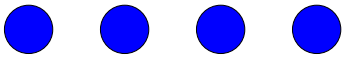
Repair-Hints

3210

NSE-8/9

HD 947



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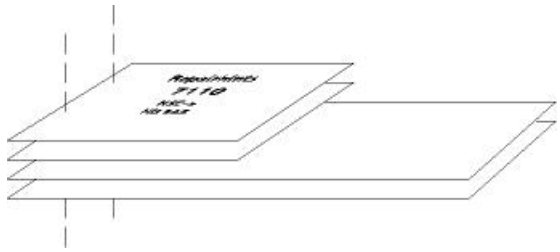
GENERAL



-How to use this document

Put the QUICK REPAIR layouts behind this manual.
Now you are able to follow these specifications with graphical layouts and it is easier for you to find the components and measuring points.

-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.

-Underfills, broken balls, µBGA

It is not possible to change underfilled components. The trial will damage PCB surely. All replaceable µBGA-components must be renewed after removing.
Check soldering points, remove oxidated solderings (broken balls) carefully by enclosing few new solder before placing new components.
µBGA must be soldered only with NMP approved µBGA-rework machines (e.g. Zevac/OK International).
Use only recommended Fluxtype and an appropriate amount of it.
Clean very careful the PCB after every rework and take great pains over the keyboard area. Don´t make any loose wiring connections anywhere.
If it is necessary to change any item located under the metal shields, remove the shield first don´t cut partially or bend it.

-Realign after repair

Characteristics of replacement parts are different.
To prevent additional faults after repair (eg. low standby time, loosing network etc...) it is necessary to retune phone values after repair.

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INTRODUCTION

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 3210 phones.
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 build 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 that reason it doesn't contain any circuit descriptions or schematics.

All measurements are made using following equipment:

Nokia repair SW	: WinTesla Version 6.43
DLL version	: NSE8 version 271.02.00 / 04.04.2000
Nokia Module Jig	: MJS-13
Digital multimeter	: Fluke 73
Oscilloscope	: Hitachi V-1565; Fluke PM 3380A/B
Spectrum Analyzer	: Advantest R3361C with an analogue probe
RF-Generator /	: Rohde & Schwarz CMD 53
GSM Tester	

While every endeavour has been made to ensure the accuracy of this document, some errors may exist. If any errors are found by the reader, 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:

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Service & Analysis Center Europe
Meesmannstr.103
D-44807 Bochum / Germany
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HW CHANGES IN NSE–8/9, HD 947, 3210

Check L102 (pictures page 7) -version and soldering if phone switches off or doesn´t switch on.

Clock- / ringing tone problems - Hw changes (SB-017).

Check R103 version if phone doesn´t charge and
check C-Cover version (Time dial removal – SB-024).

Charging problems with ACP-7 charger if battery is totally discharged (SB-042).

Check if protective Label is added / problems with switching on (SB-011).

Check version of Dome Sheet / keypad problems – high keypress force
(SB-028 & SB-032).

Check version of G701 („A“ version must changed to „B“ version) / poor or no service (SB-018).

Poweramplifier change and Modul version GD7 (SB-030).

New version of 71 MHz SAW Filter (ceramic package - SB-030).

New CCONT versions (Vs. H to I and to M)– these are not vice versa compatible
(SB-030 & SB-040).

New COBBA versions (Vs. 3.1 to 4.1) – these are not vice versa compatible
(SB-035).

COBBA underfilling (SB-037).

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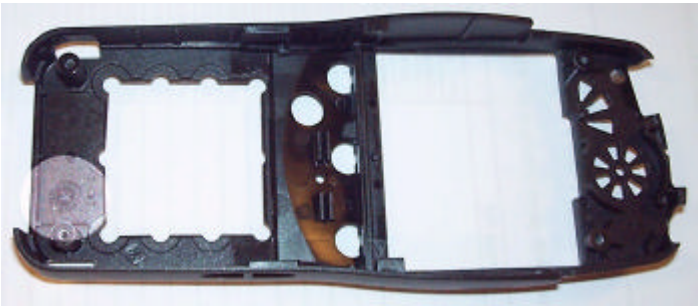
Charging problems

Check soldering of R103 or if bend – in this case change N101.
If R103 was bent – check the C-Cover version and cut the arrow of time dial in Cover or change C-Cover if necessary **(Service Bulletin 024).**



Not charging (only with ACP-7 charger) if battery is totally discharged – in this case R132 must be changed to 150k / 1% tolerance and R131 must be changed to 82k / 1% tolerance resistors
(Service Bulletin 042).

Poor or no service problems

13MHz Oscillator (G701) must be changed from version „A" (NGK3092A) to new version „B" (NGK3092B) – this VCTCXO was only used within below IMEI range and type label, marked as MADE IN FINLAND

First NSE-8 IMEI 448896/10/274359/9
Last NSE-8 IMEI 448896/10/422812/8

First NSE-9 IMEI 448898/10/098643/6
Last NSE-9 IMEI 448898/10/149081/8 **(Service Bulletin 018)**

Clock- and ringingtone problems

In some cases the ringing tone and/or the clock goes too slow or too fast – in these cases C148 must be changed to 47p / J 50V and C153 to 18p / J 50V and check sine- / squarewavesignals of B100 and change B100 if necessary **(Service Bulletin 017).**

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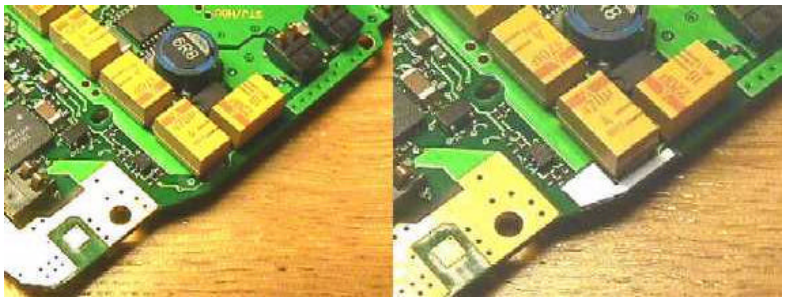
Phone doesn´t switch on

Check if track (R132 to L102) located at C110, is printed as upper layer and if this line is 0 Ohm - also place an isolation label on this track (see pictures) to protect this for short cuts to D-Cover. This is necessary in IMEI Number range below 448896/20/485419/5 and 448896/10/205064/9 (Service Bulletin 011).



Check soldering of L102 – In some cases the soldering of the coil can be broken on both sides – change if necessary – Note the different (approved) versions of L102.

The first (oldest version with soldering problem)

The new versions for better reliability below.

.
.

Keypad problems

High key press force (eg. Navikey,2,5,8,0)

These problems occure due to process change at PCB vendor.
IMEI range: First 448903/10/729000/0
Last 449142/10/432508/8
The PCB´s can be identified by an double arrow symbol on the keypad of the PCB. In this case a new modified keydome sheet is available to solve this problem.
(Service Bulletin 028 & 032)

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NEW PCB / vendor changes (GD_7) and other component changes

Z 700 / 71 MHz SAW Filter – new ceramic package

If it is necessary to change this Filter, please note: The old (CSSP) and the new (SAW) type are not compatible and cannot be changed against each other

N500 / N501 PHILIPS POWER AMPLIFIER
These are only used with PCB version GD_7xx and not compatible with the Hitachi Amplifiers (different prints). In case of replacement of any Power Amp type it is necessary to tune the sidebands (CH1 and 124 for GSM 900 and CH512 and 885 for GSM 1800) in addition to the Mid Channels (CH 60 and 700) – for tuning instructions also see **SERVICE BULLETIN 020.**

Different CCONT / N100 versions have been implemented
1st change is CCONT version 2H to version 2I – This new version can replace the old version, but not vice versa!
2nd change is CCONT version 2I to version 2M – New version can replace the old version, but not vice versa!
(Service Bulletin 030 & 40)

New COBBA / N200 version has been implemented

New version COBBA 4.1 can replace the old version COBBA 3.1,
but not vice versa! **(Service Bulletin 035)**

COBBA / N200 underfilling
To prevent that symptoms of dropping calls or loosing service occure - resulting from broken solderings under µBGA – underfilling of COBBA is the solution for those cases, it has been used since IMEI 449143/10/716000/x
NOTE:IT IS NOT POSSIBLE TO REWORK OR REPLACE AN UNDERFILLED COBBA µBGA COMPONENT !
(Service Bulletin 037)

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PHONE DOESN`T SWITCH ON-SECTION DC/DC CONVERTER

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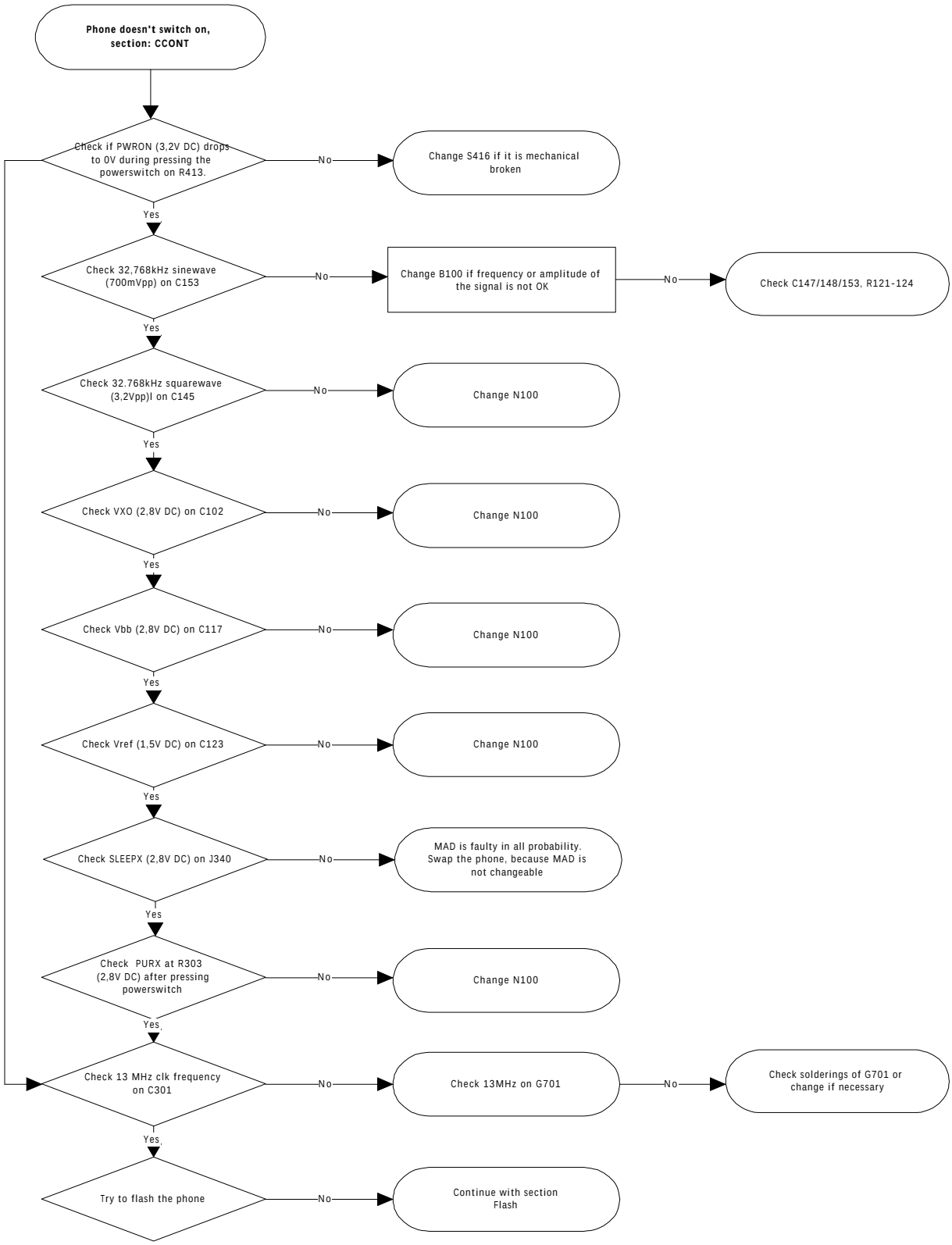
PHONE DOESN`T SWITCH ON-SECTION CCONT



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Battery connectors X101/ X102 / bend or dirty.

-Check if VBATT and Gnd are connected

Power on/off switch S416 faulty/ mechanical broken.

-Check if 3,2V at R413 decreases to 0V during pressing the powerswitch,

L102 poor soldered.

-Check soldering of L102, note different versions of L102 , also see HW- changes.
-Check the resistance in “off mode”=0Ω.
-Resolder L102 or change it.

N100 CCONT faulty:

-Check if 3,2V at R413 decreases to 0V during pressing the powerswitch.
-Check if there is a 32.768 kHz square wave at C145, (3,2Vpp).
-Check if VXO at C102 increases to 2.8 V DC.
-Check if VBB at C117 increases to 2,8V DC.
-Check if Vref at C123 increases to 1,5V DC.
-Check if PURX at R303 increases to 2,8 V DC.

B100 faulty 32,768 kHz

-Check voltage at B100, both sides 1,6VDC.
-Check 32.768 kHz sinewave at C153,(700mVpp).
-Check C147, C148, C153, R121-124.
-Check 32,768 sqarewave at C145, (3,2Vpp).

G701 faulty 13 MHz

-Check VCC 2,8V DC at C750 and Vcont at C715 (0,1-2.3V).
-Check 13 MHz output frequency; 1,2 Vpp on the output pin.
If frequency devitation is higher than +/- 50 Hz- change G701.

VB to R132 board faulty.

-Check battery voltage 2,6V at L102.
-Check the same voltage at R132.
-Check if the connection from R132 to L102 is 0Ω.
Don't forget to put the additional label on the PCB, it saves the layer (see HW-changes).

MAD (D300) faulty.

-Check if there is a 32,768 kHz square wave at C145 (3,2Vpp).
-Check the 13MHz main clock oscillator at C301 800mVpp.
-Check VBB 2,8 V DC at C117.
-Check SLEEPX 2,8 V DC on measurement point J 340.
-Check PURX 2,8 V DC at R303 (comes from CCONT).
MAD is probably faulty and not changeable.

V105 DC/DC converter fault.

-Check the voltage difference on the diode V101 anode: 2,6V DC, cathode: 3,2V DC.
-Check the 600 kHz switching frequency at pin 4, 5, 12, 13 from V105.
-Check the 1,2V operation voltage at pin 15 from V105.
-Check if pin 3 from V105 have low status ~0V, if not check V109 and the respective voltage dividers R131, R132, R134, R143, R144.
-Change V105.

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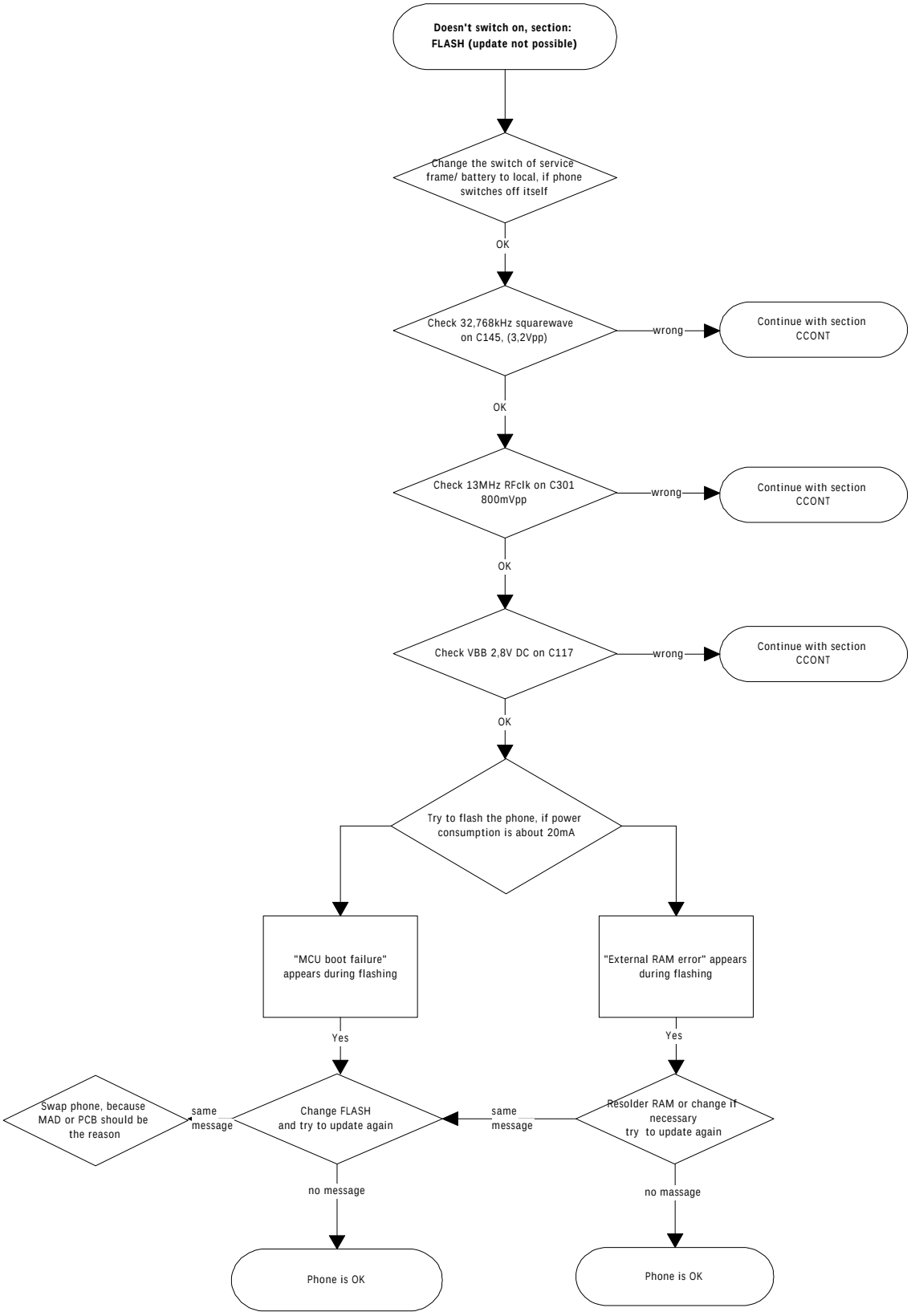
FLASH UPDATE NOT POSSIBLE/ PHONE DOESN`T SWITCH ON



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D301 Flash faulty

If the unit switches off itself, change the switch of the service frame to local mode.
-Check 32.768 kHz sleep clock signal at C145 (3.2Vpp).
-Check 13 MHz main clock oscillator at C301 800mVpp.
-Check VBB voltage at C117.
-If power consumption is approximately 20mA, try to flash the phone.
-If you get an error message during the flashing process, change D301 and try again.

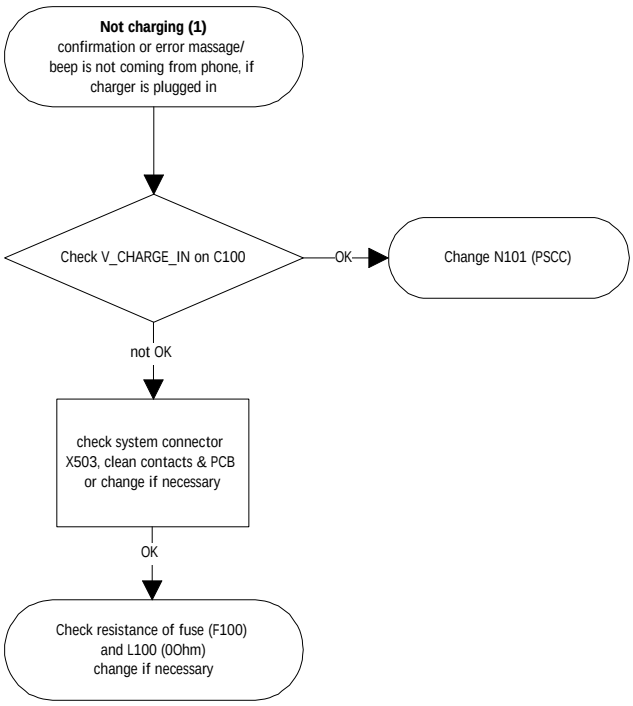
D302 RAM faulty/ poor soldering.

-Check if units current consumption is approx. 20mA.
-Check 32.768kHz sleep clock signal at C145 (3,2Vpp).
-Check 13MHz main clock oscillator at C301 (800mVpp).
-Check the VBB voltage at C117.
Resolder RAM .
Try to flash the phone.
Change RAM if you get an error message during the flash procedure "external RAM error"

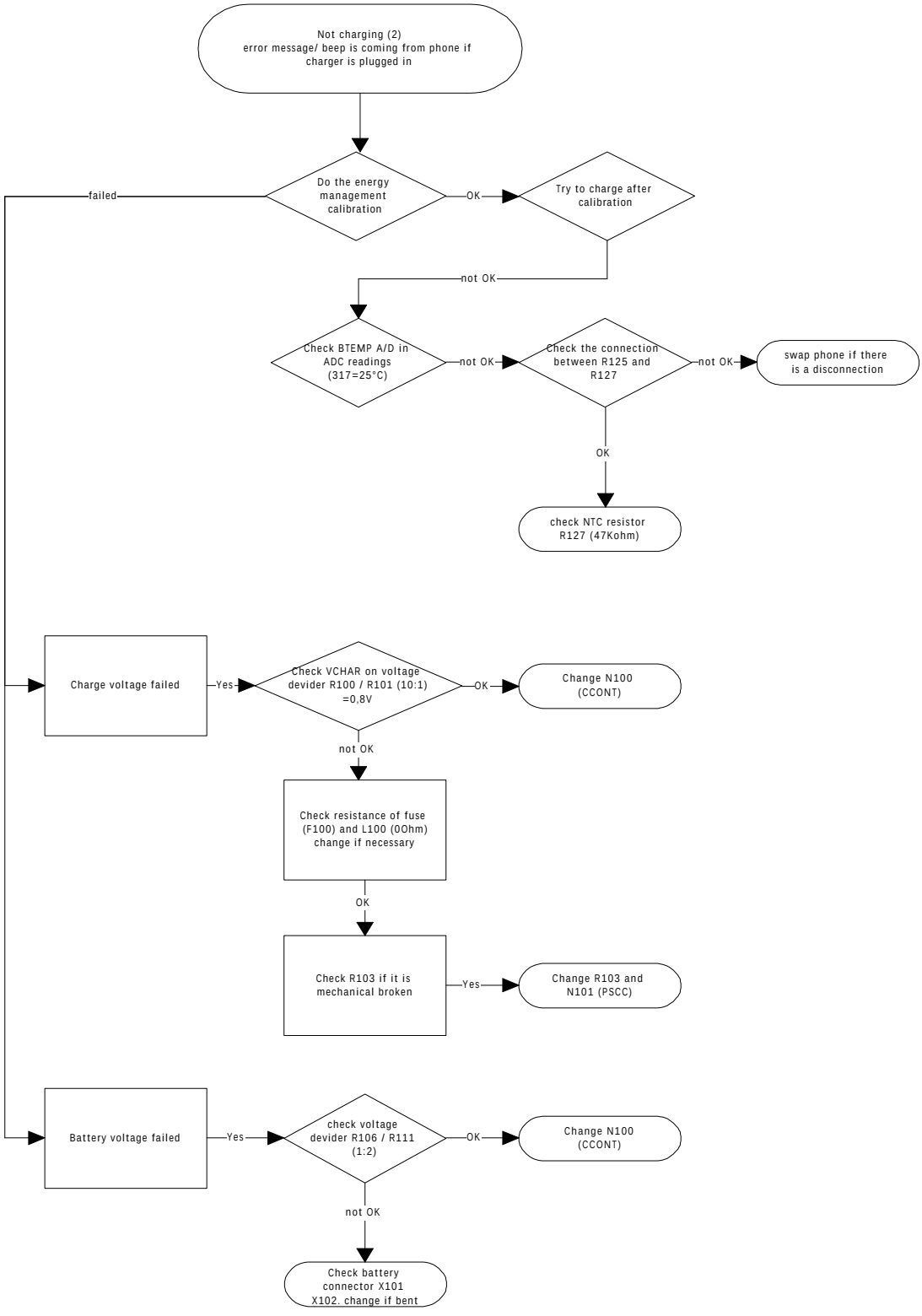
Intermittent doesn't switch on.

-Check if the unit switches on after reflashing the memory.
D301 Flash internal fail or poor soldering balls.
-Check D302, N100, L102 (broken soldered ?).

Not charging



NOT CHARGING (2)



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If you are using WinTesla NSE-8/9 DLL 2.41.03 or lower version the error message "current calibration fail" will appear in every charge tuning calibration test! See Service manual chapter "service software instructions" page 19 (Energy Management Calibration)

X503 System connector faulty

-Check the mechanical appearance of the connector.
-Clean the contacts on PCB or change connector if necessary.

F100 faulty

-Check resistance of F100 (0Ω).
-Check resistance of V_charge line to ground (OK~10KΩ).

N100 CCONT faulty/ poor soldering

-Check if any A/D values are out of limit but the corresponding DC voltages are OK (WinTesla/ local mode/ Testing/ ADC Readings...).
-If DC voltages are wrong, check corresponding voltage dividers (R100, R101).
-Check PWMOUT on R117 or R142 (1 Hz standard / 32 Hz fast).

R103 broken and N101 PSCC electrical fail.

-Check if the unit doesn't charge with the ACP-9 fast charger.
-Check the mechanical appearance of the varistor R103.
-If broken, change it, in this case also change N101 PSCC.
-Replace C-Cover or cut away the arrow in the time-dial e.g. using scalpel, see HW changes.

R125 and R127 connection faulty.

-Check if any A/D value is out of limit, especially BTEMP (317≅25°) .
-Check the connection between R125 and R127.
-Check the NTC resistor R127/47KΩ.
-If R127 is broken or poor soldered, battery indicator will appear flashing on LCD after connecting charger to phone.

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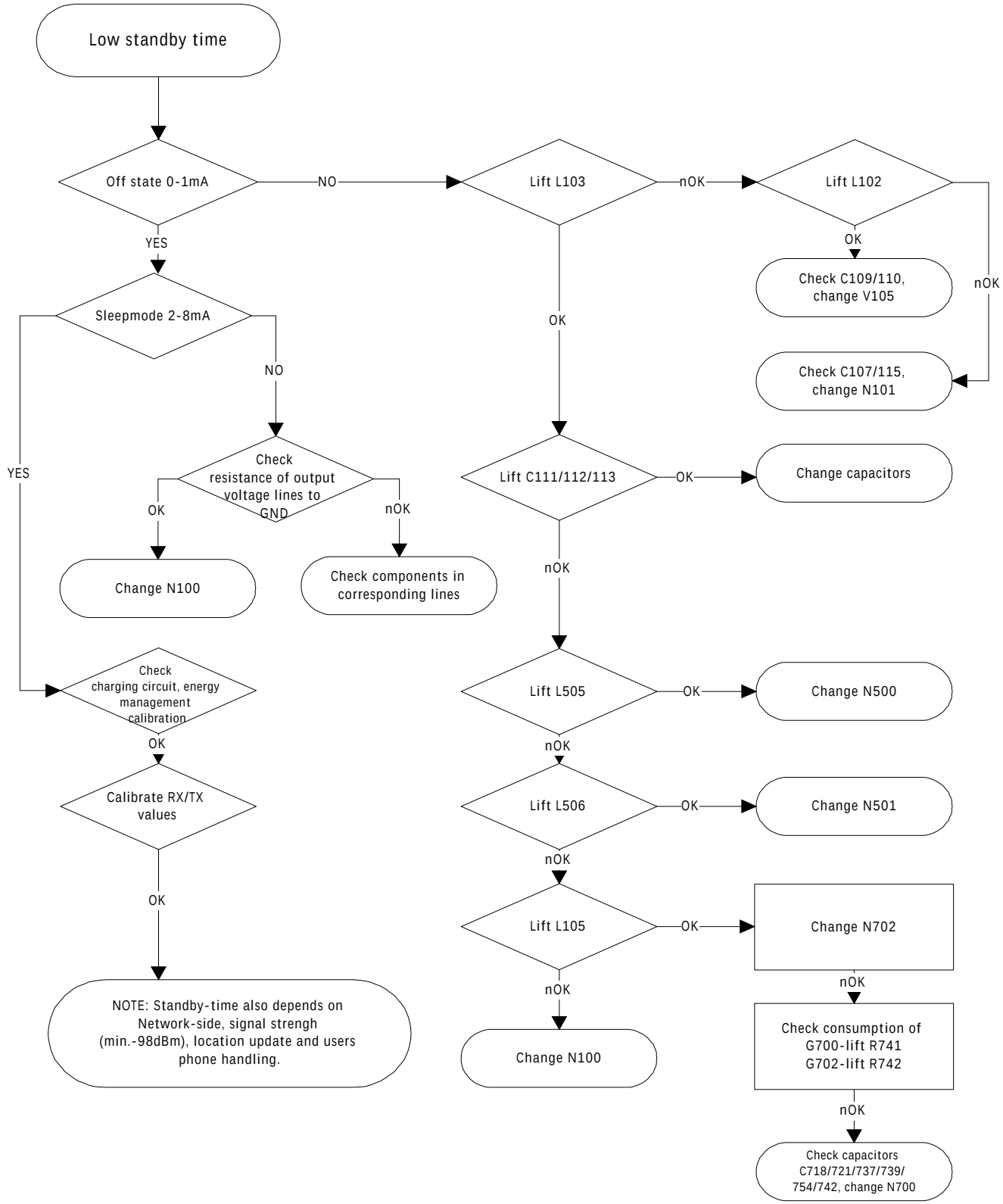
LOW STANDBY TIME



C111, C112 C113, C115 faulty

-Check the current consumption in different operation modes (refer to the table below).
-Check if the high current consumption results from the VB, Vout or output voltages of CCONT.
Disconnect coil by coil L105 (→N702) L505, L506 (→PA's) and check consumption again.
-Check and desolder C111,C112, C113 and C115.
-Calibrate Battery values if charging stops too early or battery is too hot after charging
(also see chapter "Not charging).

Figure 1: current consumption values

Function mode	Minimum current in mA	Maximum current in mA
Off state	0	1
Sleep mode	2	8
Call mode GSM 900	< 100*	< 370**
Call mode GSM 1800	< 100*	< 350**

* CH60, PL 19 CH700, PL 15
** Ch60, PL 5 CH700 PL 0
Measured with TDS-7

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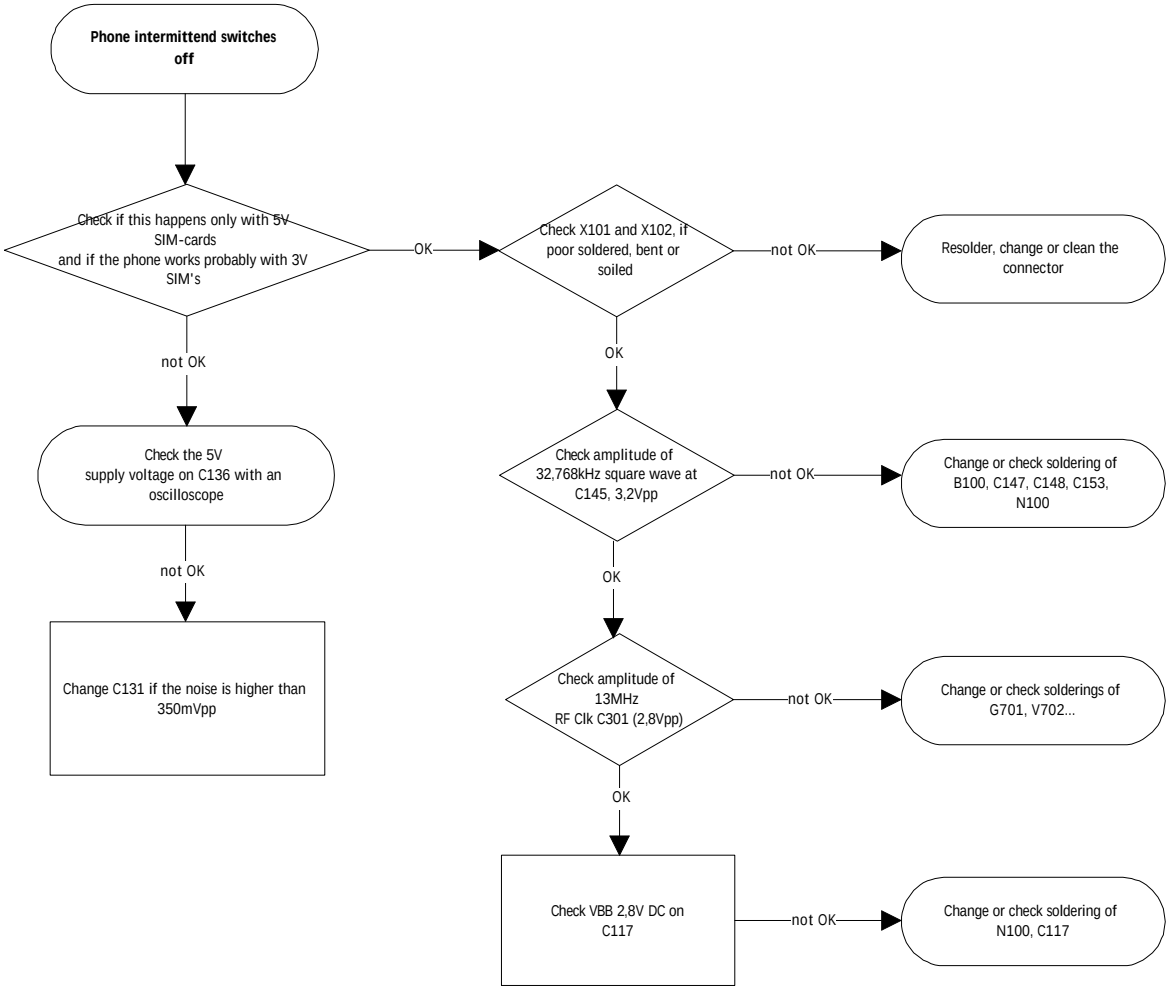
PHONE SWITCHES OFF ITSELF



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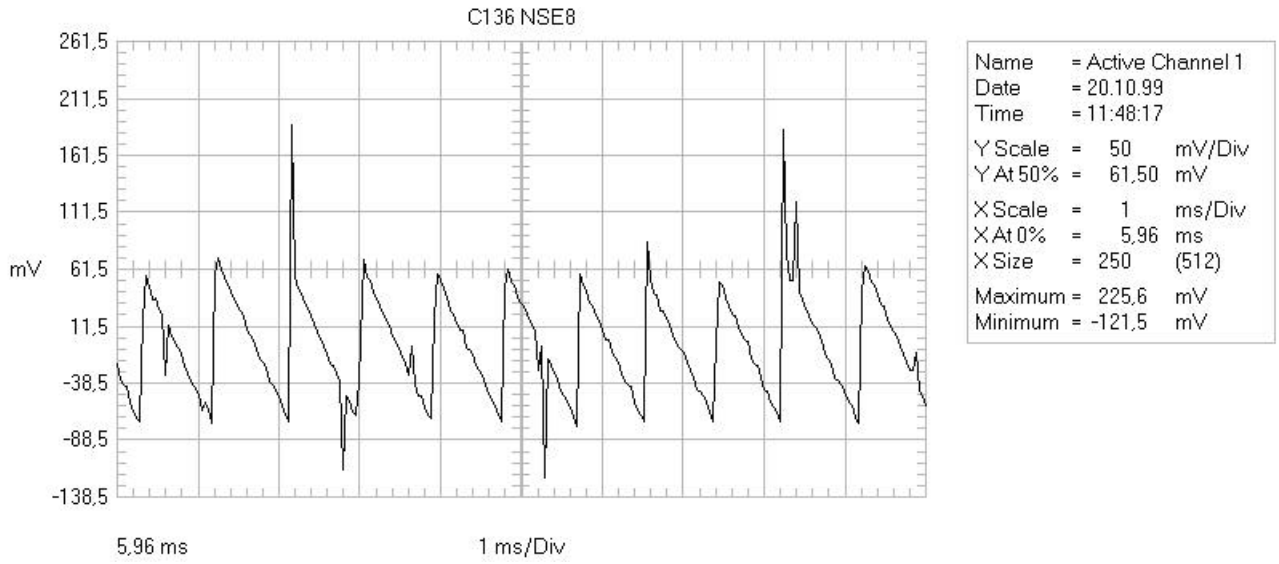
C136 10µF/10V

-Check, if the phone doesn't switch off with 3V SIM-Cards.
-Check that the 5V VSIM voltage at C136 is approximately 4,8V-5,2V with maximal 350mVpp noise overlap (view diagram below).

Diagram of normal noise at C136



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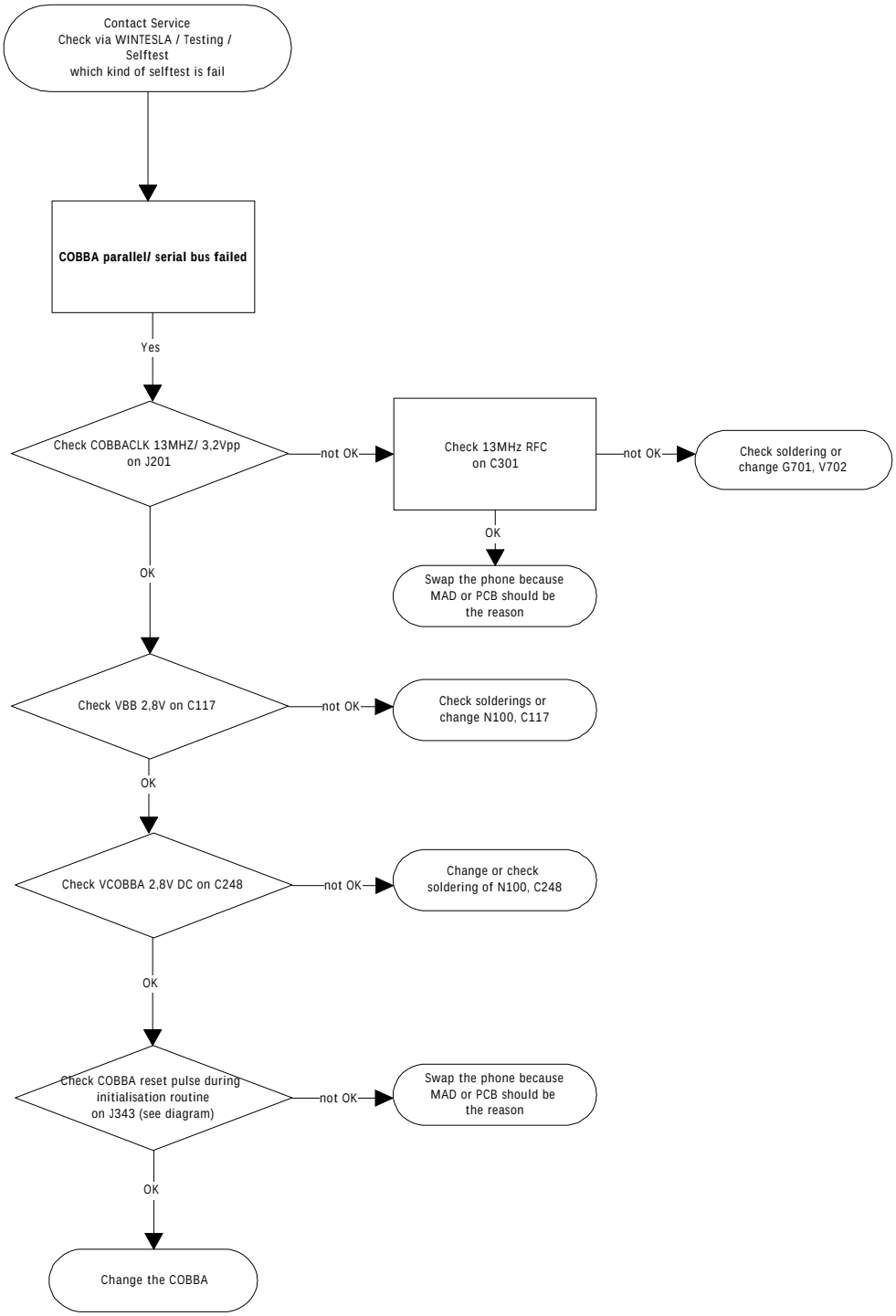
CONTACT SERVICE- COBBA PARALLEL / SERIAL BUS FAIL



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N200 COBBA faulty /solder balls broken

-Check VBB 2,8V DC at C117 near to CCONT.
-Check VCOBBA 2,8V DC C248 near to COBBA.
-Check COBBACKL 13MHz 3,2Vpp at J 201 (see diagram below).
-Check COBBA reset impulse during initialisation routine at J343 (see diagram below) .
-Change COBBA and write the IMEI and SIM-LOCK DATA back to the phone.
If error persists, MAD or PCB should be the reason.
SWAP the unit because MAD is not changeable.

Note! Rewrite SIMLOCK and IMEI entries with use of the Nokia security Password and make a SW-update or send these phones to SACE, if this procedure is not permitted to you

Figure 3: 13MHz Clock signal for the COBBA. Good practice to use DC coupled measures for digital measurements.

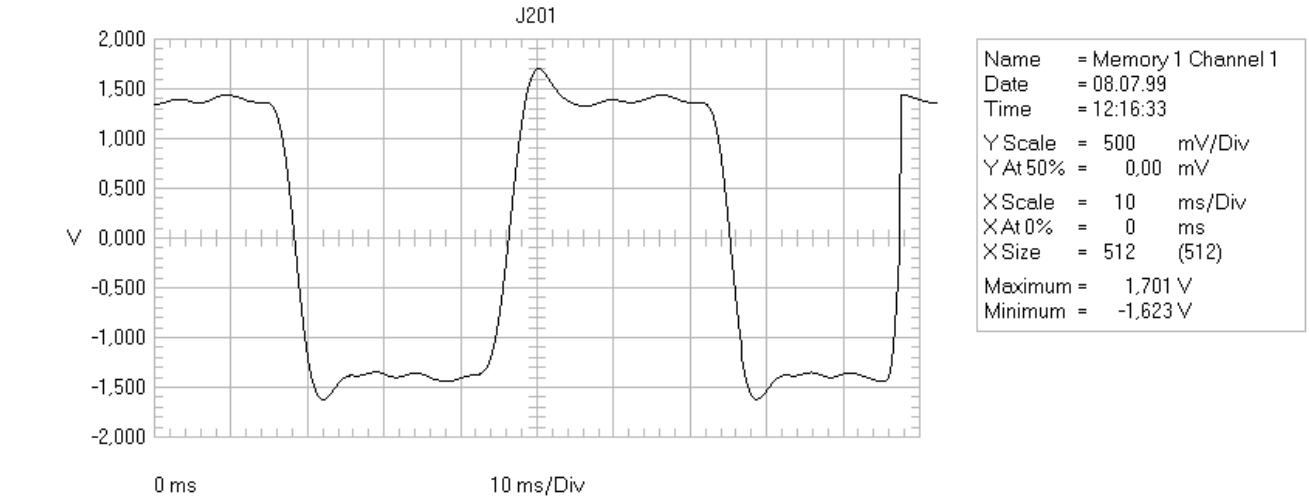
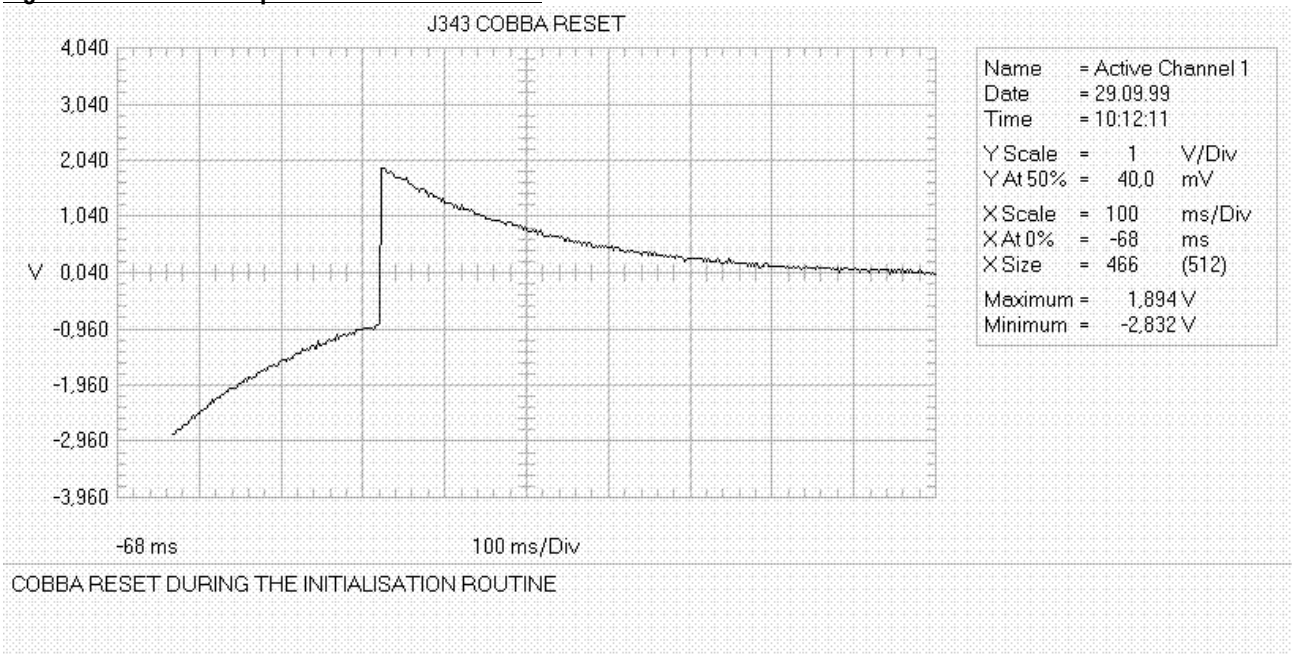
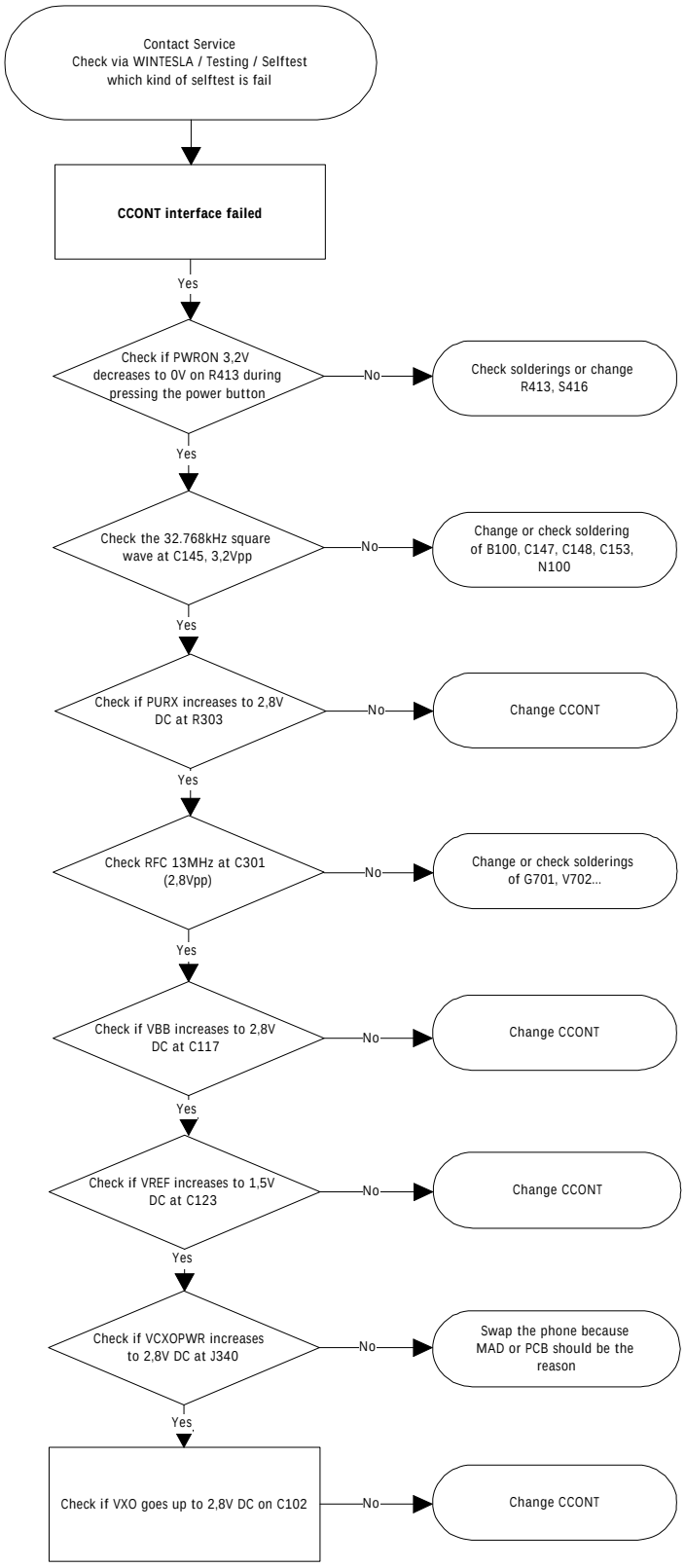


Figure 4 Measurement point J343 COBBA RESET



COBBA RESET DURING THE INITIALISATION ROUTINE

CONTACT SERVICE-CCONT INTERFACE FAIL



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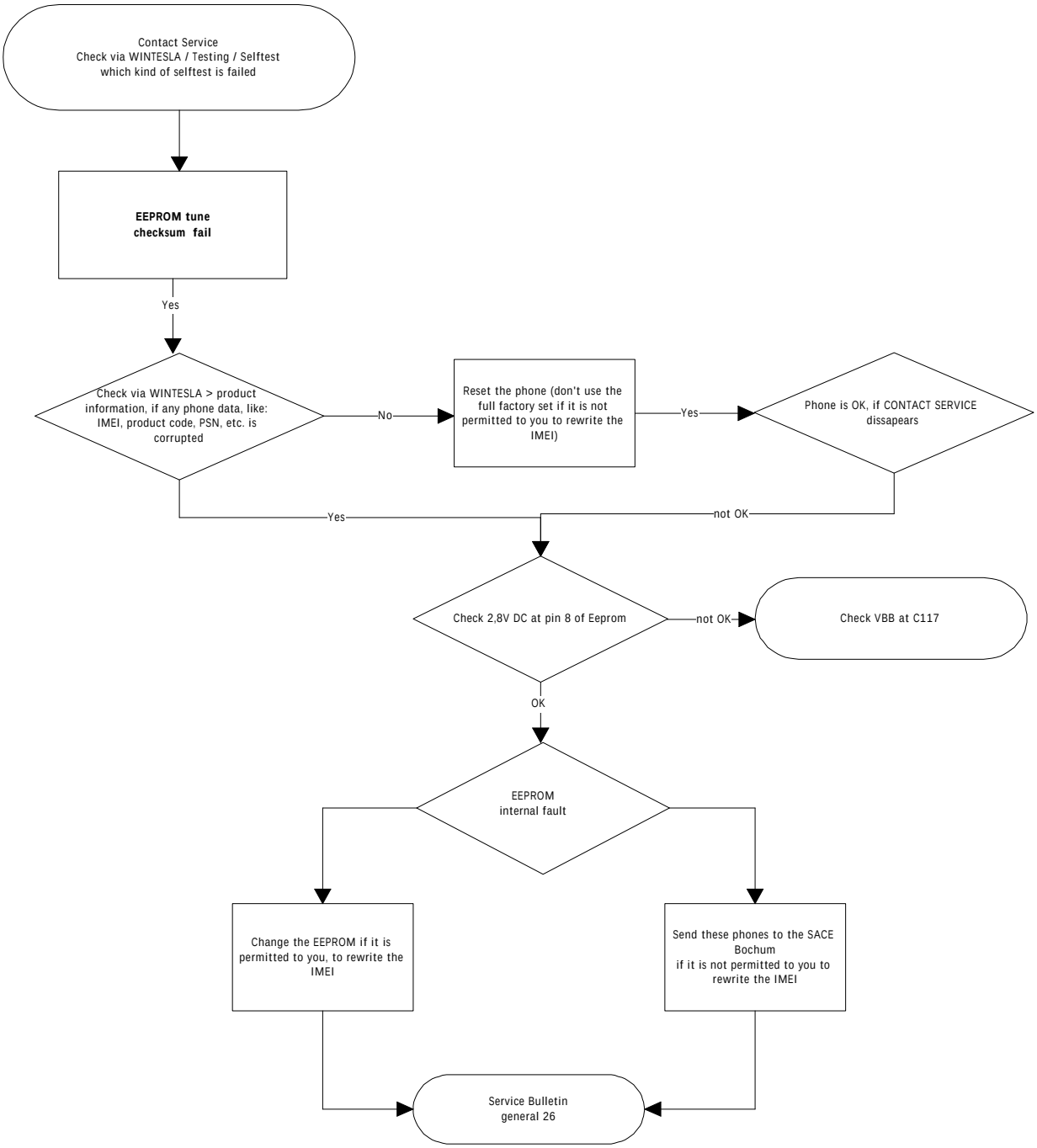
N100 CCONT faulty

-Check if 3,2V at R413 decreases to 0V during pressing the power on button.
-Check if there is a 32.768 kHz square wave at C145 (3,2Vpp).
-Check if PURX at R303 increases to 2.8 V DC.
-Check if VXO at C102 increases to 2.8 V DC.
-Check if VBB at C117 increases to 2,8V DC.
-Check if Vref at C123 increases to 1,5V DC.

CONTACT SERVICE - EEPROM CHECKSUM FAIL



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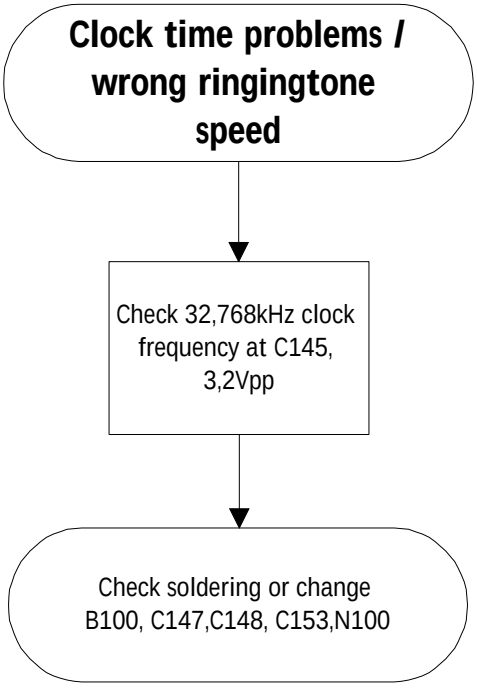
D303 Eeprom faulty

-Check with WinTesla if IMEI or product data are corrupted.
-Check 2.8V DC at pin 8 of Eeprom.
Don't use the "Full factory set" with WinTesla, otherwise the original IMEI will be changed to "65656565..."
Change the Eeprom if it is permitted to you and write back all ID data (IMEI, product code...).
If you are not autorized to change Eeprom and the IMEI is missing, write a note with a short comment, and send it together with the phone to the SACE.

Note! Rewrite SIMLOCK and IMEI entries with use of the Nokia security Password and make a SW-update or send these phones to SACE.

Clock time or user settings problems



Clock time / Ringing tone is too fast or too slow

32.786 kHz sleep oscillator B100

-Check that the sleepclk 32.768kHz square wave frequency at pin C145 isn't higher or lower
-Check the crystal B100, C147, C148, C153, N100.
-Also view the Service Bulletin 017 (capacitors C148, C153 change the value).

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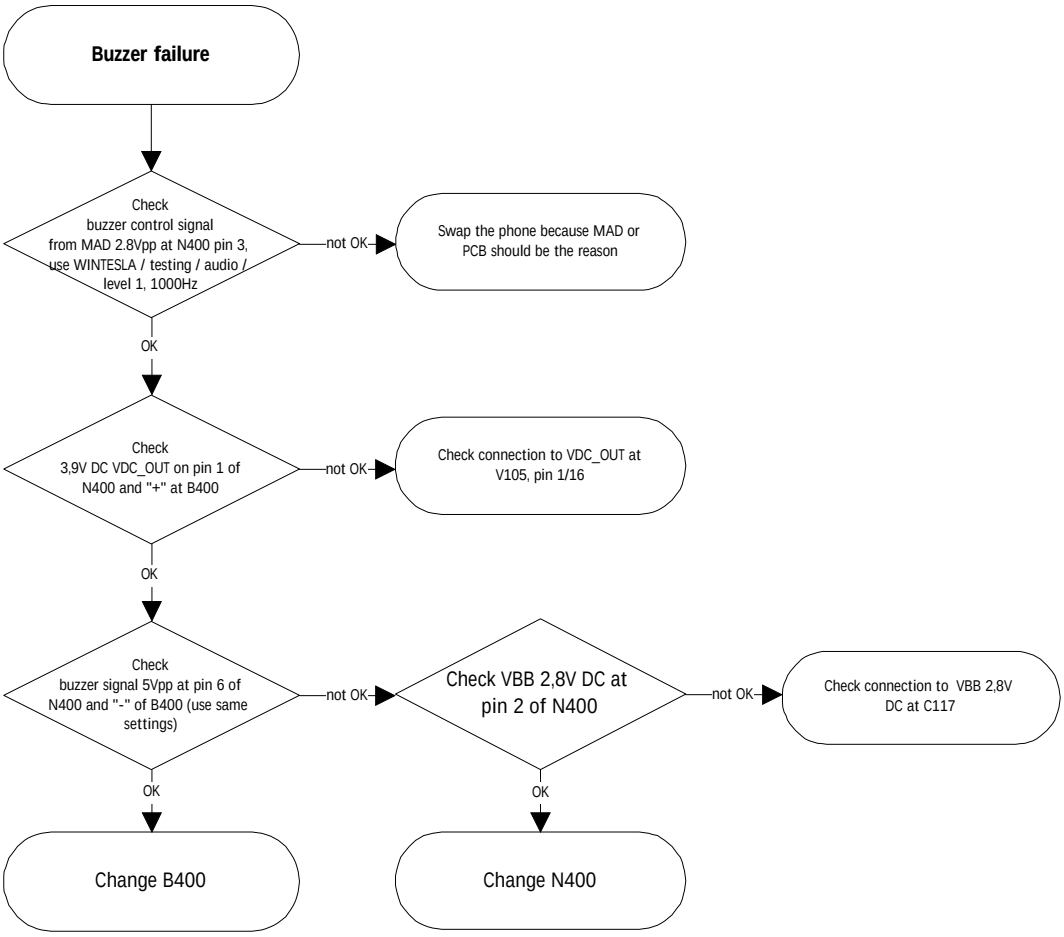
BUZZER FAILURE



B400 / board connections broken

-Check the buzzer control signal from the MAD at pin 3 of N400 2,8Vpp 1kHz
(use WinTesla / testing / audio Level 1, 1000Hz)
-Check VDC_OUT 3,9V DC pin 1 N400 and "+" of buzzer.
-Check VBB 2,8V DC at pin 2 N400.
-Check the buzzer Signal on "-" of buzzer ~5Vpp, 1kHz.
-Check the board connection pin 6 of N400 to "-" of buzzer.
-Change the buzzer.

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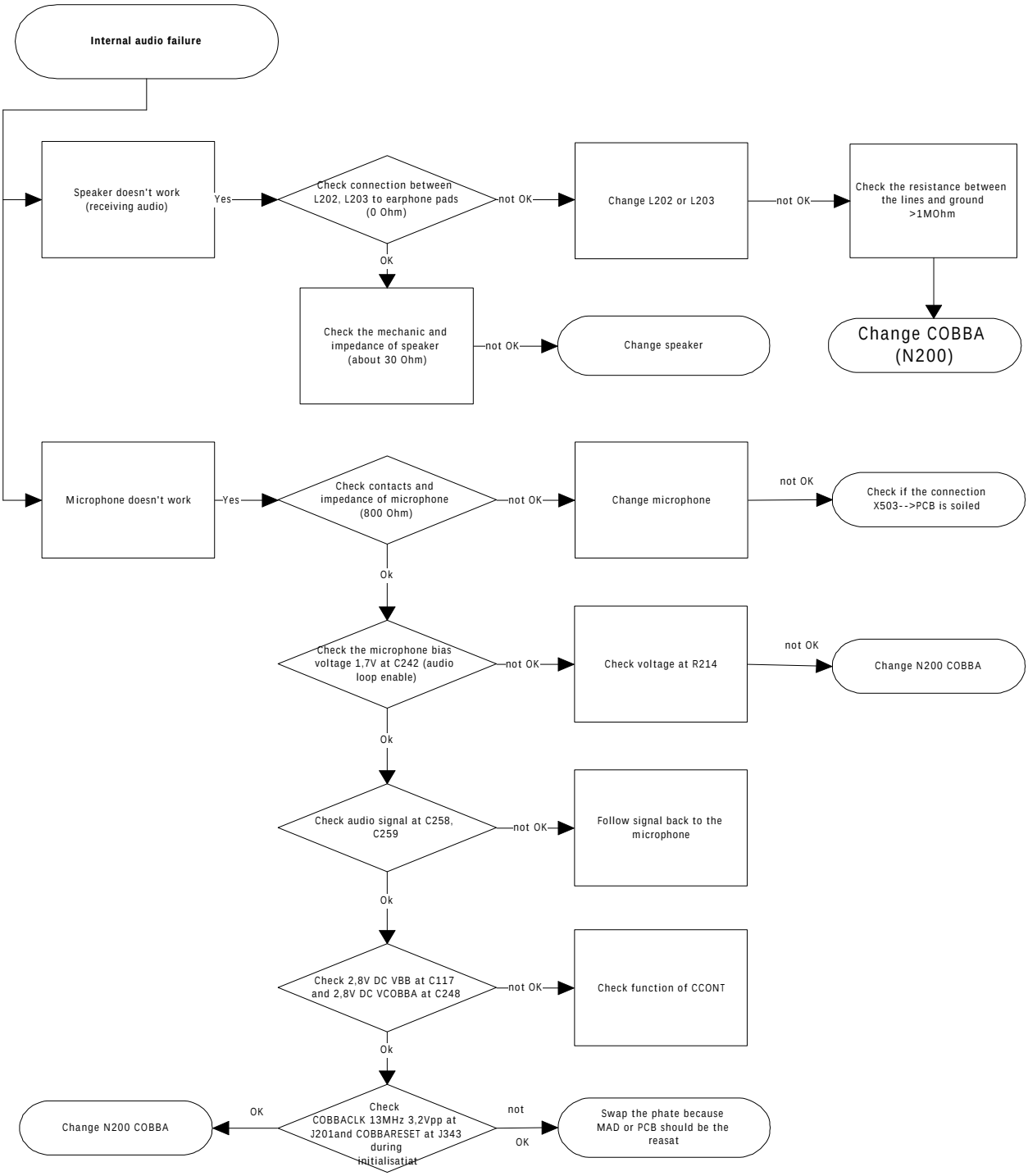
INTERNAL AUDIO FAILURE



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L202, L203 faulty

-Check resistance from L202, L203 to the earphone pads normal 0Ω.
-Check resistance from L202, L203 to ground and between both lines (normal high resistance >1MΩ).

Speaker

No / quiet / distorted receiving audio signal.
-Check the mechanics of speaker, contacts, membrane, soiling.
-Check resistance of speaker (about 30Ω).

Microphone

No / quiet / distorted transmitting audio signal.
-Check contacts of microphone.
-Check resistance of microphone (about 800Ω).
-Check microphone voltage 1.7V DC at C242 (WinTesla/ Testing/ Audio/ internal/ Loop on).
-Check audio signal at C258 and C259.

X503

-Check microphone spring contacts.
-Check spring contacts to the board (change connector if bend).
-Clean the contact pads on PCB.

N200 COBBA faulty

-Check VBB 2,8V DC at C117 near to CCONT.
-Check VCOBBA 2,8V DC C248 near to COBBA.
-Check COBBACKL 13MHz 3,2Vpp at J 201.
-Check COBBA reset impulse during initialisation routine at J343 (see the diagram "COBBA RESET").
-Change COBBA and write the IMEI and SIM-LOCK DATA back to the phone.
-If the error persist MAD or Board (PCB) should be the reason.SWAP the unit because MAD is not changeable.

Note! Rewrite SIMLOCK and IMEI entries with use of the Nokia security Password and make a SW-update or send these phones to SACE.

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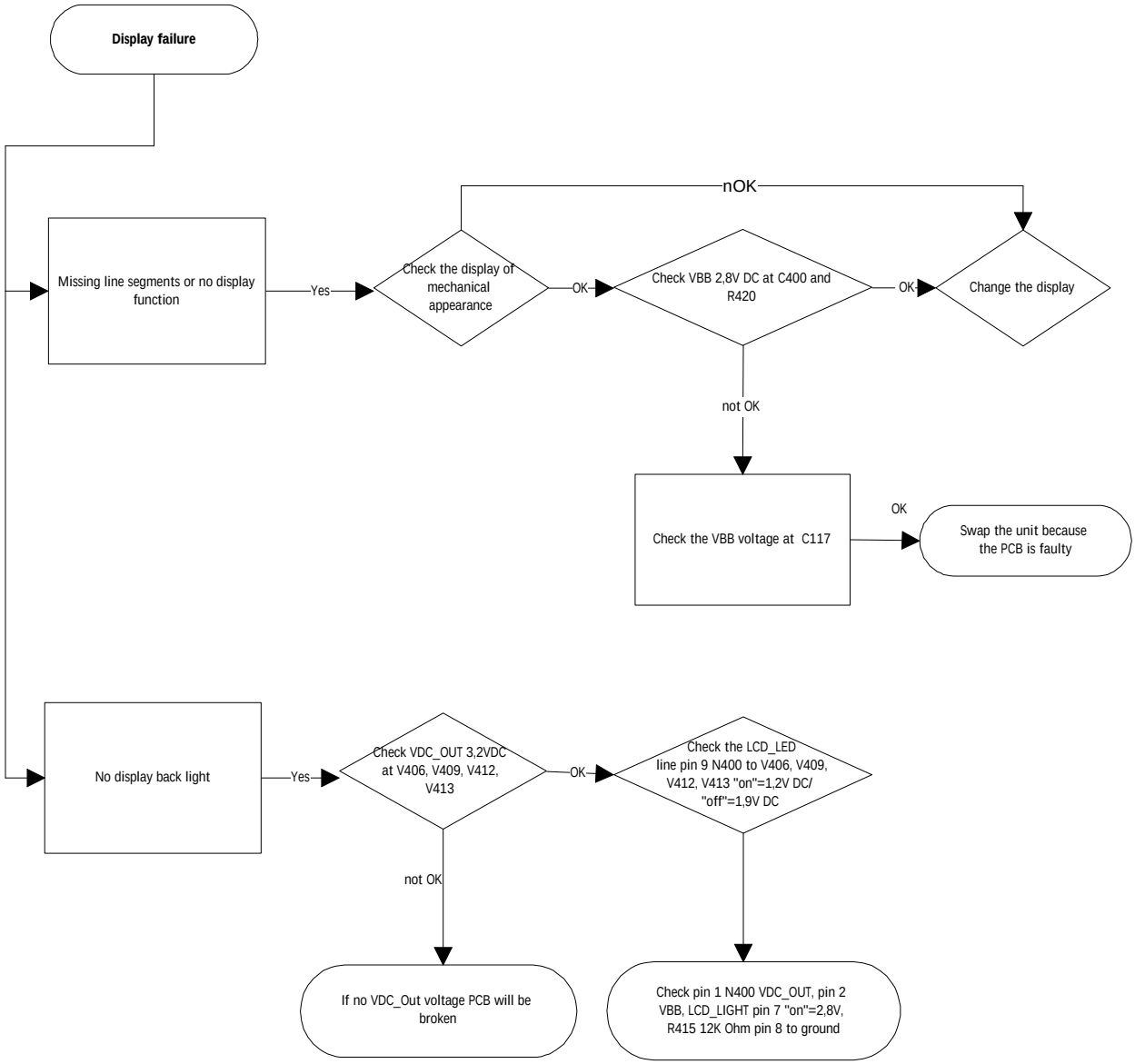
DISPLAY FAILURE



Black lines on the display or no display function

-Check VBB 2.8V DC at C400 and R420
-Change display

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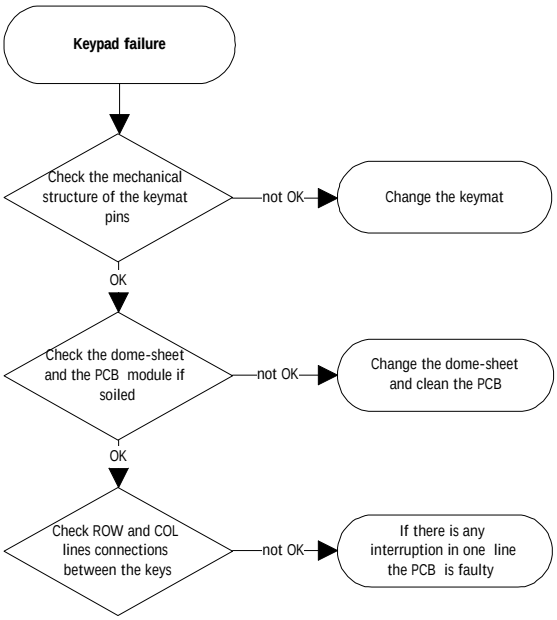
Figure 5: Faulty display

No display back light

-Check VDC_OUT 3,2V DC at V406, V409, V412, V413
-Check the LCD line pin 9 of N400 and cathode of V406, V409, V412, V413 Light "on"=1,2V DC ; "off"=1,9V DC. (Use WinTesla/ Testing/ userinterface/ 1.Test Pattern "on")
-Check the LCD_light enable line at pin 7 / N400, LCD_LIGHT "on"=2,8V DC
-Check the resistor R415 12KΩ pin 8 / N400 to ground

KEYPAD FAILURE



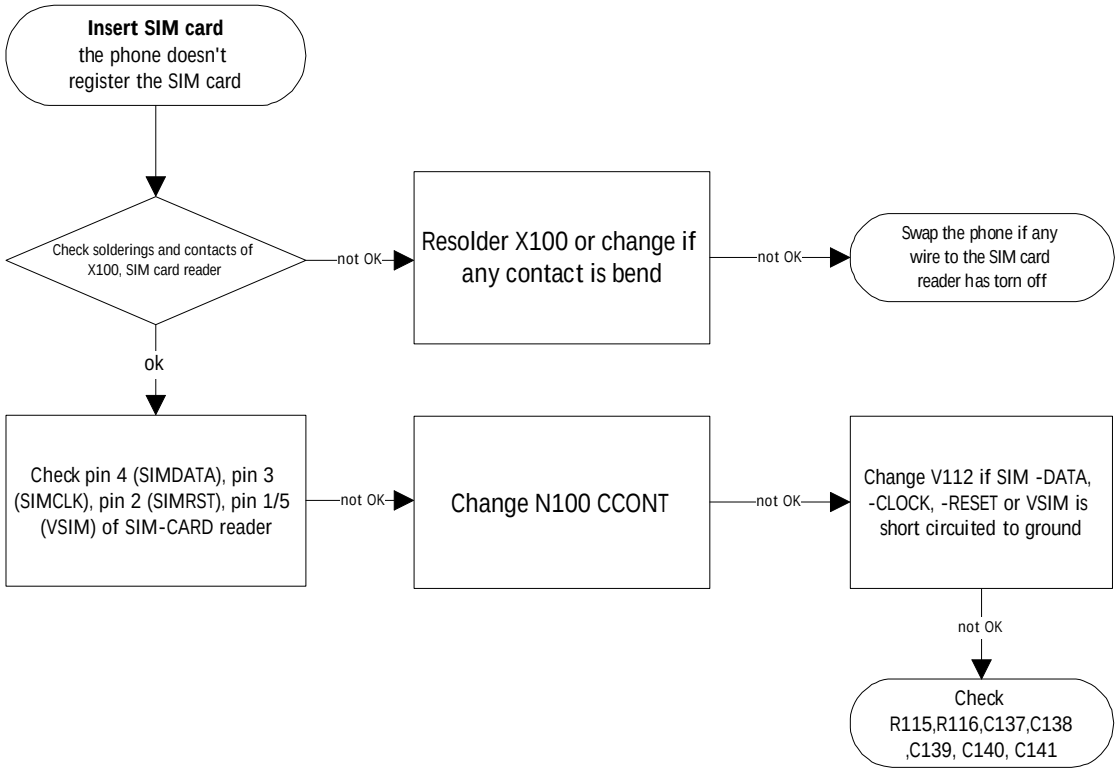
Keymat mechanical faulty

-Check the bottom of the keymat if no pins are broken or mechanically damaged

Board / Dome-sheet soiled

-If there are only one or two keys without function, check and clean the board and dome-sheet if soiled.
NOTE: Different versions of domesheets, also see HW-changes.
-If all of the keys are on the same ROW or COL line, check the connections between.
the keys and ground.
-If any line is interrupted between the keys, swap the unit because PCB is faulty.

SIMCARD FAILURE



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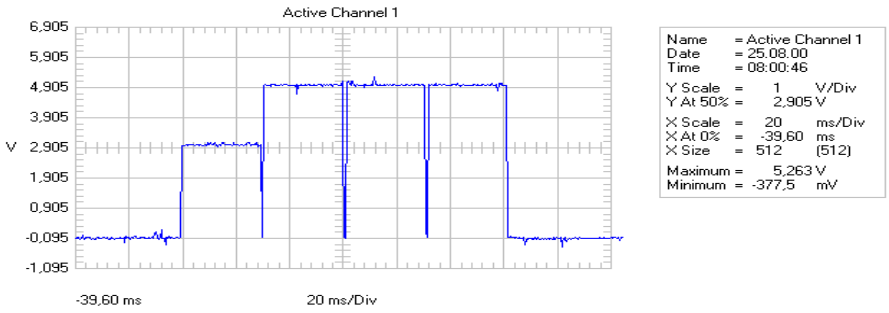
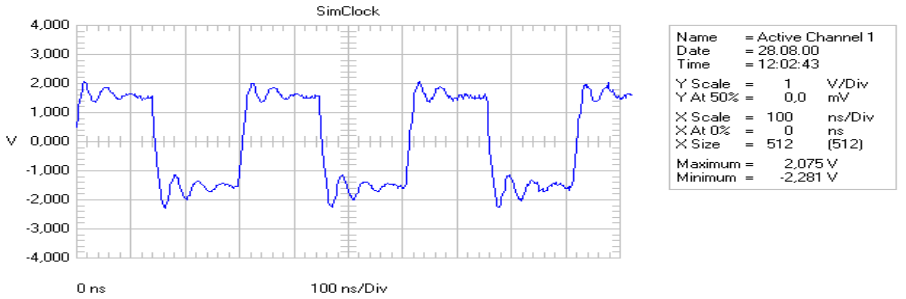
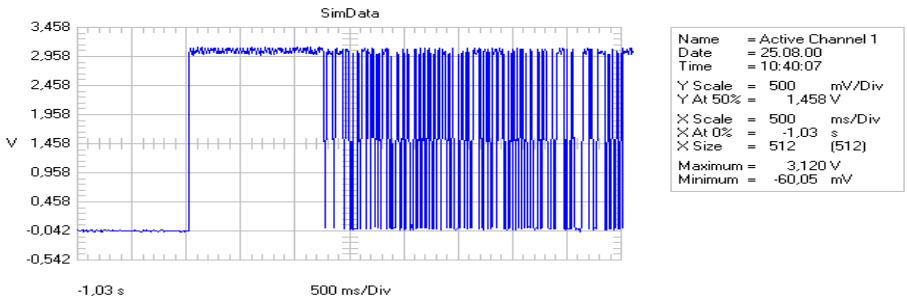
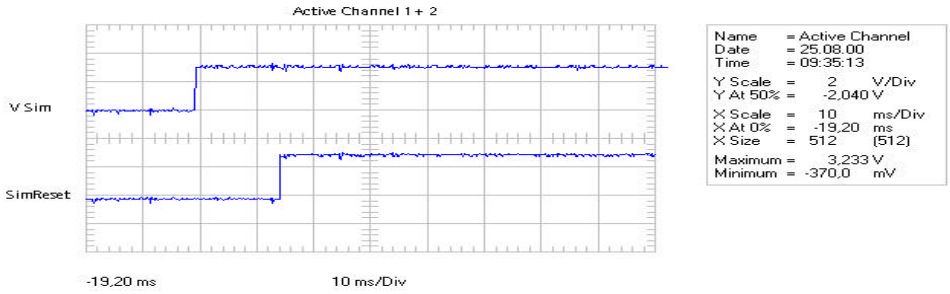


VSIM after switching on the phone without SIMcard. Ccont pulses up VSIM for four times, the first time the amplitude is 3 Volt, the next three times it is 5 Volt.
If the phone is switched on with SIMcard VSIM stays on the level with which the SIMcard will work, expected that SIMcard is not dirty or damaged.





Note that SIMclock and SIMdata are only present when SIMcard is active, for example when phone registers to network.



SIMReset is low-active, that means that the SIMcard will be reseted when SIMReset is 0 Volt. This is the case after switching on the phone (diagram above). While VSIM is already high, SIMReset keeps low for a few milliseconds – in this time the card will be reseted.

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X100, SIM card reader

Check soldering
Check contacts (change connector if bend)

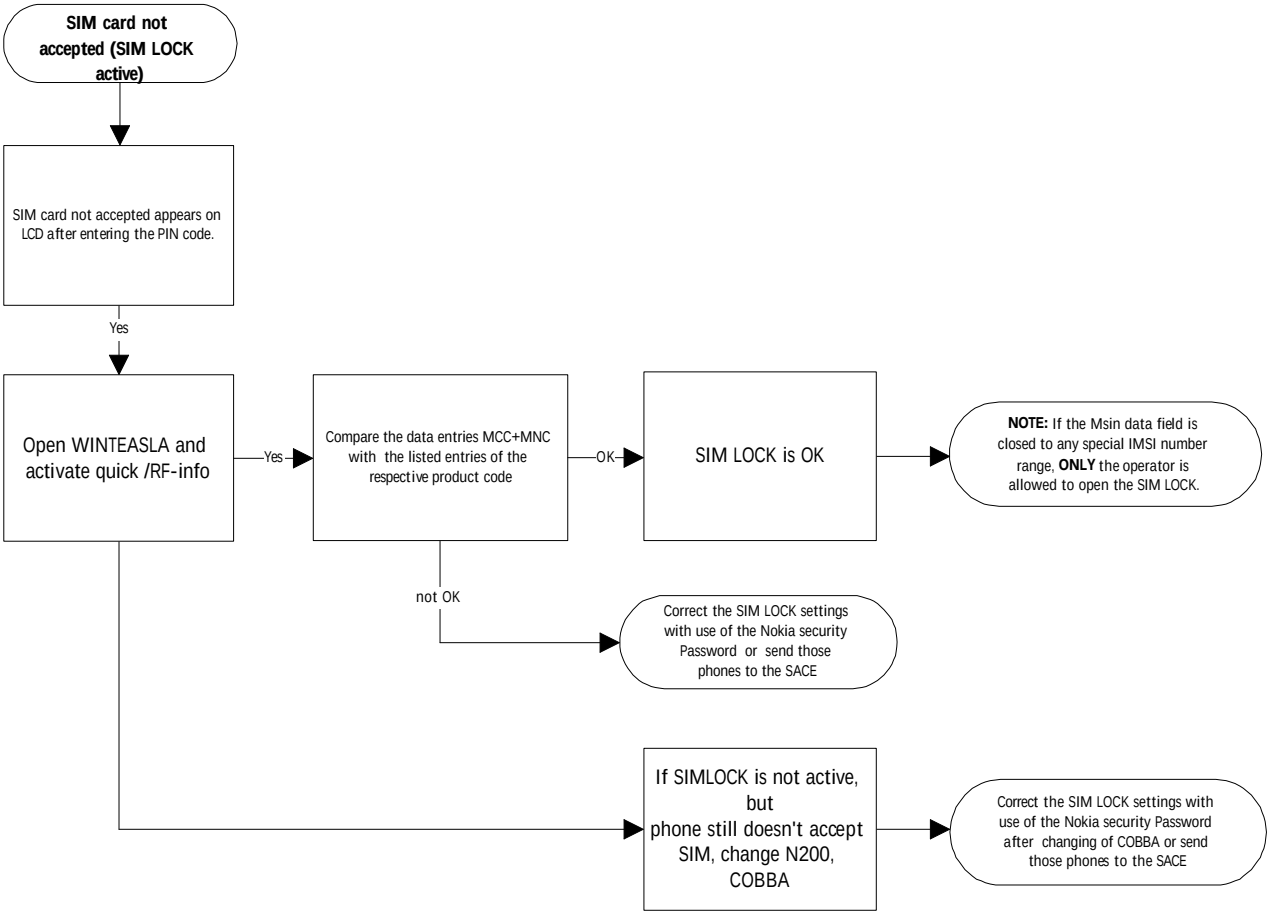
N100, CCONT

Check SIMcard –DATA (Pin 4 SIMreader), -Clock 3,25MHz (Pin 3 SIMreader), -Reset (Pin 2 SIMreader) and VSIM 3V/5V DC (Pin 1/5 SIMreader) depends to the SIM card

V112

Change component if SIM-DATA, -Clock, -Reset or VSIM is short circuited to ground
Check R115, R116, C137, C138, C139, C140, C141 for short circuit or no capacity

SIM card not accepted, SIM LOCK failure



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If message "SIM Card not accepted" appears on LCD after entering PIN code,
a SIM LOCK is probably activated in this phone or COBBA has been changed and not reprogrammed with the SIM LOCK DATA.
Initialise phone into normal mode and activate Quick/ RF-info (WinTesla) ,compare the SIM LOCK entries with the references from the operator. *Look at Figure: List of current SIM-LOC...*

N100, CCONT.

Refer to insert SIM Card procedure

N200, COBBA

Change COBBA if all SIM LOCK entries and SIM-CARD signals from CCONT are OK

Note: Rewrite SIMLOCK and IMEI entries with use of the Nokia Security Password and make a SW-update or send these phones to SACE.

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RF - PART

Low receiver signal strength indicator

Antenna faulty / wrong - Tuning

Check the fixed position of the antenna, *don't touch the conducting area with bare fingers.*
Check the antenna spring connector X501, change it if damaged. (The GND pin will always look a little bend down).
Check the receiver signal indicator with a new antenna.
Retune the unit .

No Service / It takes long time to get to service-mode.

Check that sleepclk frequency at B100 is 32.768 kHz; if lower, change B100, also see chapter "Clock time or user settings problems".

No Service

Set first the RF-Generator to a high RF-Level output e.g. –40dBm
Set the module with WinTesla into following mode: Initialise/ Local mode/ Testing/ RF Controls.../ Active unit "RX"/ operation Mode "continuous"

13MHz VCTCXO G701 out of range

Check the 13MHz reference frequency pin 15 N700 (SUMMA), pin 2 of G701, or pin 4of D700, a frequency error higher +-50Hz can create deviation of the Intermediate frequencies. View SB 18

N600 CRFU / faulty / poor soldering
Check the incoming RF- Channel frequency at pin 27 N600
Check the LNA_AGC voltage 2,8V DC pin 28 N600
Check the VRX_1 voltage 2,8V pin 15,16,23, 33, 38,45,46 N600
Check the LNA_OUT frequency pin 23 N600 and input at pin 18, 19.
An attenuation from aprox. 10-15dBm between signal input and output is normal!
Check the UHF LO frequency (2036MHz GSM900 CH60) pin 3 N600 approx. –20dBm.
No frequency deviations are allowed!
Check the output 71MHz Intermediate Frequency at pin 15/16 N600
Check the soldering of N600 or change it.

Z700 / faulty / poor soldering.
Check the 71MHz IF frequency at Z700. The normal attenuation between input and output is ~15dBm
Check the components C701, C704,C149, L701, R701 if the signal amplitude is different between the two lines
Check the soldering of Z700 or change it

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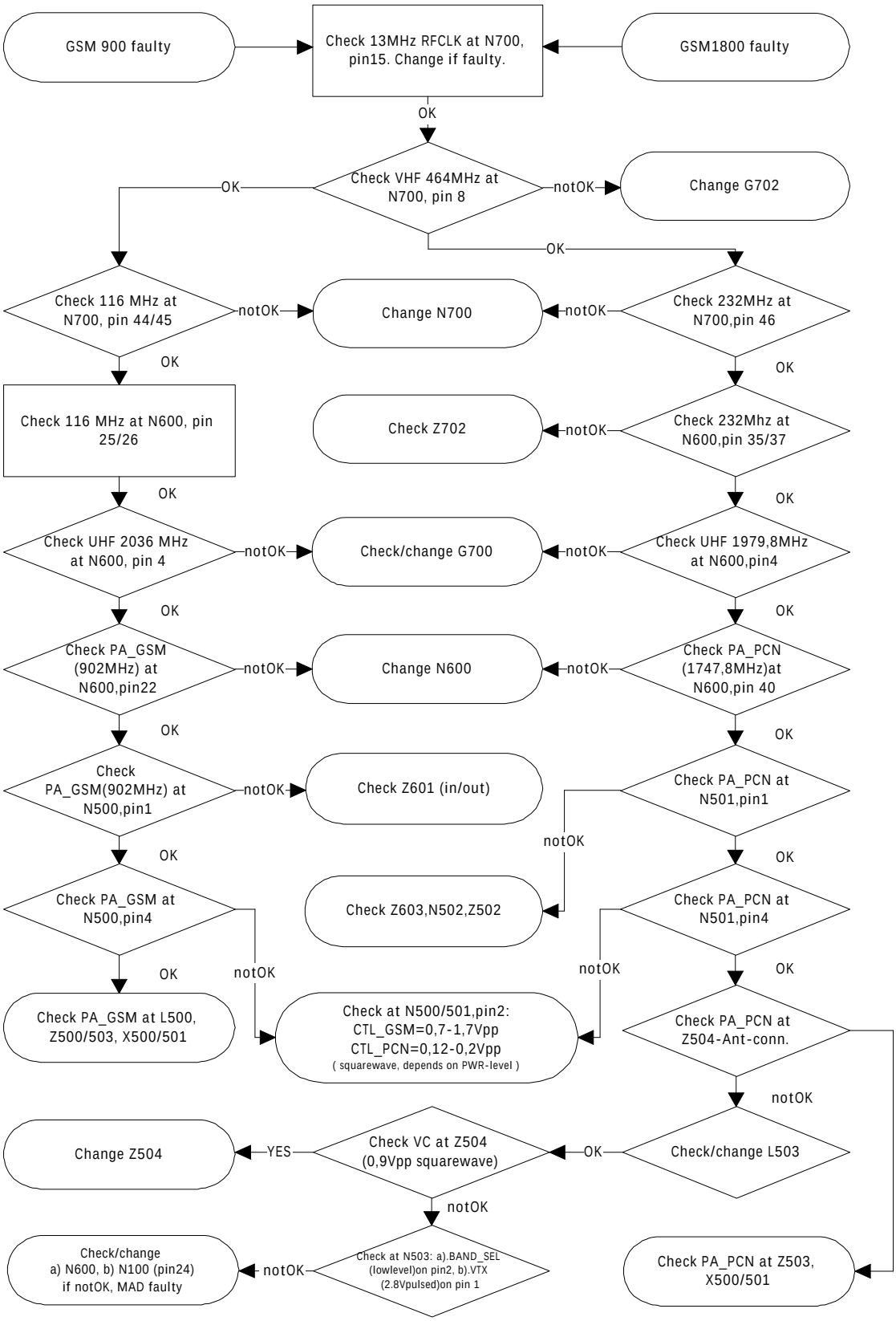
TX FAILURE



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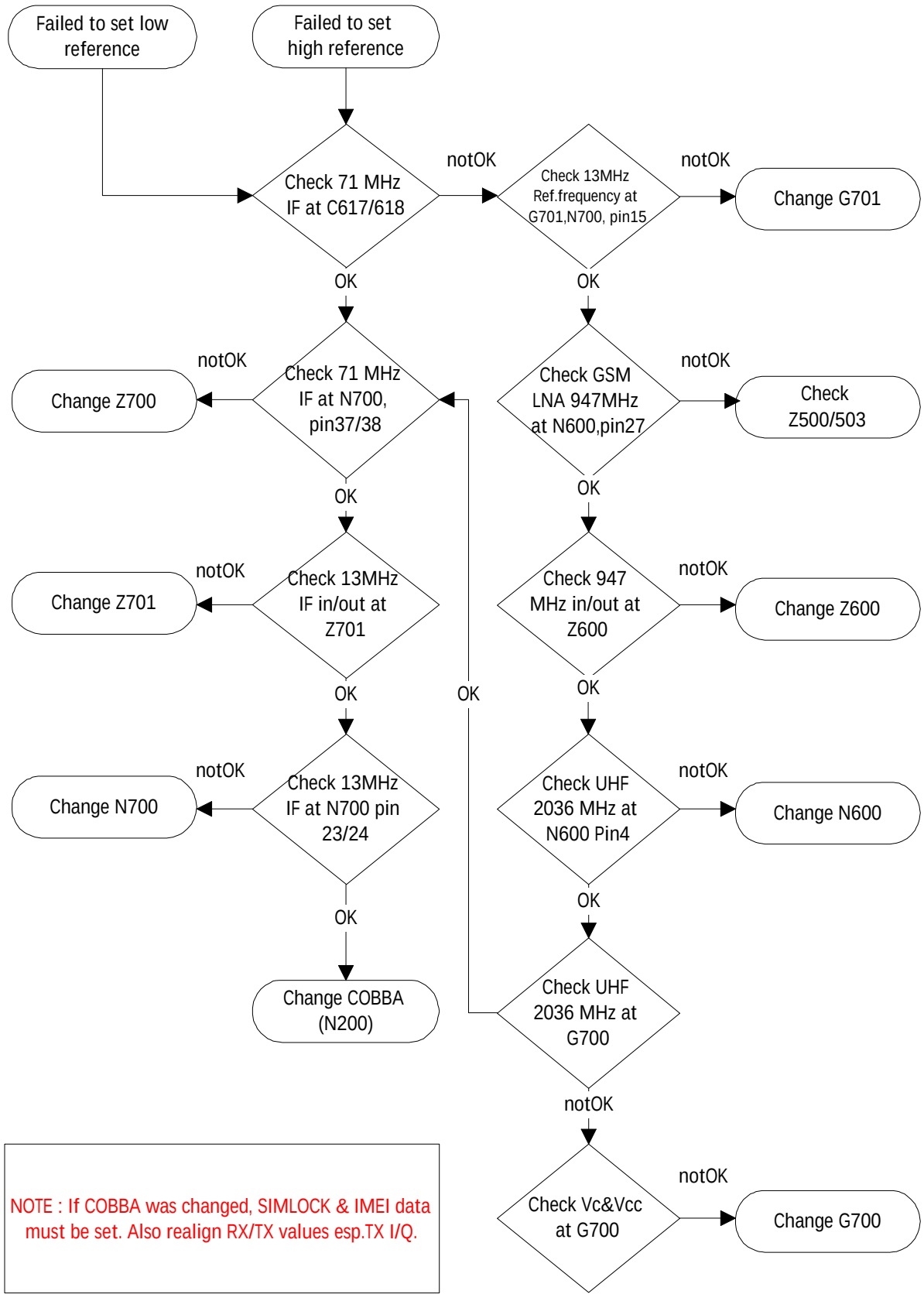
NO SERVICE GSM 900 - First check spectrum if it is only a RX failure , see spectrum charts.



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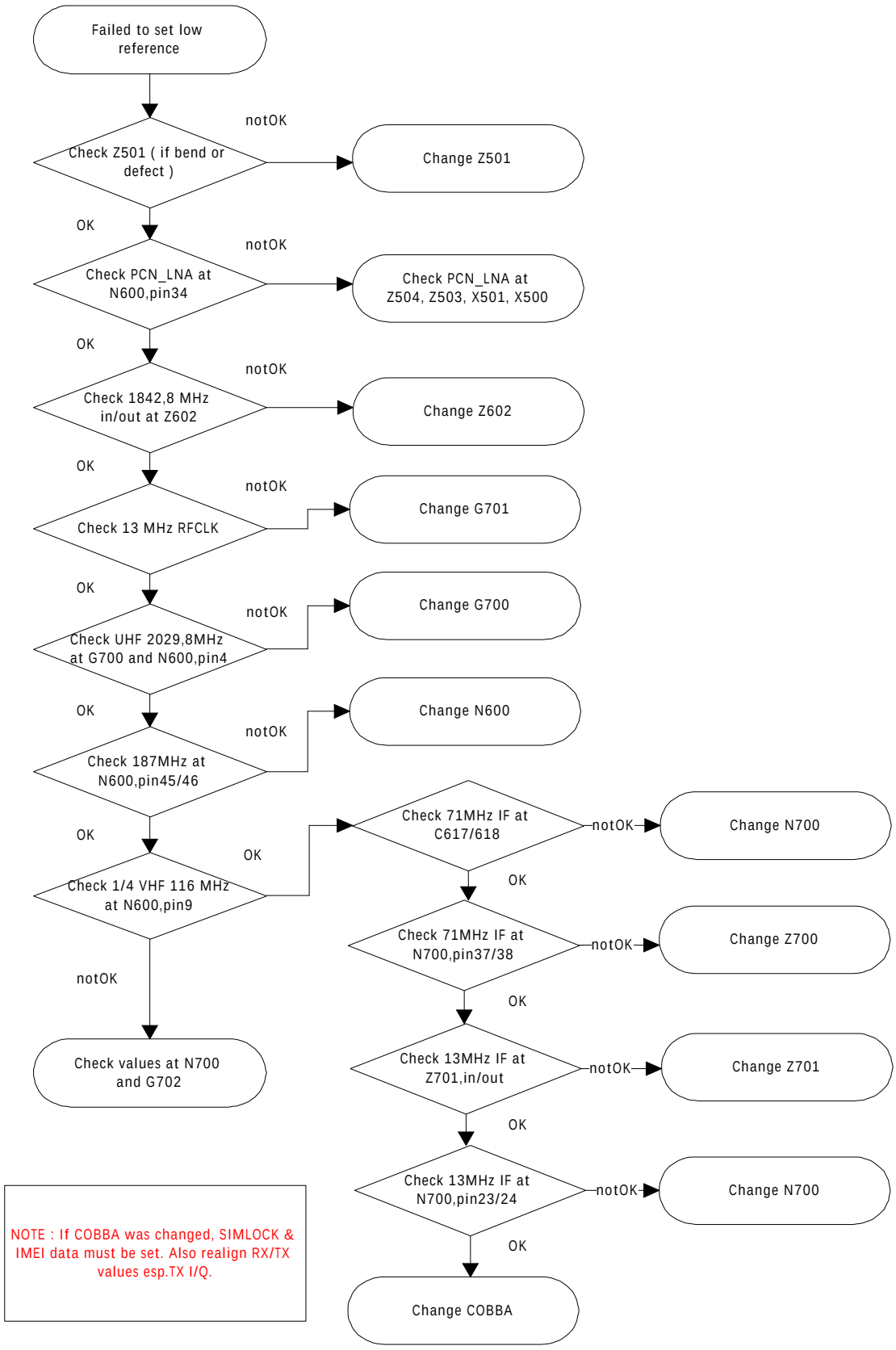
NO SERVICE GSM 1800 - First check spectrum if it is only a RX failure , see spectrum charts.



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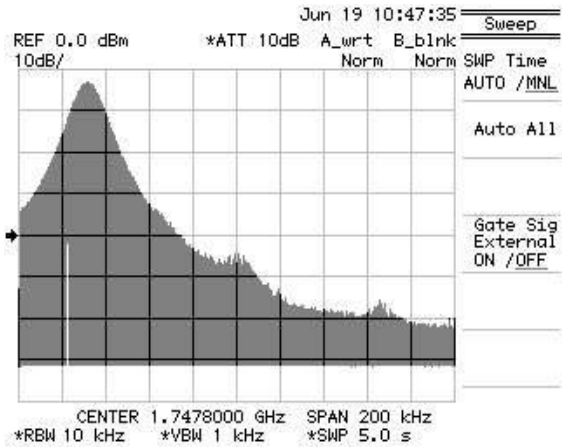
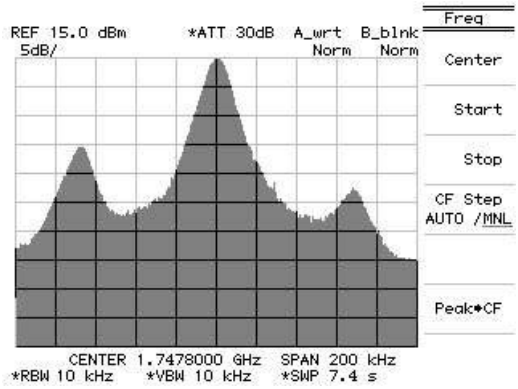
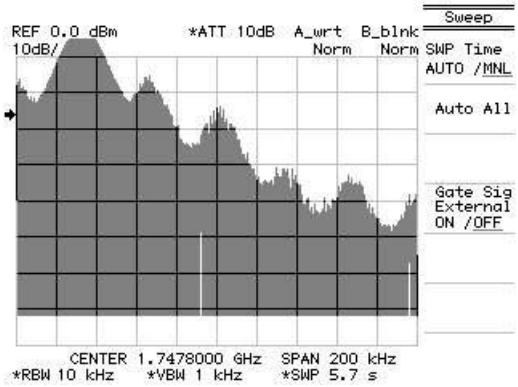
Faulty spectrum – COBBA faulty, COBBA and CCONT broken soldering.



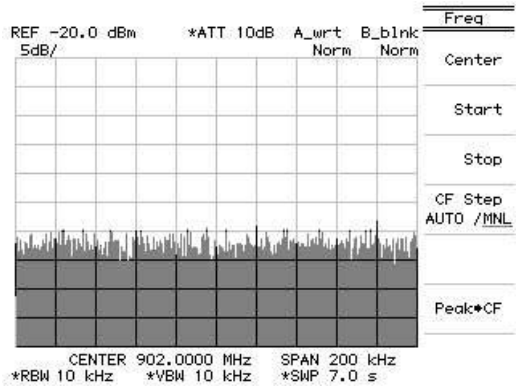
1)



3)



2)



4)

Pic1) Normal Spectrum

Pic2) Spectrum with broken soldering under CCONT
(No PCN_low reference settings in RSSI alignment).
Spectrum turnes to pic1 if N100 is pushed carefully with some nonmetallic item. This fault can also be measured at N700 pin 15.(13MHz RFCLK).

Pic3) Spectrum with faulty COBBA, RSSI-alignment is not possible.

Pic4) Spectrum with broken soldering under COBBA, RSSI- alignment is not possible. Spectrum turnes to pic 1 if N200 is pushed carefully with some nonmetallic item.

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Z701 faulty / poor soldering

-Check output 13MHz IF at pin 30 N700 (SUMMA)
-Check input 13MHz IF at pin 25, 26 N700 (SUMMA) . The attenuation between input and output is ~20dBm.
-Check 13MHz IF at Z701, around 5dBm attenuation between signal-in and signal-out
-Check soldering of Z701 or change it
-Check R717, R718, R719, C706 and the line resistance to ground (10KΩ with all components)

G700 UHF Oscillator faulty

-Check UHF frequency at G700 for high spurious or deviation
-Check UHF-VC at pin 21 N700 1,9V-3.2V DC depends on the channel.
-Check 5V VCP supply voltage at pin 13, 22 from N700 SUMMA
-Check R733 33KΩ, R730 5K6 Ω, R731 2K2Ω, C740 2,2nF
-Change oscillator G700.

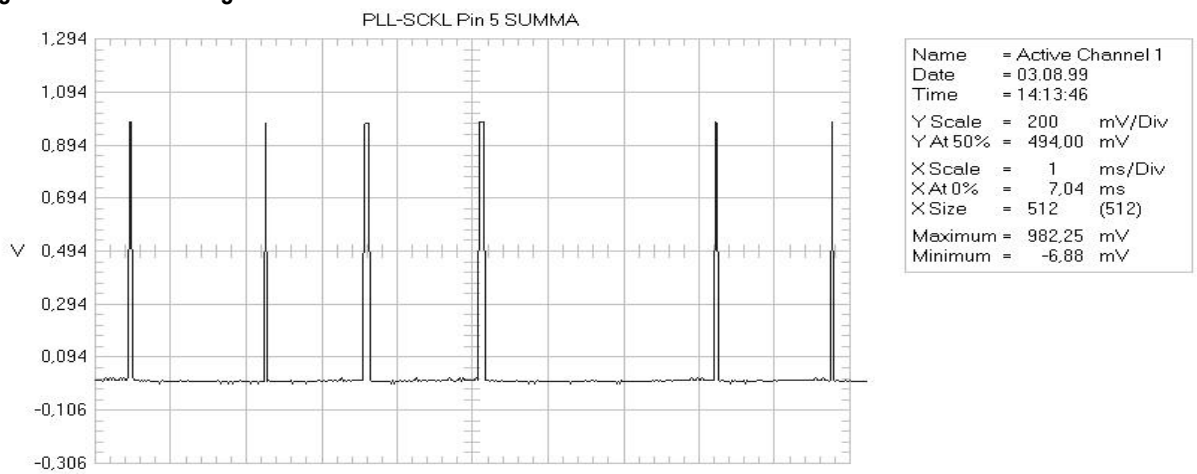
N700 SUMMA faulty / poor soldering

-Check 13MHz reference frequency pin 15 N700. (No frequency deviation higher ±50Hz is allowed!)
-Check power supply voltage VRX_2 2,8V DC pin 35 N700
-Check incoming IF 71MHz pin 37,38 N700
-Check 13MHz IF at pin 30(out),25, 26(in) N700 . The attenuation between input and output is ~20dBm
-Check control-lines for the PLL pin 5, 6, 7 from N700 (see the diagrams below)
-Check incoming VHF_LO frequency 464MHz pin 8 N700 if the 13MHz IF is deviated or do not exist measurable level approximate –20dBm!
-Check synth. power supply 2,8V DC pin 9, 19 N700 and VCC G700, G702
-Check VCP 5V DC pin 13, 22 N700
-Check control voltage for the UHF and VHF oscillator (UHF pin 21 control voltage ,depends on channel, pin12 2,2V DC at N700)
-Check the soldering of N700 or change it

No RX in PCN-Mode

RF IN: Check IF 187 MHz and 71 MHz
-Check 116MHz at pin 9 CRFU
-Check VB=2,8V (V_VHF) at pin 13 CRFU, if not OK change CCONT

Figure 7: PLL-SCKL Signal



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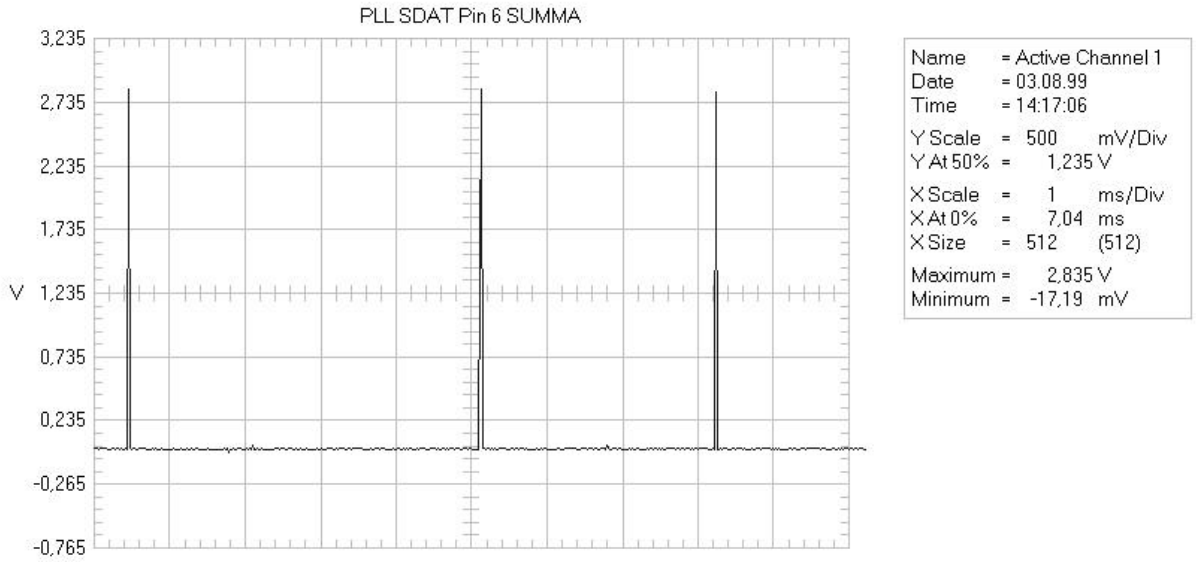
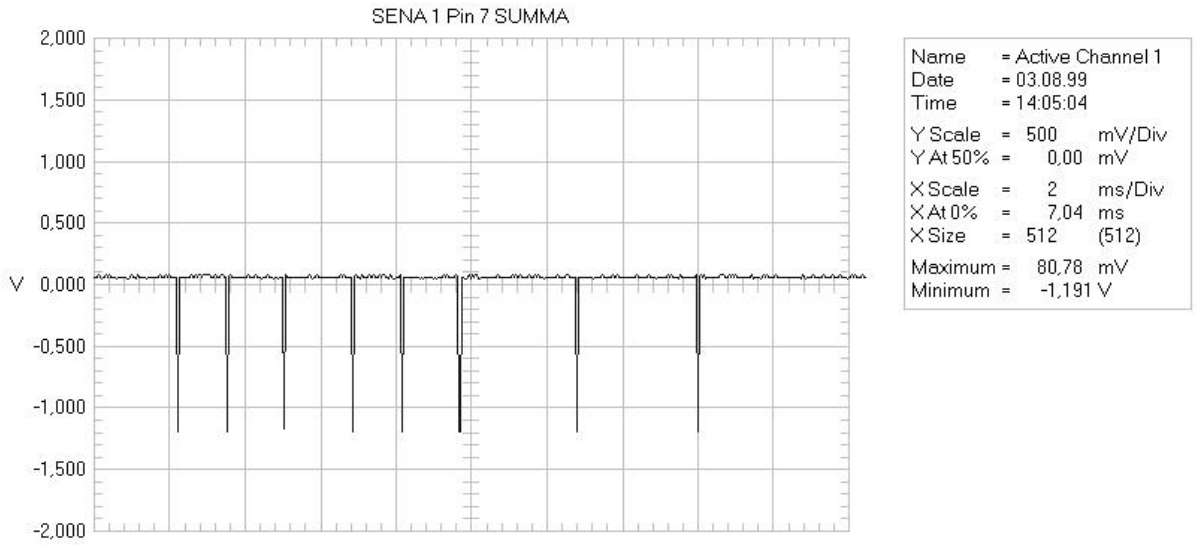


Figure 9:PLL-SENA Signal



No RX (no Rx calibration...RSSI reading fixed value)

COBBA / MAD faulty / broken solder balls
-Check if the 13MHz IF at pin 23,24 N700 SUMMA change the amplitude if you change the generator frequency level
-Check if the RXC impulse at pin 36 N700 (SUMMA) changes the amplitude if the generator frequency level is modified (see the diagram below) ***(change the operation mode first to "RX BURST MODE")***
-Check R725 if any or low signals are measurable
-Change COBBA N200(rewrite SIMLOCK and update the phone)
If the fault persists, MAD or PCB should be the reason
In this case swap the unit because MAD is not changeable

Note: Rewrite SIMLOCK and IMEI entries with use of the Nokia Security Password and make a SW-update or send these phones to SACE.

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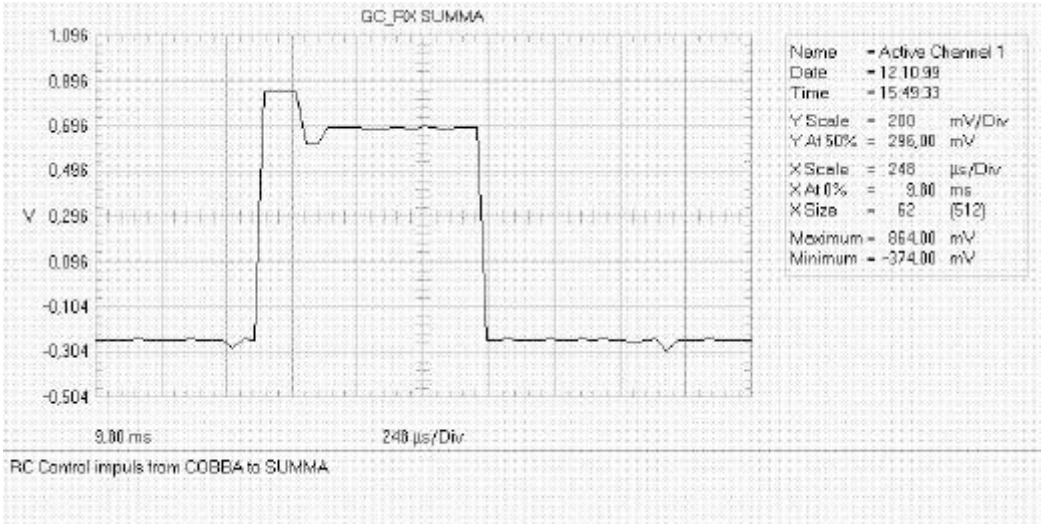
Figure 10:RX-Control Signal



Call breaks / No service

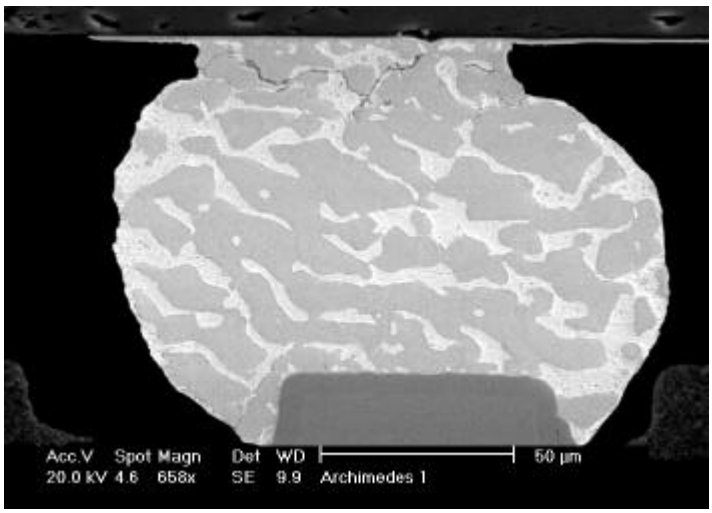
G701 13MHz Oscillator out of range or high spurious emission

-Set the phone to call mode, check if some phase and frequency errors appear especially in GSM 1800 band
-The deviations will be higher the higher the traffic channel is!
-Change G701 13MHz Oscillator

COBBA N200 broken solder balls

-Check VBB 2,8V DC at C117 near to CCONT
-Check VCOBBA 2,8V DC C248 near to COBBA
-Check COBBACLK 13MHz 3,2Vpp at J 201 (see the diagram in chapter "COBBA contact service")
-Check module in call mode with a simulator.
-Knock very careful with some nonmetallic item around the COBBA
-Check if some errors appear on the tester (phase /frequency / RX-Quality/TX-Power level)
-Change the circuit with a µBGA solder machine

. The picture shows a broken ball -viewed through a X-ray machine.



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No TX-Power or too low

See the troubleshooting chapter 4.GSM transmitter and 5. PCN transmitter from service manual

Z500 Duplexer Filter (Low TX-Power on GSM 900)

-Check TX-Power level between the TX "in" and "Antenna" pad of Z500
Resolder ground and signal connection pads at Z500
Change duplexer

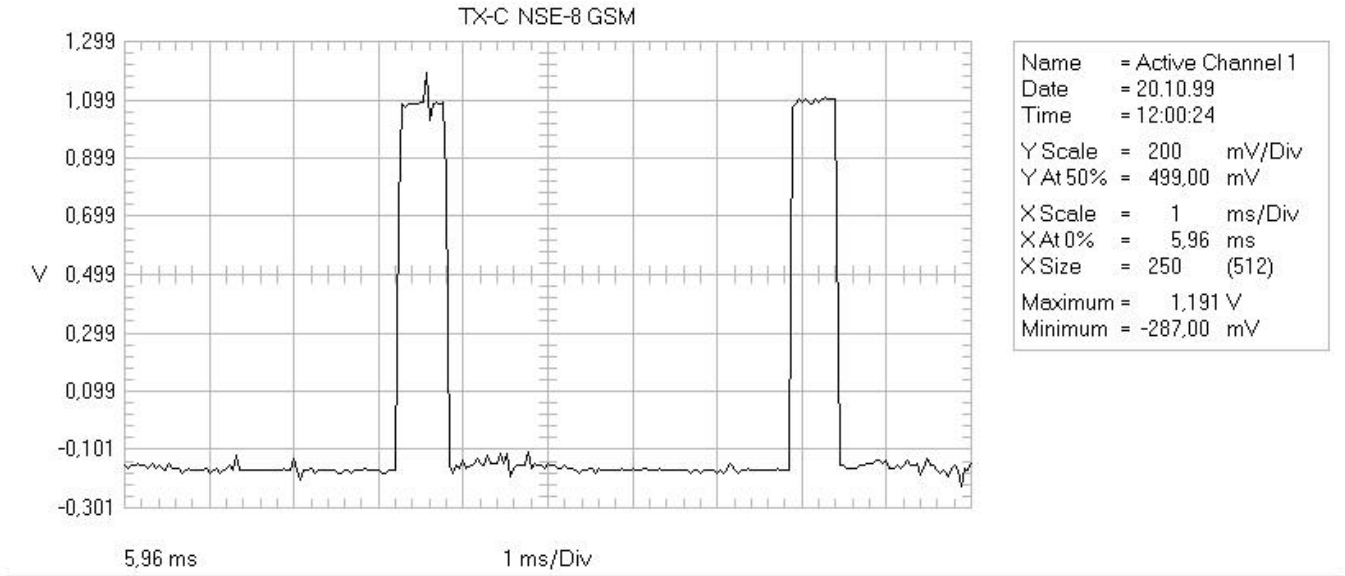
Z504 RX/TX switch GSM1800 (Low TX-Power on GSM 1800)

-Check 1V DC TX-switching voltage at Z504
-Check TX-power difference between "TX" and "ANT" pad at Z504
-Change Z504 if more than 2dBm difference is measurable

N500 /N501 Power Amplifier GSM 900 /GSM 1800

-Check the power supply VDC_OUT (3,2V→4,2V depends to power level) N500 /N501 pin 3.
-Check the input power at pin N500/ N501 in dependence on the band (nominal 0 dbm)
-Check the outgoing power at pin 4 N500/ N501
-Check the TX-Power control signal at pin 2 N500/ N501 , 0.7Vpp-1.7Vpp / 0.12..V – 0.2..V DC, dependent on the power-level (see the diagram below).
-Change PA if no or too low power comes out while power supply and control lines are OK.

Figure 11:TX-Control Signal



TX-control impuls on pin 2 from N500/N501
example on GSM 900 TX-level 6 approx. 32dBm

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Product-Codes NSE - 8		11. Okt 00
Product-Code	**SIM-Lock Data**	**Operator**
0502159		Euro - A
0502993		Euro - B
0502994		Euro - D
0503161		Euro - A / ALS
0503207		Euro - A Field Test
0503286		Euro - B
0503287	**No SIM-Lock**	Euro - B
0503288	**MCC & MNC 00101**	Euro - B
0503583	**MSIN 0000000001**	Euro - A / Wind Italy
0503703		Euro - A II
0503789		Euro - A / TIM-No GMS Italy
0503824		Euro - A / Virgin U.K.
0503897		Euro - A / KPN Orange Netherl.
0503905		Euro - A / Euskaltel Spain
0503906		Euro - A / Airtel Club Spain
0503977		Euro - A (China)
0503984		Euro - A / Omnitel Italy
0504572		Euro - A / BLU Italy
0504709	NSE - 9	APAC - C (China)
0504710	NSE - 9	APAC - C
0504711	NSE - 9	APAC - C
0504712	NSE - 9	APAC - C HR OFF
0504714	NSE - 9	APAC - C / Optus Australia
0505060		Euro - A / Wind Italy Rocket Silver
0505103		Euro - A (GD-7)
0505106		Euro - A / TIM Italy
0505112		Euro - A / Amena Spain
	NOT PRODUCED ANYMORE	
0502564	NSE - 9	APAC - C
0503206	NSE - 9	APAC - C
0503249	NSE - 9	APAC - C / Optus Australia
0503289	MCC & MNC **NOT PRODUCED ANYMORE**	Telstra / Australia APAC - C (NSE - 9)
0503298	MCC & MNC 20801 **NOT PRODUCED ANYMORE**	OLA / France Telecom Euro - A
0503299	MCC & MNC 20801 **NOT PRODUCED ANYMORE** GID 1 4F4C	OLA / France Telecom Euro - A
0503478	MCC & MNC 20820 MSIN ??????????	Bouygues Euro - B
0503564	MCC & MNC 20201 MSIN 1?????????	Cosmotel Euro - B

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Product-Codes NSE - 8			**11. Okt 00**
Product-Code	**SIM-Lock Data**		**Operator**
0503565	MCC & MNC MSIN	20205 90???????0	Panafon Euro - B
0503566	MCC & MNC MSIN	20210 99????????	Telestet Euro - B
0503567	MCC & MNC MSIN	23830 ??????????	Mobilix Euro - A
0503575	MCC & MNC MSIN	21630 ??????????	Westel 900 Euro - B
0503576	MCC & MNC MSIN	21601 ??????????	Pannon Euro - B
0503593	MCC & MNC MSIN	26001 ??????????	Polkomtel Euro - B
0503594	MCC & MNC MSIN	26801 ??????????	Telecel Euro - A
0503706	MCC & MNC MSIN	20416 ??????????	BEN Euro -A
0503707	MCC & MNC MSIN	26806 ??????????	TMN Euro - A
0503708	MCC & MNC MSIN	23002 ??????????	Eurotel - prepaid (Czech Rep.) Euro - B
0503784	MCC & MNC MSIN	23001 ??????????	Radiomobil Euro - B
0503785	MCC & MNC MSIN	23102 ??????????	Eurotel (Slovak Rep.) Euro - B
0503786	MCC & MNC MSIN	23101 ??????????	Globtel Euro - B
0503787	MCC & MNC MSIN	23201 ??????????	Mobilkom A -1 Euro - A
0503788	MCC & MNC MSIN GID 1	20420 ?????????? 504F	Dutchtone Euro - A
0503825	MCC & MNC MSIN	23002 ??????????	Eurotel - contract (Czech Rep.) Euro - B
0503826	MCC & MNC MSIN	22601 ??????????	Connex Euro - B
0503827	MCC & MNC MSIN GID 1	20412 ?????????? 434A	Telfort Euro - A
0503895	MCC & MNC MSIN	23205 ??????????	One Austria - connect Euro - A

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Product-Codes NSE - 8			**11. Okt 00**
Product-Code	**SIM-Lock Data**		**Operator**
0503896	MCC & MNC MSIN	27202 ??????????	Digifone Euro - A
0503898	MCC & MNC MSIN	26803 ??????????	Optimus Euro - A
0503899	MCC & MNC MSIN	52001 ??????????	APAC - C / AIS (NSE - 9) AIS Thailand
0503939	MCC & MNC MSIN	20408 ??????????	KPN - Telecom / postpaid Euro - A
0503940	MCC & MNC MSIN GID 1	20408 ?????????? 5050	KPN - Telecom / prepaid Euro - A
0503985	MCC & MNC MSIN	21670 ??????????	Vram Euro - B
0503986	MCC & MNC MSIN	21403 ??????????	Amena Euro - A
0504175	MCC & MNC MSIN	20801 ??????????	OLA / France Telecom Euro - A / FTOL 2
0504176	MCC & MNC MSIN	20801 ??????????	OLA / France Telecom Euro - A / FTOL 2
0504328	MCC & MNC MSIN	20801 ??????????	FT Loyalty Euro - A
0504329	MCC & MNC MSIN	20810 ??????????	SFR Euro - A
0504373	MCC & MNC MCC & MNC MSIN MCC & MNC MCC & MNC	21402 21407 ?????????? 21402 21407	Movistar Euro - A Movistar Movistar activa
0504374	MSIN GID 1 MCC & MNC MSIN	?????????? 10FF 21407 ?61???????	Euro - A Movistar activa Euro - A
0504375	MCC & MNC MSIN	21401 ??????????	Airtel club plus Euro - A
0504382	MCC & MNC MSIN	25001 ??????????	MTS Euro - B
0504383	MCC & MNC MSIN	21910 ??????????	Vipnet Euro - B
0504404	MCC & MNC MSIN	24201 ??????????	Telenor Euro - A
0504442	MCC & MNC MSIN	60401 ??????????	Maroc Telecom Euro - A

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Product-Codes NSE - 8		**11. Okt 00**
Product-Code	**SIM-Lock Data**	**Operator**
0504443	MCC & MNC 21401 MSIN 81???????? MSIN 82???????? MSIN 83???????? MSIN 84???????? MSIN 85???????? MSIN 86???????? MSIN 87???????? MSIN 88???????? MSIN 89????????	 Airtel Formula Euro - A
0504468	MCC & MNC 2380? MSIN ??????????	Debitel Euro - A
0504571	MCC & MNC 20416 MSIN 2??????????	BEN - prepaid Euro - A
0504600	MCC & MNC 29340 MSIN ??????????	Simobil Euro - B
0504688	MCC & MNC 20801 MSIN ?????????? GID 1 4D4F	FT Mobicarte Euro - F
0504713	MCC & MNC 52001 MSIN ??????????	AIS APAC - C (NSE - 9)
0504719	MCC & MNC 21901 MSIN ??????????	HT Croatian Telecom Euro - B
0504757	MCC & MNC 20420 MSIN ?????????? GID 1 5245	Dutchtone - prepaid Euro - A
0504769	MCC & MNC 24007 MSIN ??????????	Comviq Tele 2 AB Euro - A
0504774	MCC & MNC 34001 MSIN ??????????	France Caraibe Mobiles Euro - A
0504781	MCC & MNC 51502 MSIN ??????????	Globe Telecom Philippines APAC - C (NSE - 9)
0504787	MCC & MNC 21401 MSIN ??????????	Airtel formula + Euro - A
0504788	MCC & MNC 23410 MSIN ??????????	BT Cellnet U.K. Euro - A
0504822	MCC & MNC 23430 MSIN ??????????	One 2 One Rocket Silver Euro - A
0504934	MCC & MNC 26801 MSIN ??????????	NET - Telecel Euro - A
0504935	MCC & MNC 65202 MSIN ??????????	Airtel Mobil S.A Euro - A

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Product-Codes NSE - 8			**11. Okt 00**
Product-Code	**SIM-Lock Data**		**Operator**
0504957	MCC & MNC	23415	Vodafone PAYT
	MSIN	??????????	
	GID 1	E1FF	Euro - A
	MCC & MNC	26202	
	MSIN	141???????	
	MSIN	151???????	
	MSIN	202???????	
	MSIN	252???????	D 2 - Mannesmann
0504969	MSIN	303???????	Euro - A
	MSIN	363???????	
	MSIN	453???????	
	MSIN	513???????	
	MSIN	653???????	
	MSIN	813???????	
0504979	MCC & MNC	26201	D 1 De Te Mobil
	MSIN	??????????	Euro - A
0504984	MCC & MNC	23207	Telering / Austria
	MSIN	??????????	Euro - A
0505005	MCC & MNC	60400	Medi Telecom
	MSIN	??????????	Euro - A
0505006	MCC & MNC	23820	Telia
	MSIN	??????????	Euro - A
0505066	MCC & MNC	51503	Smart Philipines
	MSIN	??????????	APAC - C
0505100	MCC & MNC	23433	Orange
	MSIN	??????????	Euro - E
0505101	MCC & MNC	23430	One 2 One
	MSIN	??????????	Euro - A
0505102	MCC & MNC	26801	Telecel
	MSIN	??????????	Euro - A
0505104	MCC & MNC	26003	CENTERTEL
	MSIN	??????????	Euro - B
0505105	MCC & MNC	26002	ERA Poland
	MSIN	??????????	Euro - B
0505107	MCC & MNC	28601	Turkcel
	MSIN	??????????	Euro - A
0505108	MCC & MNC	28602	Telsim
	MSIN	??????????	Euro - A
0505109	MCC & MNC	23203	Maxmobil
	MSIN	??????????	Euro - A
0505110	MCC & MNC	27201	Eircell
	MSIN	??????????	Euro - A

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Product-Codes NSE - 8			**11. Okt 00**
Product-Code	**SIM-Lock Data**		**Operator**
0505111	MCC & MNC MSIN	65510 ??????????	MTN South Africa Euro - A
0505168	MCC & MNC MSIN	26801 ??????????	TELECEL Portugal Euro - A Blue
0505180	MCC & MNC MSIN	26203 ??????????	E - Plus Euro - A
0505220	MCC & MNC MSIN	23433 ??????????	Orange Marks & Spencer Euro - E
0505251	MCC & MNC MSIN GID 1 MCC & MNC MSIN GID 1	26201 ?????????? 02FF 26201 ?????????? 99FF	D 1 De Te Mobil Euro - A D 1 GID
0505281	MCC & MNC MSIN	41601 ??????????	Fastlink / Jordan Euro - D
0505294	MCC & MNC MCC & MNC MSIN	52001 52023 ??????????	DPC / AIS APAC - C
0505332	MCC & MNC MSIN	22803 ??????????	Orange Switzerland Euro - A
0505372	MCC & MNC MSIN	23802 ??????????	SONOFON / Denmark Euro - A
0505414	MCC & MNC MSIN	20404 ??????????	CPHS / Ireland Euro - A
0505453	MCC & MNC MSIN MCC & MNC MSIN MCC & MNC MSIN	22801 ?????????? 20404 ?????????? 26207 49????????	Swisscom Euro - A Libertel VIAG Interkom

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CHANGE HISTORY

Originator	Status	Version	Date	Comment
Jose Marquez	Draft	0.2	22.10.1999	First draft version for the repair group
	Draft	0.3	02.11.1999	Insert comments from the repair team, add layout "Test Points"
	approved	1.0	05.11.1999	First AMS version
Holger Klein	approved	2.0	04.02.2000	“not charging” reference to SB024 added Additions to chapter “no service” SIM-Locks updated Flowcharts page 15, 21 VCOBBA at C148 corrected to C248
CC-Training-Group	approved	3.0	07.09.2000	New appearance, RF- descriptions, Flowcharts and HW changes added. All documents reworked.
CC-Training-Group	approved	4.0	20.10.2000	Headers changed.
CC-Training-Group	approved	4.2	31.10.2000	Last Simlock-list and Comments added.

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