NOKIA

Service & Competence Center Europe
Customer Care Training Group

CONFIDENTIAL   1 (30)
RAE–2   Repairhints
                                    Version 1.0 Approved
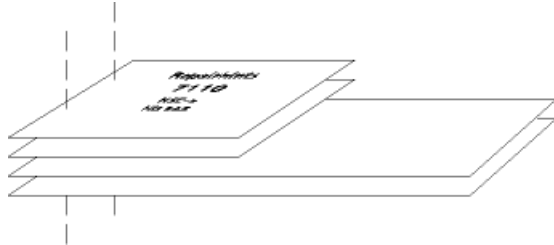
Modified 02.07.2001

Repairhints

Communicator 9110/9110i RAE 2

General

–How to use this document

Place the schematics behind this manual.
Now you are able to follow these specifictions with graphical layouts and it is easier for you to find the components and measuring points.

–General handling

Special Note: Before starting repair, interchange **all** modules (PDA, CMT, UI) with functional modules to define the faulty one. Check also the test equipment of proper functionality.

–Component characteristics

Some components contain important data.
Several described steps are only practicable if you are able to reflash/ realign the phone and/ or rewrite IMEI/ SIMlock in certain cases. Please pay attention to separate notes.
Use only the 9110i PDA SW for 9110i communicator known by the special product codes. It is not allowed to flash 9110 PDA with 9110i SW.

–µBGA components and broken balls

Special attention to µBGA components.
All µBGA´s are replaceable and must be renewed after removing. Reflow by hot air fan is not allowed.
Check soldering points, remove oxidated solderings (broken balls) carefully by enclosing a few new solders before placing new components. The only allowed way to change µBGA components is to use from NMP approved µBGA rework maschines (e.g. ZEVAC/ OK International). Use only recommended Fluxtype and an appropriate amount of it.
When changing any µBGA on PDA, check the keypad side for dirt or remnants of flux after rework. Clean PCB carefully, do not use any scratching or rubbing tools.

–Realign after repair

Characteristics of replacement parts are different.
To prevent additional faults after repair (RX quality, TX power etc.) it is necessary to retune phone values.
For tuning see Service Manual at Chapter Service SW and Tuning Instructions

IMPORTANT:

This document is intended for use by authorized NOKIA service centers only.

The purpose of this document is to provide some further service information for NOKIA Communicator 9110/I.
It contains a lot of collected tips and hints to find failures and repair solutions easily.
It also will give support to the inexperienced technicians.
Saving process time and improving the repair quality is the aim of using this document.
We have built it up based on fault symptoms (listed in "Contents") followed by detailed description for further analysis.
It is to be used additionally to the service manual and other service information like Service Bulletins. For this reason it doesn't contain any circuit descriptions or schematics.

All measurements are made by following equipment:

Nokia repair SW	: WinTesla 6.43
CMT DLL Version	: 00.00.18
PDA DLL Version	: 6.0
Nokia Module Jig	: MJS-4
Digital Multimeter	: Fluke 73
Oscilloscope	: Fluke PM 3380 B
Spectrum Analyser	: Advantest R3131C with an analogue probe
RF-Generator /	: Rohde & Schwarz CMU 200
GSM Tester	

While every endeavour has been made to ensure the accuracy of this document, some errors may exist. If the reader finds any errors, NOKIA should be notified in writing, using following procedure:

Please state:
Title of the Document + Issue Number/Date of publication.
Page(s) and/or Figure(s) in error.

Please send to: **Nokia GmbH**
                           Service & Competence Center Europe
                           Meesmannstr.103
                           D-44807 Bochum / Germany
                           Email: training.sace@nokia.com

Service & Competence Center Europe
Customer Care Training Group

CONFIDENTIAL
RAE–2

Modified 02.07.2001

4 (30)
Repairhints
Version 1.0 Approved

Contents

Attention!!! At first interchange all moduls (PDA, CMT, UI) with working ones to find out, which module is faulty.

Mechanical faults

- CMT does not start
- CMT shuts down
- Keypad failed
- "Insert SIMcard"
- Flash empty or faulty

If CMT does not start, check current consumption when pressing the power on botton.
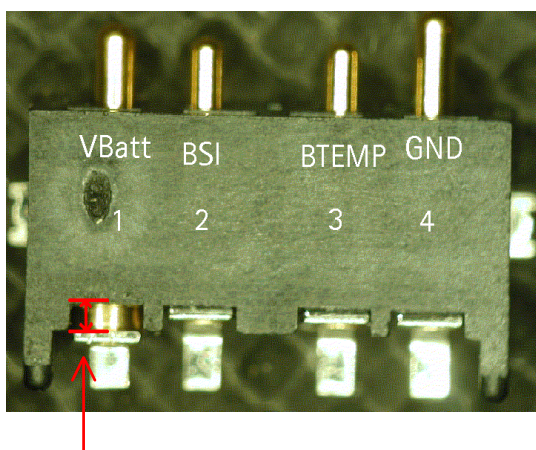- If the current consuption does not change, check **X190, C106** and **X160** for mechanical damage. (see pictures)
- If these are damaged, change if necessary.

Note! The edge is curved when the connector is broken, check also for short circuits under connector.
(**X190**)
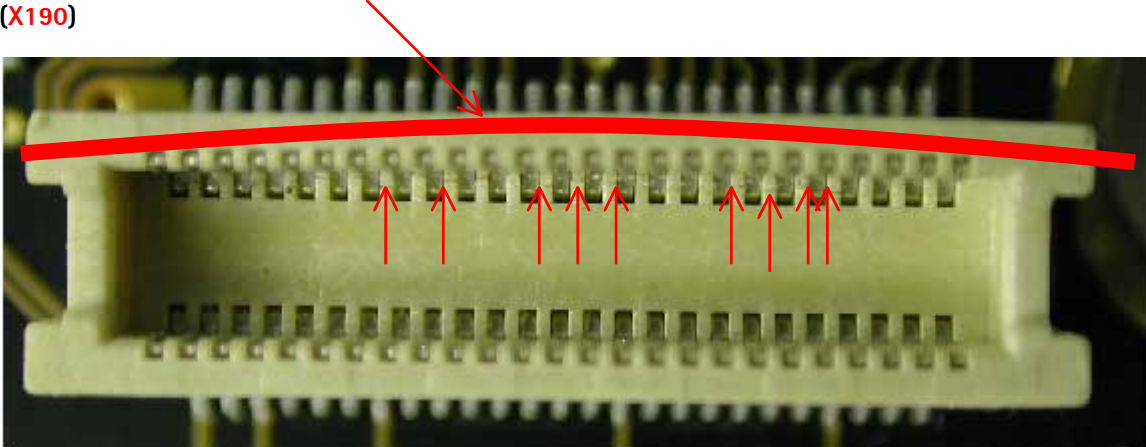
(**X160**) **Battery connector**

Mechanical damage from VBatt–Pin1 of X160

The VBatt pin is not as long as the GND pin. The phone may shut down or "Insert SIMcard" appears on CMT–Display if battery is not fixed correct in chassis. In this case the BSI pin (**B**attery **S**ize **I**ndicator) is loosing connection to battery, Change X160 (**See also SB–29**)
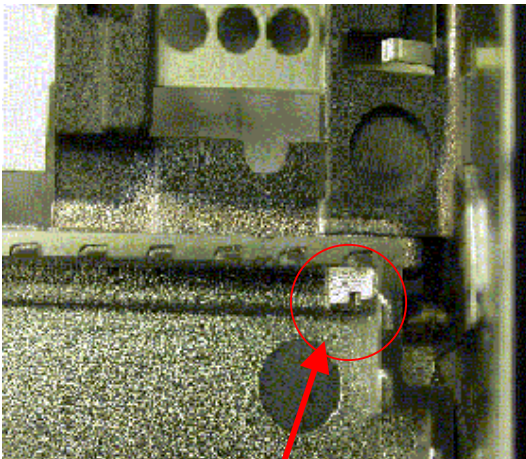
- Check **C106** for cold or broken soldering by pressing the component slightly from the side with tweezers.
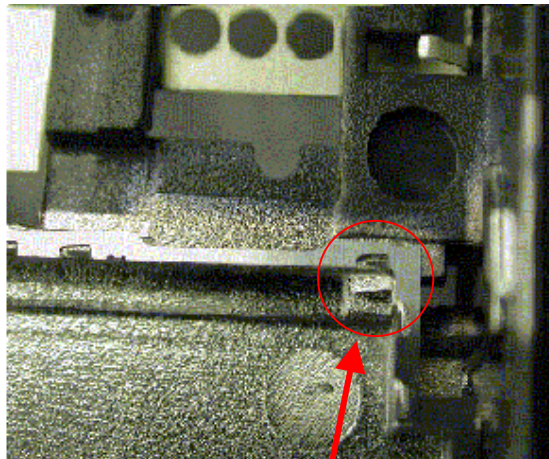
(**C106**)

Broken or cold joint

C106 is broken from old B-cover (see Pictures below)

Old B-cover   New B-cover

Checked by:	Approved by:
Customer Care Training Group	SCCE

Audio holder fault

Generally check for cold soldering at audio holder area on PDA.

Earpiece does not work

-   If the earpiece does not work, because of too short elastomer in audio holder assy, change the short one (6.8 mm, code 9780238) into the new longer version (7.1 mm, code 9780267). The reason for too short elastomer is the thicker chassis. **See SB–021**
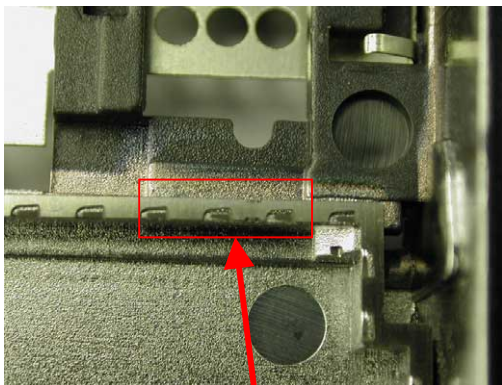
HF speaker connection failure

-   If HF speaker does not work, because of bad connection between speaker´s springs and HF speaker, change Audio holder assy from old version (code 9467029) to new one (code 9467049),

Insert SIM card

Metal gasket short circuits

-   If "Insert SIMcard" appears on CMT–Display, check first which gasket is assembled.
-   If the old one is installed, short circuits on SIM-contact Pin´s 1-3 is possible, shown in the picture below. Change metal gasket in this case. Otherwise change Back cover to the new Version, because the new metal gasket is implemented.
-   If there is the same fault, then refer to **SIMcard faults**

Old metal gasket
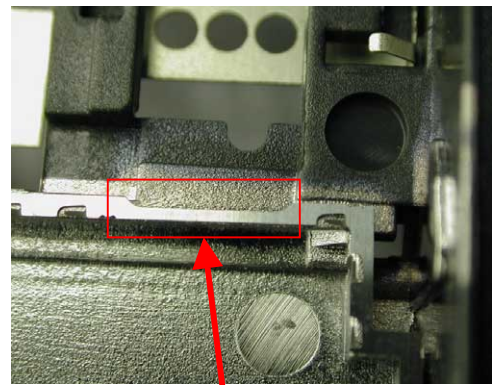
New metal gasket
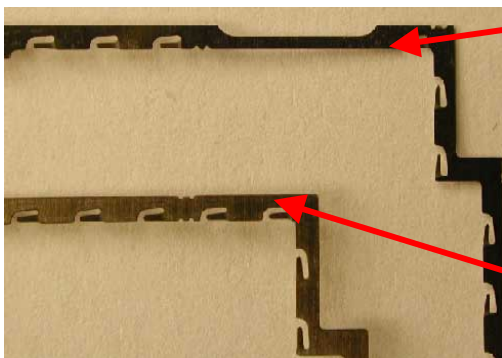
New metal gasket

Old metal gasket

Pin 1–3

Service & Competence Center Europe   Version 1.0 Approved
Customer Care Training Group   Modified 02.07.2001
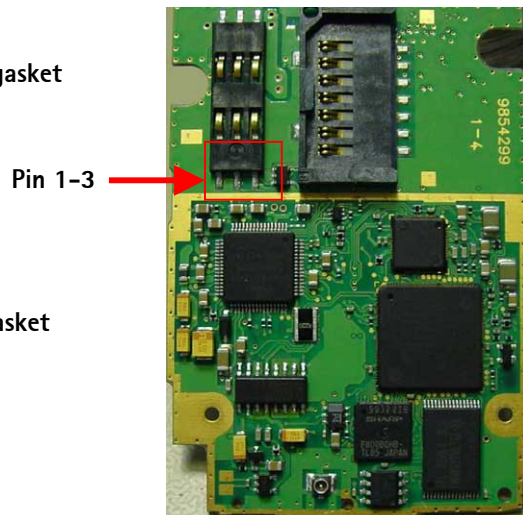
Poor battery contact

See also SB-029
Following faults will probably happen when breaking battery connection:

1. "Insert SIMcard"
2. "SIMcard rejected"
3. Dropped calls
4. CMT switches off for a short moment

-   This mentioned symptoms will happen when the battery can move slightly and the connector pin´s **BTEMP** and **BSI** have losing for a couple of milliseconds connection to battery. Change battery and install the battery pad shown in the picture below.
-   The reason for changing battery: The battery pads getting corrosive and mechanical damage

Note! Breaking battery connection can cause "memory corruption" and "Does not charge" faults.
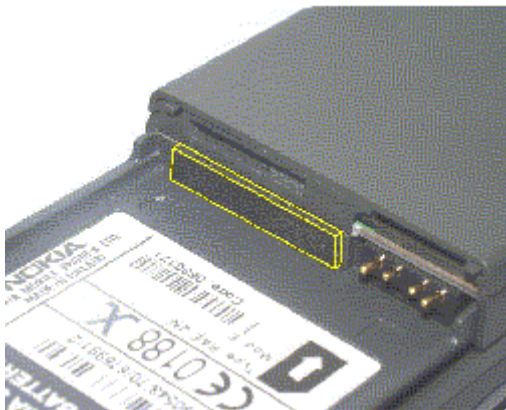
The battery pad fixes the battery, so it can not move any more
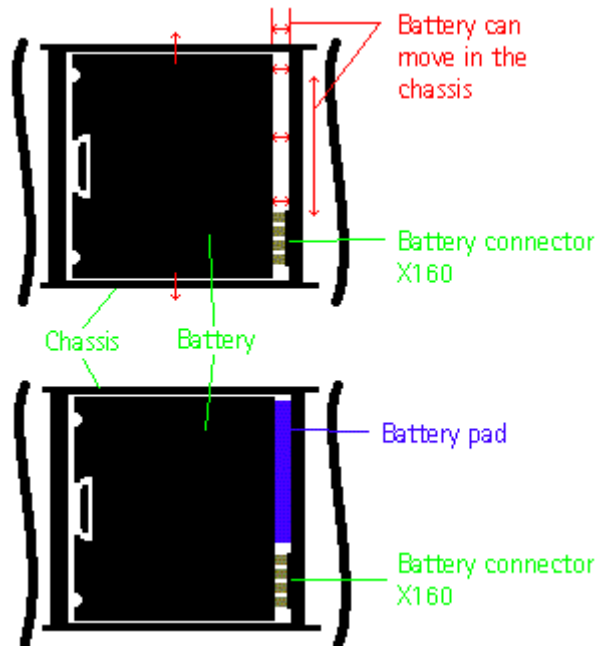
Field strength is poor or dropping calls when lid is opened

- If field strength indicator is poor or dropping calls when lid opened, the coaxial cable is broken. Change it by using the new more resistable coaxial cable (code 9780269).
- Use always the new route shown in the following picture below, because of audio problems at MIC-Line.

See also SB-023
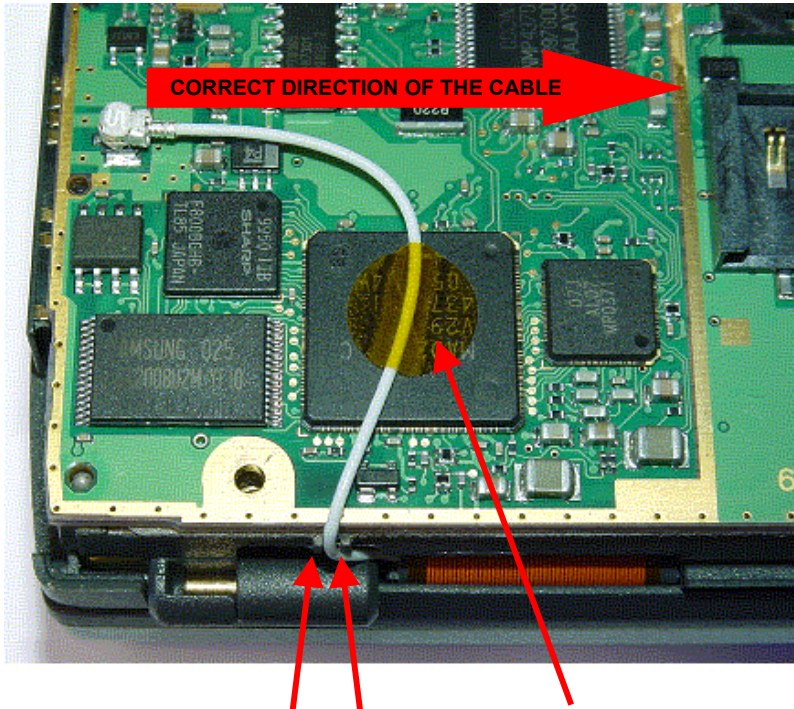
Cable routed between guidance   for better fixing use masking tape (code 7310079)

Cable routed behind the guidance rib

Poor operating time

Further symptoms:

- CMT flashing fails (no response)
- Not charging
- Current consumption too high

If there are one of these symptoms, the chassis gasket short-circuits the battery connector pins.
Cut the gasket at battery pins area with a knife.
Note! Do not scratch the chassis (beware of corrosion)
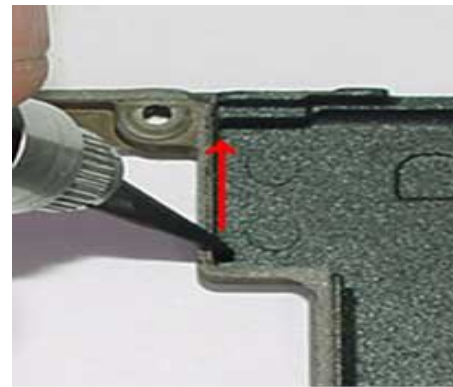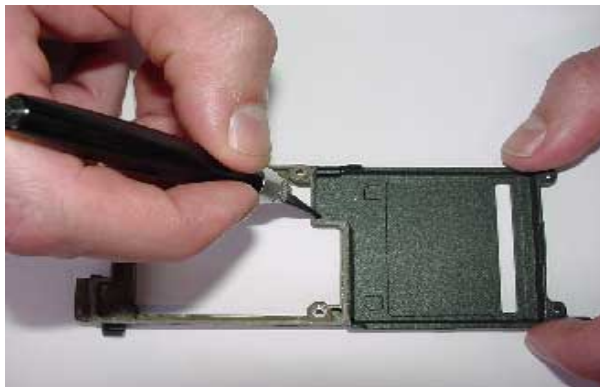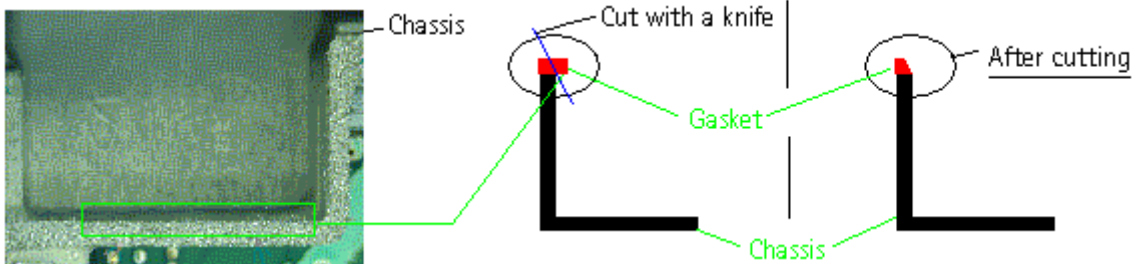
Burr in FBUS line

- **CMT flashing fails**, cause of wake up during flashing. The Burr is connecting the FBUS_TX line to ground.
- Check FBUS line on CMT (see picture), because the cutter at the production line sometimes cuts the FBUS line from CMT board badly

Burr is connecting the FBUS_TX line to ground
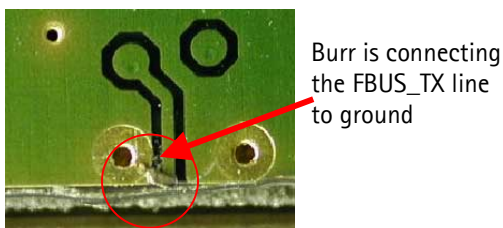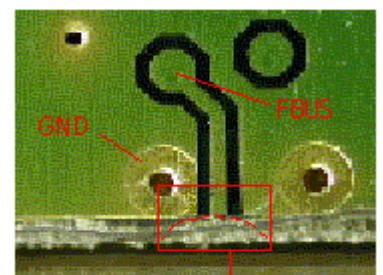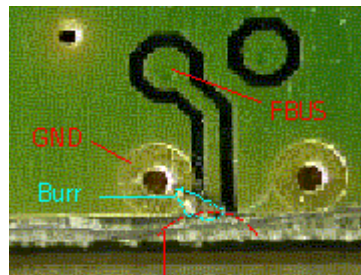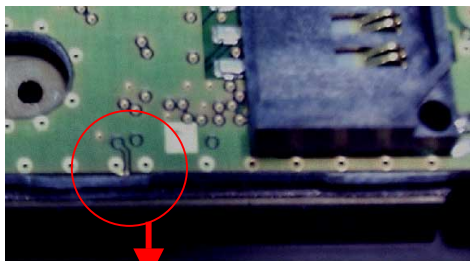
CMT electrical faults

CMT PWRONx   VBat = 3,6V
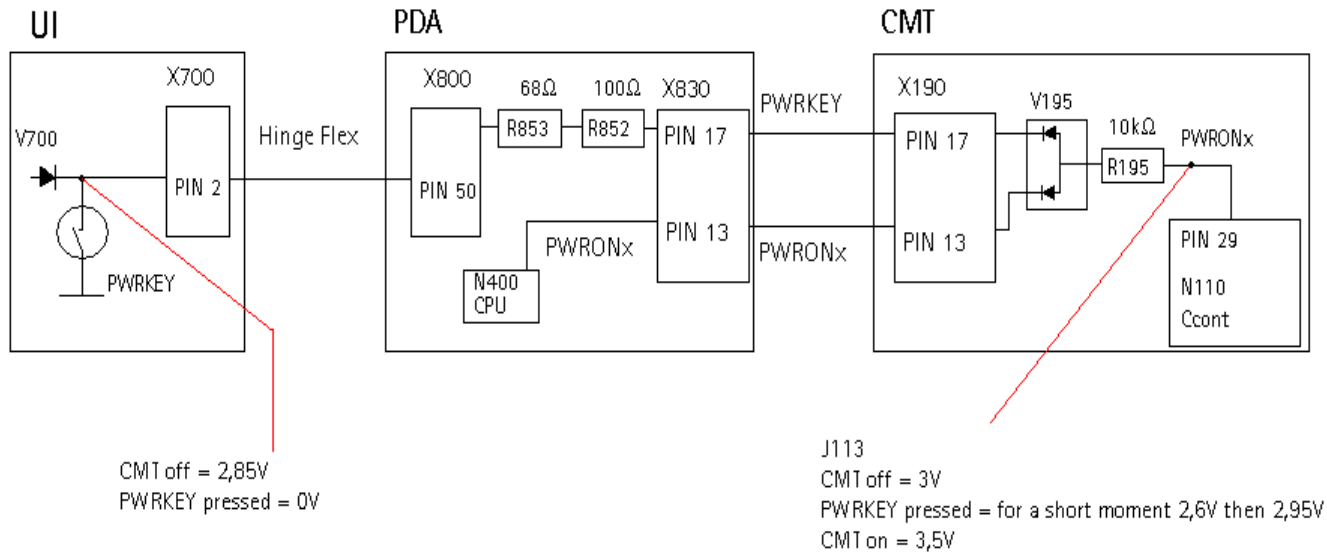
- Check voltage and all connections for broken soldering or short circuits (see picture)

Battery empty fault or power line faulty

- Check the battery voltage = 3.6V at battery pack
- Check VB=3.6V at J111
- Check VBat line (X160, L103) for short circuits
- Check BSI and BTEMP line to CCONT (X160, R122, D100, CCONT N110) for short circuits or broken connections

32.768 kHz B430 faulty

- If battery is connected, check 32.768kHz squarewave (Vpp=2.82V) at J100 (See picture below). If no signal , check sleepclock line for broken and/or short circuits from connectors X190, X830
- Check 32.768kHz sinewave (Vpp=1.20V) from B430 at J435 on PDA (See picture below)
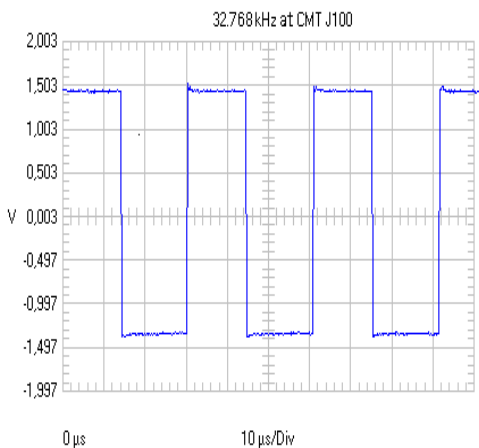
Service & Competence Center Europe   Version 1.0 Approved
Customer Care Training Group   Modified 02.07.2001
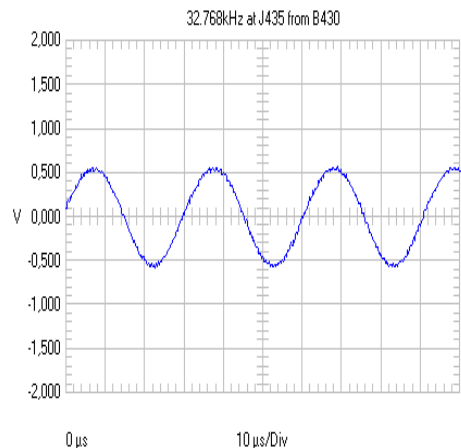
CCONT N110 faulty

- Check PWRONx=3V at J113
- Check VBB=2.8V at J109
- Check VCXOPWR=2.8V at J204
- Check VREF_2=1.5V at J107
- Check VCOBBA=2.8V at J110
- If one off the voltages is missing, check Pin´s from CCONT N110 for cold or broken soldering and surrounding components. Resolder or change faulty component.
(Note! CCONT has changed from old CCONT 2h code 4370391 to new CCONT 2I code 4370479) See SB-022

SIM Card faults

Insert SIMcard

- Check if connector pins of SIM card reader X150 are bent or soiled, change X150 if necessary.
- Check resistance at Pin 1-6 (Look picture below).
- Note! Short–circuit the X160 (battery connector) between Pin 1 and 4, to unload the capacities for a short moment. Now check the resistance between GND (Pin 4) and the other five Pin´s with a multimeter.
- If broken connection or grounded Pin´s, check V104, R124, R125, R128, C127, C128 and N110 for cold or broken solderings or change faulty component if necessary.
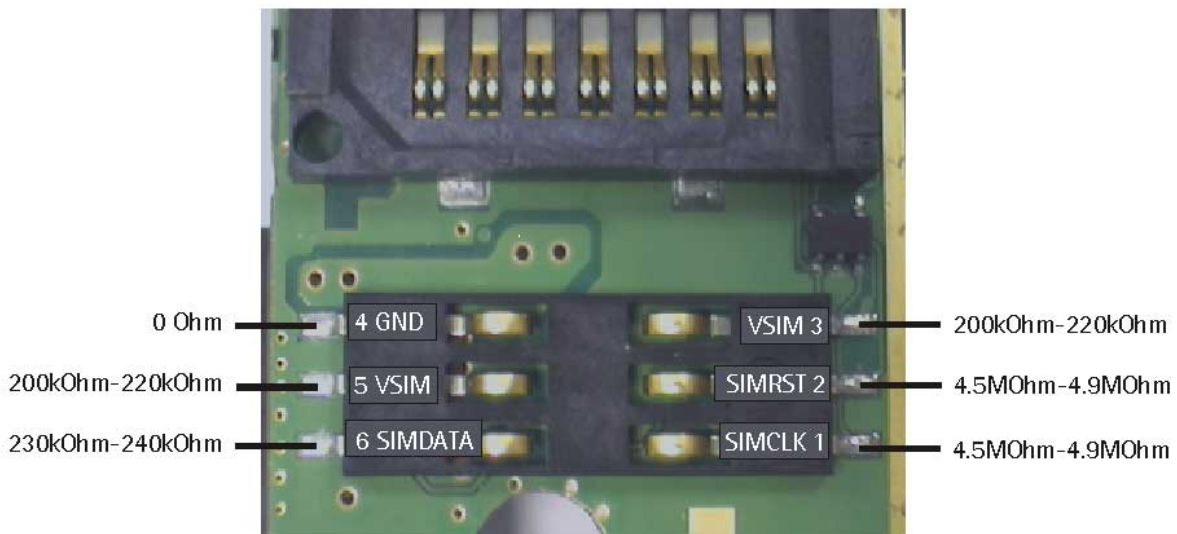
- Check VSIM=3/5V (depend on used SIMCard) at X150 Pin 3/5. If no signal, probably the CCONT N110 is faulty

VSIM PIN3 at X150

Name	= Active Channel 1
Date	= 16.03.01
Time	= 12:55:18
Y Scale =	1 V/Div
Y At 50% =	2,395 V
X Scale =	20 ms/Div
X At 0% =	-38,80 ms
X Size =	500 (512)
Maximum =	5,064 V
Minimum =	-175,0 mV

Service & Competence Center Europe   Version 1.0 Approved
Customer Care Training Group   Modified 02.07.2001
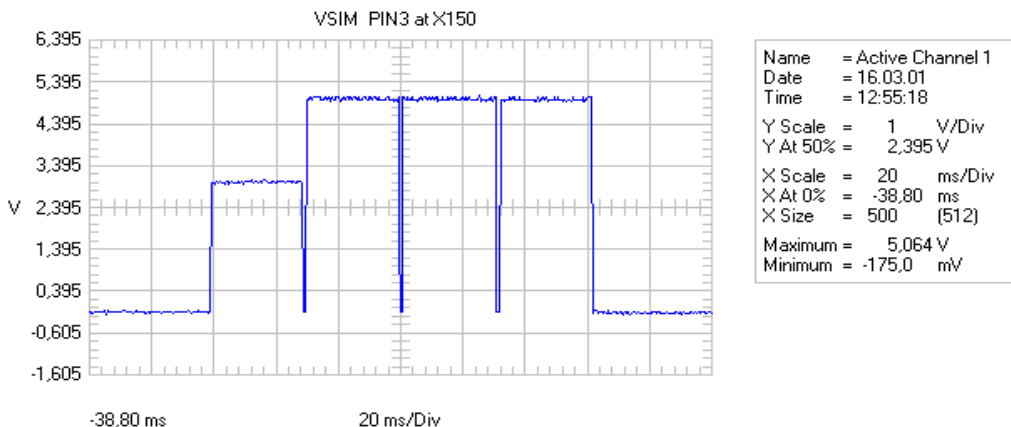
- Check SIMCLK=3.25MHz (Vpp=3.26V) at Pin 1 of X150 when phone powers on (with inserted SIMcard)
- If no signal, check SIMCLK at CCONT N110 Pin 41. If ok, change CCONT. If not ok, change MAD.
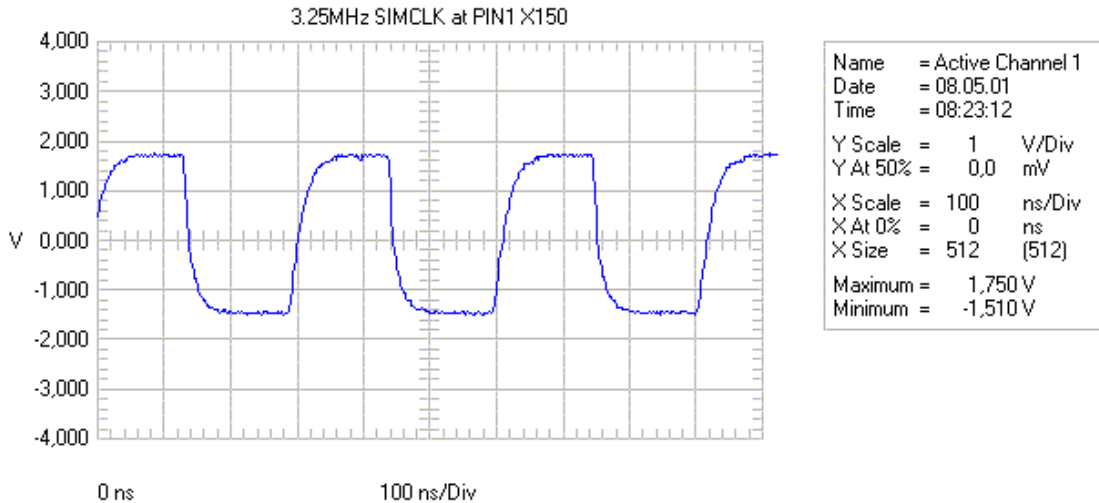
SIM card not accepted

- If "SIMcard not accepted" appears on LCD after entering PIN- Code, a SIMlock is probably activated in phone
- Check SIMlock status with WinTesla SW under menu Quick/RF-info. Compare shown SIMlock data with the listed entries of the respective product code.

Note! If the MSIN data field is closed to a special IMSI number range, only the operator is authorized to open it.

See also General SB-065

- If all SIMlocks closed, try to reprogram the SIMlock setting with NOKIA SECURITY PASSWORD or send phone to the next authorized regional service center.
- If the fault persists, check VCOBBA=2.8V at J110, if not ok refer **CMT electrical faults/CCONT**
- Check COBBACLK=13MHz (Vpp=3.47V) at J253 (see picture below), if not ok refer **CMT electrical faults/MAD**
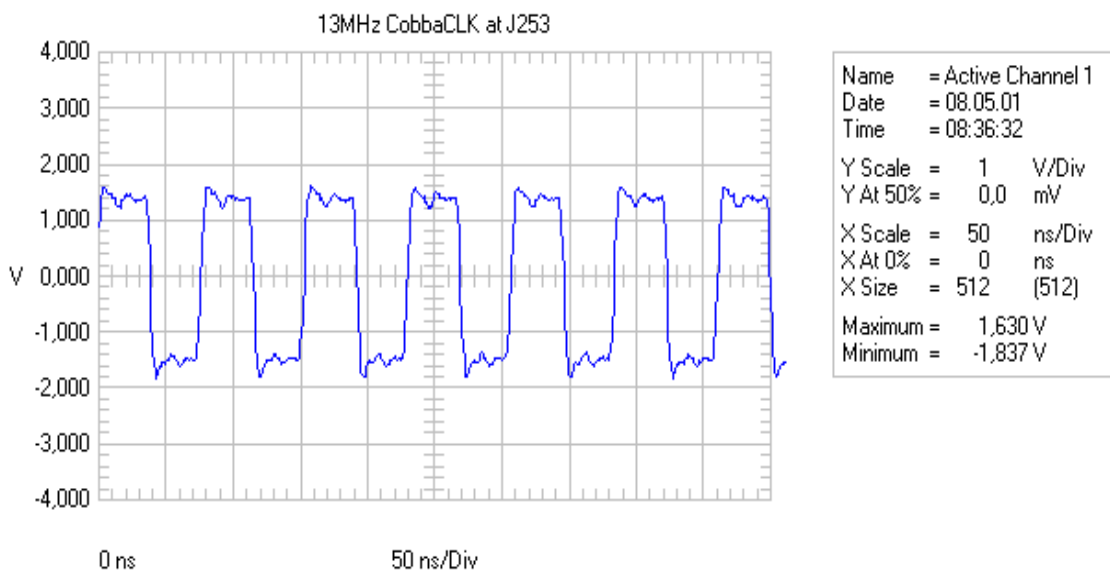
- If SIMlock data´s and SIMcard signals from CCONT are ok, change N250 COBBA

NOTE! Rewrite SIMlock and IMEI data with Nokia SECURITY Password and make a SW-update, if procedure is permitted to you.

	Checked by:	Approved by:
	Customer Care Training Group	SCCE

Not charging

- First check with WinTesla-menu Tuning/Energy Management Calibration, which fault appears.
- If charger voltage/Battery voltage out of limit, check **R103=4.7kΩ** and **R104=47kΩ.** If values not ok check VCHARG line and components for shorts or breaks, change faulty one (N110, N120, R103, R104)
- Check Pad 2 **V_IN=50kΩ** and Pad 3 **Chrg_CTRL=32KΩ** at CMT modul (X170)
- If **V_IN** has low resistance (5kΩ), check C170 and R170
- If **V_IN** has high resistance (MΩ), check F170
- If **CHRG_CTRL**=0Ω, R172 is faulty
- Check BSI-line from battery connector X160 to CCONT N110 Pin 62=10KΩ. If value is not ok check BSI line for shorts or breaks and change faulty components (C160, R122, C160, D100, N100)
- If the battery power indicator is scrolling continuously without charging or it overloads, check voltage at CHAPS N120 Pin 5 and 12. They must have the same voltage level as VB = 3.6V (depends on battery voltage). When different check N120 and R131 for cold or broken soldering, change faulty component if necessary.
- Check **PWM 32Hz** squarewave with **ACP9-Charger** and **1Hz** with **ACP7-Charger** (when connected) at Pin 7 of CHAPS. If there is no signal, change CCONT N110

Contact service

COBBA parallel

- Check VCOBBA=2.8V at J110
- Check COBBACLK=13MHz squarewave (Vpp=3.47V) at J253
- Check VBB=2.8V at J109
- If all values ok, change COBBA N250 (**in some cases named in Service Manual D250**) and rewrite SIMlock and IMEI data.
- If the fault still persists, check MAD D200 (**refer MAD faults**)

NOTE! Rewrite SIMlock and IMEI data with use of NOKIA SECURITY PASSWORD and make a SW-update, if the procedure is permitted to you.

PPM validity failed

- Try to reflash CMT SW
- If ppm-file fails when rewriting, caused by broken balls under flash, change FLASH D210
- If the same fault will happen, change MAD D200

NOKIA

CONFIDENTIAL   15 (30)
RAE-2   Repairhints
                                                Version 1.0 Approved

Service & Competence Center Europe
Customer Care Training Group   Modified 02.07.2001

CMT SW update problems

PDA or service battery fault

Check "**Relink Mode**" from PDA:
- Open the lid. In the upper left corner **5 points** and "**Relink enable**"appear on PDA–Display
- If you can see the startup logo, check if service battery is switched in test mode (switch is located at the right side of service battery)
- If the service battery is switched to test mode, change PDA and try to reflash. If reflash works, PDA is faulty (**refer to PDA faults**)

FLASH instruction when FLASH is **empty** or contains **corrupt SW** (CMT does not work)

- Switch service battery to "Test Mode" (switch is located at the right side of service battery)
- Connect the phone to FLA-7 using SCH-8 cable.
- M2BUS and FBUS lights are shining yellow
- Connect service battery with FLA-7 and other side with communicator. The FBUS light switches off
- Open the lid and check if PDA is going to "**Relink mode**" (there must be 5 points and after a few seconds "**Relink mode**" shown on PDA–Display). When PDA is in "Relink mode", the FBUS light goes on again
- Now try to flash the phone

NOTE! Do **not** push the power on button when the CMT is not working yet. If the power on button is pushed, the M2BUS/FBUS turn lights off and the WinTesla flashprogram is now waiting for communication with CMT. The only possibility to flash the phone is, when the M2BUS and FBUS lights are turned on.

FLASH D210 empty or faulty

- If the current consumption is around 5mA, try to flash the phone.
- If the fault information from prommer is: **Algorithm file or alias ID don´t find, etc,** change FLASH D210 and reflash again.
- If the fault information from prommer is: **External RAM failed,** check Pin´s of SRAM (D220) for cold or broken solderings, change D220 if necessary and reflash again.
- If the phone does not work in both cases, change D200, cause of broken or cold soldering

Note! When changing D200 see also SB–020
- New MAD 07 (code 4370611) and Jumper R151 assembled: J112=1.7V from CCONT Pin 59 V2V
- Old MAD 10 (code 4370421) and Jumper R152 assembled: J112=2.8V from CCONT Pin 55 VBB

Low standby time

SW bug
See SB–036
- If sometimes poor operation time happens when CMT is off, a reason for this fault is a CMT SW bug. Make a CMT SW update ver. 6.01 or newer

N500 faulty

- Check current consumption when CMT is in sleep mode and lid is closed, no SIM card connected (current consumption between 3.5mA–20mA)
- If the current consumption is higher then 20mA (in most cases around 500mA and higher) lift L510. When current consumption is now in limit, change N500 POWER AMPLIFIER with use of soldering machine (OK International, ZEVAC, etc.)
- If low or no TX power **refer also to CMT faults at RF part/ TX faults/ N500**

![NOKIA]

CONFIDENTIAL   16 (30)
RAE-2   Repairhints
Service & Competence Center Europe   Version 1.0 Approved
Customer Care Training Group   Modified 02.07.2001

CMT faults at RF part

No service

- Check with WinTesla RX and TX unit
- Use RF–Generator for generating 947,MHz/ +Offset 67,708kHz/-40dbm, Ch:60 and open menu Testing/RSSI reading to check "RX"
- Use menu tuning/TX power for checking the different TX–power level and under next point TX I/Q the spectrum
- Find out which part is faulty

No RX, no TX

- Check RFCLK=13MHz (Vpp=830mV) sinewave at SUMMA N690 PIN15 for the right frequency 13MHz ±50Hz
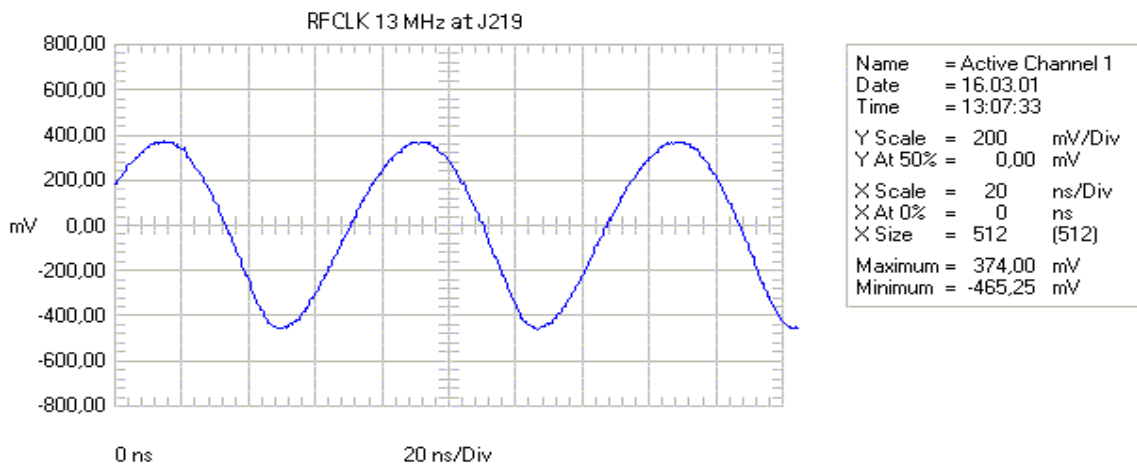
- Check AFC=1.3V (approximate value) at R547
- If AFC=0V, check short circuit on AFC line, if ok change COBBA N250
- Check 1018MHz/Ch:60 (G601), if G601 not working check power at Pin VCC=2.6V and VC=2,3V
- If VCC=0V, check line (VSYN_1) to CCONT N110 at Pin 15(VR4)
- Check **VREF_2**=1.5V at J107 and at one side of **R136**, change CCONT N110 when VREF_2=0V
- If VC=4,5V at G601, check **VREF_1**=1,49V at the other side of **R136** and Pin 41 of SUMMA (N690)
- If only VREF_1=0V, R136 is cold or broken, change or resolder R136

MAD faults

- Check RFCLK=13MHz at J219 and line between C213 and GND = 0Ω. If MΩ, check L511 for cold or broken soldering. If ok, through hole connection is broken between L511 and C213, change CMT-PWB.
- Check SLCLK=32.768kHz squarewave at J241
- Check VBB=2.8V at J109
- Check VCORE=1.7V (new MAD 07) and 2.8V(old MAD 10) at J112
- Check PURX=2.8V at J240
- Check VCXOPwr=2.8V at J204 (SleepX)

COBBA faults

- Check VCOBBA=2.8V at J110
- Check VBB=2.8V at J109
- Check COBBACLK=13MHz at J253
- Check VREF_2=1.5V at R251
- Check phone in call mode with a simulator
- Check errors (frequence, RX-Quality, TX-Power level)

RX faults

RSSI tuning problem

- If it is not possible to tune RSSI, use RF–Generator for generating 947MHz/ +Offset 67,708kHz/ –40dbm/CH=60 and open menu Testing/RF controls/Active unit "RX"/Operation mode "continuous"
- Check 947MHz/ at Duplexer Z500 between **In** and **Out** (Out at L508). The normal attenuation is –5dbm. If the attenuation is higher, change Z500.
- Check the amplification of 947MHz between Pin 25 (LNAIN) and Pin 23(LNAOUT) from CRFU N600, the increase must be +20dbm
- IF Pin 23 low or no signal, check at Pin 26 LNAAGC=2.8V(Front End on=active). When LNAAGC=0V then check in WinTesla menu RF-Controls if the **Front End ON** is activated. When not then activate them
- If nothing happens yet, check PDATA0 line for shorts or breaks (R510, C516). If ok, change MAD D200
- If LNAAGC=2.8V, then change CRFU N600
- Check RFCLK=13MHz at C515. If no signal check 13 MHz G690 (**refer to NO RX/ noTX**)
- Check 1018MHz at Pin 12 of CRFU. If no signal **refer to NO RX/ noTX**
- Check 232MHz VHF at SUMMA Pin 8. If there is no signal, **refer to TX faults/232MHz circuit**
- Check 71MHz IF at Pin 9/10 of CRFU N600. If no signal, check CRFU (**refer to CRFU N600 faulty**)
- Check 13MHz IF at Z701. The attenuation between IN and OUT is –6dbm. If higher, change Z701 in case of no signal at Pin 30 from SUMMA N690, check SUMMA (**refer to SUMMA N690 faulty**)

CRFU N600 faulty

- Check VREF_2=1.5V at Pin 16. If no signal check CCONT N110 and lines
- Check LNAAGC=2.8V (Front END on is active) at Pin 26 (PDATA0 from MAD)
- Check LNAOUT Pin 23=947MHz/CH:60
- Check UHF 1018MHz/CH:60 at Pin 12
- Check VRX=2.75V at Pin 6/17. If no signal check CCONT N110 and lines
- Change CRFU N600 if all values in limit

SUMMA N690 faulty

- Check VCP=4.6V at Pin 13, 22
- Check VREF_1=1.49V at Pin 41
- Check RFCLK=13MHz at Pin 15
- Check VSYN_2 = 2.75V at Pin 16,19 and 2.6V at Pin 9
- Check RXC=1.2V (AGC absolute=512)at Pin 36
- Change SUMMA N690 if all Values are in limit

NOKIA

CONFIDENTIAL   18 (30)
RAE-2   Repairhints
Version 1.0 Approved

Service & Competence Center Europe
Customer Care Training Group

Modified 02.07.2001

NO RX

RX-Fail
Set RF generator 947MHz ch: 60
RF-Level High output
Set Phone to RX continiuous mode

Check 13MHz
RFCLK at J706

— nOK →

Check
Vcc=2,8V
at G690

Check line between CCONT
N110 Pin25 and G690 Pin Vcc;
change CCONT if necessary
← nOK

OK

Check AFC
approximate
value =1,3V
at R547

Check AFC line, if OK
change COBBA N250
← nOK

OK

Change G690
13MHz RFCLK

OK

Check 71MHz IF
at Z650 in/out

Check 1018MHz
UHF at L509
← nOK

Check
Vcc = 2,7V
at G601
← nOK

Check VSYN_1 line to
CCONT and R535 ;
change CCONT/R535
if necessary
← nOK

OK

Check 947MHz at N600
Pin25 and line between
X170 and N600

OK

Check
13MHz IF at
Z701 in/out

nOK

Check
232MHz VHF
at N690
Pin8

Check 232MHz circuit
and surrounding
components
← nOK

OK

Change Z701

OK

Check
Vc=2,3V
at G601

If Vc=4,5 V ; Vref1= 0V
check R136 and N110 CCONT
change them if necessary
← nOK

OK

Change G601

TX faults

No TX

- Check SW Tuning/**TX-Power** and/**TX I/Q** with WinTesla
- If no TX, use WinTesla SW /Testing/ RF-conrtols/ TX-Burst mode power level 5/CH: 60

232MHz circuit

- Check 232MHz at N690 SUMMA Pin 8. If no signal, check C581 for cold or broken soldering
- Check VSYN_1=2.75V. When 0V, check line to CCONT for shorts or breaks. If ok, change CCONT N110
- Check V660: Emitter=1.8V/Collector=2.5V/Base=1.2V. If the values are not ok, check the discrete components (see picture below)
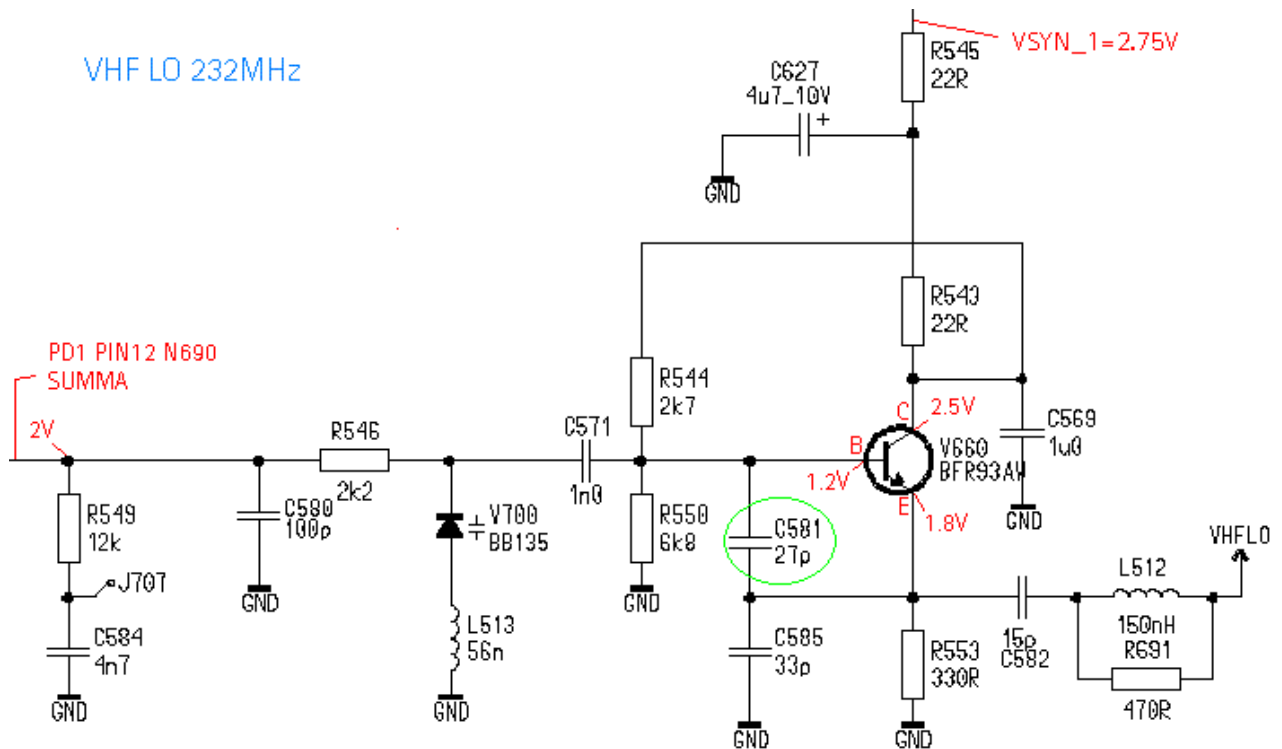
Power Amplifier N500 faults

- Check Vbatt =3.6V at Pin 1, 2, 4 and 6
- Check 902MHz at Pin 8
- Check also 902MHz at Pin 13 and put the power level from Base up to 5. The signal must be getting stronger. When you see no diffrence between base level and power level 5, check with oscilloscope VPD on J708 (see picture base and power level 5 below) when turning power level up.
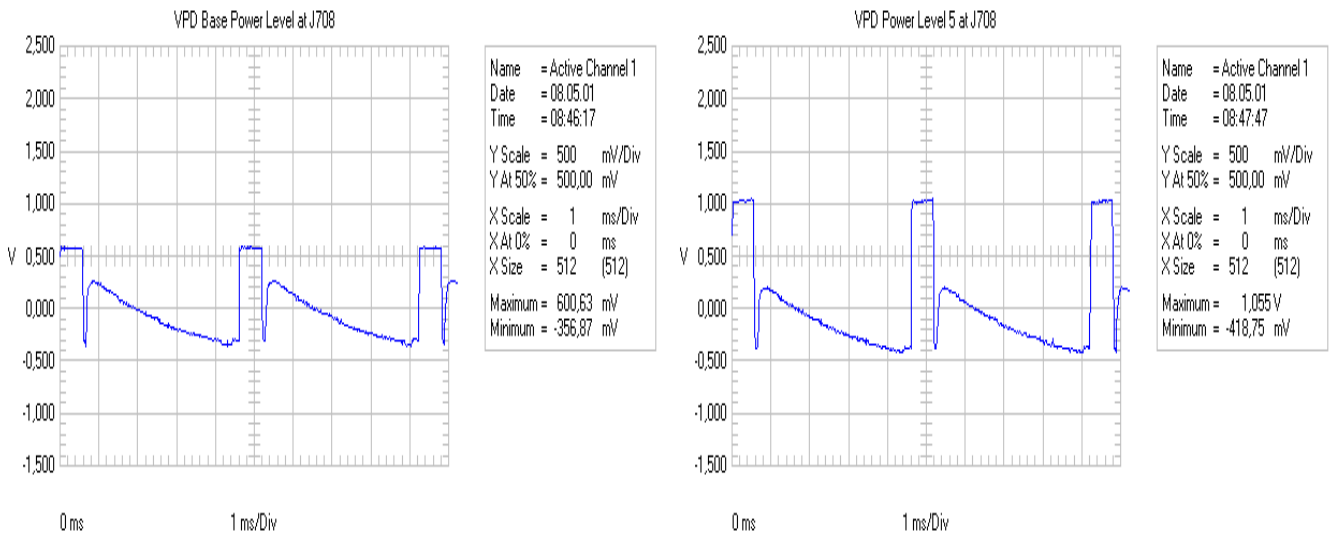
- If the values do not change at J708, check C618, R622 and SUMMA N690 Pin 31, change faulty component if necessary.
- If the values change but the signal is not getting stronger, tip very carefully with a non metallic item on top of N500.
- If the Signal gets stronger cause of cold ground soldering under component, change N500.
- Check VTX at Pin 16 (**refer NO TX, VTX picture**)
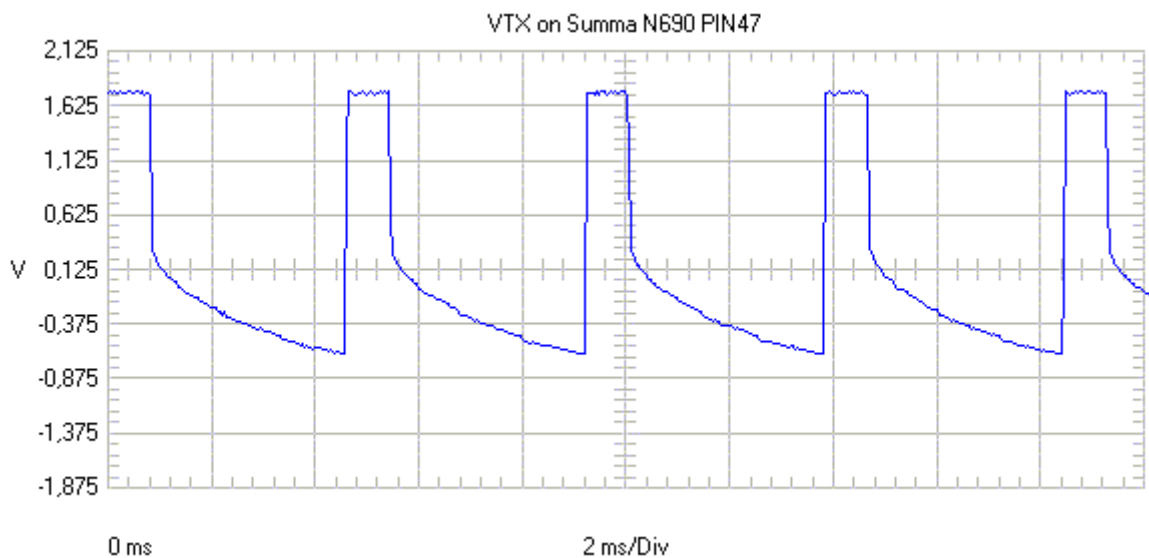
- Check 902MHz at Z500 Duplexer Pin ANT, if the signal is ok, change X170 botton connector

NOKIA

CONFIDENTIAL 21 (30)
RAE-2 Repairhints
Version 1.0 Approved

Service & Competence Center Europe
Customer Care Training Group

Modified 02.07.2001

NO TX

```
                              ┌──────────────────┐
                              │     TX–Fail      │
                              │   VBatt = 3,6V   │
                              │  902MHz ; ch : 60│
                              │  TX power Level 5 │
                              └──────────────────┘
```

Check VXO line between
CCONT Pin 25 and G690
PinVcc = 0R ; if ok change
CCONT N110

◄nOK─ Check Vcc=2,8V at J704 ◄nOK─ Check 13MHz RFCLK at J706

OK

Check 232MHz at L512 ─nOK► Check at N690 PD1=2V/Pin12 Vref_1=1,49V/Pin41 ─nOK► change N690

OK (left branch)

Check Vc between 0,5V-2,3V at G690 Pin Vc ─nOK► Check AFC line for short circuits, if ok change N250 COBBA

OK

Change G650

OK (center)

Check VSYN_1 = 2,7V at J702 ─nOK► Check VSYN_1 Line between CCONT /Pin15 and R545 = 0 R

OK ... **OK**

Check discrete components of 232MHz circuit especially C581 for cold or broken solderings, change faulty component

Change CCONT N110

Check 1018MHz UHF at N600 CRFU Pin 12 ─nOK► Check G601 1018 MHz UHF and components

OK

Check TX out line between N600 Pin 30 and N500 RFIN Pin8 for shorts or interruption ◄nOK─ Check 902 MHz at N500 Pin 8

OK

Check VBatt line for interruption ◄nOK─ Check VBatt = 3,6V at N500 Pin 1,2,4,6 ◄nOK─ Check 902MHz at N500 Pin 13

OK

Check VPD = signals with oscilloscope at N500 Pin 9, if OK change N500

OK

Check 902MHz at Z500 Pin Ant; if OK change X170 bottom connector

ATTENTION!!!
First of all interchange <u>all</u> modules (PDA, CMT, UI) with functional ones to define the faulty module

PDA (BS1, 0201484) electrical faults

PDA (BS1) does not start

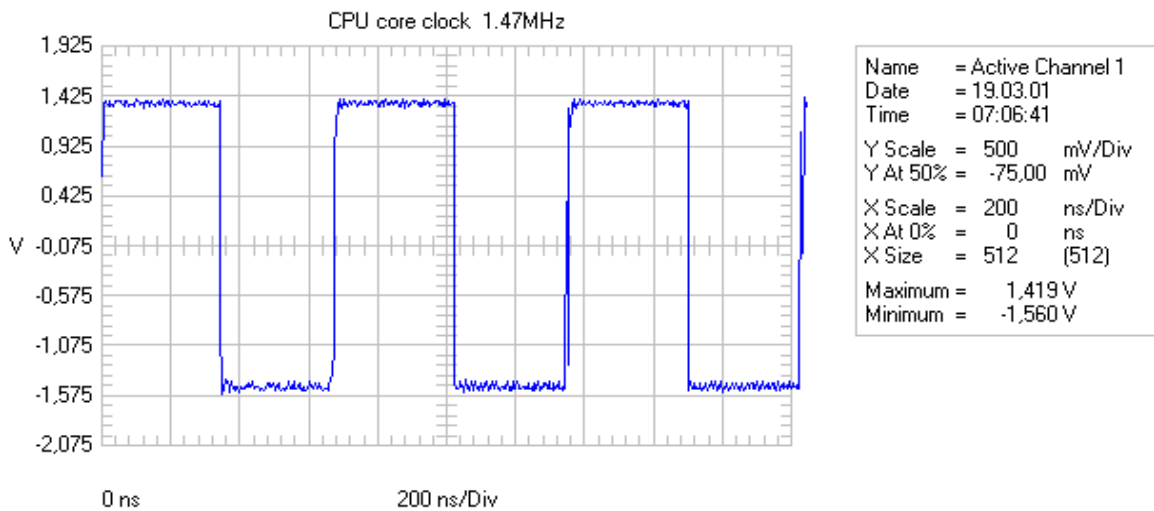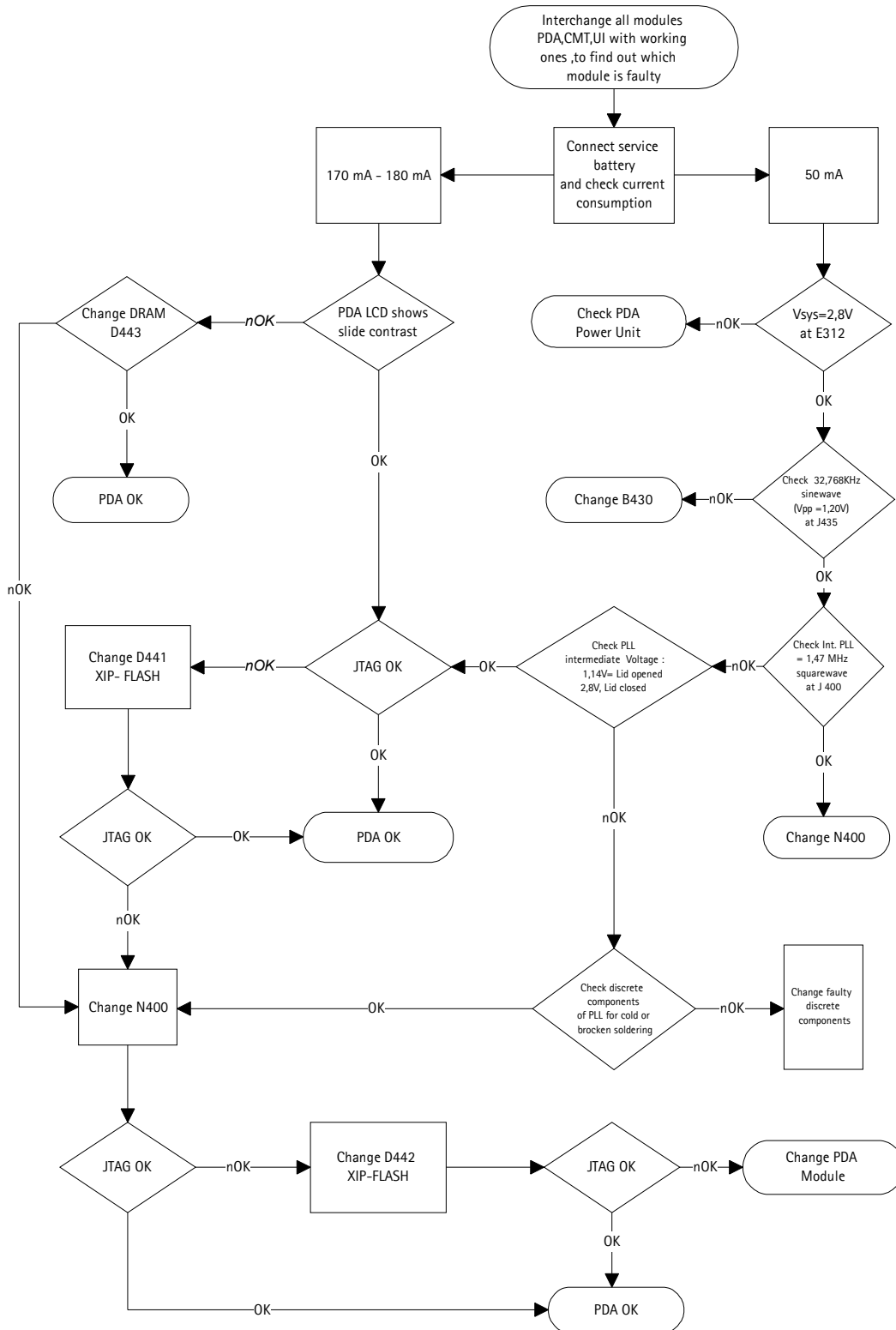(Note: If you do not have the possibility to JTAG (JTAG=<u>J</u>oint <u>T</u>est <u>A</u>ction <u>G</u>roup), send the PDA to the next authorized regional service center. Everytime changing the XIP–FLASH´S (D441, D442), the JTAG is needed).

- Connect service battery to communicator and listen to the HF speaker if you hear some **POST** BEEP Codes (<u>P</u>ower <u>o</u>n <u>s</u>elf<u>t</u>est)
- 3Beep=Memory failure in 1st 64kB of memory (connection between N400 and D441 faulty, in most cases change N400 cause of broken soldering. Otherwise the D441 XIP flash has to be changed..But if you do not have the possibilty to JTAG, change the PDA module and send the faulty one to next authorized regional service.
- Note! For more information about POST BEEP Codes see in Service Manuel Chapter 7 Troubleshooting, POST BEEP Codes
- Check current consumption when connecting service battery (see flowchart)
- Check 32.768kHz (Vpp=1.20V) sinewave at J435 of B430
- Check CPU core clock 1.47MHz (Vpp=1.5V) squarewave at J400

CPU core clock 1.47MHz

Name	= Active Channel 1
Date	= 19.03.01
Time	= 07:06:41
Y Scale	= 500 mV/Div
Y At 50%	= -75,00 mV
X Scale	= 200 ns/Div
X At 0%	= 0 ns
X Size	= 512 (512)
Maximum	= 1,419 V
Minimum	= -1,560 V

0 ns   200 ns/Div

NOKIA

CONFIDENTIAL   23 (30)
RAE-2   Repairhints

Service & Competence Center Europe   Version 1.0 Approved
Customer Care Training Group

                                               Modified 02.07.2001

PDA fail

(Note: If you do not have the possibility to JTAG (JTAG=Joint Test Action Group), send the PDA to the next authorized local service center. Everytime changing the XIP–FLASH´S (D441, D442), the JTAG is needed).

© 2001 Nokia Mobile Phones

Checked by: Approved by:
Customer Care Training Group   SCCE

Relink mode

- If "Relink enable" appears on PDA–Display after conncting the normal battery
- Check resistance between E315 and E313. Good value =MΩ, bad value=kΩ and lower cause of electrical damage,
- change N400.
- If the communicator is connected to the service battery (battery switched in Test Mode) and does not switch in "Relink mode", also change N400

NOTE! Before changing parts, interchange all modules with working ones, to find out which module is really faulty

PDA LCD faults

PDA–Display vertical stripes

- If you see vertical stripes on the PDA–Display and/or the PDA freezes after pressing buttons around the **S**-key
- Change N400

PDA–Display completly blue

After inserting the battery, the PDA–Display appears completly blue.
NOTE! Before changing parts, interchange all modules with working ones, to find out which module is really faulty.
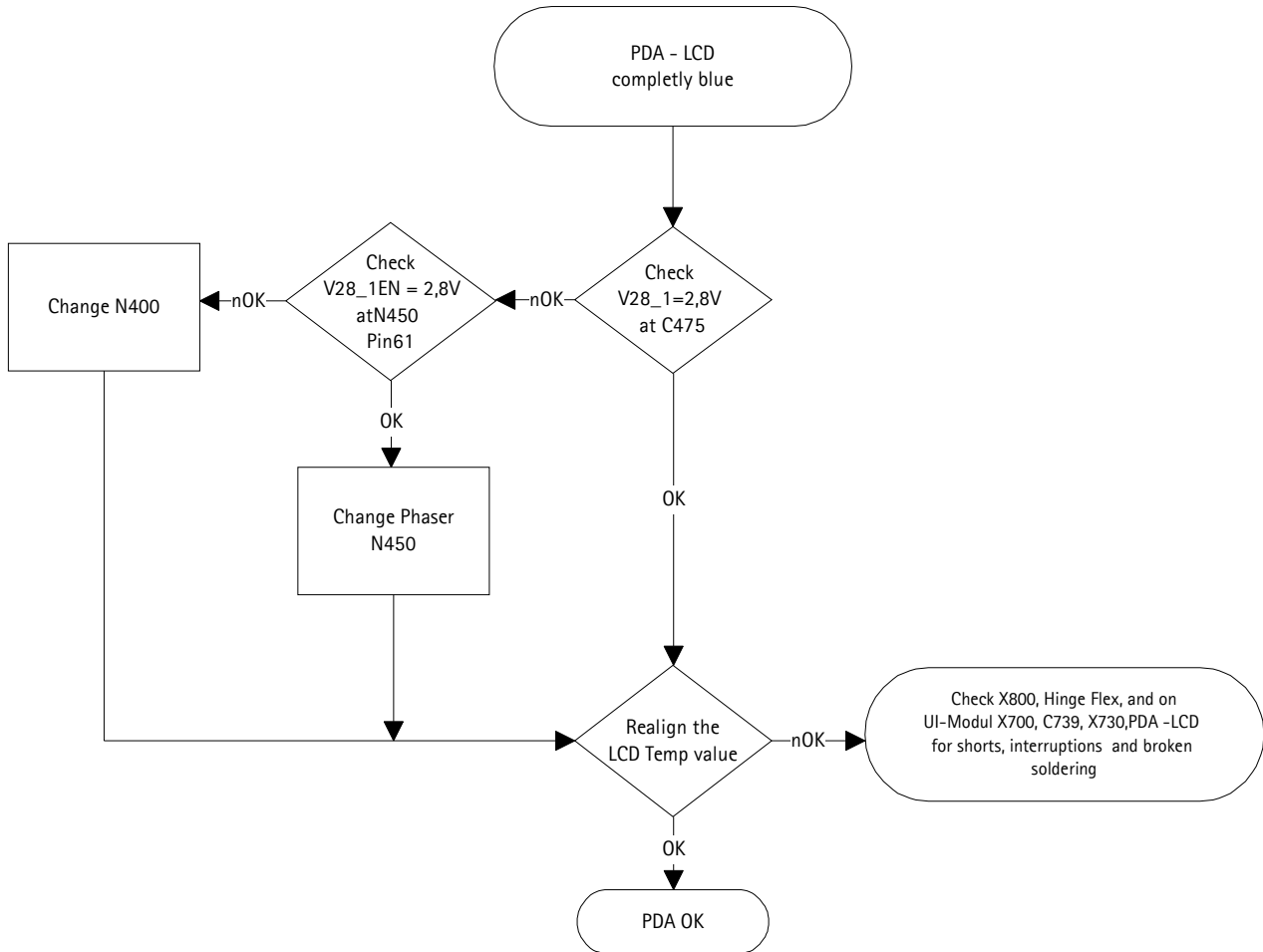
- After changing components you always have to realign LCD TEMP value. Follow the steps 1-9
     Use WinTesla SW RAE2PD to tune the PDA – Display and follow the next steps
1.   Start the RAE2PD SW
2.   Speed : 115200; Com1 (or Com2 depending on your PC setup)
3.   Choose RS protocol and press OK
4.   Switch service battery in test mode (located at the right side of service battery) and connect it with PKD–4F dongle
5.   Connect the phone to serial port com1 (or Com2 port depending of your PC setup) using DLR-2 cable
6.   Connect service battery with 9110
7.   Disconnect and then connect service battery with Fla–7 (When the lid is open, a small point appears in the upper left edge.
     (If the startup logo appears start again with step 7)
8.   If the message "Target responding in testmode" appears on PC, press "OK".
     Otherwise press "cancel" and start again with step 7

At first open Peripherals/Test LCD Panel.../and choose Grey to show a GREY-SCALE on PDA-Display. Then choose the menu and open I/O-Function/ Phaser Calibration to tune PDA-Display
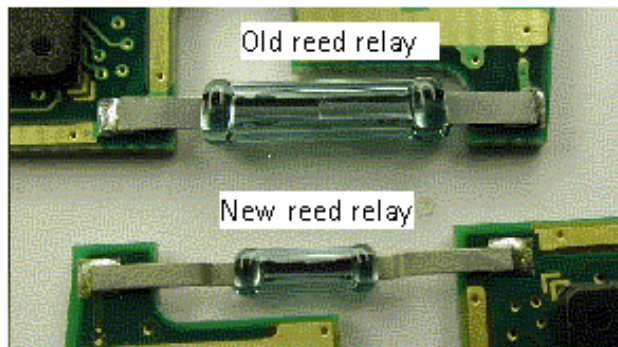

	Checked by:	Approved by:
	Customer Care Training Group	SCCE

CMT does not switch on

- When the power on button is pressed, the CMT–Display shows slight contrast but does not start, open the lid, use a magnet and put them in the lower left corner of keyboard area and check if the PDA–Display turn off
- If not, change S390 on PDA module

NOTE! Use always the new reed relay S390 (new code 5209005, old code 5309001)

New reed relay in use at HW 6000 from IMEI: 449211/70/655468/2)
See SB–035

NOKIA

Service & Competence Center Europe
Customer Care Training Group

CONFIDENTIAL   27 (30)
RAE-2   Repairhints
                                       Version 1.0 Approved
Modified 02.07.2001

PDA software faults

PDA only shows the 9110 logo and freezes or is rebooting again

    The PDA only shows the 9110 logo and freezes or reboots again, because the INI file is corrupt
    If you have to rescue some files use PC-Suite before format the PDA as in step 3
    1.   First try to format the file system by pressing the key combination: Shift–Tab–< at same time (means: check the file system)
    2.   If the fault remains try: Shift–Tab–> at same time (means: remove temporary files, including INI-files)
    3.   If the fault persists try: Shift–Tab–F at same time.(means: remove all data from PDA)

Note! More detailed discription you can find in User Manual 9110 under section Troubleshooting, problem 4

Internal Error

    The message "**INTERNAL ERROR**" appears on PDA-Display after booting the SW because the user data are corrupt
    If you have to rescue some files, try to use PC-Suite SW for Import/Export.

Note! It is possible that also corrupt files are rescued and after rewriting to PDA the same fault will happen again.

-    After rescue try to format the PDA by shortly pressing the key combination: Shift–Tab–F at same time after connecting the battery.

Note! More detailed discription you can find in User Manual 9110 /section Troubleshooting, problem 4

XIP–Checksum fail

-    After inserting battery, on PDA–Display appears: **XIP–Checksum failed**
-    Try to update checksum with use of WinTesla SW/ Menu: Product/ Open/ RAE2PD/ I/O Functions/ Update Checksum

Note! Service Battery must be switched in Test Mode. For right connection refer to PDA–Display completly blue.

-    Now disconnect Service Battery and switch it in Normal Mode. Connect Service Battery to communicator and open the lid.
-    If the same fault persists**, refer to Electrical faults: PDA does not start**
-    If update checksum is ok, try to flash the PDA
-    If flash update fails or the same fault is appears again, probably the CPU or one of the XIP flash´s are faulty, because of broken balls.

Note! Only use the 9110i PDA SW for 9110i communicator recognizable by special product codes. It is **not allowed** to flash 9110 PDA with 9110i SW. **See SB–032**

ATTENTION!!!
First of all interchange <u>all</u> modules (PDA, CMT, UI) with functional ones to define the faulty module
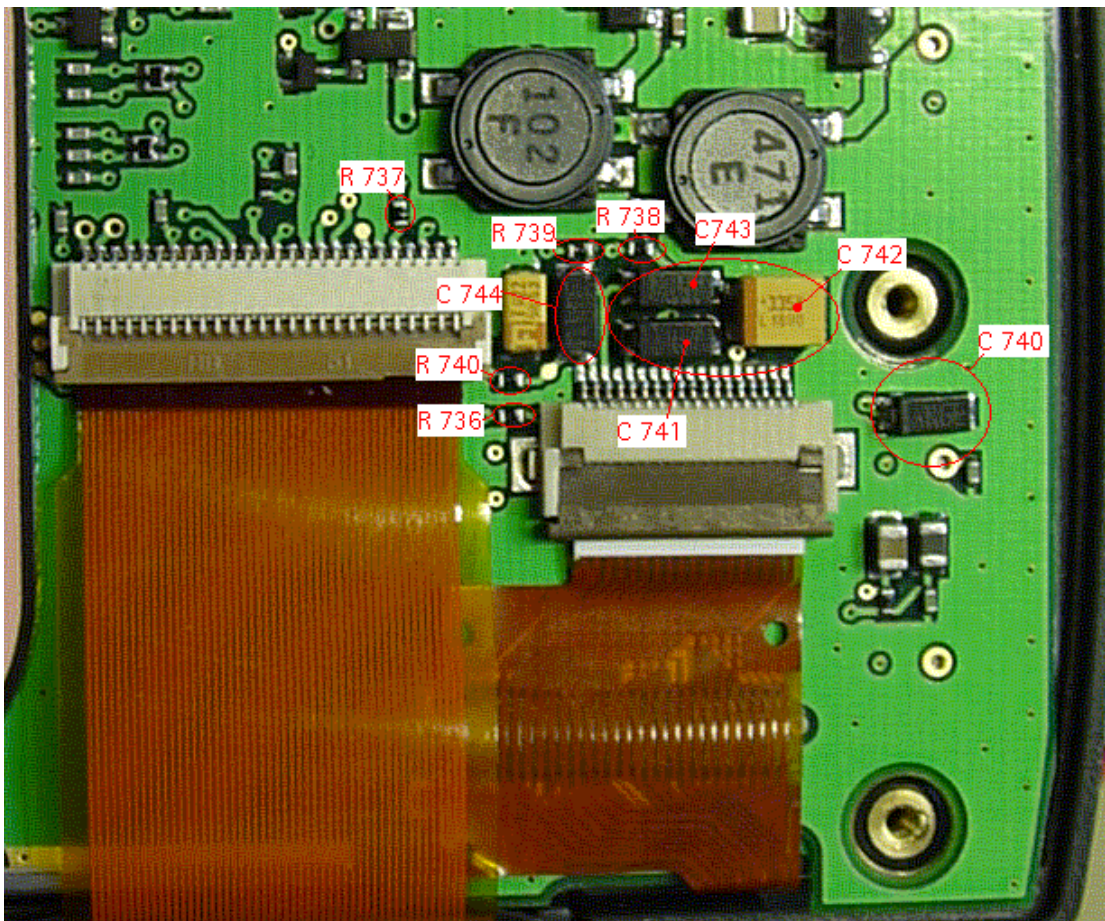
User Interface faults (0201483)

PDA reboots when lid was opened several times (only with HW version 3600,4000 and 4001 board Version 10)
See SB-017

Change the following components marked in the graphic and table

BS2 (UI) board Version 10.

Old NMP Code	Old Value	NEW NMP code	NEW Value	CCT references
1430691	2R2	1430690	0R0	R736, R737, R738, R739, R740
2610007	3µ3	2604079	220n	C740, C741, C743, C744
2611707	3µ3	2604054	470n	C742

Broken LCD (PDA, CMT)

Blue areas in PDA–Display

- The PDA–Display has a broken corner under metal frame, change PDA–Display


No lights on backlight panel

- Check connection between L730 Pin 1 & N730 Pin 4 (0Ω). If connection is open, change L730
- Check if there are 60V **AC** between Pin 6, 7 at N730. If there are only 30V **AC** or less, change N730
- Check if the backlight panel is correctly assembled
- Check if the two screws (M1, 6 x 5) at the bottom of UI are fixed with 10Ncm (this is also necessary to contact the panel to UI)

Hinge flex and /or X700/X800 fault

- If no or dark areas on PDA–Display and/or CMT–Display, check if Flex connector X700 (UI), X800 (PDA) and Hinge Flex contacts are dirty, bent or broken. Clean or change connectors/contacts if necessary
- Check also if connectors (X700, X800) are not closed correctly

CMT–Display broken

- Lines missing in CMT–Display, because of broken corner under metal frame, change CMT-Display

---

Checked by: Approved by:
                                    Customer Care Training Group   SCCE
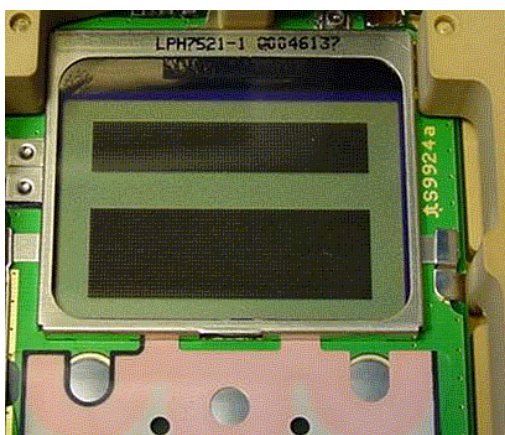
Change History

Originator	Status	Version	Date	Comment
CC Training Group	Draft	0.1	03.03.2001	First version for the repair group
CC Training Group	Approved	1.0	22.06.2001	First approved release