

FACTORY ADJUSTMENT MODE:

General

All available options are divided over 4 option bytes, which can be set in the service menu. To activate the service menu, **RC-5 code 58 with system address 7** should be transmitted to the system. When the Service menu is activated, pressing the **Status-key** will bring up option byte 0. The menu left/right keys will change the value of the option byte down or up respectively. Pressing the Menu Up key will bring up the next option byte, option byte 1.

Note, that the four option bytes are not part of the overall service menu carousel or even part of an own, “option byte” carousel. When the last option byte has been entered and menu up is pressed, the first item of the service menu will be activated again. Pressing menu-down, when any of the option bytes 1..3 is active will bring up the previous option byte. Pressing menu-down when option byte 0 is present, will bring up the last item in the service menu carousel.

Note, that the option bytes are represented in binary notation and that the Least Significant Bit (LSB, bit 0) is the most right-hand bit.

Note, that bits marked as reserved are used by other members of the CTV27X family of TV control systems.

In case the user should forget the password that has been entered, there is a “built-in” password, that will always work: 759.

Option byte 0

The following options are available in option byte 0.

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Opt StoreUp	Opt FColorOn		Opt Standby	Opt Tuner		Opt Logo	Opt Stereo
Auto store up (1..99)	Forced Color on	reserv.	Standby after power on	UV1316tuner type	reserv.	Display Logo	Simple Stereo
1=Auto store starts at program 1 0=Autostore starts at program 99	1=Auto Color killing disabled 0=Auto Color killing enabled	-	1=Al. ways goto standby after power on 0=power on mode depends on last status	1=UV1316M K2 0=Old UV1316	-	1=display 0=don't display	1=present 0=not present

Table 5.1 Option byte 0 definitions

The setmaker's logo can only be displayed if memory bank 1 is present. If this bank is present, displaying the logo can be disabled by setting bit 1 low. If the memory bank is present and bit 1 is set, then the logo will be displayed for 15 seconds, after a cold start only.

NOTE: If no text is defined for the logo in memory bank 1, this option should always be 0

Option Byte 0 adjustment settings are 1000001.

Option byte 1

The following options are available in option byte 1:

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
	Opt TDA884X		Opt SChannels			Op Chan Table	
not used	Video Chip	reserved	S-channels	not used	not used	Channel Table	
-	1=TDA884X	-	1= S-channels included 0= S-channels not included	-	-		

Table 5.2 Option byte 1 definitions

In option byte 1, the bits 0 and 1 form a number between 0 and 3.

bit 1	bit 0	
Op Chan Table		Not used for VST tuners
0	0	CCIR
0	1	UK
1	0	OIRT
1	1	Illegal

Table 5.3 Option byte 1, bits 0 and 1 determine channel table

Note, that when a VST tuner is installed, the option bits for Channel Table have no meaning.

Option Byte 1 adjustment setting are 01010000.

Option byte 2

Option byte 2 is used entirely to set the available color and sound standards.

Note, that the available systems set here must match the installed Xtal' s for the video one-chip and sound traps.

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Opt NtscBG	Opt NtscM		Opt SecamDK	Opt SecamBG	Opt Pall	Opt PalDK	Opt PalBG
NTSC-BG	NTSC-M	Not used	SECAM-DK	SECAM-BG	PAL-I	PAL-DK	PAL-BG
1=present 0=not present	1=present 0=not present	-	1=present 0=not present	1=present 0=not present	1=present 0=not present	1=present 0=not present	1=present 0=not present

Table 5.4 Option byte 2 definitions

Option Byte 2: 1. Adjustment setting are 01000001 for PAL-BG and NTSC-M.

2. Adjustment setting are 01000011 for PAL-BG/DK and NTSC-M.

3. Adjustment setting are 01011011 for PAL/SECAM-BG/DK and NTSC-M.

Option byte 3

The following tables show the options in the last of the option bytes.

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
	Opt Nr Of AV		Opt Blueback	Opt VhfH	Opt VhfL	Opt Vid Mute	Opt 24Hr
reserved			Blue background	VHF-H band	VHF-L band	Video mute if Chan. change	24 hr clock
-			1=blue background 0=no blue background	1=present 0=not present	1=present 0=not present	1=mute 0=no mute	1=24 hour 0=AM/PM

Table 5.5 Option byte 3 definitions

Bits 5 and 6 form a pair to indicate the number of available AV (external) sources.

bit 6	bit 5	
OptNrOfAV		
0	0	No external source
0	1	AV-1 only
1	0	AV-1 and AV-2
1	1	AV-1 and AV-2 and S-VHS

Table 5.6 Option byte 3, Number of AV sources

Option Byte 3 adjustment setting are 01111111 for AV-1 and AV-2 and S-VHS.

Option Byte 3 adjustment setting are 01011111 for AV-1 and AV-2.

Cathode drive level adjust (CL-ADJ)

For variation of the cathode drive level at the CRT three IIC bits CL2, 1,0 are added. The table below gives a survey of the cathode drive levels:

CL-ADJ	Variation Cathode Drive
0	57V
1	63V
2	70V
3	77V
4	84V
5	91V
6	99V
7	107V

Measuring conditions:

Brightness are set to their nominal value. As test signal is used a black field with white block. The measured cathode drive voltages have a tolerance of +/- 3V.

7 Service and Factory mode

Factory mode

When the **service contact** (pin 35) of the microprocessor is shorted to ground for 250 ms but not longer than 500 ms, CTV272V2 will show the service menu. In the service menu, configuration and geometry parameters can be modified (service alignment), using the remote or local keyboard. In service mode, the EVG-bit of the video one-chip is cleared to 0, to avoid RGBOUT blanking when the vertical deflection fails, for easier repair. To indicate that the service menu is active, CTV272V2 will display the following OSD message:

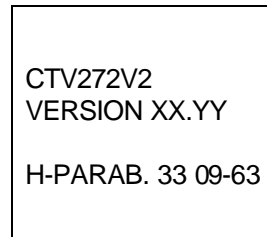


Figure 7.1 Service menu OSD

The OSD shows the identification of the TV system CTV272V2 and its version number in XX.YY format. An example of a version number is 00.04. The lowest line shows one of the alignment parameters. This is also the position on which the parameters will be shown when the service menu is active. There will only be one alignment parameter active at any given time. The alignment parameter consists of its name (refer to chapter on the **service menu** for details), its current value and the range in which the value can be altered.

When the short circuit lasts longer than 500 ms, CTV272V2 will enter Factory mode. The continuous update via the I²C bus and OSD's are suppressed. A factory computer can then write to the **non-volatile memory**. When a command from the local or remote keyboard is received, all devices are updated and the processor stops again. In this way, all non I²C bus controlled outputs of the microprocessor can still be controlled.

In factory mode, the setmaker's logo can be set, if the optional memory bank 1 is present. In this memory bank 40 bytes are available for the logo text. The characters for the logo text are NOT packed, like the characters for the program names. Any of the characters as described in the chapter on the **user interface** can be used. The logo text will be printed in two lines, the first line has a maximum of 20 characters, the second line has a maximum of 16 characters. If both lines are to be used, the upper line has to be filled out with 'Space' characters. There is no New Line character available, this will be inserted automatically after 20 characters have been read from the non-volatile memory.

The logo text can be 'ended' by either filling the remainder of the 40 bytes with spaces, or by inserting an EOL (End-Of-Logo) character. When the software reads an EOL character, the logo text will be regarded as finished.

The service line of the microprocessor is also used as a "write protect" line for the non-volatile memory. Any of the non-volatile memory IC's used can either be connected to this line or have their write protect pin (if applicable) fixed to ground. Prior to any write access to the non-volatile memory, the microprocessor will pull the service pin low.

Service Alignment

The service menu can also be activated by sending RC-5 code 58 with system address 7. When the service menu is activated, the Menu Up/Down keys will select the next item, while the Menu Left/Right keys will change the value of the item currently on screen. The following alignments can be set.

RC-5 key	Function	OSD	Range
Status	option byte 0	OPTION 0 10000001	
I/II	option byte 1	OPTION 1 01010000	
EFFECT	option byte 2	OPTION 2 01000001	
HOLD	option byte 3	OPTION 3 01111111	
-	Hotel Mode :Maximum Volume	HM VOL setting is 00	0-63
-	Hotel Mode :Initial Program	HM INI-P setting is 00	0-99
3	Horizontal shift ¹⁾	H-SHIFT setting is 34	0-63
2	E-W width ¹⁾	H-WIDTH setting is 31	0-63
1	E-W parabola ¹⁾	H-PARAB setting is 31	0-63
8	E-W corner ¹⁾	H-CORNER setting is 31	0-63
9	E-W trapezium ¹⁾	H-TRAP setting is 31	0-63
5	Vertical slope ¹⁾	V-SLOPE setting is 25	0-63
6	Vertical amplitude ¹⁾	V-AMPL setting is 41	0-63
4	Vertical S-correction ¹⁾	V-S.CORR setting is 12	0-63
7	Vertical shift ¹⁾	V-SHIFT setting is 36	0-63
Red	Red gain	R-GAIN setting is 31	0-63
Green	Green gain	G-GAIN setting is 31	0-63
Blue	Blue gain	B-GAIN setting is 31	0-63
White	Cathode drive level adjust	CL-ADJ setting is 02-04	0-7
Size	IF-PLL adjust ²⁾	IF-PLL/AFC setting is 02	0-3
Reveal	AGC adjust)	AGC-ADJ setting is 02-07	0-63
Time	Y-delay system ³⁾	Y-DELAY setting is 04	0-8
CANCEL	VSD alignment ⁵⁾	VSD setting is 00	0-1
PP	Stereo balance	STER BAL setting is 24	0-49
-	VHF-L step size A ⁴⁾	VHFL A setting is 78	0-128
-	VHF-L step size B ⁴⁾	VHFL B setting is 18	0-128
-	VH F L step size C ⁴⁾	VHFL C setting is 06	0-128
-	VHF H step size A ⁴⁾	VHFH A setting is 39	0-128
-	VHF H step size B ⁴⁾	VHFH B setting is 09	0-128
-	VHF H step size C ⁴⁾	VHFH C setting is 03	0-128
-	UHF step size A ⁴⁾	UHF A setting is 26	0-128
-	UHF step size B ⁴⁾	UHF B setting is 06	0-128
-	UHF step size C ⁴⁾	UHF C setting is 02	0-128
-	VHF-L delay time A ⁴⁾	VHFL A DL setting is 40	0-128
-	VHF-L delay time B ⁴⁾	VHFL B DL setting is 40	0-128
-	VHF-L delay time C ⁴⁾	VHFL C DL setting is 40	0-128
-	VHF-H delay time A ⁴⁾	VHFH A DL setting is 40	0-128
-	VHF-H delay time B ⁴⁾	VHFH B DL setting is 40	0-128
-	VHF-H delay time C ⁴⁾	VHFH C DL setting is 40	0-128
-	UHF delay time A ⁴⁾	UHF A DL setting is 40	0-128
-	UHF delay time B ⁴⁾	UHF B DL setting is 40	0-128
Mute	UHF delay time C ⁴⁾	UHF C DL setting is 40	0-128

1) These settings should be done with separate test signals with a 50 Hz and a 60 Hz field frequency.

These parameters are stored in separate groups for 50 Hz and 60 Hz and are recalled or set, depending on the field frequency of the currently received program.

2) The TDA884x supports an alignment free IF-PLL.

The required IF- frequency can be set by adjusting the IF- PLL value according the table below:

IF-PLL value	IF- Frequency
0	58.75 MHz
1	45.75 MHz
2	38.90 MHz
3	38.00 MHz

3) This setting should be repeated for any of the possible color standards in the TV – system, since this parameter is recalled or set, depending on the currently selected color standard.

4) VST tuners only.

5) VSD alignment, when there is no vertical deflection, the remaining horizontal line can be used for simplified Vg2 alignment

0: Vertical scan active (normal operation)

1: Vertical scan disabled

6) Stereo balance (STER BAL) setting is adjusted separation of German Stereo.

a. Set a signal generator to colour bar, stereo sound mode and off the main sound modulation (5.5 MHz signal).

b. Connect the high impedance voltmeter to L speaker output.

c. Adjust STER BAL for the maximum reading (unit of dB) on the voltmeter of the stereo separation.

Table 7.1 Basic service alignments

When a VST tuner is used, the search tuning algorithm uses three different step-sizes when searching a transmitter (refer to **VST tuning** for details). These step-sizes are called Step A, Step B and Step C. Step A is the largest step (approximately 1 MHz), Step C is the smallest step (approximately 62.5 kHz). Measured in frequency, these steps should be approximately equal for all three bands. However, the tuning voltage applied to the tuner results in different frequencies for each band. Therefore, the step-sizes should be set for each step in each band individually. Note, that the software will not set default values, after a new non-volatile memory is installed. If a UV1315 VST tuner is used, the following values for the step-sizes will give good tuning results:

Step	Value
VHF-L A	78
VHF-L B	18
VHF-L C	06
VHF-H A	39
VHF-H B	09
VHF-H C	03
UHF A	26
UHF B	06
UHF C	02

Table 7.2 Possible step-sizes for UV1315 VST tuner

For different tuners it may be necessary to obtain different values. In order to stabilize the tuner, the tuning algorithm will wait for a certain time after each step. This time is the tuning delay time, which can be set for each step-size in each band. The delay time set in the non-volatile memory is directly measured in milliseconds. The tuning algorithm itself has an update time of 40 ms, so it is useless to set the delay times to less than 40 ms. Also, for the UV1315 tuner, 40 ms is a value, which will produce good search tuning results. For different tuners it may be necessary to obtain different values.

The four option bytes can also be changed via the service menu. These are however not part of the service parameter carousel, as shown in the previous table. The following table shows the OSD for the four option bytes.

RC-5 key	Function	OSD	Range
Status	Option byte 0	OPTION 0 ¹⁾	0 - 256
Sound channel	Option byte 1	OPTION 1 ¹⁾	0 - 256
Spatial	Option byte 2	OPTION 2 ¹⁾	0 - 256
Hold	Option byte 3	OPTION 3 ¹⁾	0 - 256

Notation is in binary format, so that it is easy to see which option bits are set. Refer to the **option section** for a detailed description of the option bytes.

Table 7.3 Option bytes

Each of the option bytes can also be “stepped to” by means of the Menu Up key, provided the first option byte is at that moment on screen. Pressing Menu Up when the last option byte is active, will step to “Horizontal shift”. Using Menu down is also possible when the option bytes are on screen, to step back through the option bytes. If option byte 0 is active when Menu Down is pressed, will step back to UHF delay time C.

When a new non-volatile memory is installed, it's contents may have random values, which do not fit in the range, as set by table 7.1. The software will also not check on this situation and set appropriate default values. It is up to the service engineer or the factory to bring the service alignment values into range. Once the values have been set to a proper, in range value, it is no longer possible to set a value out of range. The software will check on ranges, when the alignment values are changed.

Hotel Mode

Hotel mode can only be set from within the service menu. The reason for this is that a separate menu with a security code is never safe enough. It is always possible, that either willingly or by accident hotel customers activate the Hotel Mode Menu and change any of the settings. The service menu however can only be activated by a special remote control device or by activating the service pin of the micro-controller.

The parameters that set Hotel Mode are always the first two items in the service menu. Therefore, a hotel technician, setting hotel mode in the service menu does not need to know all the details about the TV alignments. The hotel technician only needs to know that the first two parameters can safely be set and that the service menu should be left after the necessary settings have been made.

When Hotel Mode is active, the micro-controller will not be able to write any of the settings in the system into the non-volatile memory. The only settings that can be written are the Maximum Volume and the Initial Program of hotel mode. The Installation menu is not available in hotel mode. This also means, that programs that have been cleared, prior to setting hotel mode, can not be returned. The lock status of programs will be ignored. Also, in the Others menu, the Password item is not available when hotel mode is ON. Effectively, this means that locked programs are unlocked when hotel mode is on.

Any of the analog settings (volume, balance, brightness, contrast etc.,) can be changed, but these changes will only have effect as long as the TV is switched on. After going to standby, or powering down and up, the settings from the non-volatile memory will be recalled. Therefore, analog settings that the system should start up with should be set and stored as Personal Preset prior to setting hotel mode itself.

Hotel mode will be activated, as soon as the value for the maximum volume (HMVOL) is set to a value unequal to 0. The maximum value the analog volume can have is 63, which in normal operating conditions is visualized by a bargraph, in the most right position. Every dash in the bargraph corresponds to 4 increments in volume. The value for the maximum volume can be set from 0 to 63 and is wrapped around from 0 to 63 with the Menu Left key or wrapped around from 63 to 0 with the Menu Right key. This feature can be used to help setting the maximum volume to an acceptable value.

First, make sure the maximum volume is set to 0, which also means hotel mode is off. Set the volume level to an acceptable maximum value, by means of the Sound menu or the Volume + local or remote key. Then activate the service menu and start setting the maximum volume by using the Menu Left key. This will start the maximum value at the value of 63 and sets hotel mode active. Continue decrementing the maximum volume, until the volume at the loudspeakers starts to decrease. This is then the maximum level that can be set by the hotel customer. Another way of setting the maximum volume is just by setting a value, without the help of any audible effects.

The initial program is the number of the program. That the TV set will power up with, either from power down or standby. For all versions of the CTV27xxx package, the maximum number that can be set here is 99, also for versions that have less than 99 programs. Care should be taken to select an existing program at this location, because the system will bring value in range if necessary. The initial program in that case is then unequal to the one set at Initial Program.

When factory alignment is performed, this can either be done by a factory computer or by hand by a factory technician. In the first case, the microprocessor will have to be put in factory mode, so the factory computer will be able to write to the non-volatile memory without any problems. Make sure however, to write 0 in the HM VOL service parameter to allow analog setting to be written into the non-volatile memory.

In the second case, the factory technician must make sure, that the service parameter HM VOL (Hotel Mode maximum Volume) is set to 0. If this is not the case, also the alignment parameters will NOT be written into non-volatile memory, even though the new settings are written the corresponding components (e.g. video one-chip) of the system! If alignment parameters are changed while the hotel mode is active, powering the system down and up will restore the previous parameters as recalled from non-volatile memory.