

TOSHIBA

SERVICE MANUAL

COLOUR TELEVISION

21V53

ENTERING TO SERVICE MENU:

In order to enter service menu, first enter the main menu and then press the digits 4, 7, 2 and 5 respectively.

To select adjust parameters, use **↵** or **↵** buttons. To change the selected parameter, use **←** or **→** buttons. Selected parameter will be highlighted.

Entire service menu parameters of AK30 CHASSIS are listed below. For some of parameters the default values are given on the same table.

USING COLOUR BUTTONS ON SERVICE MENU:

- RED BUTTON (For Stereo models only): It switches the AVL to ON or OFF mode on service menu. AVL word is visible on service menu when AVL is on.
- GREEN BUTTON : It switched the PICTURE MODE to 4:3 or 16:9 on service menu. It is useful when it is necessary to adjust 16:9 picture mode vertical size.
- YELLOW BUTTON : It switches to VERTICAL SCAN DISABLE mode. It is useful to adjust screen voltage.
- BLUE BUTTON : It is used to adjust AGC and IF automatically on service menu.

OSD:

Select OSD parameter on service menu. Adjust the horizontal position of OSD to the middle of screen, by using the reference bar on bottom of service menu.

Min. Value: 000

Max. Value: 127

Recommended Value: 082

IF Adjustments:

IF1:	IF Coarse Adjustment	004
IF2:	IF Fine Adjustment	065
IF3:	IF Coarse Adjustment for L-prime	004
IF4:	IF Fine Adjustment for L-prime	065

IF NEGATIVE ADJUSTMENT (WITHOUT L' SYSTEMS)

Set the video pattern to a PAL colour bar pattern with frequency 38.9 MHz. Apply this IF signal to PIN-10 and PIN-11 of tuner. Press PROG-1 and after that BLUE (INSTALL) button from remote controller. Select the standard as BG or I. (if BG is not available) Enter service menu. Select IF1 parameter from service menu and press BLUE (INSTALL) button from remote controller. IF adjustment will be done automatically by

software. See the IF indicator on service menu, it must be like on FIGURE-1 shown below.

IF POSITIVE ADJUSTMENT (WITH L' SYSTEMS)

Set the video pattern to a SECAM-L colour bar pattern with frequency 33.9 MHz. Apply this IF signal to PIN-10 and PIN-11 of tuner. Press PROG-1 and after that BLUE (INSTALL) button from remote controller. Select the BAND VHF-1 (S1 – S4 for PLL tuners) and standard as L'. Enter service menu. Select IF1 parameter from service menu and press BLUE (INSTALL) button from remote controller. IF adjustment will be done automatically by software. See the IF indicator on service menu, it must be like on FIGURE-1 shown below.

AGC: Automatic Gain Control

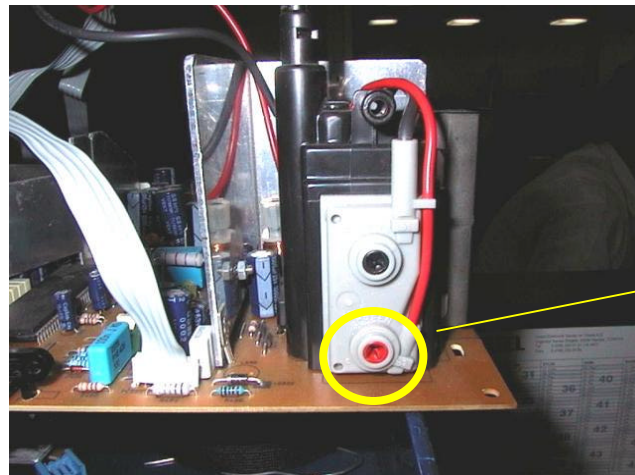
In order to do AGC adjustment, enter a **60µdBV** RF signal level from channel C-12 (224.25 MHz) Select AGC parameter from service menu. Press BLUE (INSTALL) button from remote controller. The adjustment will be done automatically by software. See the AGC indicator on service menu, it must be 1. Check that picture is normal at 90dBµV signal level.

TITANIUM B010		
01	AGC	039
02	VS1	031
03	VS2	054
04	VS3	014
05	VS4	030
06	VPOS	010
07	VLIN	050
08	HPOS	033
09	WR	025
10	WG	025
: 0 1		

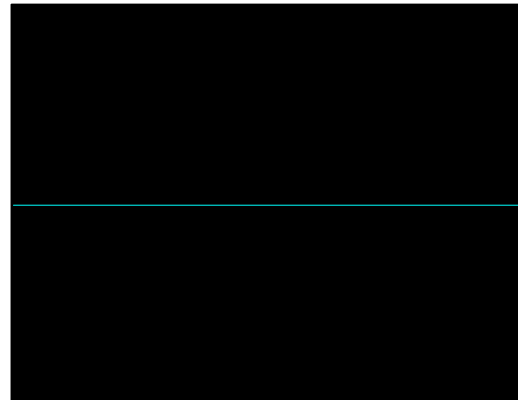
FIGURE-1

:	1	1
IF INDICATOR	AGC INDICATOR	NONE

SCREEN ADJUSTMENT: (FBT Screen)



SCREEN
ADJ.POT.



Enter service menu by pressing “MENU” and “4, 7, 2, 5” from remote controller. Then press yellow button to disable vertical scan. Adjust screen via screen pot. For a thin horizontal line. Press yellow button again to enable vertical scan. Press “TV” button to leave service menu.

VLIN: Vertical Linearity

Enter a PAL B/G circle test pattern via RF. Change VLIN till you see circle as round as possible.

Min. Value: 000
Max. Value: 063
Recommended Value: 045

VS1A: Vertical Size for 50 Hz / 4:3

Enter a PAL B/G circle test pattern via RF. Change VS1A (Vertical Size) until horizontal black lines on both the upper and lower part of the test pattern become very close to the upper and lower horizontal sides of picture tube and nearly about to disappear. Check and readjust Vertical Size item if the adjustment becomes improper after some other geometric adjustments are done.

Min. Value: 000
Max. Value: 063
Recommended Value: 030

VS1B: Vertical Size for 50 Hz / 16:9

Enter a PAL B/G circle test pattern via RF. Enter service menu and press GREEN (PICTURE) button from remote controller to switch to 16:9 picture mode on service menu. Change VS1B (Vertical Size) till the picture becomes 16:9 format. Check and readjust Vertical Size item if the adjustment becomes improper after some other geometric adjustments are done.

Min. Value: 000
Max. Value: 063
Recommended Value: 056

VP1: Vertical Position for 50 Hz

Enter a PAL B/G circle test pattern via RF. Change Vertical Position till the test pattern is vertically centered. Horizontal line at the center pattern is in equal distance both to upper and lower side of the picture tube. Check and readjust Vertical Position item if the adjustment becomes improper after some other geometric adjustments are done.

Min. Value: 000
Max. Value: 015
Recommended Value: 010

HP1: Horizontal Position for 50 Hz

Enter a PAL B/G circle test pattern via RF. Change Horizontal Position until the picture is horizontally centered. Check and readjust Horizontal Position item if the adjustment becomes improper after some other geometric adjustments are done.

Min. Value: 000
Max. Value: 063
Recommended Value: 035

VS2A: Vertical Size for 60 Hz / 4:3

Enter an NTSC-M circle test pattern via RF or video inputs. Change Vertical Size until the checkered parts of test pattern on both of upper and lower side disappear. Check and readjust Vertical Size item if the adjustment becomes improper after some other geometric adjustments are done.

Min. Value: 000
Max. Value: 063
Recommended Value: 013

VS2B: Vertical Size for 60 Hz / 16:9

Enter an NTSC-M circle test pattern via RF or video inputs. Enter service menu and press GREEN (PICTURE) button from remote controller to switch to 16:9 picture mode on service menu. Change Vertical Size until the picture becomes 16:9 format. Check and readjust Vertical Size item if the adjustment becomes improper after some other geometric adjustments are done.

Min. Value: 000
Max. Value: 063
Recommended Value: 038

VP2: Vertical Position for 60 Hz

Enter an NTSC-M circle test pattern via RF or video inputs. Change Vertical Position till the test pattern is vertically centered. Horizontal line at the center pattern is in equal distance both to upper and lower side of the picture tube. Check and readjust Vertical Position item if the adjustment becomes improper after some other geometric adjustments are done.

Min. Value: 000
Max. Value: 015
Recommended Value: 012

HP2: Horizontal Position for 60 Hz

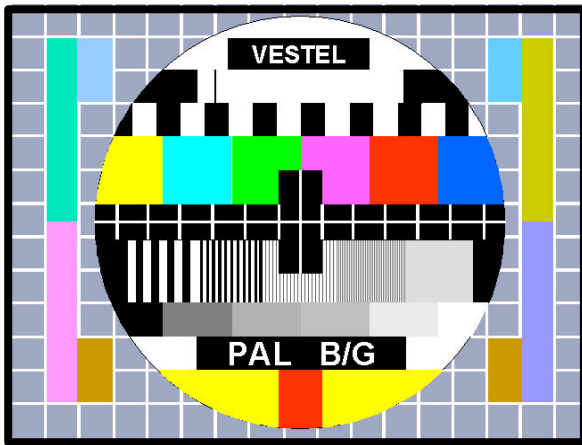
Enter an NTSC-M circle test pattern via RF or video inputs. Change Horizontal Position till the picture is horizontally centered. Check and readjust Vertical Size item if the adjustment becomes improper after some other geometric adjustments are done.

Min. Value: 000
Max. Value: 063
Recommended Value: 030

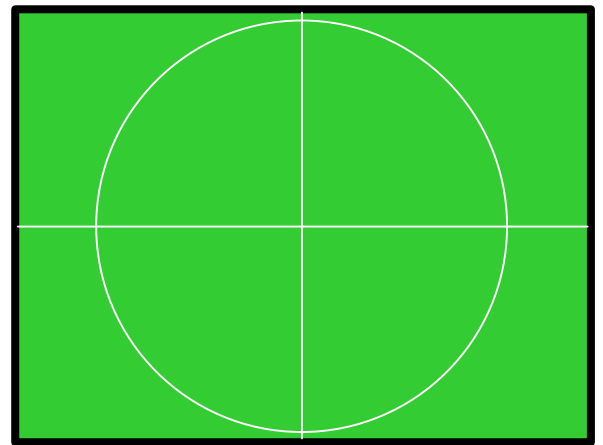
RGBH: RGB Mode Horizontal Shift Offset

Enter a RGB circle test pattern via video inputs. Force the TV to RGB mode by pressing AV button from remote controller. Change RGB Horizontal Position till the picture is horizontally centered. Check and readjust RGBH item if the adjustment becomes improper after some other geometric adjustments are done.

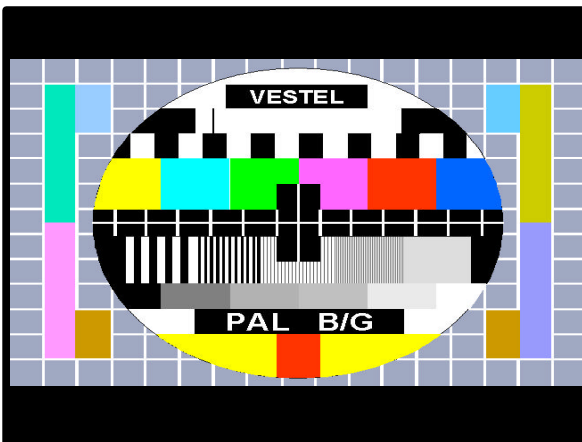
Min. Value: 000
Max. Value: 063
Recommended Value: 007



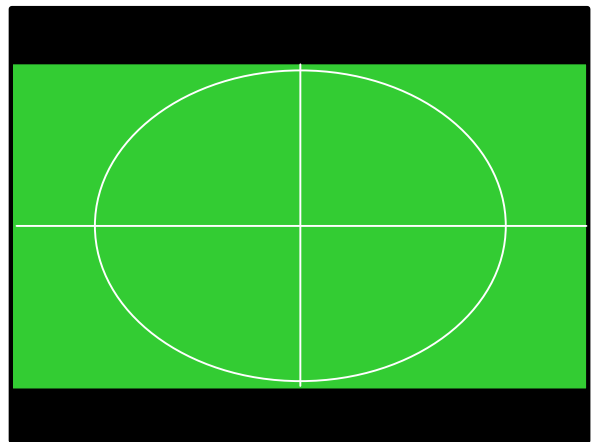
4:3 50Hz GEOMETRY ADJ.



4:3 60Hz GEOMETRY ADJ.



16:9 50Hz GEOMETRY ADJ.



16:9 60Hz GEOMETRY ADJ.

WHITE BALANCE ADJUSTMENT

The following three parameters are used to make white balance adjustment. To do this, use a Colour Analyzer. Using WR (White point adjust for RED), WG (White point adjust for GREEN), WB (White point adjust for BLUE) parameters, insert the + sign in the square which is in the middle of the screen.

WR: White Point Adjustment for RED

Use this parameter to set the strength of RED in White.

Min. Value: 000
Max. Value: 063
JVC Default: 040

WG: White Point Adjustment for GREEN

Use this parameter to set the strength of GREEN in White.

Min. Value: 000
Max. Value: 063
JVC Default: 040

WB: White Point Adjustment for BLUE

Use this parameter to set the strength of BLUE in White.

Min. Value: 000
Max. Value: 063
JVC Default: 040

BR: Bias for RED

Use this parameter to set the strength of RED in BLACK.

Min. Value: 000
Max. Value: 063

JVC AV20&21BJ8: 030
JVC AV14BJ&BM8: 024

BG: Bias for GREEN

Use this parameter to set the strength of GREEN in BLACK.

Min. Value: 000

JVC AV20&21BJ8: 031

JVC AV14BJ&BM8: 035

APR: Automatic RGB Peak Regulation (APR) Threshold

The goal of the **APR** function (*Automatic RGB peak regulation*) is to compensate the spread of contrast between sources or programs by regulating the peak amplitude of RGB signals. This results in a picture with higher contrast whatever the input signal amplitude. Besides, APR increases the contrasts of pictures with low contrast and avoids the clipping at RGB output for pictures with high amplitude.

To enable APR, refer to OP3 in Option Bytes.

Min. Value: 000

Max. Value: 015

JVC Default: 010

The following default values are the factory settings of the corresponding items. Except Volume, all values are restored when STANDARD button is pushed during no menu is displayed. Volume is set to its default value only if the A.P.S. bit is set when the TV is turned on.

BRI: Brightness

JVC AV20&21BJ8: 037

JVC AV14BJ&BM8: 035

CON: Contrast

JVC AV20&21BJ8: 035

JVC AV14BJ&BM8: 050

COL: Colour

JVC AV20&21BJ8: 043

JVC AV14BJ&BM8: 047

SHA: Sharpness

JVC AV20&21BJ8: 06

JVC AV14BJ&BM8: 08

HUE: Hue

Default Value: 31

VOL: Volume

Default Value: 15

WR-R: White Point Adjustment for RED (RGB Mode)

Use this parameter to set the strength of RED in White for a RGB Pattern.

Default Value: Not determined by JVC yet.

WG-R: White Point Adjustment for GREEN (RGB Mode)

Use this parameter to set the strength of GREEN in White for a RGB Pattern.

Default Value: Not determined by JVC yet.

WB-R: White Point Adjustment for BLUE (RGB Mode)

Use this parameter to set the strength of BLUE in White for a RGB Pattern.

Default Value: Not determined by JVC yet.

FMP1: FM Prescaler when AVL is OFF (STEREO ONLY)

Min. Value: 000

Max. Value: 127

Recommended Value: 009

NIP1: NICAM Prescaler when AVL is OFF (STEREO ONLY)

Min. Value: 000
Max. Value: 127
Recommended Value: 020

SCP1: SCART Prescaler when AVL is OFF (STEREO ONLY)

Min. Value: 000
Max. Value: 127
Recommended Value: 013

FMP2: FM Prescaler when AVL is ON (STEREO ONLY)

Min. Value: 000
Max. Value: 127
Recommended Value: 013

NIP2: FM Prescaler when AVL is ON (STEREO ONLY)

Min. Value: 000
Max. Value: 127
Recommended Value: 016

SCP2: FM Prescaler when AVL is ON (STEREO ONLY)

Min. Value: 000
Max. Value: 127
Recommended Value: 013

Tuner Settings:

In the following table, the parameters for tuner settings and the setting values of Thomson CTF 5510 are given.

Parameter	Explanation	Thomson CTF5510
F1H	High byte of VHF1-VHF3 cross-over frequency	0000 1001
F1L	Low byte of VHF1-VHF3 cross-over frequency	1001 0010
F2H	High byte of VHF3-UHF cross-over frequency	0001 1011
F2L	Low byte of VHF3-UHF cross-over frequency	1000 0010
BS1	Band switching byte for VHF1	0000 0011
BS2	Band switching byte for VHF3	0000 0110
BS3	Band switching byte for UHF	1000 0101
CB	Control byte	1000 1110

Option Bytes:

OP1: Peripheral Options

- b7: NOT USED
- b6: 1, Display “AV-3” as “F-AV”
0, Display “AV-3” as “B-AV”
- b5: 1, Turn back TV mode after the last AV (with AV key)
0, Turn back first AV mode after the last AV
- b4: 1, AV-1 S is available in AV key stream
0, AV-1 S is NOT available in AV key stream
- b3: 1, RGB is available in AV key stream
0, RGB is NOT available in AV key stream
- b2: 1, AV-3 is available in AV key stream
0, AV-3 is NOT available in AV key stream
- b1: 1, AV-2 is available in AV key stream
0, AV-2 is NOT available in AV key stream
- b0: 1, AV-1 is available in AV key stream
0, AV-1 is NOT available in AV key stream

OP2: Reception Standard Options

- b7: 1, 3-button keyboard (V-, P+, V+)
0, 4/5 button keyboard (V-, V+, P-, P+, Menu)
- b6: 1, L/L' is available
0, L/L' is not available
- b5: 1, I is available
0, I is not available
- b4: 1, DK is available
0, DK is not available
- b3: 1, BG is available
0, BG is not available
- b2: 1, 3D PANORAMA is visible (STEREO ONLY)
0, DOLBY VIRTUAL is visible

b1: NOT USED

b0: 1, LOW POWER is available
0, LOW POWER is not available

When LOW POWER is available, low power consumption is provided during Stand-by.

OP3: Video Options

b7-6: Xtal Configuration
00, 1 Xtal PAL 4.43
01, 2 Xtal PAL/NTSC 4.43/3.58
10, 1 Xtal PAL/SEC/NTSC 4.43
11, 2 Xtal PAL/SEC/NTSC 4.43/3.58

b5: 1, Enable Blue back when no signal in AV modes
0, No blue back in AV modes

b4: 1, White Insertion is ON
0, White Insertion is OFF

White Insertion permits video IC to force a white picture during soft stop to discharge the tube at switching off. It prevents white flaming while switching off the TV.

b3: 1, Blue Background when no signal
0, Disable Blue Background

b2: 1, Semi-transparent background for menu
0, Solid Menu background for menu

b1: 1, Black Stretch is ON
0, Black Stretch is OFF

The **Black Stretch** function is used to increase the contrast for darker signals (lower than 50 IRE) when the overall picture is bright, and thus improve the display of the picture details. The amplitude of the stretch depends on the average picture content.

b0: 1, APR is ON
0, APR is OFF

OP4: TV Features

- b7: NOT USED
- b6: NOT USED
- b5: 1, AK36 chassis
0, AK30 chassis
- b4: 1, Hotel Mode can be activated
0, Hotel Mode cannot be activated
- b3: 1, No Signal Timer is enabled
0, No Signal Timer is disabled
- b2: For PLL Tuner
1, Frequency based search
0, Channel table based search
(*No meaning for VST Tuner*)
- b1: NOT USED
- b0: 1, Extra 200 msec blanking for VST
0, no-extra blanking

Extra 200-msec blanking is needed for VST tuners in order to prevent the color-delaying problem in SECAM.

OP5: Channel Tables

- b7: 1, Extra 150 msec blanking more for VST (if OP4.b0 = 1, to SECAM color problem)
0, no-extra blanking
- b6: NOT USED
- b5: 1, Force both channel on even no carrier (carrier mute disable)
(for STEREO models)
0, Default value after reset
- b4: NOT USED
- b3: NOT USED
- b2: NOT USED
- b1: NOT USED

TX1: Teletext Options

b7: 1, Auto APS after Stand-By
0, no APS after Stand-By

In shipping condition, APS bit is set to 1 and after the TV is turned on for the first time, it's automatically set to 0.

b6: RESERVED (must be 0)

b5: 1, Frequency item is VISIBLE in Install Menu and APS Menu
0, Frequency item is INVISIBLE in Install Menu and APS Menu

b4-3: Chassis Code

00, EP version
01, EE version
10, EN version
11, EJ version

Chassis Code is used when no country is selected in A.P.S menu, so the software automatically selects the sound standard depending on the chassis code.

b2-1-0: Device type selection

000, EPROM M6 A
001, ROM H5 P
010, ROMLESS H5 P
011, EPROM M6 R
100, ROM M6 R
101, OSDEPROM M6 R
110, ROM M6 P
111, Read Auto Gain Table for the device from EEPROM

OTP
MASK P SERIES
MASK O SERIES

The default values of the option bytes are given in the following table:

	EN Version	EP Version	EE Version
OP1	0111 0101	0111 0101	0111 0101
OP2	0000 1001	0100 1001	0001 1001
OP3	0110 0111	1110 0111	1110 0111
OP4	0000 1001 (AV20&21BJ8) 0010 1001 (AV14BJ&BM8)	0000 1001 (AV20&21BJ8) 0010 1001 (AV14BJ&BM8)	0000 1001 (AV20&21BJ8) 0010 1001 (AV14BJ&BM8)
OP5	1000 0000	1000 0000	1000 0000
TX1	(1)001 0(101)	(1)000 0(101)	(1)000 1(101)