Adjusting Description

1.　Adjusting item

(1)　Parameters adjusted via I^{2}C bus and the items set via I^{2}C bus

The parameters adjusted via I^{2}C bus and items set via I^{2}C bus are all included in the following tables related to adjustment.

Method to enable D-mode:

Press 'D-mod' key on the factory-default R/C, the character 'D' in red displays on the right up screen.

Method to enable S-mode:

Press the 'VOL-' key on the panel until the volume is set to 00, at the same time hold the DISPLAY button on the R/C, on the right up screen will display the character 'C' in red.

Method to exit S-mode（or D-mode）:

Press the POWER button on main unit to turn off the TV and turn on the TV again.

The adjusting item in U-mode (operation for watching TV) is operated according to the owner's manual.

E^{2}PROM has been adjusted and set in the factory. If there's no necessary, don't change and initialize the data as one likes.

Table 1

1)　Contrast Unit

CNTX	MENU 8	0~3FH	Max. Contrast level (Max. Y peak—peak value) control
CNTC	MENU 9	0~3FH	Sub contrast adjustment
CNTN	MENU 8	0~3FH	Min. Contrast level (Min. Y peak—peak value) control
SCNT	MENU 8	0~0FH	Subsidiary contrast adjustment

2)　Brightness Unit

BRTX	MENU 8	0~7FH	Max. Brightness level setting
BRTC	MENU 9	0~7FH	Sub brightness adjustment
BRTN	MENU 8	0~7FH	Min. Brightness level setting
BRTS	MENU 9	0~7FH	SECAM system sub brightness setting
S-R-Y	MENU 6	0~0FH	R－Y blanking level adjustment (SECAM)
S-B-Y	MENU 6	0~0FH	B－Y blanking level adjustment (SECAM)

3)　Chroma Unit

COLX	MENU 8	0~7FH	Max. Color level setting
COLC	MENU 9	0~7FH	Sub color (sub saturation) adjustment (NTSC)
COLN	MENU 8	0~7FH	Min. Color level setting
COLS	MENU 9	0~7FH	SECAM signal's sub color adjustment
COLP	MENU 9	0~7FH	Sub color adjustment (PAL)

4)　Tint Unit

TNTX	MENU 0	0~7FH	Upper limit setting for tint control range
TNTC	MENU 9	0~7FH	Sub tint value adjustment (NTSC)
TNTN	MENU 0	0~7FH	Lower limit setting for tint control range

5) Sharpness Unit

SHPX	MENU 4	0~3FH	Sharpness' upper limit setting
SHPN	MENU 4	0~3FH	Sharpness' lower limit setting
SHPTV3	MENU 4	0~3FH	TV sub sharpness setting (3.58MHZ sub carrier)
SHPAV3	MENU 4	0~3FH	AV sub sharpness setting (3.58MHZ sub carrier)
SHPTV4	MENU 4	0~3FH	TV sub sharpness setting (4.43MHZ sub carrier)
SHPAV4	MENU 4	0~3FH	AV sub sharpness setting (4.43MHZ sub carrier)

6) OSD Unit

TXCX	MENU 0	0~3FH	Max. OSD contrast setting
RGCN	MENU 0	0~3FH	Min. OSD contrast setting
OSD	MENU 0	0~3FH	OSD horizontal adjustment
OSDV50	MENU 2	0~FFH	OSD vertical adjustment (Vertical frequency=50HZ)
OSDV60	MENU 3	0~FFH	OSD vertical adjustment (Vertical frequency=60HZ)

7) Horizon & Vertical Unit

HPOS50	MENU 2	0~1FH	Horizontal centering adjustment (FV=50Hz)
HPOS60	MENU3	0~1FH	Horizontal centering adjustment (FV=60Hz)
VPOS50	MENU 2	0~07H	Vertical centering adjustment (FV=50Hz)
VPOS60	MENU3	0~07H	Vertical centering adjustment (FV=60Hz)
HIGH50	MENU 2	0~3FH	Vertical amplitude adjustment (FV=50Hz)
HIGH60	MENU3	0~3FH	Vertical amplitude adjustment (FV=60Hz)
VLIN50	MENU 2	0~0FH	Vertical linearity adjustment (FV=50Hz)
VLIN60	MENU3	0~0FH	Vertical linearity adjustment (FV=60Hz)
VSC50	MENU 2	0~0FH	Vertical S-correction (FV=50Hz)
VSC60	MENU3	0~0FH	Vertical S-correction (FV=60Hz)
HAFC	MENU 6	0~03H	1/2 AFT data setting

8) Self-adjustment Unit

SELF-ADJ	MENU 10	0~03H	Self-adjustment mode select
PIFAFT	MENU 6	0~FFH	VCO setting, according to PIF-VCO
RFAGC	MENU 6	0~3FH	AGC setting, according to RFAGC
SELF-VCO	MENU 10	0~FFH	VCO self-adjustment object

9) White-balance Unit

RCUT	MENU 1	0~FFH	Red cutoff voltage adjustment
BCUT	MENU 1	0~FFH	Blue cutoff voltage adjustment
GCUT	MENU 1	0~FFH	Green cutoff voltage adjustment
BDRV	MENU 1	0~7FH	Blue drive gain adjustment
GDRV	MENU 1	0~7FH	Green drive gain adjustment

(2)Non bus-controlled adjusting item

The items not adjusted via I^{2}C bus mainly including the B+ voltage adjustment of switched-mode regulated power supply, IF PLL VCO coil adjustment and focusing control.

2. Adjusting Method

(1) B+ voltage adjustment

This adjustment is aiming to make the switched-mode regulated power supply enter in the stabilized power supply status meeting the demands of the design. The circuit design of the switched-mode stabilized power supply ensures that only if the B+ (+112V) voltage adjustment is correct, voltages output from +18V, +8V and +9V will reach within the error range of stabilized voltage simultaneously.

Adjusting procedure:

①Set the control point of VR801 to the central position before switched-on

②Switching in voltmeter at the output point of B+ voltage (the point is between the positive pin of C827 and GND)

③Turn on the TV set, receive the color TV test card signal

④Set the brightness and contrast to 50 (central), the corresponding beam current is about 0.8mA

⑤Adjust VR801 to make the voltmeter reading 112±0. 5V

⑥Disconnect the voltmeter, fix the adjusted point there for VR801

(2) IF VCO adjustment

This adjustment is aiming to enable the oscillation frequency of the IF VCO up to 38.0MHZ or 38.9MHz. (For the chassis with TB1238N, there's no need adjusting the IF VCO)

(3) RF AGC adjustment

This adjustment is aiming to make sure the delayed quantity of RF AGC's starting control. It's usually expected that RF AGC start control to improve the SNR of the complete machine when the IF AGC make the PIF gain drop down to the minimum. The data of RF AGC is stored in E^{2}PROM and has been well adjusted before the chassis leaves the factory. Generally speaking, it's unnecessary to adjust RF AGC when checking & repairing. If it should be adjusted for some reason, do it in line with the following principles: when receiving the local channel with the strongest TV signal, provided that there's no distortion in picture, do the adjustment to find out the minimal value of RF AGC voltage. The RF AGC voltage output from TB1238N is adjustable within the range of 0.2~9V, its optimum voltage setting is related to the adopted tuner. For example, the high-frequency gain is the maximal when the AGC voltage of TELE4-801A is at about +4.0±0.1V. So in order to enable the tuner operating on the mode that the high-frequency gain is the maximal, the voltage of RF AGC should be at 4V or so.
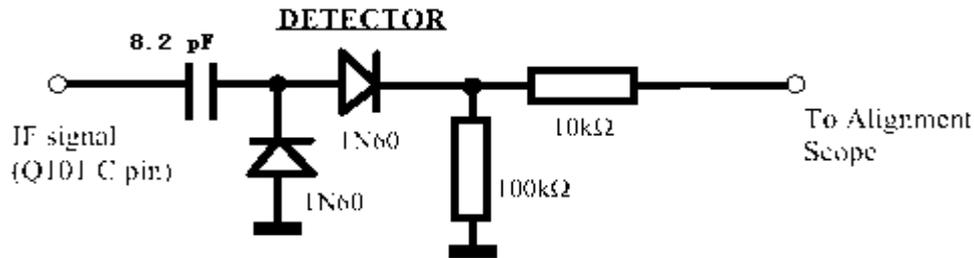
With applying a 471.25MHz RF signal (amplitude > 70dB), adjust RFAGC to set the voltage peak-peak value of waveform to 0.8 Vp-p.

Specific adjusting method:

①Tuning the TV to the local channel with the strongest signal, usually the signal strength is not less than 65dBμ . (Generally, the signal field strength at the CATV user exit can meet this demand)

②Enter S-mode

③Select MENU 3, press PRO△/▽ key to set the data of RAGC, first set the data to minimum, then increase the data slowly till the snowy dots on the screen have just disappeared.

④Exit S-mode (or D-mode)

**(4) Sub color (NTSC, PAL) and sub tint (NTSC) adjustment**

The dark & light of picture color is determined by the color saturation. From the point of chroma signal, saturation represents the amplitude size of chroma signal. If the amplitude of chroma signal is too big, limited by ACL and CRT modulation's non-linearity, distortion will occur to the tint of picture; on the contrary, when the amplitude of chroma signal is too small, the picture color becomes dark, and the tint is also not correct.

Sub color adjustment is to adjust the gain of the sub color circuit to ensure no color distortion in the picture redisplayed on the screen when the color (saturation) is set to 50 (central).

The sub color adjustment for NTSC (3.58MHZ sub carrier) signal and PAL (4.43MHZ sub carrier) signal should be done separately and sent to the sub address [Vnicolor] of TB1238N via I^{2}C bus so as to ensure no distortion in the picture under the two different systems.

Adjusting method:

1.Apply the Grey-scale/Color-bar (NTSC) to the AV input, in normal status.

2.Enter D-mode, and switch in the oscilloprobe at one terminal of R217 close to IC201 (B-OUT)

3.Select CNTC to adjust the sub-contrast, until the amplitude 'A' is 2.5Vp-p as show below
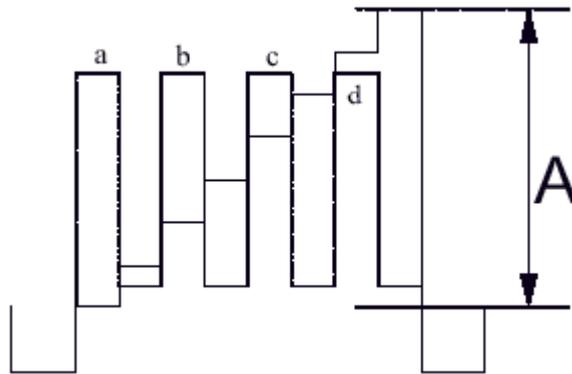
4.Select MENU 3, move the cursor to COLC. Press VOL △/▽ key to select COLC data to make the waveform a and d aligned.

5.Press VOL △/▽ key to select TNTC data to make the waveform b and c aligned.

6.Apply the Grey-scale/Color-bar (PAL) to the AV input, in normal status.

7.Re-enter D-mode, and Switch in the oscilloprobe at one terminal of R217 close to IC201 (B-OUT)

8.Press VOL △/▽ key to select COLP data to make the waveform a, b, c and d aligned

(5) Sub brightness adjustment

The function of sub brightness circuit is to control the DC level of Y signal. The aim of the Sub brightness adjustment is to make the dynamic linearity range of R/G/B signal maximal so as to ensure no distortion in the highlight brightness zone and low light brightness zone. When the DC level of Y signal is too high, the DC level of the combined R/G/B signal via matrix circuit will be too low.

This will result in that the CRT beam current is too big so that the ABL circuit will activate to limit the electron beam, therefore produce clipping distortion in the lower part of the R/G/B signal.

When the DC level of Y signal is too low, the DC level of R/G/B signal will be too high to cause the CRT cut off, thus clipping distortion occurs in the upper part of the R/G/B signal.

Adjusting method:

①Receive color test card signal .

②Set TV's brightness, contrast and color to 50(central)

③Enter S-mode (or D-mode), call out MENU 3, move the cursor to BRTC item.

④Adjust the BRTC data to make the second staircase (sub black staircase) just visible so that there's no demitint in the highlight brightness zone while it is not too dark in the lowlight brightness zone.

⑤ When receiving common TV signal, adjust the data of BRTC to make it that there's no demitint in the highlight brightness zone while it is really 'atrous' in the dark black zone, rich and clear scene displays in the picture.

(6) Sub contrast control

The aim of this adjustment is when selecting mid value (= 50) for contrast, to make the dynamic linearity range of R/G/B maximal so as to ensure the picture with rich and clear gradation.

Therefore, there's a close connection between the contrast control and picture quality.

When receiving the color TV test card signal transmitted by TV stations, operate according to the following procedure:

①Enter S-mode (or D-mode)

②Select MENU 3, press VOL△/▽ key to select CNTC data to make the gradation of gray scale clearly display on the screen.

③Set the contrast to the maximum, check the test card grayscale displaying on the screen, and adjust the CNTC data to make the gradation clearer.

④Exit the S-mod (or D-mod)

(7) Focusing Control

Focusing control is required to ensure that the picture is clear-cut after the CRT or the FBT has been replaced.

It should apply the black or white crosshatch signal for focusing adjustment, and the chassis itself has this kind of signal source (or observe the OSD directly).

Adjusting method:

①Set the contrast to 100 (max) and the brightness to 50 (central).

②Enter S-mode (or D-mode), press TV/AV key to select the black or white cross-hatch signal from among the testing signal source integrated in 87Ck38.

③Adjust the focus VR knob ('FOCUS') on T402, first rotate the knob counter-clockwise to the extreme, then rotate the knob clockwise slowly until the horizontal line on the center of the screen shines the clearest.

④Exit S-mode (or D-mode).

(8) White Balance Adjustment

The data for adjusting white balance is stored in E^{2}PROM and has been precisely adjusted before the chassis leaves the factory, so usually it's not necessary to adjust these data.

The cutoff voltage and white balance should be calibrated again after the CRT or the video AMP board has been replaced.

Adjusting method:

①Receive the color testing signal or any TV signal.

②Set the brightness, contrast and color (saturation) to 50 (central)

③Enter S-mode (or D-mode) to select the MENU 1. Use PRO △/▽ key to select the item RCUT, BCUT and GCUT, then set them all to mid value 80H separately.

④Rotate the Screen VR on T402 (FBT) counter-clockwise to the extreme.

⑤Press the '10×' key on the R/C to stop vertical scan. Rotate the Screen VR on T402 clockwise

slowly till a slight colored horizontal line is just visible on screen. Fixed the Screen VR there, don't adjust it thereafter.

⑥Press the '10×' key to restore the normal vertical scan so that the menu on the screen is visible. According to the color of the horizontal line, call out the cutoff level menu of the two other colors which did not light in the above step (or RCUT, or GCUT, or BCUT).Press the '10×'key again to stop vertical scan, and use VOL△/▽ key to adjust the data of the two selected items until the shining horizontal line becomes white, which indicates the 'black balance' adjustment has been performed.

⑦Press the '10×' key again to exit white line mode and restore the normal scan raster.

⑧Set the contrast and saturation to 50, and set the brightness to 100. According to the color displaying on the screen, select GDRV and BDRV, use VOL△/▽ key to adjust the data of the two items, don't stop the 'bright balance' adjustment until the raster on the highlight brightness zone of picture becomes white.

⑨Inspect the white balance in various statuses by adjusting the brightness and contrast from max to min. If there's something abnormal with white balance, it is required to do the black and bright balance adjustment repeatedly to ensure good white balance can be obtained both during lowlights brightness and highlight brightness.

⑩Exit the S-mode (or D-mode).

(9) Geometrical Adjustment

Receive the color TV test card signal, in normal status.

①Enter S-mode (or D-mode), call out MENU 2.

②Select HOPS50, VPOS50, HIGH50 to adjust PAL horizontal center, PAL vertical center and PAL vertical amplitude.

③Adjust the data of the items with the VOL △/▽ key to make the picture's horizontal and vertical center, vertical amplitude closest to the geometric center of the screen, and the picture touch both the upper and lower edges of screen.

④Select VLIN50(PAL vertical linearity adjustment) and VSC50(PAL vertical scan S-correction), adjust the data corresponding to the item to make the pattern's distortion minimal.

⑤The adjusting method(NTSC) is the same as PAL, but there's a slight difference in menu, which can be selected according to table 1.