5.4   Service Tools

5.4.1   ComPair

The ComPair Tool is no longer supported.

5.5   Error Codes

5.5.1   Introduction

The error code buffer contains all detected errors since the last time the buffer was erased. The buffer is written from left to right, new errors are logged at the left side, and all other errors shift one position to the right.
When an error occurs, it is added to the list of errors, provided the list is not full. When an error occurs and the error buffer is full, then the new error is not added, and the error buffer stays intact (history is maintained).
To prevent that an occasional error stays in the list forever, the error is removed from the list after more than 50 hrs. of operation.
When multiple errors occur (errors occurred within a short time span), there is a high probability that there is some relation between them.

- **If no errors are there, the LED should not blink at all in CSM or SDM. No spacer must be displayed as well.**
- **There is a simple blinking LED procedure for board level repair (home repair) so called LAYER 1 errors** next to the existing errors which are LAYER 2 errors (see Table 5-2).
  - LAYER 1 errors are one digit errors.
  - LAYER 2 errors are 2 digit errors.
- **In protection mode**.
  - From consumer mode: **LAYER 1.**
  - From SDM mode: **LAYER 2**.
- **Fatal errors, if I2C bus is blocked and the set reboots, CSM and SAM are not selectable**.
  - From consumer mode: **LAYER 1.**
  - From SDM mode: **LAYER 2.**
- In CSM mode.
  - When entering CSM: error(s) **LAYER 1** will be displayed via blinking LED. (attention: any new remote control press will disable the error blinking LED sequence, recovery by exit and invoke CSM again for re-enabling the error blinking).
- In SDM mode.
  - When SDM is entered via Remote Control code or the hardware pins, **LAYER 2** is displayed via blinking LED.
- Error display on screen.
  - In CSM no error codes are displayed on screen.
  - In SAM the complete error list is shown.

Basically there are three kinds of errors:
- **Errors detected by the Standby software which lead to protection.** These errors will always lead to protection and an automatic start of the blinking LED LAYER 1 error. (see section "5.6 The Blinking LED Procedure").
- **Errors detected by the Standby software which not lead to protection.** In this case the front LED should blink the involved error. See also section "5.5 Error Codes, 5.5.4 Error Buffer". Note that it can take up several minutes before the TV starts blinking the error (e.g. LAYER 1 error = 2, LAYER 2 error = 15 or 53).
- **Errors detected by main software (MIPS).** In this case the error will be logged into the error buffer and can be read out via ComPair, via blinking LED method LAYER 1-2 error, or in case picture is visible, via SAM.

5.5.2   How to Read the Error Buffer

Use one of the following methods:

- On screen via the SAM (only when a picture is visible). E.g.:
  - **00 00 00 00 00**: No errors detected
  - **23 00 00 00 00**: Error code 23 is the last and only detected error.
  - **37 23 00 00 00**: Error code 23 was first detected and error code 37 is the last detected error.
  - **Note that no protection errors can be logged in the error buffer.**
- Via the blinking LED procedure. See section 5.5.3 How to Clear the Error Buffer.
- Via ComPair.

5.5.3   How to Clear the Error Buffer

Use one of the following methods:
- By activation of the "RESET ERROR BUFFER" command in the SAM menu.
- If the content of the error buffer has not changed for 50+ hours, it resets automatically.

5.5.4   Error Buffer

In case of non-intermittent faults, clear the error buffer before starting to repair (**before** clearing the buffer, write down the content, as this history can give significant information). This to ensure that old error codes are no longer present.
If possible, check the entire contents of the error buffer. In some situations, an error code is only the result of another error code and not the actual cause. (e.g. a fault in the protection detection circuitry can also lead to a protection)
There are several mechanisms of error detection:
- Via error bits in the status registers of ICs.
- Via polling on I/O pins going to the standby processor.
- Via sensing of analog values on the standby processor or the Mips.
- Via a "not acknowledge" of an I²C communication.

Take notice that some errors need several minutes before they start blinking or before they will be logged. So in case of problems wait 2 minutes from start-up onwards, and then check if the front LED is blinking or if an error is logged.

Table 5-2 Error code overview

Description	Layer 1	Layer 2	Monitored by	Error/Prot	Error Buffer/Blinking LED	Device	Defective Board
I^{2}CM3 (SSB + SRF bus)	2	13	MIPS	E	BL / EB	SSB	SSB
I^{2}CM2 (BE bus)	2	14	MIPS	E	BL / EB	SSB	SSB
I^{2}CM1(FE bus)	2	18	MIPS	E	BL / EB	SSB	SSB
PNX (Fusion) doesn't boot	2	15	Stby µP	P	BL	Fusion	SSB
12V	3	16	Stby µP	P	BL	/	Supply
HDMI mux	2	23	MIPS	E	EB	SII9287	SSB
I2C switch	2	24	MIPS	E	EB	PCA9540	SSB
Channel dec DVB-T2	2	27	MIPS	E	EB	CXD2834	SSB
Channel dec DVB-S2	2	28	MIPS	E	EB	SI2169	SSB
Lnb controller	2	31	MIPS	E	EB	LNBH25	SSB
Hybrid Tuner	2	34	MIPS	E	EB	SUT-RE214Z	SSB
Main NVM	2	35	MIPS	E	EB	M24C64	SSB
Tuner DVB-S2	2	36	MIPS	E	EB	STV611X	SSB
Class-D	2	37	MIPS	E	EB	TAS 5731 PHP	SSB
µProcessor PQ	2	38	MIPS	E	EB	LPC1114	SSB
IO Expander	2	41	MIPS	E	EB	PCA9554	SSB
T° sensor SSB/set	2	42	MIPS	E	EB	LM75	T° sensor/SSB
Light sensor	6	43	MIPS	E	EB	TSL2571	Set
µP touch control	6	44	MIPS	E	EB	/	Set
RF4CE	6	46	MIPS	E	EB	/	Set
MIPS doesn't boot (SW cause)	2	53	Stby µP	P	BL	FUSION	SSB
NT72314	9	61	MIPS	E	EB	NT72314/	QFHD
NT68361	9	62	MIPS	E	EB	NT68361/	QFHD
NT72314 not alive	9	63	MIPS	E	EB	NT72314/	QFHD
NT68361 not alive	9	64	MIPS	E	EB	NT68361/	QFHD

Extra Info

- **Rebooting.** When a TV is constantly rebooting due to internal problems, most of the time no errors will be logged or blinked. This rebooting can be recognized via a ComPair interface and Hyperterminal (for Hyperterminal settings, see section "5.8 Fault Finding and Repair Tips, 5.8.6 Logging). It's shown that the loggings which are generated by the main software keep continuing.
- **Error 13 (I^{2}C bus M3, SSB + SRF bus blocked)**. Current situation: when this error occurs, the TV can reboot due to the blocked bus. The best way for further diagnosis here, is to check the logging output.
- **Error 14 (I^{2}C bus M2, BE bus blocked)**. Current situation: when this error occurs. The best way for further diagnosis here, is to check the logging output.
- **Error 18 (I^{2}C bus M1, FE bus blocked)**. Current situation: when this error occurs. The best way for further diagnosis here, is to check the logging output.
- **Error 15 (Fusion doesn't boot)**. Indicates that the main processor was not able to read his bootscript. This error will point to a hardware problem around the Fusion (supplies not OK, Fusion device completely dead, link between Mips and Standby Processor broken, etc...)
  Other root causes for this error can be due to hardware problems regarding the DDR's and the bootscript reading from the Fusion device.
- **Error 16 (12V)**. This voltage is made in the power supply and results in protection (LAYER 1 error = 3) in case of absence. When SDM (maintain grounding continuously) is activated we see blinking LED LAYER 2 error = 16.
- **Error 17 (Display Supply)**. "Power OK" not applicable.
- **Error 23 (HDMI mux)**. When there is no I^{2}C communication towards the HDMI mux after start-up, LAYER 2 error = 23 will be logged and displayed via the blinking LED procedure if SDM is switched on.
- **Error 24 (I2C switch)**. When there is no I^{2}C communication towards the I^{2}C switch, LAYER 2 error = 24 will be logged and displayed via the blinking LED procedure when SDM is switched on.
- **Error 27 (Channel dec DVB-T2)**. When there is no I^{2}C communication towards the DVB-T channel decoder, LAYER 2 error = 27 will be logged and displayed via the blinking LED procedure if SDM is switched on.
- **Error 28 (Channel dec DVB-S2)**. When there is no I^{2}C communication towards the DVB-S channel decoder,

LAYER 2 error = 28 will be logged and displayed via the blinking LED procedure if SDM is switched on.
- **Error 31 (Lnb controller)**. When there is no I^{2}C communication towards this device, LAYER 2 error = 31 will be logged and displayed via the blinking LED procedure if SDM is activated.
- **Error 34 (Tuner)**. When there is no I^{2}C communication towards the tuner during start-up, LAYER 2 error = 34 will be logged and displayed via the blinking LED procedure when SDM is switched on.
- **Error 35 (main NVM)**. When there is no I^{2}C communication towards the main NVM during start-up, LAYER 2 error = 35 will be displayed via the blinking LED procedure when SDM is switched "on". All service modes (CSM, SAM and SDM) are accessible during this failure, observed in the Uart logging as follows: "<< ERROR >>> PFPOW_.C: First Error (id19, Layer_1= 2 Layer_= 35)".
- **Error 36 (Tuner DVB-S)**. When there is no I^{2}C communication towards the DVB-S tuner during start-up, LAYER 2 error = 36 will be logged and displayed via the blinking LED procedure when SDM is switched "on".
- **Error 37 (Class-D)**. When there is no I^{2}C communication towards the Class-D amplifier during start-up, LAYER 2 error = 37 will be logged and displayed via the blinking LED procedure when SDM is switched "on".
- **Error 38 (microProcessor PQ)**. When there is no I^{2}C communication towards this processor device during start-up, LAYER 2 error = 38 will be logged and displayed via the blinking LED procedure when SDM is switched "on". This device supports the backlight + boost pwm control, scanning, 3D drive.
- **Error 41 (I/O Expander)**. When there is no I^{2}C communication towards this processor device during start-up, LAYER 2 error = 41 will be logged and displayed via the blinking LED procedure when SDM is switched "on".
- **Error 42 (Temp sensor)**. Only applicable for TV sets equipped/stuffed with temperature devices.
- **Error 43 (Light sensor)**. When there is no I^{2}C communication towards the light sensor device during start-up, LAYER 2 error = 43 will be logged and displayed via the blinking LED procedure when SDM is switched "on".
- **Error 44 (Touch control)**. When there is no I^{2}C communication towards the touch control micro processor during start-up, LAYER 2 error = 44 will be logged and

displayed via the blinking LED procedure when SDM is switched "on".

- **Error 46 (RF4CE)**. When there is no I²C communication towards the RF4CE driver during start-up, LAYER 2 error = 46 will be logged and displayed via the blinking LED procedure when SDM is switched "on".
- **Error 53**. This error will indicate that the Fusion device has read his bootscript (when this would have failed, error 15 would blink) but initialization was never completed because of hardware problems (NAND flash, DDR...) or software initialization problems. Possible cause could be that there is no valid software loaded (try to upgrade to the latest main software version). Note that it can take a few minutes before the TV starts blinking LAYER 1 error = 2 or in SDM (maintain grounding continuously), LAYER 2 error = 53.
- **Error 61 (NT72314)**. When there is no I²C acknowledge from the Novatek device (Quad full HD Bolt-on board) towards the MIPS during start-up, LAYER 2 error = 61 will be logged. Here, the Novatek device operates as frame rate convertor.
- **Error 62 (NT68361)**. When there is no I²C acknowledge from the Novatek device (Quad full HD Bolt-on board) towards the MIPS during start-up, LAYER 2 error = 62 will be logged. Here, the Novatek device supports the 4K HDMI to LVDS conversion.
- **Error 63 (NT72314 not alive)**. Error generated via I²C by the device itself, although acknowledge passed and confirmed.
- **Error 64 (NT68361 not alive)**. Error generated via I²C by the device itself, although acknowledge passed and confirmed.

5.6 The Blinking LED Procedure

5.6.1 Introduction

The blinking LED procedure can be split up into two situations:
- **Blinking LED procedure LAYER 1 error.** In this case the error is automatically blinked when the TV is put in CSM. This will be only one digit error, namely the one that is referring to the defective board (see table "5-2 Error code overview") which causes the failure of the TV. This approach will especially be used for home repair and call centres. The aim here is to have service diagnosis from a distance.
- **Blinking LED procedure LAYER 2 error.** Via this procedure, the contents of the error buffer can be made visible via the front LED. In this case the error contains 2 digits (see table "5-2 Error code overview") and will be displayed when SDM (hardware pins) is activated. This is especially useful for fault finding and gives more details regarding the root cause of the defective board.

Important remark:
For an empty error buffer, the LED should not blink at all in CSM or SDM. No spacer will be displayed.

When one of the blinking LED procedures is activated, the front LED will show (blink) the contents of the error buffer. Error codes greater then 10 are shown as follows:
1. "n" long blinks (where "n" = 1 to 9) indicating decimal digit
2. A pause of 1.5 s
3. "n" short blinks (where "n" = 1 to 9)
4. A pause of approximately 3 s,
5. When all the error codes are displayed, the sequence finishes with a LED blink of 3 s (spacer).
6. The sequence starts again.

Example: Error 12 8 6 0 0.
After activation of the SDM, the front LED will show:
1. One long blink of 750 ms (which is an indication of the decimal digit) followed by a pause of 1.5 s
2. Two short blinks of 250 ms followed by a pause of 3 s
3. Eight short blinks followed by a pause of 3 s
4. Six short blinks followed by a pause of 3 s

5. One long blink of 3 s to finish the sequence (spacer).
6. The sequence starts again.

5.6.2 How to Activate

Use one of the following methods:
- **Activate the CSM**. The blinking front LED will show the layer 1 error(s), this works in "normal operation" mode or automatically when the error/protection is monitored by the standby processor.
  In case no picture is shown and there is no LED blinking, read the logging to detect whether "error devices" are mentioned. (see section "5.8 Fault Finding and Repair Tips, 5.8.6 Logging").
- **Activate the SDM**. The blinking front LED will show the entire content of the LAYER 2 error buffer, this works in "normal operation" mode or when SDM (via hardware pins) is activated when the tv set is in protection.

5.7 Protections

5.7.1 Software Protections

Most of the protections and errors use either the standby microprocessor or the MIPS controller as detection device. Since in these cases, checking of observers, polling of ADCs, and filtering of input values are all heavily software based, these protections are referred to as software protections. There are several types of software related protections, solving a variety of fault conditions:
- **Related to supplies:** presence of the +5V, +3V3, +2V5, +1V2 and +1V1 needs to be measured, no protection triggered here.
- **Protections related to breakdown of the safety check mechanism.** E.g. since the protection detections are done by means of software, failing of the software will have to initiate a protection mode since safety cannot be guaranteed any more.

Remark on the Supply Errors
The detection of a supply dip or supply loss during the normal playing of the set does not lead to a protection, but to a cold reboot of the set. If the supply is still missing after the reboot, the TV will go to protection.

Protections during Start-up
During TV start-up, some voltages and IC observers are actively monitored to be able to optimize the start-up speed, and to assure good operation of all components. If these monitors do not respond in a defined way, this indicates a malfunction of the system and leads to a protection. As the observers are only used during start-up, they are described in the start-up flow in detail (see section "5.3 Start-up").

5.8 Fault Finding and Repair Tips
Read also section "5.5 Error Codes, 5.5.4 Error Buffer, Extra Info".

5.8.1 Ambilight

Due to the aging process on the LED's fitted on the Ambilight module, there can be a difference in the colour and/or light output of the spare ambilight modules in comparison with the originals ones contained in the TV set. Via SAM => alignments => ambilight, the spare module can be fine-tuned.
Other possibility: the original values can also be recovered via SAM, Upload to USB => alignments. Now the original settings are on the USB stick and can be reloaded into another SSB (NVM).

5.8.2 CSM

When CSM is activated and there is a USB stick connected to the TV, the software will dump the complete CSM content to the USB stick. The file (Csm.xml) will be saved in the root of the USB stick. If this mechanism works it can be concluded that a large part of the operating system is already working (MIPS, USB...)

5.8.3 Power conversion and distribution.

Description

Input power for the TV platform comes from the main power supply that delivers +3V5-STANDBY (pin 9 of connector 1M90) and +12V (pins 11,12 and 25,26 of the same connector). +3V5-STANDBY (3.5V nominal) is the permanent voltage while +12V is started by the STANDBY signal (connector 1M90, pin 10) when going from high to low. +12V is split in few branches via fuses 1UA0 (+12Va), 1UA1 (+12Vb) and 1UP1(+12-DVBS):

- +12Va serves as input voltage for the switching voltage regulators that deliver +1V1-FD and +1V5.
- +12Vb is used as input voltage for the switching voltage regulators that deliver +3V3 and +5V.
- +12V-DVBS (if DVB-S functionality is present) goes to 12V and +V-LNB switching regulators.

The on board power supply consists of 4 switching voltage regulators (5 in case of DVB-S version), 8 linear voltage regulators (9 in case of DVB-S version) and an over-current protection circuit for 12V (AMBI-POWER) ambilight boards.

All switching voltage regulators have 12V input voltage and deliver:

- +1V1-FD Fusion main core supply voltage (0.95V...1.2V - depending on DVS1 signal), stabilized close to the point of load by means of SENSE+1V1-FD signal.
- +1V5 supply voltage (1.53V nominal), for the DDR3 memories and DDR3 interface of the Fusion chip and +1V5 to +1V2-MIPS and +1V5 to +1V2-FE linear voltage regulators.
- +3V3 supply voltage (3.32V nominal): overall 3.3V for on board IC's and external ambientlight panels, also used as input voltage for linear voltage regulators delivering +1V1-FA, +1V2-FA and +2V5.
- +5V (5.15V nominal) for USB ports, Conditional Access Module and via linear voltage regulators, the DVB-T and DVB-S tuner supplies.
- +V-LNB (13V or 18V) supply for outdoor satellite reception equipment.

The linear voltage regulators are providing:

- +1V1-FA supply voltage (1.10V nominal, from +3V3) for low power analog (PLL) blocks inside Fusion chip.
- +1V2-MIPS supply voltage (1.05...1.3V depending on DVS2 signal, input voltage: +1V5) for Fusion auxiliary core.
- +1V2-FE supply voltage (1.20V nominal, from +1V5) for (if present) DVB-T2 and DVB-S2 demodulator IC devices.
- +1V2-FA supply voltage (1.20V nominal, from +3V3) for higher power analog Fusion internal blocks (mainly video ADC's).
- +2V5 supply voltage (2.5V nominal, from +3V3) for LVDS or Vx1 interface and various other internal blocks of Fusion.
- +3V3 supply voltages (3.3V nominal, from +5V) for RF tuners, separate linear regulator per tuner.
- +3V3-STANDBY supply voltage (3.3V nominal, from +3V5-STANDBY) for Fusion standby controller and IR/RF remote-control receivers.
- +3V3-LAN supply voltage (3.37V nominal, from +3V5-STANDBY) for WiFi module and LAN interface of Fusion, this supply voltage is present when ENABLE-WOLAN is high.

Start-up of switching converters is triggered by DETECT12V signal that becomes high when +12V rises above 10V and stays above 9V (1V hysteresis). DETECT12V is used as enable signal by the +12V to +5V switching converter; +12V to +1V1-FD and +12V to +1V5 (and +1V2-MIPS) will start at the same time with +5V due to ENABLE+1V5+1V1 that is set high by DETECT12V signal. Tuners are supplied from their respective linear voltage regulators when +5V starts. The rest of the supply voltages (+3V3, +2V5, +1V2-FA, +1V2-FE and +1V1-FA) are switched on a few milliseconds later by signal ENABLE+3V3.

In case of TV sets having ambilight consumption from +12V higher than 1A, the electronic protection circuit (7UAC or 7UAD and surrounding components) is used instead of fuse 1UA2. AMBI-POWER should be available shortly (100 ms) after +12V starts if there is no load on it. The over-current trigger level is around 4.1A for 7UAC and 3.5A for 7UAD. Once the over-current protection is triggered, it can be reset by removing the shortcircuit cause and keeping it under no load condition for about 100 ms.

Important remark: for tests, GND-AL must be connected to platform GND.

in Hyperterminal. The Hyperterminal is available in every Windows application via Programs, Accessories, Communications, Hyperterminal. Connect a "ComPair UART"-cable (3138 188 75051) from the service connector in the TV to the "multi function" jack at the front of ComPair II box.

Required settings in ComPair before starting to log:
- Start up the ComPair application.
- Select the correct database (open file "QFUX.X", this will set the ComPair interface in the appropriate mode).
- Close ComPair

After start-up of the Hyperterminal, fill in a name (f.i. "logging") in the "Connection Description" box, then apply the following settings:

1. COMx
2. Bits per second = 115200
3. Data bits = 8
4. Parity = none
5. Stop bits = 1
6. Flow control = none

During the start-up of the TV set, the logging will be displayed. This is also the case during rebooting of the TV set (the same logging appears over and over). Also available in the logging is the "Display Option Code" (useful when there is no picture), look for item "display number xxx" in the beginning of the logging. Tip: when there is no picture available during rebooting you are able to check for "error devices" in the logging (LAYER 2 error) which can be very helpful to determine the failure cause of the reboot. For protection state, there is no logging.

5.8.7 Guidelines Uart logging

Description possible cases:

Uart loggings are displayed:
- When Uart loggings are coming out, the first conclusion we can make is that the TV set is starting up and communication with the flash RAM seems to be supported. The Fusion processor is able to read and write in the DRAMs.
- We can not yet conclude: Flash RAM and DRAMs are fully operational/reliable. There still can be errors in the data transfers, DRAM errors, read/write speed and timing control.

No Uart logging at all:
- No startup will end up in a blinking LED status: error LAYER 1 = "2", error LAYER 2 = "53" (startup with SDM solder paths continuous short).
- Error LAYER 2 = "15" (hardware cause) is more related to a supply issue while error LAYER 2 = "53" (software cause) refers more to boot issues.

Uart loggings reporting fault conditions, error messages, error codes, fatal errors:
- Some failures are indicated by error codes in the logging, check with error codes table (see Table "5-2 Error code overview"). e.g. => <<<ERROR>>>PLFPOW_MERR.C : First Error (id=10,Layer_1=2,Layer_2=23).
- I^{2}C bus errors.
- Not all failures or error messages should be interpreted as fault. For instance root cause can be due to wrong option codes settings => e.g. "FpgaDimmingPresent: False/True".

In the Uart log startup script we can observe and check the enabled loaded option codes.

Defective sectors (bad blocks) in the Nand Flash can also be reported in the logging.

Startup in the SW upgrade application and observe the Uart logging:
Starting up the TV set in the Manual Software Upgrade mode will show access to USB, meant to copy software content from USB to the DRAM. Progress feedback can be found in the logging.

Startup in Jett Mode:
Check Uart logging in Jet mode mentioned as : "JETT UART READY".

5.8.8 Memory test

The memory test is running in the background of the main TV software. It allocates a memory pool used to write and read back predefined data, as reference to detect possible memory corruption. The memory test is enabled by dial-in of sequence "6636" while the remote control (dedicated) is in DVD mode and the TV in CSM. Once the red LED in the front of the TV set starts blinking, exit CSM in order to display video. As long as the memory test is running and no error is detected, the standby LED is blinking. Upon detection of errors, the standby LED stays continuous ON and details will be shown in the prints of the Uart logging. It is not possible to stop the memory test once launched unless the TV is restarted, also increase/decrease the frequency of the memory interface can not be set.

Startup procedure:
- Switch ON the TV set.
- Set TV use case (preferably DVBT H264 or HDMI1080p).
- Invoke CSM (dial-in "123654" on the remote control).
- Set the remote control in DVD mode, and enter sequence "6636".
- Check the loggings coming from the service connector (Mips Uart prints) :
  "**MemoryTest No errors found so far (loop xx)"
  xx : number of tests done.
- As long as the memory test is running and no error is detected, the standby LED is blinking continuously, upon detection of errors, the standby LED stays ON.
- Get out of CSM in order to see video.

COM port settings:
- Baud rate: 115200
- Data: 8 bits
- Parity: none
- Stop: 1 bit
- Flow control: none

Error detection :
In case some errors are detected, the standby LED will stop blinking and following logs can be retrieved in the Uart prints:
- Error: offset [address] (READ/WRITE) xxxxxxxx/yyyyyyyy/zzzzzzzz should be nnnnnnnn.
  with:
- Offset: offset address where error is detected from start of buffer.
- Address: physical address where error is detected from start of buffer.
- READ/WRITE: indicates if error occurred during read or write memory access.
- xxxxxxxx/yyyyyyyy/zzzzzzzz: the 3 data reads from the memory location where the error(s) occurred.
- nnnnnnnn: correct data (expected content).

In some cases the TV software can crash before an error is detected. Thus, symptoms of software crash (reboot, picture freeze, no picture) should also be considered as test failure.

5.8.9 Loudspeakers

Make sure that the volume is set to minimum during disconnecting the speakers in the ON-state of the TV. The audio amplifier can be damaged by disconnecting the speakers during ON-state of the set!

5.8.10 Power Supply

In case of no picture when CSM (test pattern) is activated and backlight doesn't light up, it's recommended first to check the LED drivers on the PSL(S).

Attention point for cable handling: (dis)connection for power cable (power supply <=> SSB) should always be executed without any bending or mechanical stress on the outsides of the connector 1M90. Risk of double pins inside the connector should be avoid in this way.

5.8.11 Display option code

Attention: In case the SSB is replaced, always check the display option code number (group 2, first option number e.g. "44855") in SAM, even when picture is available. Performance with the incorrect display option code can lead to unwanted side-effects for certain conditions.

Also supported in this chassis:
The display option code can be changed by "062598 HOME XXX" special SAM command (XXX=display option in 3 digits).