

## 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 "INFO" "MENU" "MUTE" "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

Factory	
1. ASI510 (MAIN)	10. DDP1011
2. ASI510 (SUB)	11. LNA PLUS
3. VPC3230 (MAIN)	12. DDP PATTERNS
4. VPC3230 (SUB)	13. ASI PATTERNS
5. FLI2310	14. OPTION TABLE
6. MTS9883	15. CHECK SUM
7. DNle	16. RESET
8. CCA	
9. SP ACTUATOR	

##### 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) ASI510 (MAIN)

ITEM NAME	DEFAULT	Range	REMARK
Gamma Red	32	0 ~ 127	
Gamma Green	32	0 ~ 127	
Gamma Blue	32	0 ~ 127	
Sub Color Enable	0	0 ~ 1	
Sub Color	16	0 ~ 1	
Sharpness Filter 1	0	0 ~ 63	
Sharpness Filter 2	0	0 ~ 63	
Sharpness Filter 3	0	0 ~ 63	
Sharpness Filter 4	0	0 ~ 63	
Sharpness Filter 5	0	0 ~ 63	
Sharpness Filter 6	0	0 ~ 63	
Sharpness Filter 7	0	0 ~ 63	
Sharpness Filter 8	0	0 ~ 63	
Sharpness Filter 9	0	0 ~ 63	
Sharpness Filter 10	0	0 ~ 63	
Filter H Limit	3	0 ~ 3	
Filter V Limit	3	0 ~ 3	
Filter H Chroma Limit	3	0 ~ 3	
Filter V Chroma Limit	3	0 ~ 3	
Chroma Filter Enable	0	0 ~ 1	
Noise Filter 0	0	0 ~ 15	
Noise Filter 1	0	0 ~ 15	
Noise Filter 2	0	0 ~ 31	
Noise Filter 3	0	0 ~ 15	
Noise Filter 4	0	0 ~ 15	
Noise Filter 5	0	0 ~ 31	
Noise Filter 6	0	0 ~ 15	
Noise Filter 7	0	0 ~ 15	
Noise Filter 8	0	0 ~ 31	
Noise Filter Enable	0	0 ~ 1	
NR Filter Enable	0	0 ~ 1	

## 2) ASI510 (SUB)

ITEM NAME	DEFAULT	Range	REMARK
Gamma Red	32	0 ~ 127	
Gamma Green	32	0 ~ 127	
Gamma Blue	32	0 ~ 127	
Sub Color Enable	0	0 ~ 1	
Sub Color	16	0 ~ 1	
Sharpness Filter 1	0	0 ~ 63	
Sharpness Filter 2	0	0 ~ 63	
Sharpness Filter 3	0	0 ~ 63	
Sharpness Filter 4	0	0 ~ 63	
Sharpness Filter 5	0	0 ~ 63	
Sharpness Filter 6	0	0 ~ 63	
Sharpness Filter 7	0	0 ~ 63	
Sharpness Filter 8	0	0 ~ 63	
Sharpness Filter 9	0	0 ~ 63	
Sharpness Filter 10	0	0 ~ 63	
Filter H Limit	3	0 ~ 3	
Filter V Limit	3	0 ~ 3	
Filter H Chroma Limit	3	0 ~ 3	
Filter V Chroma Limit	3	0 ~ 3	
Chroma Filter Enable	0	0 ~ 1	
Noise Filter 0	0	0 ~ 15	
Noise Filter 1	0	0 ~ 15	
Noise Filter 2	0	0 ~ 31	
Noise Filter 3	0	0 ~ 15	
Noise Filter 4	0	0 ~ 15	
Noise Filter 5	0	0 ~ 31	
Noise Filter 6	0	0 ~ 15	
Noise Filter 7	0	0 ~ 15	
Noise Filter 8	0	0 ~ 31	
Noise Filter Enable	0	0 ~ 1	
NR Filter Enable	0	0 ~ 1	

## 3) VPC3230 (MAIN)

ITEM NAME	Initial Value	Range	REMARK
BRIGHTNESS	20	-128~127	updated when h'40(Scale mode register) is written
H LPF	0	0~3	
H LPF CHROMA	0	0~1	
CONTRAST	42	0~63	updated when h'40(Scale mode register) is written
H PEAKING FILTER	2	0~2	
H PEAKING GAIN	2	0~7	
CORING Enable	0	OFF/ON	
LUMA DELAY	0	Fixel	updated when h'20(SDT) is written
IF compensation	0	0~3	Off/6dB/12dB/10dB
Chroma Bandwidth	1	0~3	narrow/normal/broad/wide
Luma LPF Enable	0	OFF/ON	
HPLL SPEED	2	0~3	No change/ Terrestrial/ VCR/ Mixed
V PEAKING	0	0~15	
YUV CONTRAST	27	0~63	480i YPbPr (Component mode)
YUV BRIGHTNESS	70	-128~127	
YUV SATCB	42	0~63	
YUV SATCR	43	0~63	
YUV TINT	0	0~63	
RGB CONTRAST	29	0~63	Scart RGB (AV mode)
RGB BRIGHTNESS	68	-128~127	
RGB SATCB	26	0~63	
RGB SATCR	30	0~63	
SATURATION	2200	0~4096	
TINT	00		

## 4) VPC3230 (SUB)

ITEM NAME	DEFAULT	Range	REMARK
BRIGHTNESS	20	-128~127	updated when h'40(Scale mode register) is written
H LPF	0	0~3	
H LPF CHROMA	0	0~1	
CONTRAST	42	0~63	updated when h'40(Scale mode register) is written
H PEAKING FILTER	2	0~2	
H PEAKING GAIN	2	0~7	
CORING Enable	0	OFF/ON	
LUMA DELAY	0	Fixel	updated when h'20(SDT) is written
IF compensation	0	0~3	Off/6dB/12dB/10dB
Chroma Bandwidth	1	0~3	narrow/normal/broad/wide
Luma LPF Enable	0	OFF/ON	
HPLL SPEED	2	0~3	No change/ Terrestrial/ VCR/ Mixed
V PEAKING	0	0~15	
YUV CONTRAST	27	0~63	480i YPbPr (Component mode)
YUV BRIGHTNESS	70	-128~127	
YUV SATCB	42	0~63	
YUV SATCR	43	0~63	
YUV TINT	0	0~63	
RGB CONTRAST	25	0~63	Scart RGB (AV mode)
RGB BRIGHTNESS	68	-128~127	
RGB SATCB	23	0~63	
RGB SATCR	31	0~63	
SATURATION	2200	0~4096	Scart RGB (AV mode)
TINT	00		

## 5) FLI2310

ITEM NAME	DEFAULT	Range	REMARK
MOTION THRES	30	0 ~ 255	
CONTRAST	128	0 ~ 255	
BRIGHTNESS	128	0 ~ 255	
SATURATION	128	0 ~ 255	
Y OFFSET	0	-1024 ~ 1023	2's complement
Cb OFFSET	0	-1024 ~ 1023	2's complement
Cr OFFSET	0	-1024 ~ 1023	2's complement
NR	1	OFF/ON	OFF : 1, ON : 0

## 6) MST9883

ITEM NAME	DEFAULT	Range	REMARK
RED GAIN	88	0 ~ 255	
GREEN GAIN	88	0 ~ 255	
BLUE GAIN	88	0 ~ 255	
RED OFFSET	128	0 ~ 255	
GREEN OFFSET	128	0 ~ 255	
BLUE OFFSET	128	0 ~ 255	
PB GAIN	142	0 ~ 255	
Y GAIN	128	0 ~ 255	
PR GAIN	142	0 ~ 255	
PB OFFSET	125	0 ~ 255	
Y OFFSET	106	0 ~ 255	
PR OFFSET	125	0 ~ 255	
Auto Color			

## 7) DNle

NO	ITEM	RANGE	DEFAULT	REMARK
1	PATT_SEL		0	Test Pattern Selection
2	SNI_PROC_SET		096B	DNle Block Enb/Bypass
3	NR_MAX_Y/C	0 ~ 255	48	Temporal NR Gain
4	NR_MIN_Y/C	0 ~ 255	16	Temporal NR Gain
5	NR_HPF_TH	0 ~ 7	00	Spatial NR Gain
6	NR_EDGE_TH	0 ~ 7	05	
7	NR_SEL	0,1,2,3	02	NR Mode Selection
8	NEOnDE	0,1	00	DE Parameter Value Selection
9	NEOnDCE	0,1	00	DCE Parameter Value Selection
10	NEOnCE	0,1	00	CE Parameter Value Selection
11	RTH2	0 ~ 15	08	NEOnDE User Set Up
12	Core	0 ~ 15	04	NEOnDCE User Set Up
13	ALPHAL	0 ~ 255	128	CE Gain
14	ALPHAU	0 ~ 255	128	
15	CE_CUTOFF	0 ~ 255	32	Boundary value for the lower part of Contrast Enhance
16	CE_UPPER	0 ~ 255	220	Boundary value for the lower part of Contrast Enhance
17	CE Gain Max L/U	0 ~ 255	160	CE Gain
18	DCE_GAIN_L/U	0 ~ 255	50	DCE Gain
19	B_RATIO		10000	Low level information for the minimum value
20	BLACK_TILT	0 ~ 255	120	Black Stretch Area
21	Black Gain Max	0 ~ 1023	358	
22	W_RATIO	~	12000	High level information for the minimum value
23	WHITE_TILT	0 ~ 255	200	
24	White Gain Max	0 ~ 1023	358	
25	GAIN 1X	0 ~ 127	8	Gain of horizontal high frequency region
26	GAIN 1Y	0 ~ 63	8	Gain of vertical high frequency region
27	GAIN 2X	0 ~ 63	12	Gain of horizontal middle frequency region
28	GAIN 2Y	0 ~ 63	4	Gain of vertical middle frequency region
29	GAIN 3X	0 ~ 63	1	Gain of horizontal low frequency region
30	NDON	0,1	1	Background Noise Detection ON/OFF Switch
31	CORING_ON	0 ~ 7	1	Coring On/Off

NO	ITEM	RANGE	DEFAULT	REMARK
32	SCALE_R	0 ~ 128	128	Log Mapping Gain
33	CORING_TH1	0 ~ 3	1	
34	CORING_TH2	0 ~ 255	1	
35	CORING_TH3	0 ~ 15	1	
36	M_CCT_FAC	0 ~ 255	80	
37	MATR_CBR	0 ~ 2047	0	YCBCR2RGB Color Matrix Conversion Coefficient Value
38	MATR_CRR	0 ~ 2047	770	YCBCR2RGB Color Matrix Conversion Coefficient Value
39	MATR_CBG	0 ~ 2047	2038	YCBCR2RGB Color Matrix Conversion Coefficient Value
40	MATR_CRG	0 ~ 2047	1784	YCBCR2RGB Color Matrix Conversion Coefficient Value
41	MATR_CBB	0 ~ 2047	908	YCBCR2RGB Color Matrix Conversion Coefficient Value
42	MATR_CRB	0 ~ 2047	0	YCBCR2RGB Color Matrix Conversion Coefficient Value
43	SCALE_ALPHA	0 ~ 255	140	Gain Value of CTE
44	RED_C_COEFF	0 ~ 255	128	Gain adjustment of the contrast for the Red Signal
45	GRN_C_COEFF	0 ~ 255	128	Gain adjustment of the contrast for the Green Signal
46	BLU_C_COEFF	0 ~ 255	128	Gain adjustment of the contrast for the Blue Signal
47	RED_B_COEFF	0 ~ 255	128	Gain adjustment of the brightness for the Red Signal
48	GRN_B_COEFF	0 ~ 255	128	Gain adjustment of the brightness for the Green Signal
49	BLU_B_COEFF	0 ~ 255	128	Gain adjustment of the brightness for the Blue Signal
50	Gamma On		0	Gamma On/Off
51	Dither Mode		0	1bit/2bit/bypass Mode
52	Sub_Contrast	0 ~ 150	102	Brightness adjustment for the height-light parts of the screen
53	Sub_Brightness	0 ~ 500	250	Brightness adjustment for the low-light parts of the screen



## 8) CCA

NO	ITEM	DEFAULT	REMARK
01	CCA	On	
02	M_Red-x	671	
03	M_Red-y	320	
04	M_Red-Y	75	
05	M_Green-x	307	
06	M_Green-y	693	
07	M_Green-Y	381	
08	M_Blue-x	145	
09	M_Blue-y	52	
10	M_Blue-Y	51	
11	M_White-x	264	
12	M_White-y	283	
13	M_White-Y	504	
14	D_Red-x	655	
15	D_Red-y	326	
16	D_Red-G	1000	
17	D_Green-x	282	
18	D_Green-y	690	
19	D_Green-G	1000	
20	D_Blue-x	147	
21	D_Blue-y	64	
22	D_Blue-G	1000	
23	D_Cyan-x	190	
24	D_Cyan-y	260	
25	D_Cyan-G	1000	
26	D_Magneta-x	277	
27	D_Magneta-y	131	
28	D_Magneta-G	1000	
29	D_Yellow-x	445	
30	D_Yellow-y	534	
31	D_Yellow-G	1000	
32	D_Cool2-Wx	263	
33	D_Cool2-Wy	267	
34	D_Cool2-Wg	1000	
35	D_Cool1-Wx	269	
36	D_Cool1-Wy	274	
37	D_Cool1-Wg	1000	
38	D_Normal-Wx	280	
39	D_Normal-Wy	288	
40	D_Normal-Wg	1000	
41	D_Warm1-Wx	293	
42	D_Warm1-Wy	302	
43	D_Warm1-Wg	1000	
44	D_Warm2-Wx	313	
45	D_Warm2-Wy	324	
46	D_Warm2-Wg	1000	
47	Desired_RGB	On	
48	DVI Move		

## 9) DDP1011

ITEM NAME	DEFAULT	Range	REMARK
V-Position	30	0 ~ 60	
H-Position	60	0 ~ 120	
LAMP	2	0 ~ 4	
Index delay	48/40	0 ~ 1023	
Seq Select	5/3	0 ~ 15	
V-Flip	Normal	0 ~ 1	
H-Flip	Normal	0 ~ 1	
Gamma	2	0 ~ 15	
SLR	0	0 ~ 1	
DMD-Bias	3	0 ~ 4	
Lamp Sync Delay	0/120	0 ~ 4095	
Lamp Boost	not used/20	0~255	

## 10) LNA PLUS

## RF\_DB-1

ITEM NAME	DEFAULT	Range	REMARK
BASE LEVEL	100	0 ~ 1024	
PK	2	0 ~ 7	
LPF2	1	0 ~ 3	
PKCOR	0	0 ~ 1	
H_P_F_ENABLE	00	0 ~ 10	
SCALE_NOISE_Y	30	0 ~ 255	
SCALE_NOISE_C	100	0 ~ 255	
DEP_GAIN2_X	4	0 ~ 255	
DEP_GAIN2_Y	4	0 ~ 255	
DEP_GAIN3_X	01	0 ~ 255	
DNle_DEP_GAIN	30	0 ~ 255	

## RF\_DB-2

ITEM NAME	DEFAULT	Range	REMARK
BASE LEVEL	230	0 ~ 1024	
PK	1	0 ~ 7	
LPF2	1	0 ~ 3	
PKCOR	1	0 ~ 1	
H_P_F_ENABLE	0	0 ~ 10	
SCALE_NOISE_Y	2	0 ~ 255	
SCALE_NOISE_C	2	0 ~ 255	
DEP_GAIN2_X	2	0 ~ 255	
DEP_GAIN2_Y	2	0 ~ 255	
DEP_GAIN3_X	1	0 ~ 255	
DNle_DEP_GAIN	20	0 ~ 255	

## RF\_DB-3

ITEM NAME	DEFAULT	Range	REMARK
BASE LEVEL	650	0 ~ 1024	
PK	0	0 ~ 7	
LPF2	1	0 ~ 3	
PKCOR	0	0 ~ 1	
H_P_F_ENABLE	0	0 ~ 10	
SCALE_NOISE_Y	0	0 ~ 255	
SCALE_NOISE_C	0	0 ~ 255	
DEP_GAIN2_X	0	0 ~ 255	
DEP_GAIN2_Y	0	0 ~ 255	
DEP_GAIN3_X	0	0 ~ 255	
DNle_DEP_GAIN	0	0 ~ 255	

## 11) DDP PATTERNS

DDP PATTERNS	REMARK
White	
Red	
Green	
Blue	
Cyan	
Mazenta	
Yellow	
H Ramp	
V Ramp	
H Lines	
Diagonal Lines	
V Lines	
Grid	
Checkerboard	
V frequency	

## 12) ASI PATTERNS

ITEM NAME	DEFAULT	Range	REMARK
CROSS BAR			
CROSS HATCH			
CHECKER			
CHARACTER			
BOX			
STEP 64			
STEP 32			
STEP 16			
STEP 8			
COLOR BAR			
FILKER_100			
FILKER_75			
FILKER_50			
FILKER_25			

## 13) OPTION

No.	ITEM	DEFAULT	CHINA	ASIA	EUROPE
1	Language Group	Europe	China	Asia	Europe
2	Language	English	Chinese	English	English
3	Jack Type	Scart	RCA	RCA	Scart
4	ATM/Area	ATM	Area	Area	ATM
5	CW/CS	CW	CS	CS	CW
6	LNA	On	ON	On	On
7	TOP TTX	On	Off	Off	On
8	TTX Group	West Europe	West Europe	West Europe	West Europe
9	AV Input	TV	Last Memory	Last Memory	Last Memory
10	High Deviation	On	On	Off	Off
11	Carrier Mute	On	Off	On	On
12	Auto Power	On	On	On	On
13	DNle Demo	On	On	On	On
14	Melody Volume	0~20	5	5	5
15	DDC Write Enable	On	Off	Off	Off
16	Plug & Play	On	On	On	On
17	Arabic/Persian	Arabic	Arabic	Arabic	Arabic
18	Debugger	Not User	Not User	Not User	Not User
19	TTX Enable/Disable	Disable	Enable	Enable	Enable
20	Lamp Timer				
21	Lamp Timer Clear				
22	SCART WSS	Normal	Normal	Normal	Normal
23	LNA Plus	On	On	On	On
24	Pilot High	0~255	13	13	13
25	Pilot Low	0~255	7	7	7
26	Sound Delay SD		Delay 390	Delay 390	Delay 390
27	Sound Delay HD		Delay 18	Delay 18	Delay 18

## 2-1-4 CCA Adjustment Service Methods

### 1) Condition of the CCA Label upon Receipt of the Service Engine





## 2) State of the CCA Measured Value Input in SET FACTORY MODE

[For Export]	[For Domestic]
CCA ON/OFF	CCA ON/OFF
Red - x : ???	Red - x : ???
Red - y : ???	Red - y : ???
Red - Y : ???	Red - Y : ???
Green - x : ???	Green - x : ???
Green - y : ???	Green - y : ???
Green - Y : ???	Green - Y : ???
Blue - x : ???	Blue - x : ???
Blue - y : ???	Blue - y : ???
Blue - Y : ???	Blue - Y : ???
White - x : ???	White - x : ???
White - y : ???	White - y : ???
White - Y : ???	White - Y : ???
WB SPREAD	WB SPREAD
DVI MOVE	DVI MOVE
D-White - x : 297	D-White - x : 277
D-White - y : 287	D-White - y : 270

## 3) CCA Service Procedures

1. Select FACTORY CCA mode on the SET.
2. Input the CCA basic engine data to the SET.
3. Input the D-White -x, y values in the coordinates per destination.
4. Switch the CCA OFF to ON, then check the picture quality and adjust (as listed below) if necessary.
 

From the 100% White Pattern, change the D-White x value to adjust the tint of the Red color:  
Higher the value emphasizes the Red color, lower the value weakens the Red color. Find appropriate value for Red Color.

From the 100% White Pattern, change the D-White y value to adjust the tint of the Green color:  
Higher the value emphasizes the Green color, lower the value weakens the Green color. Find appropriate value for Green Color.
5. 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.
6. When the adjustment is complete, check the picture quality. If necessary change the D-White x,y values to the desired tint.

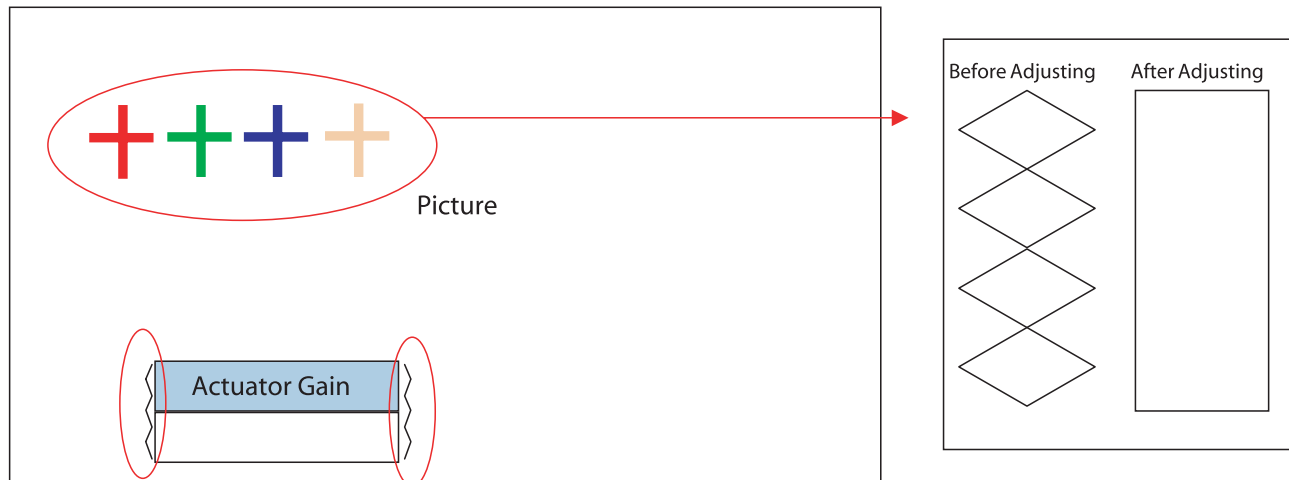
## 2-1-5 INDEX DELAY Adjustment

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 the "1. DDP1011" on the first display of ther Service Mode.
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, then adjust to the mean value.

## 2-1-6 ACTUATOR GAIN Adjustment

### 1) Before Adjustment


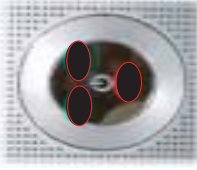
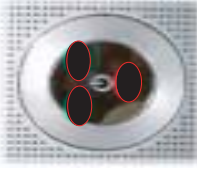



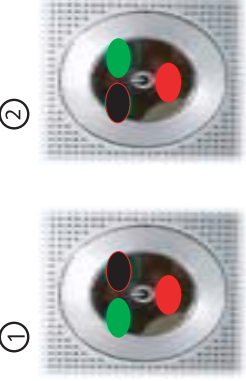
1. On the Factory Transmitter's display -> Move to Factory Mode, then select ACTUATOR GAIN for the SP Actuator.




### 2) Making Adjustments


1. As shown in the picture above, change the actuator values to eliminate saw tooth shapes from the A and B areas.
  - To fine tune, increase the data value ensuring that you get the center between the starting and ending points of the disappearing saw tooth shape.
  - > Move "5" steps further from the point where A disappears.
2. To fine tune the upper and lower areas, refer to the saw tooth shape (in the picture below) and the red, green, blue and white crosshair shape (as shown above) respectively for further adjustment.

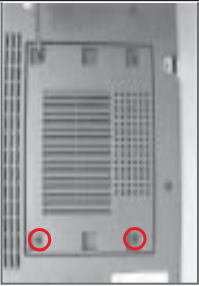






## 2-2 Contents Failure Repair Methods


No.	Item	Picture	Description	Remarks
1	Normal operation [LED Status]		1. When the power cord is plugged in, the LED indicator is not lit. 2. When the set is turned on via the remote control, the Lamp LED indicator at the right upper is lit. 3. When the timer setting function is used, the Timer LED indicator at the left upper is lit.	1. Flickering of the Lamp LED indicator means that the lamp is about to be turned on. 2. The ON state of the Lamp LED indicator means that the lamp has been turned on.
	Failure Type		Inspection Items	Remarks
	When the set is turned on, the Lamp LED does not flicker.		1. Check whether or not the power cord is connected. 2. Check the line filter fuse. 3. Check the connections of the ANALOG CN802 and CN803 connectors. 4. Check the connection of the DIGITAL CN128 connector and check if 5.7V power has been supplied to pin #3.	
	When the TEMP LED indicator flickers.		1. Check whether the temperature sensor connector attached to the engine has been inserted normally into CN106 on the Sub Detect/Actuator board. 2. Check whether the temperature sensor is normal when both terminals have been short-circuited (connected).	
	1. TIMER and TEMP LED blinking 2. LAMP and TEMP LED blinking		1. Check if the fan operates when TIMER and TEMP LED blinks. 2. Check that the cover detection switch is inserted at CN107 on the Sub Detect/Actuator board when LAMP and TEMP LED blinks. 3. When LAMP and TEMP LED blink, check that the lamp cover is properly assembled and that the switch-pressing boss(inside) is not bent.	

No.	Item	Picture	Description	Remarks
1	When the TIMER,LAMP and TEMP LED Indicators flicker simul- taneously.	 	<p>1. If the 3 LED indicators flicker from the time the set is turned on, it means:</p> <p>1) The CN602 connector on the DMD board is not inserted properly.</p> <p>2) The DVI cable that connects the DIGITAL board to the DMD board is not connected properly.</p> <p>3) If the lamp does not turn on even after turning it on three times, by powering off/on 15 second intervals:</p> <p>! The B+ 260V power is not supplied to the ballast (The cable is not connected properly between the power and the ballast.)</p> <p>@ The cable connected to the CN109 terminal on the DMD board and the CN2 terminal on the ballast is short-circuited or not connected.</p> <p># The lamp does not turn on because 5V has not been supplied to blue pin #1 on the CN2 terminal of the ballast.</p> <p>\$ 5V is supplied to the CN2 terminal on the ballast but the lamp does not turn on because the ballast has a failure. (If the lamp is replaced and 5V is supplied normally to the CN2 terminal, suspect a ballast failure if the lamp still does not turn on.)</p> <p>% The ballast is normal but the lamp does not turn on. (When 5V is supplied to CN2 and 385V to CN1, but the lamp does not turn on, try replacing the lamp. If it turns on, that means it was a lamp failure.)</p> <p>4) The color wheel engaged to the engine does not operate, or the connector which indicates the operation of the color wheel is not connected properly, and therefore does not allow the lamp to turn on. The cause can be determined when the set still does not turn on after attempting to turn it on three times.</p> <p>5) Another digital board or the DMD board has a failure. Conclusively, if the three LED indicators flicker, first check the above five items, then check the various connector connections, and then suspect a failure of the lamp or the ballast.</p>	

■ Failure if the LED indicator is normal but the screen is not displayed.

No.	Item	Picture	Description	Remarks
2	First	Check whether the External LED indicator of the set is normal.	1. When the power cord is plugged in, the LED inductor is not lit 2. What the set is turned on via the remote control the LAMP LED indicator at the left upper is lit	
	Second	Check whether the ANALOG board LED indicators inside the set are lit.	All of the three LED indicators should be turned on. * You can observe those LED indicators at the back of the set. All three LED indicators should be turned on.	
	Third	Check whether the set lamp is turned on.	When the lamp is turned off, replace it. * When you turn on the set again after replacing the lamp, - It should turn on within 30 seconds. (For 50 and 61 inch TVs) * If more than one minute passes before it turns on, or if it does not turn on, replace both the ballast within the engine and the lamp.	

Fourth [Lamp replacement]	Unplug TV, then use a screwdriver to remove the screw.		Remove the Lamp cover.		Remove the screws securing the Lamp by hand		Separate the Lamp from the engine by holding the handle and pulling it out	 	To reinstall the Lamp, follow these steps in reverse order.
	Open the back cover of the set and short the protection switch.	 Press the switch to cause a short. On the right side of the back of the set.	Check whether the power and the lamp enable signal have been supplied to the ballast.		1) Check whether 5V is supplied to the blue terminal of CN2 2) Check whether DC 380V is supplied to both end terminals of CN1	Repair plan	1) If 5V is applied to the CN2 terminal of the ballast, but the lamp does not turn on, replace the ballast. 2) When 5V is not supplied, replace first the DMD board attached to the engine. If the lamp still does not work, replace the engine. * For repair methods of the DMD board, refer to separate instructions.		
Fifth [Ballast operation check]	Check the signal supply procedure. [Check whether the signals are supplied from the analog board to the digital board]		Method for inspecting whether signals are being supplied from the digital board to the DMD board			DMD board inspection method			
Sixth [The lamp is normal, but a blank screen failure occurs.]	1) Check in which mode the screen does not display. 2) If the RF, VIDEO, DVD, or DTV mode screen does not display, check the Analog CN257 terminals, Digital CN127 connector connections, and their signaling. 3) If the DVI or PC mode screen does not display, replace and inspect the digital board. 4) If the screen does not display in any mode, check whether the signals are being output from the digital board.		Check the output of the IC117 terminal. If the signal output state is normal, suspect the DMD board. * Refer to the Digital Board Description Diagram.		1) Check whether +26V and -26V is being supplied to the DMD board. -> If the voltage is abnormal, replace the tantalum condenser (C108, C109: When failure occurs intermittently) If the problem continues after replacement, then replace the power drive IC (IC107). 2) If the DMD voltage is normal, replace the panel, or reassemble the panel. (Try to fix the four silver screws again.) * Refer to the DMD Board Description Diagram.				

2	Seventh [DMD state inspection method]	<p>Remove the heat sink attached to the DMD board and follow the directions given below.</p> <p>1) Replace the heat sink. Fix the DMD by tightening the screws again.</p> <p>2) Check signalling for each part.</p>	<p>Horizontal raster failure occurs. [Check whether the output of the R NETWORK RA101 ~ RA104 terminals of the DMD board are normal.]</p>	<p>Vertical line failure occurs. * Check whether it occurs within the regular wide range. (Less than 26mm for 50-inch TV)</p>		<p>1) If it appears at regular intervals of less than 26mm, check the DMD fixing state. → Loosen the four silver screws and then re-assemble them.</p> <p>2) If the vertical lines do not occur at regular intervals, or the intervals are more than 26mm, or irregular, replace IC115 (DDP1010).</p>	<p>* Refer to the DMD Board Description Diagram</p>	<p>* Refer to the DMD Panel PIN Terminals Characteristics Diagram.</p>	
3	Noise failure	<p>Check the noise state of the color wheel.</p> <p>1) If the noise of color wheel is loud, replace the engine or the color wheel.</p> <p>2) When the color wheel is replaced, make sure to adjust the delay value of 1.DDP1010 to factory settings. (Adjust to the position where the color red is strongest.)</p>	<p>Fan noise 1) Check the revolving state of the fan to inspect whether the fan wire is caught on the wings, then check the bearing noise.</p>	<p>Ballast noise 1) Check whether there is noise from the ballast, if noise is too loud, replace the ballast.</p>		<p>50-inch: Three fans 61-inch: Three fans</p>	<p>The color wheel is attached as shown in the following figure. Loosen the screws which fix the outer parts and then replace the color wheel.</p>		



## 2-3 ASSY PCB ANALOG Service Manual

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### ASSY PCB ANALOG Terminal Spec Characteristics

ASSY PCB ANALOG General Characteristics
1. Receives general TV signals and supplies VIDEO (COMPOSITE) signals to the DIGITAL BOARD.
2. Controls switching for and amplifies (IC133,IC134,IC137,IC140,IC124) all of the RF and sound signals, and outputs them to the speaker.
3. The power is distributed from the POWER board through the ANALOG board to the DIGITAL board. Therefore, wrong insertion of the lead connector may cause a power failure. Make sure to insert the lead connector with the protrusions on the connector header placed in the right direction.
4. If a blank screen failure occurs in the RF (general TV) mode and the ALL mode, first, check whether signals are supplied to the pins of the CN257 terminal on the Analog board, and then check whether normal signals are supplied to the Digital board and the DMD board.
5. Mode switching failure between the TV/VIDEO1 and the PC mode may not be identified when connecting the jack if any of the IC 129 PINs are short-circuited or IC itself has a failure.



## Analog board pin assignment

### CN257

Supplies AV Signals to PCB DIGITAL

Pin Name	I/O	PIN No.		I/O	Pin Name
Comp1-Y	←	1	2		GND
Comp1-Pb	←	3	4		GND
Comp1-Pr	←	5	6		GND
Comp2-Y	←	7	8		GND
Comp2-Pr	←	9	10		GND
Comp2-Pb	←	11	12		GND
N.C.	←	13	14		GND
N.C.	←	15	16		GND
N.C.	←	17	18		GND
Main-Y/V	←	19	20		GND
Main-C	←	21	22		GND
Sub-Y/V	←	23	24		GND
Sub-C	←	25	26		GND
Caption-CVBS	←	27	28		GND
IR	←	29	30		GND

### CN258

Connects Control Signals between PCB Analog and PCB Digital

Pin Name	I/O	PIN No.		I/O	Pin Name
LED1	↔	1	2	↔	SDA-Micom
LED2	→	3	4	←	SCL-Micom
LED3		5	6		GND
Key1	←	7	8	↔	SDA-Analog
Key2		9	10	←	SCL-Analog
Reset-D	←	11	12		GND
I2C-STOP	←	13	14	←	SDA-Digital
Power-SW	←	15	16		SCL-Digital
N.C.		17	18	←	GND
N.C.	←	19	20	←	I2S-CLK-HDMI
GND	←	21	22		I2S-EN-HDMI
MCLK_AUDIO	→	23	24		I2S-DATA-HDMI
S-MUTE	→	25	26	←	GND
PC-L	→	27	28	←	DVI-L
PC-R		29	30		DVI-R
GND	←	31	32	←	GND

**CN243 / CN244**

Receives Power Signals from PCB POWER

Pin Name	PIN No.		Pin Name
Power-Mute	1	2	S14.5VB
S-GND	3	4	S14.5VB
S-GND	5	6	5.7VB
GND	7	8	12VB
GND	9	10	12VB
GND	11	12	70VB
GND	13	-	

Pin Name	PIN No.		Pin Name
5VA	1	2	GND
33VB	3	4	GND
Power-SW	5	6	N.C.
N.C.	7	-	

**CN208**

Supplies Power Signals to PCB DMD

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

## CN251

Pin Name	SUB Detector/Actuator	PIN No.		SUB Detector/Actuator	Pin Name
GND	Ground	1	2	Fan-VCC	12VB
GND	Ground	3	4	SDA-Memory	SDA-M
SCL-M	SCL-Memory	5	6	Ground	GND
5VA	5VA	7	8	Ground	GND
70VB	70VB	9	10	Ground	GND

## CN223

Receives AV Signals from PCB SIDE-AV

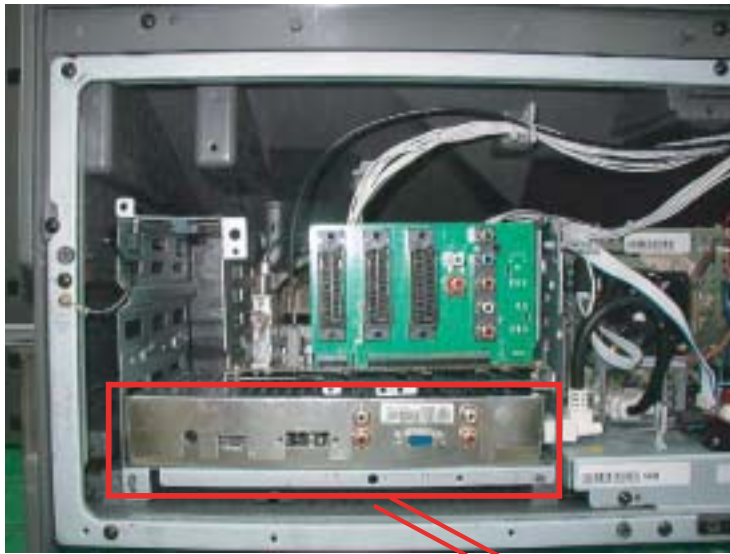
Pin Name	Side AV	PIN No.		Side AV	Pin Name
Side-Y	SVHS Y (Luma)	1	2	SVHS C (Chroma)	Side-C
GND	Ground	3	4	Video (CVBS)	Side-V
GND	Ground	5	6	Side Sound L	Side-L
GND	Ground	7	8	Side Sound R	Side-R
GND	Ground	9	10	SVHS Jack Detect	Side-SDET
Side-VDET	Video Jack Detect	11	-		

## I/O Expander Pin Assignment

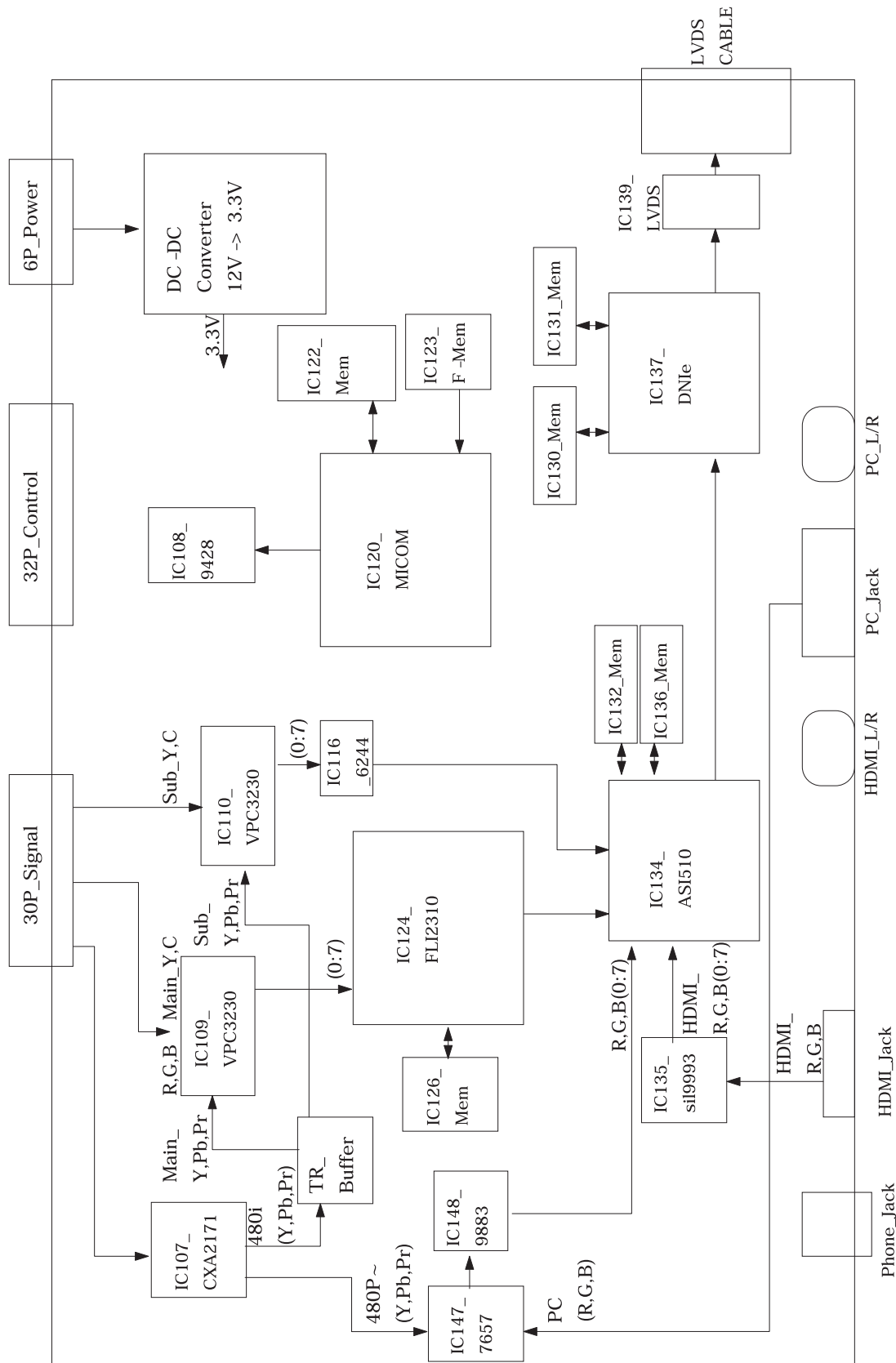
	DES	NAME	PIN	S3P9428/32-SOP	PIN	NAME	DES	
GND		VSS	1		32	VDD		
		XIN	2		31	P0.2	I/O	S1-DET
		XOUT	3		30	P0.3	I/O	S2-DET
GND		TEST	4		29	P0.4	I/O,ADC	Side-SDET
Comp2-DET	I/O	P0.1	5		28	P0.5	I/O,ADC	V1-DET
Comp1-DET	I/O	P0.0	6		27	P0.6	I/O,ADC	V2-DET
RESET-D		RESET	7		26	P0.7	I/O,ADC	Side-VDET
RF-SEL	O	P3.0	8		25	P3.1	O	SOUND-RESET
LNA-SW	O	P3.2	9		24	P3.3	O	DEFAULT
MTNR-AFT	I/O,ADC	P2.0	10		23	P1.0	I/O	DELAY1
STNR-AFT	I/O,ADC	P2.1	11		22	P1.1	I/O	DELAY2
N.C	I/O,ADC	P2.2	12		21	P1.2	I/O	GAIN0
N.C	I/O,ADC	P2.3	13		20	P1.3	I/O	GAIN1
RF-AGC	I/O,ADC	P2.4	14		19	P2.7	SCL	SCL-A
GND	ADDRESS	P2.5	15		18	P2.6	SDA	SDA-A
GND		AVSS	16		17	AVREF		

## 2-4 ASSY PCB DIGITAL Service Manual

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2-4-1 Digital Board Characteristics



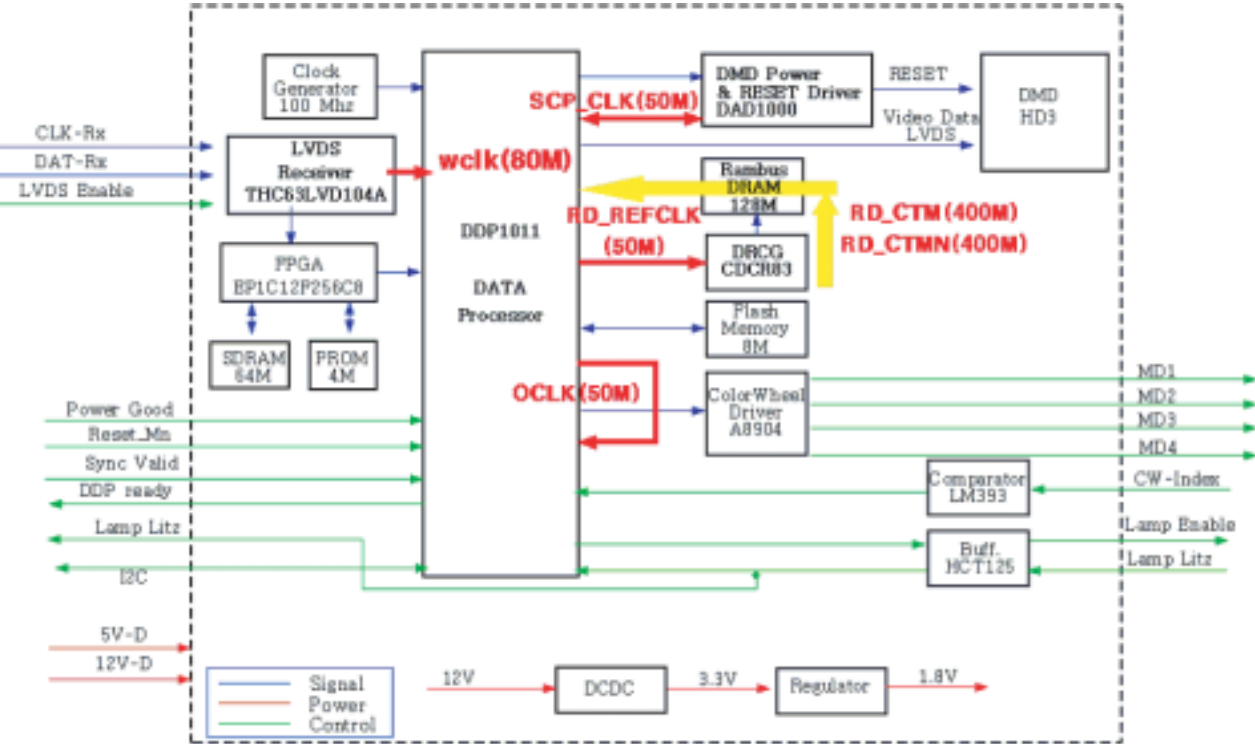
## Digital board connector pin

REFERENCE	TERMINAL	SPEC	REFERENCE	TERMINAL	SPEC
CN127	1	COMP1-Y	CN126	1	LED1
	2	GND		2	SDA-MICOM
	3	COMP1-PB		3	LED2
	4	GND		4	SCL-MICOM
	5	COMP1-PR		5	LED3
	6	GND		6	GND
	7	COMP2-Y		7	KEY1
	8	GND		8	SDA-ANALOG
	9	COMP2-PB		9	KEY2
	10	GND		10	SCL-ANALOG
	11	COMP2-PR		11	RESET-D
	12	GND		12	GND
	13	N.C		13	I2C-STOP
	14	GND		14	SDA-DIGITAL
	15	N.C		15	POWER-SW
	16	GND		16	SCL-DIGITAL
	17	N.C		17	SCART1-FB
	18	GND		18	GND
	19	MAIN-Y		19	SCART3-FB
	20	GND		20	I2S-CLK-HDMI
	21	MAIN-C		21	GND
	22	GND		22	I2S-EN-HDMI
	23	SUB-Y		23	MCLK_AUDIO
	24	GND		24	I2S-DATA-HDMI
	25	SUB-C		25	S-MUTE
	26	GND		26	GND
	27	CAPTION-CVBS		27	PC-L
	28	GND		28	DVI-L
	29	IR		29	PC-R
	30	GND		30	DVI-R
CN128	1	12V		31	GND
	2	GND		32	GND
	3	5.7V			
	4	GND			
	5	5V			
	6	GND			

2-5 ASSY PCB DMD Service Manual



DMD BOARD BLOCK DIAGRAM



### 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 BI AS REST) 26V	N#	A,B CHANNEL POSITIVE
G	The part from the present position to the GND (The black part is also a GND.)		

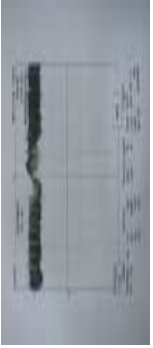
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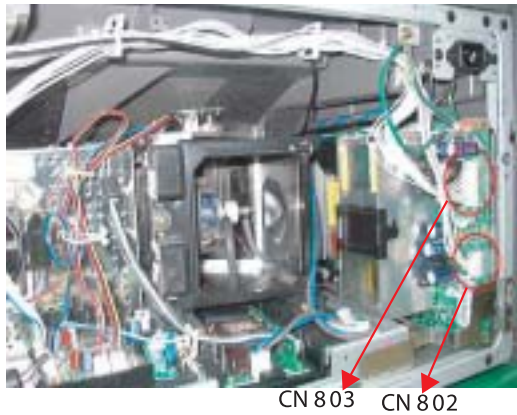
Description of Terminal Characteristics

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 SRAM READ TEST OPERATION
READOUTB(1:0)	B-CHANNEL SERIAL DATA OUT DURING SRAM READ TEST OPERATION
TP(2:0)	MANUFACTURING TEST POINT(NO CONNECTED DURING NORMAL OPERATION)
RSV_A(4:0)/ RSV_B(4:0)	RESERVED PINS (NORMAL:GND)
EVCC	REFERENCE VOLTAGE DURING SRAM READ TEST OPERATION(NORMAL GND)
VCC2	MIRROR ELECTRODE VOLTAGE(7.3V)
VCC	LOGIC SUPPLY
VSS	LOGIC GROUND

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.	1) Check whether the DC380V power is supplied to the ballast.	* For domestic model, it is needed to check whether the master power switch is turned on. * The US model has no master power.
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.	1) 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.)	1) 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).	1) 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 waveform 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.	1) If the voltage between R254 and R255 is 3V, it is normal.	
6	1) Check whether the signal and the voltage are output normally to the data line of DMD panel.	1) A waveform should be output on the data line. * Refer to the remarks.	

2-6 ASSY PCB POWER Service Manual

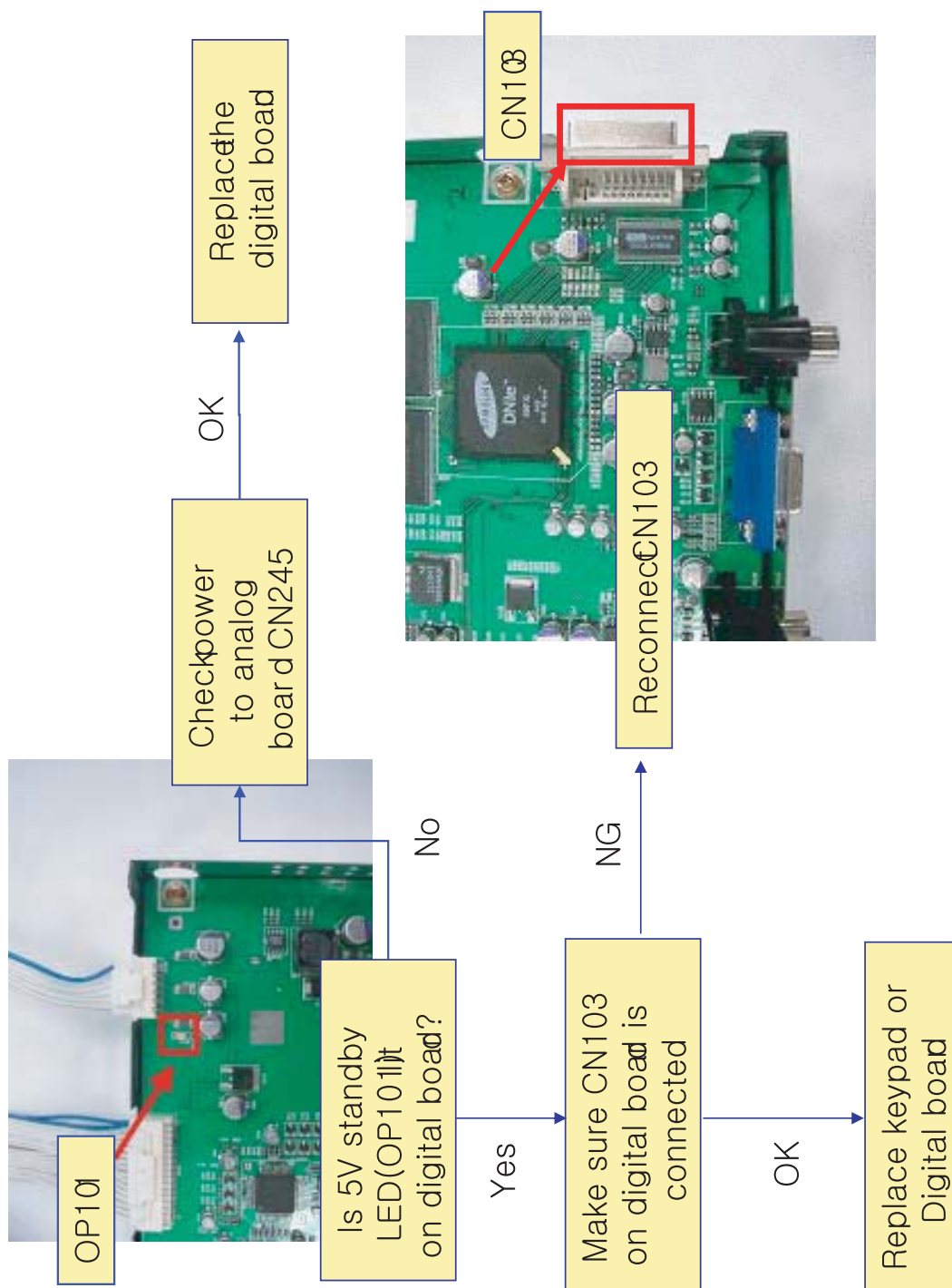


CN803							
Pin #	1	2	3	4	5	6	7
Spec	5V A	GND	33V B	GND	Power -S /W	N.C.	N.C
Used	Supplies DC voltage to the PCB ANALOG						

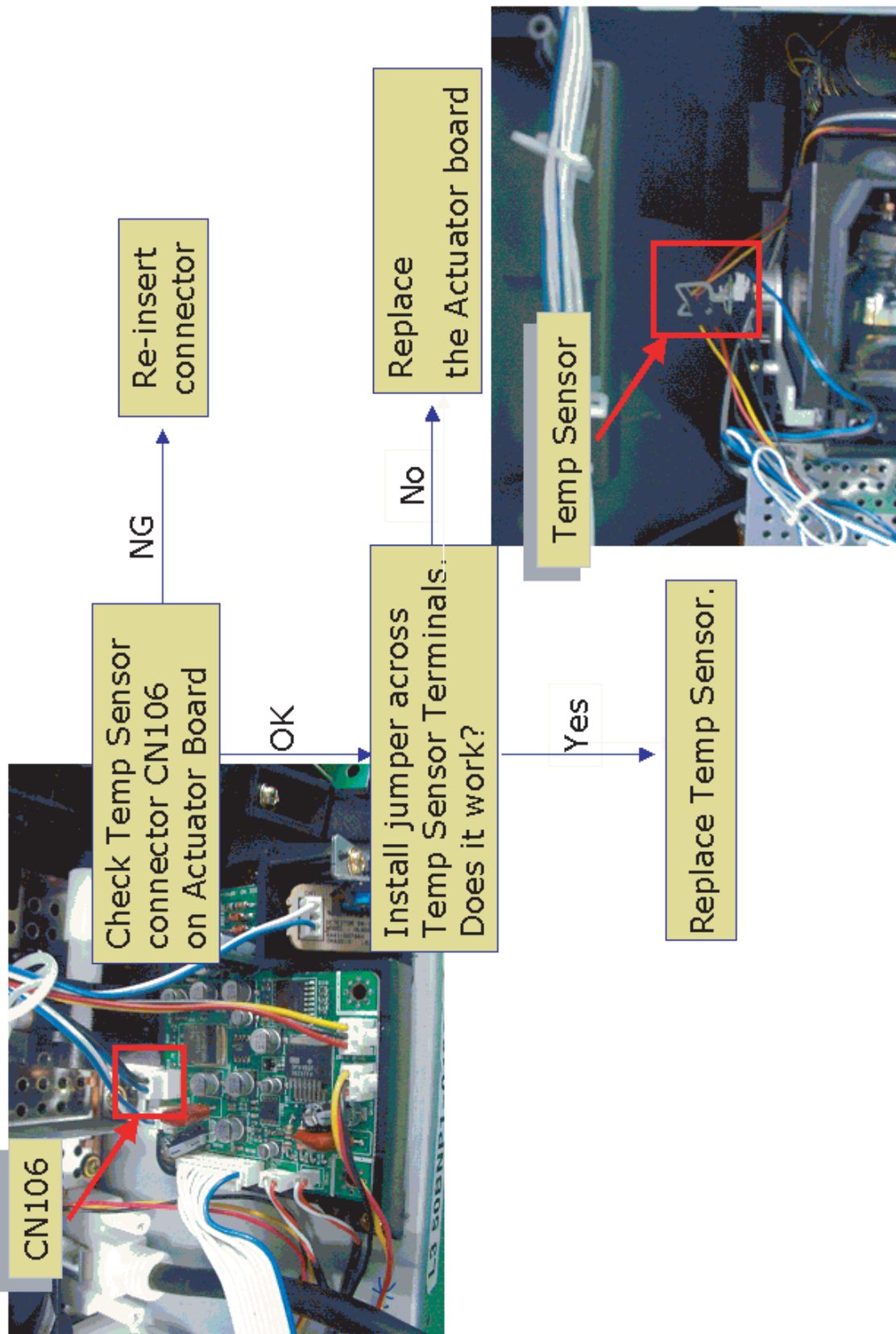
CN802							
Pin #	1	2	3	4	5	6	7
Spec	Power -Mute	S14. 5V B	S- GND	S14. 5V B	S- GND	5.7 vB	GN D
Pin #	8	9	10	11	12	13	
Spec	12V B	GND	12V B	GND	70V B	GND	
Used	Supplies DC voltage to the PCB ANALOG						

## 2-7 Troubleshooting

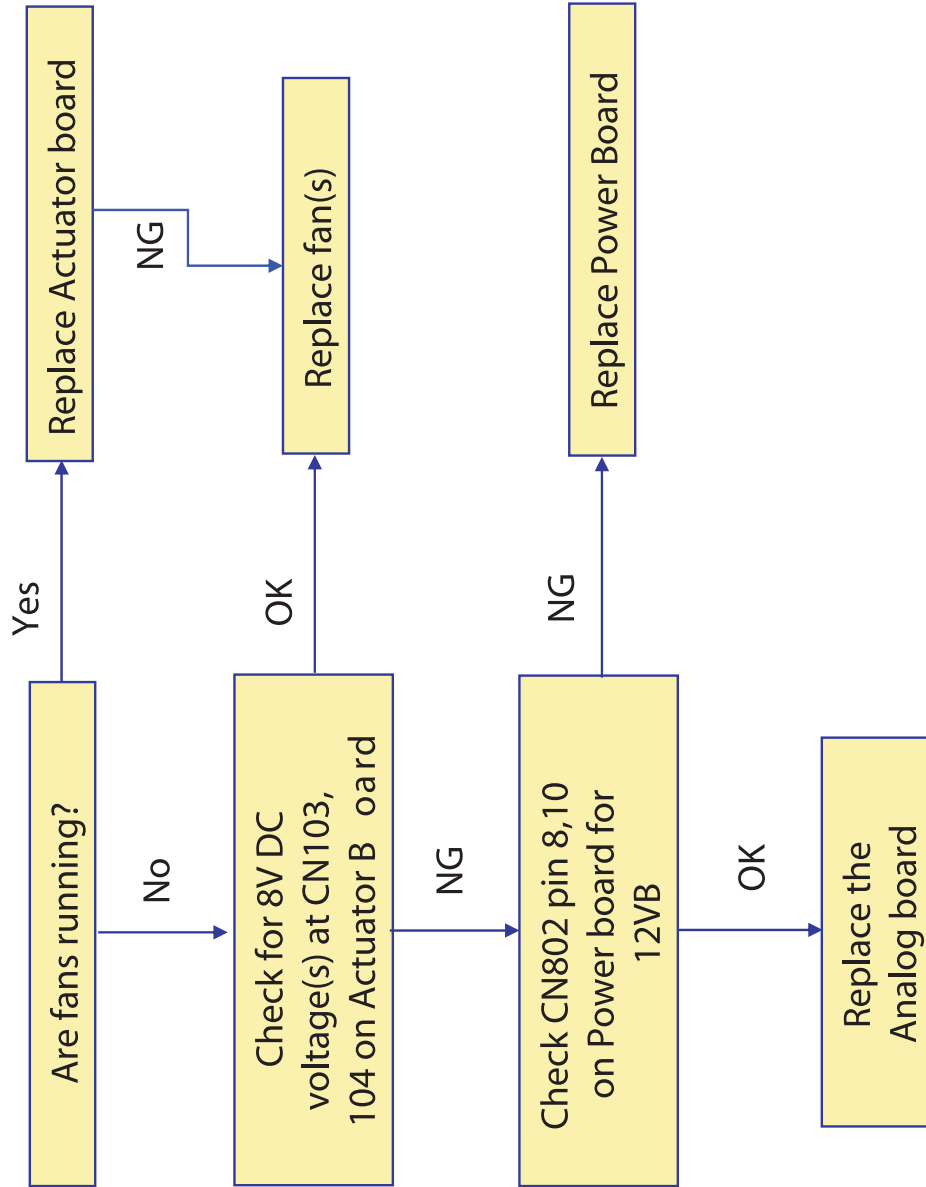
### 1. Dead SET



## 2. Blinking Temp LED

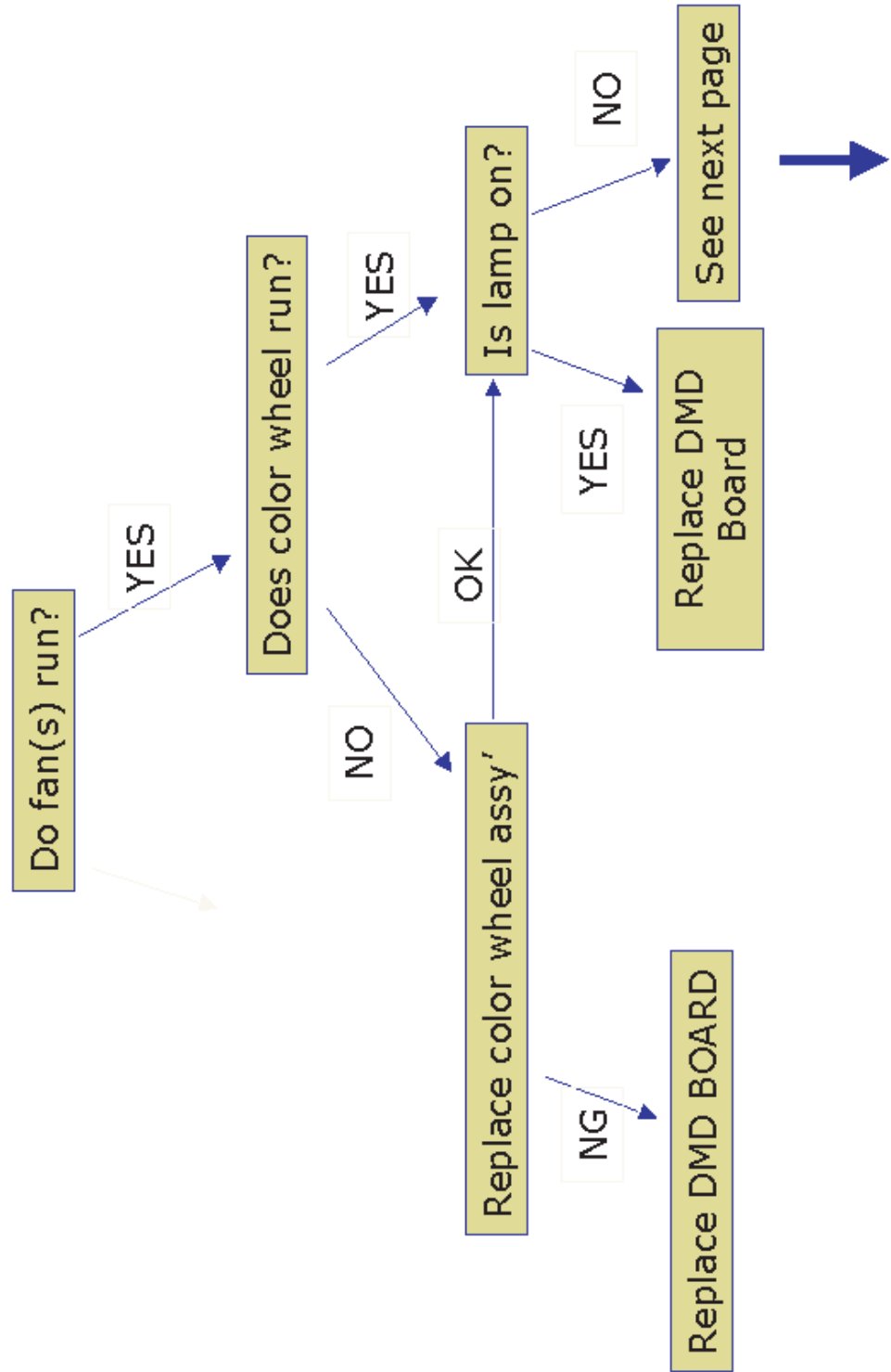


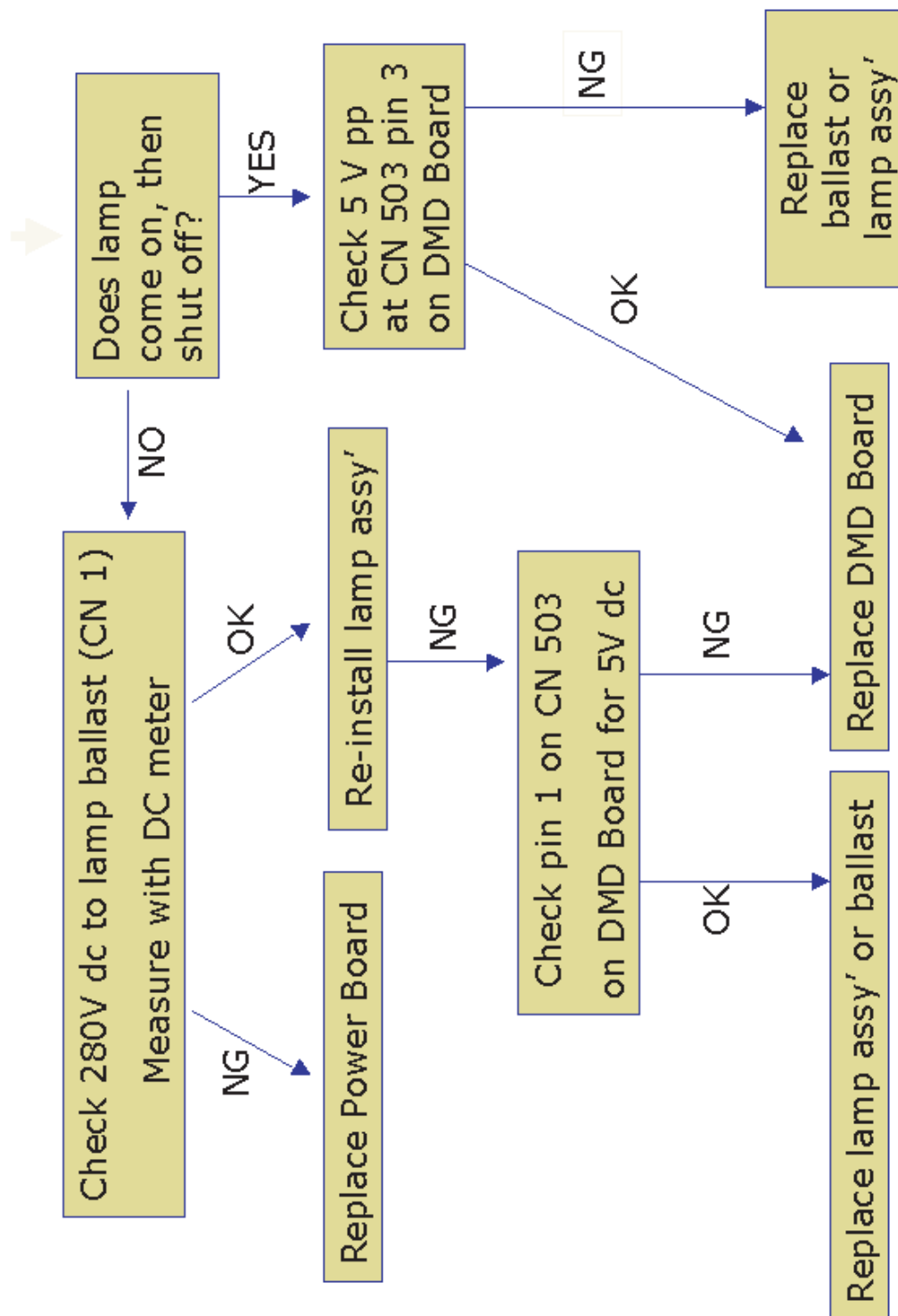
### 3. Blinking Temp and Timer LED



## 4. Blinking Lamp LED

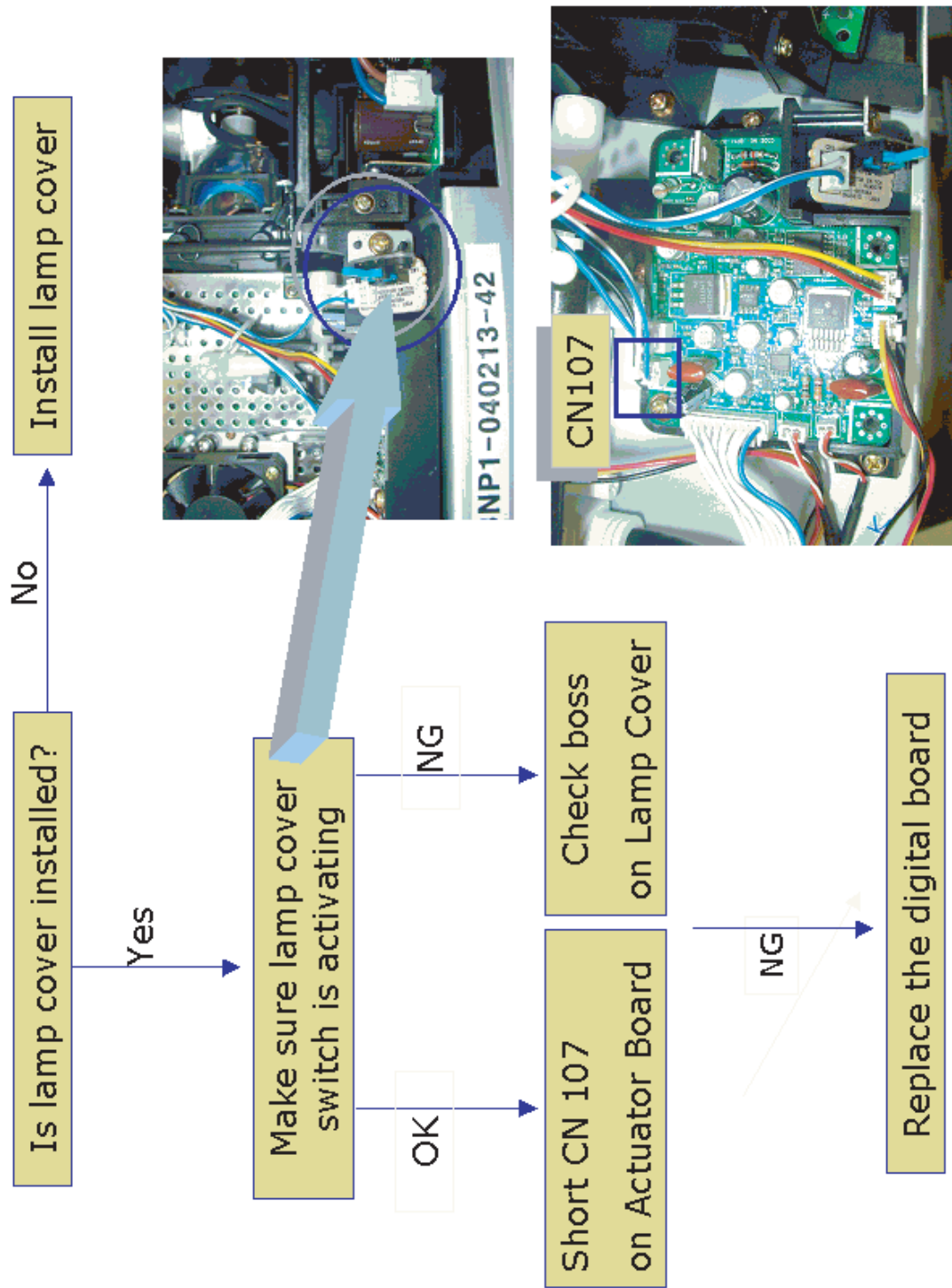
A blinking lamp LED is the most common failure indication. It can be caused by no lamp, no color wheel, no fan(s), or other defective components.





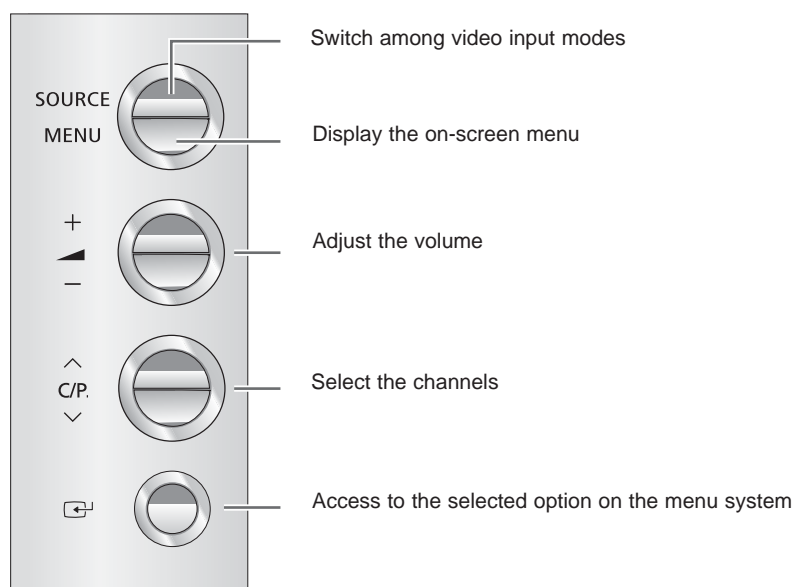


## 5. Blinking Lamp, Temp, LED's



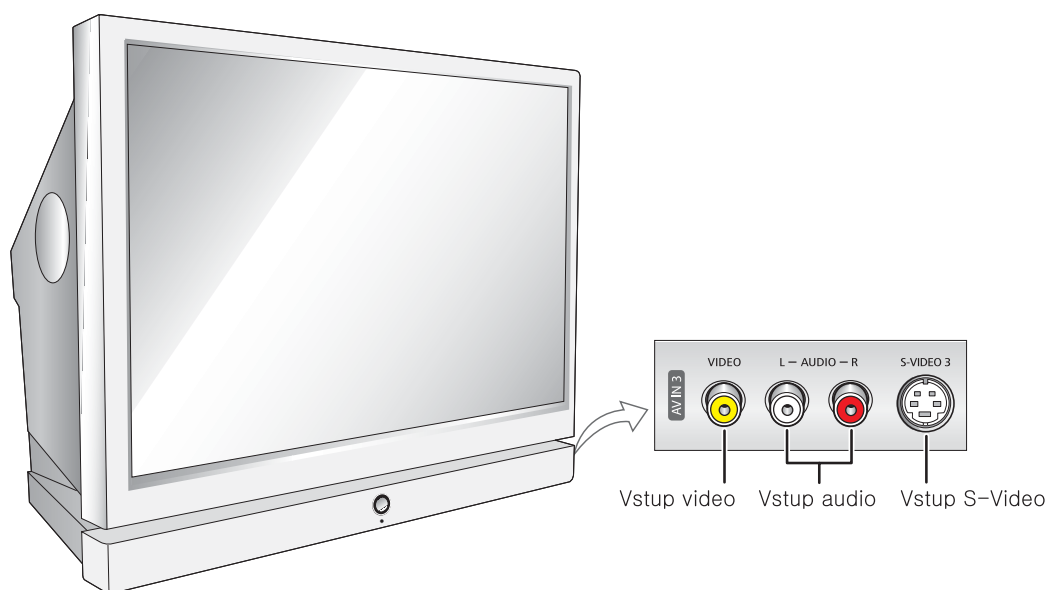
## 2-8 Side Panel Buttons

The buttons on the side panel control your TV's basic features, including the on-screen menu system. To use the more advanced features, you must use the remote control.



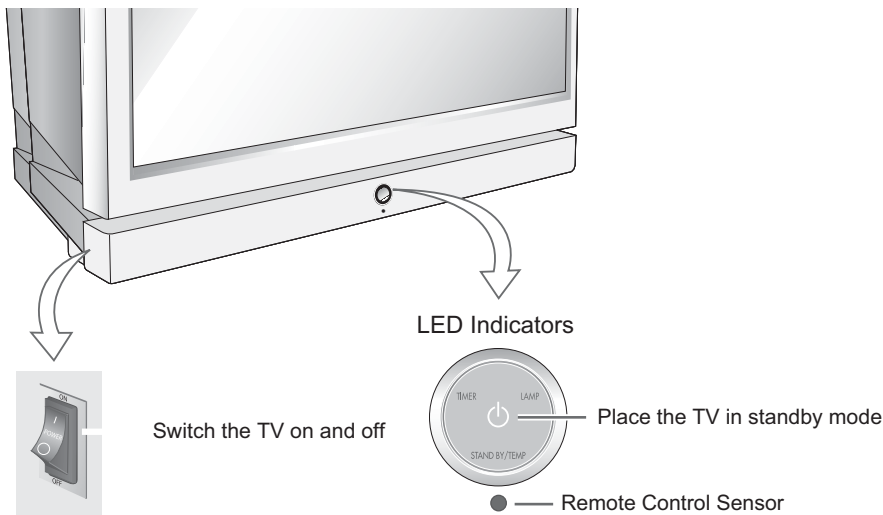
## 2-9 Side Panel Jacks

Use the side panel jacks to connect a component that is used only occasionally (a camcorder or video game, for example).



## 2-10 Front Panel LED Indicators

The three lights on the front panel indicate the status of your TV.



(●:On, ◐:Blinking, ○:Off)

TIMER	LAMP	STAND BY/TEMP	Indication
○	○	●	Standby mode.
●	○	○	A timer pilot lights when Timer Auto On or Off is selected.
○	●	○	Normal operation.
●	●	○	Normal operation (when Timer Auto On or Off is selected).
○	◐	○	Lamp is warming up. The normal picture comes on after 25 seconds.
●	◐	○	The normal picture comes on after 25 seconds. (when Timer Auto On or Off is selected)
○	◐	◐	Air vent cover in the rear of the TV is not properly installed.
○	○	◐	Inside temperature of the TV is over normal. Clean the air vent cover in the rear of the TV. Turn the TV back on after 1 hour.
◐	◐	◐	The lamp does not work, please contact an authorized Service Center for assistance.

- ◆ You can use the channel selection buttons to switch on the TV when it is in standby mode depending on the model.
- ◆ When using the on-screen menu the volume adjustment and channel selection buttons have the same function as the  $\uparrow/\downarrow$  buttons on the remote control.
- ◆ If the remote control no longer works or you have lost it, you can use controls on the panel of the TV.

## 2-11 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 Set-Top box, VCR, Cable box or DVD player.

