LG Electronics Inc.

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SERVICE MANUAL

MODELS : RH178H/188H/1999H/HDR688X

LG Electronics Inc.

LG

HDD/DVD RECORDER

SERVICE MANUAL

MODELS : RH178H/188H/1999H/HDR688X

CAUTION

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

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SECTION 1

SUMMARY

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NEW FUNCTIONS OF HDD/DVD-RECORDER

• HDMI

HDMI IS THE SPECIFICATION FOR THE HIGH-DEFINITION MULTIMEDIA INTERFACE. HDMI IS PROVIDED FOR TRANSMITTING DIGITAL TELEVISION AUDIOVISUAL SIGNALS FROM HDD-DVD RECORDER TO TELEVISION SETS, OTHER VIDEO DISPLAYS. HDMI CAN CARRY HIGH QUALITY MULTI-CHANNEL AUDIO DATA AND CAN CARRY ALL STANDARD AND HIGH DEFINITION CONSUMER ELECTRONICS VIDEO FORMATS. CONTENT PROTECTION TECHNOLOGY IS AVAILABLE. HDMI CAN ALSO CARRY CONTROL AND STATUS INFORMATION IN BOTH DIRECTIONS.

<< OPERATING >>

AUDIO, VIDEO AND AUXILIARY DATA IS TRANSMITTED ACROSS THE THREE TMDS DATA CHANNELS.

THE VIDEO PIXEL CLOCK IS TRANSMITTED ON THE TMDS CLOCK CHANNEL AND IS USED BY THE RECEIVER AS A FREQUENCY REFERENCE FOR DATA RECOVERY ON THE THREE TMDS DATA CHANNELS.

VIDEO DATA IS CARRIED AS A SERIES OF 24-BIT PIXELS ON THE THREE TMDS DATA CHANNELS.

TMDS ENCODING CONVERTS THE 8BIT PER CHANNEL INTO THE 10BIT DC–BALANCED.

VIDEO PIXEL RATES CAN RANGE FROM 25MHZ TO 165MHZ. THE VIDEO PIXELS CAN BE ENCODED IN EITHER RGB,YCBCR 4:4:4 OR YCBCR 4:2:2 FORMATS. IN ALL THREE CASES, UP TP 24 BITS PER PIXEL CAN BE TRANSFERRED.

FAST DUBBING

DUBBING MEANS A COPYING FUNCTION BETWEEN HDD TO DVD DISCS.

COPYING BETWEEN HDD TO DVD IS A COMPLETELY DIGITAL PROCESS AND THEREFORE INVOLVES NO LOSS OF QUALITY IN THE AUDIO OR VIDEO. SO THIS MEANS THAT COPYING CAN BE CARRIED OUT AT THE MAXIMUM SPEED POSSIBLE.

<< DUBBING SPEED RATE >>

NORMAL DUBBING : SPEED RATE MAX X1
FAST DUBBING : SPEED RATE MAX X4

WHEN FAST DUBBING FROM HDD TO DVD , THE SPEED OF COPYING DEPENDS ON THE RECORDING MODE AND THE KIND OF USING THE DVD DISC, AND THIS MODE IS NOT AVAILABLE FOR EDITED VIDEO TITLE IN HDD.

WHEN FAST DUBBING FROM DVD TO HDD , ONLY AVAILABLE WHEN COPYING VR MODE DISC(DVD-RW) TO HDD , AND ONLY NORMAL DUBBING AVAILABLE WHEN COPYING VIDEO MODE DISC (DVD+R/RW, DVD-R) TO HDD

PRODUCT SAFETY SERVICING GUIDELINES FOR VIDEO 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 Electronics 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 Electronics 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 noninsulated “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:

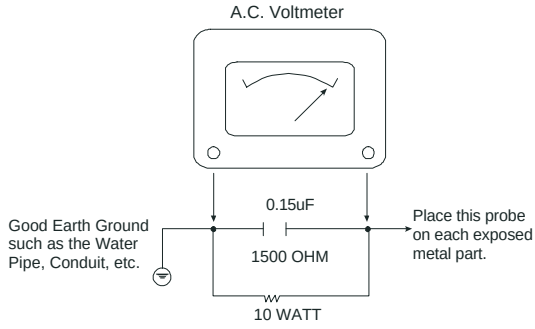
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

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 trans-ported 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 HDD/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.
Remembers Safety First:

General Servicing Precautions

1. Always unplug the HDD/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) Disconnection 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 HDD/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 whitch instruments covered by this service manual might be equipped.

5. Do not apply AC power to this HDD/DVD Recorder and/or any of its electrical assemblies unless all solid-state device heat sinks are cerrectly installed.

6. Always connect test instrument ground lead to the appropriate ground before connection 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 1M-ohm.
Note 1 : Accessible Conductive Parts including 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 grouned-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified a “anti-static” can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical charge sufficient to damage ES devices.

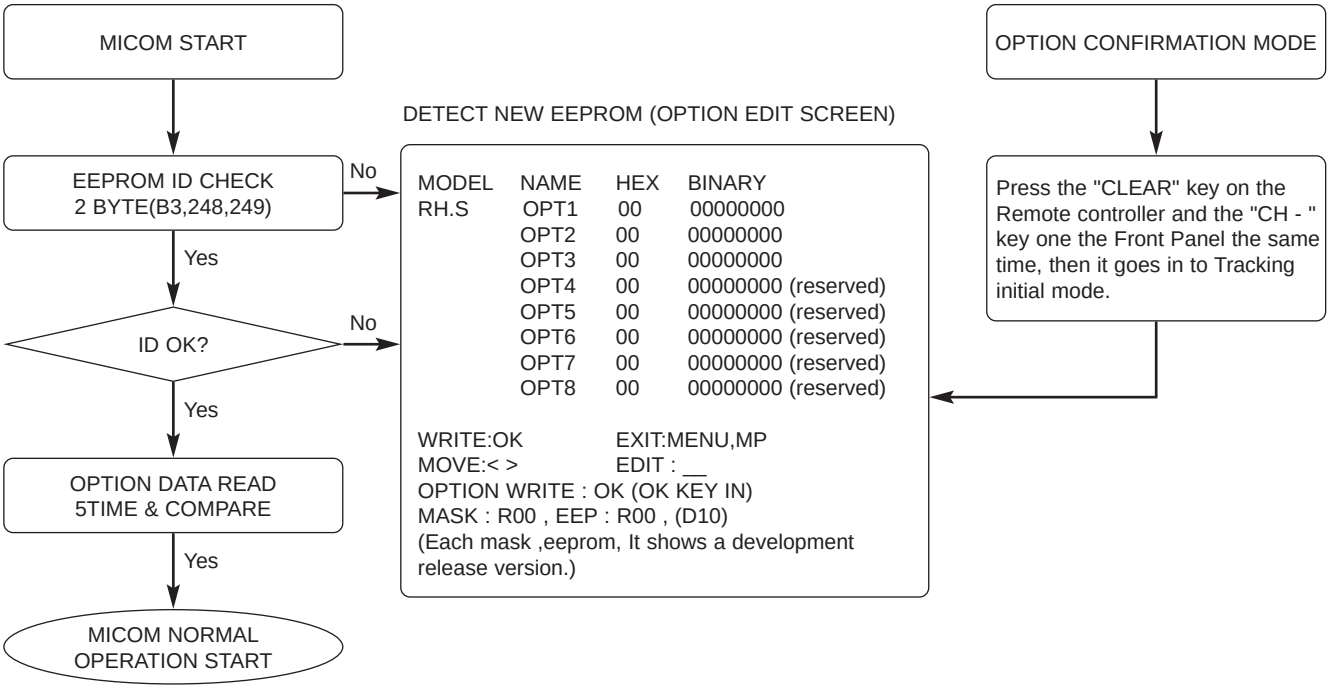
6. Do not remove a replacement ES device from its protec tive package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).

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



*** EEPROM INITIAL ***

- SETUP is displayed in the field if pressing the Front ch- & ch+ Key with the Remocon number "clear" key pressed in the status of powering on.
- AUTO SEARCH is done since the initial screen of ACMS is serviced if powering on.

SPECIFICATIONS

• GENERAL

Power requirements	AC 200-240V, 50/60 Hz
Power consumption	35W
Dimensions (approx.)	430 X 54 X 275 mm (w x h x d) without foot
Mass (approx.)	4.1 kg
Operating temperature	5°C to 35°C
Operating humidity	5 % to 90 %
Television system	PAL I, B/G, I/I, SECAM D/K, K1 color system
Recording format	PAL

• RECORDING

Recording format	DVD Video Recording, DVD-VIDEO
Recordable media	HDD (80GB), DVD-ReWritable, DVD-Recordable, DVD+ReWritable, DVD+Recordable, DVD+Recordable (Double Layer)
Recordable time	DVD (4.7GB): Approx. 1 hour (XP mode), 2 hours (SP mode), 4 hours (LP mode), 6 hours (EP mode)
	DVD+R DL (8.5GB): Approx. 3 hour (XP mode), 3 hours 40 minutes (SP mode), 7 hours 10 minutes (LP mode), 10 hours 30 minutes (EP mode)
	HDD (80GB): Approx. 20 hours (XP mode), 40 hours (SP mode), 74 hours (LP mode), 111 hours (EP mode)

Video recording format

Sampling frequency	27MHz
Compression format	MPEG 2 (VBR support)

Audio recording format

Sampling frequency 48kHz
Compression format Dolby Digital

• PLAYBACK

Frequency response	DVD (PCM 48 kHz): 8 Hz to 22 kHz, CD: 8 Hz to 20 kHz
	DVD (PCM 96 kHz): 8 Hz to 44 kHz
Signal-to-noise ratio	More than 100 dB (AUDIO OUT connector)
Harmonic distortion	Less than 0.008% (AUDIO OUT connector)
Dynamic range	More than 95 dB (AUDIO OUT connector)

• INPUTS

AERIAL IN Aerial input, 75 ohms	
VIDEO IN	1.0 Vp-p 75 ohms, sync negative, RCA jack x 2 / SCART x 2
AUDIO IN	2.0 Vrms more than 47 kohms, RCA jack (L, R) x 2 / SCART x 2
S-VIDEO IN	(Y) 1.0 V (p-p), 75 Ω, sync negative, Mini DIN 4-pin x 1
	(C) 0.3 V (p-p) 75 Ω
DV IN	4 pin (IEEE 1394 standard)

• OUTPUTS

VIDEO OUT	1 Vp-p 75 Ω, sync negative, RCA jack x 1 / SCART x 2
S-VIDEO OUT	(Y) 1.0 V (p-p), 75 Ω, sync negative, Mini DIN 4-pin x 1
	(C) 0.3 V (p-p) 75 Ω
COMPONENT VIDEO OUT	(Y) 1.0 V (p-p), 75 Ω, sync negative, RCA jack x 1
	(Pb)/(Pr) 0.7 V (p-p), 75 Ω, RCA jack x 2
Audio output (digital audio)	0.5 V (p-p), 75 Ω, RCA jack x 1
Audio output (optical audio)	3 V (p-p), 75 Ω, Optical connector x 1
Audio output (analog audio)	2.0 Vrms (1 KHz, 0 dB), 600 Ω, RCA jack (L, R) x 1 / SCART x 2

SECTION 2

CABINET & MAIN CHASSIS

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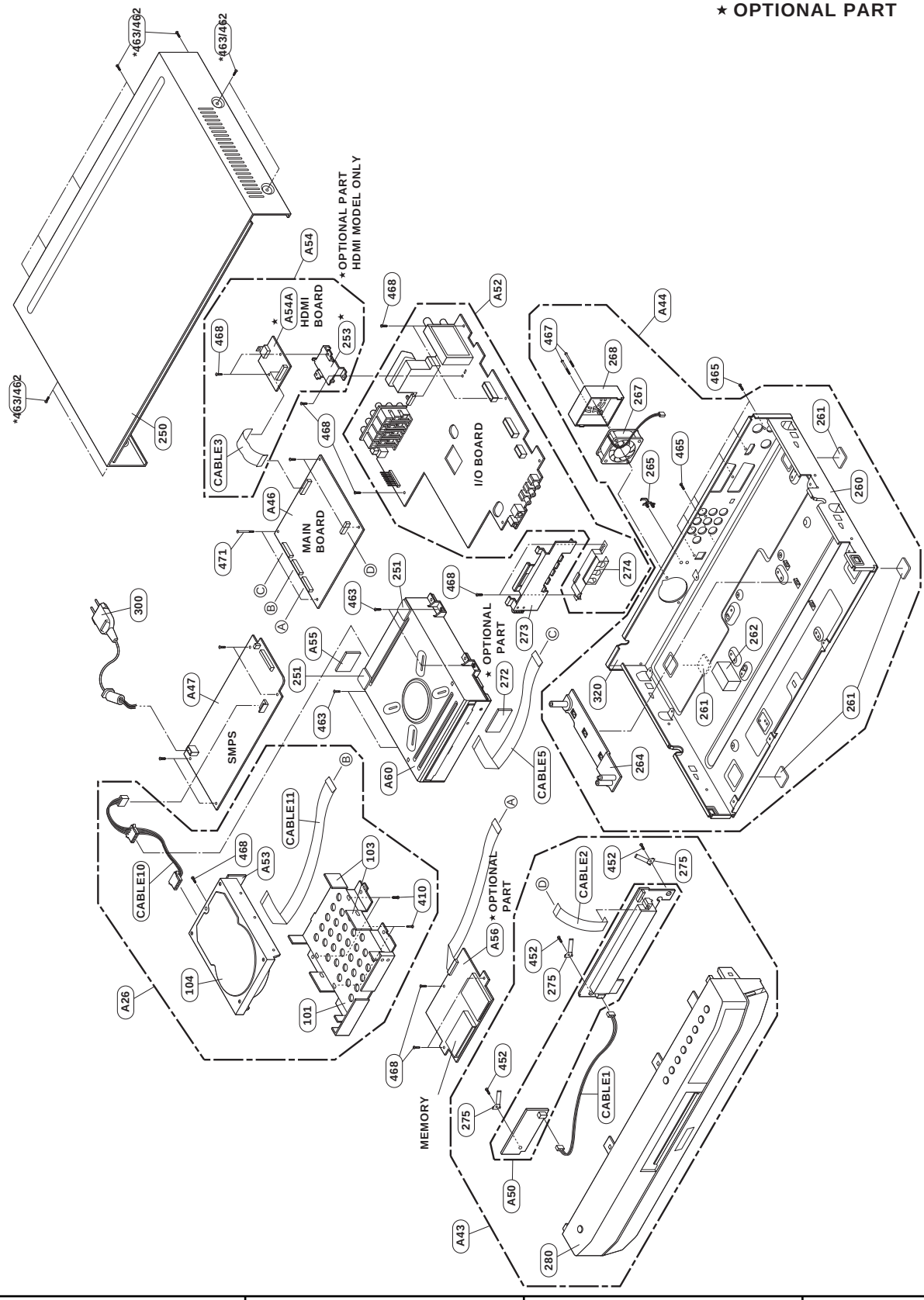
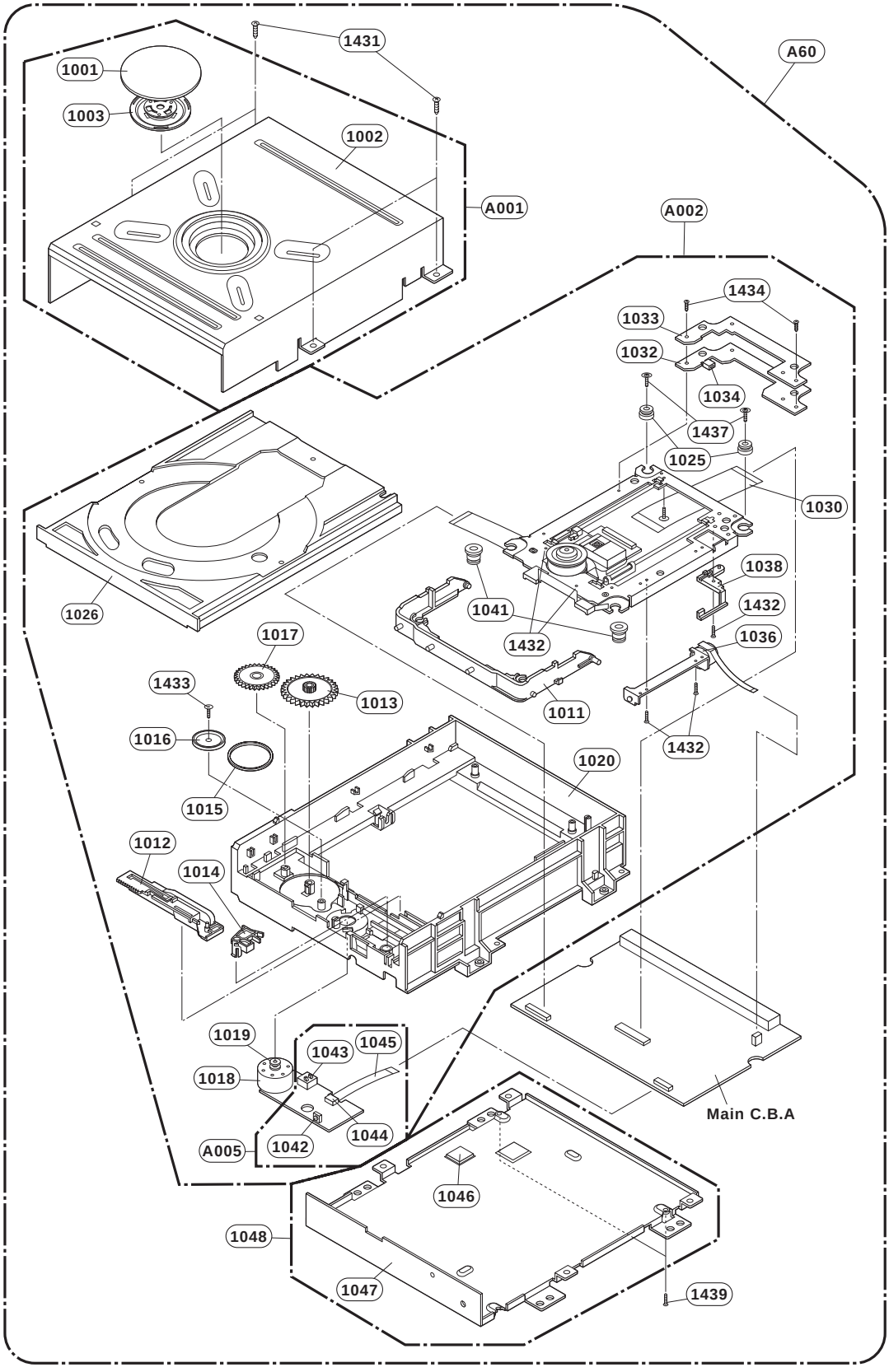
EXPLODED VIEWS

1. CABINET AND MAIN FRAME SECTION

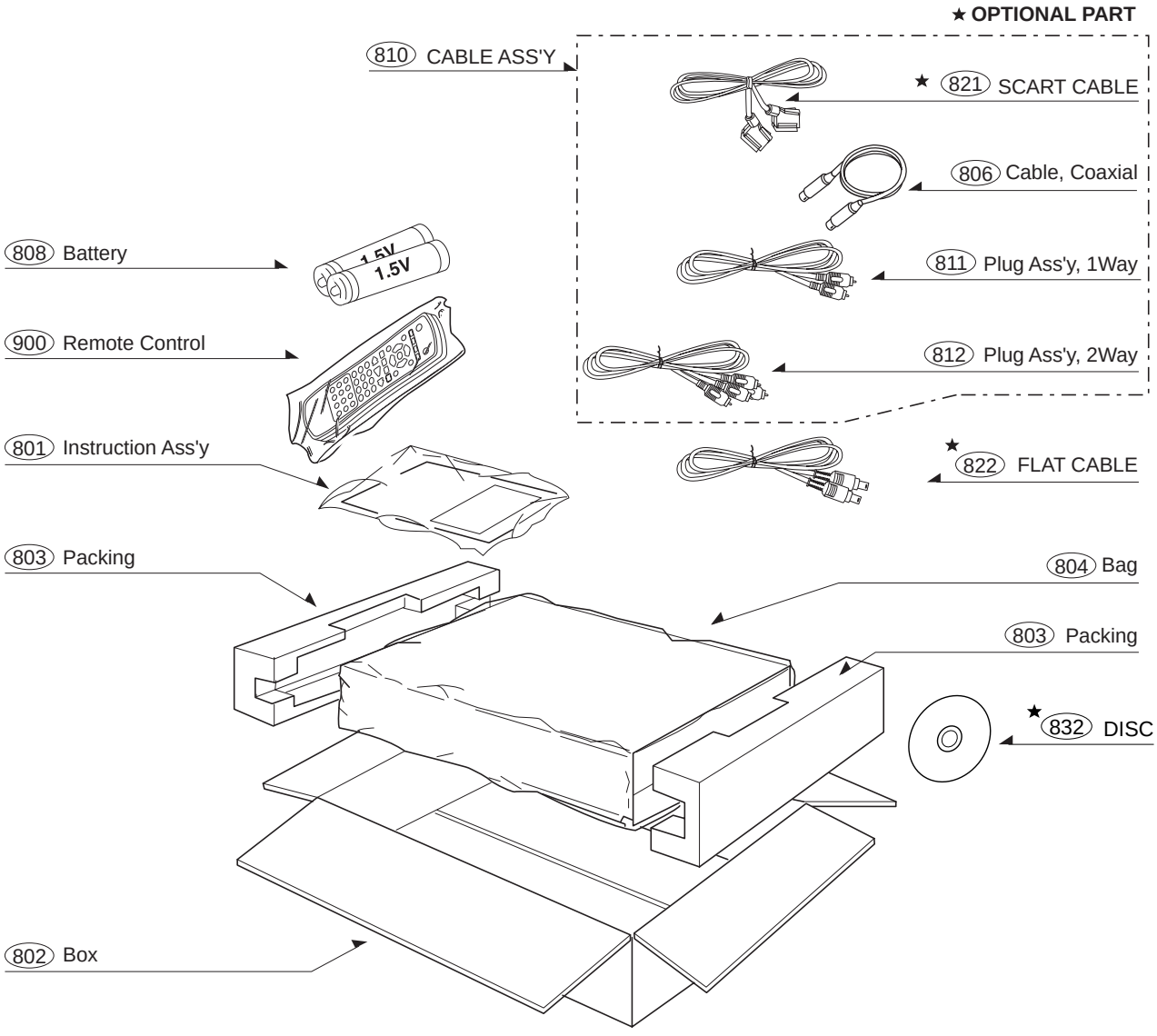
★ OPTIONAL PART



2. DECK MECHANISM SECTION(RS-01A)



3. PACKING ACCESSORY SECTION



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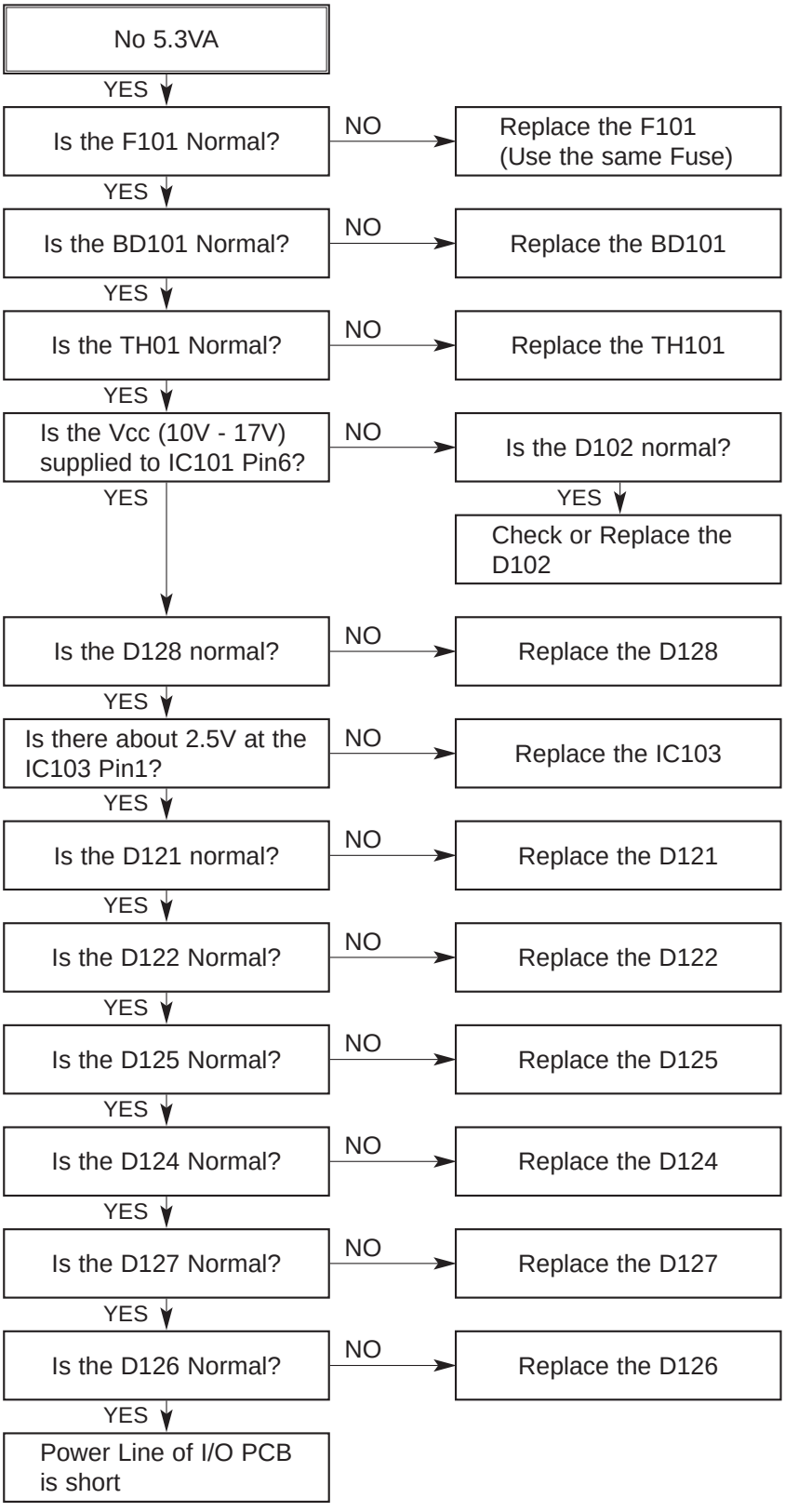
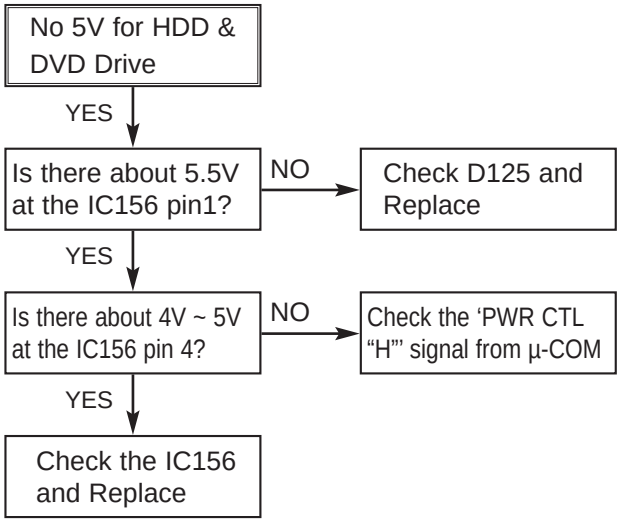
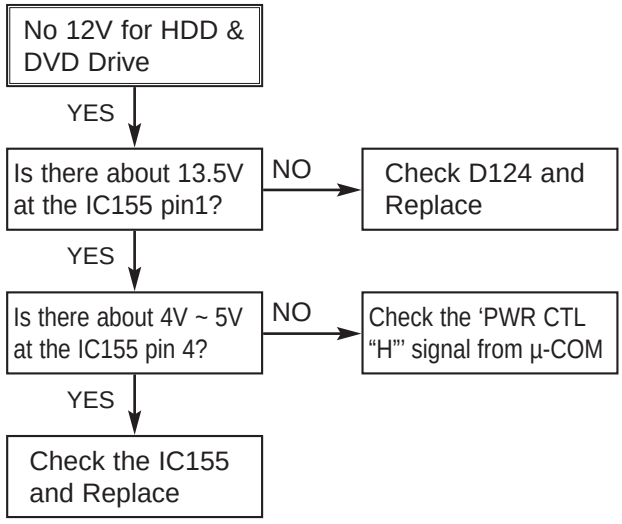
HDR PART

ELECTRICAL TROUBLESHOOTING GUIDE

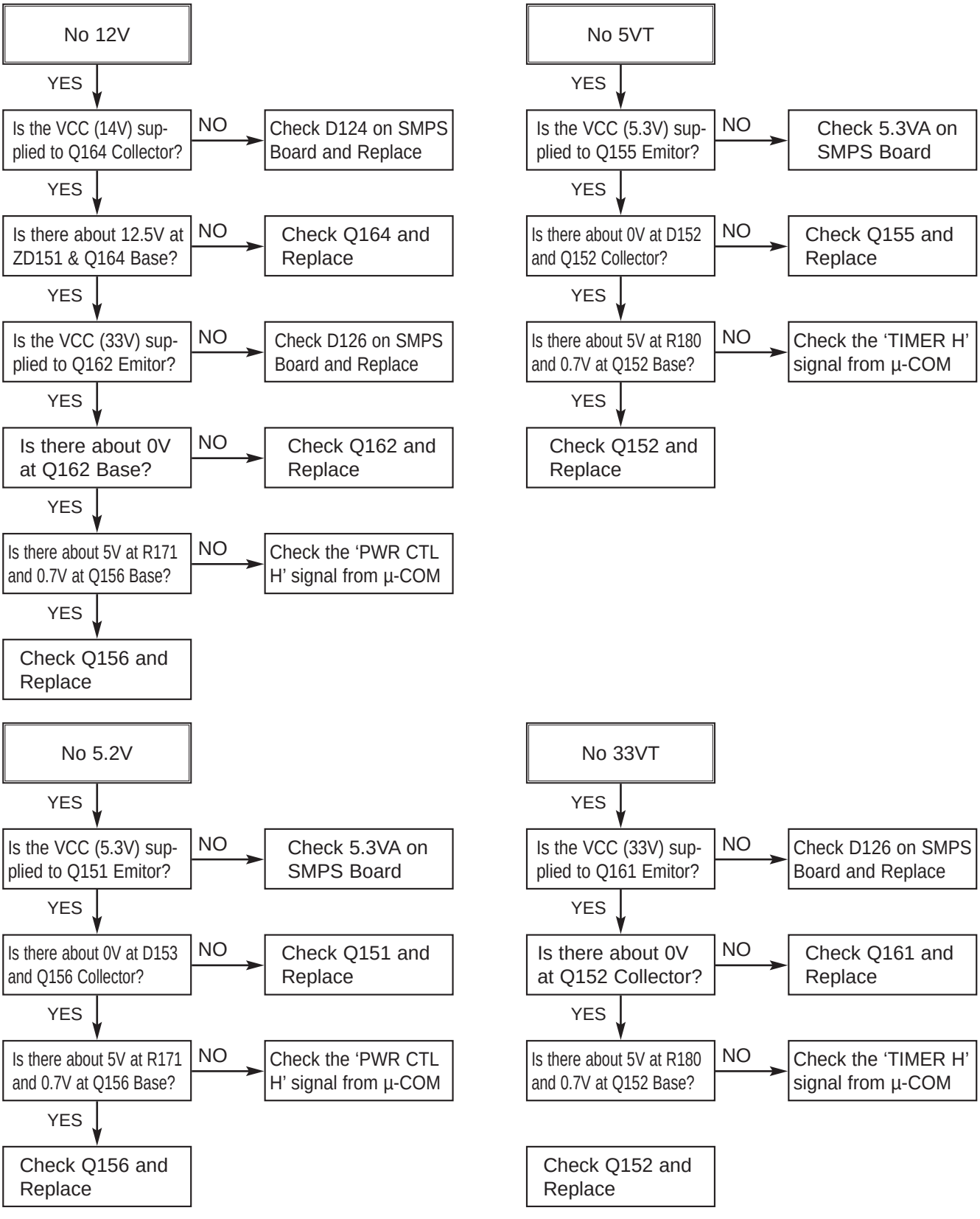
1. POWER SUPPLY ON SMPS BOARD

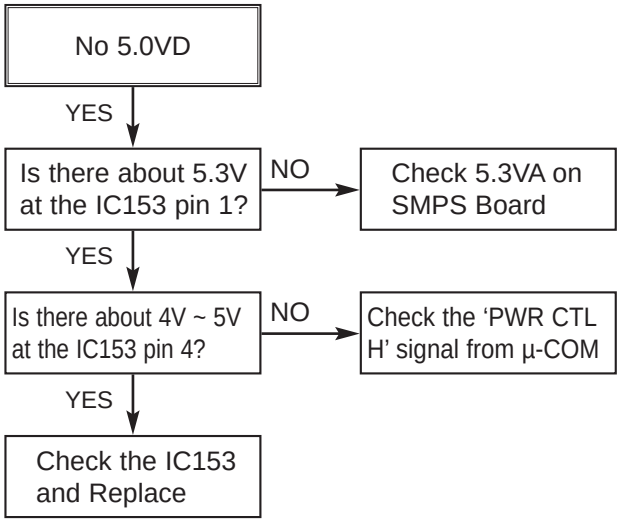


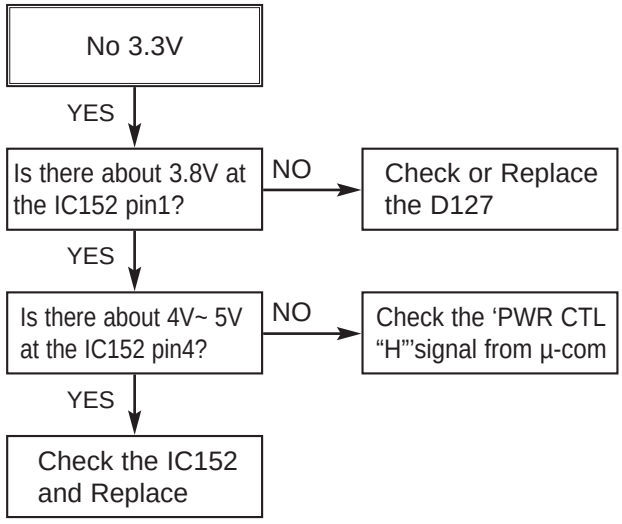

No 5V for HDD & DVD Drive
YES
Is there about 5.5V at the IC156 pin1?
NO
Check D125 and Replace
YES
Is there about 4V ~ 5V at the IC156 pin 4?
NO
Check the 'PWR CTL "H"' signal from µ-COM
YES
Check the IC156 and Replace

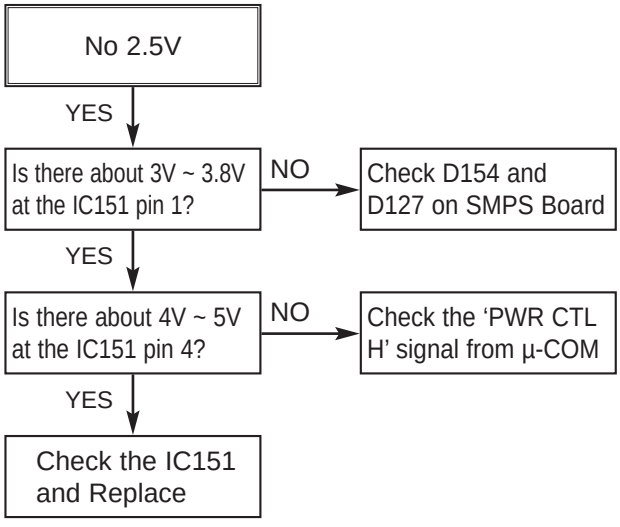

No 12V for HDD & DVD Drive
YES
Is there about 13.5V at the IC155 pin1?
NO
Check D124 and Replace
YES
Is there about 4V ~ 5V at the IC155 pin 4?
NO
Check the 'PWR CTL "H"' signal from µ-COM
YES
Check the IC155 and Replace

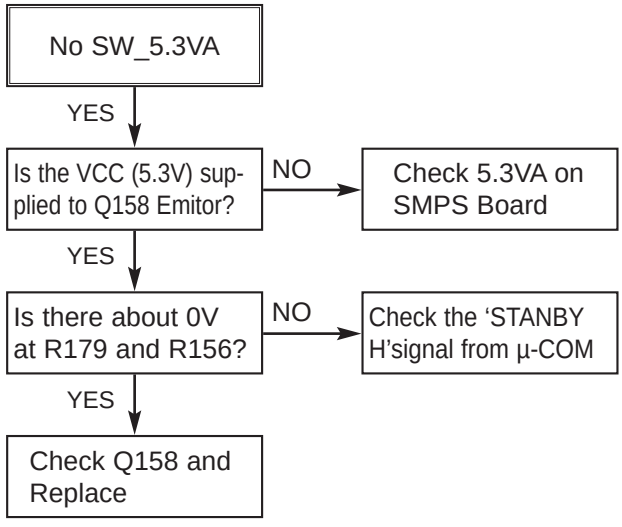
2. POWER SUPPLY ON I/O BOARD

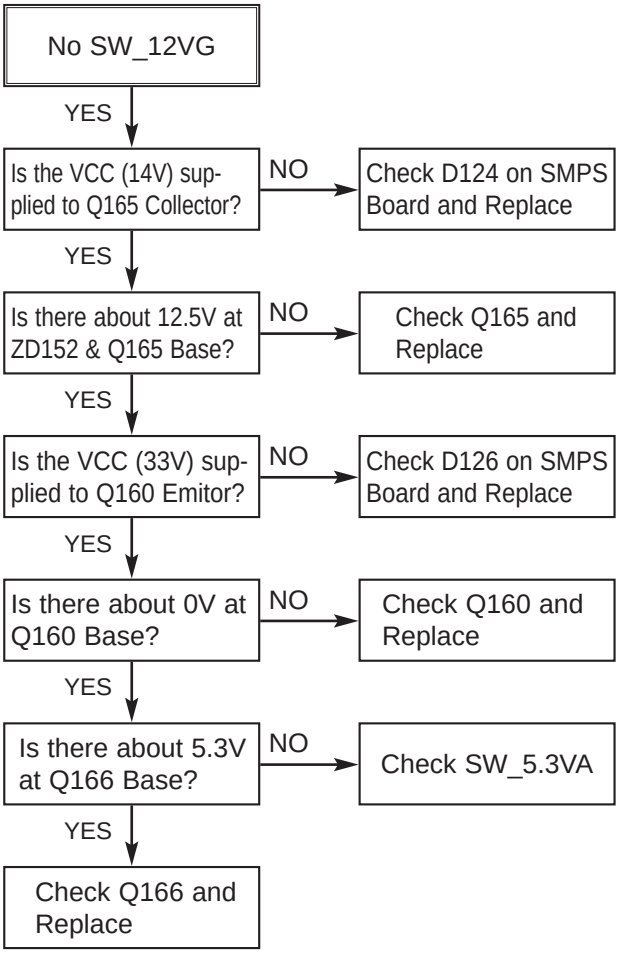


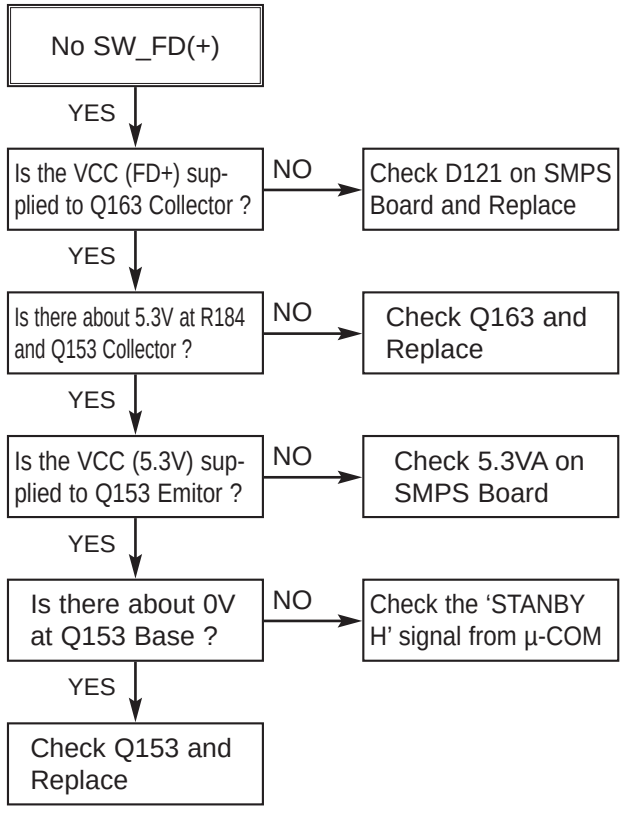

No 5.0VD
YES
Is there about 5.3V at the IC153 pin 1?
NO
Check 5.3VA on SMPS Board
YES
Is there about 4V ~ 5V at the IC153 pin 4?
NO
Check the 'PWR CTL H' signal from µ-COM
YES
Check the IC153 and Replace

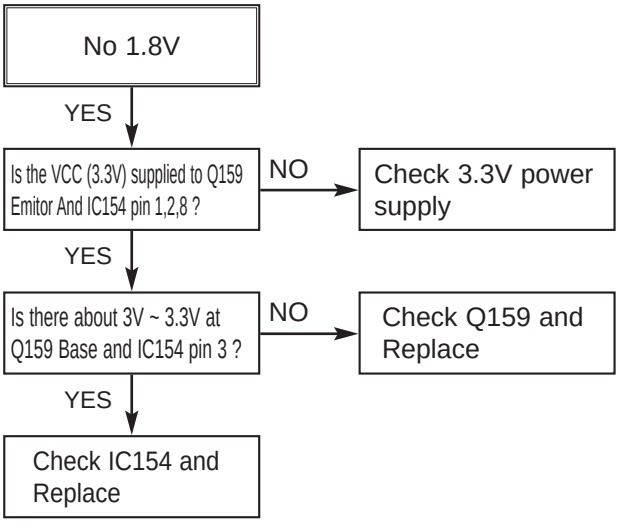

No 3.3V
YES
Is there about 3.8V at the IC152 pin1?
NO
Check or Replace the D127
YES
Is there about 4V~ 5V at the IC152 pin4?
NO
Check the 'PWR CTL "H"'signal from µ-com
YES
Check the IC152 and Replace

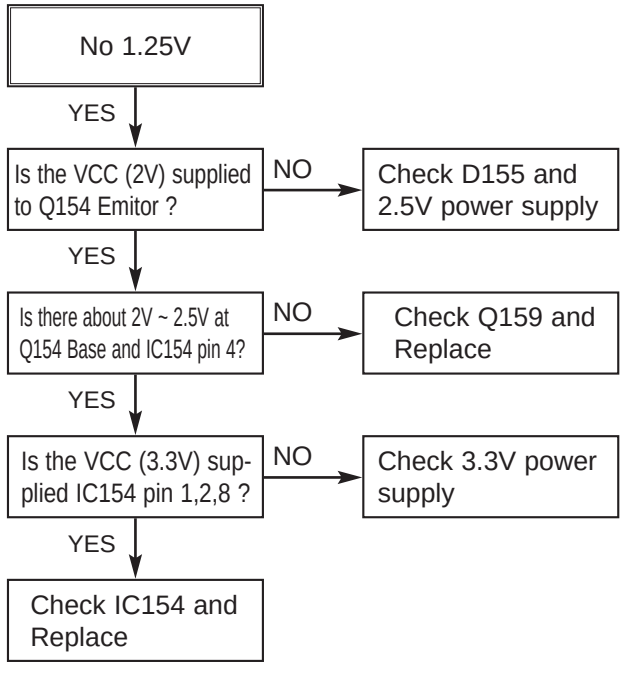

No 2.5V
YES
Is there about 3V ~ 3.8V at the IC151 pin 1?
NO
Check D154 and D127 on SMPS Board
YES
Is there about 4V ~ 5V at the IC151 pin 4?
NO
Check the 'PWR CTL H' signal from µ-COM
YES
Check the IC151 and Replace


No SW_5.3VA
YES
Is the VCC (5.3V) supplied to Q158 Emitor?
NO
Check 5.3VA on SMPS Board
YES
Is there about 0V at R179 and R156?
NO
Check the 'STANBY H'signal from µ-COM
YES
Check Q158 and Replace

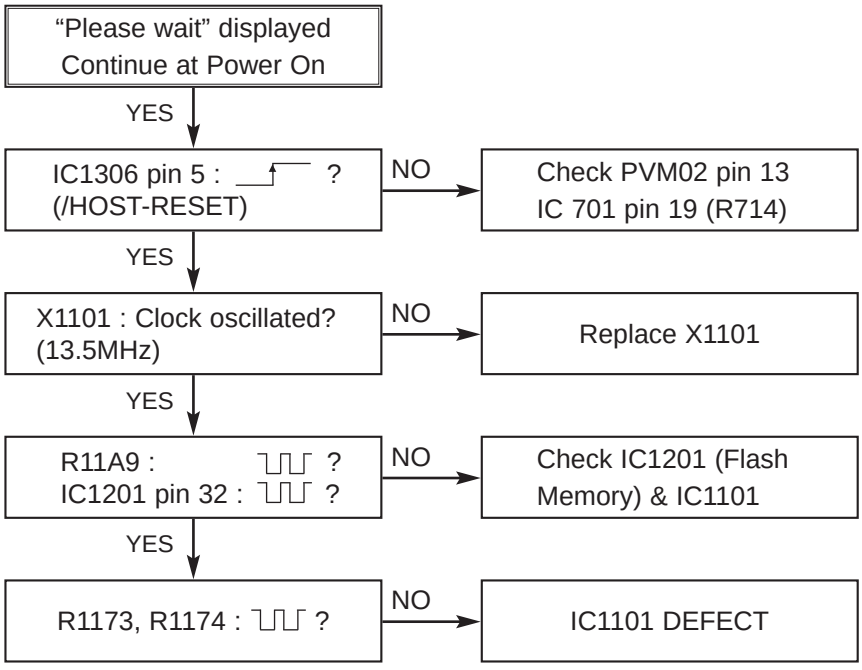

No SW_12VG
YES
Is the VCC (14V) supplied to Q165 Collector?
NO
Check D124 on SMPS Board and Replace
YES
Is there about 12.5V at ZD152 & Q165 Base?
NO
Check Q165 and Replace
YES
Is the VCC (33V) supplied to Q160 Emitor?
NO
Check D126 on SMPS Board and Replace
YES
Is there about 0V at Q160 Base?
NO
Check Q160 and Replace
YES
Is there about 5.3V at Q166 Base?
NO
Check SW_5.3VA
YES
Check Q166 and Replace


No SW_FD(+)
YES
Is the VCC (FD+) supplied to Q163 Collector ?
NO
Check D121 on SMPS Board and Replace
YES
Is there about 5.3V at R184 and Q153 Collector ?
NO
Check Q163 and Replace
YES
Is the VCC (5.3V) supplied to Q153 Emitor ?
NO
Check 5.3VA on SMPS Board
YES
Is there about 0V at Q153 Base ?
NO
Check the 'STANBY H' signal from µ-COM
YES
Check Q153 and Replace

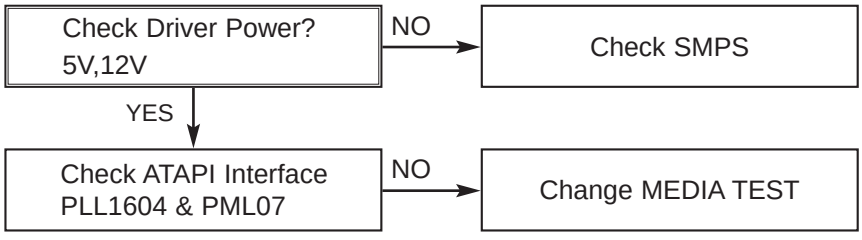

No 1.8V
YES
Is the VCC (3.3V) supplied to Q159 Emitor And IC154 pin 1,2,8 ?
NO
Check 3.3V power supply
YES
Is there about 3V ~ 3.3V at Q159 Base and IC154 pin 3 ?
NO
Check Q159 and Replace
YES
Check IC154 and Replace


No 1.25V
YES
Is the VCC (2V) supplied to Q154 Emitor ?
NO
Check D155 and 2.5V power supply
YES
Is there about 2V ~ 2.5V at Q154 Base and IC154 pin 4?
NO
Check Q159 and Replace
YES
Is the VCC (3.3V) supplied IC154 pin 1,2,8 ?
NO
Check 3.3V power supply
YES
Check IC154 and Replace

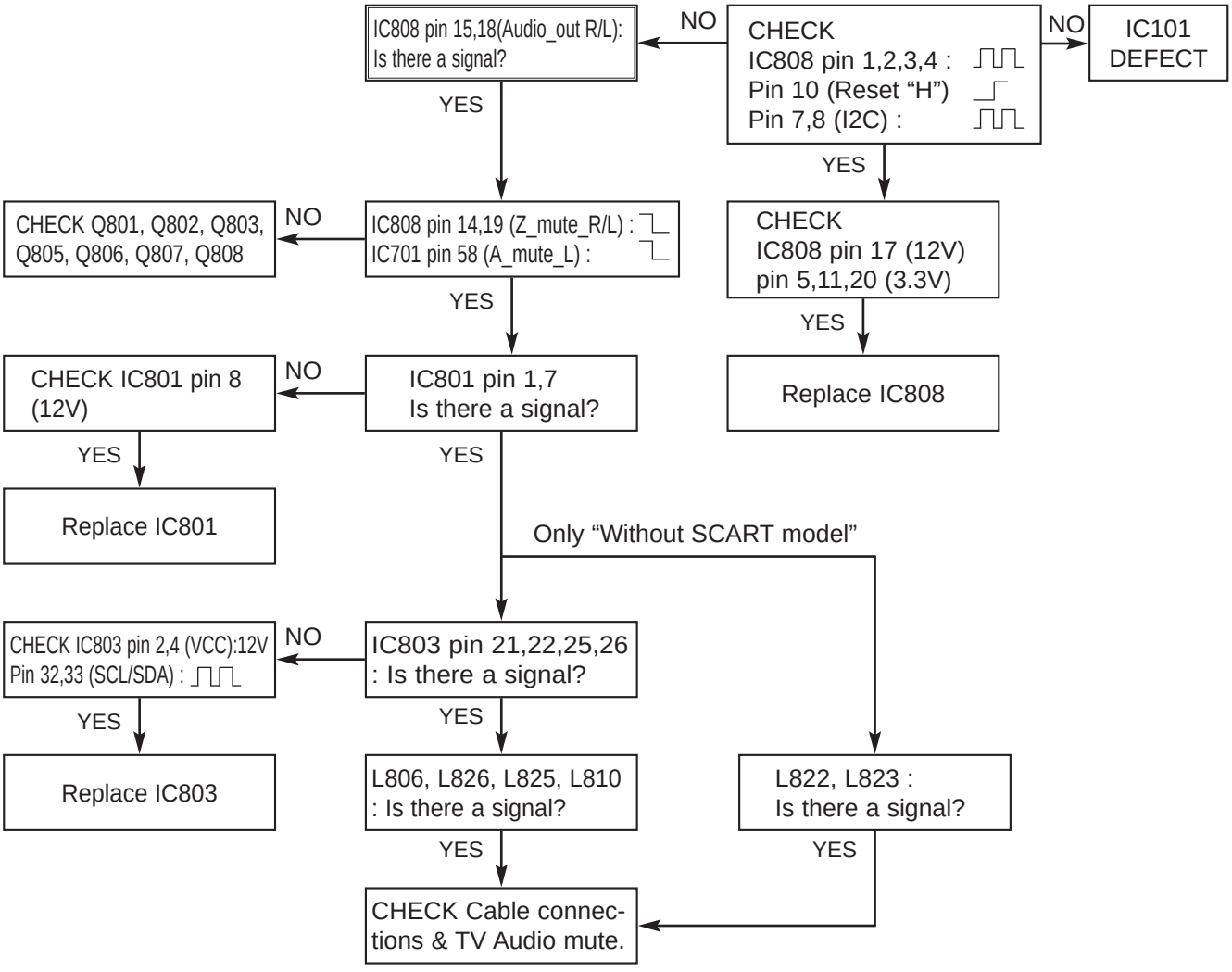
3. SYSTEM CIRCUIT PART



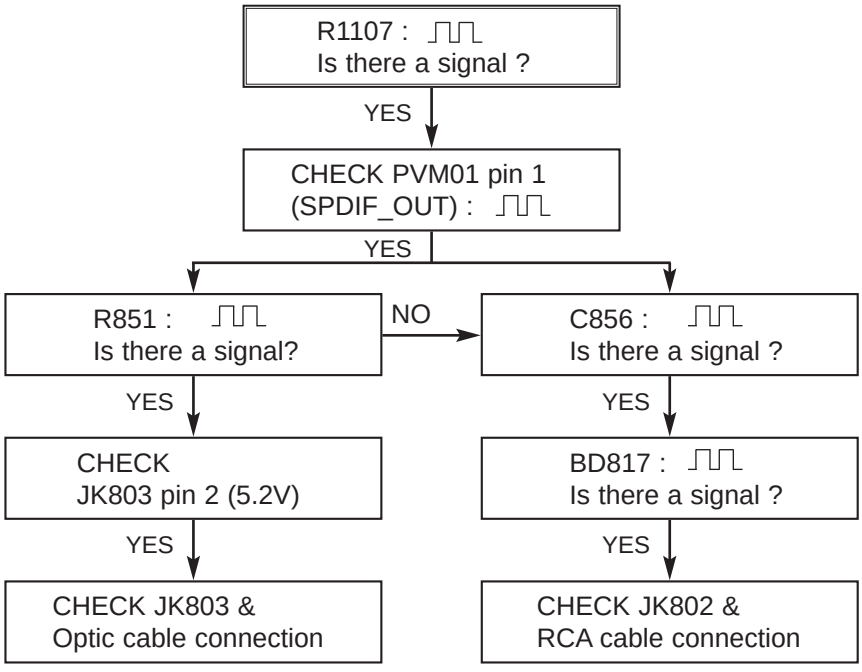
4. DISC NOT RECOGNIZED



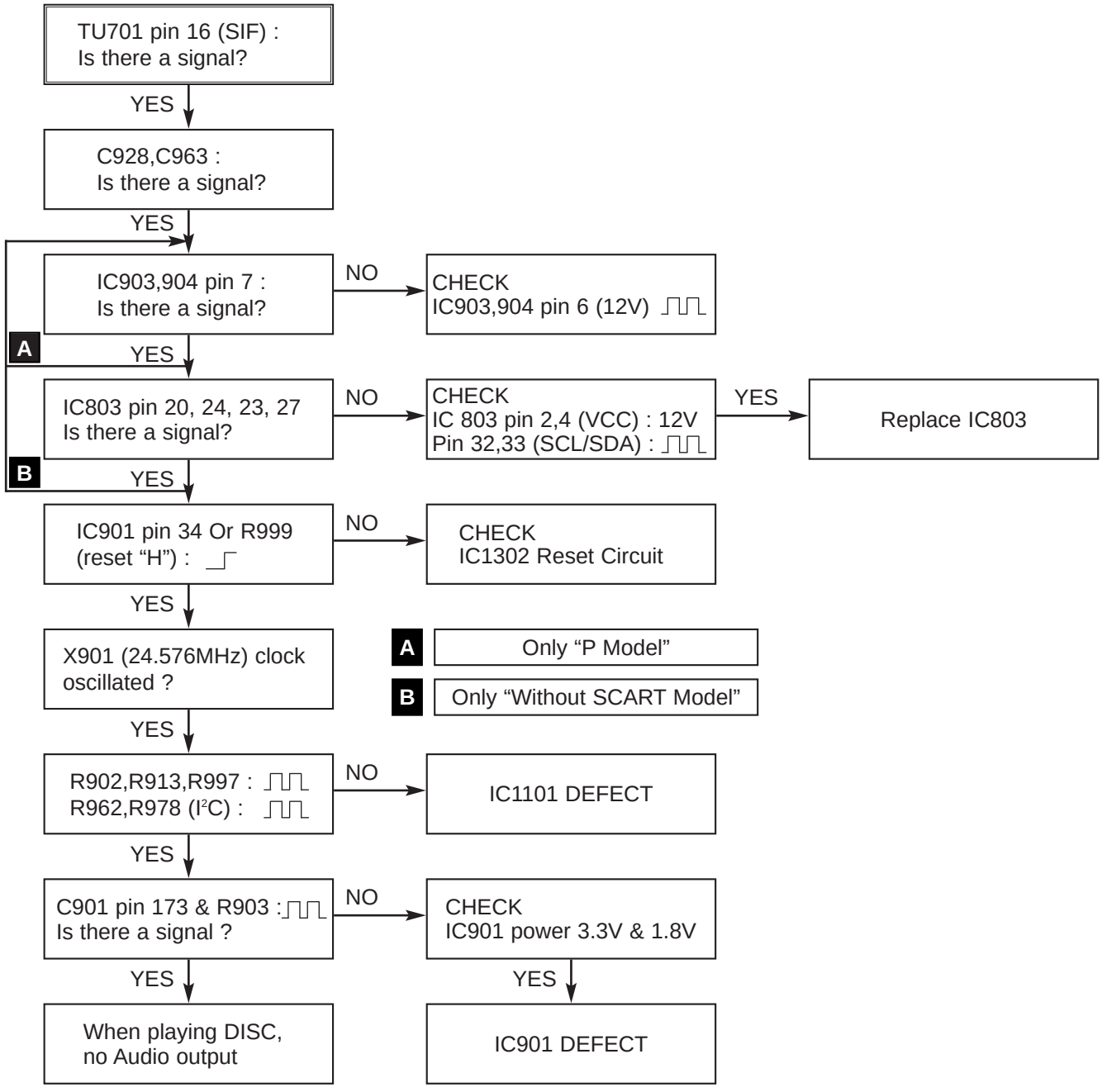
5. WHEN PLAYING DISC, NO AUDIO OUTPUT



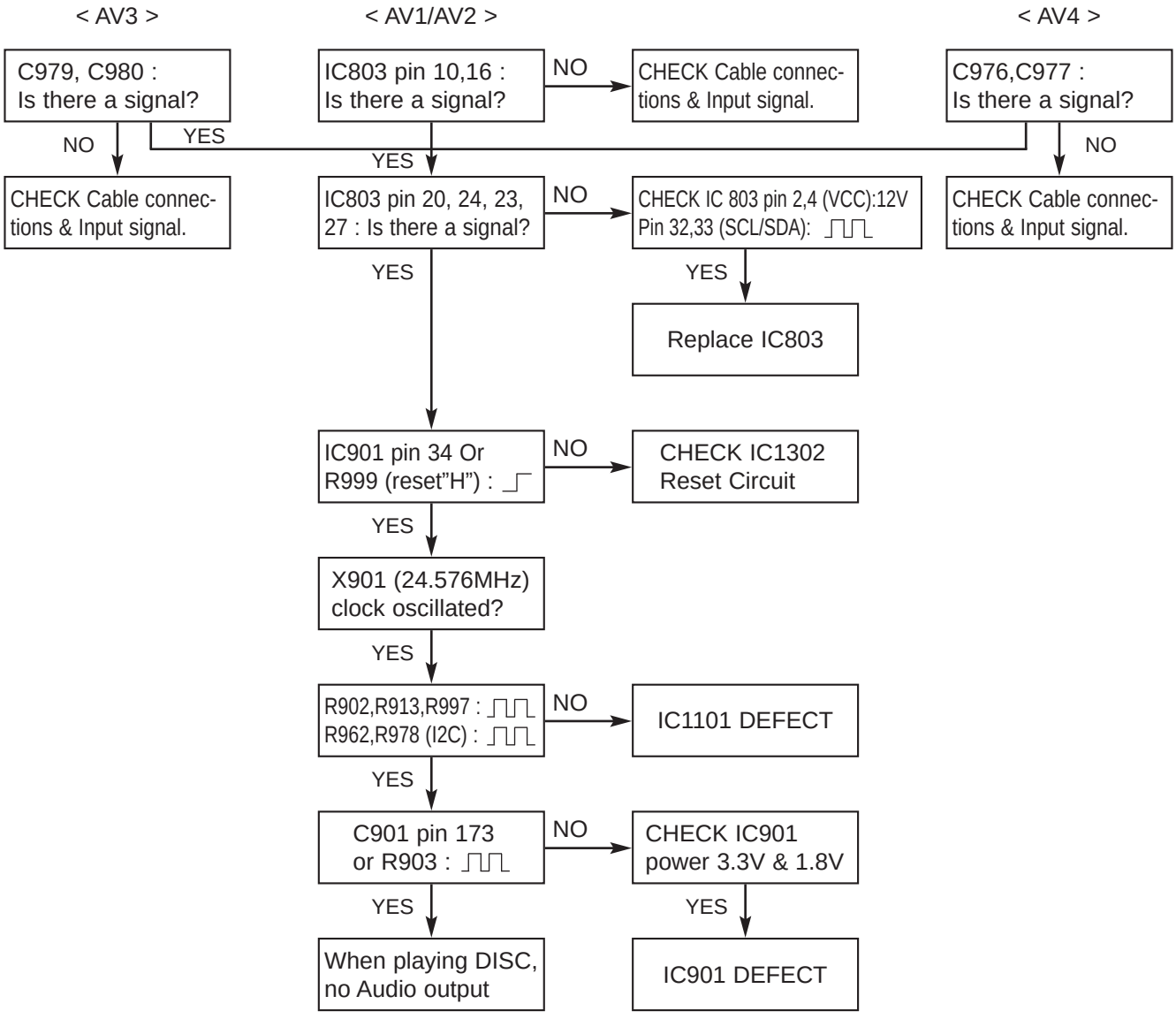
6. NO OPTICAL / DIGITAL OUTPUT



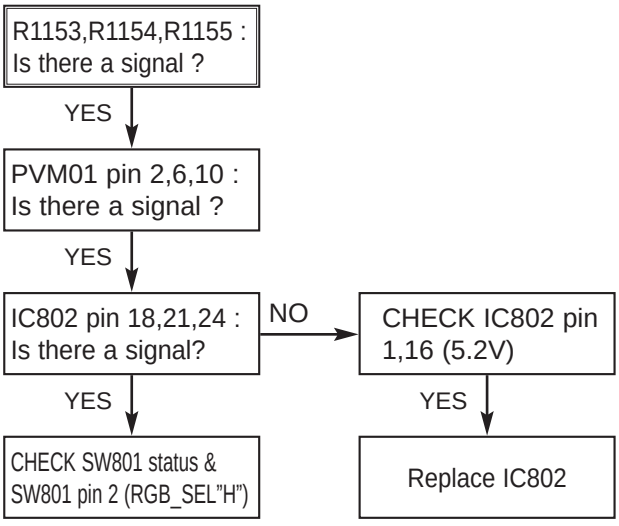
7. NO TUNER AUDIO OUTPUT



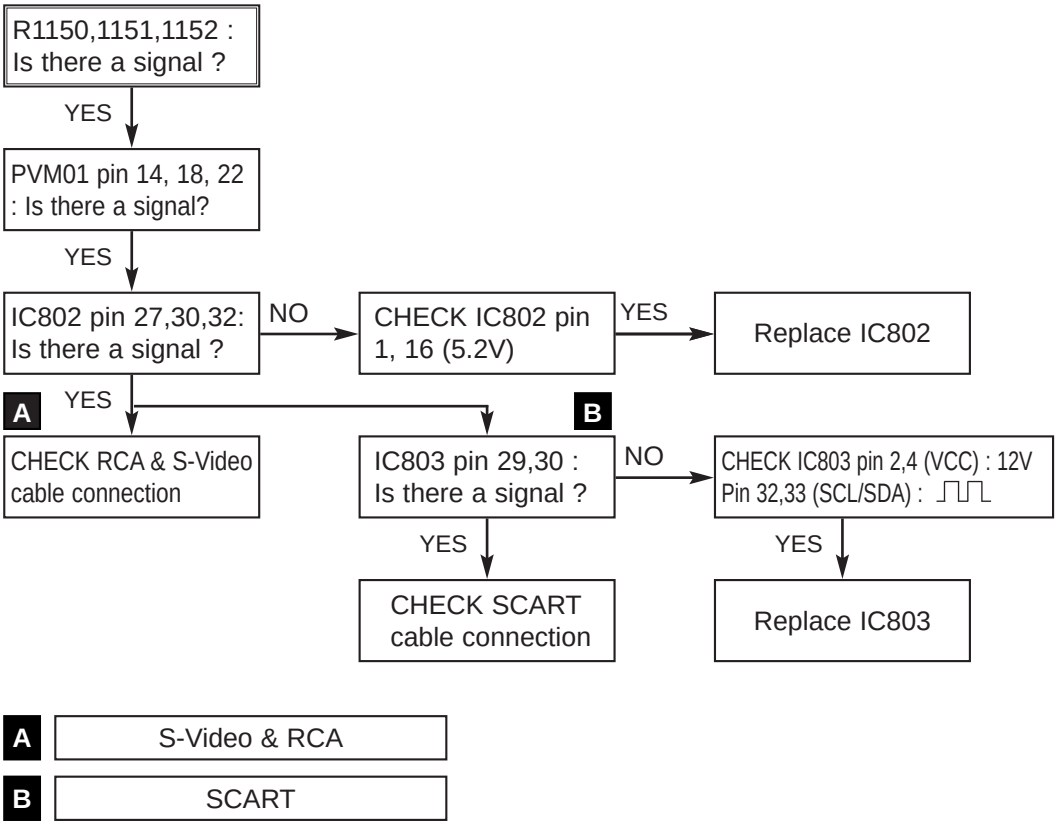
8. NO EXTERNAL INPUT AUDIO



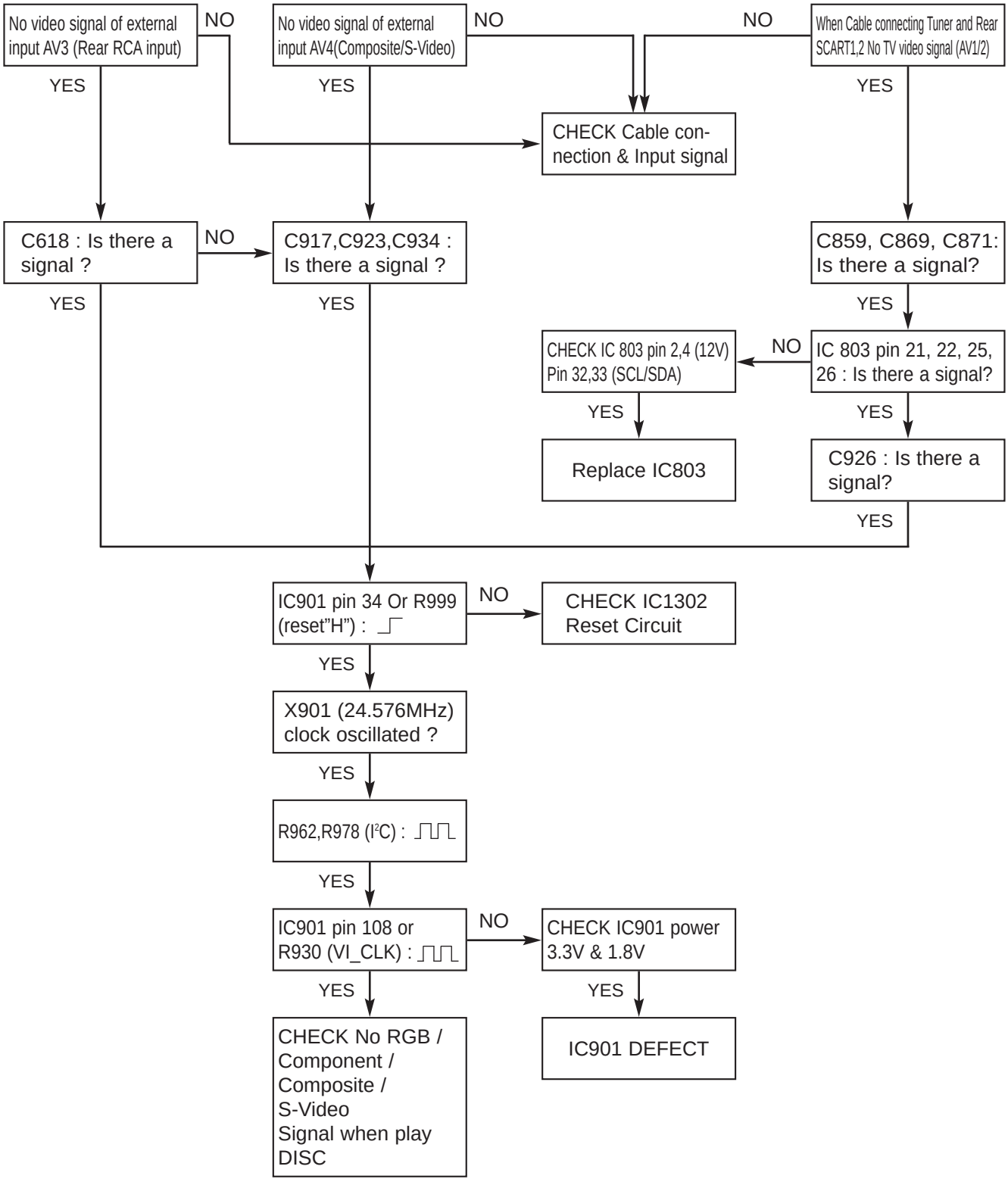
9. NO RGB / COMPONENT VIDEO SIGNAL WHEN PLAY DISC



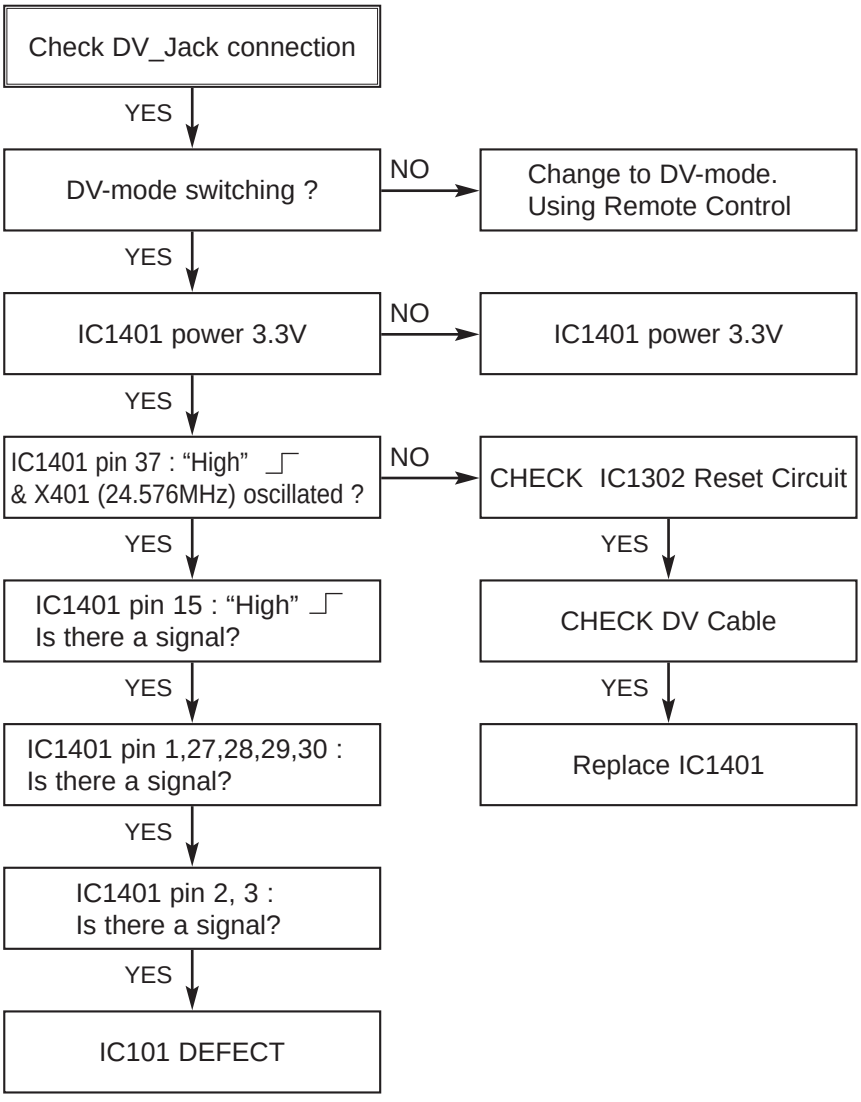
10. NO COMPOSITE / S-VIDEO SIGNAL WHEN PLAY DISC



11. NO TV, EXTERNAL INPUT VIDEO SIGNAL



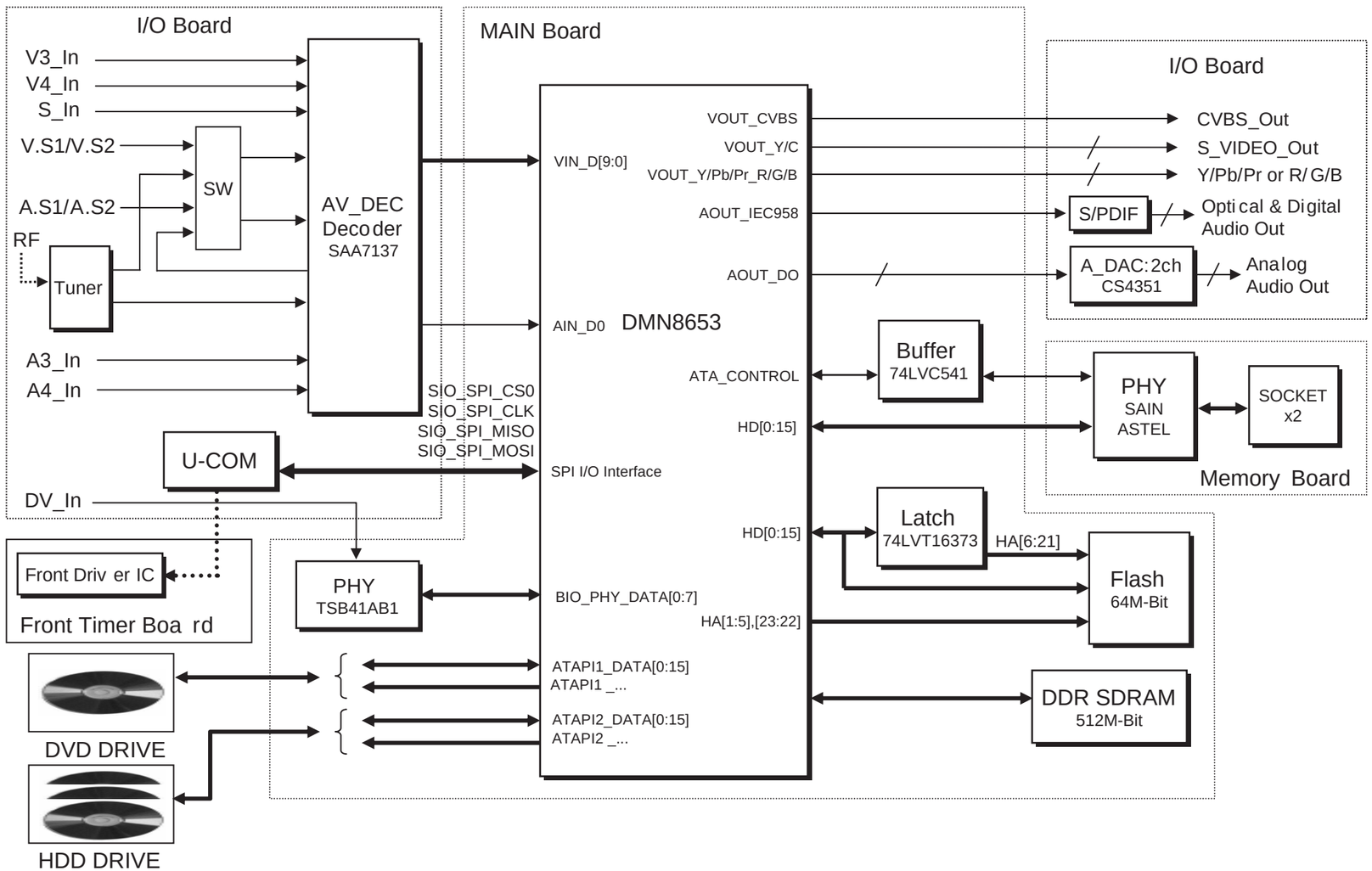
12. NO DV(IEEE 1394) INPUT (VIDEO/AUDIO) SIGNAL



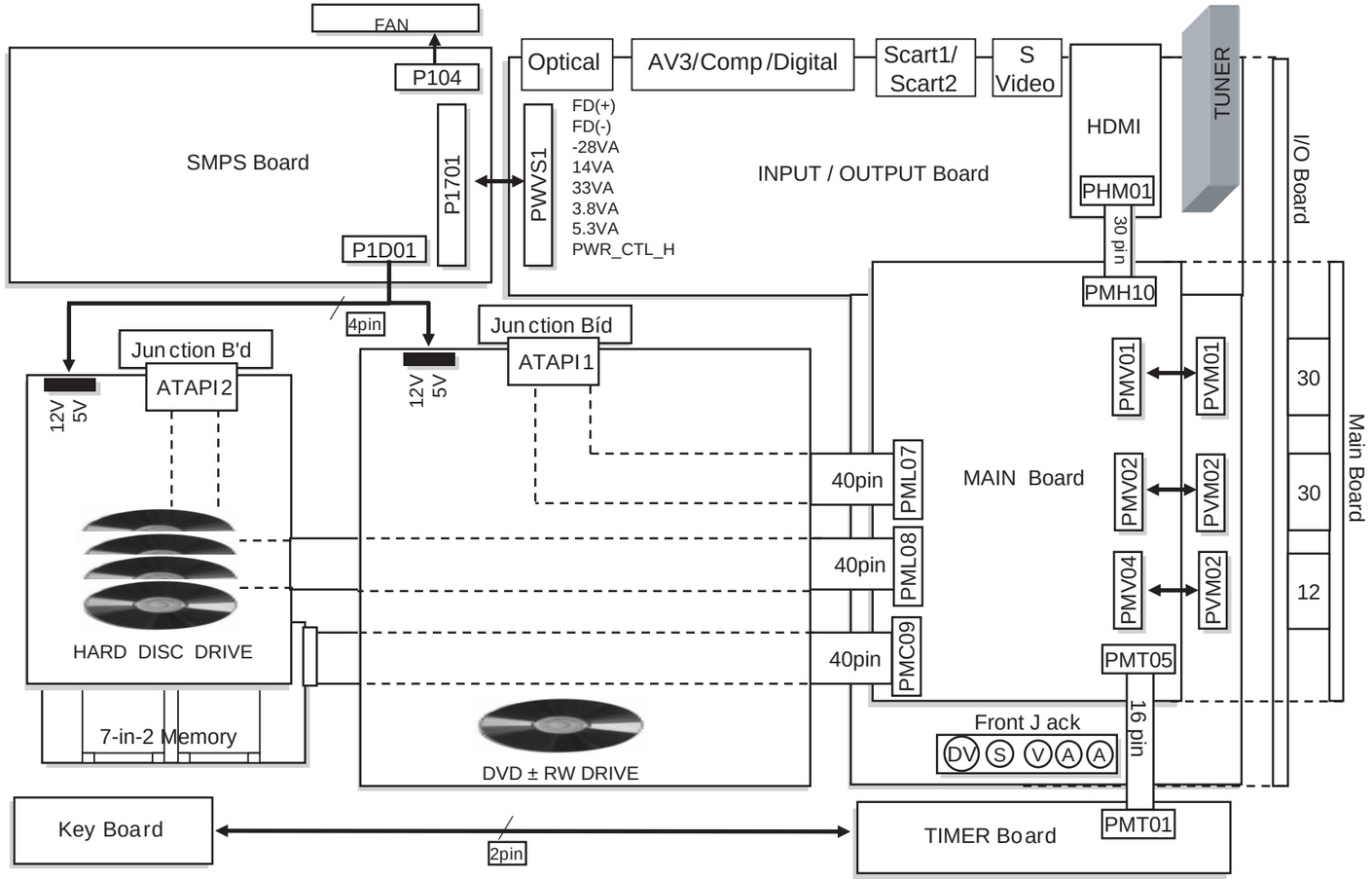
MEMO

BLOCK DIAGRAMS

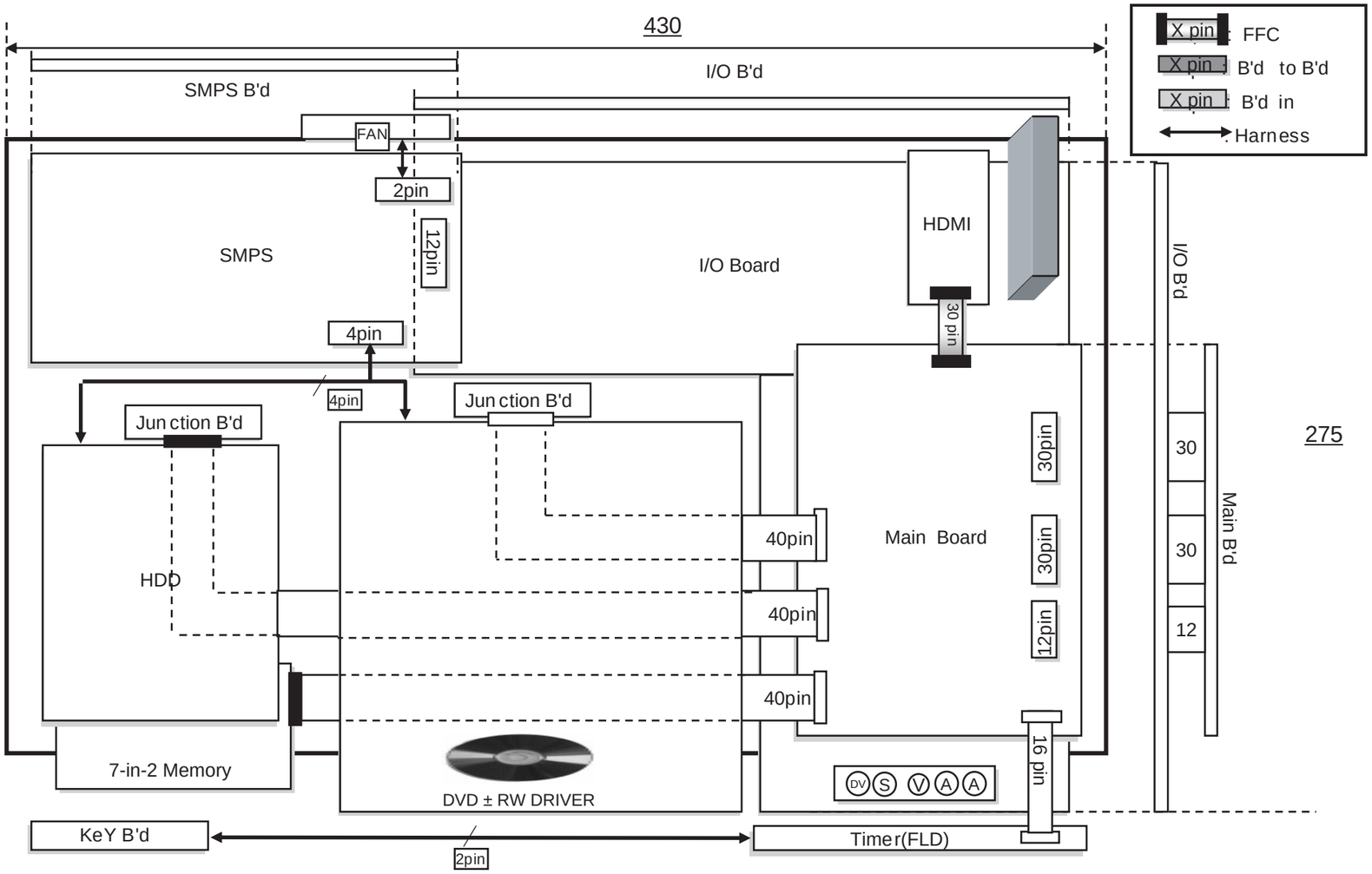
1. OVERALL BLOCK DIAGRAM



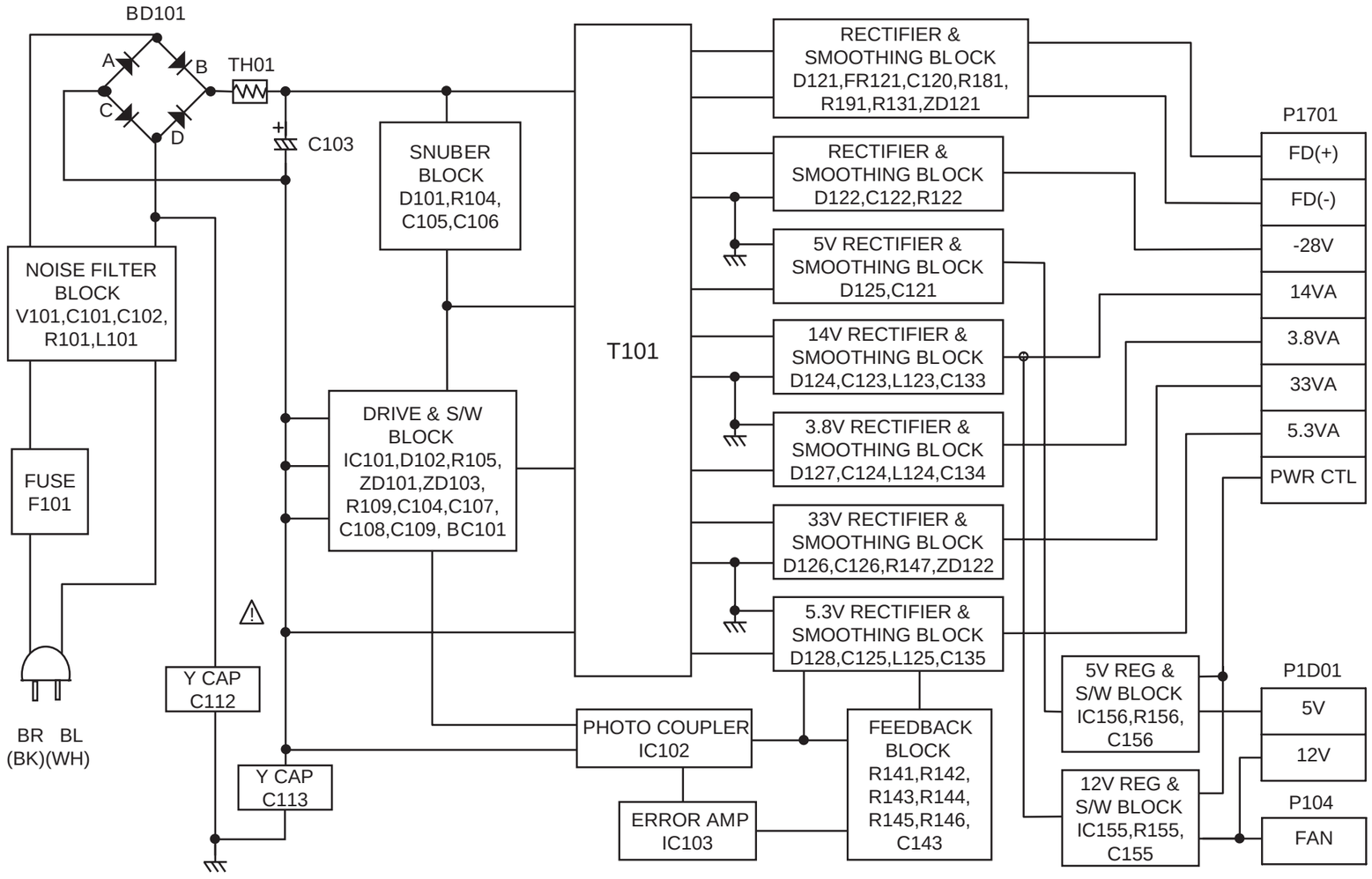
2. LAYOUT CONNECTION BLOCK DIAGRAM_1



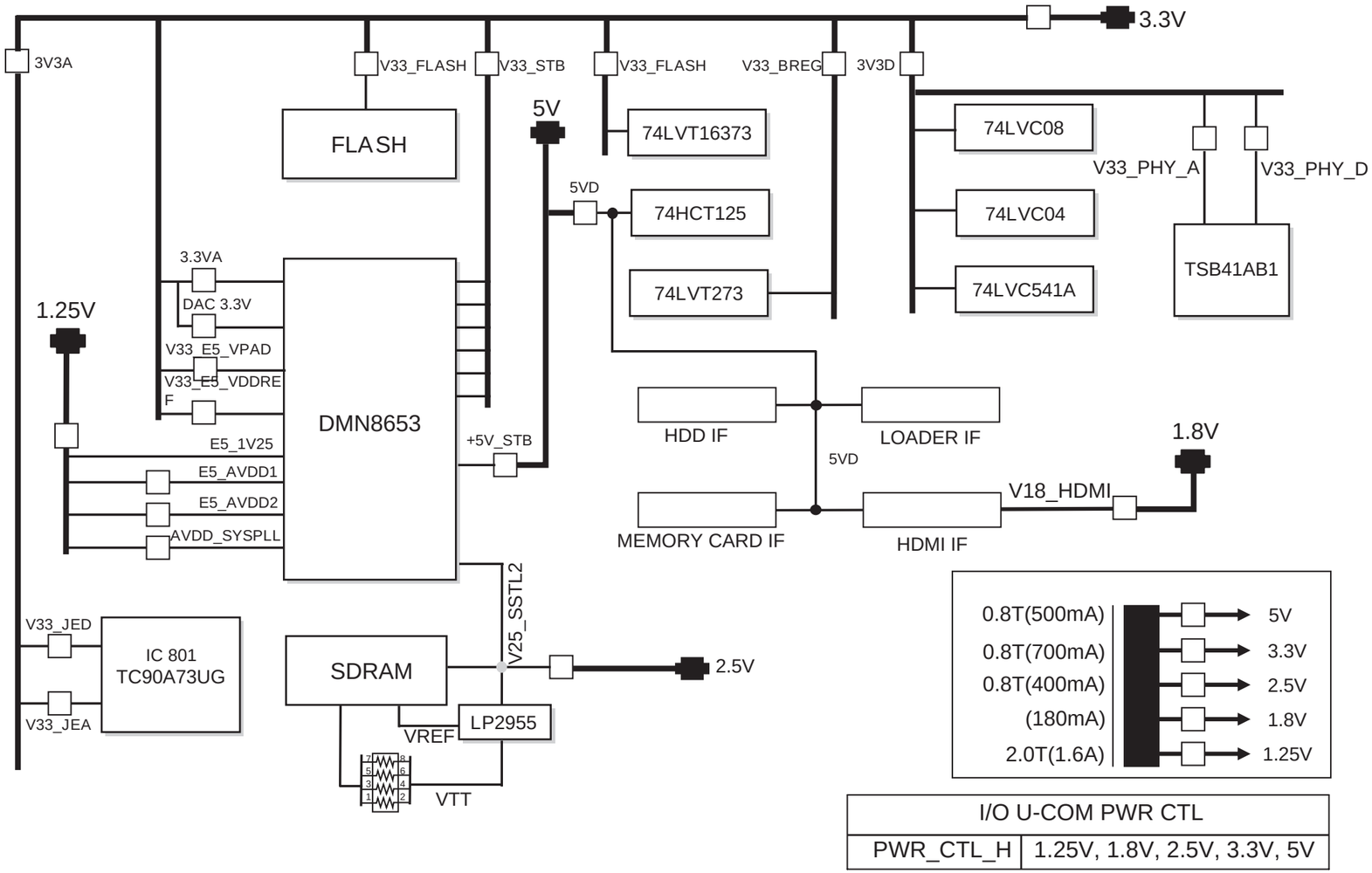
3. LAYOUT CONNECTION BLOCK DIAGRAM_2



4. SMPS Block Diagram

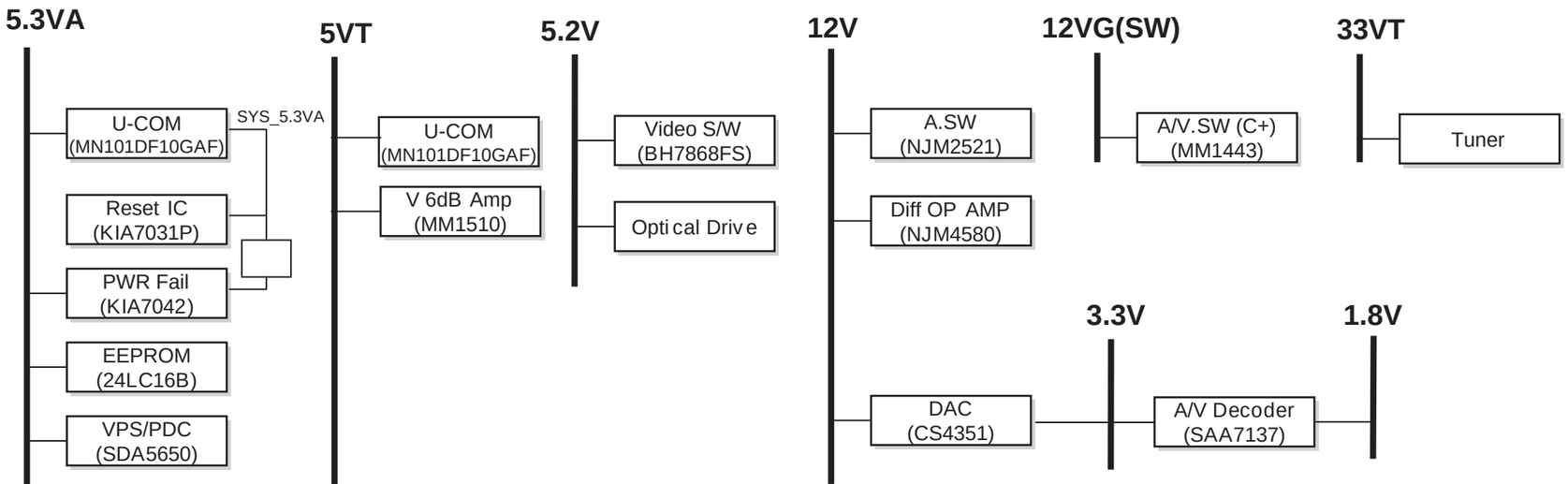


5. Power : Main Board Block Diagram



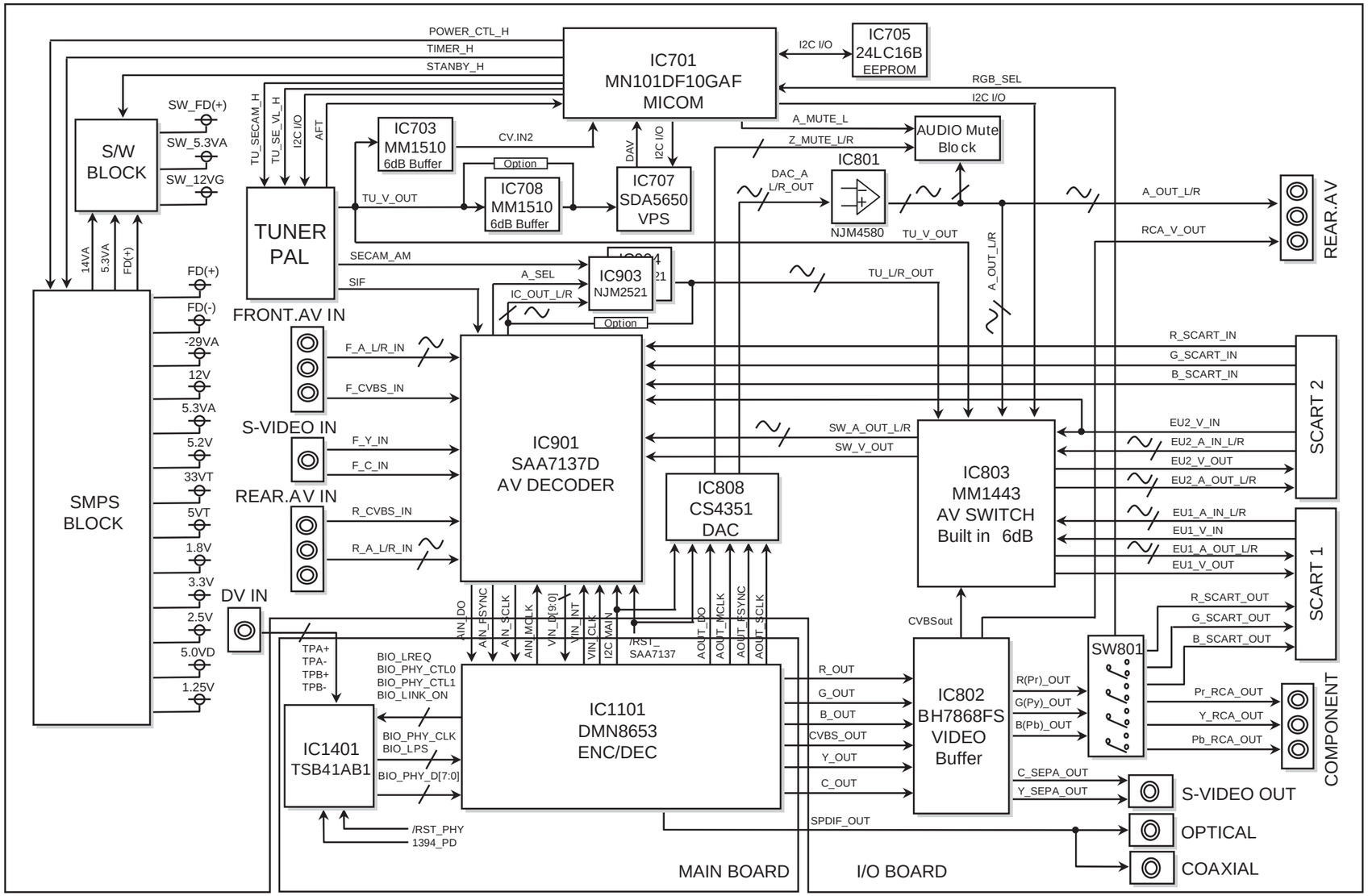
I/O U-COM PWR CTL	
PWR_CTL_H	1.25V, 1.8V, 2.5V, 3.3V, 5V

6. Power : I/O Board Block Diagram

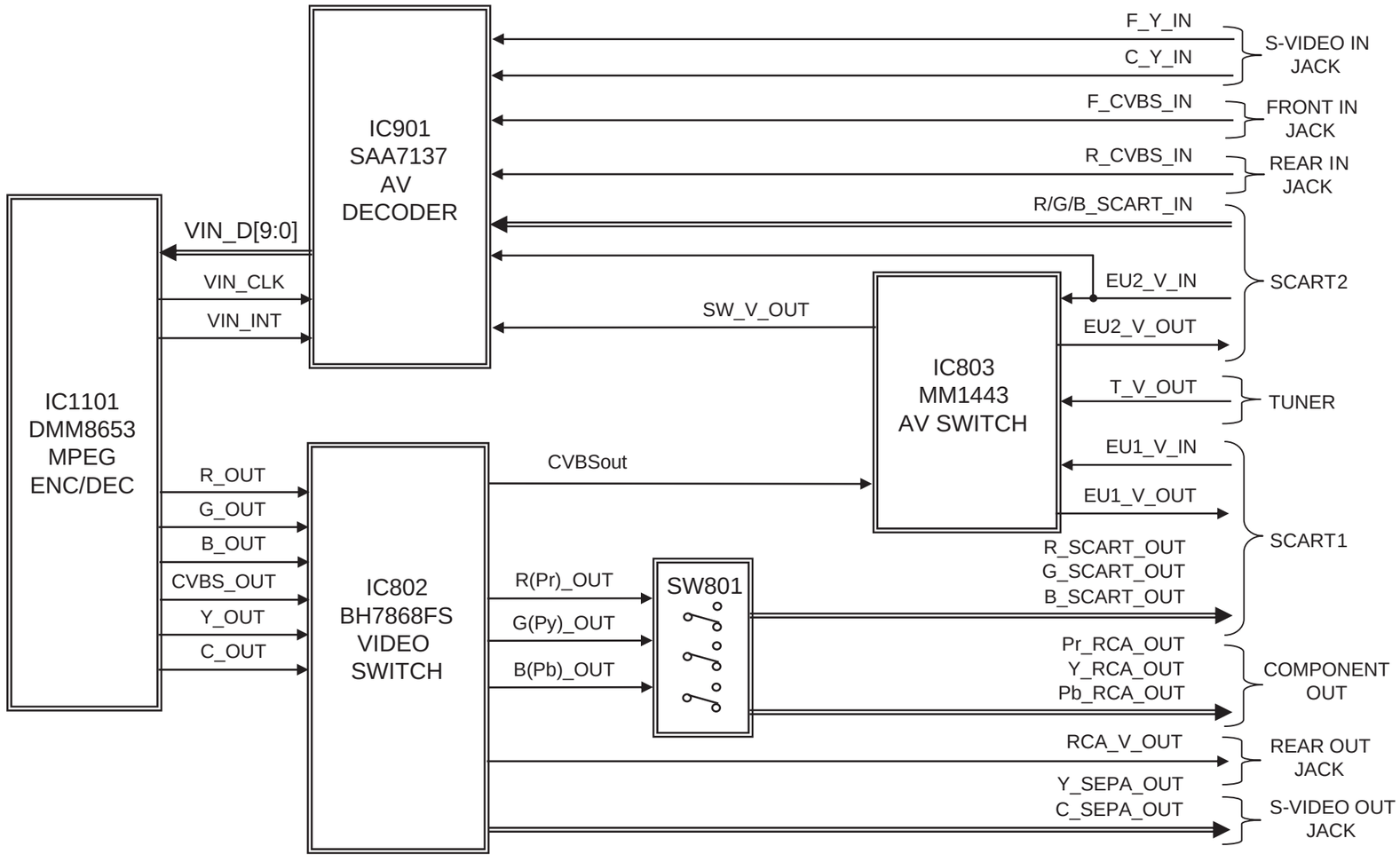


I/O U-COM PWR CTL	
PWR_CTL_H	5.2V, 12V, 3.3V, 1.8V
TIMER_H	5VT, 33VT
STANBY_H	12VG(SW)

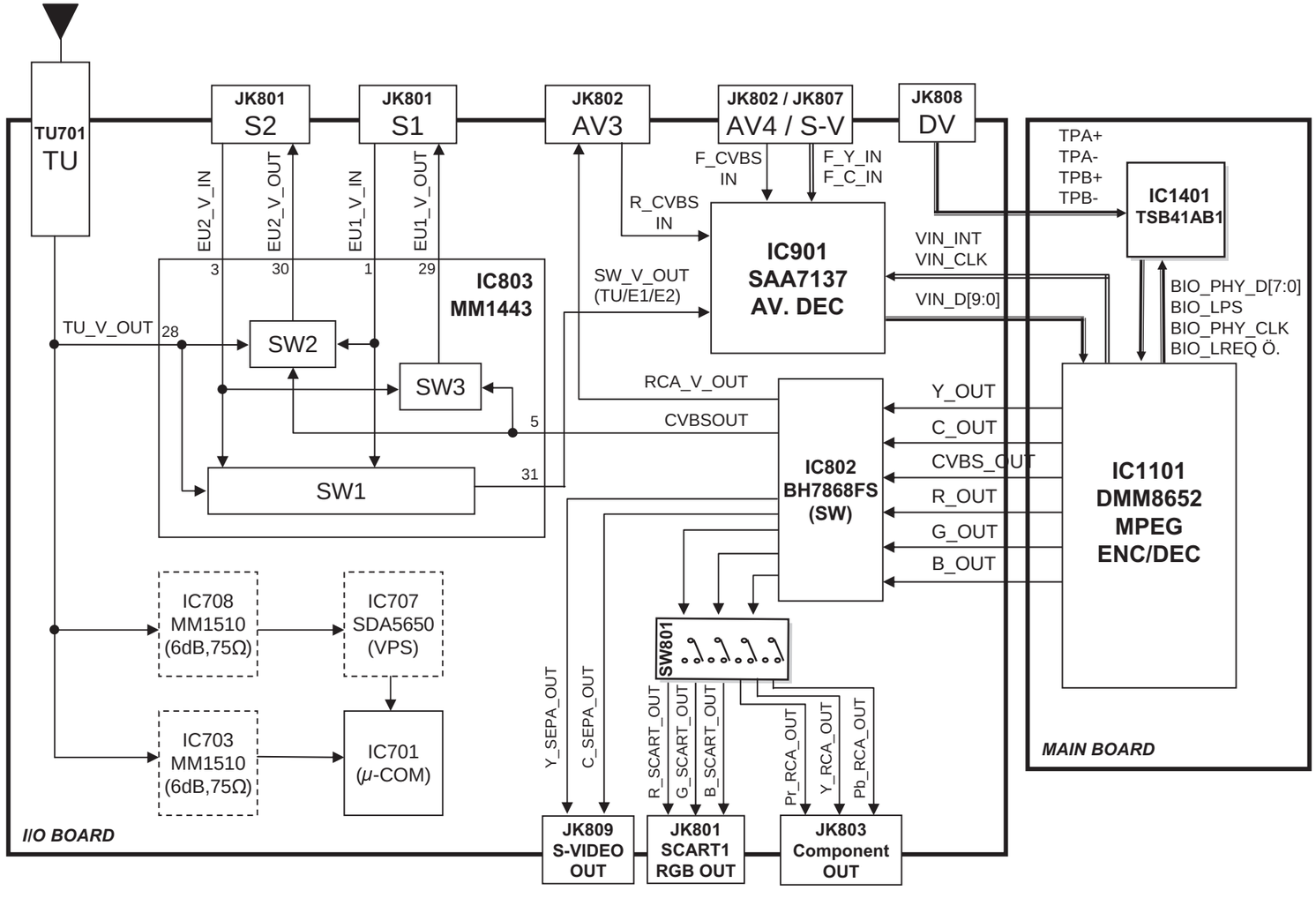
7. IN/OUT BLOCK DIAGRAM (SCART MODEL ONLY)



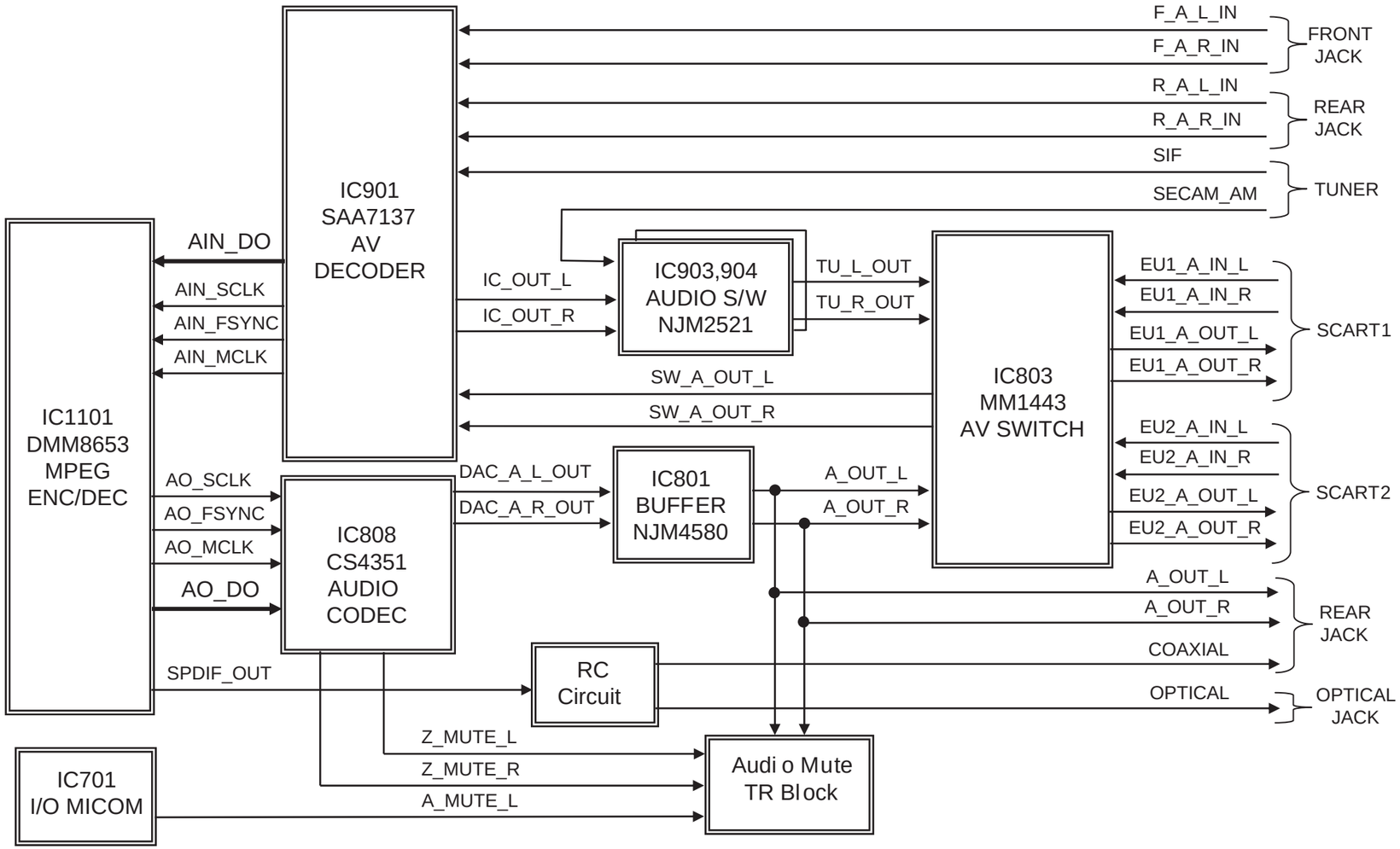
8. VIDEO BLOCK DIAGRAM



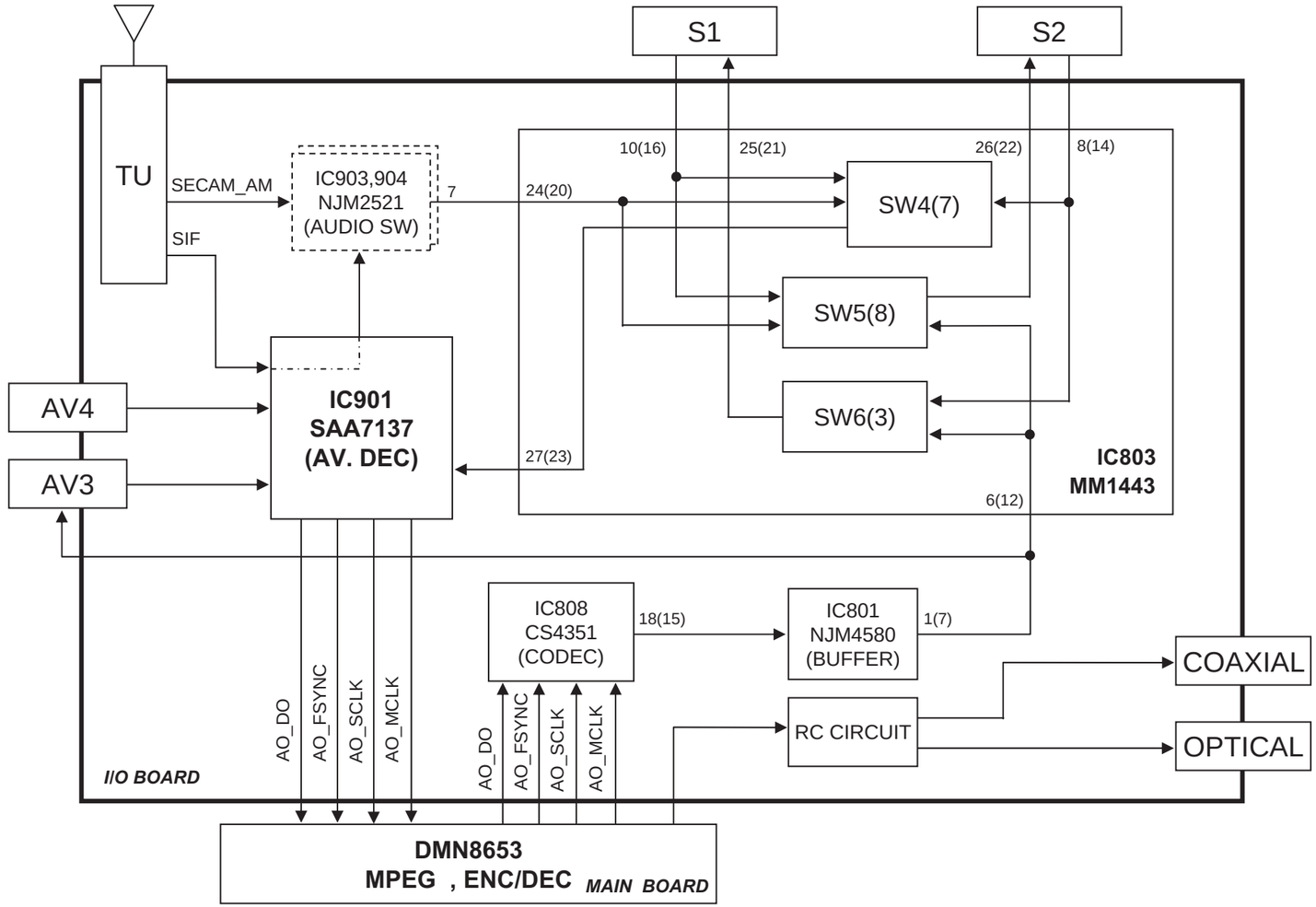
9. VIDEO S/W PATH BLOCK DIAGRAM



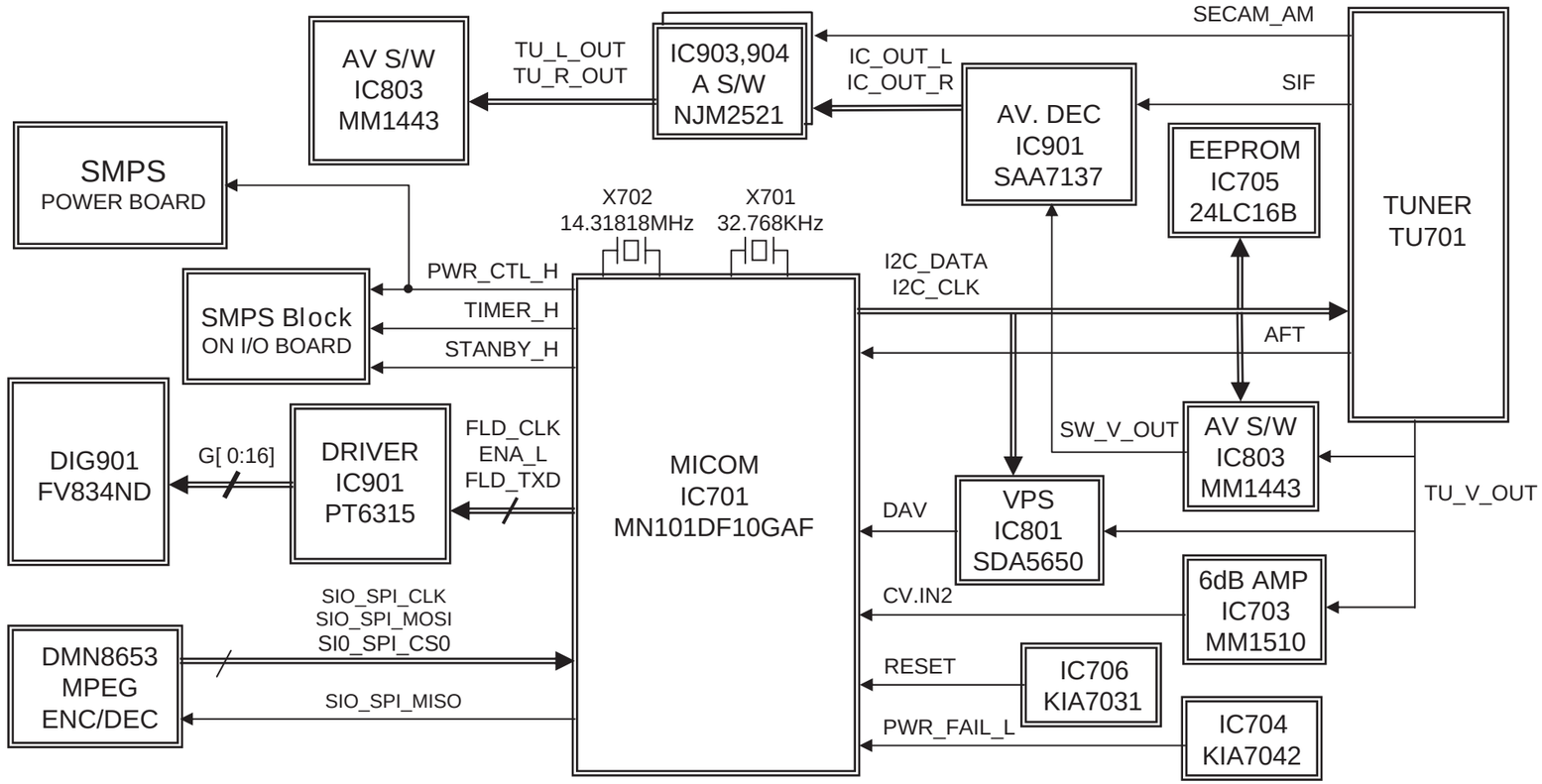
10. AUDIO BLOCK DIAGRAM



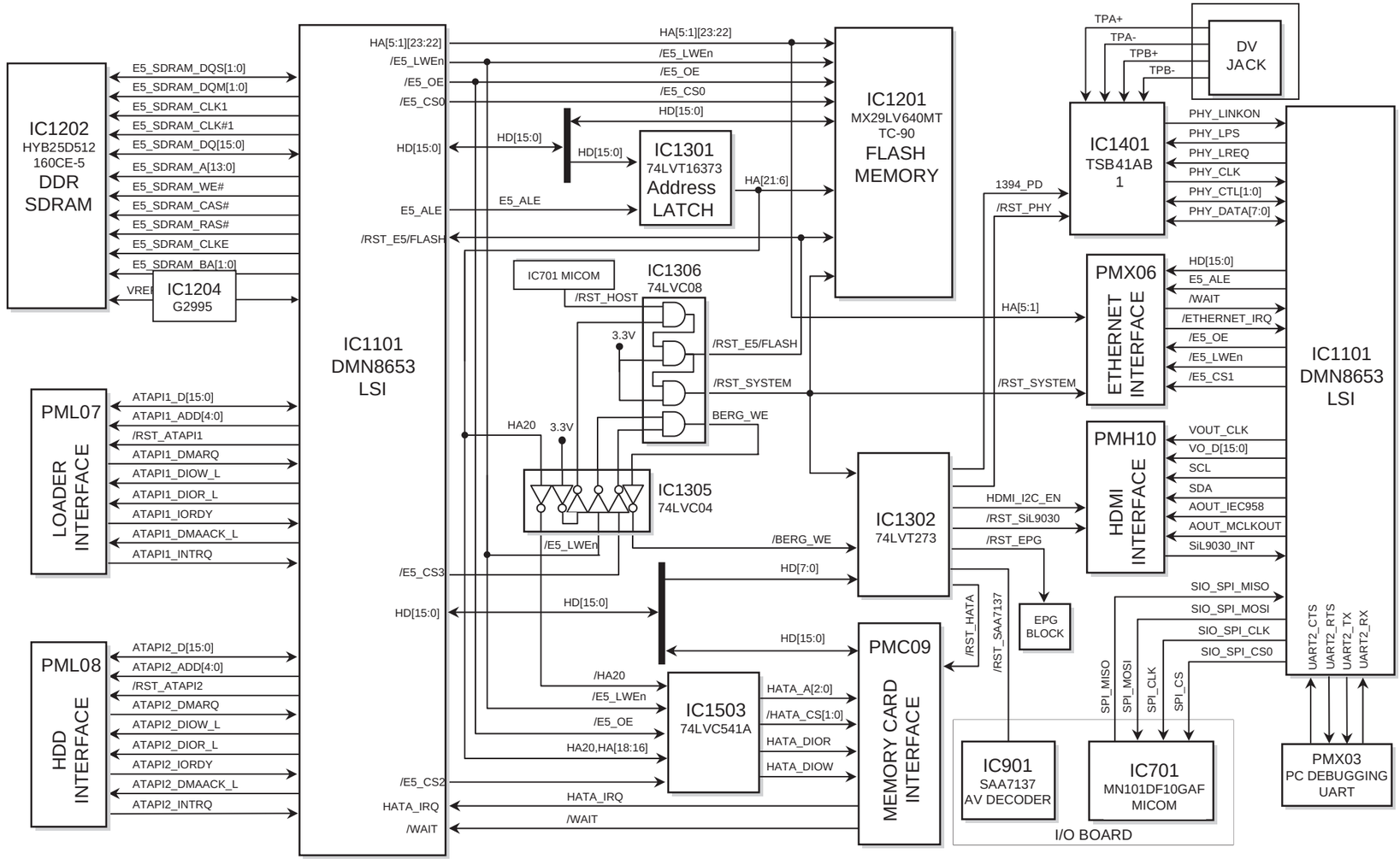
11. AUDIO S/W PATH BLOCK DIAGRAM



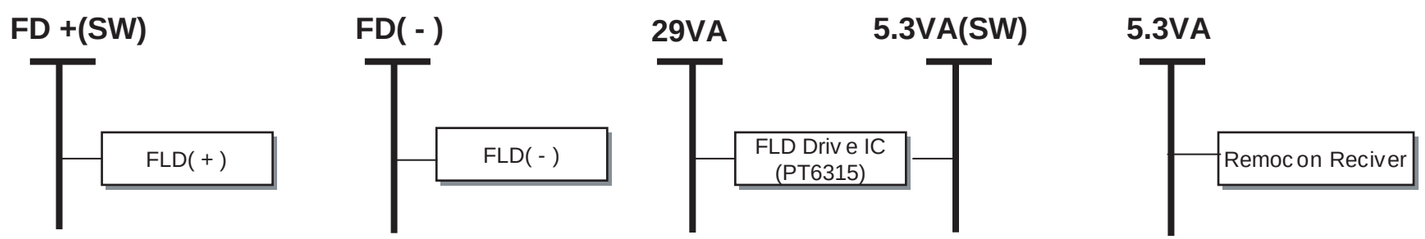
12. FLD / µ-COM / TUNER BLOCK DIAGRAM



13. MAIN BLOCK DIAGRAM (SCART MODEL ONLY)



14. TIMER BLOCK DIAGRAM



I/O U-COM PWR CTL	
STANBY_H	5.3VA(SW), FD+(SW)

CIRCUIT DIAGRAMS

1. SMPS 1 CIRCUIT DIAGRAM

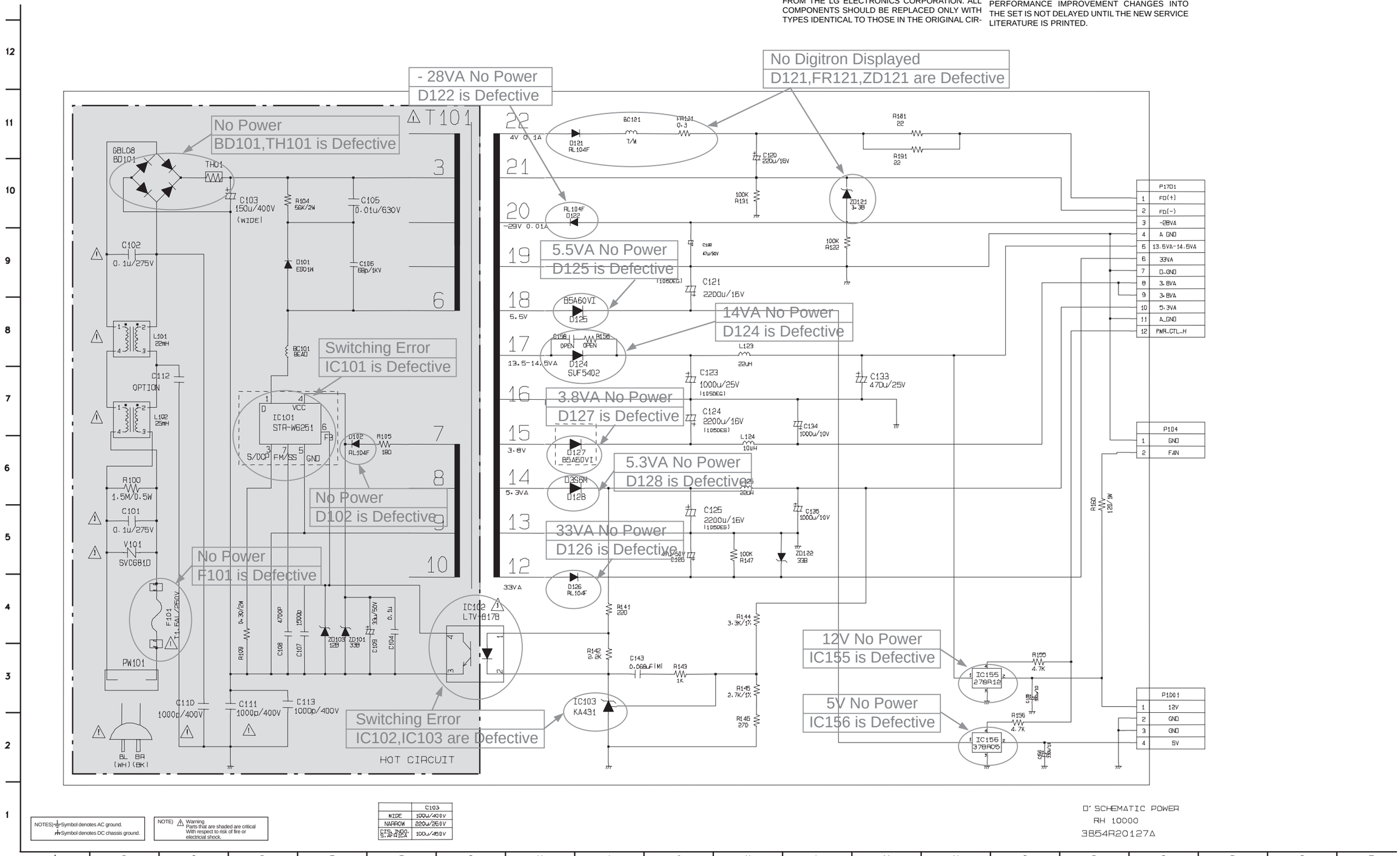
IMPORTANT SAFETY NOTICE

WHEN SERVICING THIS CHASSIS, UNDER NO CIRCUMSTANCES SHOULD THE ORIGINAL DESIGN BE MODIFIED OR ALTERED WITHOUT PERMISSION FROM THE LG ELECTRONICS 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.



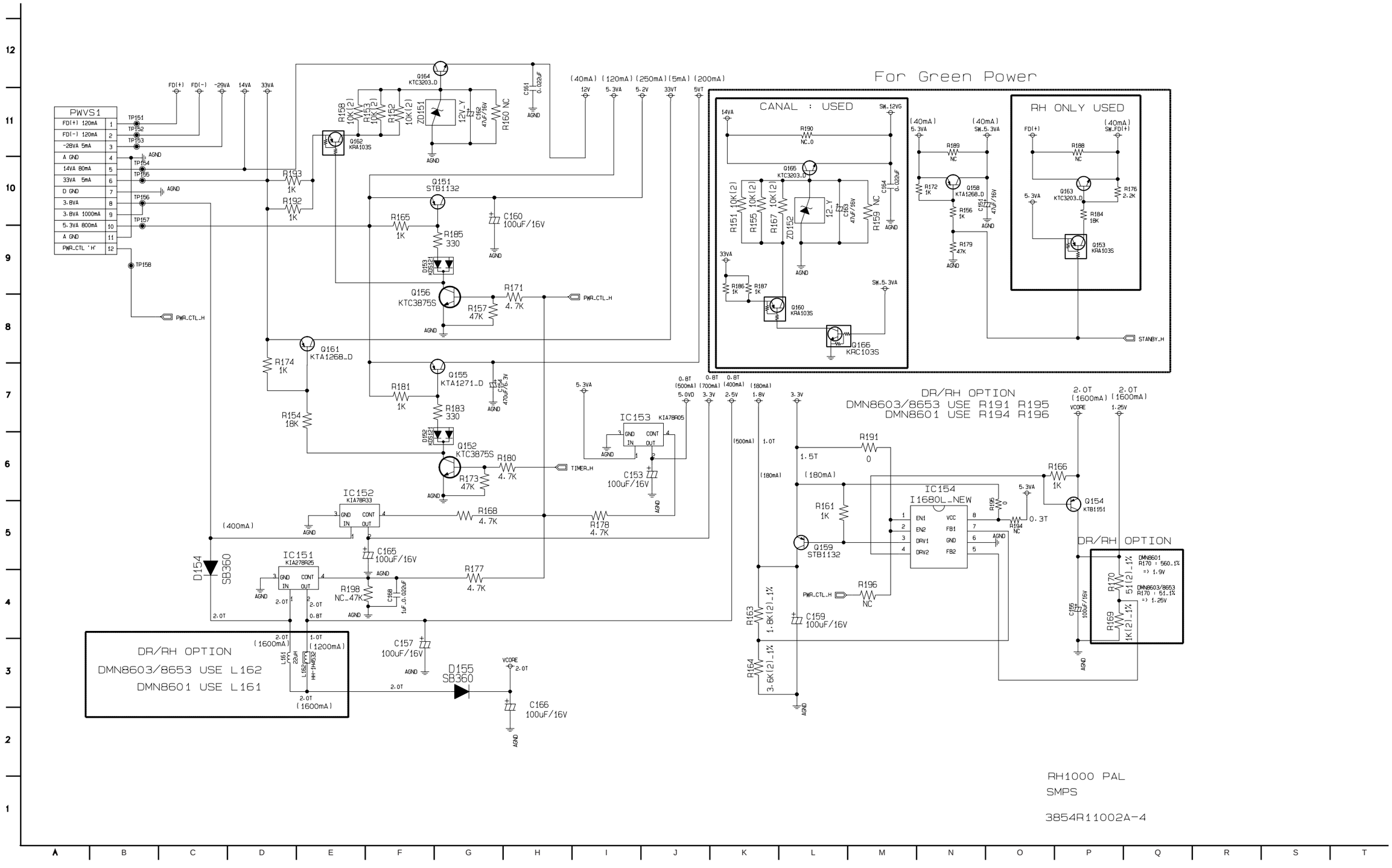
	C103
WIDE	100u/400V
NARROW	220u/250V
CTS, INDO, SAMHWA	100u/450V

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

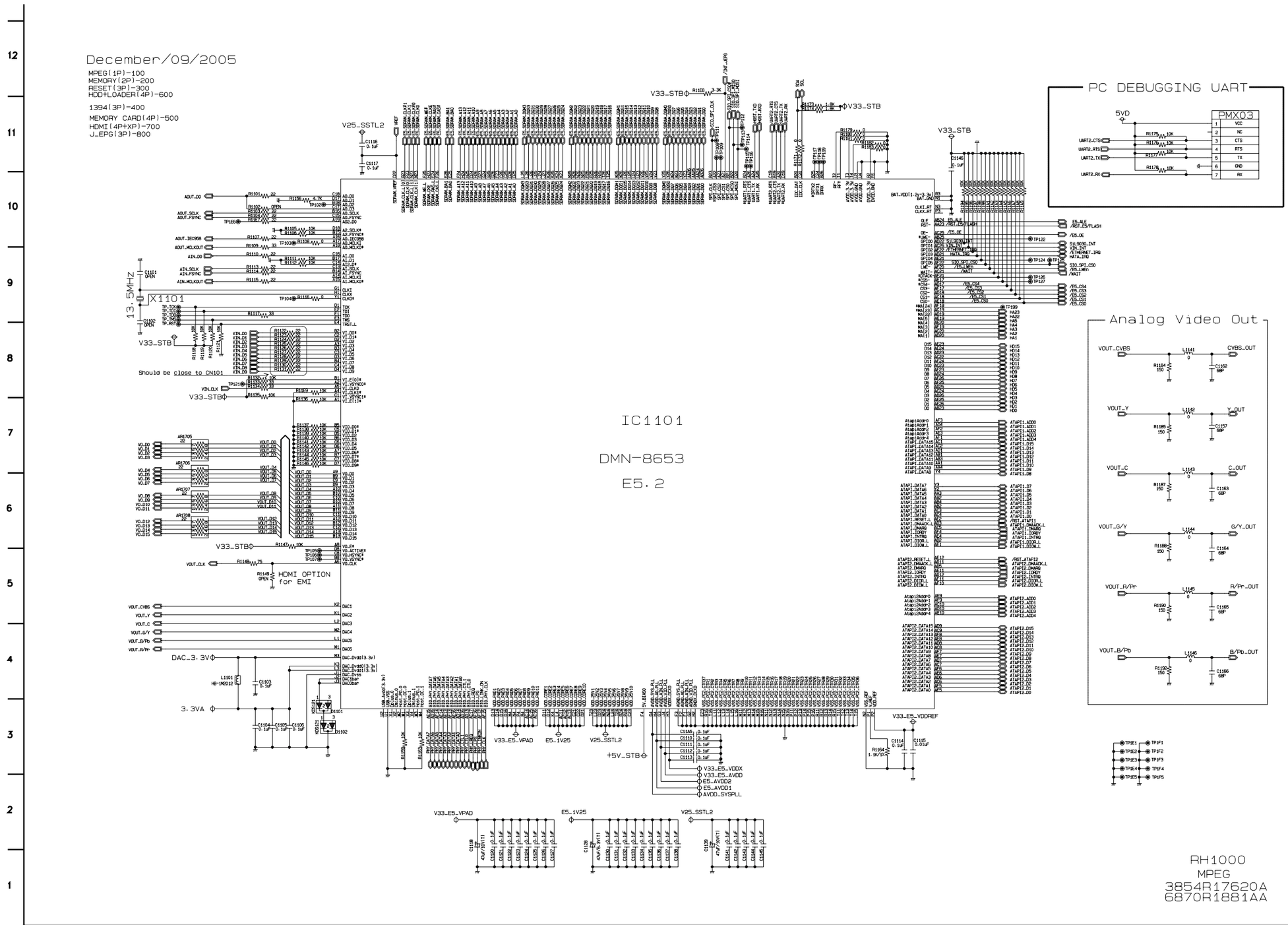
NOTE) ⚠ Warning
Parts that are shaded are critical With respect to risk of fire or electricial shock.

D' SCHEMATIC POWER
RH 10000
3B54R20127A

2. SMPS 2 CIRCUIT DIAGRAM



3. MPEG CIRCUIT DIAGRAM

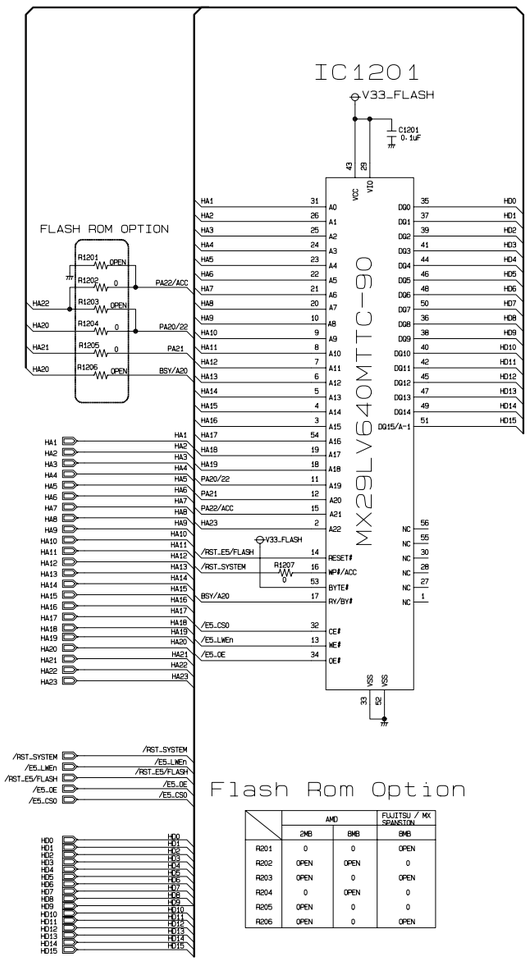


4. FLASH/DDR CIRCUIT DIAGRAM

December/09/2005

FALSH DDR

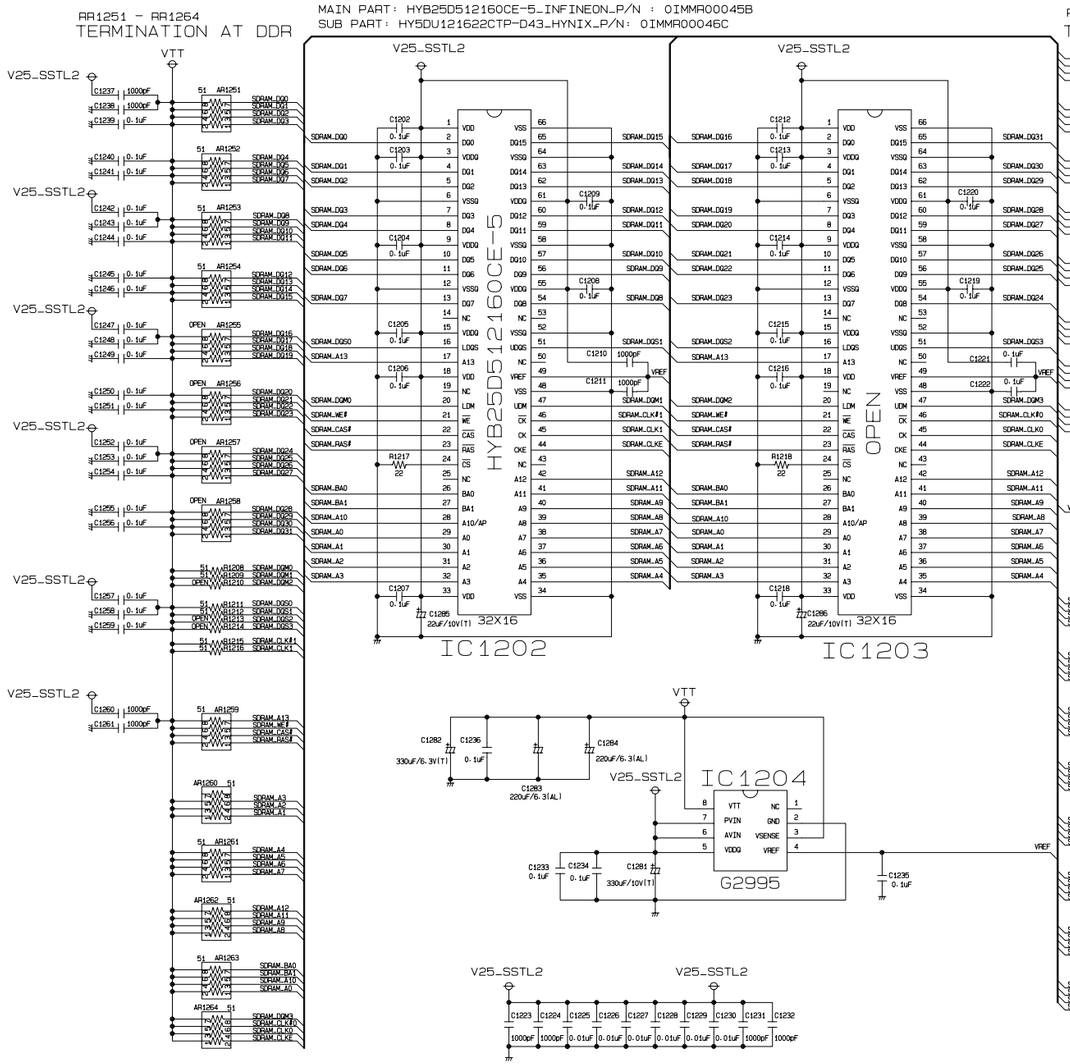
#17 (A13) : 1Gbit based module
(NC) : 512 Mbit or smaller dies



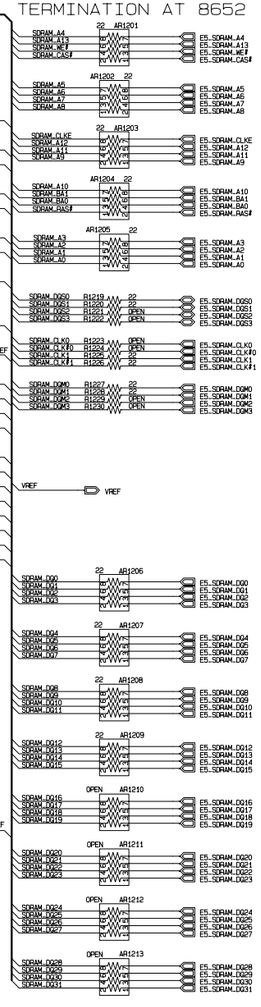
	AMD		FUJITSU / MX SPANSION
	2MB	8MB	8MB
R201	0	0	OPEN
R202	OPEN	OPEN	0
R203	OPEN	0	OPEN
R204	0	OPEN	0
R205	OPEN	0	0
R206	OPEN	0	OPEN

AR1251 ~ AR1264
TERMINATION AT DDR

MAIN PART: HYB25D512160CE-5_INFINEON_P/N : 0IMMR00045B
SUB PART: HY5DU121622CTP-D43_HYNIX_P/N: 0IMMR00046C



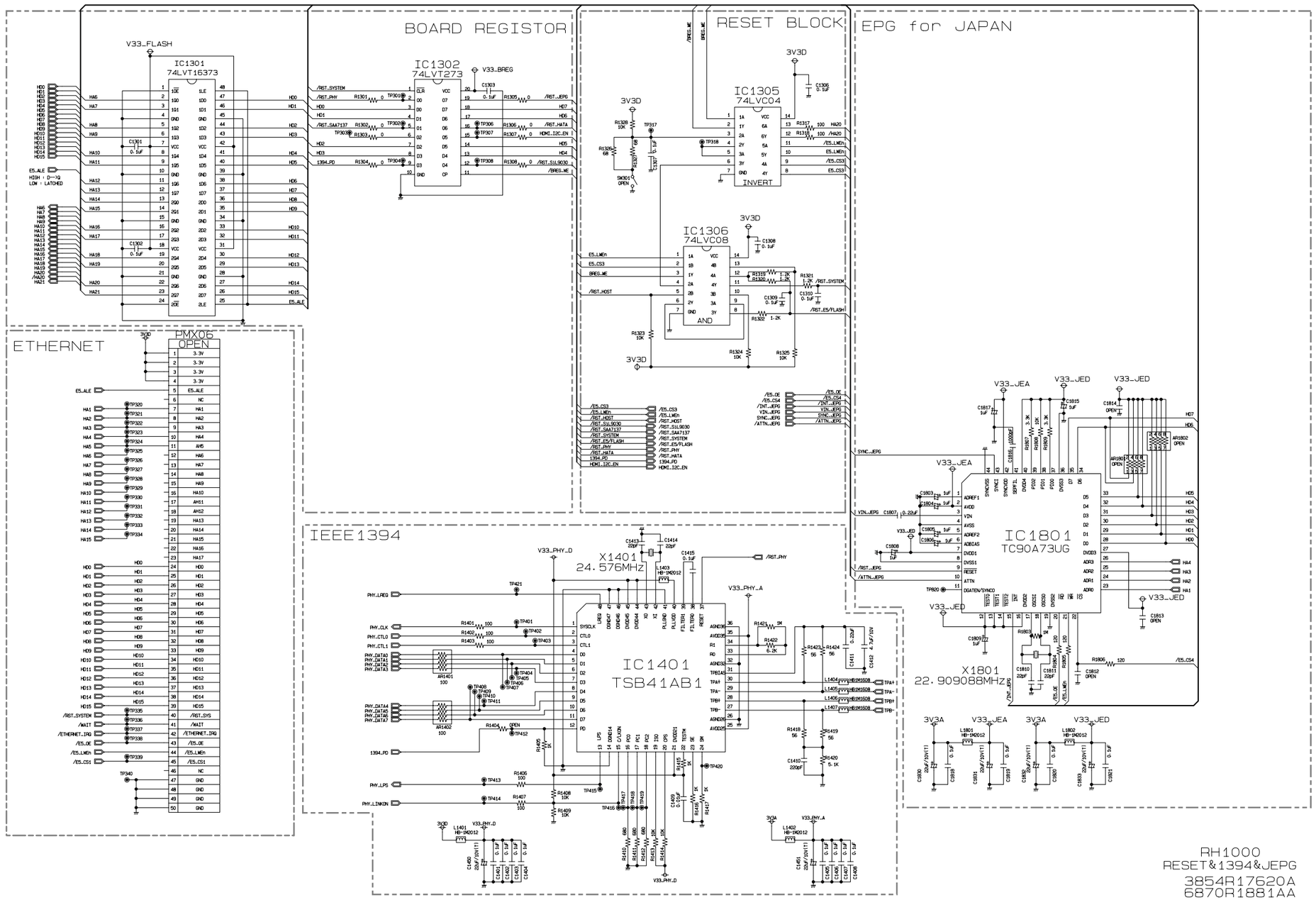
AR201 ~ AR213
TERMINATION AT 8652



RH1000
FLASH / DDR
3854R17620A
6870R1881AA

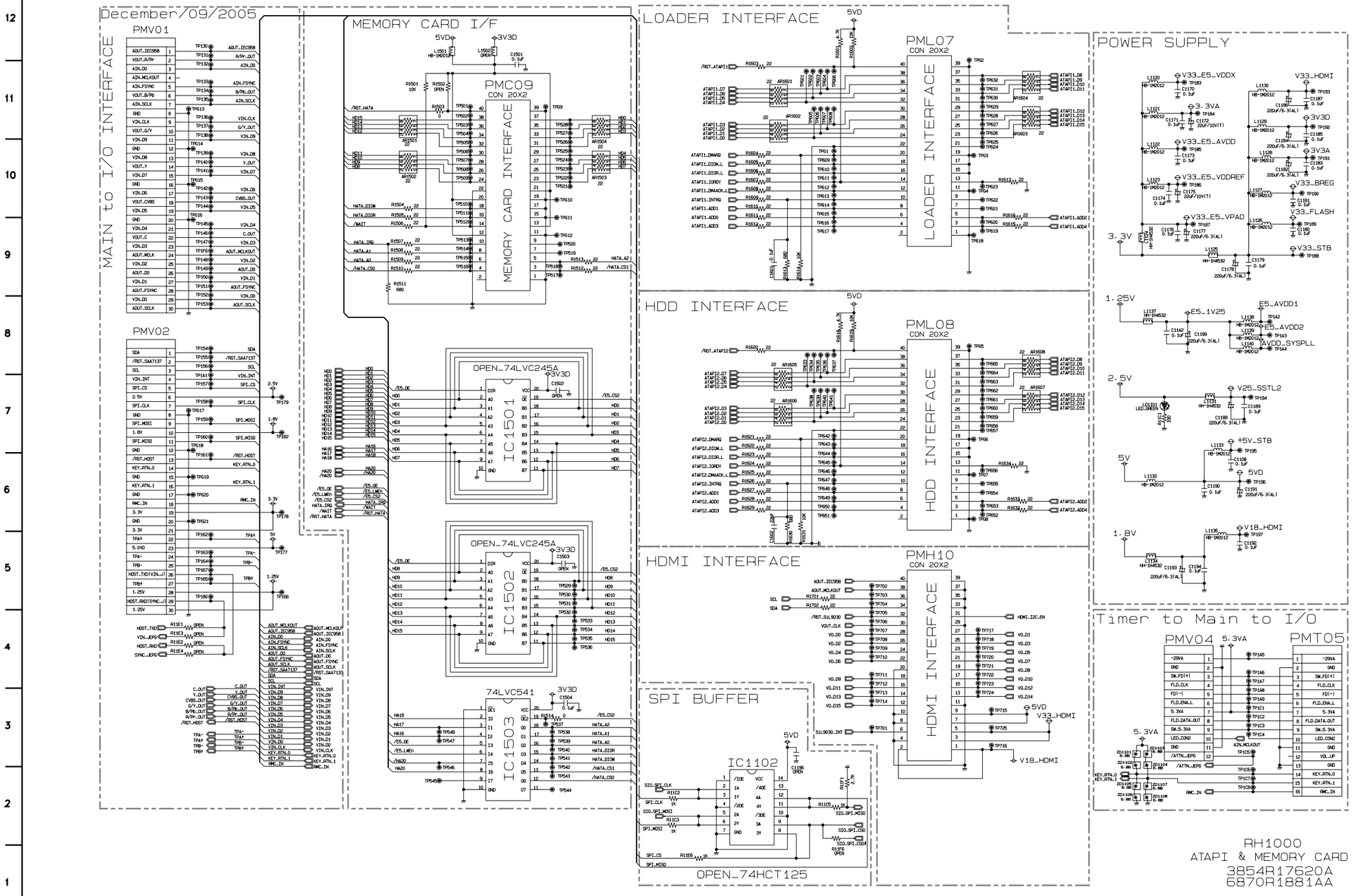
5. RESET & 1394 & JEPG CIRCUIT DIAGRAM

December/09/2005

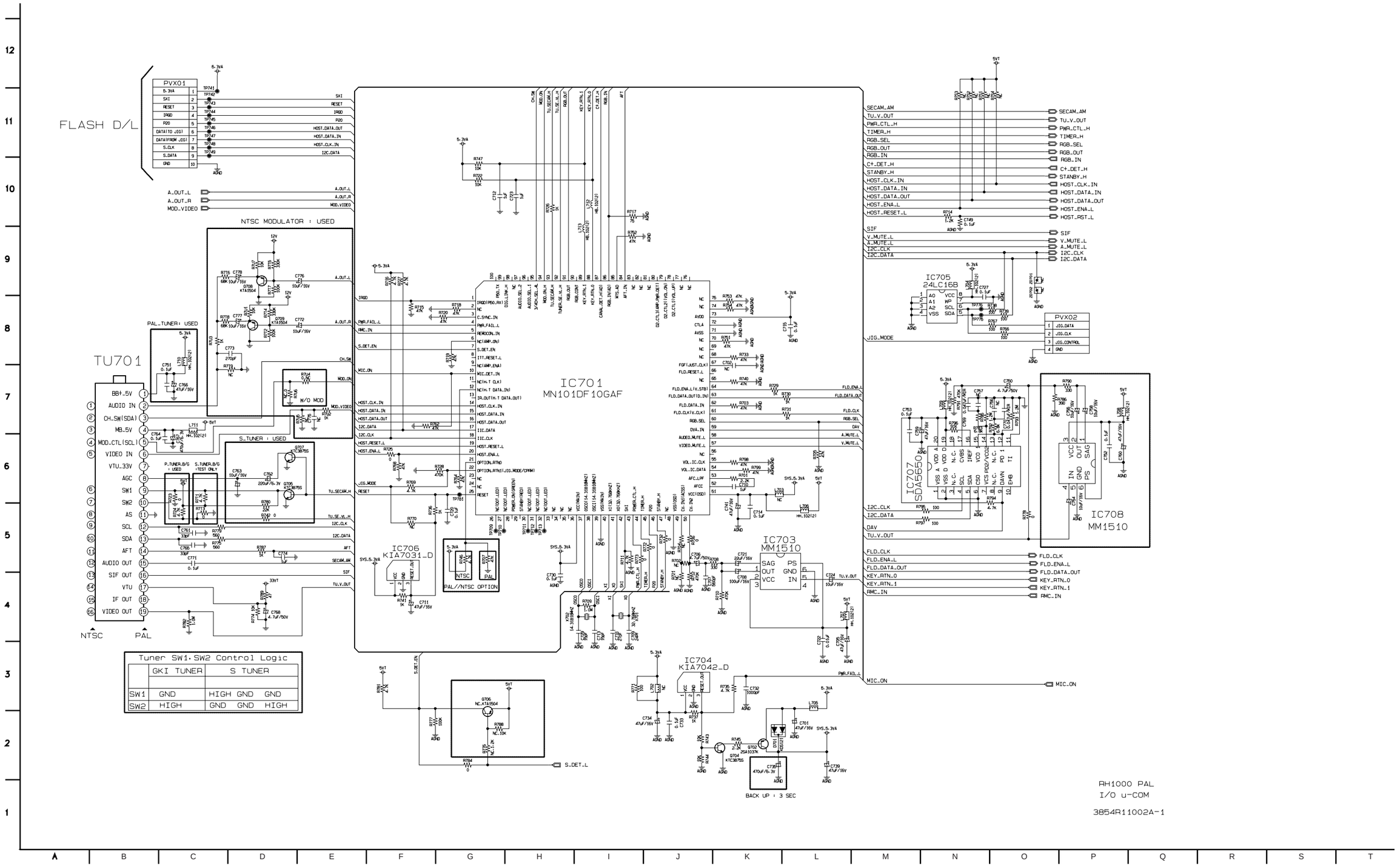


RH1000
RESET&1394&JEPG
3854R17620A
6870R1881AA

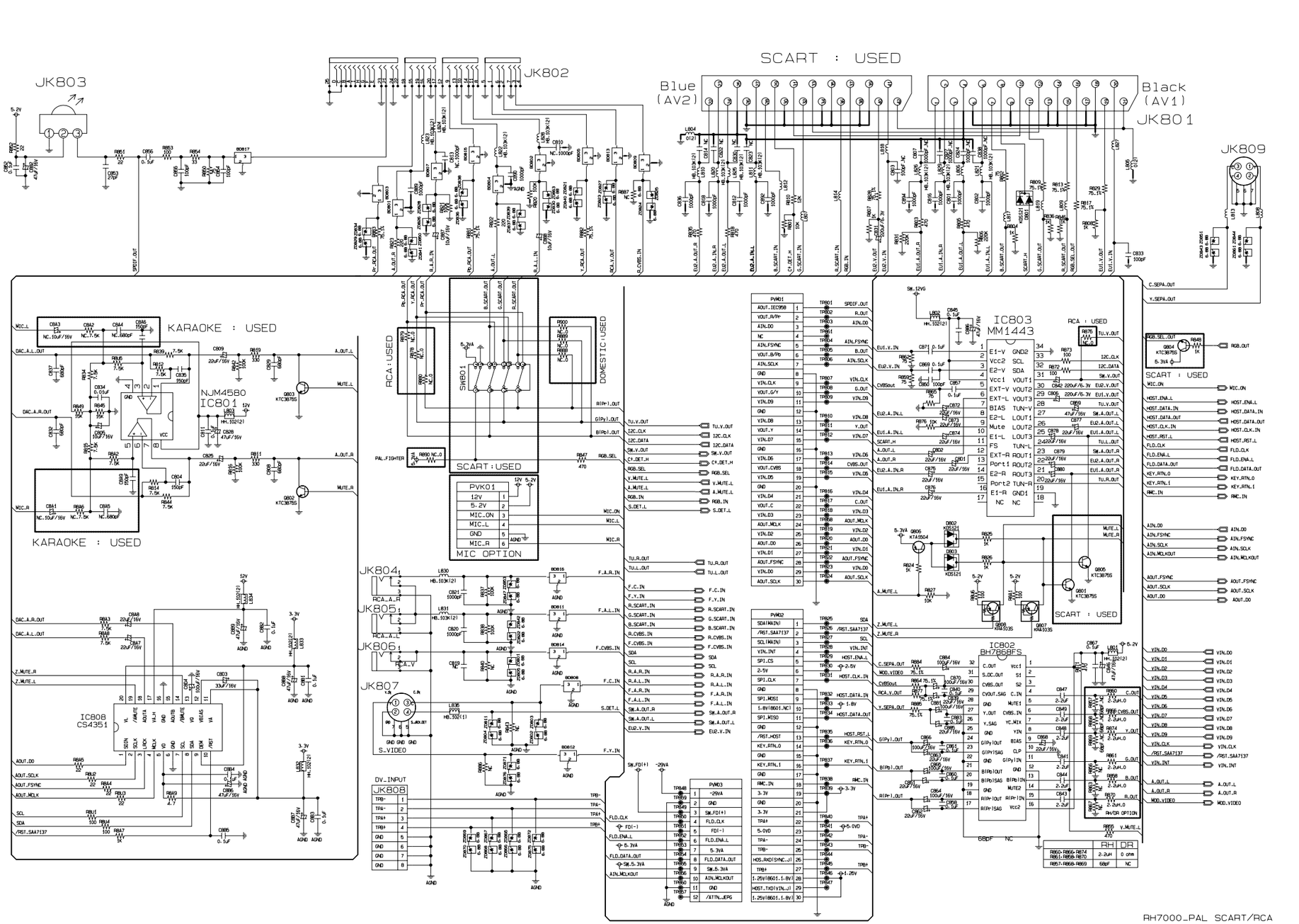
6. ATAPI & MEMORY CARD CIRCUIT DIAGRAM



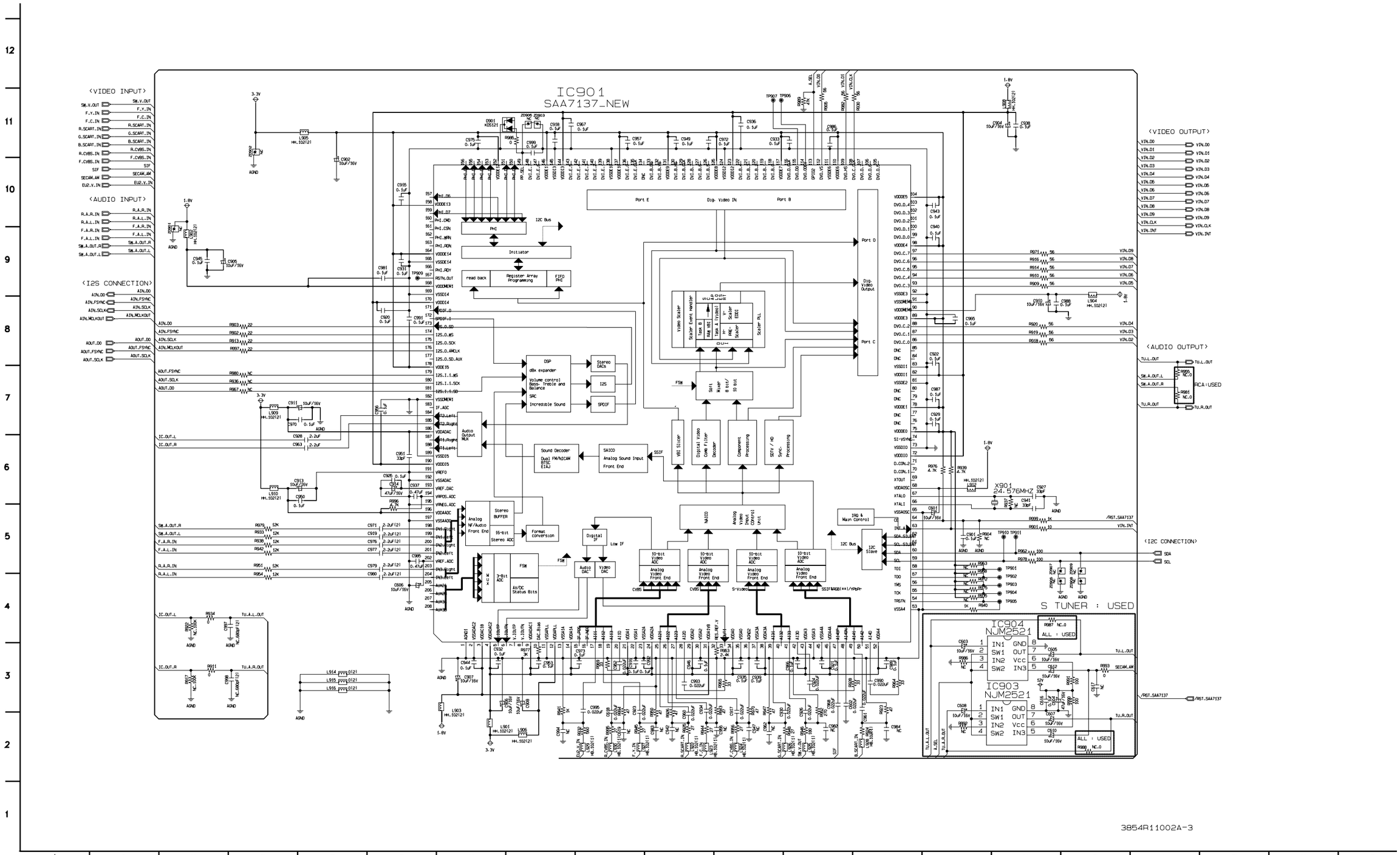
7. I/O, µ-COM CIRCUIT DIAGRAM



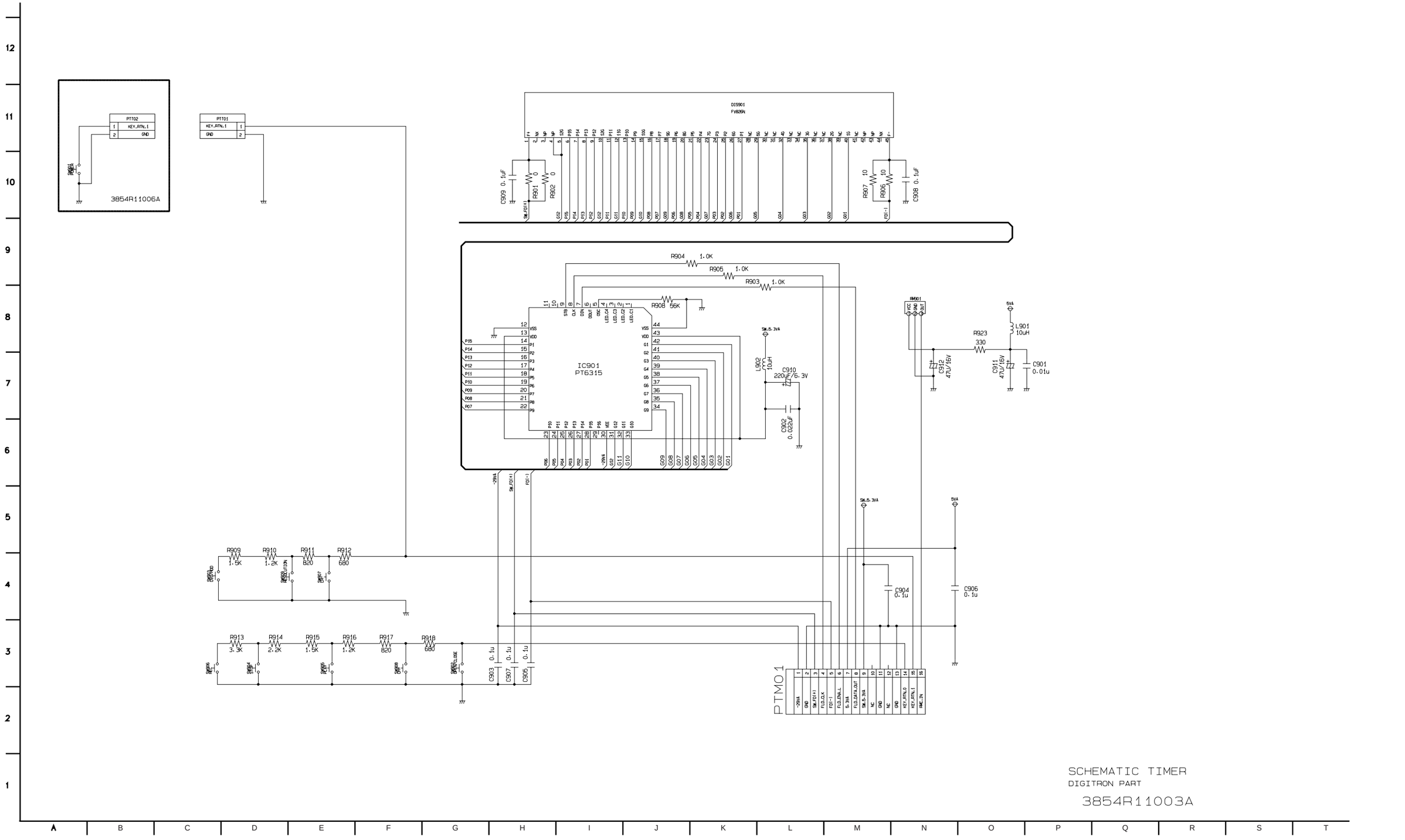
8. TUNER/MPX/ADC/DAC/JACK CIRCUIT DIAGRAM



9. DECODER CIRCUIT DIAGRAM



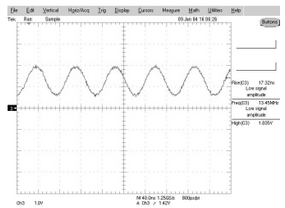
10. TIMER CIRCUIT DIAGRAM



SCHEMATIC TIMER
DIGITRON PART
3854R11003A

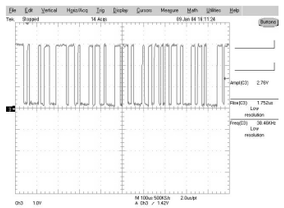
• WAVEFORMS

①



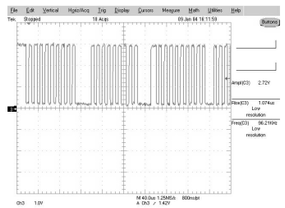
X1101
13.5 MHz

②



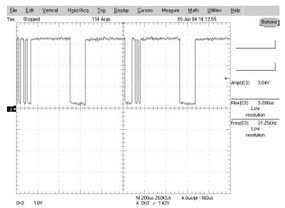
PMV 02
PIN1
SDA

③



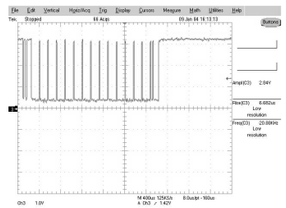
PMV02
PIN3
SCL

④



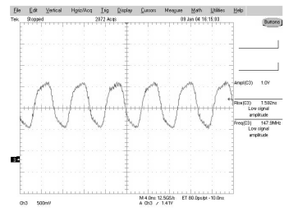
PMV02
PIN29
HOST_RXD

⑤



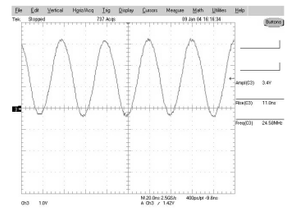
PMV02
PIN26
HOST_TXD

⑥



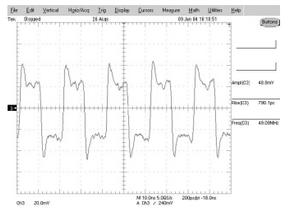
IC1202
PIN45
SDRAM_CLK1

⑦



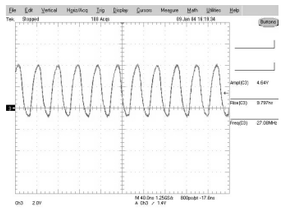
X1401
24.576MHz

⑧



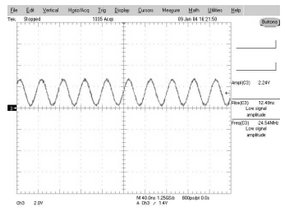
IC1401
PIN1
PHY_CLK

⑨



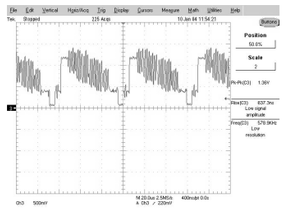
PMV01
PIN9
VIN_CLK

⑩



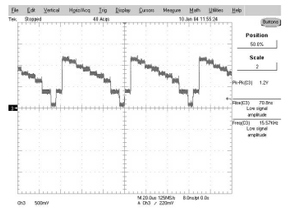
X901
14.31818MHz

⑪



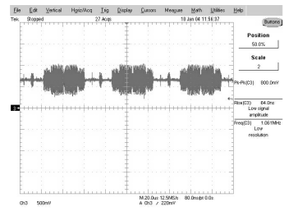
PMV01
PIN18
VOUT_CVBS

⑫



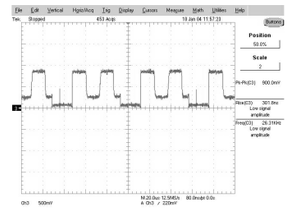
PMV01
PIN10
VOUT_G/Y

⑬



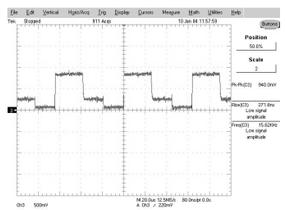
PMV01
PIN22
VOUT_C

⑭



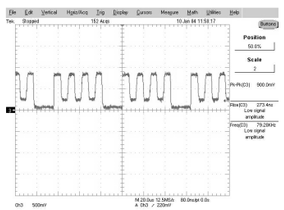
PMV01
PIN2
VOUT_R/Pr

⑭



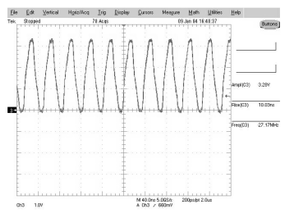
PMV01
PIN10
VOUT_G/Y

⑯



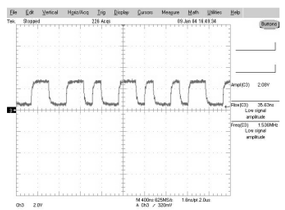
PMV01
PIN06
VOUT_B/Pb

⑰



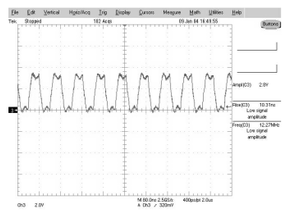
IC901
PIN108
27MHz

⑱



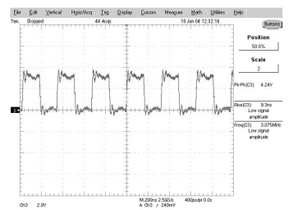
PMV01
PIN01
AOUT_IEC958

⑲



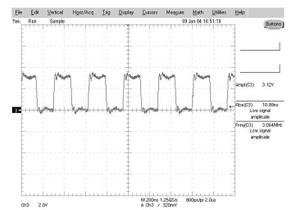
PMV04
PIN10
AIN_MCLKOUT

⑳



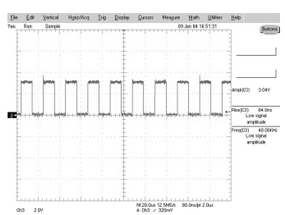
PMV01
PIN07
AIN_SCLK

㉑



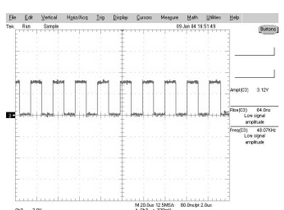
PMV01
PIN24
AOUT_MCLK

㉒



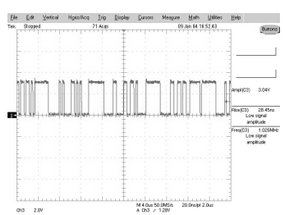
PMV01
PIN05
AIN_FSYNC

㉓



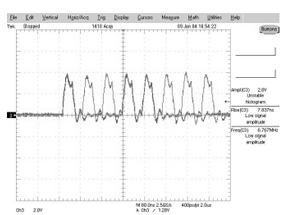
PMV01
PIN_FSYNC
AOUT_FSYNC

㉔



PMV01
PIN26
AOUT_D0

㉕



PMV01
PIN29
VIN_D0

• CIRCUIT VOLTAGE CHART

MODE / PIN NO.	EE	PB	REC
IC101 LSI DMN8653			
A1	1.17	1.19	1.17
A2	0.00	0.00	0.00
A3	1.37	1.36	1.36
A4	0.00	0.00	0.00
A5	1.61	1.64	1.64
A6	1.60	1.62	1.62
A7	1.58	1.61	1.59
A8	3.20	3.23	3.21
A9	1.25	0.67	1.25
A10	1.58	1.62	1.60
A11	1.25	0.67	1.25
A12	1.08	0.94	1.06
A13	1.10	1.08	1.10
A14	NC	NC	NC
A15	3.22	3.23	3.20
A16	1.63	1.64	1.62
A17	1.63	1.64	1.98
A18	1.63	1.64	1.63
A19	0.00	0.00	0.00
A20	3.24	3.24	3.23
A21	0.00	0.00	0.00
A22	0.00	0.00	0.00
A23	0.00	0.00	0.00
A24	3.23	3.24	3.22
A25	2.31	2.32	2.30
A26	3.21	3.21	3.21
B1	3.21	3.22	3.21
B2	0.27	0.27	0.27
B3	1.39	1.39	1.39
B4	1.22	1.22	1.21
B5	0.00	0.00	0.00
B6	1.16	1.21	1.18
B7	1.01	1.07	1.01
B8	3.20	3.20	3.19
B9	1.18	1.22	1.18
B10	1.02	1.07	1.02
B11	1.19	1.22	1.18
B12	1.22	1.25	1.24
B13	2.17	2.14	2.17
B14	1.60	1.61	1.59
B15	1.61	1.62	1.60
B16	1.62	1.62	1.61
B17	0.00	0.00	0.00
B18	0.00	0.00	0.00
B19	4.91	4.91	4.91
B20	3.12	3.14	3.14
B21	2.75	2.80	2.84
B22	4.80	4.90	4.82
B23	3.08	3.11	3.10
B24	3.21	3.21	3.21
B25	3.20	3.23	3.21
B26	3.21	3.23	3.21
C1	2.24	2.25	2.25
C2	2.67	2.67	2.66

MODE / PIN NO.	EE	PB	REC
C3	1.32	1.32	1.32
C4	1.28	1.28	1.27
C5	0.00	0.00	0.00
C6	1.19	0.38	1.17
C7	1.10	1.08	1.10
C8	2.86	2.86	2.85
C9	1.18	0.38	1.18
C10	1.10	1.08	1.10
C11	1.19	0.38	1.17
C12	1.02	1.07	1.01
C13	1.62	1.63	1.61
C14	0.00	0.00	0.00
C15	1.62	1.63	1.61
C16	1.21	1.21	1.20
C17	0.00	0.00	0.00
C18	1.62	1.64	1.61
C19	0.00	0.00	0.00
C20	3.15	3.18	3.16
C21	1.08	1.05	1.05
C22	1.08	1.05	1.05
C23	2.35	2.29	2.30
C24	3.21	3.23	3.21
C25	1.14	1.10	1.10
C26	1.17	1.16	1.15
D1	2.25	2.25	2.25
D2	1.55	1.55	1.55
D3	1.50	1.50	1.49
D4	1.62	1.62	1.61
D5	1.25	0.66	1.25
D6	1.18	0.94	1.06
D7	1.80	1.77	1.80
D8	2.49	2.49	2.48
D9	1.08	0.94	1.07
D10	1.81	1.78	1.81
D11	1.08	1.05	1.05
D12	1.08	1.05	1.05
D13	3.22	3.24	3.22
D14	3.22	3.24	3.22
D15	3.22	3.24	3.22
D16	3.22	3.24	3.22
D17	0.00	0.00	0.00
D18	1.61	1.61	1.60
D19	4.91	4.91	4.91
D20	3.05	3.05	3.04
D21	1.08	1.05	1.05
D22	1.19	1.17	1.17
D23	2.35	2.29	2.30
D24	1.12	1.08	1.04
D25	1.14	1.09	1.03
D26	1.14	1.09	1.08
E1	0.89	0.40	0.85
E2	2.23	2.24	2.24
E3	2.25	2.26	2.25
E4	0.00	0.00	0.00
E23	0.00	0.00	0.00

MODE / PIN NO.	EE	PB	REC
E24	2.01	1.97	1.97
E25	1.21	1.18	1.18
E26	1.18	1.18	1.16
F1	0.00	0.00	0.00
F2	0.00	0.00	0.00
F3	0.00	0.00	0.00
F4	1.05	1.05	1.06
F23	1.19	1.16	1.15
F24	1.18	1.06	1.02
F25	2.03	1.98	1.98
F26	2.08	1.93	1.85
G1	1.48	1.49	1.49
G2	0.00	0.00	0.00
G3	1.05	1.05	1.06
G4	2.35	2.26	2.30
G23	1.17	1.16	1.15
G24	1.18	1.16	1.15
G25	1.17	1.16	1.15
G26	1.16	1.16	1.15
H1	1.69	1.72	1.73
H2	0.00	0.00	0.00
H3	3.23	3.24	3.22
H4	1.06	1.05	1.06
H23	2.10	2.05	2.05
H24	1.14	1.09	1.06
H25	1.12	1.08	1.05
H26	1.17	1.14	1.15
J1	0.00	0.00	0.00
J2	1.58	1.58	1.58
J3	1.58	1.58	1.58
J4	3.23	3.23	3.22
J23	1.18	1.18	1.18
J24	1.11	1.11	1.11
J25	1.11	1.11	1.11
J26	1.11	1.11	1.11
K1	0.63	0.61	0.64
K2	0.64	0.62	0.64
K3	3.21	3.22	3.20
K4	1.08	1.05	1.05
K23	1.11	1.11	1.11
K24	1.13	1.13	1.13
K25	1.12	1.12	1.12
K26	1.11	1.11	1.11
L1	0.72	0.72	0.72
L2	0.73	0.73	0.64
L3	3.21	3.22	3.20
L4	1.08	1.05	1.05
L11	0.00	0.00	0.00
L12	0.00	0.00	0.00
L13	0.00	0.00	0.00
L14	0.00	0.00	0.00
L15	0.00	0.00	0.00
L16	0.00	0.00	0.00
L23	2.35	2.29	2.30
L24	2.35	2.29	2.30

MODE / PIN NO.	EE	PB	REC
L25	0.35	0.32	0.30
L26	1.16	1.16	1.15
M1	0.72	0.72	0.73
M2	0.64	0.62	0.73
M3	3.21	3.22	3.20
M4	3.22	3.24	3.22
M11	0.00	0.00	0.00
M12	0.00	0.00	0.00
M13	0.00	0.00	0.00
M14	0.00	0.00	0.00
M15	0.00	0.00	0.00
M16	0.00	0.00	0.00
M23	1.22	1.20	1.20
M24	2.35	2.29	2.30
M25	0.35	0.32	0.30
M26	1.16	1.16	1.15
N1	0.00	0.00	0.00
N2	0.00	0.00	0.00
N3	0.00	0.00	0.00
N4	3.22	3.24	3.22
N11	0.00	0.00	0.00
N12	0.00	0.00	0.00
N13	0.00	0.00	0.00
N14	0.00	0.00	0.00
N15	0.00	0.00	0.00
N16	0.00	0.00	0.00
N23	1.20	1.17	1.16
N24	2.35	2.29	2.30
N25	1.13	1.13	1.13
N26	1.13	1.13	1.13
P1	1.18	1.18	1.18
P2	3.22	3.23	3.22
P3	NC	NC	NC
P4	3.22	3.24	3.22
P11	0.00	0.00	0.00
P12	0.00	0.00	0.00
P13	0.00	0.00	0.00
P14	0.00	0.00	0.00
P15	0.00	0.00	0.00
P16	0.00	0.00	0.00
P23	1.21	1.19	1.19
P24	2.35	2.29	2.30
P25	1.13	1.13	1.13
P26	1.14	1.14	1.14
R1	0.00	0.00	0.00
R2	0.00	0.00	0.00
R3	0.00	0.00	0.00
R4	3.22	3.24	3.22
R11	0.00	0.00	0.00
R12	0.00	0.00	0.00
R13	0.00	0.00	0.00
R14	0.00	0.00	0.00
R15	0.00	0.00	0.00
R16	0.00	0.00	0.00
R23	1.20	1.17	1.17

MODE / PIN NO.	EE	PB	REC
R24	2.35	2.29	2.30
R25	1.18	1.18	1.18
R26	1.18	1.18	1.18
T1	0.00	0.00	0.00
T2	0.00	0.00	0.00
T3	0.00	0.00	0.00
T4	0.00	0.00	0.00
T11	0.00	0.00	0.00
T12	0.00	0.00	0.00
T13	0.00	0.00	0.00
T14	0.00	0.00	0.00
T15	0.00	0.00	0.00
T16	0.00	0.00	0.00
T23	2.35	2.29	2.30
T24	2.35	2.29	2.30
T25	1.18	1.18	1.18
T26	1.18	1.18	1.18
U1	0.00	0.00	0.00
U2	NC	NC	NC
U3	0.00	0.00	0.00
U4	0.00	0.00	0.00
U23	1.18	1.18	1.18
U24	1.18	1.18	1.18
U25	1.18	1.18	1.18
U26	1.18	1.18	1.18
V1	NC	NC	NC
V2	NC	NC	NC
V3	NC	NC	NC
V4	NC	NC	NC
V23	1.18	1.18	1.18
V24	1.18	1.18	1.18
V25	1.18	1.18	1.18
V26	1.18	1.18	1.18
W1	0.00	0.00	0.00
W2	NC	NC	NC
W3	NC	NC	NC
W4	0.00	0.00	0.00
W23	1.18	1.18	1.18
W24	1.18	1.18	1.18
W25	0.35	0.32	0.30
W26	1.16	1.16	1.15
Y1	1.65	1.65	1.64
Y2	0.76	0.74	0.84
Y3	0.00	0.00	0.00
Y4	0.77	0.75	0.86
Y23	1.18	1.18	1.18
Y24	1.18	1.18	1.18
Y25	0.35	0.32	0.30
Y26	1.16	1.16	1.15
AA1	0.77	0.77	0.88
AA2	0.77	0.76	0.84
AA3	0.77	0.77	0.84
AA4	0.76	0.74	0.85
AA23	3.12	3.13	3.11
AA24	1.18	1.18	1.10

MODE / PIN NO.	EE	PB	REC
AA25	1.18	1.18	1.18
AA26	1.18	1.18	1.18
AB1	0.77	0.77	0.87
AB2	0.76	0.75	0.84
AB3	0.77	0.75	0.87
AB4	0.77	0.76	0.84
AB23	0.00	0.00	0.00
AB24	0.00	0.00	0.00
AB25	3.21	3.23	3.21
AB26	1.18	1.18	1.12
AC1	0.78	0.78	0.89
AC2	0.77	0.76	0.89
AC3	0.77	0.77	0.84
AC4	0.76	0.76	0.84
AC5	0.00	0.00	0.00
AC6	1.95	1.92	1.93
AC7	1.94	1.90	1.91
AC8	1.91	1.88	1.90
AC9	1.94	1.91	1.92
AC10	0.00	0.00	0.00
AC11	1.08	1.05	1.05
AC12	1.08	1.05	1.05
AC13	1.08	1.05	1.05
AC14	3.22	3.24	3.22
AC15	3.22	3.24	3.22
AC16	3.22	3.24	3.22
AC17	0.00	0.00	0.00
AC18	3.22	3.24	3.21
AC19	0.00	0.00	0.00
AC20	0.00	0.00	0.00
AC21	3.82	3.82	3.81
AC22	2.87	2.86	2.86
AC23	0.00	0.00	0.00
AC24	0.00	0.00	0.00
AC25	3.21	3.23	3.21
AC26	3.23	3.24	3.22
AD1	0.76	0.74	0.87
AD2	3.23	3.24	3.22
AD3	3.23	3.05	3.22
AD4	0.00	0.00	0.00
AD5	0.00	0.00	0.00
AD6	1.95	1.92	1.93
AD7	0.00	0.00	0.00
AD8	1.93	1.90	1.91
AD9	1.93	1.90	1.91
AD10	3.22	3.23	3.21
AD11	3.22	3.24	3.21
AD12	0.00	0.00	0.00
AD13	0.07	0.07	0.07
AD14	0.00	0.00	0.00
AD15	0.00	0.00	0.00
AD16	0.03	0.03	0.03
AD17	3.23	3.24	3.22
AD18	3.22	3.24	3.21
AD19	0.00	0.00	0.00

MODE / PIN NO.	EE	PB	REC
AD20	0.00	0.00	0.00
AD21	0.00	0.00	0.00
AD22	3.23	3.24	3.22
AD23	0.00	0.00	0.00
AD24	0.00	0.00	0.00
AD25	0.00	0.00	0.00
AD26	0.00	0.00	0.00
AE1	3.23	3.24	3.22
AE2	3.23	3.24	3.22
AE3	3.23	3.24	3.22
AE4	0.00	0.00	0.00
AE5	1.94	1.91	1.92
AE6	1.92	1.87	1.89
AE7	1.92	1.89	1.91
AE8	1.95	1.92	1.93
AE9	0.00	0.00	0.00
AE10	3.21	3.22	3.21
AE11	4.50	4.50	4.50
AE12	3.23	3.24	3.22
AE13	0.00	0.00	0.00
AE14	0.00	0.00	0.00
AE15	0.00	0.00	0.00
AE16	0.00	0.00	0.00
AE17	3.23	3.24	3.22
AE18	3.22	3.24	3.21
AE19	0.00	0.00	0.00
AE20	0.00	0.00	0.00
AE21	3.23	3.24	3.22
AE22	3.20	3.23	3.21
AE23	0.00	0.00	0.00
AE24	2.87	2.86	2.86
AE25	0.00	0.00	0.00
AE26	0.00	0.00	0.00
AF1	3.22	3.23	3.21
AF2	0.00	0.00	0.00
AF3	0.00	0.00	0.00
AF4	4.60	4.60	4.61
AF5	1.96	1.92	1.94
AF6	1.93	1.89	1.91
AF7	1.95	1.92	1.93
AF8	1.93	1.90	1.91
AF9	0.00	0.00	0.00
AF10	3.23	3.23	3.21
AF11	3.23	3.23	3.21
AF12	0.00	0.00	0.00
AF13	0.00	0.00	0.00
AF14	0.00	0.00	0.00
AF15	1.64	1.66	1.66
AF16	3.21	3.23	3.23
AF17	3.22	3.24	3.21
AF18	0.00	0.00	0.00
AF19	0.00	0.00	0.00
AF20	3.21	3.23	3.21
AF21	3.23	3.24	3.22
AF22	3.23	3.24	3.22

MODE / PIN NO.	EE	PB	REC
AF23	0.00	0.00	0.00
AF24	0.00	0.00	0.00
AF25	0.00	0.00	0.00
AF26	0.00	0.00	0.00
C151 KIA78R25			
1	3.25	3.24	3.23
2	2.52	2.52	2.52
3	0.00	0.00	0.00
4	4.88	4.88	4.88
IC152 KIA78R33			
1	3.64	3.63	3.62
2	3.28	3.28	3.28
3	0.00	0.00	0.00
4	4.43	4.42	4.41
IC153 KIA78R05			
1	5.28	5.28	5.28
2	4.97	4.97	4.97
3	0.00	0.00	0.00
4	4.88	4.88	4.88
IC154 IP1680			
1	3.25	3.25	3.25
2	3.25	3.25	3.25
3	2.55	2.56	2.55
4	1.12	1.12	1.12
5	1.71	1.72	1.71
6	0.00	0.00	0.00
7	1.25	1.25	1.25
8	3.25	3.25	3.25
IC701 MN101DF10GAF			
1	0.00	0.00	0.00
2	5.12	5.12	5.12
3	0.00	0.00	0.00
4	4.80	4.80	4.80
5	4.86	4.86	4.87
6	0.01	0.01	0.01
7	5.13	5.13	5.13
8	5.15	5.15	5.16
9	0.01	0.01	0.01
10	0.00	0.00	0.00
11	5.16	5.16	5.16
12	0.00	0.00	0.00
13	5.15	5.15	5.16
14	4.82	4.83	4.89
15	0.04	0.04	0.04
16	0.12	0.11	0.08
17	5.05	5.05	5.05
18	5.06	5.06	5.06
19	5.10	5.10	5.11
20	4.91	4.90	4.90
21	0.00	0.00	0.00
22	0.01	0.01	0.01
23	0.01	0.01	0.01
24	0.33	0.31	0.14
25	5.16	5.16	5.16
26	0.05	0.05	0.05

MODE / PIN NO.	EE	PB	REC
27	0.00	0.00	0.22
28	5.16	5.16	5.16
29	0.01	0.01	0.01
30	0.01	0.01	0.01
31	0.01	0.01	0.01
32	0.01	0.01	0.01
33	0.31	0.32	0.15
34	0.33	0.32	0.16
35	0.01	0.01	0.01
36	5.16	5.16	5.16
37	2.53	2.52	2.54
38	2.43	2.42	2.42
39	0.00	0.00	0.00
40	1.99	1.95	1.95
41	2.55	2.55	2.55
42	0.00	0.00	0.00
43	4.88	4.89	4.89
44	4.89	4.90	4.90
45	0.01	0.01	0.01
46	0.64	0.63	0.63
47	0.01	0.01	0.01
48	0.00	0.00	0.00
49	1.04	1.04	1.04
50	2.78	2.90	2.89
51	5.13	5.13	5.13
52	3.01	3.04	3.05
53	2.54	2.54	2.54
54	5.10	5.10	5.10
55	5.10	5.10	5.10
56	0.01	0.01	0.01
57	5.09	5.09	5.09
58	5.00	5.00	5.01
59	5.25	5.02	5.00
60	0.00	0.00	0.00
61	4.94	4.94	4.93
62	0.00	0.00	0.00
63	0.82	0.81	0.81
64	4.83	4.82	4.82
65	0.00	0.00	0.00
66	0.00	0.00	0.00
67	0.00	0.00	0.00
68	0.00	0.00	0.00
69	0.00	0.00	0.00
70	0.00	0.00	0.00
71	0.00	0.00	0.00
72	0.00	0.00	0.00
73	5.25	5.25	5.25
74	0.00	0.00	0.00
75	0.00	0.00	0.00
76	0.01	0.01	0.00
77	0.01	0.01	0.01
78	0.01	0.01	0.01
79	0.01	0.01	0.01
80	0.01	0.01	0.01
81	0.01	0.01	0.01

MODE / PIN NO.	EE	PB	REC
82	0.24	0.19	0.14
83	0.24	0.19	0.15
84	1.94	1.92	1.93
85	0.00	0.00	0.00
86	0.00	0.00	0.00
87	0.00	0.00	0.00
88	5.25	5.25	5.25
89	5.25	5.25	5.25
90	0.01	0.01	0.01
91	0.01	0.01	0.01
92	0.02	0.02	0.02
93	0.01	0.01	0.01
94	0.01	0.01	0.01
95	0.01	0.01	0.01
96	5.16	5.16	5.16
97	0.01	0.01	0.01
98	0.01	0.01	0.01
99	0.01	0.01	0.01
100	5.16	5.16	5.16
IC703 MM1510			
1	2.24	2.24	2.24
2	2.37	2.37	2.38
3	5.13	5.13	5.13
4	1.87	1.87	1.87
5	0.00	0.00	0.00
6	5.13	5.13	5.13
IC704 KIA7042			
1	5.21	5.21	5.21
2	0.00	0.00	0.00
3	4.80	4.80	4.80
IC706 KIA7031			
1	5.17	5.17	5.17
2	0.00	0.00	0.00
3	5.17	5.16	5.16
IC705 24LC16B			
1	0.00	0.00	0.00
2	0.00	0.00	0.00
3	0.00	0.00	0.00
4	0.00	0.00	0.00
5	5.05	5.05	5.06
6	5.06	5.06	5.06
7	0.00	0.00	0.00
8	5.25	5.25	5.25
IC707 SDA5650			
1	0.00	0.00	0.00
2	0.00	0.00	0.00
3	0.00	0.00	0.00
4	5.06	5.06	5.06
5	5.05	5.05	5.06
6	0.00	0.00	0.00
7	0.42	0.42	0.42
8	0.00	0.00	0.00
9	5.25	5.01	5.00
10	2.80	2.79	2.81
11	0.00	0.00	0.00

MODE / PIN NO.	EE	PB	REC
12	2.47	2.48	2.48
13	0.00	0.00	0.00
14	2.49	2.48	2.49
15	2.47	2.48	2.49
16	1.57	1.56	1.57
17	1.48	1.54	1.54
18	0.00	0.00	0.00
19	5.25	5.25	5.25
20	5.25	5.25	5.25
IC801 NJM4580			
1	6.06	6.06	6.07
2	6.06	6.06	6.07
3	6.05	6.05	6.05
4	0.00	0.00	0.00
5	6.05	6.05	6.05
6	6.06	6.06	6.06
7	6.06	6.06	6.06
8	12.12	12.12	12.12
IC802 BH7868FS			
1	5.19	5.19	5.19
2	0.05	0.06	0.06
3	0.05	0.06	0.06
4	2.28	2.27	2.27
5	5.00	5.00	5.00
6	1.78	1.60	1.60
7	5.14	5.14	5.15
8	1.78	1.58	1.54
9	2.27	2.27	2.27
10	0.00	0.00	0.00
11	1.77	1.57	1.56
12	0.00	0.00	0.00
13	2.25	2.25	2.25
14	5.00	5.00	5.00
15	2.24	2.27	2.27
16	5.19	5.19	5.20
17	2.31	2.35	2.34
18	2.32	2.37	2.35
19	0.00	0.00	0.00
20	2.32	2.30	2.32
21	2.33	2.32	2.32
22	0.00	0.00	0.00
23	1.90	1.51	1.46
24	2.29	1.79	1.71
25	0.00	0.00	0.00
26	1.91	1.52	1.45
27	2.31	1.81	1.75
28	0.00	0.00	0.00
29	1.98	1.57	1.49
30	2.39	1.85	1.79
31	0.06	0.06	0.06
32	2.39	2.37	2.37
IC803 MM1443			
1	2.74	2.74	2.74
2	12.15	12.15	12.15
3	2.74	2.74	2.74

MODE / PIN NO.	EE	PB	REC
4	12.15	12.15	12.15
5	3.06	3.22	3.18
6	5.75	5.75	5.75
7	5.76	5.76	5.76
8	5.70	5.70	5.70
9	0.01	0.01	0.01
10	5.70	5.70	5.70
11	11.55	11.55	11.55
12	5.75	5.75	5.75
13	0.01	0.01	0.01
14	5.70	5.70	5.70
15	0.01	0.01	0.01
16	5.70	5.70	5.70
17	0.00	0.00	0.00
18	0.00	0.00	0.00
19	0.00	0.00	0.00
20	5.70	5.70	5.70
21	5.81	5.81	5.81
22	5.81	5.80	5.80
23	5.74	5.74	5.73
24	5.70	5.70	5.70
25	5.80	5.80	5.80
26	5.80	5.80	5.80
27	5.73	5.73	5.73
28	3.31	3.26	3.33
29	2.47	2.62	2.35
30	2.47	2.62	2.35
31	1.88	1.88	1.80
32	5.05	5.05	5.05
33	5.07	5.07	5.07
34	0.00	0.00	0.00
IC808 CS4351			
1	1.61	1.61	1.62
2	1.62	1.62	1.61
3	1.62	1.62	1.62
4	1.63	1.63	1.63
5	3.17	3.17	3.17
6	0.00	0.00	0.00
7	3.08	3.08	3.08
8	3.03	3.03	3.03
9	3.23	3.23	3.23
10	3.21	3.20	3.20
11	3.22	3.22	3.22
12	1.25	1.25	1.25
13	4.12	4.12	4.12
14	12.12	12.12	12.12
15	4.11	4.11	4.11
16	0.00	0.00	0.00
17	12.13	12.13	12.13
18	4.12	4.12	4.12
19	12.12	12.12	12.12
20	3.23	3.22	3.22
IC901 SAA7317			
1	0.00	0.00	0.00
2	0.00	0.00	0.00

MODE / PIN NO.	EE	PB	REC
3	1.88	1.87	1.87
4	2.94	2.96	2.95
5	2.94	2.96	2.94
6	2.94	2.96	2.94
7	2.94	2.96	2.94
8	2.94	2.96	2.94
9	2.94	2.95	2.94
10	1.13	1.13	1.16
11	0.00	0.00	0.00
12	2.95	2.97	2.95
13	0.00	0.00	0.00
14	2.94	2.96	2.93
15	0.17	0.89	0.37
16	0.17	0.75	0.37
17	0.57	1.90	0.59
18	0.57	0.40	0.63
19	0.58	0.78	0.71
20	0.00	0.99	2.36
21	2.94	2.96	2.94
22	0.00	0.00	0.00
23	0.00	0.00	0.00
24	2.94	2.96	2.93
25	0.58	0.60	0.57
26	0.58	0.57	0.57
27	0.57	0.47	0.47
28	1.00	1.00	1.00
29	2.94	2.96	2.93
30	0.00	0.00	0.00
31	1.88	1.87	1.87
32	0.00	0.01	0.01
33	0.00	0.01	0.01
34	2.94	2.96	2.93
35	0.00	0.00	0.00
36	0.00	0.00	0.00
37	0.00	0.00	0.00
38	2.94	2.96	2.93
39	0.57	0.58	0.58
40	0.56	0.58	0.63
41	0.97	0.98	1.00
42	0.99	1.00	1.00
43	2.94	2.96	2.93
44	0.00	0.00	0.00
45	0.00	0.00	0.00
46	2.94	2.96	2.93
47	0.05	0.08	0.10
48	0.01	0.01	0.01
49	0.58	0.59	0.59
50	0.58	0.59	0.63
51	1.00	0.99	1.00
52	3.13	2.96	2.93
53	0.00	0.00	0.00
54	0.04	0.04	0.04
55	0.19	1.49	1.83
56	2.95	2.94	2.91
57	0.19	2.16	2.97

MODE / PIN NO.	EE	PB	REC
58	2.95	2.96	2.91
59	2.98	2.98	2.94
60	2.98	2.98	3.14
61	0.22	0.99	1.65
62	0.22	1.28	1.70
63	2.98	3.15	3.14
64	2.98	3.15	3.14
65	0.00	0.00	0.00
66	0.93	0.93	0.93
67	0.94	0.91	0.95
68	1.89	1.89	1.89
69	1.67	1.64	1.64
70	3.12	3.13	3.12
71	3.12	3.12	3.12
72	1.88	1.88	1.89
73	0.02	0.02	0.02
74	1.35	1.29	1.56
75	3.14	3.15	3.14
76	0.31	0.46	1.38
77	0.31	0.22	0.42
78	3.14	3.15	3.13
79	0.31	0.33	0.44
80	0.32	0.52	0.41
81	0.02	0.02	0.02
82	1.88	1.88	1.89
83	0.02	0.02	0.02
84	0.31	0.58	1.30
85	0.31	0.40	1.30
86	1.44	1.32	0.03
87	1.31	1.33	0.03
88	1.43	1.35	0.03
89	2.97	2.97	3.13
90	1.89	1.89	1.89
91	0.02	0.02	0.02
92	0.02	0.02	0.02
93	0.04	1.46	0.04
94	0.04	1.48	0.04
95	0.03	1.09	0.04
96	0.03	1.13	0.04
97	0.04	0.02	0.04
98	3.14	2.96	3.13
99	0.37	1.44	0.43
100	0.35	1.32	0.41
101	0.29	1.34	1.45
102	0.28	1.47	1.43
103	0.28	1.50	1.45
104	3.18	2.96	3.13
105	0.01	1.10	1.41
106	0.01	1.13	1.41
107	0.01	1.52	1.48
108	0.04	1.51	0.04
109	0.03	2.47	0.04
110	3.18	2.96	3.13
111	0.02	0.02	0.02
112	0.04	0.26	0.26

MODE / PIN NO.	EE	PB	REC
113	0.07	0.07	0.07
114	0.26	1.56	1.58
115	0.27	2.49	2.46
116	0.27	1.47	1.45
117	3.19	2.96	2.93
118	0.21	0.33	1.37
119	0.22	0.32	1.35
120	0.27	0.33	1.37
121	0.22	0.34	1.38
122	0.27	0.37	1.37
123	1.88	1.85	1.85
124	0.02	0.02	0.02
125	2.98	2.96	2.93
126	0.43	0.45	1.35
127	0.42	0.44	1.36
128	0.43	0.44	1.38
129	0.43	0.43	1.36
130	0.43	0.44	1.36
131	2.96	2.96	2.93
132	0.51	0.44	1.33
133	0.52	0.35	1.31
134	0.52	0.50	1.33
135	0.41	0.53	1.42
136	1.44	1.44	1.43
137	2.96	2.96	2.93
138	0.02	0.02	0.02
139	1.31	1.31	1.30
140	1.33	1.32	1.36
141	1.48	1.48	1.49
142	1.49	1.52	1.43
143	1.10	1.11	1.10
144	1.85	1.85	1.88
145	0.02	0.02	0.02
146	2.96	2.96	3.20
147	1.13	1.12	0.37
148	1.51	1.53	0.37
149	0.22	0.20	0.23
150	0.49	0.50	0.37
151	0.49	0.45	0.37
152	3.13	2.96	3.20
153	0.52	0.54	0.37
154	0.53	0.38	0.37
155	0.53	0.41	0.35
156	0.53	0.40	1.44
157	0.59	0.52	1.42
158	3.13	2.97	2.93
159	0.51	0.52	1.53
160	0.51	0.52	1.43
161	0.55	0.52	1.40
162	0.59	0.52	1.45
163	0.62	0.52	1.34
164	3.13	2.97	2.93
165	0.02	0.02	0.02
166	0.60	0.54	1.34
167	0.02	0.02	0.02

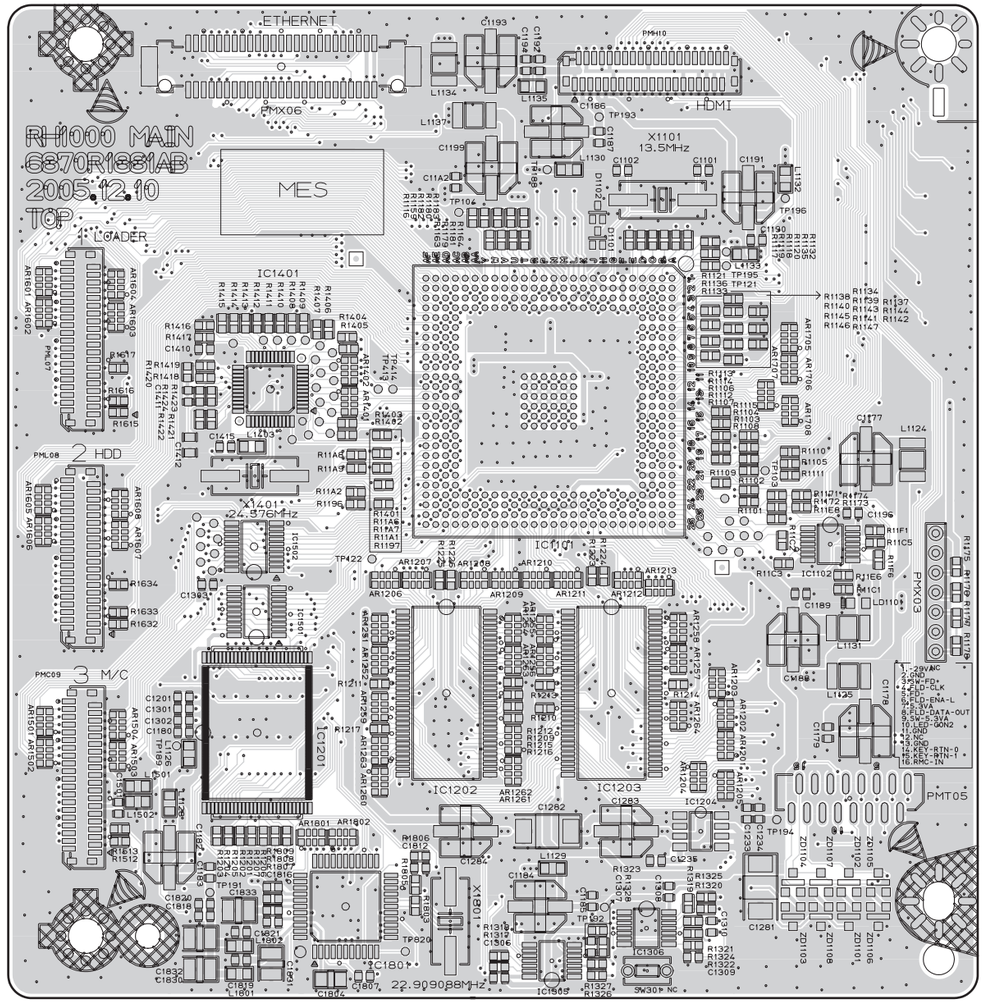
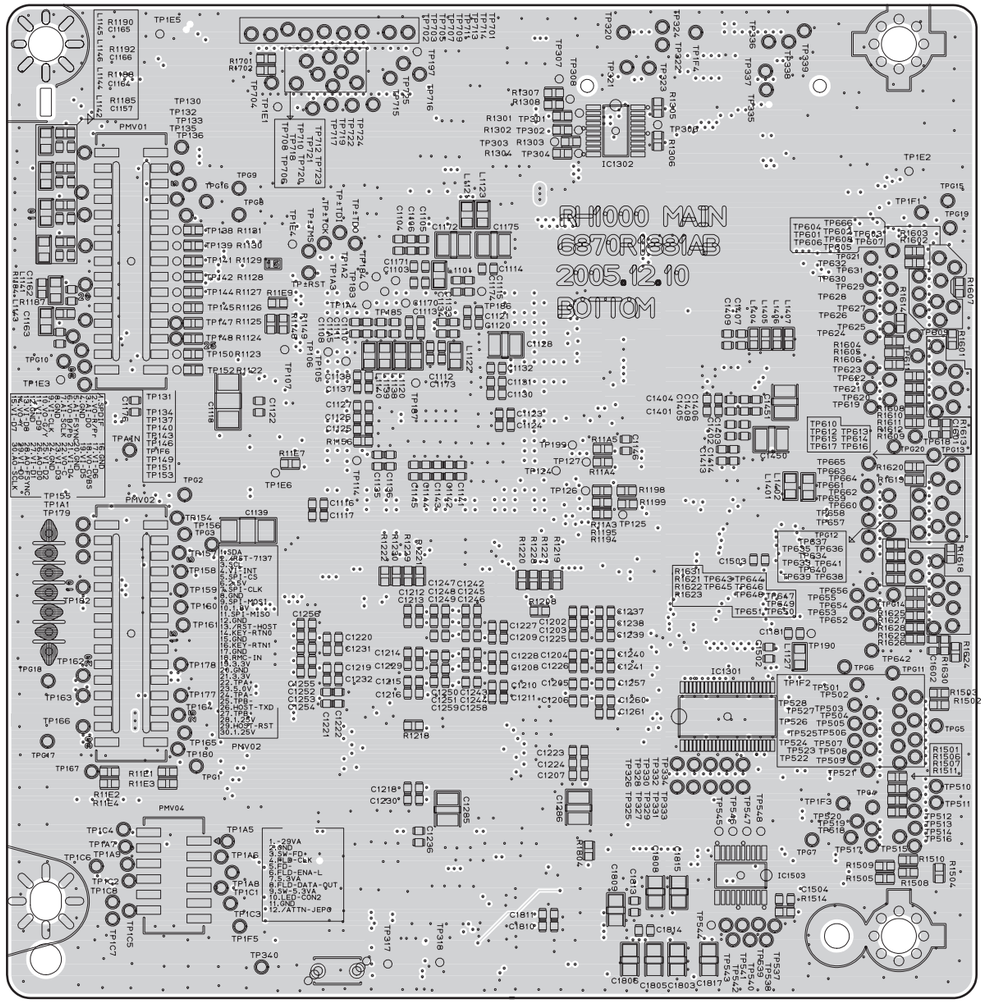
MODE / PIN NO.	EE	PB	REC
168	1.88	1.87	1.05
169	0.02	0.02	0.02
170	1.85	1.85	1.87
171	1.50	1.56	1.88
172	1.35	1.37	1.68
173	1.27	1.32	1.10
174	1.49	1.49	1.49
175	1.51	1.51	1.49
176	2.98	2.99	2.95
177	2.95	2.95	2.92
178	2.96	2.97	2.93
179	1.50	1.50	1.48
180	1.50	1.51	1.49
181	1.52	1.50	1.48
182	0.02	0.02	0.02
183	0.01	0.01	0.01
184	1.45	1.46	1.46
185	1.45	1.46	1.45
186	2.96	2.97	2.93
187	1.46	1.46	1.45
188	1.46	1.46	1.46
189	0.02	0.02	0.02
190	1.85	1.82	1.85
191	0.00	0.00	0.00
192	0.00	0.00	0.00
193	1.45	1.47	1.44
194	2.96	2.97	2.93
195	0.00	0.00	0.00
196	2.96	2.97	2.93
197	0.00	0.00	0.00
198	1.44	1.44	1.43
199	1.44	1.45	1.43
200	1.44	1.44	1.42
201	1.44	1.45	1.43
202	1.48	1.48	1.46
203	1.44	1.44	1.43
204	1.44	1.44	1.43
205	0.56	1.46	1.16
206	0.57	1.45	1.25
207	0.57	1.46	1.24
208	0.57	1.64	1.12
IC903 NJM2521			
1	7.10	7.09	7.08
2	0.01	0.01	0.01
3	7.22	7.20	7.18
4	0.01	0.01	0.01
5	7.22	7.21	7.19
6	10.70	10.69	10.69
7	7.46	7.45	7.43
8	0.00	0.00	0.00
IC904 NJM2521			
1	7.10	7.09	7.07
2	0.01	0.01	0.01
3	7.22	7.21	7.19
4	0.01	0.01	0.01

MODE / PIN NO.	EE	PB	REC
5	7.22	7.21	7.19
6	10.70	10.69	10.67
7	7.46	7.45	7.43
8	0.00	0.00	0.00
Q151 STB1132 : 5.2V			
E	5.27	5.27	5.27
C	5.21	5.21	5.21
B	4.52	4.52	4.52
Q155 KTA1271 : 5VT			
E	5.26	5.27	5.27
C	5.18	5.18	5.18
B	4.48	4.49	4.48
Q158 KTA1268 : SW_5.3VA			
E	5.26	5.26	5.26
C	5.20	5.20	5.20
B	4.56	4.56	4.55
Q161 KTA1268 : 33VT			
E	33.90	33.90	34.00
C	33.80	33.80	33.90
B	33.40	33.30	33.30
Q164 KTC3202 : 12V			
E	12.12	12.12	12.12
C	12.99	12.99	12.99
B	12.74	12.74	12.74
Q163 KTC3203 : SW_FD(+)			
E	-19.30	-19.30	-19.30
C	-19.20	-19.20	-19.20
B	-18.60	-18.60	-18.60
Q165 KTC3203 : SW_12VG			
E	12.16	16.16	12.15
C	12.99	12.98	12.99
B	112.79	12.79	12.80

PRINTED CIRCUIT DIAGRAMS

1. MAIN P.C.BOARD

(TOP VIEW)



(BOTTOM VIEW)