

SAMSUNG

TFT-LCD TV/MONITOR

Chassis
VR22EO

Model
LW22N23N

SERVICE *Manual*

TFT-LCD TV/MONITOR



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4 Alignments and Adjustments

4-1 General Alignment Instruction

1. Usually, a color TV-VCR needs only slight touch-up adjustment upon installation.
Check the basic characteristics such as height, horizontal and vertical sync.
2. Use the specified test equipment or its equivalent.
3. Correct impedance matching is essential.
4. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test result.
5. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.
6. Do not attempt to connect or disconnect any wire while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.
7. To protect against shock hazard, use an isolation transform.

4-2 Factory Mode Adjustments

4-2-1 Entering Factory Mode

- To enter "Service Mode" Press the remote -control keys in this sequence :

- If you do not have Factory remote - control



- If you have Factory remote - control



- The buttons are active in the service mode.

- Remote - Control Key : Power, Arrow Up, Arrow Down, Arrow Left
Arrow Right, Menu, Enter, Number Key(0~9)
- Function - Control Key : Power, CH +, CH -, VOL +, VOL -,
Menu, TV/VIDEO(Enter)

4-2-2 Factory Mode Tree

1. PC Calibration		
2. Option Table 2C34 0050	10. Checksum	0000
3. Color Control	11. Adjust	
4. PW565	12. Reset	
5. VPC3230-MAIN		
6. ADC		
7. DNle		
8. MDIN- 150		
9. Test Pattern		
T_VIC22PEU_0908 02/05/2004 16:04:38		

1. PC Calibration	10. Checksum	0000
2. Option Table 2C34 0050		
3. Color Control	11. Adjust	
4. PW565	12. Reset	
5. VPC3230-MAIN		
6. ADC		
7. DNle		
8. MDIN- 150		
9. Test Pattern		
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2. Option Table 2C34 0050			
Flesh Tone	Off	Area	CW
LNA	Off	DebugExpress	Off
Language	English	High Deviation	Off
Melody Volume	10	TXt Group	Osd Language
TTX List	Flop	DNle Demo	On
TTX TOP	Off	TTX Page	200page
Auto FM	On	Bus Stop	Off
Help	On	DDC Write	Off
		SSON	On
Panel Life Time : 3Day 15h 18m			
T_VIC22PEU_0908 02/05/2004 16:04:38			

- | | | |
|---------------------------|---------------|------|
| 1. PC Callbration | 10. Check sum | 0000 |
| 2. Option Table 2C34 0050 | 11. Adjust | |
| 3. Color Control | 12. Reset | |
| 4. PW565 | | |
| 5. VPC3230-MAIN | | |
| 6. ADC | | |
| 7. DNle | | |
| 8. MDIN - 150 | | |
| 9. Test Pattern | | |

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3. Color Control

Pw565 White Balance
Dnie White Balance

3. Color Control

Pw565 White Balance

Sub- Brightness	128	Sub- Contrast	128
Red Offset	128	Red Gain	128
Green Offset	128	Green Gain	128
Blue Offset	128	Blue Gain	128
Brightness	45	TTX-Bright	100

3. Color Control

Dnie White Balance

Sub- Brightness	117	Sub- Contrast	100
Red Offset	128	Red Gain	130
Green Offset	128	Green Gain	128
Blue Offset	124	Blue Gain	124

4 Alignments and Adjustments

1. PC Callbration

2. Option Table 2C34 0050

3. Color Control

4. PW565

5. VPC3230-MAIN

6. ADC

7. DNle

8. MDIN - 150

9. Test Pattern

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10. Check sum 0000

11. Adjust

12. Reset

➔

4. PW565

Red Gain140

Green Gain140

Blue Gain140

Red Offset140

Green Offset140

Blue Offset140

APLOff

T_VIC22PEU_0908

Pixel Shift

Pixel Number4

Time4

Virtual Framelo2

Alpha255

Beta255

Degree30

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Video Port

YB_1120

YB_2200

Xth_0110

Xth_1190

DECS DemoOff

1. PC Callbration

2. Option Table 2C34 0050

3. Color Control

4. PW565

5. VPC3230-MAIN

6. ADC

7. DNle

8. MDIN - 150

9. Test Pattern

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10. Check sum

11. Adjust

12. Reset

0000

➔

5. VPC3230-MAIN

CT

30

CIPCT

29

KILVL

07

BR

90

PFS

02

PKCOR

01

ACC_SAT

80

PK

02

FB_GAIN

22

TINT

00

VPK

00

HV_SLVL

0B

SATCb

24

LPF2

00

SATCr

2B

CBW2

00

CIPTNT

1F

CBW

03

CIPBR

C5

IFC

00

T_VIC22PEU_0908

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1. PC Calibration	10. Check sum	0000	→	6. ADC			
2. Option Table 2C34 0050	11. Adjust			Red Gain	8C	Pr Gain	A0
3. Color Control	12. Reset			Green Gain	8C	Y Gain	A0
4. PW565				Blue Gain	8C	Pb Gain	A0
5. VPC3230-MAIN				Red Offset	46	Pr Offset	43
6. ADC				Green Offset	46	Y Offset	45
7. DNle				Blue Offset	46	Pb Offset	42
8. M DIN - 150				Current	04	TTX Phase	96
9. Test Pattern				VCO	02	TTX Contrast	00
T_VIC22PEU_0908 02/05/2004 16:04:38							

1. PC Calibration	10. Check sum	0000	→	7. DNle TV			
2. Option Table 2C34 0050	11. Adjust			NR_ScaleMaxY	32	NR_TH_HRF	7
3. Color Control	12. Reset			NR_ScaleMinY	16	NR_TH_EDGE	6
4. PW565				NR_ScaleMaxC	32	NR_SEL	3
5. VPC3230-MAIN				NR_ScaleMinC	16	CE_CutOff	16
6. ADC				Scale Noise_Y	72	CE_Upper	254
7. DNle				Scale Noise_C	100	CE_Gain	48
8. M DIN - 150				Limit_Y	126	CE_HPF_Gain	128
9. Test Pattern				Limit_C	132	DCE_Gain	128
T_VIC22PEU_0908 02/05/2004 16:04:38				Next			

7. DNle TV			
Prev.	Black_Slope_Fix	0	White_Slope_Fix
BWS_B_Gain 375	B_Ratio 12000		B_Pgain_Ratio_Rise 224
BWS_W_Gain 375	W_Ratio 12000		B_Pgain_Ratio_Rise 128
WTE_Gain 300	Black_Tilt 66		W_Pgain_Ratio_Rise 224
CTE_Gain 32	White_Tilt 191		W_Pgain_Ratio_Rise 128
BS_On 1	Black_Gain_Max 358		Next
WS_On 1	White_Gain_Max 358		
White_Slope_Fix 0	Black_Slope_Gain 256		
T_VIC22PEU_0908 02/05/2004 16:04:38			

- | | | |
|---------------------------|---------------|------|
| 1. PC Calibration | 10. Check sum | 0000 |
| 2. Option Table 2C34 0050 | 11. Adjust | |
| 3. Color Control | 12. Reset | |
| 4. PW565 | | |
| 5. VPC3230-MAIN | | |
| 6. ADC | | |
| 7. DNle | | |
| 8. MDIN- 150 | | |
| 9. Test Pattern | | |

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8. MDIN- 150

Front Noise Reduction Filter
Horizontal Peaking Filter
Edge Enhancement Filter
Input Test Pattern
Output Test Pattern
Deinterlace Control

8. MDIN- 150

Front Noise Reduction Filter

Noise_Reduction_Flt0	255	Noise_Reduction_Flt_On	0
Noise_Reduction_Flt1	0	Noise_Reduction_Flt_Difference	0
Noise_Reduction_Flt2	0	Median_Flt_On	0
Noise_Reduction_Flt3	0	Median_Flt_Difference	0
Noise_Reduction_Flt4	0	Noise_Reduction_Flt_Diff_Sel	0
Noise_Reduction_Flt5	0		
Noise_Reduction_Flt6	0		
Noise_Reduction_Flt7	0		

8. MDIN- 150

Horizontal Peaking Filter

H_Peaking_Flt0	256	H_Peaking_Flt_Enable	1
H_Peaking_Flt1	0	H_Peaking_Flt_Gain	20
H_Peaking_Flt2	896	H_Peaking_No_Sum	0
H_Peaking_Flt3	0	H_Peaking_Inverse	0
H_Peaking_Flt4	0		
H_Peaking_Flt5	0		
H_Peaking_Flt6	0		
H_Peaking_Flt7	0		

8. MDIN- 150

Edge Enhancement Filter

Edge_Cor_Offse	8
Edge_Enh_Level	2
Edge_Enh_2D_Flt_Enable	1

8. MDIN- 150

Input Test Pattern

In_Test_RGB	0
In_Test_Ptrn	0
In_Test_Format	0

8. MDIN- 150

Output Test Pattern

Out_Test_Ptrn 0
 Out_Dark_Scrn_Main 0

8. MDIN- 150

Deinterlace Control

Deint_Mode	1	Deint_Edge_En	2	Deint_Film_Min	0
Deint_C_Delay_Sel	0	Deint_Edge_Thres	255	Film_Mode_Thres	5
Median_Tap	0	Film_Invaild_Lines	8	Bad_Edit_En	1
Expander_Tap	1	Film32_Mo_Thres	160	Caption_Mode	3
Deint_Thres	24	Film_Mode	5	D_Caption_V_Pos	160
Fast_Mode	1	D_Film_Slide_Cnt	0	Deint_Dis_Color	5
N_Median_Tap	1	D_Film_Slide_Cor	40	Deint_Dis_Mode	0
D_Fast_Mode_Thres	4	Deint_Film_Plus	1		
N_Deint_Thres	24	Deint_Film_Minus	3		
Very_Fast_En	1	Deint_Film_Max	3		

- | | |
|-------------------|-----------------------|
| 1. PC Callbration | 10. Check sum 0000 |
| 2. Option Table | 11. Adjust |
| 3. Color Control | 12. Reset |
| 4. PW565 | |
| 5. VPC3230-MAIN | |
| 6. ADC | |
| 7. DNle | |
| 8. MDIN- 150 | |

9. Test Pattern

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9. Test Pattern

1. Luma Ramp (16 Step)
2. Luma Ramp (128 Step)
3. White 16
4. White 240
5. Color Bar
6. RGB Ramp (32 Step)

4 Alignments and Adjustments

1. PC Calibration	10. Check sum	0000
2. Option Table	11. Adjust	
3. Color Control	12. Reset	
4. PW565		
5. VPC3230-MAIN		
6. ADC		
7. DNle		
8. MDIN - 150		
9. Test Pattern		
T_VIC22PEU_0908 02/05/2004 16:04:38		

1. PC Calibration	10. Check sum	0000	➔
2. Option Table	11. Adjust		
3. Color Control	12. Reset		
4. PW565			
5. VPC3230-MAIN			
6. ADC			
7. DNle			
8. MDIN - 150			
9. Test Pattern			
T_VIC22PEU_0908 02/05/2004 16:04:38			

11. Adjust

TTX-Brightness	20	Movie	70 47 50 50	LD av pal	9
TTX-Contrast	20	LD rf pal-b/g	9	LD av secam	8
TTX-Sharpness	65	LD rf pal-d/k	6	LD av ntsc 3.57	9
CarrierMute	42	LD rf pal-i	10	LD av ntsc 4.43	9
Pilot High	14	LD rf secam-b/g	8	LD av pal 60	9
Pilot Low	7	LD rf secam-b/g	10	ValidLockCnt	2
Dynamic	100 45 75 65	LD rf secam-l/i	9	RF_db-1	
Standard	85 45 60 60	LD rf ntsc4.43	9	RF_db-2	

1. PC Calibration	10. Check sum	0000
2. Option Table	11. Adjust	
3. Color Control	12. Reset	
4. PW565		
5. VPC3230-MAIN		
6. ADC		
7. DNle		
8. MDIN - 150		
9. Test Pattern		
T_VIC22PEU_0908 02/05/2004 16:04:38		

* Unless otherwise specified, do not adjust data in Factory Mode.

* Data may be changed for display improvement.

4-3 White Balance Adjustment

1. In factory mode (1, 3, 6), you can adjust the white balance.
2. As the adjustment and data values differ depending on input sources, different adjustments are required for RF, PC/DVI modes.
3. Optimum condition data for each mode are saved as default values. (Refer to Table 2, 3)
4. As the RF mode is applied with the same vlaues as for VIDEO and S-VIDEO, adjustment can be made in any of RF, VIDEO and S-VIDEO modes.

Table 4-1. White Balance Setting Conditions

Mode	High Light			Low Light		
	"x"	"y"	Y	"x"	"y"	Y
RF	285	295	35fL	289	287	1.6fL
DVI(A)	285	295	23fL	285	295	0.7fL
DVI(D)	285	295	23fL	285	295	0.7fL

Table 4-2. Color Control Default Vlaue

Mode	RF	DTV	PC	Mode	RF	DTV	PC
Sub-Brightness	127	131	149	Sub-Contrast	95	65	42
Red Offset	130	133	128	Red Gain	128	128	128
Green Offset	128	128	128	Green Gain	128	128	128
Blue Offset	130	131	128	Blue Gain	131	128	128
Brightness	45	45	50	Contrast	100	100	80

Table 4-3. Color Control Default Vlaue

Mode	PC	Mode	DTV
Red Gain	8C	Pr Gain	A0
Green Gain	8C	Y Gain	A0
Blue Gain	8C	Pb Gain	A0
Red Offset	46	Pr Offset	40
Green Offset	46	Y Offset	40
Blue Offset	46	Pb Offset	40
Current	05		
VCO	02		

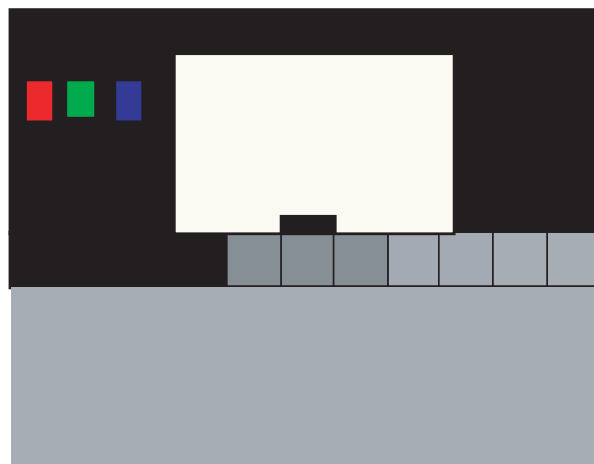
4-3-1 Conditions for Measurement

1. On the basis of toshiba ABL pattern : High Light level (57 IRE)
- INPUT SIGNAL GENERATOR : MSPG-925LTH
* Mode NO 1 : 750X480@60 Hz
NO 6 : 1280X720@60 Hz
NO 21 : 1024X768@60 Hz
* Pattern NO 36 : 16 Color Pattern
NO 16 : Toshiba ABL Pattern
2. Optical measuring device : CA210 (FL)
Please use the MSPG-925 LTH generator for model LTP227W.

4-3-2 Method of Adjustment

1. Adjust the basic level of DTV and PC input signals.
 - a) Set the input to the mode in which the adjustment will be made (PC).
* Input signal - PC Mode : Model #21 (1024*768 Mode), Pattern #16 (Picture 4-1)
 - b) Enter factory Calibration, confirm the ADC data (PC Mode Only).
* ADC default value : Table 4-3.

Picture 4-1 Toshiba ABL Pattern

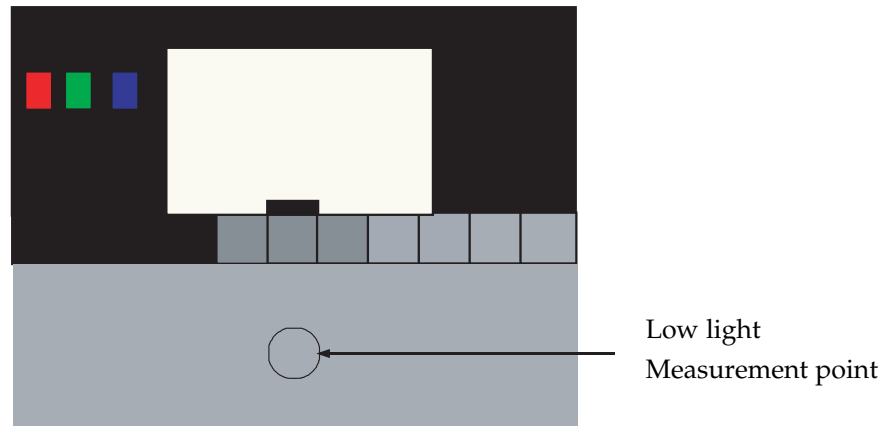


2. Adjust the white balance of RF, DTV and PC Modes.
 - a) Set the input to the mode in which the adjustment will be made (RF → DTV → PC).
* Input signal - VIDEO Mode : Model #1 (750*480 Mode), Pattern #16
- PC Mode : Model #21 (1024*768 Mode), Pattern #16
 - b) Enter factory color control, confirm the data.

c) Adjust the low light. (Refer to table 1, 2 in adjustment position by mode)

- Adjust sub - Brightness to set the 'Y' value.
- Adjust red offset ('x') and blue offset ('y') to the color coordinates.
- * Do not adjust green offset data.

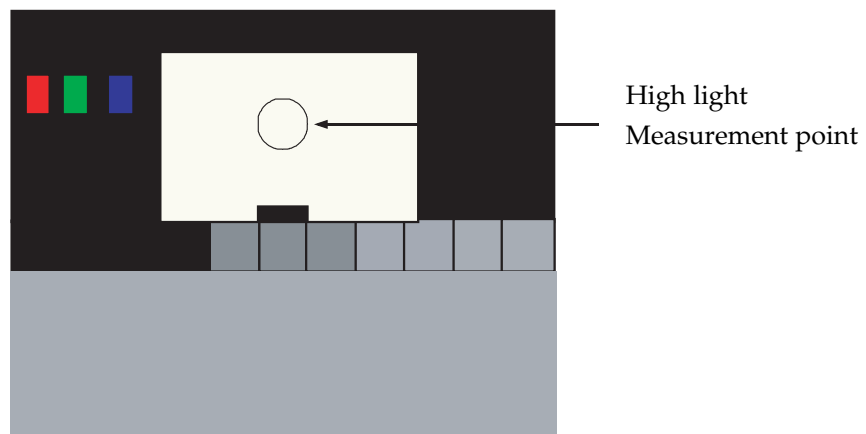
Picture 4-2 Toshiba ABL Pattern



d) Adjust the high light. (Refer to table 1, 2 in adjustment position by mode)

- Adjust red gain ('x') and blue gain ('y') to the color coordinates.
- * Do not adjust the green gain and sub-contrast (Y) data.

Picture 4-3 Toshiba ABL Pattern



4-3-3 Option Table

Option	Default	Option 1	Option 2	Option 3	Remark
DebugExpress	Off	Off (FIX)	Off (FIX)	Off (FIX)	* When a Jig control use to On
LNA	Off (FIX)	Off (FIX)	Off (FIX)	Off (FIX)	-
Vchip	On	On	On	On	-
VchipArea	USA	USA+ Canada	USA	USA+ Canada	-
Melody Volume	10	10	0 ~ 19	0 ~ 19	0 ~ 19
DnieDemo	On	On	On	On	-
I2c Bus Stop	Off	Off	Off	Off	-
Video Mute	3 X 100	3 X 100	3 X 100	3 X 100	[msec]
DECS Demo	On	On	On	On	-
YB_1	100	100	100	100	1 ~ 255
YB_2	200	200	200	200	1 ~ 255
Xth_0	90	90	90	90	1 ~ 254
Xth_1	190	190	190	190	10 ~ 254
Sub_Woofer	Off	Off	Off	Off	Don't Adjust
Corner Freq.	15	15	15	15	Don't Adjust
Data	0A94	0A9C	0094~ 1394	009C~ 139C	00XX ~ 13XX

* The default settings are most recommended for Option Data. Each data may be adjusted.

4-3-4 PW565

* Below figures are for contrast adjustment of PW565 (IC565). Do not change the data.

Mode	Data
Red Gain	128
Green Gain	128
Blue Gain	128
Red Offset	128
Green Offset	128
Blue Offset	128

4-3-5 VPC 3230-MAIN

* Data may be adjusted.

MODE	Data	MODE	Data
CT	20	PK	03
BR	8E	VPK	00
ACC_SAT	80	LPF2	00
TINT	32	CBW2	00
SATCb	1F	CBW	03
SATCr	3F	IFC	03
CIPNT	20	KILVL	07
CIPBR	B5	PKCOR	01
CIPCT	20	FB_GAIN	22
PFS	02	HV_SLVL	0E

4-3-6 ADC

*Adjust the R(Pr), G(Y), B(Pb) gain and offset to the basic level of DTV and PC Input signals.

Mode	PC	Mode	DTV
Red Gain	8C →Adjust	Pr Gain	A0 →Adjust
Green Gain	8C →Adjust	Y Gain	A0 →Adjust
Blue Gain	8C →Adjust	Pb Gain	A0 →Adjust
Red Offset	46 →Adjust	Pr Offset	40 →Adjust
Green Offset	46 →Adjust	Y Offset	40 →Adjust
Blue Offset	46 →Adjust	Pb Offset	40 →Adjust
Current	05		
VCO	02		

4-3-7 DNle

* Control the specify item that a output signals of scalar (PW565).

* This data can be changed without notice.

Mode	Data	Mode	Data	Mode	Data
NR_ScaleMaxY	32	NR_SEL	3	DEP_NR_DET_Gain	8
NR_ScaleMinY	16	CE_CutOff	0	DEP_R_INT	16
NR_ScaleMaxC	32	CE_Upper	220	BWS_B_Gain	375
NR_ScaleMinC	16	CE_Gain	255	BWS_W_Gain	375
NR_TH_HRF	7	CE_HPF_Gain	128	WTE_Gain	1023
NR_TH_EDGE	5	DCE_Gain	32	CTE_Gain	50
Limit_Y	129	CTI_Gain	7		
Limit_C	144	DEP_TH_Cor	15		

4-3-8 MDIN-150

* Control the specify item that a output signals (RF, CVBS, S-VHS Modes) of MDIN-150 (IC405).

* This data can be changed without notice.

4-3-9 Test Pattern

* Use below test patters to demonstrate the image display of PW565 (IC565).

- 1) Luma Ramp (16 step)
- 2) Luma Ramp (128 Step)
- 3) White 16
- 4) White 240
- 5) Color Bar
- 6) RGB Ramp (32 Step)

4-3-10 Check sum

* XXXX : Displays the current check sum size of the MICOM.
(Varies depending on program update)

4-3-11 Reset

* Initializes the data in the MICOM. (Set to default value)

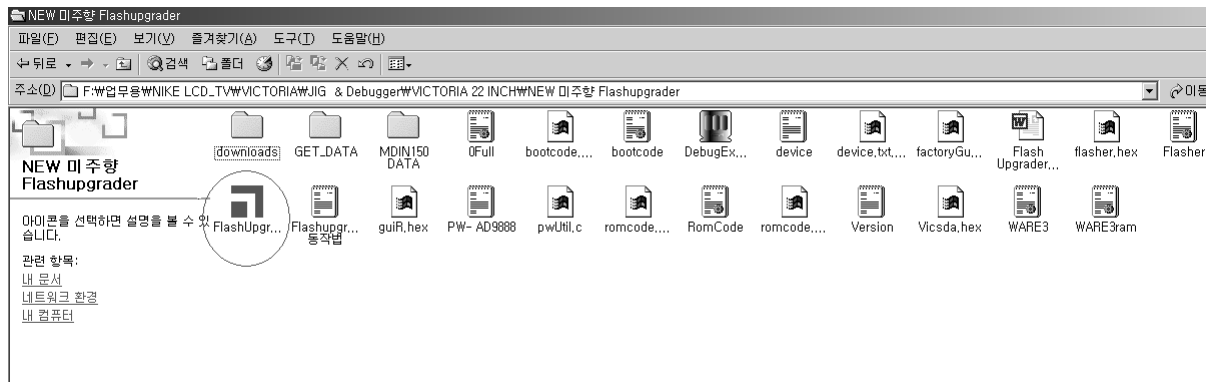
Use 'Reset' to restore adjustmints made in Factory Mode to the original settings.

4-3-12 T_VIC22NUS_0166 11/27/2003 20:10:51

* Displays the MICOM program version

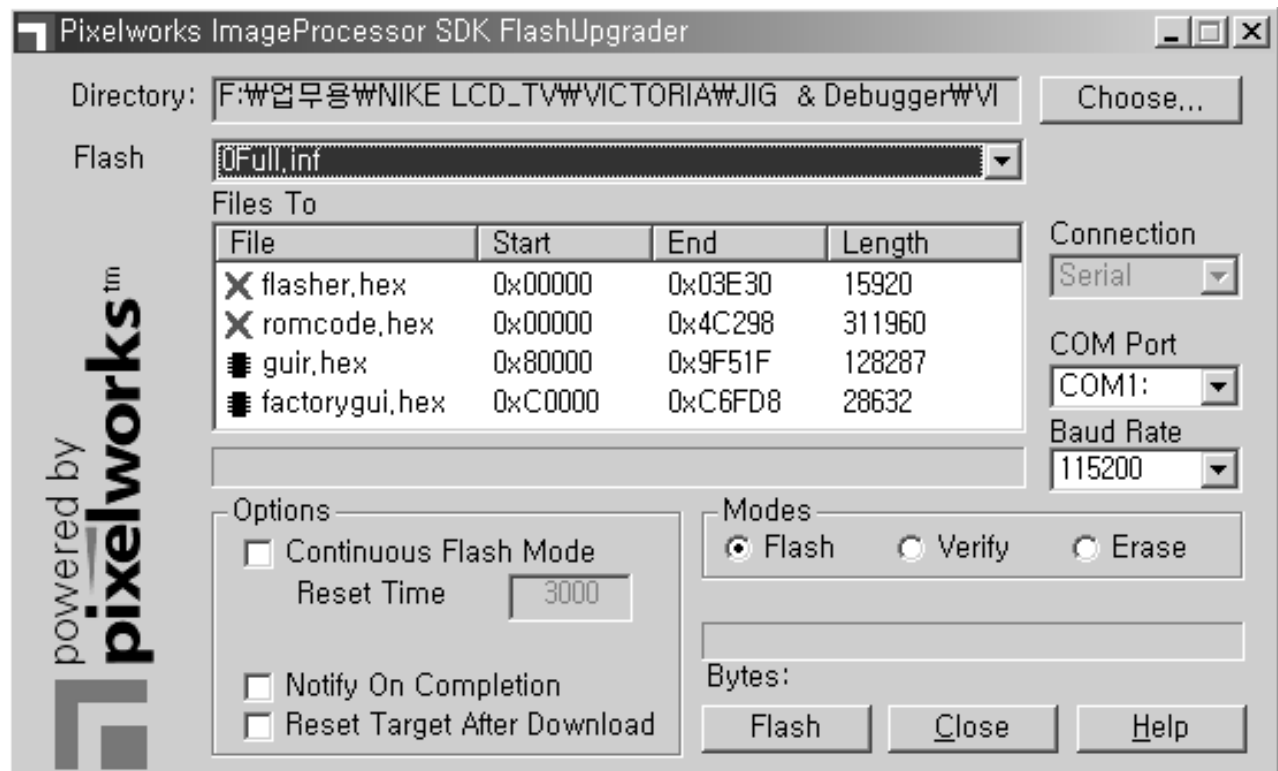
4-4 How to use SW(FlashupgradNT) for LTP227W Set program update

1. Store program practice file in new folder.
2. Connect Set and Jig Cable to execute Program Update.
(Refer to the Picture 4-4 attachment)
3. After completing the JIG Cable connection, store Update practice program (hex file 3EA) in new folder.
(guiR, romcode, factoryGui).
4. Click FlashupgradNT.exe icon 2 times and execute it.
(Upgrader OSD screen is marked)



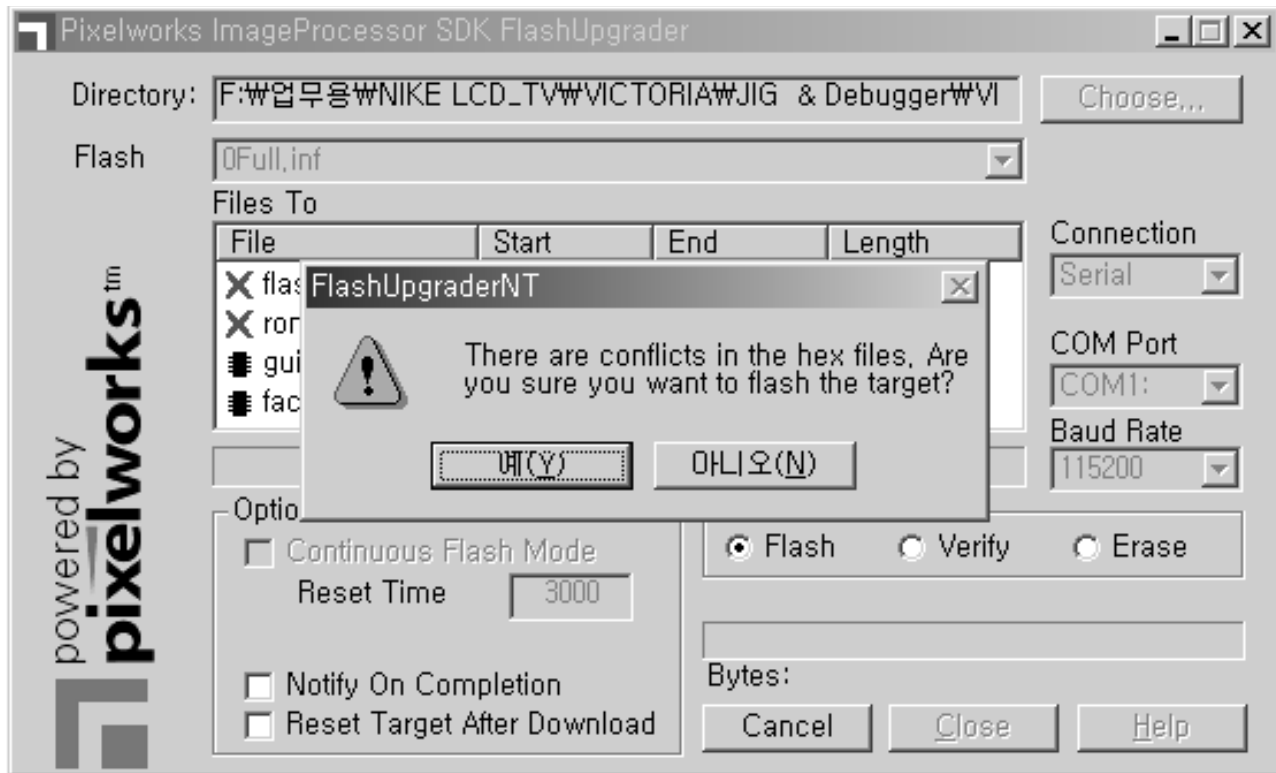
Picture 4-4

5. Select OFull.inf in Flash.
(flaher, romcode, guir, factorygui items look in Files To)



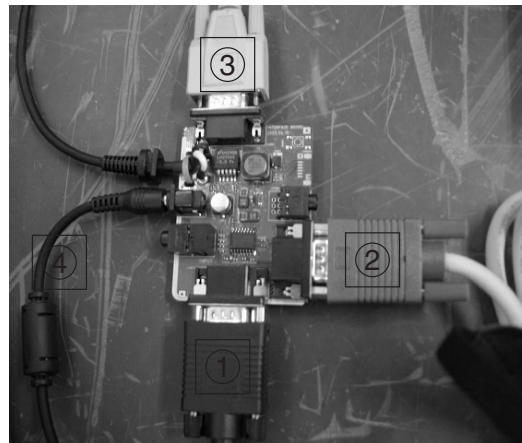
Picture 4-5

6. Click the “Flash” that is under right of OSD screen.
(if warning message comes out, Click the “Yes”(Y).)



Picture 4-6

7. After acting No.6, extract Set's Power Cable and connect it again.
8. During acting No.7, program Update sledding is marked sequentially on OSD screen.
9. After Program Update completion, act NO.7 again.
10. Program Update is completed.



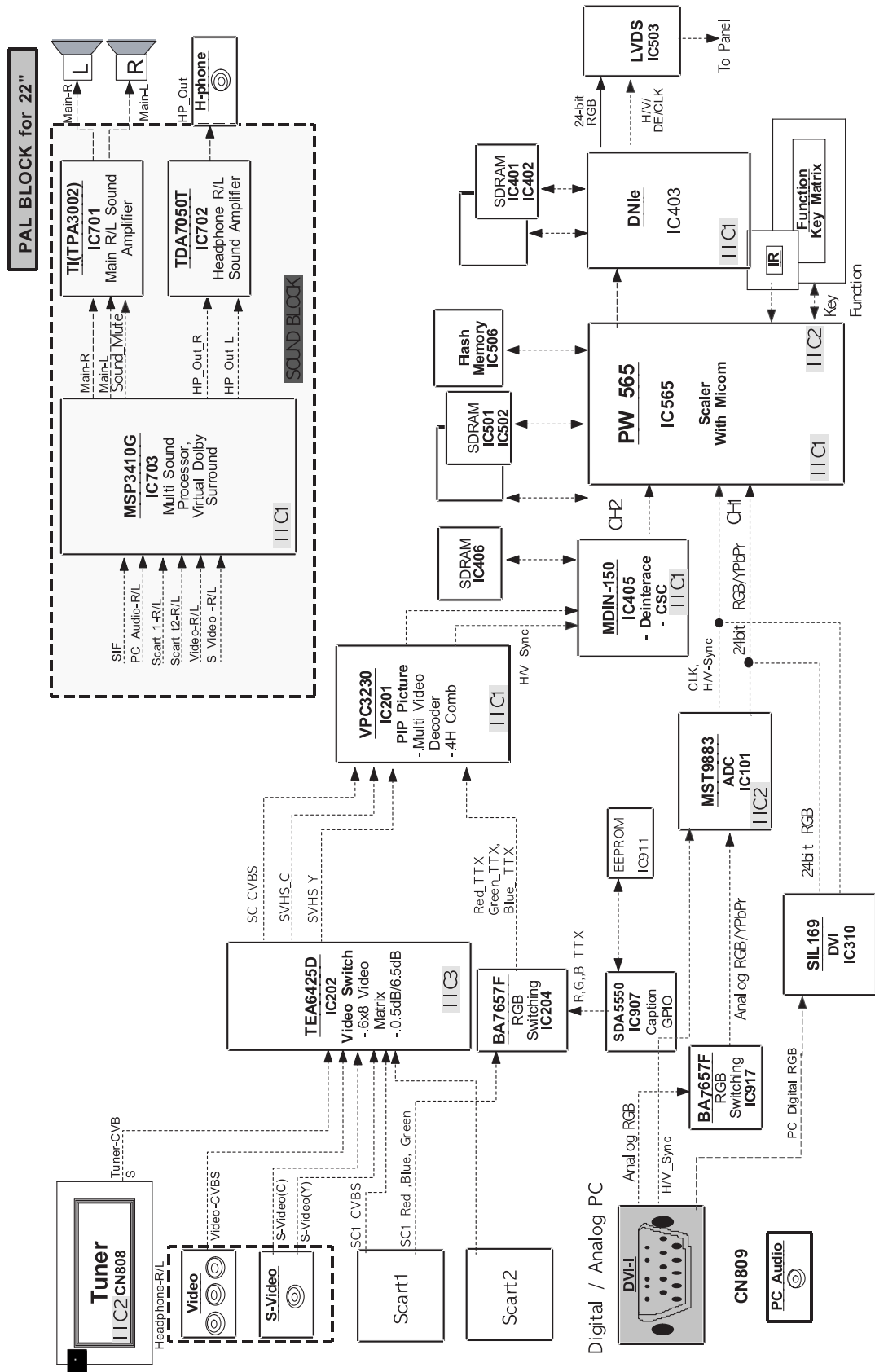
Picture 4-7

<Attachment Picture 4-7 : JIG Cable Connection Explain>

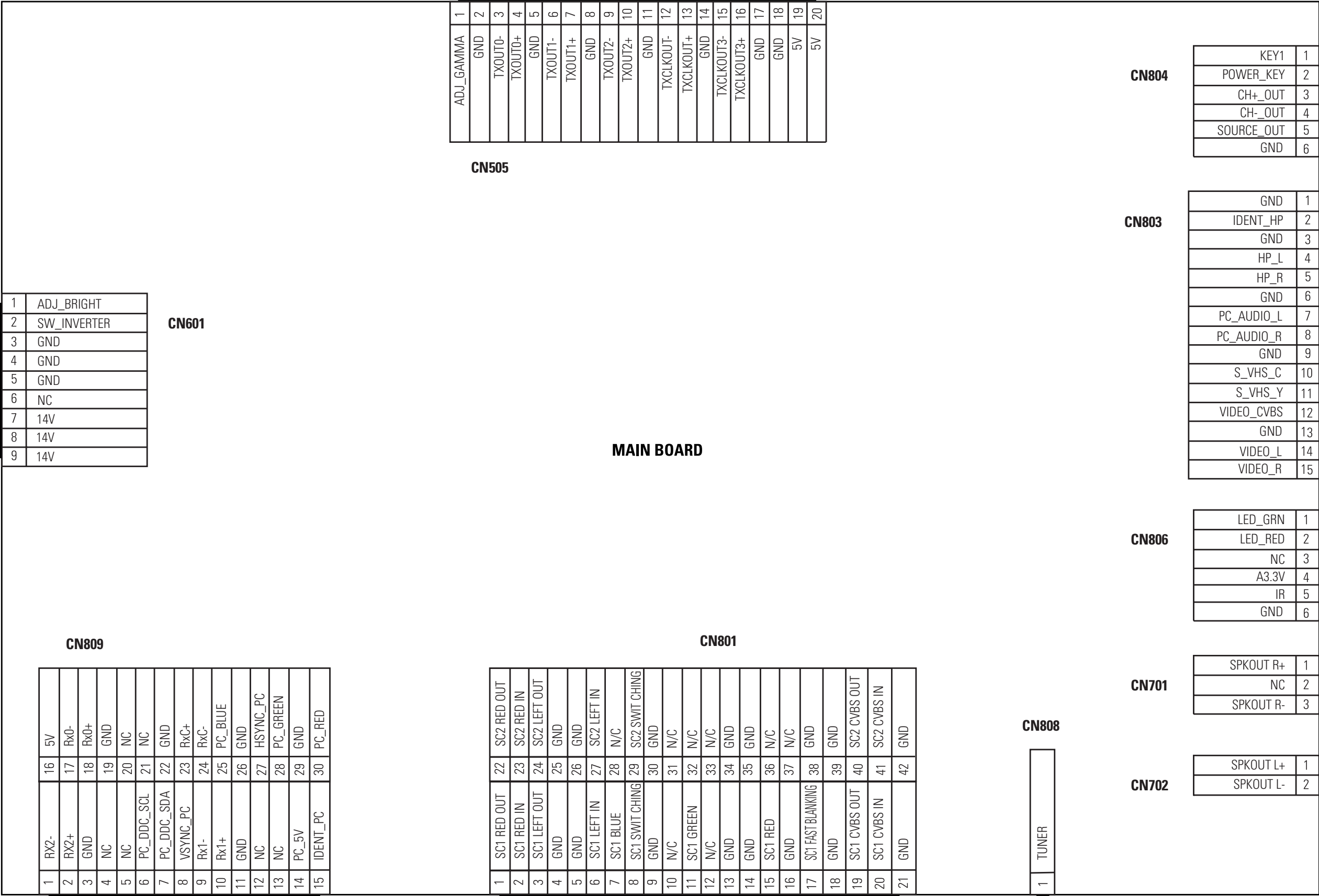
1. Connect with PC Pattern Generator's output.
(Connect only when you want to see PC screen.)
2. Connect with JIG Output (15 pins) and PC Input (PC/DVI 24 pins) terminal.
3. Connect with COM Port1 of PC (9 Pins).
4. Connect 14V 4.5A Adaptor Cable.

8 Block Diagram

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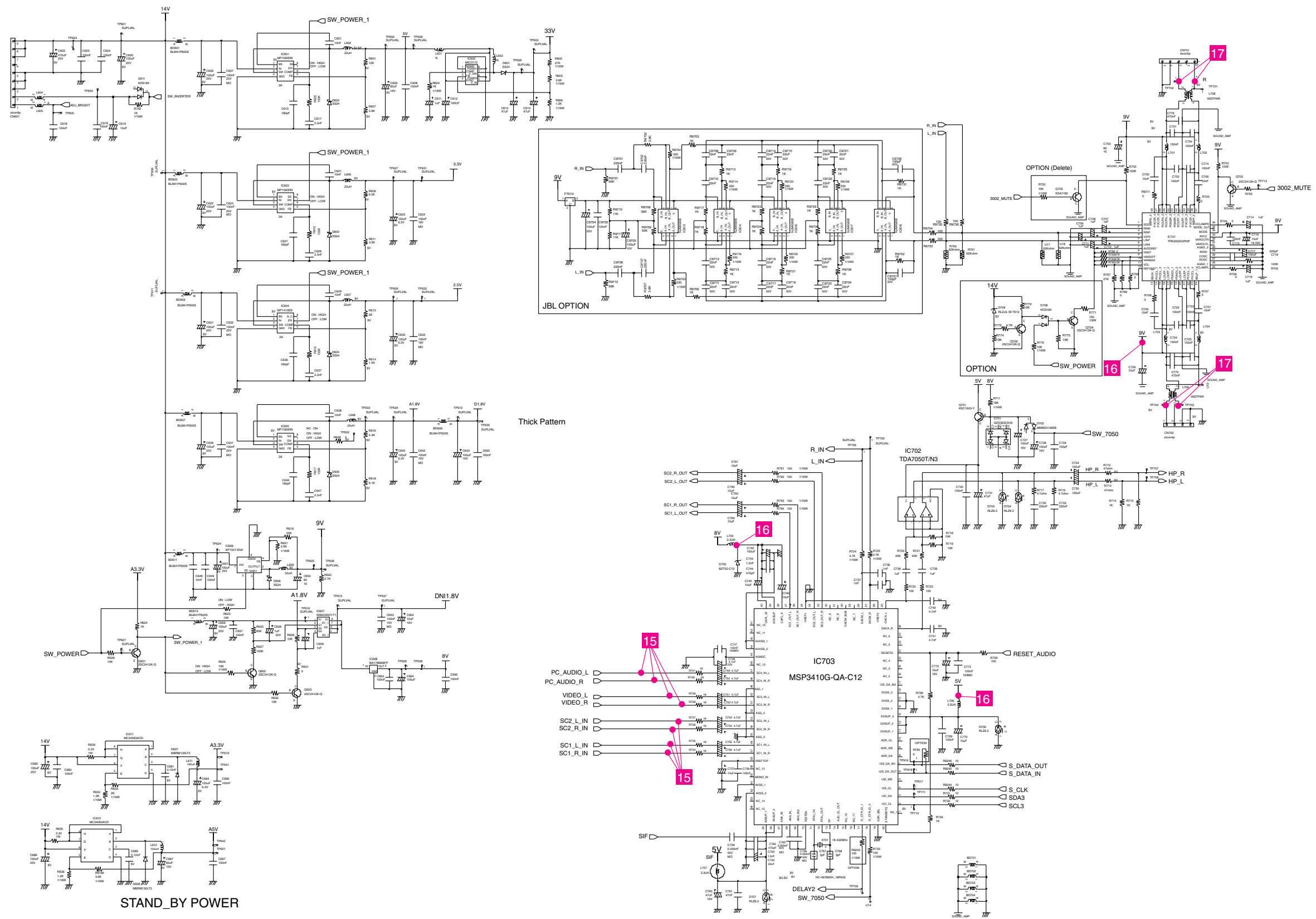


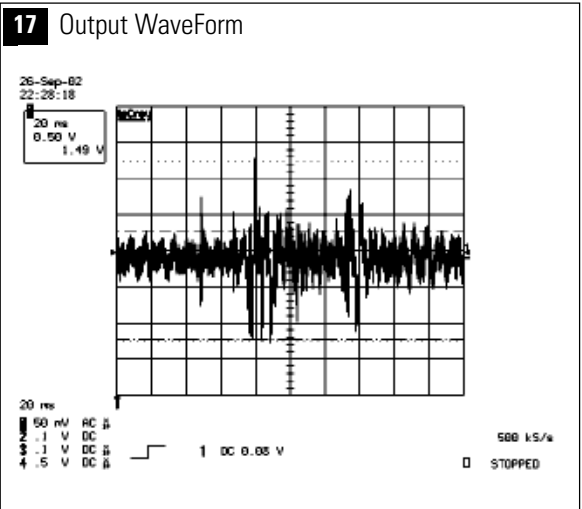
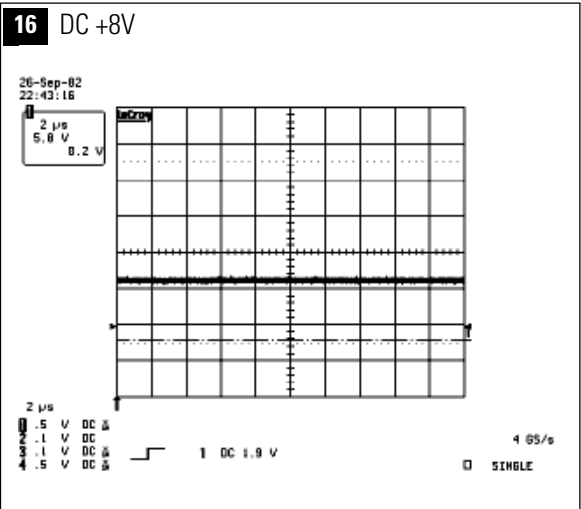
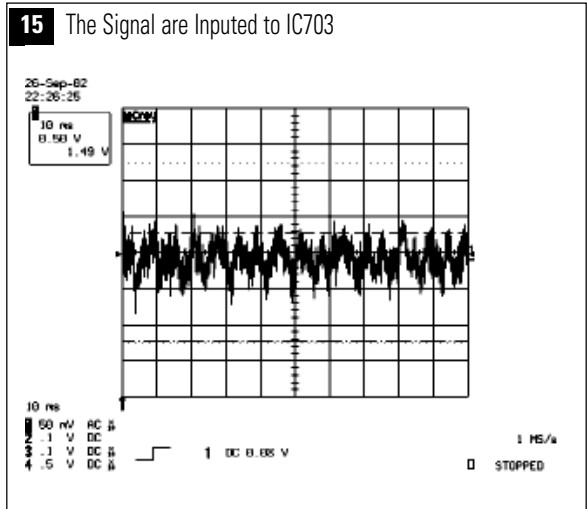
9 Wiring Diagram



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11-5 SOUND PROCESSOR, SOUND AMP, POWER Schematic Diagram

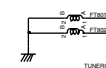
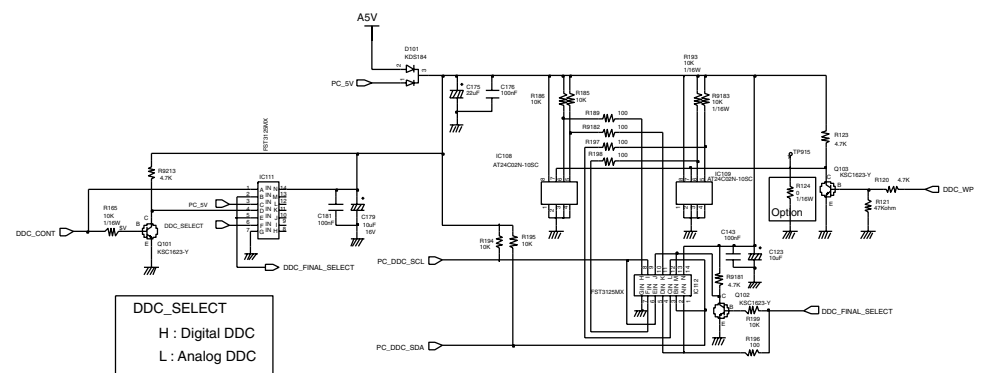
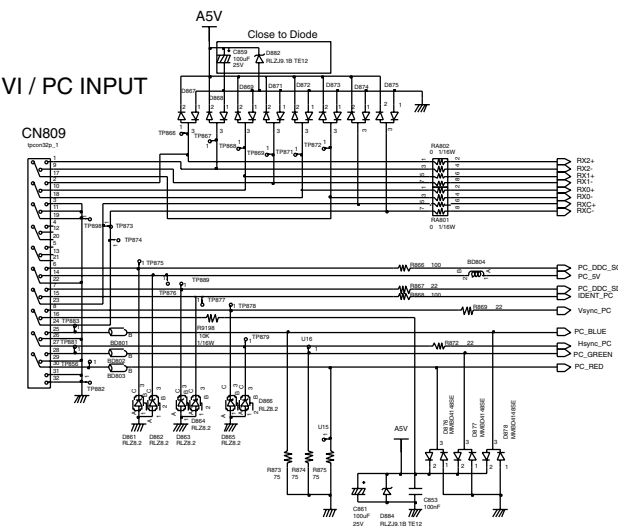
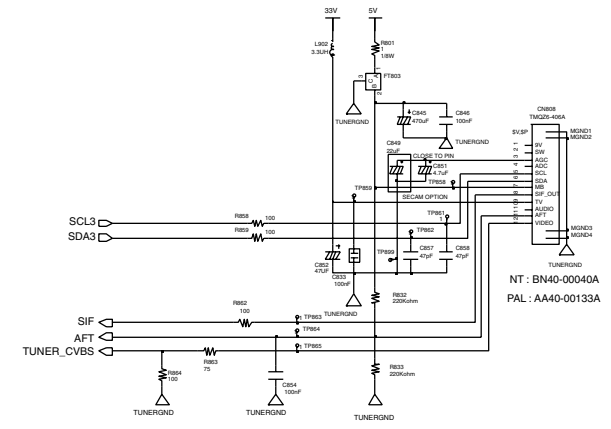
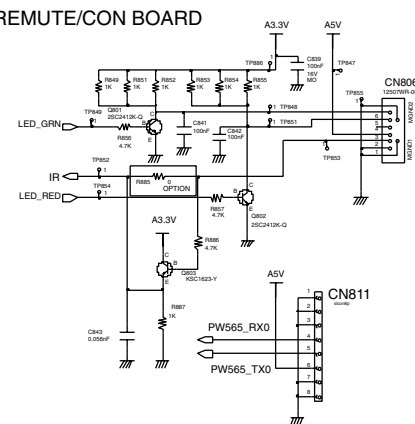
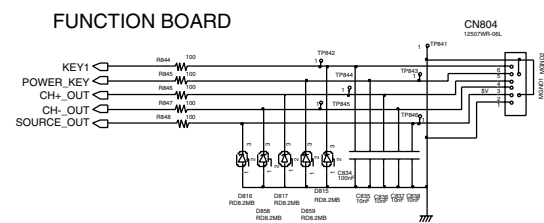
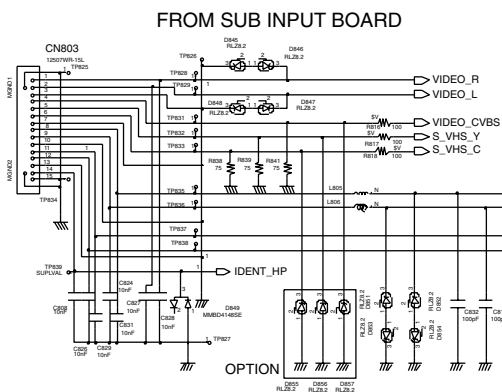
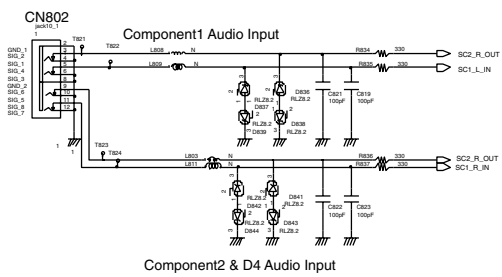
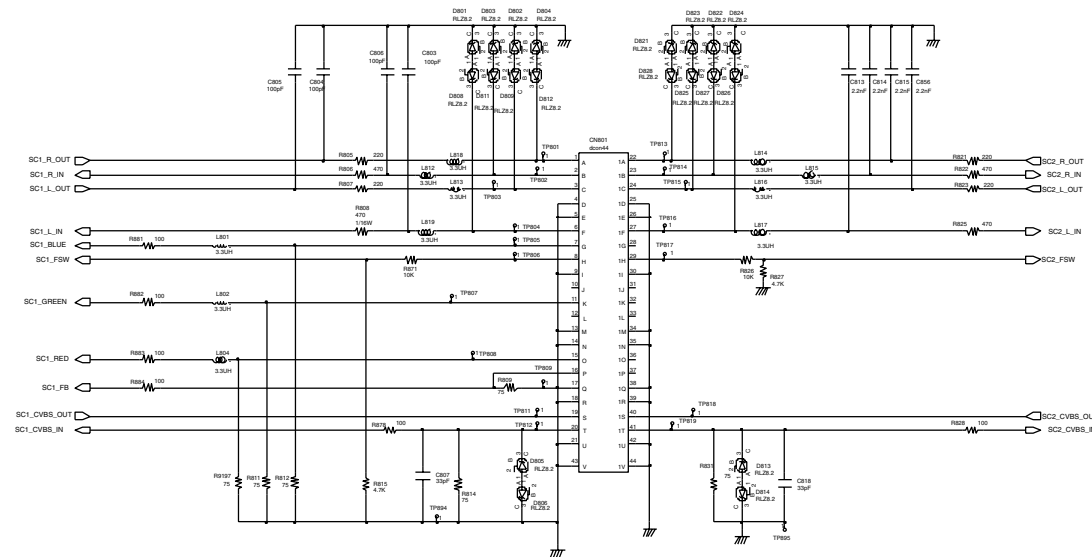




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11-6 INPUT CONECTOR Schematic Diagram

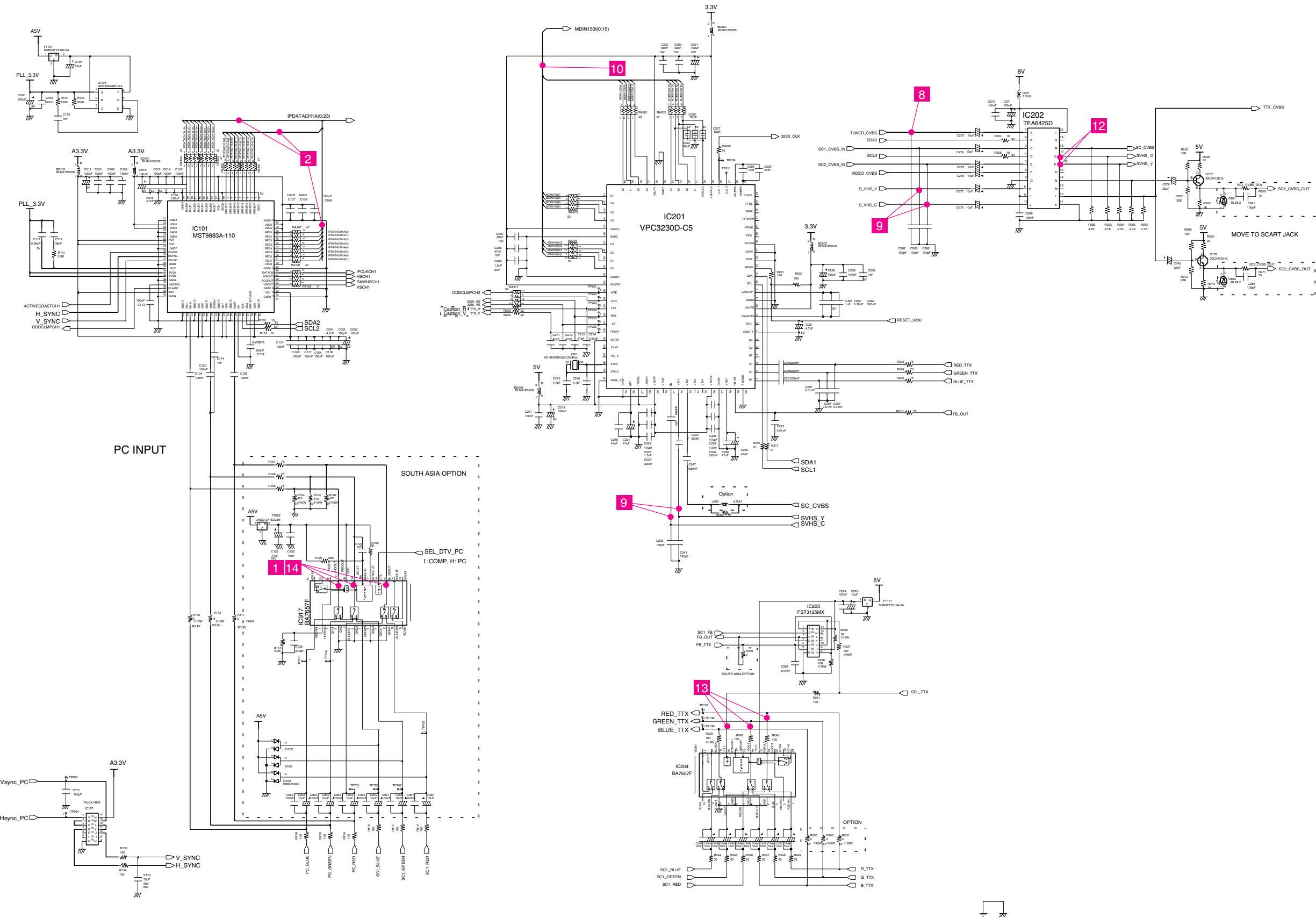
DUAL SCART JACK
(3722-001991)



11 Schematic Diagrams

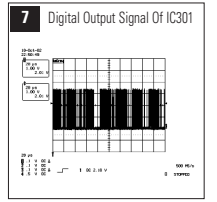
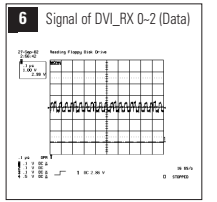
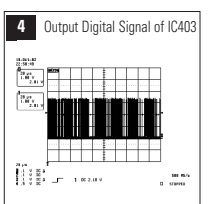
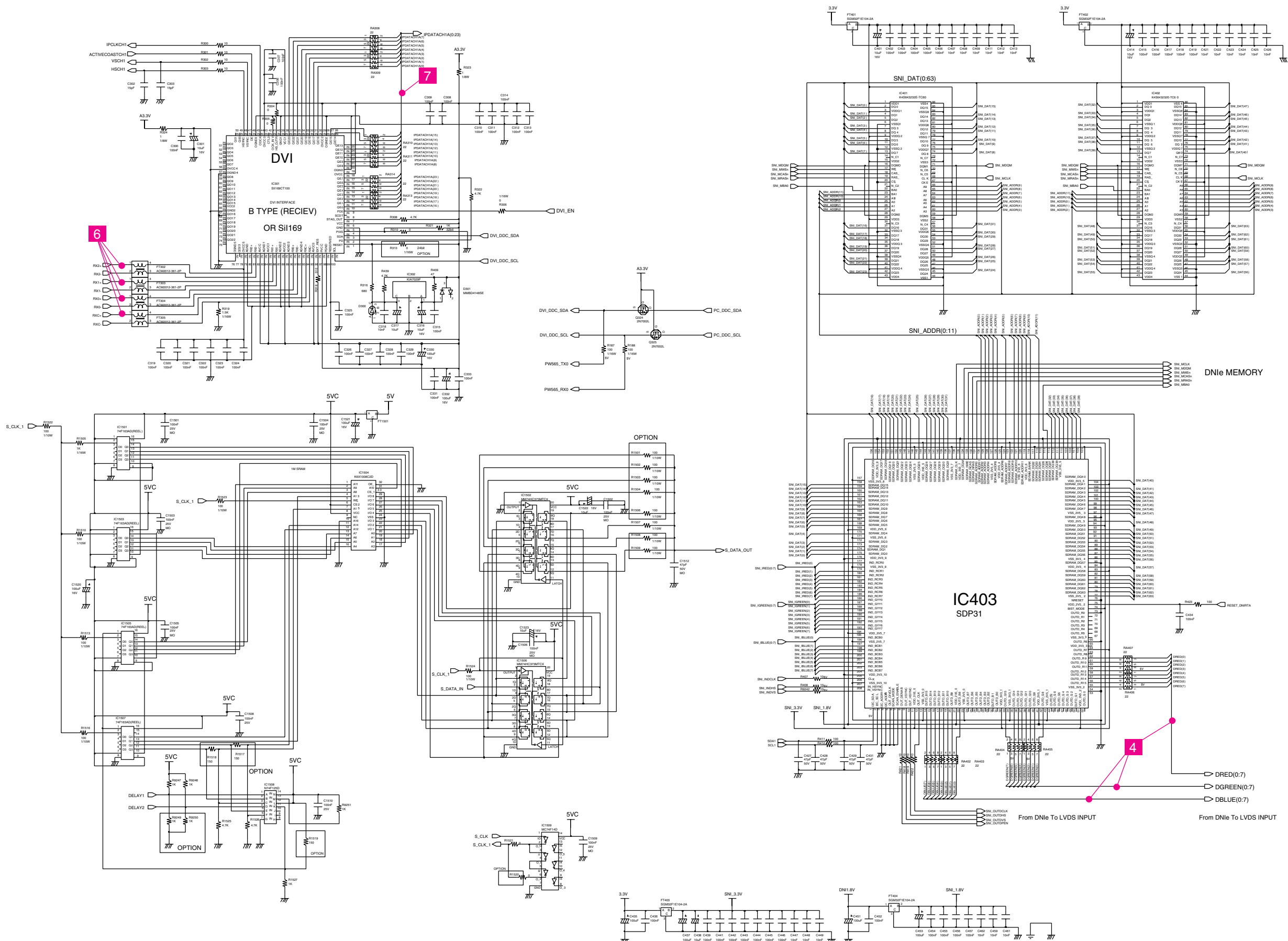
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11-1 VIDEO DECODER ADC, SWITCH Schematic Diagram



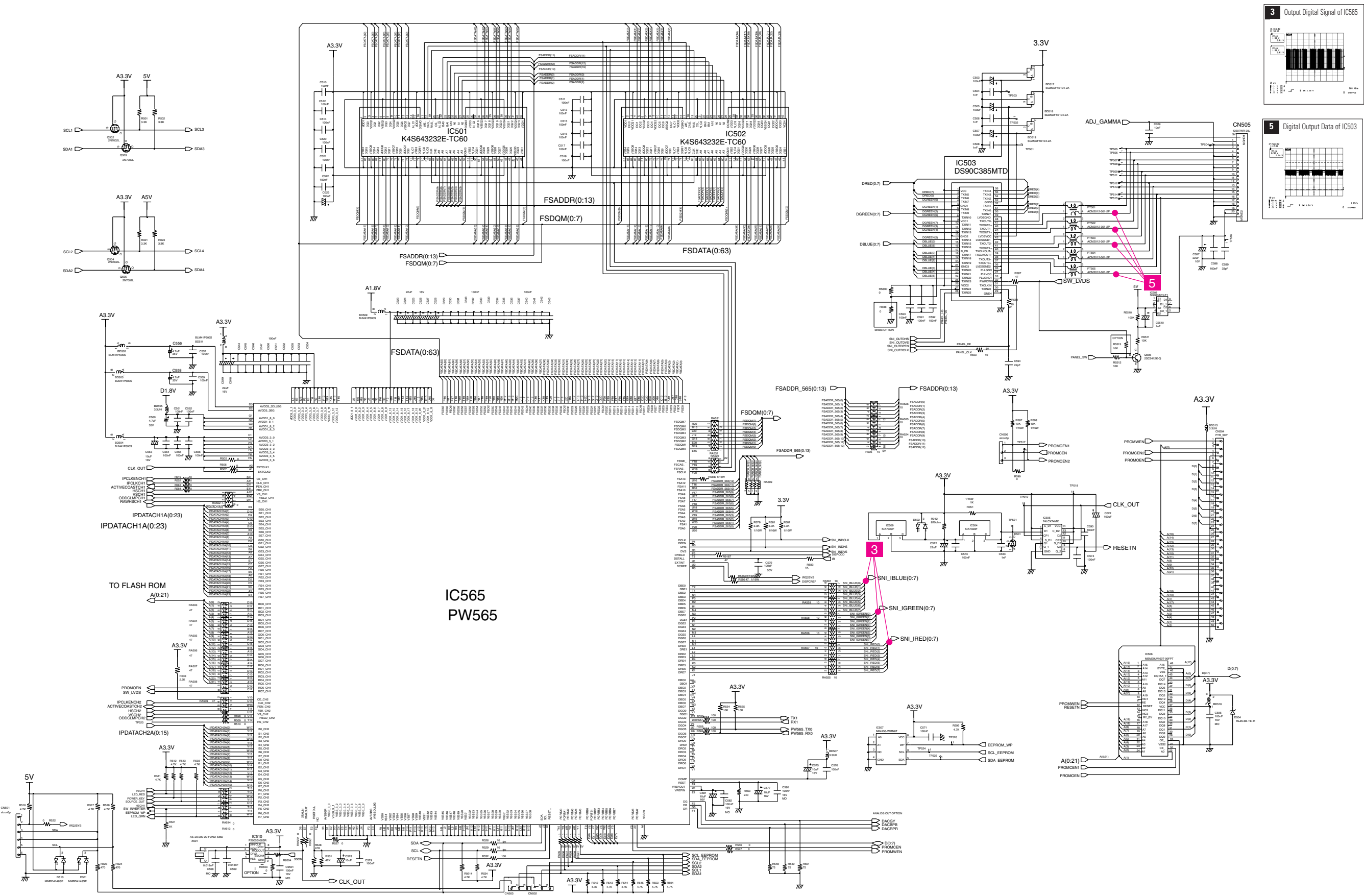
* This Document can not be used without Samsung's authorization.

11-2 DVE, DNI 3D Comb Schematic Diagram



* This Document can not be used without Samsung's authorization.

11-3 PW565_Scaler LVDS, Video_Memory, Flash_Memory Schematic Diagram



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11-4 CAPTION, TTX DEINTERLACER, SUB_MICOM Schematic Diagram

