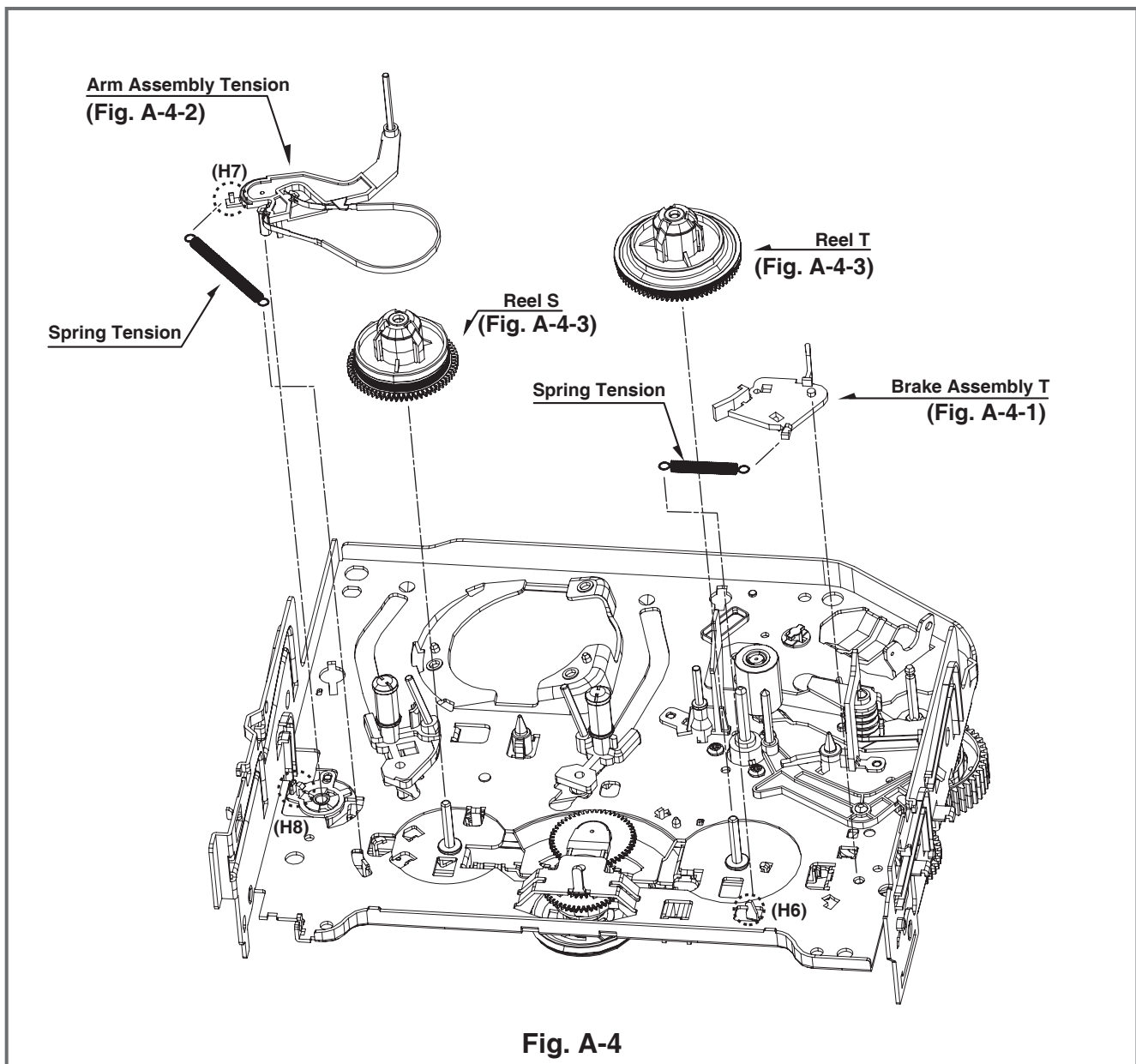


Fig. A-4

13. Brake Assembly T (Fig. A-4-1)

- 1) Release the spring tension from the lever spring hook (H6).
- 2) Disassemble the brake assembly T while lifting it upward.

14. Arm Assembly Tension (Fig. A-4-2)

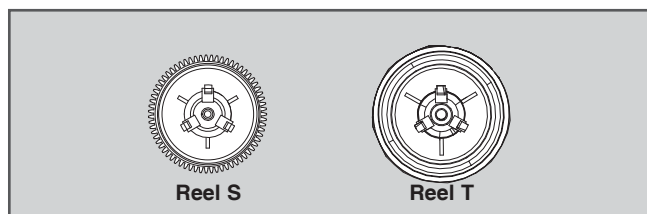
- 1) Release the spring tension (H7) from the arm assembly tension.
- 2) After releasing the hook (H8) of the base tension, separate it while lifting it up.

CAUTIONS

Spring used for both brake assembly T and arm assembly tension is used (2EA used).

15. Reel S/Reel T (Fig. A-4-3)

- 1) Disassemble the reel S/ reel T while lifting it up (comparison between Reel S and Reel T)



DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

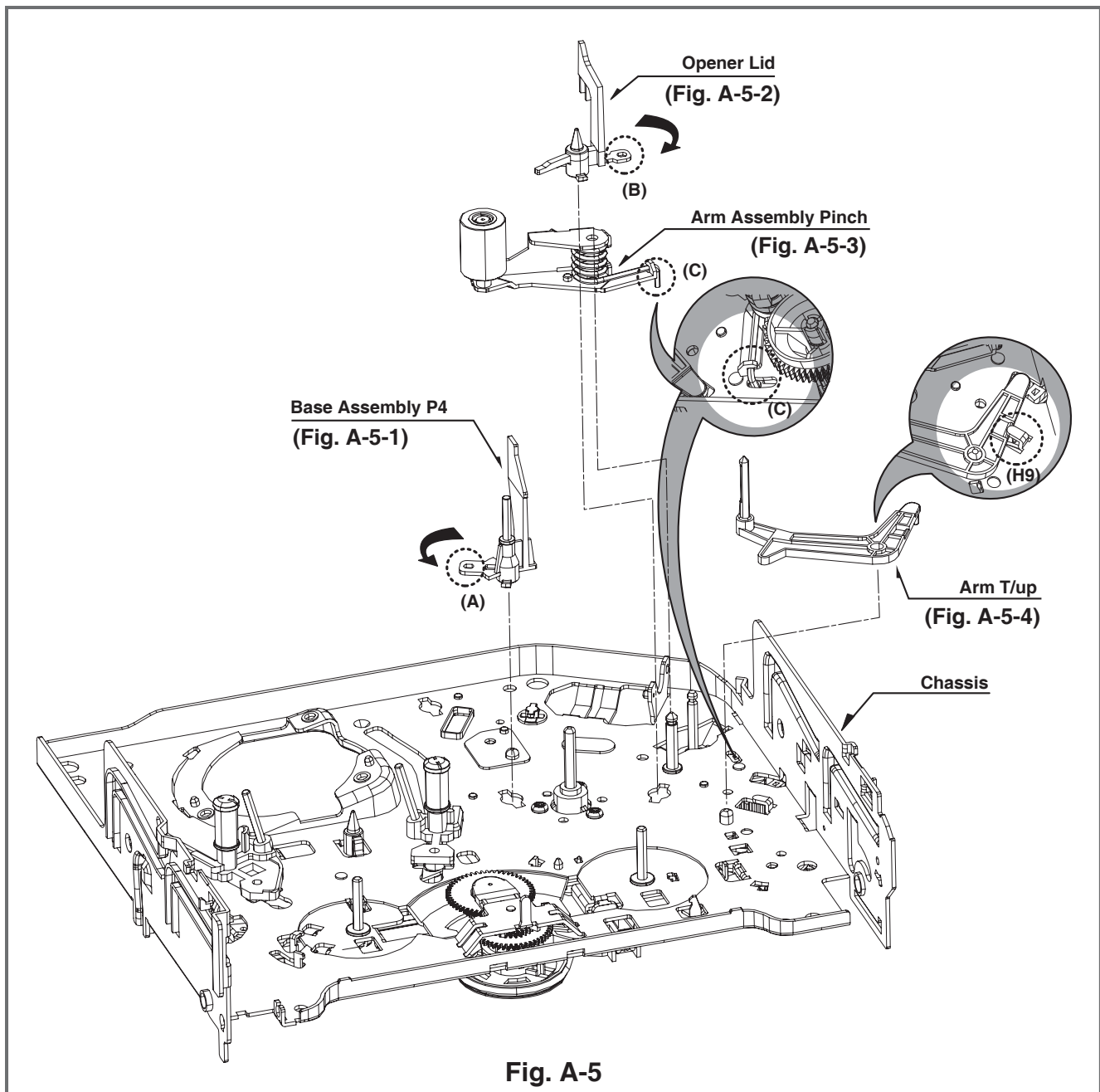


Fig. A-5

16. Base Assembly P4 (Fig. A-5-1)

- 1) Release the (A) part of the base assembly P4 from the embossing of chassis.
- 2) Hold the base assembly P4 up while turning it counter-clockwise.

17. Opener Lid (Fig. A-5-2)

- 1) Release the (B) part of the opener lid from the embossing of chassis.
- 2) Disassemble the opener lid upward while turning it counter-clockwise.

18. Arm Assembly Pinch (Fig. A-5-3)

- 1) Lift the arm assembly pinch up.

19. Arm T/up (Fig. A-5-4)

- 1) Turn the arm T/up to release the anchor jaw (H9) part of chassis and then lift it upward.

CAUTIONS

For the assembly, check the (C) part of the arm assembly pinch is assembled as in drawing.

- REVERSE THE MECHANISM.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

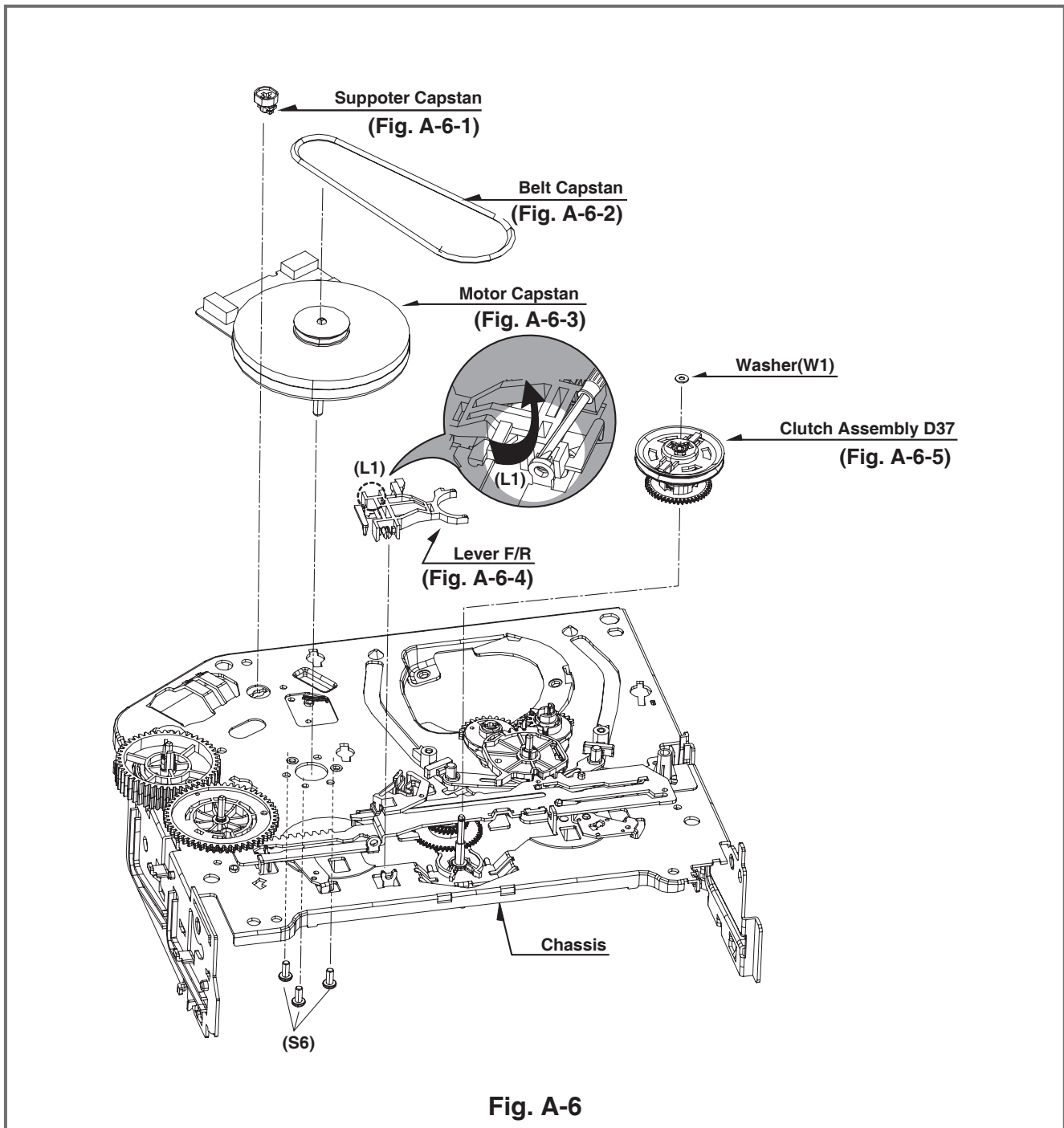


Fig. A-6

20. Supporter, Capstan (Fig. A-6-1)

- 1) Turn the supporter and Capstan by 90 deg. clockwise with a driver, for disassembly.

21. Belt Capstan (Fig. A-6-2) / Motor Capstan (Fig. A-6-3)

- 1) Separate the belt Capstan.
- 2) Undo 3 screws (S6) on the bottom side of chassis and disassemble it upward.

22. Lever F/R (Fig. A-6-4)

- 1) Release the locking tab (L1) and then disassemble it upward.

23. Clutch Assembly D37 (Fig. A-6-5)

- 1) Remove the washer (W1) and then disassemble it upward.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

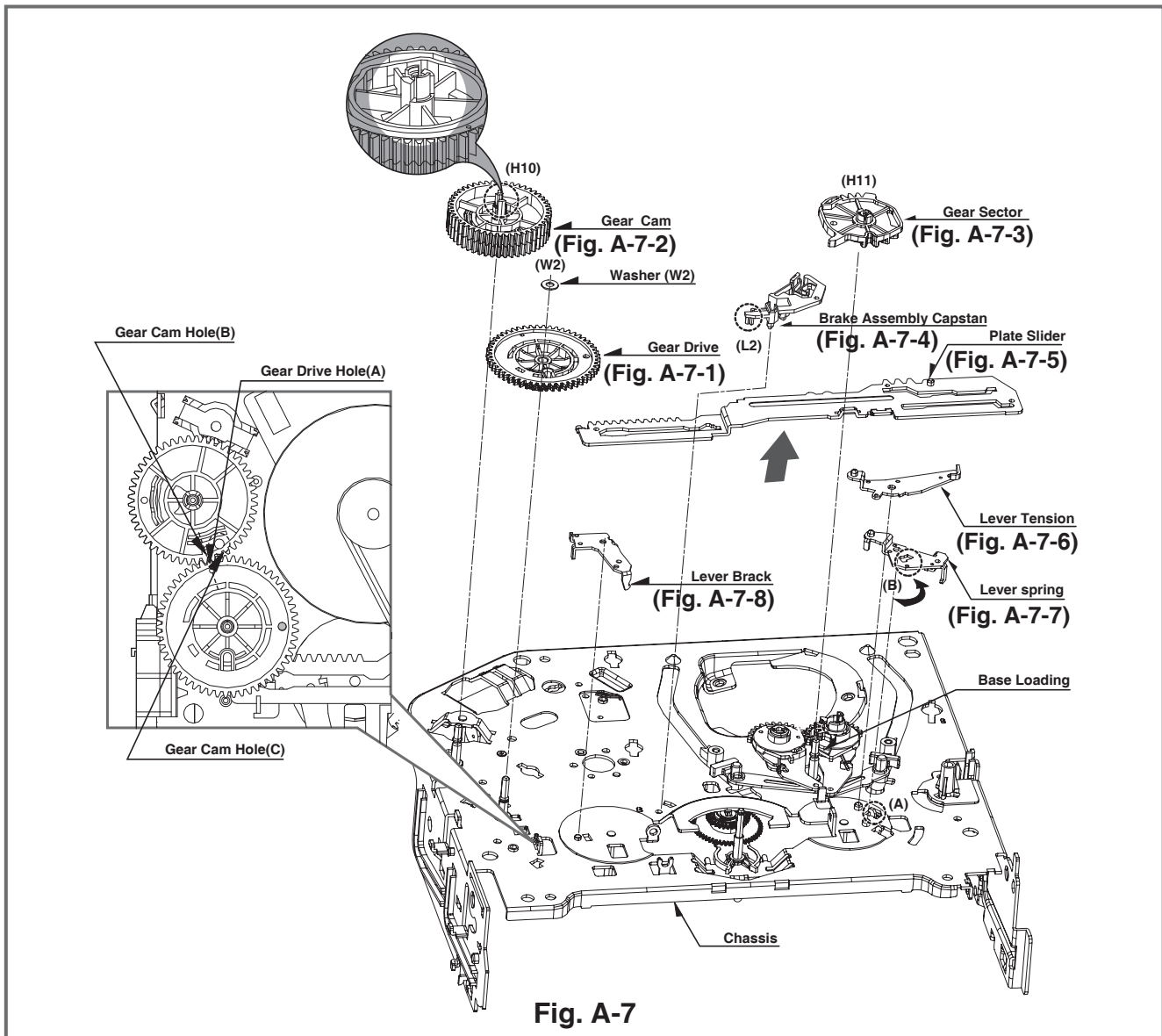


Fig. A-7

24. Gear Drive (Fig. A-7-1)/ Gear Cam (Fig. A-7-2)

- 1) Remove the washer (W2) and then disassemble the gear drive.
- 2) Release the hook (H10) of the gear cam and then disassemble it upward.

CAUTIONS

For the assembly, adjust both the gear drive hole (A) and the gear cam hole (B) straightly and then line up the gear cam hole (C) to the chassis hole.

25. Gear Sector (Fig. A-7-3)

- 1) Release the hook (H11) of the gear sector and then lift the gear sector upward.

26. Brake Assembly Capstan (Fig. A-7-4)

- 1) Release the locking tab (L2) on the bottom side of the plate slider and then disassemble it upward.

27. Plate Slider (Fig. A-7-5)

- 1) Disassemble the plate slider while lifting it up.

28. Lever Tension (Fig. A-7-6)

- 1) Release the lever tension from the guide (A) of chassis while turning it counter-clockwise.
- 2) Disassemble the lever tension while lifting it up.

29. Lever Spring (Fig. A-7-7)

- 1) Release the (B) part of the lever spring from the guide (A) of chassis while turning it counter-clockwise.
- 2) Disassemble the lever tension while lifting it up.

30. Lever Brake (Fig. A-7-8)

- 1) Disassemble the lever brake while lifting it up.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

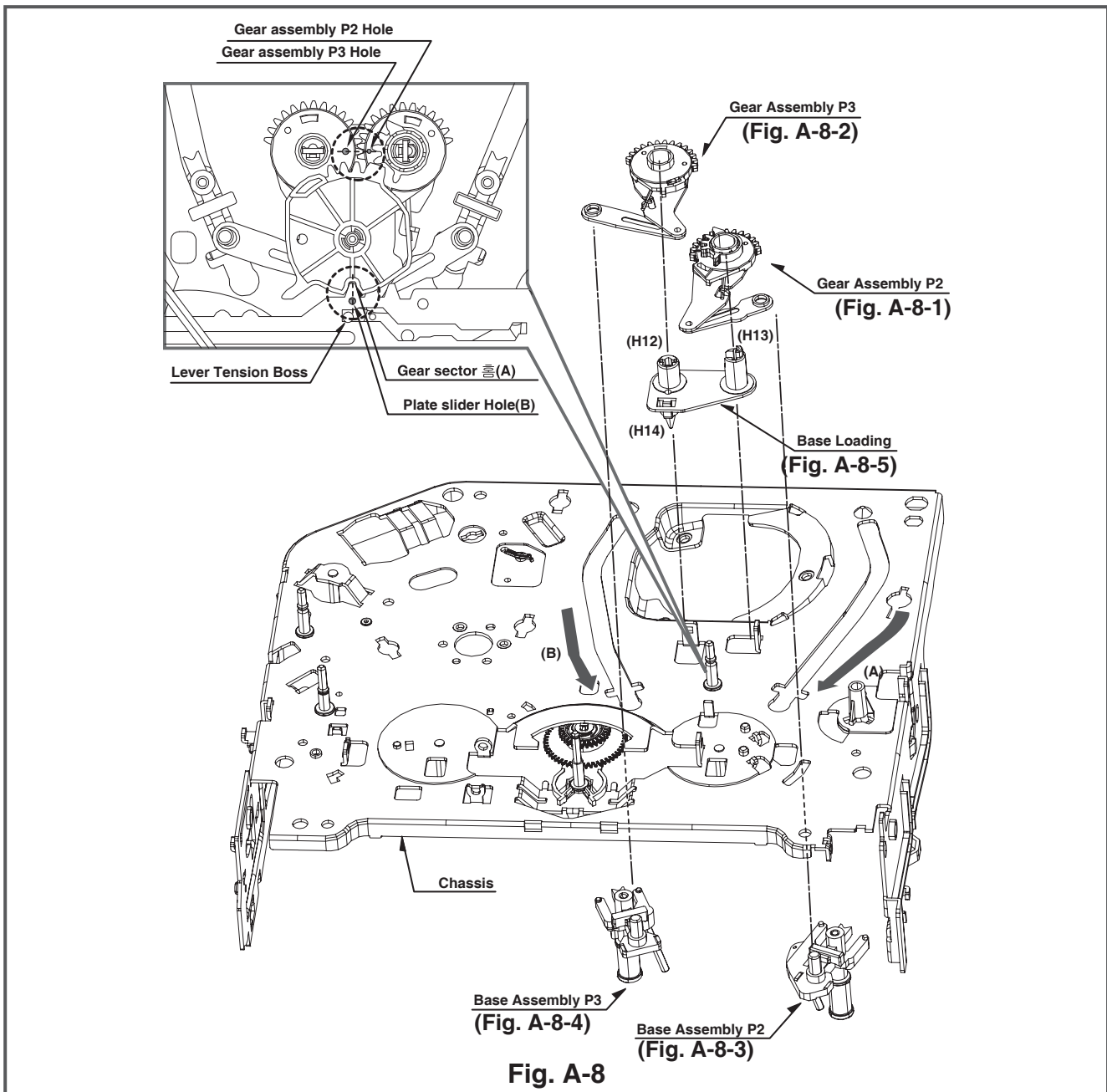


Fig. A-8

31. Gear Assembly P2 (Fig. A-8-1)/ Gear Assembly P3 (Fig. A-8-2)

- 1) Lift the gear assembly P2 upward.
- 2) Lift the gear assembly P3 upward.

CAUTIONS

For the assembly, check that the holes of both the gear assembly P2 and P3 are adjusted straightly, and then line up the gear section groove (A) to the plate slider hole (B).

32. Base Assembly P2 (Fig. A-8-3)/ Base Assembly P3 (Fig. A-8-4)

- 1) Disassemble the base assembly P2 downward while moving it toward the arrow (A) direction along with the guide hole of chassis.
- 2) Disassemble the base assembly P2 downward while moving it toward the arrow (B) direction along with the guide hole of chassis.

33. Base Loading (Fig. A-8-5)

- 1) Release 3 hooks (H12, 13, 14) of the base loading, and then disassemble them upward.
- Reverse the mechanism.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

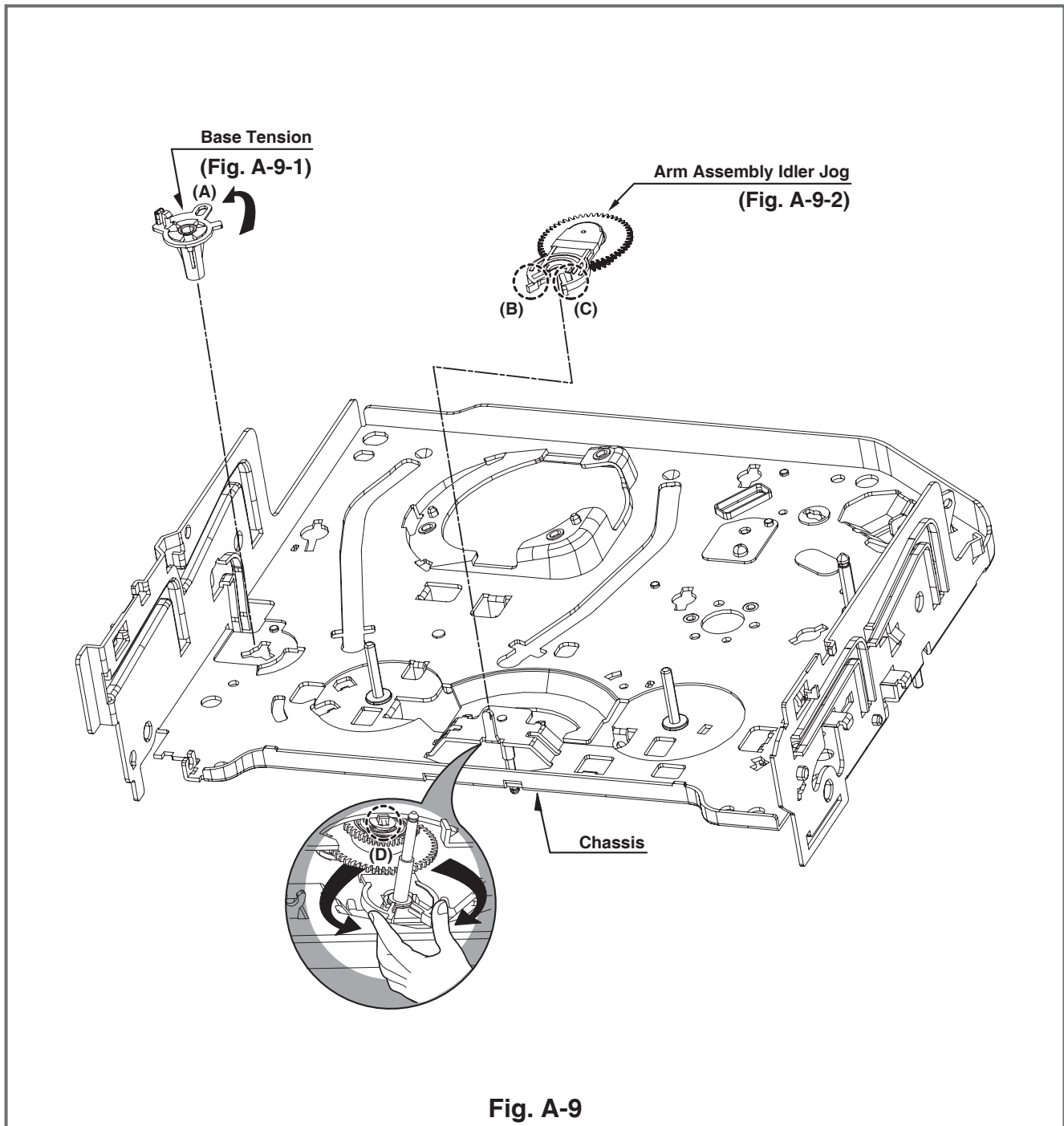


Fig. A-9

34. Base Tension (Fig. A-9-1)

- 1) Release the (A) part of the base tension from the embossing of chassis.
- 2) Lift the base tension upward while turning it anti-clockwise.

35. Arm assembly Idler Jog (Fig. A-9-2)

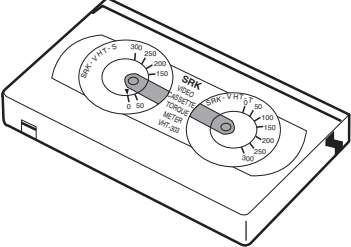
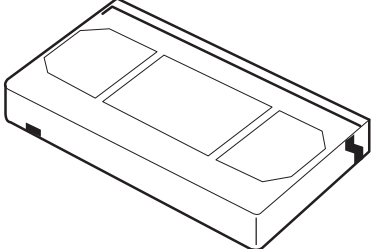
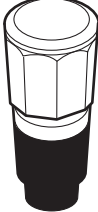

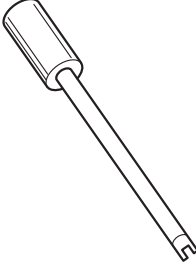
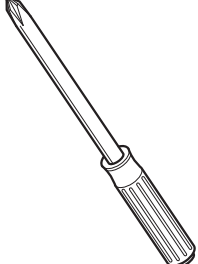
- 1) Push both (B), (C) parts in Fig. A-9-2 toward the arrow direction.
- 2) Disassemble the arm assembly idler upward.

CAUTIONS

Take care to ensure that the (D) part in the drawing is not hung on chassis in disassembly.

DECK MECHANISM ADJUSTMENT

• Fixtures and Tools for Service

<p>1. Cassette Torque Meter SRK-VHT-303(Not SVC part) Part No:D00-D006</p>  <p>A cassette-shaped torque meter with two circular gauges on top. The left gauge is labeled 'SRK VHT-303 TORQUE METER MT-303' and has a scale from 0 to 250. The right gauge is labeled 'SRK VHT-303' and has a scale from 0 to 100.</p>	<p>2. Alignment tape Part No NTSC:DTN-0001 PAL:DTN-0002</p>  <p>A rectangular alignment tape with a central slot and two smaller rectangular sections on either side.</p>	<p>3. Torque gauge 600g.Cm ATG Part No:D00-D002</p>  <p>A cylindrical torque gauge with a black base and a silver top section.</p>
<p>4. Torque gauge adaptor Part No:D09-R001</p>  <p>A small cylindrical adaptor with a central opening and a textured top surface.</p>	<p>5. Post height adjusting driver Part No:DTL-0005</p>  <p>A long, thin driver with a cylindrical handle and a pointed tip.</p>	<p>6. + Type driver (ø5)</p>  <p>A standard Phillips (+) type screwdriver with a textured handle.</p>

DECK MECHANISM ADJUSTMENT

1. Mechanism Assembly Mode Check

Purpose of adjustment : To make tools normally operate by positioning tools accurately.

Fixtures and tools used	VCR (VCP) status	Checking Position
• Blank Tape (empty tape)	• Eject Mode (with cassette withdrawn)	• Mechanism and Mode Switch
1) Turn the VCR on and take the tape out by pressing the eject button. 2) Separate both top cover and plate top, and check both the hole (A) of gear cam and the hole (A') of chassis correspond (Fig. C-2). 3) If it is done as in the paragraph 2): Turn the gear cam as in No.2) after dismantling the motor assembly L/D.	4) Undo the screw fixing the deck and the main frame, and separate the deck assembly. Check both the hole (A) of gear cam and the hole (A') of chassis correspond (Fig. C-1). 5) Check the mode S/W on the main P.C. board locates at a proper position as in (B) of the Fig. (C-1). 6) Connect the deck to the main P.C. board and perform all types of test.	

CHECK DIAGRAM

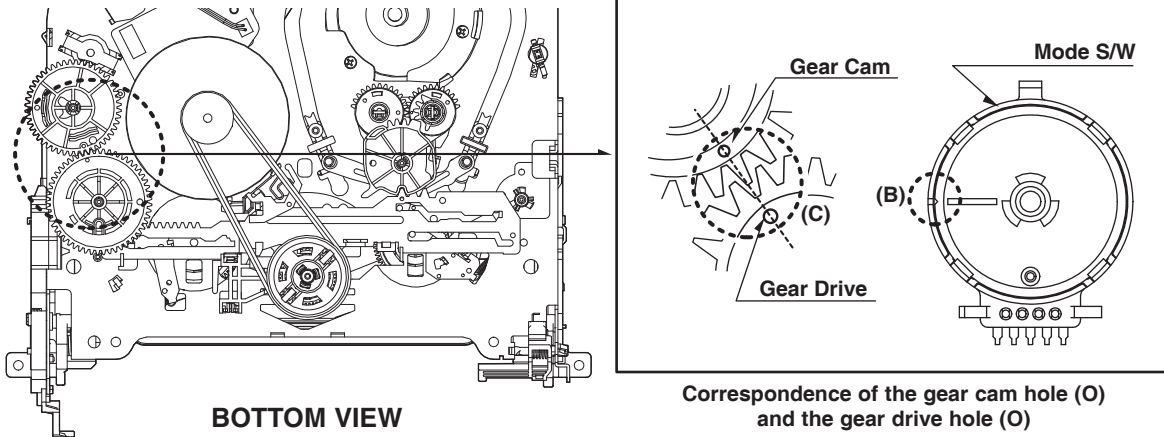


Fig. C-1

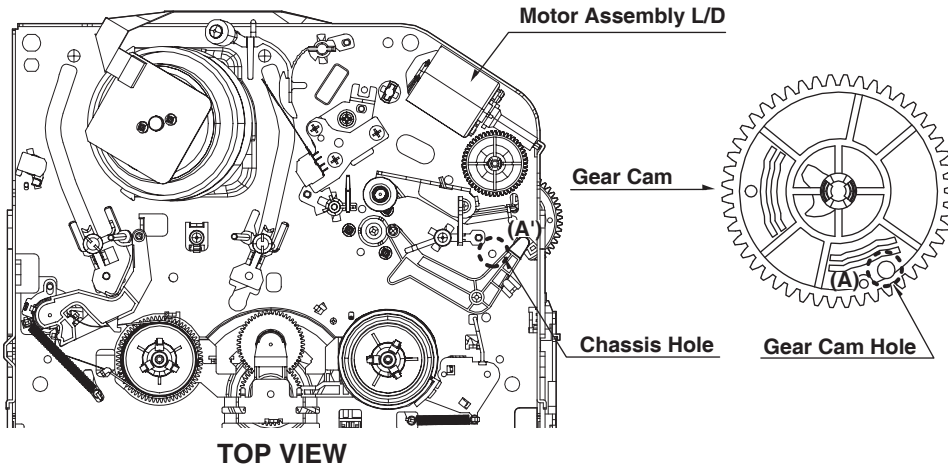


Fig. C-2

DECK MECHANISM ADJUSTMENT

2. Previous Preparation for Deck Adjustment

(Preparation to load the VCR (VCP) with cassette tape not inserted)

- 1) Unplug the power cord.
- 2) Separate the top cover and the plate assembly top.
- 3) Plug in power cord.
- 4) Turn the VCR (VCP) on and load the cassette while pushing the lever stopper of the holder assembly CST backward. In this case, clog both holes on the housing rail part of chassis to prevent detection of the end sensor.

If doing so, proceeding to the stop mode is done. In this status, input signals of all modes can be received. However, operation of the Rewind and the Review is impossible since the take-up reel remains at stop status and so cannot detect the reel pulse (however, possible for several seconds).

3. Torque Measuring

Purpose of Measuring: To measure and check the reel torque on the take-up part and the supply part that performs basic operation of the VCR (VCP) for smoothly forwarding the tape.
Measure and check followings when the tape is not smoothly wound or the tape velocity is abnormally proceeded:

Fixtures and tools used	VCR (VCP) status	Measuring method		
<ul style="list-style-type: none"> • Torque Gauge (600 g.cm ATG) • Torque Gauge Adaptor • Cassette Torque Meter SRK-VHT-303 	<ul style="list-style-type: none"> • Play (FF) or Review (REW) Mode 	<ul style="list-style-type: none"> • Try to operate the VCR (VCP) per mode with the tape not inserted (See '2. Prior Preparation for Deck Adjustment). • Measure after adhering and fixing the torque gauge adaptor to the torque gauge (Fig. C-3-1) • Read scale of the supply or take-up part of the cassette torque meter (Fig. C-3-2). 		
Item	Mode	Instruments	Reel Measured	Measuring Value
Fast forward Torque	Fast Forward	Torque Gauge	Take-Up Reel	More than 400g°cm
Rewind Torque	Rewind	Torque Gauge	Supply Reel	More than 400g°cm
Play Take-Up Torque	Play	VHT-303	Take-Up Reel	40~100g°cm
Review Torque	Review	VHT-303	Supply Reel	120~210g°cm

NOTE

Adhere the torque gauge adaptor to the torque gauge for measuring the value.

• Cassette Torque Meter (SRK-VHT-303)

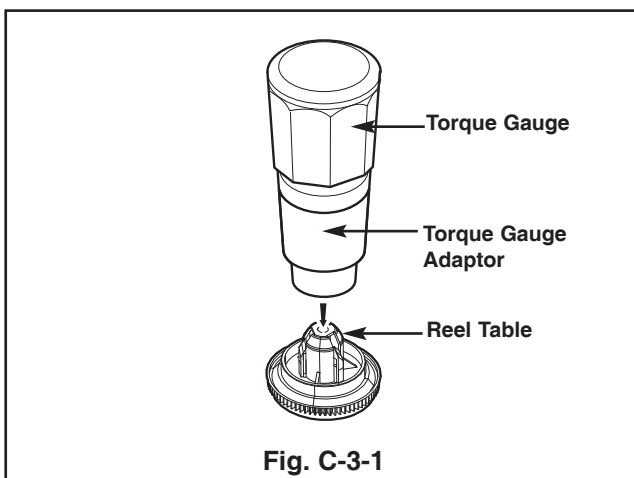


Fig. C-3-1

• Torque Gauge (600g.cm ATG)

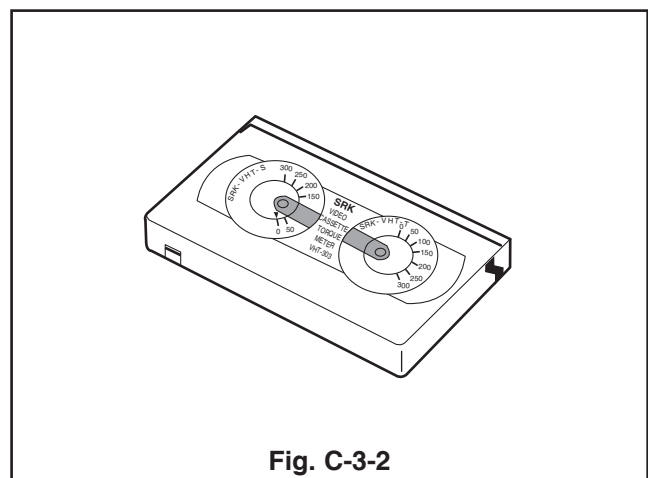


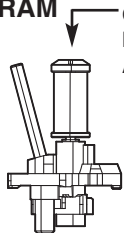
Fig. C-3-2

DECK MECHANISM ADJUSTMENT

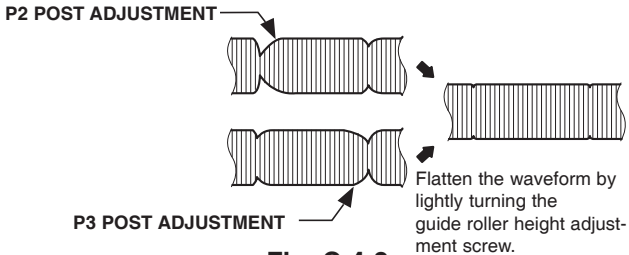
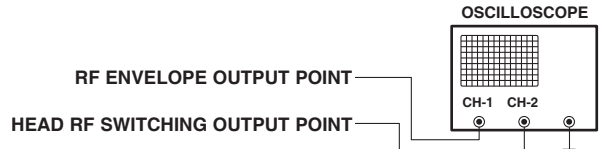
4. Guide Roller Height Adjustment

Purpose of adjustment: To ensure that the bottom surface of the tape can travel along with the tape lead line of the lower drum by constantly adjusting and maintaining the height of the tape.

4-1. Prior Adjustment

Fixtures and tools used	VCR (VCP) status	Adjustment position
<ul style="list-style-type: none"> • Post Height Adjusting Driver 	<ul style="list-style-type: none"> • Play or Review Mode 	<ul style="list-style-type: none"> • The guide roller height adjusting screw on the supply guide roller and the take-up guide roller
Adjustment Procedure <ol style="list-style-type: none"> 1) Move the tape and check the bottom surface of the tape travels along with the guide line of the lower drum. 2) If the tape travels toward the lower part of guide line on the lower drum, turn the guide roller height adjusting screw to the left 3) If it travels to the upper part, turn it to the right. 4) Adjust the height of the guide roller to ensure that the tape is guided on the guide line of the lower drum at the inlet/outlet of the drum. (Fig. C-4-1) 		ADJUSTMENT DIAGRAM  Fig. C-4-1

4-2. Fine Adjustment

Fixtures and tools used	Measuring tools and connection position	VCR (VCP) status	Adjustment position
<ul style="list-style-type: none"> • Oscilloscope • Standard test tape • Post height adjusting driver 	<ul style="list-style-type: none"> • CH-1: PB RF Envelope • CH-2: NTSC : SW 30Hz PAL : SW 25Hz • Head switching output point • RF Envelope output point 	<ul style="list-style-type: none"> • Play the standard test tape. 	<ul style="list-style-type: none"> • Guide roller height adjusting screw
<ol style="list-style-type: none"> 1) Play the standard test tape after connecting the probe of oscilloscope to the RF envelope output point and the head switching output point. 2) Tracking control (playback): Locate it at the center. (Set the RF output to the maximum value via the tracking control when such adjustment is completed after the drum assembly is replaced.) 3) Height adjusting screw: Flatten the RF waveform. (Fig. C-4-2) 4) Move the tracking control (playback) to the right/left. (Fig. C-4-3) 5) Check that the start and the end of the RF output reduction width are constant. 		Waveform  Fig. C-4-2	
<p>CAUTIONS</p> <p>There must exist no crumpling and folding of the tape due to excess adjustment or insufficient adjustment.</p>		Connection Diagram  Fig. C-4-2	

DECK MECHANISM ADJUSTMENT

5. Audio/Control (A/C) Head Adjustment

Purpose of adjustment : To ensure that audio and control signals can be recorded and played correctly by constantly maintaining distance between tape and head, and tape tension between the P3 post and the P4 post.

5-1. Prior Adjustment (performed only when no audio output appears in play of the standard test tape)

Fixtures and tools used	VCR (VCP) status	Adjustment position
<ul style="list-style-type: none"> Blank Tape (Empty Tape) Driver (+) Type ϕ 5 	<ul style="list-style-type: none"> Play the blank tape (empty tape). 	<ul style="list-style-type: none"> Tilt adjusting screw (C) Height adjusting screw (B) Azimuth adjusting screw (A)

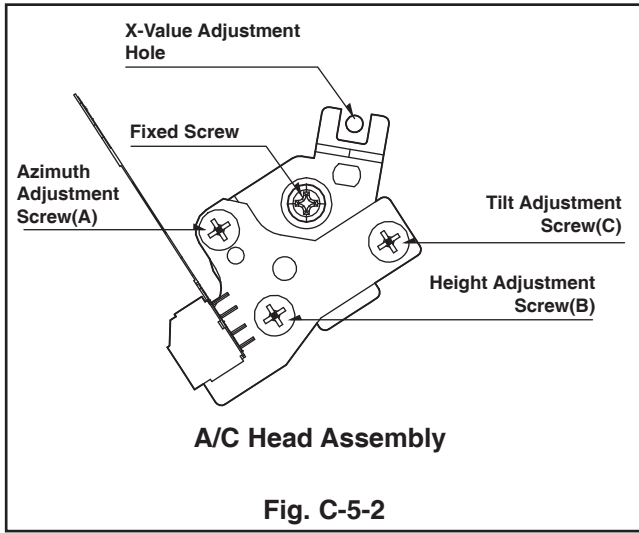
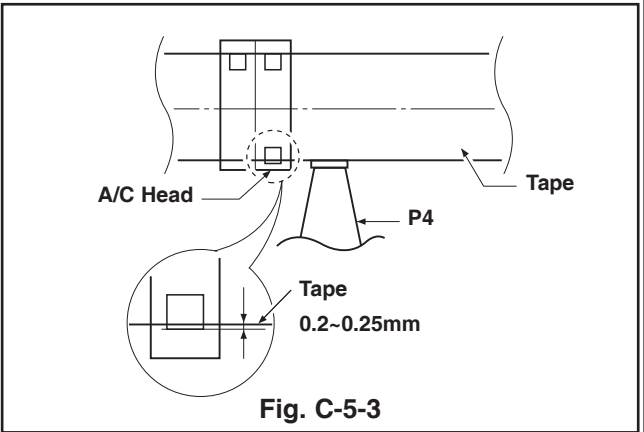
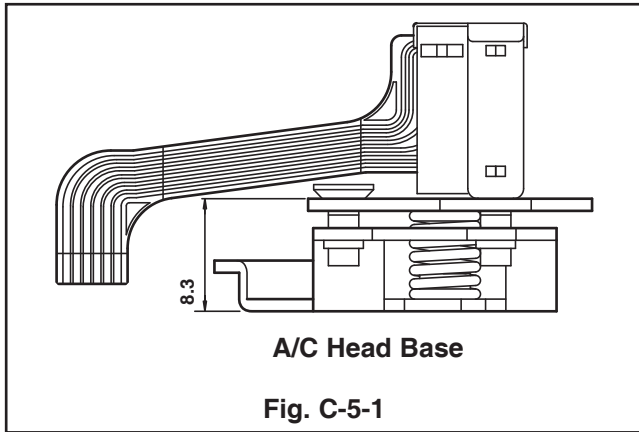
Adjustment Procedure/Adjustment Diagrams

- Basically use the A/C head assembly adjusted as in SPEC.
- Check if there is crumpling and folding of the tape around the A/C head. If it is, Turn and adjust the tilt adjusting screw to ensure that the tape corresponds to the bottom guide of the P4, and recheck the tape path after proceeding play for 4-5 seconds.

- Where the tape bottom is not equal to Fig. C-5-3, Adjust the height by using the height adjusting screw (B) and then readjust it by using the tilt adjusting screw (C).

CAUTIONS

Always check the height of the A/C head since the most ideal height of the A/C head can be obtained when the bottom part of the tape is away 0.2 ~ 0.25mm from the bottom part of the A/C head.



DECK MECHANISM ADJUSTMENT

5-2. Tape Path Check between Pinch Roller and Take up Guide (Check in the Rev Mode)

- 1) Check the tape pass status between the pinch roller and the take-up guide. (Check if there is crumpling of the tape pass and folding of the take-up guide.)
 - (1) When holding of the take-up guide bottom occurs
Turn the tilt adjusting screw (C) clockwise and move the tape to ensure there is no crumbling or folding of the tape.
 - (2) When holding of the take-up guide top occurs
Turn the tilt adjusting screw (C) counter-clockwise and move

the tape to ensure there is no crumbling or folding of the tape.

- 2) Check if there is folding of the tape at the bottom or top of the take-up guide in cutting-off the REV mode

CAUTIONS

If the RF waveform is changed after adjusting the A/C head, perform fine adjustment to ensure the RF waveform is flattened.

5-3. Fine Adjustment (Azimuth Adjustment)

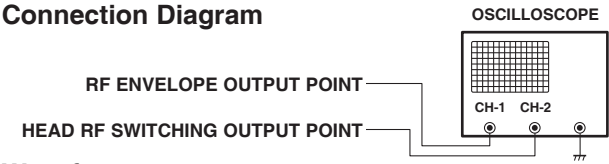
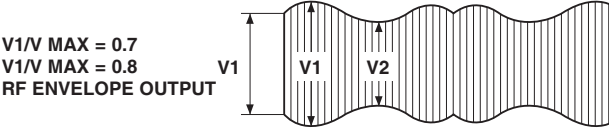
Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
<ul style="list-style-type: none"> • Oscilloscope • Standard test tape (only for SP) • Driver (+) Type $\phi 4$ 	<ul style="list-style-type: none"> • Audio Output Jack 	<ul style="list-style-type: none"> • Play the standard test • Tape, 1KHz, 7KHz. 	<ul style="list-style-type: none"> • Azimuth Adjusting Screw (A) • Height Adjusting Screw (B)
Adjustment Procedure <ol style="list-style-type: none"> 1) Connect the probe of Oscilloscope to the audio output jack. 2) Ensure that Audio 1KHz, 7KHz output is flattened at the maximization point by adjusting the Azimuth adjusting screw (A). 			<p style="text-align: center;">Fig. C-5-4</p>

6. X-distance Adjustment

Purpose of adjustment: To maintain compatibility with other VCR (VCP).			
Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
<ul style="list-style-type: none"> • Oscilloscope • Standard test tape (only for SP) • Driver (+) Type $\phi 4$ 	<ul style="list-style-type: none"> • CH-1: PB RF Envelope • CH-2: NTSC ; SW 30Hz PAL:SW 25Hz • Head switching output point • RF Envelope output point 	<ul style="list-style-type: none"> • Play the standard test tape. 	<p style="text-align: center;">Left Grove of Base A/C Right</p>
Adjustment Procedure <ol style="list-style-type: none"> 1) After releasing the auto tracking, lightly turn the fixing screw. Turn the (+) type driver ($\phi 3 \sim \phi 4$) on the X-distance adjusting hole to the right or left. Adjust the RF envelope level to the maximum point and then fix the fixing screws. 2) For the 31mm head, adjust it with the SP tape recorded in the width of 31mm since the head travels on the tape track only for SP with the width of 58mm. 		Connection Diagram <p style="text-align: center;">Fig. C-6</p>	

DECK MECHANISM ADJUSTMENT

7. Adjustment after Drum Assembly (Video Heads)

Purpose of adjustment : To adjust and stabilize the height change, X-distance change, etc depending on the guide roller after assembling the drum.			
Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
<ul style="list-style-type: none"> Oscilloscope Standard test tape (only for SP) Post Height Adjusting Driver Driver (+) Type ϕ 5 	<ul style="list-style-type: none"> CH-1: PB RF Envelope CH-2: NTSC : SW 30Hz PAL:SW 25Hz Head switching output point RF Envelope output point 	<ul style="list-style-type: none"> Play the blank tape. Play the standard test tape. 	<ul style="list-style-type: none"> Fine adjustment of guide roller Switching Point Tracking Preset X-distance
Checking/Adjustment Procedure <ol style="list-style-type: none"> 1) Play the blank tape (empty tape) and check whether the guide roller crumbles or wrinkles the tape and adjust it if necessary. 2) Check that the RF envelope output waveform is flat, and adjust the height of the guide roller while playing the standard test tape. 3) Adjust the switching point. 4) Check if the RF envelope output is the maximum when the tracking control locates at the center. If not maximum, set up to ensure that RF envelope output becomes the maximum by turning the (+) type driver (ϕ 3 ~ ϕ 4) on the base A/C groove. 		Connection Diagram  Waveform  <p> $V1/V_{MAX} = 0.7$ $V1/V_{MAX} = 0.8$ RF ENVELOPE OUTPUT </p>	

8. Check of Traveling Device after Deck Assembly

8-1. Audio, RF Normalization Time (Locking Time) Check in Play after CUE or REV

Fixtures and tools used	Measuring standard	Connection position	VCR (VCP) status
<ul style="list-style-type: none"> Oscilloscope 6H 3KHz Color Bar Standard Test tape Stop Watch 	<ul style="list-style-type: none"> RF Locking Time: Within 5 seconds Audio Locking Time: Within 10 seconds 	<ul style="list-style-type: none"> CH-1: PB RF Envelope CH-2: Audio output RF Envelope output point Audio output jack 	<ul style="list-style-type: none"> Play the 6H 3KHz Color Bar Standard Test tape.
Checking Procedure <ol style="list-style-type: none"> 1) Check that the locking time of the RF and Audio waveform has fallen within the measuring standard in conversion of the play mode from the CUE or the REV mode. 		<ol style="list-style-type: none"> 2) Perform sections 5 and 6 if it deviates from the standard. 	

8-2. Check of Tape Curl and Jam Status

Fixtures and tools used	Fixtures and tools used	Fixtures and tools used
<ul style="list-style-type: none"> T-160 Tape T-120 Tape 	<ul style="list-style-type: none"> There must be no jam or curl at the first, middle and end position of tape. 	<ul style="list-style-type: none"> Travel the tape at the position of its first and end.
Checking Procedure <ol style="list-style-type: none"> 1) Check that there is no abnormality of traveling post status. 2) There must be no abnormal operation of the counter in 		<ol style="list-style-type: none"> if bottom tape folds. There must be no abnormality of audio signal top tape is damaged. 3) If there is abnormality, perform the adjustment in sections 4 and 5.

PROTECTION, MAINTENANCE AND CHECK OF VIDEO FUNCTION

1. Checking Points prior to Repair

Following abnormal phenomena may be repaired by removal of foreign materials and oil supply. Check if oiling is required or cleaning status is required.
Determine that necessity of checking and repair.

Phenomena	Checking Points and Cause	Replacement
Color beat	Pollution of Full-Erase Head	○
S/N, Color Faded	Pollution of Video Head	○
Horizontal, Vertical Jitte	Pollution of Video Head or Tape Transport System	○
Poor Sound, Low Sound	Pollution of Audio/Control Head	○
No tape wound or tape wound loosely. FF or REW impossible, or slow turning	Pollution of Pinch Roller or Belt Capstan Belt	○
Tape loosely wound in REV or Unloading	Deterioration of Clutch Assembly D37 Torque	○
	Pollution of Drum and Traveling Device	Fig. C-9-3

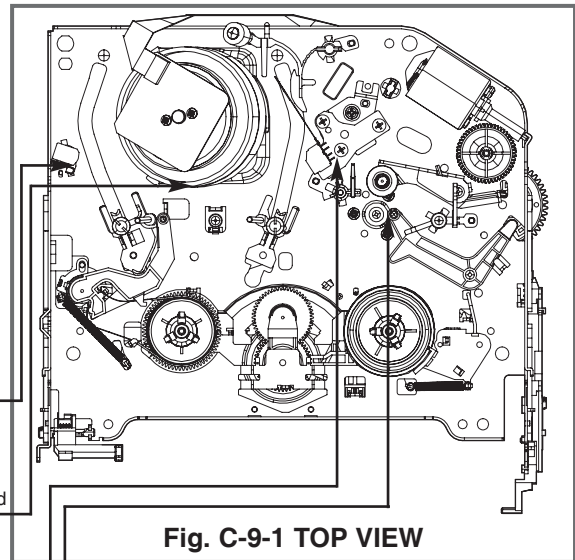


Fig. C-9-1 TOP VIEW

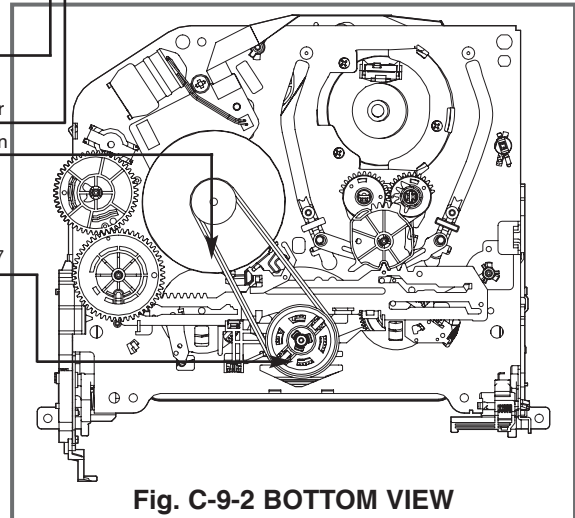


Fig. C-9-2 BOTTOM VIEW

CAUTIONS

If operation of the position with (O) mark is abnormal even after removing cause, replace it with substitute product since it shows damage or wearing.

* No. (1) ~ (12) shows sequence that the tape moves from the supply reel to the take-up reel.)

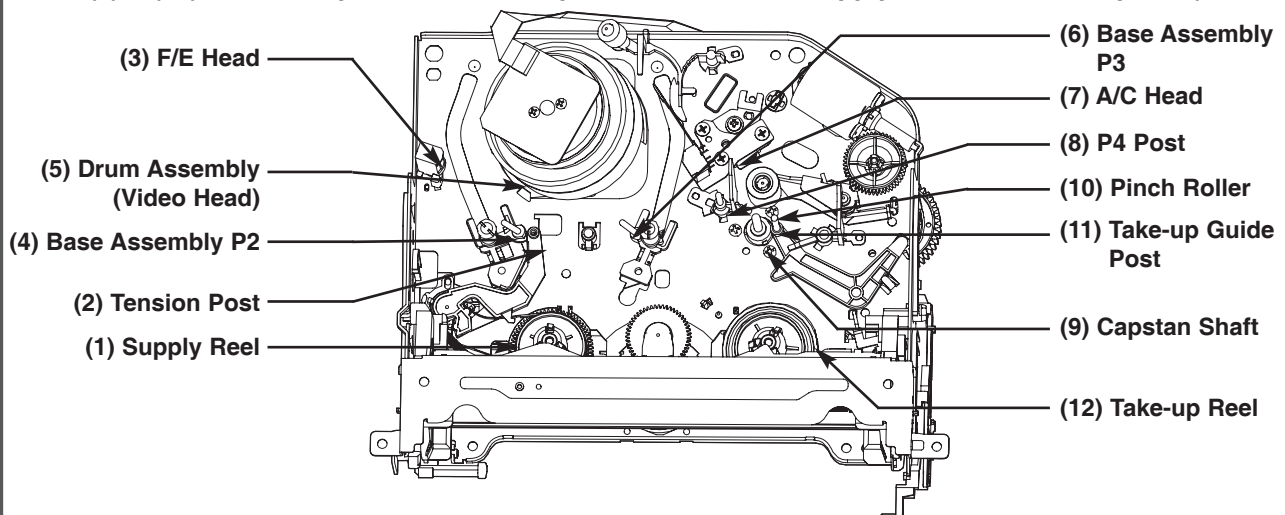


Fig. C-9-3 Tape Transport System

PROTECTION, MAINTENANCE AND CHECK OF VIDEO FUNCTION

2. Essential Check and Repair

Recording density of the video is far higher than the audio. Therefore video parts are very precise so as to allow only error of 1/1000mm or so in order to maintain compatibility with other videos.

If one of these parts is polluted or old, same phenomena will appear as they are damaged.

To maintain clear screen, regular check, replacement of old and damaged parts and oil supply, etc are essential.

3. Regular Check and Repair

Check and repair schedule is not constant since they vary depending on method that the consumer uses video and environment where the video is installed at.

However, for the video used by common household, good screen will be maintained if regular check and repair per 1,000 hours is performed. The following chart shows relationship between using time and checking time:

Table 1

Time Requiring Checking	About 1 year	About 18 months	About 3 years
Average hours used per day	▲	▲	▲
One hour	[Bar chart showing increasing frequency]		
Two hours	[Bar chart showing increasing frequency]		
Three hours	[Bar chart showing increasing frequency]		

4. Tools for Check and Repair

- (1) Grease: Floil G-3114 (KANTO) or equivalent grease (Green)
- (2) Grease: Kanto G-754, PL-433 (Yellow)
- (3) Alcohol (Isopropyl Alcohol)
- (4) Cleaning Patch (cloth)

5. Maintenance Process

5-1) Removal of Foreign Material

- (1) Removal of foreign material from video head (Fig. C-9-4)
First try to use a cleaning tape.

Use a cleaning patch if foreign materials are not removed with the cleaning tape due to severely dirty head.

Soak the cleaning patch in alcohol and put it to the head tip. Smoothly turn the drum (turning cylinder) to the right or left (In this case, the cleaning patch must not be moved vertically).

After completely drying the head, test the traveling status of the tape.

If alcohol (Isopropyl Alcohol) remains at the video head, the tape may be damaged when this solution touches the head surface.

Never use a cloth bar (commercial sale)

- (2) Wipe the tape transport system and the drive system with the cleaning patch soaked in alcohol (Isopropyl Alcohol) when removing foreign materials from them.

- 1) The part touched with the traveling tape is called the tape transport system. The drive system consists of parts to make the tape travel.

- 2) Care must be exercised so that unreasonable force to change the pattern will not be applied to the tape transport system during removal of foreign materials.

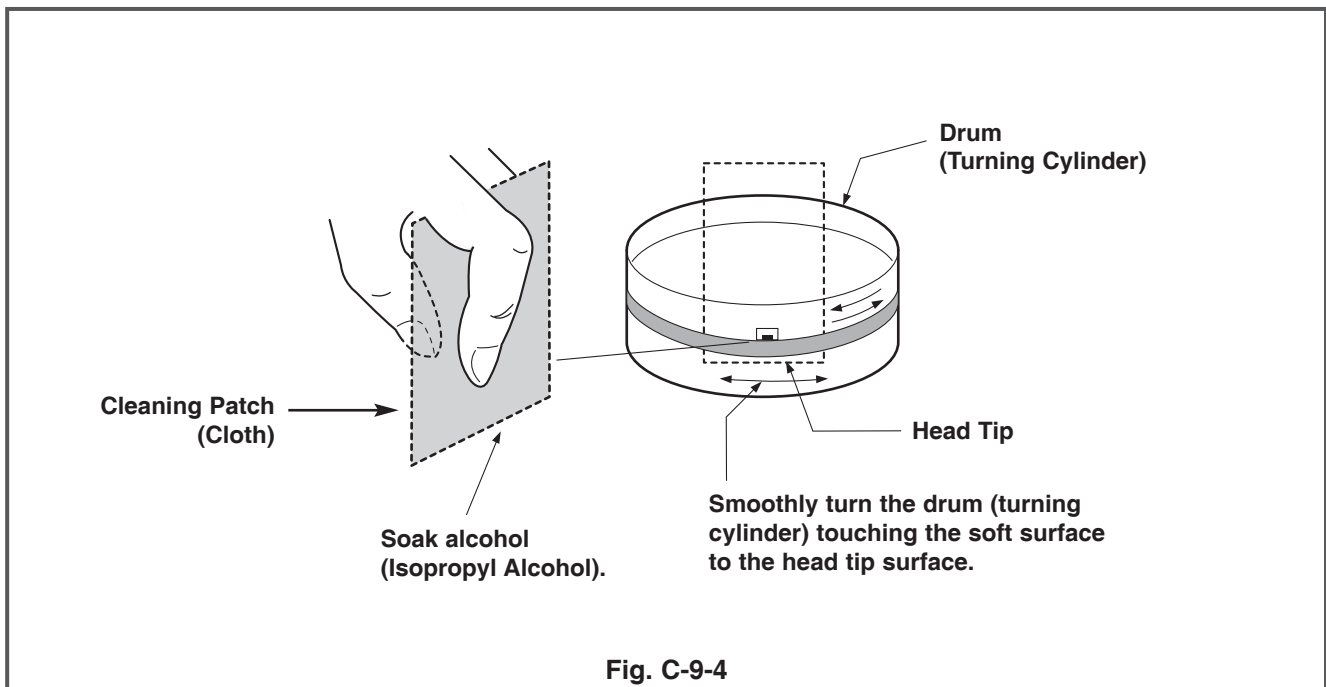


Fig. C-9-4

PROTECTION, MAINTENANCE AND CHECK OF VIDEO FUNCTION

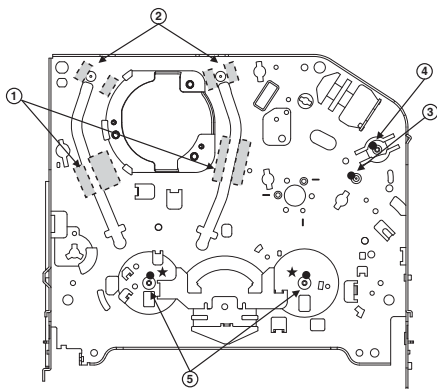
5-2) Grease Applications

(1) Grease Application Method

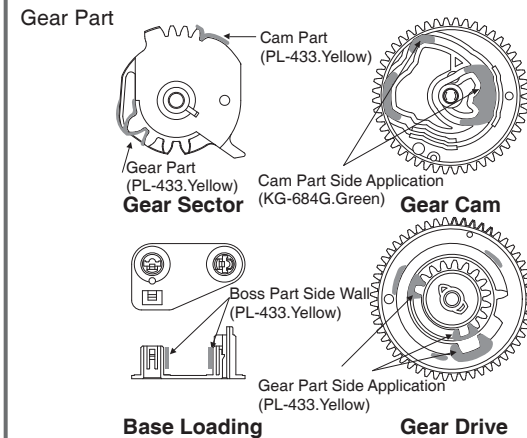
Apply grease by using a cloth swab or brush. Care must be exercised so that excess quantity should not be used. If the excessive quantity is applied, wipe it with the gauze soaked in alcohol (Isopropyl Alcohol).

NOTE: POSITION OF GREASE APPLICATION

- | | |
|--|----------------------------------|
| (1) Inner Side Surface and Top Surface of Loading Path | (4) Gear Wheel Shaft |
| (2) Stable Adhesion Part of Base P2, P3 | (5) Reel S. T. Shaft |
| (3) Arm Pinch Shaft | (1) (2) (3) (4): KG-684G (Green) |
| | (5): PL-433 (Yellow) |



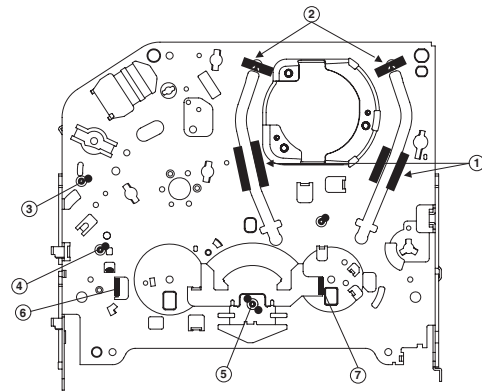
Chassis (TOP)



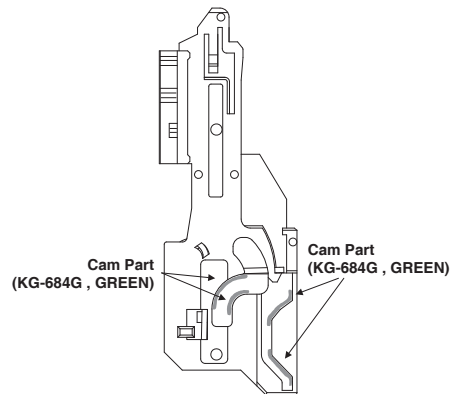
(2) Regular Grease Application

Apply grease to the designated application position every 500 hour.

- | | |
|--|--|
| (1) Inner Side Surface and Top Surface of Loading Path | (6) Guide Part on the Plate Slider Side Wall (Left) |
| (2) Stable Adhesion Part of Base P2, P3 Coil | (7) Guide Part on the Plate Slider Side Wall (Right) |
| (3) Gear Cam Shaft | (1) (2) (3) (4) (5) (6) (7): KG-684G (Green) |
| (4) Gear Drive Shaft | |
| (5) Clutch Shaft Groove | |



Chassis (Bottom)



Gear Rack F/L

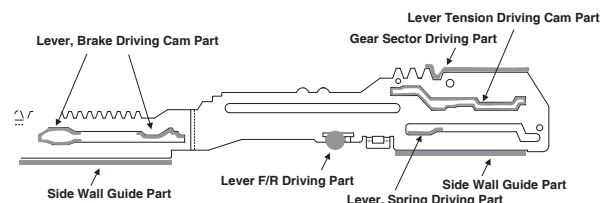
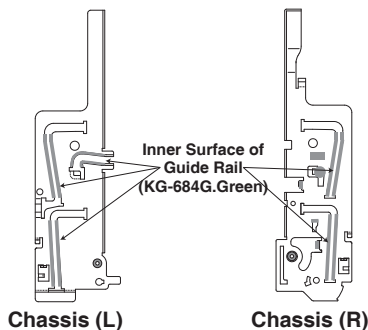
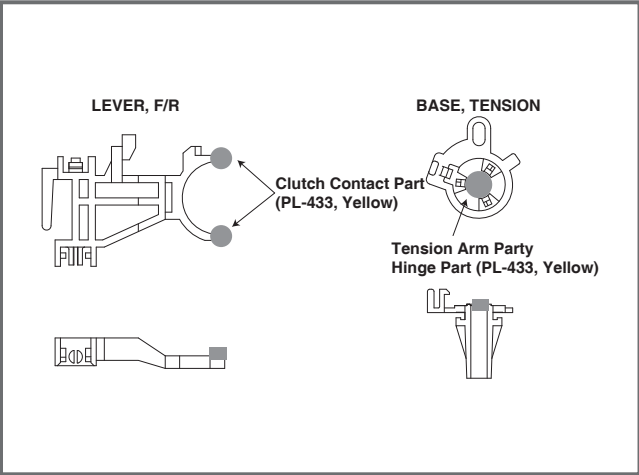


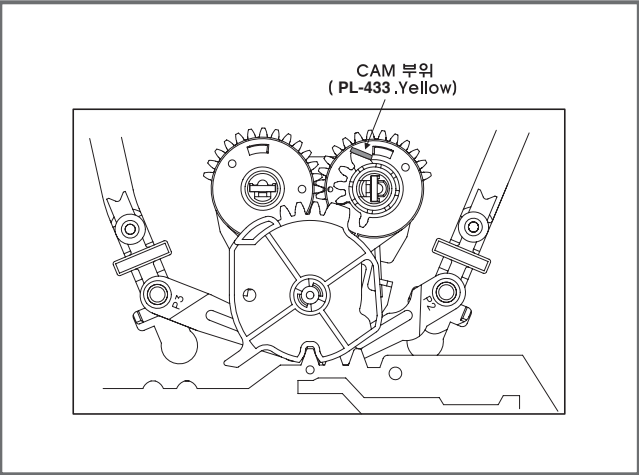
Plate Slider

PROTECTION, MAINTENANCE AND CHECK OF VIDEO FUNCTION

Lever, F/R, Base, Tension



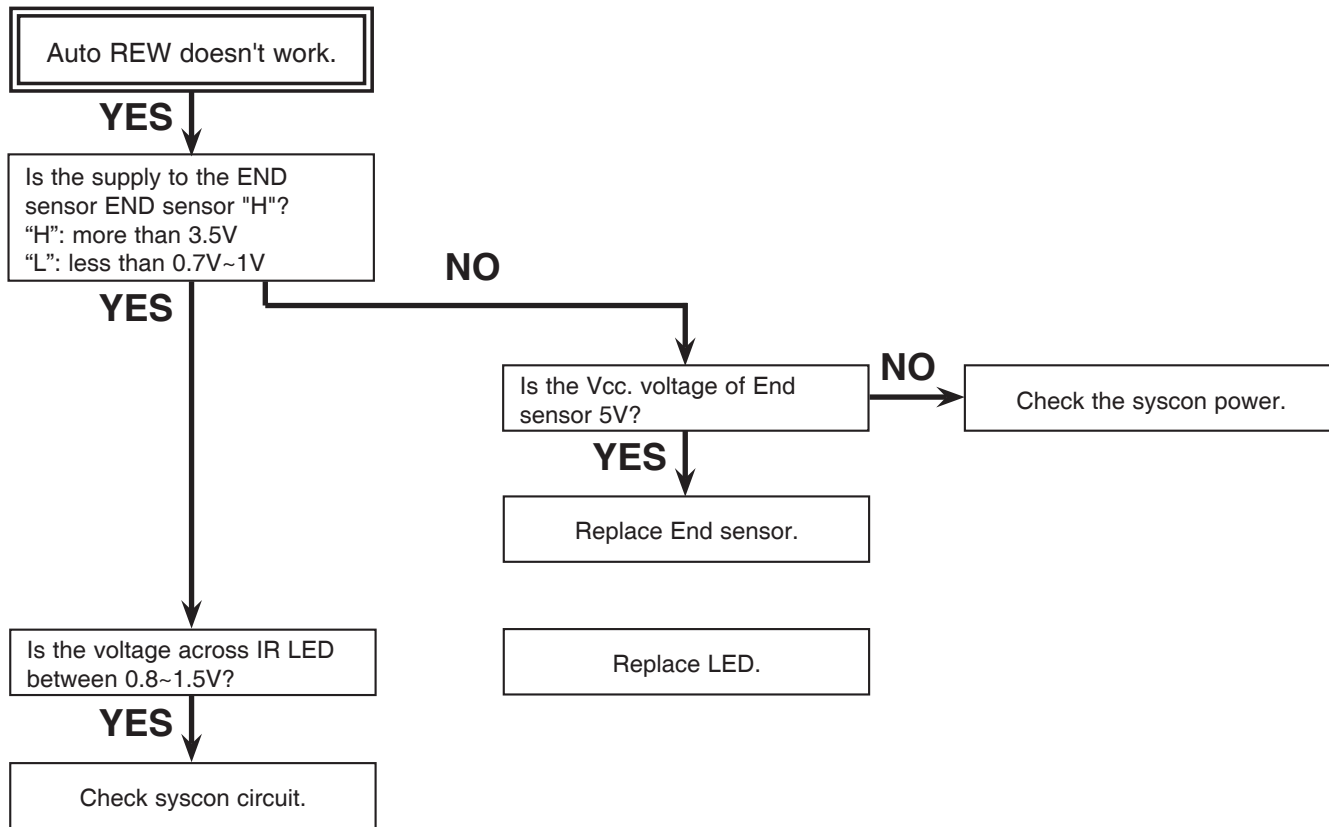
GEAR AY, P2 & P3



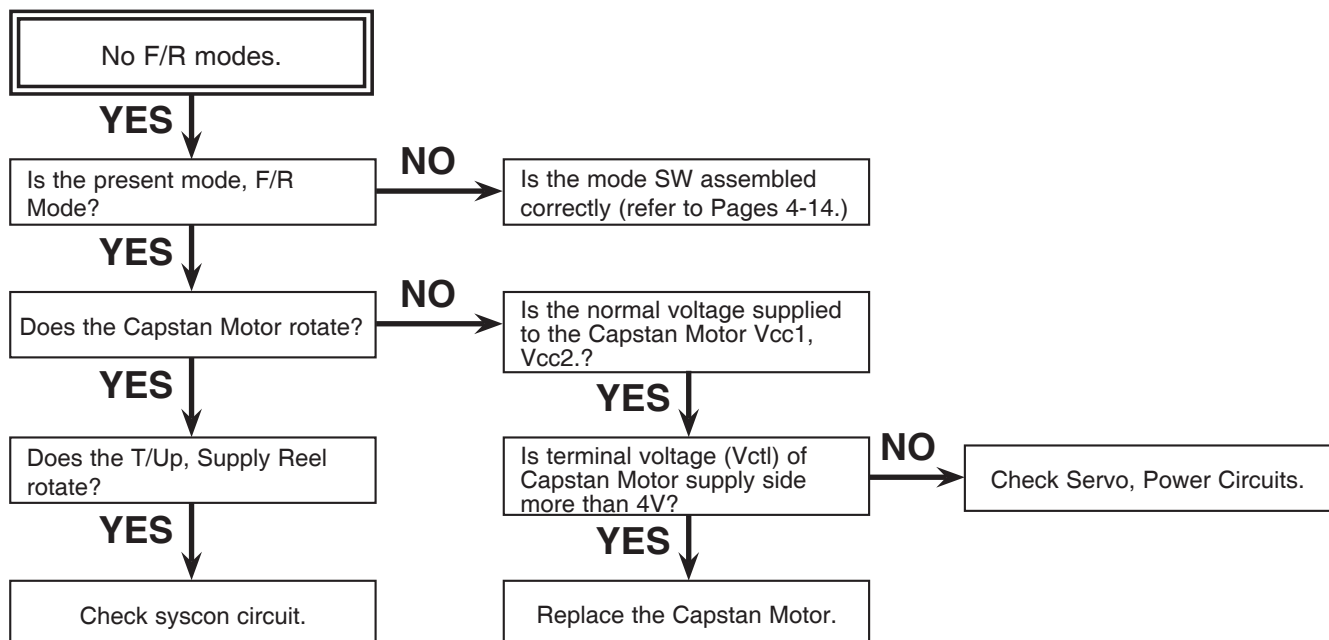
MECHANISM TROUBLESHOOTING GUIDE

1. Deck Mechanism

A.



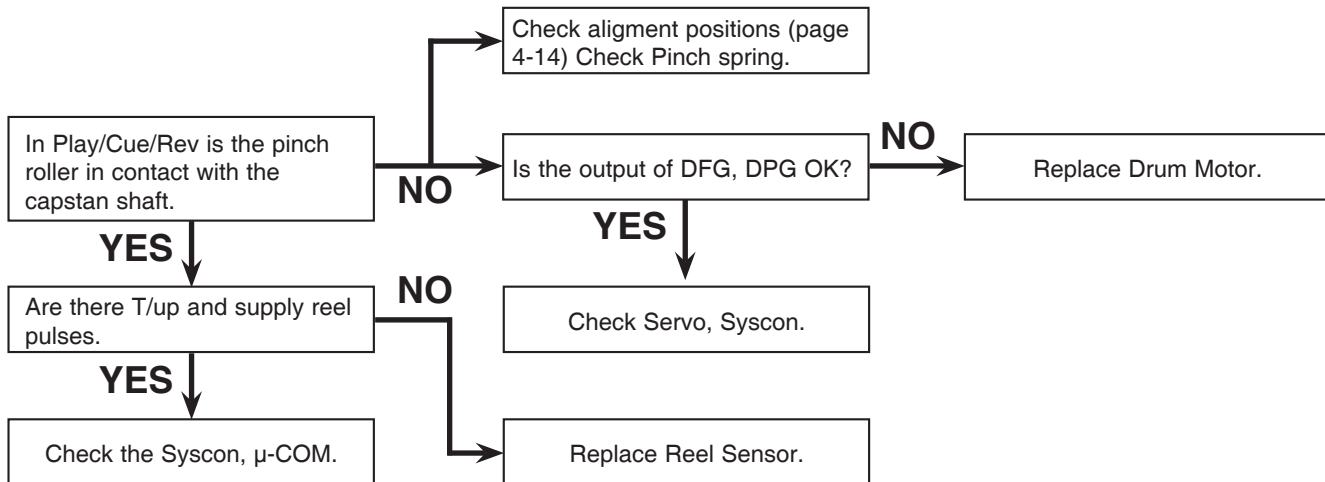
B.



MECHANISM TROUBLESHOOTING GUIDE

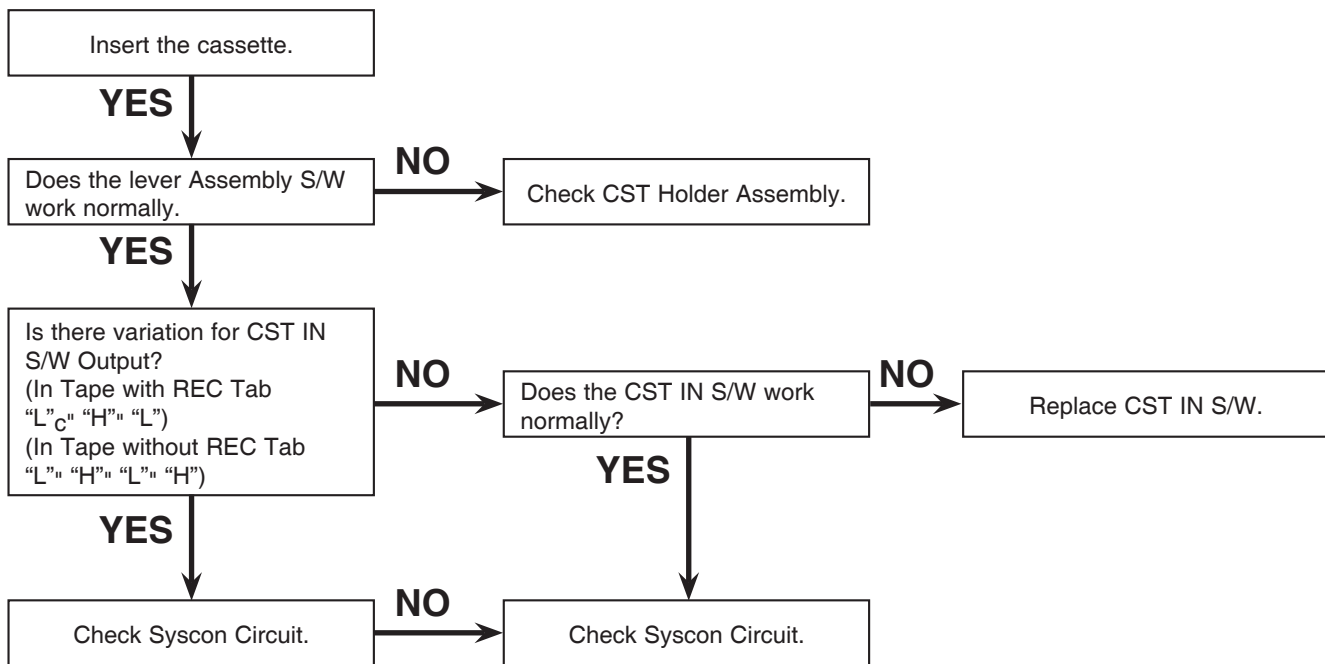
C.

**AUTO STOP.
(PLAY/CUE/REV)**



D.

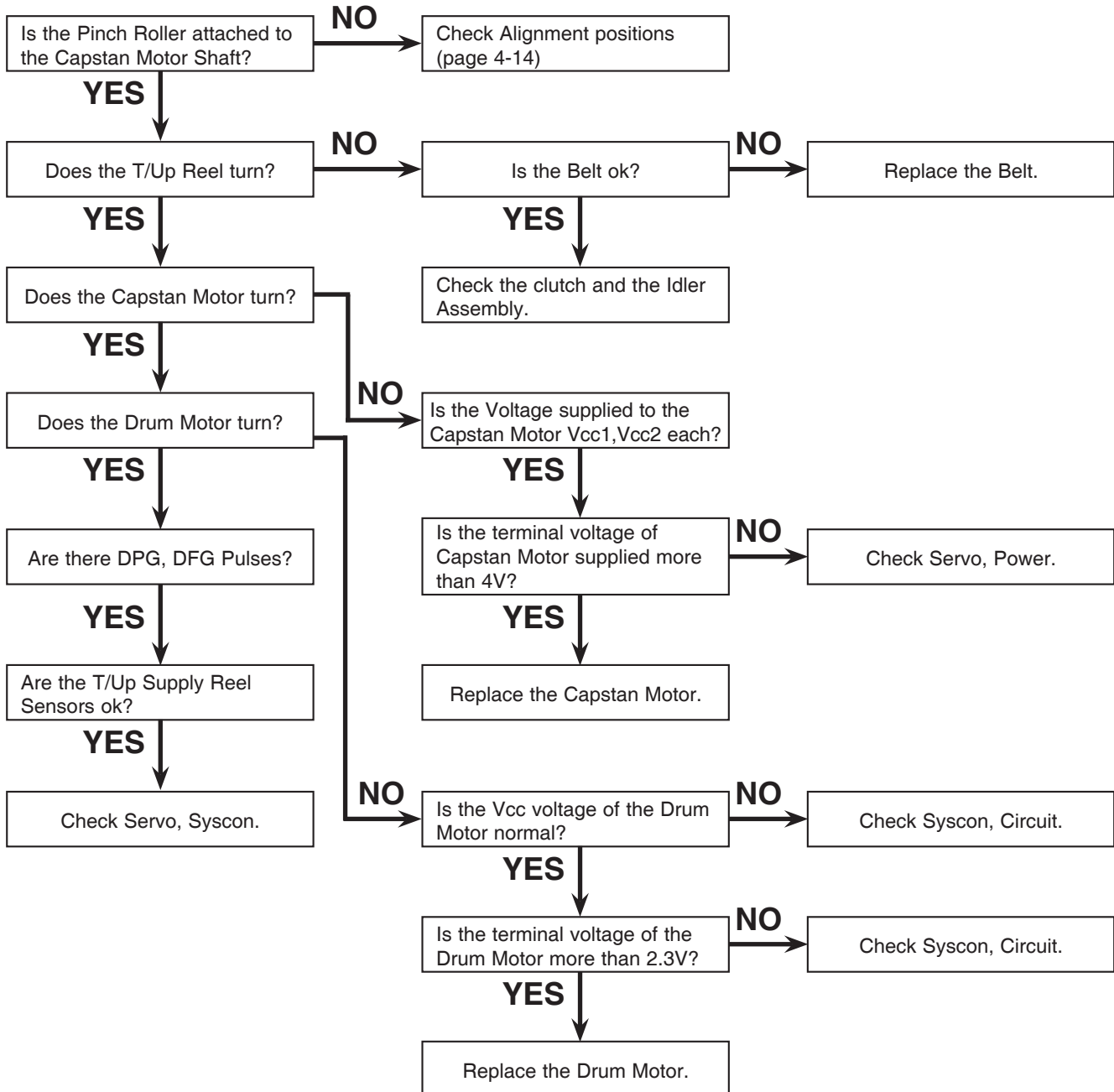
No cassette loading.



MECHANISM TROUBLESHOOTING GUIDE

E.

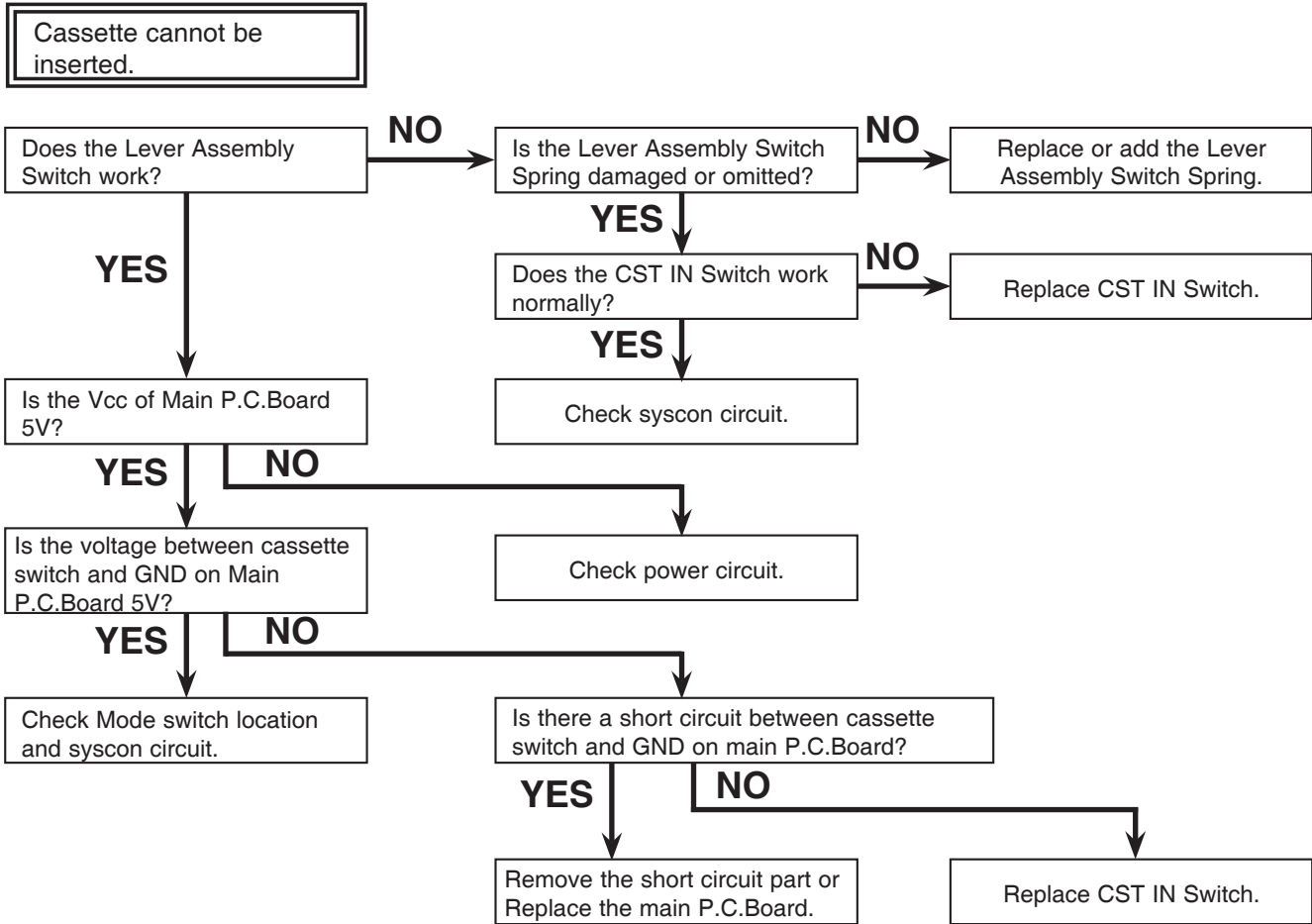
In PB mode Tape Presence not sensed.



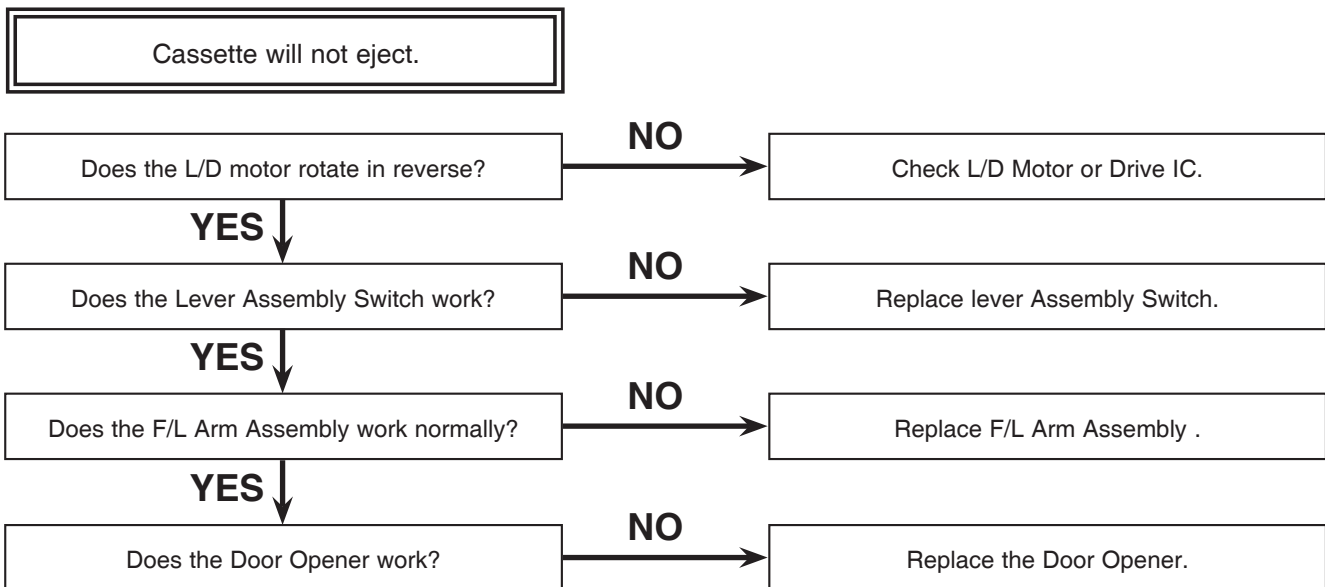
MECHANISM TROUBLESHOOTING GUIDE

2. Front Loading Mechanism

A.

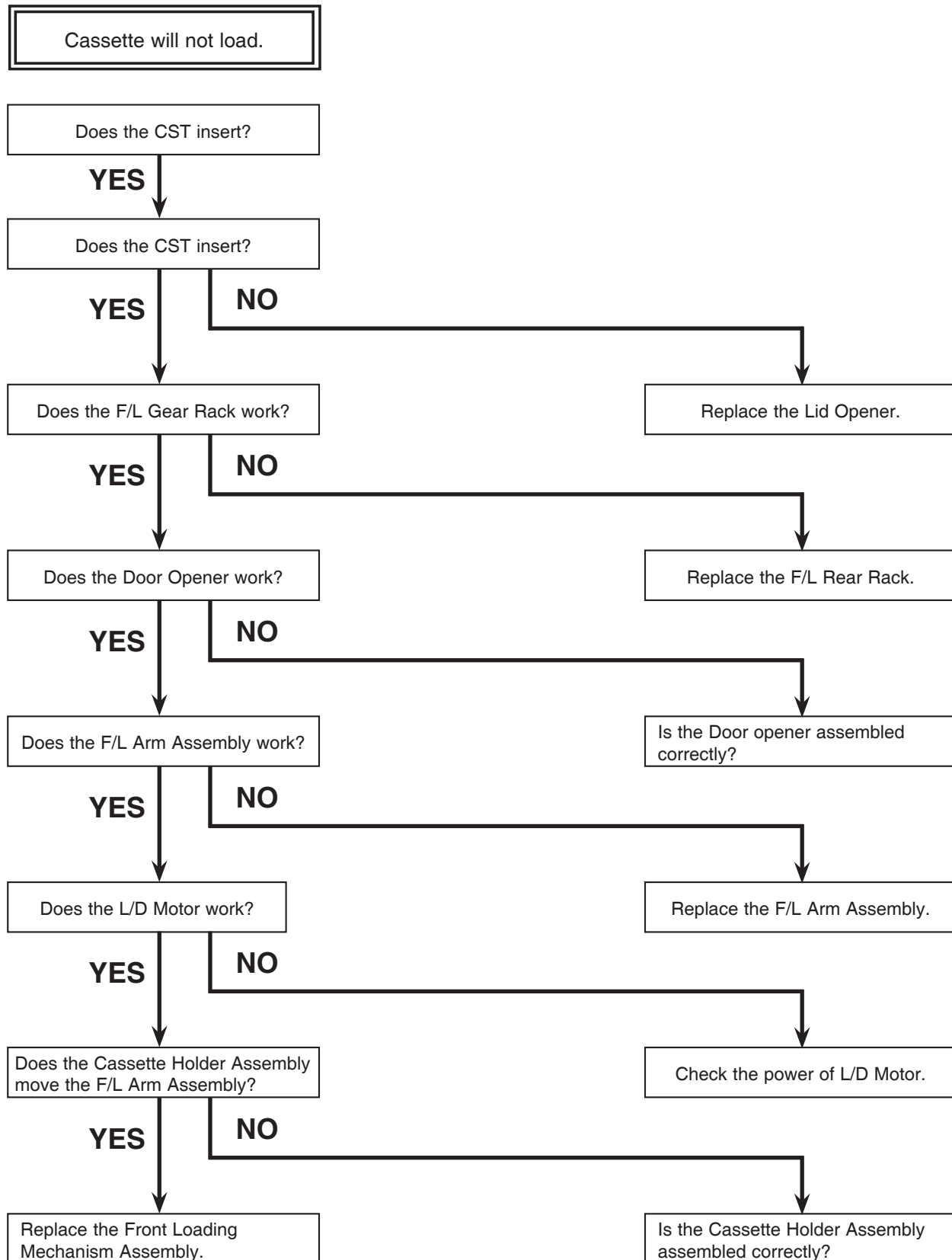


B.



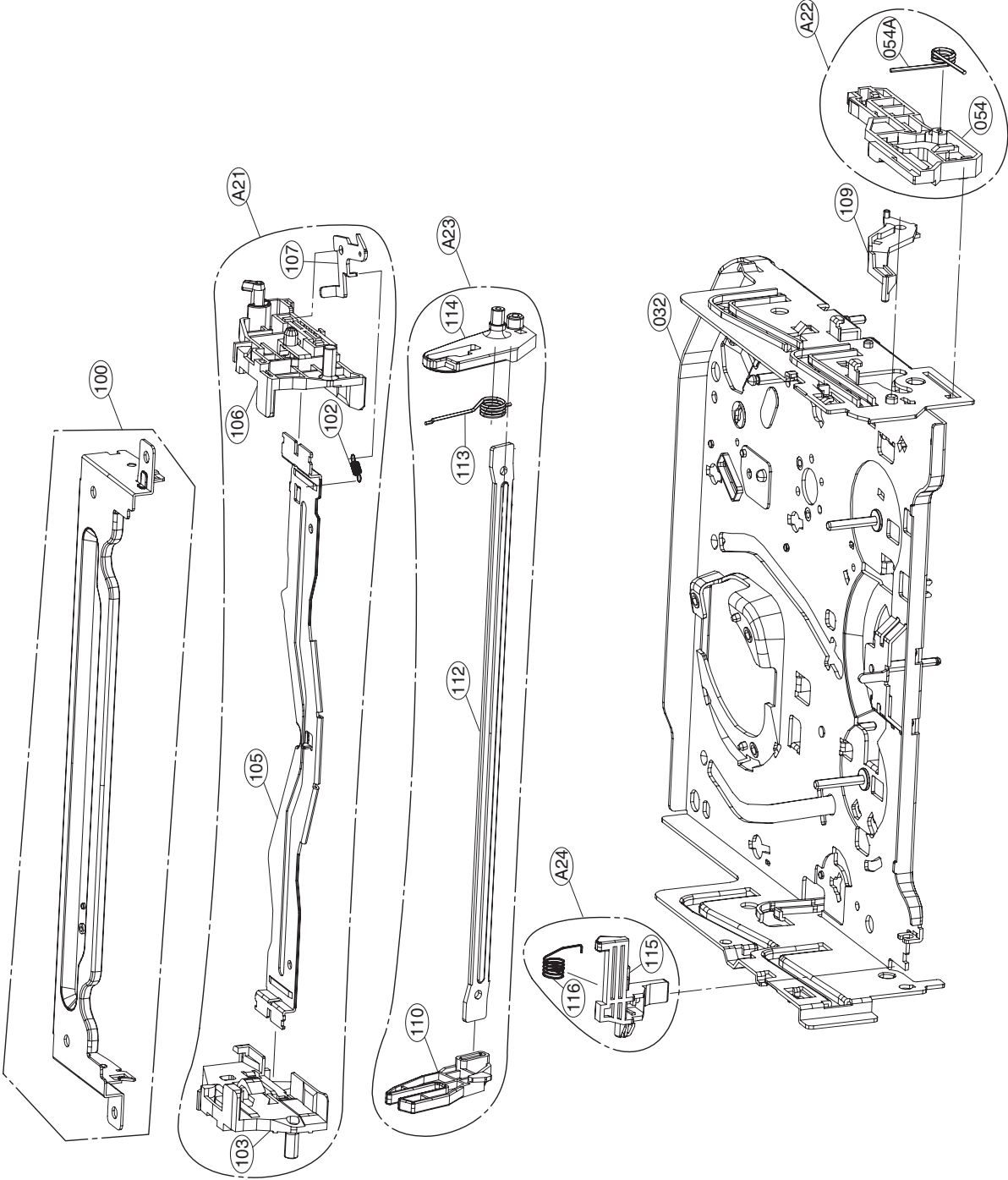
MECHANISM TROUBLESHOOTING GUIDE

C.



EXPLODED VIEWS

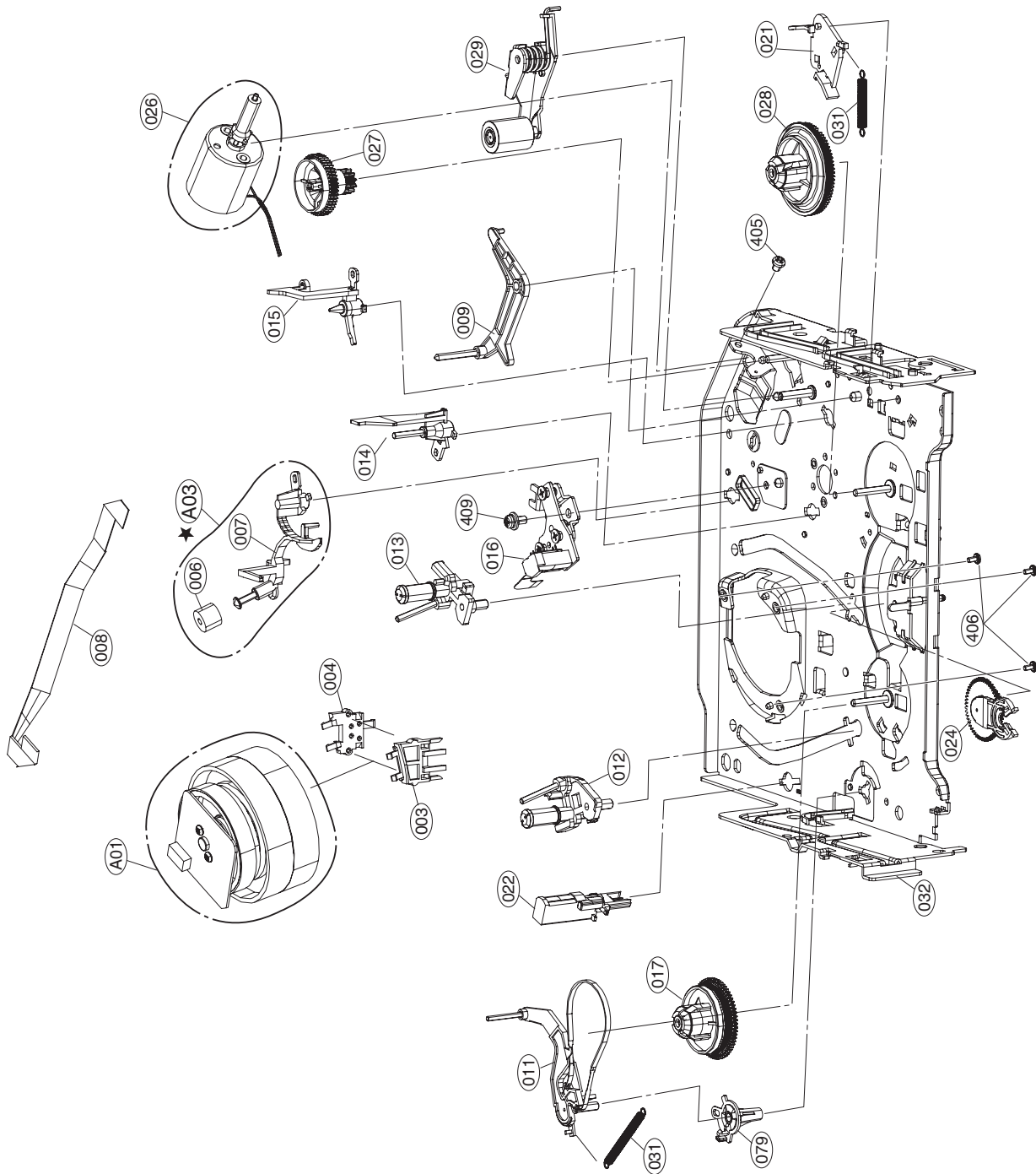
1. Front Loading Mechanism Section



EXPLODED VIEWS

2. Moving Mechanism Section (1)

★ OPTIONAL PART



MEMO

A series of horizontal dotted lines for writing a memo.

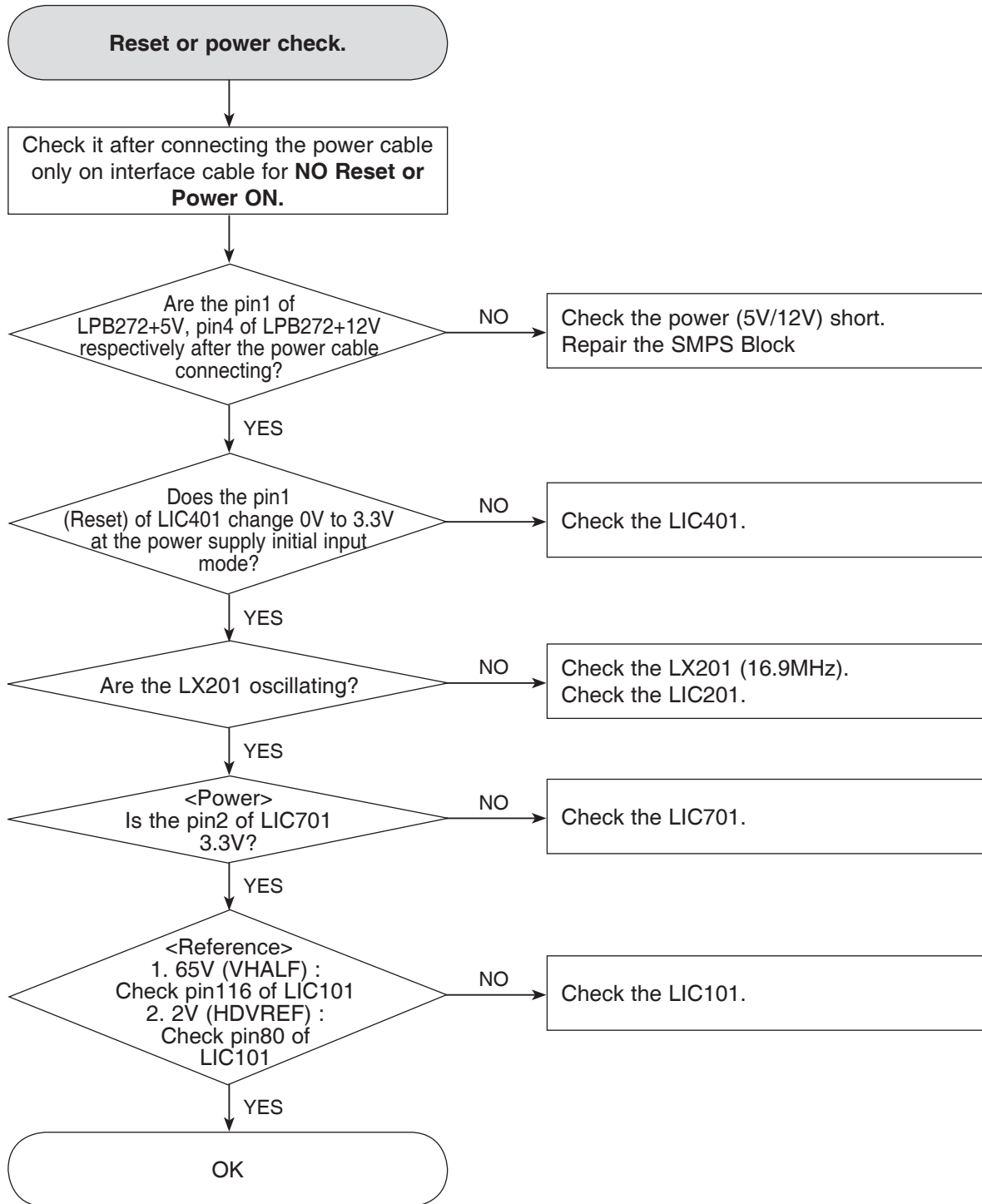
SECTION 5

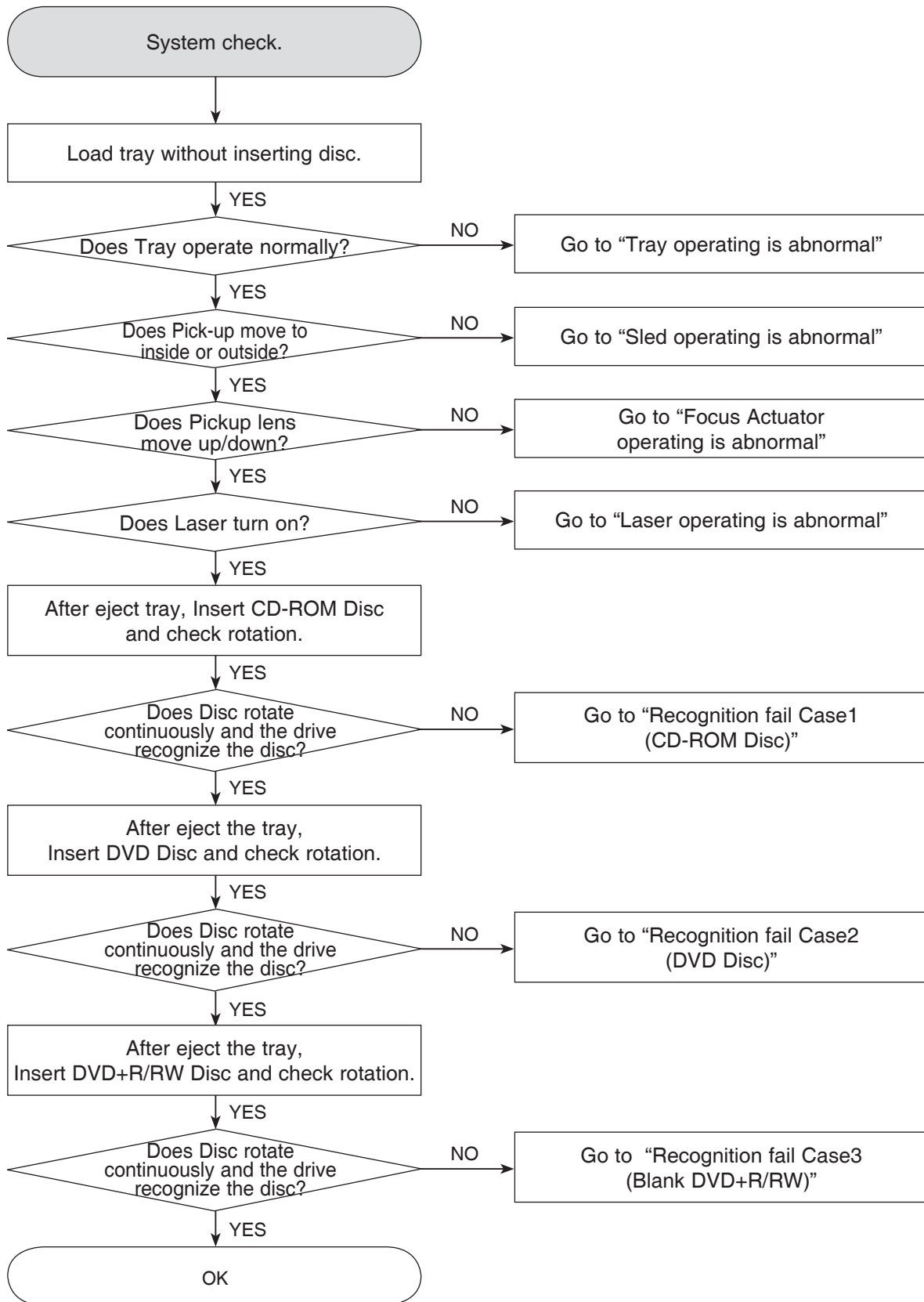
RV9 LOADER PART

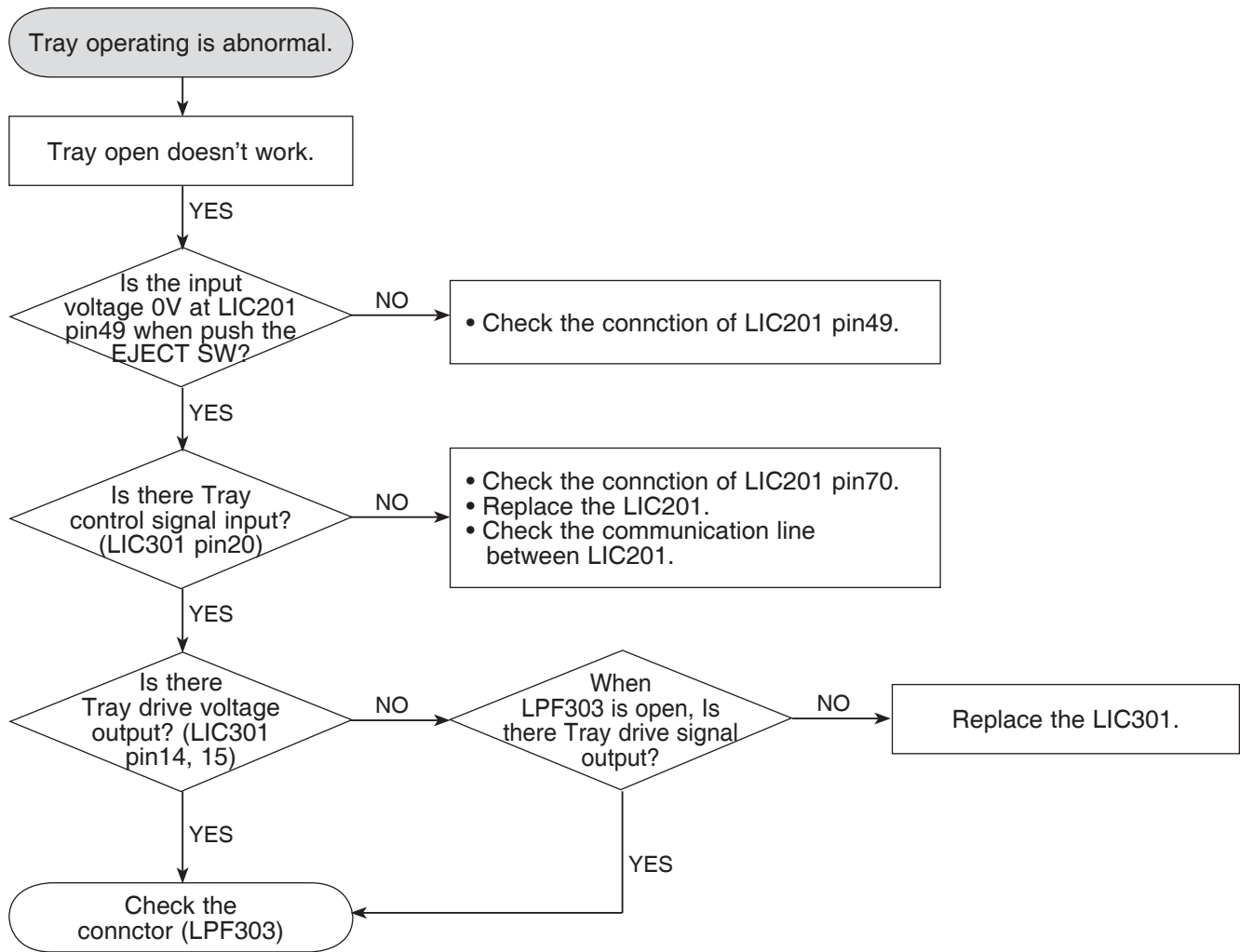
CONTENTS

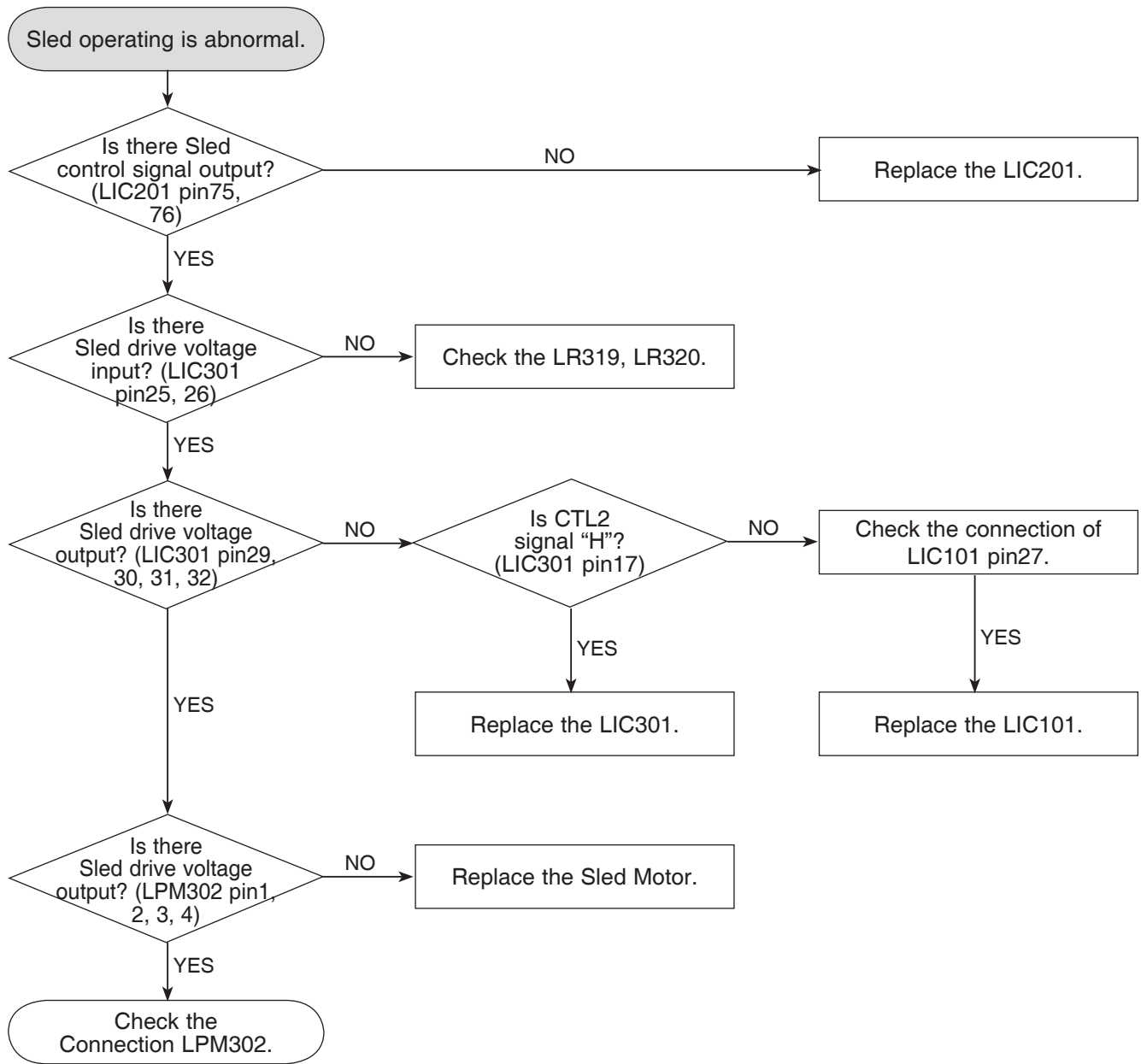
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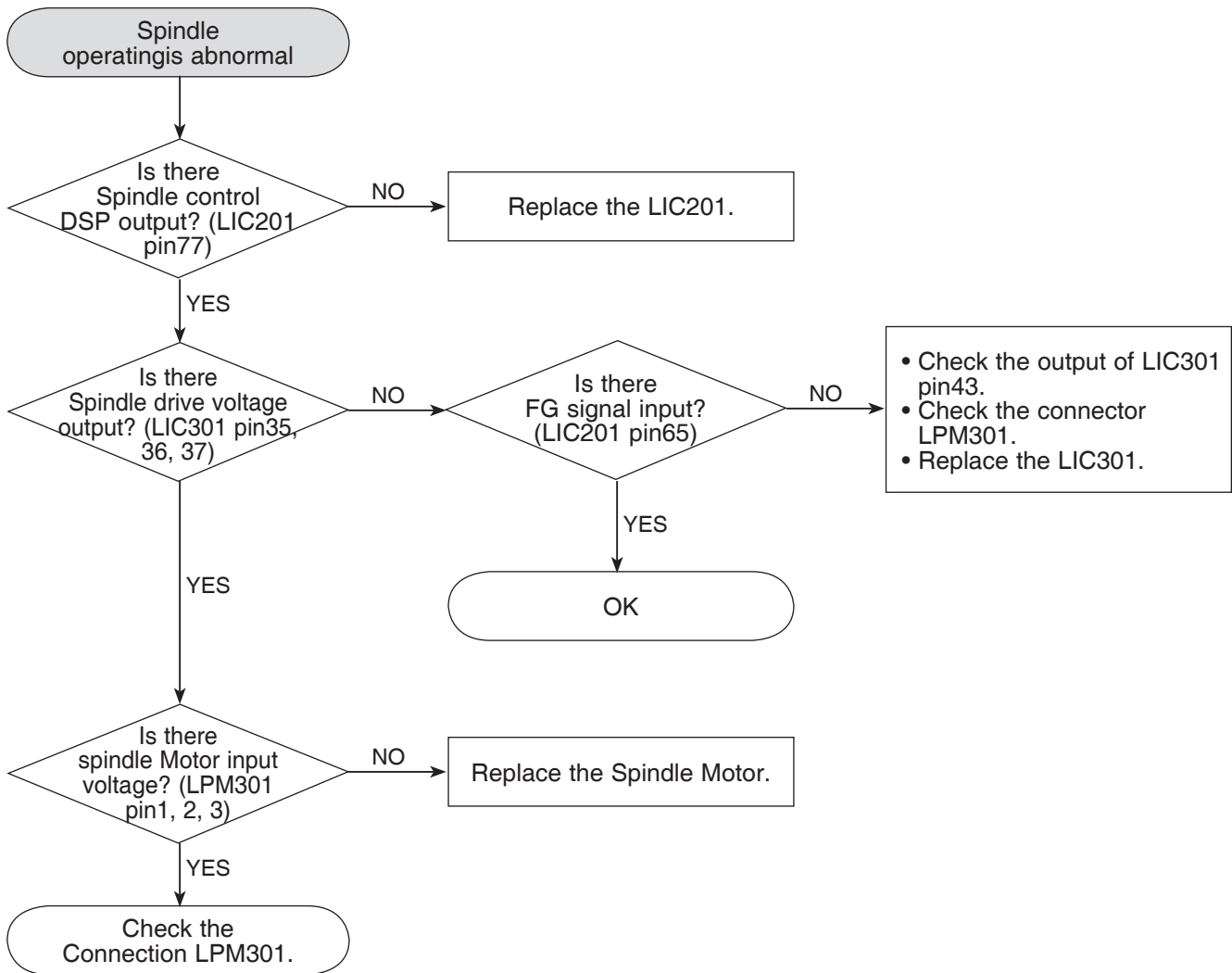
ELECTRICAL TROUBLESHOOTING GUIDE

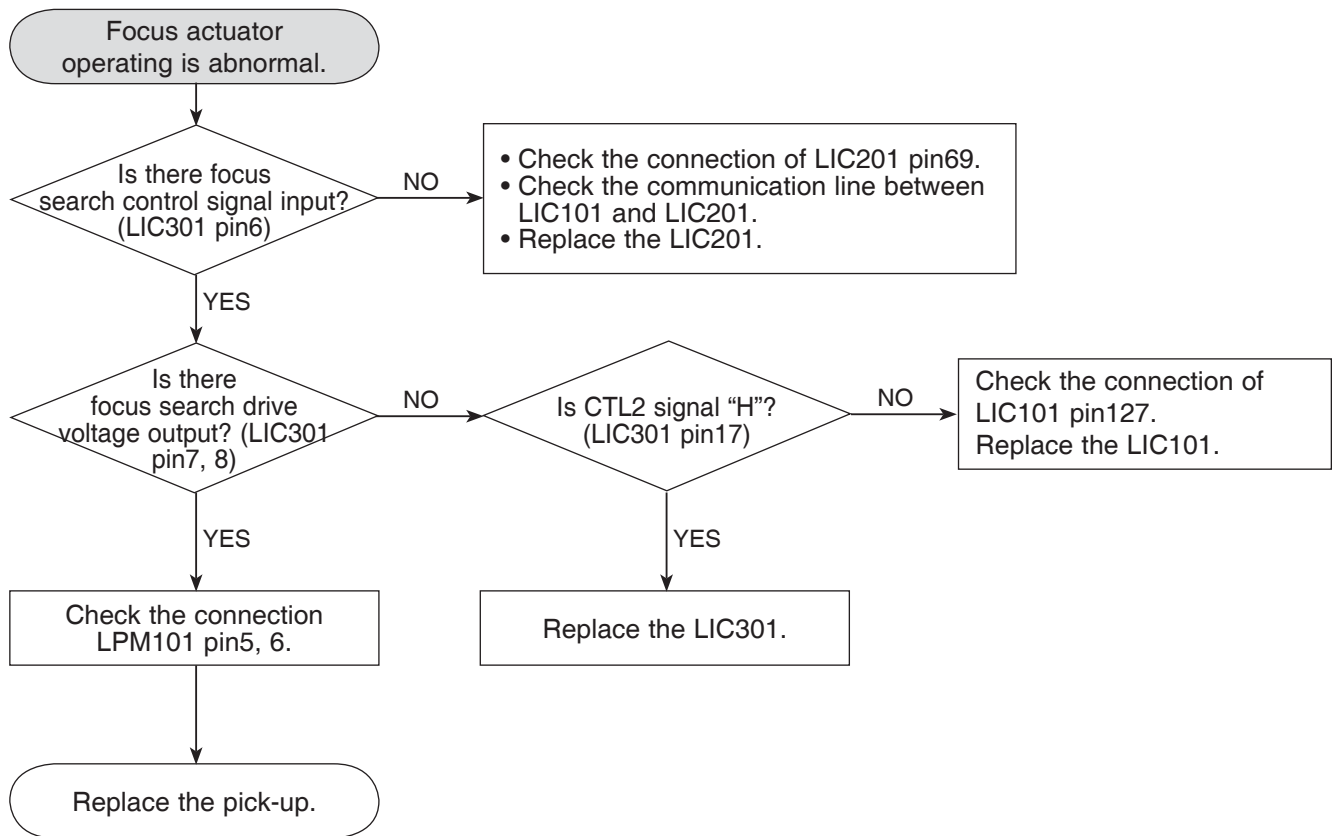
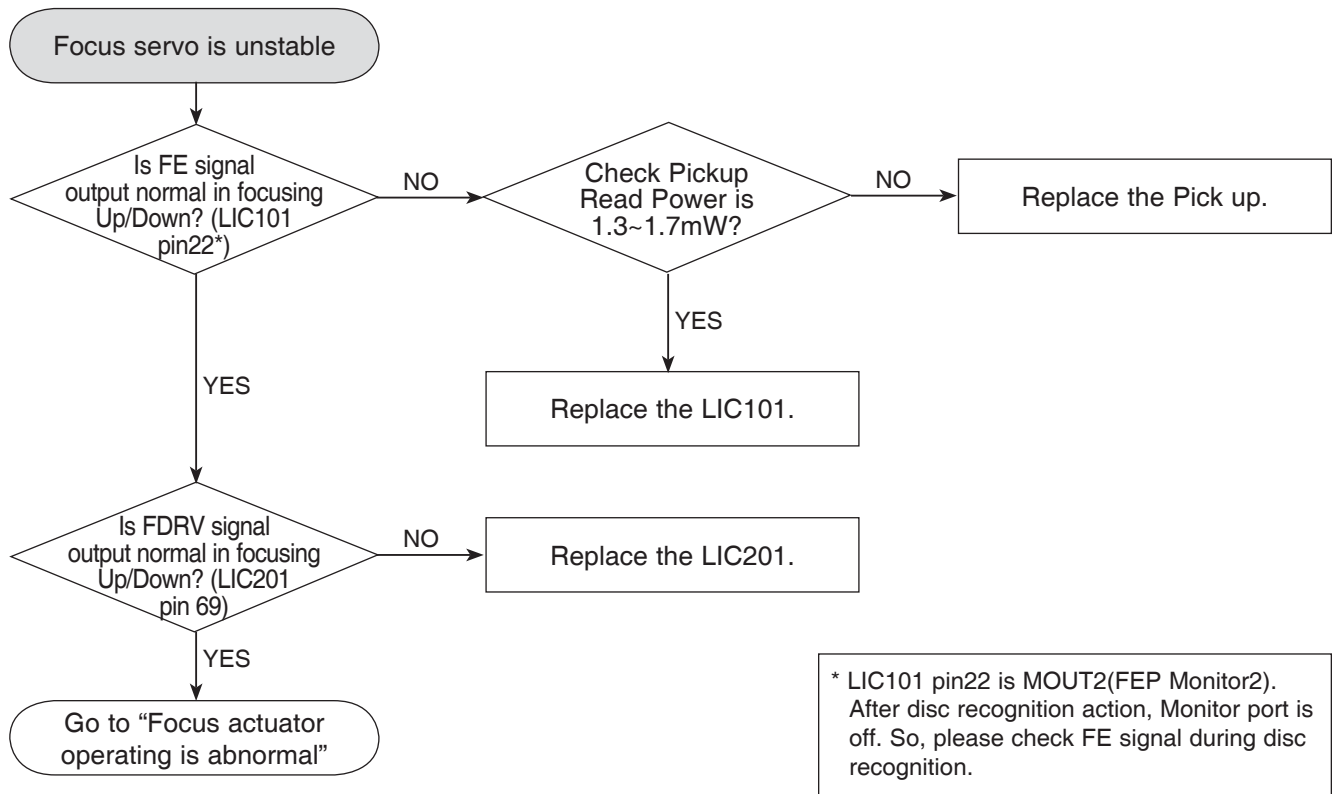


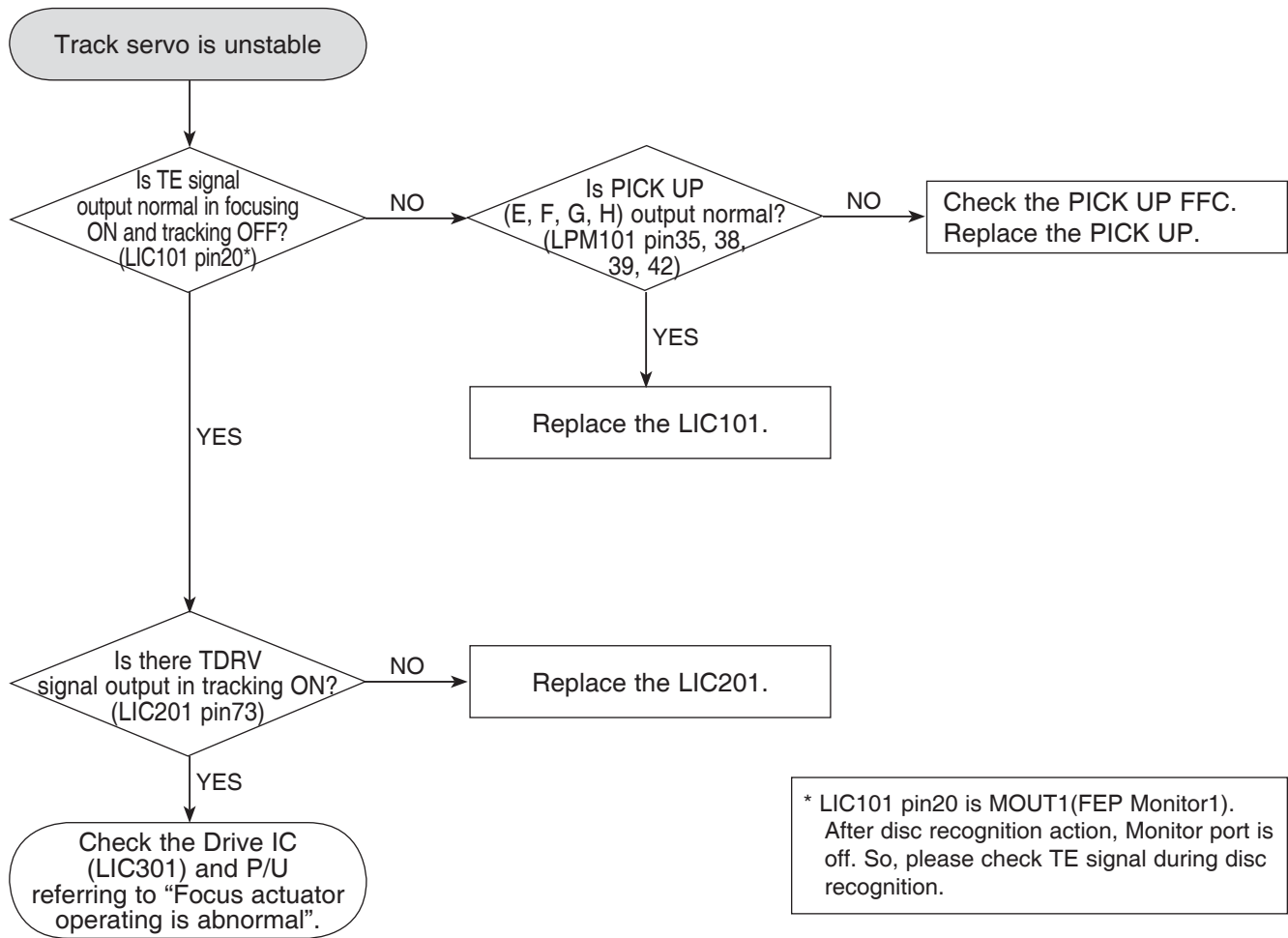


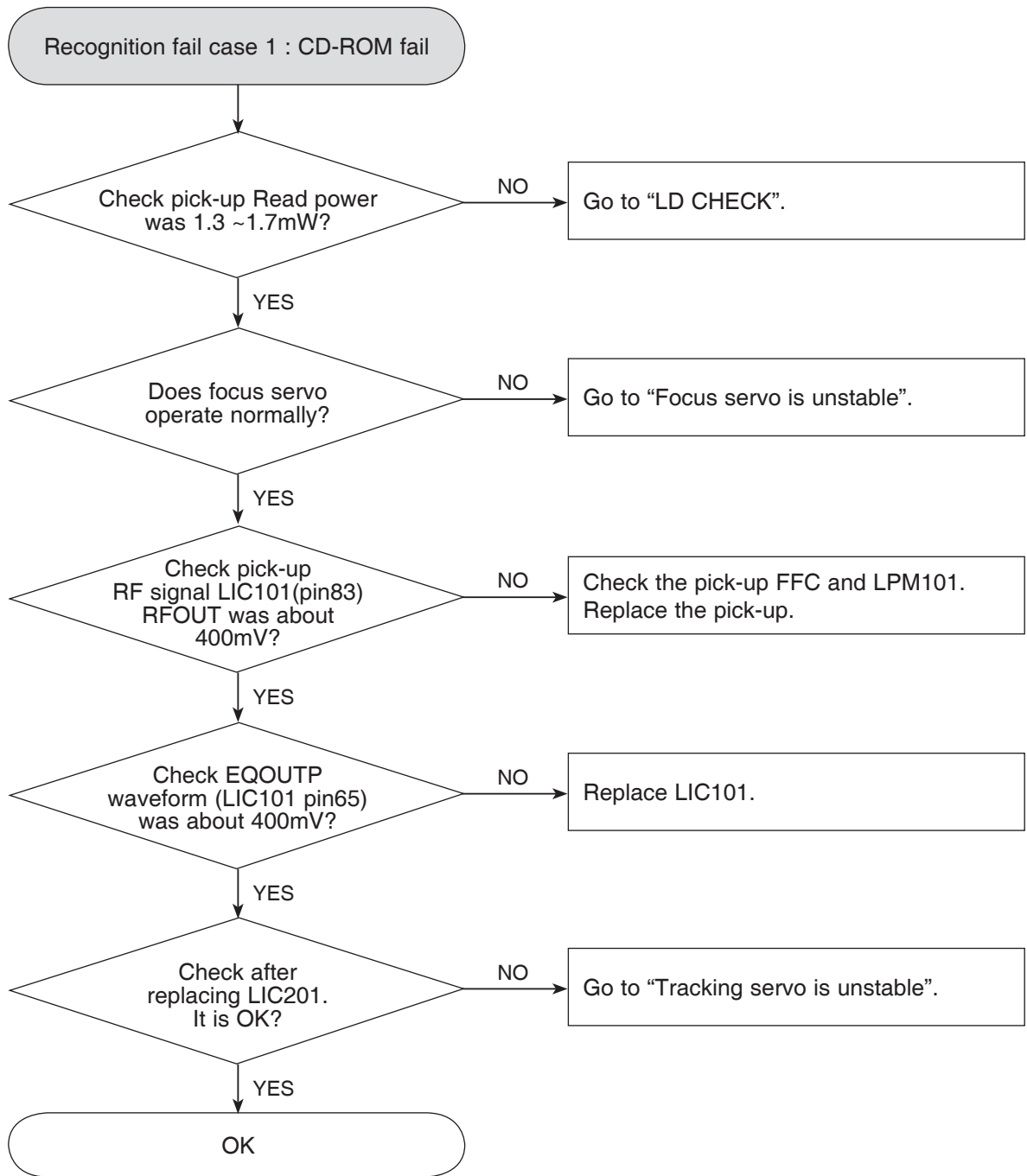


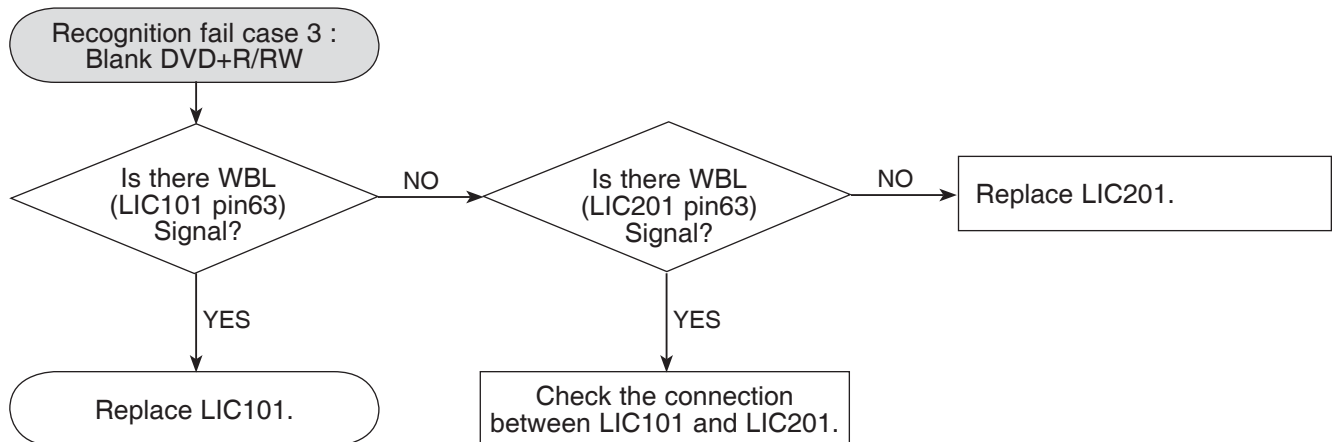
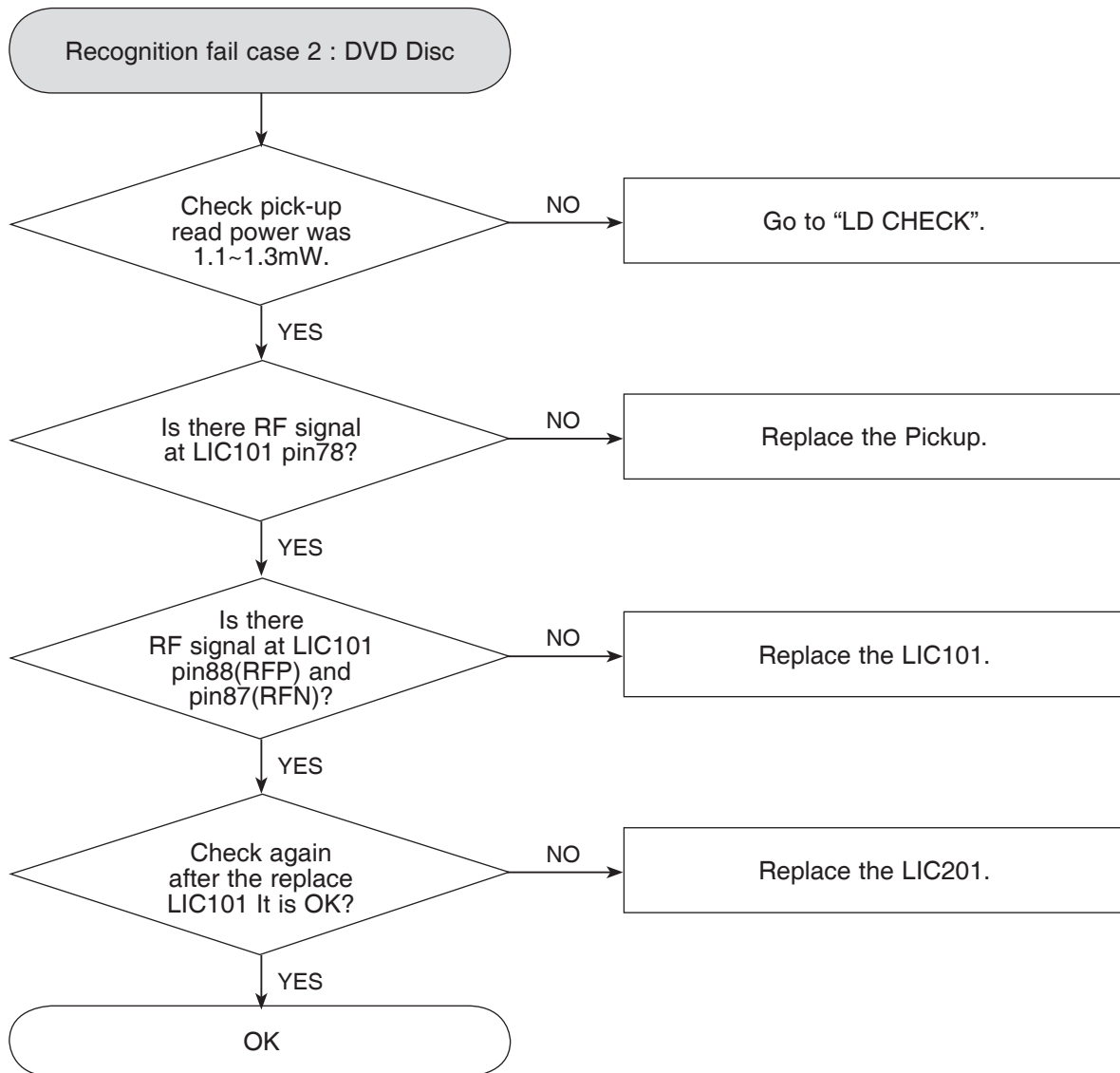


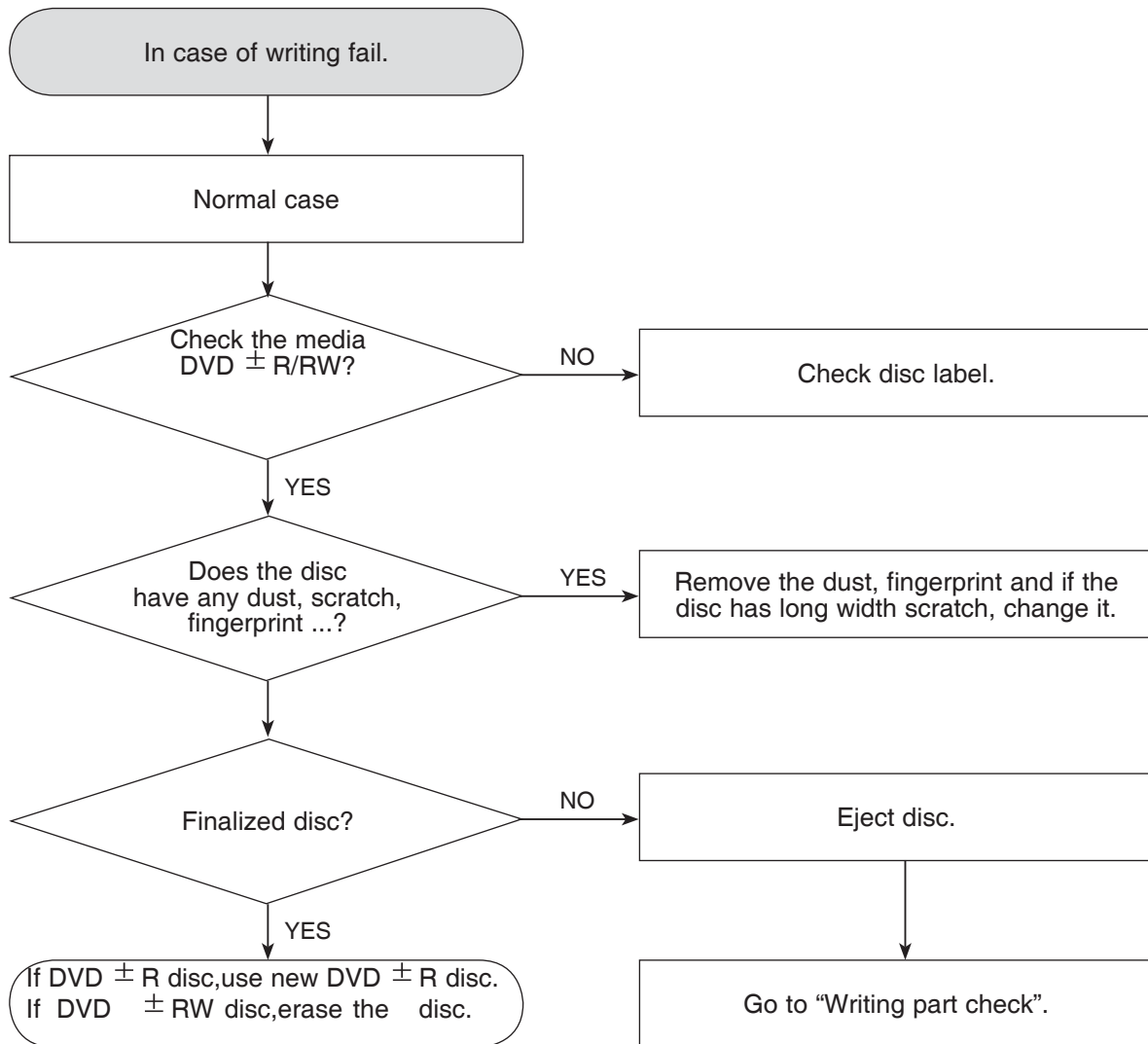


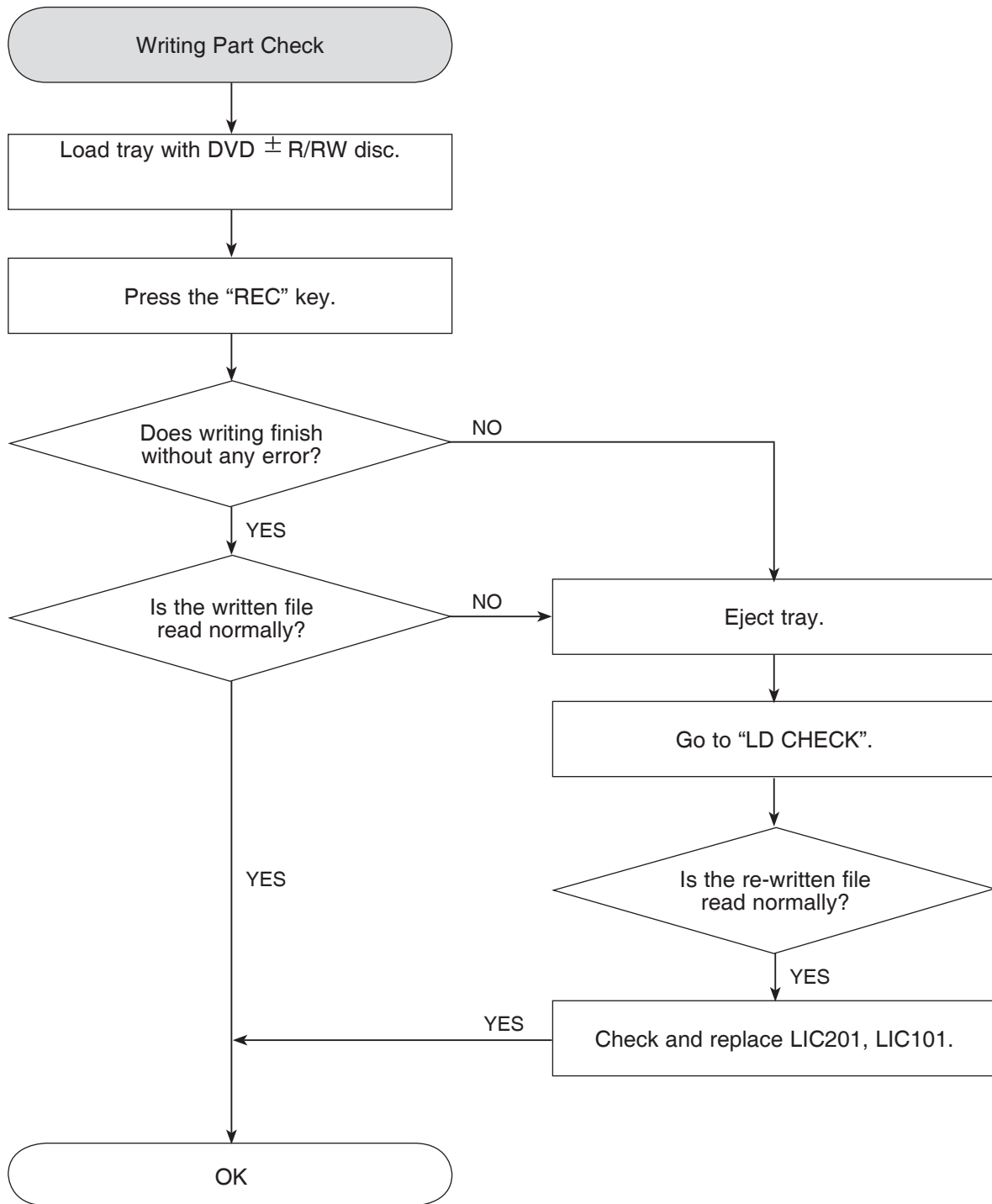


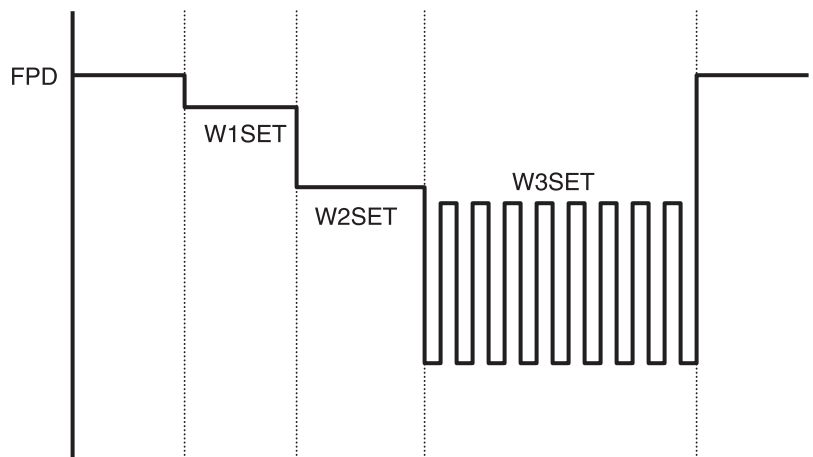
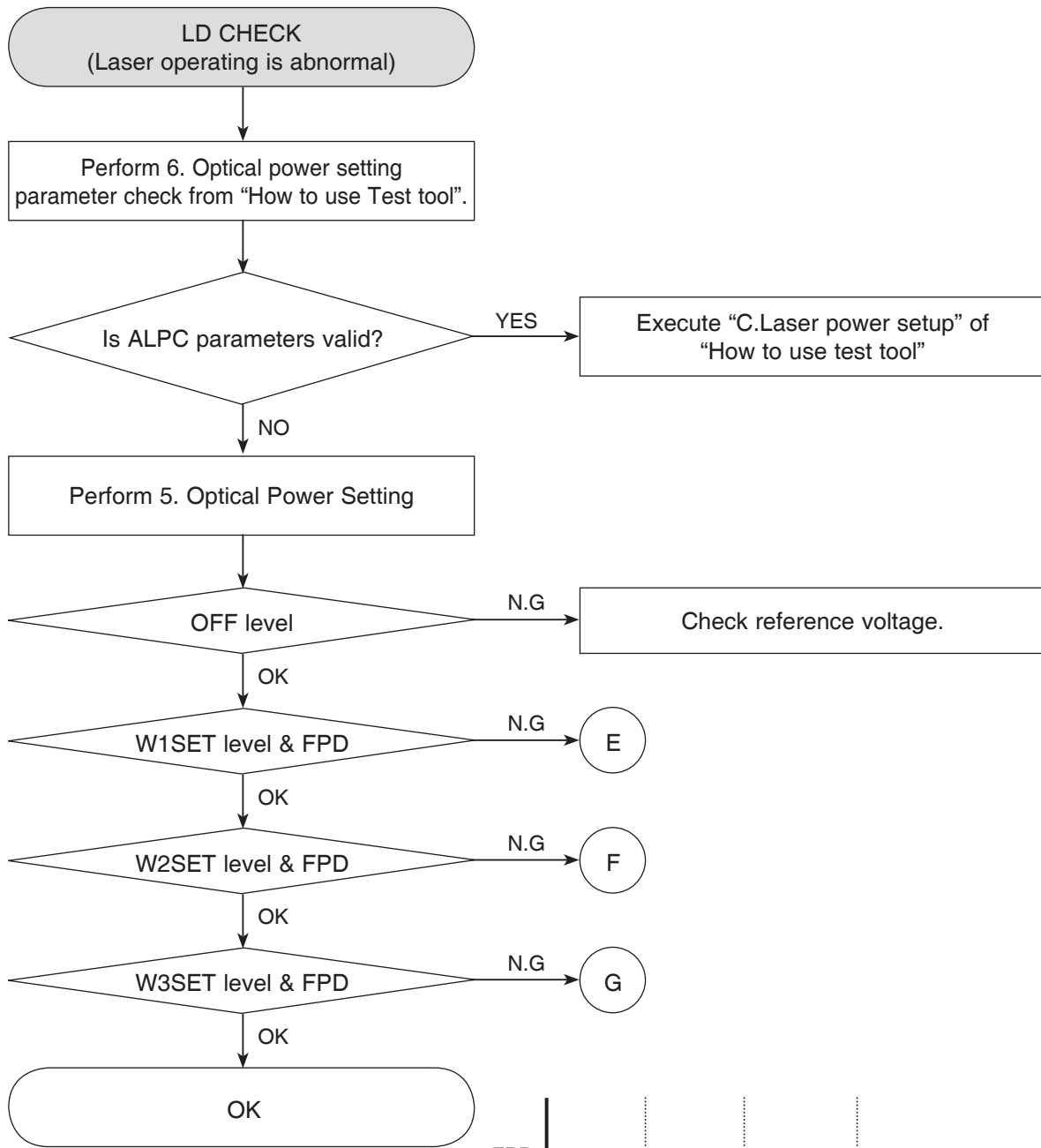


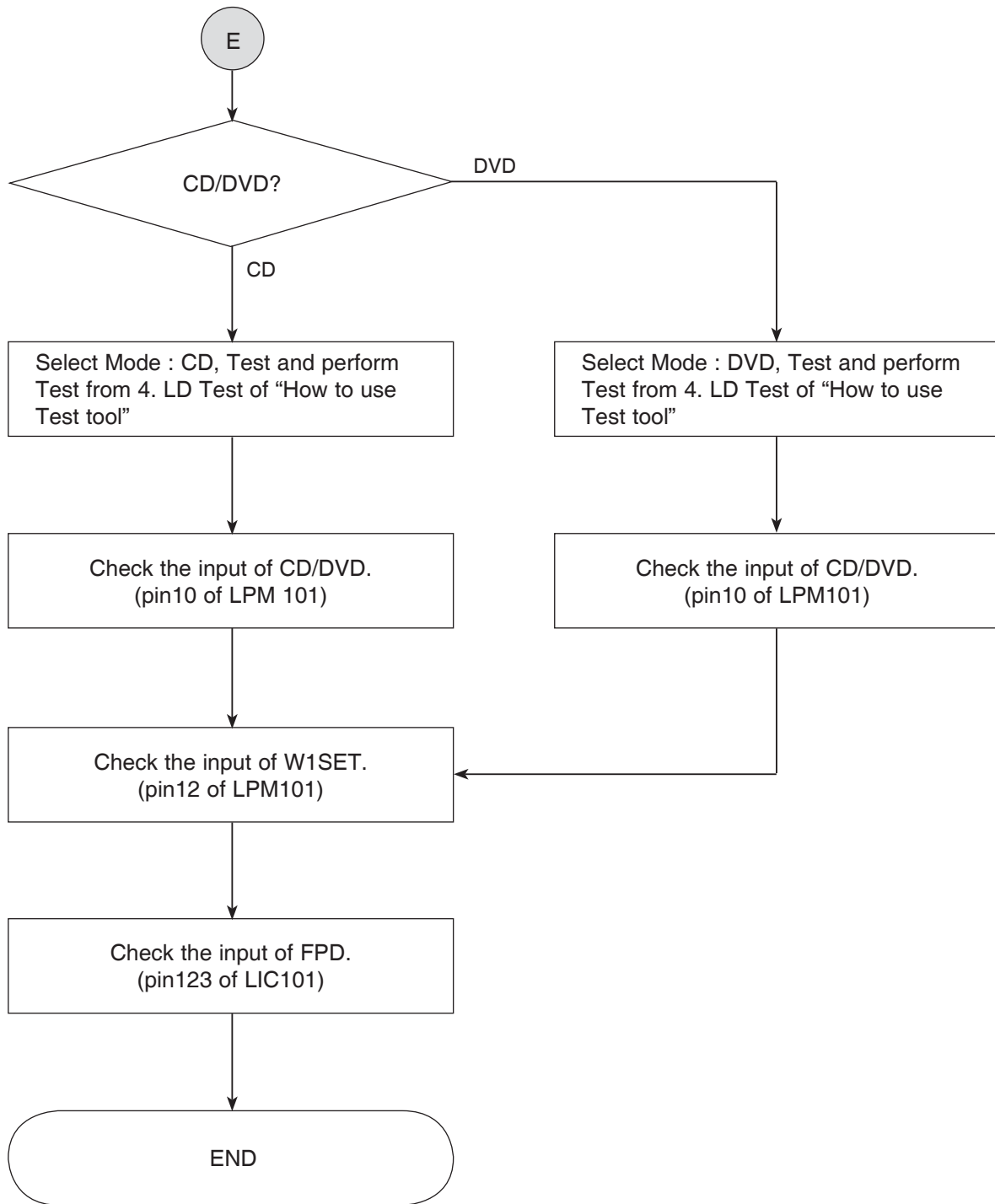


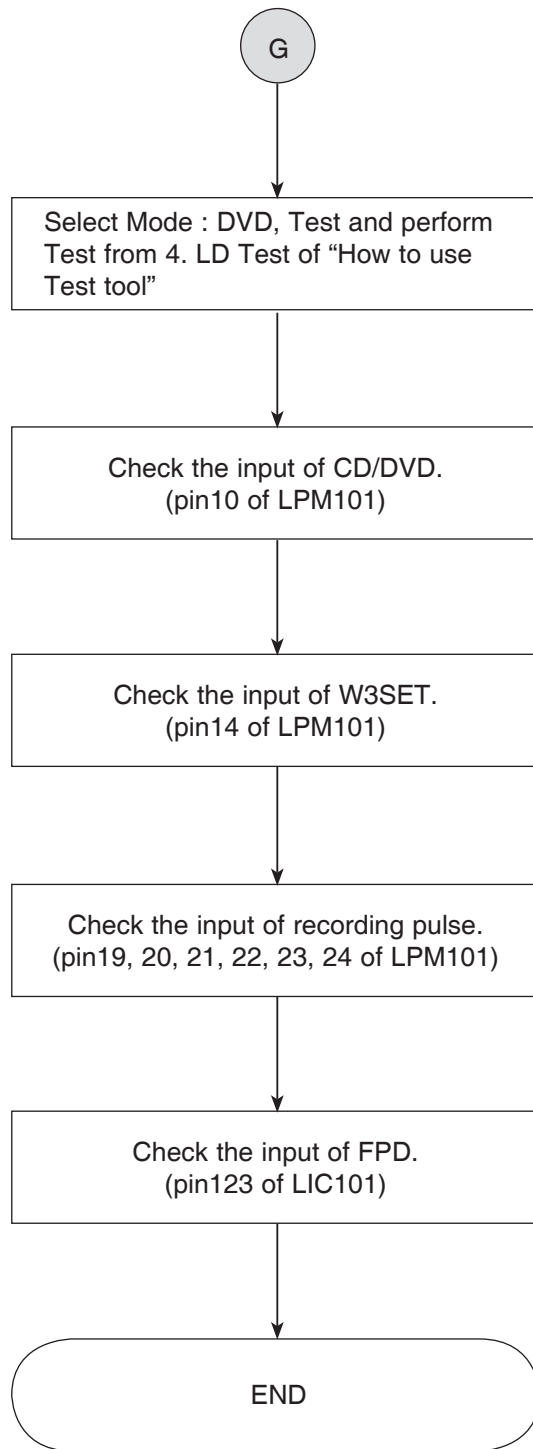
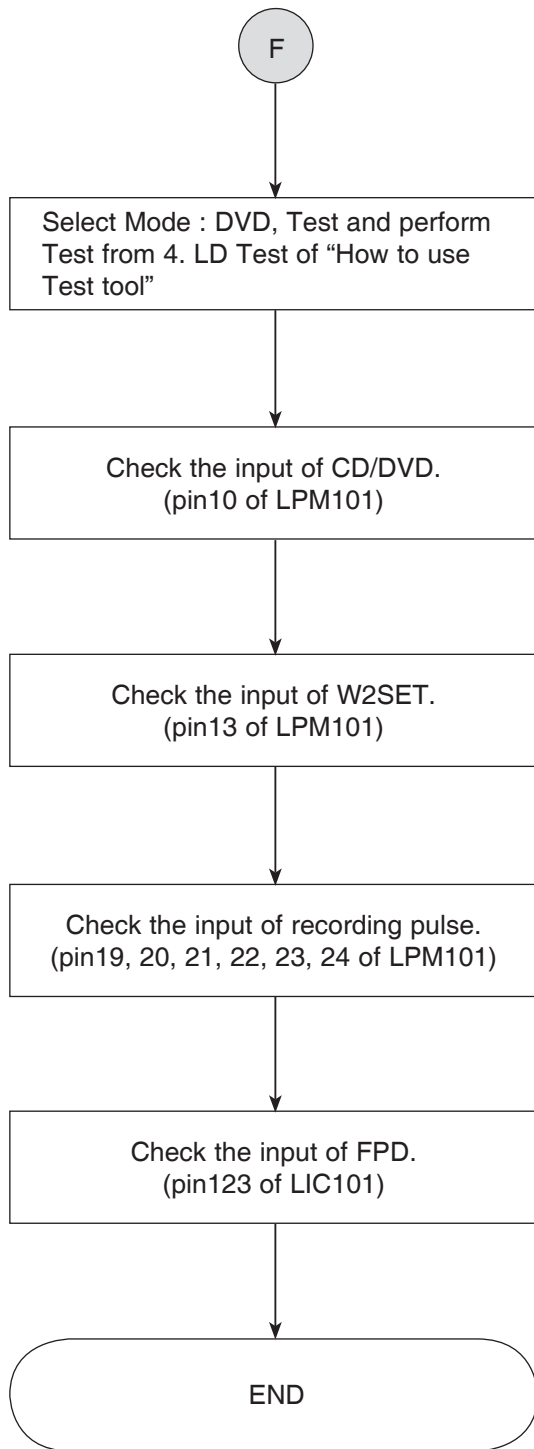








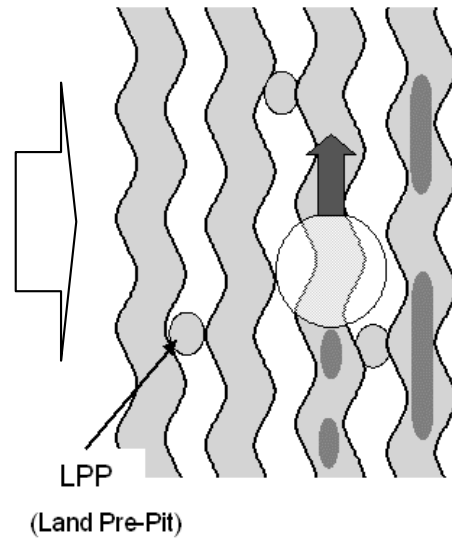
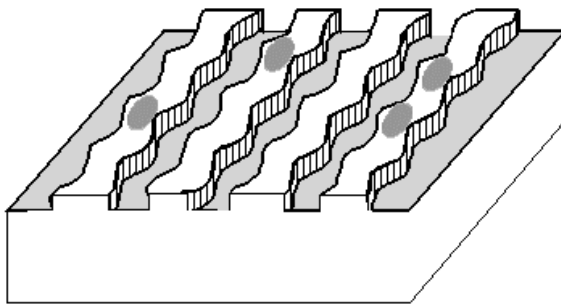
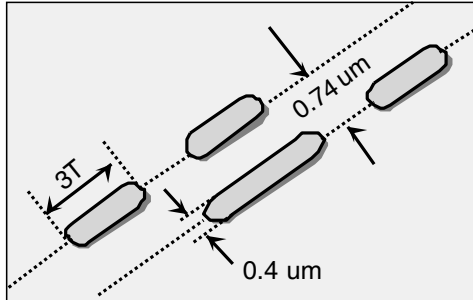




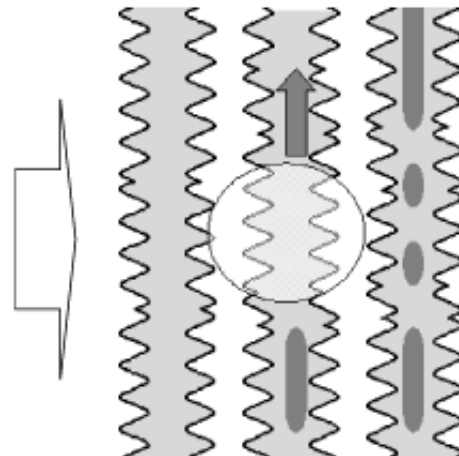
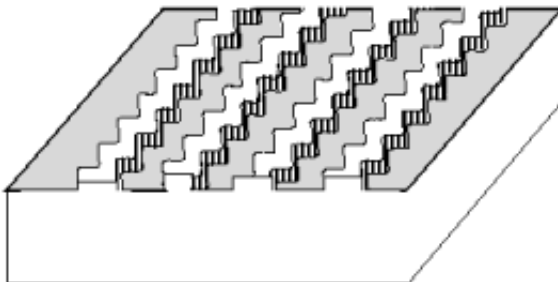
THE DIFFERENCE OF DVD-R/RW, DVD+R/RW DISCS AND DVD-ROM

1. RECORDING LAYER

- DVD-ROM (Read Only Disc)



- DVD+R/RW Disc

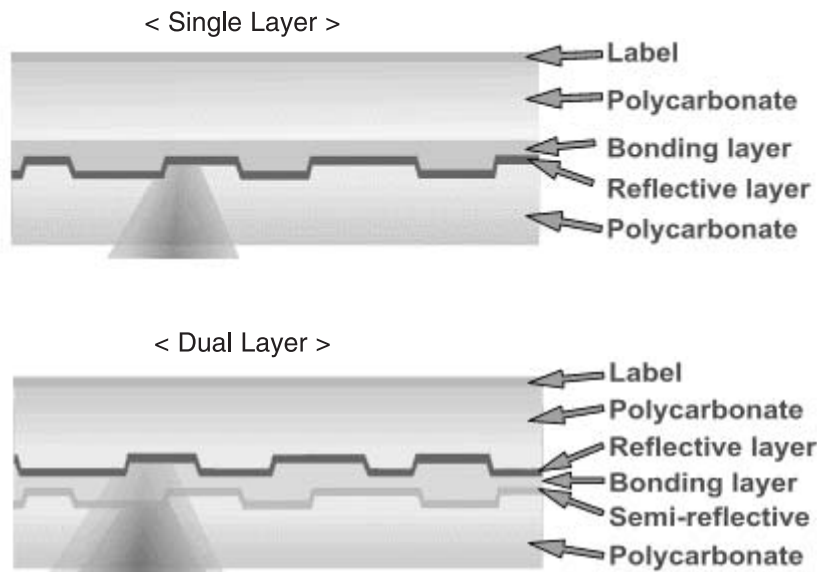


2. DISC SPECIFICATION

	DVD-ROM		DVD-R	DVD-RW	DVD+R	DVD+RW
	Single-Layer	Dual-Layer				
Media Type	Read Only	Read Only	Dye	Phase change	Dye	Phase change
User data capacity	4.7GB	8.54GB	4.7GB	4.7GB	4.7GB	4.7GB
Wavelength	650nm	650nm	650nm	650nm	650nm	650nm
Reflectivity	45~85%	18~30nm	45~85%	18~30%	45~85%	18~30nm
Track pitch	0.74 μ m	0.74 μ m	0.74 μ m	0.74 μ m	0.74 μ m	0.74 μ m
Minimum pit length	0.4 μ m	0.4 μ m	0.4 μ m	0.4 μ m	0.4 μ m	0.4 μ m
Modulation	>0.6	>0.6	>0.6	>0.6	>0.6	>0.6
Channel bit-rate	26.16MHz	26.16MHz	26.16MHz	26.16MHz	26.16MHz	26.16MHz
Wobble Frequency	–	–	140KHz	140KHz	817.4KHz	817.4KHz
Addressing	26.16MHz	26.16MHz	Wobble & LPP	Wobble & LPP	Wobble(ADIP)	Wobble(ADIP)
Read Power (mW)					0.7 \pm 0.1	0.7 \pm 0.1
Write Power (mW)	–					
Jitter	<8%	<8%	<8%	<8%	<9%	<9%

3. DISC MATERIALS

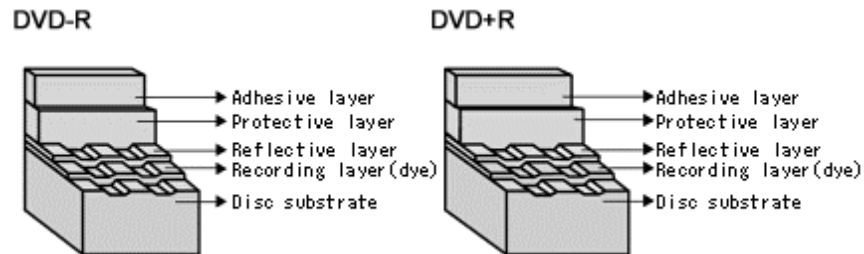
1) DVD-ROM



2) Recording format using organic dye material (DVD-R / DVD+R)

The format that records data through the creation of recorded marks by changing the organic dye material with a laser beam.

• Disc structure



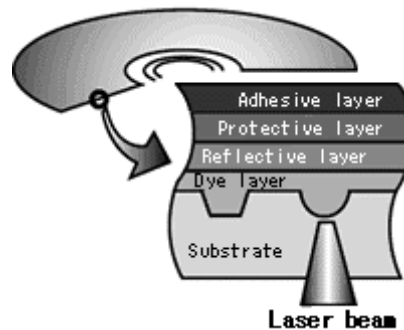
• Recording principles

[Recording]

Recording is done by changing the organic dye layer and the substrate with a laser. When a strong laser is applied to a disc, the temperature of the organic dye material goes up, the dye is decomposed and the substrate changes at the same time. At this time, a durable bit is created as is the case with a CD-ROM.

[Playback]

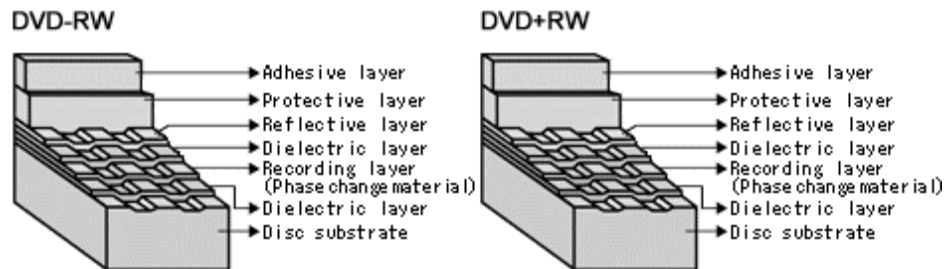
Signals are read with the differences of the reflection of a laser from pits.



3) Recording format using phase-change recording material (DVD-RW / DVD+RW)

Data is recorded by changing the recording layer from the amorphous status to the crystalline status, and played back by reading the difference of the reflection coefficient.
Amorphous: Non-crystalline.

• Disc structure



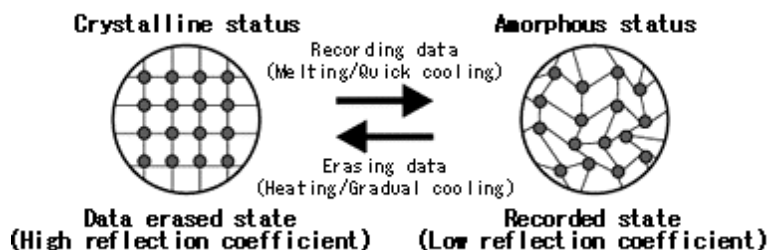
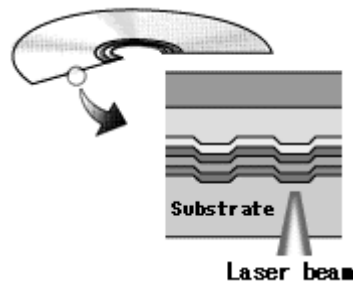
• Recording principles

[Recording]

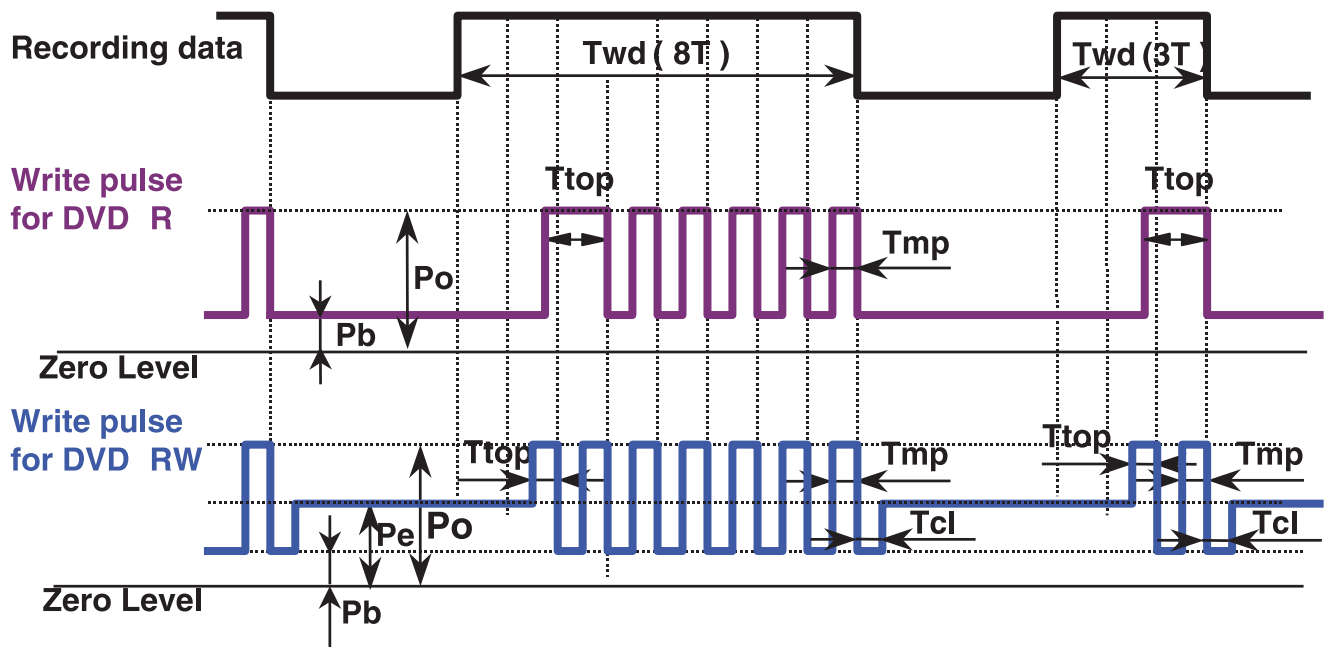
When a high-power laser is applied to the recording material, it melts and then becomes amorphous with a low reflection coefficient when it quickly cools off. When a mid-power laser is applied to heat gradually the recording material and then gradually cools it off, it becomes crystal with a high reflection coefficient.

[Playback]

A low-power laser is used for playback. The amount of reflected light depends on the status (amorphous or crystalline) of the recording material. This is detected by an optical sensor.



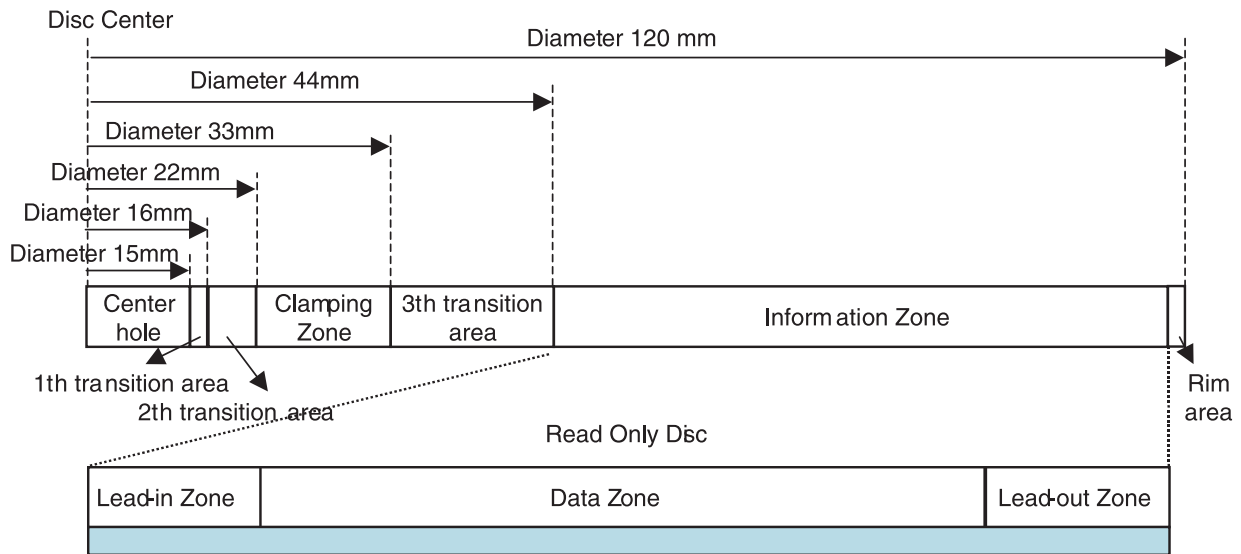
To make recordings, it is necessary to modulate the write pulse, which is called "Write Strategy". There can be many types in Write Strategy. Typically Write Strategy for DVD \pm R has NMP(Non Multi-Pulse) type and MP(Multi-Pulse) type. In NMP type each single mark is created by subsequent separated short pulses. In MP type each single mark is created by one continuous pulse. Write Strategy for DVD \pm RW has Type 1 and Type 2. In Type 1 the mark with nT width is created by one top pulse and $(n-2)$ multi-pulses. Thus mark $3T$ is made by one top pulse and one multi-pulse. In Type 2 the mark with nT width is created by one top pulse and $(n-3)$ multi-pulses. Thus mark $3T$ is made by one top pulse only. RV9 uses MP type Write Strategy for DVD \pm R and Type 1 for DVD \pm RW as shown below.



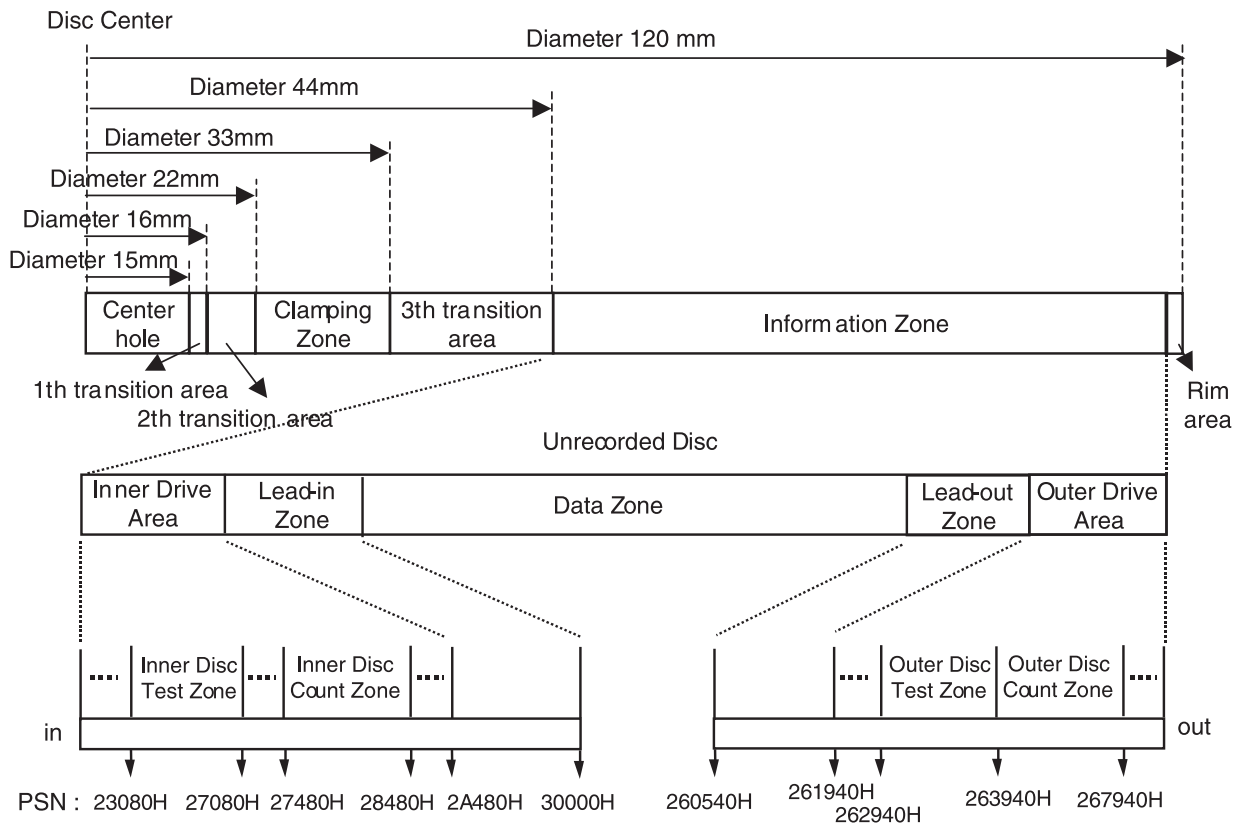
Po :Write Power (Peak Power)
 Pe :Erase Power
 Pb :Bias Power

4. ORGANIZATION OF THE INNER DRIVE AREA, OUTER DRIVE AREA, LEAD-IN ZONE AND LEAD-OUT ZONE

1) Layout of DVD-ROM disc

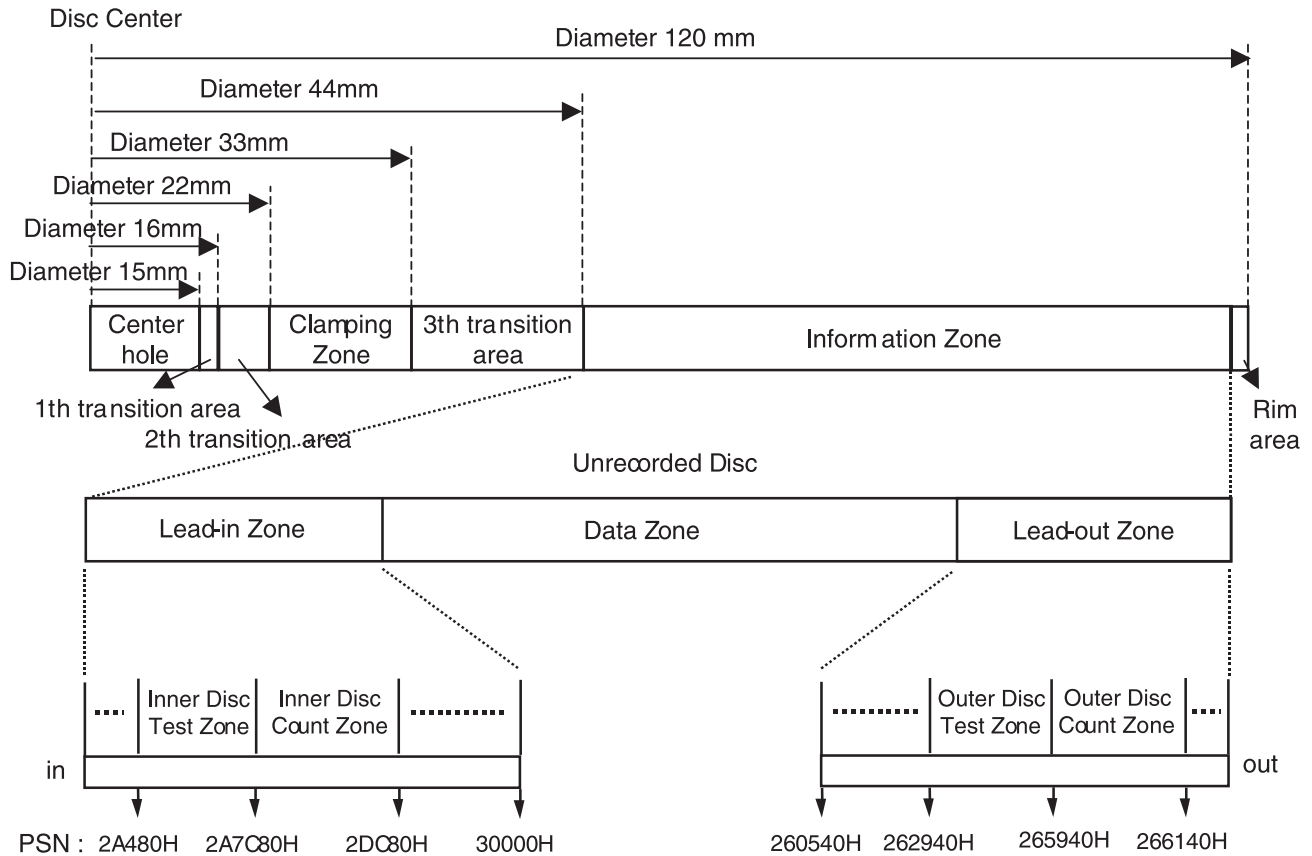


2) Layout of DVD+R disc



Inner Disc Test Zone : for performing OPC procedures.
 Inner Disc Count Zone : For counting the number of OPC algorithm performed in IDT Zone.
 Outer Disc Test Zone : for performing OPC procedures.
 Outer Disc Count Zone : For counting the number of OPC algorithm performed in IDT Zone.

3) Layout of DVD+RW disc



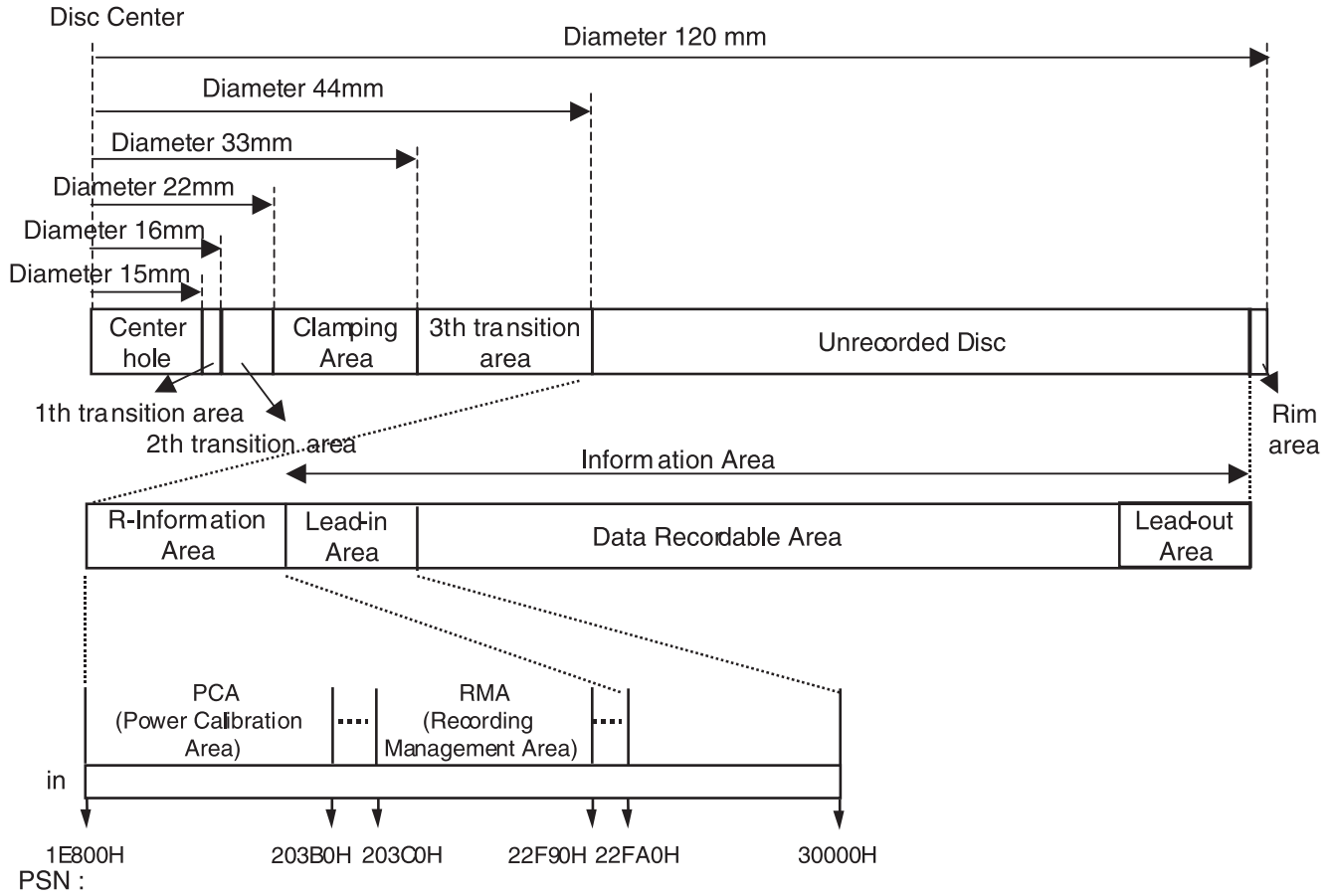
Inner Disc Test Zone : for performing OPC procedures.

Inner Disc Count Zone : For counting the number of OPC algorithm performed in IDT Zone.

Outer Disc Test Zone : for performing OPC procedures.

Outer Disc Count Zone : For counting the number of OPC algorithm performed in IDT Zone.

4) Layout of DVD-R/RW disc



AUTOMATIC OPTICAL POWER SETTING (SET-BASED)

The RV9 mounted models are supported by the B/END to automatically execute the optical power setting of the loader at the set condition with the following steps.

1. Use the remote controller to select the mode as Lock position at the Setup menu.
2. Use the remote controller to enter 5 -> 7 -> 2 -> 0 into the set.
When they are normally entered, the GUI is displayed as shown at Fig. 1.
3. When you select 'Yes', the optical power setting is automatically proceeded and it takes about 20 seconds.
4. When setting is finished, OK or NG is displayed on the screen.
The OK screen is displayed for the normal termination (Fig. 2)
The NG screen is displayed for the abnormal termination (Fig. 3)
5. When you select 'Yes' button, the GUI is cleared and it normally operates.



Fig. 1



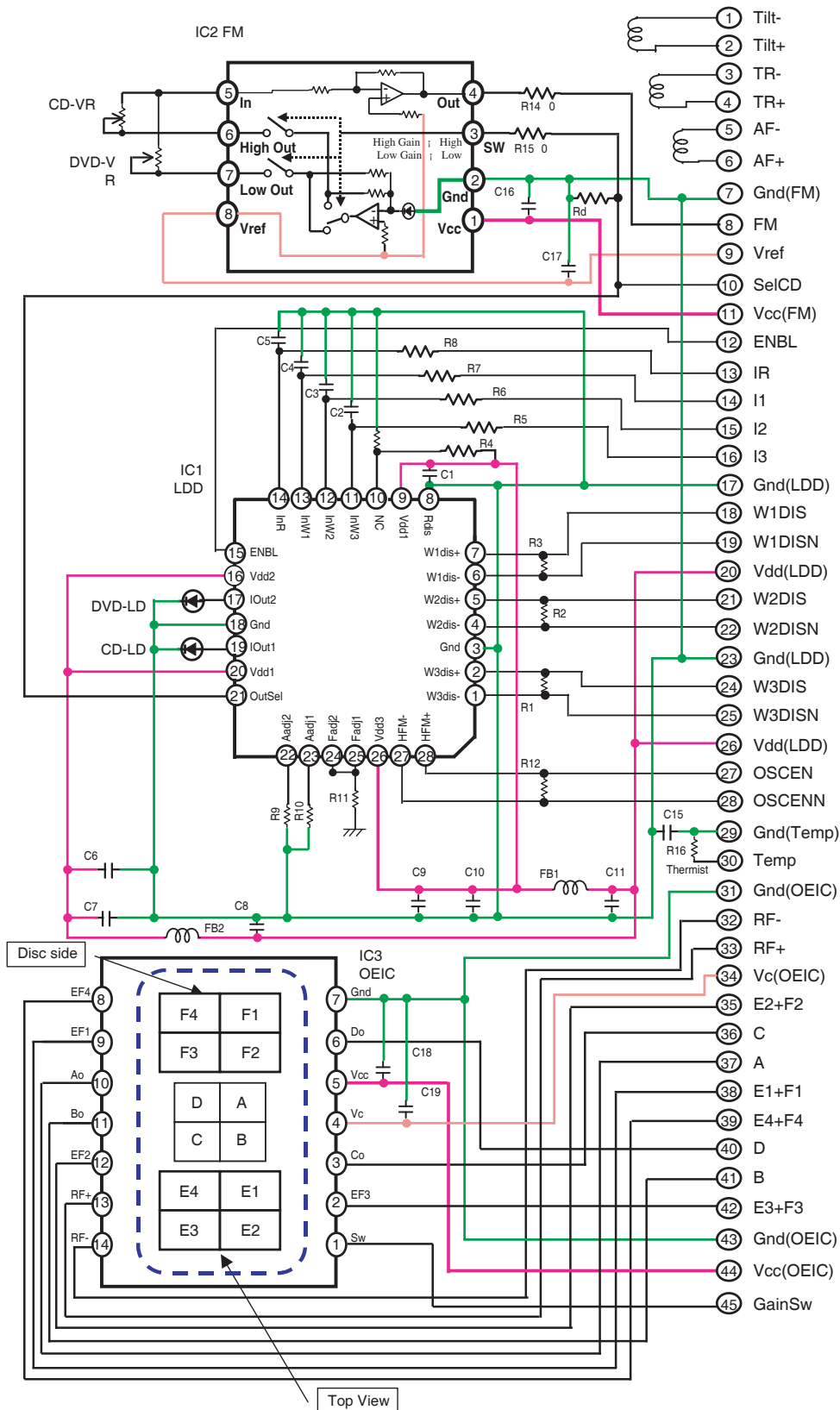
Fig. 2



Fig. 3

INTERNAL STRUCTURE OF THE PICK-UP

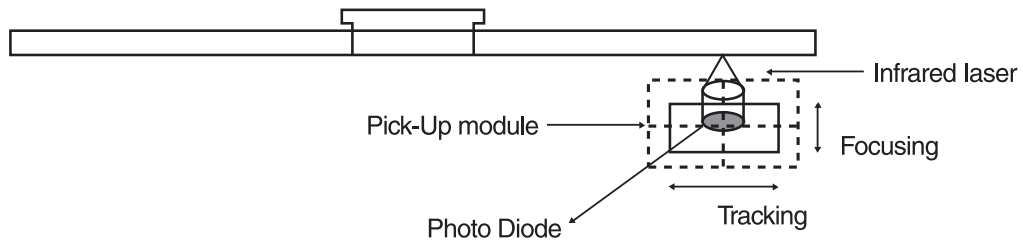
1. BLOCK DIAGRAM OF THE PICK-UP (HOP-7232TL)



2. PICK UP PIN ASSIGNMENT

No.	Signal Name	Signal Description	I/O
1	Tilt-	Tilting Actuator drive signal -	I
2	Tilt+	Tilting Actuator drive signal +	I
3	TR-	Tracking Actuator drive signal -	I
4	TR+	Tracking Actuator drive signal +	I
5	AF-	Focusing Actuator drive signal -	I
6	AF+	Focusing Actuator drive signal +	I
7	Gnd(FM)	Ground connection for FM	
8	FM	FM output	O
9	Vref	FM reference voltage input	I
10	SELCD	High:selects CD-LD,CD-VR Low: selects DVD-LD,DVD-VR	I
11	Vcc(FM)	Power supply for FM (+5 V)	
12	ENABLE	Disables output current regardless of **DIS (Low voltage:No lout)	I
13	IR	Input current for current amplifier	I
14	I1	Input current for current amplifier	I
15	I2	Input current for current amplifier	I
16	I3	Input current for current amplifier	I
17	GND(LDD)	Ground connection for LDD	
18	W1DIS	LVDS control for output current (Low active) (LVDS+)	I
19	W1DISN	LVDS control for output current (LVDS-)	I
20	VDD(LDD)	Power supply for LDD (+5 V)	
21	W2DIS	LVDS control for output current (Low active) (LVDS+)	I
22	W2DISN	LVDS control for output current (LVDS-)	I
23	Gnd(LDD)	Ground connection for LDD	
24	W3DIS	LVDS control for output current (Low active) (LVDS+)	I
25	W3DISN	LVDS control for output current (LVDS-)	I
26	Vdd(LDD)	Power supply for •DD (+5 V)	
27	OscEn	LVDS control for Oscillator (High active) (LVDS+)	I
28	OscEnN	LVDS control for Oscillator (LVDS-)	I
29	Gnd(TEMP)	Ground connection for Thermister	
30	TEMP	Resistance for controlling temperature	O
31	Gnd(OEIC)	Ground for OEIC	O
32	RF-	Signal OEIC RF negative differential output	O
33	RF+	Signal OEIC RF positive differential output	O
34	Vc(OEIC)	Reference voltage input for OEIC (+2.1 V)	I
35	E2+F2	Signal OEIC output EF2	O
36	C	Signal OEIC output C	O
37	A	Signal OEIC output A	O
38	E1+F1	Signal OEIC output EF1	O
39	E4+F4	Signal OEIC output EF4	O
40	D	Signal OEIC output D	O
41	B	Signal OEIC output B	O
42	E3+F3	Signal OEIC output EF3	O
43	Gnd(OEIC)	Ground for OEIC	
44	Vcc(OEIC)	Power supply for OEIC (+5 V)	I
45	GainSw	OEIC output gain control (High voltage:Low gain , Middle:Middle gain , Low:High gain)	I

3. SIGNAL DETECTION OF THE P/U



1) Focus Error Signal ==> $(A+C)-(B+D)$

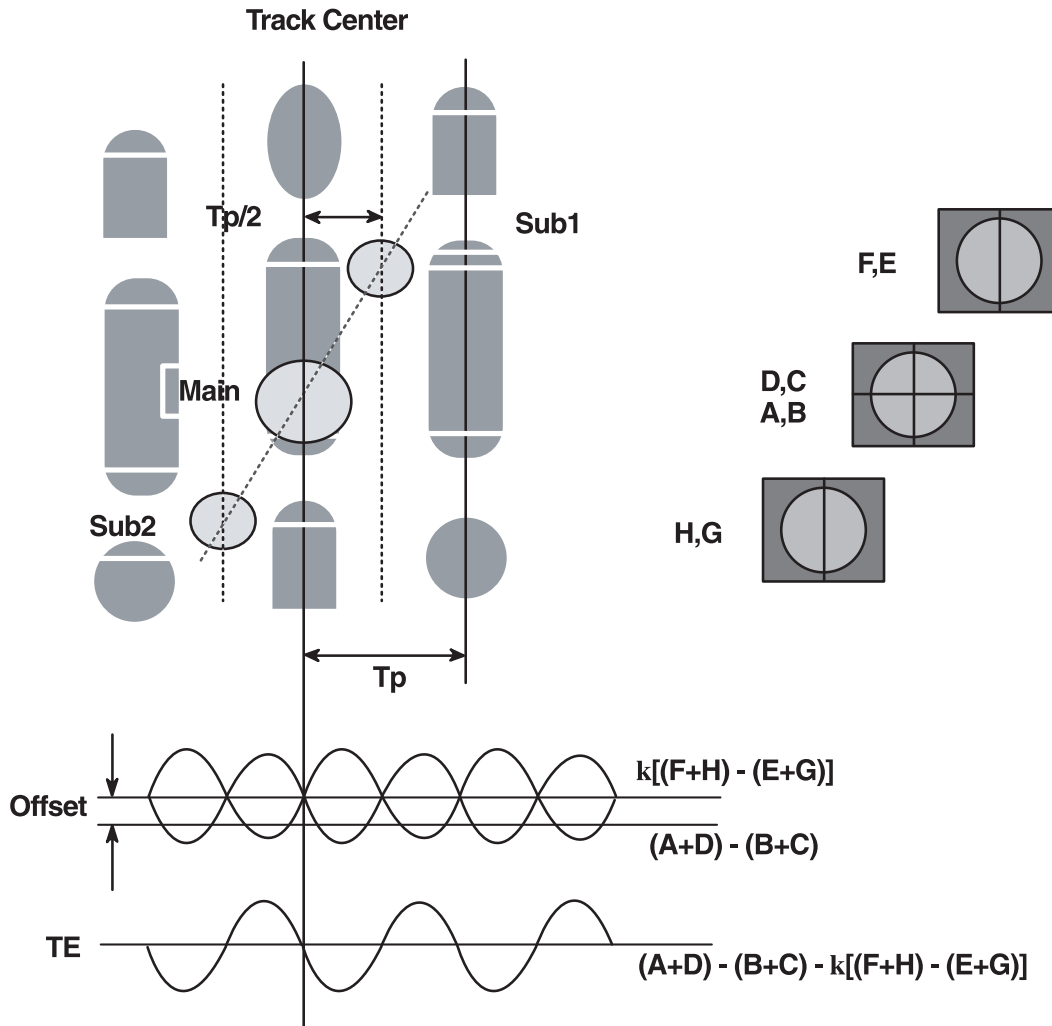
This signal is generated in RF IC (LIC121 : AN22113A) and controls the pick-up's up and down to focus on Disc.

2) Tracking Error Signal (DPP Method) ==> $\{(A+D)-(B+C)\} - k \times \{(EF1+EF4)-(EF2+EF3)\}$

This signal is generated in RF IC (LIC121 : AN22113A) and controls the pick-up's left and right shift to find track on Disc.

3) RF Signal ==> $(A+B+C+D)$

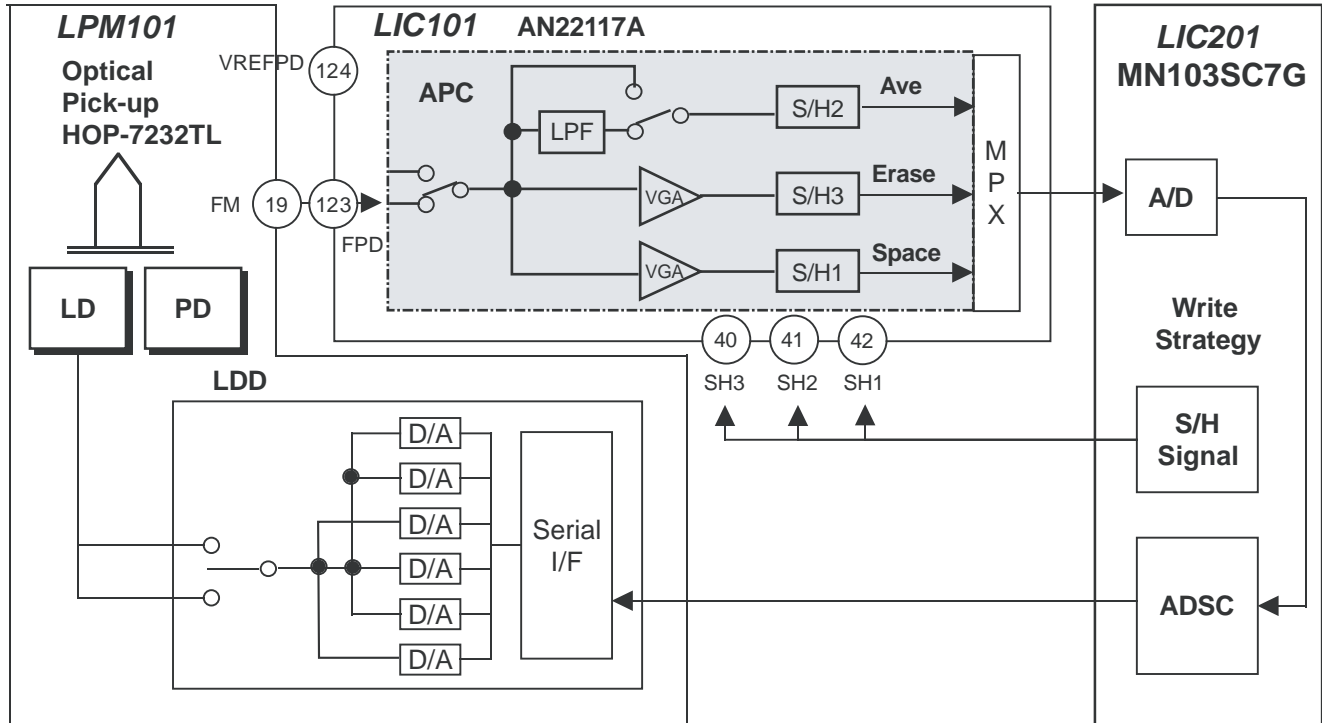
This signal is converted to DATA signal in DSP IC (LIC201 : MN103SA6G).



DESCRIPTION OF CIRCUIT

1. ALPC (AUTOMATIC LASER POWER CONTROL) CIRCUIT

1-1. Block Diagram

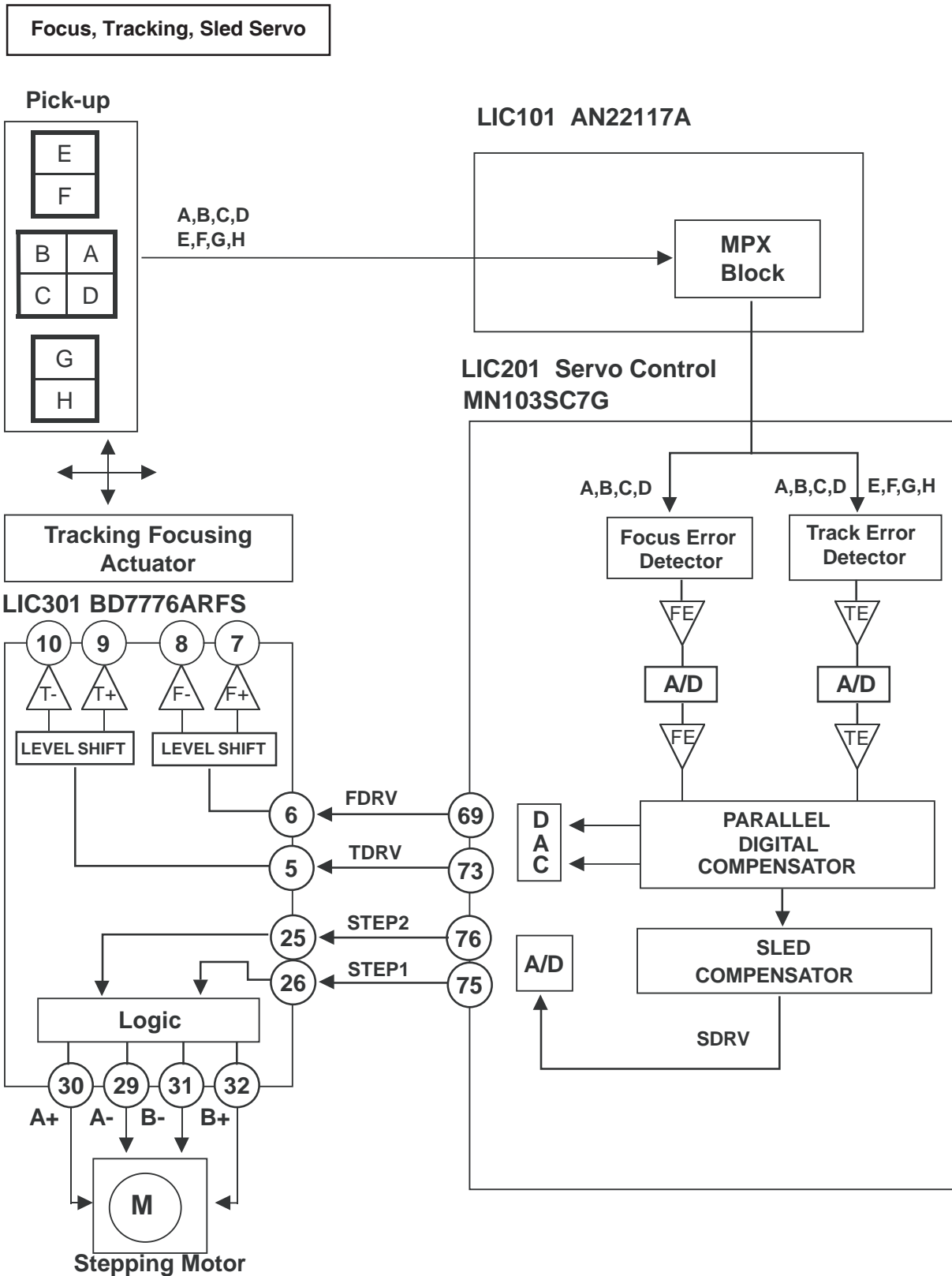


1-2. ALPC (Automatic Laser Power Control) Circuit Operation

The ALPC block detects the laser output power of the front monitor. The power signal detected with the PD for front monitor detection is input the voltage from the VPD pin(123Pin), the reference signal of the input signal is input from the VREFPD pin(124Pin). The ALPC block generates the signals from the input laser power signals in the following detection systems. This block has four detection paths:All average value path, multi pulse average/peak value detection path, erase/bottom value detection path, space/playback power value detection path.

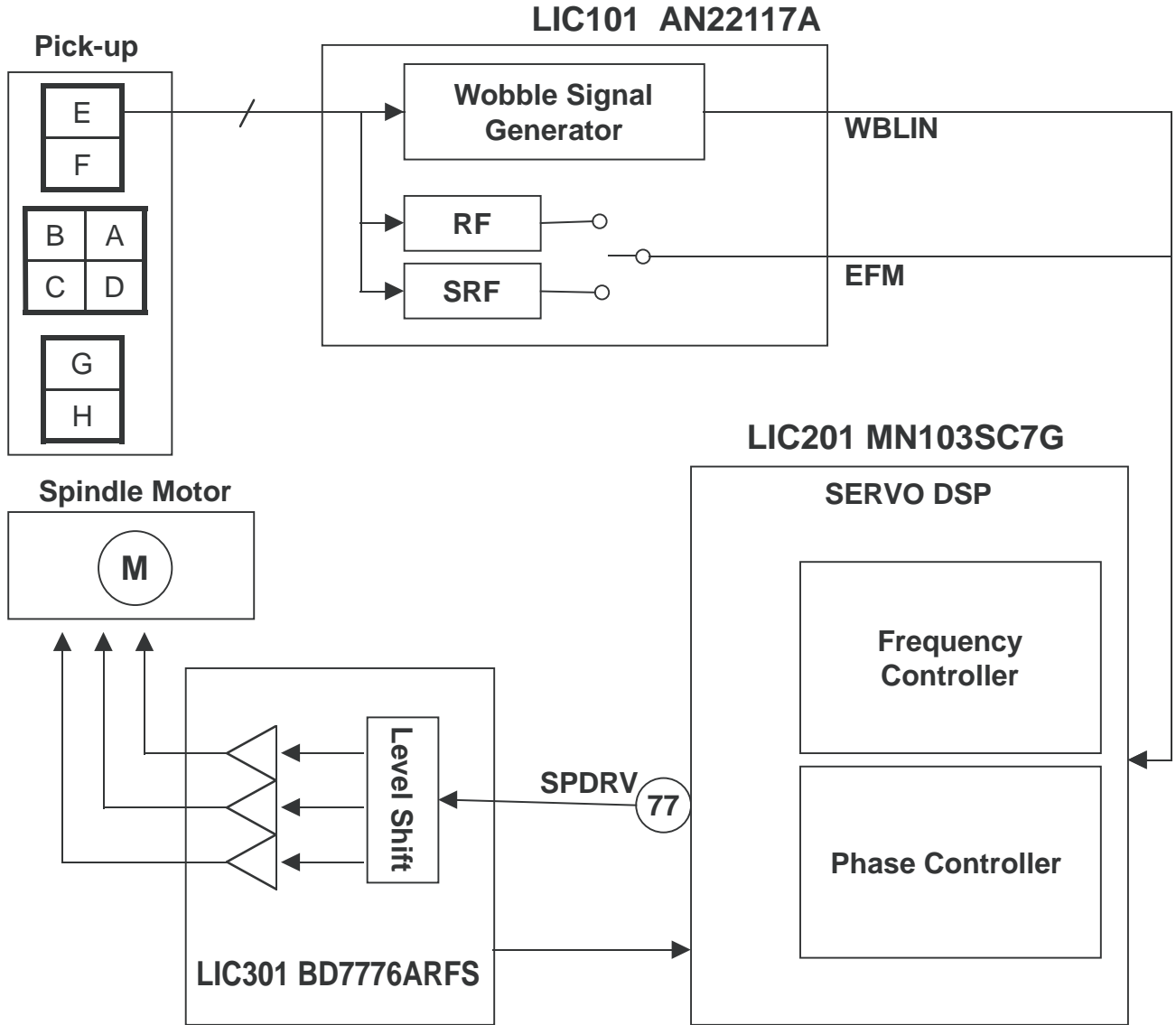
2. FOCUS/TRACKING/SLED SERVO CIRCUIT

2-1. Focus, Tracking & Sled Servo Process



3. SPINDLE SERVO CIRCUIT

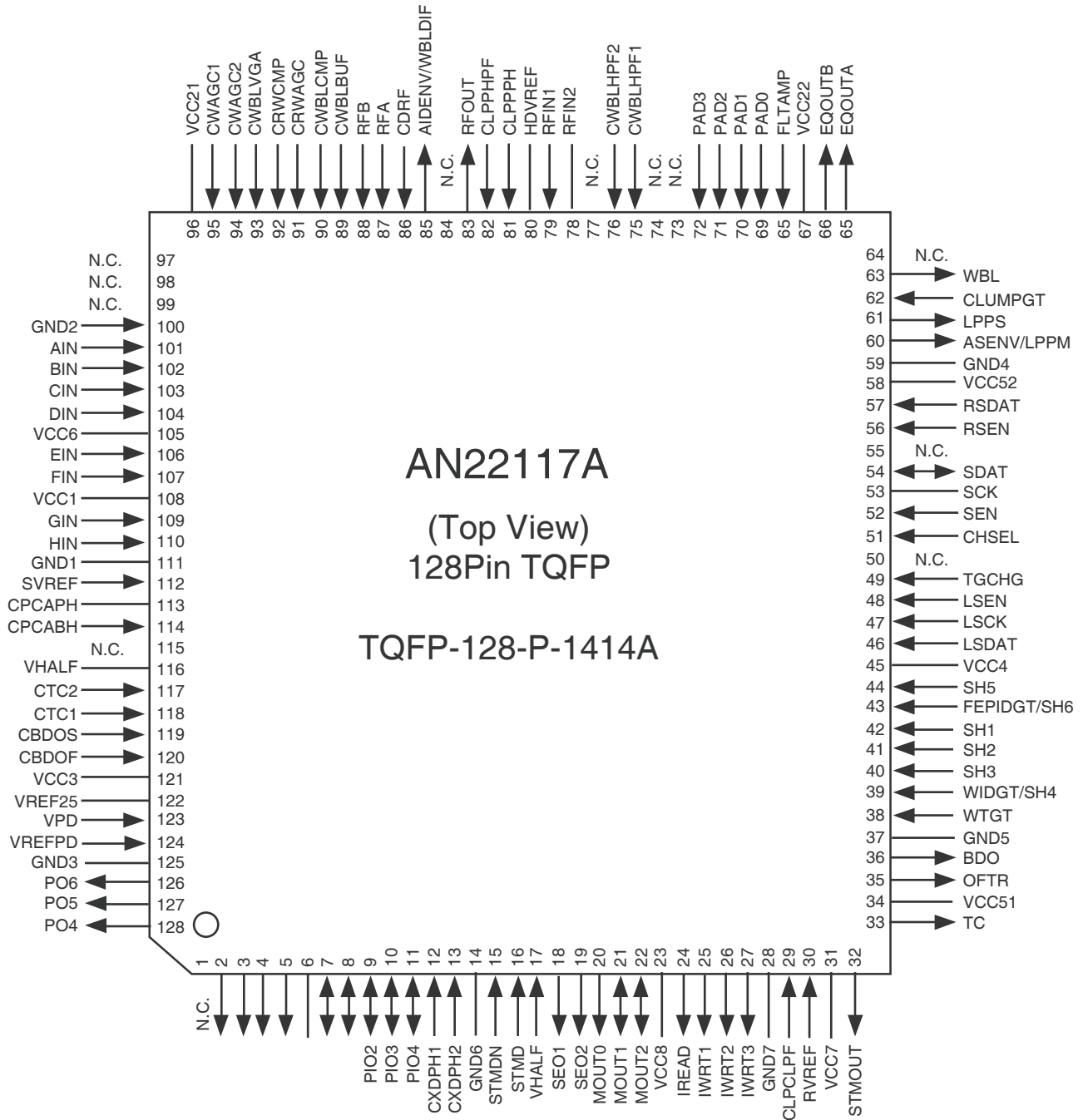
3-1. Spindle Servo Process



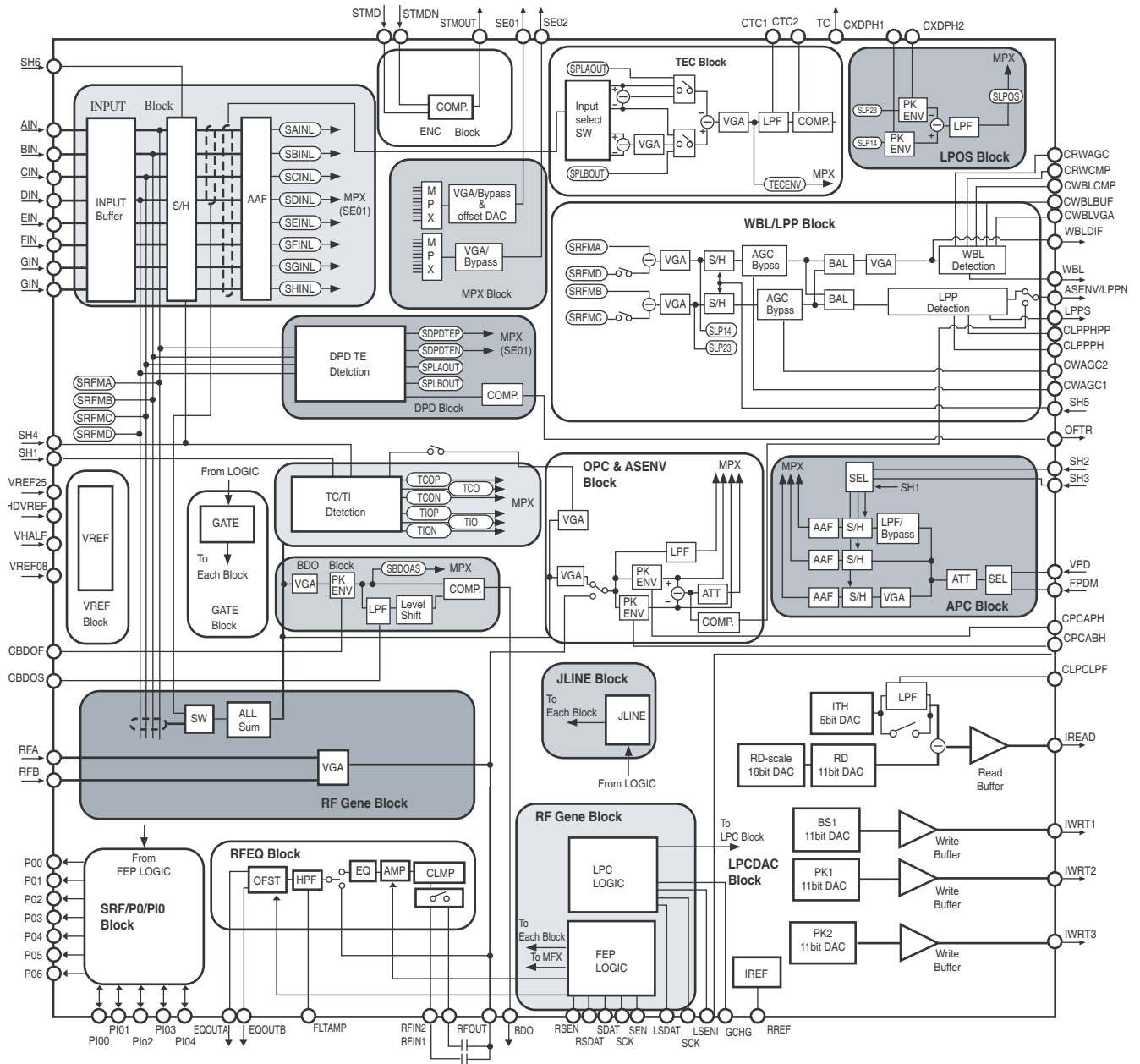
MAJOR IC INTERNAL BLOCK DIAGRAM AND PIN DESCRIPTION

1. LIC101 (AN22117A) : FEP(RF) ANALOG SIGNAL PROCESSOR

- Pin Assignment



• **Block Diagram**



- **Pin Assignment**

Pin no.	Pin Name	Type	Function
1	NC	-	-
2	PO3	O	General CMOS output pin
3	PO2	O	Head Amp/OEIC gain change signal output pin 3.
4	PO1	O	Head Amp/OEIC gain change signal output pin 2.
5	PO0	O	Head Amp/OEIC gain change signal output pin 1.
6	VCC53	PS	Power supply pin for CMOS I/F & LOGIC.
7	PIO0	I/O	General CMOS Input/Output pin 0.
8	PIO1	I/O	General CMOS Input/Output pin 1.
9	PIO2	I/O	General CMOS Input/Output pin 2.
10	PIO3	I/O	General CMOS Input/Output pin 3.
11	PIO4	I/O	General CMOS Input/Output pin 4.
12	CXDPH1	I	PH capacitor connection pin 1 for LPOS.
13	CXDPH2	I	PH capacitor connection pin 2 for LPOS
14	GND6	PS	GND pin for BG.
15	STMDN	I	PD input pin for STM.
16	STMD	I	PD input pin for STM.
17	VREF08	O	0.8V reference voltage output pin (APC).
18	SEO1	O	Output pin 1 after selection of each error signal.
19	SEO2	O	Output pin 2 after selection of each error signal.
20	MOUT0	O	Analog monitor 0.
21	MOUT1	I/O	Analog monitor 1.
22	MOUT2	I/O	Analog monitor 2.
23	VCC8	PS	Power supply pin for LPC (5.0V)
24	IREAD	O	DAC electric current output pin for READ.
25	IWRT1	O	DAC electric current output pin 1 for WRITE.
26	IWRT2	O	DAC electric current output pin 2 for WRITE.
27	IWRT3	O	DAC electric current output pin 3 for WRITE.
28	GND7	PS	GND pin for LPC.
29	CLPCLPF	I	Capacitor connection pin for LPC/DAC LPF.
30	RVREF	I	Capacitor connection pin for reference voltage setting.
31	VCC7	PS	Power supply pin for LPC (3.3V).
32	STMOUT	O	Encoder circuit comparator output.
33	TC	O	Track cross signal output.
34	VCC51	PS	Power supply pin for CMOS I/F & LOGIC(3.3V)
35	OFTR	O	OFTR signal output.
36	BDO	O	BDO output.
37	GND5	PS	Ground pin for CMOS I/F.
38	WTGT	I	Write gate signal input pin (pull-down)
39	WIDGT/SH4	I	VFO through signal input pin. ROPC mark detection sampling signal input pin (pull-down)
40	SH3	I	PCA average detection, APC space detection/Playback power detection/ Erase detection sample timing signal input pin(pulldown).

Pin no.	Pin Name	Type	Function
41	SH2	I	PCA peak/bottom detection, APC space detection/ Playback power detection/Eraser detection sample timing signal input pin (pulldown)
42	SH1	I	ROPC space detection, APC space detection/ Playback power detection sample timing signal input pin(pulldown).
43	FEPIDGT/SH6	I	CAPA through signal input pin/servo sampling signal input pin (pull-down)
44	SH5	I	Sample-and-hold timing signal input pin of wobble S/H at recording (pull-down)
45	VCC4	PS	Power supply pin for internal LOGIC (5.0V)
46	LSDAT	I/O	Serial data input for LPC.
47	LSCK	I	Serial clock enable input LPC.
48	LSEN	I	Serial enable input for LPC.
49	TGCHG	I	LPC DAC bank change control signal input pin.
50	NC	-	-
51	CHSEL	I	Serial MPX channel change data input pin.
52	SEN	I	Serial enable input pin for FEP (pull-down)
53	SCK	I	Serial clock input pin for FEP (pull-up).
54	SDAT	I/O	Serial data input pin for FEP.
55	NC	-	-
56	RSEN	I	Serial enable input for RF (pull-down).
57	RSDAT	I	Serial signal data input for RF
58	VCC52	PS	Power supply pin for CMOS I/F & internal current source power supply pin2 (3.3V)
59	GND4	PS	Ground pin for internal LOGIC
60	ASENV/LPPM	O	ASENV output/LPP mark output pin
61	LPPS	O	LPP space output pin
62	CLUMPGT	I	RFAGC input bias circuit clamp setting input pin (pulldown)
63	WBL	O	WBL binary output
64	NC	-	-
65	EQOUTA	O	Equalizer filter output pin 1.
66	EQOUTB	O	Equalizer filter output pin 2.
67	VCC22	PS	Power supply pin for RFEQ/LPP (5.0V)
68	FLTAMP	I	Filter final stage AMP reference voltage stabilization pin.
69	PAD0	I	A/D input pin 0
70	PAD1	I	A/D input pin 1
71	PAD2	I	A/D input pin 2
72	PAD3	I	A/D input pin 3
73	NC	-	-
74	NC-	-	-
75	CWBLHPF1	I	HPF capacitor connection pin for WBLAGC 1.
76	CWBLHPF2	I	HPF capacitor connection pin for WBLAGC 2.
77	NC	-	-

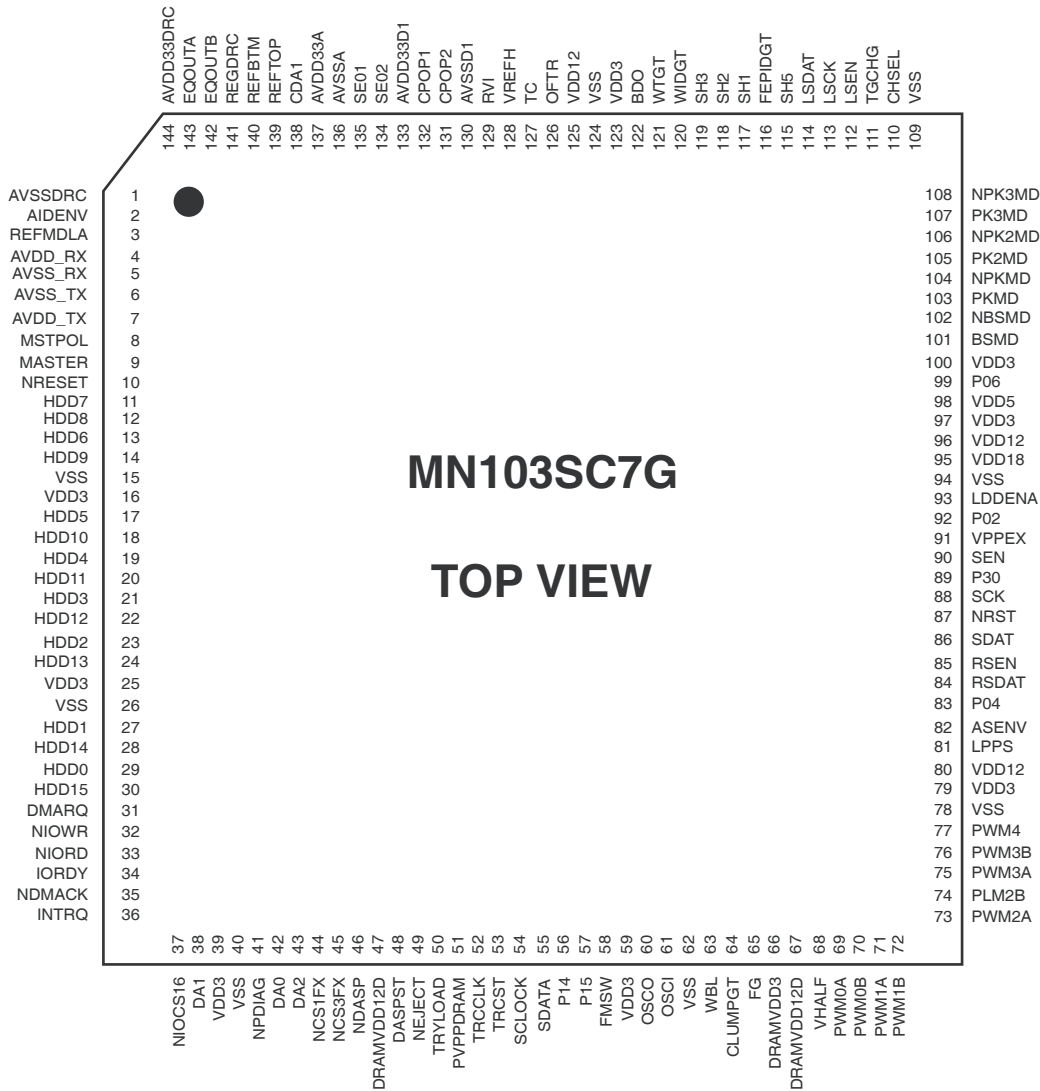
Pin no.	Pin Name	Type	Function
78	RFIN2	I	RFAGC signal input pin 2.
79	RFIN1	I	RFAGC signal input pin 1.
80	HDVREF	O	2.2V reference voltage output pin.
81	CLPPPH	I	Capacitor connection pin for LPP peak hold
82	CLPPHPF	I	Capacitor connection pin for LPPHPF
83	RFOUT	O	RF signal output pin.
84	NC	-	-
85	AIDENV/WBLDIF	O	ASENV binary output/Differential signal output pin for ADIP detection
86	CDRF	I	CD RF signal input pin.
87	RFA	I	DVD RF differential input pin 1.
88	RFB	I	DVD RF differential input pin 2.
89	CWBLBUF	I	Capacitor connection pin for WBLDIF.
90	CWBLCMP	I	Floating Capacitor connection pin for VGA before WBL binary.
91	CRWAGC	I	AGC adjustment capacitor connection pin for +RW.
92	CRWCMP	I	Floating Capacitor connection pin for VGA before WBLDIF AGC.
93	CWBLVGA2	I	Floating Capacitor connection pin for VGA before SRL.
94	CWAGC2	I	AGC adjustment capacitor connection pin 2 for WBL extraction.
95	CWAGC1	I	AGC adjustment capacitor connection pin 1 for WBL extraction.
96	VCC21	PS	-
97	NC	-	-
98	NC	-	-
99	NC	-	-
100	GND2	PS	Power supply pin for RF gene/WBL (5.0V)
101	AIN	I	DVD Tracking input pin 1.
102	BIN	I	DVD Tracking input pin 2.
103	CIN	I	DVD Tracking input pin 3.
104	DIN	I	DVD Tracking input pin 4.
105	VCC6	PS	Power supply pin for DPD (3.3V)
106	EIN	I	CD main signal input pin 1.
107	FIN	I	CD main signal input pin 2.
108	VCC1	PS	Power supply pin for INPUT MATRIX/SERVO (5.0V)
109	GIN	I	CD servo signal input pin 1.
110	HIN	I	CD servo signal input pin 2.
111	GND1	PS	Ground pin for INPUT MATRIX/SERVO/DPD.
112	SVREF	I	OEIC signal reference level input pin.
113	CPCAPH	I	PCA pick hold capacitor connection pin.
114	CPCABH	I	PCA bottom bold capacitor connection pin.
115	NC	I	-
116	VHALF	O	Reference voltage output pin 1/2 VCC (3.3V).
117	CTC2	I	Floating capacitor connection pin for tracking error binary.

Pin no.	Pin Name	Type	Function
118	CTC1	I	Capacitor connection pin for TC HPF.
119	CBDOS	I	Capacitor connection pin for BDO detecting circuit LPF.
120	CBDOF	I	Capacitor connection pin for BDO detecting circuit Pick detection.
121	VCC3	PS	Power supply pin for APC/OPC/ASENV (5.0V).
122	VREF25	O	2.5V reference voltage output pin.
123	VPD	I	DVD front monitor signal input pin.
124	VREFPD	I	Front light system reference level input pin.
125	GND3	PS	Ground pin for APC/OPC/ASENV.
126	PO6	O	Ground CMOS output pin 6.
127	PO5	O	Ground CMOS output pin 5.
128	PO4	O	Ground CMOS output pin 4.

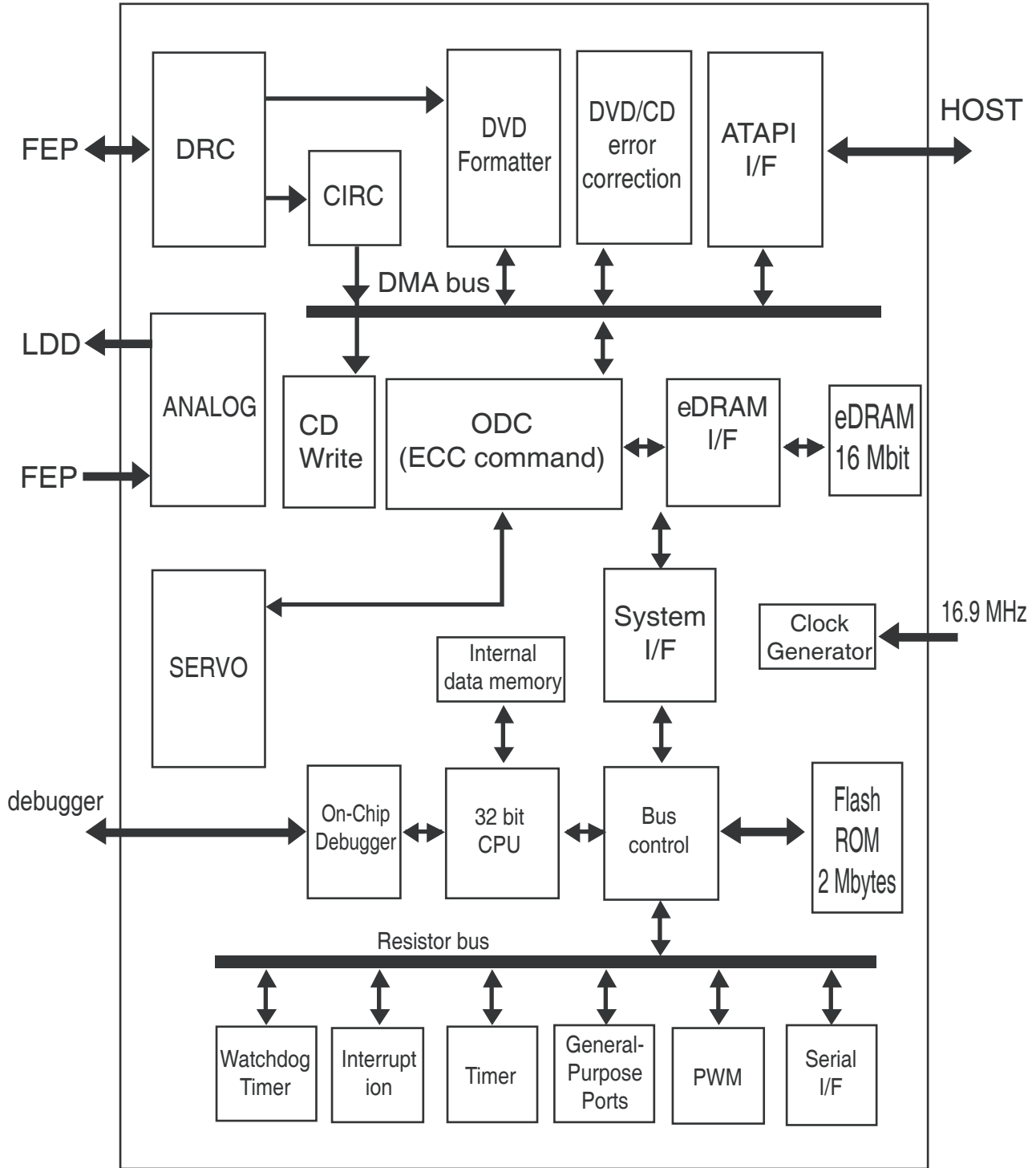
I : Input pin O: Output pin I/O : I/O pin PS : Power supply/Ground pin N.C: Non Connection

2. LIC201 (MN103SC7G) : ENCODER, DECODER & DSP SINGAL PROCESSOR

- Pin Assignment



- Block Diagram (SODC : MN103SC7G)



• Pin Table

Pin Number	Pin Name	I/O	Connection Target	Description
1	AVSSDRC	GND	GND	DRC analog Vss
2	AIDENV	I	FEP	TE signal for DVD-RAM
	WBLDIF			ADIP detector signal input
3	REFMDLA	O	Cap	Analog-to-digital converter reference voltage for ADIP
4	AVDD_RX	Power supply	Power supply	Analog power supply (3.3V)
5	AVSS_RX	GND	GND	Analog ground
6	AVSS_TX	GND	GND	Analog ground
7	AVDD_TX	Power supply	Power supply	Analog power supply (3.3V)
8	MSTPOL	I/O	-	MASTER pin polarity switch
	TRCDATA 1		-	Trace data 1
	P17		-	General-purpose I/O (GIO/PWM1)
9	MASTER	I/O	HOST	ATAPI master/slave signal
	P23		-	General-purpose I/O (GIO/TxD0/PWM0)
10	NRESET	I	HOST	ATAPI reset signal
11	HDD7	I/O	HOST	ATAPI data I/O
12	HDD8	I/O	HOST	ATAPI data I/O
13	HDD6	I/O	HOST	ATAPI data I/O
14	HDD9	I/O	HOST	ATAPI data I/O
15	VSS	GND	GND	Digital Vss
16	VDD3	Power supply	Power supply	I/O pad VDD (3.3V)
17	HDD5	I/O	HOST	ATAPI data I/O
18	HDD10	I/O	HOST	ATAPI data I/O
19	HDD4	I/O	HOST	ATAPI data I/O
20	HDD11	I/O	HOST	ATAPI data I/O
21	HDD3	I/O	HOST	ATAPI data I/O
22	HDD12	I/O	HOST	ATAPI data I/O
23	HDD2	I/O	HOST	ATAPI data I/O
24	HDD13	I/O	HOST	ATAPI data I/O
25	VDD3	Power supply	Power supply	I/O pad VDD (3.3V)
26	VSS	GND	GND	Digital Vss
27	HDD1	I/O	HOST	ATAPI data I/O
28	HDD14	I/O	HOST	ATAPI data I/O
29	HDD0	I/O	HOST	ATAPI data I/O
30	HDD15	I/O	HOST	ATAPI data I/O
31	DMARQ	O	HOST	DMA request to ATAPI host
32	NIOWR	I/O	HOST	ATAPI host write signal
33	NIORD	I/O	HOST	ATAPI host read signal
34	IORDY	O	HOST	Ready signal to ATAPI host
35	NDMACK	I	HOST	ATAPI host DMA acknowledge signal

Pin Number	Pin Name	I/O	Connection Target	Description
36	INTRQ	O	HOST	ATAPI Interrupt request to ATAPI host
37	NIOCS16	I/O	HOST	ATAPI host bus width select signal
	P22		-	General-purpose I/O (GIO)
38	DA1	I	HOST	ATAPI host address signal input
39	VDD3	Power supply	Power supply	I/O pad VDD (3.3V)
40	VSS	GND	GND	Digital Vss
41	NPDIAG	I/O	HOST	Diagnostic signal from ATAPI slave to master
42	DA0	I	HOST	ATAPI host address signal
43	DA2	I	HOST	ATAPI host address signal
44	NCS1FX	I	HOST	ATAPI host chip select signal
45	NCS3FX	I	HOST	ATAPI host chip select signal
46	NDASP	I/O	HOST	ATAPI host chip select signal
47	DRAMVDD12D	Power supply	Power supply	DRAM VDD (1.2V)
48	DASPST	I/O	-	DASP setting
	TRCDATA0		-	Trace data 0
	P16		-	General-purpose I/O (GIO/PWM0)
49	NEJECT	I/O	Mecha	Tray eject signal (SODC external interrupt)
	P25		-	General-purpose I/O (GIO)
50	TRYLOAD	I/O	Mecha	Tray eject signal (SODC external interrupt)
	P26		-	General-purpose I/O (GIO)
51	PVPPDRAM	Power supply	Cap	DRAM internal power supply output
52	TRCCLK	I/O	-	Trace clock
	P20		-	General-purpose I/O (GIO/TxD0/PWM0)
53	TRCST	I/O	-	Trace status
	P21		-	General-purpose I/O (GIO/RxT0/PWM1)
54	SCLOCK	I/O	-	Debugger clock
55	SDATA	I/O	-	Debugger data
56	P14	I/O	-	General-purpose I/O(GIO/SerialCLK0/PWM0/external interrupt 3)
	TRCDATA2		-	Trace data 2
	EXTRIG1		-	Trigger 1
57	P15	I/O	-	General-purpose I/O(GIO/RxD0/PWM1/external interrupt 4)
	TRCDATA3		-	Trace data 3
	EXTRIG2		-	Trigger 2
58	FMSW	I/O	PU	Power monitor detector multiplier conversion signal
	P03		-	General-purpose I/O (GIO)
60	OSCO	O	X'tal	Oscillator output
61	OSCI	U	X'tal	Oscillator input (16.9344 MHz)
62	VSS	GND	GND	Digital Vss
63	WBL	I	FEP	Wobble binary signal

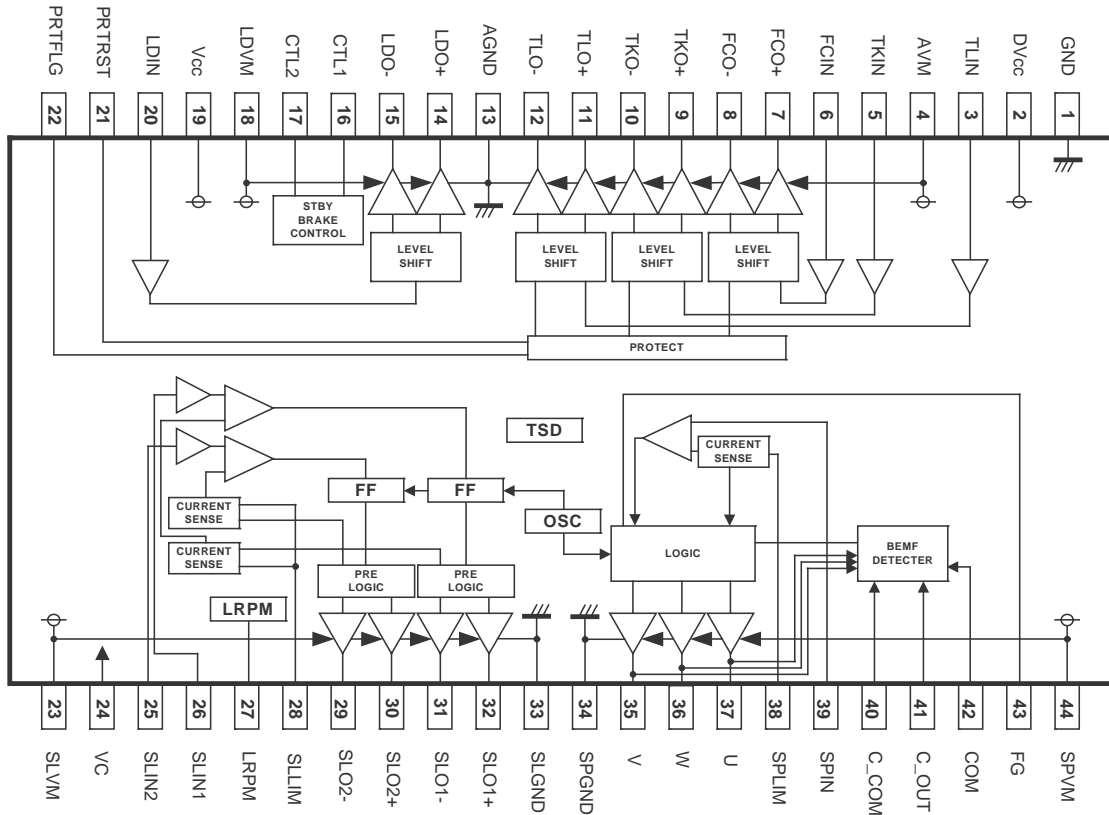
Pin Number	Pin Name	I/O	Connection Target	Description
64	CLUMPGT	O	FEP	RF AGC bias circuit clamp signal
65	FG	I	DRIVER	Spindle FG input
66	DRAMVDD3	Power supply	Power supply	DRAM VDD (3.3V)
67	DRAMVDD12D	Power supply	Power supply	DRAM VDD (1.2V)
68	VHALF	I/O	FEP	Drive pin central reference voltage input
69	PWM0A	O	DRIVER	Focus drive differential PWM+ output, focus drive BSDA output.
70	PWM0B	I/O	DRIVER	Focus drive differential PWM- output
	P10		-	General-purpose I/O (GIO/TxD0/SerialCLK0/PMW0)
71	PWM1A	O	DRIVER	Focus 2 (tilt) drive differential PWM+ output, focus 2 drive BSDA output.
72	PWM1B	I/O	DRIVER	Focus 3 (tilt) drive differential PWM-output
	P11		-	General-purpose I/O (GIO/RxD0/PWM1)
73	PWM2A	I/O	DRIVER	Tracking drive differential PWM+ output, tracking drive BSDA output
	P27		-	General-purpose I/O (GIO/PWM0)
74	PWM2B	I/O	DRIVER	Tracking drive differential PWM - output
	TX		HOST	IEC60958-compliant digital output
	P12		-	General-purpose I/O (GIO/TxD0)
75	PWM3A	I/O	DRIVER	Traverse drive differential PWM+ output, stepper 1 drive output
	P31		-	General-purpose I/O (GIO/PWM0)
76	PWM3B	I/O	DRIVER	Traverse drive differential PWM- output, stepper 2 drive output
	P31		-	General-purpose I/O (GIO/RxD0/PWM1)
77	PWM4	O	DRIVER	Spindle drive output
78	VSS	GND	GND	Digital Vss
79	VDD3	Power supply	Power supply	I/O pad VDD (3.3V)
80	VDD12	Power supply	Power supply	Internal logic VDD(1.2V)
81	LPPS	I	FEP	LPP space input
82	ASENV	I	FEP	ASENV input
	LPPM		-	LPP mark input
83	P04	I/O	-	General-purpose I/O (GIO/TxD0/PWM1/external interrupt 1)
	GENE0		Mache	Inner limit switch input
84	RSDAT	I/O	FEP	FEP serial interface data 2 (RF)
85	RSEN	O	FEP	FEP serial interface enable 2 (RF)
86	SDAT	I/O	FEP	FEP serial interface data
87	NRST	I	Reset	IC Reset input (power on reset)
88	VDD3	Power supply	Power supply	I/O pad VDD(3.3)
89	P30	I/O	-	General-purpose I/O (GIO/TxD1)
90	SEN	O	FEP	FEP serial interface enable

Pin Number	Pin Name	I/O	Connection Target	Description
91	VPPEX	Power supply	Power supply	Flash memory power supply Vpp
92	P02	I/O	-	General-purpose I/O (GIO/RxD0/PWM0/external interrupt 0)
	NLDERR		PU	Laser error detection signal
93	LDDENA	O	PU	LDD enable signal
94	VSS	GND	GND	Digital Vss
95	VDD18	Power supply	Power supply	Flash memory power supply Vpp
96	VDD12	Power supply	Power supply	Internal logic VDD (1.2V)
97	VDD3	Power supply	Power supply	I/O pad VDD (1.2V)
98	VDD5	Power supply	Power supply	DRAm VDD (5.0V)
99	P06	I/O	-	General-purpose I/O (GIO/RxD0/PWM1/external interrupt 2)
	HFON		PU	External high frequency module (HFM) ON/OFF
100	VDD3	Power supply	Power supply	I/O pad VDD (1.2V)
101	BSMD	O	PU	BIAS modulation signal differential current output
102	NBSMD	O	PU	NBIAS modulation signal differential current output
103	PKMD	O	PU	PEAK1 modulation signal differential current output
104	NPKMD	O	PU	NPEAK1 modulation signal differential current output
105	PK2MD	O	PU	PEAK2 modulation signal differential current output
106	NPK2MD	O	PU	NPEAK2 modulation signal differential current output
107	PK3MD	I/O	PU	PEAK3 modulation signal differential current output
	SRF1			OEIC gain switching timing adjustment 1 (when using external WTST)
	P00		-	General-purpose I/O (GIO/TxD0/PWM0)
108	NPK3MD	I/O	PU	NPEAK3 modulation signal differential current output
	SRF2			OEIC gain switching timing adjustment 2 (when using external WTST)
	P01		-	General-purpose I/O (GIO/RxD0/PWM1)
109	VSS	GND	GND	Digital Vss
110	CHSEL	I/O	FEP	Serial MPX channel conversion data output signal
	MMOD		-	Test mode selection signal(Do not connect to a pull-up resistor or similar part.)
111	TGCHG	I/O	FEP	Write power switch signal
	P05		-	General-purpose I/O (GIO)
112	LSEN	O	PU	LDD serial interface enable
113	LSCK	O	PU	LDD serial interface clock
114	LSDAT	I/O	PU	LDD serial interface data
115	SH5	I/O	FEP	Write WOBBLE sample and hold sampling signal
116	FEPIDGT	I/O	FEP	CAPA punch out signal
	SH6			Servo S/H sample signal
	P07		-	General-purpose I/O (GIO/SerialCLK1)

Pin Number	Pin Name	I/O	Connection Target	Description
117	SH1	I/O	FEP	Sample timing signal for ROPC space detection, APC space detection, and read power detection
118	SH2	I/O	FEP	Sample timing signal for PCA peak, bottom detection, APC peak detection, and mean valuer detection
119	SH3	I/O	FEP	Sample timing signal for PCA mean value detection, APC space detection, and read power detection, and erase detection
120	WIDGT	I/O	FEP	VFO punch out signal
	SH4			ROPC mark detection sampling signal
	P24		-	General-purpose I/O (GIO/TxD1)
121	WTGT	O	FEP	Write gate
122	BDO	I	FEP	Dropout signal input
123	VDD3	Power supply	Power supply	I/O pad VDD (3.3V)
124	VSS	GND	GND	Digital Vss
125	VDD12	Power supply	Power supply	Internal logic VDD (1.2V)
126	OFTR	I	FEP	Off track signal input
127	TC	I	FEP	Track crossing signal input
128	VREFH	I	FEP	2.2V reference voltage input
129	RVI	I/O	Res.	Fixed current source for LVDS, WBL, and analog blocks
130	AVSSD1	GND	GND	WOBBLE analog Vss
131	CPOP2	I/O	Cap. Res.	Filter connection pin for wobble PLL
132	CPOP1	I/O	Cap. Res.	Filter connection pin for wobble PLL
133	AVDD33DI	Power supply	Power supply	WOBBLE analog VDD (3.3V)
134	SE02	I	FEP	Error signal output after selection, analog input
135	SE01	I	FEP E	rror signal output after selection, analog input
136	AVSSA	GND	GND	Servo analog-to-digital converter analog Vss
137	AVDD33A	Power supply	Power supply	Servo analog-to-digital converter analog VDD (3.3V)
138	CDA1	O	Cap	Smoothing capacitance for DRC-VCO
139	REFTOP	O	Cap	Analog-to-digital converter reference voltage for DRC (TOP)
140	REFBTM	O	Cap	Analog-to-digital converter reference voltage for DRC (BOTTOM)
141	REGDRC	O	Cap	DRC analog-to-digital converter analog VDD (1.2V) Internal regurator output
142	EQOUTB	I	FEP	RF differential signal (NEG)
143	EQOUTA	I	FEP	RF differential signal (POS)
144	AVDD33DRC	Power supply	Power supply	DRC analog-to-digital converter analog VDD (3.3 V)

3. LIC301 (BD7776ARFS) : CD-ROM/DVD-ROM 7CH POWER DRIVER

- Block Diagram



- Pin Function

No	Pin name	Description	No	Pin name	Description
1	GND	GND	23	SLVM	Motor driver power supply
2	DVcc	PWM block control power supply	24	VC	Reference voltage input
3	TLIN	Tilt motor driver input	25	SLIN2	Motor driver input2
4	AVM	Actuator driver block power supply	26	SLIN1	Motor driver input1
5	TKIN	Tracking driver input	27	LRPM	Low speed rotational motor transfer terminal
6	FCIN	Focus driver input	28	SLLIM	Input terminal for slide current limit
7	FCO+	Focus driver inverted output	29	SLO2-	Motor driver 2 non-inverted output
8	FCO-	Focus driver non-inverted output	30	SLO2+	Motor driver 2 inverted output
9	TKO+	Tilt driver inverted output	31	SLO1-	Motor driver 1 non-inverted output
10	TKO-	Tilt driver non-inverted output	32	SLO1+	Motor driver 1 inverted output
11	TLO+	Tracking driver inverted output	33	SLGND	Motor driver power supply GND
12	TLO-	Tracking driver non-inverted output	34	SPGND	Spindle driver power supply GND
13	AGND	BTL driver GND	35	V	Spindle driver output V
14	LDO+	Loading driver inverted output	36	W	Spindle driver output W
15	LDO-	Loading driver non-inverted output	37	U	Spindle driver output U
16	CTL1	Loading driver control input	38	SPLIM	Input terminal for spindle current limit
17	CTL2	Loading driver control input	39	SPIN	Spindle control voltage input
18	LDVM	Loading driver power supply	40	C_COM	Condenser connection terminal (com)
19	Vcc	Power supply	41	C_OUT	Condenser connection terminal (OUT)
20	LDIN	Loading driver input	42	COM	Motor coil input terminal
21	PRTRST	Protect input	43	FG	FG signal output
22	PRTFLG	Protect flag output	44	SPVM	Spindle driver Power supply

BLOCK DIAGRAM

