2. Alignment and Adjustments

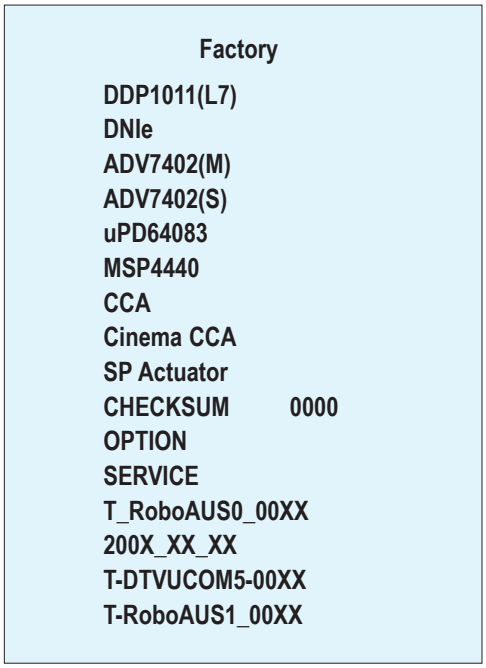
2-1 When Entering Service Mode:

2-1-1 Service Mode Entry Method

1. Turn off the power to make the SET STAND-BY mode.
2. In order to enter the Service Mode, Press "Mute" → "1" → "8" → "2" → "POWER" button on the Remote Control.
   In case entry into SERVICE MODE is unsuccessful, repeat the procedures above.

2-1-2 Initial DISPLAY State in times of SERVICE MODE Switch overs

2-1-2(A) OSD DISPLAY



2-1-2(B) BUTTONS OPERATIONS WITHIN SERVICE MODE

MENU	Full Menu Display / Move to Parent Menu
Direction keys ▲ / ▼	Item Selection by Moving the Cursor
Direction keys ◀ / ▶	Data Increase/Decrease for the Selected Item
Source	Cycles through the active input source that are connected to the unit

2-1-3 Details of Control

1) DDP1011

No	Item	Range	Default	Remark
1	V-Position	0~60	36	Screen upper and lower adjustment
2	H-Position	0~120	65	Screen left right adjustments
3	LAMP SYNC		Pulse(P)	Pulse(P), Pass(T)
4	INDEX DELAY	0~359	40	Index Delay adjustment
5	SEQ SELECT	0~15	5	Sequence Selection
6	V-FLIP	Normal/Flip	Normal	Vertical Flip Operation
7	H-FLIP	Normal/Flip	Normal	Horizontal Flip Operation
8	GAMMA	0~15	2	Gamma Table Selection
9	SLR	OFF/ON	OFF	SLR Function Selection
10	DMD_BIAS	B,C,D,E	E	DMD Bias bin vlotage selection
11	Lamp Boost	0~63	20	Lamp Boost value selection
12	Lamp Sync Delay	0~4095	0	Lamp Sync delay value selection
13	Test Pattern		0	Test Pattern Selection

2) DNIe

No	Item	Range	Default	Remark
1	Test Pattern		0	Test Pattern Selection
2	NR_MAX Y/C	0~255	48	Temporal NR Gain
3	NR_MIN Y/C	0~255	16	Temporal NR Gain
4	Core	0~15	4	NEOnDCE User Set Up
5	B_RATIO		12000	Low level information for the minimum value
6	BLACK_TILT	0~255	120	Black Stretch Area
7	W_RATIO		12000	High level information for the minimum value
8	WHITE_TILT	0~255	200	White Stretch Area
9	GAIN1X	0~63	30	Gain of horizontal high frequency region
10	GAIN1Y	0~63	20	Gain of vertical high frequency region
11	GAIN2X	0~63	17	Gain of horizontal middle frequency region
12	GAIN2Y	0~63	13	Gain of vertical middle frequency region
13	GAIN3X	0~63	11	Gain of horizontal low frequency region
14	NDON		ON	ON,OFF Background Noise Detection ON/OFF Switch
15	CORING_ON		ON	ON,OFFCoring On/Off
16	SCALE_R	0~255	160	Log Mapping Gain
17	WTE_CSC		YCCRGB	YCCRGB,YPPRGB
18	DITHER_MOD		0	1,2,3
19	RED_C_COEFF		128	Gain adjustment of the contrast for the Red signal
20	GRN_C_COEFF		128	Gain adjustment of the contrast for the Green signal
21	BLU_C_COEFF		128	Gain adjustment of the contrast for the Blue signal
22	RED_B_COEFF		128	Gain adjustment of the brightness for the Red signal
23	GRN_B_COEFF		128	Gain adjustment of the brightness for the Green signal
24	BLU_B_COEFF		128	Gain adjustment of the brightness for the Blue signal
25	Sub Contrast	0~150	120	Brightness adjustment for the high-light parts of the screen
26	Sub Brightness		230	Brightness adjustment for the low-light parts of the screen

3) ADV7402(M)

No	Item	Range	Default	Remark
1	AUTO COLOR			Auto Color function execution
2	SOG_SYNC_LEV			Embedded Sync Trigger Level
3	AGC_TIM			AGC Time Constant Selection
4	GAIN_MAN			ON,OFF Manual Gain Control Enable
5	A_GAIN			Manual Gain Value for Channel A
6	B_GAIN			Manual Gain Value for Channel B
7	C_GAIN			Manual Gain Value for Channel C
8	A_OFFSET			Channel A Offset
9	B_OFFSET			Channel B Offset
10	C_OFFSET			Channel C Offset
11	YPM	0~7	4	Y Peaking Filter Mode
12	YSFM	0~32	1	Y Shaping Filter Mode
13	WYSFM	0~32	19	Wide Band TY Shaping Filter Mode
14	CSFM		0	C Shaping Filter Mode
15	Contrast	0~255	128	Contrast Adjust
16	Brightness	0~255	128	Brightness Adjust
17	Hue	0~255	128	Hue Adjust
18	CKILLTHR	0~7	3	Colour Kill Threshold
19	SD_OFF_Cb	0~255	128	SD Offset Cb Channel
20	SD_OFF_Cr	0~255	128	SD Offset Cr Channel
21	SD_SAT_Cb	0~255	128	Saturation Cr Channel
22	SD_SAT_Cr	0~255	128	Saturation Cb Channel
23	IFFILTSEL	0~7	3	IF Filter Select
24	LTA	0~3	0	Luma Timing Adjust
25	CTA	0~7	2	Chroma Timing Adjust
26	DNR_TH	0~255	0	DNR Noise Threshold
27	DCT	0~3	0	Digital Clamp Timing
28	LAGC	0~7	0	Luma Automatic Gain Control
29	LAGT	0~3	3	Luma Automatic Gain Timing
30	LMG		1144	Luma Manual Gain
31	CAGC	0~7	2	Chroma Automatic Gain Control
32	CAGT	0~3	3	Chroma Automatic Gain Timing
33	CMG		2458	Chroma Manual Gain
34	CTI_AB_EN		ON	ON,OFF Chroma Transient Improvement Alpha Blend Enable
35	CTI_AB	0~3	3	Chroma Transient Improvement Alpha Blend

No	Item	Range	Default	Remark
36	CTI_C_TH	0~255	8	CTI Chroma Threshold
37	NSFSEL	0~3	0	Split Filter Selection NTSC
38	CTAPSN	0~3	2	Chroma Comb Taps NTSC
39	CCMN	0~7	0	Chroma Comb mode NTSC
40	YCMIN	0~7	0	
41	HSSLICE			
42	VSSLICE			
43	DLL_PH			
44	ST_NOISE		OxFFFF	

4) ADV7402(S)

No	Item	Range	Default	Remark
1	AUTO_COLOR			
2	SOG_SYNC_LEV	0~31	11	Embedded Sync Trigger Level
3	AGC_TIM	0~7	0	AGC Time Constant Selection
4	GAIN_MAN		ON	ON,OFF Manual Gain Control Enable
5	A_GAIN	0~1024	275	Manual Gain Value for Channel A
6	B_GAIN	0~1024	287	Manual Gain Value for Channel B
7	C_GAIN	0~1024	287	Manual Gain Value for Channel C
8	A_OFFSET	0~1024	0	Channel A Offset
9	B_OFFSET	0~1024	512	Channel B Offset
10	C_OFFSET	0~1024	512	Channel C Offset
11	YPM	0~7	4	Y Peaking Filter Mode
12	YSFM	0~32	1	Y Shaping Filter Mode
13	WYSFM	0~32	19	Wide Band TY Shaping Filter Mode
14	CSFM	(0~7)	0	C Shaping Filter Mode
15	Contrast	0~255	128	Contrast Adjust
16	Brightness	0~255	126	Brightness Adjust
17	Hue	0~255	128	Hue Adjust
18	CKILLTHR	0~7	3	Colour Kill Threshold
19	SD_OFF_Cb	0~255	128	SD Offset Cb Channel
20	SD_OFF_Cr	0~255	128	SD Offset Cr Channel
21	SD_SAT_Cb	0~255	128	Saturation Cr Channel
22	SD_SAT_Cr	0~255	128	Saturation Cb Channel
23	IFFILTSEL	0~7	3	IF Filter Select
24	LTA	0~3	0	Luma Timing Adjust
25	CTA	0~7	3	Chroma Timing Adjust
26	DNR_TH	0~255	0	DNR Noise Threshold
27	DCT	0~3	0	Digital Clamp Timing
28	LAGC	0~7	0	Luma Automatic Gain Control
29	LAGT	0~3	3	Luma Automatic Gain Timing
30	LMG	0~4096	1064	Luma Manual Gain
31	CAGC	0~7(0~3)	2	Chroma Automatic Gain Control
32	CAGT	0~3	3	Chroma Automatic Gain Timing
33	CMG	0~4096	2458	Chroma Manual Gain
34	CTI_AB_EN		ON	ON,OFF Chroma Transient Improvement Alpha Blend Enable
35	CTI_AB	0~3	3	Chroma Transient Improvement Alpha Blend

No	Item	Range	Default	Remark
36	CTI_C_TH	0~255	8	CTI Chroma Threshold
37	NSFSEL	0~3	0	Split Filter Selection NTSC
38	CTAPSN	0~3	2	Chroma Comb Taps NTSC
39	CCMN	0~7	0	Chroma Comb mode NTSC
40	YCMIN	0~7	0	
41	HSSLICE	0~3	1	
42	VSSLICE	0~3	3	
43	DLL_PH			
44	ST_NOISE		OxFFFF	

5) Upd64083

No	Item	Range	Default	Remark
1	DYCOR	0~15	2	DY detection coring level
2	DYGAIN	0~15	9	DY detection gain
3	DCCOR	0~15	3	DC detection coring level
4	DCGAIN	0~15	6	DC detection gain
5	YHCOR	0~3	1	Y output high frequency component coring
6	CDELAY	0~3	4	C signal output delay
7	YPFT		3	YPFT adjustment
8	YPFG		8	YPFG adjustment

6) MSP4440

No	Item	Range	Default	Remark
1	MDB Effect	0~127	56	Micronas Dynamic Bass
2	SRS Dialog	0~127	64	SRS Dialog clarity adjustment
3	PLL			Pilot low adjustment
4	PLH			Pilot high adjustment

7) CCA

No	Item	Range	Default	Remark
1	CCA	On/Off	On	CCA On/Off Selection
2	Red-x	0~32768	640	Red-x adjustment
3	Red-y	0~32768	340	Red-y adjustment
4	Red-Y	0~32768	86	Red-Y adjustment
5	Green-x	0~32768	300	Green-x adjustment
6	Green-y	0~32768	620	Green-y adjustment
7	Green-Y	0~32768	300	Green-Y adjustment
8	Blue-x	0~32768	150	Blue-x adjustment
9	Blue-y	0~32768	60	Blue-y adjustment
10	Blue-Y	0~32768	53	Blue-Y adjustment
11	White-x	0~32768	291	White-x adjustment
12	White-y	0~32768	300	White-y adjustment
13	White-Y	0~32768	439	WHite_Y adjustment
14	WB Spread			Spread CCA value to all mode
15	Move HDMI			Move to the HDMI Mode
16	DRedX		640	Target Red X value for CCA
17	DRedY		330	Target Red Y value for CCA
18	DGreenX		300	Target Green X value for CCA
19	DGreenY		620	Target Green Y value for CCA
20	DBlueX		150	Target Blue X value for CCA
21	DBlueY		60	Target Blue Y value for CCA
22	DCyanX		205	Target Cyan X value for CCA
23	DCyanY		270	Target Cyan Y value for CCA
24	DMagentaX		290	Target Magenta X value for CCA
25	DMagentaY		140	Target Magenta Y value for CCA
26	DYellowX		425	Target Yellow X value for CCA
27	DYellowY		515	Target Yellow Y value for CCA
28	D_White_X		291	Target White X value for CCA
29	D_White_Y		300	Target White Y value for CCA
30	DTV/HDMI		0	

8) Cinema CCA

No	Item	Range	Default	Remark
1	DRedX		640	Target Red X value for CCA
2	DRedY		340	Target Red Y value for CCA
3	DGreenX		300	Target Green X value for CCA
4	DGreenY		620	Target Green Y value for CCA
5	DBlueX		150	Target Blue X value for CCA
6	DBlueY		60	Target Blue Y value for CCA
7	DCyanX		205	Target Cyan X value for CCA
8	DCyanY		270	Target Cyan Y value for CCA
9	DMagentaX		290	Target Magenta X value for CCA
10	DMagentaY		140	Target Magenta Y value for CCA
11	DYellowX		425	Target Yellow X value for CCA
12	DYellowY		515	Target Yellow Y value for CCA
13	D_White_X		313	Target White X value for CCA
14	D_White_Y		329	Target White Y value for CCA

9) CHECKSUM 0000

Excute Checksum calcuation

10) OPTION

No	Item	Range	Default	Remark
1	Lamp Clear			Initialize lamp using time. Lamp Life is set to zero
2	User Reset			All setting is back to the default
3	WB Reset		OFF	Initialize the White Balance value
4	EER Reset			Clear the EEPROM
5	Lamp Life		0h	Time for which the lamp has been used
6	AUTO POWER	ON/OFF	ON	The sets turns on automatically when the power cord is plugged in
7	DNIe DEMO	ON/OFF	ON	DNIe Demo function selection
8	Lamp Control		Dynamic	Dynamic, Always
9	MUTE TIME		600ms	Time which the screen will be black while switching channels
10	EDID WRITE			
11	DELAY MOD	ON/OFF	OFF	Sound Delay Module ON/OFF selection
12	DBG/ANY SEL	Debug/AnyNet		Select the use of the Aynet jack
13	GEM/GEMIR SEL	GemIR/Gemstar		Not used
14	226 TEST PATT			Xilleon 226 test pattern
15	Set Default Data			Initialize Service Data
16	DDC protection		OFF	DDC write ON/OFF selection
17	LNA Default		AUTO	LNA setting OFF/Auto selection
18	PROTECT		ON	Protection ON/OFF selection
19	WATCH DOG			Watch Dog ON/OFF selection
20	WD COUNT		0	Count for Watch Dog event
21	Auto Pgm Range		8	Not used

11) SERVICE

No	Item	Range	Default	Remark
1	V-Position		36	Screen upper and lower adjustment
2	H-Position		65	Screen left right adjustment
3	LAMP SYNC		Pulse(P)	
4	Actuator Gain			Actuator Gain adjustment
5	INDEX DELAY		40	Index delay adjustment
6	AUTO COLOR			Auto Color function execution
7	CCA			CCA menu
8	Lamp Clear			Initialize Lamp using time
9	User Reset			All setting is back to the default

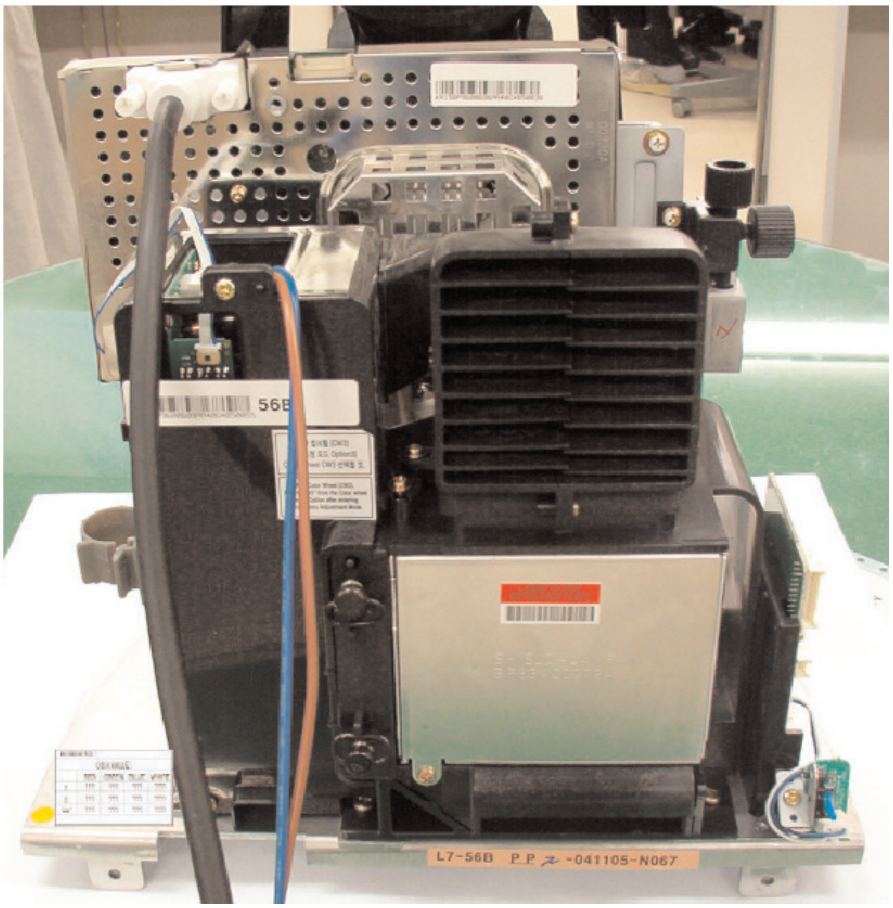
2-2 CCA Adjustment Service Methods

CCA Adjustment is needed after changing a light engine or digital board

2-2-1 CCA

In DLP TV, even the same RGB color may differ depending on the light engine. CCA (Color Coordinate Adjustment) corrects the color to achieve the color accuracy. CCA performs color correction after measuring and inputting the current light engine's data on actual color coordinates for displayed Red, Green, Blue, and White color patterns, using a color coordinate measuring equipment. At this moment, color correction is performed on the basis of previously inputted Desired Color Coordinates and Measured Color Coordinates. Measured Data on Service Engine's color coordinates is presented on the CCA label. Input the label values to perform CCA color correction.

2-2-2 Condition of the CCA Label upon Receipt of the Service Engine



* "CCA LABEL" describes the measured color coordinates on the light engine.

2-2-3 CCAService Procedures

To execute CCA adjustment , perform the following steps:

1. Turn off the power to make the SET STAND-BY mode.
2. In order to enter the Service Mode, Press "Mute" → "1" → "8" → "2" → "POWER" button on the Remote Control.
3. Select FACTORY > SERVICE > CCA mode on the SET.
4. Switch the CCA OFF.
5. Input the CCA basic engine data to the SET.
6. Input the D-White -x, y values in the coordinates per destination. (if necessary)
7. Select WB SPREAD, then press Enter to activate the WB Spread SET ensuring that you adjust until you get the OK sign. After adjusting, exit Factory Mode.
8. When the adjustment is complete, check the picture quality.

CCA Menu in FACTORY Mode

CCA ON/OFF		
Red	- x	: ???
Red	- y	: ???
Red	- Y	: ???
Green	- x	: ???
Green	- y	: ???
Green	- Y	: ???
Blue	- x	: ???
Blue	- y	: ???
Blue	- Y	: ???
White	- x	: ???
White	- y	: ???
White	- Y	: ???
WB SPREAD		
Move HDMI		

* Attention

Performing CCA is independent on current display's resolution and input signal type if you don't measure color coordinates data. Measuring color coordinates data requires specific equipment not possessed by service personnel, what makes performing manual adjustment impossible. Adjusting CCA is applied to all the signal mode. Don't change Desired value because it will be hamful to the color of the SET.

2-3 INDEX DELAY Adjustment

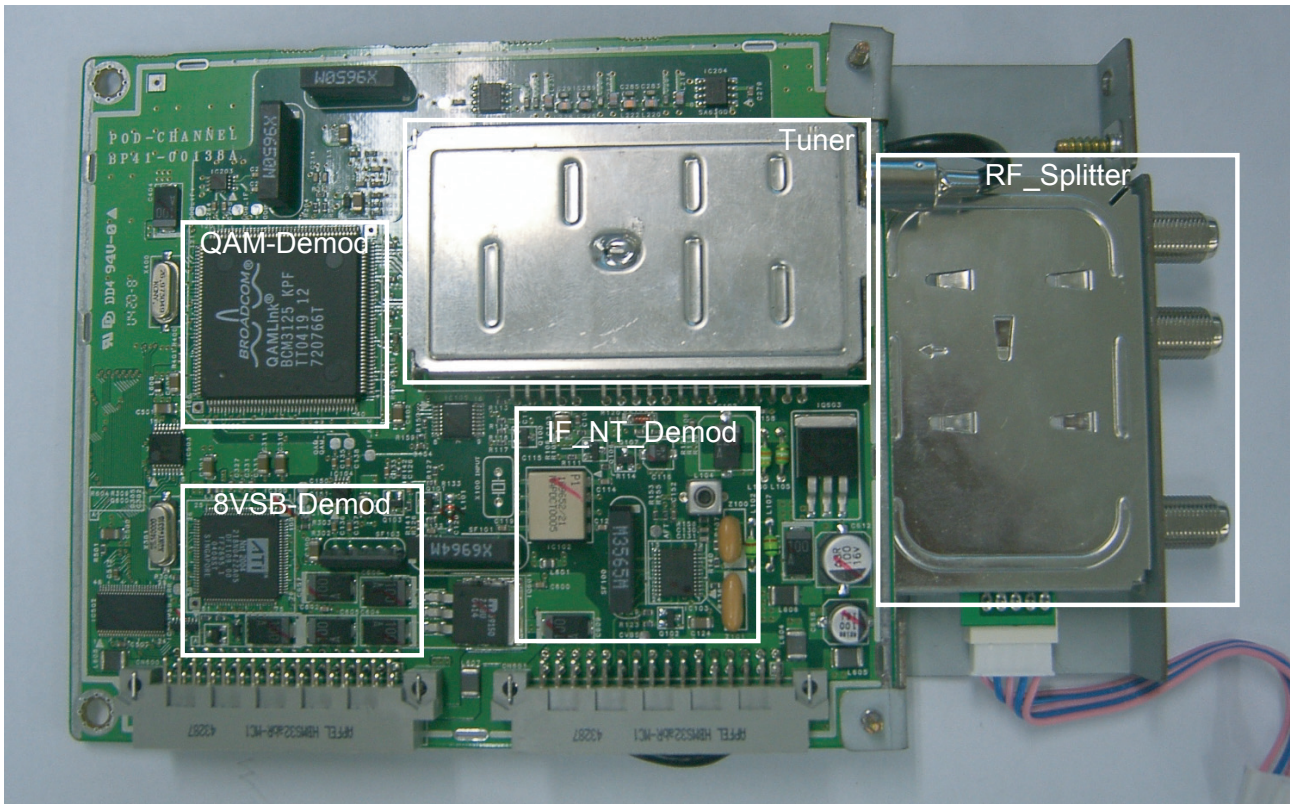
1. Turn off the power to make the SET STAND-BY mode.
2. In order to enter the Service Mode, Press "Mute" → "1" → "8" → "2" → "POWER" button on the Remote Control.
3. Select "Service" on the first display of the Service mode menu.
4. Press the ▲ ▼ (Up or Down) button to move to INDEX DELAY, then press ENTER to select.
5. The INDEX DELAY setup screen (with a red bar at the bottom of the screen) will be displayed.
6. Press the ◀ ▶ (Left of Right) button to check the red color at the bottom of the screen at its minimum and maximum values of changing from red to magenta, then adjust to the mean value.

2-4 Projected Image Adjustment

1. Turn off the power to make the SET STAND-BY mode.
2. In order to enter the Service Mode, Press "Mute" → "1" → "8" → "2" → "POWER" button on the Remote Control.
3. Select "Service" on the first display of the Service mode menu.
4. Select the V-position for vertical positioning and H-position for horizontal positioning by using the ▲ ▼(up, down) buttons.
   ※ Do not set the V-position value to 34 or 35.
   (Setting to these values will cause horizontal lines on the right side of the screen.)

2-5 POD Channel Board

2-5-1 Assy POD Channel Board



* Analog Channel Tuning
* Digital(VSB, QAM) Channel Tuning
* 3wire(CLK,Data,Select) control in method tuner control

CN600

Transporting video stream

Pin Name	PIN No.		Pin Name
S_5V	1	32	NRESET
GND	2	31	GND
QAM_SCL	3	30	VSB_SDA
QAM_SDA	4	29	VSB_SCL
GND	5	28	CH_RST
DRX	6	27	CRX
QTX	7	26	ETX
ITX	8	25	CTX
GND	9	24	GND
TS_CLK	10	23	TS_SEL
TS_SYNC	11	22	TS_VAL
TS_D7	12	21	TS_D6
TS_D5	13	20	TS_D4
TS_D3	14	19	TS_D2
TS_D1	15	18	TS_D0
D3.3V	16	17	GND

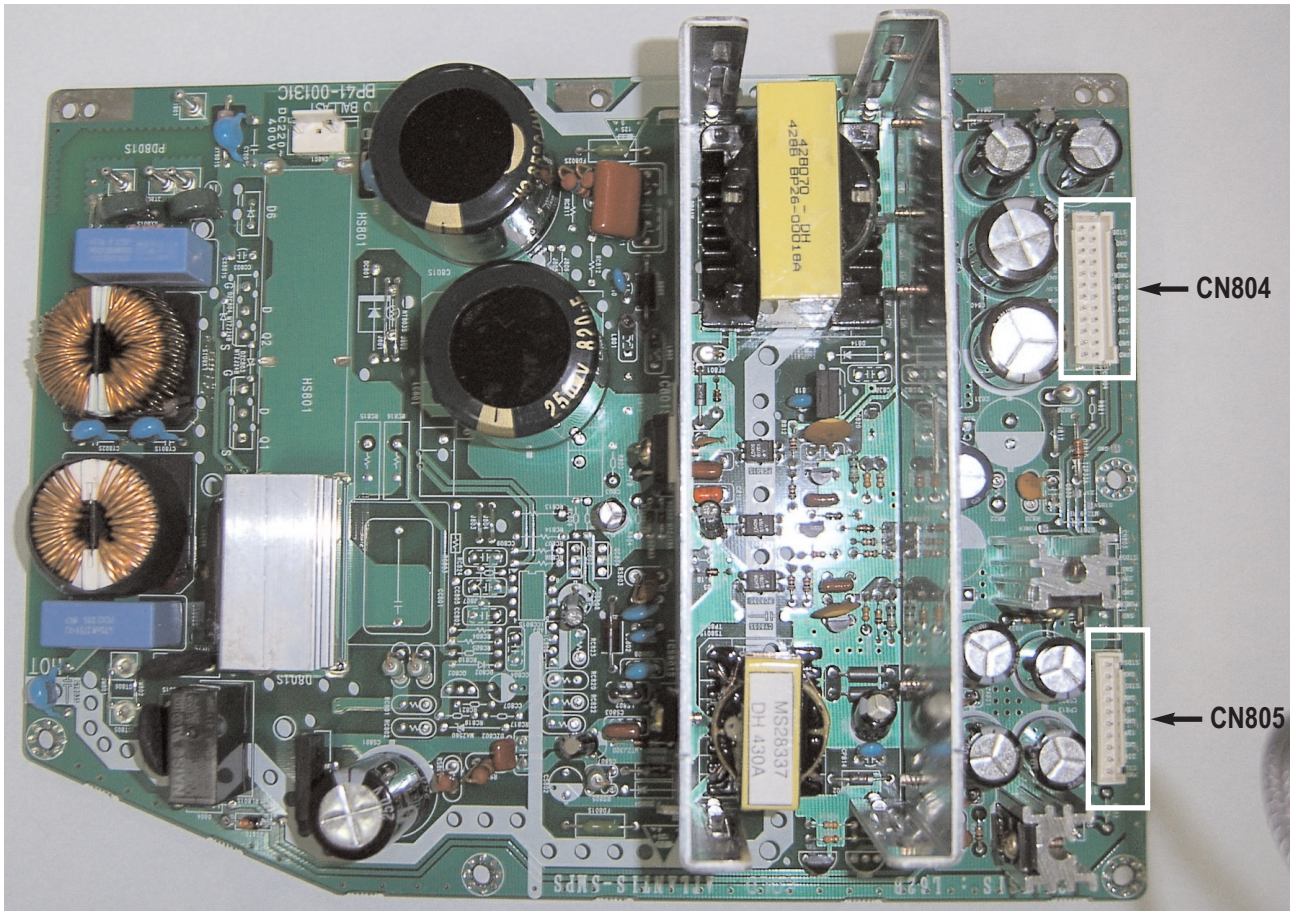
CN601

Connecting the control signal between Digital & Channel board

Pin Name	PIN No.		Pin Name
S_A30V	1	32	GND
GND	2	31	GND
S_A9V	3	30	TU_CLK
GND	4	29	TU_EN
GND	5	28	TU_DAT
S_A6.5V	6	27	GND
GND	7	26	XTAL_ON_OFF
NTSC_AFT	8	25	GND
GND	9	24	GND
CVBS	10	23	Crystal_CTL
GND	11	22	TU_AGC
SIF	12	21	GND
GND	13	20	GND
GND	14	19	GND
GND	15	18	GND
GND	16	17	GND

2-6 ASSY PCB POWER Service Manual

2-6-1 Assy Power Board



* Supply DC Voltage

CN805
Connecting Power to Analog Board

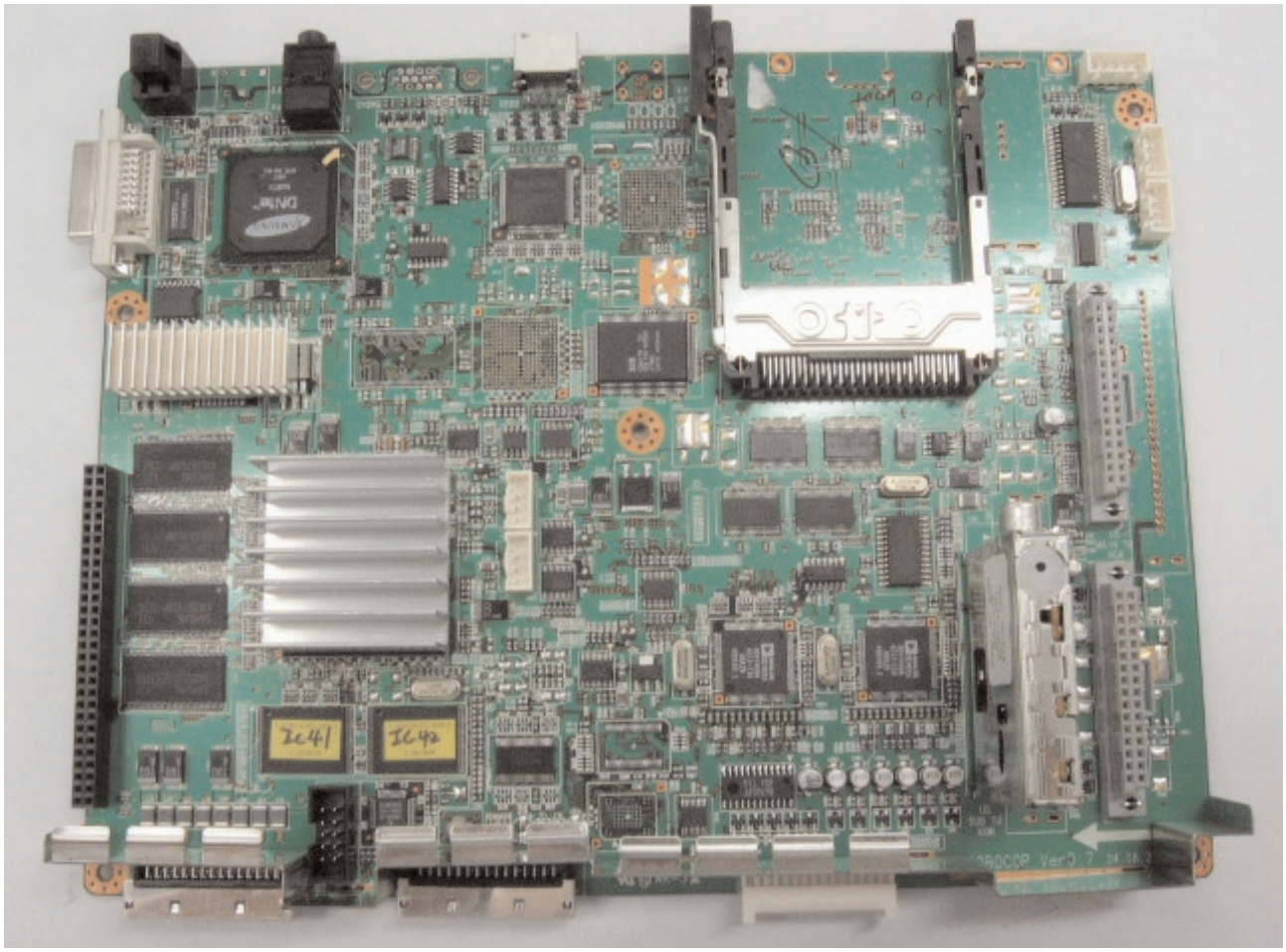
Pin Name	PIN No.
STD 5V	1
GND	2
STD 5V	3
GND	4
12VA	5
GND	6
12VA	7
GND	8
33VA	9
POD-SW	10

CN804
Connecting Power to Analog Board

Pin Name	PIN No.		Pin Name
STD 5V	1	2	S-MUTE
GND	3	4	S14.5V
33V	5	6	GND
GND	7	8	S14.5V
POWER-SW	9	10	GND
5.5VB	11	12	5.5VB
GND	13	14	GND
12VB	15	16	12VB
GND	17	18	GND
12VB	19	20	12VB
GND	21	22	GND
GND	23	24	80VB

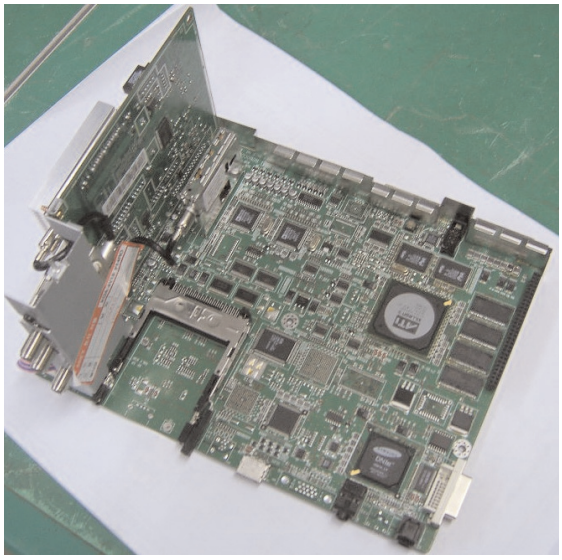
2-7 ASSY PCB DIGITAL Service Manual

2-7-1 Assy Digital Board



RS232 - S/W Upgrarde and Anynet
HDMI - A/V Input

* Microprocessor (Generates turn on signal to power board)
* Monitor LED's
* All Digital Video Processing
* Sensor / Switch Controls
* OSD / Menu
* Reset Switch
* Connected with POD channel Board. See the right picture.



Digital Board Connector Pin

CN16

Connecting the control signal between Digital & Analog Board

Pin Name	PIN No.		Pin Name
I2SWS_OUTA	1	2	TxDM
I2SSD_OUTA	3	4	RxDM
I2SCLK_OUTA	5	6	GND
GND	7	8	SDA_M5
SDA_PANNEL	9	10	SCL_M5
SCL_PANNEL	11	12	NT_I2S_SCLK
GND	13	14	NT_I2S_LRCLK
NT_I2S_DATA	15	16	USB_SW_UP_P
nMICOM_INIT	17	18	USB_SW_UP_N
nRESET	19	20	S_nRESET
ANALOG_nRST	21	22	DDP_READY
MD_nRESET	23	24	PWRGOOD
LAMP_ERROR	25	26	DTV_Lt
DLP_SYNCVAL	27	28	DTV_Rt
GND	29	30	GND

CN17

Connecting Power to the Digital Board

Pin Name	PIN No.		Pin Name
MD3.3V	1	2	MD3.3V
MD3.3V	3	4	D3.3V
GND	5	6	D3.3V
GND	7	8	GND
STB_6.5V	9	10	GND
GND	11	12	GND
STB_9V	13	14	D5.7V
GND	15	16	D5.7V
STB_30V	17	18	GND
STB_5V	19	20	GND
5VA	21	22	D12V
GND	23	24	GND
GND	25	26	D9V
33V	27	28	GND

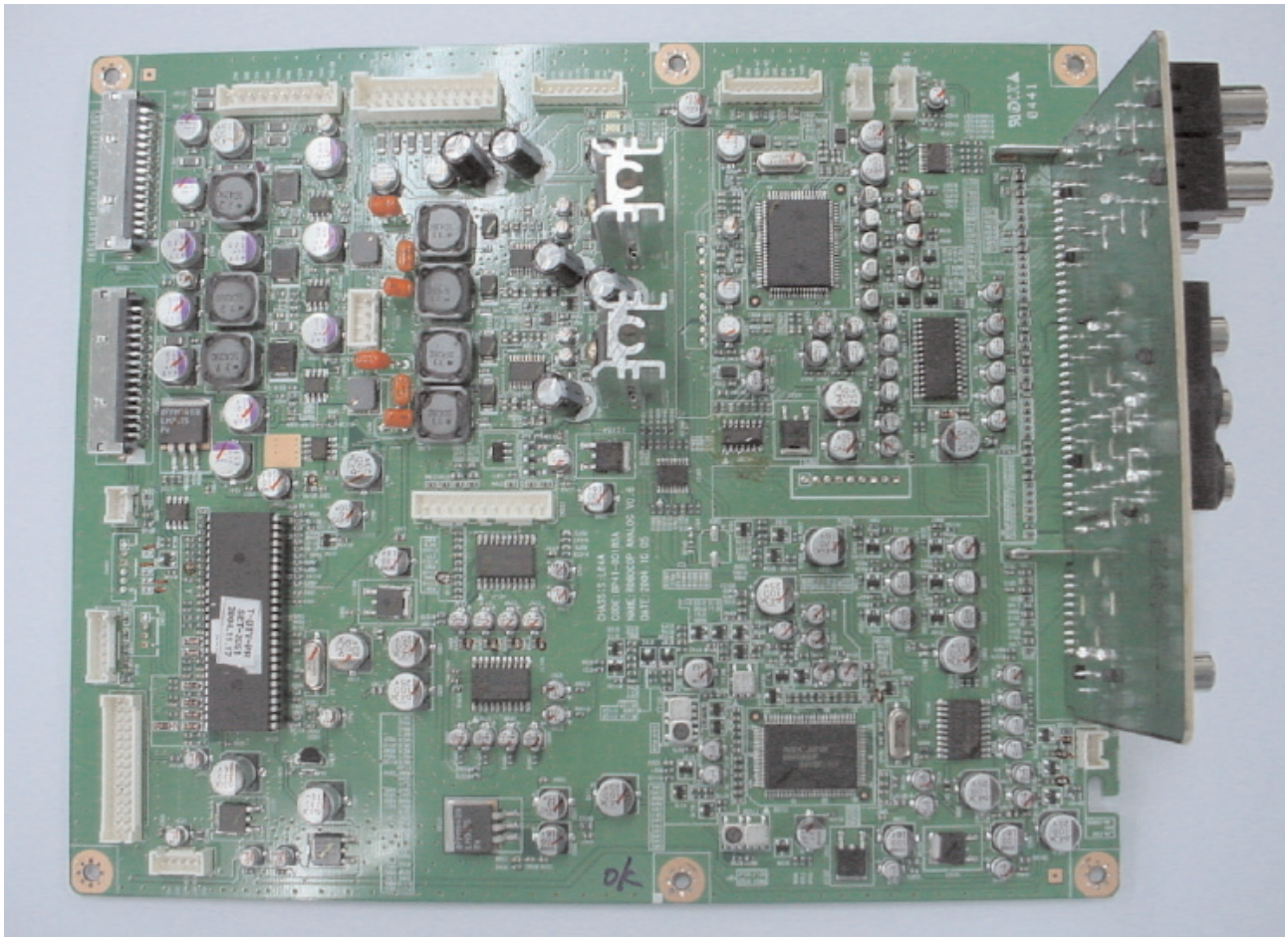
CN21

Connecting the audio / video signal from the rear input terminal

Pin Name	PIN No.		Pin Name
MAIN_Y	1	2	GND
MAIN_C	3	4	GND
SUB_Y	5	6	GND
SUB_C	7	8	GND
DTV_CVBS	9	10	GND
COMP1_Y	11	12	GND
COMP1_Pb	13	14	GND
COMP1_Pr	15	16	GND
COMP2_Y	17	18	GND
COMP2_Pb	19	20	GND
COMP2_PR	21	22	GND
M_CVBS	23	24	GND
M_SIF	25	26	GND
S_CVBS	27	28	GND
S_SIF	29	30	GND

2-8 ASSY PCB ANALOG Service Manual

2-8-1 Assy Analog Board



* Distributes supply voltage from the Power Board to Digital Board
* Transfers Turn-On Command from Digital Board to Power Board
* Encompasses the majority of the Audio Circuit
* Analog Video Switching / Processing
* Analog AudioSwitching / Processing
* 3D Comb Processing

Analog Board Pin Assignment

CN275
Connecting USB cable for Software Upgrade

Pin Name	PIN No.
GND	1
5VB	2
USB-NEG	3
USB-POS	4
GND	5

CN250
For Debugging

Pin Name	PIN No.
SDA-DMD	1
SCL-DMD	2
GND	3
5VA	4

CN266
Connecting Power and the Control Signal to the Sub Detector Board

Pin Name	PIN No.
GND	1
12VB	2
GND	3
SDA-M1	4
SCL-M1	5
GND	6
5VA	7
GND	8
70VB	9
GND	10

CN249
For Debugging

Pin Name	PIN No.
SDA-A	1
SCL-A	2
GND	3
5VA	4

CN259
Connecting Power to the DMD

Pin Name	PIN No.
5VB	1
5VB	2
GND	3
GND	4
12VB	5
12VB	6
GND	7
GND	8
GND	9

CN268
Connecting Power to the Digital Board

Pin Name	PIN No.		Pin Name
3.3V-ATI	1	2	3.3V-ATI
3.3VB-D	3	4	3.3V-ATI
3.3VB-D	5	6	GND
GND	7	8	GND
GND	9	10	6.5VA-D
GND	11	12	GND
5.7VB	13	14	9VA
5.7VB	15	16	GND
GND	17	18	30VA
GND	19	20	5VA
12VB	21	22	5VA
GND	23	24	GND
9VB	25	26	GND
GND	27	28	33VB
GND	29	30	GND

CN265

Connecting the IR signal

Pin Name	PIN No.
IR	1
GND	2
5VA	3

CN274

Connecting the Power and Control Signal to the POD Fan

Pin Name	PIN No.
FAN-ERROR	1
GND	2
8VA-FNA	3

CN264

Connecting front LCD indicators & Buttons

Pin Name	PIN No.
LED1	1
KEY1	2
KEY2	3
SDA-M1	4
SCL-M1	5
12VB	6
GND	7

CN223

Transmitting Video Signal from Side Terminal

Pin Name	PIN No.
SIDE-Y	1
SIDE-C	2
GND	3
SIDE-V	4
GND	5
SIDE-L	6
GND	7
SIDE-R	8
GND	9
SIDE-SDET	10
SIDE-VDET	11

CN228

Connecting and transmitting Audio signal to Speaker

Pin Name	PIN No.
-L-OUT	1
+L-OUT	2
-R-OUT	3
+R-OUT	4

CN257

Connecting the audio / video signal from the rear input terminal

Pin Name	PIN No.		Pin Name
MAIN_Y	1	2	GND
MAIN_C	3	4	GND
SUB_Y_V	5	6	GND
SUB_C	7	8	GND
DTV_CVBS	9	10	GND
COMP1_Y	11	12	GND
COMP1_Pb	13	14	GND
COMP1_Pr	15	16	GND
COMP2_Y	17	18	GND
COMP2_Pb	19	20	GND
COMP2_Pr	21	22	GND
MTNR_CVBS	23	24	GND
MTNR_SIF	25	26	GND
STNR_CVBS	27	28	GND
STNR_SIF	29	30	GND

CN258

Connecting the control signal between Digital and Analog

Pin Name	PIN No.		Pin Name
TxDM	1	2	ATI-I2S-WS
RxDM	3	4	ATI-I2S-DATA
GND	5	6	ATI-I2S-CLK
SDA_A	7	8	GND
SCL_A	9	10	SDA_DMD
I2SCLK	11	12	SCL_DMD
I2S_WS	13	14	GND
USB_POS	15	16	I2S_DATA
USB_NEG	17	18	CPU_INIT
SOUND_RESET	19	20	CPU_RESET
DDP_READY	21	22	RESET_D
PWRGOOD	23	24	MD_nRESET
DTV_L	25	26	LAMP_ERROR
DTV_R	27	28	DLP_SYNCVAL
GND	29	30	GND

CN267

Connecting Power

Pin Name	PIN No.		Pin Name
5VA	1	2	POWER-MUTE
GND	3	4	S16VB
33VB	5	6	GND
GND	7	8	S16VB
POWER-SW	9	10	GND
5.7VB	11	12	5.7VB
GND	13	14	GND
12VB	15	16	12VB
GND	17	18	GND
12VB	19	20	12VB
GND	21	22	GND
GND	23	24	70VB

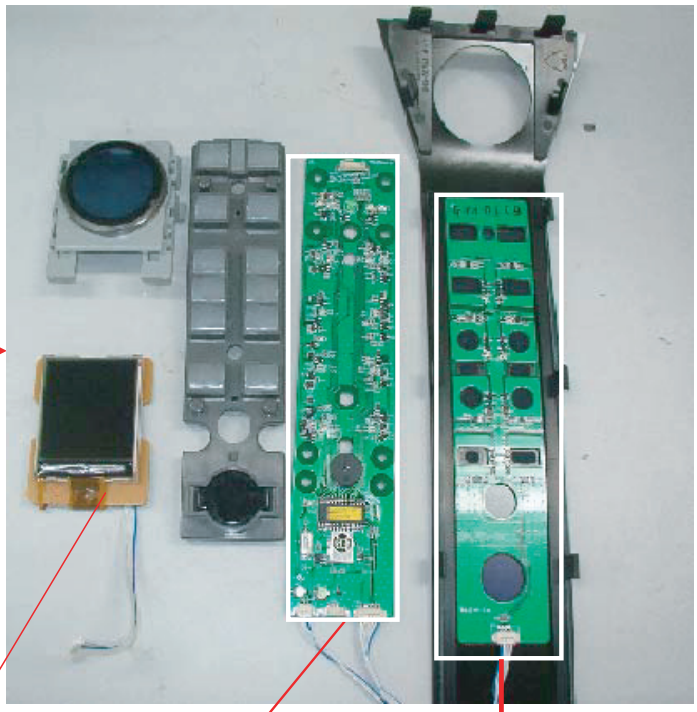
CN270

Connecting Power

Pin Name	PIN No.
5VA	1
GND	2
5VA	3
GND	4
12VA	5
GND	6
12VA	7
GND	8
30VA	9
POD-SW	10

2-9 Information Window & Touch Key Board Assy

Front LCD Window & Touch Key



LCD Panel
BP07-00013A

LED Board
BP41-00162A

Touch Board
BP41-00163A

CN1
Connecting the IR signal & Front Buttons

Pin Name	PIN No.
IR_LED	1
KEY1	2
KEY2	3
SDA	4
SCL	5
9VA	6
GND	7

CN3 & CN4
Connecting Front Buttons

Pin Name	PIN No.
GND	1
KEY2	2
KEY1	3
VDD	4
GND	5

CN2
Connecting the IR signal

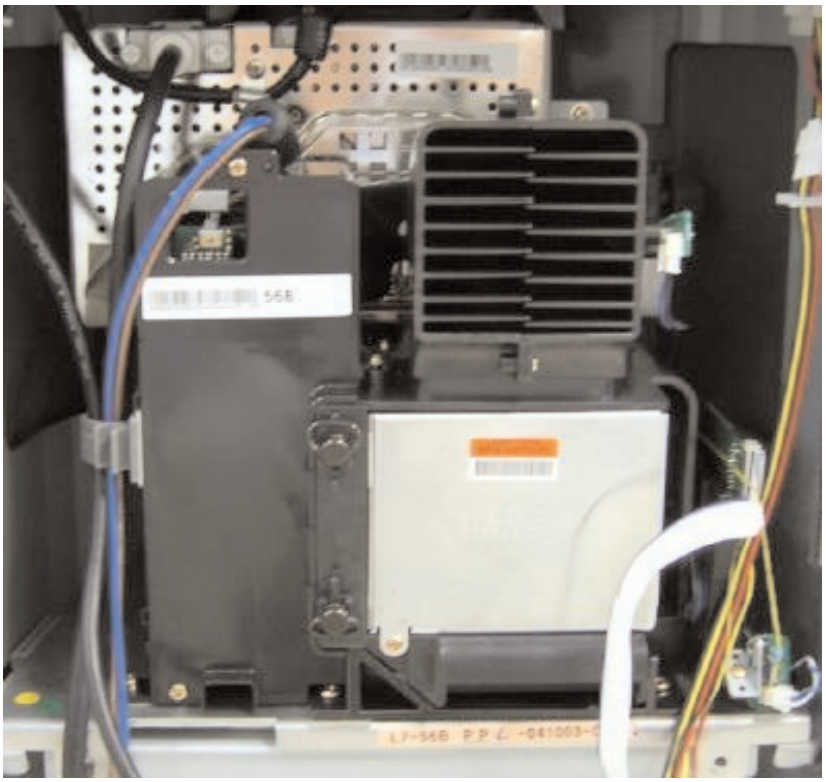
Pin Name	PIN No.
IR	1
GND	2
5VA	3

CN5-1
Connecting front LCD indicators

Pin Name	PIN No.
LCD_LED_Anode	1
GND	2
5VA	3
GND	4
LCD_DATA	5
LCD_CLOCK	6
LCD_CS	7

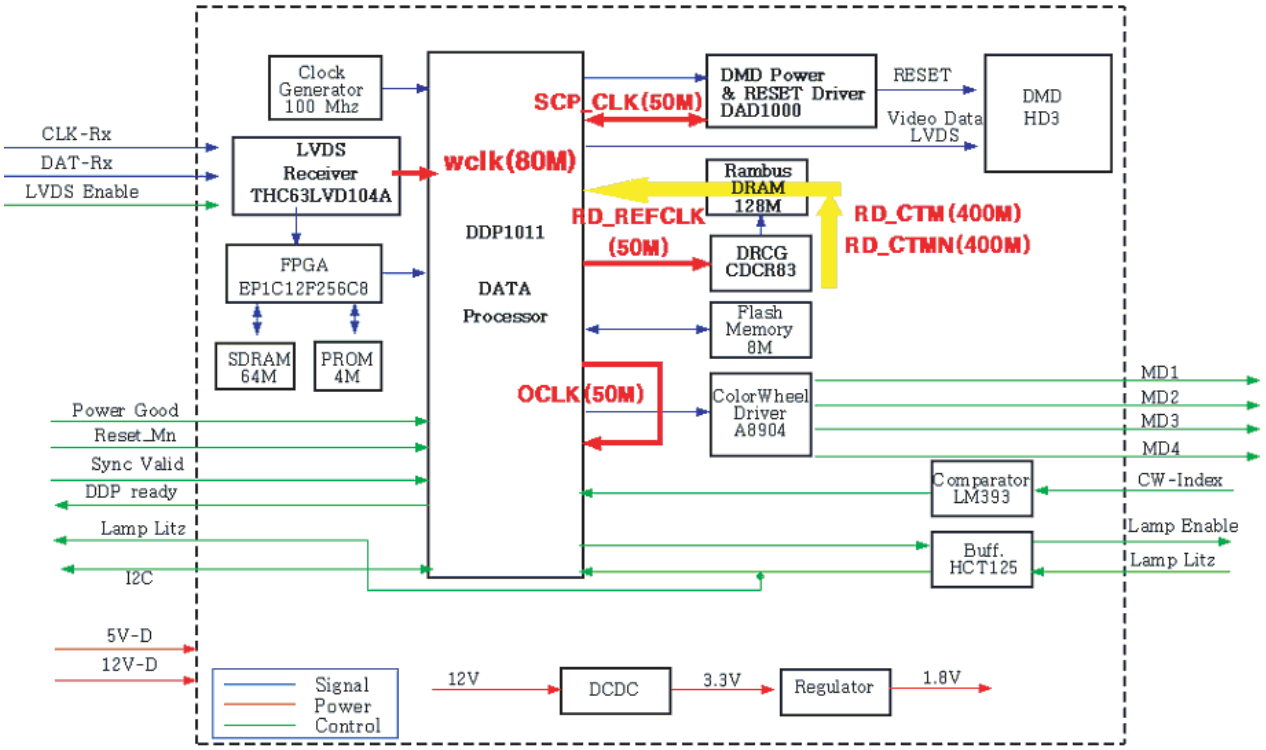
2-10 ASSY PCB DMD Service Manual

2-10-1 Assy DMD Board



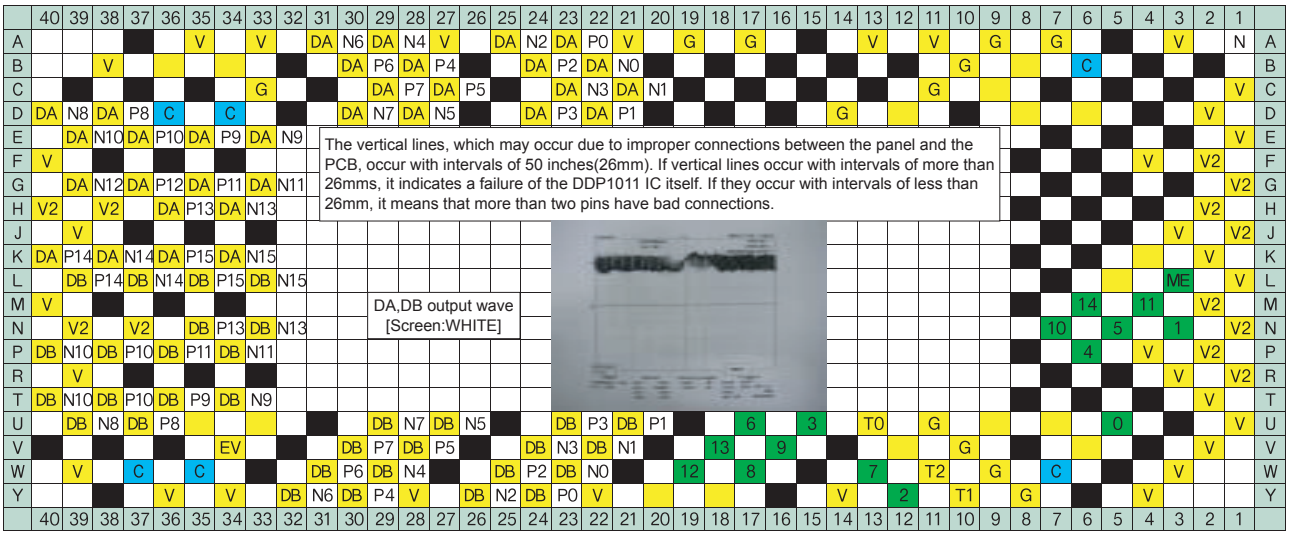
* Control Lamp Turn-On
* Powers Color Wheel Motor
* Drives DMD Panel
* Sensor Control
* Attached to optical Engine

2-10-2 Block Diagram



2-10-3 DMD Panel Pin Terminal Characteristics Diagram

※ Remove the heat sink attached to the DMD Board and tighten the screws in four places and then inspect the characteristics of each pin terminal.



Pin Name	Description	Pin Name	Description
V	Voltage : 3.3V	T	Test Point
V2	VCC2 : 8V	ME	Mirror Bias Extra
DA	A Channel Data Bus [When measured, there should be a waveform]	C	Clock
DB	B Channel Data Bus [When measured, there should be a waveform]	P#	A,B Channel Positive
No.	MBRST# (Mirror Bias Rest) 26V	N#	A,B Channel Negative
G	The part from the present position to the GND (The black part is also a GND.)		

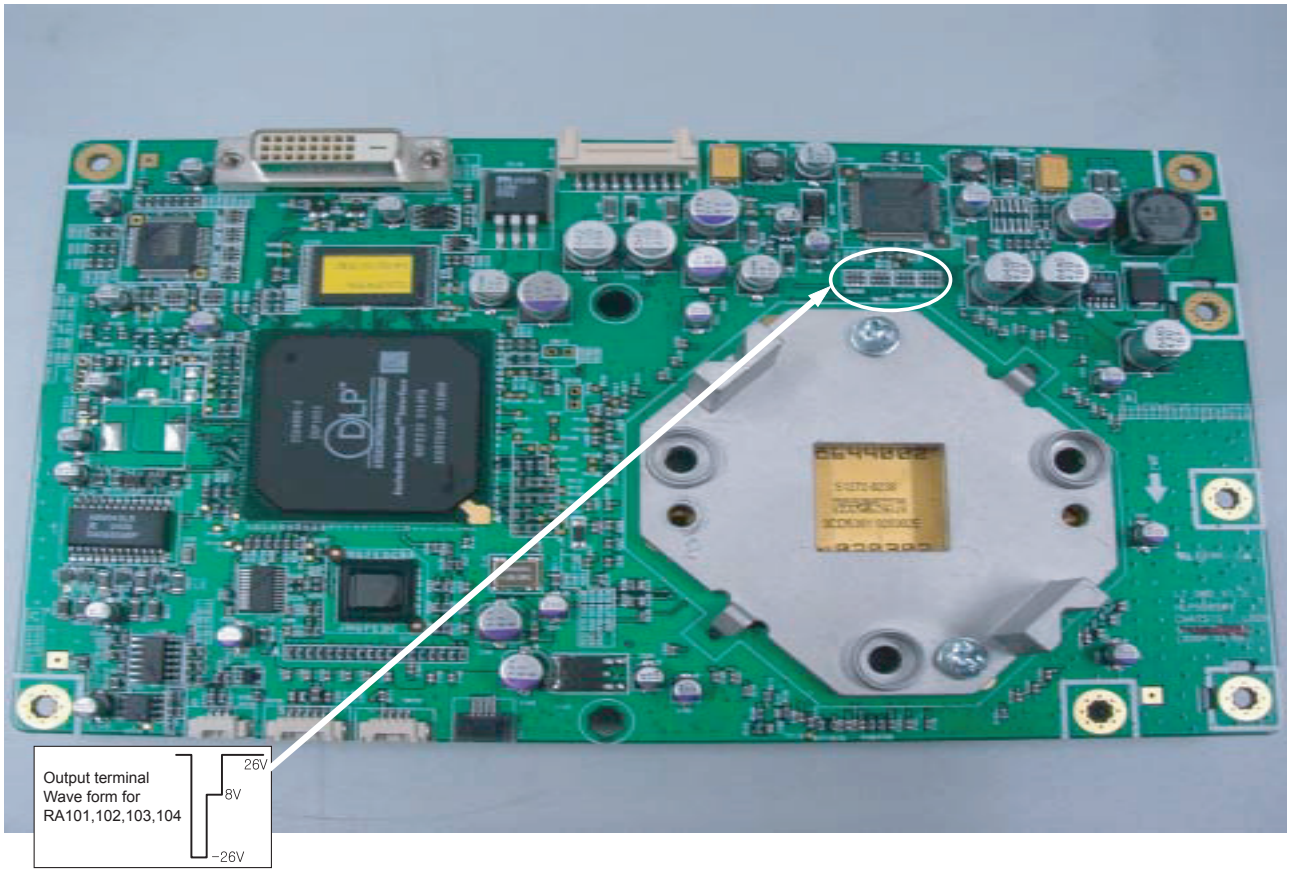
2-10-4 Description of Terminal Characteristics

PIN NAME	DESCRIPTION
SCTRL_BN/P	B channel LVDS serial control
DCLK_BN/P	B channel LVDS CLOCK
SCPDI	SERIAL CONTROL DATA INPUT
SCPDO	SERIAL CONTROL DATA OUTPUT
SCPENB	SERIAL CONTROL ENABLE
SCPCK	SERIAL CONTROL CLOCK
DMD RESETB	DMD LOGIC RESET
MBRST(14:0)	MIRROR BIAS RESET
MBRST_EXTRA	UNUSED MIRROR BIAS RESET
SCR_CLR	TEST CLEAR PINS(NORMAL GND)
READOUTA(1:0)	A-CHANNEL SERIAL DATA OUT DURING SPAM READ TEST OPERATION
READOUTB(1:0)	B-CHANNEL SERIAL DATA OUT DURING SPAM READ TEST OPERATION
TP(2:0)	MANUFACTORING TEST POINT(NO CONNECTED DURING NORMAL CPERATION)
RSV_A(4:0)/RSV_B(4:0)	RESERVED PINS(NORMAL:GND)
EVCC	REFERENCE VOLTAGE DURING SPAM READ TEST OPERATION(NORMAL GND)
VCC2	MIRROR ELECTRODE VOLTAGE(7.3V)
VCC	LOGIC SUPPLY
VSS	LOGIC GROUND

2-10-5 Engine Failure Inspection Flow Chart for the DMD Board

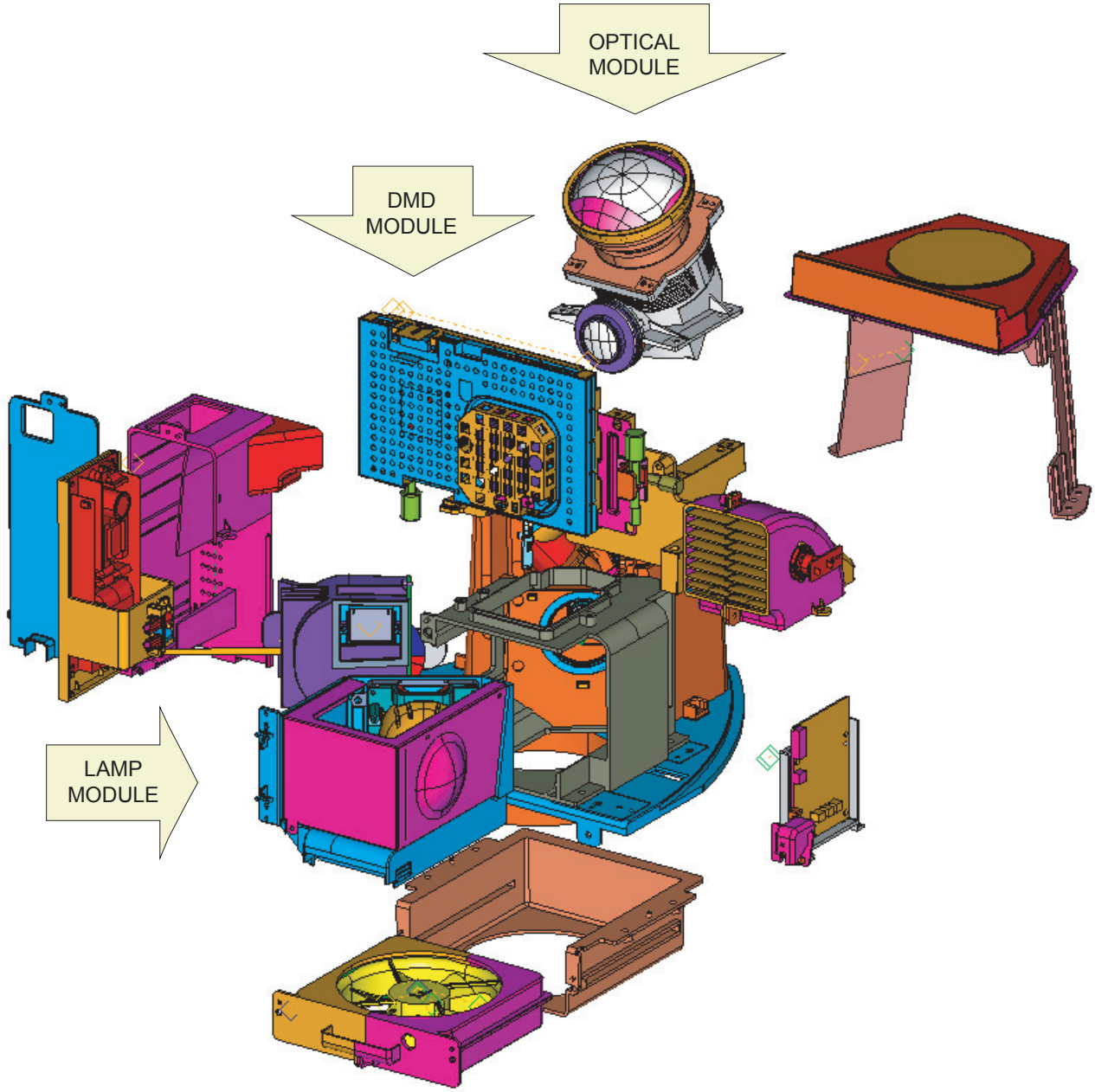
No	Description	Key Point	Remark
1	1) When the power cord is plugged in, 2) DC 380V is automatically supplied to the ballast.	Check whether the DC380V power is supplied to the ballast.	
2	1) When the power key is pressed via the remote control, the micom of the digital board outputs high (5V) PWR signals. 2) The power board operates normally. 5V and 12V are supplied to the DMD CN105 terminal.	Check whether 5V and 12V are supplied to the CN105 terminal.	* 12V must be supplied to operate the motor. (The voltage of the motor driving power is 12V.)
3	1) The MTR Reset signal is supplied to the R161 terminal of the motor IC101 from the micom on the digital board and then the motor starts to drive. 2) If the color wheel rotates for a certain time and then stops, check whether the color wheel sensor is normal. (Check the waveform on the No.2 terminal below CN102.)	After the set is powered on, check whether 5V is detected on pin No.49 of IC101. → After a while, the sound generated by the rotating color wheel is heard.	* If 5V is not detected, the motor will not operate.
4	1) Check whether the signal (SCI: START CONTROL INPUT) that turns on lamp #2 of CN109 on the DMD board is high (5V).	Check whether CN109 #2 signal is 5V.	* When SCI is high (5V), the lamp litz of CN109 is low (0V). * CN109 #2 terminal voltage changes to pulse wave form 14 seconds after (for 50 inch TV) the time that the voltage is 5V. * When about 4 seconds have passed after changing to pulse waveform, the screens are displayed on the set.
5	1) Method for checking whether the DDP1010 IC RESET is normal.	If the voltage between R254 and R255 is 3V, it is normal.	

2-10-6 Output Voltage States of the DMD Board Parts



2-11 Optical Science

2-11-1 Engine

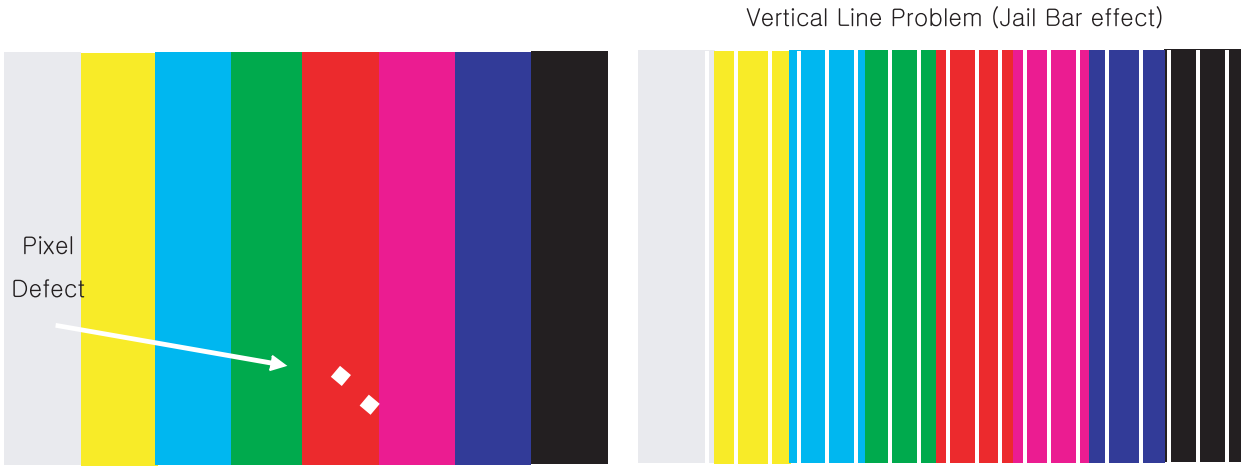


2-11-2 Optical Specification

Parameter	Nominal Value	Unit	Connent
Brightness	600	nits	7-segment color wheel, TI development board, no spoke light recapture, reference lamp
Uniformity (ANSI)	+/- 15 +/- 25	% %	+ : brightest of 13 ANSI points/average of 9 points - : darkest of 13 ANSI points/average of 9 points
Contrast full on/off	2000:01:00	n.a.	7 segment color wheel, TI development board, no spoke light recapture
Color Temperature	7,500 K (Warm 1)	n.a.	measured in image center
F-number	$\geq$ 2.5	n.a.	design value
Projection distance at 50" screen size	585	mm	projection distance : distance from vertex of front lens to projection screen
Exit pupil position	47.26 mm	mm	design value, distance to vertex of front lens
F.O.V (Field of View)	91	deg.	design value
Panel size	17.5104 x 9.8496	mm	Diamond Pixel Configuration
Lateral color aberration @ 50" (R-G ; B-G)	$\leq$ 7 $\leq$ 7	㎛ ㎛	Desion value 440/546/640 ㎛
TV distortion - in horizontal direction - in vertical direction	$\leq$ | 0.3 | $\leq$ | 0.3 |	% %	Pin Cushion or Barrel condition
folding angle	66	deg.	mechanical design value

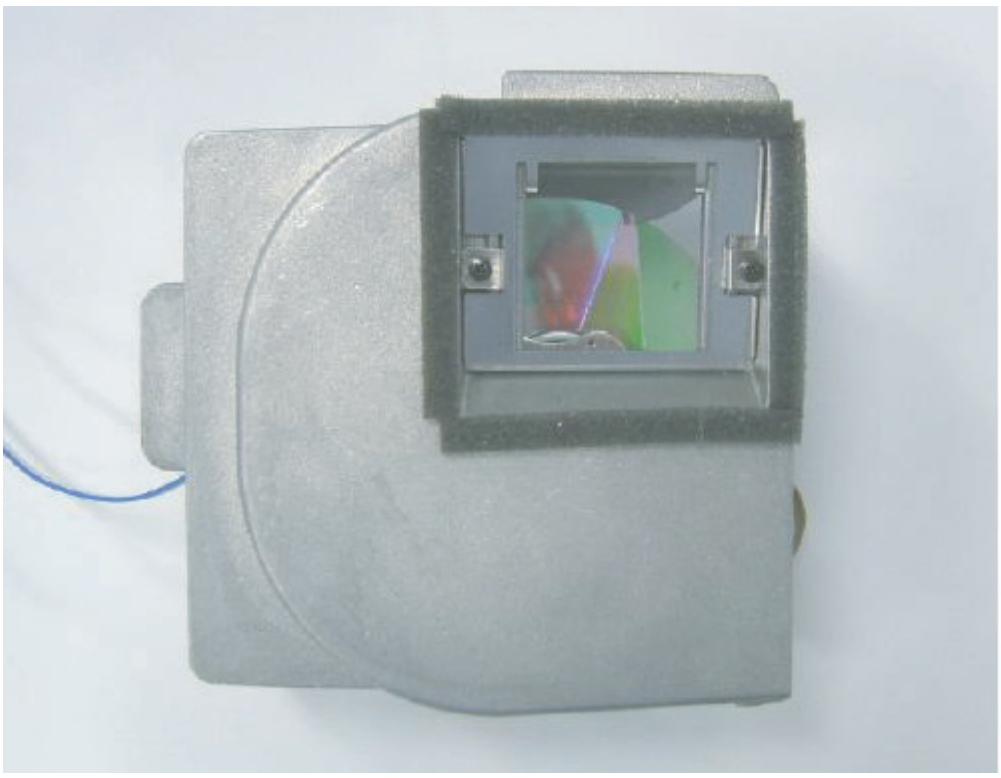
2-12 Service

2-12-1 Service Hint #1 - DMD Board Assy



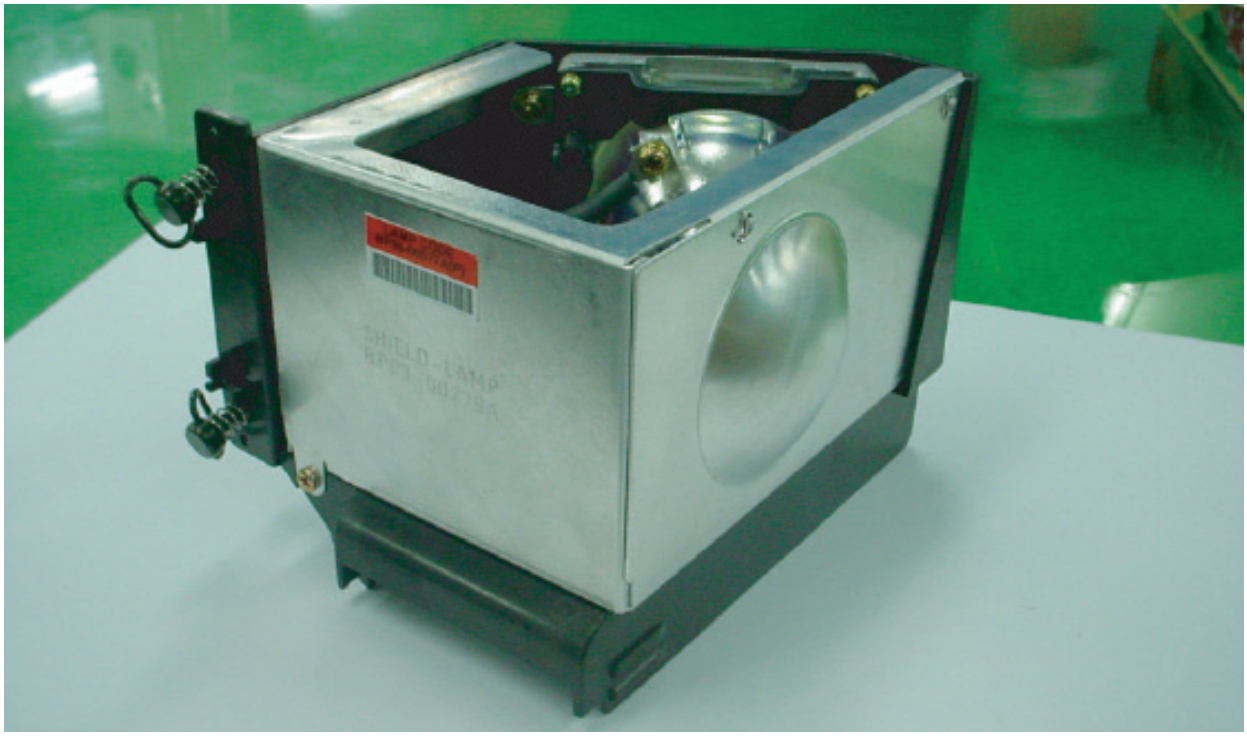
Problem : PIXEL DEFECT, VERTICAL LINE
Solution : Change the DMD Board assembly

2-12-2 Service Hint #2 - ColorWheel Assy



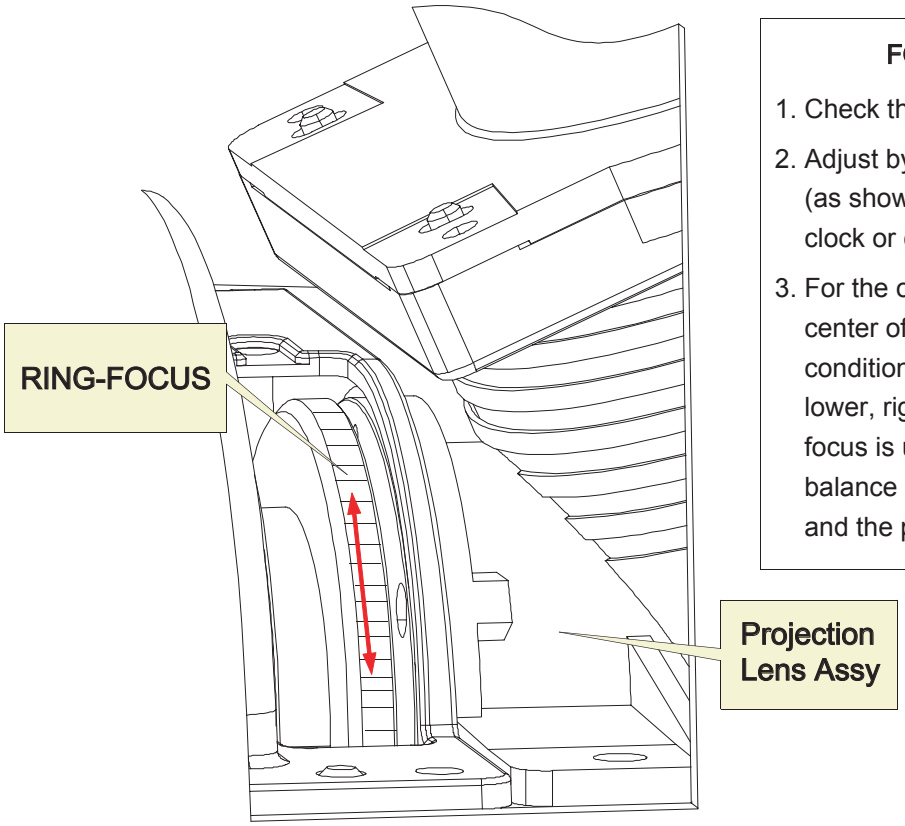
Problem : INCREASED NOISE
Solution : Change the Color wheel module

2-12-3 Service Hint #3 - LAMP Assy



Problem : LOW BRIGHTNESS or No Power
Solution : Change the Lamp module

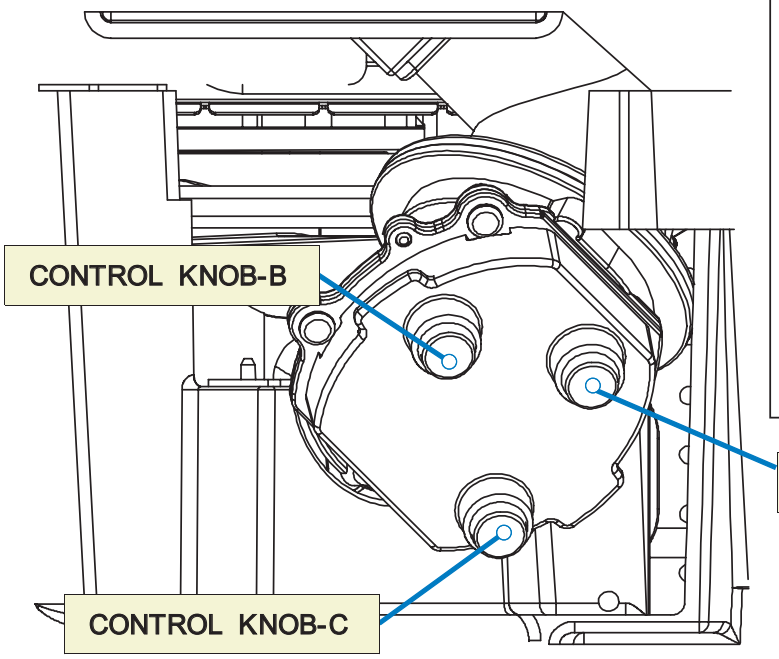
2-13 Focus Adjustment



FOCUS Adjustment

1. Check the picture. If out of focus:
2. Adjust by turning the focus-ring (as shown in the picture on the left) clock or counter clockwise.
3. For the optimum focus, adjust the center of the picture to the optimum condition first. If the upper and lower, right and left or diagonal focus is unbalanced, maintain the balance level between the center and the peripheral to 6:4.

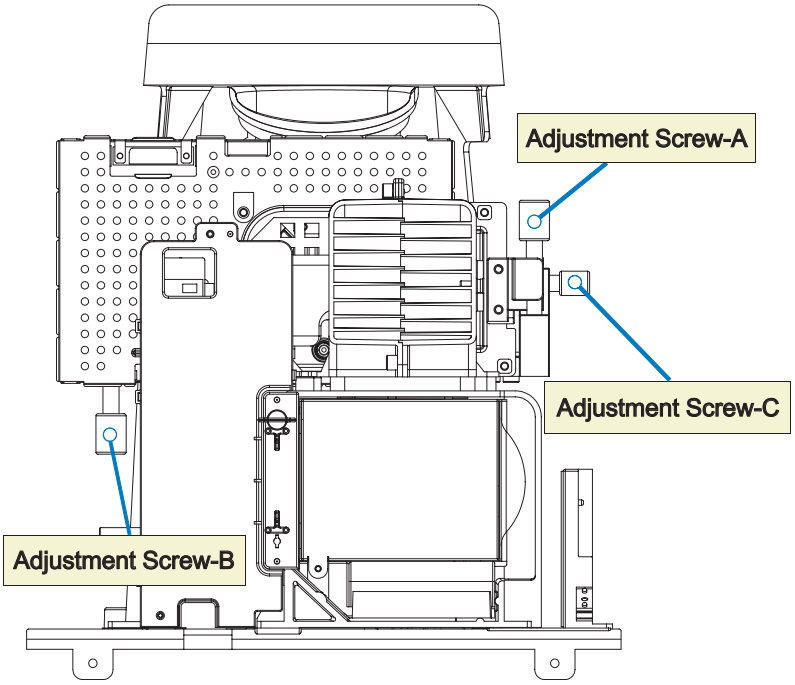
2-14 Illumination Adjustment



Illumination Adjustment

1. Turn the Control Knob-A
   : to move the illumination light source above or below (the picture)
2. Turn the Control Knob-B
   : to move the illumination light source diagonal (to the picture)
3. Turn the Control Knob-C
   : to move the illumination light source to the right or left (of the picture)

2-15 Projected Image Adjustment

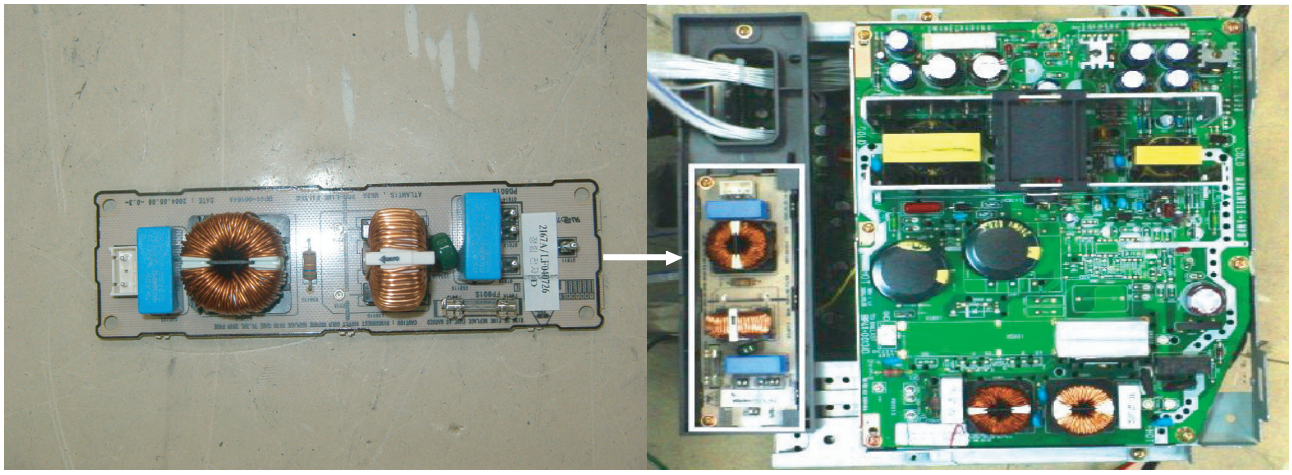


Projected Image Adjustment

1. To adjust up or down:
   1) Turn the adjustment screw (A) clockwise, and the adjustment screw (B) counter clockwise to move the image above the picture, and
   2) Turn the adjustment screw (A) counter clockwise, the adjustment screw (B) clockwise to move the image below the picture.
2. To adjust to the right or left:
   Turn the adjustment screw (C) clockwise or counter clockwise.
3. To adjust the TILT
   1) Turn the adjustment screw (A) and (B) clockwise simultaneously to move to the left of the picture, and
   2) Turn the adjustment screw (A) and (B) counter clockwise simultaneously to move to the right of the picture.

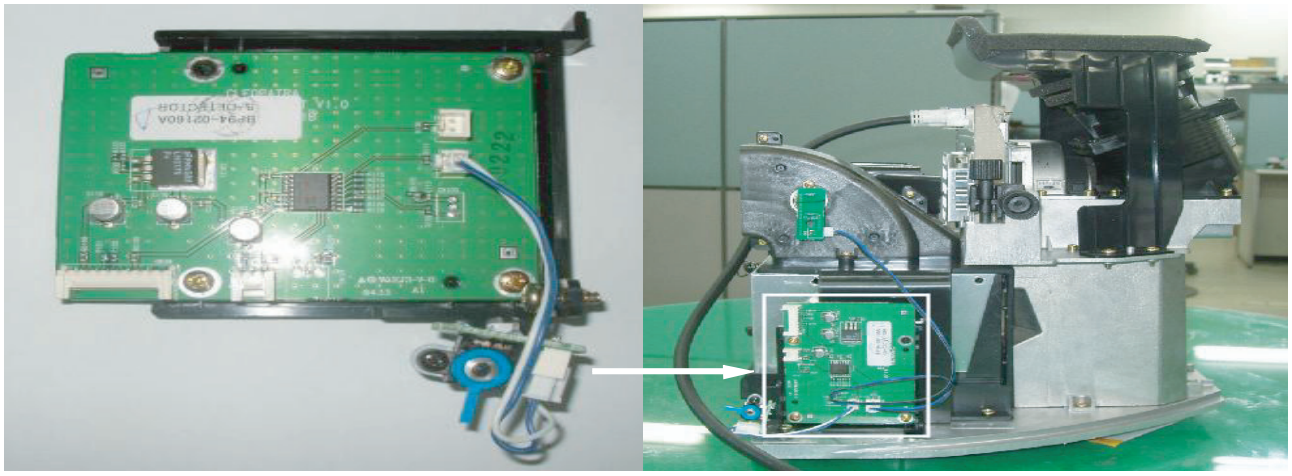
2-16 Line Filter

2-16-1 Assy Line Filter Board



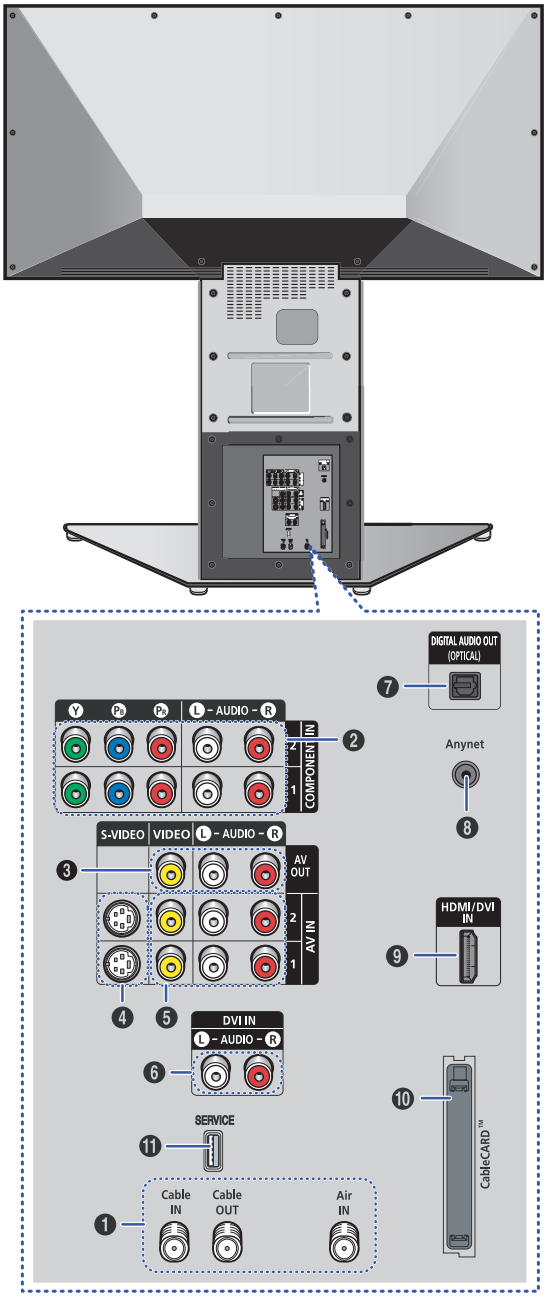
2-17 Sub Dector Board

2-17-1 Sub Dector Board



2-18 Rear Panel Jacks

Use the rear panel jacks to connect components such as a VCR. You can connect different components such as VCRs, Set-Top Box and a DVD player etc., because there are two sets of video input jacks and two set of component video input jacks on the rear panel of your TV. For more information, please see "Connections".



① ANTENNA terminals
Two independent cables or antennas can be connected to these terminals. Use "Cable IN" and "Air IN" terminals to receive a signal from VHF/UHF antennas or your cable system. Use the "Cable OUT" terminal to send the signal being received by the "Cable IN" terminal out to another component (such as a Cable Set-Top Box).

② Component1, 2 jacks (Y, PB, PR, L, R)
Use these jacks to connect the component video/audio signals from a DVD player or a set top box when using the component video input jacks.

③ VIDEO/AUDIO OUTPUT jacks
Sends video/audio signal from the TV to an external source, such as a VCR.
These jacks are available only in RF, Video and S-Video modes.

④ S-VIDEO INPUT jacks
Connects an S-Video signal from an S-VHS VCR or DVD player.

⑤ VIDEO/AUDIO INPUT jacks
Connect video/audio signals from external sources, such as VCR or DVD players.

⑥ DVI (Digital Visual Interface) AUDIO INPUT jacks
Connect to the digital audio output jacks of a device with DVI output.

⑦ DIGITAL AUDIO OUT(OPTICAL) jack
Connect to a Digital Audio Component.

⑧ Anynet
Please refer to the Anynet Owner's Instruction.

⑨ HDMI (High Definition Multimedia Interface)/ DVI INPUT jack
Connect to the HDMI jack of a device with HDMI output.
Connect to the digital video output jack for device with DVI output.

⑩ CableCARD™
Insert the CableCARD into the slot.

⑪ SERVICE
This jack is for software upgrades.

2-19 Remote Control

You can use the remote control up to about 23 feet from the TV. When using the remote control, always point it directly at the TV. You can also use your remote control to operate your VCR, Cable box, DVD player or Samsung Set-Top Box.

1. POWER
   Turns the TV on and off.

2. P.MODE
   Adjust the TV picture by selecting one of the preset factory settings (or select your personal, customized picture settings.)

3. ANTENNA
   Press to select "AIR" or "CABLE".

4. CHANNEL NUMBER
   Press to directly tune to a particular channel.

5. -
   Press to select additional channels (digital and analog) being broadcast by the same station. For example, to select channel "54-3", press "54", then press "-" and "3".

6. VOL+, VOL-
   Press to increase or decrease the volume.

7. MUTE
   Press to mute the TV sound.

8. ANYNET
   Runs the Anynet view functions and sets up Anynet devices.

9. MENU
   Displays the main on-screen menu.

10. CH.LIST
    Displays the channel list.

11. FAV.CH (Favorite Channel)
    Press to switch between your favorite channels.

12. MODE
    Selects a target device to be controlled by the Samsung remote control (i.e., TV, STB, VCR, CABLE, or DVD).

13. PRE-CH
    Tunes to the previous channel.

14. SOURCE
    Press to display all of the available video sources (i.e., TV, Set-Top box, VCR, DVD, DTV).

15. CH
    Press to change channels.
    Moves from one set of screen information to the next in TV Guide menu.

16. INFO
    Press to display information on the TV screen.

17. EXIT
    Press to exit the menu.

18. ▲, ▼, ◄, ►, ENTER
    Press to select highlight up, down, left, or right. While using the on-screen menus, press the ENTER to activate (or change) a particular item.

19. MTS(Multichannel Television Stereo)
    Press to choose Stereo, Mono or SAP (Secondary Audio Program).

20. PIP(Picture In Picture)
    Displays the available channels in sequence.
    (These buttons change channels in the PIP window only.)

21. STILL
    Press to pause the current screen.

22. ASPECT
    Press to change the screen size.

23. SRS
    Activates TruSurround.

24. DNIe
    (Digital Natural Image engine)
    Activates DNIe.

25. SET
    Used during set up of this remote control, so that it will work compatibly with other devices.
    (Set-Top box, VCR, Cable box, DVD, etc.)

26. SLEEP
    Press to select a preset time interval for automatic shutoff.

27. PIP Controls
    CH ∧ / ∨; Press to displays the available channels in sequence. (These buttons change channels in the PIP window only.)

28. CAPTION
    Controls the caption decoder.

29. VCR/DVD Controls
    Controls VCR or DVD functions: Rewind, Stop, Play/Pause, Fast Forward.

27. RESET
    If your remote control is not functioning properly, take out the batteries and press the reset button for about 2~3 secons. Re-insert the batteries and try using the remote control again.