3 Factory adjustment mode

3.1 Enter into factory adjustment menu

Press SLEEP→PIC→DSP→MENU button on the remote controller in order (the period of two press should be less than 5 seconds), the screen will appear factory alignment menu.

3.2 Factory menu operation

Repeatedly press "MENU" button，then the menu will enter into PAGE 1→PAGE 2→PAGE 3→ PAGE 4→PAGE 5 and recycle；press ▲ or ▼ button can select adjustment items upward or downward, and press ◄ or ► button to confirm or adjust the item's value.

3.3 To exit the factory menu

Press "SLEEP" button to exit the factory adjustment menu.

4 Adjustment method

4.1 B+ voltage adjustment

a）Make sure the power supply is AC120 V/60 Hz（for America or Canada area）.

b）Connect the digital voltmeter to B+ testing point，receive A7 signal, set the picture control to "STANDARD" status, adjust RP501 to make B+ voltage be (24": 135V ±0.2 V , 20": 100 V± 0.2 V) (just for pure flat CRT, as regards to other CRT，B+ value will be marked on the parts list.）

c）In STAND BY mode, the B+ voltage will be under 20V.

4.2 OSD position adjustment

Receive NTSC signal，change the factory adjustment menu page 3 OSD item's value to make user's menu be in screen's center position.

4.3 AGC adjustment

a） Receive 60 dB split field (or grey-scale) signal.

b） Use oscilloscope or digital voltmeter to monitor tuner 1 pin's voltage （RFAGC pin）.

c）Select factory adjustment menu page 4 R-AGC item, making use of [←][→] button to increase the value from down to up until the voltage just reach 4.0 V，at this time picture noisy spots should disappear basically. Otherwise continue to fine tune R-AGC item.

d） Exit the factory menu.

4.4 Focus adjustment

4.4.1 Receive A12 signal, set picture mode to "STANDARD" status.

4.4.2 Adjust FBT FOCUS potentiometer to make screen's B area's focus optimum.

4.5 Screen-grid voltage,white balance adjustment

4.5.1 Receive A7 split field signal, set picture mode to "STANDARD" status.

4.5.2 Keep RCUT's value, not change it （for example set it to 60），roughly adjust GCUT and BCUT value to make white balance basically normal.

4.5.3 Set colour,contrast to minimum，set brightness to 50. Use oscilloscope to monitor CRT board red gun waveform，adjust PAGE 4 BRTS value to make black level be 175 V.

4.5.4 Adjust SCREEN（accelerating electrode）potentiometer to make picture brighten 4 lattices.

4.5.5 Fine adjust white balance（colour temperature：12000K±8MPCD X=0.270±0.008 Y=0.283±0.008）.

4.5.6 Adjust PAGE 2 BRTN value to make colour ,brightness,contrast all be minimum，picture“white block”slightly lights up.

4.6 Horizontal,vertical scanning center adjustment

4.6.1 PAL（50 Hz）horizontal,vertical center adjustment

Receive G23 signal, set picture mode to “STANDARD”status, fine tune vertical center VP50，horizontal center HPOS，to make picture center be in accordance with screen center.

4.6.2 NTSC（60 Hz）H-center,V-center adjustment

Receive A6 signal, set picture mode to “STANDARD” status, adjust V-center VP60，H-center HPS，to make picture center be in accordance with screen center.

4.7 Vertical scanning amplitude adjustment

4.7.1 PAL（50 Hz）vertical amplitude adjustment

Receive D35 signal, set picture mode to “STANDARD” status, adjust vertical amplitude HIT，to make picture up/down overscanning be screen size’s 8%.

4.7.2 NTSC（60 Hz）vertical amplitude adjustment

Receive A12 signal, set picture mode to “STANDARD”status, adjust V-amplitude HITS，to make picture up/down overscanning be screen size’s 8%.

4.8 Raster correction adjustment,H-amplitude adjustment

4.8.1 PAL（50 Hz）raster correction adjustment ,H-amplitude adjustment.

Receive PAL white crosshatch signal, set picture mode to “STANDARD” status, adjust DPC to make raster distortion be in minimum, adjust WID to make picture left/right overscanning be screen size’s 8%.

4.8.2 NTSC（60 Hz）raster correction adjustment

Receive NTSC A21 signal，set picture mode to“STANDARD”status, adjust DPCS to make raster distortion minimum，adjust WIDS to make picture left/right overscanning be screen size’s 8%.

4.9 If scanning linearity distortion and raster geometrical distortion can not reach the requirements, and if necessary, can make use of factory adjustment menu to adjust the following items：

VLIN	V-linearity adjustment（PAL）
VLIS	V-linearity adjustment (NTSC）
VSC	Vertical S-correction adjustment （PAL）
VSS	Vertical S-correction adjustment （NTSC）
CNRT	Top corners’ correction
CNRB	Bottom corners’ correction
KEY	Trapezoid correction （PAL）
KEYS	Trapezoid correction（NTSC）

4.10 Maximum sound output power

Receive single tone signal, set volume to maximum，the sound output power is 2×3 W(24”) and 2×2.5 W(20”) .（can fine adjust factory menu V100）

5 Checking points

5.1 High voltage check

5.1.1 Connect high voltmeter to CRT second anode and GND.

5.1.2 Receive A7 signal, set picture mode to “STANDARD” status, measure the high voltage value, the reading should be 29 kV±1 kV.

5.1.3 When setting brightness and contrast to minimum(zero beam current), measure the high voltage value, the reading should not exceed 32 kV.

5.2 CRT filament voltage check

Receive A7 signal, set picture mode to “STANDARD” status, use effective value voltmeter to measure CRT filament voltage, the reading should be (6.3±0.3) Vrms.

5.3 X-ray protection check

5.3.1 Receive A7 signal, set picture mode to “STANDARD” status.

5.3.2 Short S301, X-ray protection circuit should effect.

5.4 Picture and sound check

5.4.1 Receive standard TV signal.

5.4.2 Make use of picture control buttons to check colour, contrast ,brightness,sharpenss,tint’s control function.

5.4.3 Make use of sound control buttons to check sound control function.

5.5 Sub-brightness check.

Receive A7 signal, set colour, contrast , brightness all to 0,picture left one lattice slightly lights up.

5.6 This set can produce 14 kinds of testing signals by itself. In factory menu when select some adjustment item, every press of AV button for one time, it will produce one testing signal.

5.7 Colour purity and convergence check (in normal way)

5.8 AV terminal input/output check

5.9 Other control buttons on the set/remote controller function check

6 Out-factory mode preset

Press ”SHOP OUT” button, out-factory status will be preset to:

6.1	Picture menu:	Colour	70
		Brightness	70
		Contrast	100
		Sharpness	50
		Tint	00
		Blue background	On
6.2	Volume preset to:	30	
6.3	Language menu:	ENGLISH	
6.4	Colour system :	AUTO	
6.5	NOISE REDUCE:	OFF	

6.6	TV mode:	Channel positionA2
6.7	SVM:	MILD
6.8	V-CHIP PASSWORD:	0000
6.9	CHILD LOCK MENU PASSWORD:	0000
6.10	SOUND MODE:	NEWS
6.11	TV/CATV CHANNEL:	Both set to ADD
6.12	CCD CHANNEL:	Set to OFF
6.13	V-CHIP:	Set all ratings and contents to IGNORE
6.14	V-CHIP BLOCK ON/OFF:	Set to OFF

7 Power adaptability check

AC 120V/60Hz (for North America area. If have other special AC power supply requirements, then check with requirements).

APPENDIX 1 FACTORY ADJUSTMENT MENU

Page	Item NO.	OSD symbol	Preset	Adjustment item	Analogue setting	Input signal	Adjustment method
1	1	HPOS	0E	50Hz H-center	STANDARD	D35	To make picture horizontal center be in accordance with CRT center
	2	WID	10	50Hz H-size	STANDARD	D35	To make H-size meet standard
	3	HPS	03	60Hz H-center	STANDARD	A12	To make picture vertical center be in accordance with CRT center
	4	WIDS	01	60Hz H-size	STANDARD	A12	To make H-size meet standard
	5	HIT	35	50Hz V-size	STANDARD	D35	To make V-size meet standard
	6	VP50	06	50Hz V-center	STANDARD	D35	To make picture vertical center be in accordance with CRT center
	7	VLIN	0E	50Hz V-linearity	STANDARD	D35	To make upper/dower part crosshatch height be equal
	8	VSC	05	50Hz V S-correction	STANDARD	D35	To make upper/middle/lower part crosshatch height be in equal
	9	HEHT	04	Horizontal high voltage compensation	STANDARD	D35/A12	Fix
	10	VEHT	04	Vertical high voltage compensation	STANDARD	D35/A12	Fix
	11	TNTC	40	NTSC tint center value setting	Contrast 100 Tint 100 brightness70 color70	A7	Fix

	12	TNTN	00	NTSC tint minimum value setting	Contrast 100 Tint 0 brightness70 color 70	A7	fix
	13	SCOL	02	Sub-color adjustment	STANDARD	A7	Fix
	14	SCNT	07	Sub-brightness adjustment	STANDARD	Gray scale	Fix
	15	ASSH	00	Non-symmetry sharpness			Fix
1	16	ABL	23	ABL control (refer to appendix 2 for details)	SPORTS	A7	Fix
	17	VSS	02	60Hz V S-correction	STANDARD	A12	To make upper/middle/lower part crosshatch height be equal.
	18	VLIS	FE	60Hz V-linearity	STANDARD	A12	To make upper/lower part crosshatch height be equal
	19	VP60	02	60Hz V-center	STANDARD	A12	To make picture vertical center be in accordance with CRT center.
	20	HITS	03	60Hz V-size	STANDARD	A12	To make V-size meet standard
2	21	G CUT	66	Dark area white balance		Black/white balance signal or A7	To make picture dark area obtain standard white color.
	22	B CUT	6C				
	23	G DRV	45	Bright area white balance	SPORTS	Black/white balance signal or A7	To make picture bright area obtain standard white color.
	24	B DRV	4D				
	25	R CUT	60	Dark area white balance		Black/white balance signal or A7	To make picture dark area obtain standard white color.
	26	CNTX	3D	Contrast maximum value setting	SPORTS	Gray scale	Fix
	27	CNTC	36	Contrast center value setting	Contrast 50	Gray scale	Fix
	28	CNTN	22	Contrast minimum value setting	Contrast0 color 0 brightness50	Gray scale	Fix
	29	BRTX	3D	Brightness maximum value setting	Contrast50 color 0 brightness100	A7	Fix

	30	BRTC	36	Brightness center value setting	contrast0 color 0 brightness50	A7	Refer to adjustment methods
	31	OSD	17	OSD H-position setting		Any TV signal and display MENU screen	The character be in screen center.
	32	COLX	70	Color maximum value setting	SPORTS	A7	Fix
	33	COLC	3B	Color center value setting (NTSC)	STANDARD	A7	Fix
	34	COLP	20	Color center value setting (PAL)	STANDARD	AV（PAL）	Fix
	35	COLN	00	Color minimum value setting	Contrast 100 color 0 brightness50	A7	To make picture without color
	36	TNTX	6F	NTSC tint maximum value setting	Contrast 100 color 70 brightness70 tint 0	A7	Fix
	37	BRTN	20	Brightness minimum value setting	Contrast 0 color 0 brightness0	A7	Refer to adjustment method
	38	BRTS	24	Sub-brightness	contrast0 color 0 brightness50	A7	Refer to adjustment method
	39	V100	E0	VOL-100% volume setting	VOL-100%	Mono signal	Refer to adjustment method
	40	RAGC	2A	RF AGC	STANDARD	A7	Refer to adjustment method
3	41	DPC	0C	50Hz pincushion correction	STANDARD	D35	To correct picture E/W pincushion
	42	KEY	1B	50Hz pincushion correction	STANDARD	D35	To correct picture trapezoid
	43	DEF	01	Interlace scan setting 01			Fix
	44	FLG 0	52	Refer to Appendix 2 for details			Fix
	45	FLG 1	E5	Refer to Appendix 2 for details			Fix

	46	STBY	00	Refer to Appendix 2 for details			Fix
	47	TNCD	40	Tint center (DVD)			Fix
	48	VBLK	00	Refer to Appendix 2 for details			Fix
	49	MOD	03	Refer to Appendix 2 for details			Fix
	50	UCOM	80	Refer to Appendix 2 for details			Fix
3	51	MOD3	80	Refer to Appendix 2 for details			Fix
	52	OPT	17	Refer to Appendix 2 for details			Fix
	53	OPTM1	B2	Refer to Appendix 2 for details			Fix
	54	OPTM2	65	Refer to Appendix 2 for details			Fix
	55	TUNR	02	Tuner select			Fix
	56	CNRT	1D	Top edge/corner correction	STANDARD	D35/A12	To correct top edge and corner vertical line
	57	CNRT	15	Bottom edge/corner correction	STANDARD	D35/A12	To correct bottom edge and corner vertical line
	58	KEYS	01	60Hz trapezoid correction	STANDARD	A12	To correct picture trapezoid
	59	DPCS	00	60Hz pincushion correction	STANDARD	A12	To correct picture E/W pincushion
4	60	ST3	1F	Sub-sharpness center value when input NTSC3.58 TV signal	STANDARD	A12	Fix
	61	SV3	30	Sub-sharpness center value when input NTSC3.58 AV signal	STANDARD	AV-N3.58	Fix

	62	SV4	30	Sub-sharpness center value when input non NTSC3.58 AV signal.	STANDARD	AV-N4.43	Fix
	63	SVD	30	Sub-sharpness center value when in DVD input	STANDARD	DVD	Fix
	64	SHPX	1A	Sharpness maximum value setting	Sharpness 100	A12	Fix
	65	SHPN	1D	Sharpness minimum value setting	Sharpness 0	A12	Fix
	66	TXCX	1F	DVD sub-color maximum value	SPORTS	DVD	Fix
	67	RGCN	1F	DVD sub-color minimum value	STANDARD	DVD	Fix
	68	DCBS	22				Fix
	69	CLTM	0F	Refer to appendix 2 for details	STANDARD	A12	Fix
	70	CLVO	4F	Refer to appendix 2 for details	STANDARD	AV	Fix
	71	CLVD	58	Refer to appendix 2 for details	STANDARD	DVD	Fix
	72	CCD OSD	16	CCD H-position		Display CCD caption	CCD character be in screen center
	73	CCD OSDH	55	CCD OSD oscillating frequency			Fix
	74	HAFC	05	AFC gain			Fix
	75	VCEN	00	IC output vertical signal center			Fix
	76	NSHP	10	Noise reducing degree	STANDARD		Fix
	77	SYCT	08	(TEST)			Fix
	78	NOIS	01	(TEST)			Fix
	79	ONTM	00	POWER ON MUTE TIMER			Fix
5	80	V25	D0	Volume setting in VOL-25%	VOL-25	MONO signal	Fix

	81	V50	E0	Volume setting in VOL-50%	VOL-50	MONO signal	Fix
	82	OSDF	55	OSD oscillating frequency			Fix
	83	SUR 1	00	Surround sound data at Sound register 1			Fix
	84	BASC	30	Bass center value setting	VOL-50	Sound sweep frequency signal	Fix
	85	BASX	40	Bass maximum value setting	VOL-50		Fix
	86	TREC	39	Treble center value setting	VOL-50		Fix
	87	BALC	32	Balance center value setting	VOL-50		Fix
	88	WOFC	3D	Woofer center value setting			Fix
	89	BAS 1	32	Bass data at Sound Register 1	VOL-50		Fix
	90	BAS 2	5A	Bass data at Sound Register 2	VOL-50		Fix
	91	TRB 1	32	Treble data at Sound Register 1	VOL-50		Fix
5	92	TRB 2	28	Treble data at Sound Register2	VOL-50		Fix
	93	WCTL	30	Woofer control			Fix
	94	WON 1	00	“Woofer on” at Sound Register 1			Fix

Note 1: firstly adjust PAL signal (D35), then adjust NTSC (A12), then recheck PAL signal (D35), please prior to guarantee NTSC raster.

Note 2: when check PAL color, the inputting signal should be AV signal.

Appendix 2 factory adjustment menu remarks

FLG0	BIT0	Over Mod Switch	0:normal	1:POF over-modulation switch is connected
	BIT1	AFT window	0:out of AFT window	1:in the AFT window
	BIT2	Buzz reduction	0:Nyquist Buzz cancel on	1:off
	BIT3	Orthogonal detection gain	0:ont use	1:not use
	BIT4	Local SECAM	0:not use	1:not use

	BIT5	5.65MHz SIF	0:not use	1:not use
	BIT6	5.74MHz SIF	0:not use	1:not use
	BIT7	Frequency select no VCO adjustment	0:have VCO	1:without VCO
FLG1		CW on/off	0:off	1:on, CW ouput from IC pin26#
	BIT1	Y out on	0:not use	1:not use
	BIT2	MIZ gain	0:SIF 1MHz convert gain, low gain	1:high gain
	BIT5	C trap pass(test)	0:not use	1:not use
	BIT6	Detection NTSC3.58	0:not use	1:not use
	BIT7	teletext	0:not use	1:not use
MOD	BIT0	AKB CUT OFF sensitivity gain	00:X9.75 01:X10	10:X10.25 11:X10.50
	BIT1			
	BIT2	Cut off range	0:-0.65 to +6.5	1:-0.65 to +0.85
UCOM	BIT0	inner ADC	00:GND	10:B out
	BIT1		01:R out	11:Monito RF AGC via ADC
	BIT2	rest pattern from ucom	0:normal	1:
	BIT3	use ucom sync switch	0:normal	1:use ucom sync
	BIT4	Sync to ucom	0:no use	1:no use
	BIT5	v-switch out ucom	0:no use	1:no use
	BIT7	OSD HD input polarity	0:no use	1:no use
MOD3	BIT4-0	VIDEO mute time	Mute time=data X 8ms	
	BIT7	VIDEO mute type	0:Y mute	1:RGB out cut off DC
OPT	BIT0	FBB-MUTE	0:	1:when blue background off, not do MUTE
	BIT1	FBB-EXMUTE	0:	1: when blue background off, not do EXT-MUTE
	BIT2	FYMUTE USE	0:	1:when switching channels, use Y-MUTE
	BIT3	Sound gain SW	0:50Hz	1:500mV RMS-25kHz/dev
	BIT4	Vertical frequency force	0:50Hz	1:60Hz
	BIT5	Sync detection	0:exernal	1:internal
	BIT7	Sync distinguish way	0:	1:gain noise detection
OPTM1	BIT0	FJP-SVM USE	0:SVM out	1:monitor out
	BIT1	AV select	0:AV1-AV2(DVD)-AV3	1:AV1-AV2-DVD
	BIT2	FJP-GAME	0:without game	1:have game
	BIT3	On-timer indication	0:low level, on-timer on	1:high level, on-timer on
	BIT6	FJP-M-PAL	0:others	1:only PAL-M
	BIT7	FJP-stereo	0:without stereo	1:have stereo
OPTM2	BIT0	FJP-Y.U.V	0:without Y.U.V	1:have Y.U.V
	BIT1	FJP-language	0:English/French/Spanish	1:English/Tradtional Chinese
	BIT2	F52797-VAMP	0:no gain	1:6dB gain
	BIT4	FJP-display button	0;timer display OSD	1:always display
	BIT5	FJP-woofer	0:without woofer	1:have woofer
	BIT6	FJP-AUTO	0:AUTO2(35N,M-PAL,N-PAL)	1:AUTO1(44P,35N,44N)

CLTM (in TV mode)	BIT0	Y delay (in TV mode)	000:-40ns 001:0 010:40ns 011:80ns	100:120ns 101:160ns 110:200ns 111:240ns
	BIT1			
	BIT2			
	BIT3	NTSC matrix	00:NTSC1(93°)	10,11 for DVD
	BIT4		01:NTSC2(108°)	
	BIT5	C-GAMMA	0:Chroma γ correction off	1:Chroma correction on
	BIT6	Color kill off	0:normal	1:color killer always off
	BIT7	P/N ID	0:P/N color killing sensitivity 1.2/1.5mVp-p	1:6.6/6.4mVp-p
CLVO (in AV mode)	BIT0	Y delay (in TV mode)	000:-40ns 001:0 010:40ns 011:80ns	100:120ns 101:160ns 110:200ns 111:240ns
	BIT1			
	BIT2			
	BIT3	NTSC matrix	00:NTSC1(93°)	10,11 for DVD
	BIT4		01:NTSC2(108°)	
	BIT5	C-GAMMA	0:Chroma γ correction off	1:Chroma γ correction on
	BIT6	Color kill off	0:normal	1:color killer always off
	BIT7	P/N ID	0:P/N color killing sensitivity 1.2/1.5mVp-p	1:6.6/6.4mVp-p
CLVD (in DVD mode)	BIT0	Y delay (in TV mode)	000:-40ns 001:0 010:40ns 011:80ns	100:120ns 101:160ns 110:200ns 111:240ns
	BIT1			
	BIT2			
	BIT3	NTSC matrix	00:NTSC1(93°)	10,11 for DVD
	BIT4		01:NTSC2(108°)	
	BIT5	C-GAMMA	0:Chroma γ correction off	1:Chroma γ correction on
	BIT6	Color kill off	0:normal	1:color killer always off
	BIT7	P/N ID	0:P/N color killing sensitivity 1.2/1.5mVp-p	1:6.6/6.4mVp-p
NDHP	When NOISE REDUCE ON, sharpness register′s content = OSD sharpness value-NSHP value			