Technical Description
Specification of KEY for CI Plus, DTCP-IP, One-to-One, Widevine and Netflix
## General information:
1. EEPROM (IC8902) for spare parts has the seed of KEY for each.
2. The final KEY data will be generated by PRO4 IC (IC8000) when SELF CHECK was done and are stored in both PRO4 IC (IC8000) and EEPROM (IC8902).
   All KEYs are not generated for all models.
   The necessary KEY are only generated and stored depend on the feature of models.

Replacement of ICs:
When PRO4 IC (IC8000) is replaced, EEPROM (IC8902) should be also replaced with new one the same time.
When EEPROM (IC8902) is replaced, PRO4 IC (IC8000) is not necessary to be replaced the same time.
After the replacement of IC, SELF CHECK should be done to generate the final KEY data.
How to SELF CHECK: While pressing [VOLUME (-)] button on the main unit, press the **STATUS** $\boxed{i}$ button on the remote control for more than 3 seconds.
TV will be forced to the factory shipment setting after this SELF CHECK.

Models and Keys:

Model No.	Keys				
	CI PLUS	**DTCP-IP**	**One-to-One (for USB Rec.)**	**Widevine**	**Netflix**
TX-L55WT50E	Yes	Yes	Yes	Yes	Yes
TX-L55WT50T	Yes	Yes	Yes	Yes	Yes

USB HDD Recording:
General information:
Digital TV programmes can be recorded in USB HDD.
A One-to-One key generated in A-board by SELF CHECK binds TV and USB-HDD for communication.
That key is only one key for them. If the key is difference, TV can not access USB-HDD.

Caution:
New key will be generated by following SELF CHECK and previous TV programmes recorded in USB HDD will not be viewed.
SELF CHECK: While pressing [VOLUME (-)] button on the main unit, press the **STATUS** $\boxed{i}$ button on the remote control for more than 3 seconds

Setting Inspection
Voltage Confirmation

A board

Description	Test point	Voltage	
SUB1.1V	TP8100	1.10V - 1.22V	
SUB 1.5 V	TP8101	1.435V - 1.585V	
SUB1.8V	TP8700	1.7V – 1.9V	
SUB3.3V	TP5400	3.17V – 3.43V	
SUB5V	TP5420	4.80V - 5.25V	
USB5V	TP5440	4.94V – 5.40V	
FE1.2V	TP5780	1.14V – 1.26V	
FE1.2V/2.5V	TP5720	2.375V – 2.625V	
PNL12V	TP4004 (TP4005)	11.5V – 12.9V	
LNB_OUTPUT	TP6702	Horizontal	17.0V - 19.0V
		Vertical	12.5V – 14.0V

Self Check

Self-check is used to automatically check the bus lines and hexadecimal code of the TV set. To enter Self-Check mode, keep pressing the down **(-/v)** button on the TV set and press the **STATUS** $\boxed{i}$ button on the remote control. To exit Self Check, switch off the TV set at the power button.

TX-L55WT50E

55FHD	Panasonic 2012LCD Self Check Complete	

TUN	O.K.
STBY	O.K.
MEM1	O.K.
MEM2	O.K.
AVSW	O.K.
LAN	O.K.
ZWEI	O.K.
SAT-TU	O.K.
ID	O.K.
ID2	O.K.
BT	O.K.
WiFi	O.K.

PEAKS-SOFT	1.619
PEAKS-EEP	01.06.0011
LSI-PACKAGE	0.016
LSI-RELEASE	1.14
STBY-SOFT	1.00.02
STBY-EEP	1.00.0015
STBY-ROMCORR	0.00.00
ZWEI-SOFT	09010011

SUM	C15D
MODEL ID	09
	03012100
	00040000

TX-L55WT50T

55FHD	Panasonic 2012LCD Self Check Complete	

TUN	O.K.
STBY	O.K.
MEM1	O.K.
MEM2	O.K.
AVSW	O.K.
LAN	O.K.
ZWEI	O.K.
SAT-TU	O.K.
ID	O.K.
ID2	O.K.
BT	O.K.
WiFi	O.K.

PEAKS-SOFT	1.619
PEAKS-EEP	01.06.0027
LSI-PACKAGE	0.016
LSI-RELEASE	1.14
STBY-SOFT	1.00.02
STBY-EEP	1.00.0015
STBY-ROMCORR	0.00.00
ZWEI-SOFT	09010011

SUM	C178
MODEL ID	09
	03042300
	00040000

Display	Ref. No.	Description	P.C.B.
TUN	TU6702	TUNER	A-Board
STBY	IC8000	Peaks-PRO4	A-Board
MEM1	IC8900	NAND FLASH MEMORY	A-Board
MEM2	IC8902	EEPROM PEAKS PRO4	A-Board
AVSW	IC3001	AUDIO/VIDEO SWITCH	A-Board
LAN	IC8600	LAN CONTROLER	A-Board
ZWEI	TC-unit	TC-unit on panel	TC-unit
SAT-TU	TU6702	TUNER	A-Board
ID	IC8902	CI+, DTCP-IP, C2mod	A-Board
ID2	IC8902	WIDEVINE , NETLFLIX	A-Board
BT	IC8458	USB HUB	A-Board
	N5HZZ0000113	BT DONGLE	BT Dongle
WiFi	IC8458	USB HUB	A-Board
	N5HBZ0000067	WIFI DONGLE	Wifi Dongle

If the CCU ports have been checked and found to be incorrect or not located then " - - " will appear in place of "O.K.".

Power LED blinking timing chart

1. Subject
   Information of LED Flashing timing chart.

2. Contents
   When abnormality has occurred the unit, the protection circuit operates and reset to the stand by mode. At this time, the defective block can be identified by number of blinking of the Power LED on the front panel of the unit.

Blinking times	Blinking timing	Contents	Check point
1	Once — 4 sec — Light / No Light	BL_SOS	A BOARD P BOARD
3		IROM SOS	A BOARD
7		SUB3.3V_SENSE_SOS	A BOARD
8		SOS	A BOARD
9		SOUND_SOS	A BOARD
10		ZWEI_SOS	TC-unit on panel
12		BE_SOS	A BOARD
13		EMERGENCY	A BOARD

Service Mode Function

MPU controls the functions switching for each IICs through IIC bus in this chassis. The following setting and adjustment can be adjusted by remote control in Service Menu

How to enter SERVICE

While pressing **(-/v)** button on the TV unit, press ⎡**0**⎤ on the remote control for 3 times within 2 seconds.

Note:

To exit from Service mode, press the exit button on remote control.

SERVICE

SERVICE	Peaks SOFT	1.619	OPTION 1	34
ADJUST	Peaks EEP	01.06.0027	OPTION 2	ee
WB-ADJ	LSI PACKAGE	0.016	OPTION 3	01
OPTION	LSI DATA	1.01.04	OPTION 4	53
SRV-TOOL	STBY SOFT	1.00.02	MODEL ID	09
DRV CHECK	STBY EEP	0.08.0015		03012100

SERVICE
- SERVICE
- ADJUST
- WB-ADJ
- OPTION
- SRV-TOOL
- DRV CHECK

(Service info box):
- Peaks SOFT 1.619
- Peaks EEP 01.06.0027
- LSI PACKAGE 0.016
- LSI DATA 1.01.04
- STBY SOFT 1.00.02
- STBY EEP 0.08.0015
- STBY ROMCOR 0.00.00
- ZWEI SOFT 7.100.0008
- AJAX-CE 0.47.5
- OPTION 1 34
- OPTION 2 ee
- OPTION 3 01
- OPTION 4 53
- MODEL ID 09
- 03012100
- 00040000
- R/E Cnt 000/000
- INV Cnt 0000
- AVSW re

Key Command

- Press the **3/4** button to change the adjustment values or function.
- Press the **1/2** button to step up/down through the functions and adjustments
- Press the numerical button **VOLUME (+/-)** to change of each option item.
- Press the **OK** button after each adjustment has been made to store the required values.

ADJUST row

ADJUST DYNAMIC
- CONTRAST 000
- YMAX

ADJUST DYNAMIC COLOR 50

ADJUST DYNAMIC TINT 00

ADJUST DYNAMIC SUB-BRT 800

ADJUST DYNAMIC BACKLGT 200

ADJUST DYNAMIC H-POS 0

ADJUST DYNAMIC H-AMP 0

ADJUST DYNAMIC V-POS 0

ADJUST DYNAMIC V-AMP 0

Help box (CONTRAST/YMAX):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 9:PICTURE MENU SELECT
- YELLOW:AUTO ADJUST
- VOL :ADJUST
- OK :WRITE

Help box (others):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 9:PICTURE MENU SELECT
- VOL :ADJUST
- OK :WRITE

ADJUST DYNAMIC
- VCOM 193
- BEFORE 193

Help box (VCOM):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 5 :FLICKER PATTERN
- 9 :PICTURE MENU SELECT
- OK :WRITE
- VOL :ADJUST

WB-ADJ row

WB-ADJ DYNAMIC
- R-GAIN 79
- BEFORE 79
- METHOD 02
- COLOR TEMP NORMAL

WB-ADJ DYNAMIC
- G-GAIN 77
- BEFORE 77
- METHOD 02
- COLOR TEMP NORMAL

WB-ADJ DYNAMIC
- B-GAIN 80
- BEFORE 80
- METHOD 02
- COLOR TEMP NORMAL

WB-ADJ DYNAMIC
- R-CENT 85
- BEFORE 85
- METHOD 02
- COLOR TEMP NORMAL

WB-ADJ DYNAMIC
- G-CENT 80
- BEFORE 80
- METHOD 02
- COLOR TEMP NORMAL

WB-ADJ DYNAMIC
- B-CENT 95
- BEFORE 95
- METHOD 02
- COLOR TEMP NORMAL

Help box (WB-ADJ):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 7:COLOR TEMP SELECT
- 9:PICTURE MENU SELECT
- 0:WB METHOD SELECT
- VOL :ADJUST
- OK :WRITE/WB DIFF ADJ

OPTION row

OPTION DYNAMIC Boot SD

OPTION DYNAMIC STBY-SET 00

OPTION DYNAMIC CLK MODE O0

OPTION DYNAMIC CLOCK ON

OPTION DYNAMIC Emergency ON

OPTION DYNAMIC Y/C Delay

OPTION DYNAMIC OPT 1 00110100

OPTION DYNAMIC OPT 2 11101110

OPTION DYNAMIC OPT 3 00000001

Help box (Boot):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 9:PICTURE MENU SELECT
- VOL :ADJUST

Help box (STBY-SET):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 9:PICTURE MENU SELECT
- OK :POWER OFF

Help box (CLK MODE):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 9 :PICTURE MENU SELECT
- VOL:ADJUST

Help box (CLOCK):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 9 :PICTURE MENU SELECT
- VOL:ADJUST

Help box (Emergency):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 9 :PICTURE MENU SELECT
- VOL:ADJUST

Help box (Y/C Delay):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 9:PICTURE MENU SELECT
- VOL :ADJUST
- OK :WRITE

Help box (OPT 1):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 5,6:BIT SELECT
- 9:PICTURE MENU SELECT
- VOL :ADJUST
- OK :WRITE

Help box (OPT 2/OPT 3):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 5,6:BIT SELECT
- 9:PICTURE MENU SELECT
- VOL :ADJUST
- OK :WRITE

OPTION DYNAMIC
- EDID-CLK MID
- HDMI 1

OPTION DYNAMIC OPT 4 01010011

Help box (EDID-CLK):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 7 :HDMI SELECT
- 9 :PICTURE MENU SELECT
- OK:WRITE

Help box (OPT 4):
- 1,2:MAIN SELECT
- 3,4:SUB SELECT
- 5,6:BIT SELECT
- 9:PICTURE MENU SELECT
- VOL :ADJUST
- OK :WRITE

SRV-TOOL

SRV-TOOL DYNAMIC 00

Help box:
- 1,2:MAIN SELECT
- 9:PICTURE MENU SELECT
- OK:ENTER

DRV-CHECK

DRV-CHECK DYNAMIC
- USBHDD CHECK 00

Help box:
- 1,2:MAIN SELECT
- 9:PICTURE MENU SELECT
- OK 3sec:HDD CHK START

Service Tool Mode

How to access

1. Select [SRV-TOOL] in Service Mode.
2. Press [OK] button on the remote control.

SRV-TOOL		
TD2Microcode:005a0910		
Flash ROOM: AD – F1		
PTCT:00.00.00.00.00	Time 00051:30	On/Off 0000042

Display of TD2Microcode version →
Display of Flash ROM maker code →
Display of SOS History →

← POWER ON TIME/COUNT
Press [MUTE] button (3sec)

Display of SOS History

SOS History (Number of LED blinking) indication.
From left side; Last SOS, before Last, three occurrence before, 2nd occurrence after shipment, 1st occurrence after shipment.
This indication will be cleared by [Self/check indication and forced to factory shipment setting].

Power ON Time, On/Off

Note: To display TIME/COUNT menu, highlight position, then press MUTE for 3sec.
Time: Cumulative power on time, indicated hour: minute by decimal.
On/Off: Number of On/Off switching by decimal.
Note: This indication will not be cleared by either of the self-checks or any other command.

Exit

Disconnect the AC cord from wall outlet or switch off the power with [Power] button on the main unit.

Hotel Mode

1. Purpose
   Restrict a function for hotels.
2. Access command to the Hotel mode setup menu.
   In order to display the Hotel mode setup menu,
   please enter the following command (within 2 second).
   [TV] : Vol.[Down] + [REMOTE] : AV (3 times)

   Then, the Hotel mode setup menu is displayed.

```
Hotel mode

  Hotel mode              | Off  |

  Initial INPUT           | Off  |

  Initial POS             | Off  |

  Initial VOL Level       | Off  |

  Maximum VOL Level       | 100  |

  Button Lock             | Off  |

  Remote Lock             | Off  |

  Private Information      | Keep |


          Select
   OK         EXIT
       ◁○▷
         ▽    RETURN
```

3. To exit the "Hotel mode" menu press the EXIT
   button on remote control.
4. Explain the Hotel mode setup menu.

ITEM	Function
Hotel Mode	Select hotel mode ON/OFF
Initial INPUT	Select input signal modes. Set the input, when each time power is switched on. Selection: Off/Analog /DVB-S/DVB-C/DVB-T/AV1/AV2/PC/ HDMI1/HDMI2/HDMI3/HDMI4 *Off: give priority to the last memory. However, Euro Model is compulsorily set to TV. *AVnS/AVnC: only Euro model selectable * PC:selectable with VGA option
Initial POS	Select programme number. Selection: Off/0 to 99 *Off: give priority to the last memory
Initial VOL Level	Adjust the volume when each time power is switched on. Selection/Range: Off/0 to 100 *Off: give priority to the last memory
Maximum VOL Level	Adjust maximum volume. Range: 0 to 100
Button Lock	Select local key conditions. Selection: Off/SETUP/MENU/ALL *Off: altogether valid *Setup: only F-key is invalid (Tuning guide (menu) can not be selected.) *MENU: only F-key is invalid (only Volume/Mute can be selected.) *All: altogether invalid.
Remote Lock	Select remote control key conditions. Selected" Off/SETUP/MENU *Off: altogether valid *Setup: only Setup menu is invalid MENU: Picture/Sound/Setup menu are invalid
Private Information	Select private information for VIERA Cast is Keep or Reset if Hotel mode is set to [On] when TV power on. Selection : Keep/Reset •Keep: private information for VIERA Cast is keep •Reset: private information for VIERA Cast is reset

Data Copy by SD Card

Purpose

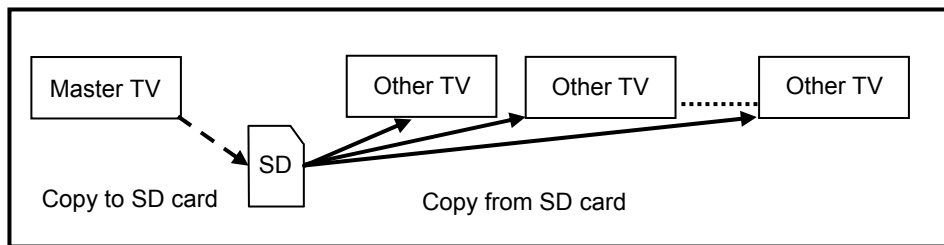## a) Board replacement (Copy the data when exchanging A-board):

When exchanging A-board, the data in original A-board can be copied to SD card and then copy to new A-board.
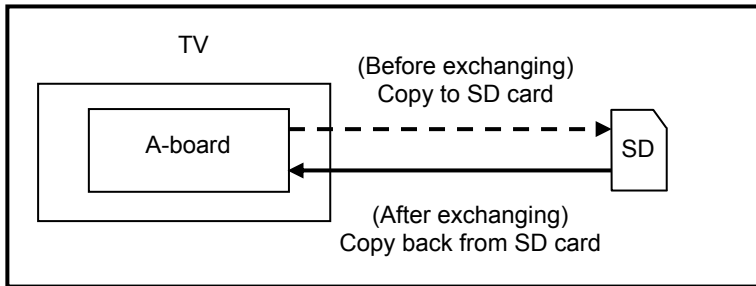
```
┌─────────────────────────────────────────┐
│           TV                              │
│                     (Before exchanging)   │
│  ┌──────────────┐     Copy to SD card     │
│  │              │  - - - - - - - - →  ┌──┐ │
│  │   A-board    │  ←───────────────── │SD│ │
│  │              │                     └──┘ │
│  └──────────────┘   (After exchanging)    │
│                   Copy back from SD card   │
└─────────────────────────────────────────┘
```

Following data can be copied.
   User setting data
   (inc. Hotel mode setting data)
   Channel scan data
   Adjustment and factory preset data

b) Hotel (Copy the data when installing a number of units in hotel or any facility):

When installing a number of units in hotel or any facility, the data in master TV can be copied to SD card and the copy to other TVs.

```
┌───────────────────────────────────────────────────────────────┐
│  ┌──────────┐     ┌────────┐  ┌────────┐         ┌────────┐    │
│  │ Master TV│     │Other TV│  │Other TV│ ....... │Other TV│    │
│  └──────────┘     └────────┘  └────────┘         └────────┘    │
│            ╲      ↗     ↗                    ↗                  │
│         ┌──┐                                                    │
│  Copy to│SD│      Copy from SD card                             │
│  SD card└──┘                                                    │
└───────────────────────────────────────────────────────────────┘
```

Following data can be copied.
   User setting data
   (inc. Hotel mode setting data)
   Channel scan data

Preparation

Make pwd file as startup file for (a) or (b) in an empty SD card.
   1. Insert an empty SD card to your PC.
   2. Right-click a blank area in a SD card window, point to New, and then click text document. A new file is created by default (New Text Document.txt).
   3. Right-click the new text document that you just created and select rename, and then change the name and extension of the file to the following file name (a) or (b) and press ENTER.

File name:
   (a) For Board replacement: boardreplace.pwd
   (b) For Hotel: hotel.pwd

Note:
      Please make only one file to prevent the operation error.
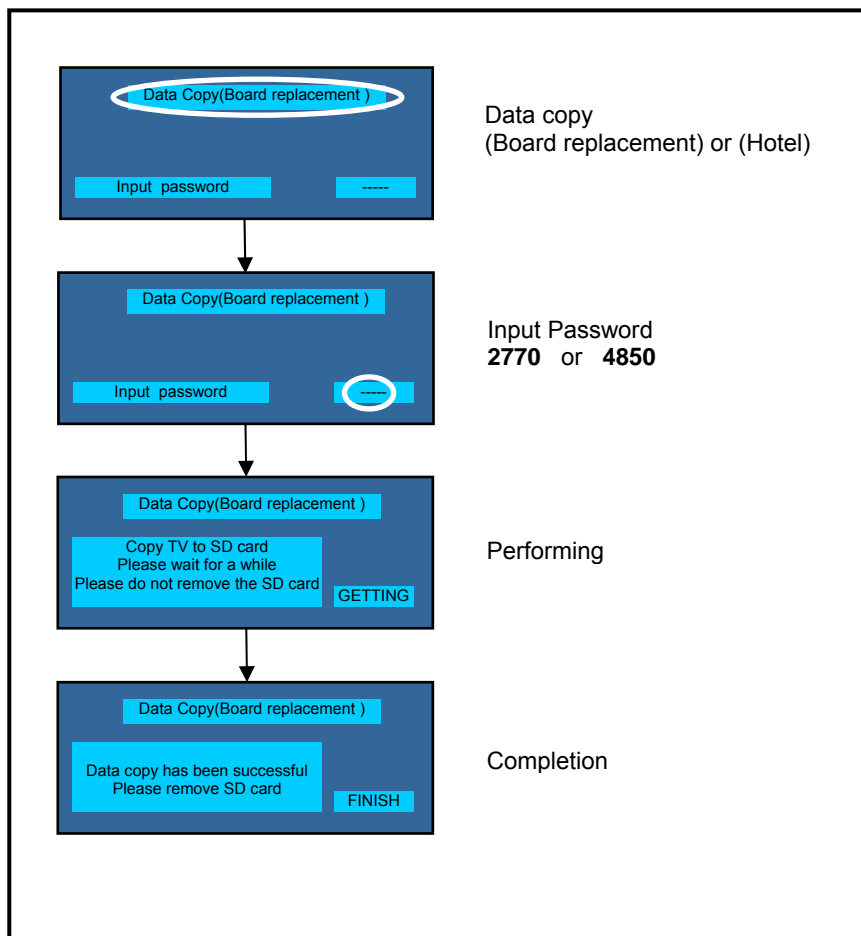   No any other file should be in SD card.

Data Copy from TV set to SD Card

1. Turn on the TV set.
2. Insert SD card with a startup file (pwd file) to SD slot.
   On-screen Display will be appeared according to the startup file automatically.
3. Input a following password for (a) or (b) by using remote control.
   (a) For Board replacement: 2770
   (b) For Hotel: 4850
   Data will be copied from TV set to SD card.
   It takes around 2 to 6 minutes maximum for copying.
4. After the completion of copying to SD card, remove SD card from TV set.
5. Turn off the TV set.

Note:
Following new folder will be created in SD card for data from TV set.
(a) For Board replacement: user_setup
(b) For Hotel: hotel

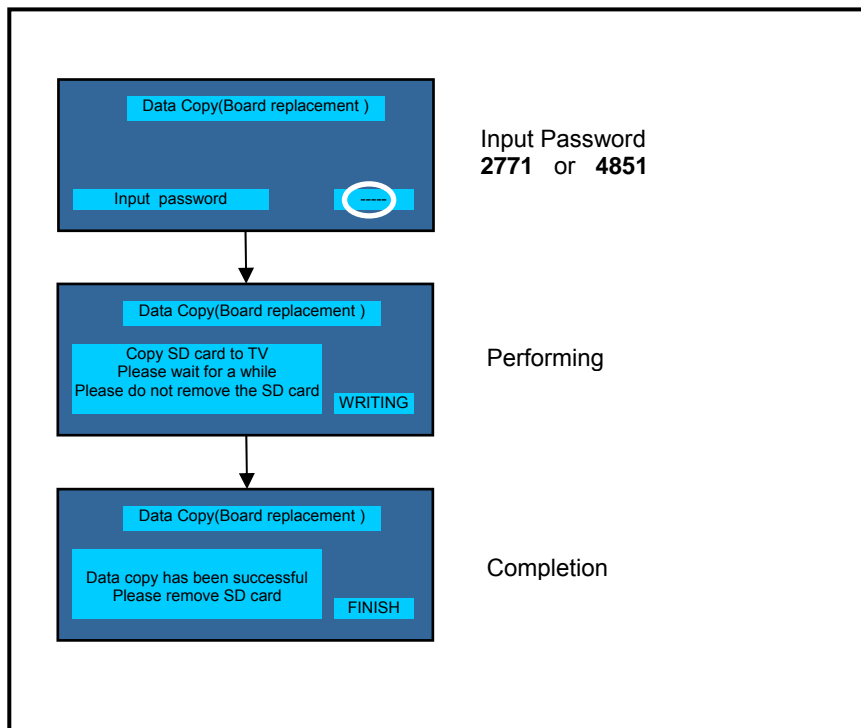|	
Data Copy(Board replacement) Input password -----	Data copy (Board replacement) or (Hotel)
Data Copy(Board replacement) Input password -----	Input Password **2770** or **4850**
Data Copy(Board replacement) Copy TV to SD card Please wait for a while Please do not remove the SD card GETTING	Performing
Data Copy(Board replacement) Data copy has been successful Please remove SD card FINISH	Completion

Data Copy from SD Card to TV set

1. Turn on the TV set.
2. Insert SD card with Data to SD slot.
   On-screen Display will be appeared according to the Data folder automatically.
3. Input a following password for (a) or (b) by using remote control.
   - (a) For Board replacement: 2771
   - (b) For Hotel: 4851

   Data will be copied from SD card to TV set.
4. After the completion of copying to SD card, remove SD card from TV set.
   - (a) For Board replacement: Data will be deleted after copying (Limited one copy).
   - (b) For Hotel: Data will not be deleted and can be used for other TVs.
5. Turn off the TV set.

Note:
1. Depending on the failure of boards, function of Data for board replacement does not work.
2. This function can be effective among the same model numbers.

Data Copy(Board replacement) Input password -----	Input Password **2771** or **4851**
Data Copy(Board replacement) Copy SD card to TV Please wait for a while Please do not remove the SD card WRITING	Performing
Data Copy(Board replacement) Data copy has been successful Please remove SD card FINISH	Completion

Option Bytes Description

OPTION1			
	b1	TEXT Ch Refresh	ON (1) / OFF (0)
	b2	ID-1	ON (1) / OFF (0)
	b3	Macrovision Auto-judge	ON (1) / OFF (0)
	b4	Surround enable low bit	ON (1) / OFF (0)
	b5	Surround enable high bit	ON (1) / OFF (0)
	b6	Enable HDMI force reset	ON (1) / OFF (0)
	b7	TINT_Component_HDMI	ON (1) / OFF (0)
OPTION2			
	b0	Adjust gain enable	ON (1) / OFF (0)
	b1	A2 BG enable (5.5MHz)	ON (1) / OFF (0)
	b2	A2 DK1 enable (6.26MHz)	ON (1) / OFF (0)
	b3	A2 DK3 enable (5.742MHz)	ON (1) / OFF (0)
	b4	NICAM scan	ON (1) / OFF (0)
	b5	NICAM BG enable (5.5MHz)	ON (1) / OFF (0)
	b6	NICAM I enable (6.0MHz)	ON (1) / OFF (0)
	b7	NICAM DK enable (6.5MHz)	ON (1) / OFF (0)
OPTION3			
	b0	NICAM priority	ON (1) / OFF (0)
	b1	Starhub scan enable (Singapore)	ON (1) / OFF (0)
	b2	Enable special edge smoother function (CHINA)	ON (1) / OFF (0)
	b3	A2 DK2 enable	ON (1) / OFF (0)
	b4	Inhibition of countermeasure for SIF signal drop	ON (1) / OFF (0)
	b5	Get onid from physical CH (CHINA)	ON (1) / OFF (0)
	b6	SSU search enable for HOTEL model	ON (1) / OFF (0)
	b7	SASO mute (ASIA)	ON (1) / OFF (0)
OPTION4			
	b0	enable Video Distortion Countermeasure for Analog VIF.	ON (0) / OFF (1)
	b2	3DYC color motion detect	ON (1) / OFF (0)
	b3	RF Clamp Current minimum (TAIWAN)	ON (1) / OFF (0)
	b4	SHOP banner enable	ON (1) / OFF (0)
	b6	PIP	ON (1) / OFF (0)
	b7	Enable workaround for Polsat CAM problem (POLAND)	ON (1) / OFF (0)

Adjustment Method

Sub-Contrast/White Balance Adjustment

Instrument Name	Connect to	Remarks
1. Remote controller 2. LCD WB meter (Minolta CA-210 or equivalent) 3. Comunication jig 4. Computer for external control		Correlation can be also taken by CS-1000A or equivalent

Procedure	Remarks

Subcontrast adjustment
1. Receive PAL colour bar (100% white) RF signal.
2. Enter "Contrast" adj. In SERVICE mode.
3. Start adjusting by using Yellow Key.
4. If the adjustment finished normally, the letter of Contrast will change from red to black.
 	
White Balance adjustment
1. Procedure basically performs checking using the production software and make automatic adjustment using external computer.
2. It adjusts in the mode of: Colour balance Normal
                              Viewing Mode Dynamic
 	
                     Normal
Highlight   x: 0.307 ± 0.010
                       y: 0.322 ± 0.010
 	
                     Normal
Lowlight   x: 0.307 ± 0.010
                       y: 0.322 ± 0.010
	Let the panel standfor more than 3 hours at more than 20 °C.
	Basically perform adjustment in the ambient environment of room temperature more than 20 °C.
	The aging time is more than20 min at above room temperature.
	
	Applied signal
	
	100% full colour bar
	0.7V p-p white peak
	85% modulation
	
	100% WHITE
	
	50% GRAY