# Adjustment instruction

At any input source then press the "Mute" (Remote control) and External Manual key to enter factory mode
During Factory menu, if "Mute" (Remote control) key is pushed, system will exit factory mode.
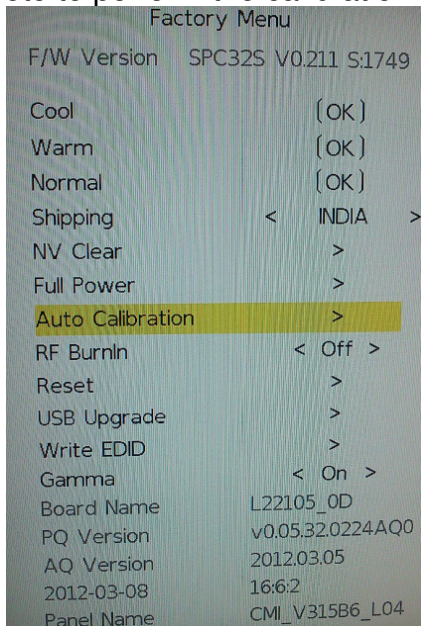
4-1. Source Calibration

4-1.1. Follow Compal provided auto adjustment tool or refer below process if no tool.
Set the generator to input the source Component on LCD-TV AV1.
The Generator ASTRO-859 or equal equipment set on Timing 720p color bar of 100%.
ASTRO setting:
  Timing: PG2 940 720p/60 or 50Hz, Pattern: PG2 924 NTSC Color bar 100% as below picture.
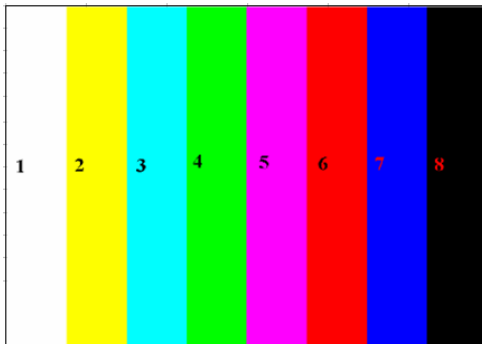
Color Bar 100/100-H									
		1	2	3	4	5	6	7	8
Y	mV	700					147	47	0
Pb	mV	0					-81	350	0
Pr	mV	0					350	-34	0
Y	16 to 235	235					62	31	16
Cb	16 to 240	128					102	240	128
Cr	16 to 240	128					240	117	128

4-1.2. Press the up or down key on remote controller to select the Auto Calibration icon with press the key ">" on remote to perform the calibration.
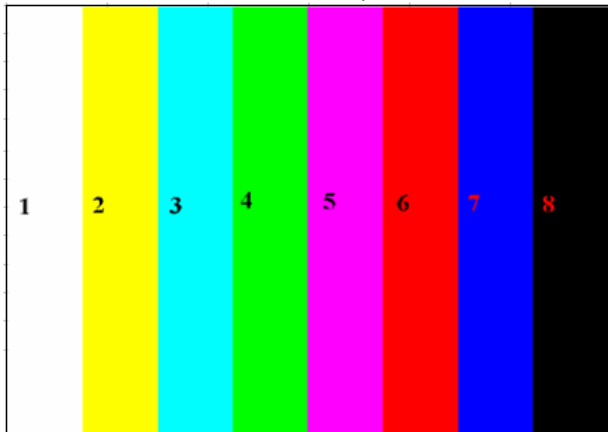
The calibration performing is automatically, when show the OK means finish.
Repeat 4-1.2 for VGA source calibration.
Astro-859 or equal equipment is set on timing 1024x768 60Hz, Pattern color bar below
ASTRO setting:
Timing: PG2 963 1024*768/60Hz, Pattern: PG2 924 NTSC Color bar 100% as below picture.

		1	8
R	mV	700	0
G	mV	700	0
B	mV	700	0

4-2. Color Temperature Adjustment & Check

4-2.1   Set the signal generator to HDMI 720p full white pattern, into LCD-TV HDMI IN.
ASTRO-859 or equal equipment, PG2 timing 857, pattern 956,
The adjustments that G gain and G Offset is keep always 512 without change.
Only adjust the R and B with gain and offset.

4-2.2   Press the up or down key on remote controller to select the Cool first.
Press "OK" key to enter adjusts items.
Firstly adjusts the Offset on signal level 30IRE(77/255) with R Offset and B Offset for
in spec as below table.
Secondly, adjusts the Gain on signal 70IRE(179/255) with R Gain and B Gain for in
spec as below table.
Repeat to 30IRE and next 70IRE adjustments for meet 30/70 IRE spec as below table.

	Cool
R Gain	532
G Gain	512
B Gain	552
R Offset	496
G Offset	512
B Offset	501

Specification

Model	Color	x	y	Signal Level
SPC22S SPC32S SPC32P SPC42P	Temperature			
	Cool	0.273	0.28	70IRE
		0.274	0.284	30IRE
	Normal	0.289	0.306	70IRE
		0.291	0.306	30IRE
	Warm	0.318	0.331	70IRE
		0.322	0.325	30IRE
	Tolerance = +/-0.005			

4-2.3. Select 「Warm」

Step 1.First Turning Gain parts of RGB.
    (1) Warm spec.:
        x= 0.318±0.005
        y= 0.331±0.005
    (2) If the x and y value are larger than specification,
        Decrease R GAIN drive from default value.
        Increase B GAIN drive from default value

    (3) If the x or y or both x and y value is/are smaller than specification.
        Decrease B GAIN drive from default value

    (4) According to a x and y value, please following adjustment of (4)-1 or (4)-2.
            (4)-1 If x value is higher than spec
                Decrease R GAIN drive from default value.
                Increase B GAIN drive from default value.
            (4)-2 If y value is higher than spec,
                Decrease B GAIN drive from default value
Step 2.When finish Gain parts, then turning OFFSET parts

    Select 「Normal」
    (1) Medium spec.: (Same as the Gain session)
        x= 0.289±0.005
        y= 0.306±0.005
    (2) If the x and y value are larger than specification,
        Decrease R OFFSET drive from default value.
        Increase B OFFSET drive from default value.
    (3) If the x or y or both x and y value is/are smaller than specification.
        Decrease B OFFSET drive from default value
    (4) According to a x and y value, please following adjustment of (4)-1 or (4)-2.
            (4)-1 If x value is higher than spec
                Decrease R OFFSET drive from default value.
                Increase B OFFSET drive from default value.
            (4)-2 If y value is higher than spec,
                Decrease B OFFSET drive from default value
                Step 3.When finishing OFFSET parts, then recheck Gain parts .unitl Both of them meet the
                target specification.
Step 3. Than select 「Cool」 using same way to adjust the setting.
        x= 0.273±0.005
        y= 0.280±0.005

4-2.4. Exit Factory Mode:
After finish adjusting color temperature press [MENU] to exit factory mode.

(5) Items of Factory menu

When in PC/ Component/ Video (Composite)/ ANT inputs then press the **[MUTE] key by remote control and press [MENU] key by side key over 2 sec** to enter factory mode.
During Factory menu, if **[EXIT]** key is pushed, system will exit factory mode.
Press up and down key can move high light item from **Color Temperature -> Shipping -> NV Clear -> Full Power -> Auto Calibration -> RF Burn In -> Reset -> USB Upgrade -> Write EDID -> Gamma.**
Push **[OK] or [>]** key can select high light item function. (Press left and right can adjust value)
Display model name, firmware version and released date on top.
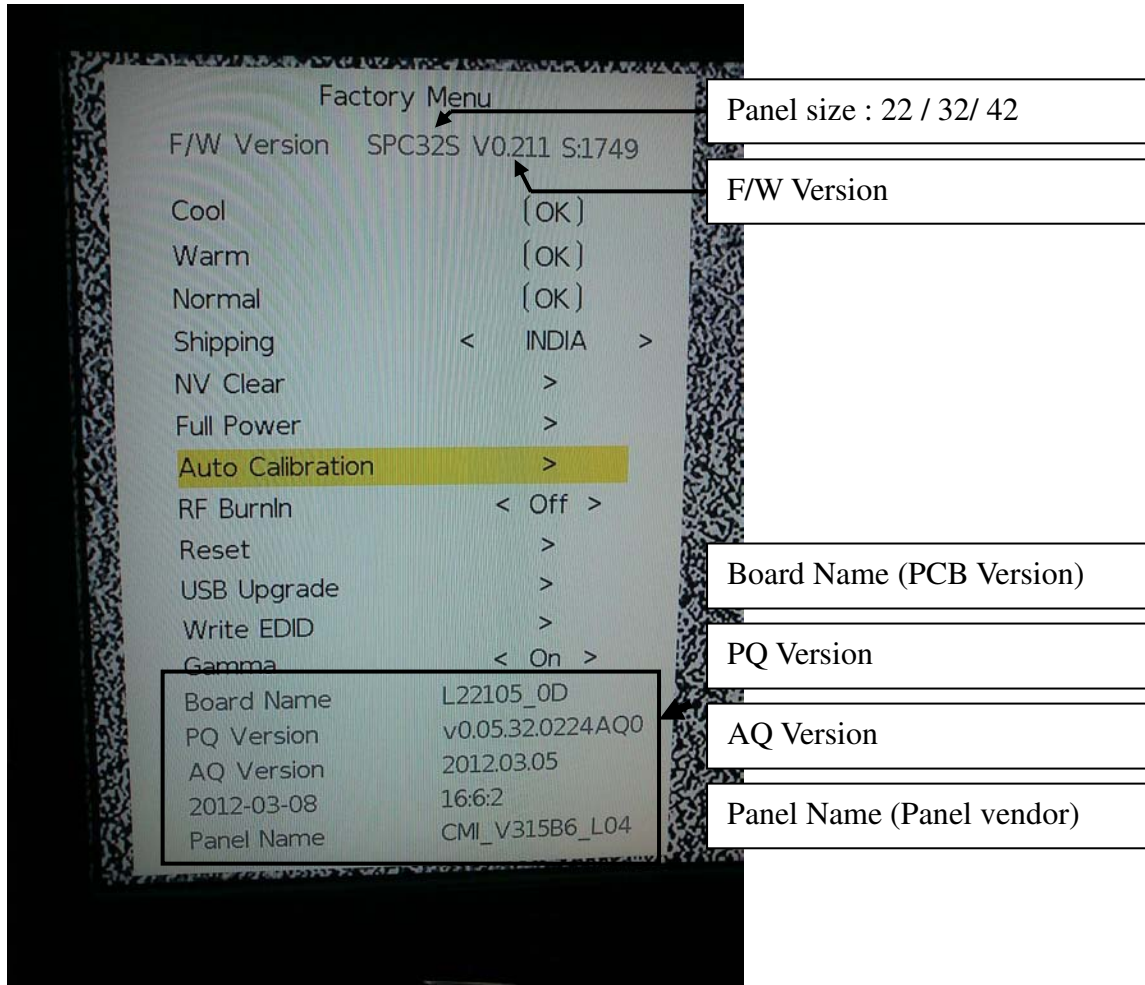
1) Factory Color Temp data edit
   Press up or down key can select high light item function
   Press enter key to enter the item.
   -Color temp default preset No (Warm, Medium, Cool).
   -R, G, B data for each preset
   Press "Up" or "Down" key to select "R", "G", "B" item
   Press "Left" or "Right" key to set the "R", "G", "B" value
   Press "MENU" or "EXIT" item to exit to factory mode

2) Shipping mode
   Select shipping country then "Reset" for into shipping mode.

3) NV CLEAR

Initialize program's default values to NVRAM for following adjustment items accuracy.

In factory mode it is the first and important step to make sure all values are default value and correct

- Reset settings: Gamma table, Channel table (Favorite channel, Channel label etc.), Model table (H/V Position, Clock, Phase), Source dependent setting (Contrast, Brightness etc.), Common setting (Volume, Language etc.), Parental Control (Rating, Password etc), Closed Caption.

To avoid a mistake initial process after factory setting is done. This item will have a check dialog "yes or no" to do the initial or not.

4) Full power
This is for power consumption testing.
To measure the maximum power consumption of TV set, we adjust the value of following items to maximum.
- Video: Contrast maximum value, Brightness maximum value, Backlight maximum value.
- Audio: Volume maximum value, Bass default value, Treble default value.
Press enter key to turn on Full Power and OSD stay display until press enter key to recover from Full Power.

5) Auto Calibration
Source Calibration (gain/offset) must be adjusted color by firmware automatic adjustment in PC, Composite and Component input source.
This item will have a result dialog "OK" or "NG".

6) RF Burn In
Use "snow" pattern for burn in. Selected items are "On" and "Off".
While turn on burn in mode, firmware will automatically turn off "Auto power off" function.
If there is no power supply suddenly, firmware will re-enter burn in mode automatically when power supply is back
Pressed the "Power" key, firmware will automatically turn off burn in mode.
Burn in mode: Source is "ANT/Cable" and channel is NTSC channel 3.

7) Reset
Reset all settings of OSD menu to default value.
- Reset settings: Channel table, Model table (H/V Position, Clock, Phase), Source dependent setting (Contrast, Brightness etc.), Common setting (Volume, Language etc.), Parental Control (Rating, Password etc), Closed Caption.

8) USB Upgrade
Upgrade firmware through USB.

9) Write EDID
Write EDID into VGA and HDMI EEPROM.
This item will have a check dialog "yes or no" to do the initial or not.
10) Gamma
For factory test value of gamma.

(6) Performance check

6-1 TV function
Connect RF to the center signal source, enter Channel menu → auto tuning, check if there are channels be skipped, check if the picture and speaker are normal.

6-2 AV terminals
Input Video signal, check if the picture and sound are normal.

6-3 YPbPr terminal
Input YUV signal (VG859 signal generator), separately input the YUV signals listed in table4 and check if the display and sound are normal at any situation (power on, channel switch and format convert, etc.)

Table4 YUV signal format

MODE	FREQ	PERIOD	SYNC POLARITY	PIXEL CLOCK	Display	SYNC WIDTH	BACK PORCH
	LINE(kHz) FRAME (Hz)	LINE (pixel) FIELD (lines)	LINE FIELD	(MHz)	LINE (pixel) FRAME (lines)	LINE (pixel) FRAME (lines)	LINE (pixel) FRAME (lines)
	15.734	1716	Negitive	27	1440	124	114
59.94Hz 720x480i	59.94	525	Negitive		480	3	15
	31,469	858	Negitive	27	720	62	60
59.94Hz 720x480P	59.94	525	Negitive		480	6	30
	45	1650	Positive	74.25	1280	40	220
60Hz 1280x720P	60	750	Positive		720	5	20
	33.75	2200	Positive	74.25	1920	44	148
60Hz 1920X1080i	60	1125	Positive		1080	5	15
	67.5	2200	Positive	148.5	1920	44	148
60Hz 1920X1080P	60	1125	Positive		1080	5	36

6-4 VGA terminal

Input VGA signal (VG848 signal generator), separately input the signals listed in table5 and check the display and sound. If the image is deflection of the Horizontal and vertical, select Menu->Setup->Auto Adjust to perform auto-correct.

Table5 VGA signal format

Mode	FREQ	PERIOD	SYNC POLARITY	PIXEL CLOCK	Display	SYNC WIDTH	BACK PORCH
	LINE(kHz) FRAME(Hz)	LINE (pixel) FIELD(lines)	LINE FIELD	(MHz)	LINE (pixel) FRAME(lines)	LINE (pixel) FRAME (lines)	LINE (pixel) FRAME (lines)
VGA 60Hz	31.469	800	Negative	25.175	640	96	40
640x480	59.941	525	Negative		480	2	25
SVGA 60Hz	37.879	1056	Positive	40	800	128	88
800x600	60.317	628	Positive		600	4	23
XGA 60Hz	48.363	1344	Negative	65	1024	136	160
1024x768	60.004	806	Negative		768	6	29
WXGA 60Hz	47.776	1664	Negative	79.5	1280	128	192
1280x768	59.87	798	Positive		768	7	20
WXGA 60Hz	47.712	1792	Positive	85.5	1360	112	256
1360x768	60.015	795	Positive		768	6	18

6-5 HDMI terminal

Input HDMI signal (VG859 signal generator), separately input the signals listed in table6 and check the display and sound (32 KHz, 44.1 KHz, 48 KHz) at any situation (power on, channel switch and format convert, etc.)

Table6 HDMI signal format

FREQ	FREQ	PERIOD	SYNC POLARITY	PIXEL CLOCK	Display	SYNC WIDTH	BACK PORCH
MODE	LINE(kHz) FRAME(Hz)	LINE (pixel) FIELD(lines)	LINE FIELD	(MHz)	LINE (pixel) FRAME (lines)	LINE (pixel) FRAME (lines)	LINE (pixel) FRAME (lines)
VGA 60Hz	31.469	800	Negitive	25.175	640	96	40
640x480	59.94	525	Negitive		480	2	25
SVGA 60Hz	37.879	1056	Positive	40	800	128	88
800x600	60.317	628	Positive		600	4	23
XGA 60Hz	48.363	1344	Negitive	65	1024	136	160
1024x768	60.004	806	Negitive		768	6	29
WXGA 60Hz	47.776	1664	Negitive	79.5	1280	128	192
1280x768	59.87	798	Positive		768	7	20
WXGA 60Hz	47.712	1792	Positive	85.5	1360	112	256
1360x768	60.015	795	Positive		768	6	18
59.94Hz 720x480i	15.734	1716	Negitive	27	1440	124	114
	59.94	525	Negitive		480	3	15
59.94Hz 720x480P	31.469	858	Negitive	27	720	62	60
	59.94	525	Negitive		480	6	30
60Hz 1280x720P	45	1650	Positive	74.25	1280	40	220
	60	750	Positive		720	5	20
60Hz 1920X1080i	33.75	2200	Positive	74.25	1920	44	148
	60	1125	Positive		1080	5	15
60Hz 1920X1080P	67.5	2200	Positive	148.5	1920	44	148
	60	1125	Positive		1080	5	36
24Hz 1920x1080P	27	2750	Positive	74.25	1920	44	148
	24	1125	Positive		1080	5	36

6-6 other functions check

a)   Check the turn on/turn off timer, sleep timer, picture/sound mode, OSD, stereo and analog TV Teletext, etc.

(7) USB Software updated

(1) Plug the USB with the firmware file named .
(2) Into Factory mode & select USB upgrade , USB upgrade message would appear automatically.
(3) Select Yes, and then start the upgrading.
(4) Upgrading is starting, please wait for the progress finish.
(5) When the progress completed, press Remote power on .

Working principle analysis of the unit

1. PAL/SECAM and NTSC signals flow:
Antenna reception, B/G, I, D/K, signal will be send to tuner M40CPT-2PNB-E_1, then Tuner will be demodulating and output standard video signal TV-CVBS, and sound SIF signal.
TV-CVBS will send to the master control IC SPV7168Mx to video decode, de-interlace and scaler, then output LVDS level drive for panel display.
The sound IF (SIF) will be fed into SPV7168Mx, after demodulating, pre-amplifying, bass adjusting and volume control, the sound signal will be output two ways, one way will be transform into digital I2S signal and sent to digital amplifier TAS5707, then sent to speaker, another will be sent analog sound signal to earphone amplifier TPA6132.

2. Composite & Component signal flow
Composite & Component signal path AV signal switch by menu "Setup"->"Video1" Input fed to SPV7168Mx, to perform video decode, de-interlace and scaler, then output LVDS drive level for panel display.
Audio signal from Composite terminal via matched resistance is fed to SPV7168Mx, to bass adjust and volume control, the sound signal will be output two ways, one way will be transform into digital I2S signal and sent to digital amplifier TAS5707, then sent to speaker, another will be sent analog sound signal to earphone amplifier TPA6132.

3. PC signal flow
PC signal via terminal socket sent to SPV7168Mx, output R/G/B of 24 bit to back end module to decode, and image scale, then send to LVDS level drive for panel display.
Sound signal of PC terminal via matched resistance and sent to SPV7168Mx, to bass adjust and volume control, the sound signal will be output two ways, one way will be transform into digital I2S signal and sent to digital amplifier TAS5707, then sent to speaker, another will be sent analog sound signal to earphone amplifier TPA6132.

4. HDMI signal flow
One HDMI video signals are directly fed to the master control IC SPV7168Mx, to digital decode, image scale, then output LVDS drive level for panel display. HDMI audio signal via decoder built-in SPV7168Mx, to bass adjust and volume control, the sound signal will be output two ways, one way will be transform into digital I2S signal and sent to digital amplifier TAS5707, then sent to speaker, another will be sent analog sound signal to earphone amplifier TPA6132.

5. Multimedia signal flow
Multimedia signal via USB connector   sent to SPV7168Mx, then output R/G/B of 24 bit to back end module to Video decode, de-interlace and image scale, then send to LVDS level drive for panel display.
Sound signal of Multimedia signal sent to SPV7168Mx, to bass adjust and volume control, the sound signal will be output two ways, one way will be transform into digital I2S signal and sent to digital amplifier TAS5707, then sent to speaker, another will be sent analog sound signal to earphone amplifier TPA6132

APPENDIX

SPECIFICATIONS

SPECIFICATIONS

Maximum Visible Range

22" : (H)477×(V)268 mm

32" : (H)698×(V)392 mm

Picture Resolution

1366 X 768 pixels

Voltage

AC 110-240V, 50/60Hz

Power rating

22" : 52 W

32" : 97 W

Stand by condition

0.6W

Colour System

PAL/NTSC3.58/NTSC4.43/SECAM

Sound System

D/K, I, M, B/G

Channel Coverage

VHF Low band: 48.25~144.25 MHz

VHF High band: 145.25~420.25 MHz

UHF band: 421.25~863.25 MHz

Sound specialty

Maximum Output Power

22" : 3W+3W(10% THD)

32" : 5W+5W(10% THD)

Input terminals

Other	PC	1
	HDMI / DVI	1
	RF	1
	USB	1
AV1	AV / COMPONENT	1
	AV / COMPONENT Audio	1
AV 2	AV	1
	AV Audio	1
AV 3	AV	1
	AV Audio	1

Output terminals

Audio out	HeadPhone
1	1

APPENDIX

SPECIFICATIONS

Dimensions

22"

(Including Pedestal) :

543(W) x 390(H) x 164(D) mm

(Without Pedestal) :

543(W) x 348(H) x 63(D) mm

32"

(Including Pedestal) :

779(W) x 545(H) x 250(D) mm

(Without Pedestal) :

779(W) x 494(H) x 107(D) mm

Net Weight (Including Pedestal)

22" : 5 kg

32" : 10 kg

Operating Environment

Temperature: 0°C to 40°C

Humidity: 20 % to 80 %

• Specifications are subject to change without notice.

• The On-Screen Menu and figures in this manual may differ slightly from the product.