SyncMaster 320P (LBE32PS)

Training Manual

SAMSUNG ELECTRONICS CO.,LTD
Visual Display Division
LCD Monitor Group

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everyone's invited™

Overview

1. Background of Development

▶To introduce into airports, cinemas, and other public facilities, where PDPs are currently predominant

▶To create a new market using the advantages of LCD Monitors

▶To address standardization/officialization by enabling distribution to all regions of a single model having no local derivation

▶To expand the large LCD product market

Overview

2. Product Features

▶VMB (Vertical Marketing Business) Model

▶MFM ((Multi Function Monitor) :

Receives diverse support other than PC (DVI, AV, S- video, Component)

▶Response Time 8ms PVA adopted

▶Sound function reinforced by adopting Dolby Virtual, BBE

▶ Picture quality enhanced by adopting DNIe, Digital Noise Reduction

▶RS232 Remote Control (MDC software provided)

▶Video input: PC(D_SUB,DVI), BNC, DVI, Component, AV, S- Video

▶Audio input: PC(D_SUB,DVI) Stereo, Video (AV, S- Video), Component, BNC

▶Image & sound output: PC, BNC, AV, S- Video, Component out, speaker out

▶10W x 2 built- in speaker

▶PIP automatic switch timer function: PIP automatically pops- up when setting time

▶PIP, OSD menu transparency control

▶Sleep timer (automatic switch- off) function

▶ Wall & Ceiling Mounting (Optional VESA Wall Mount Kit)

▶ Network function supported

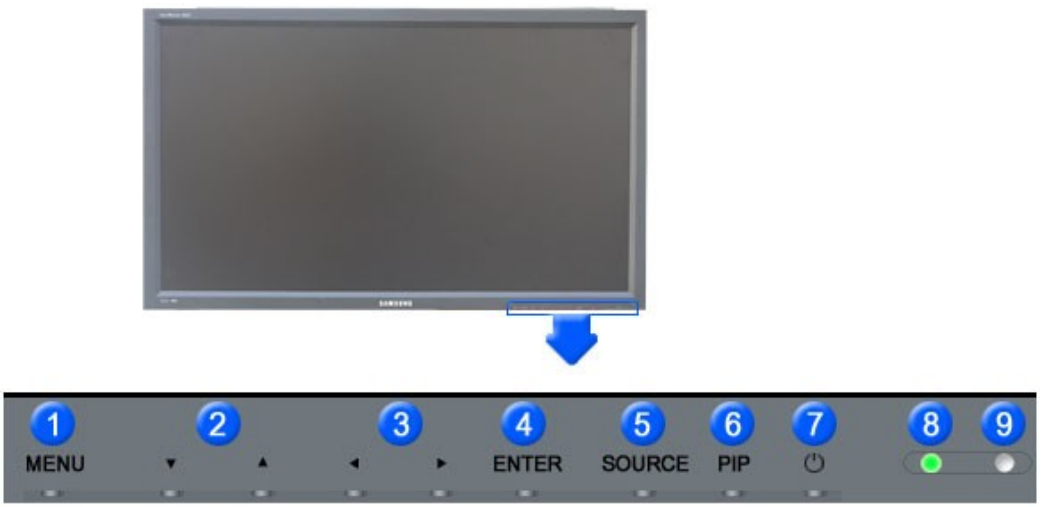
BBE (Barcus- Berry Electronics)
Sounds are clearer and finely detailed.
Bass sounds are amplified, but original sound is recreated with more clarity and definition.

3. Specifications

	BE40PS
Model Name	SyncMaster 320P
Panel	AMLCD 32" (LTA320W2- L01)
Optimum Resolution	1366x 768 (WXGA) 60Hz
Display Size	32" (16:9)
Brightness	450cd/m^2
Contrast Ratio	1000:1
Response Time	8 ms
Viewing Angle	Left/Right/Up/Down : 89/89/89/89
PC Input	D- SUB, DVI
Video System	AV, S- Video, Component
Power Consumption	Less than 180 W Max.
DPMS	Less than 5 W
Sound Output	Max. 10W x 2

Introduction(Front)

Viewing the Control Panel



1. MENU
2. Navigate button (Up-Down button)
3. Adjust button (Left-Right button)/ Volume button
4. ENTER
5. SOURCE
6. PIP
7. Power button
8. Power indicator
9. Remote Control Sensor

MENU :
Use this button to open the on-screen menu and exit from the menu screen or close screen adjustment menu.

Up/Down button :
Moves from one menu item to another vertically or adjusts selected menu values.

Adjust / Volume button :
Moves from one menu item to another horizontally or adjusts selected menu values. Also adjusts the audio volume.

ENTER :
Activates a highlighted menu item.

SOURCE:
Switches from PC mode to Video mode.
Changing the source is allowed only in external devices that are connected to the monitor at the time. To switch Screen modes:
[PC] -> [BNC] -> [DVI] -> [AV] -> [S-Video] -> [Component]

PIP :
Push the PIP button to turn PIP screen On/Off.
More than one PIP couldn't be overlapped on screen as BNC and the component use the same terminal.
PC / DVI : AV / S-Video / Component Mode

- **BNC**: AV / S-Video Mode
- **AV / S-Video** : PC / BNC / DVI Mode
- **Component**: PC / DVI Mode

POWER: Use this button to turn the monitor on and off.

LED: Power Indicator shows PowerSaver mode by green blinking.

Remote Control Sensor: Aim the remote control towards this spot on the Monitor.

Introduction(Rear)

Rear

1. RS232C OUT/IN(RS232C Serial Port):
MDC(Multiple Device Control) Program Port

2. DVI IN(HDCP) (PC Video Connection Terminal)
: Using DVI Cable (DVI-D to DVI-D)
- DVI mode (Digital PC)

3. PC IN(RGB) (PC Video Connection Terminal)
: Using D-Sub Cable (15 pin D-Sub) - PC mode
(Analog PC)

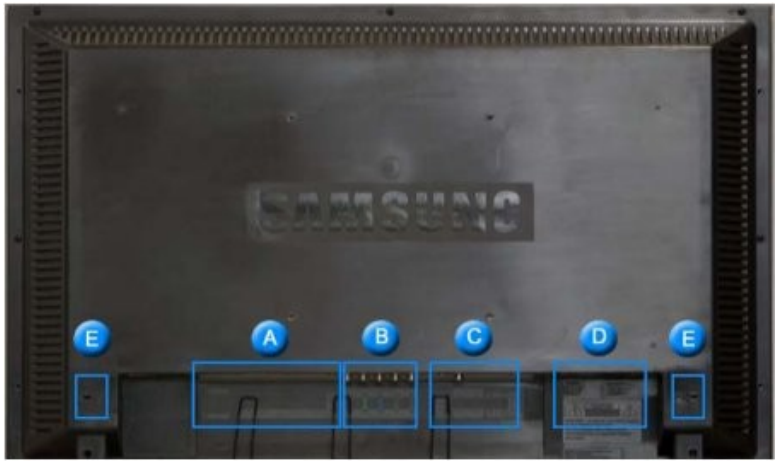
4. PC/DVI/BNC AUDIO IN (PC/DVI/BNC Audio Connection Terminal (Input))

5. COMPONENT AUDIO IN [L-AUDIO-R]
(Component Audio Connection Terminal (Input))

6. BNC/COMPONENT OUT
(BNC/Component Connection Terminal (Output))
- BNC (Analog PC) Connection :
connecting R, G, B, H, V port
- Component Connection : connecting PR, Y, Pb port

7. BNC/Component IN
(BNC/Component Connection Terminal (Input))

Viewing the Connection Panel

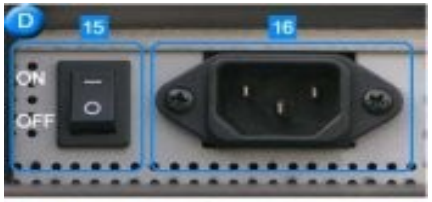


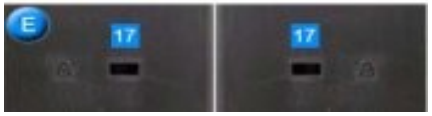
BNC

COMPONENT

Introduction(Rear)

Rear





8.AV AUDIO IN [L-AUDIO-R]
(Monitor Audio Connection Terminal (Input))

9.AV OUT [VIDEO](VIDEO Connection Terminal) :
AV mode (Output)

10.AV IN [VIDEO](VIDEO Connection Terminal)
(Input)

11. AV OUT [S-Video](S-Video Connection Terminal):
S-Video mode (Output)

12.AV IN [S-Video](S-Video Connection Terminal)
(Input)

13.EXT SPEAKER(8 Ω) (EXT Speaker Connection Terminal)

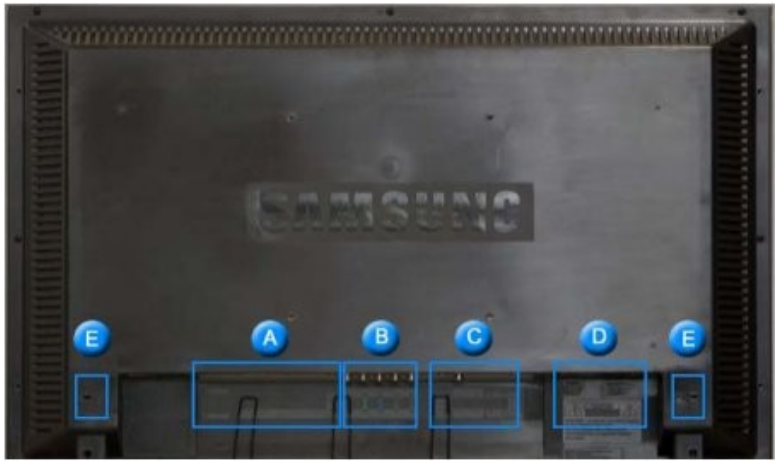
14.MONITOR [L-AUDIO-R] (Monitor Audio Connection Terminal (Output))
- MONITOR OUT is the terminal for sound output of PC, DVI or BNC.

15. POWER S/W

16. POWER IN

17. Kensington Lock
The Kensington lock is a device used to physically fix the system when using it in a public place.
(The locking device has to be purchased separately.)

Viewing the Connection Panel



AV

EXT SPEAKER

Unpacking

Accessories

Quick Setup Guide

Warranty Card
(Not available in all locations)

User's Guide, MDC software,
Natural Color software,
MagicNet software

D-Sub Cable

Power Cord

Speaker Wire Cable

Remote Control

Batteries (AAA X 2)

Cover-Hole

15pin D-sub cable	BN39-00244B
Speaker Wire cable	BN39-00315A
Adaptor Connector	3705-001262
Remote Control	BN59-00464A

Semi Stand

Screw(4EA)
TAPTITE : M4 x L15

BNC to RCA
Adapter Jack

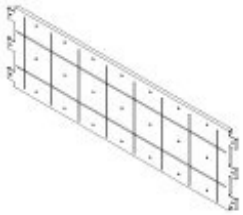
Unpacking

Accessories(Sold Separately)

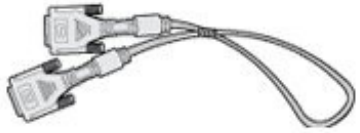
Wall Mount KIT

Speaker Set

Stand KIT



VESA Bracket



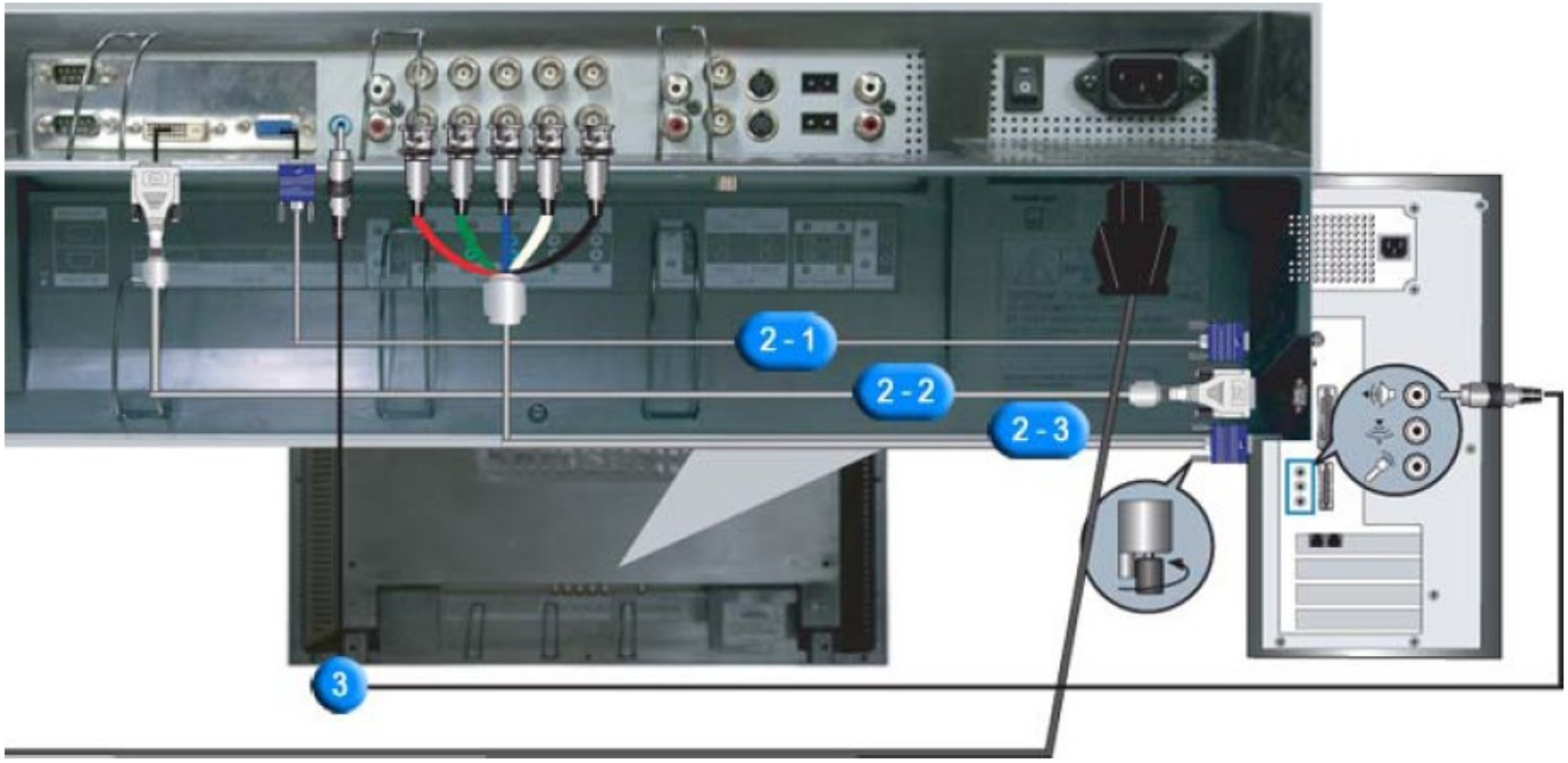
DVI Cable

Comparison

		SEC (320P)	NEC (LCD3000)	LG (L3200T)	Remark
Picture					
Panel	Size	32"(1366x768) → PVA	30"(1280x768) → PVA	32"(1366x768) → S-IPS	
	Spec	450cd/m², 1000:1 170/170, 8ms	450cd/m², 800:1 170/170, 25ms	500cd/m²,800:1 178/178, 8ms	
Input	PC	D-Sub, DVI-D, BNC	D-Sub, DVI-D, BNC	D-Sub, DVI-D	
	Video	S-Video, CVBS, Component	S-Video, CVBS, Component	S-Video, CVBS, Component SCART	
	TV	-	-	Tuner option	
Feature	Speaker	10Watts x 2Ch VR Dolby, BBE	7Watts x 2Ch Stereo	10Watts x 2Ch SRS WOW	
	Function	PIP/PBP/POP, DNIe-Pro MDC Program Network MFM - option VESA Wall Mount Hole	Long Cable Compensation NaviSet, Removable Bezel VESA Wall Mount Remote Control	PIP/PSM/Zoom Optional Rear Panel Slot (NTSC, PAL/SECAM, Information) Light/Heat Sensor (Option)	

Connecting the Monitor

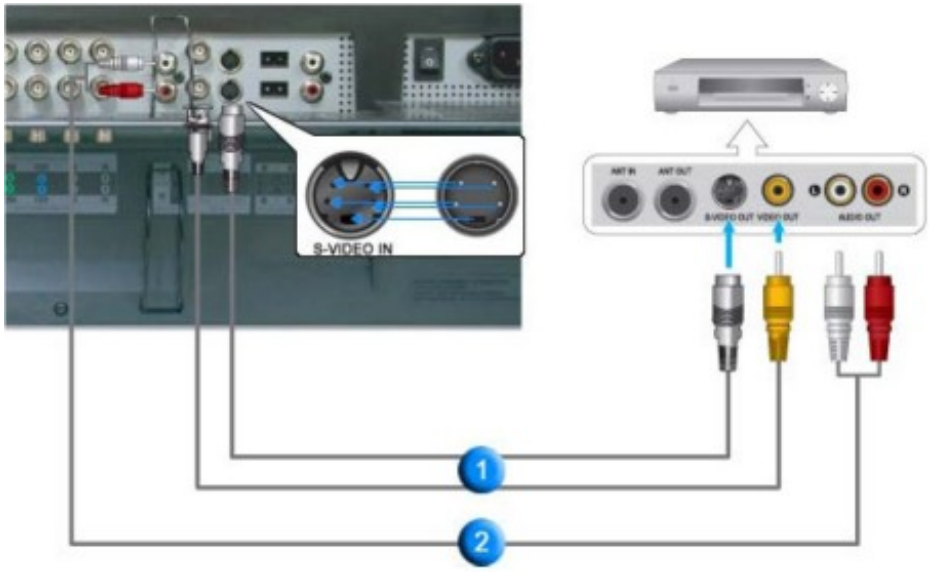
Connecting to a Computer



1.Connect the power cord for your monitor to the power port on the back of the monitor. Trun on power switch.
2.There are 3 ways to connect the signal cable to your monitor. Choose one of the followings :
2-1. Using the D-sub (Analog) connector on the video card.
Connect the signal cable to the **15 pin D-sub Port** on the back of your monitor.
2-2. Using the DVI (Digital) connector on the video card.
Connect the DVI Cable(DVI-D + DVI-D) to the **DVI Port** on the back of your Monitor.
2-3. Using the BNC (Analog) connector on the video card.
Connect the BNC Cable to the **BNC/COMPONENT IN - R, G, B, H, V port** on the back of your Monitor and the **15 pin D-sub Port** on the computer.
3. Connect the audio cable for your monitor to the audio port on the back of your computer.
4. Turn on both your computer and the monitor.

Connecting the Monitor

Connecting to a VCR



1.AV input devices like VCRs or Camcorders are connected to the **AV IN [VIDEO]** or **AV IN [S-VIDEO]** of the monitor using the S-VHS or BNC cable.

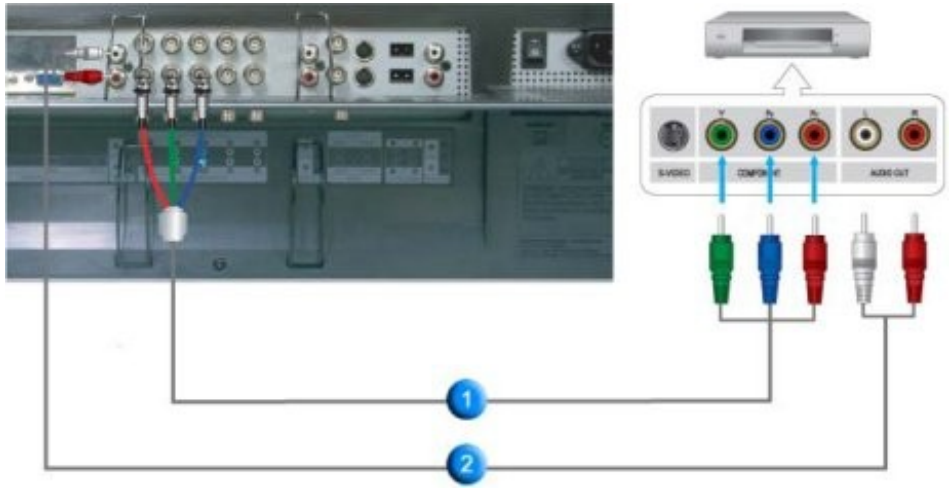
2. Connect the Audio (L) and Audio (R) terminals of a VCR or Camcorders to the monitor's **MONITOR IN [L-AUDIO-R]** using audio cables.

3. Select **AV** or **S-Video** that is connected to a VCR or Camcorders using the Source button on the monitor's front or remote control.

4. Then, start the VCR or Camcorders with a tape inserted.

Connecting the Monitor

Connecting to a DVD Player



1.Connect a set of audio cables between the **COMPONENT AUDIO IN [L-AUDIO-R]** on the Monitor and the AUDIO OUT jacks on the DVD player.

2. Connect a Component cable between the **BNC/COMPONENT IN - PR, Y, PB port** on the Monitor and the PR, Y, PB jacks on the DVD player.

3. Select **Component** that is connected to a DVD player using the Source button on the monitor's front or remote control.

4. Then, start the DVD Player with a DVD disc inserted.

Connecting the Monitor

Connecting Speakers

1. Tighten the SET and the speaker using the screws.

* Mount the set of the speaker without the speaker stand.

2. Connect the speaker connection cable between the speaker connection jack on the rear of the SET and the speaker connection jack on the rear of the speaker.

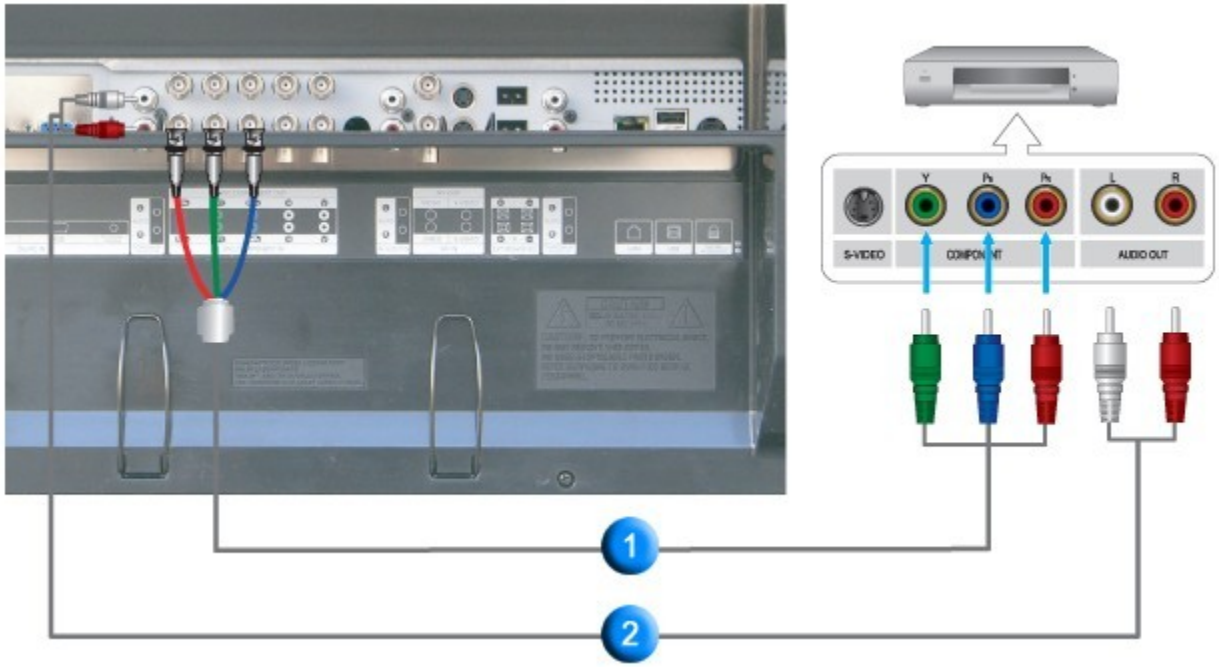
Do not move the SET holding the speaker when the SET is connected to the speaker.
The speaker-bracket for connecting the SET speaker my be damaged.

PC Compatibility

PV Stage

No	Chip Maker	Card Name
1	ATI	Radone X800Pro
2		Radone X300
3		RADEON 9600
4	S3	Prosavage
5	Matrox	G550
6	nVIDIA	GeForce FX5700
7		PCX5750
8		GeForce 6600
9		GeForce FX5200
10	Inter	i915G

Cautions When Connecting External Devices



When connecting component of DVD or STB terminal, Y, Pb, Pr color must be distinguished for normal color to appear.

DVD or STB terminal also has separate input and output, so output terminal must be connected to monitor.

Set terminals must be connected with clear distinction of input and output.

Installing Stand Kit

Installing the Semi Stand

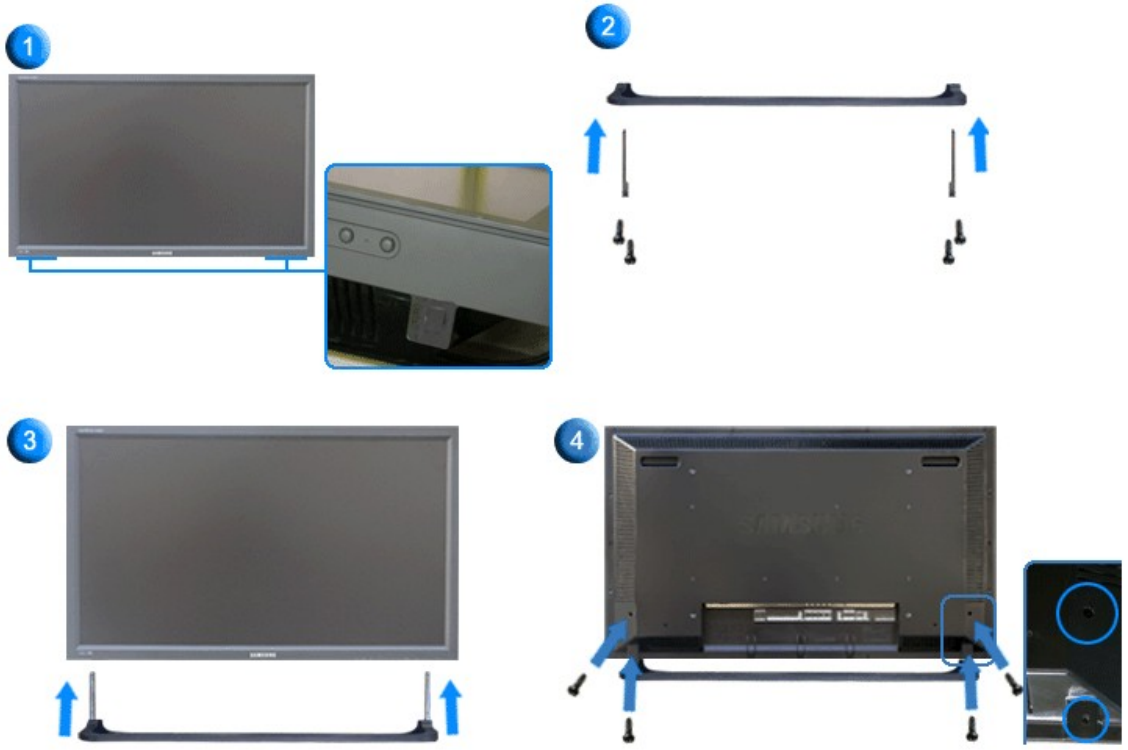
1. A 'Cover-Protector' is used to protect the hole at the bottom of the monitor, where the stand is inserted. Be sure to remove the 'Cover-Protector' when attaching the provided Semi Stand or stand kit (sold separately) and cover the hole using the 'Cover-Hole' when attaching the wall mount kit.
2. Set up the left and right stands respectively.
3. Put the stand into the hole at the bottom of the monitor.
   Insert screw into the hole indicated and tighten. (M4 × L15)

The Semi Stand is provided only for screen adjustment before the stand kit or wall mount kit (sold separately) is attached. The Semi Stand is not intended for use as a regular stand and Samsung Electronics is not responsible for any problems caused by using it instead of the regular products. Never use the Semi Stand as the regular stand.

Installing Stand Kit

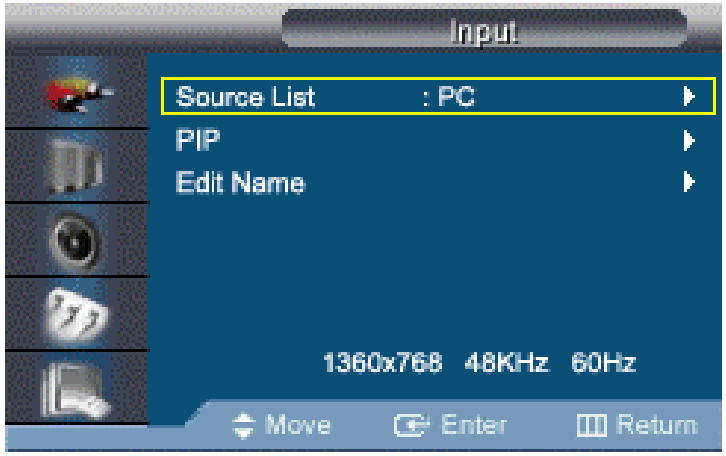
Installing Stand Kit

(Sold separately)



1. A 'Cover-Protector' is used to protect the hole at the bottom of the monitor, where the stand is inserted. Be sure to remove the 'Cover-Protector' when attaching the provided Semi Stand or stand kit (sold separately) and cover the hole using the 'Cover-Hole' when attaching the wall mount kit.
2. Make sure you put the parts in the right direction and in the right place. (M4 × L15)
3. Put the stand into the hole at the bottom of the monitor.
4. Insert screw into the hole indicated and tighten. (M4 × L15)

Adjusting Your Monitor(Input)



Source List

Use to select PC, BNC or other external input source connected to the Monitor.

PIP

When external A/V devices such as VCRs or DVDs are connected to the monitor, PIP allows you to watch video from those devices in a small window super-imposed on the PC Video signal. (Off/On)

1) PIP

Off / On: Turn the PIP Screen on or off.

2) Source

: PC/DVI, BNC, AV/S-Video, Component

: Select the input source for the PIP.

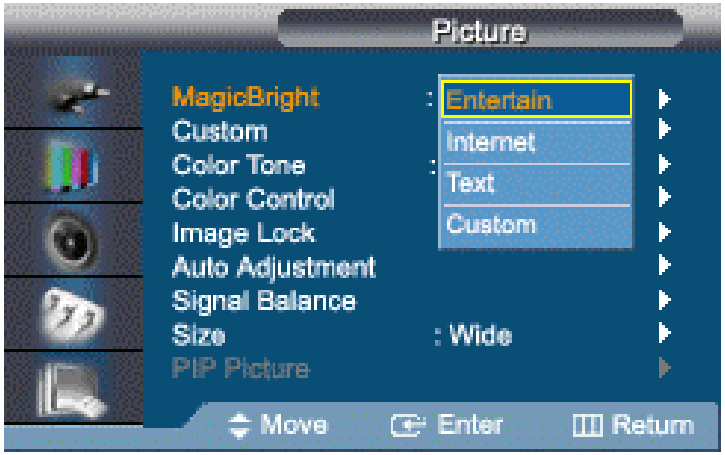
3) Size : Change the Size of the PIP window.

4) Position: Change the Position of the PIP window.

Edit Name

Name the input device connected to the input jacks to make your input source selection easier.

Adjusting Your Monitor(Picture : PC/BNC/DVI)



MagicBright™

MagicBright™ is a new feature providing the optimum viewing environment depending on the contents of the image you are watching.
Currently four different modes are available: Entertain, Internet,Text and Custom.

Custom :Change the contrast and brightness according to personal preference.

1) Contrast : Adjust the contrast.

2) Brightness : Adjust the brightness.

Color Tone

The tone of the color can be changed : Cool, Normal, Warm, and Custom

Color Control

1) Red 2) Green 3) Blue

Adjust the individual R, G, B color controls.
Image Lock

Image Lock is used to fine-tune and get the best image by removing noise that creates unstable images with jitter and shimmer.

1) Coarse : Removes noise such as vertical stripes.

2) Fine : Removes noise such as horizontal stripes.

3) Position : Adjusts the screen location horizontally and vertically.

Auto Adjustment : The values of Fine, Coarse, position are adjusted automatically.

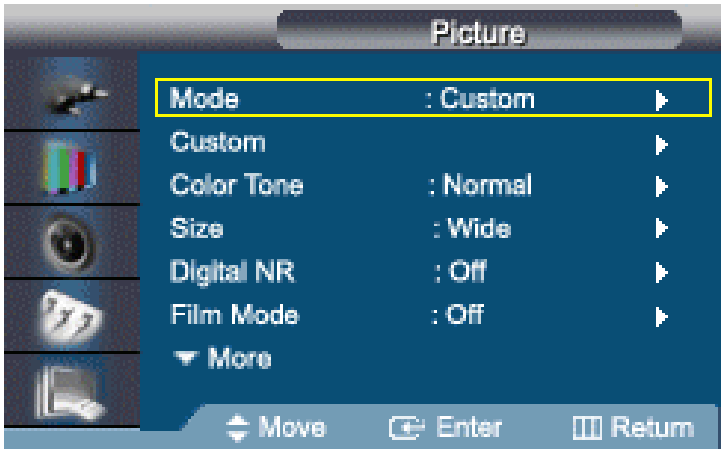
Signal Balance : Used to make up for the weak RGB signal which has been transmitted by a long signal cable.

Size :You can switch the Size. : Wide and 4:3

PIP Picture

You can adjust the PIP Screen Settings.
: Contrast, Brightness, Sharpness, Color,Tint

Adjusting Your Monitor(Picture : AV/S-Video/Component)



P.Mode

The Monitor has four automatic picture settings ("Dynamic", "Standard", "Movie" and "Custom") that are preset at the factory.

Custom : Change the contrast and brightness according to personal preference. : Contrast, Brightness, Sharpness, Color, Tint

Color Tone

The tone of the color can be changed. The individual color components are also user adjustables.

: Cool2, Cool1, Normal, Warm1, Warm2

Size

You can switch the Size. : Wide, Panorama, Zoom1, Zoom2, 4:3

Digital NR

Digital Noise Reduction. : Off / On
Film Mode : The Film Mode feature offers you a theater-quality viewing experience.

DNIe Demo : DNIe Demo technology will match every signal to your eyes.

PIP Picture

You can adjust the PIP Screen Settings. : Contrast, Brightness

Adjusting Your Monitor(Sound)

Mode

The Monitor has a built-in high fidelity stereo amplifier.

: Standard, Music, Movie, Speech, Custom

Custom

1) Bass : Emphasize low frequency audio.

2) Treble : Emphasize high frequency audio.

3) Balance : Allows you to adjust the sound balance between the left and right speakers.

Dolby Virtual

Dolby Virtual simulates the effect of the Dolby Surround sound system, recreating the movie-theatre or concert-hall- quality sound.

BBE

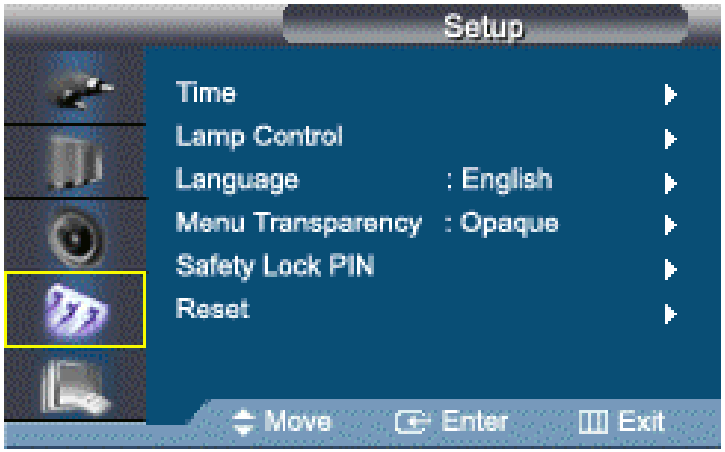
BBE (Bass Booster Effect) recreates the natural sound and improves sound clarity through boosting high and low range frequencies.
As a result, high sounds are clearer, brilliant and finely detailed while low sounds are tight, well-defined and harmonically rich.

☞ **BBE and Dolby Virtual cannot be functioned at the same time.**

Sound Select

You can select either Main or Sub when PIP is On.

Adjusting Your Monitor(Setup)



Time

Use to choose one of 4 time settings, Clock Set, Sleep Timer, On Timer, and Off Timer.

When you select turning **Yes** the **On Timer** or **Off Timer** when **Clock Set** is undefined, a guiding message pops up: "Set the clock first.".

Lamp Control

Used to adjust Backlight in order to reduce energy consumption.

Language : English, Germany, Spanish, French, Italian, Swedish

Japanese, Russian, Chinese, Korean, Portuguese

Menu Transparency : **Changes the opaqueness of the background of the OSD.**

High, Medium, Low, Opaque

Safety Lock PIN

You can change the password.

Reset : Image Reset, Color Reset

Adjusting Your Monitor(Multi Control)

Multi Control

Assigns individual ID to the SET.

: ID Setup, ID Input

Disassembly

Place monitor face down on cushioned table. Remove 12 screws from the rear cover

Remove 12 screws from the Shield and lift up the Shield.

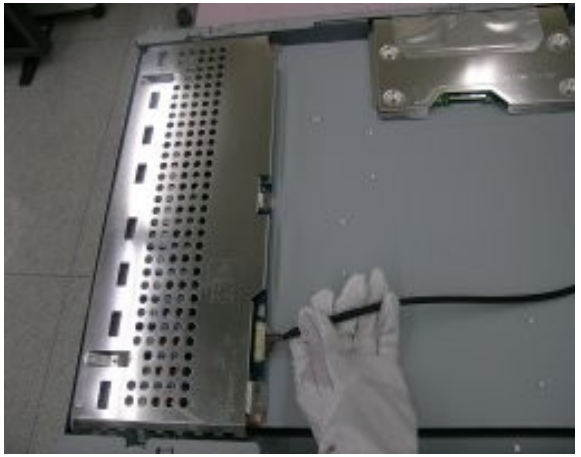
Disassembly

Disconnect cables from the boards and remove 6 screws from the Power board.

Remove 6 screws from the Main board.

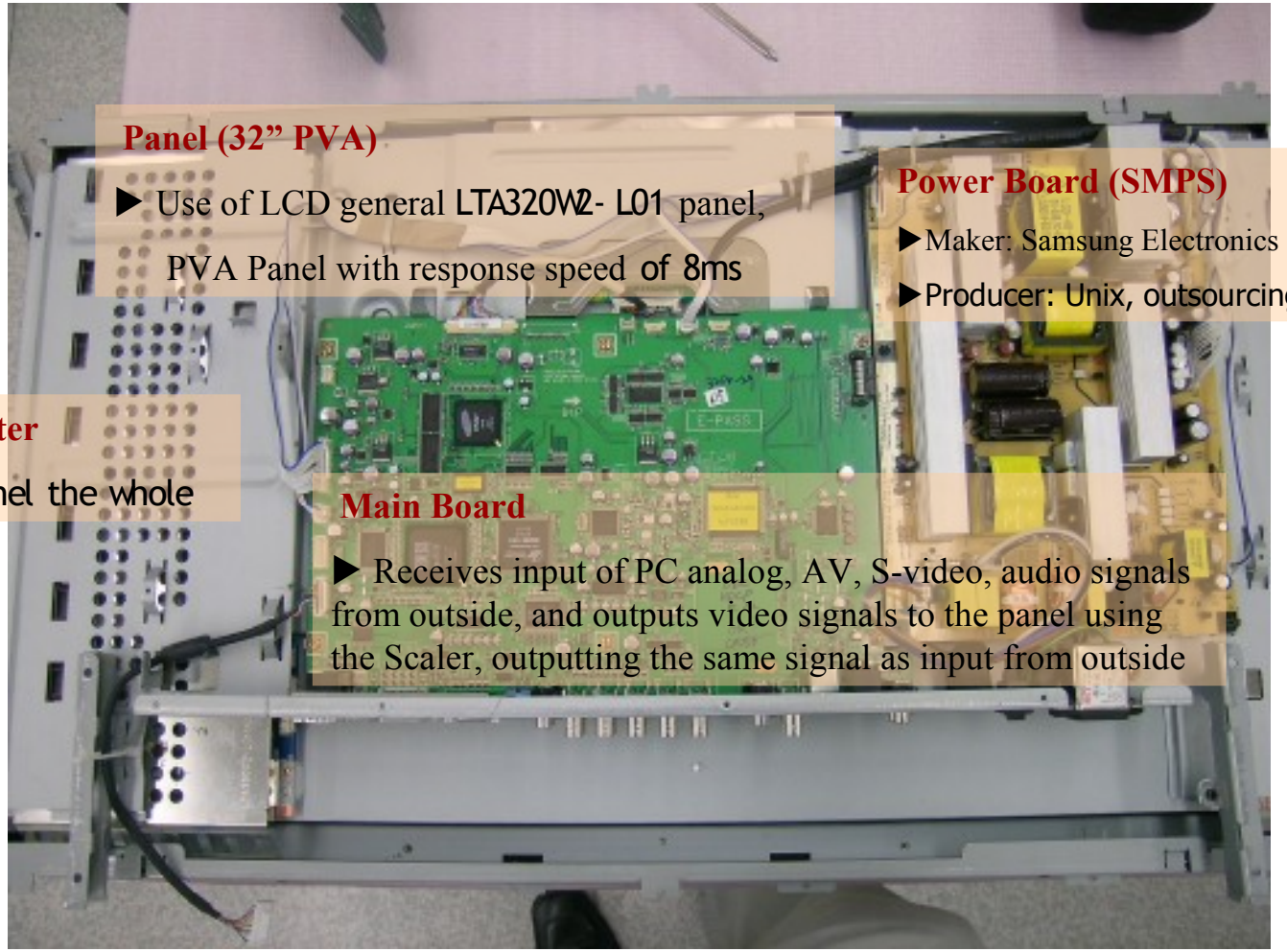
Disassembly

Remove 3 screws from the Bottom BRKT.



Eliminate Main Board and SMPS, remove the bottom BRKT.

Internal View



Panel (32” PVA)

▶ Use of LCD general LTA320W2- L01 panel,

PVA Panel with response speed of 8ms

Power Board (SMPS)

▶Maker: Samsung Electronics

▶Producer: Unix, outsourcing

Inverter

▶ Panel the whole

Main Board

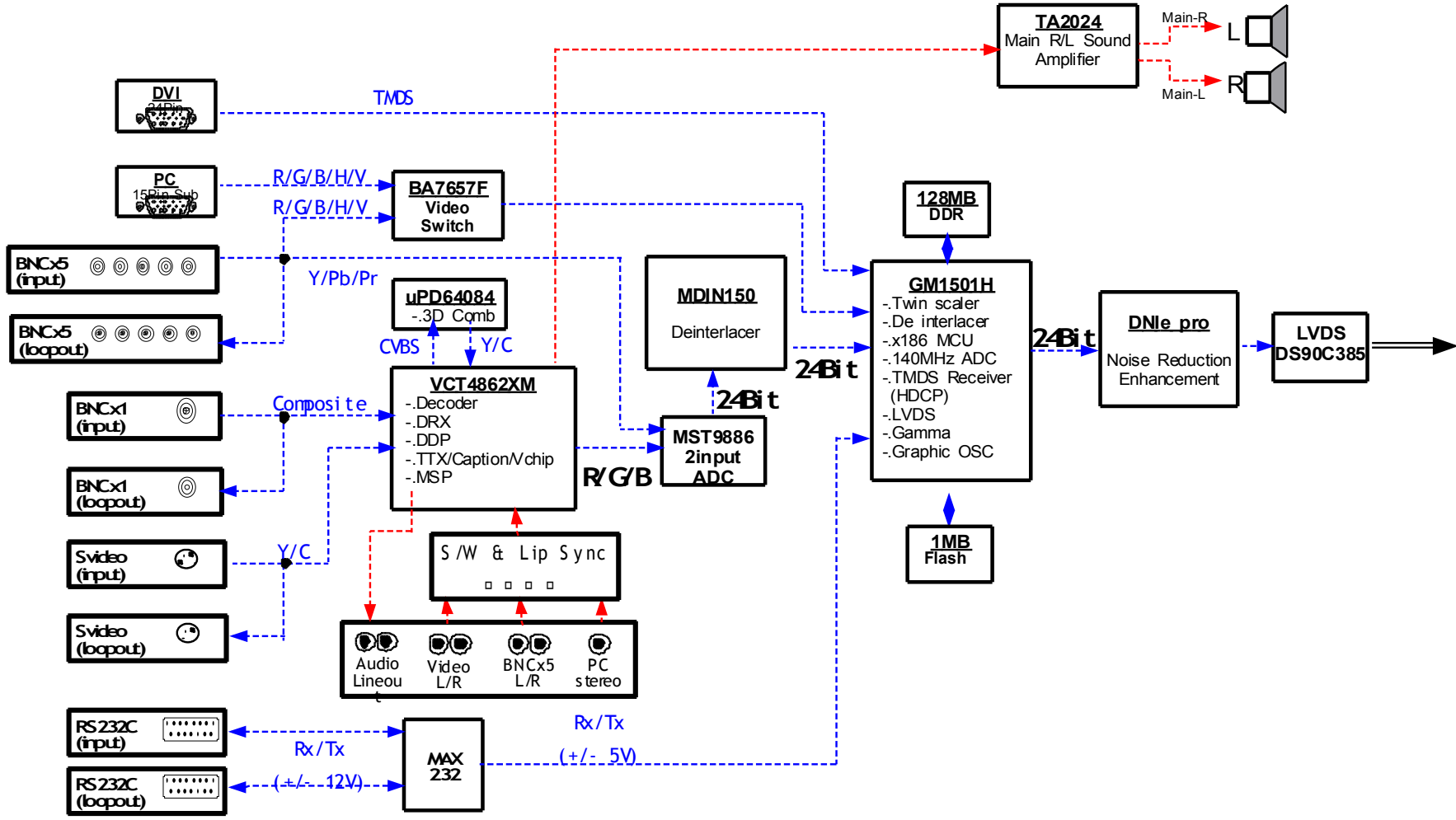
▶ Receives input of PC analog, AV, S-video, audio signals from outside, and outputs video signals to the panel using the Scaler, outputting the same signal as input from outside

Function Board

▶ Function key and remote control IR signals are transmitted to Main board, with signal on LED

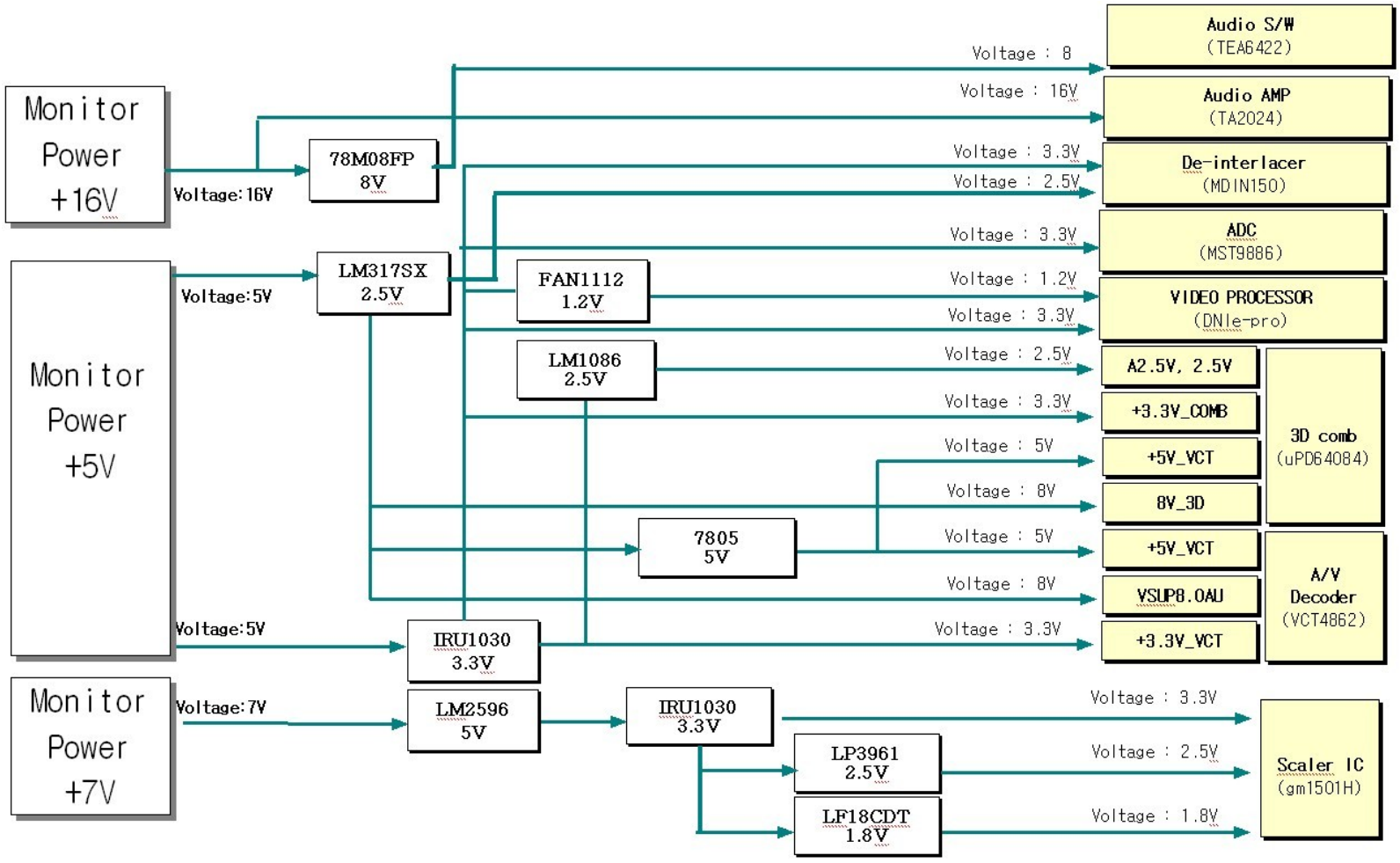
Block Diagram (Main Circuit)

Main

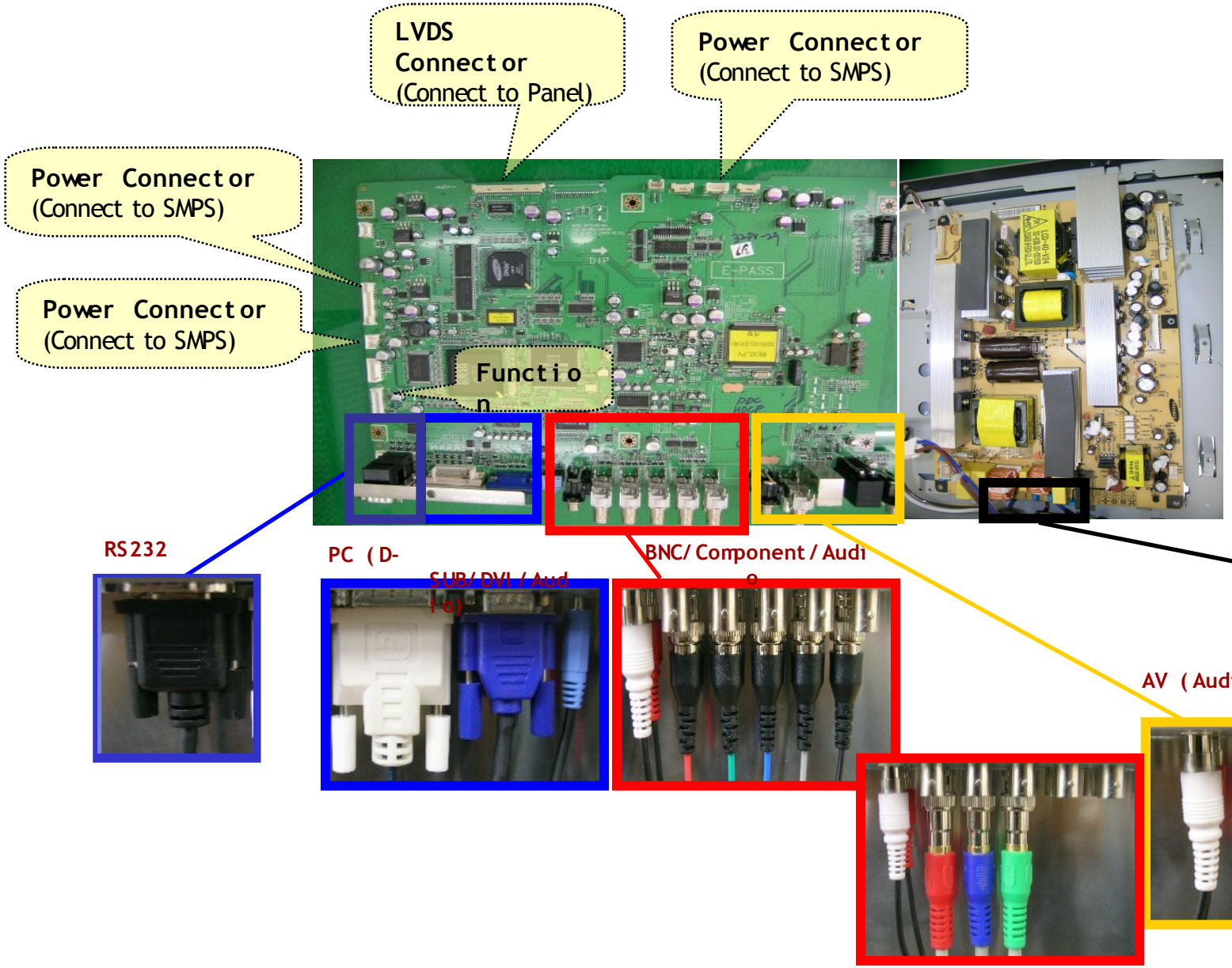


Block Diagram (Main - Power)

Main Power Tree



Board Connections - Main



Board Connections - SMPS

Power Connector
(Connect to MAIN board)

Power Connector
(Connect to MAIN board)

Power Connector
(Connect to MAIN board)

Inverter Connector
(From rear side, Connect to Left Inverter)

Connect to AC socket

Connect to Mechanical switch

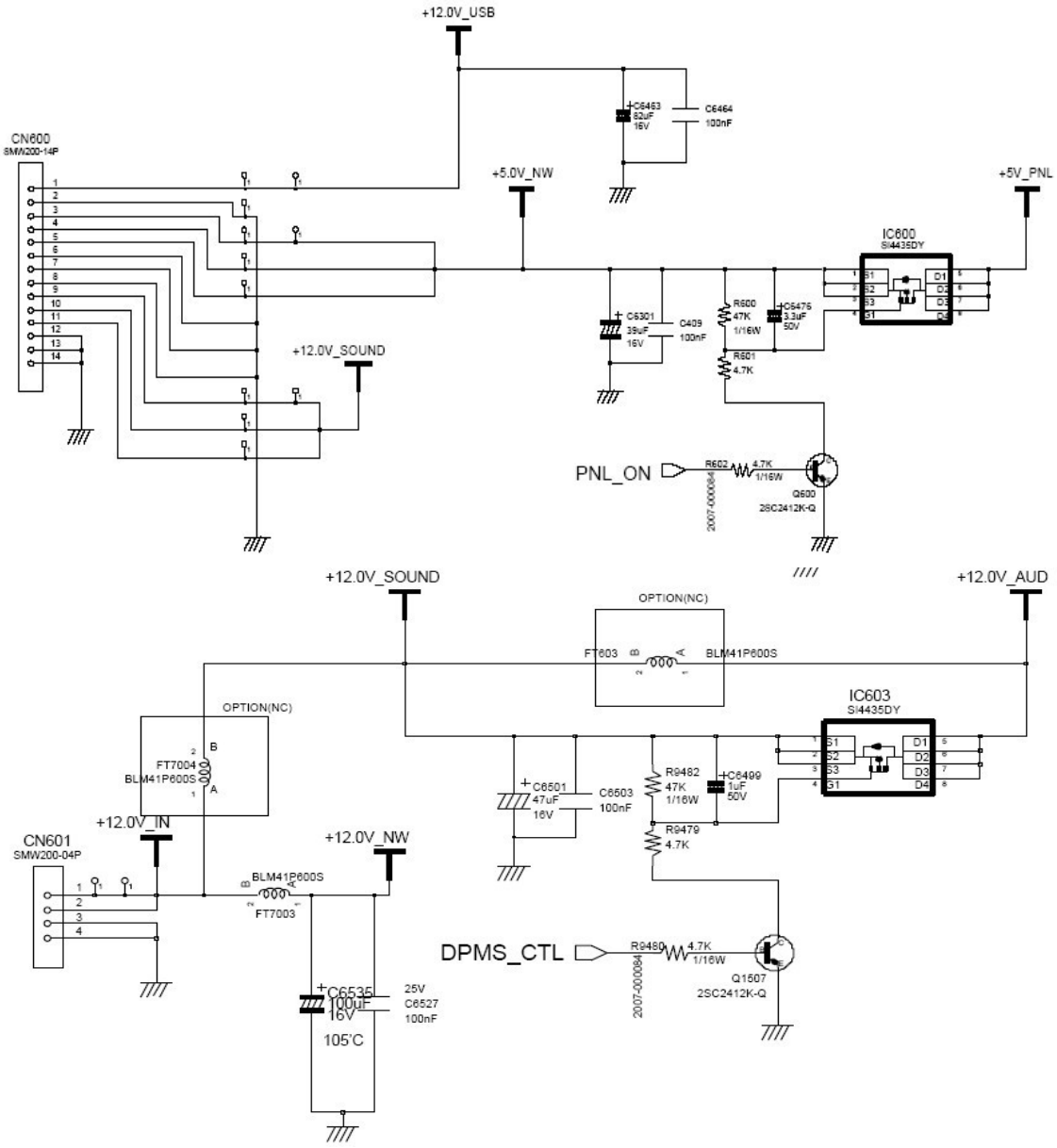
Schematics : Power 1

CN 600

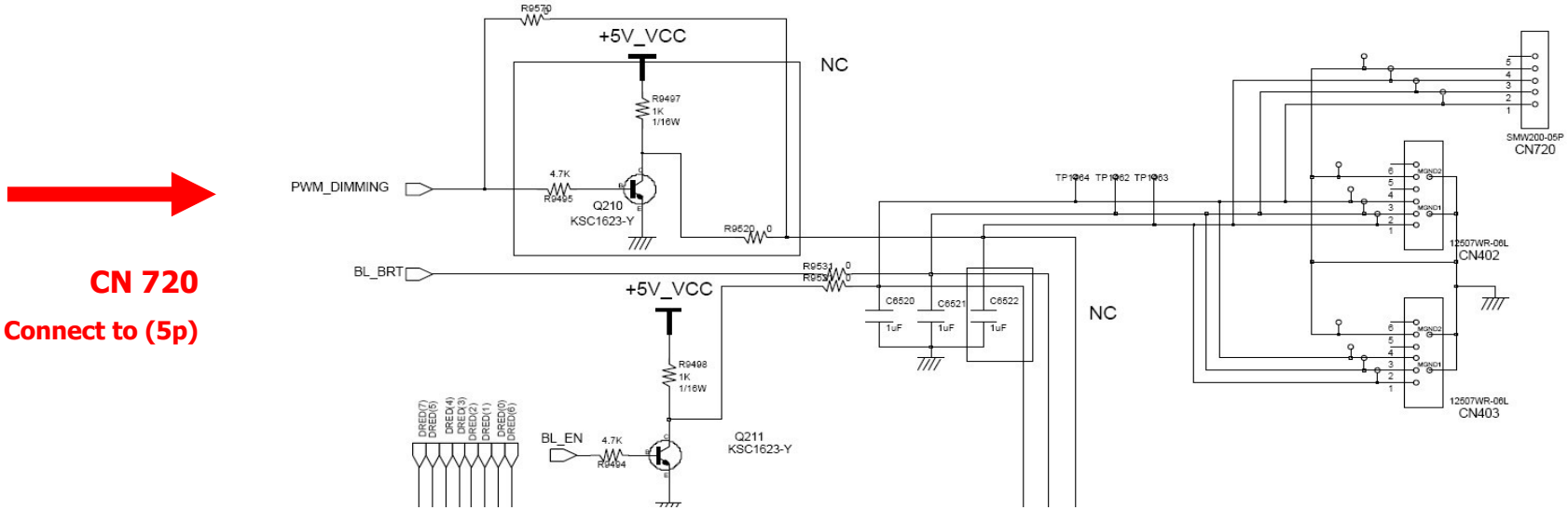
Connect to SMPS(14p)

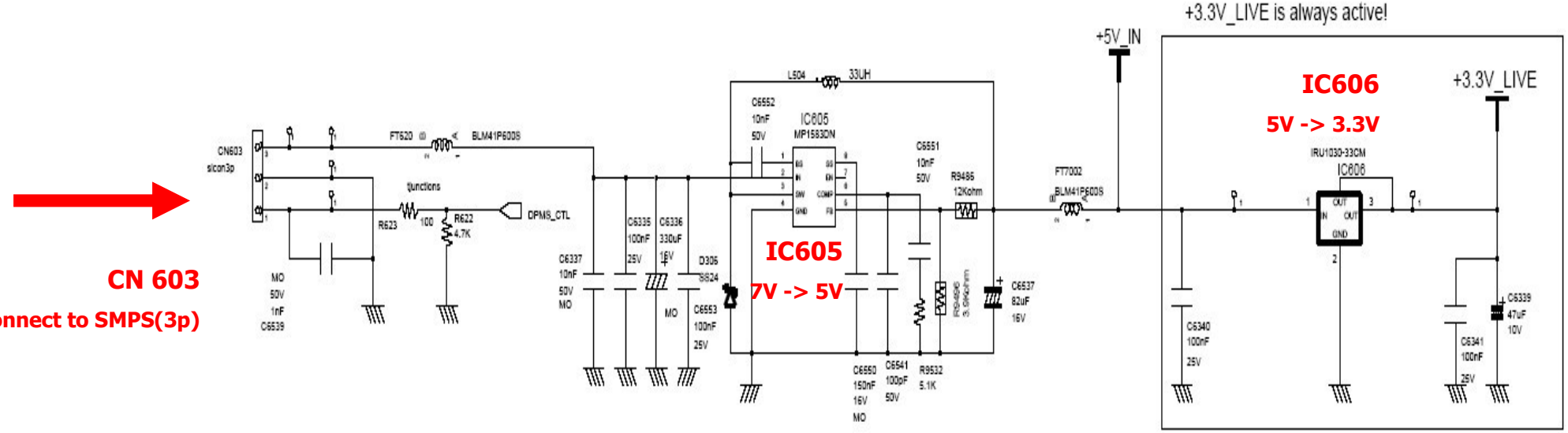
CN 601

Connect to SMPS(4p)

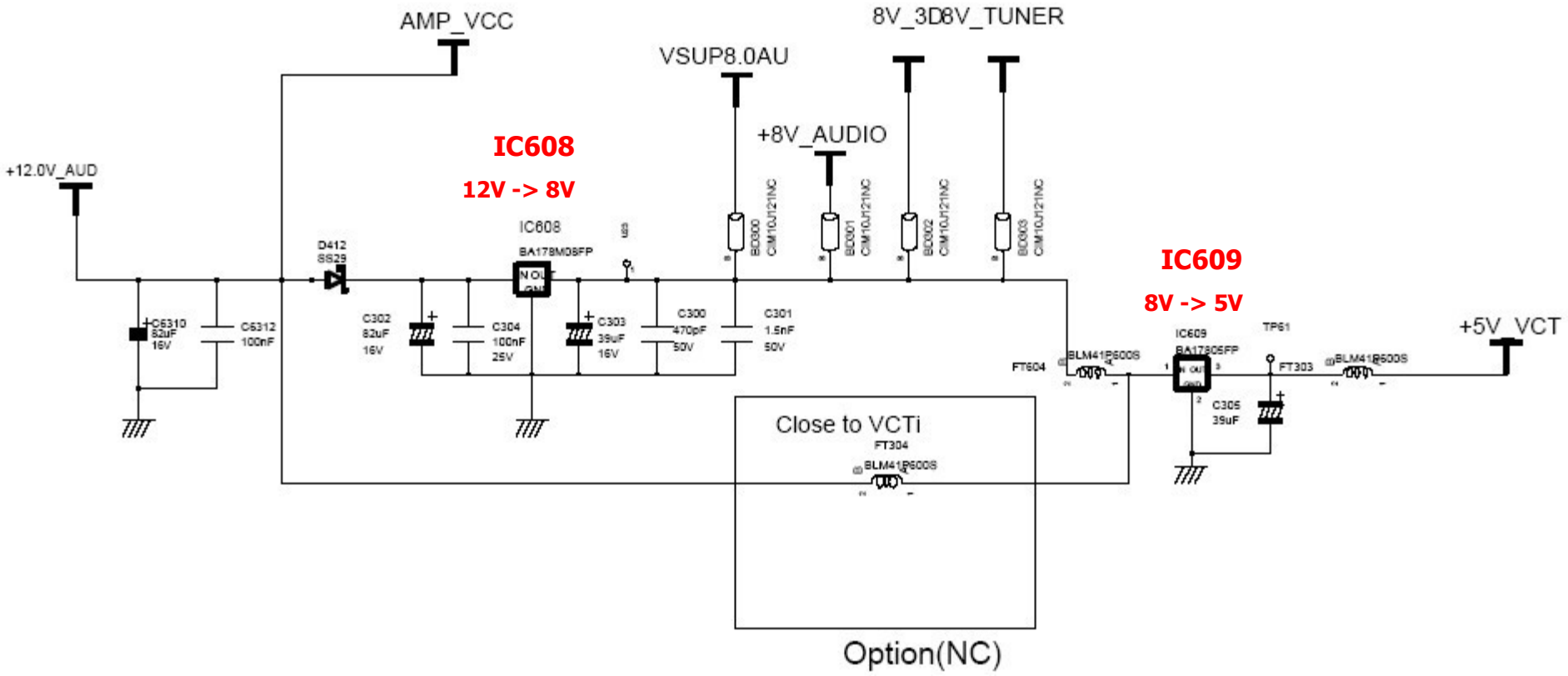


Schematics : Power 1

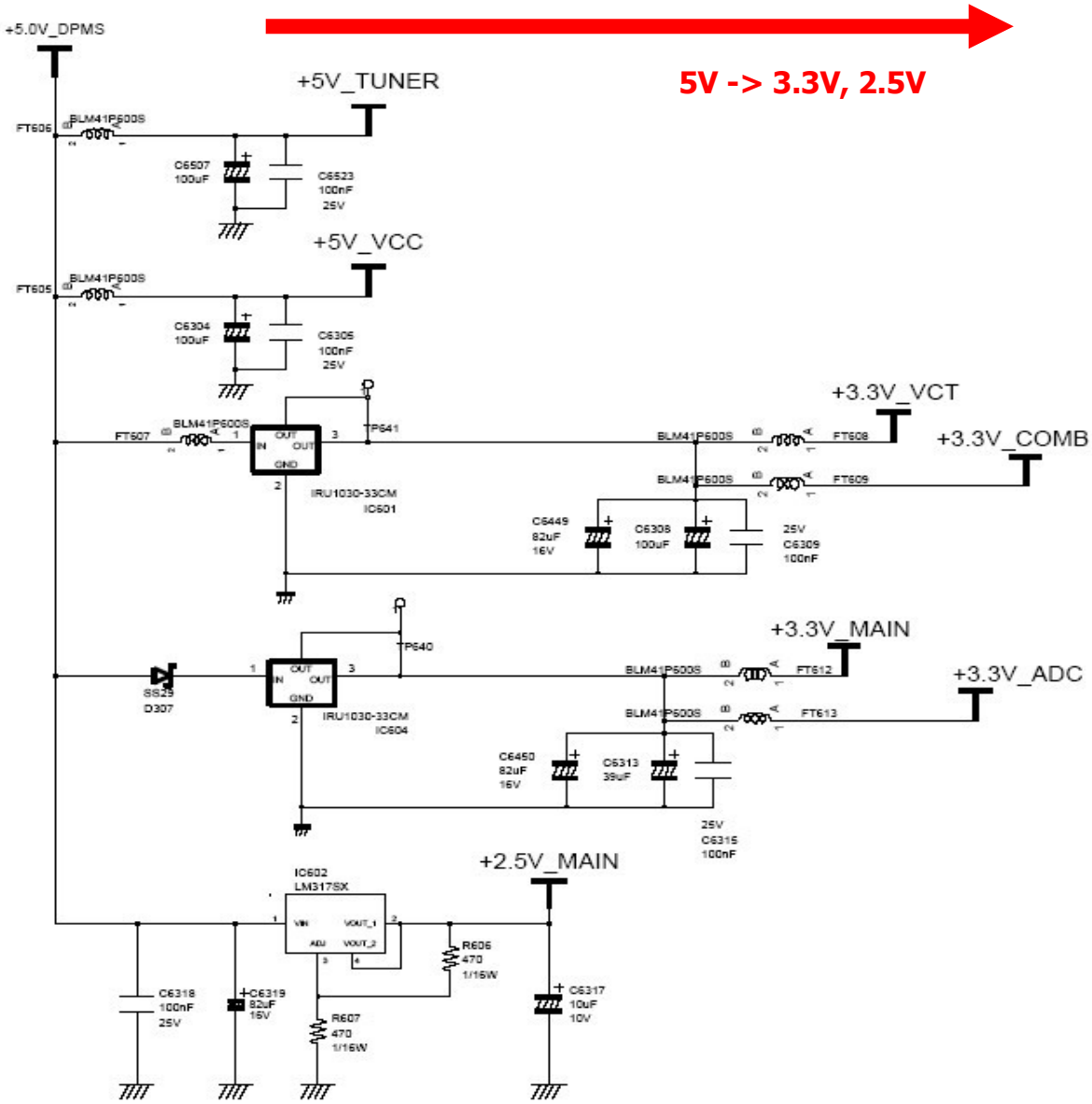




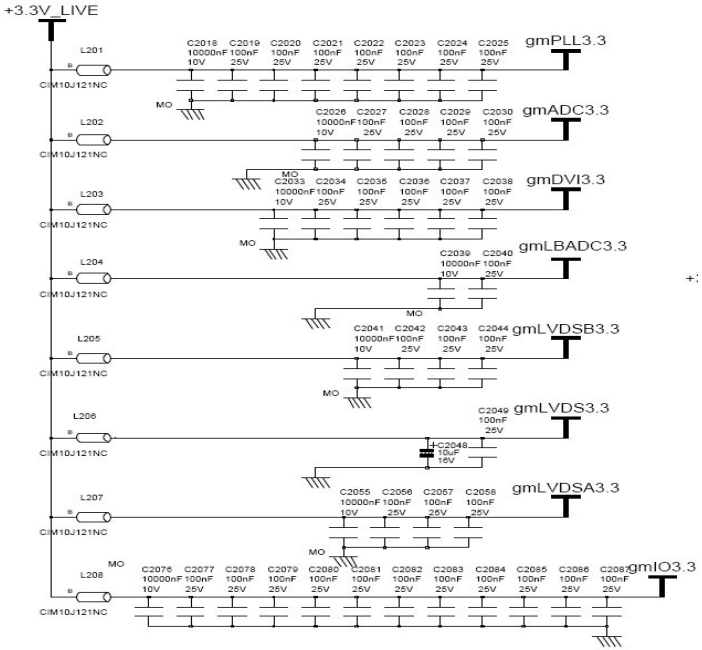
Schematics : Power 1

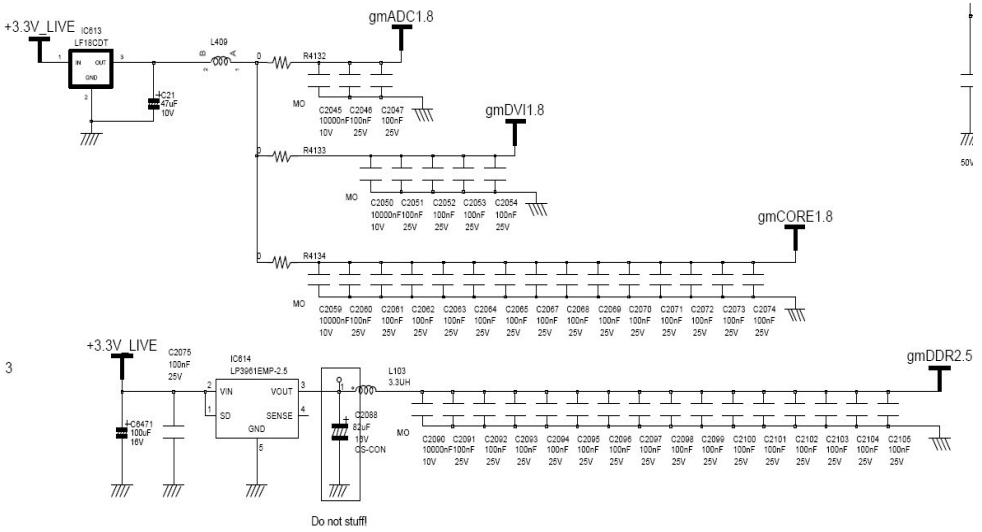


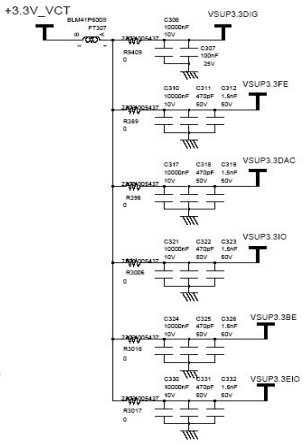
Schematics : Power 1

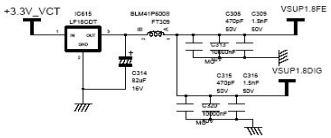


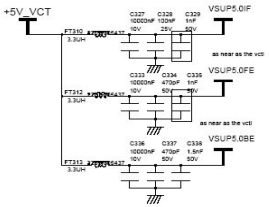
Schematics : Power 2

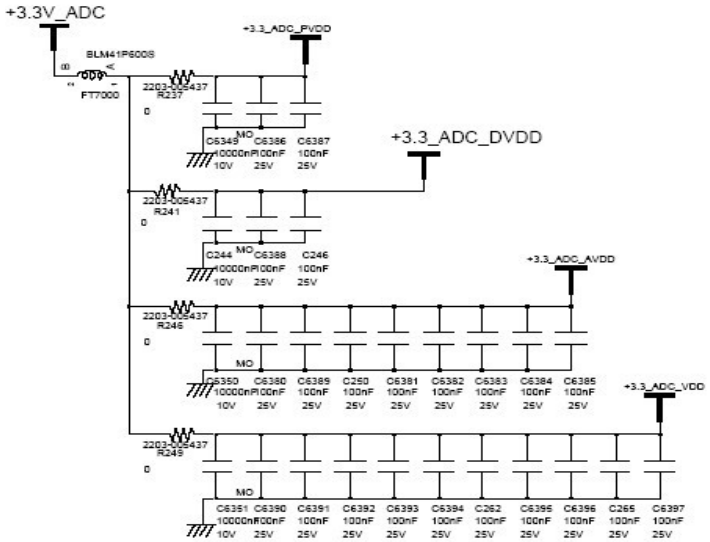








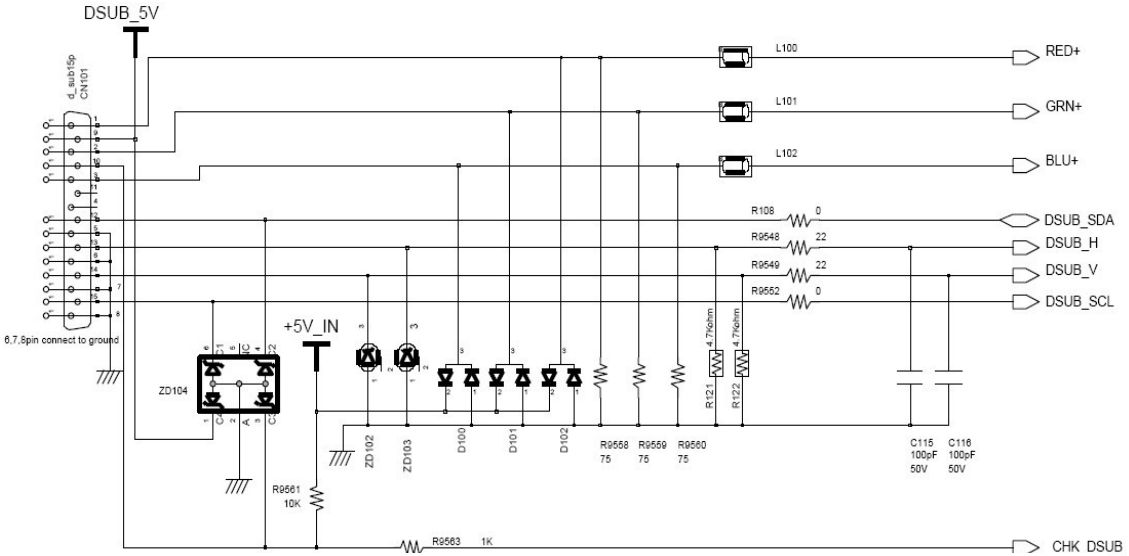




Schematics : PC/DVI Input

CN 101

PC Signal In

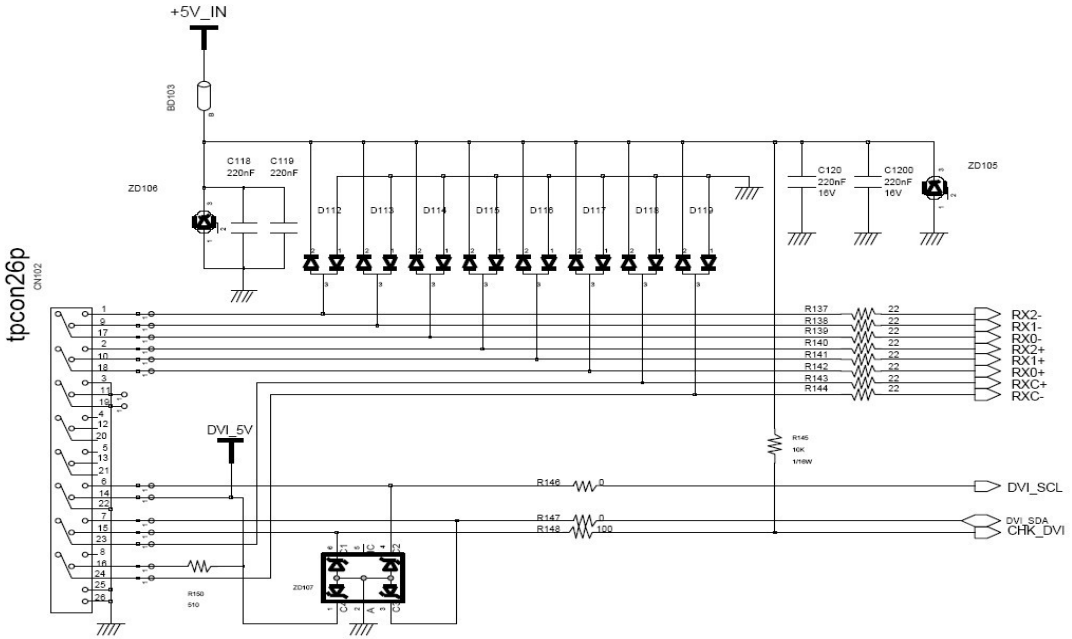


IC300

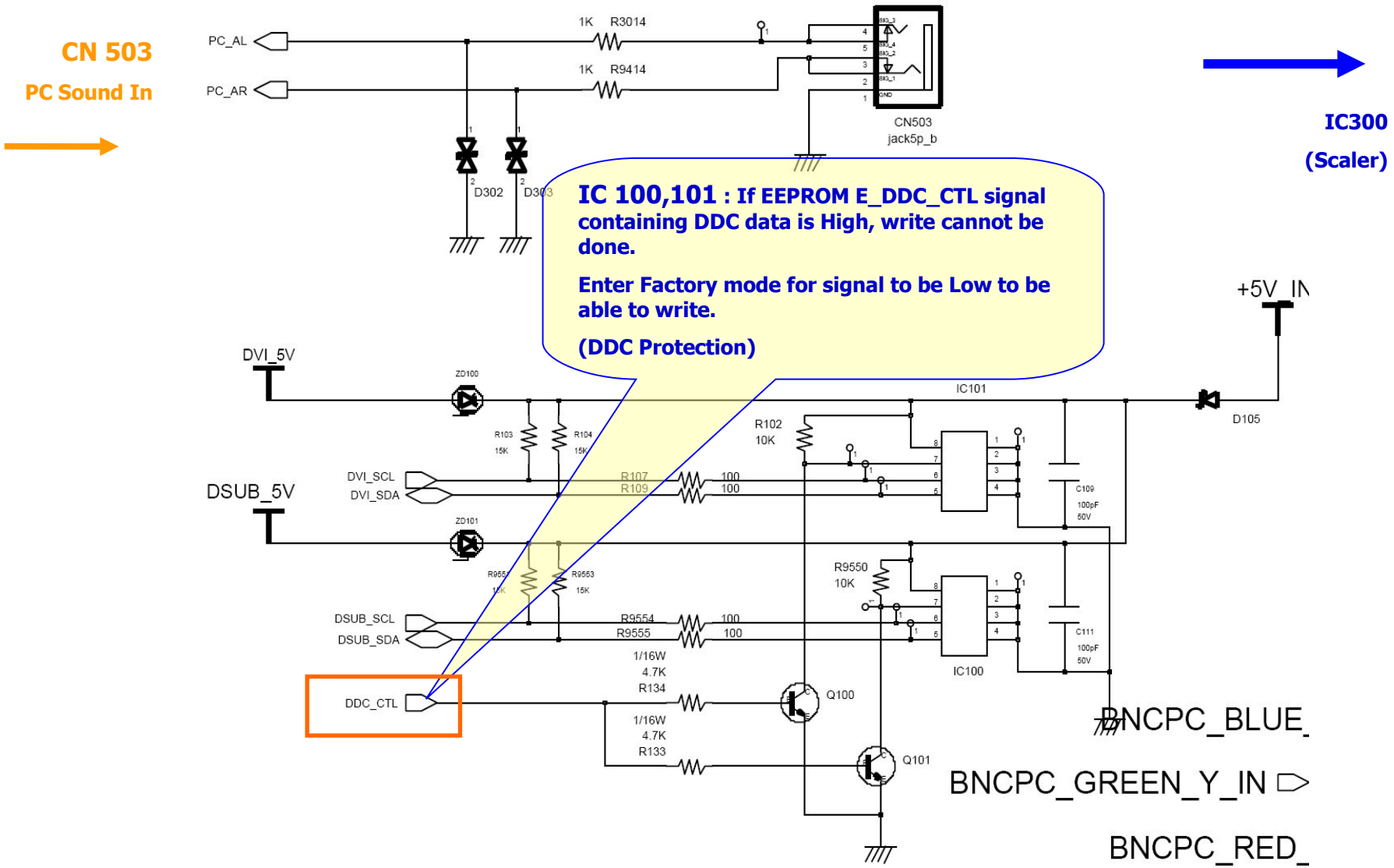
(Scaler)

CN 102

DVI Signal In



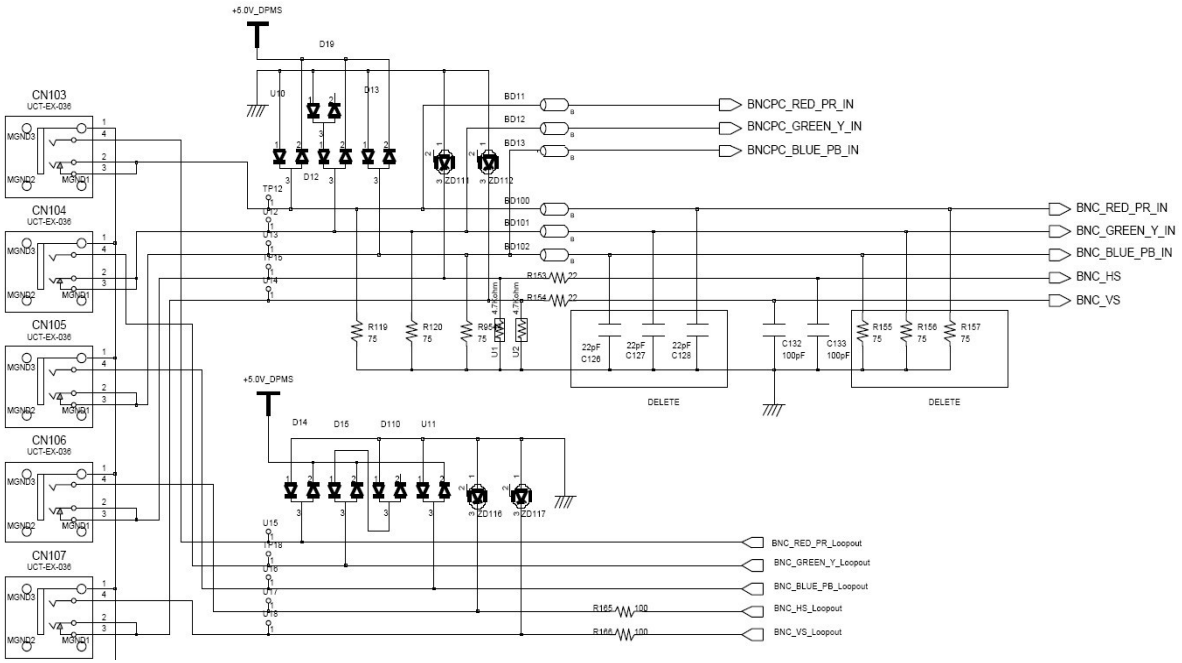
Schematics : PC Input



Schematics : BNC /Component Input

CN 103~107

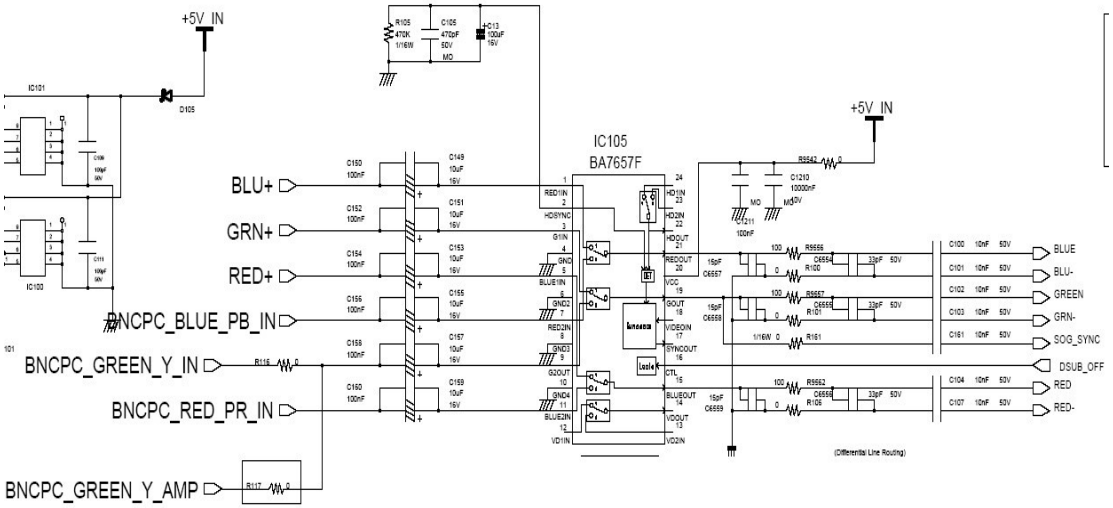
BNC/Component Signal Input



IC105

(Switch)

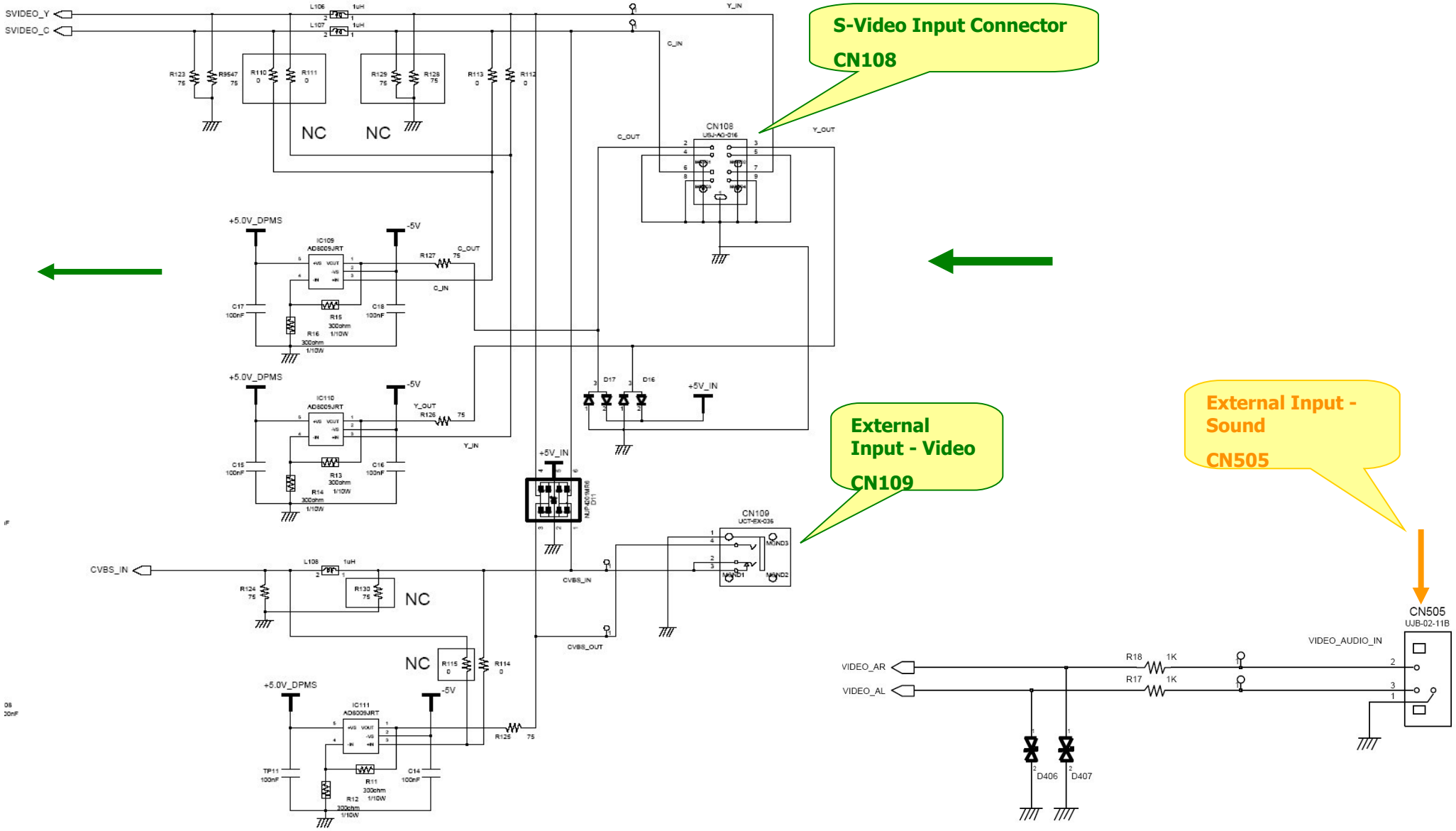
BNC/ Component Input



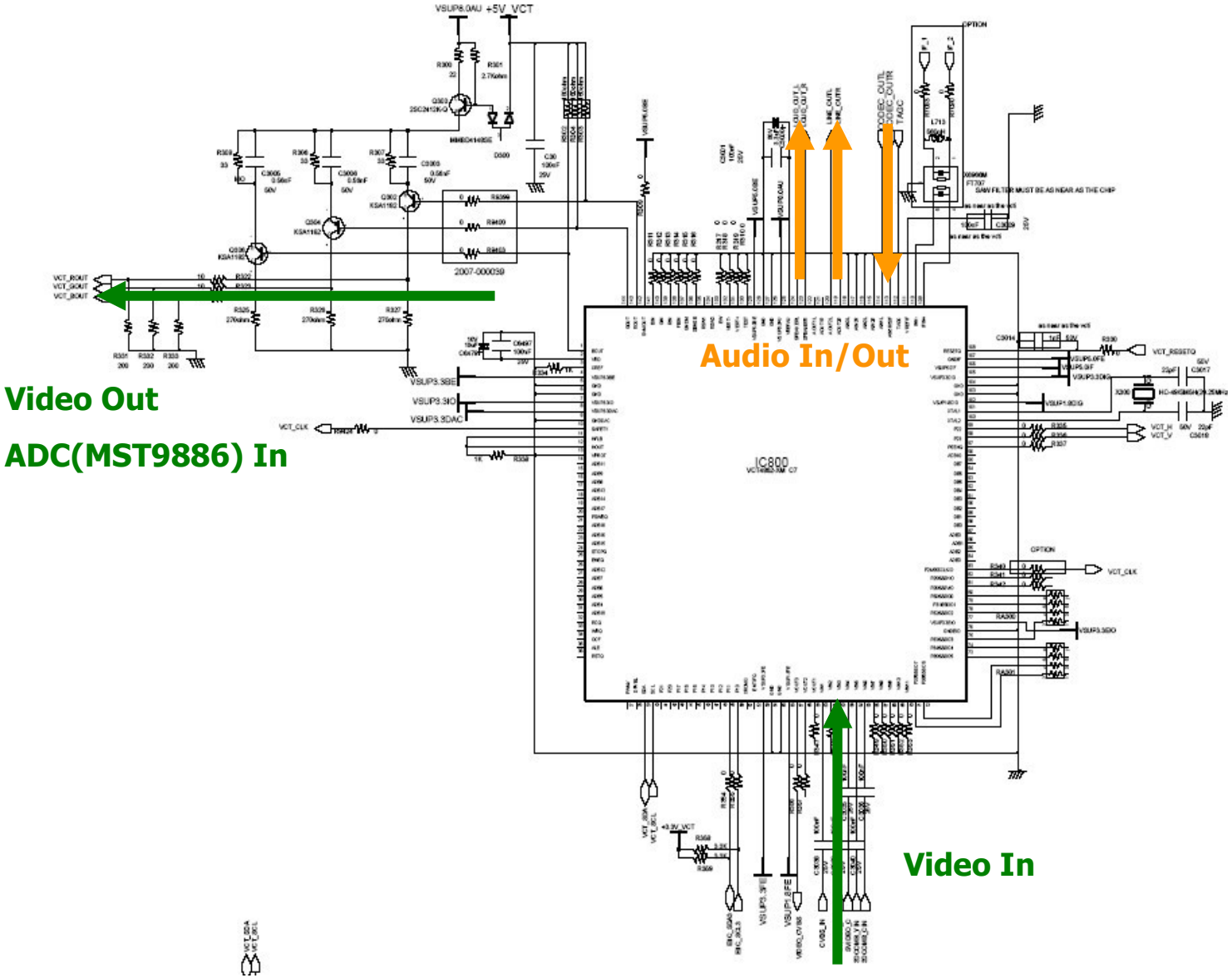
IC300

(Scaler)

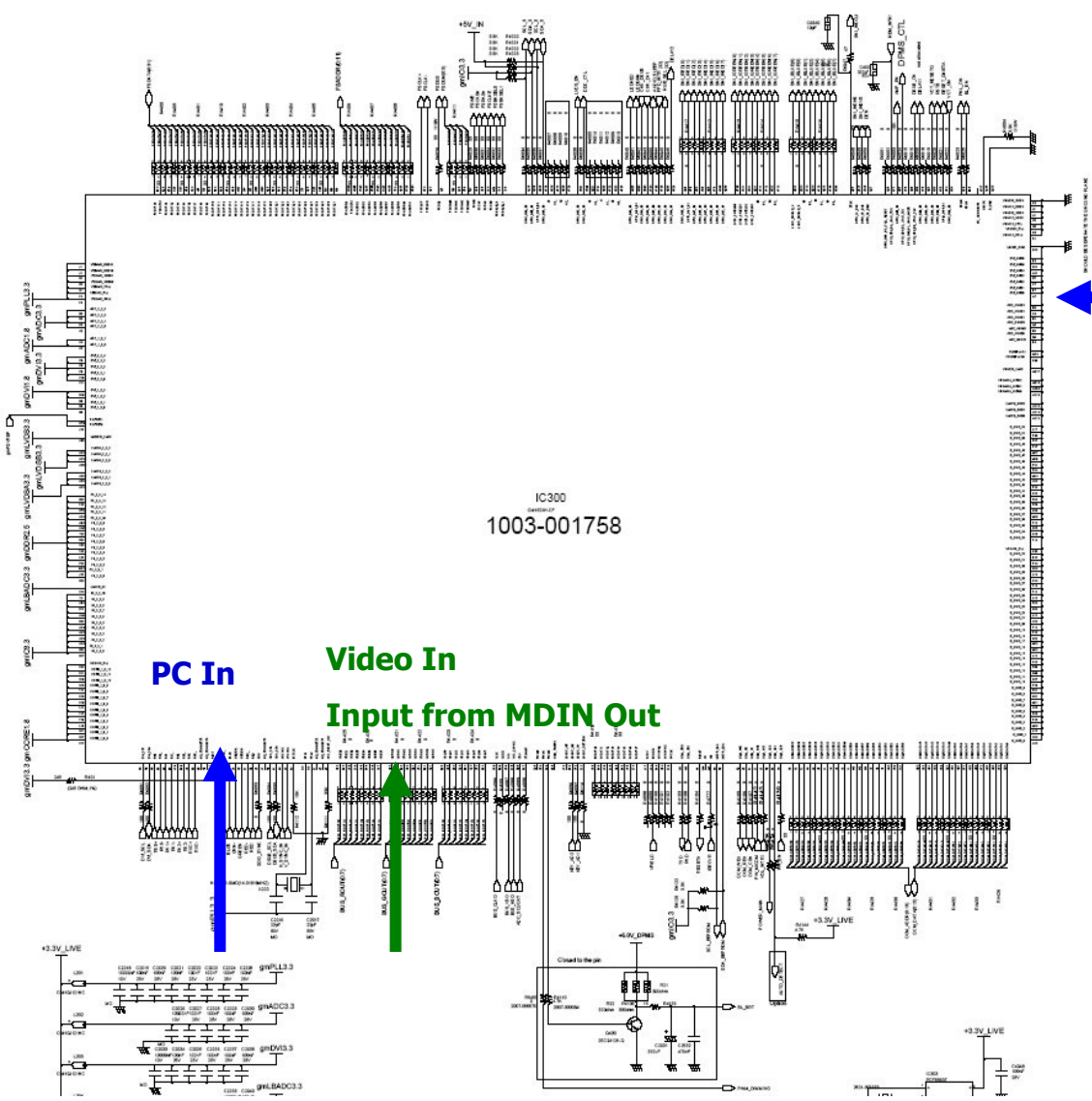
Schematics : Video Input

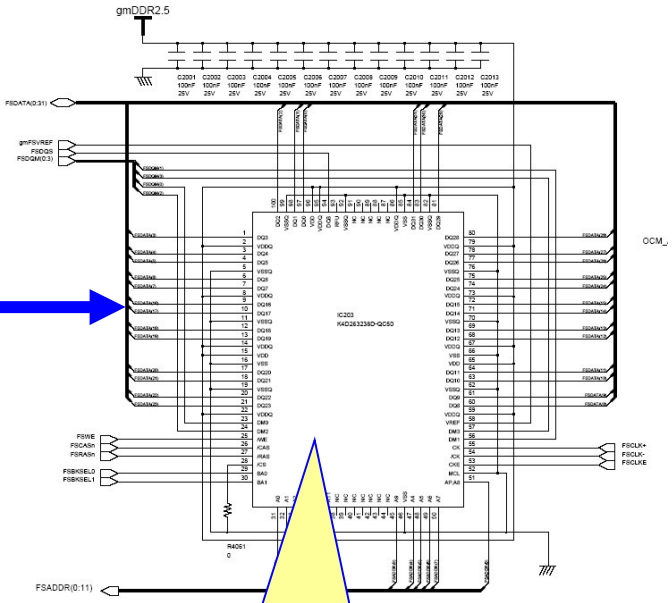


Schematics : Signal Processing VCTi



Schematics : Scaler gm1501H



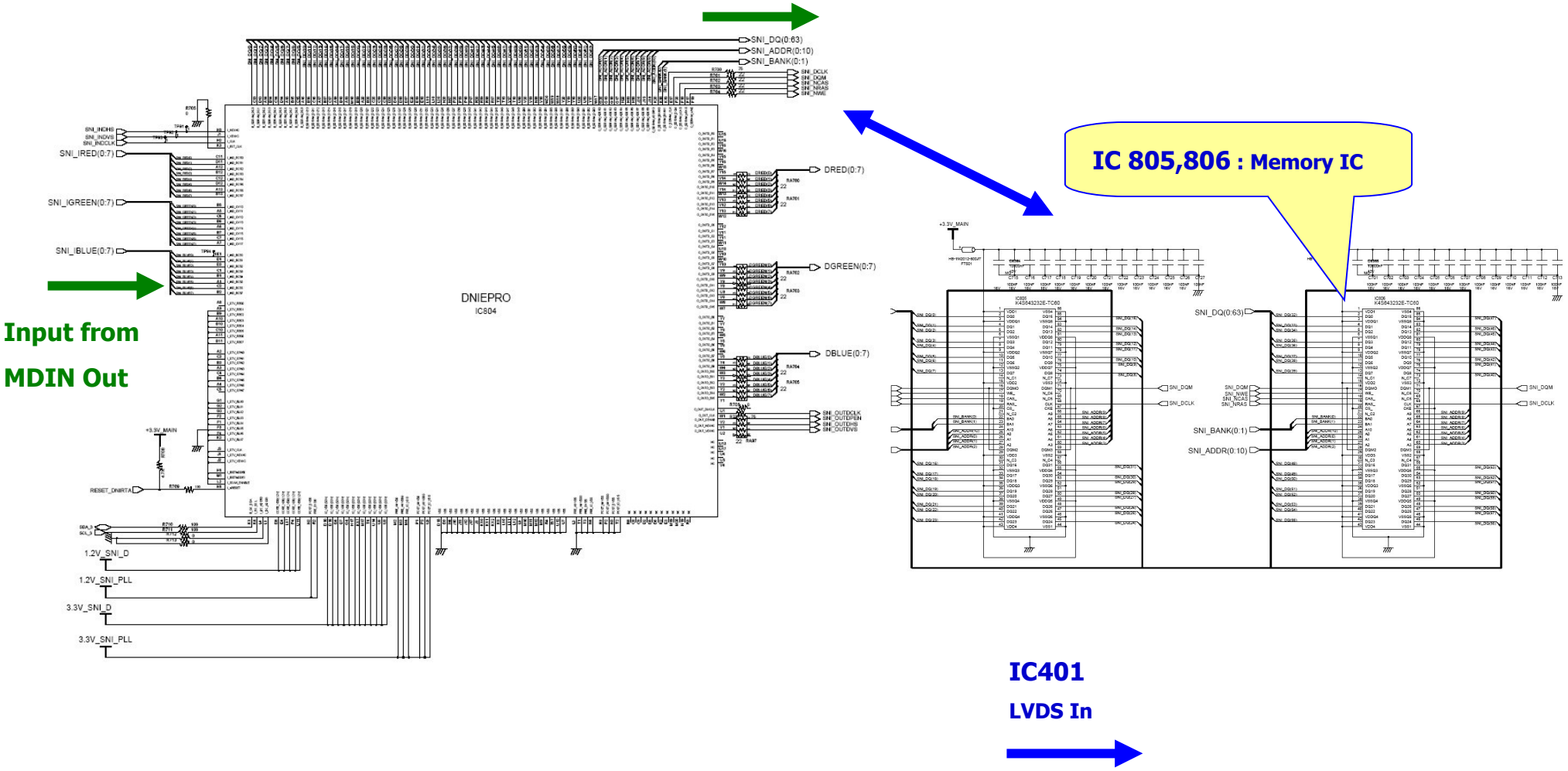


IC 203 :Memory IC

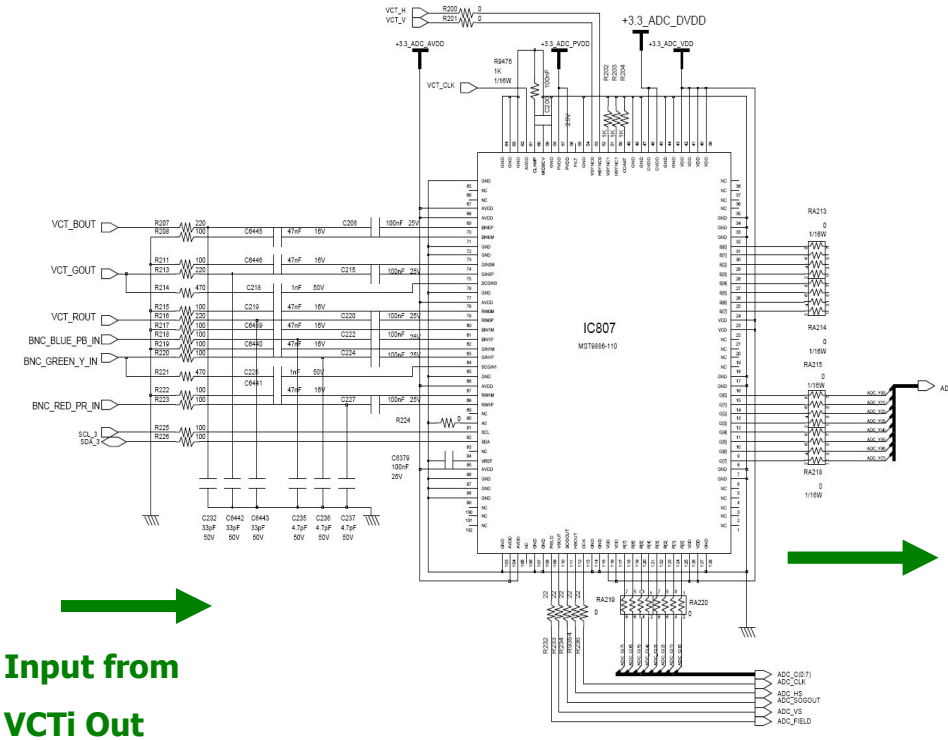
IC804

DNIe-pro In

Schematics : DNIe-pro

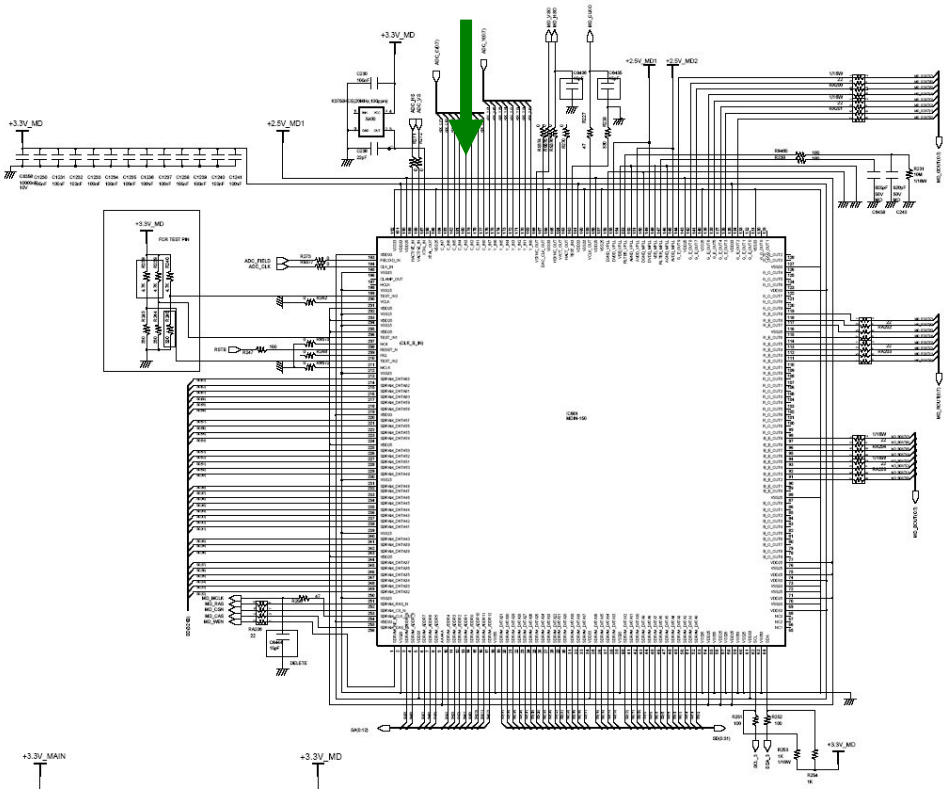


Schematics : ADC (MST9886), MDIN-150



Input from

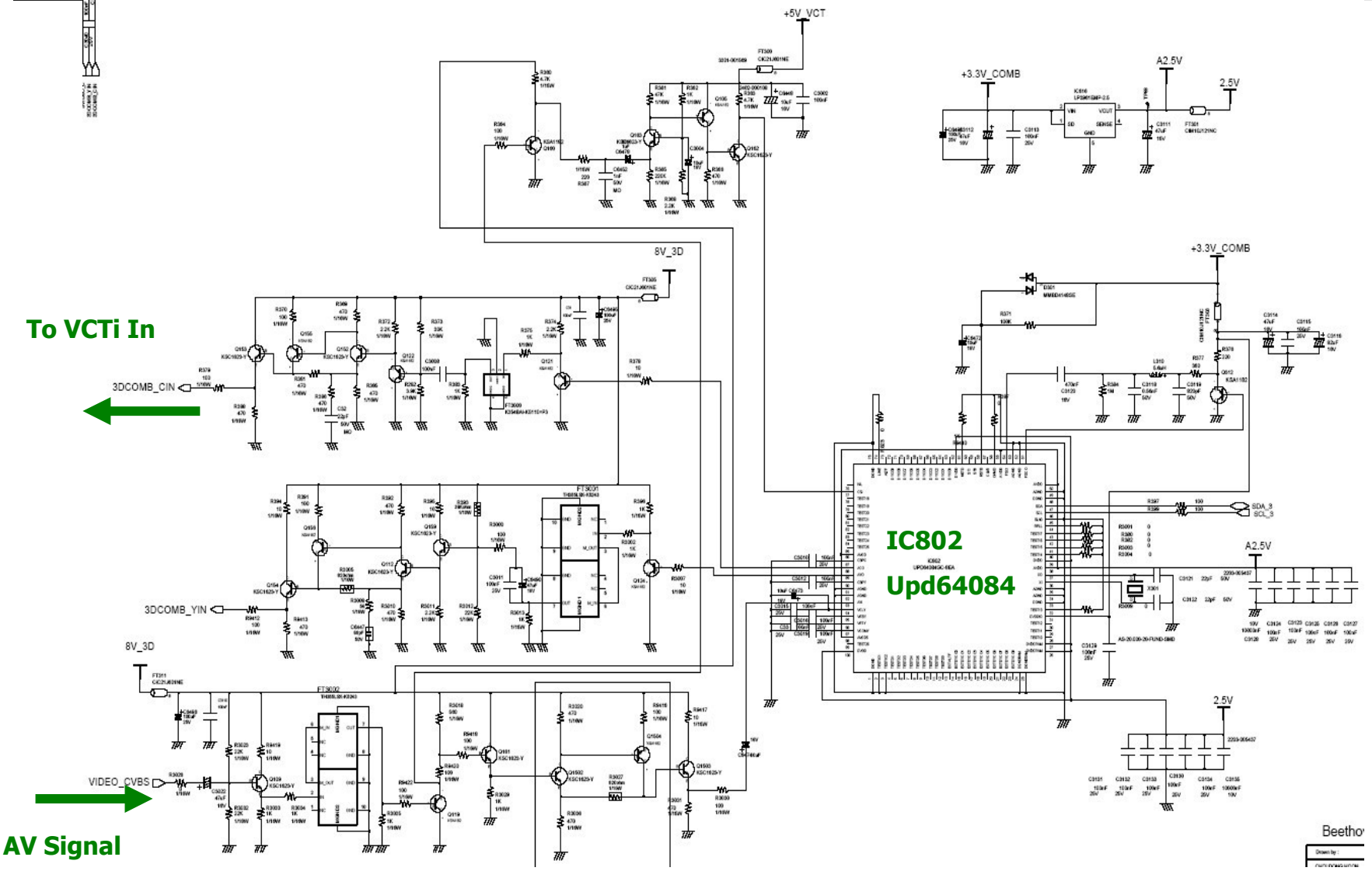
VCTi Out



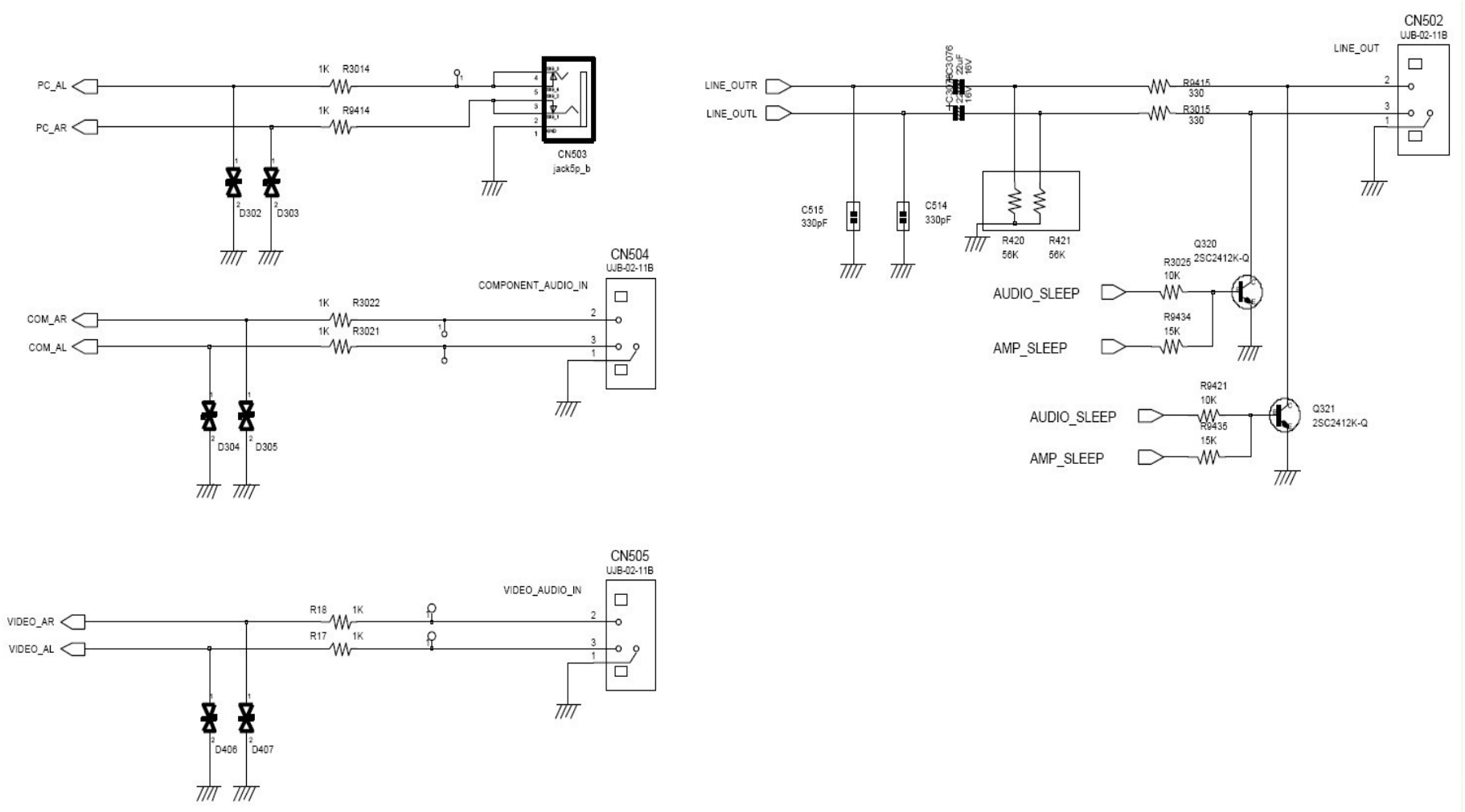
IC300

Scaler In

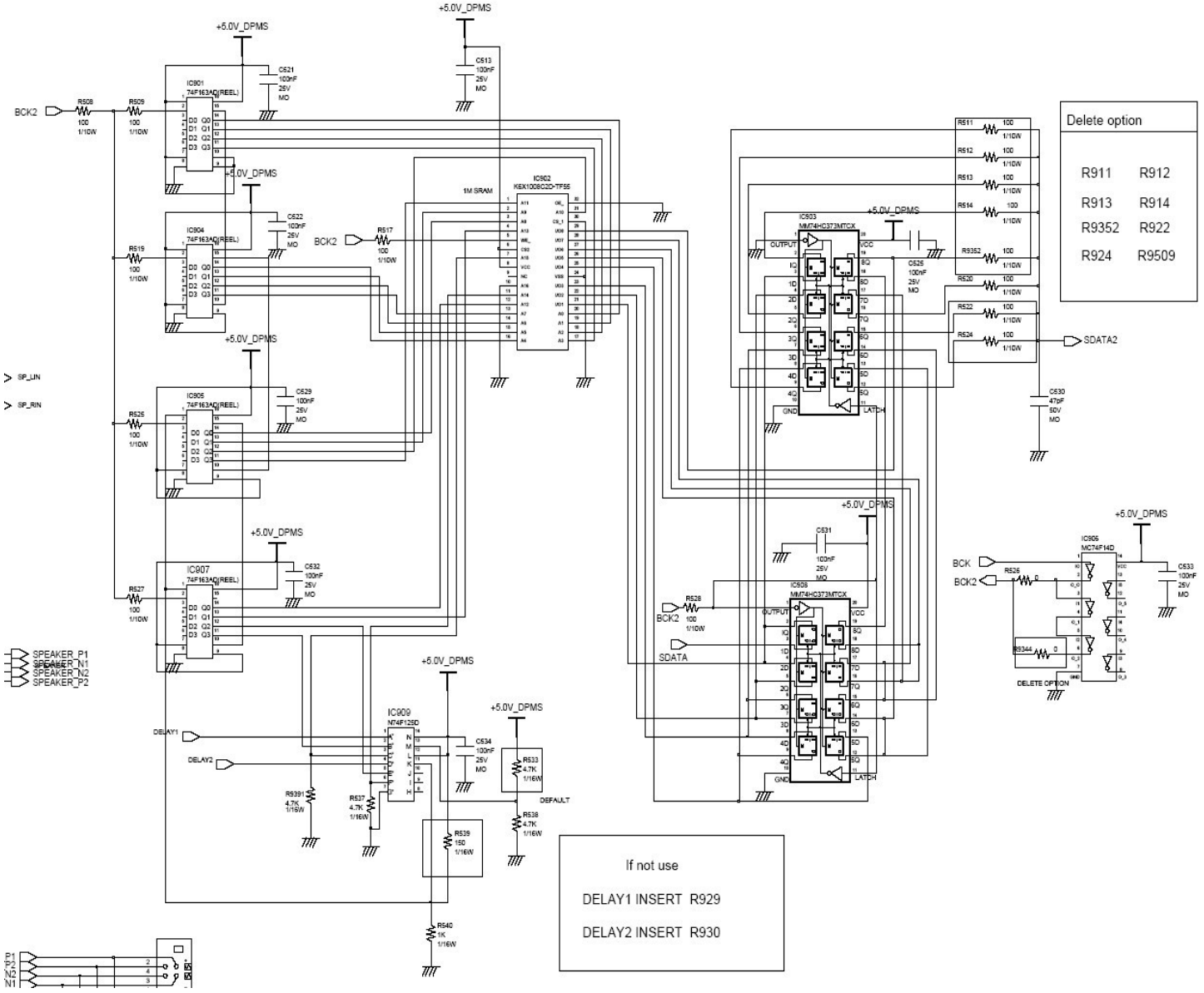
Schematics : Upd64084



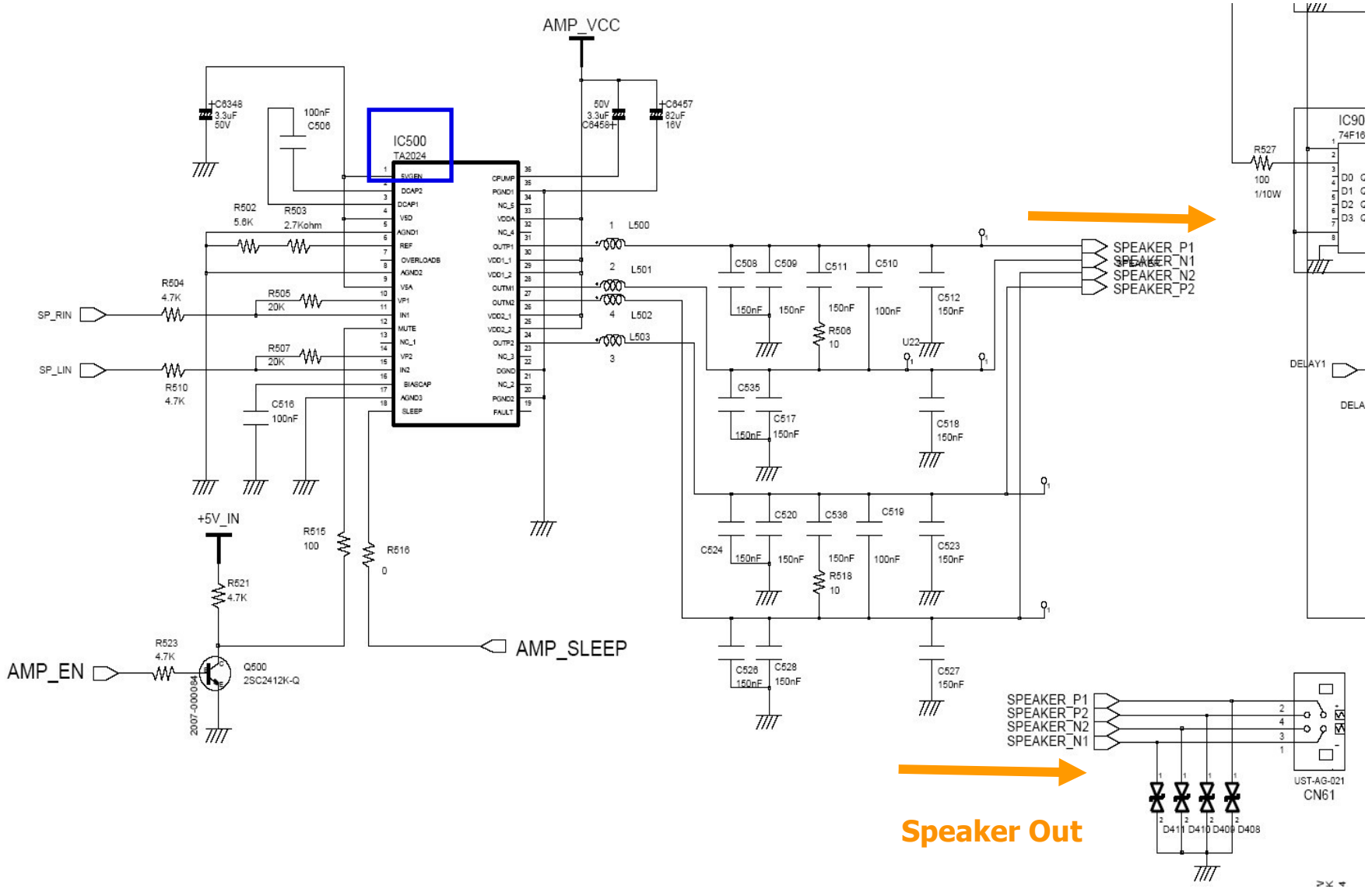
Schematics : Audio (Input)



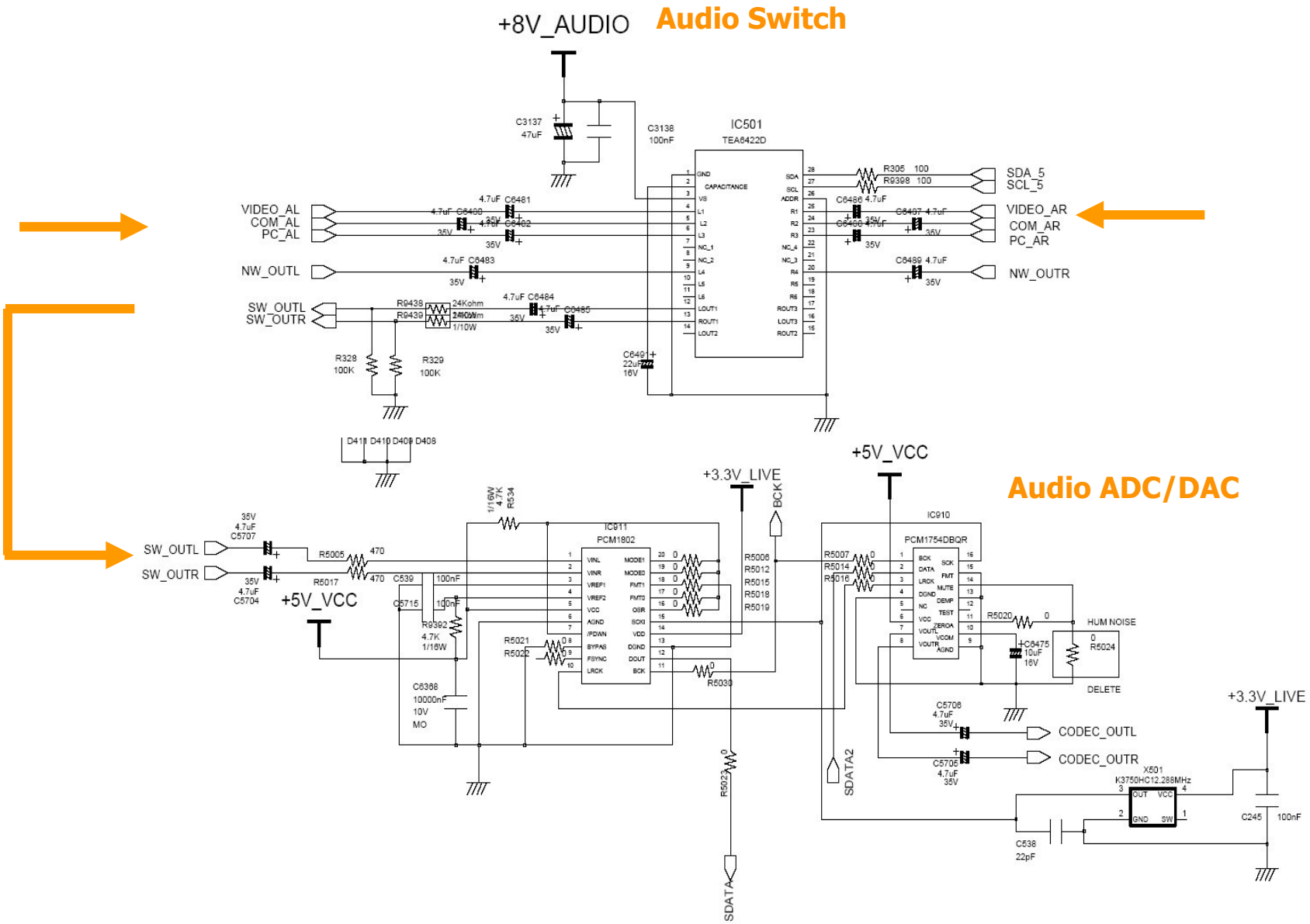
Schematics : Audio (Lip_sync Circuit)



Schematics : Audio AMP

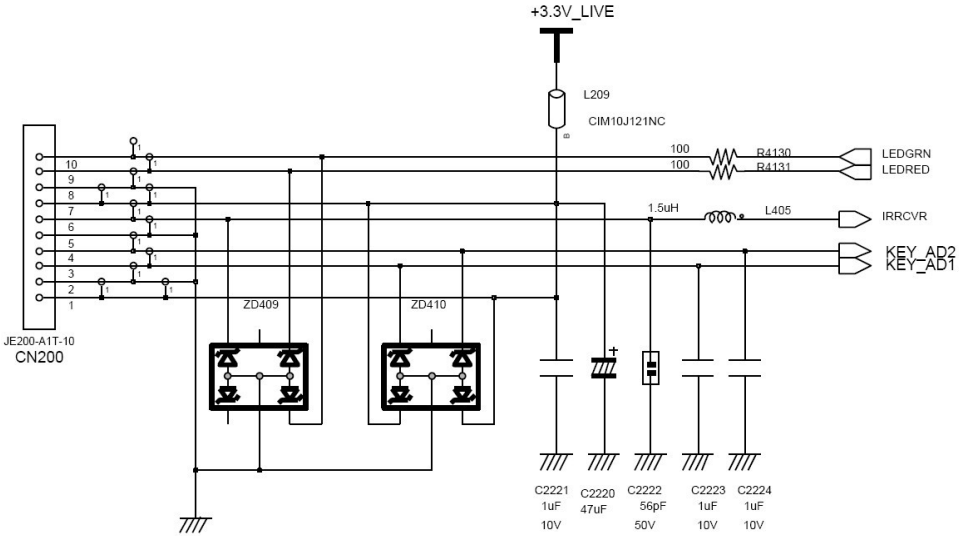


Schematics : Audio AMP

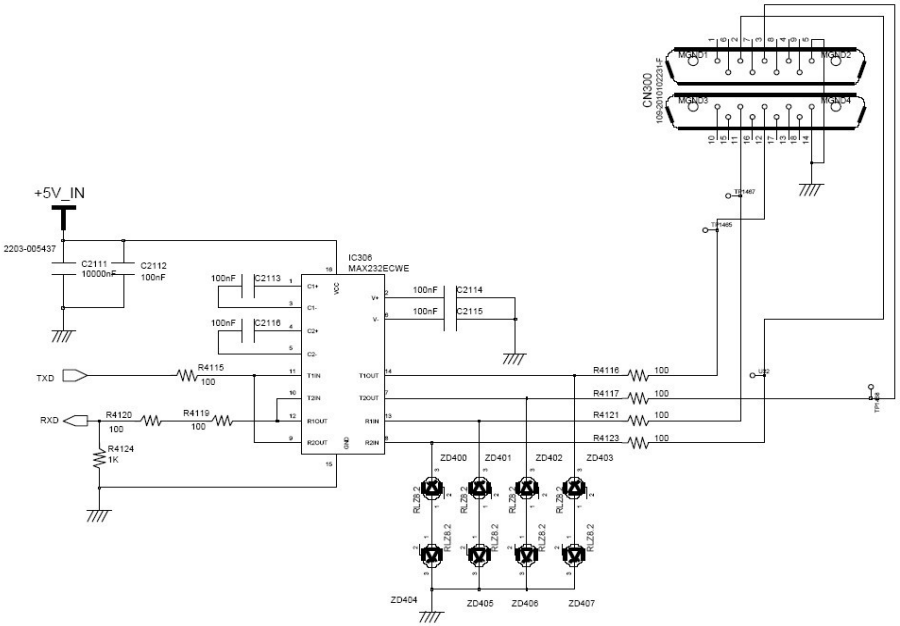


Schematics : EPROM

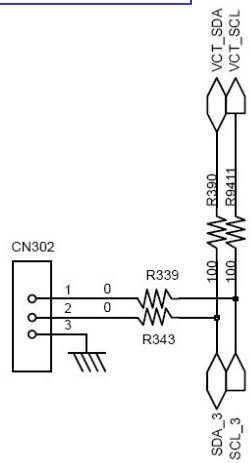
Function (CN200)



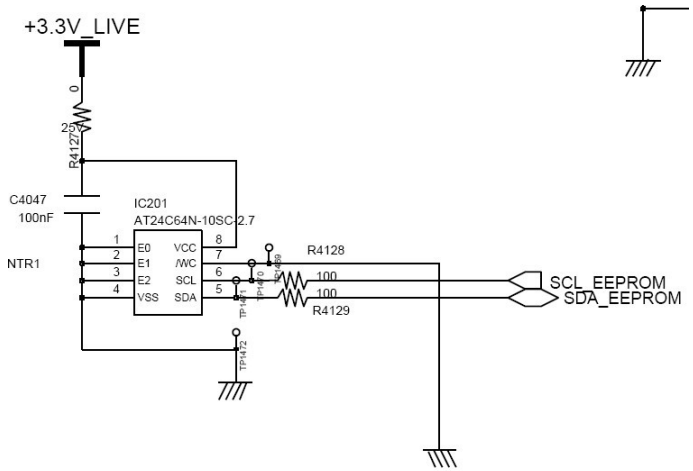
RS232 (IC306)



VCTi JIG (CN302) for R&D



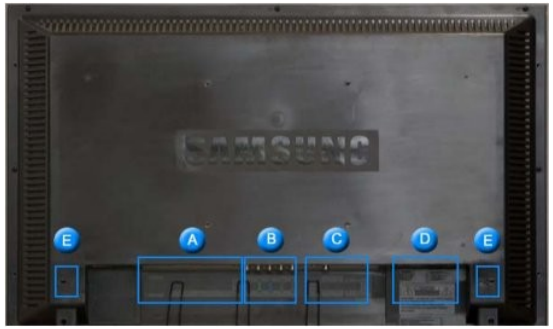
EEPROM, 24C64 (IC201)

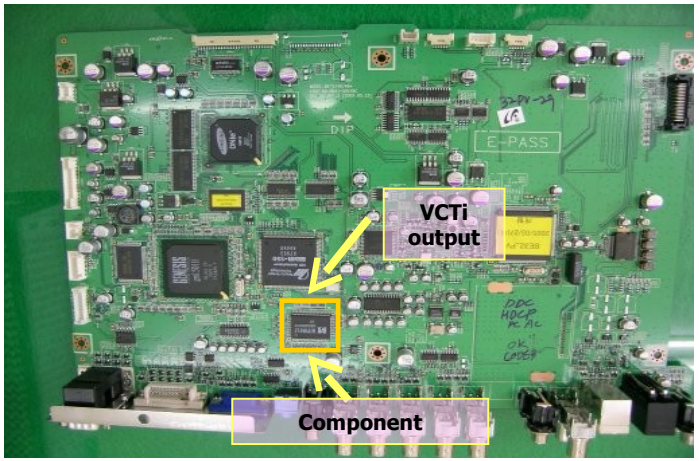


Main board part

1. MST9886

- 8- bit ADC
- 1 input 1 output
- Component input
  (Y,Pb,Pr → R, G, B (D))
- VCT input
  (R,G,B (A) → R, G, B (D))





DTV STB, DVD Input

Y,Pb,Pr(Component)

Pin 83, 84, 81, 88

R,G,B(VCTI)

Pin 79, 75, 74, 69

I²C

MST9886 IC807

MDIN150 Input

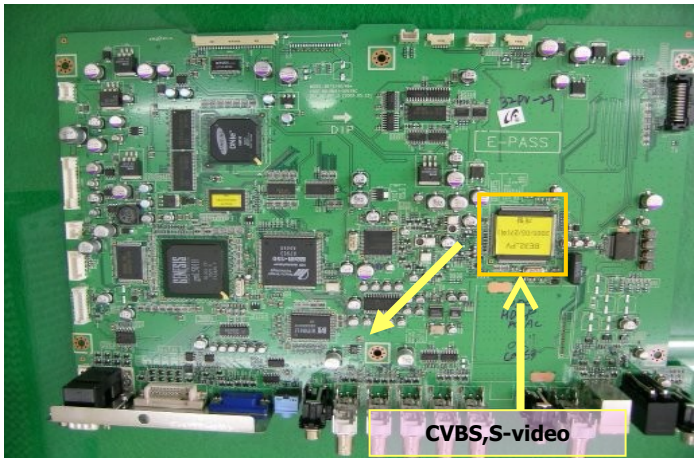
Pin 8~15	ADC_Y (8bit)
Pin 118~125	ADC_C (8bit)
Pin 112	H-Sync
Pin 110	V-Sync
Pin 113	CLOCK

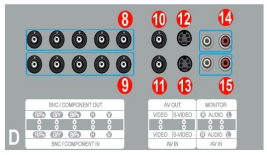
Y,Pb,Pr or R,G,B signals are analog output signals of DTV set-top or DVD player. Thus, Scaler(gm1501H) cannot interpret the signals. So, analog must simply be converted to digital, and the component used for this is MST9886.

Main board part

2.VSP(Inside VCTi)

- 3 Inputs, 1 Output
- CVBS, S- Video





Ext. Video Signal In

Video(AV)

Pin 60 (VCR)

S-Video

Pin 62,63 (Y,C)

I²C

VCTI
IC800

MST9886 In

Pin 143 → R

Pin 144 → G

Pin 1 → B

Pin 99 → H-Sync

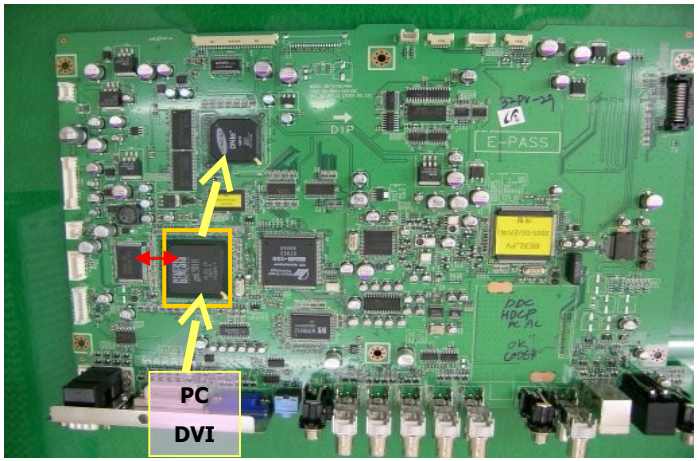
Pin 98 → V-Sync

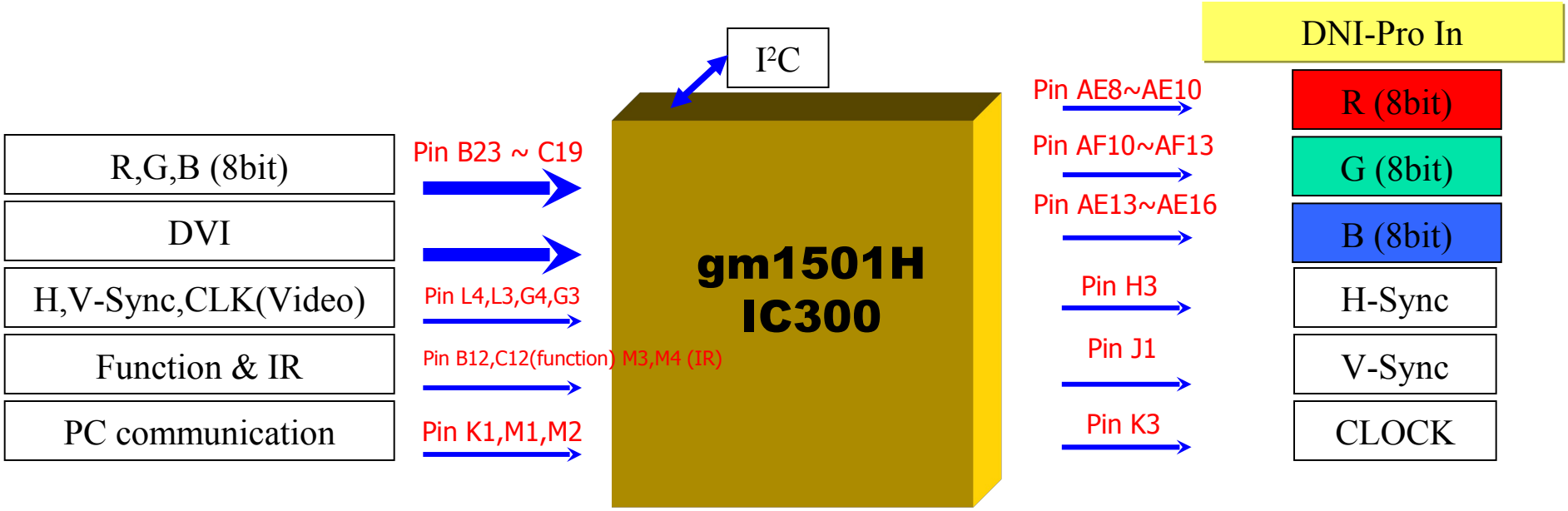
Pin 83 → CLOCK

Main board part

3. gm1501H

- GENESIS Scaler IC
- Micro- processor Inside
- Supporting RxTx
- Supporting OSD and PIP

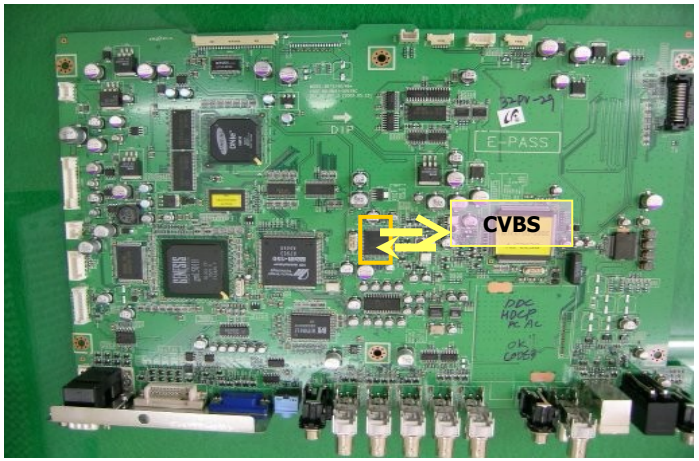


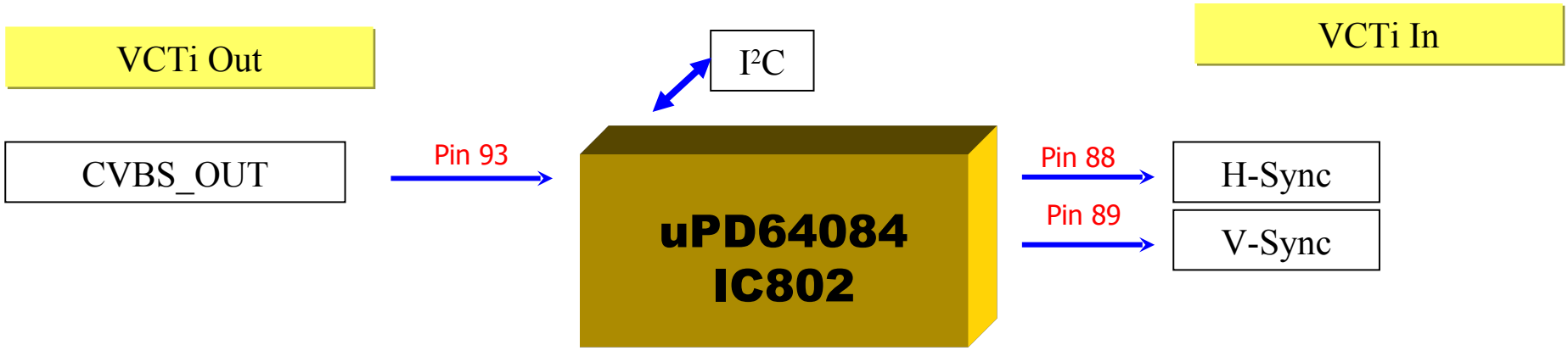


Main board part

4. uPD64084

- 10 bit ADC
- 3 input 1 output
- 3D- comb filter Inside
- Using it to Component 480i, Video1(CVBS), Video2(S- Video)

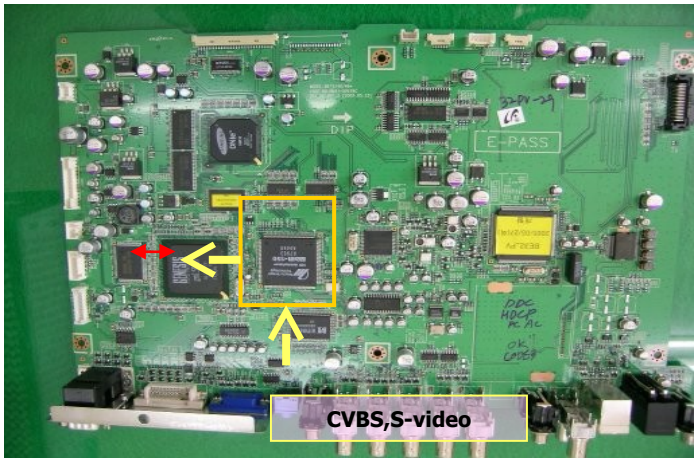


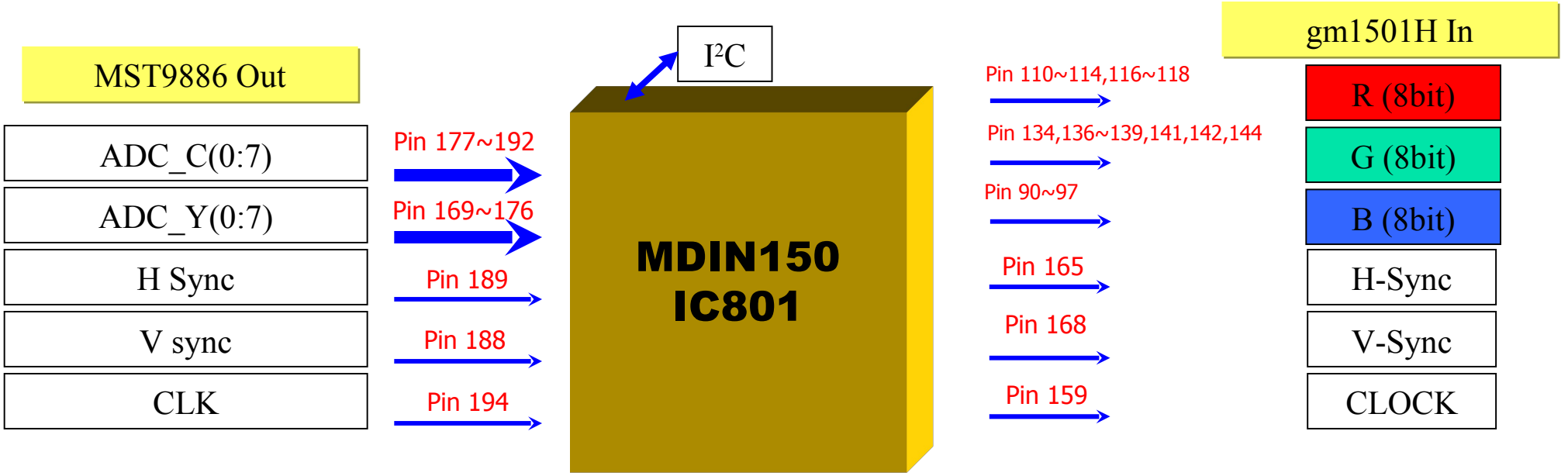


Main board part

5. MDIN150

- Deinterlacer
- Noise reduction & Signal enhancement
- Programmable brightness, contrast, tint, saturation, etc
- Using it to CVBS and S- Video

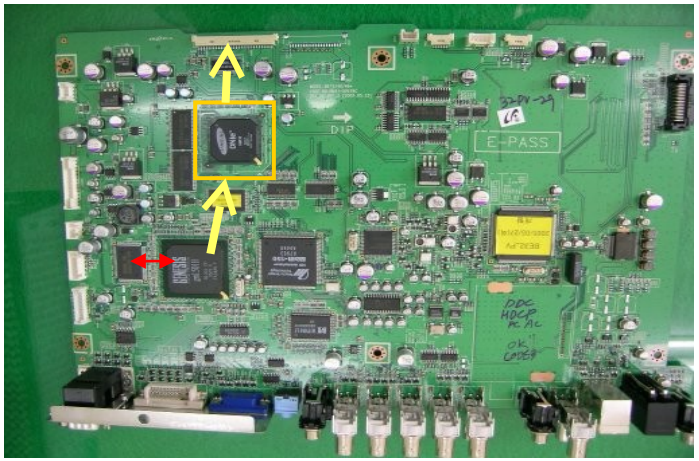


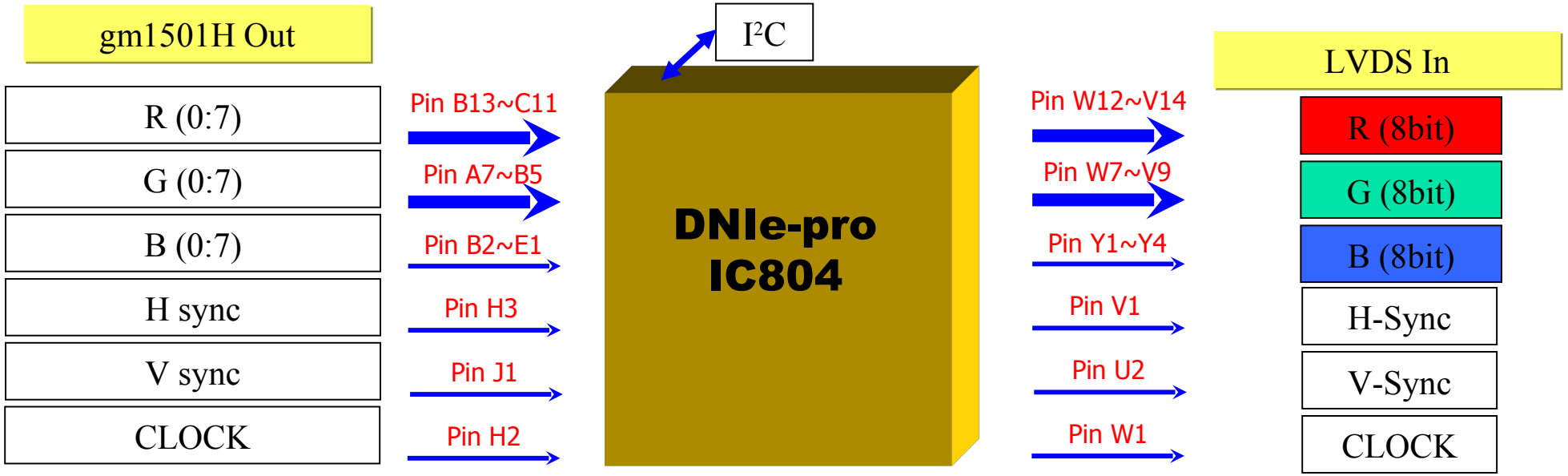


Main board part

6. DNI- pro

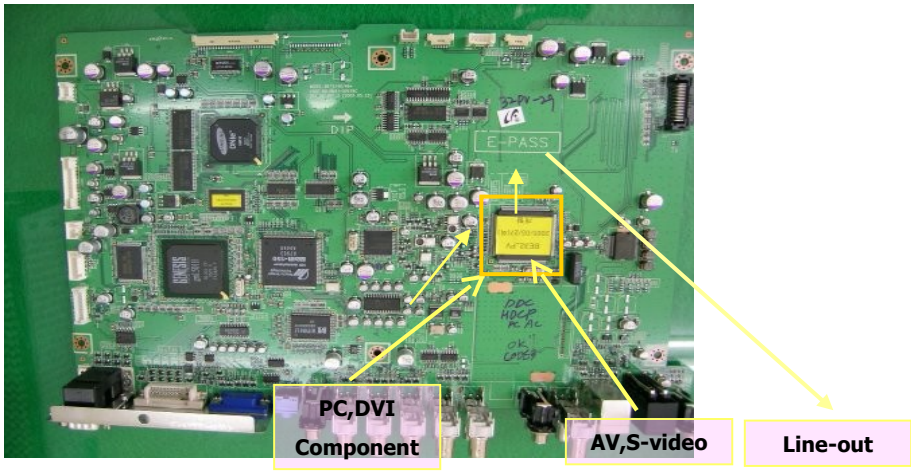
- Digital Natural Image Engine
- Noise reduction
- Detail enhancement
- Contrast enhancement, black and white stretch

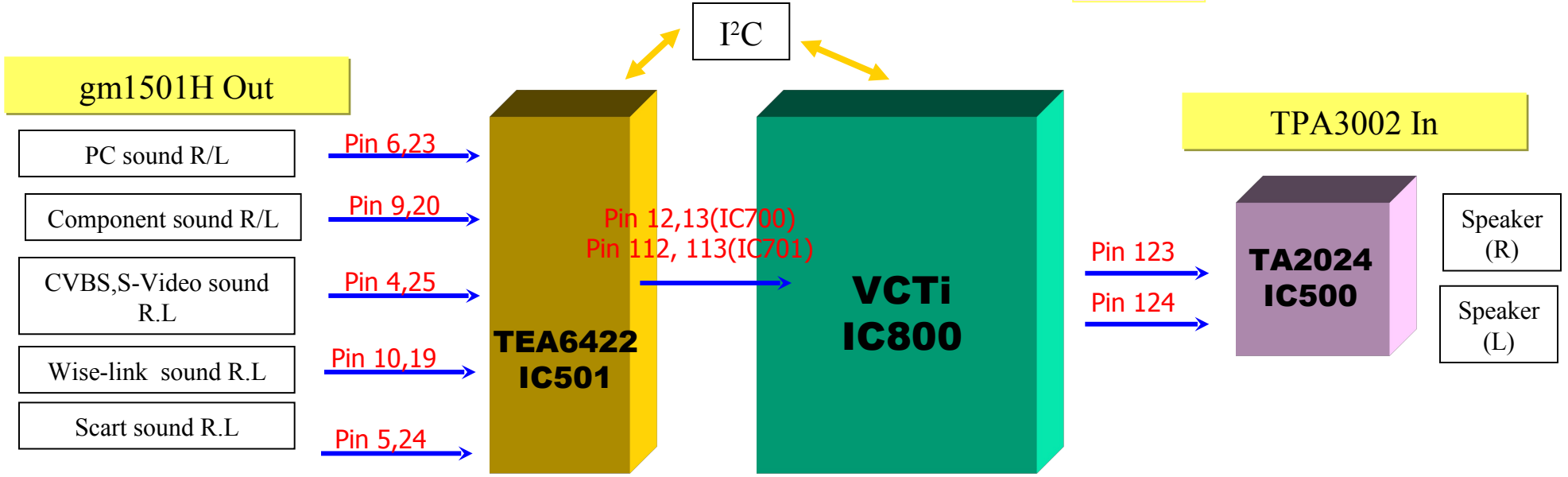




7. MSP (Inside VCTI)

- Global version (All sound standard)
- BBE , Virtual Dolby Sound,Mute
- Amplifier : TA2024

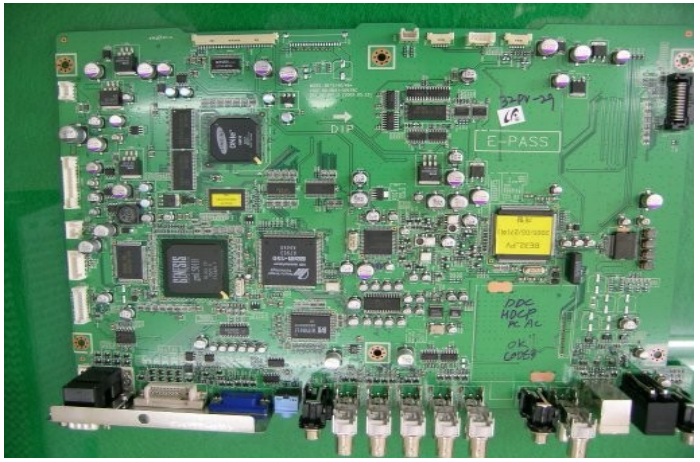




MSP(Inside VCT)

Entering Main Board Factory Menu

- Power OFF -> Mute -> 1 -> 8 -> 2 -> Power ON
- Using Factory Remote: Info + Factory



Function board part

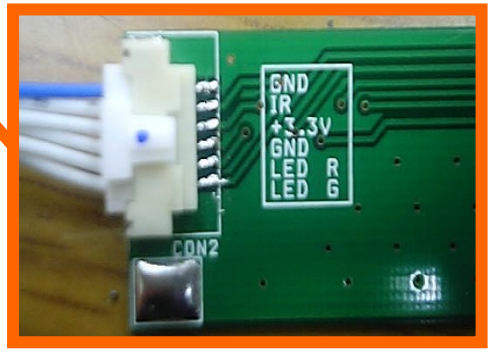
Connecting Function Board

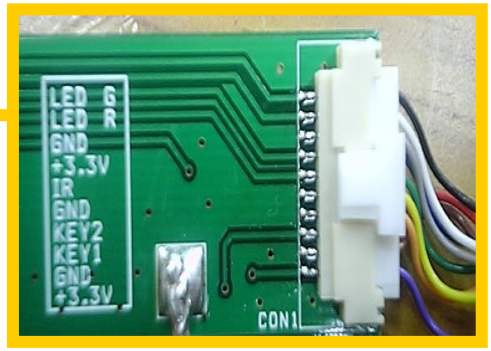
Connect to Main B'd

Function Connector (Connect to Main Board)

Connect to CN200 on Main Board

Attached to Front



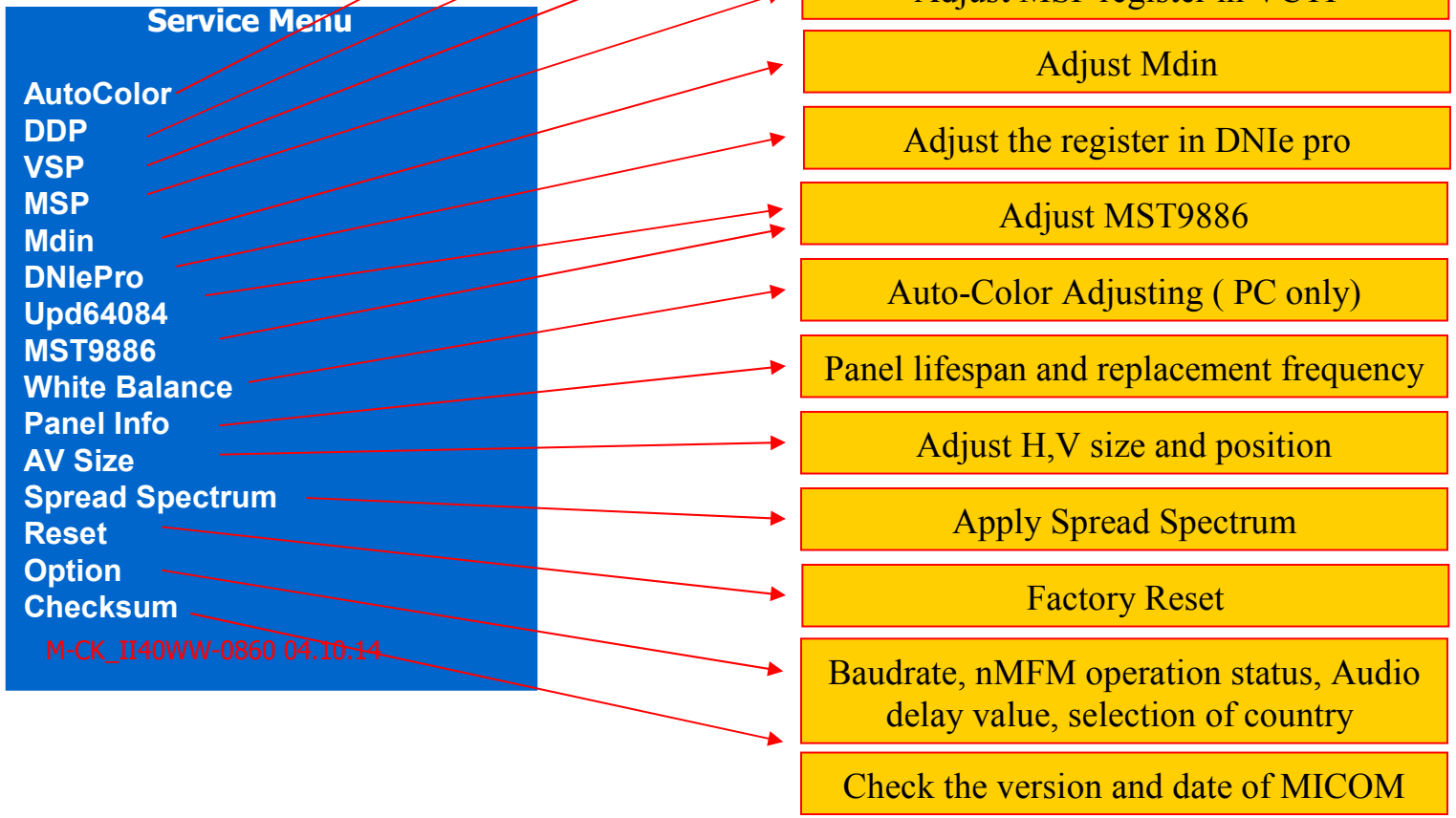


Service Mode

1. How to Enter Service Mode using REMOCON

(1) Power Off + MUTE + 1+ 8 + 2 + Power On
(2) INFO + FACTORY (Using Factory Remote)

2. Service Mode Menu



DDP (Display and Deflection Processor)

Service Menu

DDP
VSP
MSP
MST9886
White Balance
AutoColor
Panel Info
AV Size
Spread Spectrum
Reset
Option
Checksum

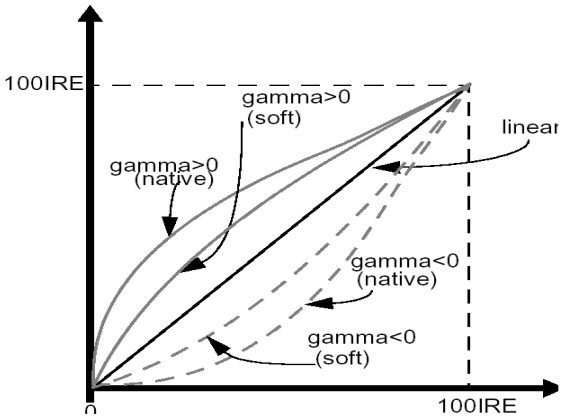
M-CK_I140WW-0860 04.10.14

DDP Part

NCE
BLE
CUTOFF
WHITE DRIVE
BLUE STRETCH
LTI
CTI
PEAKING
Adjust Misc
LUMAMIX
MATRIX

Non-linear Color space Enhancer (NCE)
: Controls the gamma of AV, S-video source.

Do not change value unless necessary, since this is a function added for management by developers according to specifications of each departure port.



DDP (Display and Deflection Processor)

Service Menu

- **DDP**
- **VSP**
- **MSP**
- **MST9886**
- **White Balance**
- **AutoColor**
- **Panel Info**
- **AV Size**
- **Spread Spectrum**
- **Reset**
- **Option**
- **Checksum**

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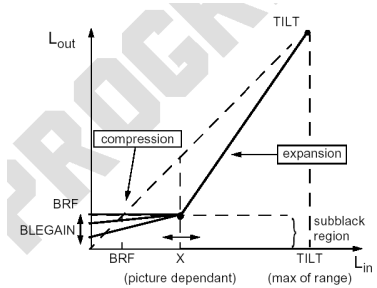
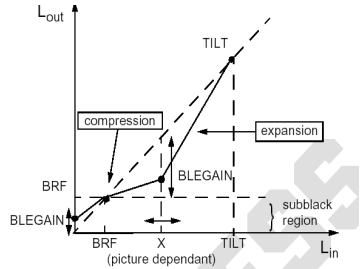
DDP Part

- NCE
- BLE
- CUTOFF
- WHITE DRIVE
- BLUE STRETCH
- LTI
- CTI
- PEAKING
- Adjust Misc
- LUMAMIX
- MATRIX

BLE MODE	3
0:no 1:auto 2:dyna 3:static	
BLE GAIN	3
BLE TILT	5
STATIC BLE	1

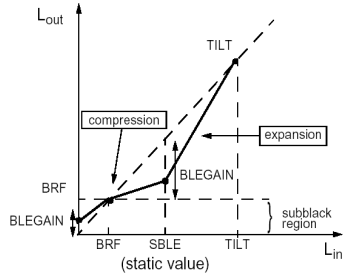


Autocontrast mode



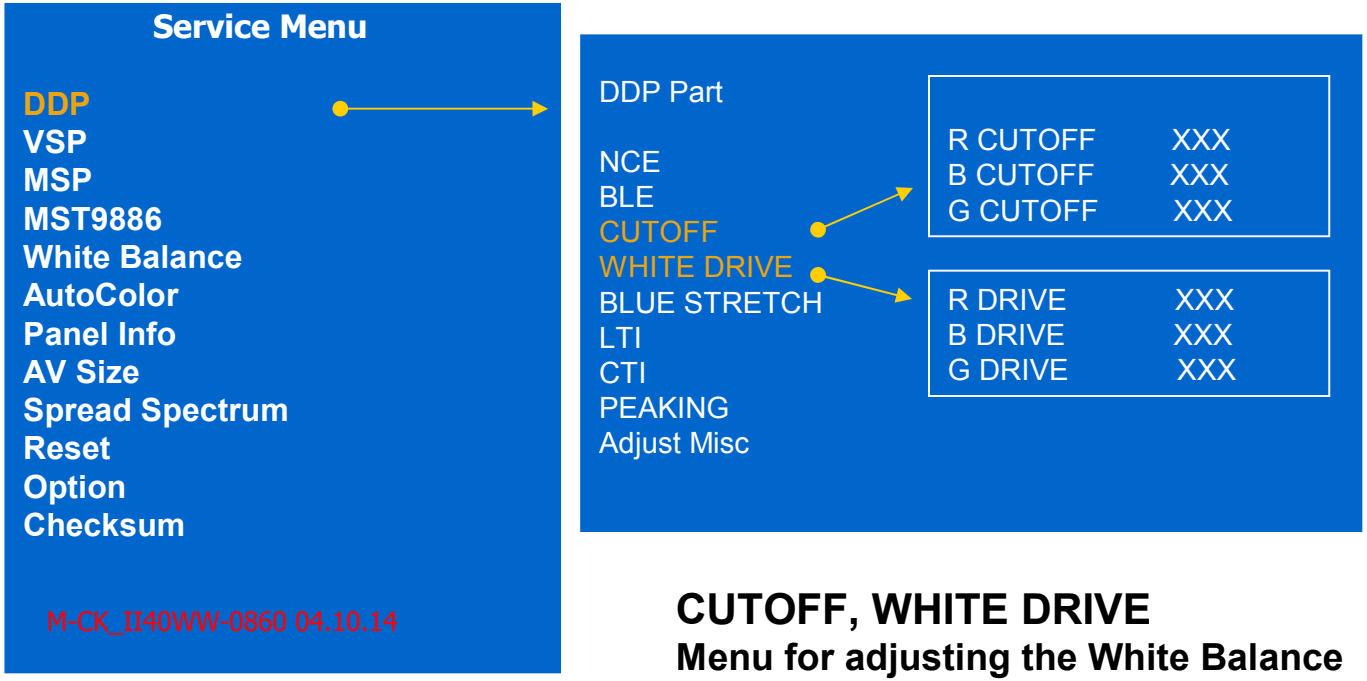
Dvnamic BLEC mode

Black Level Expander/Compressor (BLEC)
: bright image is left as is, Black image is controlled to be darker (AV,S-Video)



Static BLEC mode

DDP (Display and Deflection Processor)



CUTOFF, WHITE DRIVE

Menu for adjusting the White Balance (Min:0 Max: 511)

DDP (Display and Deflection Processor)

Service Menu

- **DDP**
- **VSP**
- **MSP**
- **MST9886**
- **White Balance**
- **AutoColor**
- **Panel Info**
- **AV Size**
- **Spread Spectrum**
- **Reset**
- **Option**
- **Checksum**

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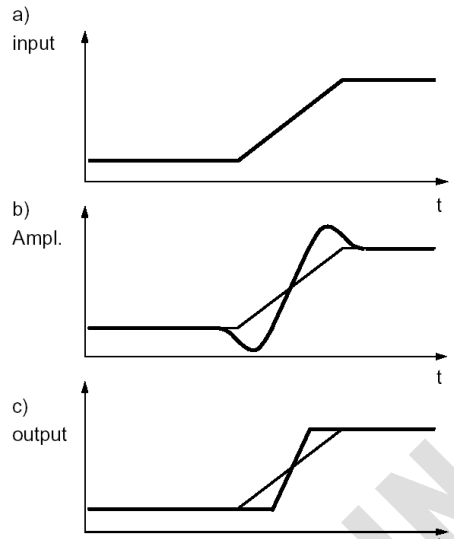
DDP Part

- NCE
- BLE
- CUTOFF
- WHITE DRIVE
- BLUE STRETCH
- LTI
- CTI
- PEAKING
- Adjust Misc
- LUMAMIX
- MATRIX

LTI CORING	1
LTI GAIN	15

CTI CORING	3
CTI GAIN	6



a) input of LTI/CTI
b) correction signal
c) sharpened output of LTI/CTI

Luma/Chrominance Transient Improvement (LTI/CTI)

Shoot signal adjustment for brightness signals and color contrast signals to improve sharpness and reduce peaking (AV,S-Video)

DDP (Display and Deflection Processor)

Service Menu

- **DDP**
- **VSP**
- **MSP**
- **MST9886**
- **White Balance**
- **AutoColor**
- **Panel Info**
- **AV Size**
- **Spread Spectrum**
- **Reset**
- **Option**
- **Checksum**

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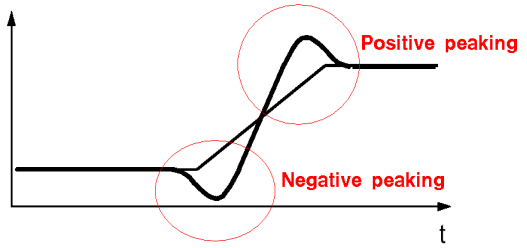
DDP Part

- NCE
- BLE
- CUTOFF
- WHITE DRIVE
- BLUE STRETCH
- LTI
- CTI
- PEAKING
- Adjust Misc
- LUMAMIX
- MATRIX

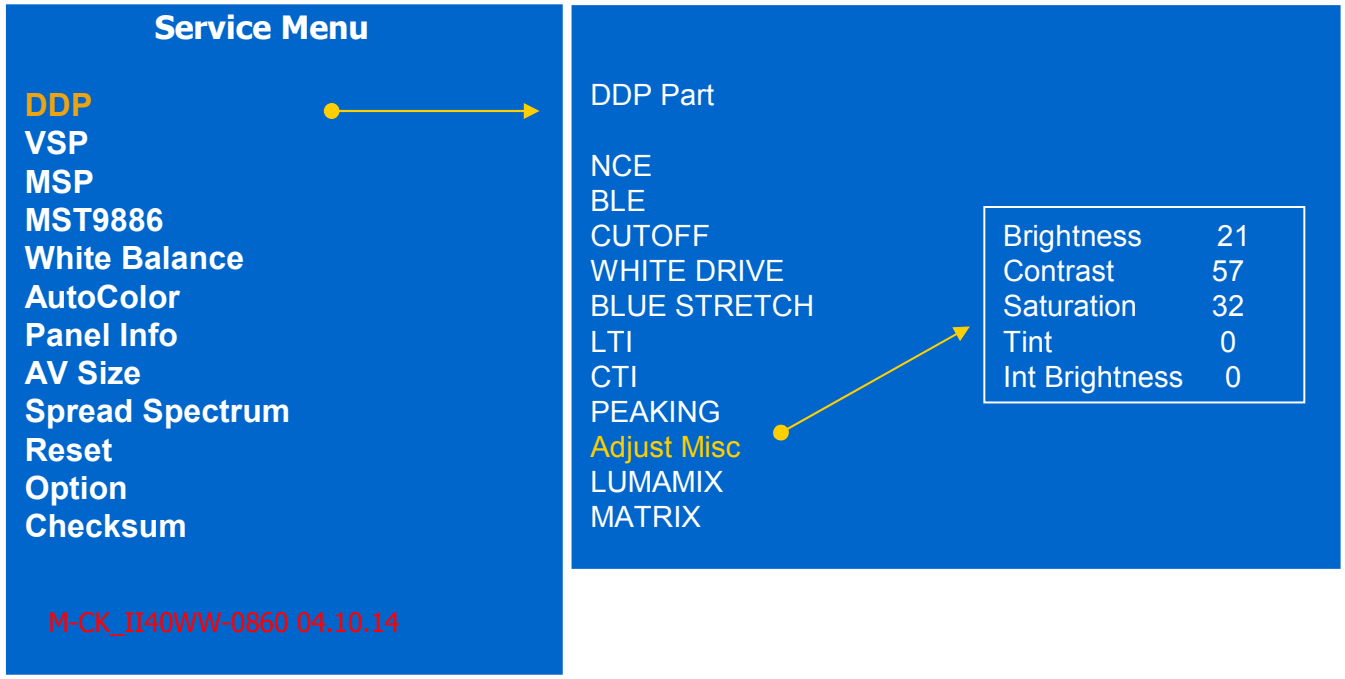
Pos Peak	13
Neg Peak	13
Peak Coring	6



Peaking

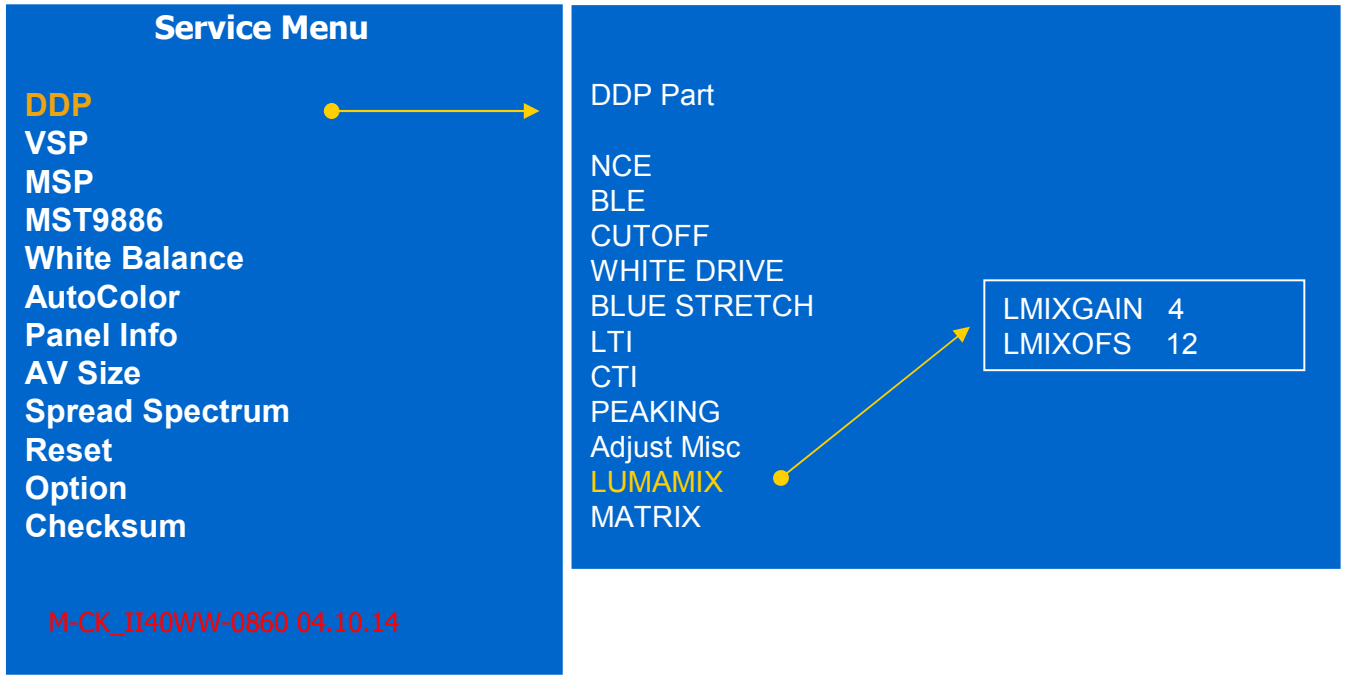
Peaking is made strong or weak by controlling overshoot and undershoot
(AV,S-Video)

DDP (Display and Deflection Processor)



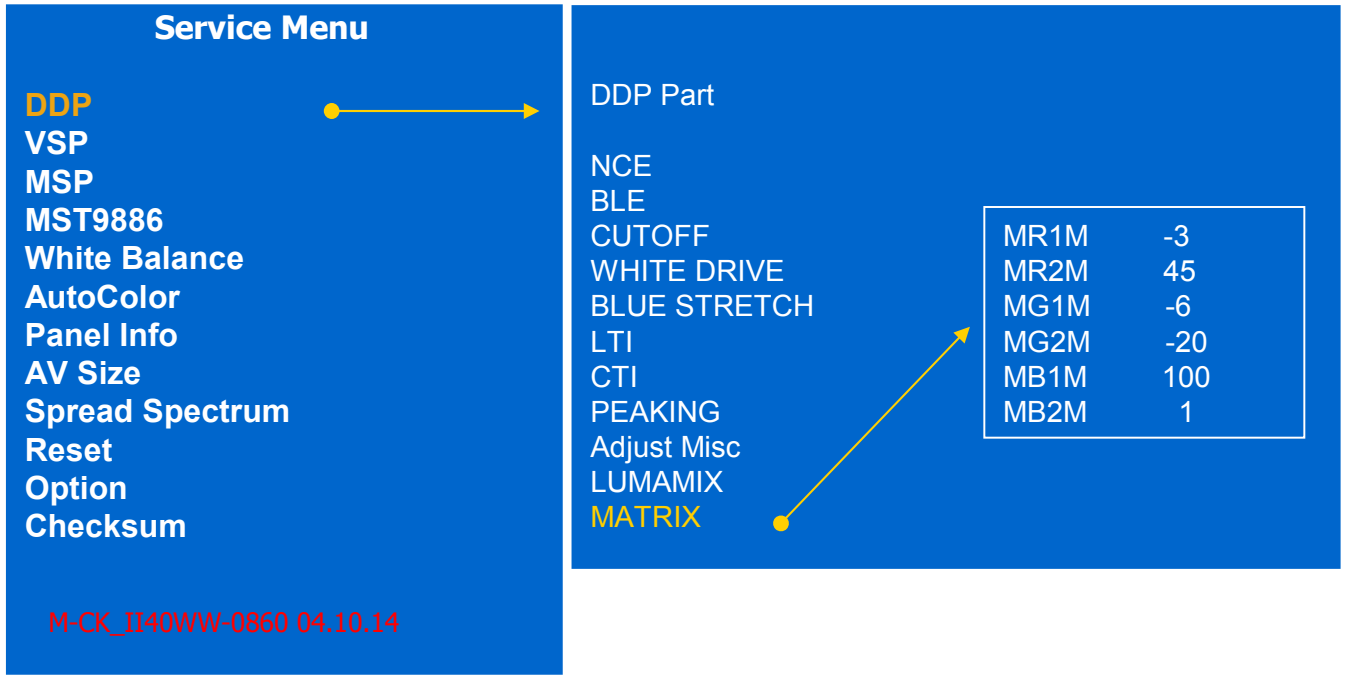
Contrast, Brightness, Saturation and Tint Control
(AV,S-Video)

DDP (Display and Deflection Processor)



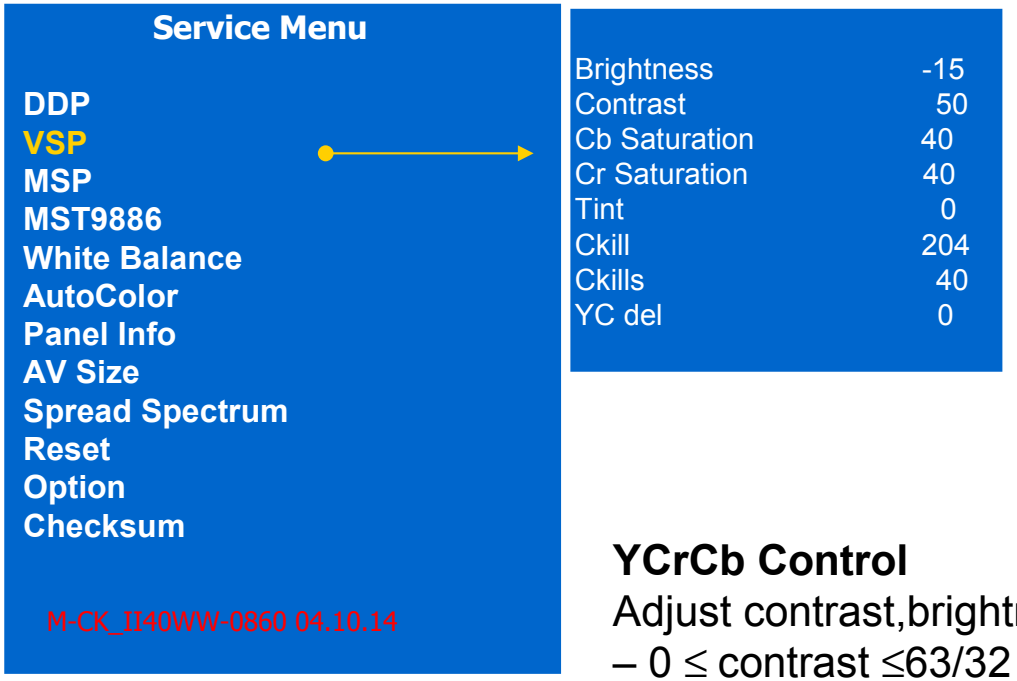
Mixing Coefficient Gain, Offset Control
(AV,S-Video)

DDP (Display and Deflection Processor)



Programmable Inverse Matrix
(AV,S-Video)

VSP (Video Processor) part

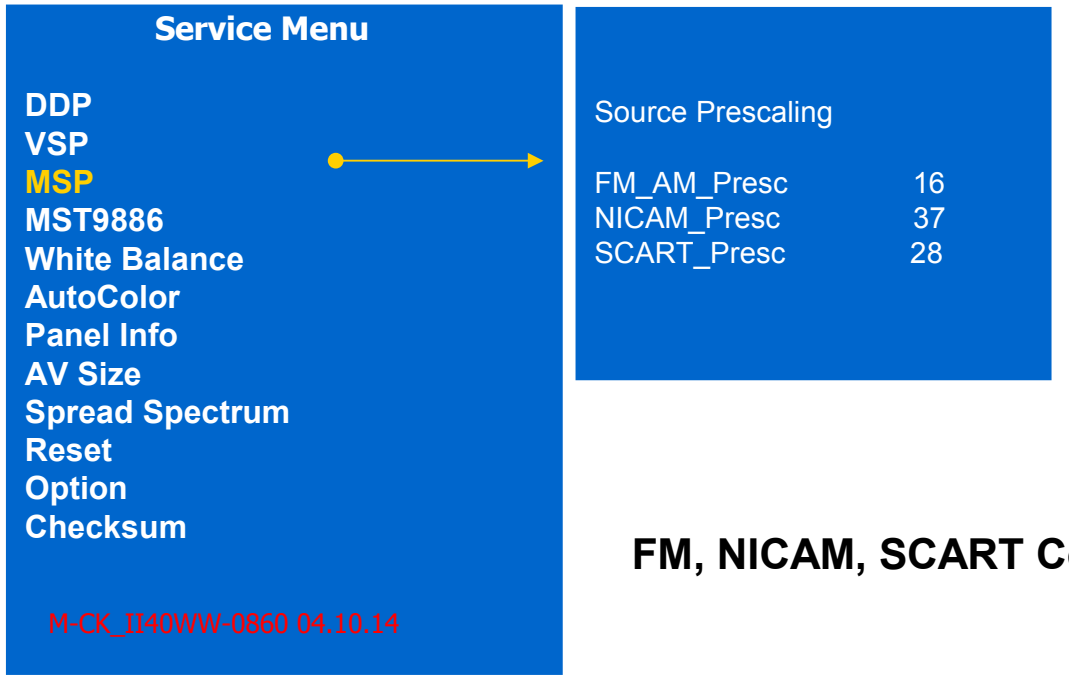


YCrCb Control

Adjust contrast,brightness,color saturation, and tint of RGB

– 0 ≤ contrast ≤63/32 (**CONADJ)**
– –128 ≤ brightness ≤ 127 (**BRTADJ)**
– 0 ≤ saturation Cr ≤ 63/32 (**VSATADJ**)
– 0 ≤ saturation Cb ≤ 63/32 (**USATADJ**)
– -45° ≤ tint ≤ +45° (**TINT**)

MSP(Multistandard Sound Processor)



FM, NICAM, SCART Control

MST9886 part

Used for color control. But excessive setting may saturate the color.
Extreme caution needed.!!

Service Menu

- DDP
- VSP
- MSP
- MST9886
- White Balance
- AutoColor
- Panel Info
- AV Size
- Spread Spectrum
- Reset
- Option
- Checksum

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MST9886 Gain/Offset

RED Gain	97
GREEN Gain	95
BLUE Gain	97
RED Offset	153
GREEN Offset	153
BLUE Offset	153

ADC (MST9886)
Red/BLUE/GREEN input gain/offset □□

White Balance

Used for color control. But excessive setting may saturate the color.
Extreme caution needed.!!

Service Menu

- DDP
- VSP
- MSP
- MST9886
- White Balance
- AutoColor
- Panel Info
- AV Size
- Spread Spectrum
- Reset
- Option
- Checksum

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White Bal [DNIe]	Gain/Offset
RED Gain	128
GREEN Gain	128
BLUE Gain	128
RED Offset	0
GREEN Offset	0
BLUE Offset	0

White Balance (DNIe)
RED / BLUE / GREEN gain/offset □□

Auto Color

Service Menu

- DDP
- VSP
- MSP
- MST9886
- White Balance
- AutoColor
- Panel Info
- AV Size
- Spread Spectrum
- Reset
- Option
- Checksum

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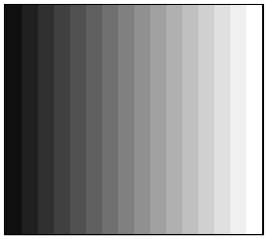
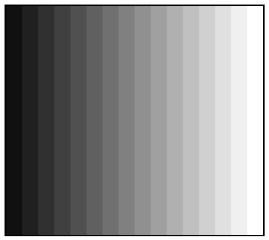


PC analog Only (1360x768@60 16 gray pattern)
Color control operates normally only in certain modes of certain patterns, but in other cases, the operation may distort color. Also, color control is not normal when controlling color in a mode other than XGA 60Hz.

Extreme caution needed.!!



Component (720p 16 gray pattern)
Color control operates normally only in certain modes of certain patterns, but in other cases, the operation may distort color. **Extreme caution needed.!!**

Color Tone	
RED Gain	255
BLUE Gain	255
GREEN Gain	255
RED Offset	0
GREEN Offset	0
BLUE Offset	0

Used for PC, Component color tone control in the color control part provided by gm1501

Panel Info/Reset/Auto adj.

Service Menu

- DDP
- VSP
- MSP
- MST9886
- White Balance
- AutoColor
- Panel Info
- AV Size
- Spread Spectrum
- Reset
- Option
- Checksum

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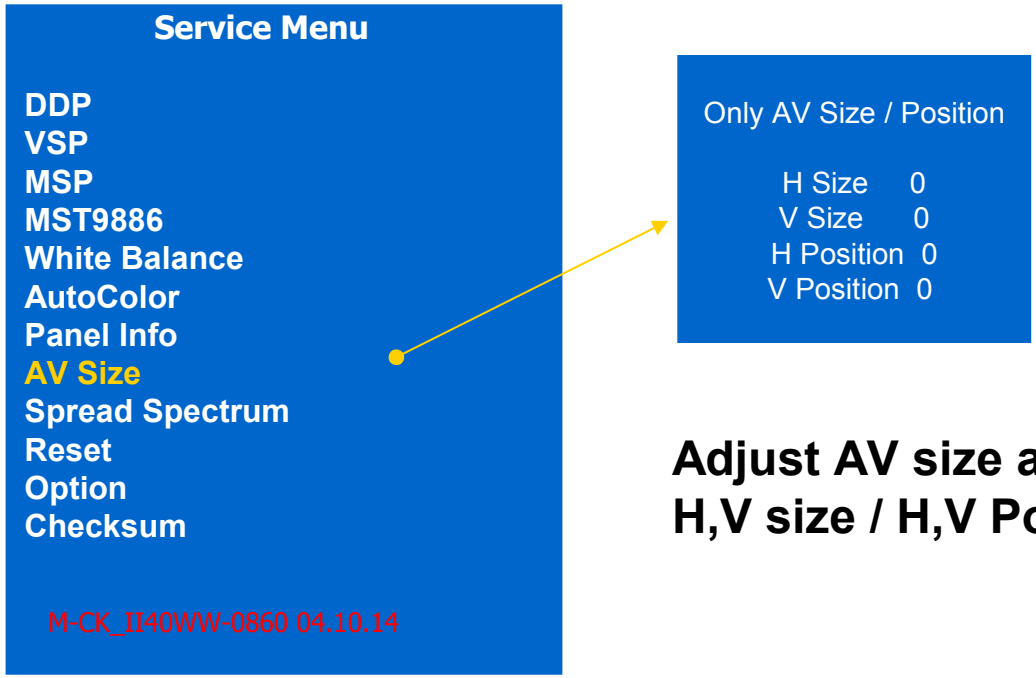
Panel Information
Total Hr: xxx
Time xxx
Ch.No xxx

Time Reset : Push the Menu button on the front for five seconds

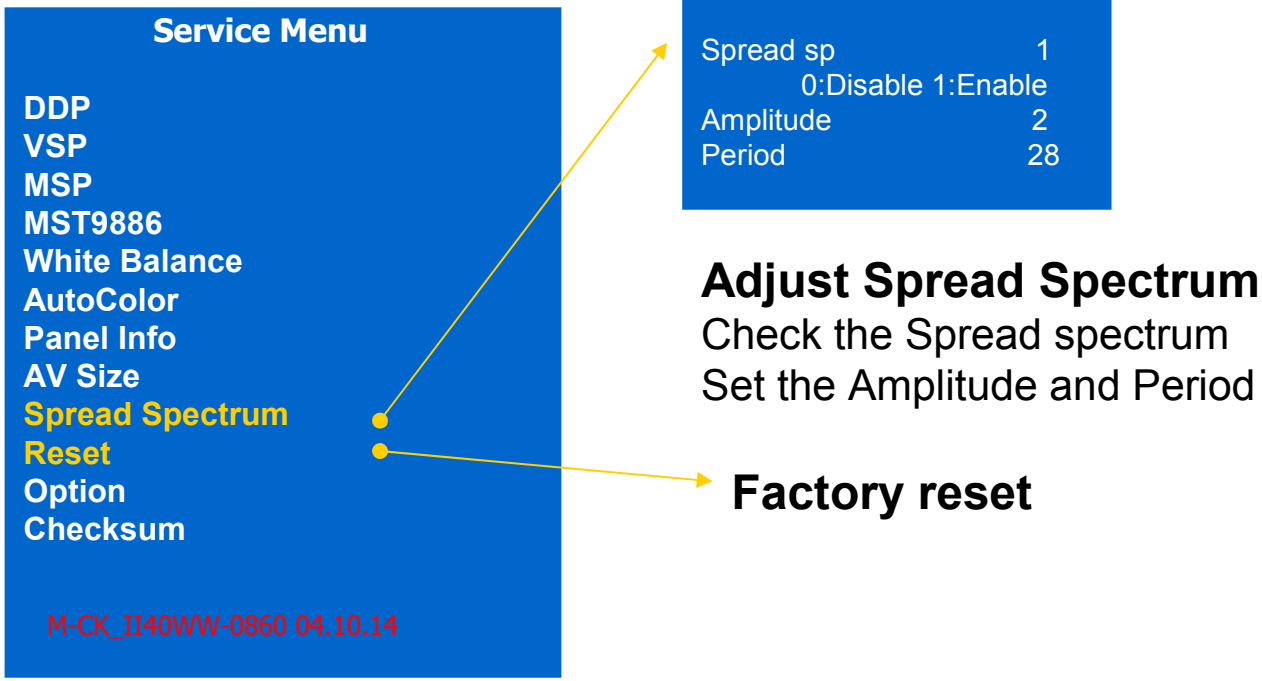
Factory Reset
(Turn the Power off and on after Reset.)

Option / Checksum



Adjust AV size and position.
H,V size / H,V Position

Option/Checksum



Adjust Spread Spectrum
Check the Spread spectrum
Set the Amplitude and Period

Factory reset

Option / Checksum

Service Menu

DDP
VSP
MSP
MST9886
White Balance
AutoColor
Panel Info
AV Size
Spread Spectrum
Reset
Option
Checksum

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Option

Baudrate		19200 / 115200
Remocon		Enabled / Disabled
nMFM		ON / OFF
DNIe Demo		ON / OFF
Scroll Control	➔	Scroll Period off /1/2/…/10
		Scroll Second off/1/2/…/5

Adjust Option

Set the Baudrate
Set the Remote Control
Set the Network
Set the DNIe
Set the Scroll (period, second)

CheckSum

Trouble Shooting

NO POWER

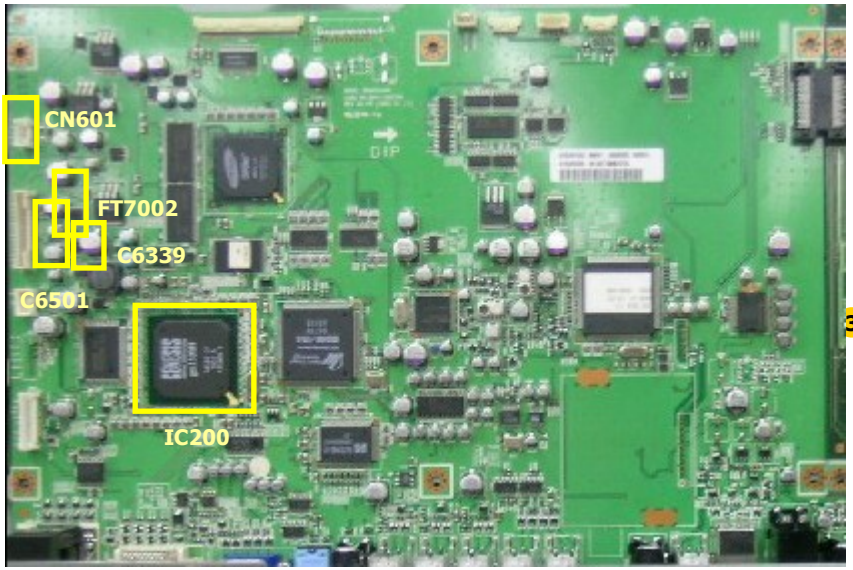
Does proper 12V appear at Pin No. 9,10,11 CN601 ? (+12.0V_NW)
- NO → Check Adaptor
- YES ↓

Does proper 12V appear at FT620 ? 1
- NO → Check related circuit of CN604
- YES ↓

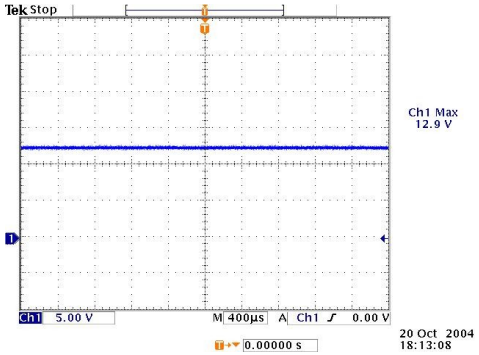
Does proper 5V appear at FT7002 ? (+5V_IN) 2
- NO → Check related circuit of IC609
- YES ↓

Does proper 3.3V appear at C6339 ? (+3.3V_LIVE)
- NO → Check related circuit of IC610
- YES ↓

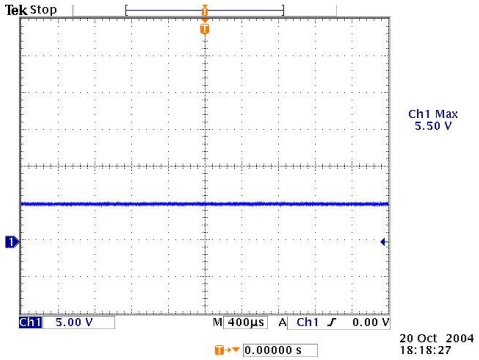
Check IC200 (scaler) or IC201, 203 3
- NO → Power board defect. Replace power board.



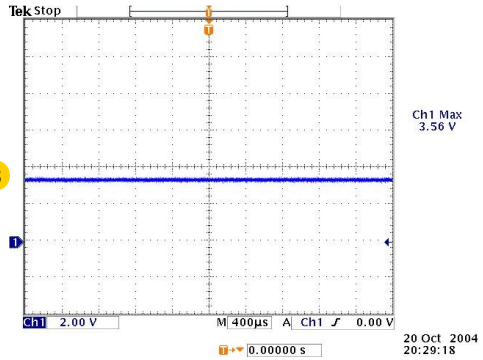
1



2



3



Trouble Shooting

PC (D-SUB) No Screen

Does proper +5V at FT602?
- NO → Check power board. *Refer to 1.no power (previous page)
- YES ↓

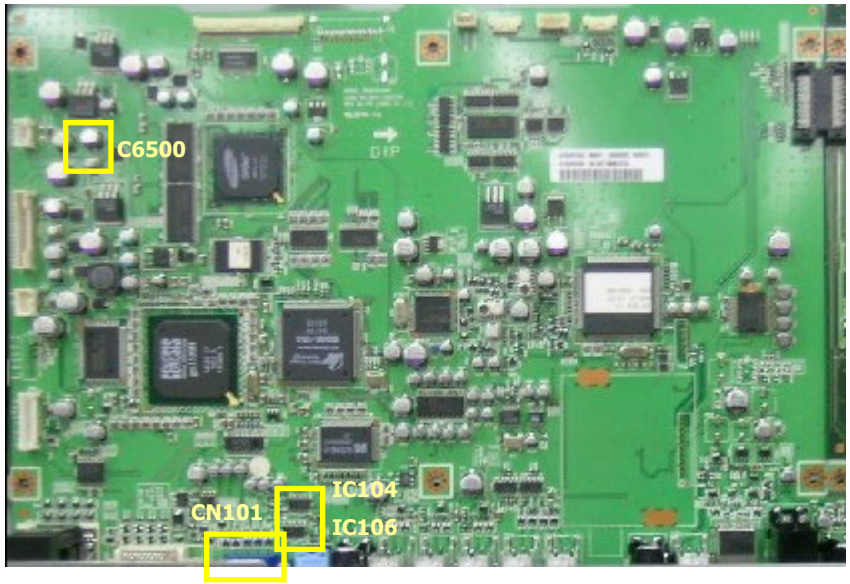
Does proper 5V appear at Pin 5,6,7 and 8 of IC5709 ?
- NO → Check LED on after pushing the power button.
- YES ↓

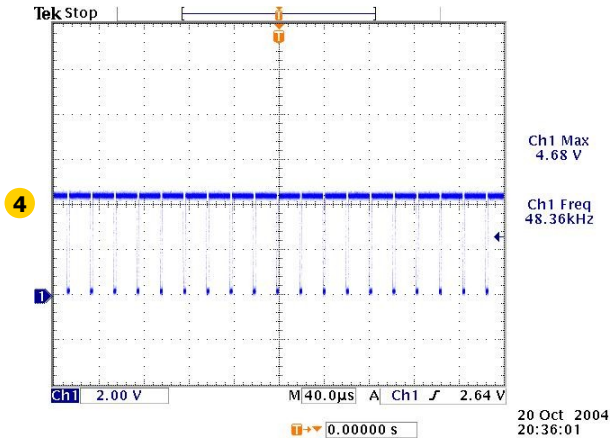
Check cable connection.
- NO → Connect D-SUB cable
- YES ↓

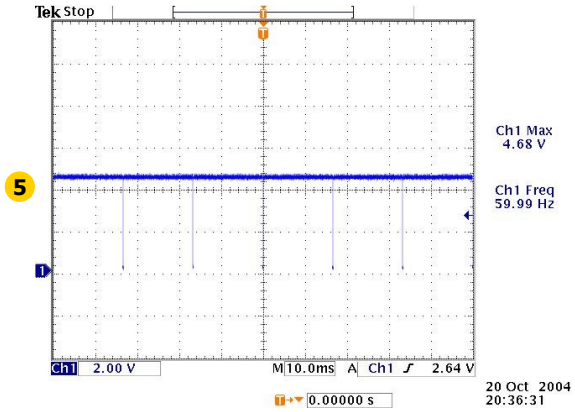
Does the picture appear at Pin 8 (H-sync) 4 10 (V-sync) 5 of IC104
- NO → IC104 defect change main board.
- YES ↓

Does the picture appear at Pin 1 (H-sync) 4 8 (V-sync) 5 of IC105
- NO → IC105 defect change main board.
- YES ↓

Panel defect.
Replace LCD Panel.

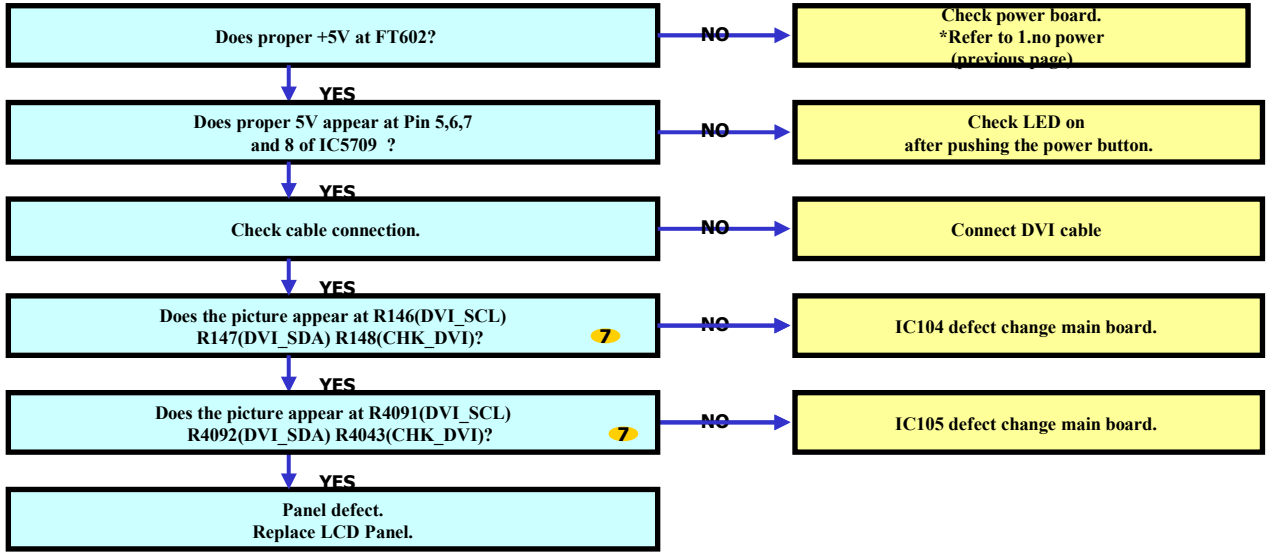


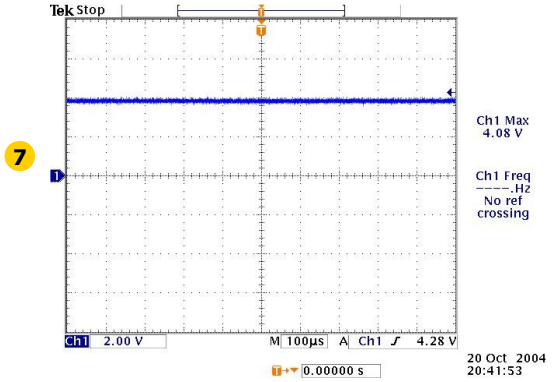


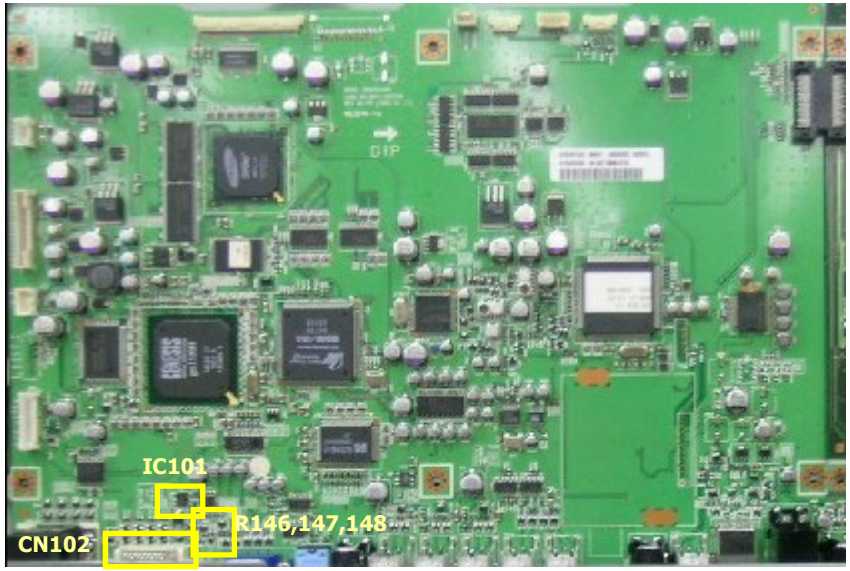


Trouble Shooting

PC (Digital) No Screen

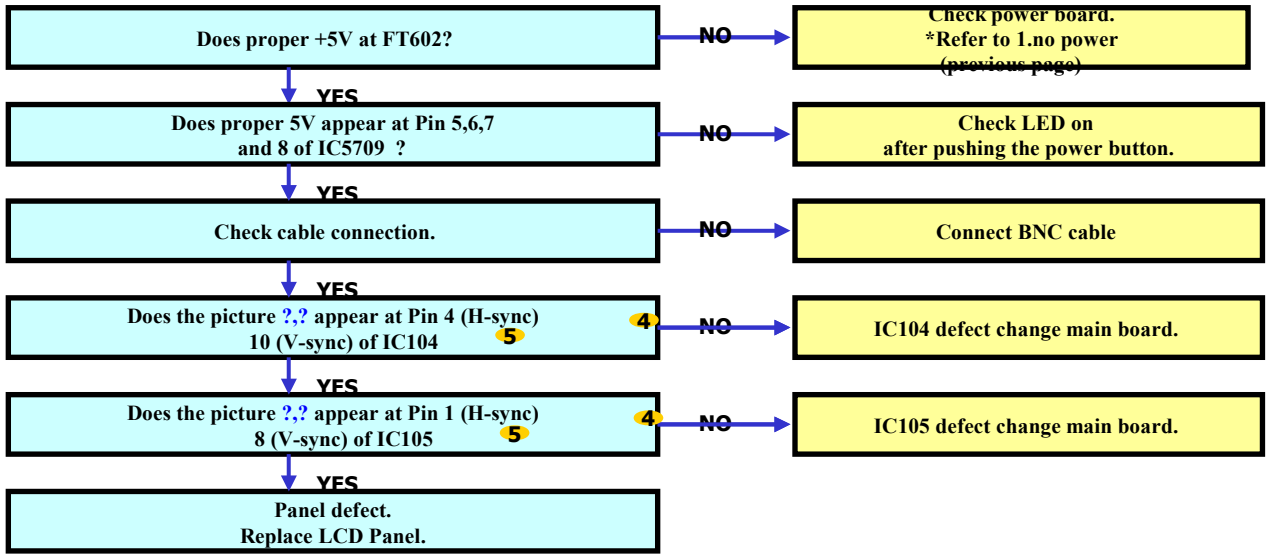


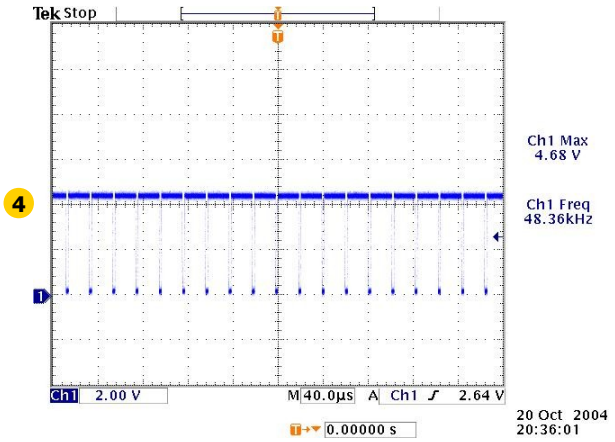


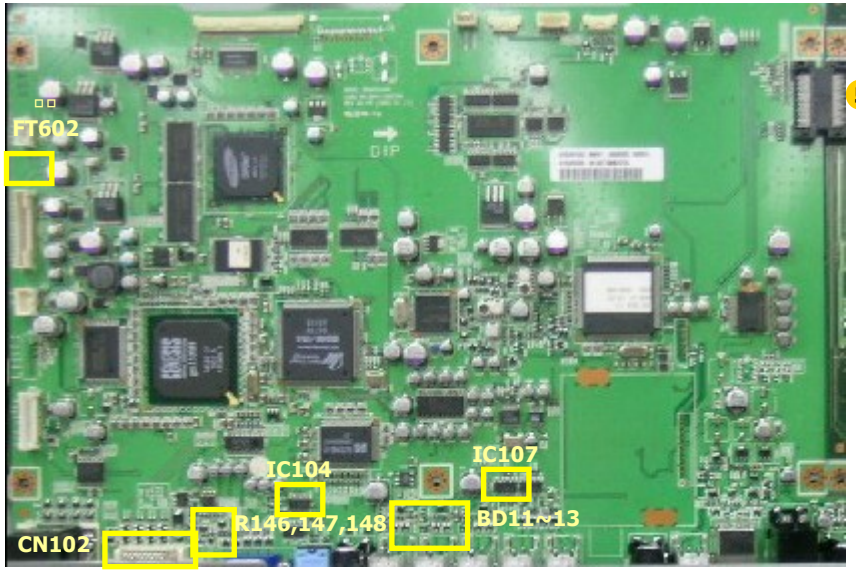


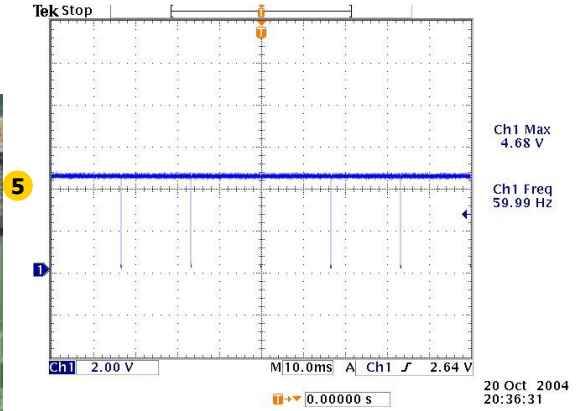
Trouble Shooting

BNC No screen



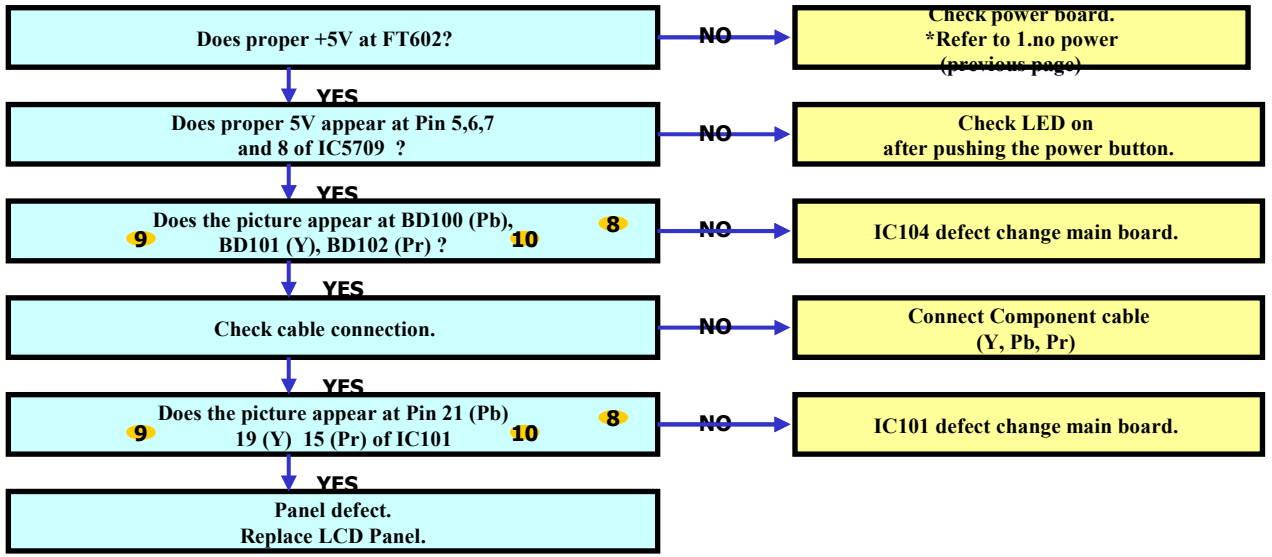


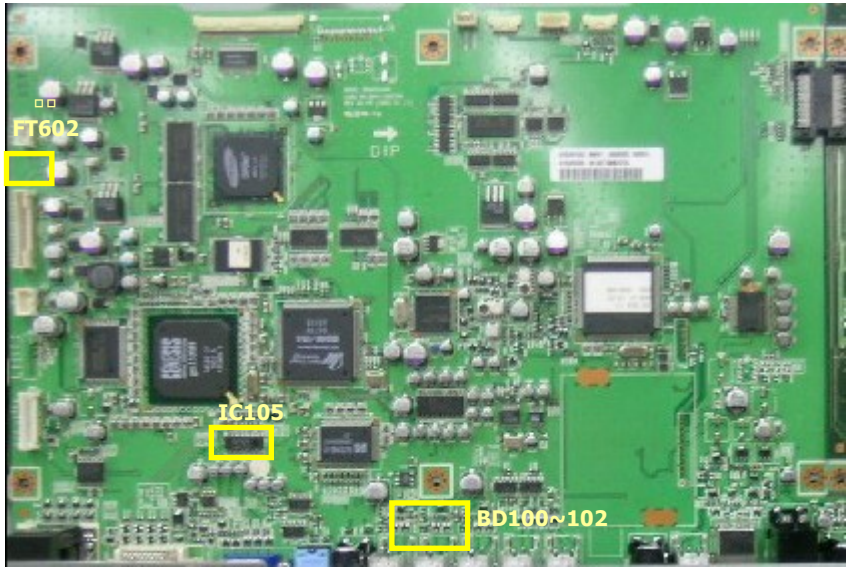


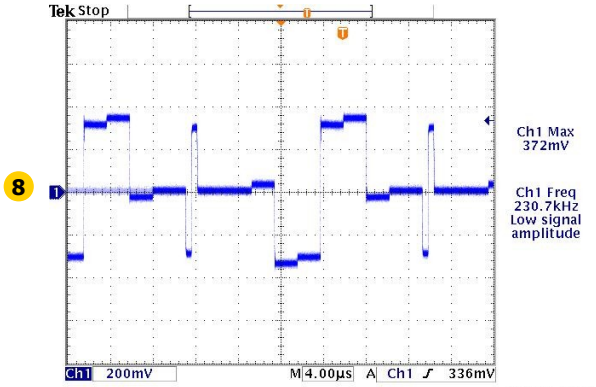


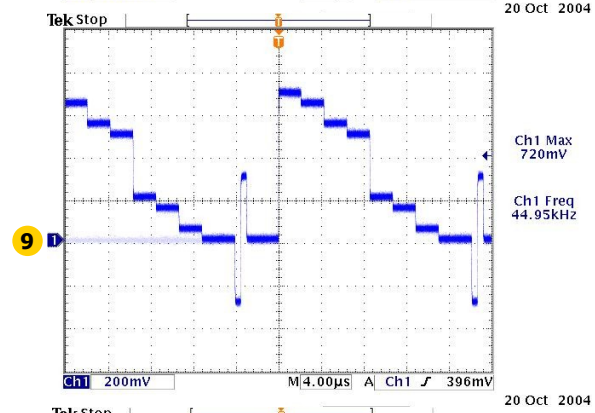
Trouble Shooting

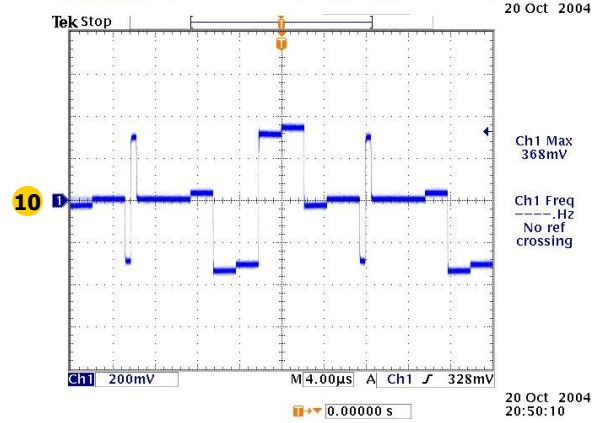
Component No screen





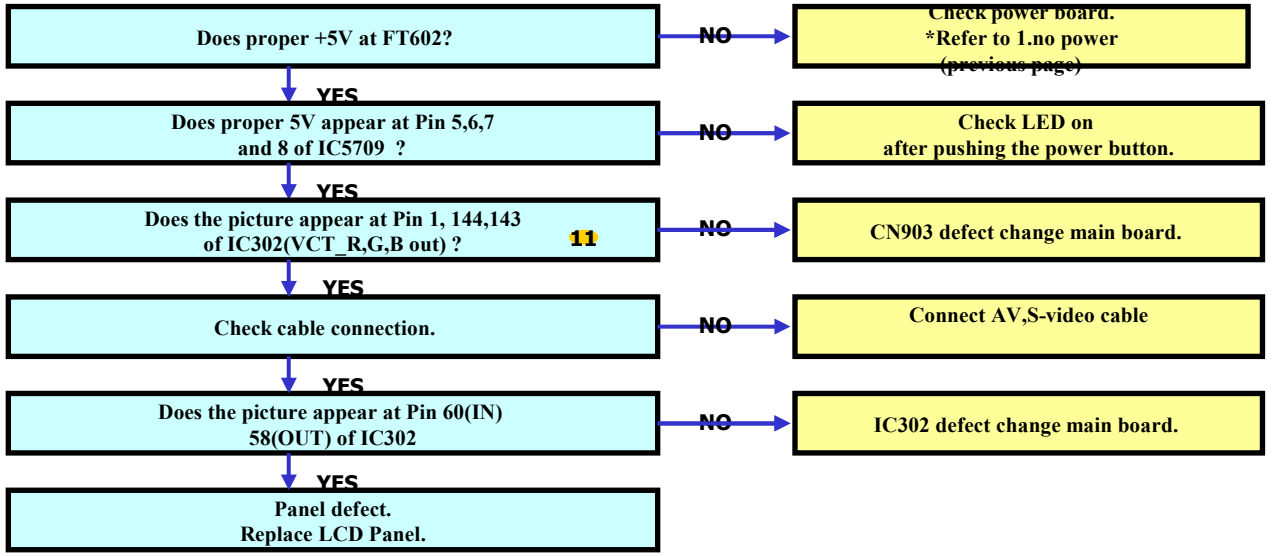


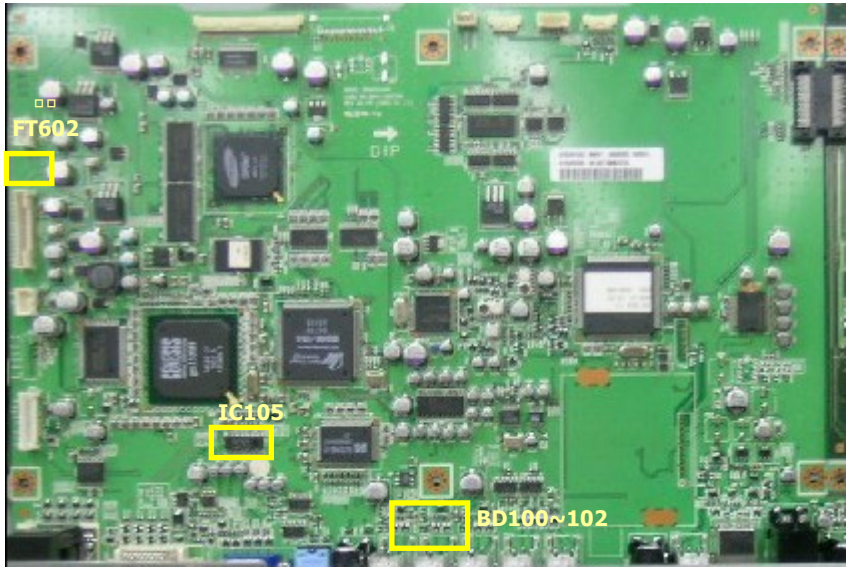




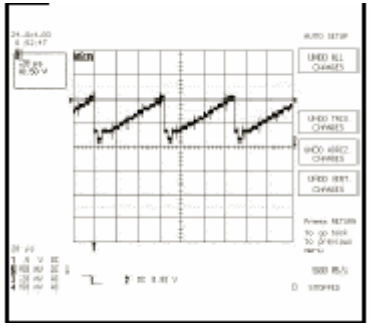
Trouble Shooting

AV, S-video No screen

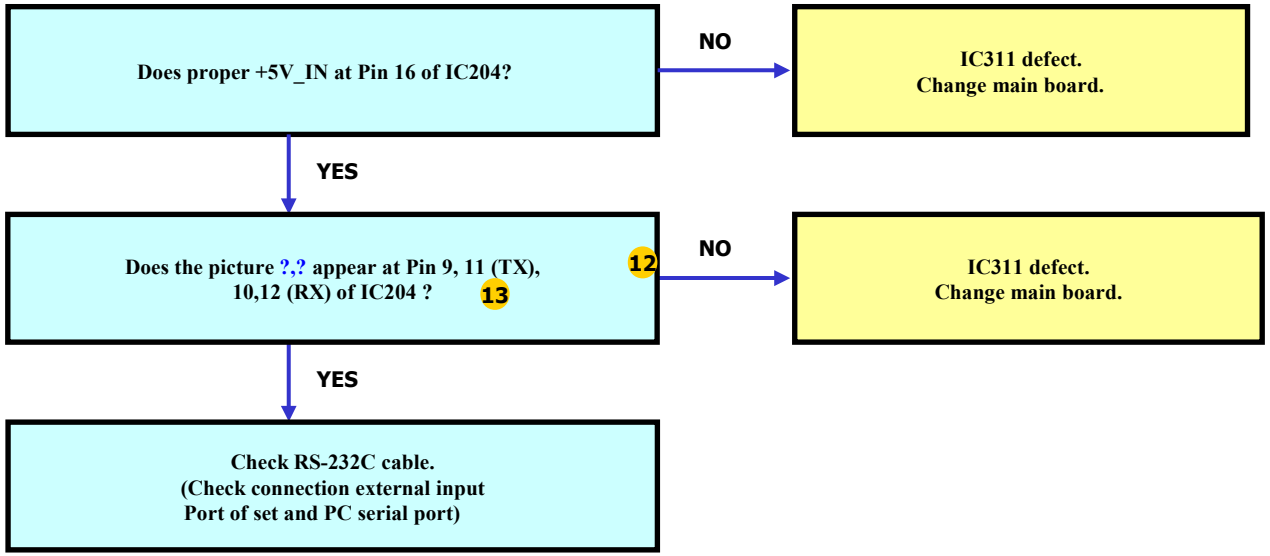


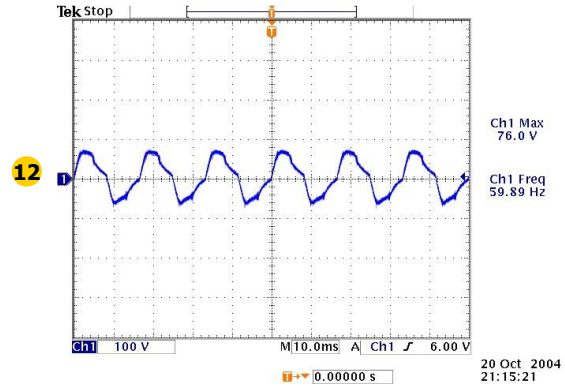


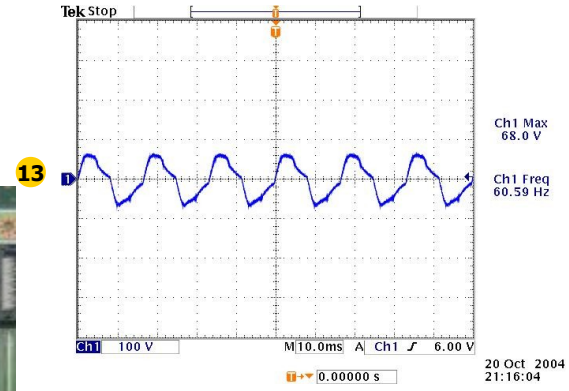
11



No Communication using serial port (RS-232C)







Trouble Shooting

PC No Sound – (1)

Does the picture appear at R3014 ,R9414 ?14
- NO → Check cable connection and Connector stereo cable.
- YES ↓

Does proper +12V at Pin 9,10,11 CN601?
- NO → Check power board. *Refer to 1.no power (previous page)
- YES ↓

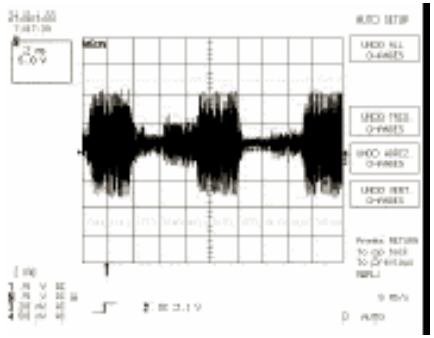
Does proper +8V appear at BD301 ?
- NO → Check LED on after pushing the power button.
- YES ↓

Does the picture appear at Pin 6 (PC_AL) 23 (PC_AR) of IC304 ?
- NO → IC304 defect change main board.
- YES ↓

Does the picture appear at Pin 1 (SW_OUTL) , 2 (SW_OUTR) of IC1802 ?
- NO → IC1802 defect change main board.
- YES ↓

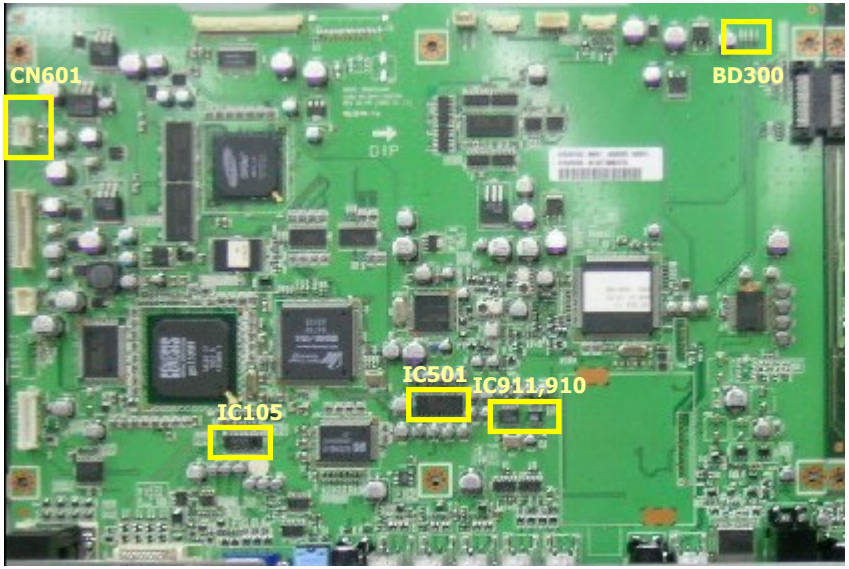
Does the picture appear at Pin 7 (CODEC_OUTL) , 8(CODEC_OUTR) of IC1754 ?
- NO → IC1754 defect change main board.

14

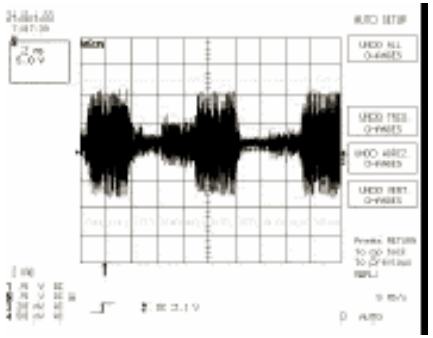


Refer to **

PC No Sound – (1)



14



Trouble Shooting

PC No Sound – (2)

Does the picture appear at Pin 124 (LOUD_OUT_L) 123(LOUD_OUT_R) of IC302?

NO → IC302 defect change main board.

YES ↓

Does the picture appear at Pin 15 (SP_LIN) 11(SP_RIN) of IC500 ?

NO → IC500 defect change main board.

YES ↓

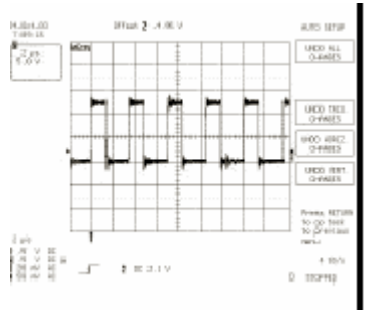
Does the picture appear at Pin 31 28,27,24 of IC500 ? 15

NO → IC500 defect change main board.

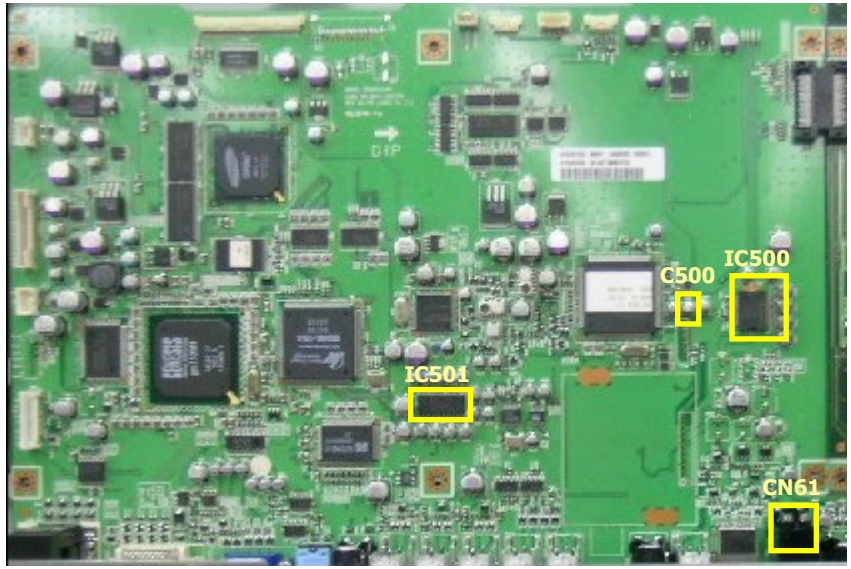
YES ↓

Check Speaker

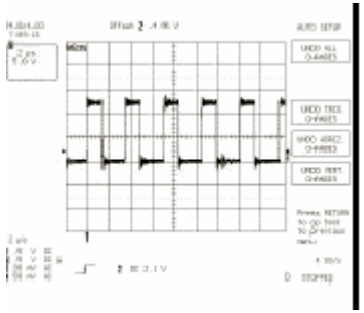
15



PC No Sound – (2)



15



Trouble Shooting

SAMSUNG

**** PC , BNC Sound**

Does the picture ?,? appear at Pin 6 (PC_AL) 23 (PC_AR) of IC304 ? → NO → IC304 defect change main board.

**** Component Sound**

Does the picture ?,? appear at Pin 5 (COM_AL) , 24 (COM_AR) of IC304 ? → NO → IC304 defect change main board.

**** Video, S-video Sound**

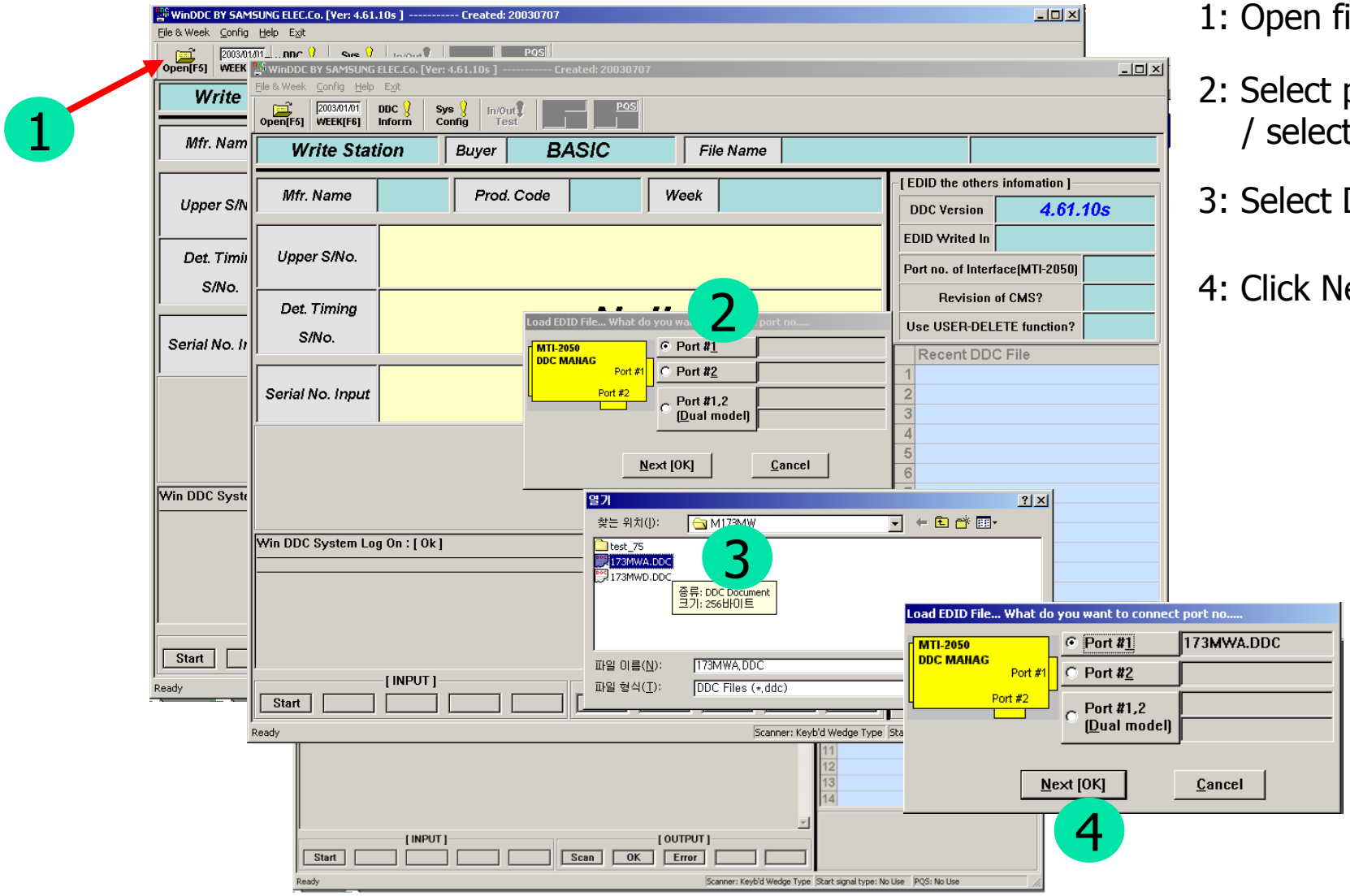
Does the picture ?,? appear at Pin 4 (VIDEO_AL) , 25 (VIDEO_AR) of IC304 ? → NO → IC304 defect change main board.

DDC Entry

DDC file name: BE32A.DDC / BE32D.DDC

SAMSUNG

You must enter Service Mode to enter DDC: Release DDC Protection



1: Open file

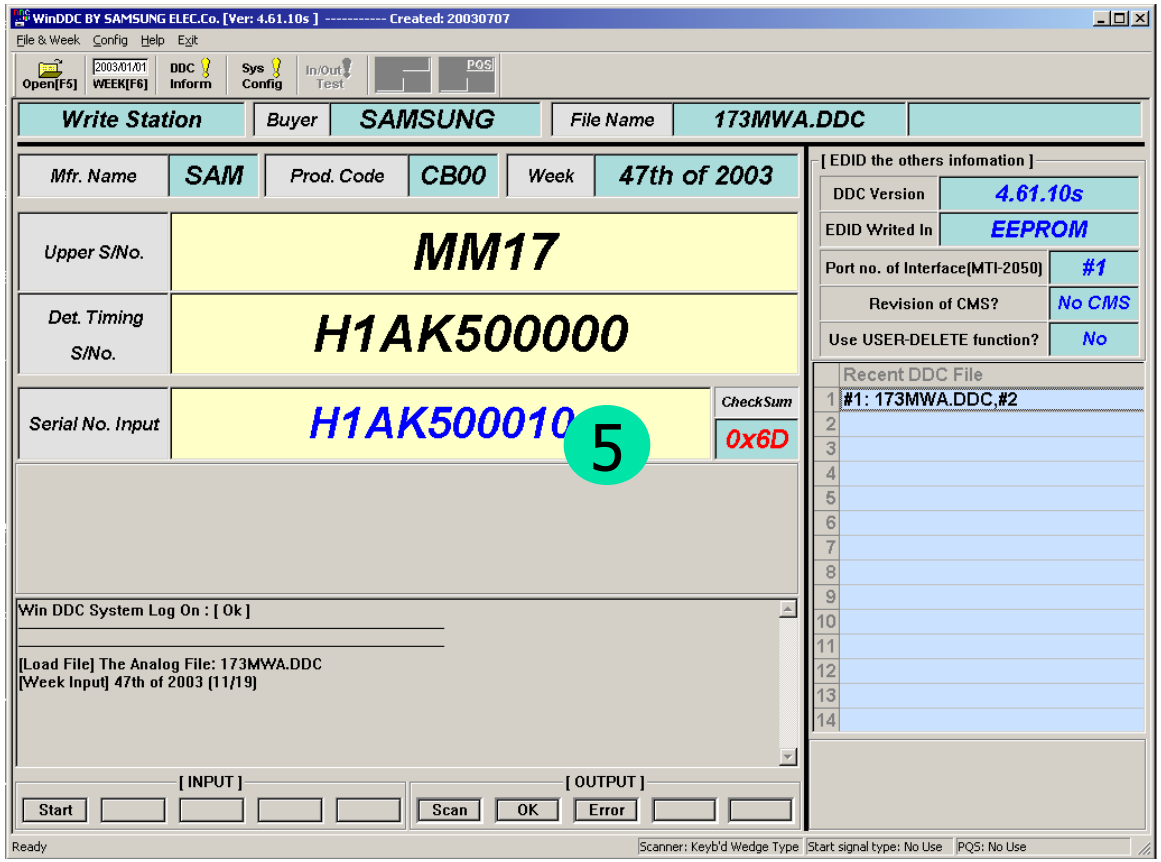
2: Select port 1(D-SUB) / select port 2(DVI)

3: Select DDC file

4: Click Next (OK) button

DDC Entry

DDC file name: BE32A.DDC / BE32D.DDC

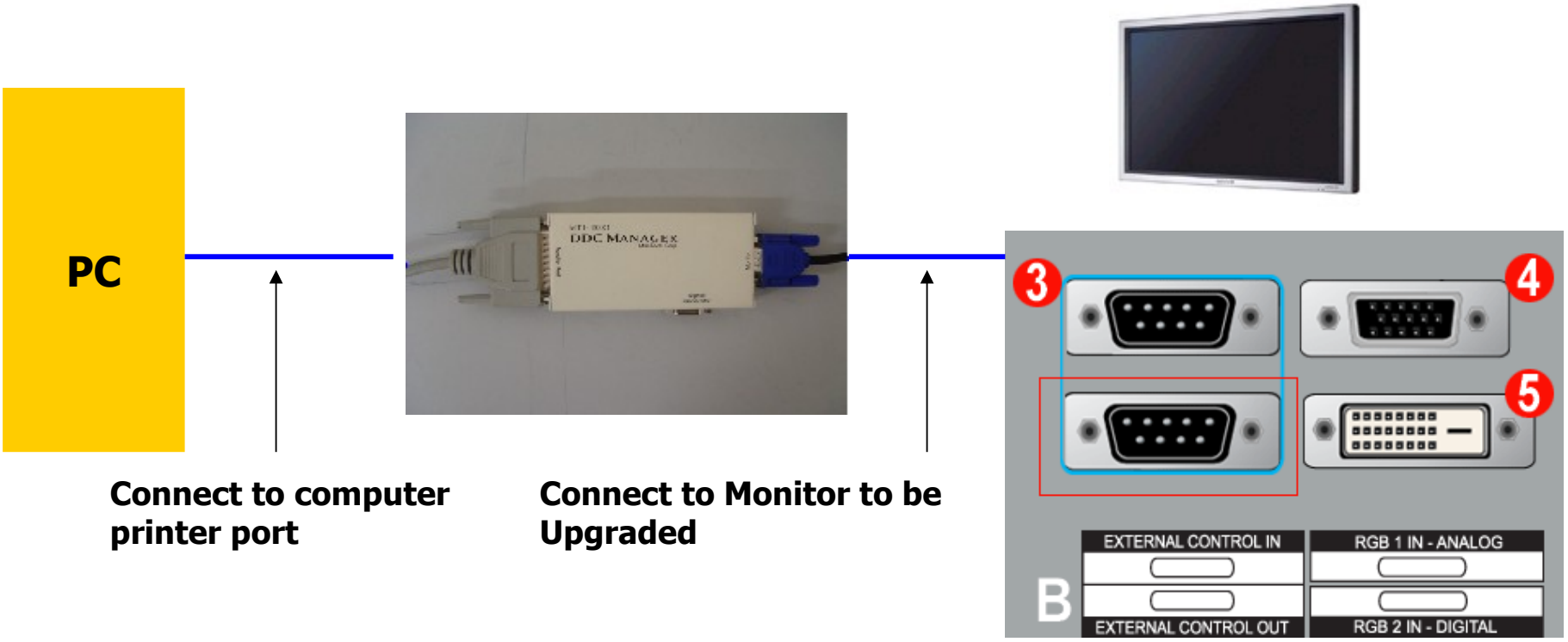


5: Press Enter after entering the serial number of the monitor

After Analog input, repeat 2~5 times for Digital input

Program Upgrading - MAIN

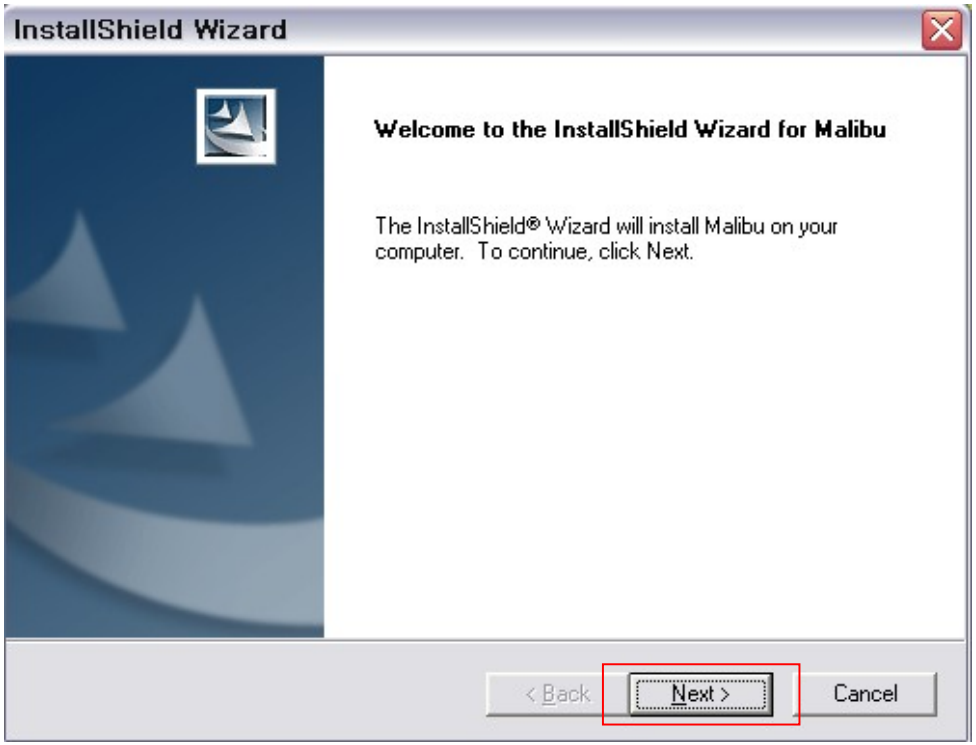
Connecting the Parallel port (printer port) of the PC with the D-SUB cable of the Monitor to be upgraded

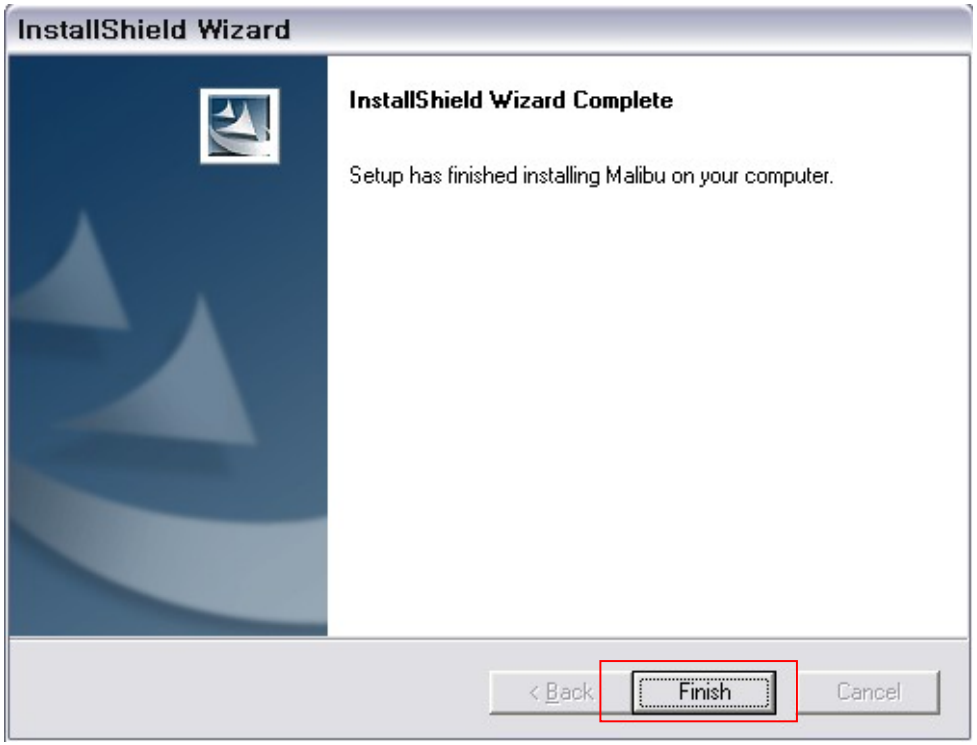


Program Upgrading - MAIN

Malibu Flash Downloader 1.7 File

After running the Exe. File and pressing "OK", press "Next" to Install, and installation is complete (see attachment)



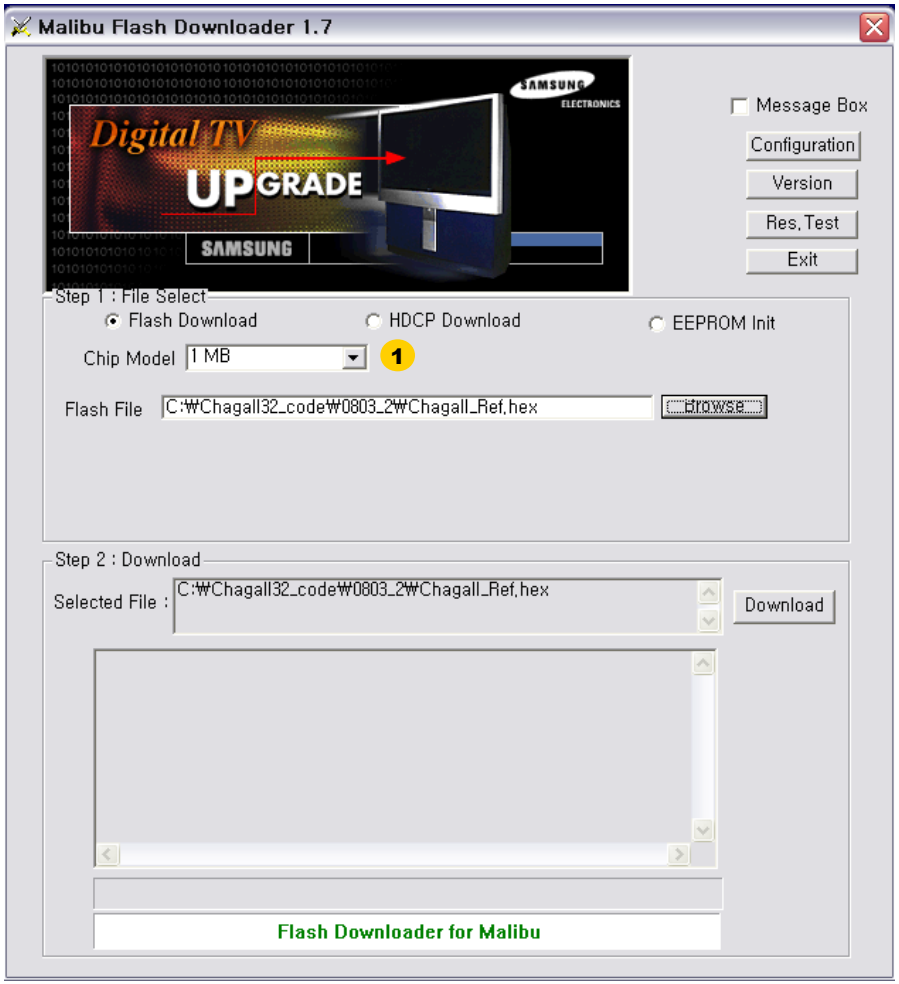


This can be operated regardless of the Windows OS system.

Once installation using the attached Setup.exe is completed, an icon appears on the desktop.

Double click this icon to run the program.

Program Upgrading - MAIN

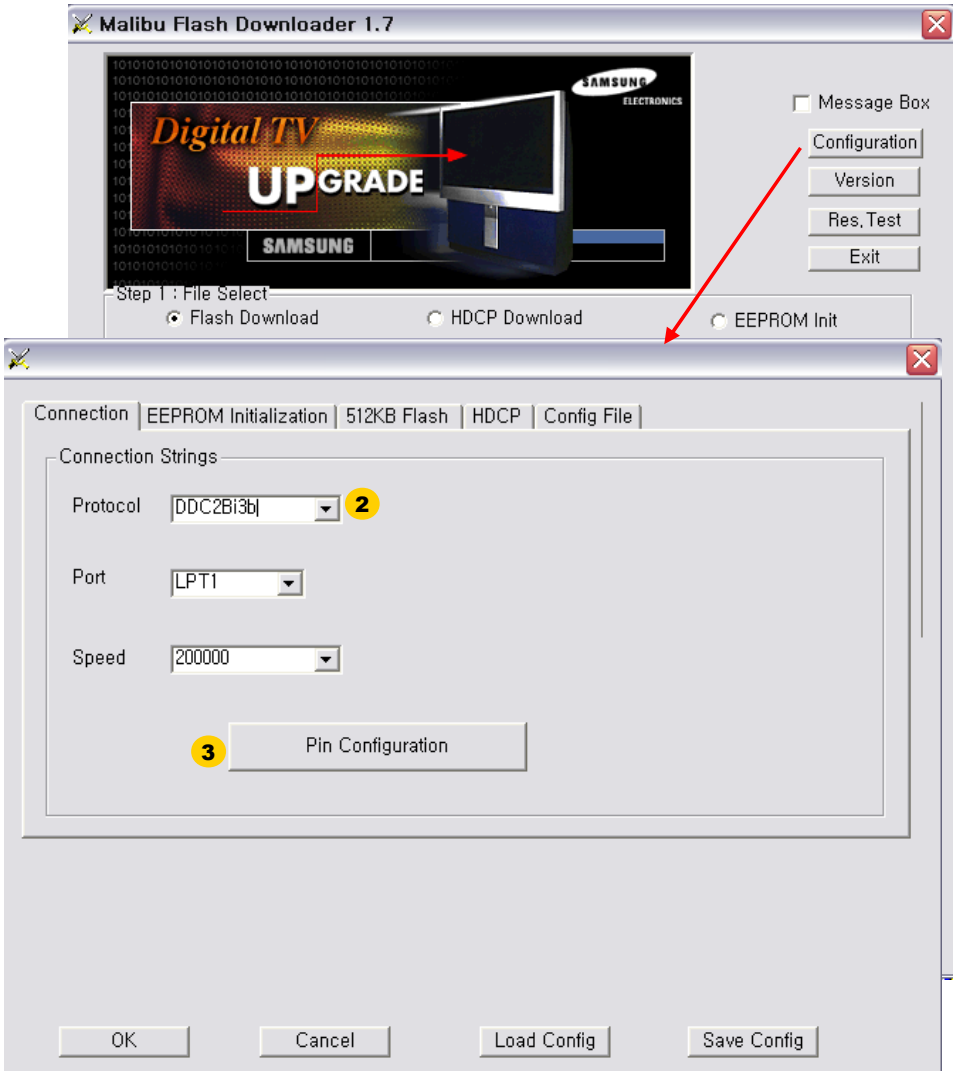


1 In the File Select menu,

Flash Download

→Set up as shown in picture
Chip Model: 1MB should be set up first

Program Upgrading - MAIN



2 After installing the program

Connection

→Set up as shown in picture

DDC2Bi 3b

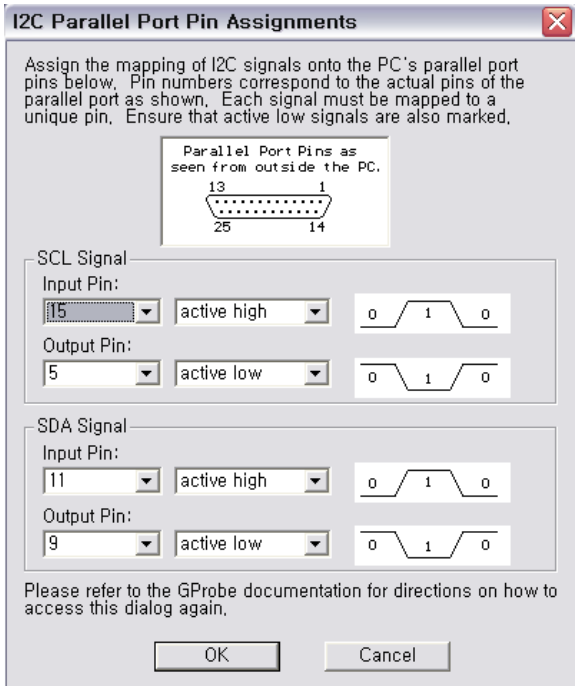
LPT1

200000

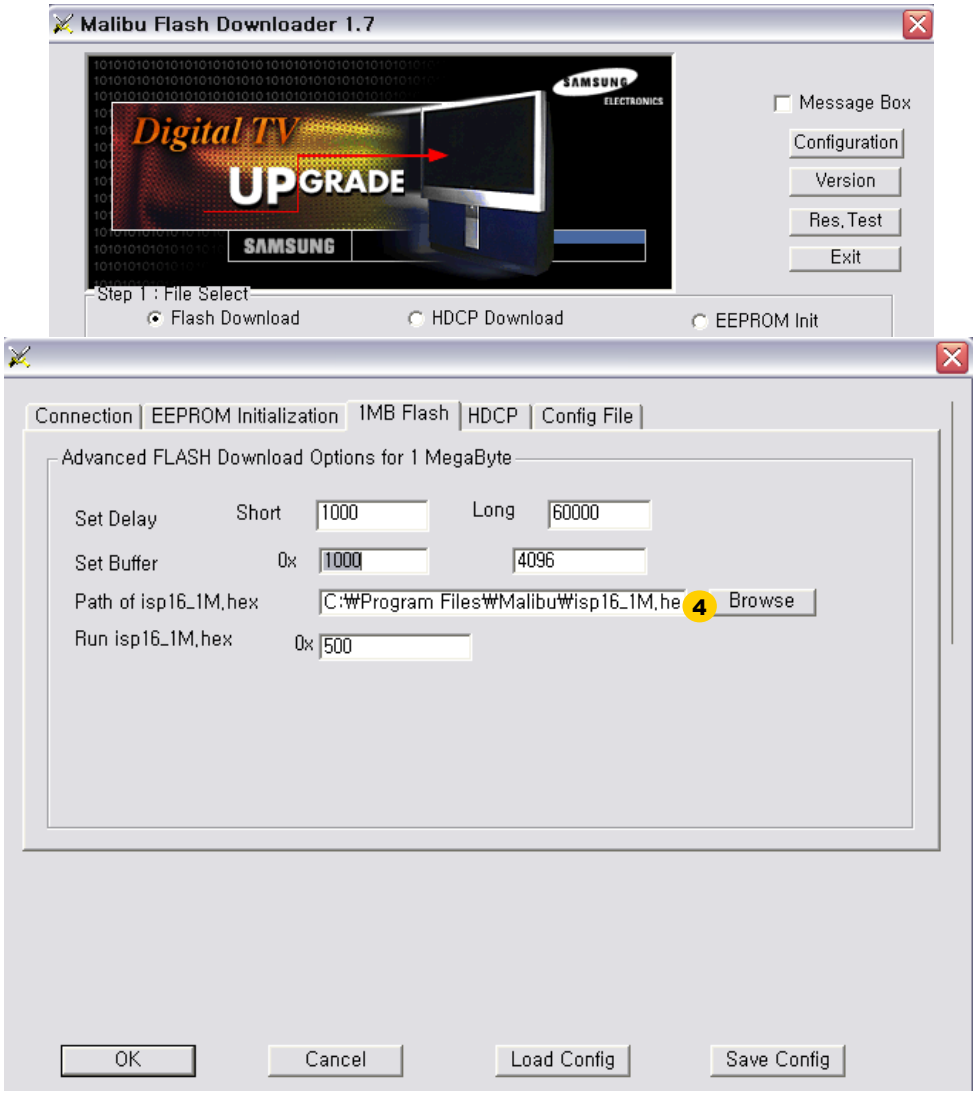
3 After installing the program

Pin Configuration

→ Set up as shown in picture

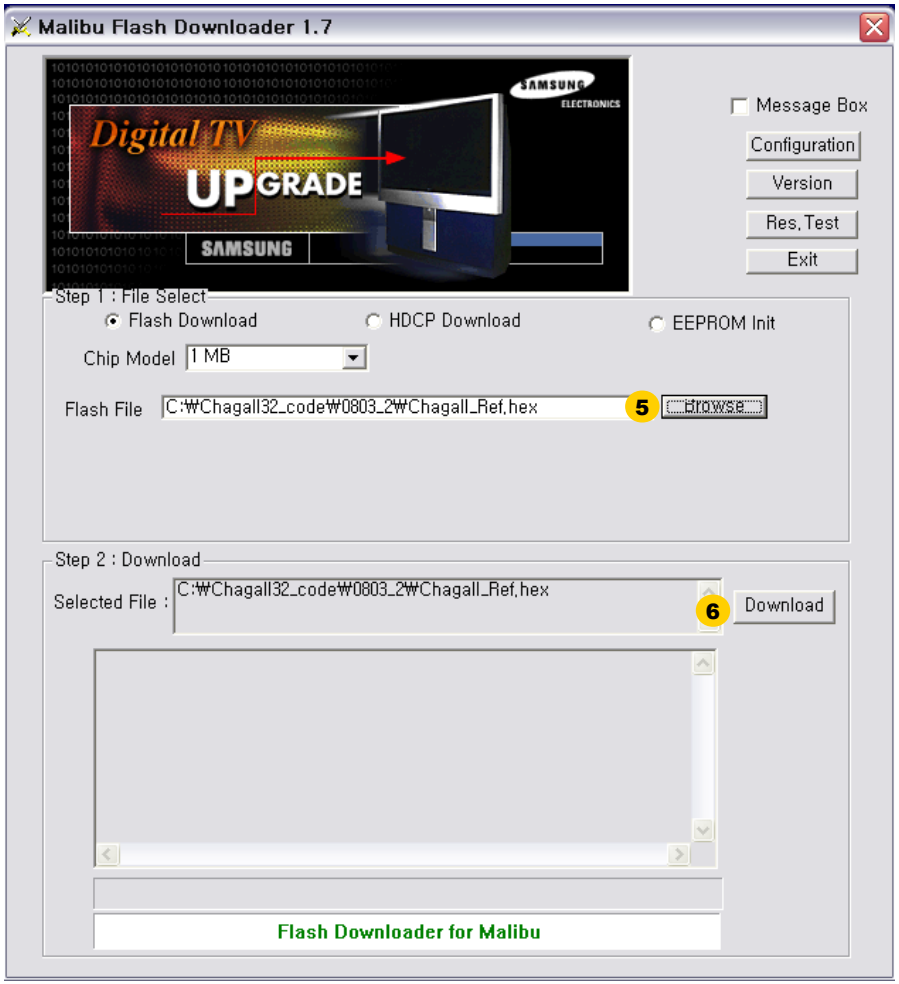


Program Upgrading - MAIN



4 1MB Flash
Isp16_1M. Hex
→ Setting is done automatically

Program Upgrading - MAIN



5 In Browse, select the file to be downloaded

Press 5 to Download

6 If Download is completed without errors, and download success message comes up
Turn Board power off/on

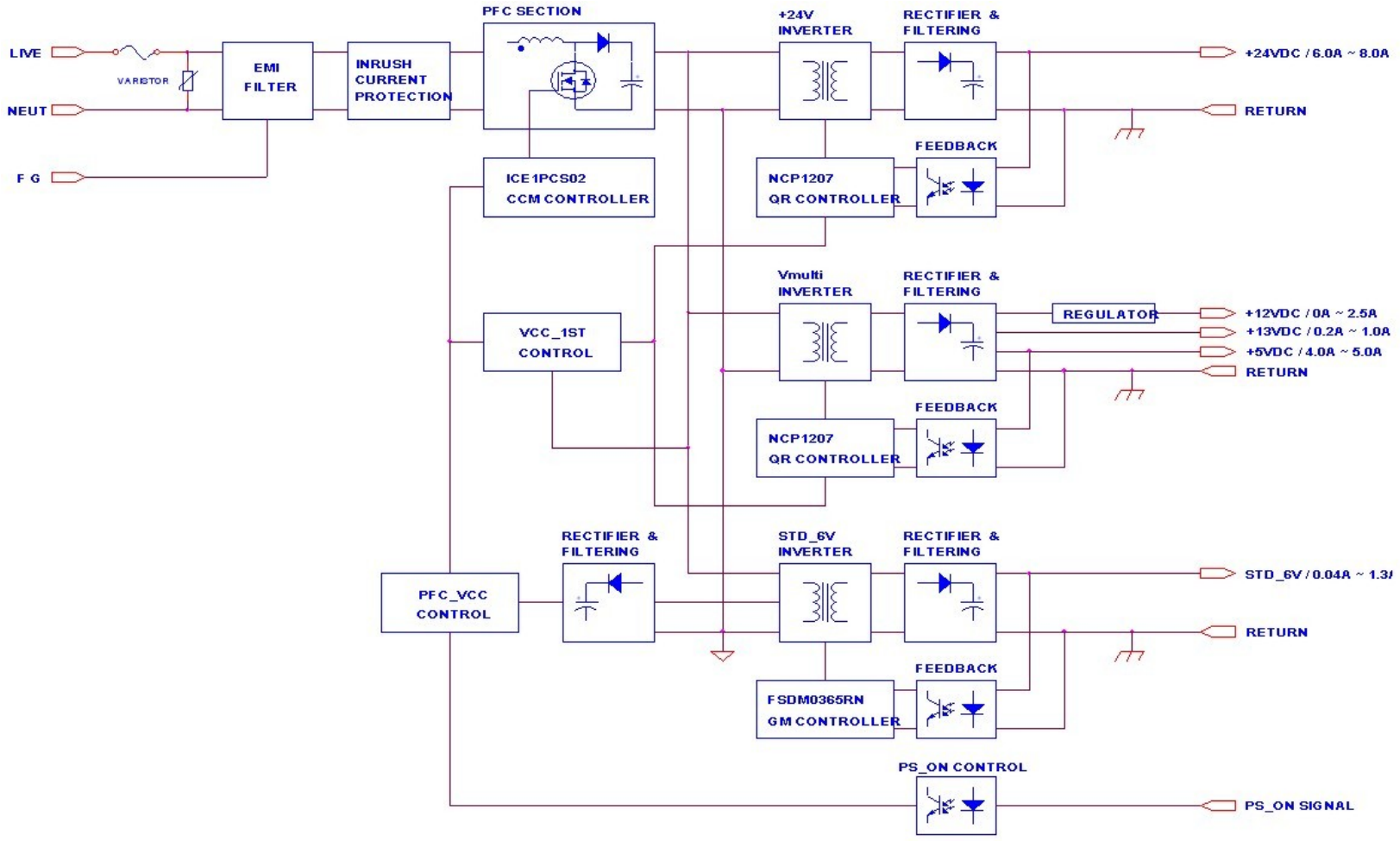
In Factory mode, check the Checksum and date to see if the code is correct for downloading

What To Do after Board Replacement

Main Board

- Check PC color control status
- DDC input (Both Analog and Digital input required)
- After entering service mode and resetting, turn Hard power off

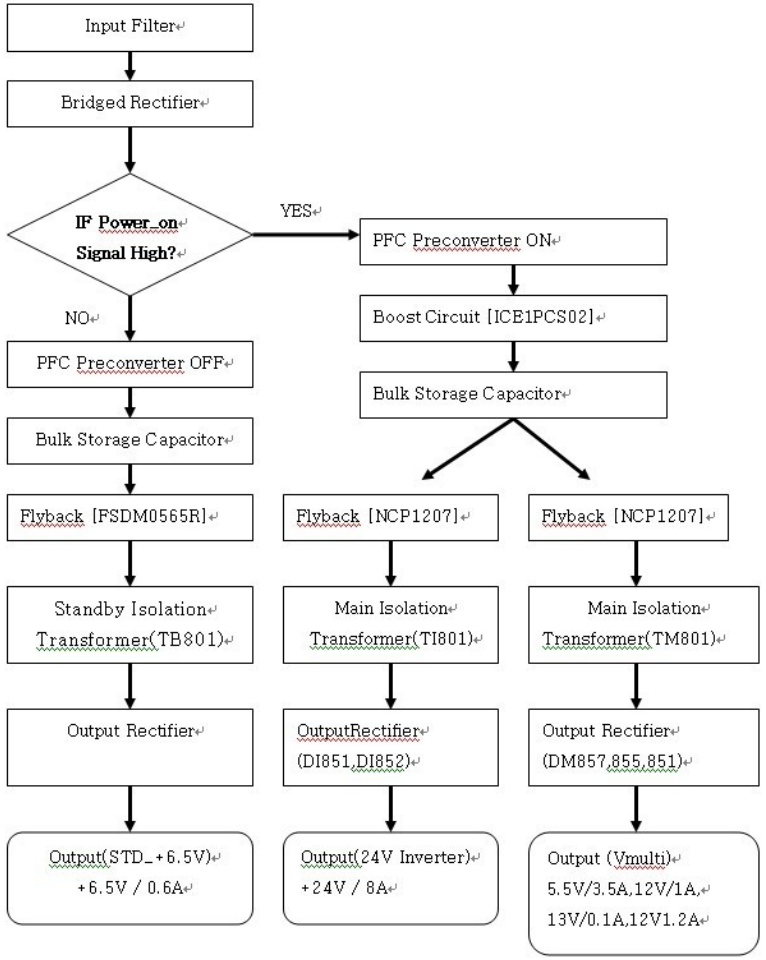
32” SMPS Block Diagram



32” SMPS Trouble Shooting

NO POWER

System Requirements
Vin : 90~264V, 47~63HZ

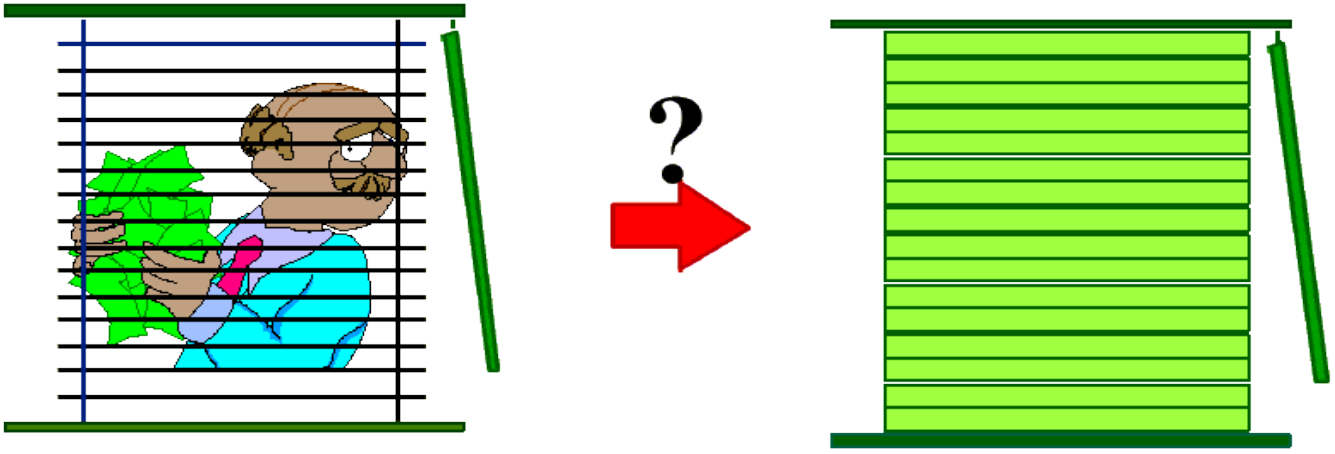


Schematics
(Adapter)

Acrobat Document

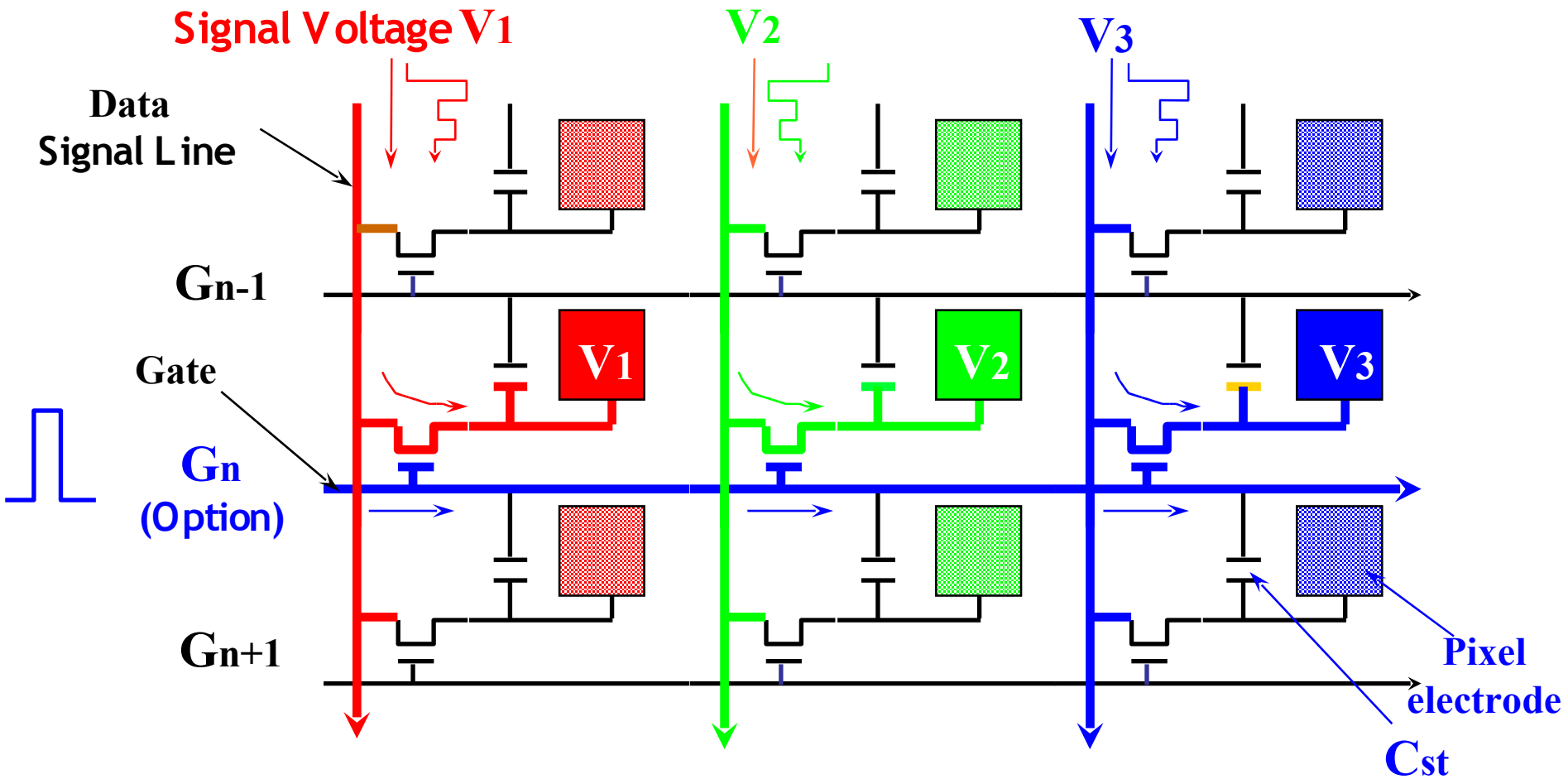
Understanding the Optical Characteristics of LCD

WHAT IS A BASIC CONCEPT OF LIQUID CRYSTAL DISPLAY?



When shutter is open, it's On, when shutter is shut, it's Off: the role of the shutter is played by liquid crystal.

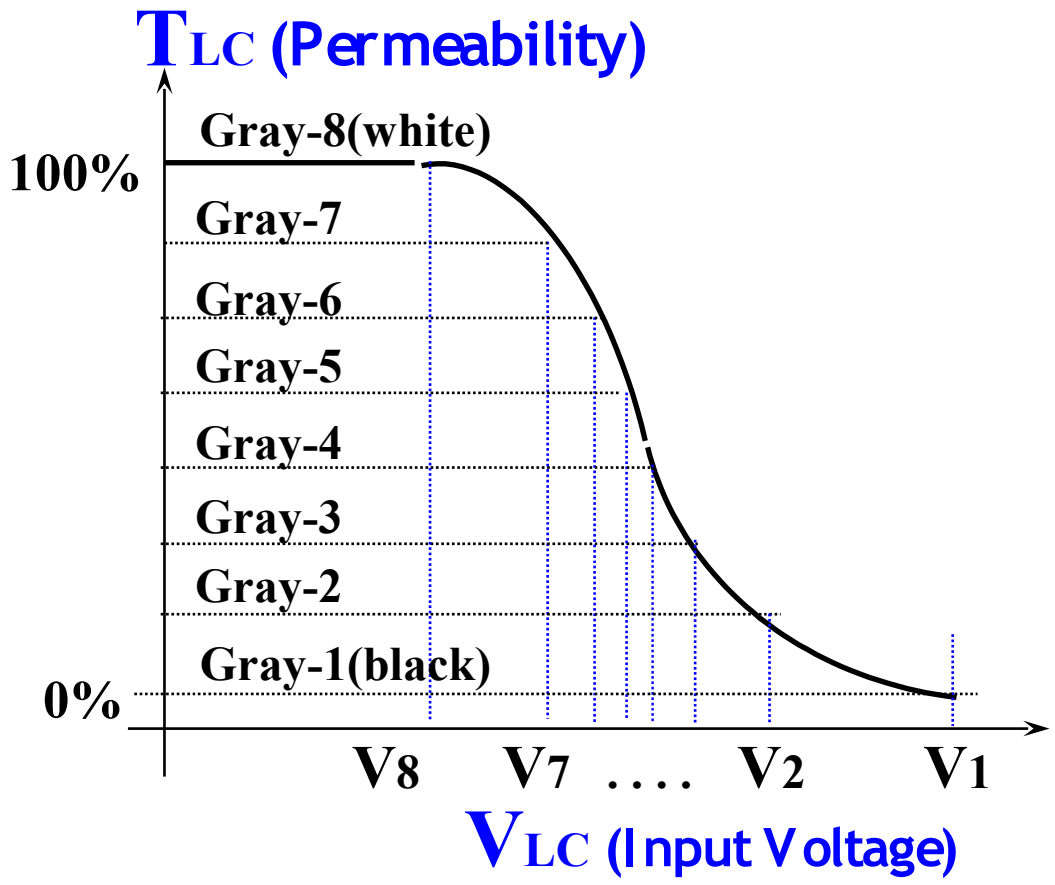
TFT-LCD Operation Principles



GRATSCALE(COLOR) Expression

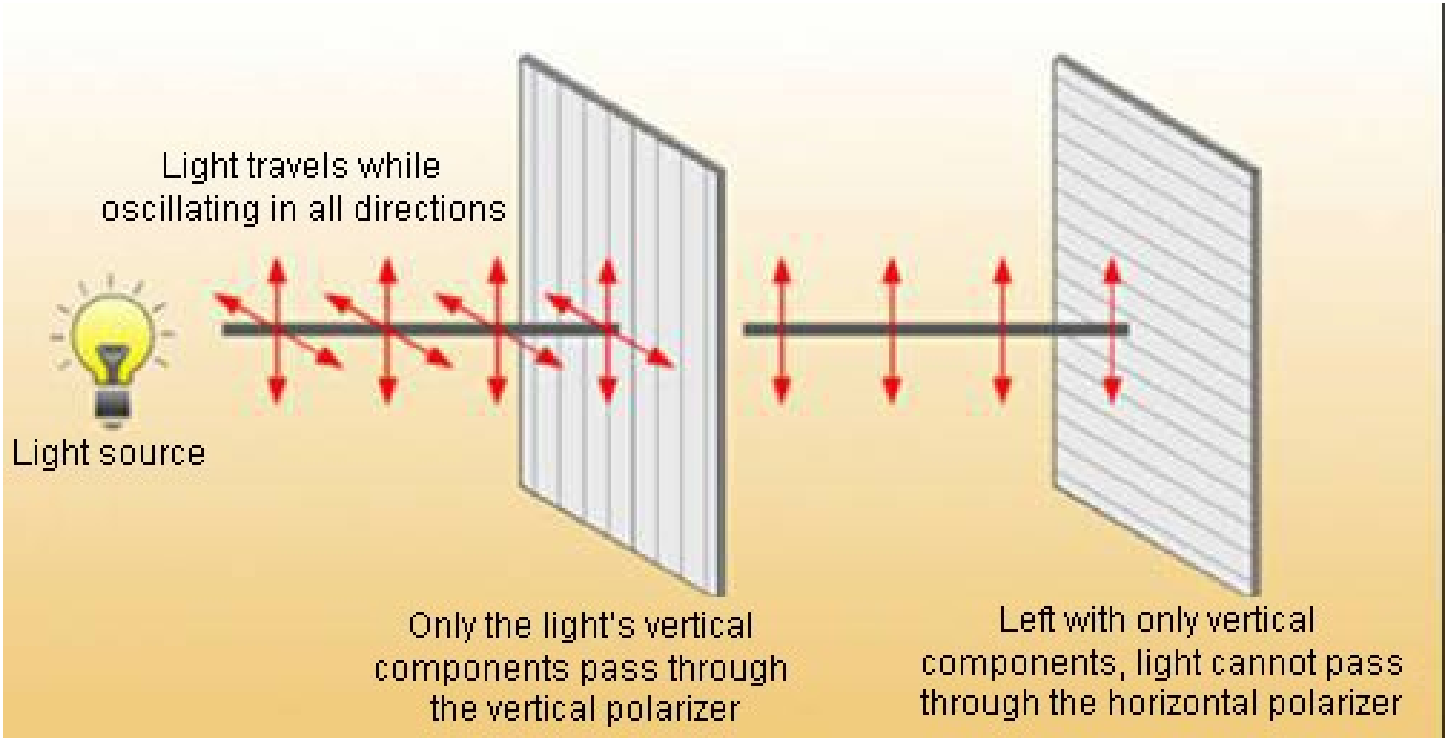
$$\#\ \text{of Color} = 2^{n}(R) \times 2^{n}(G) \times 2^{n}(B) = 2^{3n}$$

n= # of bit / (RGB)



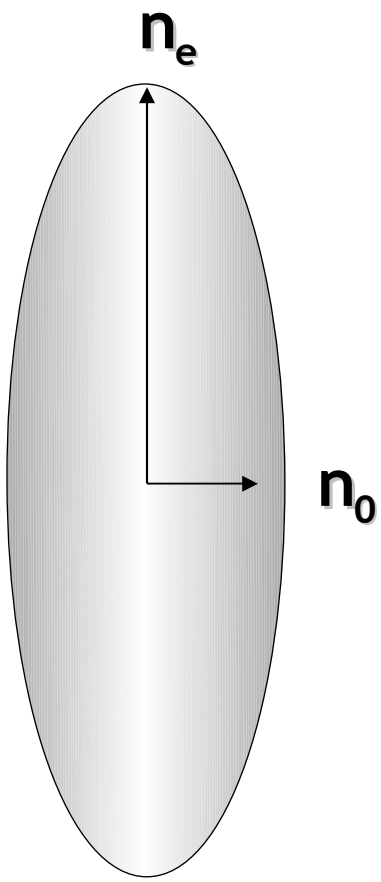
LDI	Gray	Colors
1 bit	B/W	8
3 bit	8	512
4 bit	16	4,096
6 bit	64	262,144
8 bit	256	16.7 M
Analog	□□	Full

Characteristics of Polarizer



Characteristics of LC

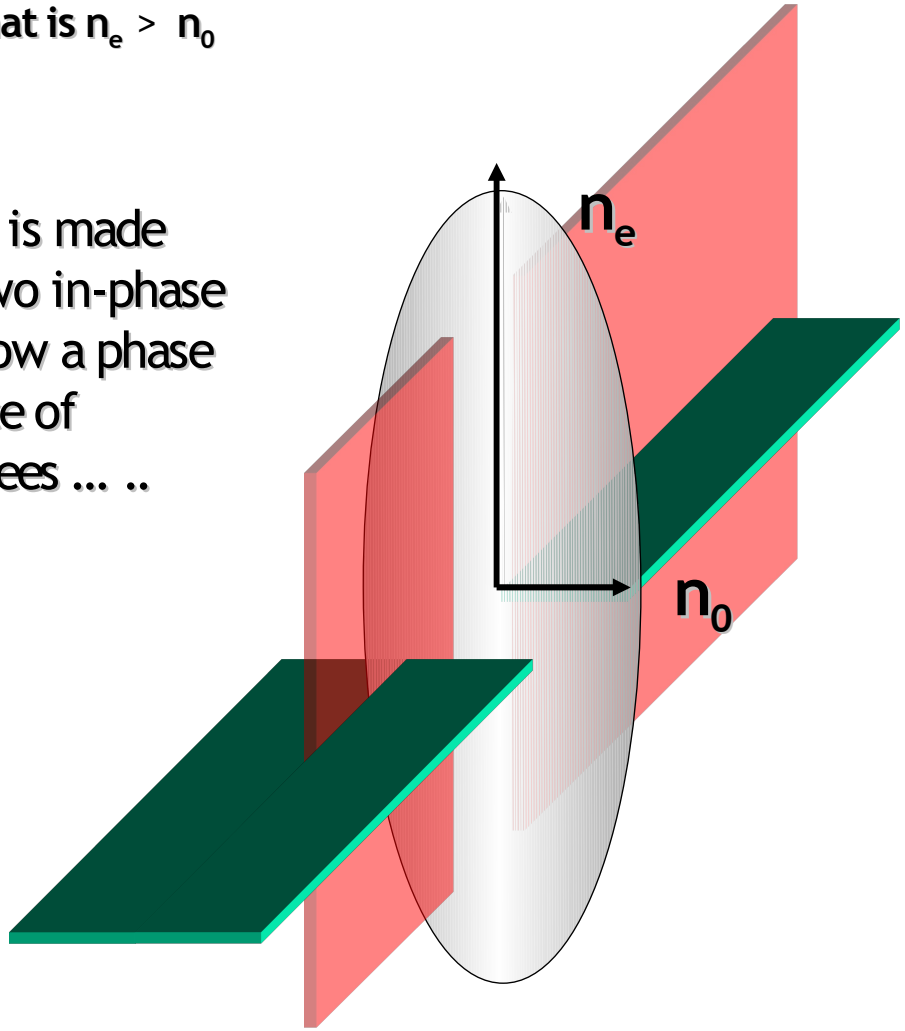
- Anisotropy of refraction rate ($n_e \neq n_0$)
  - Determines the optical characteristics of LCD
- Anisotropy of permittivity rate ($\varepsilon_e \neq \varepsilon_o$)
  - Enables electrical control of LC



Changes in Light Travel Speed Depending on the Medium

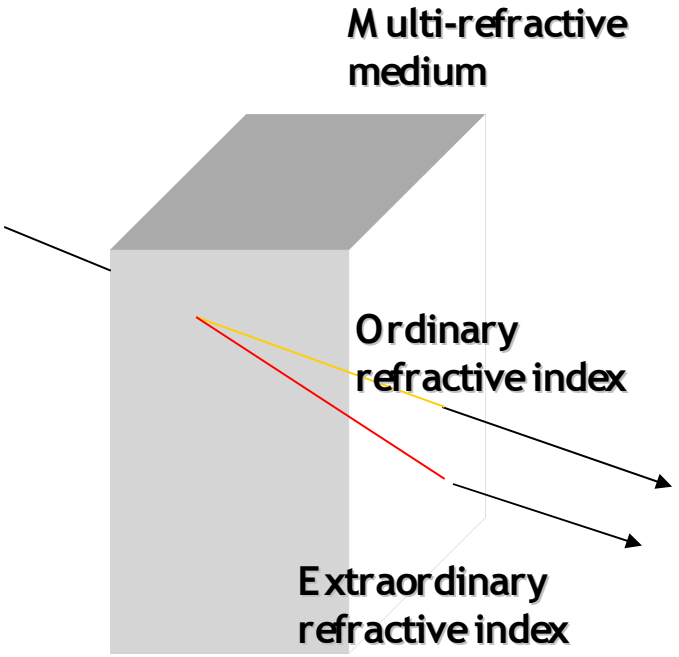
Medium that is $n_e > n_0$

If design is made so that two in-phase lights show a phase difference of 180 degrees … ..



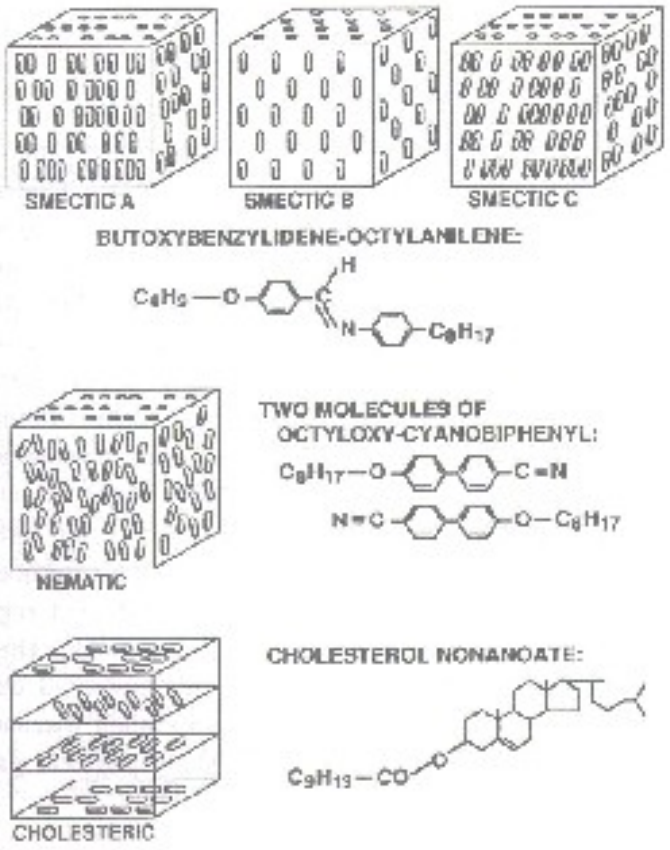
Slow

Fast

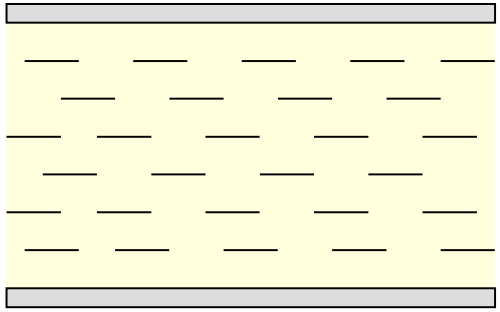


LC Types (Structure)

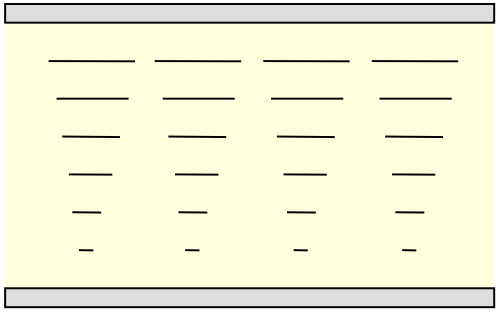
- Smectic
  - Maintains regularity of molecular positions toward one direction
- Nematic
  - Maintains the order of direction without regularity of molecular positions
- cholesteric
  - Molecular arrangement within a layer is in the long axis direction
  - The surface of layers have a parallel structure



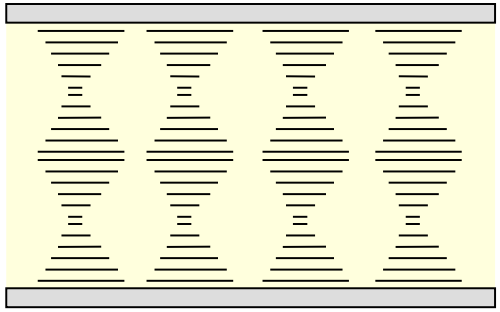
Control of Liquid Crystals Orientation



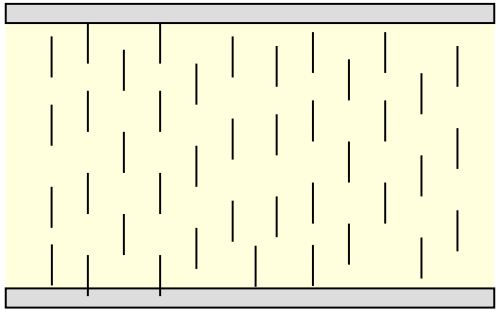
Homogeneous



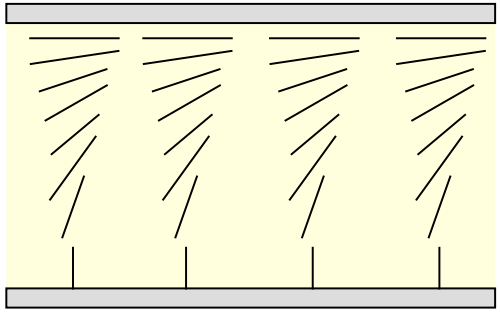
Twisted



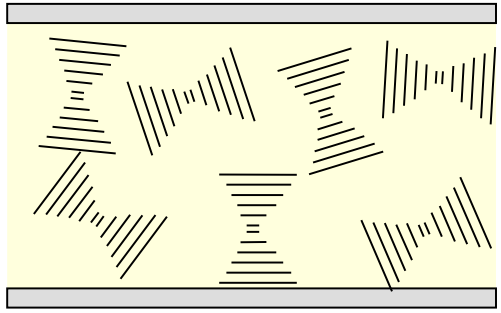
Grandjean



Homeotropic



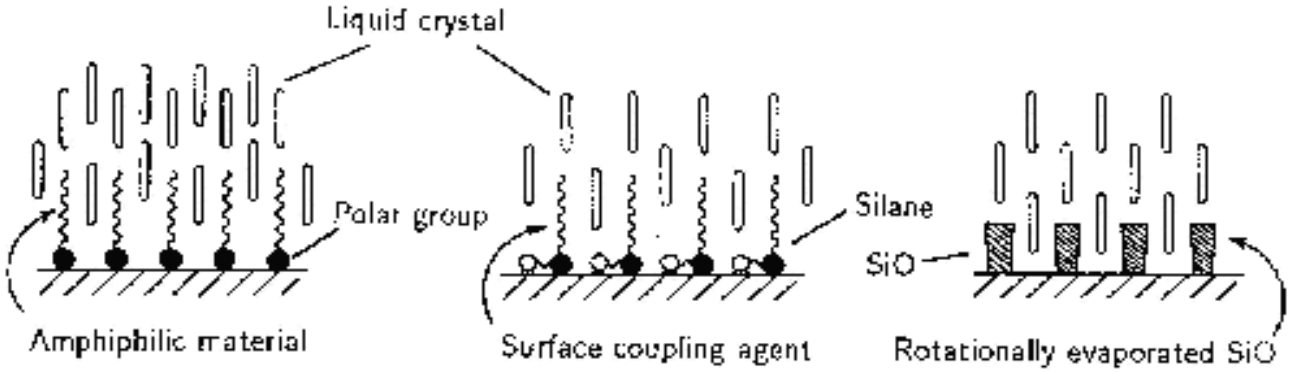
Hybrid



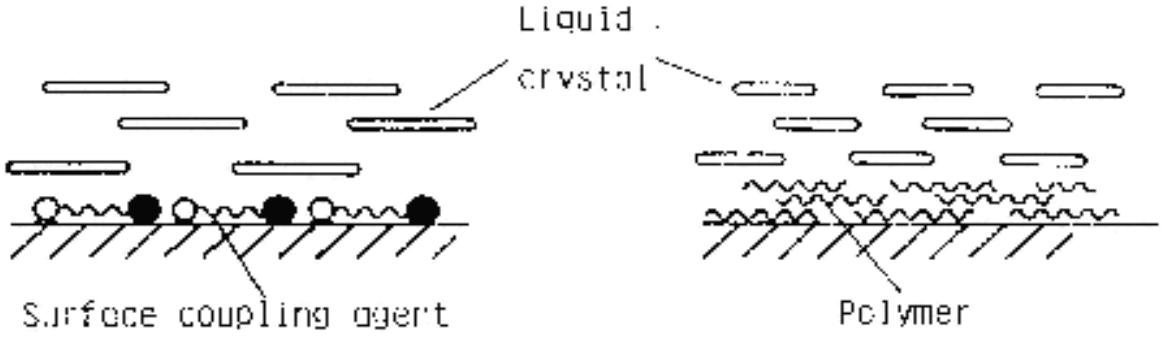
Focal-conic

LC Molecular Alignment

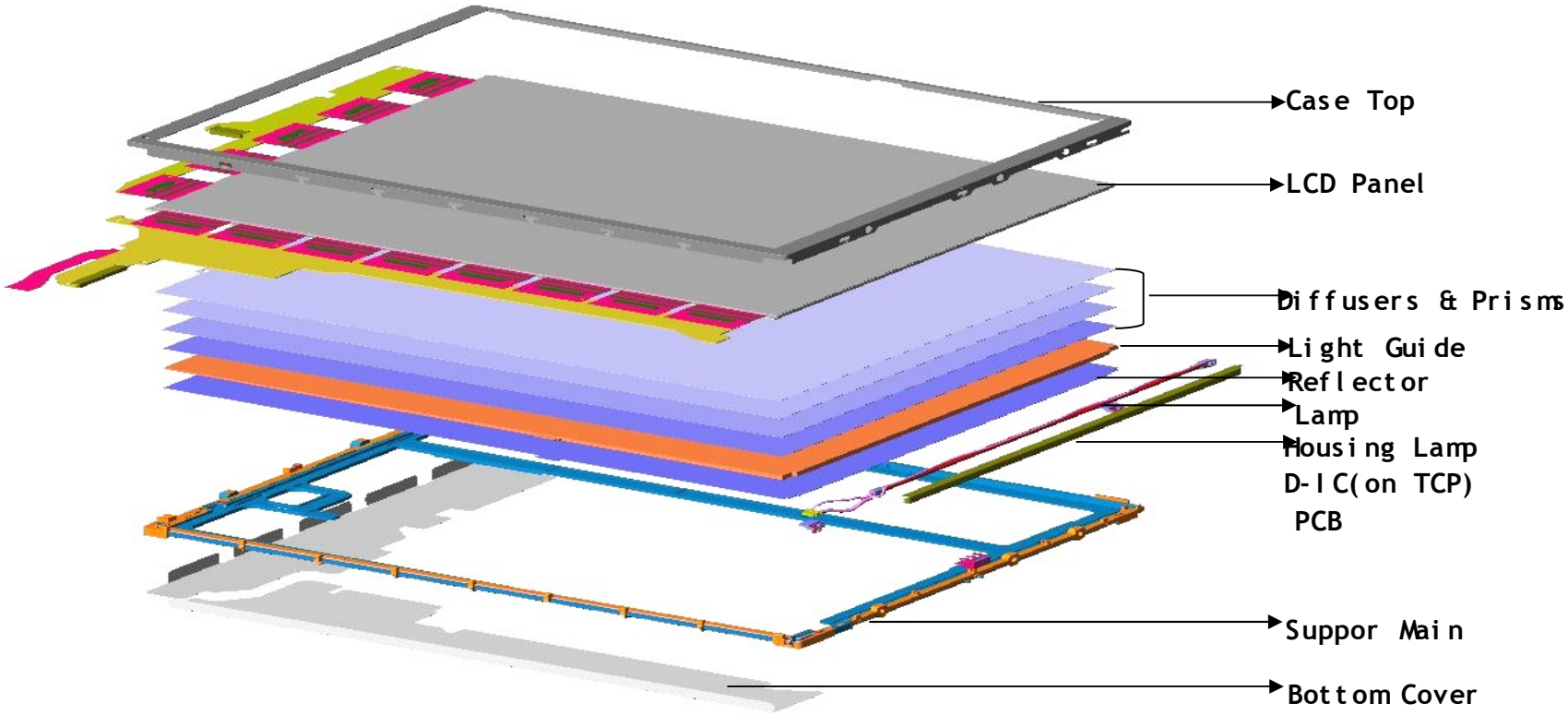
- Vertical Alignment



- Horizontal Alignment



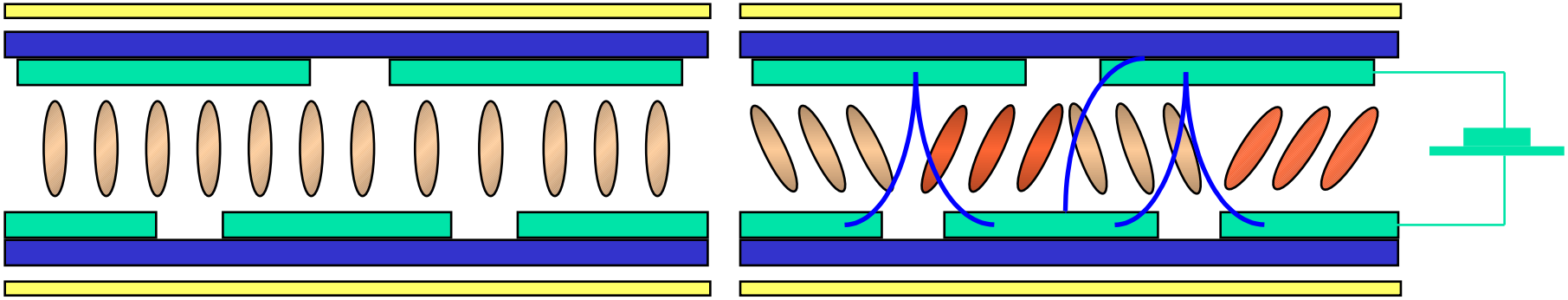
Panel Structure



- PVA Mode

PVA Operation Principles

- PVA : Patterned Vertical Alignment



OFF State (Black)

On State (White)

PVA Advantages and Disadvantages

- Advantages
  - Wide view angle
  - High productivity (no rubbing process)
  - Strong with Image Sticking
  - High contrast ratio
- Disadvantages
  - Weak to impact (vertical alignment characteristic)
  - High unit price LC (new color filter,LC, alignment material)

Terms

Dot Pitch
The image on a monitor is composed of red, green and blue dots. The closer the dots, the higher the resolution. The distance between two dots of the same color is called the 'Dot Pitch'. Unit: mm

Vertical Frequency
The screen must be redrawn several times per second in order to create and display an image for the user. The frequency of this repetition per second is called Vertical Frequency or Refresh Rate. Unit: Hz
Example: If the same light repeats itself 60 times per second, this is regarded as 60 Hz.

Horizontal Frequency
The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle. The inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz

Interlace and Non-Interlace Methods
Showing the horizontal lines of the screen from the top to the bottom in order is called the Non-Interlace method while showing odd lines and then even lines in turn is called the Interlace method. The Non-Interlace method is used for the majority of monitors to ensure a clear image. The Interlace method is the same as that used in TVs.

Plug & Play
This is a function that provides the best quality screen for the user by allowing the computer and the monitor to exchange information automatically. This monitor follows the international standard VESA DDC for the Plug & Play function.

Sync Signal
Sync (Synchronized) Signals refer to the standard signals that are required to display desired colors on the monitor. They are divided into Vertical and Horizontal Sync Signals. These signals display normal color images by the set resolution and frequency.

Terms

Types of Sync Signals

- Separate: This is a scheme of transmitting individual vertical sync signals to the monitor.
- Composite: This is a scheme of combining vertical sync signals into one composite signal and transmitting it to the monitor. The monitor displays the color signals by separating the composite signal into original color signals.

Resolution

The number of horizontal and vertical dots used to compose the screen image is called 'resolution'. This number shows the accuracy of the display. High resolution is good for performing multiple tasks as more image information can be shown on the screen.

Example) If the resolution is 1360 X 768 , this means the screen is composed of 1360 horizontal dots (horizontal resolution) and 768 vertical lines (vertical resolution).

Multiple Display Control (MDC)

A Multiple Display Control (MDC) is an application allowing various displays to be easily and simultaneously operated on a PC. RS-232C, a standard of serial communication, is used for the communication between a PC and a display.

Terms

A2 This system uses two carriers to transmit voice data. Countries such as South Korea and Germany use this system.

BTSC Broadcast Television System Committee
The stereo broadcasting system that is used in most of the countries that have adopted the NTSC system, including the United States, Canada, Chile, Venezuela and Taiwan. It also refers to the organization that has been organized to promote its development and management.

EI AJ Electronic Industries Association of Japan

Satellite Broadcasting Broadcasting service provided via satellite. Enables high picture quality and clear sound throughout the country regardless of the location of the viewer.

Sound Balance Balances the levels of the sound coming from each speaker in televisions with two speakers.

Multichannel Television Stereo You can select the MTS (Multichannel Television Stereo) mode.

External Device Input External device input refers to video input from such external video devices as VCRs, camcorders and DVD players, separate from a TV broadcast.

Terms

CATV

"CATV" refers to the broadcasting service offered at hotels, schools and other buildings through their own broadcasting system, apart from VHF or UHF broadcasting by terrestrial broadcasters. The CATV programs may include movies, entertainment and educational programs. (Different from cable TV.)
CATV can be viewed only within the area in which the CATV service is offered.

Cable TV

Whereas the terrestrial broadcasting is delivered via frequency signals through the air, cable broadcasting is transmitted via a cable network. In order to view cable TV, one must purchase a cable receiver and hook it up to the cable network.