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## 4. Alignment and Adjustments

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### 4-1 General Alignment Instructions

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1. Usually, a color TV-VCR needs only slight touch-up adjustment upon installation. Check the basic characteristics such as height, horizontal and vertical sync and focus.
2. Observe the picture for good black and white details. There should be objectionable color shading; if color shading is present, demagnetize, perform purity and convergence adjustments described below.
3. Use the specified test equipment or its equivalent.
4. Correct impedance matching is essential.
5. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test results.
6. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.
7. Do not attempt to connect or disconnect any wires while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.
8. To protect against shock hazard, use an isolation transformer.

### 4-2 Automatic Degaussing

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A degaussing coil is mounted around the picture tube, so that external degaussing after moving the TV should be unnecessary. But the receiver must be properly degaussed upon installation.

The degaussing coil operates for about 1 second after the power is switched ON. If the set is moved or turned in a different direction, the power should be OFF for at least 10 minutes.

If the chassis or parts of the cabinet become magnetized, poor color purity will result. If this happens, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube and the sides and front of the receiver. Slowly withdraw the coil to a distance of about 6 feet before turning power OFF.

If color shading persists, perform the following Color purity and Convergence adjustments.

### 4-3 High voltage Check

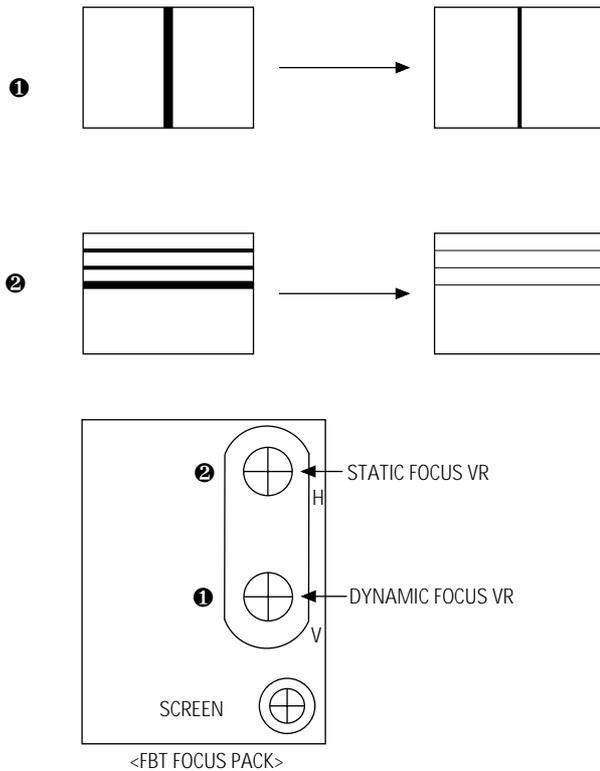
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**CAUTION :** There is no high voltage adjustment on this chassis. The B+ power supply should be +135 volts (with full color- bar input and normal picture level).

1. Connect a digital voltmeter to the second anode of the picture tube.
2. Turn on the TV. Set the Brightness and Contrast controls to minimum (zero beam current).
3. Adjust the Brightness and contrast controls to both extremes. Ensure that the high voltage does not exceed 32 KV under any conditions.

## 4-4 Dynamic Focus Adjustment

1. A dynamic focus adjustment should be done after replacing the CRT PCB, FBT or CRT.
2. Input a crosshatch pattern.
3. Enter " STANDARD " in video mode.
4. Turn the Dynamic focus VR fully clockwise (maximum). (❶)
5. Turn the Static focus VR fully counterclockwise (maximum). (❷)
6. Slowly turn the static focus VR counterclockwise. Adjust until the vertical line in the middle of the screen has maximum clarity. (❶)
7. Slowly turn the dynamic focus VR (clockwise) and adjust the 3rd horizontal line for maximum clarity. (❷)
8. Repeat 4-7, if necessary.



## 4-5 SCREEN Adjustment

1. Input Toshiba Pattern
2. Enter "Service Mode". (Refer to "Service Mode")
3. Select "G2-Adjust".
4. Set the values as below.

29 Inch	21 Inch
<b>IBRM = 220</b>	<b>IBRM = 220</b>
<b>WDRV = 35</b>	<b>WDRV = 35</b>
<b>CDL = 220</b>	<b>CDL = 165</b>
<b>COLR G B = 150 150 150</b>	<b>COL = 70</b>

5. Turn the SCREEN VR until "MRCR G B" and "MRWDG" are green and those value are about 100.  
(The incorrect SCREEN Voltage may result that "MRCR G B" and "MRWDG" should be red)

**Note 1.** When you do not have Toshiba Pattern, follow this method.

1. Set the TV on the condition that AV mode no signal(black)
2. Enter the "Menu" and set the mode to blue screen off.
3. Enter the "Service Mode".
4. Select " G2-Adjust".
5. Set the values as below.

**IBRM = 220**  
**WDRV = 35**  
**CDL = 220**  
**COLR G B = 150 150 150**

6. Turn the SCREEN VR until the value of " MRCR G B" is about 120. Do not mind that the "OSD" Color is red.

■ After completing G2-Adjust, follow this procedure.

- ① Enter the "Video Adjust 1".
- ② Choose any item in menu. (ex. Select "Red Cutoff")
- ③ Change the value of item you select, and recover the value.

For example, when the value of "Red Cutoff" is 127, change the value to 128 and restore the value to 127.

If you do not follow this procedure, the picture may be abnormal.  
 For example, when the TV set is on, the picture becomes brighter gradually.

## 4-6 E<sup>2</sup>PROM (IC902) Replacement

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1. When IC902 is replaced, all adjustment data revert to the initial values.  
So, all adjustment values when servicing should be readjusted.
2. After IC902 is replaced, connect the AC power supply cord.
3. Turn the power switch ON.
4. In stand-by, warm up the TV for at least 10 seconds.
5. Power on the TV.

## 4-7 White Balance Adjustment

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- Equipment : Color-Analyzer (CA-100)
- Input Signal : Pattern signal (Toshiba pattern)

1. Select STANDARD from the menu.
2. Input an 100% White pattern.
3. Enter the "Service Mode". (Refer to "4-8 Service Mode")
4. Warm up the TV set at least for 30 minutes.
5. Input a Toshiba pattern signal.
6. Enter the "Video Adjust1".
  - Adjust "Sub Contrast" so that Y (luminance) becomes  $40 \text{ ft} \pm 3$ .
  - Use "Red Drive" and "Blue Drive" to adjust High-Light (x : 290, y : 300)
  - Adjust "Sub Bright" so that Y (luminance) becomes  $1.3\text{ft} \pm 0.3$ .
  - Use "Red Cutoff" and "Blue Cutoff" to adjust Low-Light (x : 290, y : 300).
7. Adjust CA-100 so that the final adjustment value can be fixed.
8. Use the Channel Up/Down (▲/▼) buttons to move the cursor on the adjustment modes.
9. Use the Volume +/- buttons to change the adjustment value.

## 4-8 Factory Adjustment

### 4-8-1 Service Mode

1. To enter the "Service Mode", Press the remote-control keys in this sequence :

- If you do not have Factory remote-control



- If you have Factory remote-control



2. After the Service Mode is entered, the initial screen is as shown in the figure below.



\* These hexa digits are check sum value which depends on the MICOM.  
If check sum value is changed, the value of E<sup>2</sup>PROM Data newly initialed.

3. Use the Channel Up/Down buttons to move the cursor in the adjustment parameters.

#### Note 2.

- When CRT, CRT PCB, FBT, E<sup>2</sup>PROM (sometimes MICOM) is replaced, the adjustment values should be controlled.
- After the Service adjustment is completed, Do not select "Reset" in the service mode menu. (After above procedure is done, power is on initially and the "Plug and Play" will be operated.)

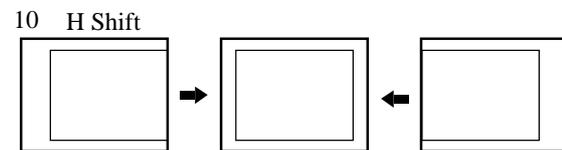
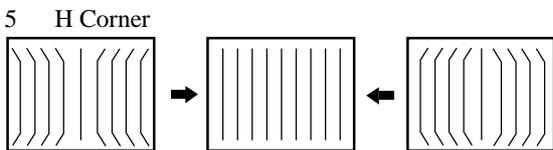
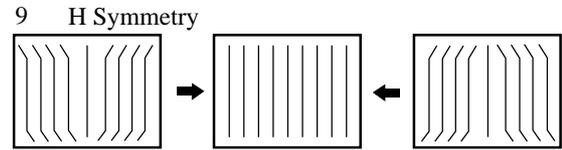
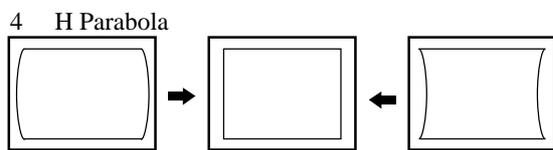
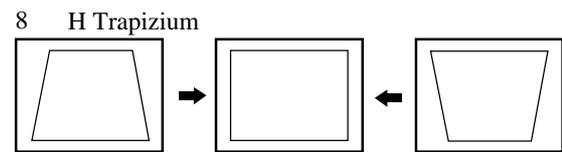
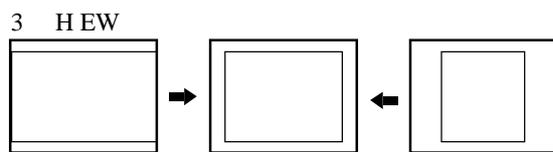
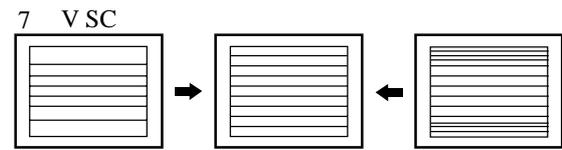
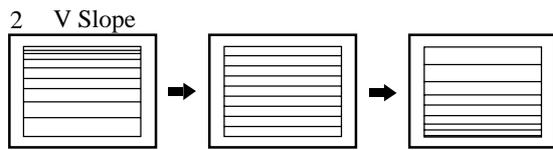
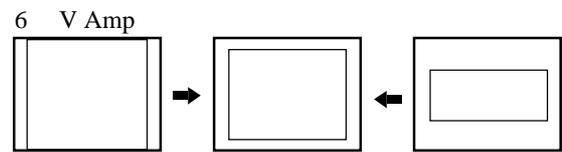
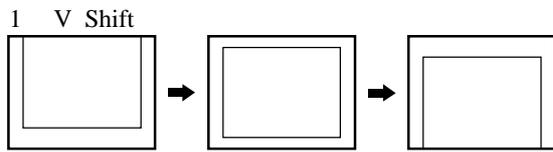
### 4-8-2 Memory Data

#### 4-8-2(A) DEFLECTION (GEOMETRIC ADJUSTMENT VALUE)

 Fixed Value

No.	OSD	Range	Initial Value	Function	Remark
1	V Shift	-128 ~127	-30	Adjust Vertical Picture Position	
2	V Amp	-128 ~127	-7	Adjust Vertical Picture Size	
3	V Slope	-128 ~127	-3	Adjust Vertical Slope Correction	
4	V SC	-128 ~127	<b>-17</b>	Adjust Vertical S-Correction	Not to be adjusted
5	H EW	-128 ~127	73	Adjust Horizontal Picture Size	
6	H Trapizium	-128 ~127	-47	Adjust Horizontal Trapeziod	
7	H Parabola	-128 ~127	-7	Adjust Horizontal Parabola Wave	
8	H Symmetry	-128 ~127	<b>13</b>	Adjust Horizontal Symmetry	Not to be adjusted
9	H Corner	-128 ~127	23	Adjust Horizontal Corner	
10	H Shift	-128 ~127	13	Adjust Horizontal Position	
11	PIP Contrast	0 ~ 15	8	Adjust PIP Contrast	
12	PIP Tint	0 ~ 63	0	Adjust PIP Tinit	
13	PIP PAL V Pos	0 ~ 255	26	Adjust PIP Vertical Position (Main Picture is PAL)	
14	PIP NTSC V Pos	0 ~ 255	23	Adjust PIP Vertical Position (Main Picture is NTSC)	
15	PIP H Pos	0 ~ 255	30	Adjust PIP Horizontal Position	
16	PIP BLKLG	0 ~ 15	6	Adjust PIP Green Cutoff Level	

4-8-2(B) SCREEN CHANGE (I2C BUS GEOMETRIC ADJUSTMENT)

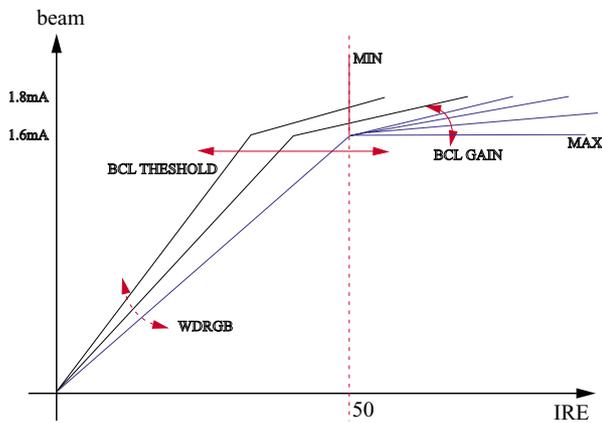


4-8-2(C) VIDEO ADJUST 1

Fixed Value

No.	OSD	Range	Initial Value	Function	Remark
1	Red Cutoff	0 ~255	127	Adjust Red Cutoff Level	Low Light
2	Green Cutoff	0 ~255	127	Adjust Green Cutoff Level	
3	Blue Cutoff	0 ~255	127	Adjust Blue Cutoff Level	
4	Red Drive	0 ~255	127	Adjust Red Output Gain	High Light
5	Green Drive	0 ~255	127	Adjust Green Output Gain	
6	Blue Drive	0 ~255	127	Adjust Blue Output Gain	
7	Sub Bright	0 ~ 200	100	Adjust Brightness Level	Low Light
8	Sub Contrast	0 ~ 13	50	Adjust Contrast Level	High Light
9	Sub Color	0 ~ 27	27	Adjust Color Level	Not to be adjusted
10	Sub Tint	0 ~ 100	80	Adjust Tint	
11	BCL Threshold	0 ~ 255	65	Adjust Beam Control Limit Refer to Note 3	
12	BCL Gain	0 ~ 15	8		
13	BCL Time	0 ~ 15	9		
14	TTX Contrast	0 ~ 255	90	Adjust OSD/TTX Contrast	
15	YC Delay	0 ~ 8	*	Refer to Table 1	

**Note 3.** Beam Control Limit Characteristic



**Table 1.** YC Delay Adjustment Table

YC Delay	PAL					SECAM					NTSC	
	Def.	BG	DK	I	L	Def.	BG	DK	I	L	Def.	M
Value	4	3	6	6	7	1	1	5	8	5	4	3

✍ The "Def." means that TV is in AV mode.

4-8-2(D) VIDEO 2 ADJUST

Fixed Value

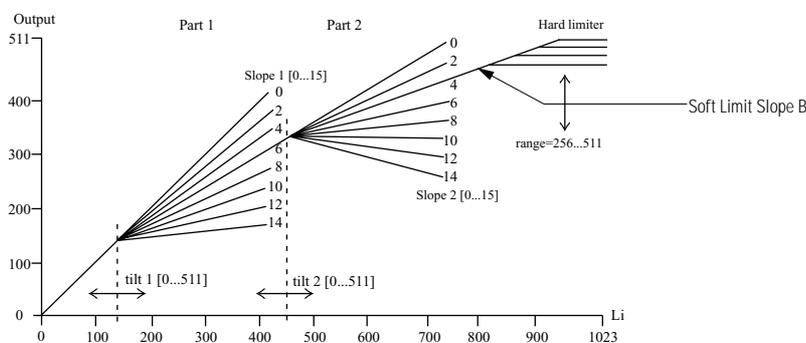
No.	OSD	Range	Initial Value	Function	Remark
1	B stretch-BTHR	0 ~ 55	50	Black Stretch Threshold	
2	B stretch-BTLT	0 ~ 15	8	Black Stretch Tilt Position	
3	B stretch-BAM	0 ~ 31	4	Black Stretch Amount	
4	Coring <i>✍</i>	10 ~ 31	20	Luma Peaking Filter Coring	
5	RGB Bright	0 ~ 255	45	OSD/TTX RGB Bright	
6	RGB Contrast	0 ~ 255	15	OSD/TTX RGB Contrast	
7	EHT Time	0 ~ 15	0	Electronic High Tension Response Time	
8	EHT Compensation	0 ~ 255	90	Electronic High Tension Coefficient	

*✍* Coring : The Value of Center Frequency for the active bandwidth.

4-8-2(E) VIDEO 3 ADJUST

No.	OSD	Range	Initial Value	Function	Remark
1	Peak Threshold	0 ~ 255	185	White Peak Level Threshold	Refer to Note Below
2	Soft Limit Slope B	0 ~ 15	4	Refer to Picture Below	
3	Hard Limit	0 ~ 255	255		
4	Peak Video Ref	0 ~ 4	0	White Peak Level Threshold Reference	
5	Peak Video Gain	0 ~ 5	0	White Peak Level Threshold Gain	
6	ACC-REF(PAL/NTSC)	0 ~ 40	33	Auto Color Control	
7	ACCR(SECAM)	0 ~ 39	39		

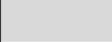
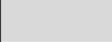
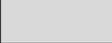
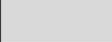
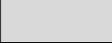
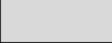
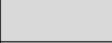
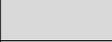
**Note 4. Soft Limit & Hard Limit**



*✍* "Soft Limit" is that Limiting the peak white without feed-back, but "Peak Limit" is that with feed-back for white peak level

4-8-2(E) OPTION

 Fixed Value

No.	OSD	Initial Value 	Function	Remark
1	Language		Arab, Iran, Lybya, CIS	OSD Language
2	Sound		A2/NICAM, V-Dolby, Mono, L-Stereo	Depending on IC601 Refer to Note 5
3	CRT		4:3, Wide, Q(12.8:9), 4:3-16:9, Q-16:9	S:S-VHS, D:DVD
4	AV Mode		2Scart, 2Scart+S, 1RCA, 2RCA, 2RCA+S, 2RCA+D, 2RCA+S+D, 1Scart	
5	X-Ray		Off, On	
6	Tilt Control		Off, On	
7	Auto FM		Off, On	
8	PIP		2-Tuner, 1-Tuner, Off	
9	Txt Language		Arabic, Farsi, Arab-Hebrew, West Europe, East Europe, Russian, Greek-Turkey	
10	LNA		Off, On	When PIP is "2-Tuner", set to "ON"
11	Equalizer		Off, On	
12	High Deviate		Off, On	
13	TTX On/Off		Off, On	
14	AV by CH key		Off, On	Without "TV/VIDEO" key in the front panel, set to "On"

 Initial Value : Refer to Note 6 on the next page.

**Note 5.**

Sound	IC601
A2/NICAM	MSP3400D, MSP3410D
V-DOLBY	MSP3411G
Mono	Not used this mode for KS3A Chassis
L-Stereo	

**Note 6. Option.**

	CS29A5WT8X/UMG	CS29A6PF8X/HAC	CS29A6WT8X/BWT	CS29A5MT9X/BWT
Description	Initial Vaue	Initial Vaue	Initial Vaue	Initial Vaue
LANGUAGE	Arab	Arab	CIS	CIS
SOUND	V-Dolby	V-Dolby	A2/Nicam	A2/Nicam
CRT	4:3	4:3	4:3	4:3
AV MODE	2 RCA + S	2 RCA + S	2 SCART + S	2 SCART + S
X-RAY	OFF	OFF	OFF	OFF
TILT CONTROL	ON	ON	ON	ON
AUTO FM	ON	ON	ON	ON
PIP	OFF	2-Tuner	OFF	2-Tuner
TEXT LANGUAGE	Arabic	Farsi	RUSSIAN	RUSSIAN
LNA	OFF	ON	OFF	ON
EQUALIZER	ON	ON	ON	ON
HIGH DEVIATE	ON	ON	ON	ON
TTX ON/OFF	ON	ON	ON	ON
AV BY CH KEY	ON	OFF	OFF	ON
OPTION BYTE	84 CC D8	85 DC 5E	83 AC 28	83 AC AE

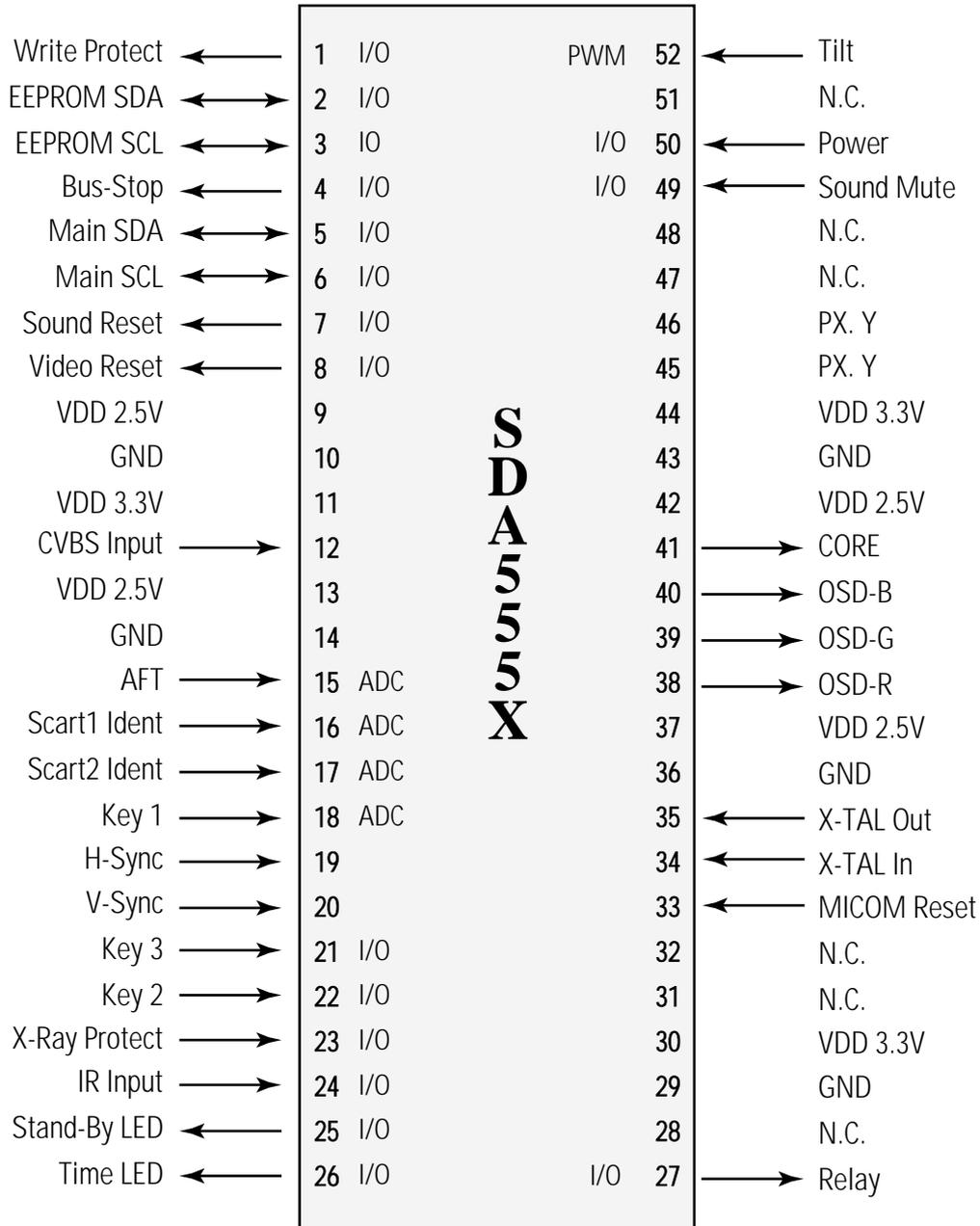
## 4-8-2(F) OTHERS

 Fixed Value

No.	OSD	Range	Initial Value	Function	Remark
1	VSU	96 ~ 111	98	Vertical Set Up Time	
2	H QEW	-30 ~ 30	0		
3	H ZOOM Parabola	-30 ~ 30	8	Adjust Horizontal Parabola in Zoom Mode	
4	H 16:9 Parabola	-30 ~ 30	-15	Adjust Horizontal Parabola in 16:9 Mode	
5	TTX H Shift	-30 ~ 30	6	Adjust Horizontal OSD/TTX Position	
6	Mono Sound System	BG/DK/I/M	BG		
7	V Slice Level	0 ~ 3	2		
8	Melody Volumn	0 ~ 20	8	Adjust Melody Volumn	

## 4-9 MICOM

### 4-9-1 Pin Layout



## 4-9-2 Pin Assignment Specification

PIN NO	FUNCTION	ASSIGN	IN/OUT	ACTIVE H/L	DESCRIPTION
1	I/O	Write Protect	Out	Low	EEPROM Write Protection
2	I/O	ROM SDA	I/O		EEPROM Serial Data Line
3	I/O	ROM SCL	I/O		EEPROM Serial Clock Line
4	I/O	Bus Stop	In	Low	Disable Micom IIC
5	I/O	Main SDA	I/O		Peripheral IC Serial Data Line
6	I/O	Main SCL	I/O	Low	Peripheral IC Serial Clock Line
7	I/O	Sound Reset	Out	Low	MSP IC Initial Control
8	I/O	Video Reset	Out		VDP IC Initial Control
9	Vdd	VDD 2.5V			
10	GND				
11	Vdd	VDD 3.3V			
12	CVBS	CVBS Input	In		TTX CVBS Input
13	Vdd	VDD 2.5V			Analog B+
14	GND				Analog Ground
15	ADC	AFT	In		Auto Fine Tuning Control
16	ADC	SC1-ID	In		Scart1 Ident
17	ADC	SC2-ID	In		Scart2 Ident
18	ADC	Key1	In		Key1 Input
19	HS	H-Sync	In		Horizontal Sync Input
20	VS	V-Sync	In		Vertical Sync Input
21	I/O	Key3	In		Key3 Input
22	I/O	Key2	In		Key2 Input
23	I/O	X-Ray	In		X-Ray Protection
24	I/O	IR-In	In		Remocon Signal Input
25	I/O	STD-LED	Out		LED Drive Output(Red)
26	I/O	TIM-LED	Out		LED Drive Output(Green)

## 4-9-2 Pin Assignment Specification (Continued)

PIN NO	FUNCTION	ASSIGN	IN/OUT	ACTIVE H/L	DESCRIPTION
27	I/O	Relay	Out	Low	Activate Degaussing Coil
28	N.C.				Not Used (Programmed Gound Level)
29	GND				Analog Ground
30	Vdd	VDD 3.3V			Not Used (Programmed Gound Level)
31	N.C.				Not Used (Programmed Gound Level)
32	N.C.				Micom Hardware Reset
33	Reset	Reset	In	Low	Crystal Oscillation Input
34	X-In	X-TAL In	In	6MHz	Crystal Oscillation Output
35	X-Out	X-TAL Out	Out	6MHz	Analog Ground
36	GND				Analog B+
37	Vdd	VDD 2.5V			OSD/TTX Output (Red)
38	R	OSD-R	Out		OSD/TTX Output (Green)
39	G	OSD-G	Out		OSD/TTX Output (Blue)
40	B	OSD-B	Out		Fast Blank/Half Contrast Output
41	COR	CORE	Out		
42	Vdd	VDD 2.5V			
43	GND				
44	Vdd	VDD 3.3V			
45	I/O	PX.Y	In		When The Caption Function Adopted, Used.
46	I/O	PX.Y	Out		
47	N.C.				Not Used (Programmed Gound Level)
48	N.C.				
49	I/O	S-Mute	Out	High	Sound Amp Mute
50	I/O	Power	Out	Low	Picture On/Off Control
51	N.C.				Not Used (Programmed Gound Level)
52	I/O	Tilt	Out	PWM	Tilt Control Output