Internal Use Only

website:http://biz.LGservice.com

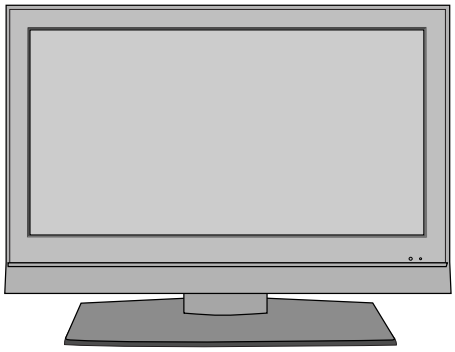
LG

LCD TV
SERVICE MANUAL

CHASSIS : LJ81A

MODEL : 42LB7DF 42LB7DF-SB

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



CONTENTS

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Replacement Parts List.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

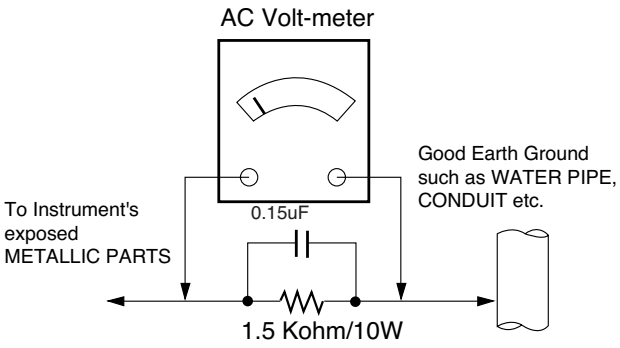
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1MΩ and 5.2MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)
Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the SAFETY PRECAUTIONS on page 3 of this publication.
NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.
   Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

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 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 to prevent 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 type 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 electrical charges 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. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500ºF to 600ºF.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature. (500ºF to 600ºF)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
   CAUTION: Work quickly to avoid overheating the circuitboard printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500ºF to 600ºF)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This specification is applied to LJ81A chassis.

Chassis	Model Name	Market	Brand	Remark
LJ81A	42LB7DF-SB	Central and South AMEROCA	LG	

2. Requirement for Test

Testing for standard of each part must be followed in below condition.

(1) Temperature : 20 ± 5°C, CST : 40± 5°C
(2) Humidity : 65% ± 10%
(3) Power : Standard input voltage (100-240V~, 50/60Hz)
*Standard Voltage of each products is marked by models.
(4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with SBOM.
(5) The receiver must be operated for about 20 minutes prior to the adjustment.

3. Test method

3.1 Performance : LGE TV test method followed
3.2 Demanded other specification
Safety : UL, CSA, IEC Specification
EMC : FCC, ICES, IEC

Model Name	Market	Appliance
42LB7DF-SB	Central and South AMEROCA	Safety : IEC/EN60065 EMC : CISPR13

4. General Specification(TV)

No	Model	Specification	Option	Remark
1	Receiving System	1) SBTVD / NTSC / PAL-M / PAL-N		
2	Available Channel	1) VHF : 02~13 2) UHF : 14~69 3) DTV : 02-69 4) CATV : 01~135		
3	Input Voltage	1) AC 100 ~ 240V 50/60Hz		
	Market	Central and South AMERICA		
4	Screen Size	42 inch Wide (1366 x 768)	HD	
		42 inch Wide (1920 x 1080)	FULL HD	
5	Aspect Ratio	16:9		
6	Tuning System	FS		
7	Module	LC420WU6-SLA1	FULL HD	42LB7DF-SB
8	Operating Environment	1) Temp : 0 ~ 40 deg 2) Humidity : ~ 80 %		
9	Storage Environment	1) Temp : -20 ~ 60 deg 2) Humidity : ~ 85 %		

5. Chroma & Brightness

No	Item			Min	Typ	Max	Unit	Remark
1	White brightness (Center 1-point/Full white Pattern)			400	500		cd/m^2	42LB7DF-SB
2	Brightness uniformity			80			%	Full white
3	Color coordinate	RED	X	Typ-0.03	0.638	Typ+0.03	Typ.	
			Y		0.340		+0.03	
		GREEN	X		0.279			
			Y		0.611			
		BLUE	X		0.146			
			Y		0.062			
		WHITE	X		0.272			
			Y		0.278			
4	Color coordinate uniformity							N/A
5	Contrast ratio			700:1	1000:1			NORMAL
				7000:1	10000:1			DCR
	Color Temperature	Cool Standard Warm		Typ. -1000	11000 9300 6500	Typ. +1000		<Test Condition> HDMI Input, 85% Full white pattern
	Color Distortion, DG					10.0	%	
	Color Distortion, DP			43.0		10.0	deg	
	Color S/N, AM/FM			-80			dB	
	Color Killer Sensitivity						dBm	

6. Component Video Input (Y, CB/PB, CR/PR)

No	Resolution	H-freq(kHz)	V-freq(kHz)	Pixel clock	Proposed
1	720*480	15.73	60	13.5135	SDTV ,DVD 480I
2	720*480	15.73	59.94	13.5	SDTV ,DVD 480I
3	720*480	31.47	60	27.027	SDTV 480P
4	720*480	31.47	59.94	27.0	SDTV 480P
5	1280*720	45.00	60.00	74.25	HDTV 720P
6	1280*720	44.96	59.94	74.176	HDTV 720P
7	1920*1080	33.75	60.00	74.25	HDTV 1080I
8	1920*1080	33.72	59.94	74.176	HDTV 1080I
9	1920*1080	67.500	60	148.50	HDTV 1080P
10	1920*1080	67.432	59.939	148.352	HDTV 1080P
11	1920*1080	27.000	24.000	74.25	HDTV 1080P
12	1920*1080	26.97	23.94	74.176	HDTV 1080P
13	1920*1080	33.75	30.000	74.25	HDTV 1080P
14	1920*1080	33.71	29.97	74.176	HDTV 1080P
15	1920*1080	56.25	50.000	148.5	HDTV 1080P
16	1920*1080	28.125	25.000	74.25	HDTV 1080P

7. RGB Input (PC)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
	PC					DDC
1	640*350	31.468	70.09	25.17	EGA	X
2	720*400	31.469	70.08	28.32	DOS	O
3	640*480	31.469	59.94	25.17	VESA(VGA)	O
4	640*480	37.861	72.80	31.50	VESA(VGA)	O
5	640*480	37.500	75.00	31.50	VESA(VGA)	O
6	800*600	35.156	56.25	36.00	VESA(SVGA)	O
7	800*600	37.879	60.31	40.00	VESA(SVGA)	O
8	800*600	48.077	72.18	50.00	VESA(SVGA)	O
9	800*600	46.875	75.00	49.50	VESA(SVGA)	O
10	1024*768	48.363	60.00	65.00	VESA(XGA)	O
11	1024*768	56.476	70.06	75.00	VESA(XGA)	O
12	1024*768	60.023	75.02	78.75	VESA(XGA)	O
13	1280*768	47.776	59.870	79.5	CVT(WXGA)	O
14	1280*768	60.289	74.893	102.25	CVT(WXGA)	O
15	1360*768	47.712	60.015	85.50	VESA (WXGA)	O
16	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
17	1280*1024	79.976	75.025	135	VESA (SXGA)	O
18	1600*1200	75.00	60.00	162	VESA (UXGA)	O
19	1920*1080	67.5	60	148.5	HDTV 1080P	O

8. HDMI Input (PC/DTV)

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
	PC					DDC
1	640*350	31.468	70.09	25.17	EGA	X
2	720*400	31.469	70.08	28.32	DOS	O
3	640*480	31.469	59.94	25.17	VESA(VGA)	O
4	640*480	37.861	72.80	31.50	VESA(VGA)	O
5	640*480	37.500	75.00	31.50	VESA(VGA)	O
6	800*600	35.156	56.25	36.00	VESA(SVGA)	O
7	800*600	37.879	60.31	40.00	VESA(SVGA)	O
8	800*600	48.077	72.18	50.00	VESA(SVGA)	O
9	800*600	46.875	75.00	49.50	VESA(SVGA)	O
10	1024*768	48.363	60.00	65.00	VESA(XGA)	O
11	1024*768	56.476	70.06	75.00	VESA(XGA)	O
12	1024*768	60.023	75.02	78.75	VESA(XGA)	O
13	1280*768	47.776	59.870	79.5	CVT(WXGA)	O
14	1360*768	47.712	60.015	85.50	VESA (WXGA)	O
15	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
16	1280*1024	79.976	75.025	135	VESA (SXGA)	O
17	1600*1200	75.00	60.00	162	VESA (UXGA)	O
18	1920*1080	67.5	60	148.5	HDTV 1080P	O
	DTV					
1	720*480	31.47	60	27.027	SDTV 480P	
2	720*480	31.47	59.94	27.00	SDTV 480P	
3	1280*720	45.00	60.00	74.25	HDTV 720P	
4	1280*720	44.96	59.94	74.176	HDTV 720P	
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6	1920*1080	33.72	59.94	74.176	HDTV 1080I	
7	1920*1080	67.500	60	148.50	HDTV 1080P	
8	1920*1080	67.432	59.939	148.352	HDTV 1080P	
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11	1920*1080	33.75	30.000	74.25	HDTV 1080P	
12	1920*1080	33.71	29.97	74.176	HDTV 1080P	
13	1920*1080	56.25	50.000	148.5	HDTV 1080P	
14	1920*1080	28.125	25.000	74.25	HDTV 1080P	

9. General specifications (module)

No	Item	Value	Unit	Remark
1	Active Screen Size	1067.31 (diagonal)	mm	42.02 inches
2	Outline Dimension	983(H)x576(V)x47.3(D)	mm	
3	Pixel Pitch	0.4845 x 0.4845	um	
4	Pixel Format	1920(H)x1080(V) RGB stripe arrangement		
5	Color Depth	8bit 16.7	Mbit	
6	Luminance ,White	500 (center 1 point typ)	cd/m^2	
7	Viewing Angle (CR>10)	R/L 178(Typ),U/D 178(Typ)	degree	
8	Power Consumption	168.36	Watt	
9	Weight	11(Typ), 12(Max)	kg	
10	Display Operating Mode	Transmissive mode ,normally black		
11	Surface Treatment	Hard coating (3H)		

10. Electro Optical Characteristic Specifications (module standard)

No	Item			Min	Typ	Max	Unit	Remark
1	Contrast Ratio	CR		800	1000			
		CR with DCR						
2	Surface Luminance, White			400	500		Cd/m^2	Full white
3	Luminance Variation					1.3		(•‰ white/5P)
4	Response Time	Gray to Gray			5	8	msec	
		Rise+decay			10	14		
5	Color coordinate	RED	X	Typ	TBD	Typ		Full Pattern
			Y	-0.03	TBD	+0.03		
		GREEN	X		TBD			
			Y		TBD			
		BLUE	X		TBD			
			Y		TBD			
		WHITE	X		TBD			
			Y		TBD			
6	Viewing Angle (CR>10)	X axis right(ø=0)		89			degree	
		X axis left(ø=180)		89				
		Yaxis up (ø=90)		89				
		Z axis down(ø=270)		89				
7	Gray Scale	Without DCR			2.2			
		With DCR						

12. Customer Menu Setup (Shipment Condition)

No	Item		Condition	Remark
1	Input Mode		TV02CH	
2	Volume Level		20	
3	Mute		Off	
4	Aspect Ratio		16:9	
5	Video	EZ Picture	Daylight	
		Color temperature	(Disable)	Can be access only EZ picture is setting user mode
		XD	Auto	
		Advanced	Cinema: Off	
		Reset		
6	Audio	Audio Language	Off	
		EZ SoundRite	Off	
		EZ Sound	Normal	
		Balance	0	
		Treble	50	
		Bass	50	
		Front Surround	Off	
		TV Speaker	On	
7	Timer	Auto clock	Off	
		Manual Clock	Off	
		Off Timer	Off	
		On Timer	Off	
		Auto Off	Off	
8	Option	Aspect Ratio	16:9	
		Caption/Text	Off	
		Caption Option	Off	
		Language	English	
		ISM Method	Normal	
		SET ID	1	
9	Lock	Lock System	Off	
		Set password	On	(Default : 0000)
		Block channel	None	
		Movie Rating	Off	
		TV Rating-Children	Off	
		TV Rating-General	Off	
		Audio Block	Off	
10	Channel Memory		none	

ADJUSTMENT INSTRUCTION

1. Application Range

This spec sheet is applied all of the 'LJ81A' Chassis.

2. Specification

(1) Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test instrument.
(2) Adjustment must be done in the correct order.
(3) The adjustment must be performed in the circumstance of 25±5°C of temperature and 65±10% of relative humidity if there is no specific designation.
(4) The input voltage of the receiver must keep 100-220V~, 50/60Hz.
(5) The receiver must be operated for about 5 minutes prior to the adjustment.
- ● After RGB 100% Full White pattern(06CH) then process Heat-run(or “8.Test patter” condition of EZ-Adjust status).
- ● Enter into HEAT-RUN MODE
  1) Press the POWER ON KEY on R/C for adjustment.
  2) Press ADJ button of Service remocon. Select “10.Test pattern” and, after select “White” using navigation button, and then you can see 100% Full White pattern.
  3) In this status you can maintain Heat-Run useless any pattern generator.

*** Notice!**

If you maintain one picture over 20minute(Especially sharp distinction black with white pattern-13Ch, or Cross hatch pattern-09Ch) then it can appear image stick near black level.

3. Adjustment items

3-1. PCB Assembly adjustment

- ● CPLD DOWNLOAD
- ● Adjust 480i Comp1
- ● Adjust 1080p Comp1 / RGB
  - If it necessary, it can adjustment at Manufacture Line.
  - You can see set adjustment status at **“9.ADJUST CHECK”** of the **“In-start menu”**.

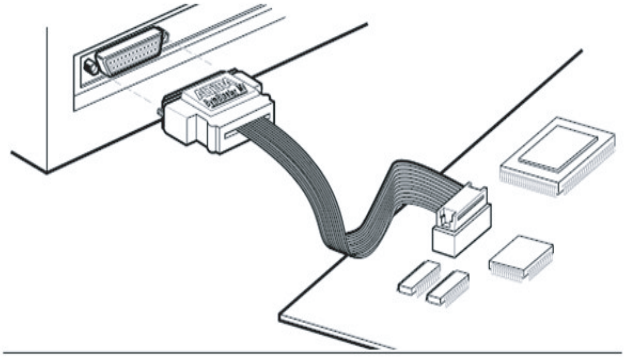
3-2. Set Assembly Adjustment

- ● EDID(The Extended Display Identification Data) / DDC(Display Data Channel) download
- ● Color Temperature(White Balance) Adjustment
- ● Make sure RS-232C control
- ● Selection Factory output option

4.PCB Assembly Adjustment

4-1. CPLD DOWNLOAD

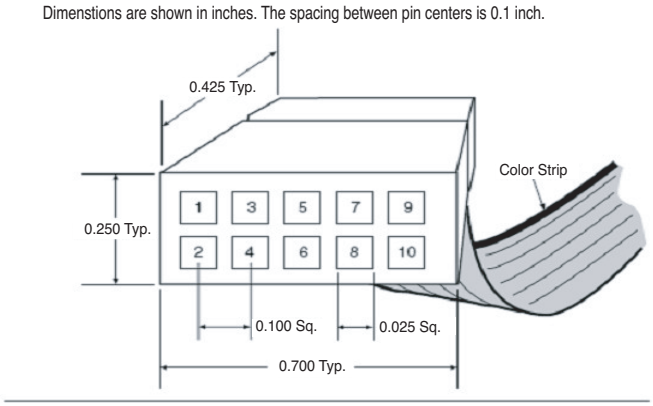
- JTAG MODE



(1) <<PRINT PORT>> PIN MAP

Component	JTAG Mode Signal Name
2	TCK
3	TMS
8	TDI
11	TDO
13	-
15	VCC
18 to 25	GND

(2) <<10P WAFER>> PIN MAP



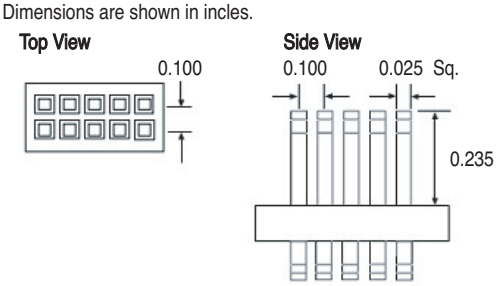
1) Table 2. Identifies the 10-pin female plug's pin names for the corresponding download mode.

Table2. ByteBlasterMV Female Plug;s Pin Names & Download Models

Pin	PS Mode		JTAG Mode	
	Singal Name	Description	Singal Name	Description
1	DCLK	Clock singnal	TCK	Clock singnal
2	GND	Signal ground	GND	Signal ground
3	CONF_DONE	Configuration control	TDO	Data to device
4	VCC	Power supply	VCC	Power supply
5	nCONFIG	Configuration control	TMS	JTAG state machine control
6	-	No connect	-	No connect
7	nSTATUS	Configuration status	-	No connect
8	-	No connect	-	No connect
9	DATA0	Data to device	TDI	Data to device
10	GND	Signal ground	GND	Signal ground

(3) Circuit Board Header Connection

- The ByteBlasterMV 10-pin female plug connects to a 10-pin male header on the circuit board. The 10-pin male header has two rows of five pins, which are connected to the device's programming or configuration pins.
- The ByteBlasterMV cable receives power and downloads data via the male header. Fig.1 shows the dimensions of a typical 10-pin male header.



(Fig.1) 10-Pin Male Header Dimensions

1) Table 3. Through 5 summarize the absolute maximum ratings, recommended operating conditions, and DC operating conditions for the ByteBlasterMV cable.

Table 3. ByteBlasterMV Cable Absolute Maximum Ratings

Symbol	Parameter	Conditions	Min	Max	Unit
Vcc	Supply voltage	With respect ot ground	-0.5	7.0	V
VI	DC input voltage	With respect ot ground	-0.5	7.0	V

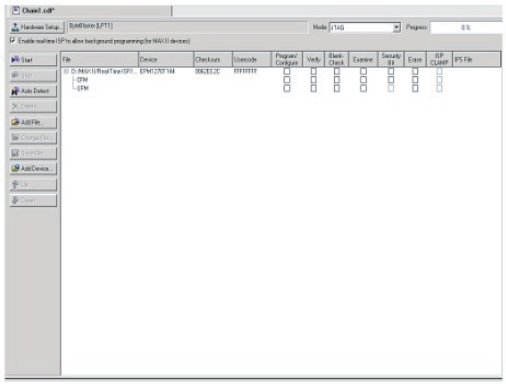
Table 4. ByteBlasterMV Calbe Recommended Operating Conditions

Symbol	Parameter	Conditions	Min	Max	Unit
Vcc	Supply voltage 5.0-V Operation		4.5	5.5	V
	Supply voltage 3.3-V Operation		3.0	3.6	V

(4) Real-Time ISP with the Quartus II Software.

1) The programming file formats generated by the Quartus II software that support these two features are the Programmer Object File(.pof) that is used with the Quartus II programmer, and the Jam File(.jam) and Jam Byte-Code File(.jbc) that are used with either the Quartus II programmer or other programming tools.

2) Ensure that you enable this feature before programming a MAX II device through the Quartus II programmer. You can enable the real-time ISP feature by selecting the Enable real-time ISP to allow background programming(for MAX II devices) option from the Quartus II programmer window. Refer Fig.2.



(Fig.2) Real-Time ISP Option in the Quartus II Programmer Window

3) You can also enable the real-time ISP feature in the Quartus II software through the following steps:
   1. Choose Options(Tool menu).
   2. Choose Programmer under the Category section.

(5) MAX II Device Handbook, Volume1.

- To configure or program one or more devices with the ByteBlasterMV cable and the Quartus II programmer.

1) Compile a project. The Quartus II compiler generates a **.sof** file to configure APEX II, APEX 20K, Mercury, and Excalibur devices. To program an EPC configuration device, a **.pof** or JAM STAPL format file should be used.

2) Attach the ByteBlasterMV cable to a parallel port on a PC and insert the 10-pin female plug into the prototype system containing the target device. The board must supply power to the ByteBlasterMV cable.
   - For the Windows Nt operating system, a driver must be installed before using the ByteBlasterMV cable, go to the “ByteBlasterMV and MasterBlaster Installation” section in the Quartus II.

3) Open the Quartus II programmer by selecting Open Programmer from the (Processing Menu). Choose Setup... in the Programming Hardware section. Specify the ByteBlasterMV cable and the appropriate LPT port. Please see “Changing Setup” under the ByteBlasterMV cable in the Quartus II software Help menu for more information.

4) Select either passive serial or JTAG programming mode and then add the files and/or devices you want to program or configure using the **add file..** or **add device...** buttons to create a chain description file**(.cdf).**
   - The programmer has two programming modes “ passive serial and JTAG, In passive mode, you select which SOFs to include in the device chain. In JTAG mode, you add specific devices and configuration devices to the device chain, in addition to POFs and SOFs, and you have several programming options for each configuration device in the chain. In JTAG mode, you can verify an EPC configuration device’s contents against its programming file data, check that a device is blank, examine a programmed device and save its data to file, or use its data to program or verify another configuration device.

5) Choose the start button in the Quartus II software to program or configure the device(s). The ByteBlasterMV cable downloads the data from the SOF and/or POF file(s) into the device(s).

4-2. Using RS-232C

Orher	Command	Set response
Inter the Adjustment Mode	ad 00 00	d 00 OK00x
Change the Source	kb 00 04	b 00 00 OK04x(Adjust 480i comp1)
Start Adjustment	kb 00 06	b 00 OK06x(Adjust 1080p comp1/RGB)
Return the	ad 00 10	
Response		OKx(Success condition) NGx(Failed condition)
Read Adjustment data	(main) ad 00 20 (sub) ad 00 21	(main) 00000000000000000000000007c007b006dx (Sub) 00000007000000000000000007c00830077x
Confirm Adjustment	ad 00 99	NG 03 00x (Failed condition) NG 03 01x (Failed condition) NG 03 02x (Failed condition) OK 03 03x (Success condition)
End of Adjustment	ad 00 90	d 00 OK90x

* See ADC Adjstment RS-232C Protocol_Ver1.0

● Necessary items before Adjustmment items
- Pattern Generator : MSPG-925FA
- Adjust 480i Comp1
  (MSPG-925A : model-209, pattern-65)
- Adjust 1080p Comp1/RGB
  (MSPG-925FA : Model-225, pattern-65)

* If you want more information then see the below Adjsutment method(Factory Adjustment)

● Adjustment sequence
- ad 00 00 : Enter the ADC Adjustment mode.
- kb 00 04 : Change the mode to Component(No actions)
- ad 00 10 : Adjust 480i Comp1.
  (Change the mode and adjustment action)
- kb 00 06 : Change to RGB-DTV mode(No action)
- ad 00 10 : Adjust 1080p Comp1/RGB.
  (Change the mode and adjustment action)
- ad 00 90 : End of the adjustment.

* Factory Adjustment

5. Auto Adjust Component 480i/1080p RGB 1080p

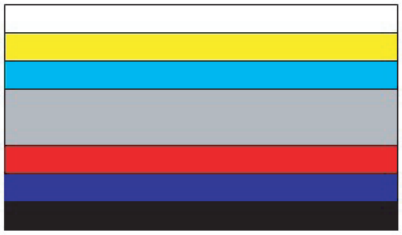
5-2. Summary

- Adjustment component 480i/1080i and RGB 1080p is Gain and Black level setting at Analog to Digital converter, and compensate the RGB deviation

5-3. Using in strument

- Adjustment remocon, 801GF(802B, 802F, 802R) or MSPG925FA pattern generator.(It can output 480i/1080i horizontal 100% color bar pattern signal, and its output level must setting 0.7V±0.1V p-p correctly)

* You must make it sure its resolution and pattern cause every instrument can have different setting.



<Fig.3> Adjustment pattern : 480i/1080p 60Hz Pattern

5-4. Adjustment method 480i Comp1, Adjust 1080p Comp1/RGB

(1) ADC 480i Component1 adjustment.
- Check connection of Component1
- MSPG-925FA -> Model : 209, Pattern : 65

1) Set Component 480i mode and 100% Horizontal Color Bar Pattern(HozTV31Bar), then set TV set to Component1 mode and its screen to “NORMAL”
2) After get the signal, wait more a second and enter the “Ez-Adjust” with press ADJ key of Service remocon. After then select “3.ADC 480i Comp1” with navigator button and press “Enter”. It is automatically adjustment.
3) You can see “ADC Component1 Success” message after Adjustment success.
4) Error Messages: When its adjustment is not correct, “ADC Component1 480i Fail” message displayed. If component is not connection “Component1 Not Connected”, its format is not 480i then “Not Valid Format”, its signal don’t out then “Check Signal Status” message displayed. These messages will be displayed just a second.

(2) ADC 1080p Component1 / RGB adjustment
- Check connection both of Component1 and RGB
- MSPG-925FA -> Model: 225, Pattern:65

1) Set Component 1080p mode and 100% Horizontal Color Bar Pattern(HozTV31Bar), then set TV set to Component1 mode and its screen to “NORMAL”
2) If adjustment is correctly finished, “ADC Component1 Success” message will be displayed. But adjustment is not correctly finished, “ADC Component1 1080p Fail” message will be displayed.
3) After adjustment Component1 mode, move to RGB-DTV mode automatically and RGB adjustment start. After RGB Adjustment successfully finished, “ADC RGB 1080P Success” message will be displayed.
4) If Adjustment doesn’t success, check conditions all of the adjustment condition and adjustment again. See “Error Messages” sentence.
5) After adjustment finished, press “ADJ” key and exit from Adjustment mode.

6. EDID (The Extended Display Identification Data)/ DDC (Display Data Channel) Download.

6-1. Summary

(1) It is established in VESA, for communication between PC and Monitor without order from user for building user condition. It helps to make easily use realize “Plug and Play” function.

(2) For EDID data write, we use DDC2B protocol.

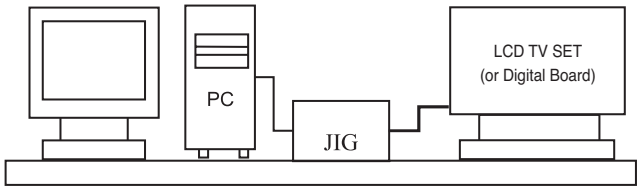
6-2. Write HDMI EDID data

(1) Using instruments

1) Jig.(PC Serial to D-Sub connection) for PC, DDC adjustment.
2) S/W for DDC recording (EDID data write and read)
3) D-sub jack
4) Additional HDMI cable connection Jig.

(2) Preparing and setting.

1) Set instruments and Jig. Like pic.5), then turn on PC and Jig.
2) Operate DDC write S/W (EDID write & read)
3) It will operate in the DOS mode.



<Fig.4> For write EDID data, setting Jig and another instruments

6-3. EDID data (Model name = LG TV)

(1) HDMI-1 EDID table

	00	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	00	11	01	03	80	73	41	96	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	AF	CF	00	31	40	45	40	61	40	81	80	A9	40
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	C4	8E	21	00	00	1E	02	3A	80	18	71	38	2D	40
50	58	2C	45	00	C4	8E	21	00	00	1E	00	00	00	FD	00	30
60	58	1F	64	11	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	8A

	00	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	18	F1	47	84	05	03	02	20	22	10	23	15	07	50
10	67	03	0C	00	10	00	B8	2D	01	1D	00	72	51	D0	1E	20
20	6E	28	55	00	C4	8E	21	00	00	1E	01	1D	80	18	71	1C
30	16	20	58	2C	25	00	C4	8E	21	00	00	9E	8C	0A	D0	8A
40	20	E0	2D	10	10	3E	96	00	C4	8E	21	00	00	18	8C	0A
50	D0	8A	20	E0	2D	10	10	3E	96	00	13	8E	21	00	00	18
60	26	36	80	A0	70	38	1F	40	30	20	25	00	C4	8E	21	00
70	00	1A	00	00	00	00	00	00	00	00	00	00	00	00	00	27

(2) HDMI-2 EDID table

	00	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	00	11	01	03	80	73	41	96	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	AF	CF	00	31	40	45	40	61	40	81	80	A9	40
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	C4	8E	21	00	00	1E	02	3A	80	18	71	38	2D	40
50	58	2C	45	00	C4	8E	21	00	00	1E	00	00	00	FD	00	30
60	58	1F	64	11	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	8A

	00	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	18	F1	47	84	05	03	02	20	22	10	23	15	07	50
10	67	03	0C	00	20	00	B8	2D	01	1D	00	72	51	D0	1E	20
20	6E	28	55	00	C4	8E	21	00	00	1E	01	1D	80	18	71	1C
30	16	20	58	2C	25	00	C4	8E	21	00	00	9E	8C	0A	D0	8A
40	20	E0	2D	10	10	3E	96	00	C4	8E	21	00	00	18	8C	0A
50	D0	8A	20	E0	2D	10	10	3E	96	00	13	8E	21	00	00	18
60	26	36	80	A0	70	38	1F	40	30	20	25	00	C4	8E	21	00
70	00	1A	00	00	00	00	00	00	00	00	00	00	00	00	00	17

(3) HDMI-3 EDID table

	00	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	00	11	01	03	80	73	41	96	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	AF	CF	00	31	40	45	40	61	40	81	80	A9	40
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	C4	8E	21	00	00	1E	02	3A	80	18	71	38	2D	40
50	58	2C	45	00	C4	8E	21	00	00	1E	00	00	00	FD	00	30
60	58	1F	64	11	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	8A

	00	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	18	F1	47	84	05	03	02	20	22	10	23	15	07	50
10	67	03	0C	00	30	00	B8	2D	01	1D	00	72	51	D0	1E	20
20	6E	28	55	00	C4	8E	21	00	00	1E	01	1D	80	18	71	1C
30	16	20	58	2C	25	00	C4	8E	21	00	00	9E	8C	0A	D0	8A
40	20	E0	2D	10	10	3E	96	00	C4	8E	21	00	00	18	8C	0A
50	D0	8A	20	E0	2D	10	10	3E	96	00	13	8E	21	00	00	18
60	26	36	80	A0	70	38	1F	40	30	20	25	00	C4	8E	21	00
70	00	1A	00	00	00	00	00	00	00	00	00	00	00	00	00	07

(4) Analog(RGB) EDID table

	00	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	1E	6D	01	00	01	01	01	01
10	00	11	01	03	18	73	41	96	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	AF	CF	00	31	40	45	40	61	40	81	80	A9	40
30	01	01	01	01	01	01	66	21	50	B0	51	00	1B	30	40	70
40	36	00	C4	8E	21	00	00	1A	02	3A	80	18	71	38	2D	40
50	58	2C	45	00	C4	8E	21	00	00	1E	00	00	00	FD	00	30
60	58	1F	64	11	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	F6

	00	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	02	03	04	00	0E	1F	00	80	51	00	1E	30	40	80	37	00
10	C4	8E	21	00	00	1C	F1	27	00	A0	51	00	25	30	50	80
20	37	00	C4	8E	21	00	00	1C	26	36	80	A0	70	38	1F	40
30	30	20	25	00	C4	8E	21	00	00	0A	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	BC
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	31

* See Working Guide if you want more information about EDID communication.

7. Adjustment Color Temperature (White Balance)

7-1. Using Instrucments

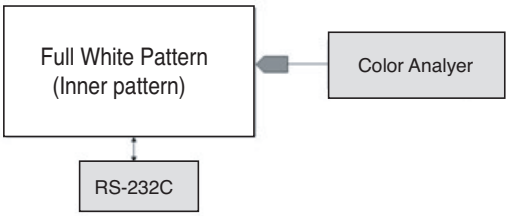
(1) Color Analyzer: CA-210 (CH 9)
- Using LCD color temperature, Color Analyzer (CA-210) must use CH 9, which Matrix compensated (White, Red, Green, Blue compensation) with CS-2100. See the Coordination bellowed one.

(2) Auto-adjustment Equipment (It needs when Auto-adjustment - It is availed communicate with RS-232C : Baud rate: 115200)

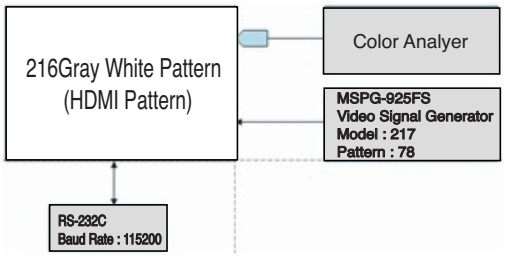
(3) Video Signal Generator MSPG-925F 720p, 216Gray (Model: 217, Pattern 78)

7-2. Connection Diagram(Auto Adjusment)

(1) Using Inner Pattern



(2) Using HDMI input



<Fig. 5> Connection diagram for Adjusment White balance

7-2. White Balance Adjusment

(1) If you can't adjust with inner pattern, then you can adjust it using HDMI pattern. You can select option at "Ez-Adjust Menu - 7. White Balance" there items "NONE, INNER, HDMI". It is normally setting at inner basically. If you can't adjust using inner pattern you can select HDMI item, and you can adjust.

(2) In manual Adjust case, if you press ADJ button of service remocon, and enter "Ez-Adjust Menu - 7. White Balance", then automatically inner pattern operates. (In case of "Inner" originally "Inner" will be selected.
1) Connect all cables and equipments like Pic.5)
2) Set Baud Rate of RS-232C to 115200. It may set 115200 orignally.
3) Connect RS-232C cable to set
4) Connect HDMI cable to set
5) Select LA75A Chassis at Adjustment equipment, and adjust.

■ RS-232C Command(Commonly apply)

RS-232C Command [CMD	ID	DATA]	Meaning
wb	00	00	Start white balance adjustment
wb	00	10	Start Gain adjustment(Internal white pattern)
wb	00	1f	End Gain adjustment
wb	00	20	Start Offset adjustment (Internal white pattern)
wb	00	2f	End Offset adjustment
wb	00	ff	End white Balance adjustment (Internal pattern disappear)

- Wb 00 00 Start Auto-adjustment of white balance
- Wb 00 10 Start Gain adjustment (Inner pattern)
- Jb 00 c0
- …
- Wb 00 1f End of Adjustment
* If it needs, offset adjustment(wb 00 20-Start, wb 00 2f-End)
- Wb 00 ff End of white balance adjustment (Inner pattern disappear)

*** Notice!**

Adjustment Mapping information.

	RS-232C COMMAND [CMD ID DATA]			Min	CENTER (DEFAULT)			Max
	Cool	Mid	Warm		Cool	Mid	Warm	
R Gain	jg	ja	jd	00	184	192	192	192
G Gain	jh	jb	je	00	187	183	159	192
B Gain	ji	jc	jf	00	192	161	95	192
R Cut					64	64	64	127
G Cut					64	64	64	127
B Cut					64	64	64	127

- When Color temperature (White balance) Adjustment. (Automatically)
  1) Press "Power only key" of service remocon and operatie automatically adjustment.
  2) Set BaudRate to 115200.
- You must start "wb 00 00" and finish it "wb 00 ff".
- If it needs, then adjustment "Offset".

7-3. White Balance Adjusment (Manual adjustment)

(1) Test Equipment: CA-210
  1) Using LCD color temperature, Color Analyzer (CA-210) must use CH 9, which Matrix compensated (White, Red, Green, Blue compensation) with CS-2100. See the Coordination bellowed one.

(2) Manual adjustment sequence is like bellowed one.
  1) Turn to “Ez-Adjust” mode with press ADJ button of service remocon.
  2) Select “10.Test Pattern” with CH+/- button and press enter. Then set will go on Heat-run mode. Over 30 minutes set let on Heat-run mode.
  3) Let CA-210 to zero calibration and must has gap more 10cm from center of LCD module when adjustment.
  4) Press “ADJ” button of service remocon and select “7.White-Balance” in “Ez-Adjust” then press “ ▶” button of navigation key.
  (When press “ ▶” button then set will go to full white mode)
  5) Adjust at three mode (Cool, Medium, Warm)
  6) If “Medium” and “Warm” mode.
  - Let R-Gain to 192 and R, G, B-Cut to 64 and then control G, B gain adjustment High Light adjustment.
  7) With volume button (+/-) you can adjust.
  8) After all adjustment finished, with Enter (■ key) turn to Ez-Adjust mode. Then with ADJ button, exit from adjustment mode.

(3) Using CS-1000 Equipment.

Color Temperature	Remark
COOL	T=11000K, Δuv=0.000, X=0.276, Y=0.283
MEDIUM	T= 9300K, Δuv=0.000, X=0.285, Y=0.293
WARM	T= 6500K, Δuv=0.000, X=0.313, Y=0.329

(4) Using CS-210 Equipment.(9CH)
  - Contrast value : 216Gray

Color temperature	Color analyzer	Color coordinate	
		X	Y
COOL	CA-210	0.276±0.002	0.283±0.002
MEDIUM	CA-210	0.285±0.002	0.293±0.002
WARM	CA-210	0.313±0.002	0.329±0.002

7-4. Test of RS-232C control

- Press In-Start button of Service Remocon then set the “4.Baud Rate” to 115200. Then check RS-232C control.

7-5. Selection of Country option

- Selection of country option is allowed only North American model (Not allowed Korean model). It is selection of Country about Rating and Time Zone.

(1) Models: All models which use LA75A Chassis (See the first page.)
(2) Press “In-Start” button of Service Remocon, then enter the “Option” Menu with “PIP CH-” Button.
(3) Select one of these three (USA, CANADA, MEXICO) defends on its market using “Vol. +/-” button.

8. GND and ESD Testing

8-1. Prepare GND and ESD Testing

- Check the connection between set and power cord.

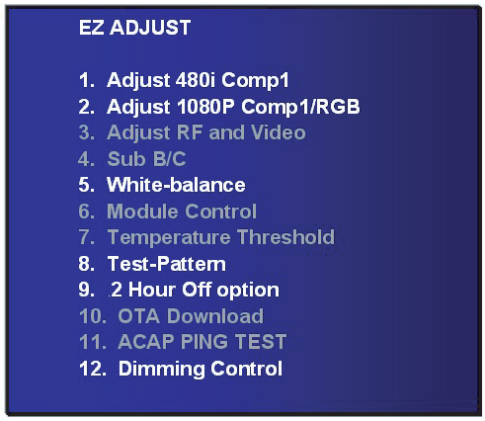
8-2. Operate GND and ESD auto-test

(1) Fully connectd(Between set and power cord) set enter the Auto-test sequence.
(2) Connect D-Jack AV jack test equipment.
(3) Turn on Auto-controller(GWS103-4)
(4) Start Auto GND test.
(5) If its result is NG, then notice with buzzer.
(6) If its result is OK, then automatically it turns to ESD Test.
(7) Operate ESD test
(8) If its result is NG, then notice with buzzer.
(9) If its result is OK, then process next steps. Notice it with Good lamp and STOPER Down.

8-3. Check Items

(1) TEst Voltage
  1) GND : 1.5KV/min at 100mA
  2) Signal : 3KV/min at 100mA
(2) Test time : just 1 second.
(3) Test point
  1) GND test: Test between Power cord GND and Signal cable metal GND.
  2) ESD test: Test between Power cord GND and Live and neutral.
(4) Leakage current: Set to 0.5mA(rms)

9. Default Service option



9-1. ADC-Set

(1) R-Gain adjustment Value (default 128)
(2) G-Gain adjustment Value (default 128)
(3) B-Gain adjustment Value (default 128)
(4) R-Offset adjustment Value (default 64)
(5) G-Offset adjustment Value (default 64)
(6) B-Offset adjustment Value (default 64)

9-2. White balance. Value

	CENTER(DEFAULT)			Max
	Cool	Mid	Warm	
R Gain	184	192	192	192
G Gain	189	184	150	192
B Gain	192	161	84	192
R Cut	64	64	64	127
G Cut	64	64	64	127
B Cut	64	64	64	127

9-3. Temperature Threshold

(1) Threshold Down Low 20
(2) Threshold Up Low 23
(3) Threshold Down High 70
(4) Threshold Down High 75

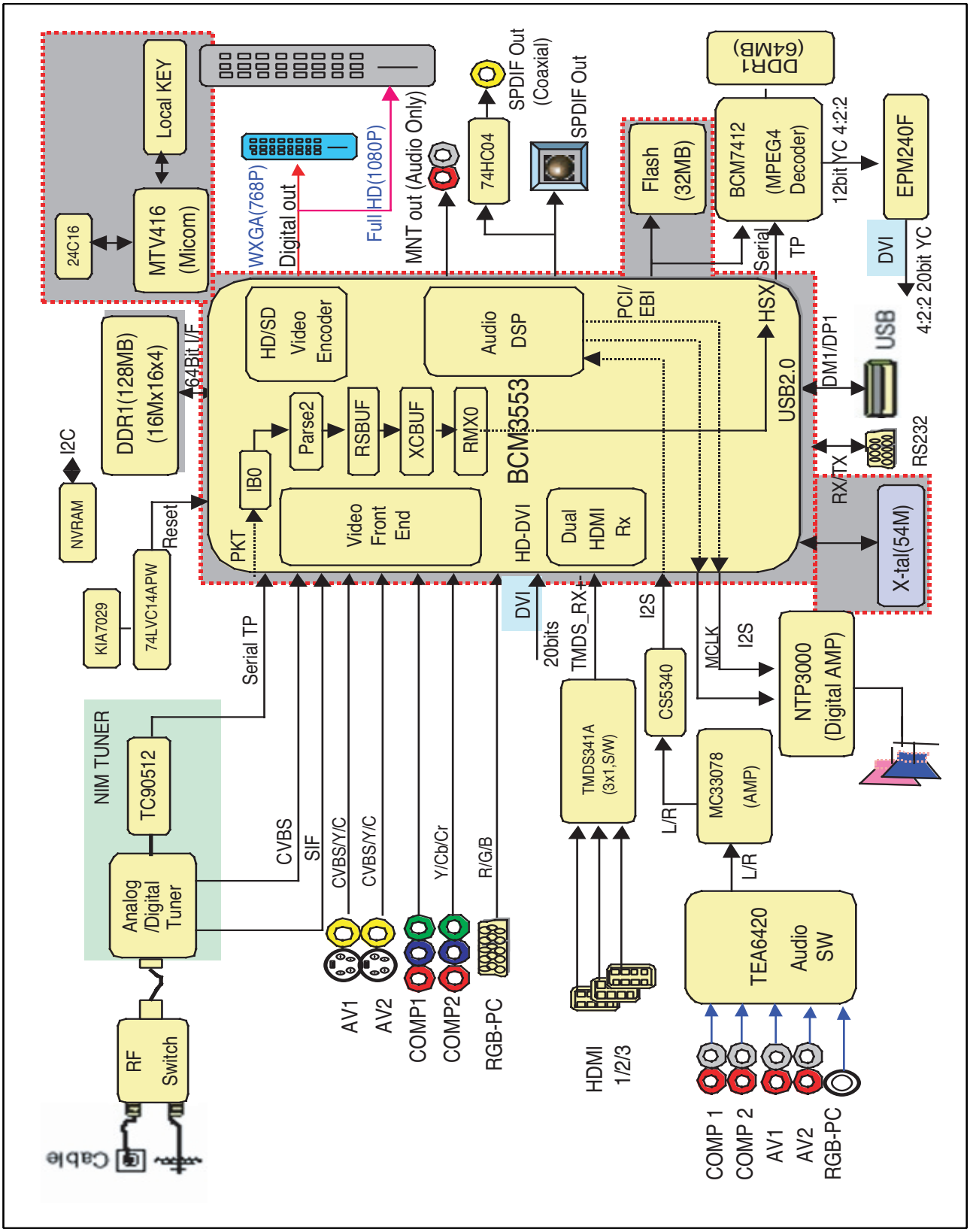
10. Default Service option

No	Item			Condition
1	Input Mode			TV02CH
2	Volume Level			10
3	Mute			Off
4	Aspect Ratio			16:9
5	Picture	Picture Mode		Vivid
		User1	Back Light	100
		Contrast		100
		Bright		50
		Sharpness		70
		Color		70
		Tint		0
		Color Temperature		Medium
		Picture Reset		
6	Audio	Sound Mode		Standard
		Auto Volume		Off
		Clear Voice		Off
		Front Surrround		Off
		Balance		0
		TV Speaker		On
7	Time	Clock		Auto
		Off Timer / On Timer		Off
		Sleep Timer / Auto Off		
8	Option	Language(Menu/Audio)		Portugues
		SimpLink		On
		Key Lock		Off
		Caption		Off
		Set ID		1
9	Channel Memory			RF : 2,3,4,5,6,7,8,9,10,11, 12,13,14,30,51,63 CATV : 15,16,17

TROUBLESHOOTING

1. Power-Up Boot Fail

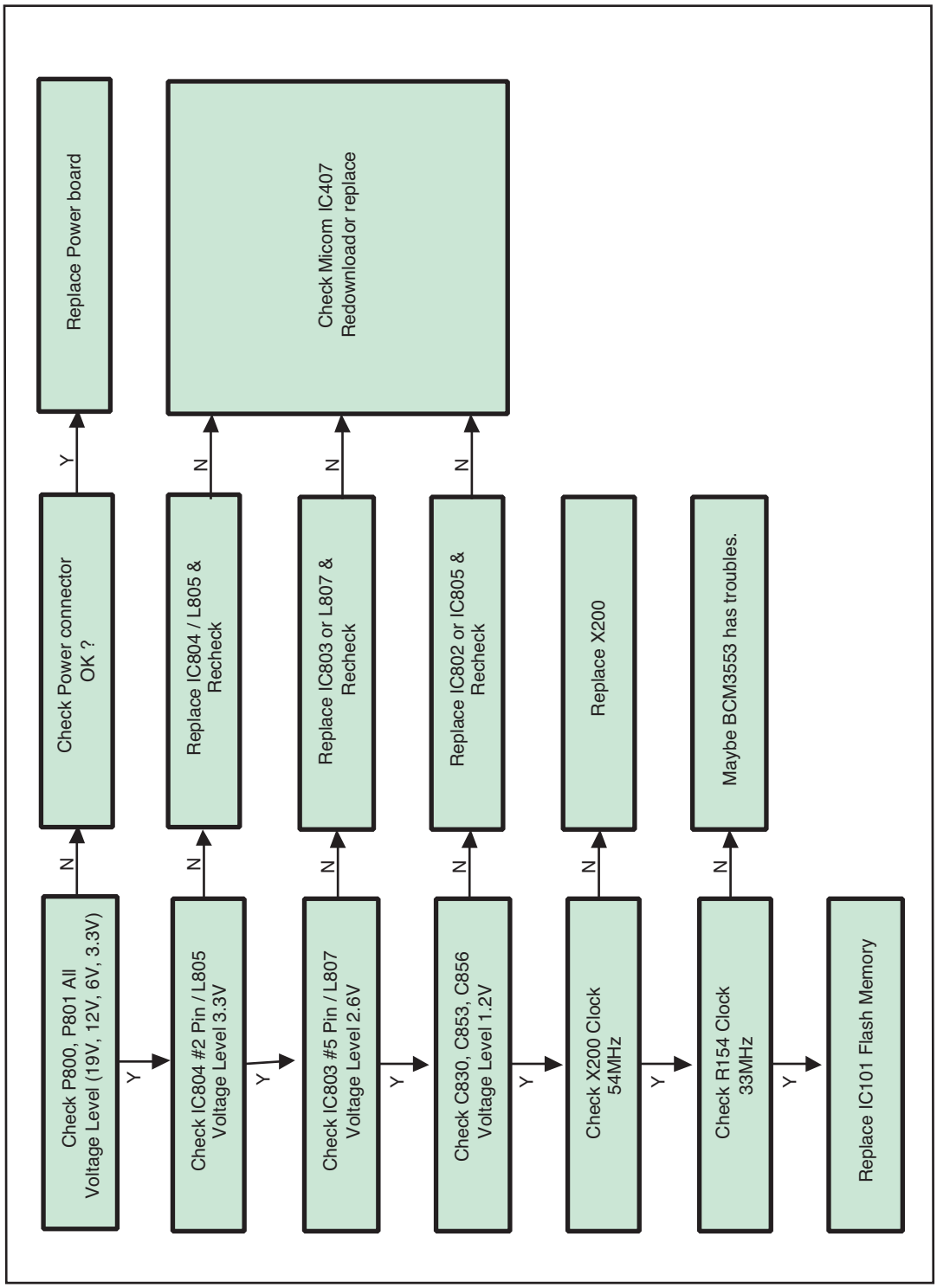
1-1. Block Diagram of Troubleshooting



TROUBLESHOOTING

1. Power-Up Boot Fail

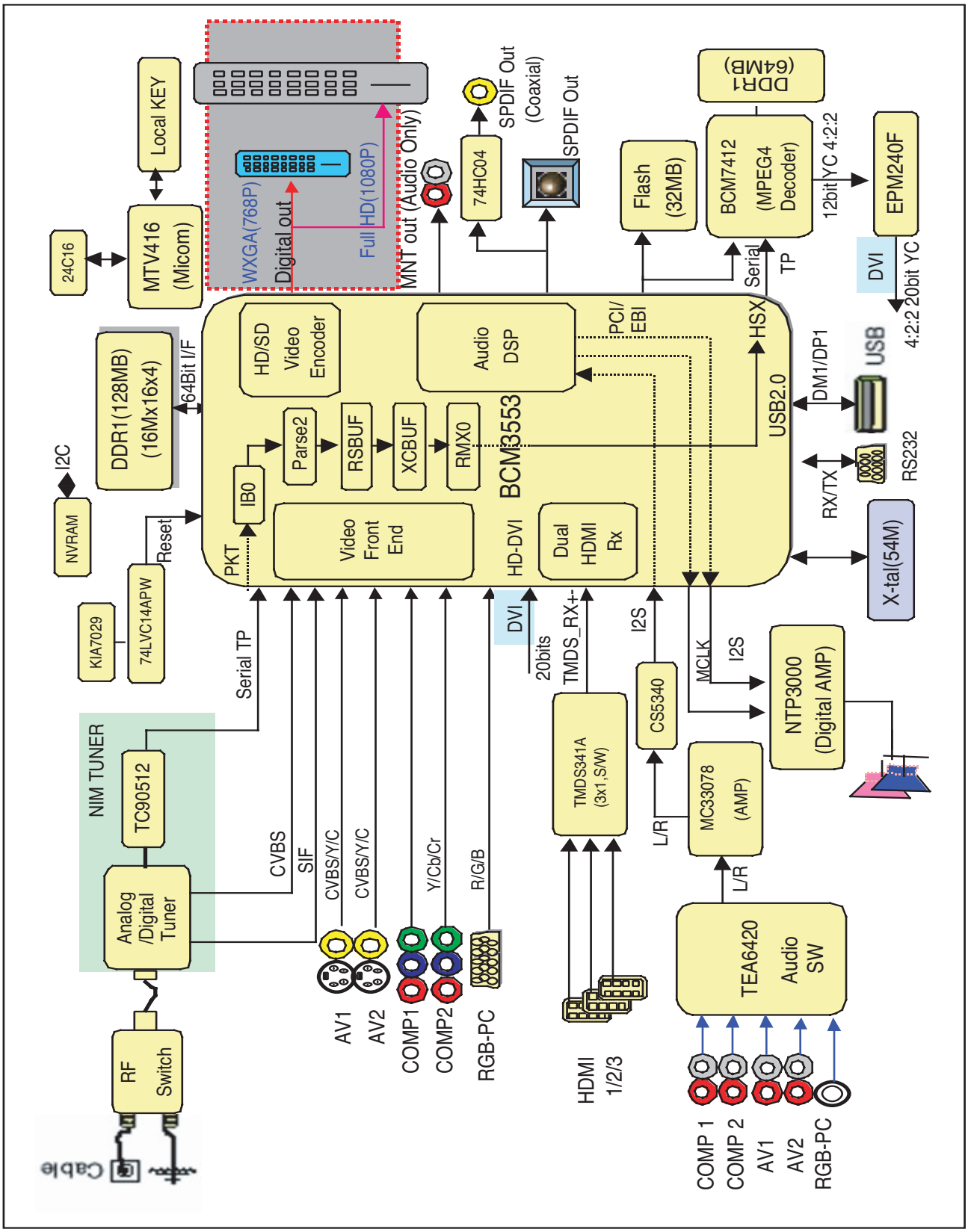
1-2. Troubleshooting



TROUBLESHOOTING

2. No OSD

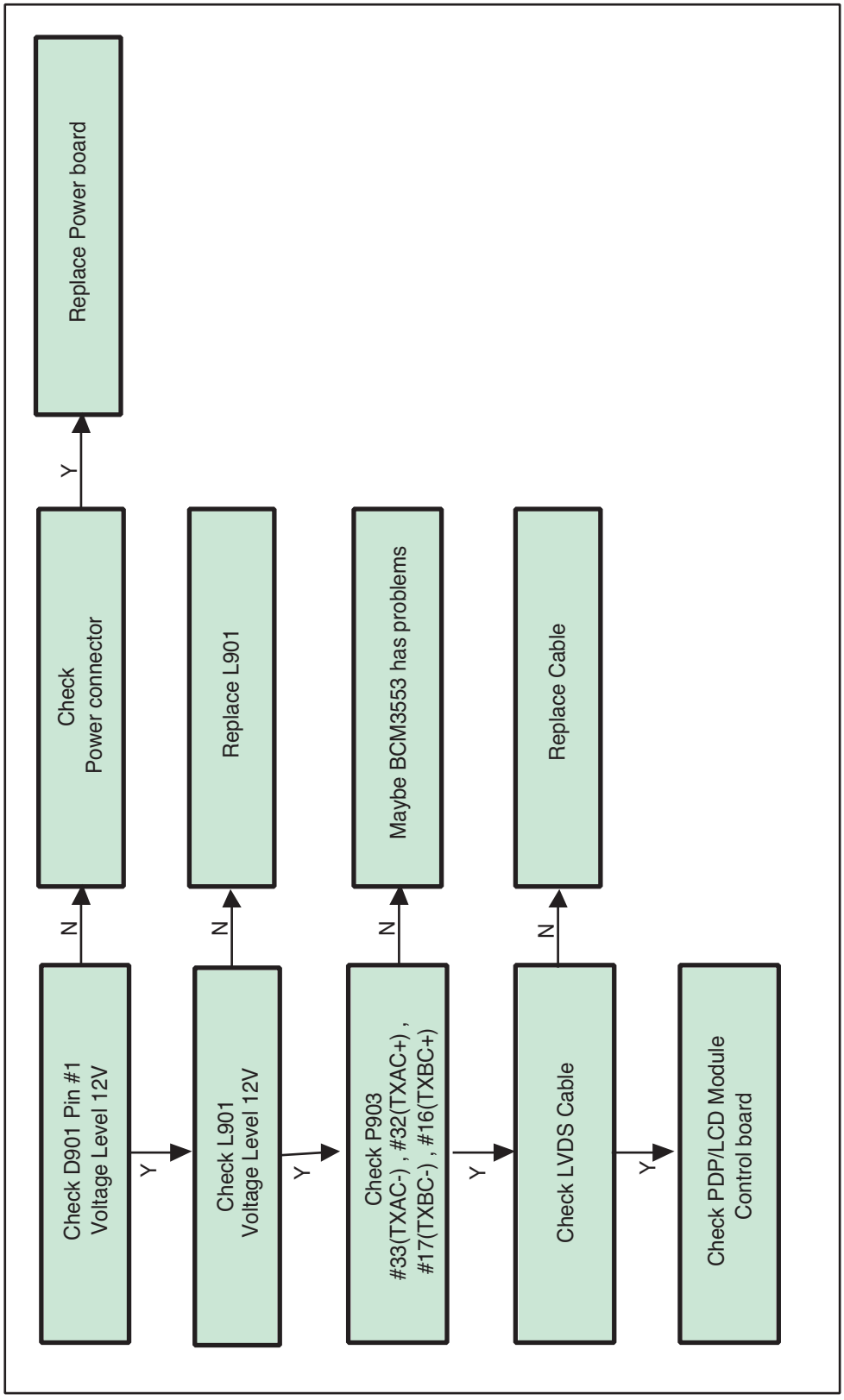
2-1. Block Diagram of Troubleshooting



TROUBLESHOOTING

2. Power-Up Boot Fail

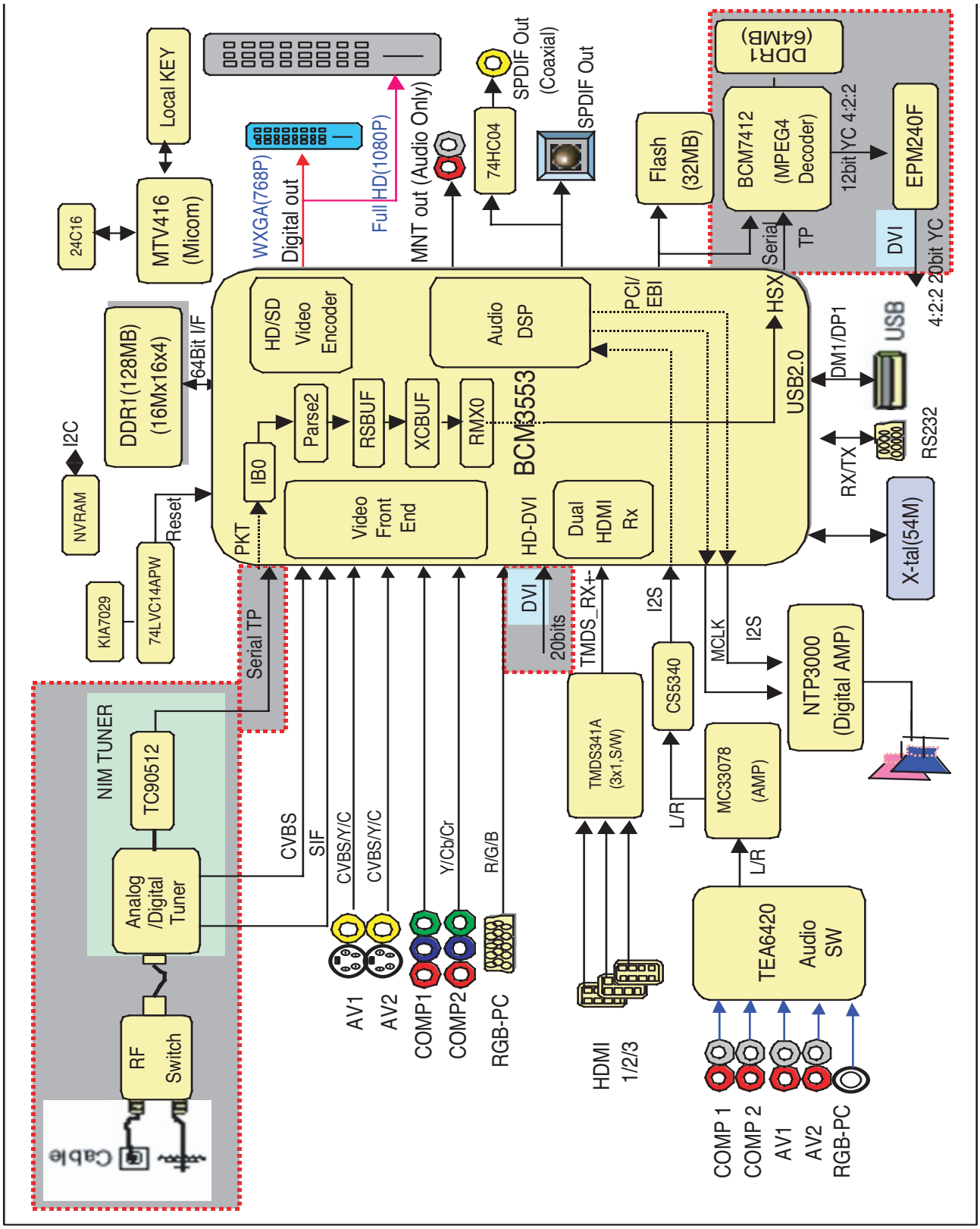
2-2. Troubleshooting



TROUBLESHOOTING

3. Digital TV Video

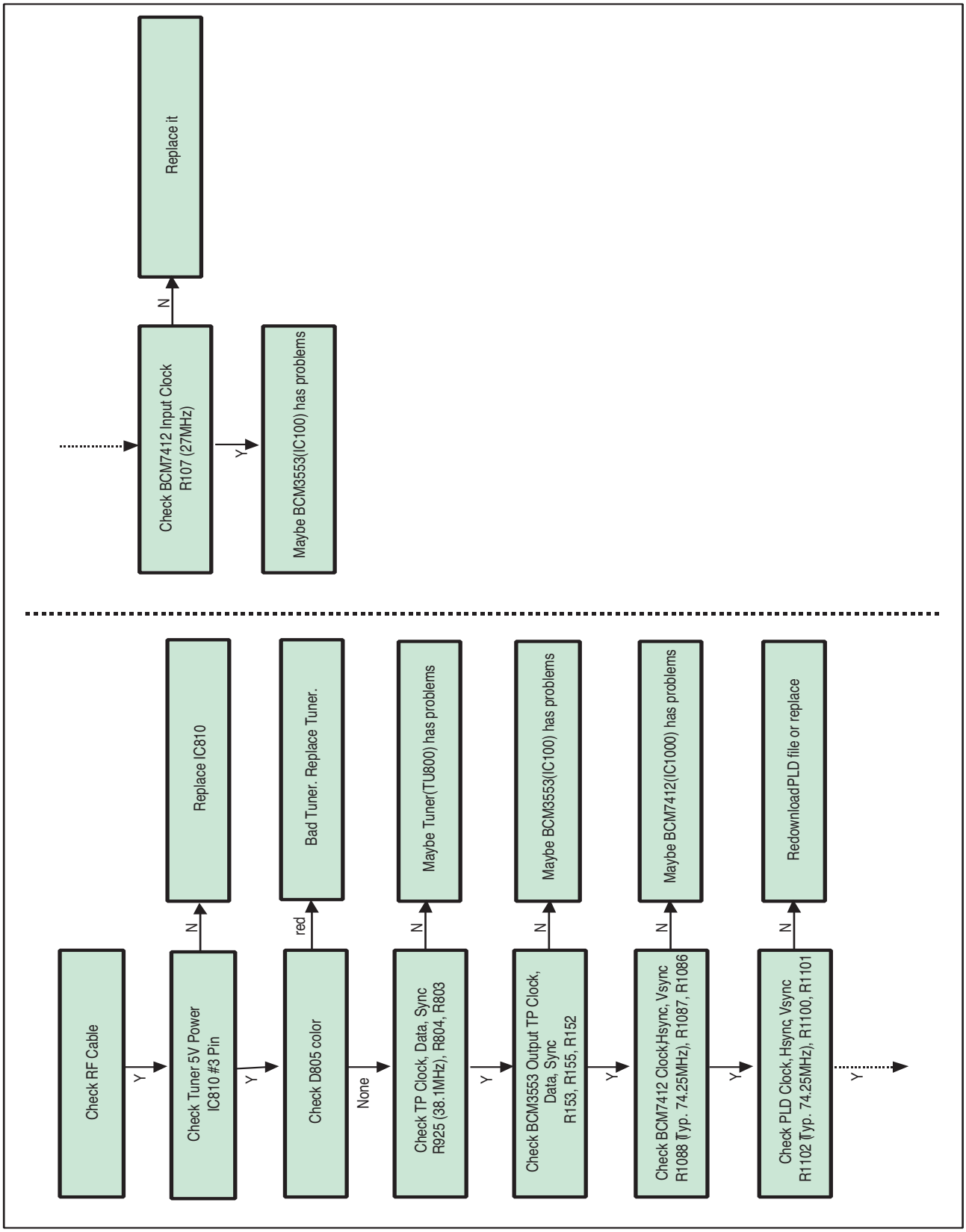
3-1. Block Diagram of Troubleshooting



TROUBLESHOOTING

3. Digital TV Video

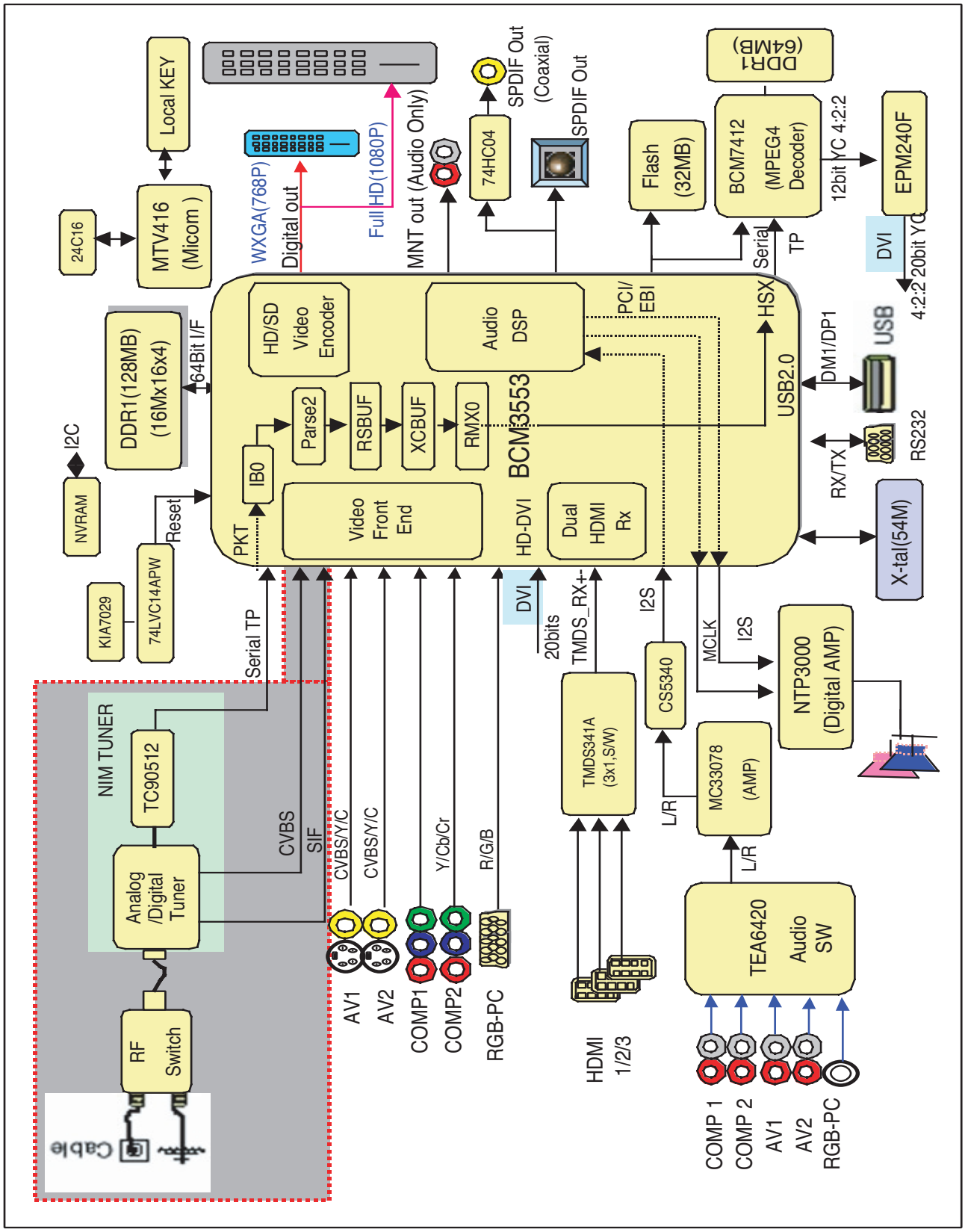
3-2. Troubleshooting



TROUBLESHOOTING

4. Analog TV Video

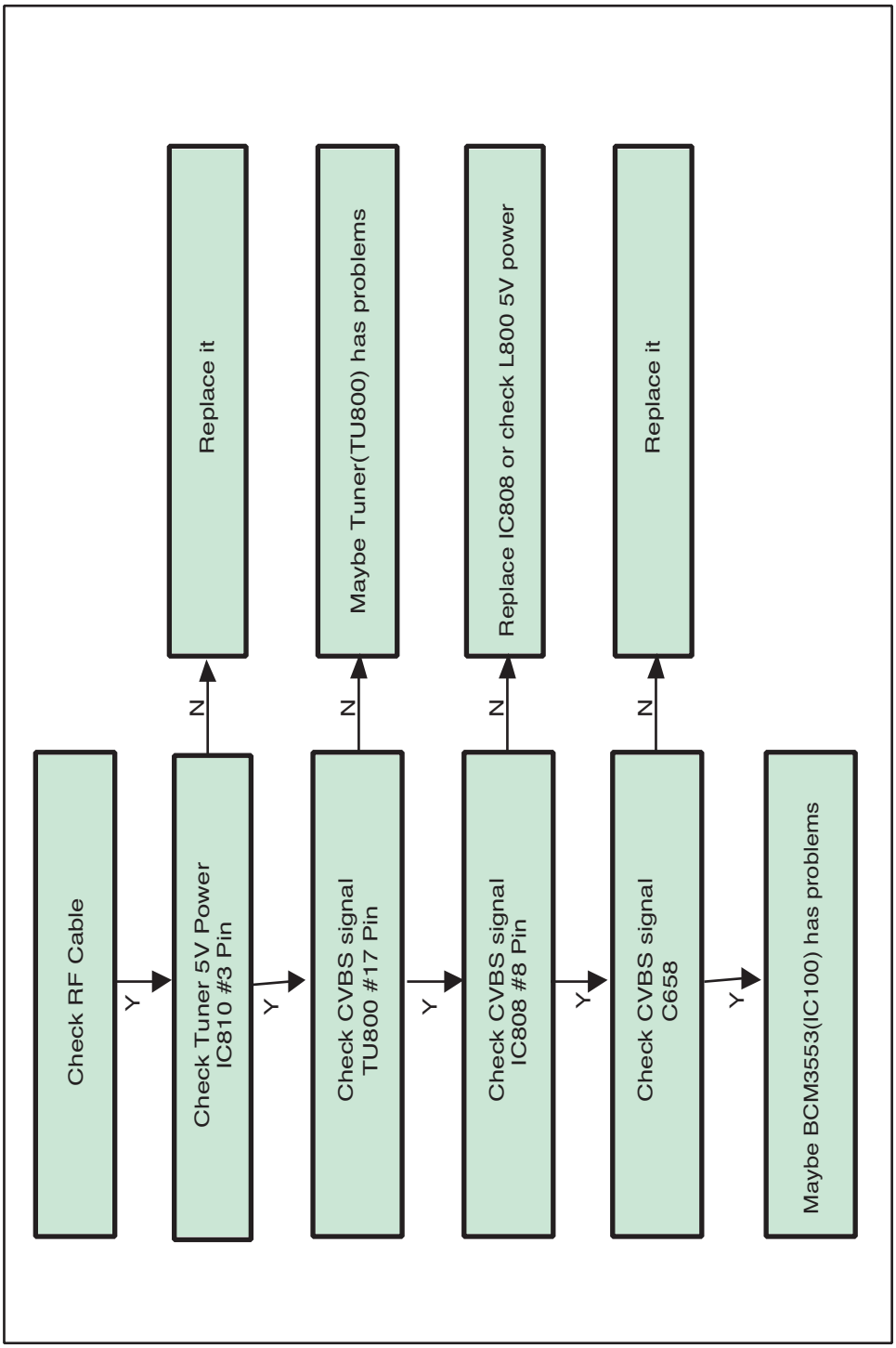
4-1. Block Diagram of Troubleshooting



TROUBLESHOOTING

4. Analog TV Video

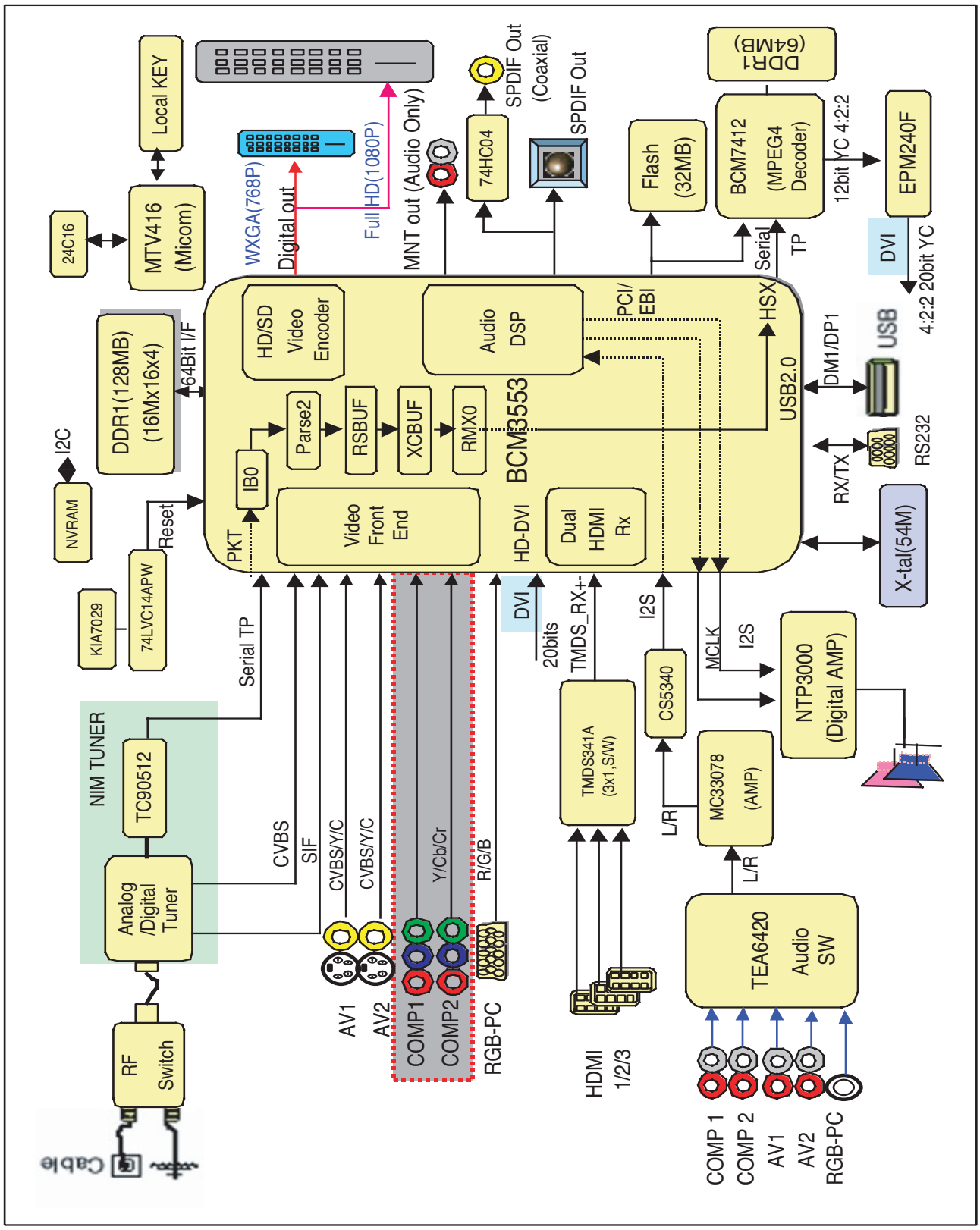
4-2. Troubleshooting



TROUBLESHOOTING

5. Component Video

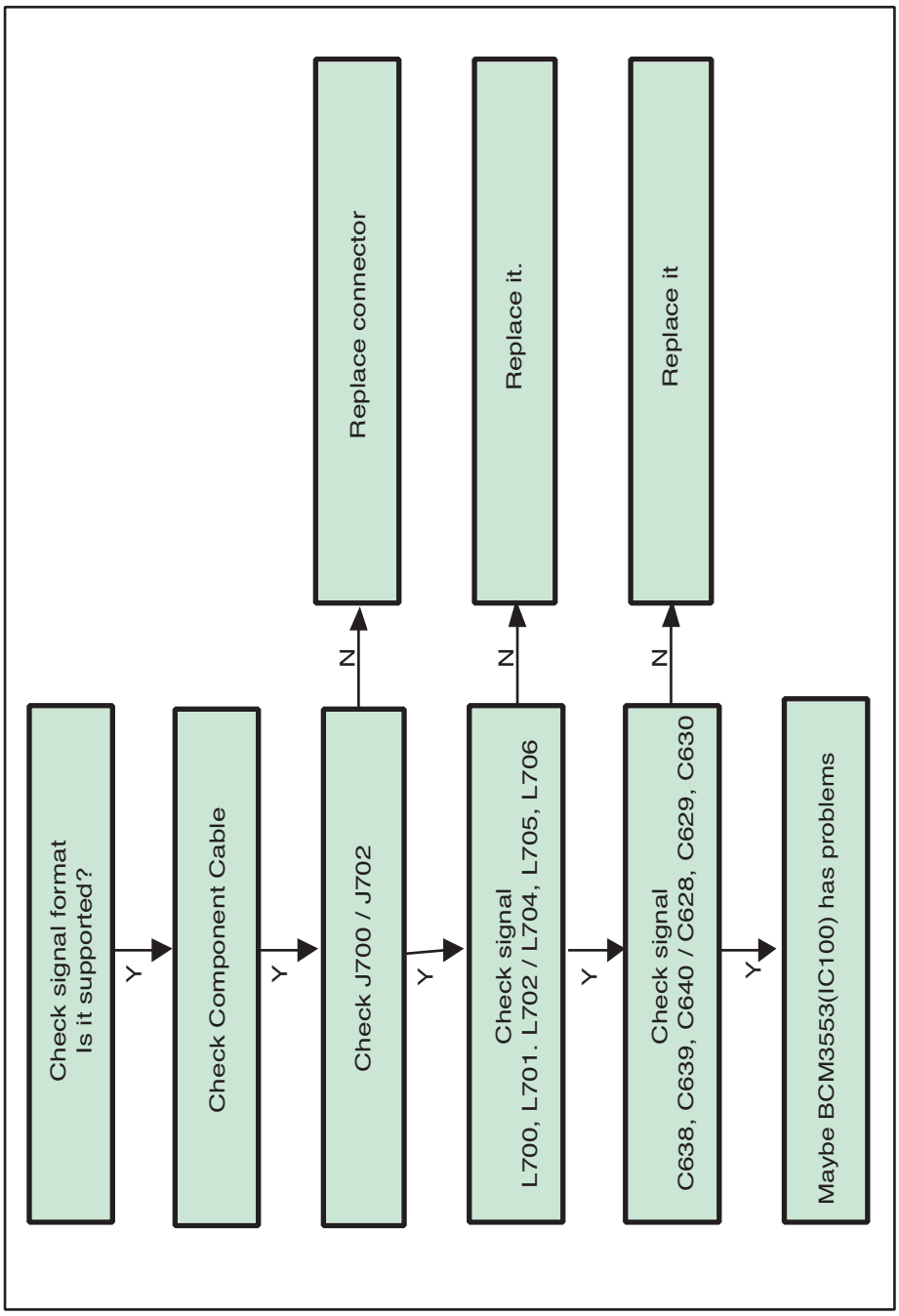
5-1. Block Diagram of Troubleshooting



TROUBLESHOOTING

5. Component Video

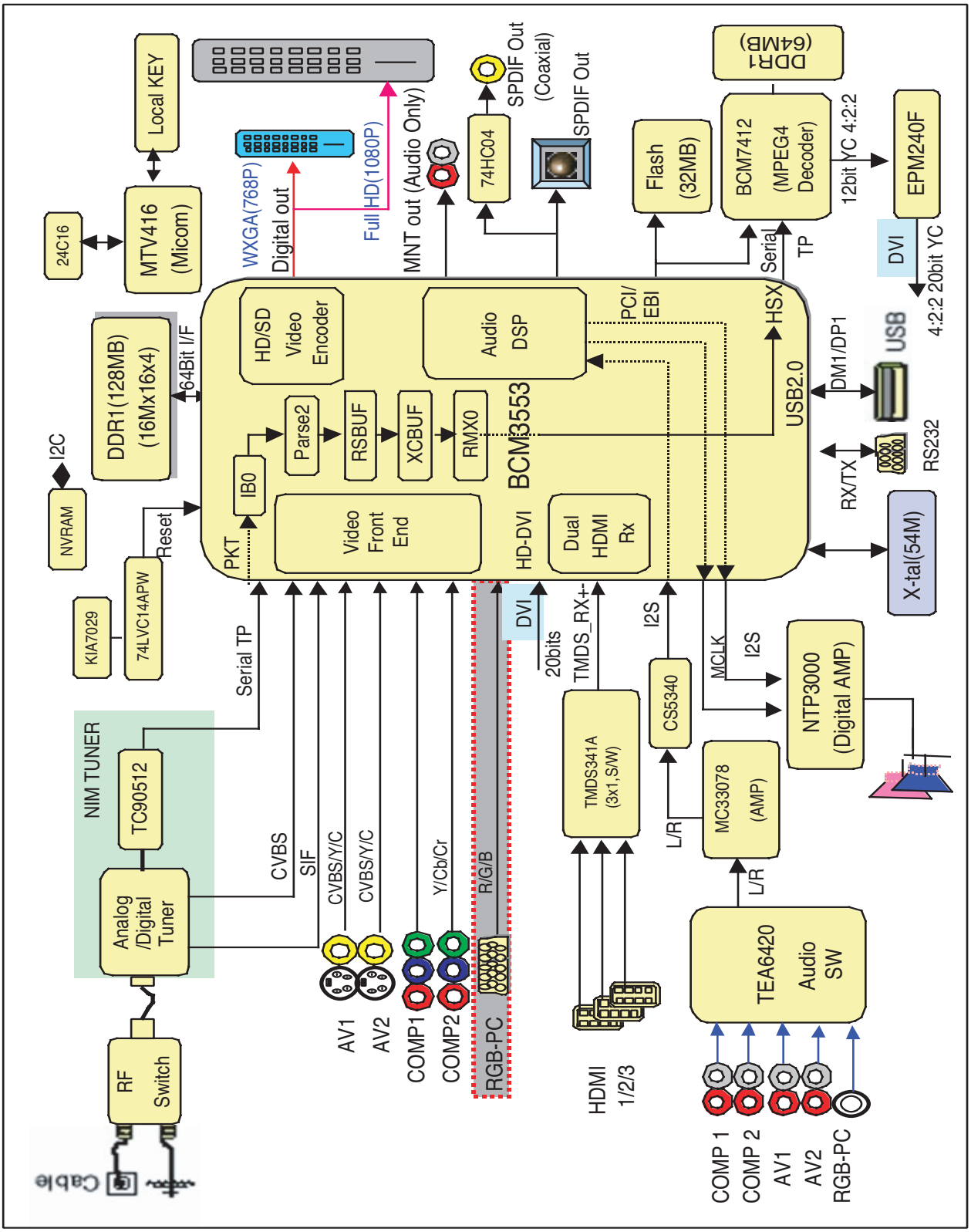
5-2. Troubleshooting



TROUBLESHOOTING

6. RGB Video

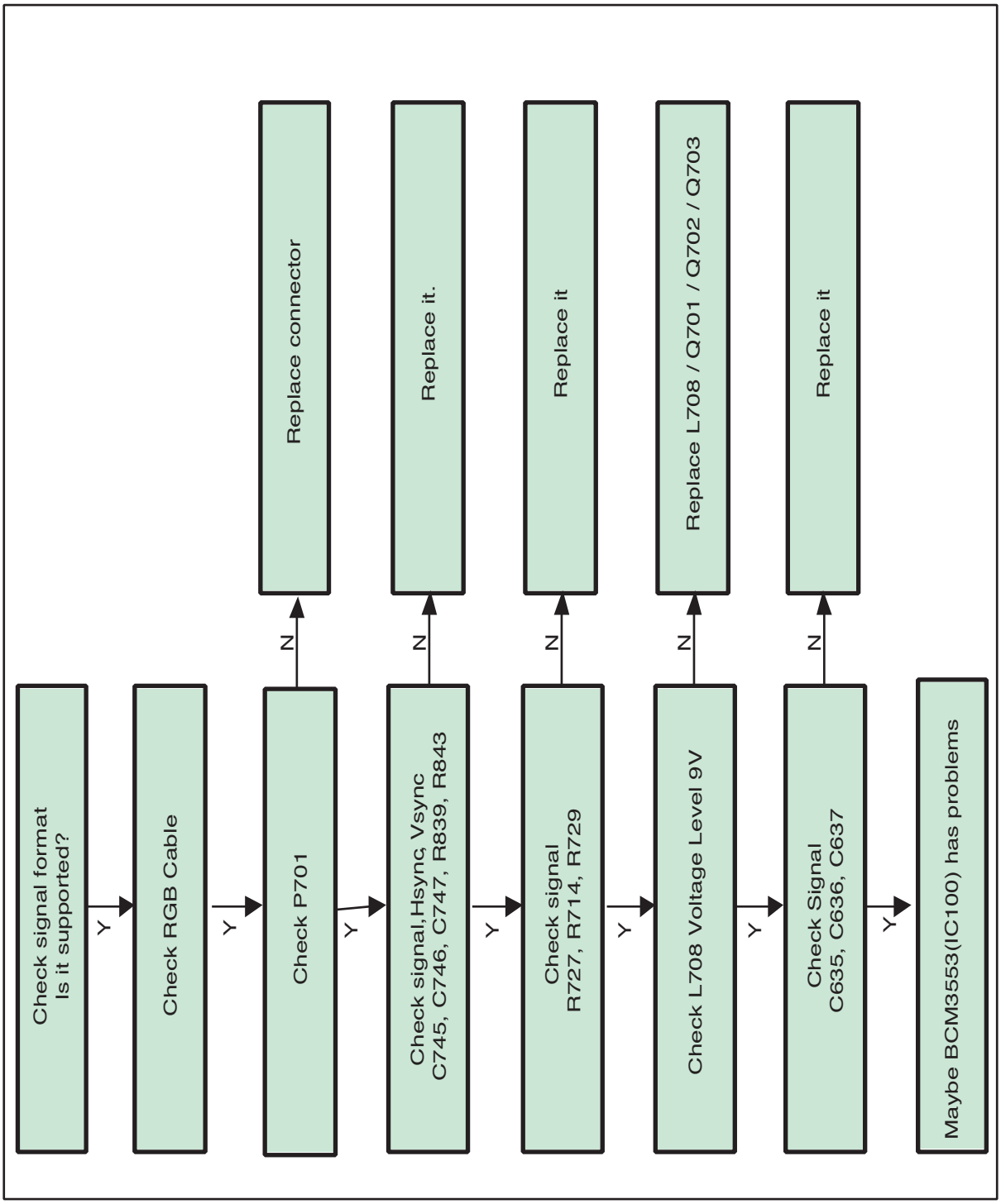
6.1 Block Diagram of Troubleshooting



TROUBLESHOOTING

6. RGB Video

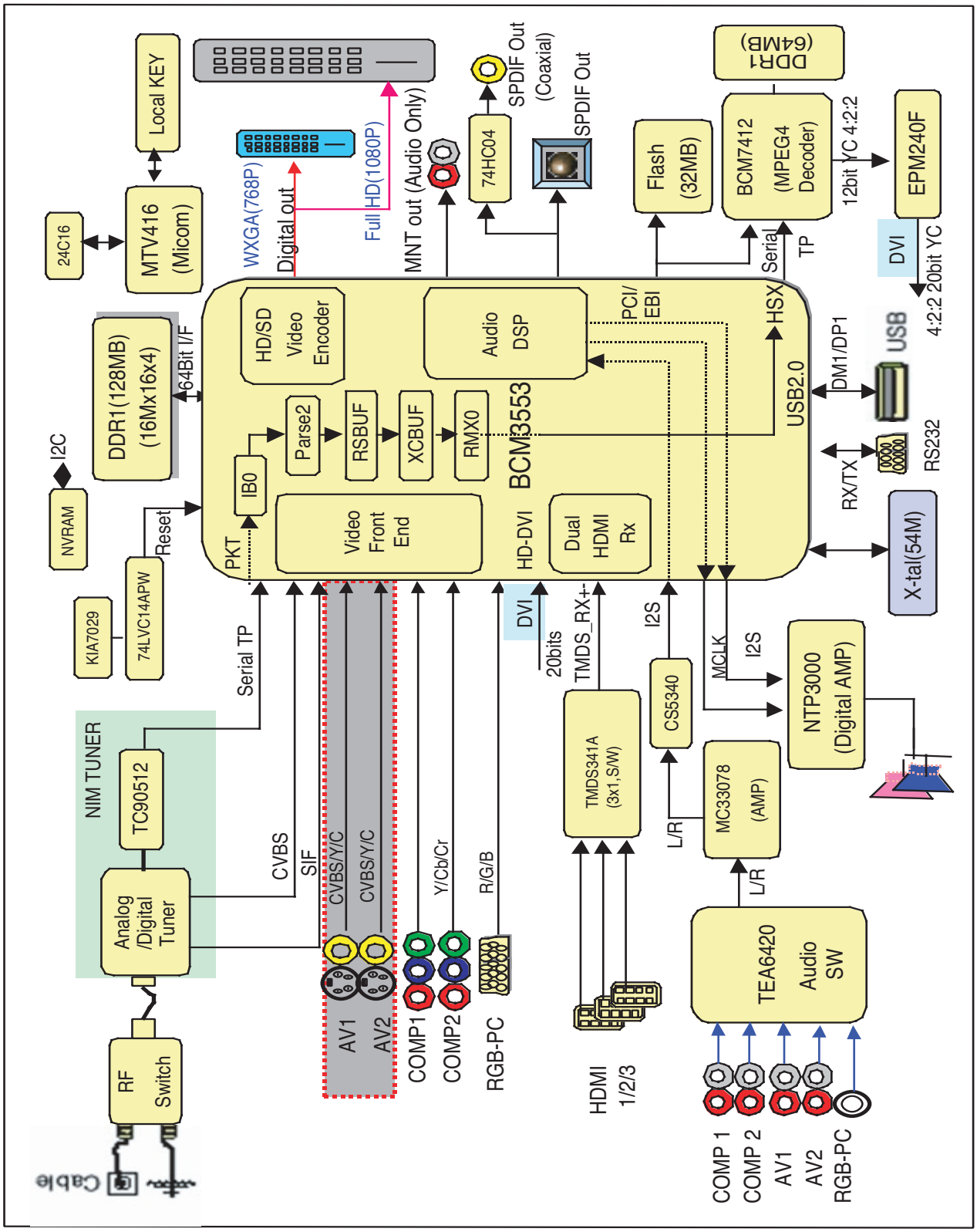
6.2 Troubleshooting



TROUBLESHOOTING

7. AV Video

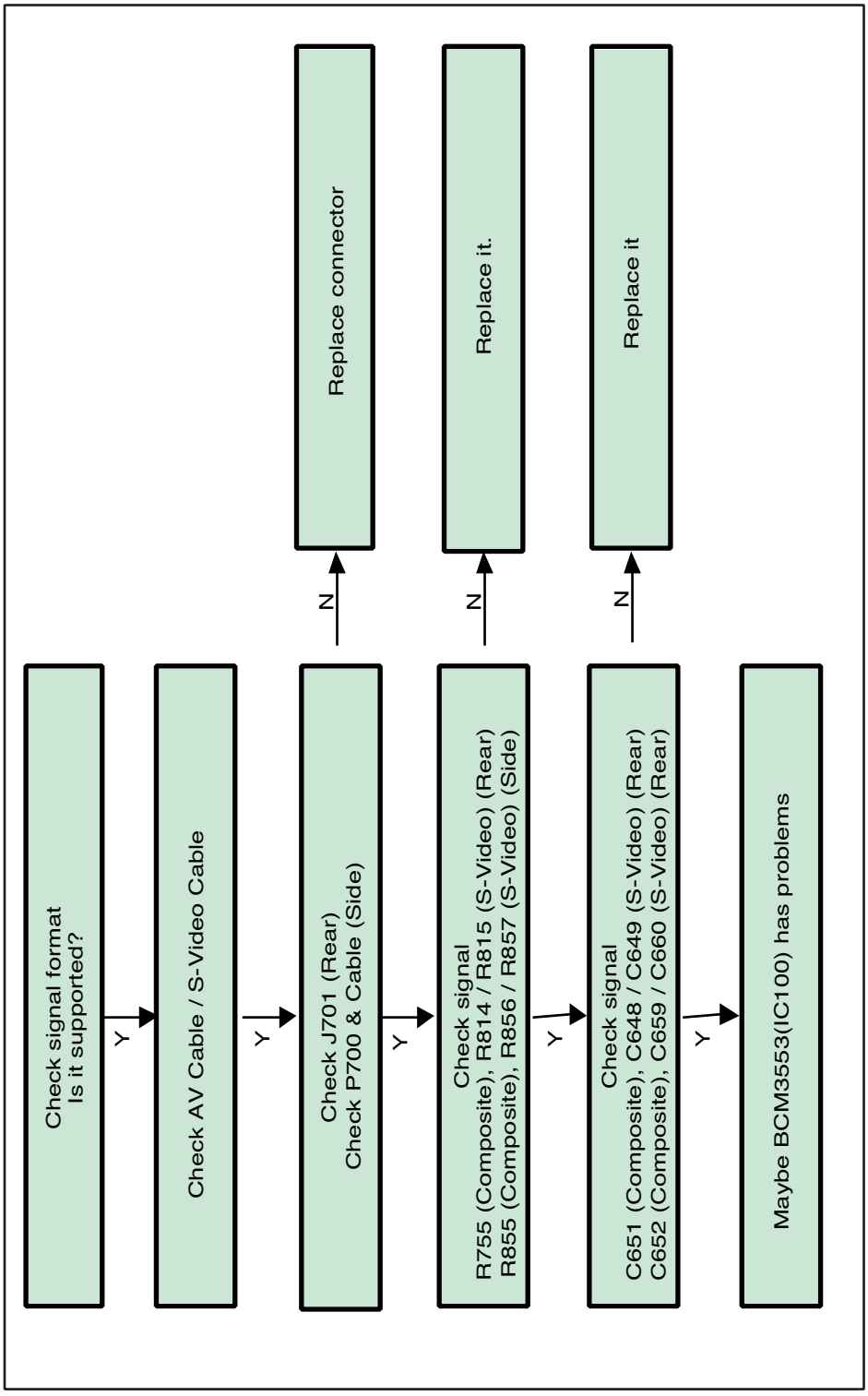
7-1. Block Diagram of Troubleshooting



TROUBLESHOOTING

7. AV Video

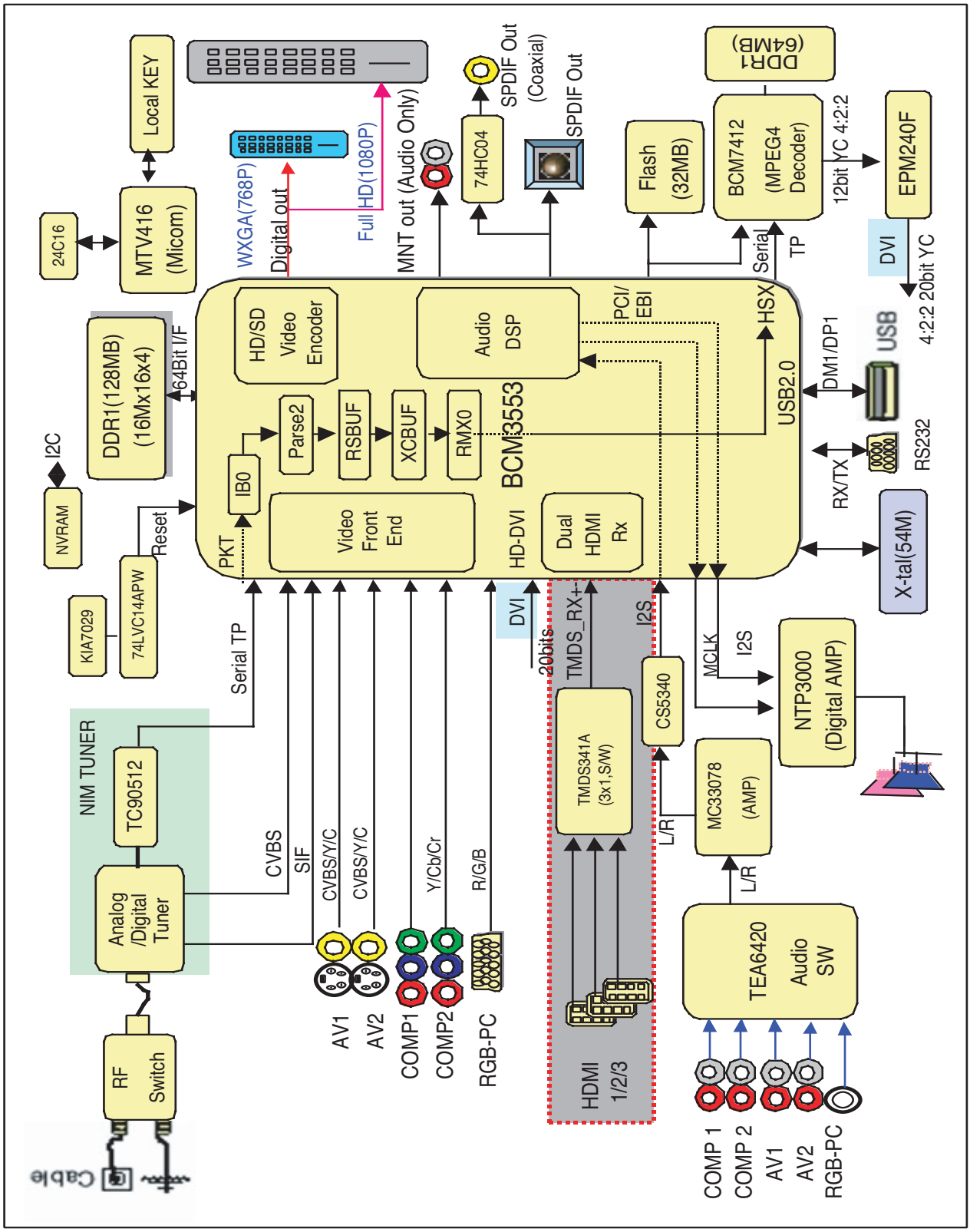
7-2. Troubleshooting



TROUBLESHOOTING

8. HDMI Video

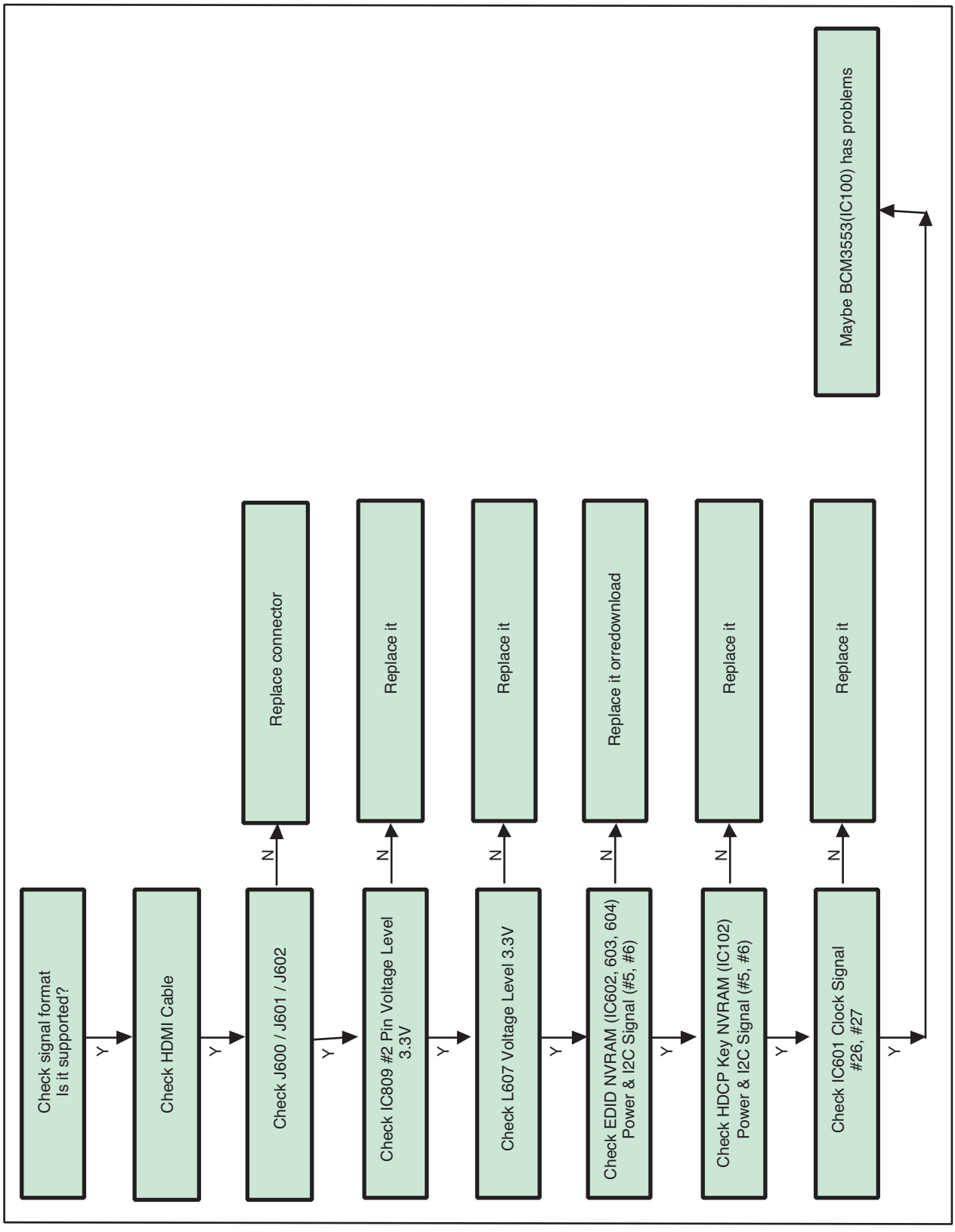
8-1. Block Diagram of Troubleshooting



TROUBLESHOOTING

8. HDMI Video

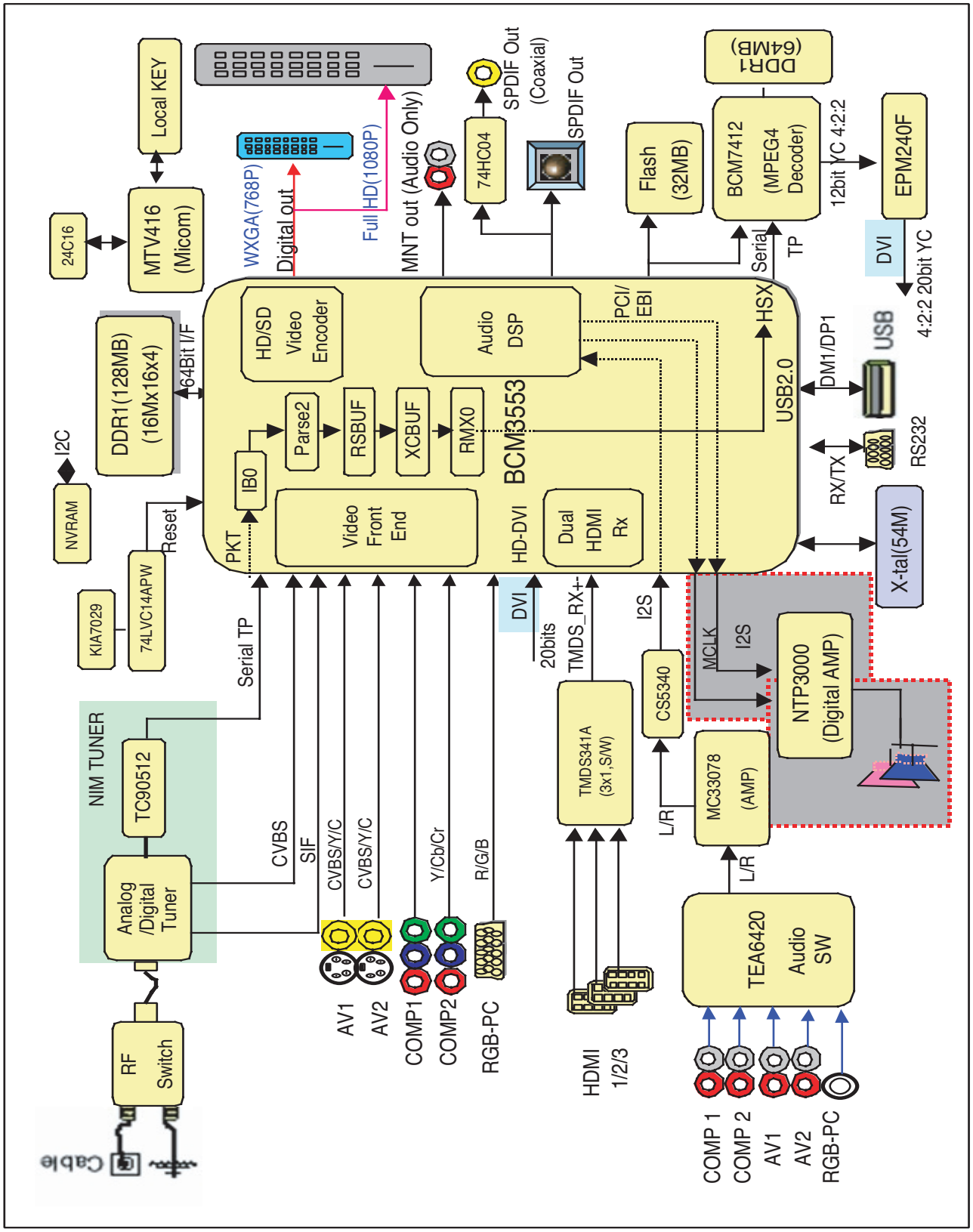
8-2. Troubleshooting



TROUBLESHOOTING

9. All Source Audio

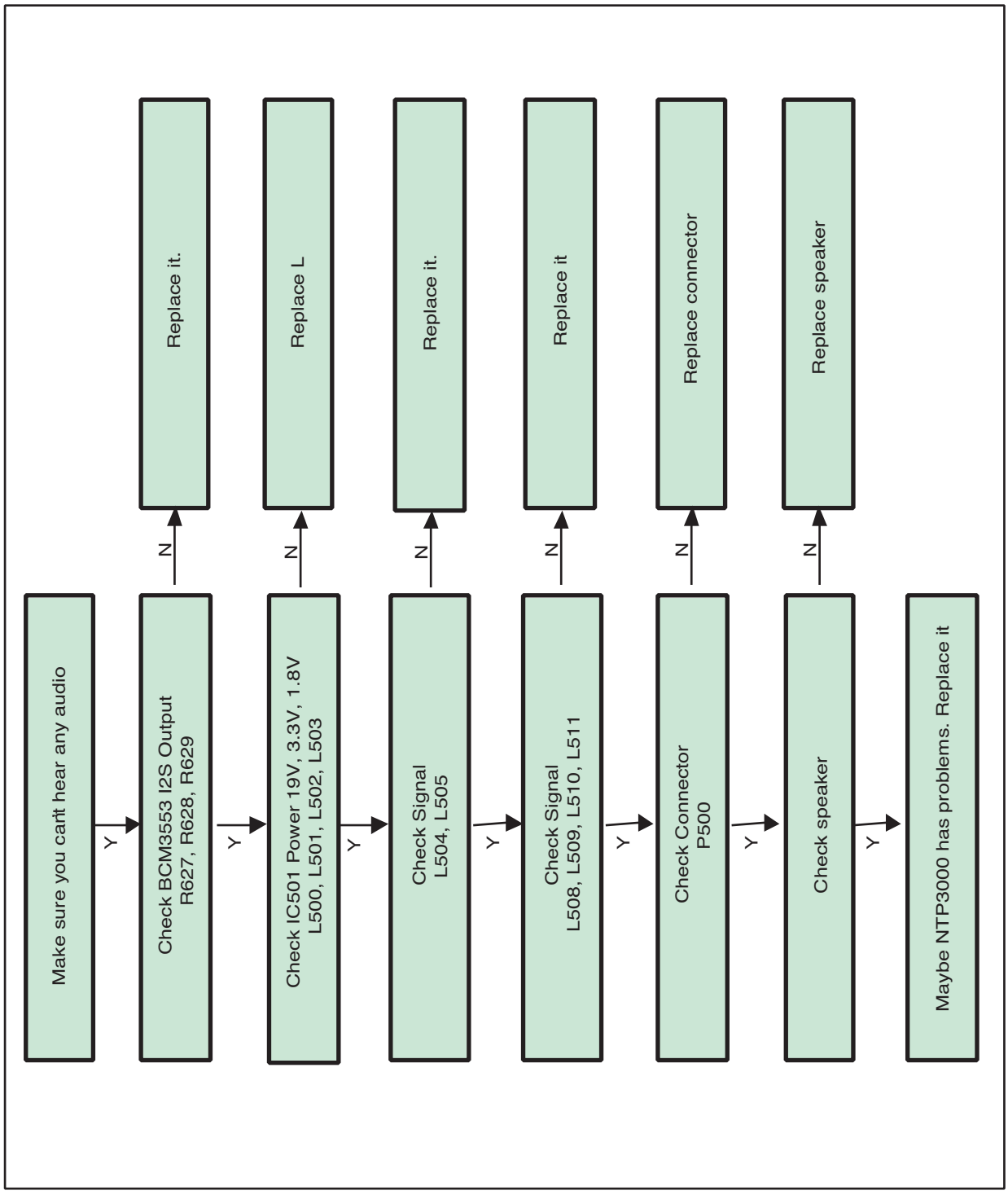
9-1. Block Diagram of Troubleshooting



TROUBLESHOOTING

9. All Source Video

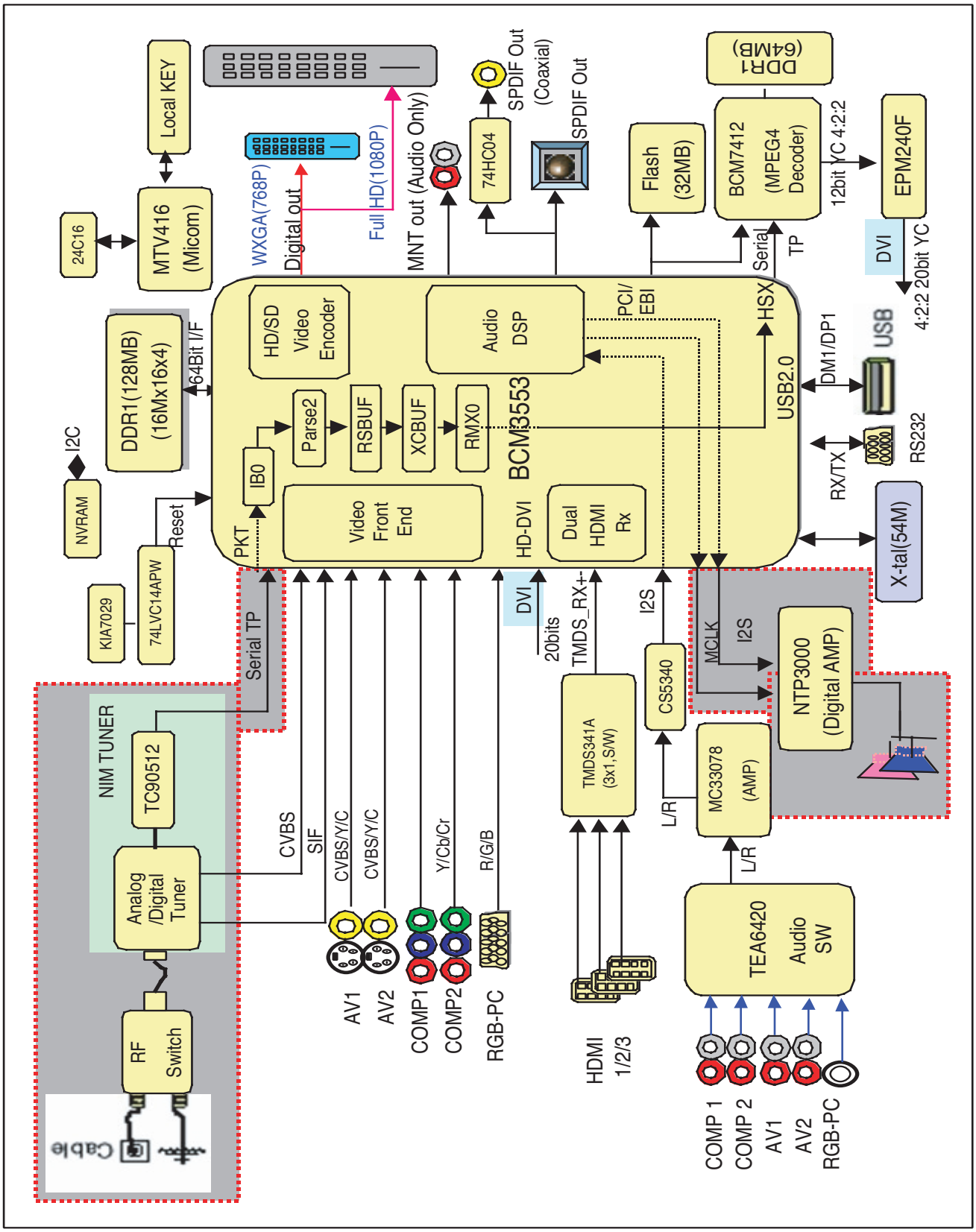
9-2. Troubleshooting



TROUBLESHOOTING

10. Digital TV Audio

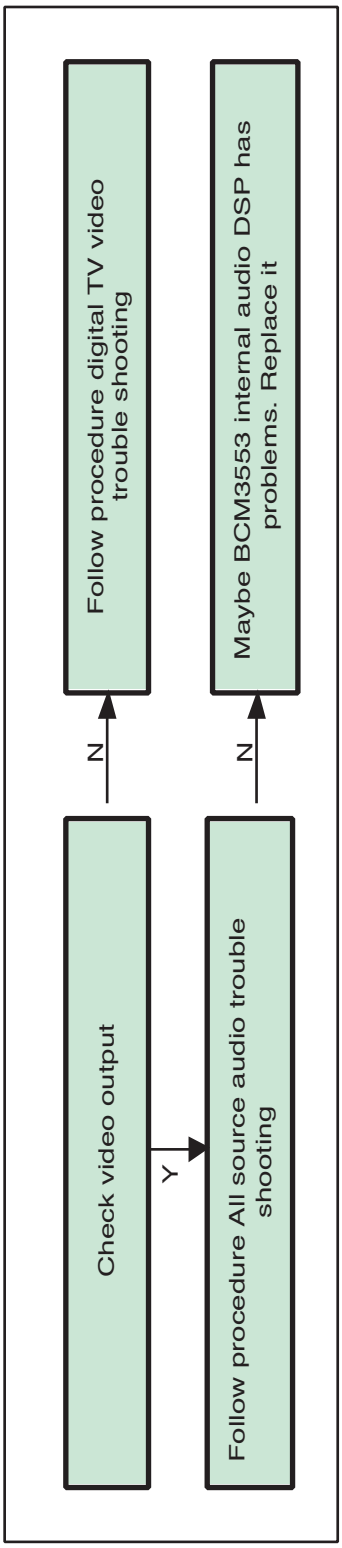
10-1. Block Diagram of Troubleshooting



TROUBLESHOOTING

10. Digital TV Audio

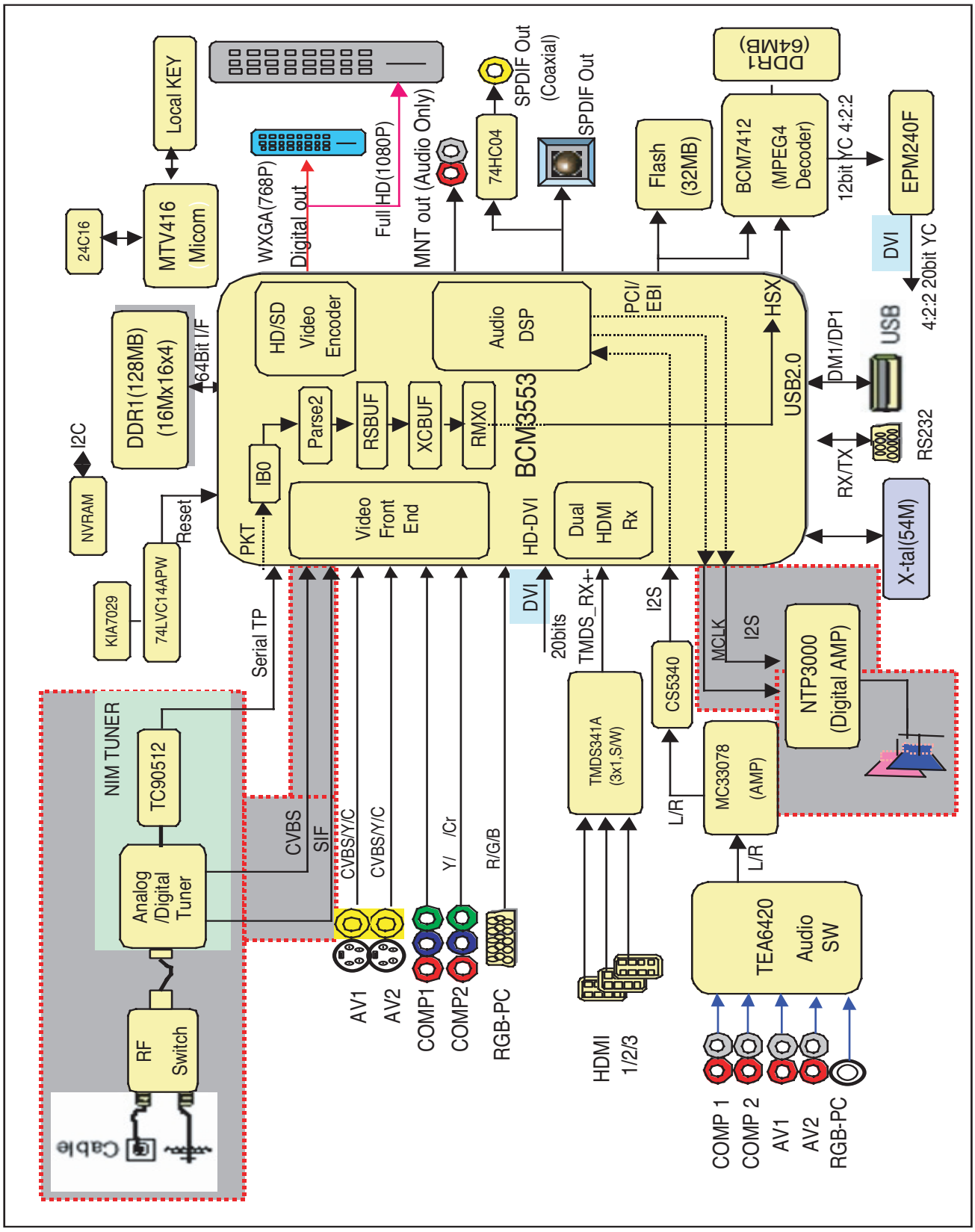
10-2. Troubleshooting



TROUBLESHOOTING

11. Analog TV Audio

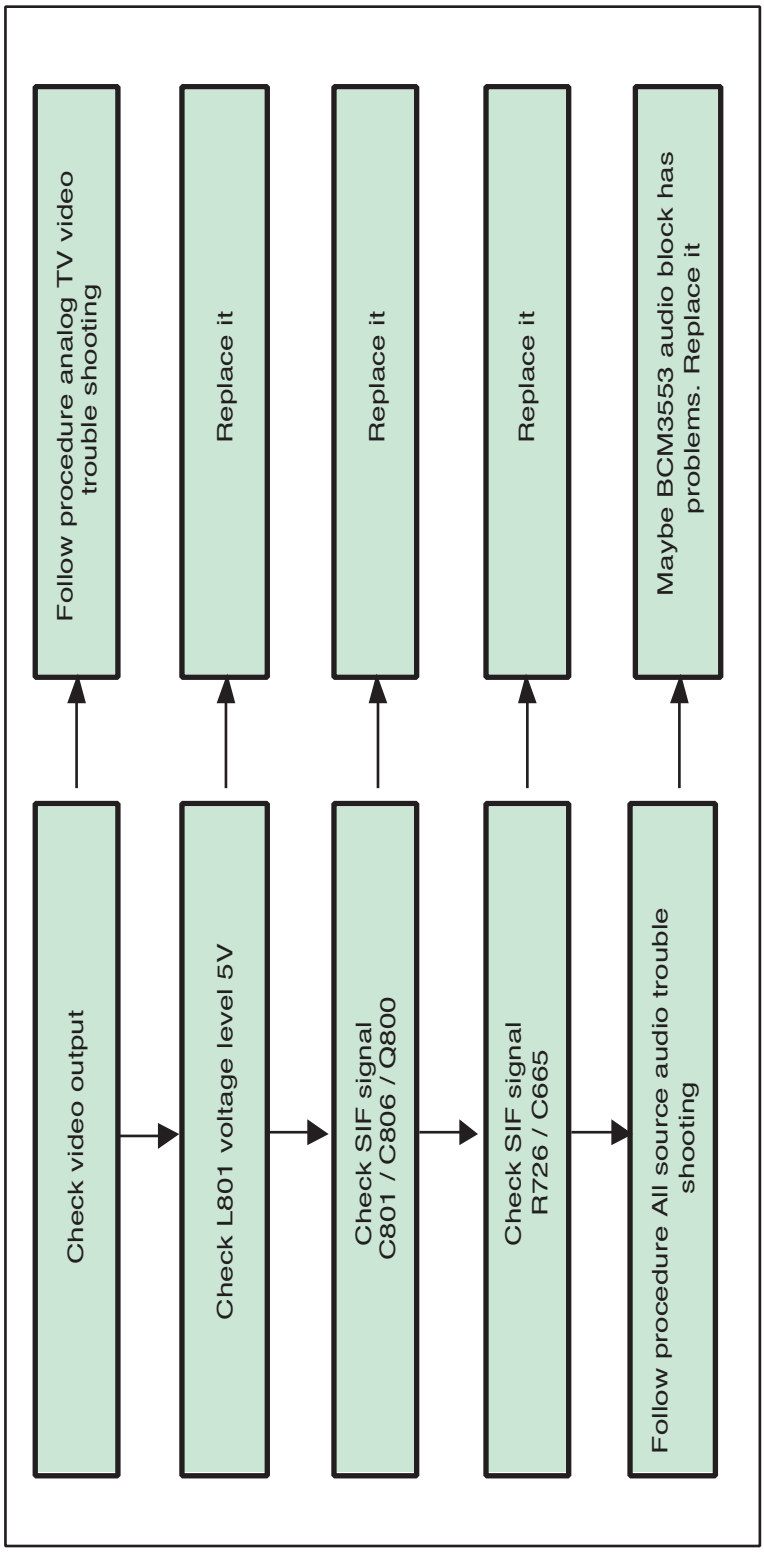
11-1. Block Diagram of Troubleshooting



TROUBLESHOOTING

11. Analog TV Video

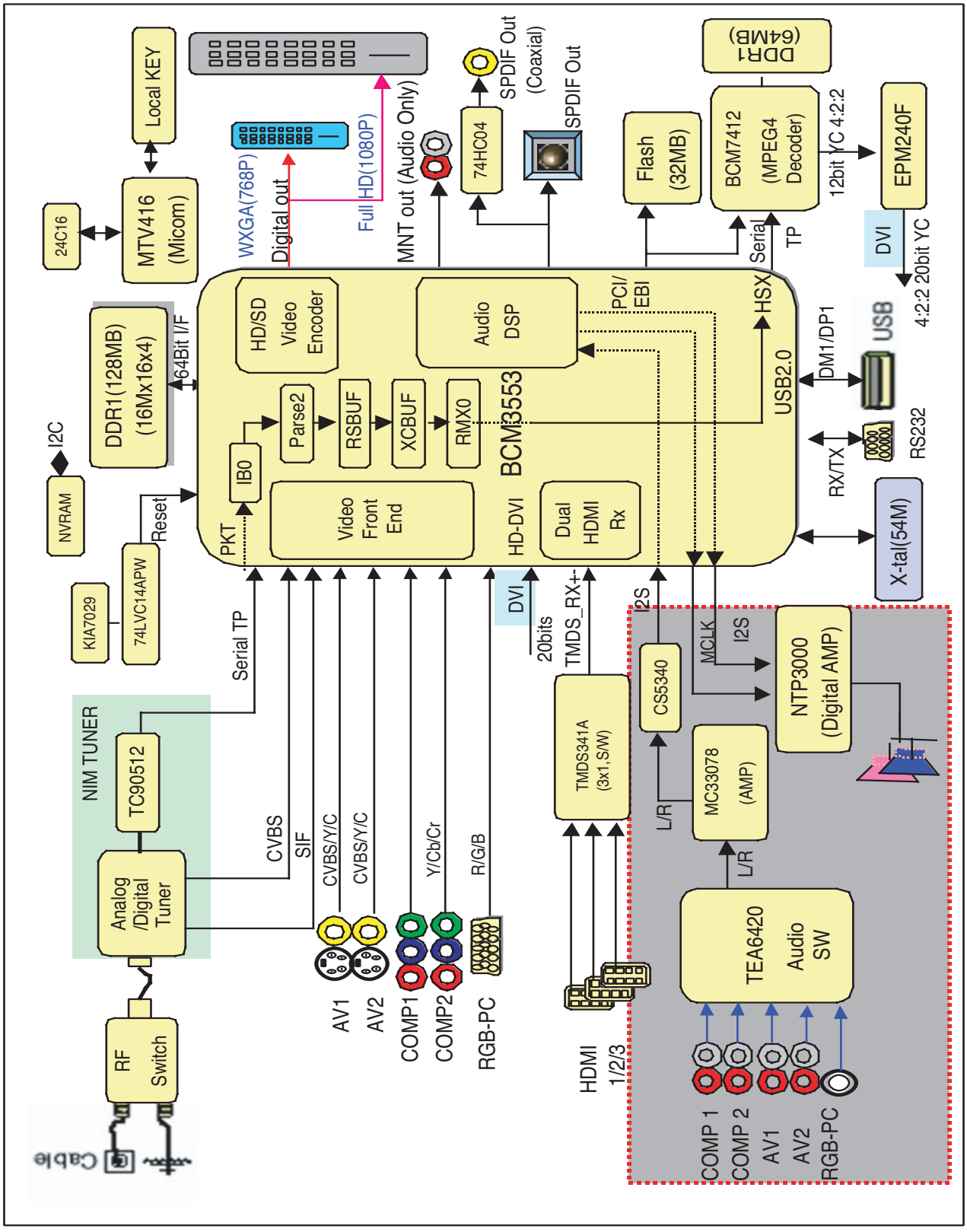
11-2. Troubleshooting



TROUBLESHOOTING

12. Component / RGB / AV Audio

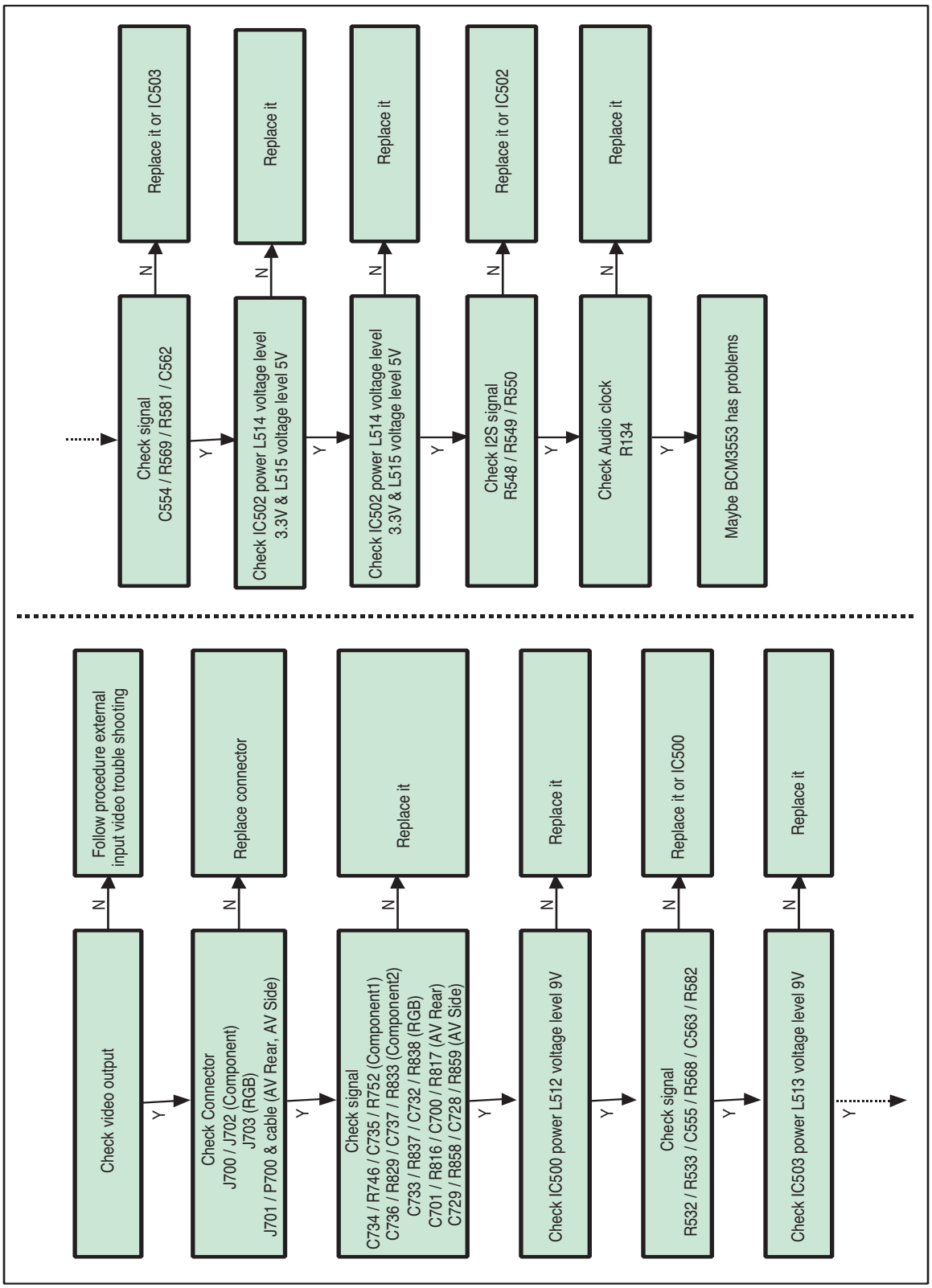
12-1. Block Diagram of Troubleshooting



TROUBLESHOOTING

12. Component / RGB / AV Audio

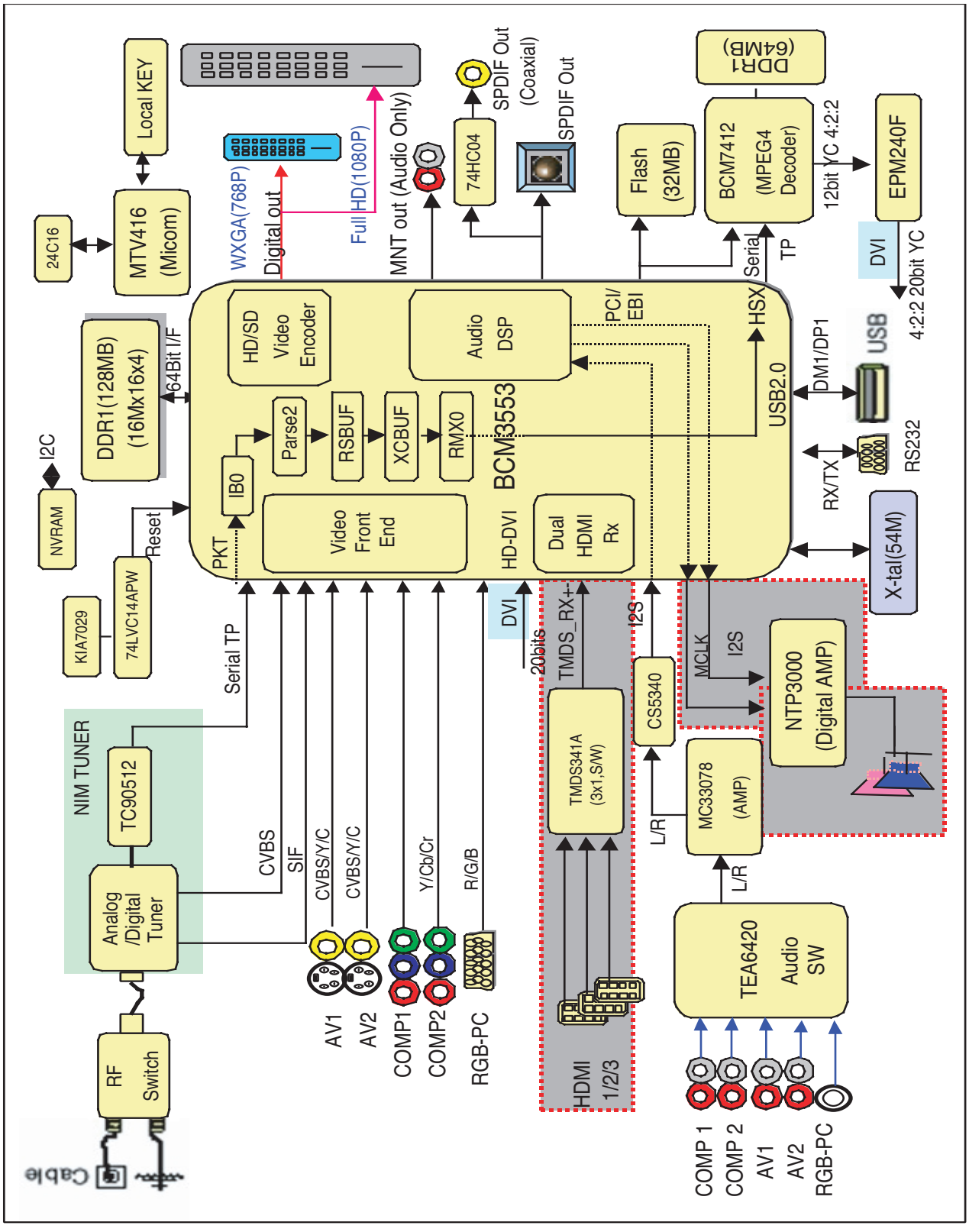
12-2. Troubleshooting



TROUBLESHOOTING

13. HDMI Audiol

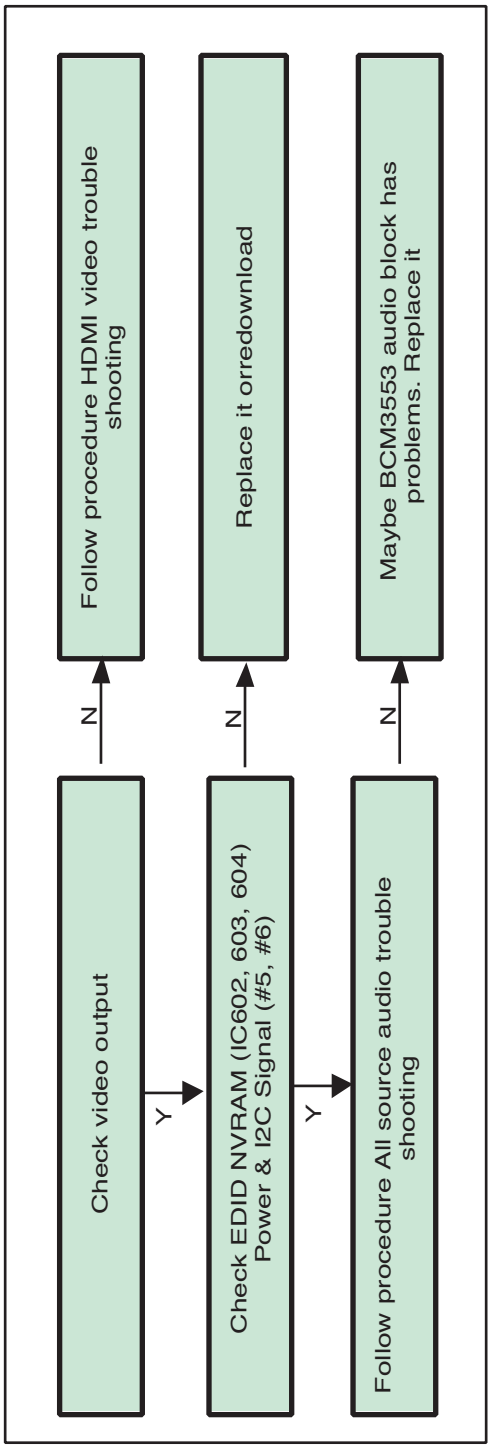
13-1 Block Diagram of Troubleshooting



TROUBLESHOOTING

13. HDMI Audio

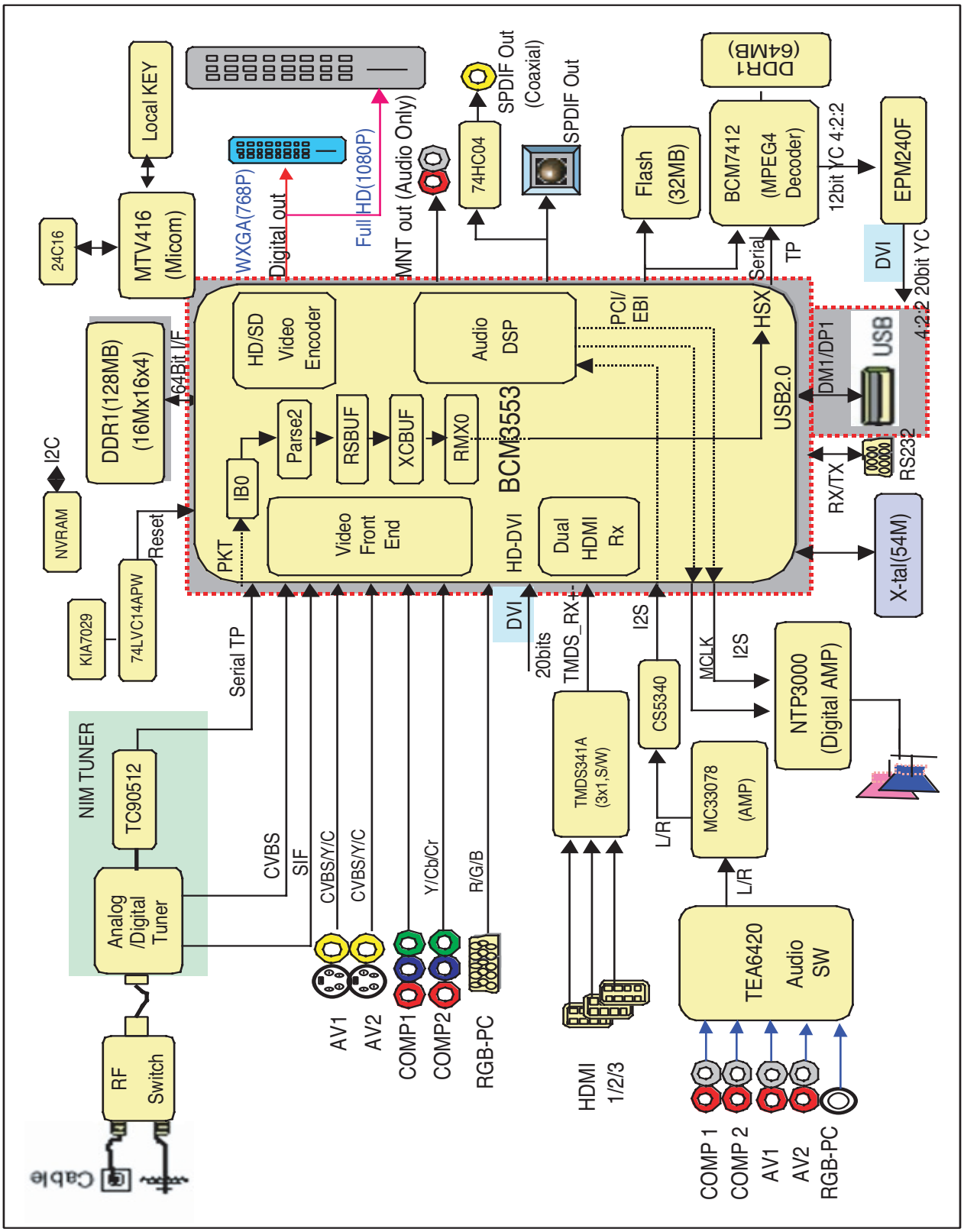
13-2. Troubleshooting



TROUBLESHOOTING

14. USB

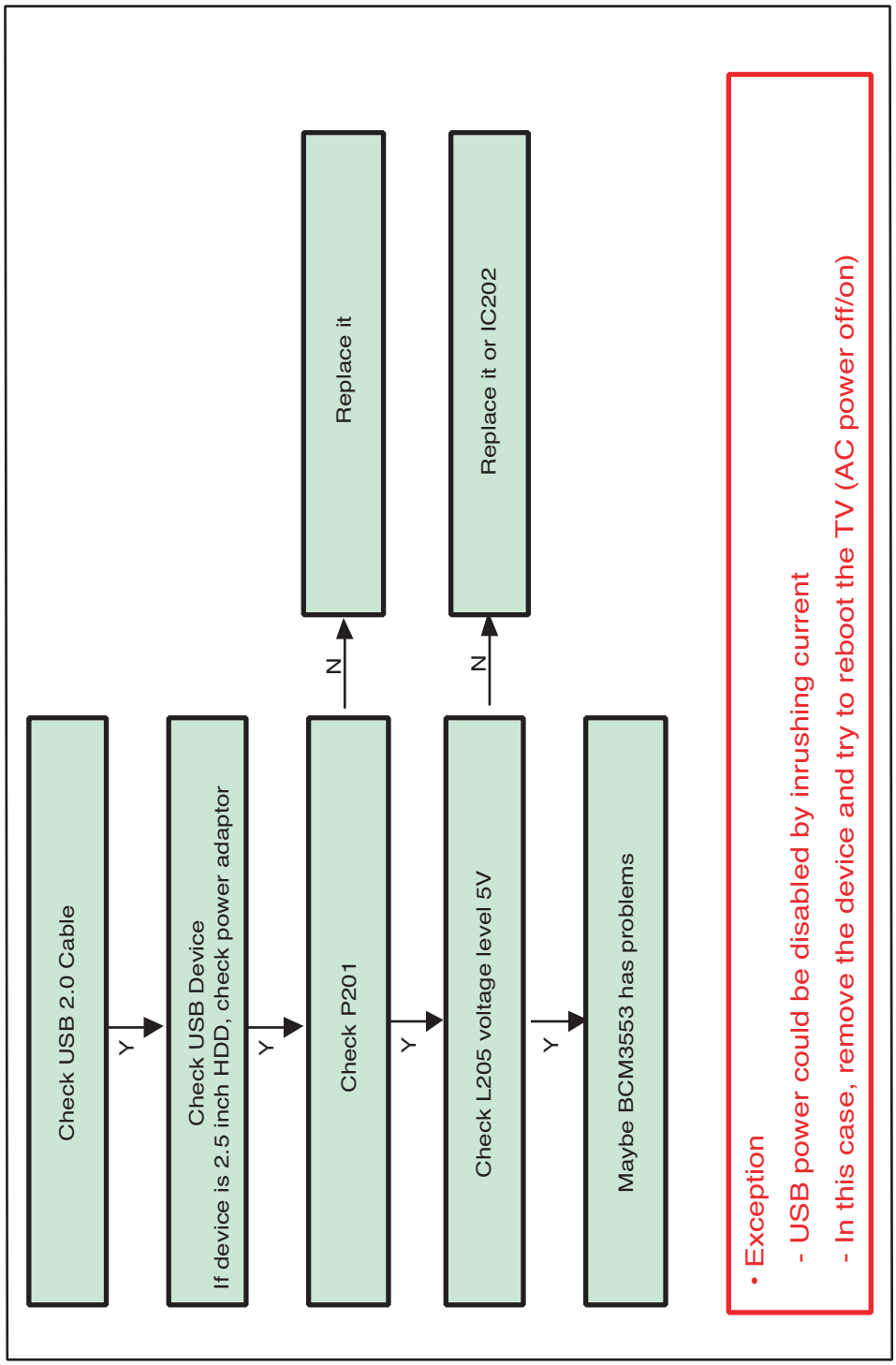
14-1. Block Diagram of Troubleshooting



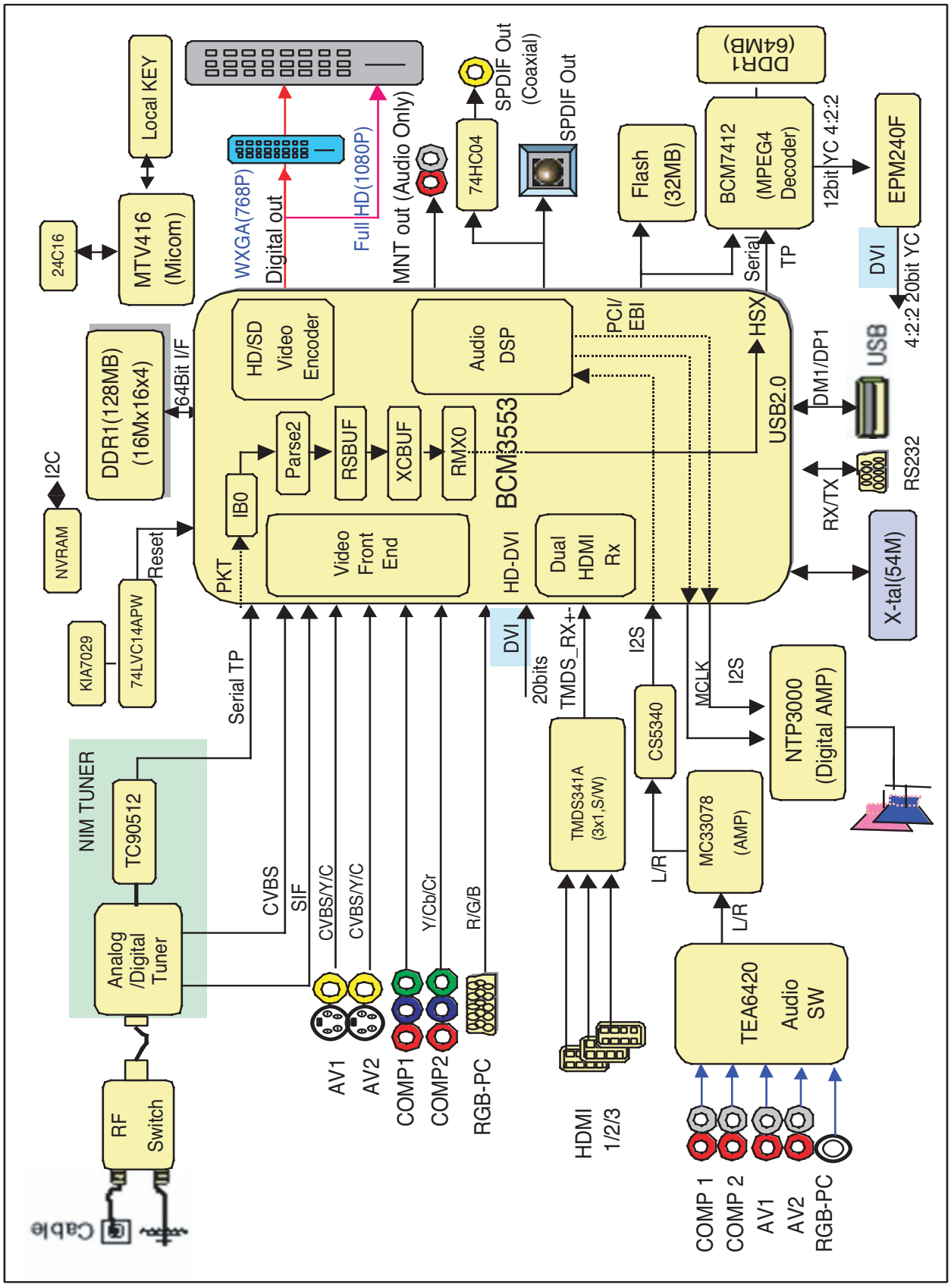
TROUBLESHOOTING

14. USB

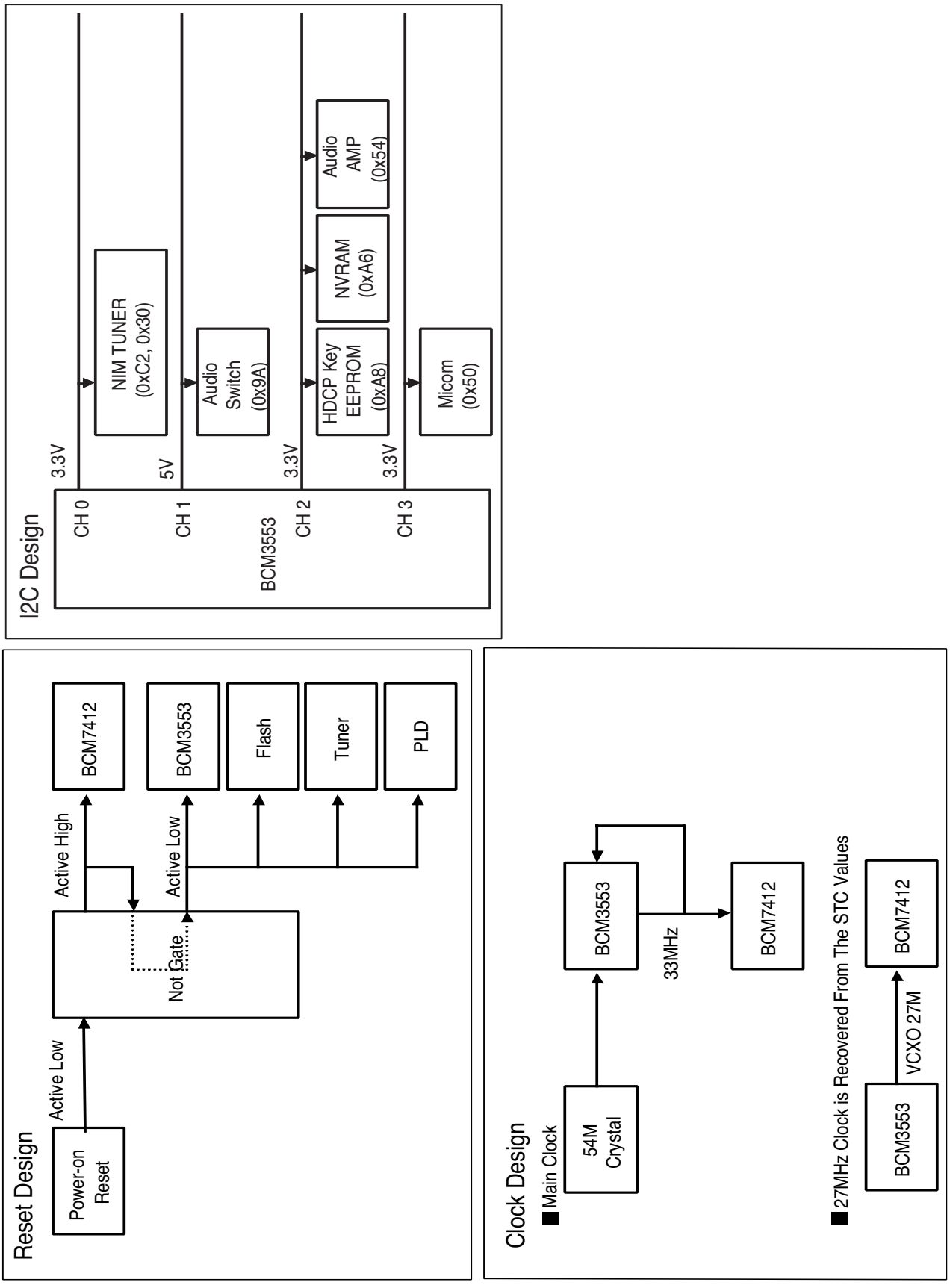
14-2. Troubleshooting



BLOCK DIAGRAM



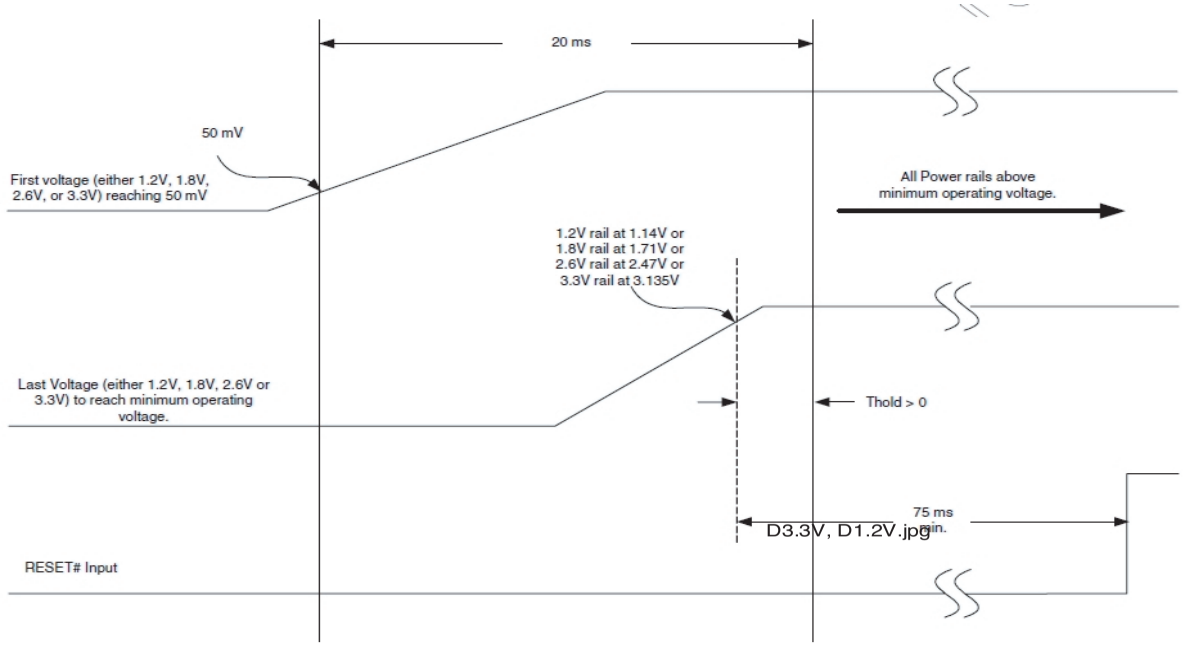
BLOCK DIAGRAM



Power-Up Sequence

■ BCM3553

- A Controlled power-up sequence is necessary to establish the two core voltages before the pad voltage is applied



■ BCM7412

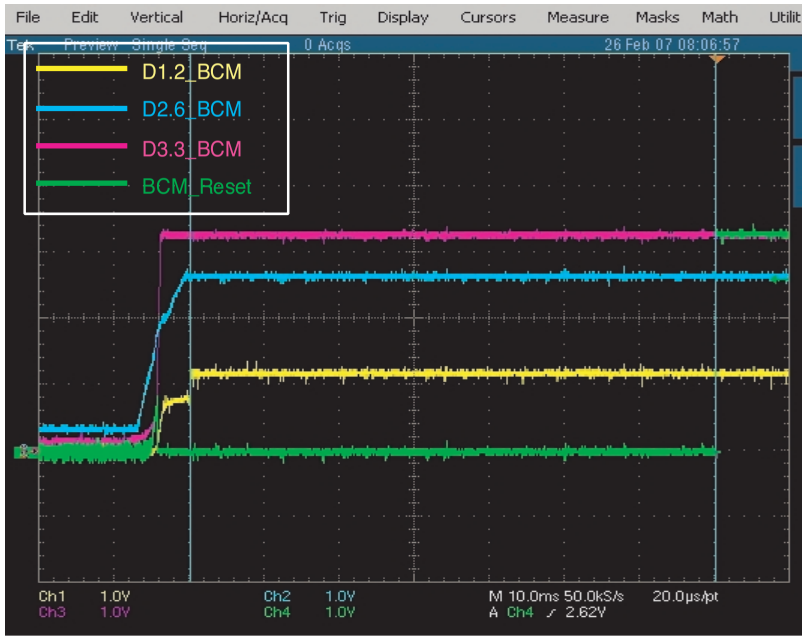
- Recommends the following power-up sequence: 1.2V -> 2.5V -> 3.3V
- Recommends no more than 5ms between different supplies
  All Voltages should regulate at their nominal output voltages no later than 10ms

■ So, Power-up is Controlled by Micom

- These 3 voltages should ramp up within 20ms total in any order, no sequence required, supplying
- 1.2V/2.6V/3.3V simultaneously is meet our requirement too.

Power-Up Sequence

1) Power Sequence measurement waveform



2) Result

- Initially 1.2V, 2.6V, 3.3V ramp up in 10ms.(Spec. : within 20ms)
- Actually Reset time is approximately 100ms(considering the variation of R, C) after power on.(Spec. : after 75ms)

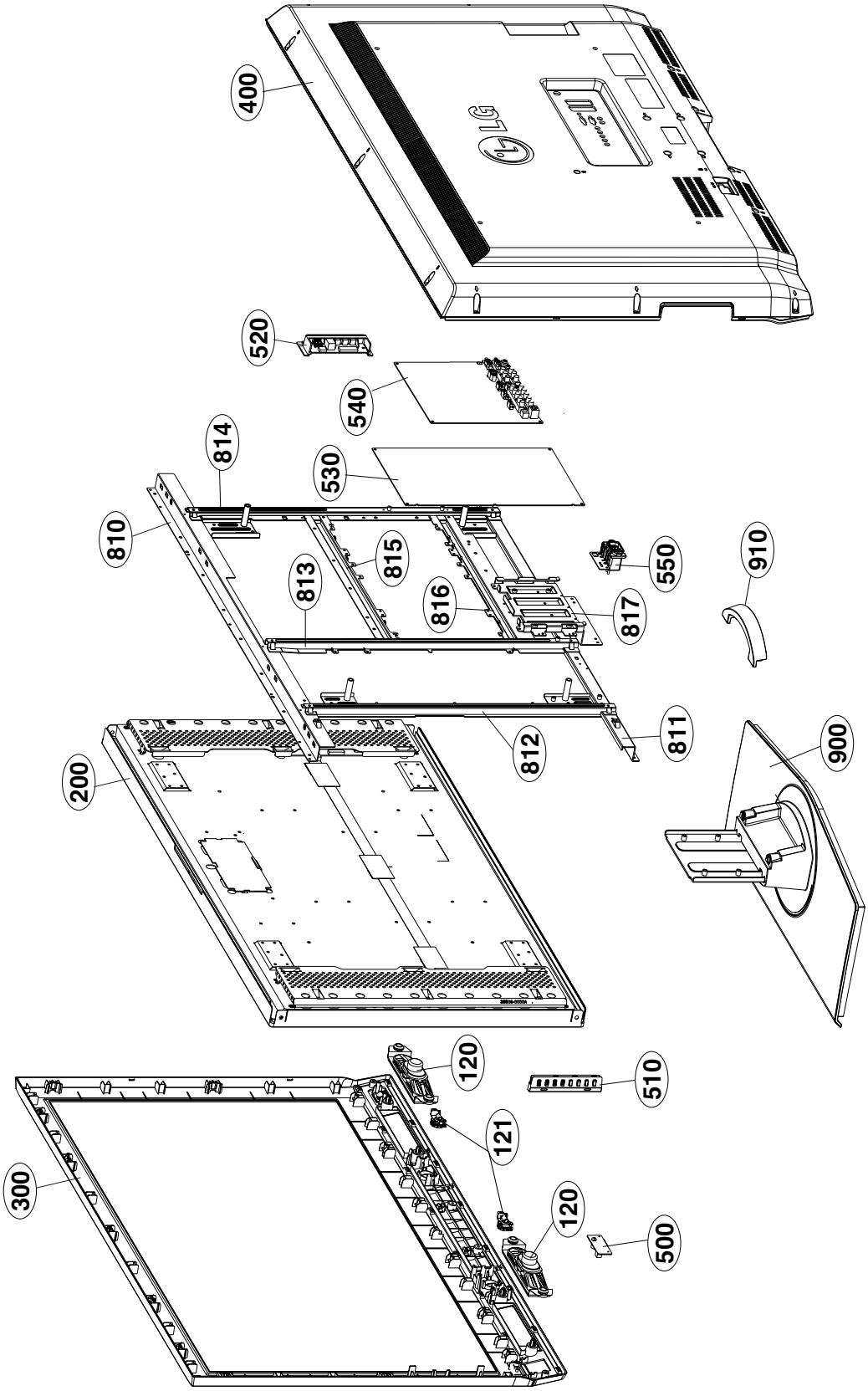
BLOCK DIAGRAM

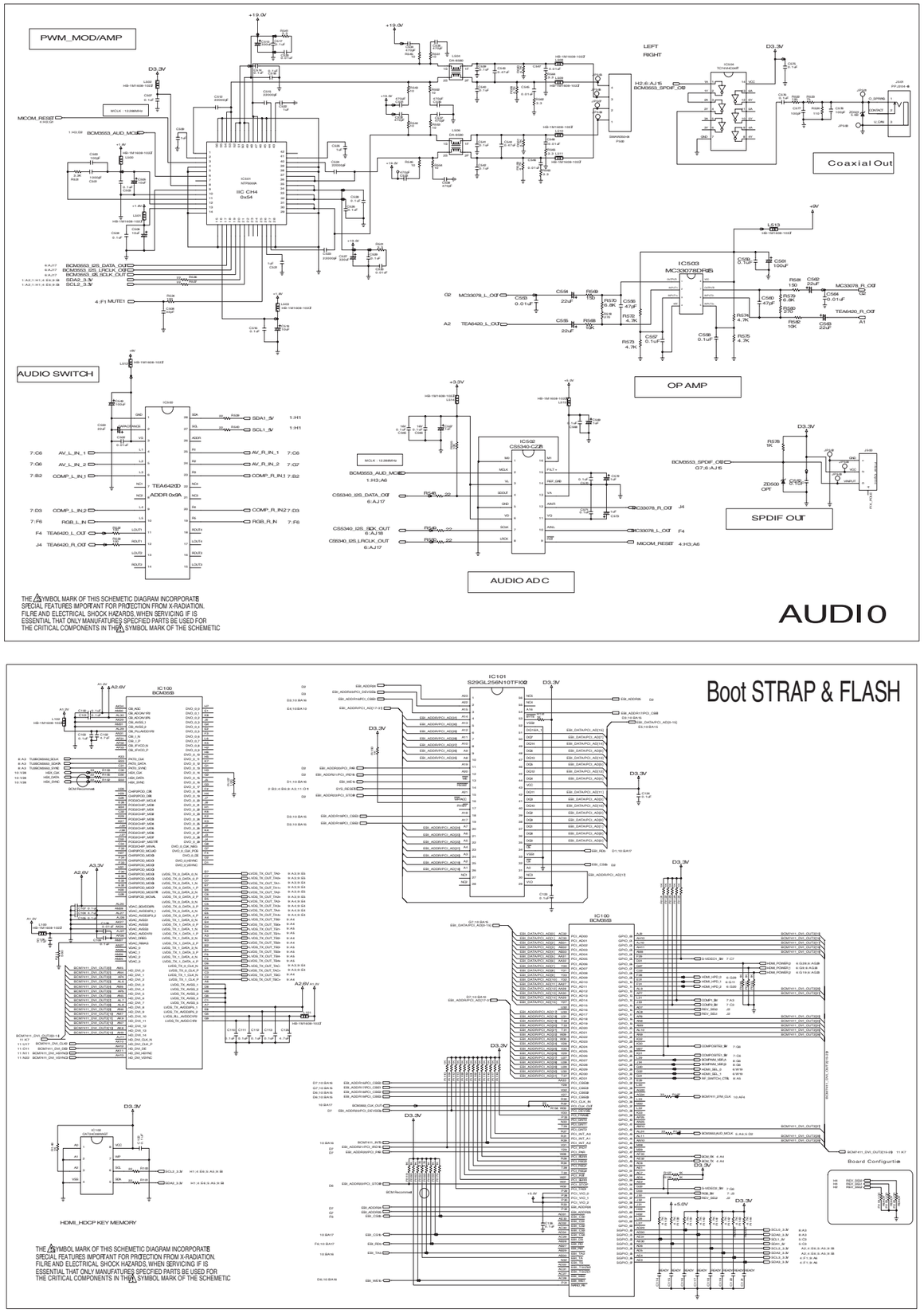
GPIO Structure

GPIO	Signal Name	Direction	Description
5	S-VIDEO1_SW	Input	S-Video 1 Auto Detect
6	HDMI_POWER_0	Input	HDMI 0 Power Detect
7	HDMI_POWER_1	Input	HDMI 1 Power Detect
8	HDMI_POWER_2	Input	HDMI 2 Power Detect
9	HDMI_HPD_0	Output	HDMI 0 Hot Plug Detect
10	HDMI_HPD_1	Output	HDMI 1 Hot Plug Detect
11	HDMI_HPD_2	Output	HDMI 2 Hot Plug Detect
14	COMP1_SW	Input	Component 1 Auto Detect
15	COMP2_SW	Input	Component 2 Auto Detect
16	REV_SEL0	Input	Board Revision 0
17	REV_SEL1	Input	Board Revision 1
23			Reserved
24	COMPOSITE2_SW	Input	Composite 2 Auto Detect
26	COMPOSITE1_SW	Input	Composite 1 Auto Detect
29	HDMI_SEL_0	Output	HDMI Source 0 Select
30	HDMI_SEL_1	Output	HDMI Source 1 Select
31	RF_SWITCH_CTRL	Output	RF Switch Control
38			Reserved
39			Reserved
40			Reserved
41			Reserved
55	S-VIDEO2_SW	Input	S-Video 2 Auto Detect
56	RGB_SW	Input	RGB Auto Detect
62	REV_SEL2	Input	Board Revision 2

MEMO

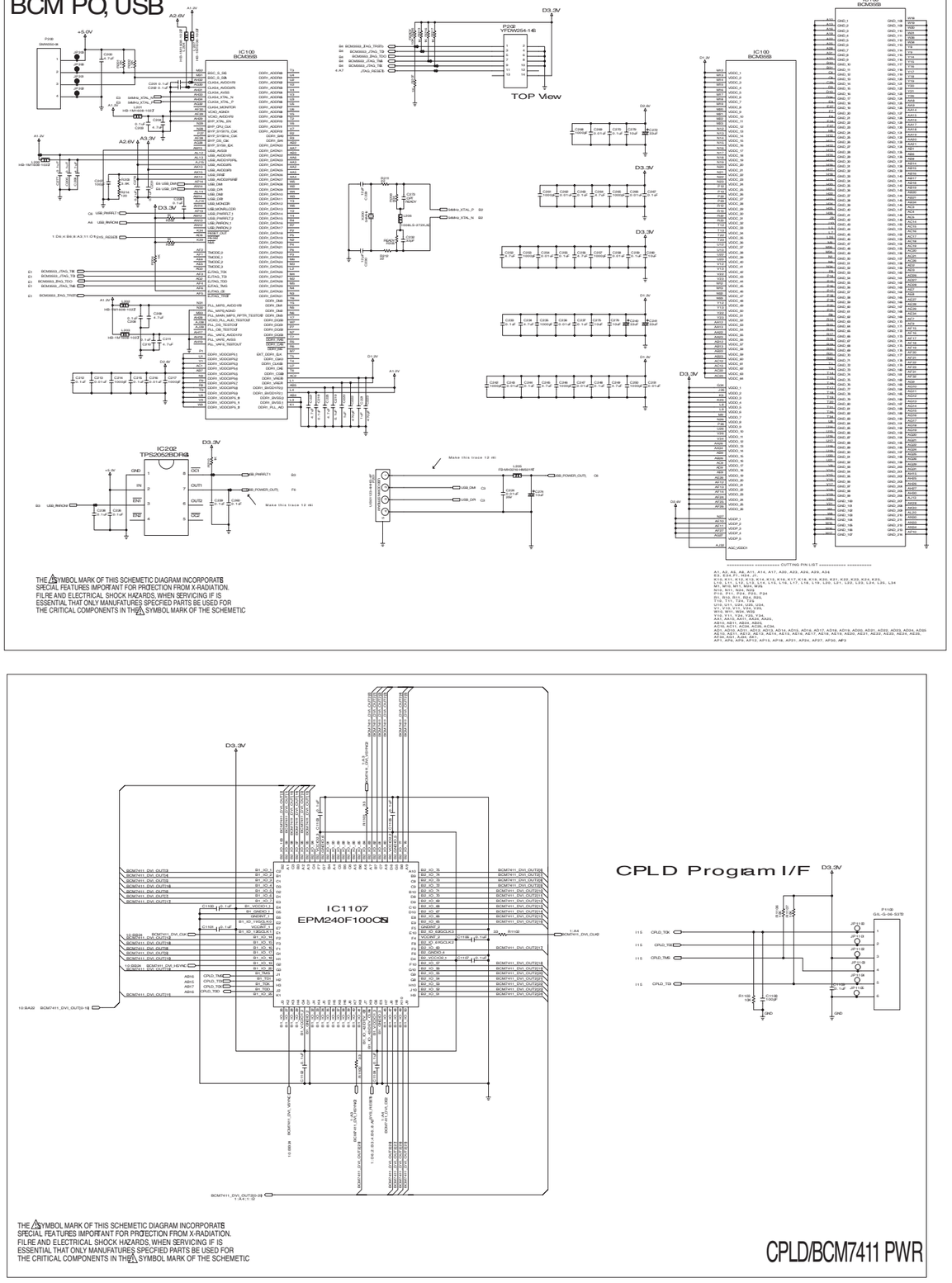
EXPLODED VIEW





THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROJECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC

BCM PO, USB

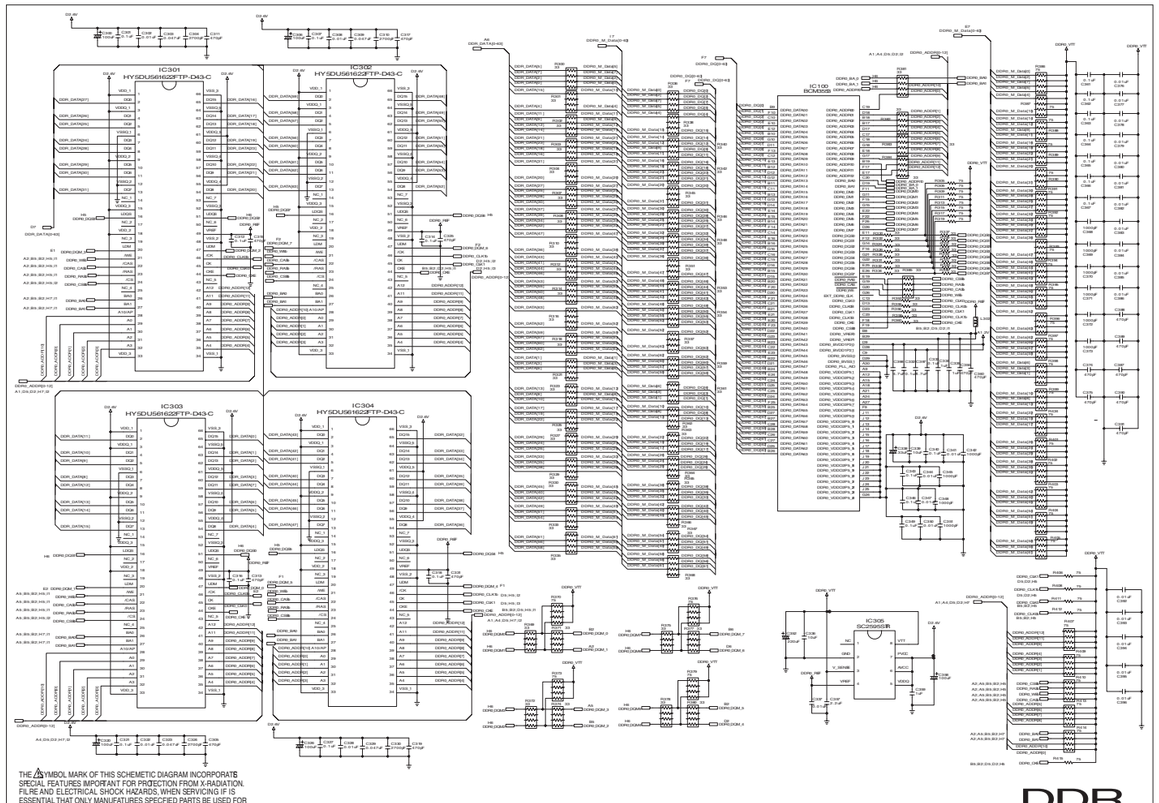


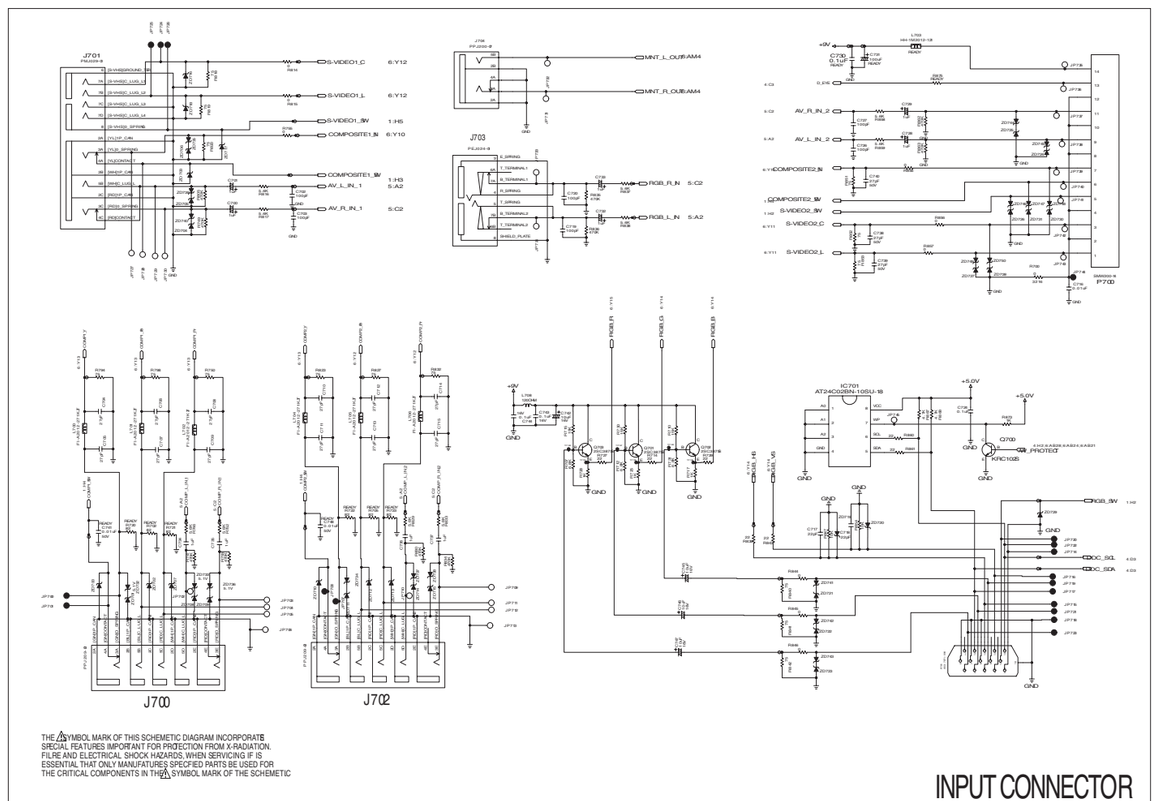
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROJECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC

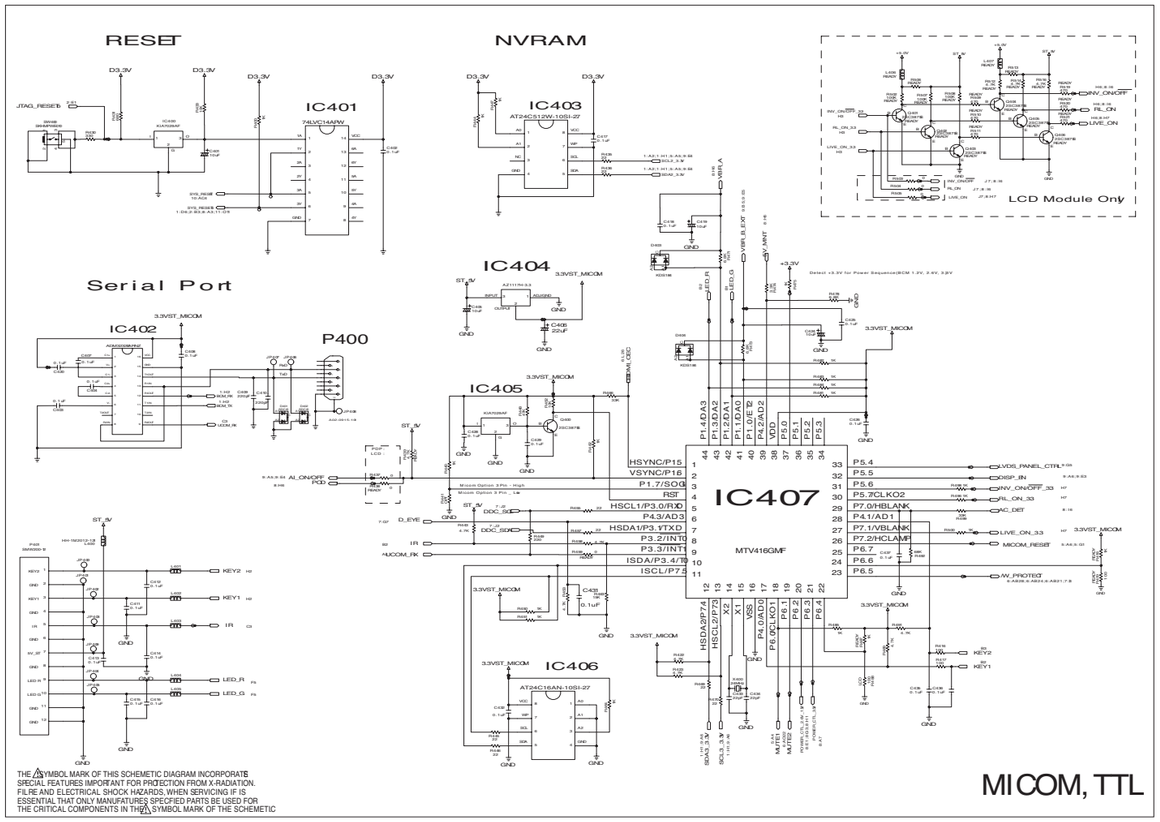
Boot STRAP & FLASH

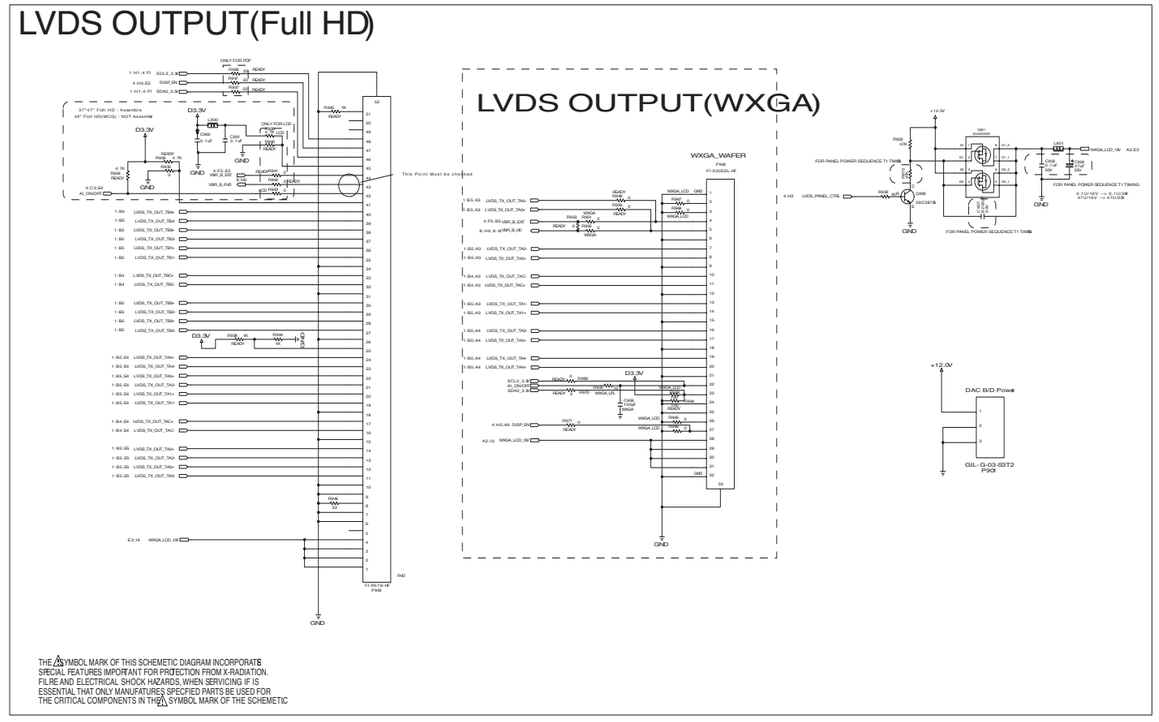
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROJECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC

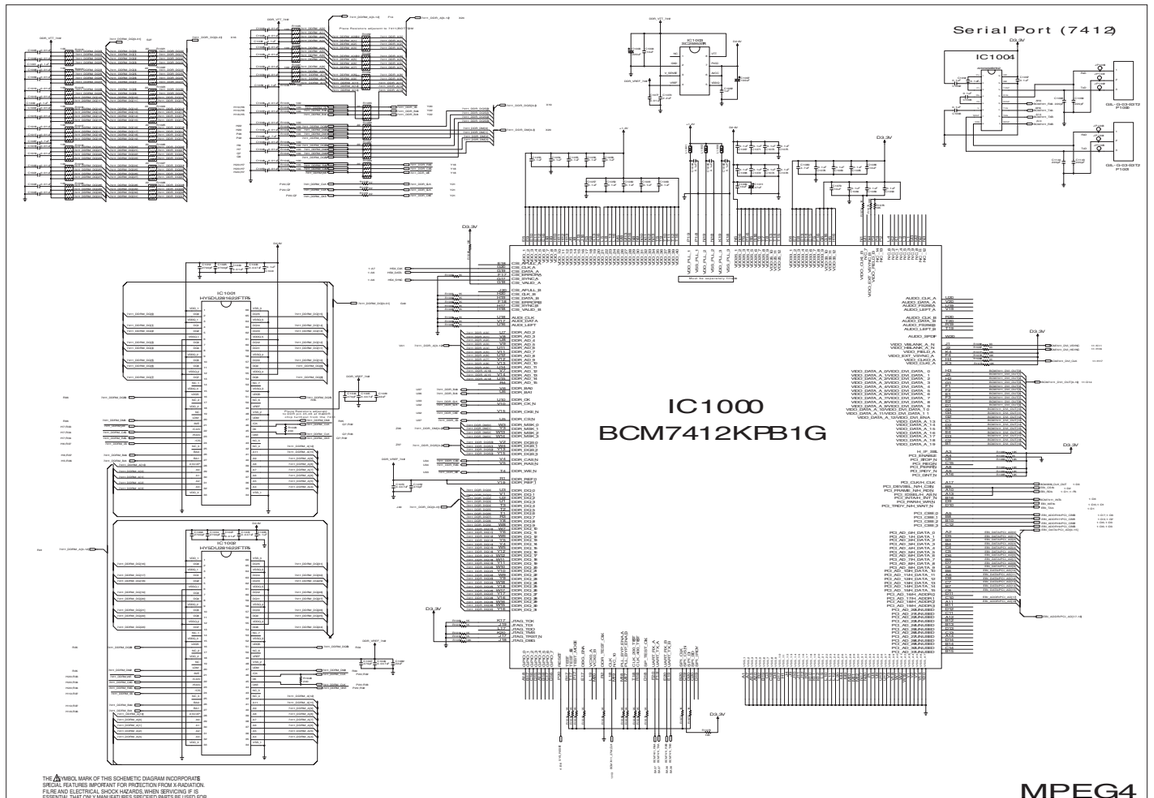
CPLD/BCM7411 PWR

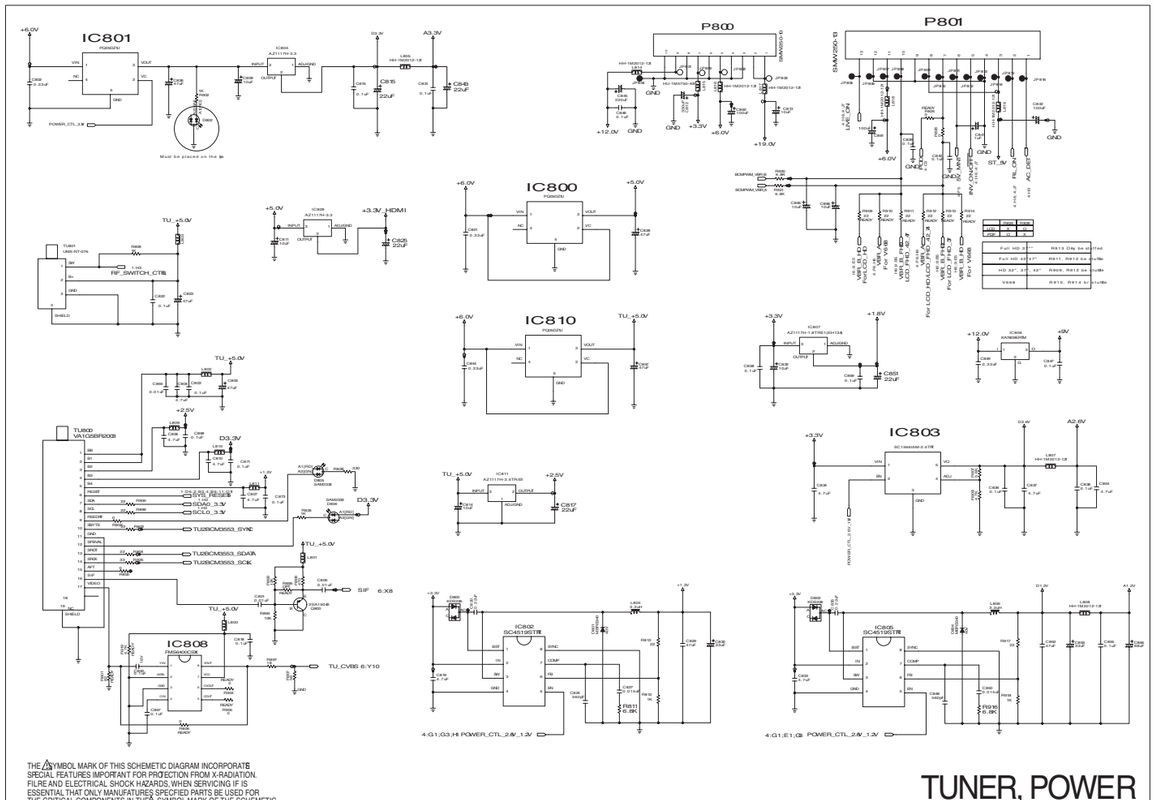


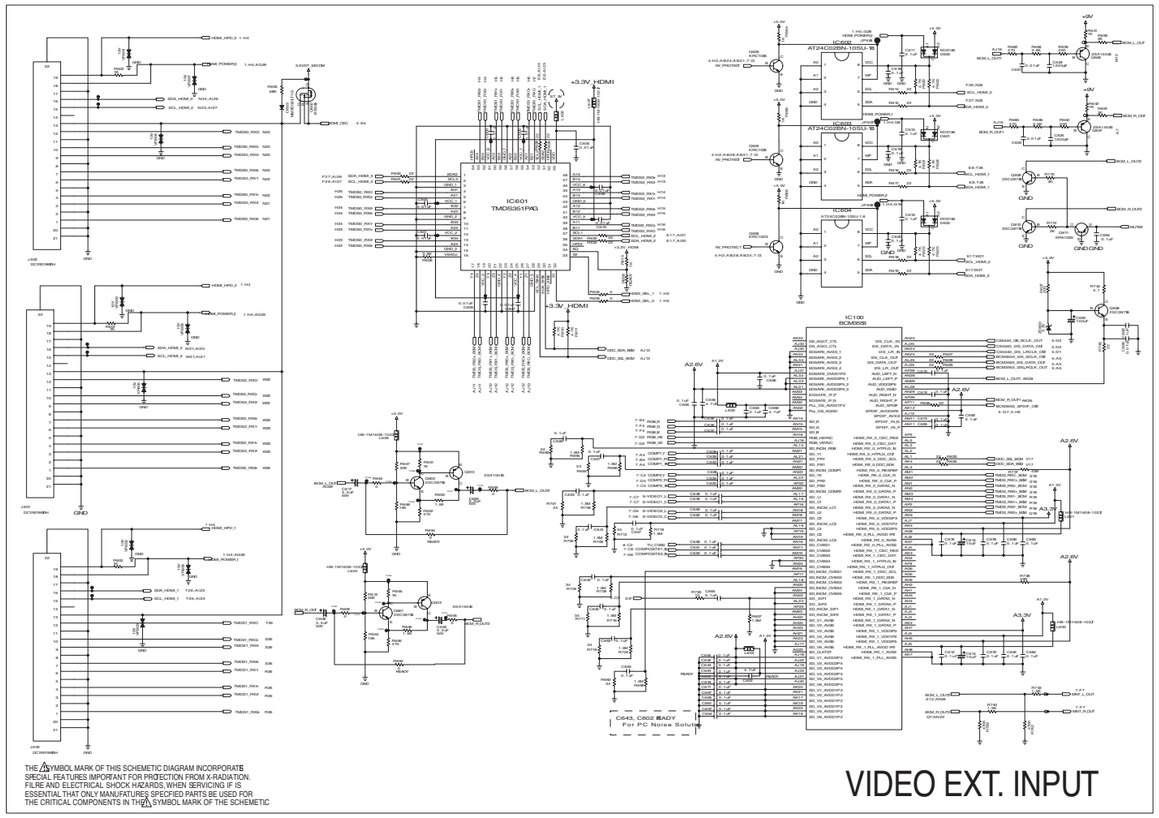






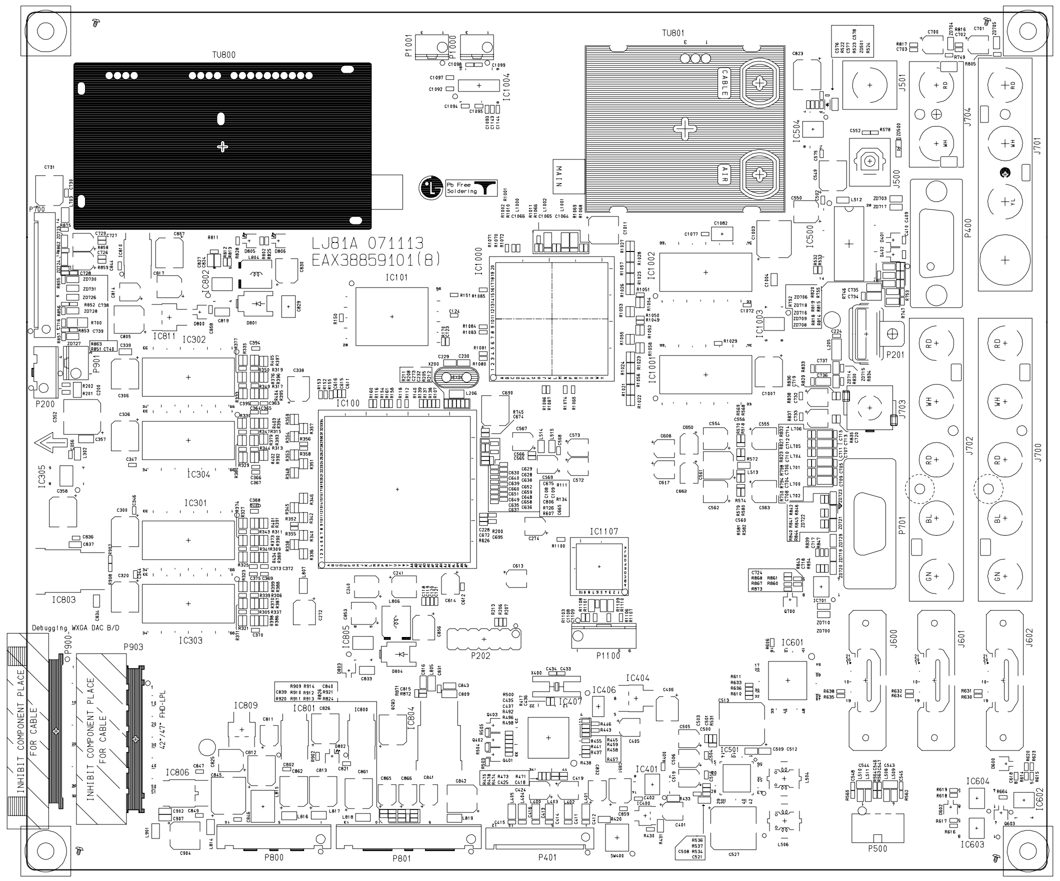




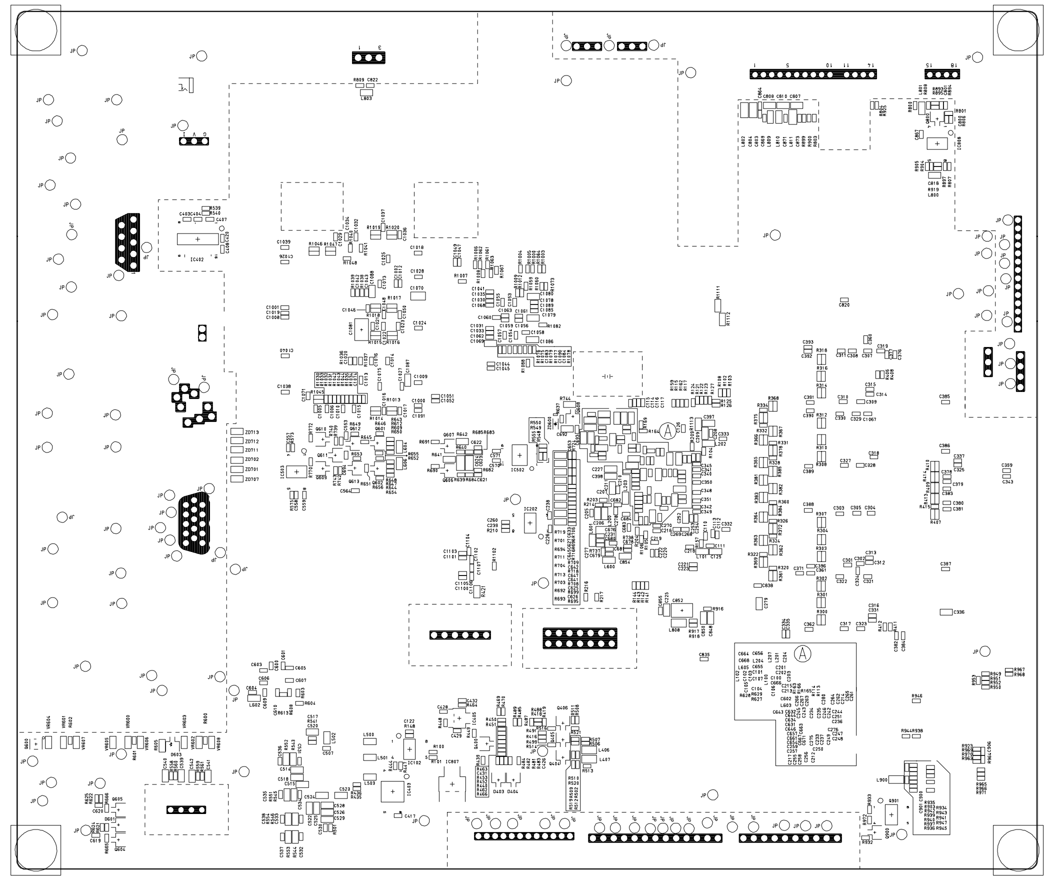


PRINTED CIRCUIT BOARD

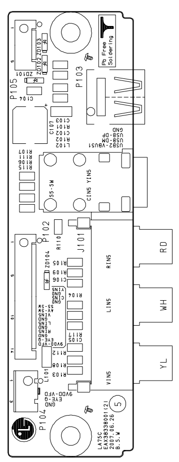
MAIN (TOP)



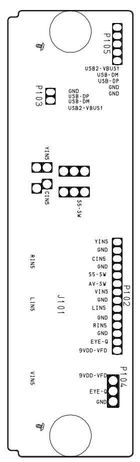
MAIN (BOTTOM)



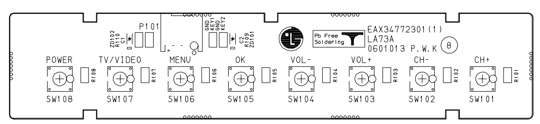
SIDE A/V (TOP)



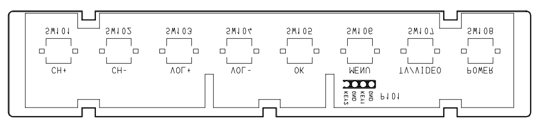
SIDE A/V (BOTTOM)



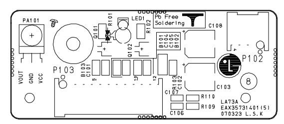
CONTROL B/D(TOP)



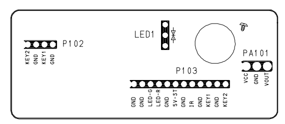
CONTROL B/D(BOTTOM)



IR/LED(TOP)



IR/LED(BOTTOM)



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