

2. Alignment & Adjustment

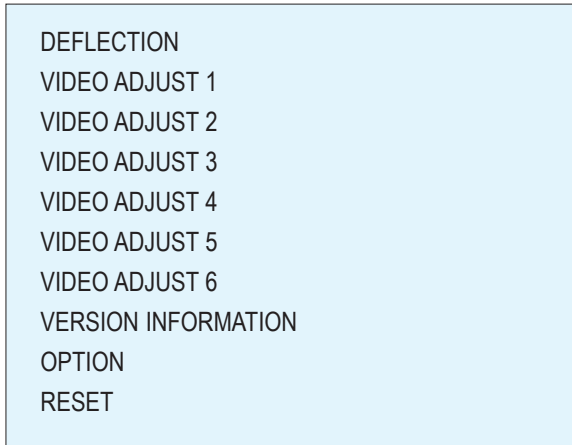
2-1 When entering the service mode:

1. Turn on the TV, and then select "STANDARD" on the picture adjustment mode.
2. Turn off the TV (STAND-BY).
3. Enter the service mode by pressing the remote control keys in the following sequence :



Note : If necessary, re-do steps 1~3.

4. Initial SERVICE MODE DISPLAY State



5. Service Mode Control Keys

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

2-2 Factory Data

+ DVI connection item is corresponded to DVI application model.
(HCR4245W)

1. Deflection

No	Item	Initial Data	Var/Fix	Range	Adjust Data
					All Mode
1	V Amp	31	Var	0 ~ 63	31
2	V Shift	32	Fix	0 ~ 63	32
3	H EW	31	Var	0 ~ 63	31
4	H Shift	34	Fix	0 ~ 63	34
5	V LIN	7	Fix	0 ~ 15	7
6	Up_Lin	0	Fix	0 ~ 15	0
7	Low_Low	0	Fix	0 ~ 15	0
8	V SC	7	Fix	0 ~ 15	7
9	H Par	20	Fix	0 ~ 63	20
10	Up_Cor	31	Fix	0 ~ 63	31
11	Low_Cor	31	Fix	0 ~ 63	31
12	H Tra	31	Fix	0 ~ 63	31
13	Bow	31	Fix	0 ~ 63	31
14	Angle	31	Fix	0 ~ 63	31
15	V Position	31	Fix	0 ~ 63	31
16	Up UCG	0	Fix	0 ~ 3	0
17	Lo UCG	0	Fix	0 ~ 3	0
18	CXA Left Blk	55	Fix	0 ~ 63	55
19	CXA Right Blk	15	Fix	0 ~ 63	15

2. Video Adjust 1

No	Item	Initial Data	Var/Fix	Range	Adjust Data	
					DTV/480p/ 720p/1080i	NT(Analog)/VIDEO SVIDEO/480i
1	RED Cutoff	25	Var	0 ~ 63	25	25
2	GREEN Cutoff	25	Var	0 ~ 63	25	25
3	BLUE Cutoff	25	Var	0 ~ 63	25	25
4	Color On/Off	1	Fix	0/1	1	1
5	CR Offset	32	Var	0 ~ 63	32	32
6	CB Offset	32	Var	0 ~ 63	32	32
7	RED Drive	35	Var	0 ~ 63	35	35
8	GREEN Drive	35	Var	0 ~ 63	35	35
9	BLUE Drive	35	Var	0 ~ 63	35	35
10	Sub Bright	20	Var	0 ~ 63	20	20
11	Sub Contrast	8	Var	0 ~ 15	8	8
12	Sub Color	10	Fix	0 ~ 23	6	10 / 15 / 15 / 10
13	Sub Tint	6	Fix	0 ~ 63	6	6 / 5 / 5 / 5
14	CTI Level	1	Fix	0 ~ 3	1	1
15	COL Axis	2	Fix	0 ~ 3	2	2
16	LTI Level	1	Fix	0 ~ 3	1	1
17	LTI Mode	1	Fix	0 ~ 3	1	1
18	System	2	Fix	0 ~ 3	2	2

3. Video Adjust 2

No	Item	Initial Data	Var/Fix	Range	Adjust Data	
					DTV/480p/ 720p/1080i	NT(Analog)/VIDEO SVIDEO/480i
1	ABL Mode	3	Fix	0 ~ 3	3	3
2	Gamma	1	Fix	0 ~ 3	1	1
3	DPIC Level	2	Fix	0 ~ 3	2	2
4	DC Trans	2	Fix	0 ~ 3	2	2
5	ABL TH	15	Fix	0 ~ 15	15	15
6	VM Level	2	Fix	0 ~ 3	2	2
7	VM Coring	0	Fix	0 ~ 3	0	0
8	VM f0	2	Fix	0 ~ 3	2	2
9	VM Limit	3	Fix	0 ~ 3	3	3
10	VM Delay	0	Fix	0 ~ 3	0	0
11	SHP CD Gain	1	Fix	0 ~ 3	1	1
12	SHP f0	0	Fix	0/1	0	0
13	SHP f1 Gain	3	Fix	0 ~ 3	3	3
14	Pre/Over	1	Fix	0 ~ 3	2	1
15	AKB Timing	11	Fix	0 ~ 32	11	11
16	S ABL	3	Fix	0 ~ 3	0	0
17	P ABL	10	Fix	0 ~ 15	10	10
18	Picture Limit	3	Fix	0 ~ 3	3	3

4. Video Adjust 3

No	Item	Initial Data	Var/Fix	Range	Adjust Data	
					All Mode	
1	H Comp	12	Fix	0 ~ 15	12	
2	V Comp	8	Fix	0 ~ 15	8	
3	Pin Comp	0	Fix	0 ~ 7	0	
4	AFC Comp	0	Fix	0 ~ 7	0	
5	CG HAO	5	Fix	0 ~ 20	5	
6	CG VAO	5	Fix	0 ~ 20	5	
7	BKG Level	25	Fix	0 ~ 63	25	
8	CM THRESHOLD	42	Fix	20 ~ 80	42	
9	CM Det Time	0	Fix	0.5sec/1step	0	
10	Pixel_shift_Time	60	Fix	0/5/30/60	60	
11	H_Peaking	2	Fix	0 ~ 7	2	
12	PFS	2	Fix	0 ~ 3	2	
13	LPF 2	1	Fix	0 ~ 3	1	
14	PKCOR	0	Fix	0 /1	0	
15	CKILL	2	Fix	0 ~ 15	8(2)	
16	AFT On/Off	1	Fix	0/1	1	
17	Melody Volume	10	Fix	0 ~ 20	10	

5. Video Adjust 4

No	Item	Initial Data	Var/Fix	Range	Adjust Data		
					480p other	720p (Component)	1080i (Component)
1	YC RF Delay	1	Fix	0~31	1		
2	YC AV Delay	5	Fix	0~31	5		
3	Chroma Band RF	0	Fix	0 ~ 63	0		
4	Chroma Band Video	0	Fix	0 ~ 63	0		
5	Chroma Band SVideo	1	Fix	0 ~ 63	1		
6	IF Comp	2	Fix	0 ~ 4	2		
7	IF Comp Video	4	Fix	0 ~ 4	4		
8	IF Comp SVideo	4	Fix	0 ~ 4	4		
9	9883 RED CUTOFF	128	Fix	0 ~ 255	123	122	122
10	9883 GREEN CUTOFF	128	Fix	0 ~ 255	105	105	99
11	9883 BLUE CUTOFF	128	Fix	0 ~ 255	123	124	124
12	9883 Phase	88	Fix	0 ~ 255	88	176	176
13	9883 Sync Level	50	Fix	0 ~ 255	50	32	32

6. Video Adjust 5

No	Item	Initial Data	Var/Fix	Range	Adjust Data
					NT(Analog)
1	BASE LEVEL	Read	Fix		
2	RFDB1_H_PEAKING	0	Fix		0
3	RFDB1_LPF2	1	Fix		1
4	RFDB1_PKCOR	0	Fix		0
5	RFDB1_SHARPNESS	75	Fix		75
6	RFDB2_H_PEAKING	0	Fix		0
7	RFDB2_LPF2	1	Fix		1
8	RFDB2_PKCOR	1	Fix		1
9	RFDB2_SHARPNESS	50	Fix		50
10	RFDB3_H_PEAKING	0	Fix		0
11	RFDB3_LPF2	2	Fix		2
12	RFDB3_PKCOR	1	Fix		1
13	RFDB3_SHARPNESS	20	Fix		20
14	RFDB1_VALUE	112	Fix		112
15	RFDB2_VALUE	200	Fix		200
16	RFDB3_VALUE	500	Fix		500

7. Video Adjust 6

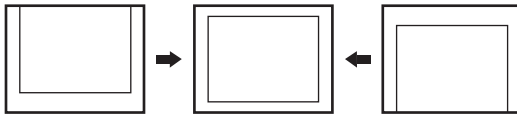
No	Item	Initial Data	Var/Fix	Range	Adjust Data	
					DTV/480p/ 720p/1080i	NT(Analog)/VIDEO SVIDEO/480i
1	ALPHAL	128	Fix	0 ~ 255	128	128
2	ALPHAU	128	Fix	0 ~ 255	128	128
3	CE_CUTOFF	32	Fix	0 ~ 255	32	32
4	CE_UPPER	220	Fix	0 ~ 255	220	220
5	CE GainMax L	160	Fix	0 ~ 255	160	160
6	CE GainMax U	160	Fix	0 ~ 255	160	160
7	GAIN1X	16	Fix	0 ~ 63	16	16
8	GAIN1Y	8	Fix	0 ~ 63	8	8
9	GAIN2X	8	Fix	0 ~ 63	8	8
10	GAIN2Y	4	Fix	0 ~ 63	4	4
11	GAIN3X	1	Fix	0 ~ 63	1	1
12	CORING_ON	1	Fix	0 ~ 1	1	1
13	CORING_TH1	2	Fix	0 ~ 7	2	2
14	CORING_TH2	1	Fix	0 ~ 7	1	1
15	CORING_TH3	1	Fix	0 ~ 7	1	1
16	SD3_K	8	Fix	0 ~ 255	8	8
17	Skin_X	24	Fix	0 ~ 63	24	24
18	Skin_Y	29	Fix	0 ~ 63	29	29
19	SCALE_R	75	Fix	0 ~ 255	75	75
20	SCALE_ALPHA	140	Fix	0 ~ 255	140	140
21	Gamma On	0	Fix	0 ~ 7	0	0
22	Dither Mode	0	Fix	0 ~ 7	0	0
23	NDON	1	Fix	0 ~ 1	1	1
24	NEOnDE	1	Fix	0 ~ 1	1	1
25	NEOnCE	1	Fix	0 ~ 1	1	1
26	RTH2	10	Fix	0 ~ 15	10	10
27	Sub_Contrast	128	Fix	0 ~ 255	128	128
28	Sub_Brightness	0	Fix	0 ~ 255	0	0

8. Option

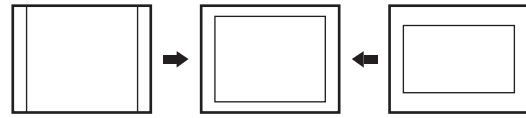
No	Item	Initial Data	Var/Fix	Range	Adjust Data	
					Korea	America
1	Anynet Enable	On	Var	On/Off	On	On
2	DNle	Off	Var	On/OFF/Demo	Demo	Off
3	Panel Key	Enter	Var	Enter/Mute	Enter	Enter
4	LNA	On	Var	On/Off	On	Off
5	DVI	Off	Var	On/Off	Off	On
6	V-CHIP	USA	Var	Off/USA/USA+C	Off	USA

2-3 Screen Change (When adjusting I2C Bus Geometric items)

1 V SHIFT



6 V SIZE



2 V LINEARITY



7 V - S - CORRECTION



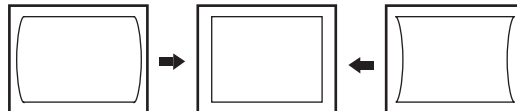
3 H SIZE



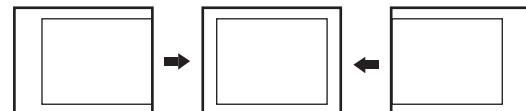
8 PIN PHASE



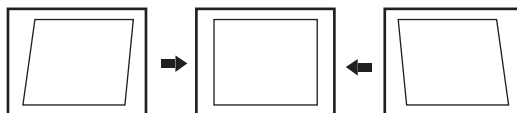
4 PIN AMP



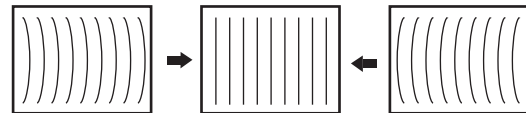
9 H SHIFT



5 V ANGLE



10 V BOW



2-4 Other Adjustments



2-4-1 Screen Adjustment

1. Warm up the TV for at least 30 minutes.
 2. Select the "STANDARD" Video Mode.
 3. Turn to the Video Mode (No Signal) using a remote-control.
 4. Connect an oscilloscope to RK,GK,BK.
 5. Adjust the VR Screen (in the Focus Pack) to have 20VP-P for the RK, GK and BK pulse.
(Turn the R, G and B VR screen fully counterclockwise at each flyback line.)
- ※ Voltage adjustment can't be done using a normal multi-tester. For adjustment, use an oscilloscope.
The voltage shown by the tester is false data because the AC peak to peak voltage is adjusted under DC conditions.

2-4-2 White Balance Adjustment

1. Select the "STANDARD" Video Mode.
2. Input 100% white pattern.
3. In the stand-by mode, press the remote-control keys in the following sequence:




4. Warm up the TV for at least 30 minutes.
5. Input a 10-step signal.
6. R-cut off, B-cut off, and G-cut off by pressing the  keys.
7. Adjust the low light with viewing the dark side of the screen.
8. Select R-drive, G-drive, and B-drive by pressing the  keys.
9. Adjust the high light with viewing the light side of the screen.
10. If necessary, redo screen adjustments and 6~9.
11. Press the Add key to exit.

2-4-3 Sub-Brightness Adjustment

1. Input a sub-brightness adjustment signal. (TOSHIBA PATTERN)
2. In the stand-by mode, press the remote-control keys in the following sequence :



3. Select SBT by pressing the  keys.
4. Adjust so that the 63 step on the right side of the screen is not seen (Use the keys).
5. Press the Menu key to exit.

2-4-4 Static Focus Adjustment

Precaution

1. Select the "STANDARD" video mode.
2. Input a crosshatch pattern.
3. Cover the lenses that are not being adjusted.
4. Connect a convergence jig and read data.
5. Adjust the lens for best focus. (See Fig, 2-1)

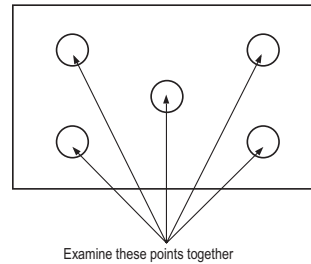


Fig. 2-1 Crosshatch Pattern.

Static Focus (continued)

Vary the focus pack VR (Red, Blue) on the front cabinet. Adjust the TV for best possible focus around the center of the crosshatch pattern, without losing overall screen balance. Figure Crosshatch Pattern Examine these points together.

2-4-5 Lens Focus Adjustment

1. Preparation
 - ① Set the Screen to "STANDARD". (Contrast : 100 / Brightness : 50)
 - ② Set the pattern to Crosshatch.
 - ③ Adjust the electric focus before beginning.
 - ④ Adjust the DY tilt (TILT) before beginning.
2. How to Adjust (Green Lens Adjustment)
 - ① Loosen the lens screw for easier adjustment.
 - ② Press Mute, 1, 8 and 3, sequentially to enter Convergence Mode.
 - ③ Display only the Green pattern by using the +100, 0, and Previous Channel Keys in order to turn the R, G, and B patterns On/Off respectively.
 - ④ Turn the Green Lens clockwise/Counterclockwise to adjust for optimum status. (Repeat if unsuccessful, varying the VR of the front Focus Pack.)
 - ⑤ Perform steps 1~3 for the R and B Lenses.
3. Note

Green determines picture quality; pay close attention for exact adjustment.

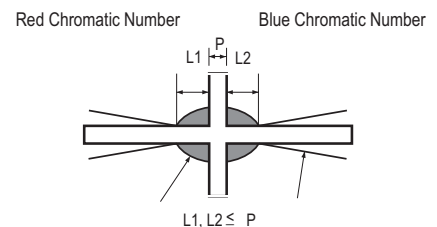
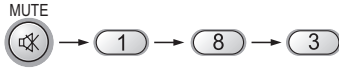


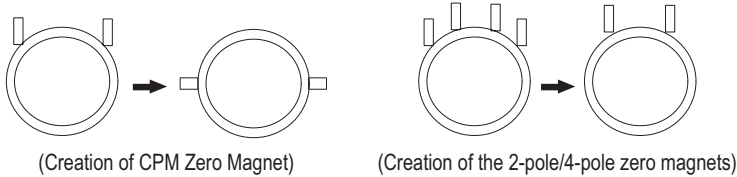
Fig. 2-2 Color Aberration

2-5 Beam Alignment Adjustments

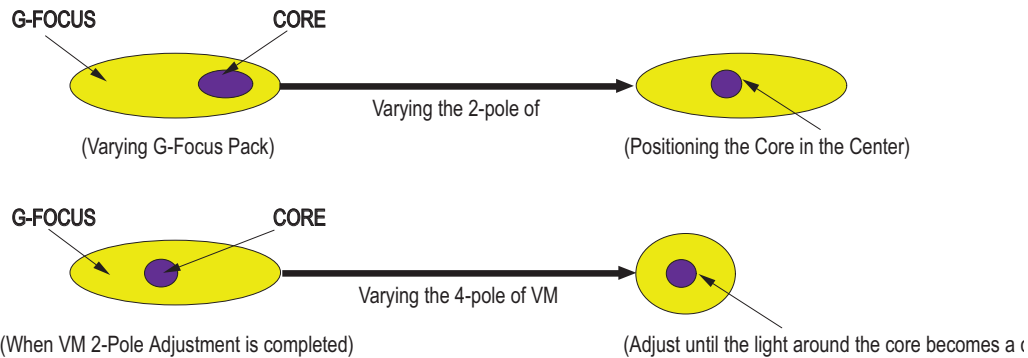
1. Select the "STANDARD" Video Mode.
2. Warm up the set at least for 10 minutes.
3. Enter the Convergence mode by pressing the remote control buttons in the following sequence.



4. Set the Beam Alignment Adjustment CY to Zero magnetic field area.



5. Press the 7- digit button for a while, on the remote control, and a vibrating dot-pattern appears.
6. Adjust the Focus-pack VR for defocusing.
7. Mute the other patterns (R/B) other than G-PATTERN. (Use "+100" / "PRE-CH" Key on the remote control.)
8. Adjust the 2, 4 polarities of VM-COIL as shown in figure below.
9. Adjust the G-Focus until any light around the core disappears.
10. Adjust G-Focus so that the surrounding flash can disappear from the spot.

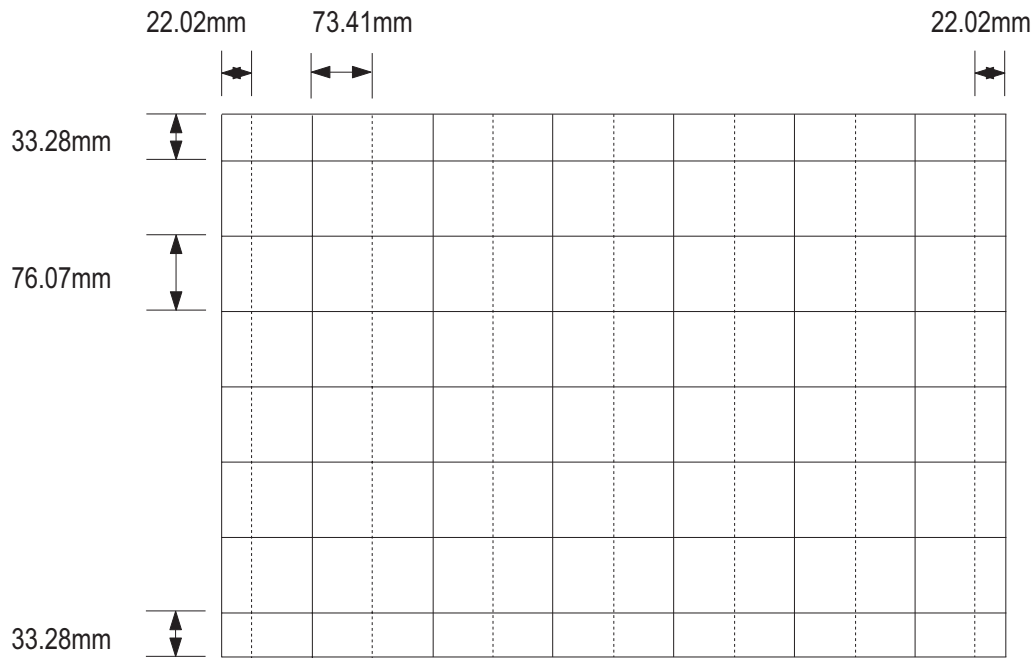


11. After G-Focus adjustments are complete, adjust R-Focus as above procedures.
12. The B-CRT adjustments can be omitted because the variance of beam focus is small. (Only Vm-coil is mounted.)
13. Adjust the Focus-pack VR for fine focusing.
14. Press the 7- digit button for a while, on the remote control, and the mode changes to the Convergence Adjustment mode.
15. Press the "S.MODE" Key on the remote control to return to normal viewing.

2-6 Convergence-Jig

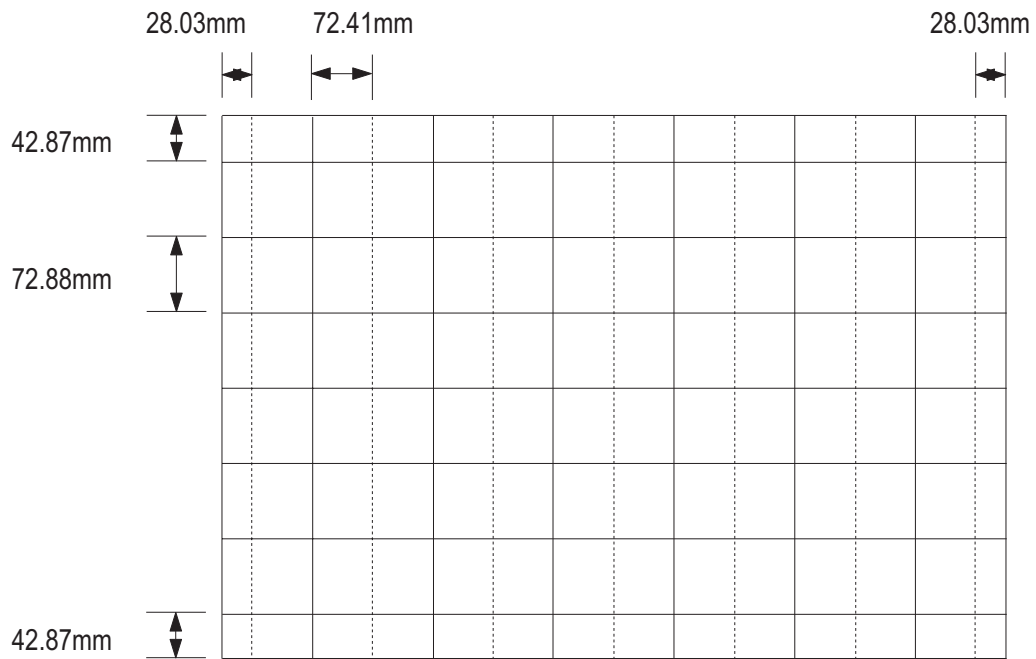
2-6-1 4245W RF Mode

Screen Size : X 925, Y 523 (X: 378 = 9*2 + 30*12 , Y:440=28* 2+64* 6)

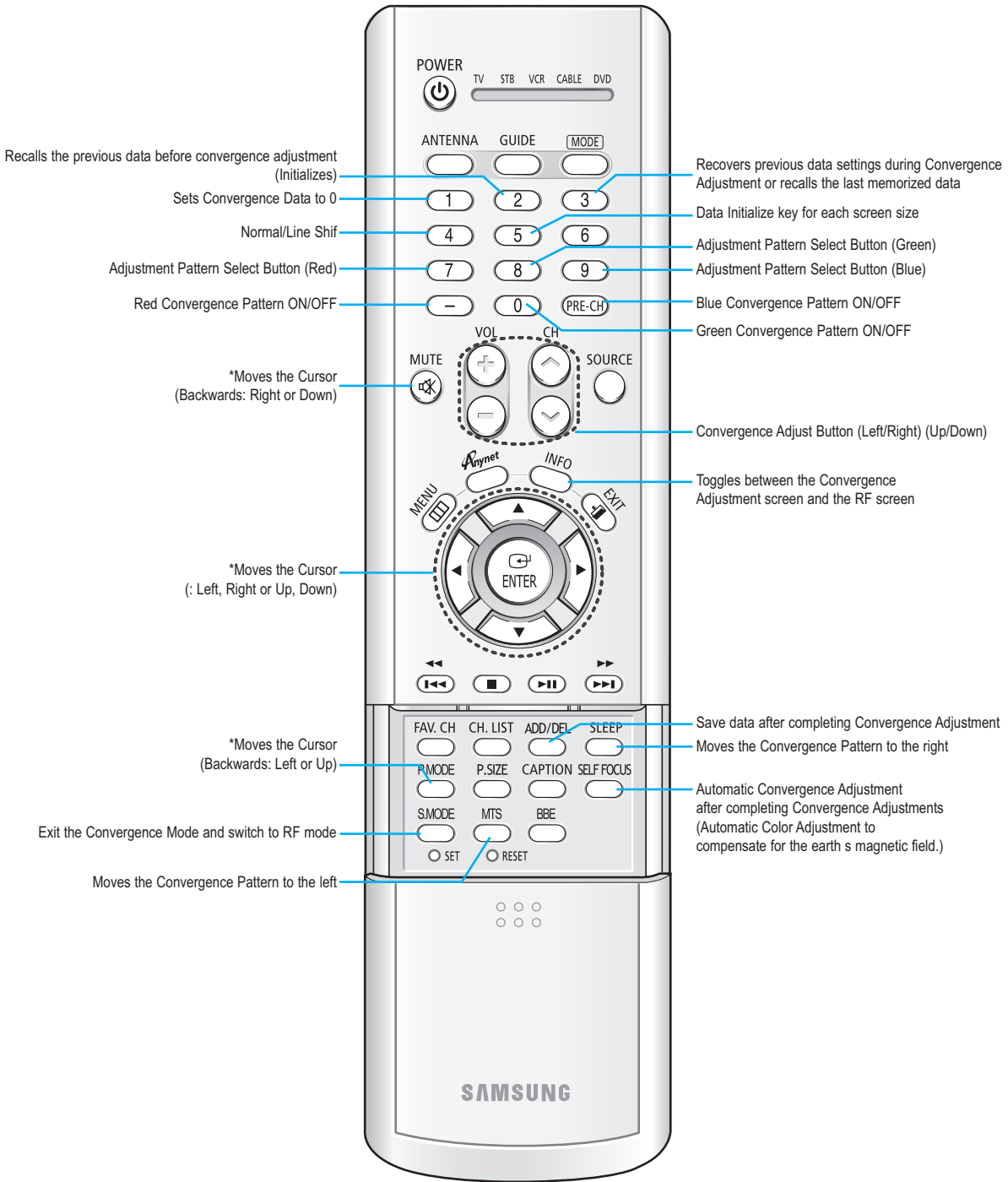


2-6-2 4245W DTV Mode

Screen Size : X 925, Y 523 (X: 396 = 12*2 + 31* 12, Y : 488= 40* 2+68* 6)



2-7 Remote Control Key Functions in Convergence Mode



2-8 Pin Assign

2-8-1 Micom Block

Pin #	Pin Assign	Pin #	Pin Assign
1	WP	52	POWER
2	SCL-E2PROM	51	MICOM-D6
3	SDA-E2PROM	50	MICOM-D5
4	BUS-STOP	49	MICOM-D4
5	SDA-MICOM	48	MICOM-D3
6	SCL-MICOM	47	MICOM-D2
7	N.C	46	MICOM-D1
8	N.C	45	MICOM-D0
9	VDD 2.5V	44	VDD 3.3V
10	GND	43	GND
11	VDD 3.3V	42	VDD 2.5V
12	CAPTION-CVBS	41	N.C
13	VDDA 2.5V	40	N.C
14	GND	39	N.C
15	N.C	38	N.C
16	N.C	37	VDDA 2.5V
17	KEY2	36	GND
18	KEY1	35	XTAL-OUT
19	HSYNC	34	XTAL-IN
20	VSYNC	33	RESET
21	KEY3	32	N.C
22	5V-INT	31	N.C
23	PROTECT	30	VDD 3.3V
24	IR	29	GND
25	STB-LED	28	MICOM-INT
26	TIMER-LED	27	CPU-nRESET

2-8-2 Convergence Module

CN01			
PIN NAME	PIN	PIN	PIN NAME
N.C	1	32	GND
GND	2	31	5V
Dynamic-Fcous	3	30	-5V
GND	4	29	N.C
D2(SCL)	5	28	GND
D1	6	27	V-BLK
GND	7	26	H-BLK
C-SYNC	8	25	GND
R	9	24	RH
G	10	23	RV
B	11	22	GH
D3(SDA)	12	21	GV
N.C	13	20	BH
IR	14	19	BV
F-BLK	15	18	GND
GND	16	17	GND

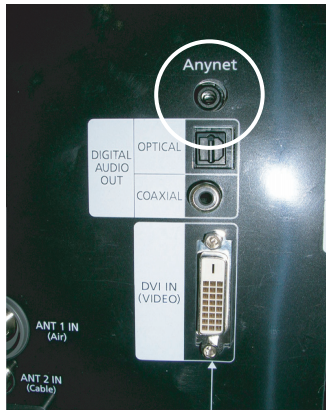
CN02	
PIN	PIN NAME
1	GND
2	5V
3	UP
4	GND
5	5V
6	Right
7	GND
8	5V
9	Left
10	GND
11	5V
12	Down

2-8-3 DTV Module

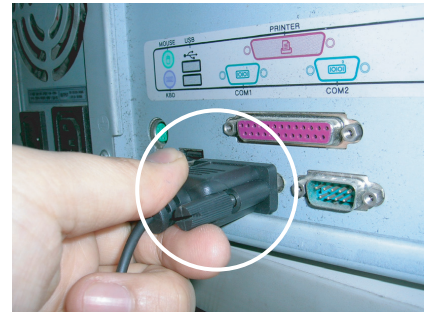
CN100			
Pin #	Pin Assign	Pin #	Pin Assign
1	SDA-CH	25	AGC-SW
2	SCL-CH	26	BUS-STOP
3	NC	27	TS-VLD
4	NC	28	GND
5	NC	29	TS-SYNC
6	DVI-ID	30	GND
7	NC	31	TS-CLK
8	GND	32	GND
9	TS-DATA7	33	NC
10	TS-DATA6	34	NC
11	TS-DATA5	35	AMP-MUTE
12	TS-DATA4	36	CPU-nRESET
13	TS-DATA3	37	S-RESET
14	TS-DATA2	38	NC
15	TS-DATA1	39	12V
16	TS-DATA0	40	GND
17	GND	41	GND
18	DTV-Y	42	STB-5V
19	DTV-PB	43	STB-5V
20	DTV-PR	44	GND
21	GND	45	GND
22	DTV-HSO	46	3.3V-D
23	DTV-VSO	47	3.3V-D
24	GND	48	3.3V-D

CN101			
Pin #	Pin Assign	Pin #	Pin Assign
1	SCL-CG	25	SCL-M5
2	SDA-CG	26	SDA-M5
3	2RF-SW	27	GND
4	TU-RST	28	GND
5	GND	29	COMP2-Y
6	AUD-SDATAO	30	COMP2-PB
7	GND	31	COMP2-PR
8	AUD-SCLK	32	GND
9	AUD-LRCLK	33	NC
10	GND	34	GND
11	NC	35	MAIN-C
12	NC	36	GND
13	GND	37	MAIN-Y/C
14	COMP1-Y	38	GND
15	COMP1-PB	39	GND
16	COMP1-PR	40	DTV-CVBS
17	GND	41	GND
18	NC	42	SCL-MICOM
19	GND	43	SDA-MICOM
20	NT-SOUND-L	44	GND
21	NT-SOUND-R	45	XTAL-ON/OFF
22	VOLT-DET	46	GND
23	NC	47	5V
24	NC	48	5V

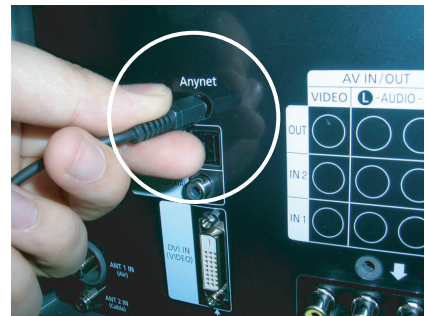
2-9 Firmware Upgrading Method using Anynet port



Using Serial cable

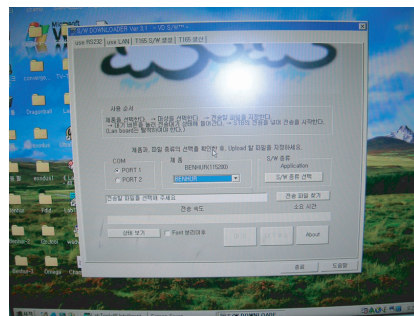


Connecting Serial cable to PORT1 or COM1 port of your PC

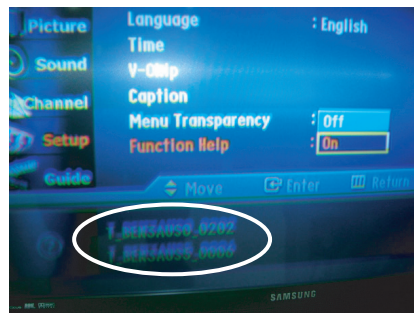


Connecting Serial cable to Anynet port of Terminal Board

After upgrading is finished, Turn Off and turn on the TV by using AC-CORD



Firmware upgrade using your Upgrading Tool



Activating Function Help in the OSD Menu, and pressing Display key in the remote control.
Confirm your final S/W version