

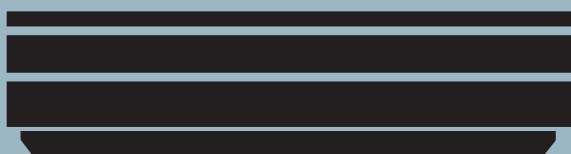
HDR 1

Type 4640, 4641, 4642

Service Manual

English

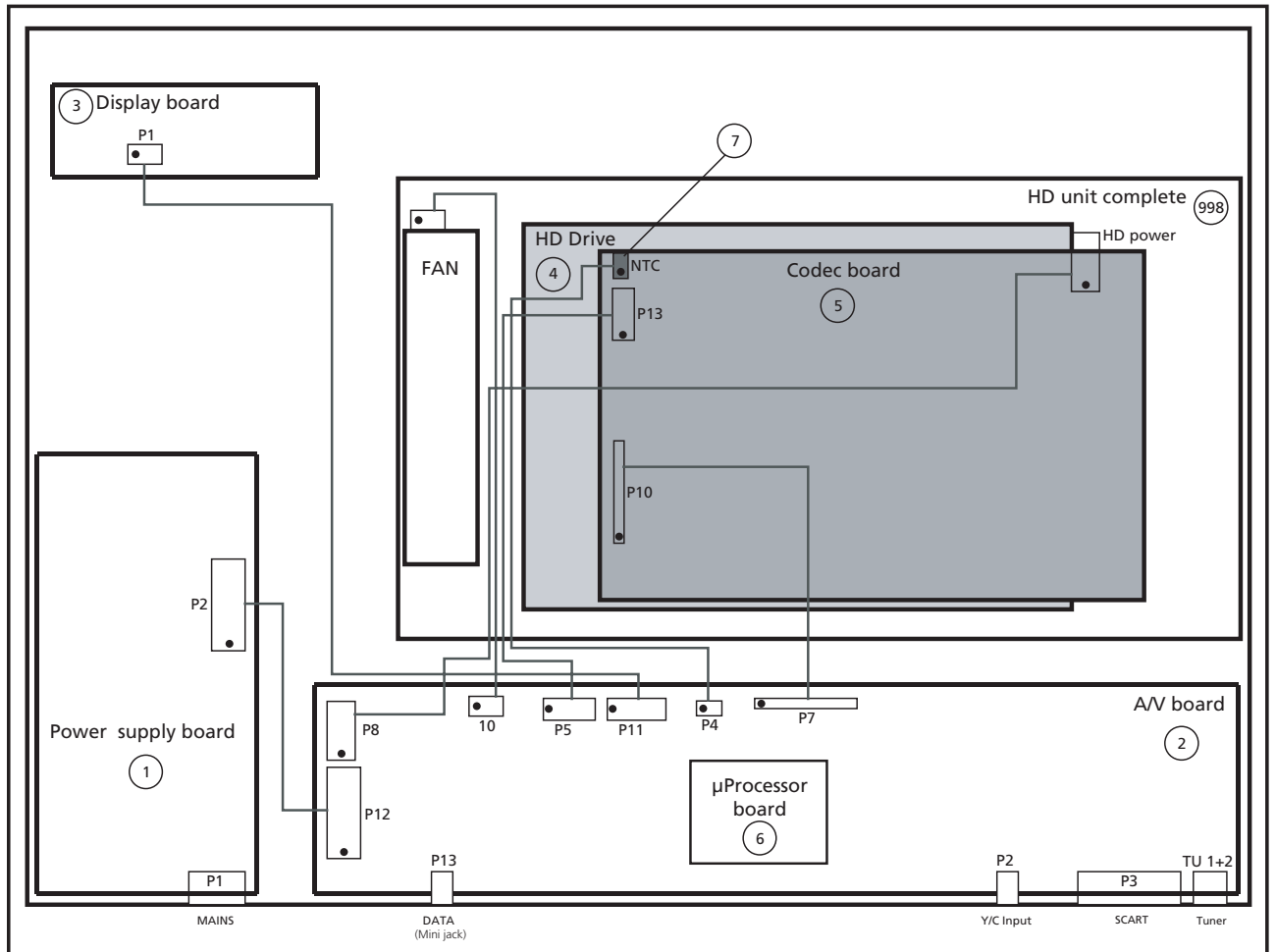
*German, French, Italian, Spanish, Danish and Dutch versions
are available in the Retail System*



*This Service Manual must be returned
with the defective parts/back-up suitcase !*

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- | | |
|-----------|--|
| PCB1 | Power supply board |
| PCB2 | A/V board |
| PCB3 | Display board |
| PCB7 | NTC |
| 998Module | HD unit complete, incl. PCB4, PCB5, PCB7 |

How to service

Strategy

The HDR 1 is to be serviced in the customer's home.

The static-protective field service kit must always be used when the product is disassembled or modules are being handled.

The repair involves replacement of the HD unit, module(s) or fan.
The replaced modules must be returned for repair at Bang & Olufsen, Module Repair Department.

Fault description and error codes must be returned with the replaced parts.
Use the Module Repair form or the form in the Retail Order System, Exchange Module.

The EEPROM 6IC6 must be transferred to the AV board in the HDR 1, hereby maintaining the customer settings.

The ServiceTool is required in several service situations, e.g. update of SW.
Refer to the ServiceTool for full description of features and operation.

Preparations before service

Always remember to download the latest version of the Service Manual.
Fault description and error codes must be returned with the replaced parts.
Use the Module Repair form or the form in the Retail Order System, Exchange Module.

Fault explanation and demonstration

Before troubleshooting is initiated, let the customer demonstrate the fault, if possible.

Error code

The error code contains data that may be used for repairing the module(s) and must be returned with the module(s).

Handling the error code

1. Take a note of the error code, for example on the Module repair form.
2. Use the error code when troubleshooting.
3. Return the error code, either on the Module Repair form or in the Retail system.
4. Before returning the HDR 1 to the customer, clear the error code.

Recommended tools for service

B&O ServiceTool.
White gloves.
Soft lint-free cloth.
IC-pliers. (Part no. 3629145).

Handling and cleaning

Static electricity

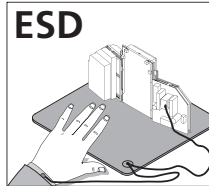


Static electricity may damage the product.

Static-protective field service kit.

A static-protective field service kit must always be used when the product is disassembled or modules are being handled.

Follow the instructions in the guide and use the ESD-mat for both old and new modules.



Please note:

When mains voltage on the product is required, remove the connection between the product and the ESD-mat.

The chassis or modules must always be connected to the static-protective field service kit or placed in an ESD-proof bag.

Symbol of safety components



When replacing components with this symbol, the same type has to be used, also the same values for ohm and watt.

The new component is to be mounted in the same way as the replaced one.

Lithium battery



WARNING

Short-circuit and overcharging of some types of lithium batteries may result in a violent explosion.

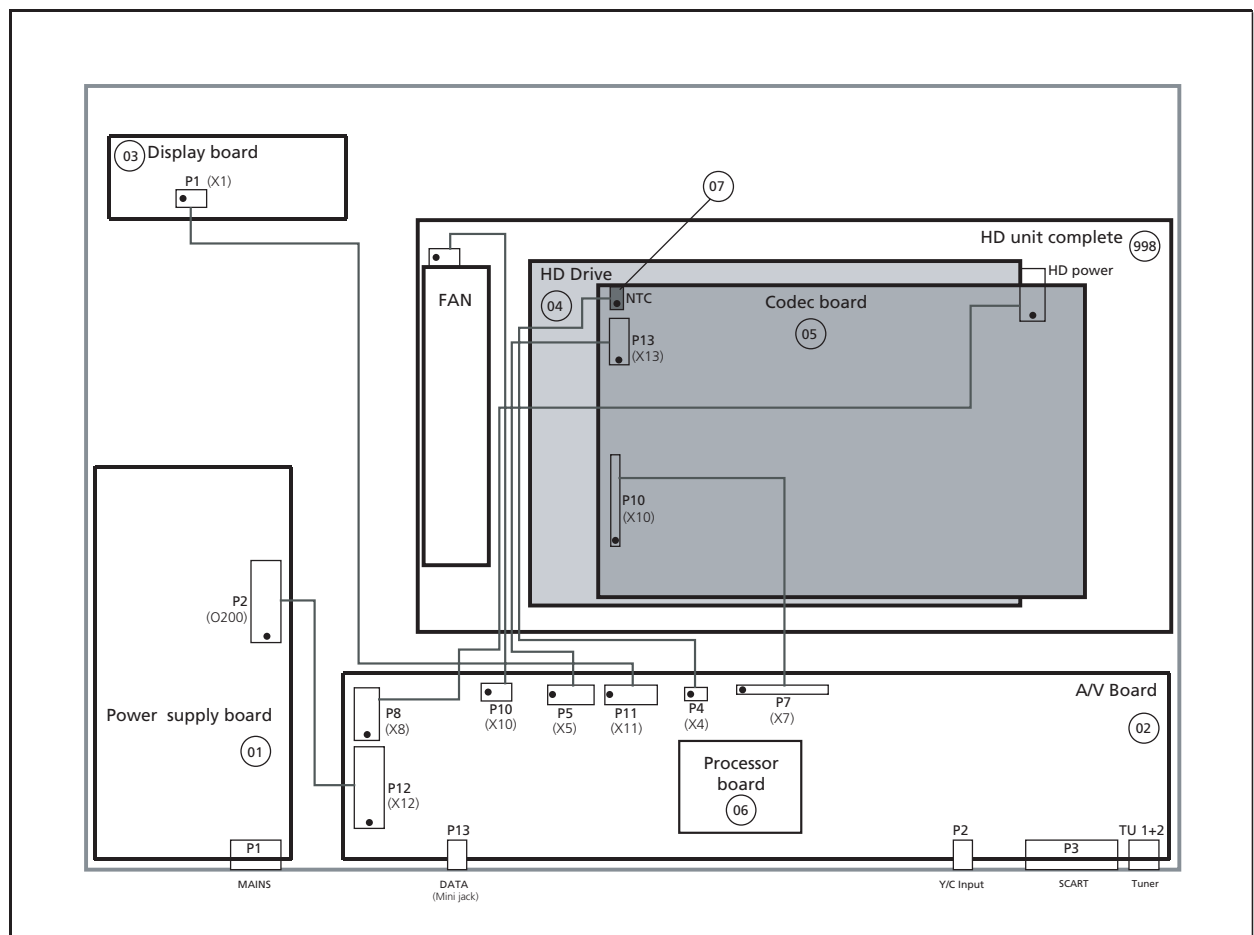
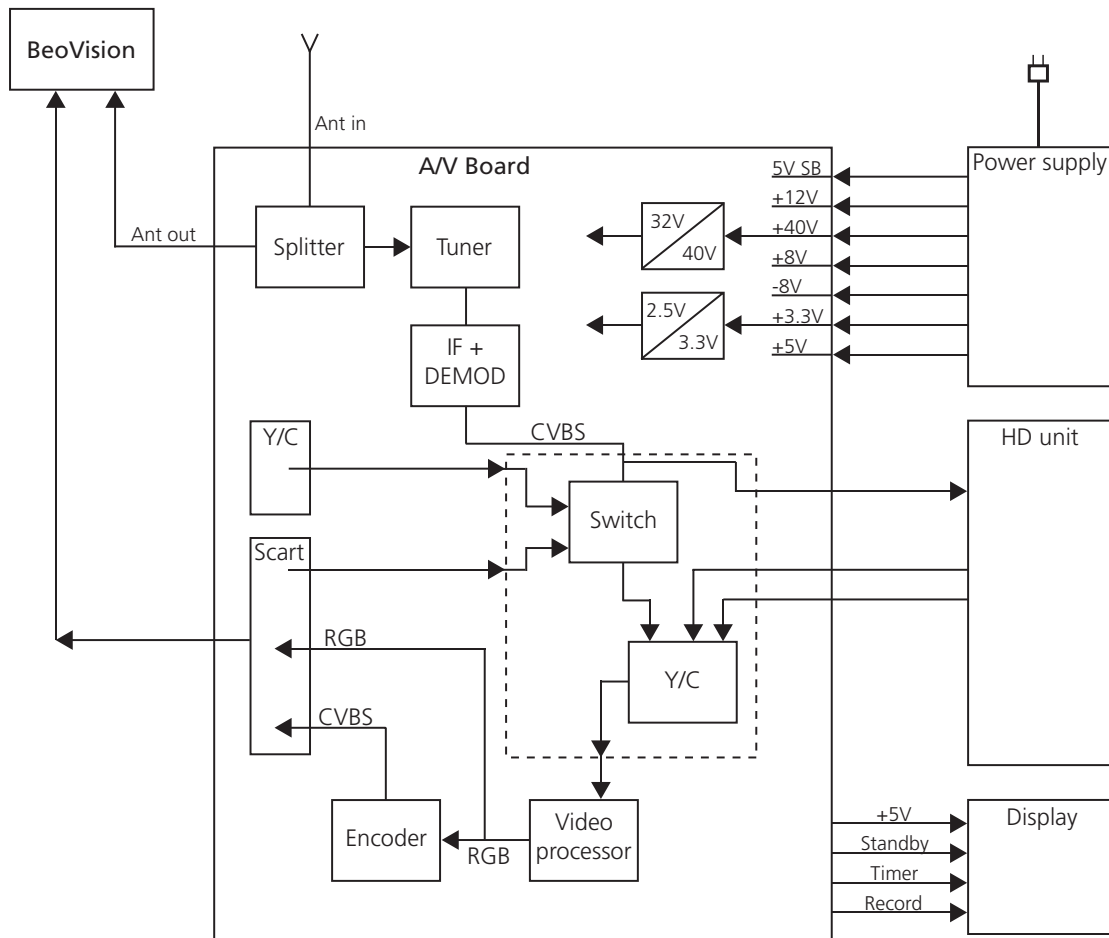
Transport and handling

It is recommended to:

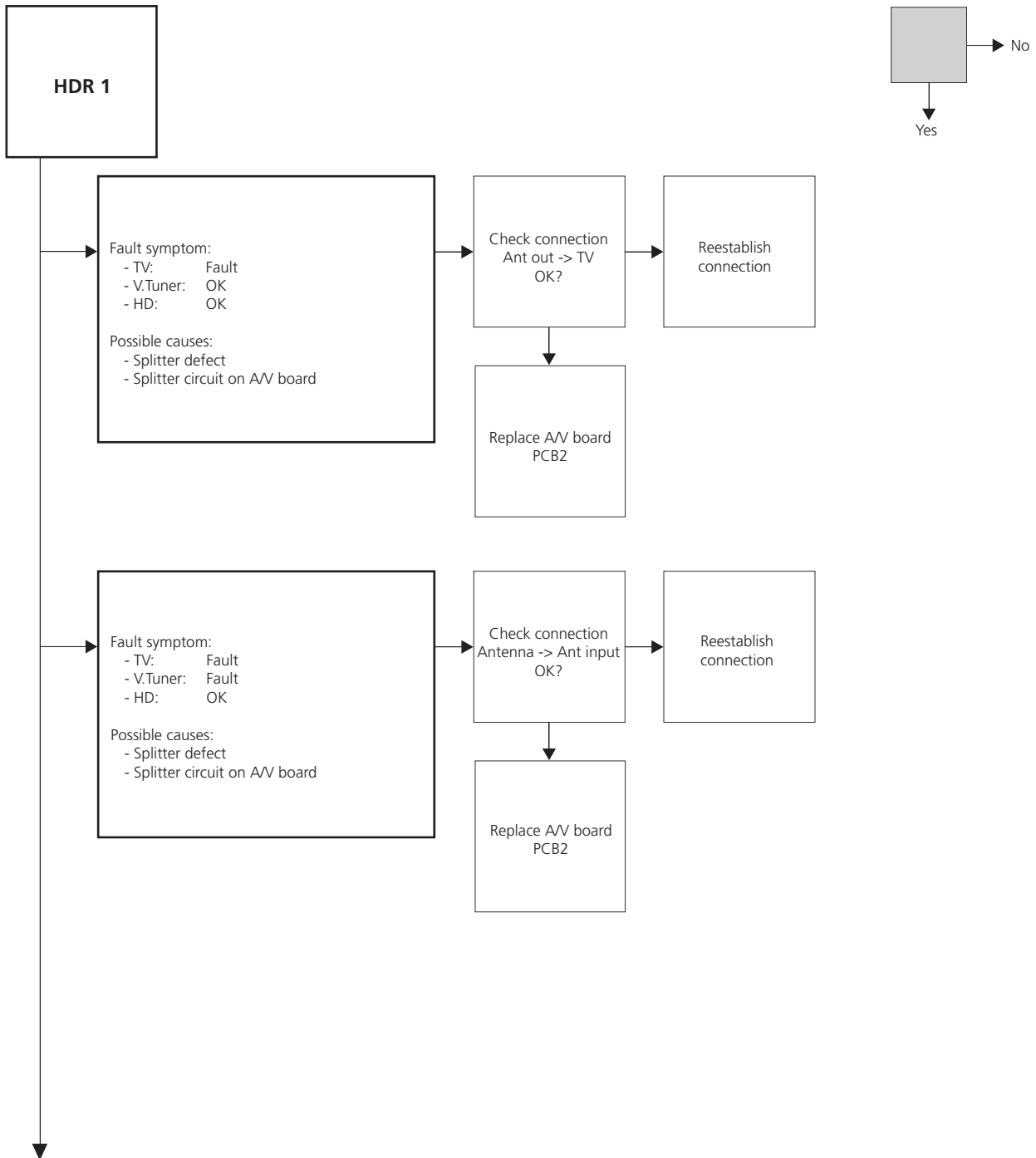
- use the product cover when transporting the product.
- do not move the HDR 1 when it is operating.

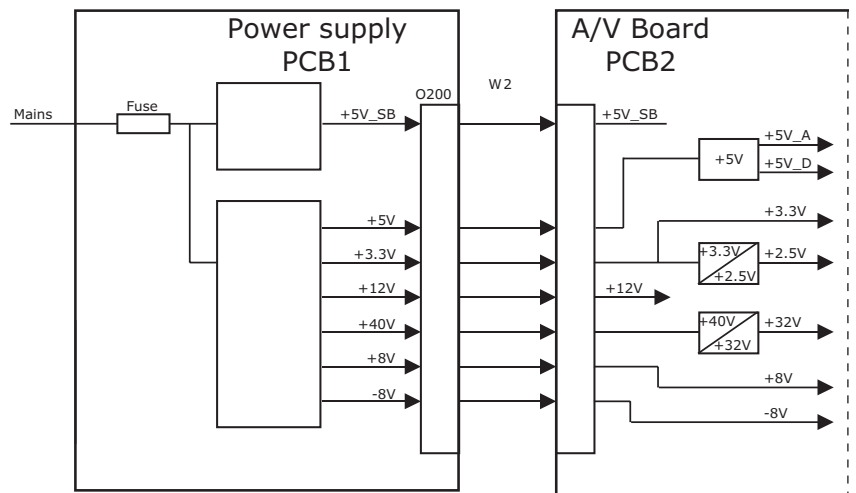
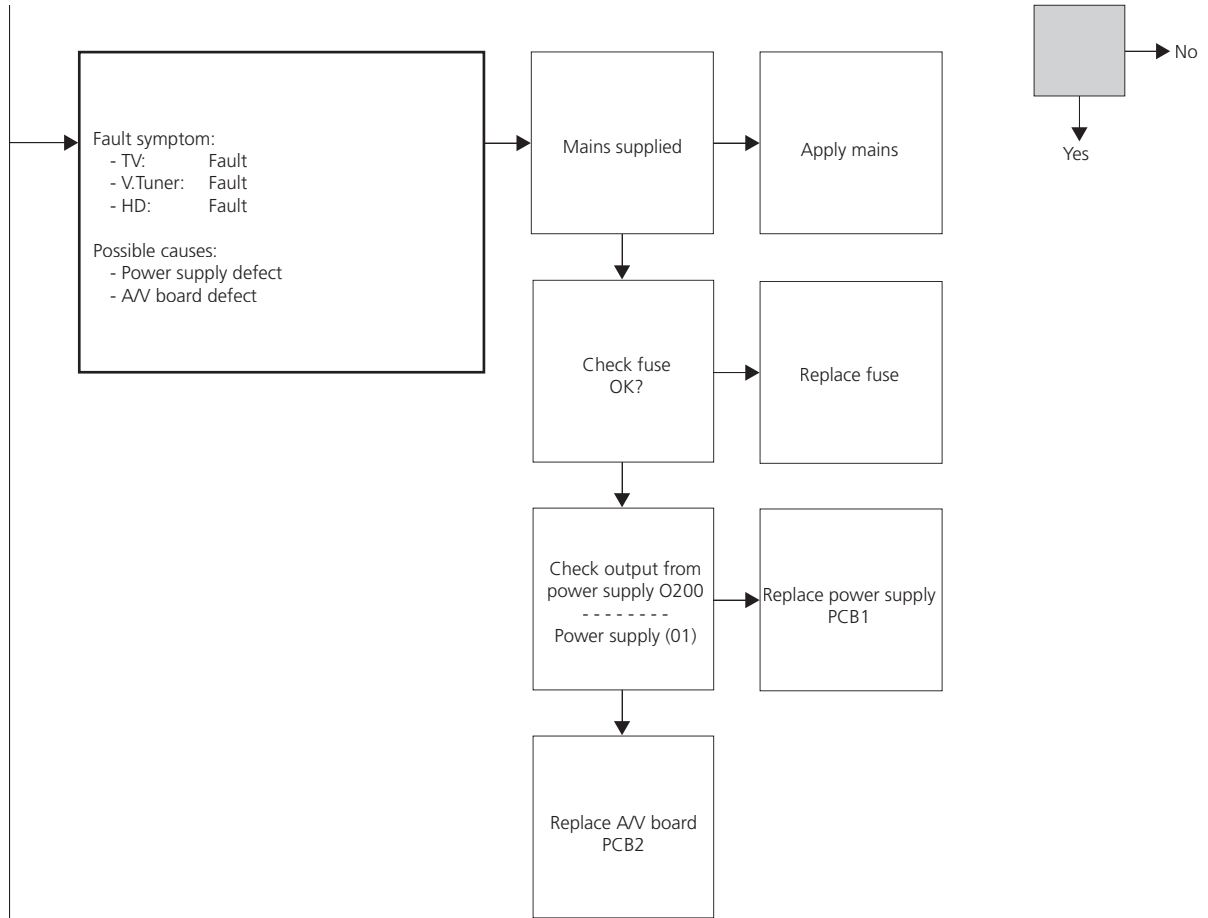
Cleaning

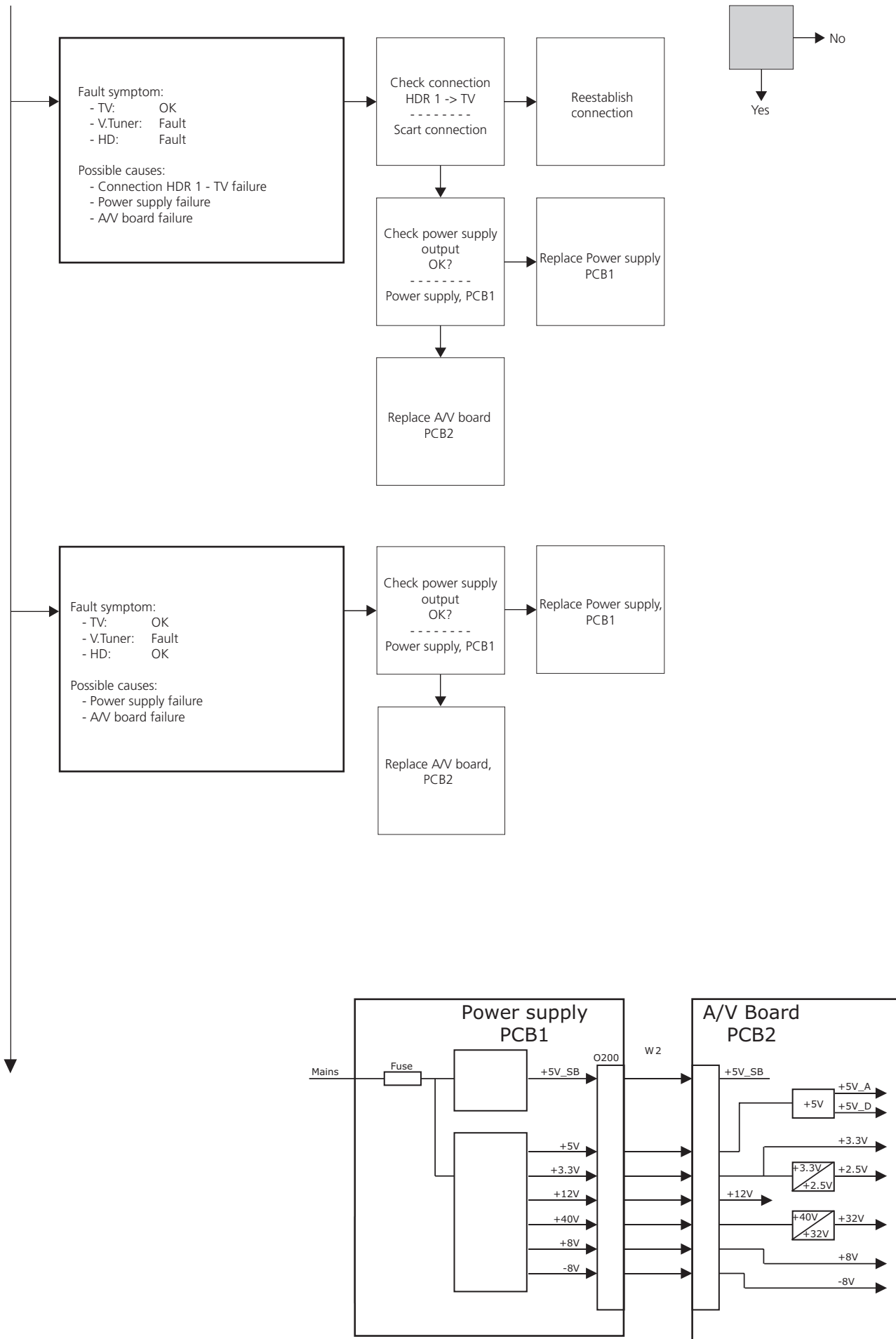
Please refer to the chapter "Final check after repair" or the User's guides.

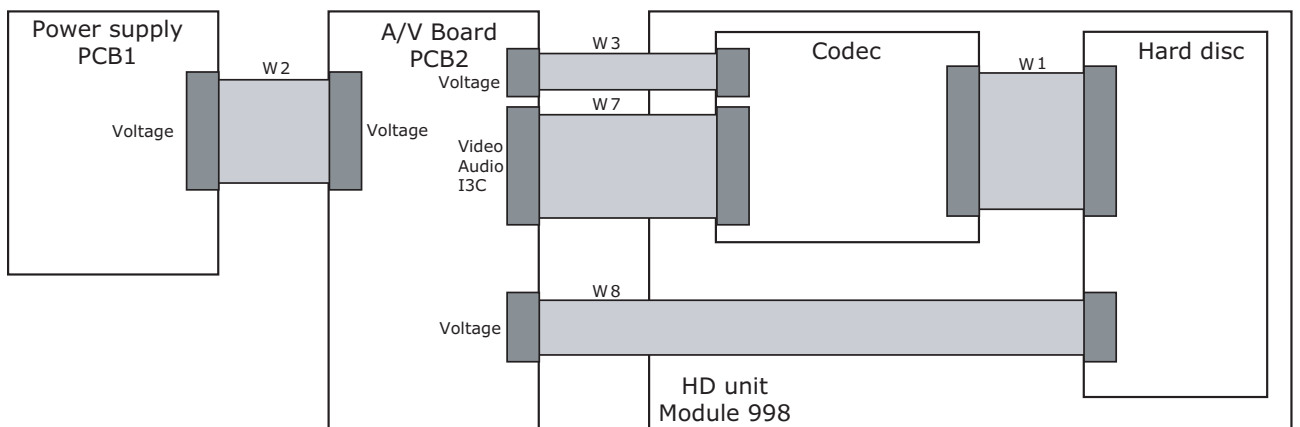
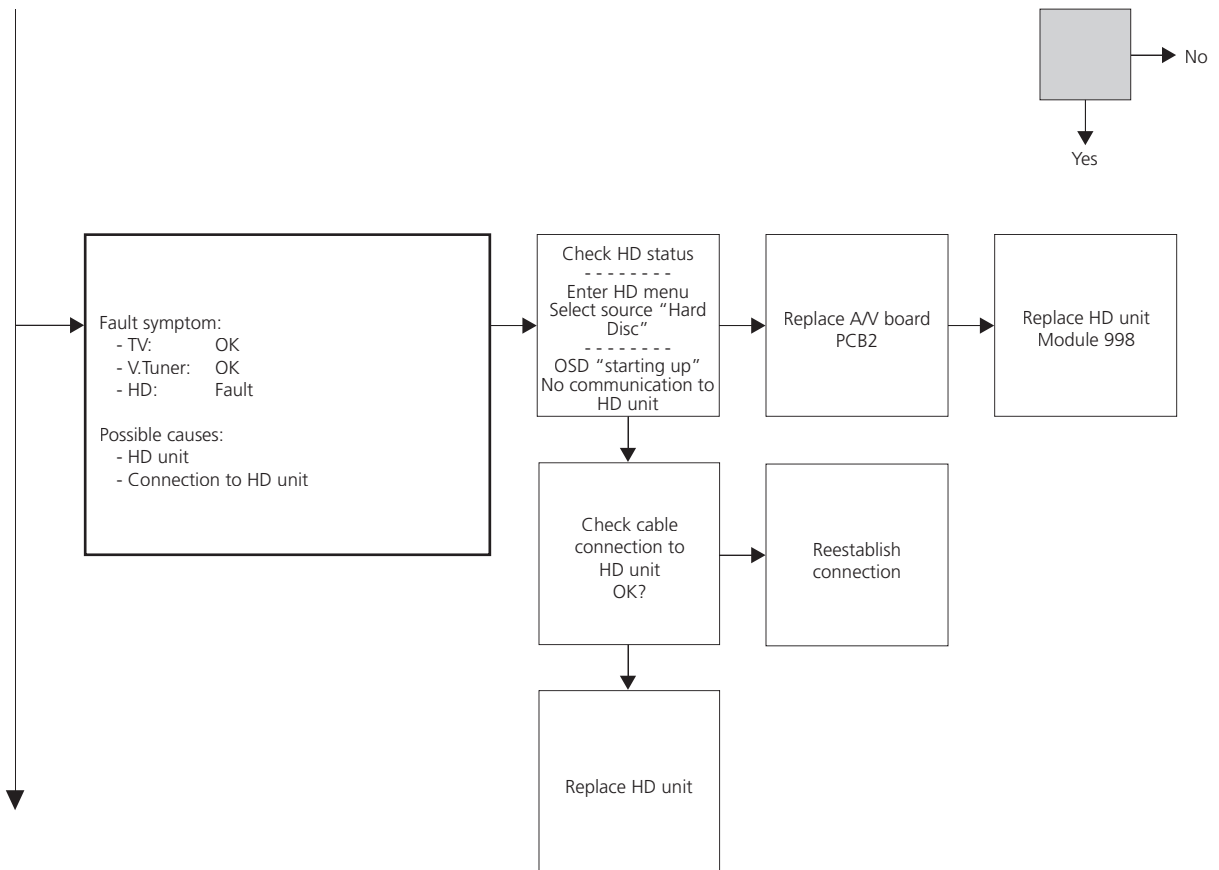


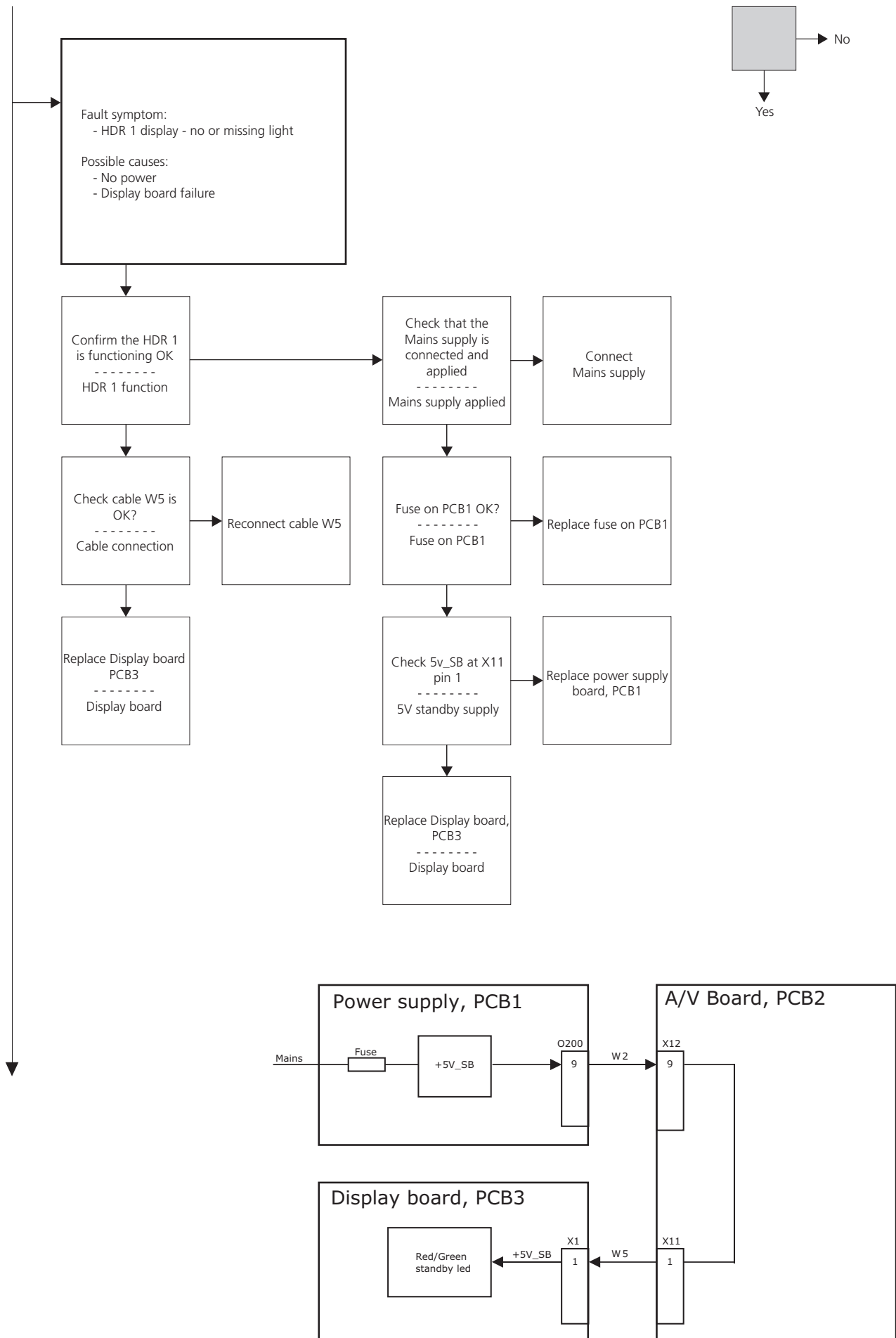
Fault flow chart

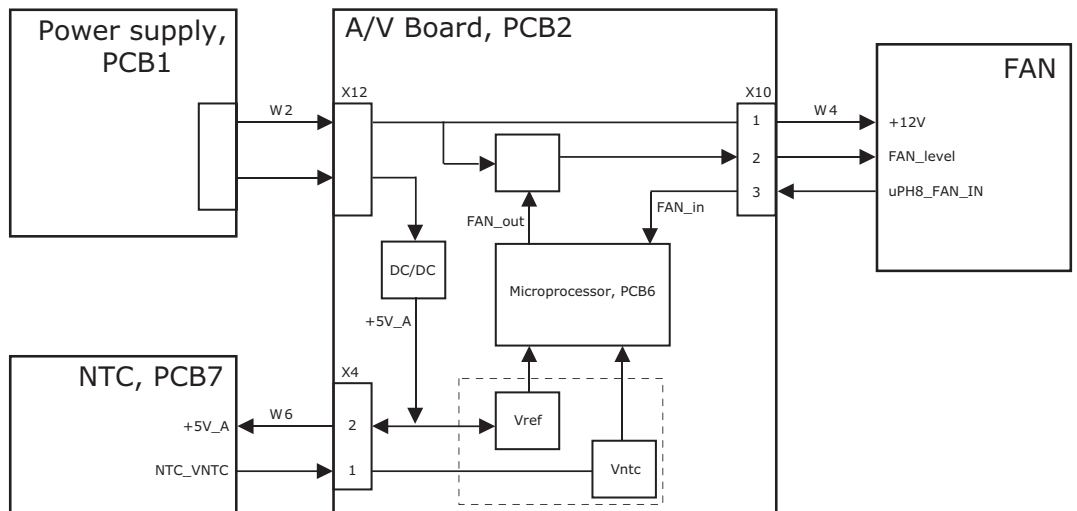
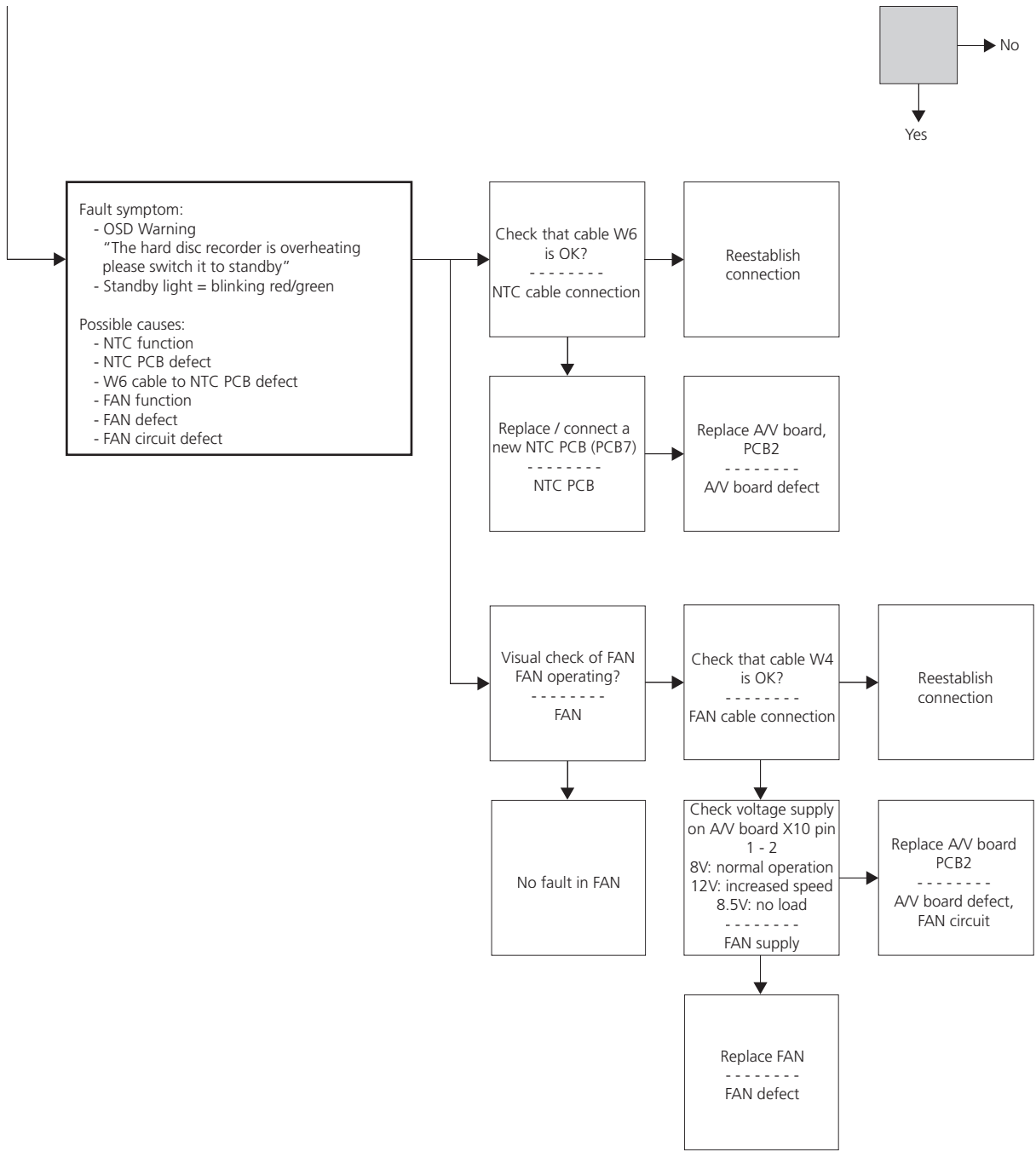












Adjustments and configuration

Navigation	▲ ▼	select menu
Activate	GO	activate selected menu
Return	STOP	return to the previous menu
Exit	EXIT	exit service mode
Adjust	◀ ▶	change value or mode

Picture adjustments

Adjustment in picture adjustment is not necessary.
All values are factory adjusted for optimum performance.

If settings are lost, insert default values.

Current values

BRIGHTNESS	13
COLOUR	13
CONTRAST	20

R-DR	32
G-DR	32
B-DR	32

BLACK OFFSET R	6
BLACK OFFSET G	8

Geometry adjustments

No geometry adjustments are necessary.

HDR TUNER MENU

TUNER SYSTEM	B/G	ON
	L	OFF
	M	OFF
	D/K	OFF
	I	OFF
AFC		OFF
LOW TUN RANGE		45
HIGH TUN RANGE		860
LOWER BAND LIMIT		170
UPPER BAND LIMIT		450
VHF-1 CONSTANT		162
VHF-2 CONSTANT		148
UHF CONSTANT		49
TUNER TAKEOVER		26
IF ADJUST		33
AFC STATUS		O/L
FM SOUND ADJUST		14
CN SOUND		OFF
LOAD FREQUENCY		45
RESET TO DEFAULT		

AFC ON

AFC is always on during normal operation.

AFC OFF

AFC OFF is obtained by

1. Set AFC OFF
If AFC = OFF – change AFC to ON – OFF, AFC is now deactivated.
If AFC = ON – change AFC to OFF – ON – OFF, AFC is now deactivated.
2. Set LOAD FREQUENCY to required frequency.

This function is only necessary if the HDR tuner is to be adjusted manually.

TUNER TAKEOVER, IF ADJUST & FM SOUND ADJUST

Data is transferred from EEPROM on AV BOARD to 61C6.

Manual adjustment is not required.

Select RESET TO DEFAULT.

Press **GO**.

The data are transferred.

The menu shifts to SERVICE MENU.

Final check after repair

Final check after repair

The final check after repair, describes the activities that are needed to ensure the product will be returned in perfect condition to the customer.

The contents are:

- Insulation test / AC leakage test.
- Check product information.
- Restore the setup and check connections.
- Final cleaning of the product.

Insulation test

Each HDR 1 must be insulation tested after having been dismantled. Make the test when the set has been reassembled and is ready to be returned to the customer.
Flashovers must not occur during the testing procedure!

Make the insulation test as follows:

Short-circuit the two pins of the mains plug and connect them to one of the terminals of the insulation tester. Connect the other terminal to ground on the aerial socket.

NOTE!

To avoid damaging the HDR 1 it is essential that both terminals of the insulation tester have good contact.

Slowly turn the voltage control of the insulation tester until a voltage of 2.5 kV ac and max. 10mA is obtained.

Maintain that voltage for one second, then slowly turn it down to 0 V ac again.

Monitor information

The scope of this check is, to ensure the following:

- The product has maintained the correct identity.
- The error code register is cleared.

Procedure

Enter Service menu – A/V board – H8 information.

Check the serial number is correct.

Clear the error code.

Select error code and press **GO**.

Customer setup

Remember to inform the customer of any changes that have been made in the user setup, due to procedures in the service manual, such as Connections, Replay, Recording quality, etc.
Restore the product to the customer setup.

SETUP

Parental lock code
Groups
Recording quality
Recording duration
Connections
Replay
Menu language
Tuning
Clock

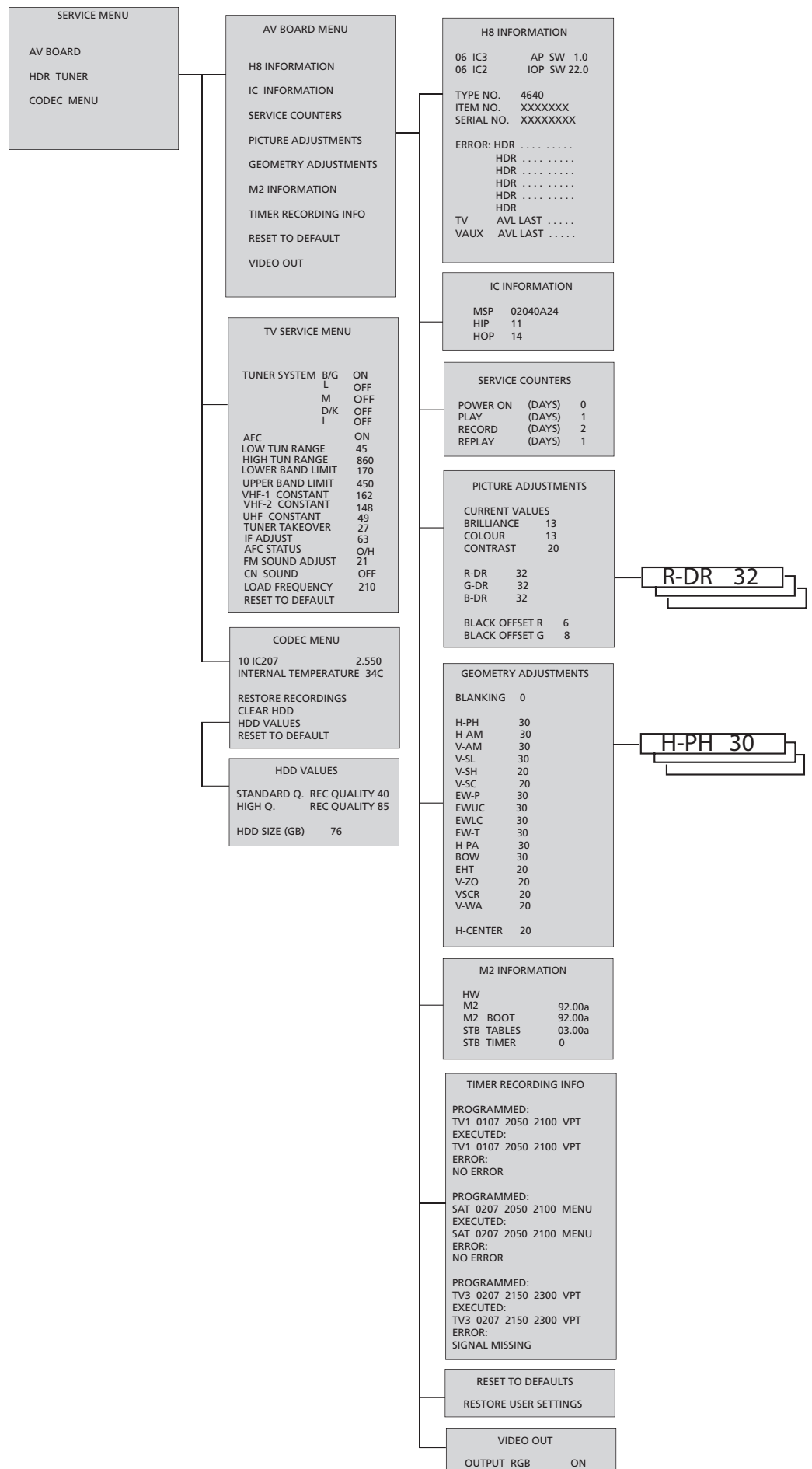
Check all sources are working correctly

- Check that picture and sound on all sources are working correctly.

Clean the product

Never use alcohol or other solvents to clean any part of the HDR 1.
Wipe dust off the surfaces using a dry, soft cloth. Remove grease stains or persistent dirt with a soft, lint-free, firmly wrung cloth, dipped in a solution of water containing only a few drops of mild detergent, such as washing-up liquid.

Service menu



Service Mode

On page 3.1 see an overview of the Service Mode menus, and operation in Service Mode.

AV BOARD MENU

The PICTURE ADJUSTMENTS and GEOMETRY ADJUSTMENTS lines are described in the section on adjustments.

H8 INFORMATION

- Software version numbers
- Type, item and serial numbers
- Latest 6 HDR errors
- Latest AVL error from the TV and VAUX sockets

ERROR:HDR

Shows the latest 6 HDR 1 errors (e.g. IIC bus errors) and display them on the screen. The 5 latest HDR 1 errors are shown as error codes and displayed with the month/date (four digits) as provided by the clock. The most recent error is displayed at the top.

XX-YZ (XX = IIC address
 Y = IIC bus 1 or bus 2
 Z = any IIC bus segment A/B/C/D)

AVL error codes from the TV and VAUX sockets

. No error registered
 TI Transmission impossible
 TD Data link tied down

After repair of an error that has triggered the display of an error code, the error code has to be deleted. This is done by pressing **GO** in the H8 INFORMATION menu.

IIC bus error

An IIC bus error means that the communication on the bus fails when the microcomputer tries to communicate with the address in question.

In most cases this means that the addressed IC is defective but the defect could also be in one of the components surrounding the IC or in other components on the bus. Addresses in connection with IIC bus errors:

Error code	Module	IC	Function	BUS
22	2	D21 SDA6000	M2 Processor	IIC-1
8A	2	D23 TDA9321H	Colour decoder & IF (HIP)	IIC-2A
8C	2	D25 TDA9330H	Video processor (HOP)	IIC-2A
80	2	D3 MSP3415G (type 4640)	Sound processor	IIC-2B
84	2	D3 MSP3415G (type 4642)	Sound processor	IIC-2B
88	2	D3 MSP3415G (type 4641)	Sound processor	IIC-2B
A2	2	D17 PCF8563TF	Real-time clock	IIC-2C1
C0	2	TU1 CTF5510	Tuner	IIC-2A
A4	2	D1 M24C02	AV Board EEPROM	IIC-2C
60	5		CODEC FEP	IIC-2B

IC INFORMATION

Shows the version numbers for the IC's mentioned.

MSP = MSP3410D

HIP = TDA9321H

HOP = TDA9330H)

SERVICE COUNTERS

The values are stored in the EEPROM. If faulty readings of the values in the EEPROM occur all service counter values will be set to 0.

M2 INFORMATION

M2

Software versions for the teletext processor SDA6000.

M2 BOOT

Bootloader software. Must be compatible with the M2 application software.

STB TABLES

The line shows the software version for conversion of Set-top Box remote control codes into Beo4 codes.

The software is programmed into the M2 processor and the information will appear only when the information is present in the M2 processor.

STB TIMER

Is default set to 0 but can be altered if timing problems occurs during start up with certain Set-top Boxes.

TIMER RECORDING INFO

Shows a log of the last three performed timer recordings.

If a recording has (partly) failed, the log may indicate the cause of the problem.

RESET TO DEFAULT

By RESTORE USER SETTINGS, HDR 1 returns to first time power up.

After RESTORE USER SETTINGS set HDR 1 into St. by and then switch it on again.

The user is prompt to go through the SETUP menu, as all SETUP's are set to default.

FEATURE LEVEL	=	BASIC (Note!)
PARENTAL LOCK CODE	=	0,0,0,0
GROUPS	=	MOVIES, NEWS, SCIENCE, SPORTS and CHILDREN
RECORDING QUALITY	=	HIGH
RECORDING DURATION	=	3:00
CONNECTIONS	=	NONE
REPLAY	=	BASIC
MENU LANGAUGE	=	ENGLISH

Note! FEATURE LEVEL must be set to ADVANCED to get all lines on the menu.

VIDEO OUT

It is possible to disable RGB OUT which is useful on some TV's.

TV SERVICE MENU

In TUNER SYSTEM it is possible to set only relevant tuner systems to ON (only multi standard). This is done to reduce the tuning time.

AFC ON/OFF is used in connection with adjustments but it may also be useful in other situations.

The AFC is set to ON when the HDR1 has been turned off by means of the mains switch.

CN SOUND (ON) / OFF

Used to compensate for different sound modulation levels from TV transmitters in China.

Normally the frequency deviation is 100 kHz, but in China some TV transmitters are transmitting "Wide Sound" which has a frequency deviation of 360 kHz. This results in bad sound - distortion - because of the higher modulation level. To compensate for this CN SOUND must be set to ON.

The function is only working in combination with the tuner system D/K.

If the function is set to ON with other tuner systems it will not influence the sound.

RESET TO DEFAULT

Loads tuner data from the EEPROM on the AV Board (PCB2) to the EEPROM on the Processor Board (PCB6).

LOW TUN RANGE	45
HIGH TUN RANGE	860
LOWER BAND LIMIT	170
UPPER BAND LIMIT	450

VHF-1 CONSTANT	161
VHF-2 CONSTANT	146
UHF CONSTANT	52

These items are for factory use.

TUNER TAKEOVER	26
IF ADJUST	8
AFC STATUS	O/H
FM SOUND ADJUST	14
LOAD FREQUENCY	62

These items are described in the section on adjustments.

CODEC MENU

10 IC207

CODEC software version.

INTERNAL TEMPERATURE

Shows the actual inside temperature in the HDR 1.

Safe operation temperature range is below 53°C.

When the temperature is between 53 – 56 °C a warning is displayed.
It is recommended to turn off the HDR 1 and let it cool down.

If the temperature is >57°C the HDR 1 will shut down and it is not possible to turn it back on before a cooling period of 30 minutes are elapsed.

RESTORE RECORDINGS

Reads the HDD recordings on the HDD and create an index on 6IC6.
This function may be used if the 6IC6 has been replaced or the HD unit is replaced.

All recordings that are stored on the HDD are indexed in the index in the EEPROM, 6IC6.

6IC6 contains all the parameters that are changed or created by the user, f.ex. program groups, parental lock, ect.

CLEAR HDD

Deletes all tracks on the HDD.

1. Turn off HDR 1.
2. Turn on HDR 1.
Press **V.MEM** on Beo4.
3. Select **HARD DISC** in SELECT SOURCE.
4. Select **SETUP** in MENU.
5. Enter Service Menu.
Press **0 0 GO**.
6. Select **CODEC MENU** in SERVICE MENU.
7. Select **CLEAR HDD**.
When the HDD is cleared the HDR 1 returns to SERVICE MENU.
8. Select **CODEC MENU** in SERVICE MENU.
9. Select **RESTORE RECORDINGS**.
When the recordings are restored the HDR 1 returns to SERVICE MENU.
10. Return to MENU.
Exit the SERVICE MENU by pressing **STOP STOP** on the Beo4.
11. Select **HARD DISC CONTENT**.
Verify the HDD is empty.
If the HDD is not empty return to step 1 and restart the CLEAR HDD.
12. Set the HDR 1 into Stand by.
Do not boot the HDR 1 by removing the mains supply.
13. The HDD is now cleared.

HDD VALUES

Set the recording quality in Standard Q. and High Q.

Set the value for the HDD size (for future use).

STANDARD Q.	REC QUALITY	40	app. 45 hours
HIGH Q.	REC QUALITY	85	app. 20 hours
HDD SIZE(GB)	76	FUTURE USE	

RESET TO DEFAULT

For future use !

ServiceTool

Considerations before connecting the ServiceTool to the product

- Disconnect the product from the Mains supply.
- Follow the instructions described in the ServiceTool.

Contents in ServiceTool

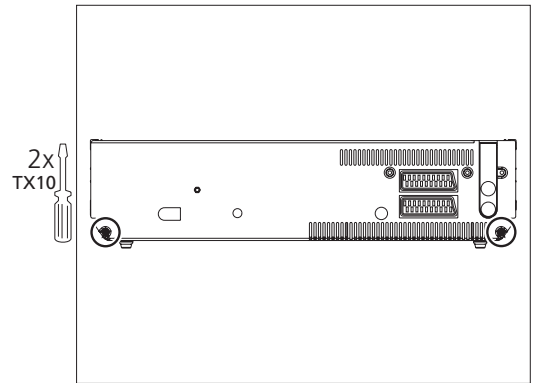
The ServiceTool will contain the complete information concerning:

- How to connect the ServiceTool to the product.
- List of functions handles by the ServiceTool.
- Instruction for using the functions.

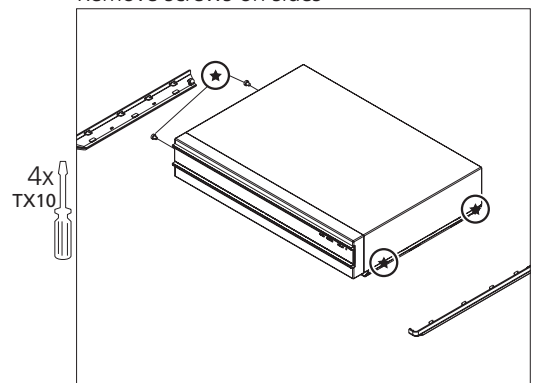
The ServiceTool does not contain:

- Description of access and connection to internal connectors inside the product.

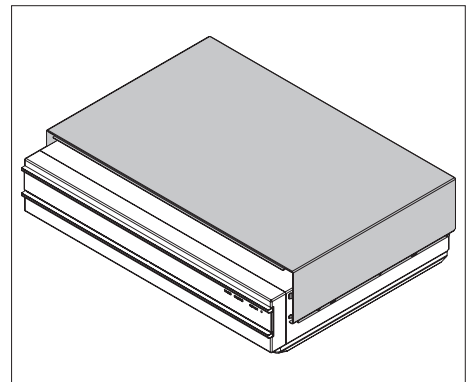
Remove screws on back



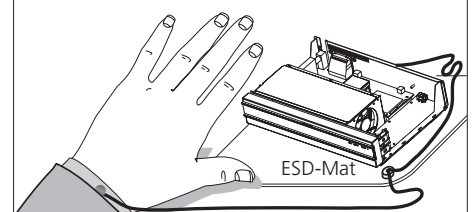
Remove screws on sides



Pull off cover



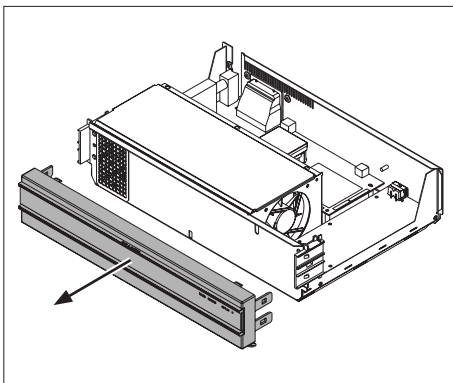
ESD



➔ 4.1 Remove cover

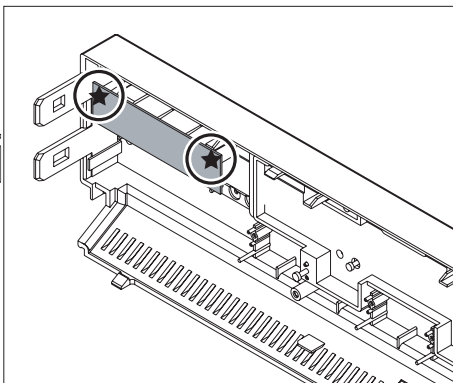


Pull out front



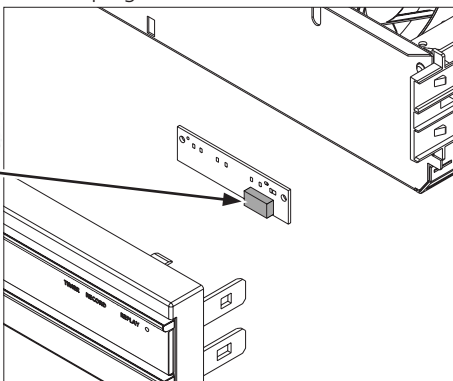
Remove screws

2x
TX10

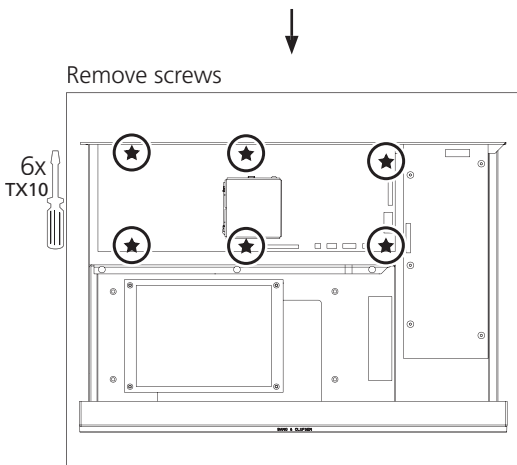
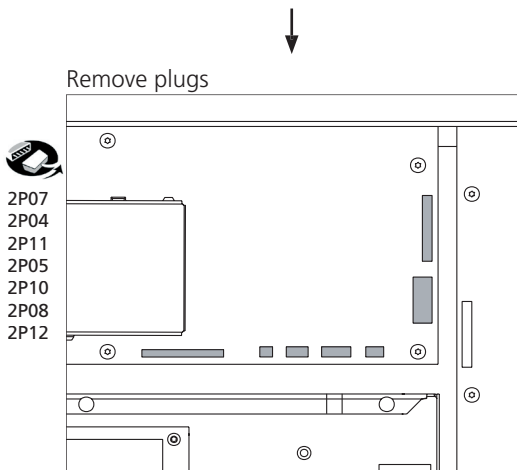
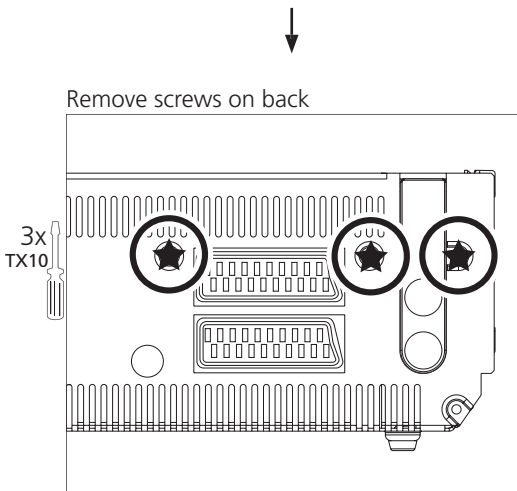


Remove plug

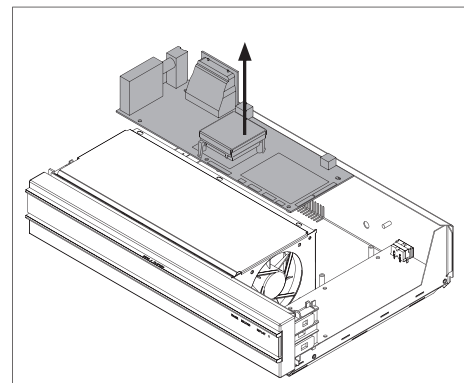
3P01



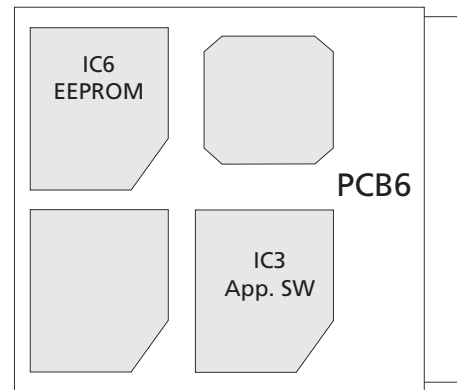
4.1 Remove cover



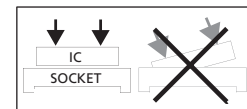
Pull out AV board



Note: transfer 6IC6



Replace 6IC6:
Use IC-pliers
(part no. 3629145)



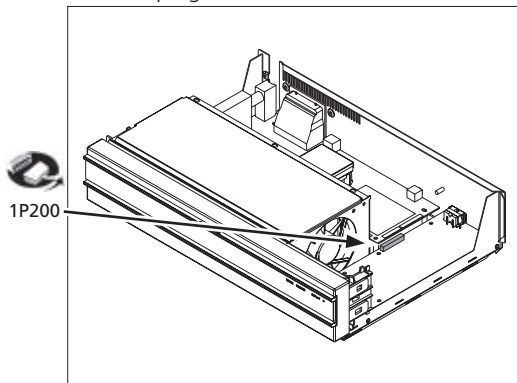
Transfer data from AV Board to 6IC6.
TUNER TAKEOVER, IF ADJUST & FM SOUND
ADJUST. Refer to Adjustments.



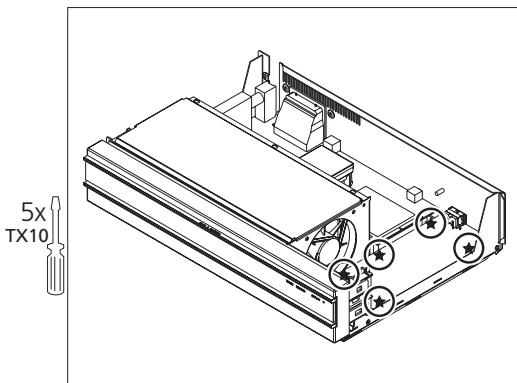
➔ 4.1 Remove cover



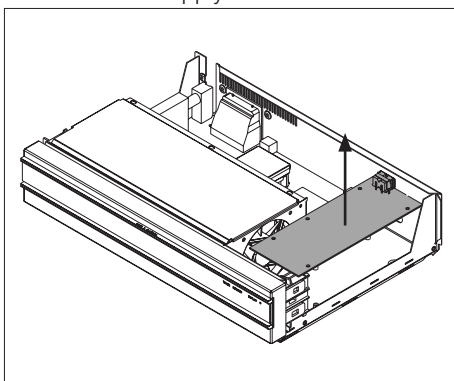
Remove plug



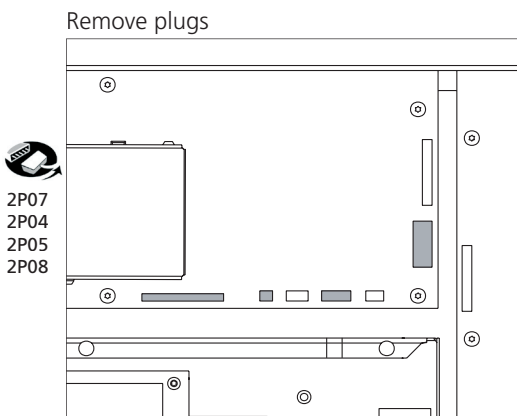
Remove screws



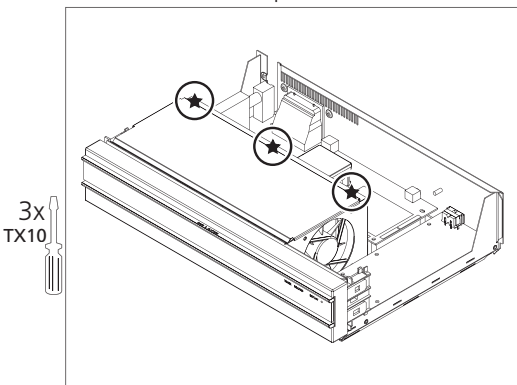
Pull out Power supply board



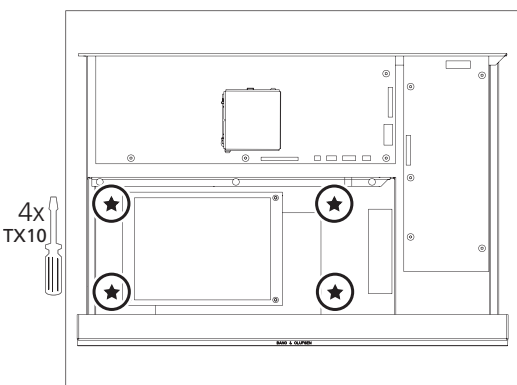
4.1 Remove cover



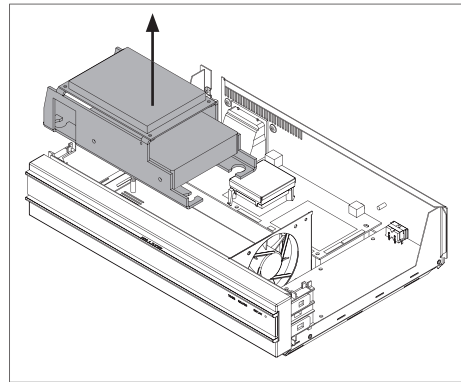
Remove screws and pull off cover



Remove screws



Pull out complete HD unit



Access the CODEC MENU in the Service menu.
Use RESTORE RECORDINGS.

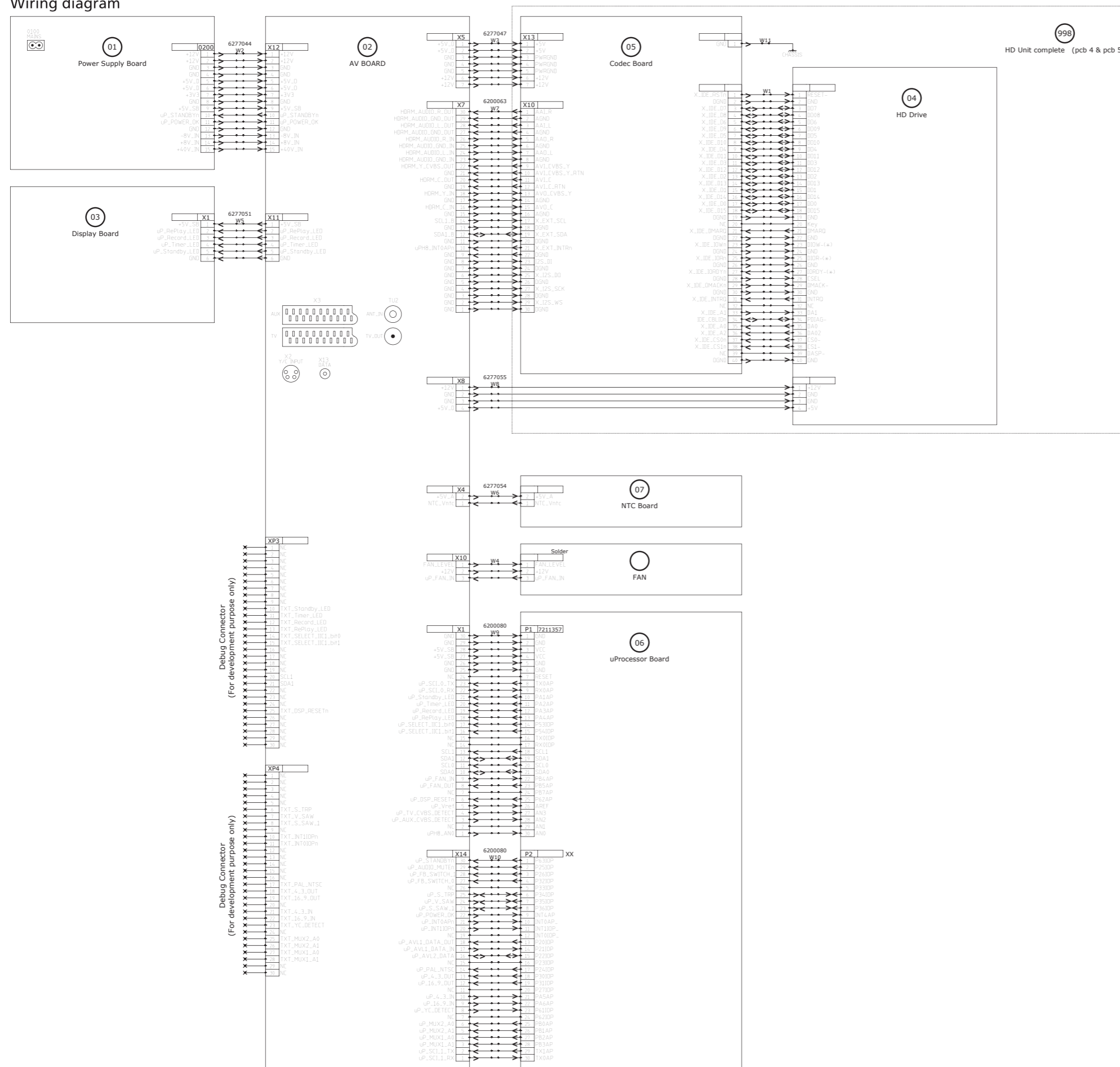


SPECIFICATION GUIDELINES FOR SERVICE USE		HDR 1
CTV system		*See type survey
Cabinet finish		Black/Silver
Terminal recommended via BeoVision		Beo4
Video		PAL, SECAM, NTSC colour decoder
HDD		80Gb
Record and playback		Simultaneous
Playing time		High Q, 20 hours / Standard Q, 45 hours
Number of Timer Recordings		Max. 15
Sound		Analog audio (Mono, A2, Nicam)
Menu		National language on menus (UK, D, F, I, E, NL, DK, S)
Signal-to-noise-ratio		Typical 110 dB, A weighted, in Audio mode
Dimensions W x H x D		38 x 9.7 x 28 cm
Weight		4.0 kg
Power supply		195 - 265 volts 50/60 Hz
Power consumption		Typical 21 watts / St-By < 1 watt
		16:9 detection on both scart connectors
Set-top Box controller (STB-C)		Built-in
CONNECTIONS		
TV & AUX	Pin 1	Audio R out 1V RMS 150 ohms
	Pin 2	Audio R in 1V RMS 40 kohms
	Pin 3	Audio L out 1V RMS 150 ohms
	Pin 4	Audio GND
	Pin 5	Blue GND
	Pin 6	Audio L in 1V RMS 40 kohms
	Pin 7	Blue 0.7 Vpp 75 ohms (out TV) (in AUX)
	Pin 8	16:9/4:3 info
		AVL 2 way (TV)
		AVL 1 way (AUX)
	Pin 9	Green GND
	Pin 10	Not used
	Pin 11	Green 0.7 Vpp 75 ohms (out TV) (in AUX)
	Pin 12	Not used
	Pin 13	Red GND
	Pin 14	Blanking GND
	Pin 15	Red 0.7 Vpp 75 ohms (out TV) (in AUX)
	Pin 16	Blanking Logic 0 = 0V to 0.4V (out TV) (in AUX) Logic 1 = 1V to 3V R in 75 ohms
	Pin 17	Video out GND
	Pin 18	Video in GND
	Pin 19	Composite video out 1 Vpp 75 ohms
	Pin 20	Composite video in 1 Vpp 75 ohms
	Pin 21	Shield
Y/C INPUT	Pin 1	Y GND
	Pin 2	C GND
	Pin 3	Luminance in (Y) 1 Vpp 75 ohms
	Pin 4	Chrominance in (C) 1 Vpp 75 ohms
		Auto config if Y/C signal is present
DATA		Mini jack 3.5 mm Control of Set-top Box and SW update for M2 processor
Aerial		Coax aerial in 75 ohms
TV		Coax aerial out 75 ohms
Subject to change without notice		

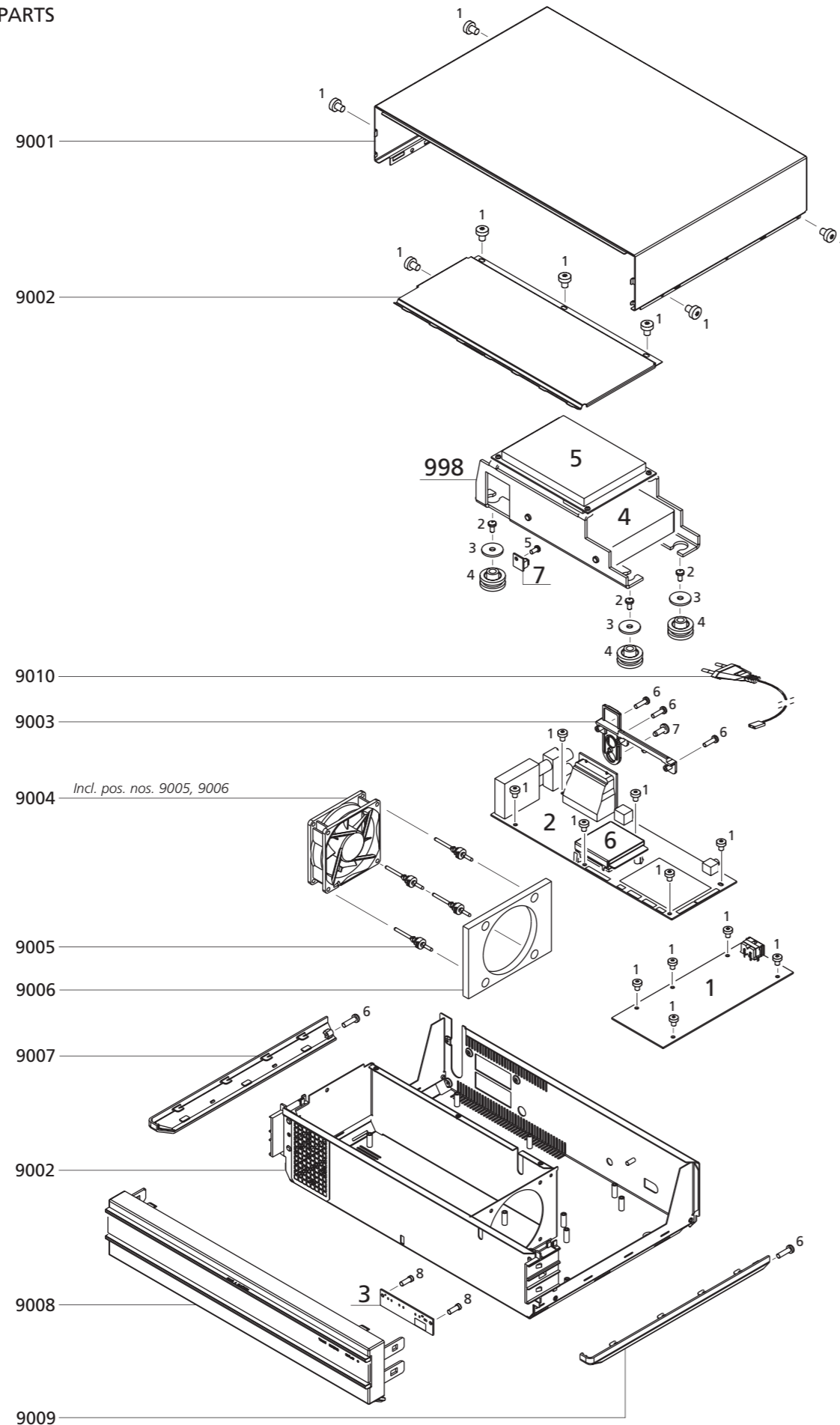
Type survey

Type	Chassis	System	Market	Modification to other TV systems		
				B/G	B/G,L/L',D/K,I	B/G,M,D/K,I
4640	NEU	B/G	Australia, Austria, Belgium, Croatia, Denmark, Finland, Germany, Greece, Holland, Israel, Italy, Kuwait, New Zealand, Norway, Oman, Portugal, Slovenia, Spain, Sweden, Turkey, United Arab Emirates, Indonesia, Malaysia, Singapore, Thailand		8001699	8001696
4641	HK	B/G,M,D/K,I	Hong Kong, China		8001699	
4642	FGB	B/G,L/L',D/K,I	Bahrain, Egypt, France, Lebanon, Qatar, Saudi Arabia, Switzerland, Czech Repub., Hungary, Poland, Slovak, Russia, Morocco, South Afrika, UK			8001696

Wiring diagram



AVAILABLE PARTS
HDR 1



HDR 1

9001	3400482	Top cover, black
	3400487	Top cover, silver
9002	3112006	Iron chassis, top and bottom
9003	3320224	Wire holder
9004	8410001	Fan incl. pos. nos. 9005, 9006
9005	3938010	Spacer f/fan
9006	3947025	Foam f/fan
9007	3320756	Side part, left
9008	3451035	Front panel
9009	3320755	Side part, right
9010	6100245	Mains lead EU
	6100328	Mains lead GB
	6100248	Mains lead AUS
	6100040	Mains lead CN

1Module	8001690	PCB1, Power Supply board
2Module	8001864	PCB2, AV Board BG incl. PCB6
	8001696	PCB2, AV Board BGMIDKL incl. PCB6
	8001699	PCB2, AV Board BGLL'IDK incl. PCB6

3Module	8001879	PCB3, Display Board
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6Module		µProcessor Board
6IC3	8344448	SW
6IC6	8343712	EEPROM
<i>PCB µProcessor Board is not available as spare part</i>		

7Module	8100090	PCB7, NTC Board
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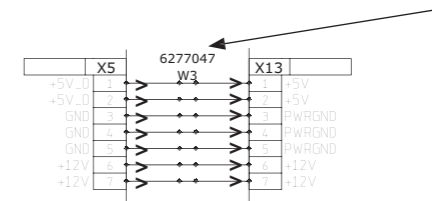
998Module	8053049	PCB998, HD unit, incl. PCB4, PCB5, PCB7
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Survey of screws etc.

1	2058075	Screw 3 x 5mm
2	2038118	Screw 3 x 6mm
3	2622492	Washer
4	2938008	Rubber damper
5	2013176	Screw 3 x 6mm
6	2013137	Screw 3 x 10mm
7	2058017	Screw 3 x 8mm
8	2052040	Screw 3 x 8mm

Wire bundles

See wiring diagram page 6.1.
The part no. is printed on the diagram above the wire bundle, as shown.



Parts not shown

3375258	Bag w/screws and washers
6270803	AV cable, 3m
6270070	Antenna cable, 3m
8330352	IR blaster f/external source
3395260	Back-up suitcase
3375073	Product cover

Packing

3396135	Set of foam
3392509	Outer carton

Available documentation

See Retail System

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