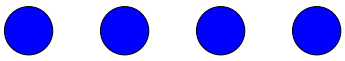
Repairhints

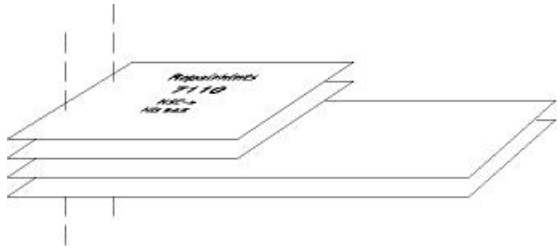
3310

NHM-5

HDa 12



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. Reflow is not allowed.
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.

-PCB handling & cleaning

Only use appropriate cleaning materials, don`t use scratching or rubbing tools. Clean PCB carefully after every rework and take great pains over the keyboard area. Don´t make any loose wiring connections anywhere.
If it is necessary to clean the PCB, please pay attention to the following: Because of organic surface protection (OSP), cleaning must only be done with a lint-free cloth which may be moisten with DI-water. IPA or other solvent like ethanol should only be used to clean gold pads for spring contacts without affecting the surrounding copper layers.
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.

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 3310 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	: 311.03.00
Nokia Module Jig	: MJS-19
Digital multimeter	: Fluke 73
Oscilloscope	: Hitachi V-1565; Fluke PM 3380A/B
Spectrum Analyzer	: Advantest R3131 with an analogue probe
RF-Generator / GSM Tester	: Rohde & Schwarz CMU 200

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.

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Contents

HW-CHANGES IN 3310/NHM-5/HDa 12

Intermittent switches off problem (SB 12)

In case of HW-ID 0600, 0601,0602, 0603, 0604, 0607, 0608, 0612 and 0614 change following parts:

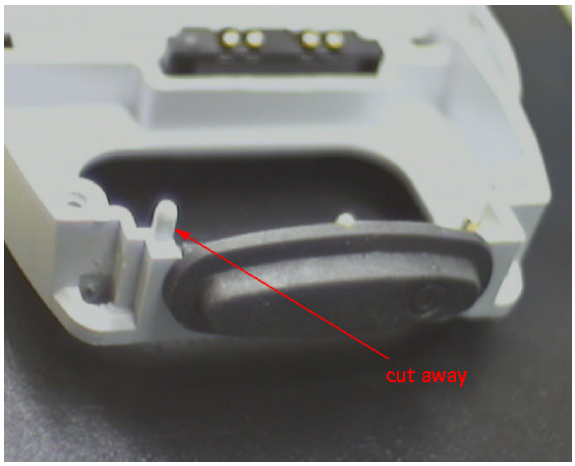
R559 from 2.2kΩ	to 1kΩ	(1430754)
C559 from 100pF	to 47pF	(2320552)
C560 from 1nF	to 47pF	(2320552)
C303 from 1nF	to 47pF	(2320552)

Since HW-ID 0615 these changes are implemented in production.

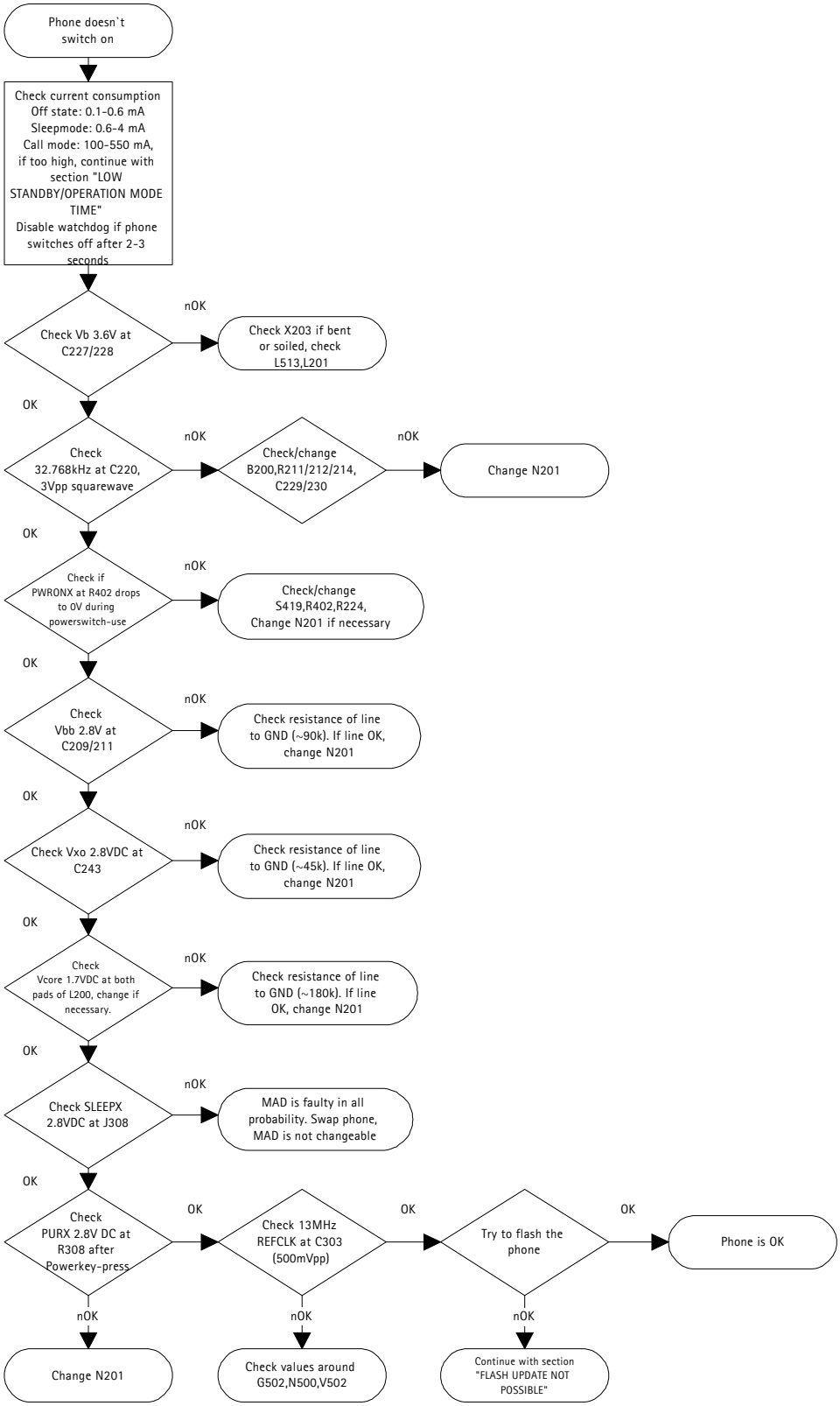
Software update to PhoneSW 4.06 or higher makes above mentioned HW update unnecessary (SB16)

Difficulties when removing B-Cover (SB 13)

If customers critisize bad removal of B-Cover cut away the guiding pin of the D-Cover (see picture below)
After this procedure it is necessary to assemble the phone with a torque screwdriver prepared for **30Ncm**!



PHONE DOESN`T SWITCH ON



X203 Battery connector

Check if bent or soiled.
Check that pads of connector on PCB are clean.

S419 Power on/off switch faulty

Check that voltage at R402 is 3.6V when powerswitch is not pressed.
If voltage is not ok, check R402 and R224, change N201 if necessary.
If voltage at R402 is ok, it must decrease to 0V if S419 is pressed, else change S419.
Disable watchdog by connecting R224 to GND if phone switches off after 2 or 3 seconds.

B200 Sleep Clock Oscillator faulty

Check 32.768kHz, 3Vpp squarewave at pad of C220 located towards B200.
If oscillator does not work, check voltage at the two pads of B200 which are located
towards N201, normally 1.6V DC. If not ok, check periphery of B200 or change CCONT N201.
If frequency is not ok, check parts around B200 (R211, R212, R214, C229/230).

G502 Reference oscillator faulty

Check Vcc 2.7V DC at G502 pin 2 and Vcont (varies between 0.03V and 2.3V, typically 1.3VDC) at C552.
Check 26MHz Clk-frequency at pin 3 of G502, 1Vpp
Check 13MHz Clk-frequency at C559, 300mVpp
If not ok, check voltages for HAGAR N500. (Detailed information in chapter "No Service").
Check 13MHz Clk-frequency at C303, 500mVpp at pad located towards V103.
If not ok, check values around V502

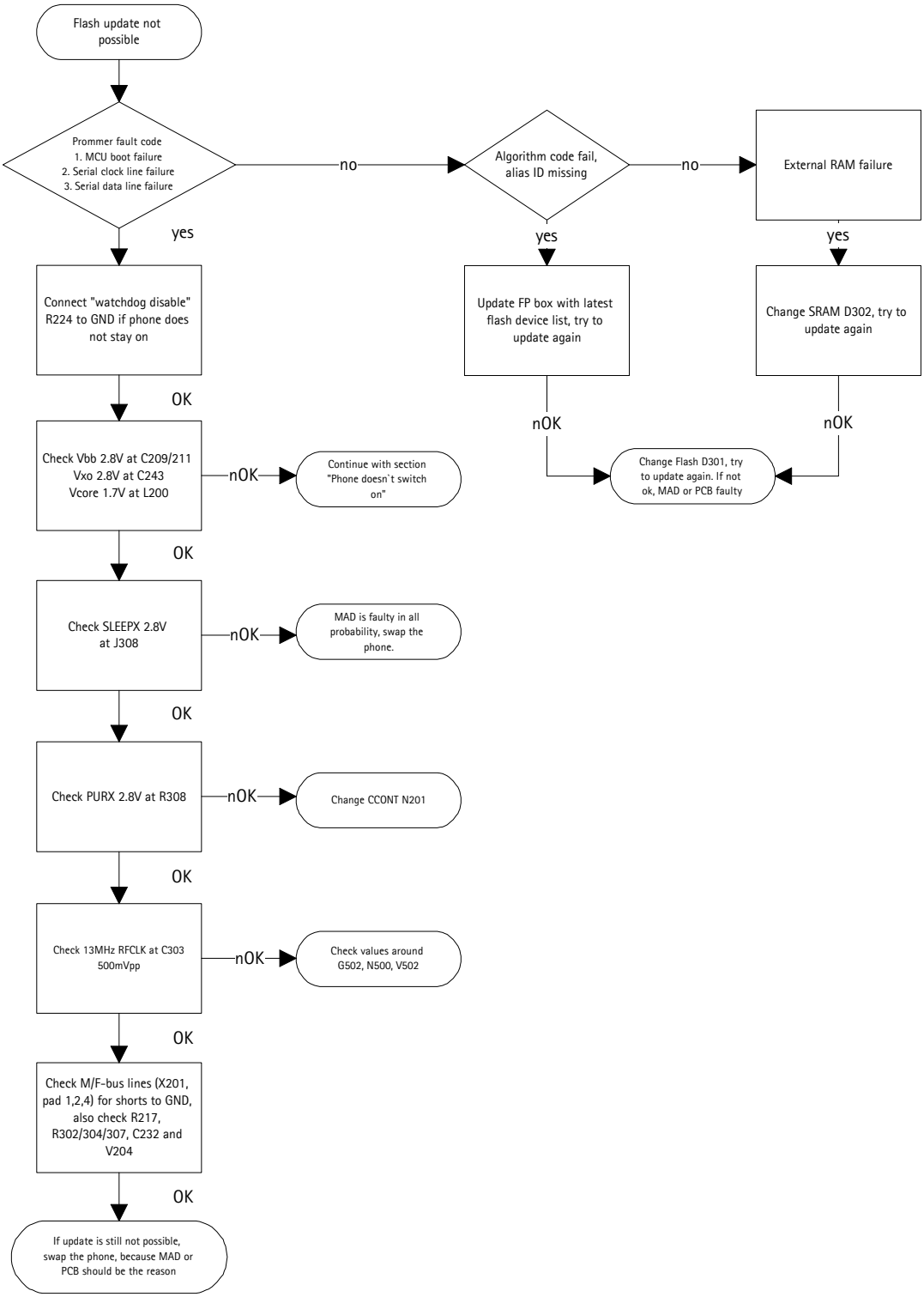
N201 CCONT faulty

Check Vb 3.6V DC at C227/228.
Check 32.768kHz, 3Vpp squarewave at pad of C220 located towards B200.
Check that PWRONX decreases from 3.6V DC to 0V at R402 if powerswitch is
pressed.
If these conditions are fulfilled output voltage lines should rise to their intended values
and PURX is released after some milliseconds by CCONT.
If CCONT does not work, check output voltage lines for shorts to ground (check current consumption!),
if ok, change CCONT with µBGA soldering machine and run energy management calibration.

D300 MAD faulty

Check 32.768kHz squarewave at C220.
Check 13MHz Clk-frequency at C303.
Check Vbb 2.8V DC at C209/211 and Vcore 1.7V DC at L200.
Check SLEEPX 2.8V DC at J308.
Check PURX 2.8V DC at R308.
Try to flash the phone.
MAD is probably faulty, swap the phone because MAD is not changeable.

FLASH UPDATE NOT POSSIBLE



PHONE INTERMITTENT SWITCHES OFF/DOESN`T SWITCH ON

Check first of all phone´s software version.
If version is < 4.06, make SW update and check if fault persists.
If phone switches off intermittent although phone SW is 4.06 or higher and battery is fully charged, check phone´s HW-ID.
In case of HW-ID 0600, 0601,0602, 0603, 0604, 0607, 0608, 0612 and 0614 it is necessary to change the following parts:

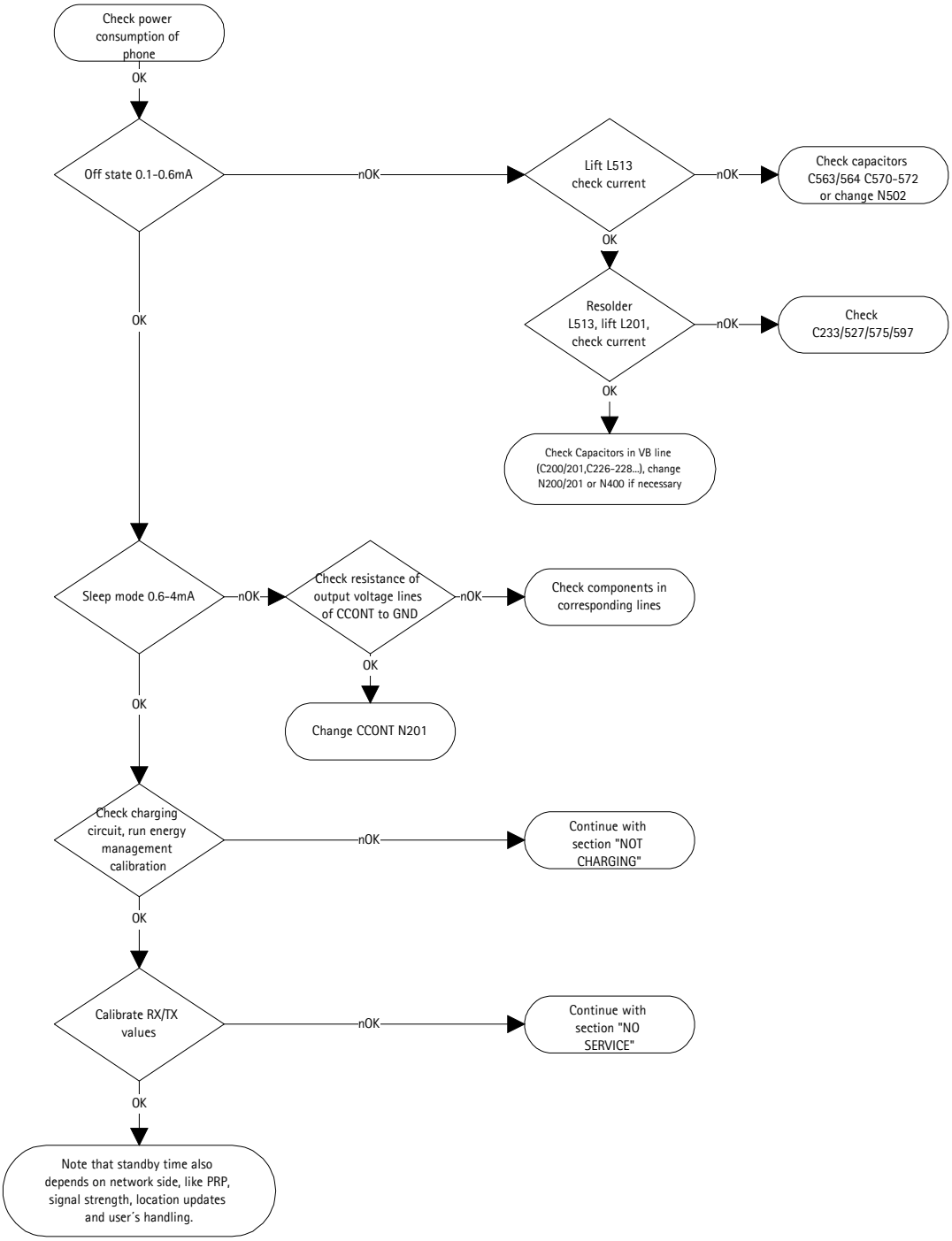
R559 from	2.2kΩ to 1kΩ	(1430754)
C559 from	100pF to 47pF	(2320552)
C560 from	1nF to 47pF	(2320552)
C303 from	1nF to 47pF	(2320552)

If HW-ID is 0615 or higher, the above mentioned changes are already done.

Other possibilities if SW- and/or HW-update do not solve the problem:

Check mechanical appearance of connector X203.
Check that pads of X203 on PCB are clean.
Check amplitude of 32.768kHz at C220, 3Vpp squarewave,
probably broken solderings under CCONT N201. Remove CCONT and replace it with µBGA soldering machine, run energy management calibration after changing CCONT.
The same problem may be caused by N500, because the reference oscillator G502 (26MHz) is divided to 13MHz system clock by HAGAR N500.

LOW STANDBY/OPERATION MODE TIME



Check current consumption in different operation modes:

Function mode	Minimum current in mA	Maximum current in mA
Off state	0.1	0.6
Sleep mode	0.6	4
Call mode GSM 900	130	550
Call mode GSM 1800	100	530

Off state current fail

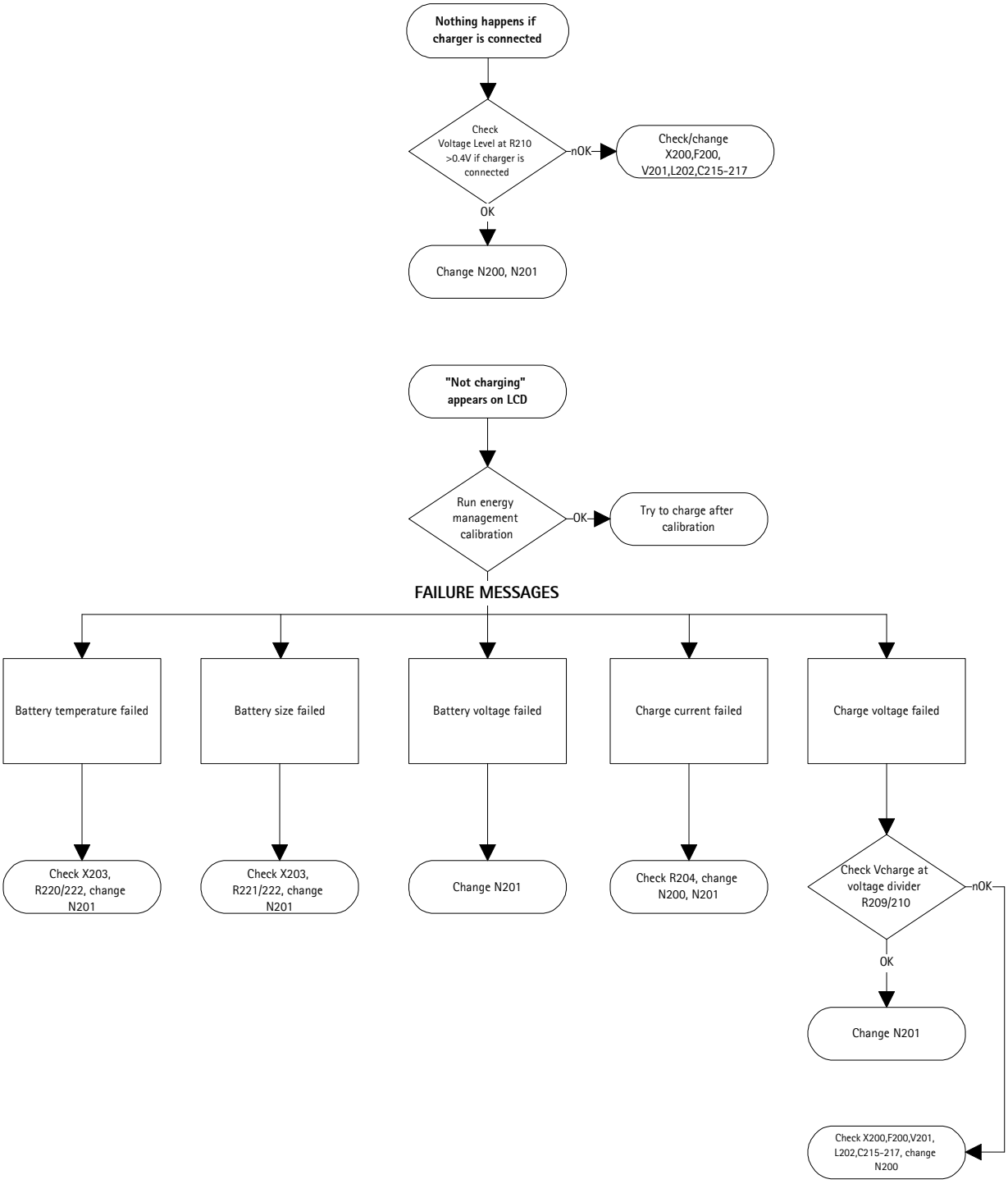
Lift L513 to define the fault if off state current is not ok.
If current is still not ok, lift C563/564 and C570-572 one by one or change
power amplifier N502, which is the reason in most cases.
If current is ok after removing L513, resolder it and lift L201. If current is too high,
check capacitors C233,C527,C575 and C597. If current consumption is ok after lifting L201,
you have to check capacitors in Vb-line (eg C200/201, C226-228,C247...) or change N200/201, N400.

Sleep mode current fail

Check resistance of output voltage lines of CCONT N201 to ground.
Resistance should be higher than 10kΩ except Vsyn1 (~ 4.7kΩ),
if resistance of any line is not ok, check/change parts of this line,
if resistance of all lines is ok, change CCONT N201.

If the standby/operation mode time is still not ok, check charging circuit and
run the energy management calibration.
It also can be necessary to calibrate the Rx/TX values of the phone.

NOT CHARGING



X200 DC/HS connector, X203 battery connector

Check mechanical appearance of connectors,
make sure that pads for connectors on PCB are clean.

F200 faulty

Check resistance of fuse F200 (0 Ω)

CHRGR+ line short circuited to ground

Check resistance of CHRGR+ line at F200 to GND (~ 50 kΩ),
if resistance is not ok, remove L202 and check again.
If resistance is ok now, C215/216 or N200 should be the reason,
if resistance is still not ok, V201 faulty in all probability, also check C217.

CCONT N201 faulty

Change CCONT if any A/D value is out of limit but DC voltage is ok.
If DC voltages are not ok, check corresponding voltage dividers and
battery connector X203.
Run energy management calibration after changing CCONT!

Energy management calibration

Run calibration:
- If charging stops too early or battery gets hot.
- If message „ not charging" appears on LCD.
- If any part in the charging circuit has been replaced.

CONTACT SERVICE

This fault means that the phone software is able to run and thus the watchdog of CCONT N201 can be served. Selftest functions run when power is switched on and software is executed from flash. If any selftest fails, a "Contact Service" text is shown on LCD.

Most common faults:

MCU ROM Checksum failed

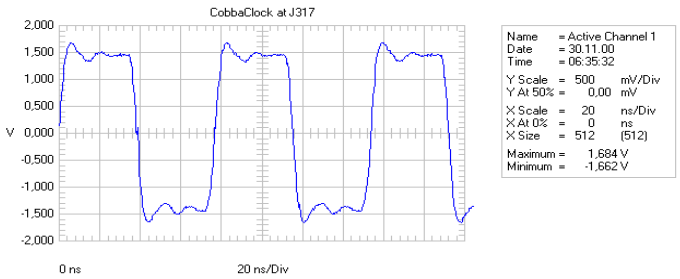
Try to flash the phone. If not ok after flashing, probably D301 faulty. Change D301 with µBGA soldering machine and try to update once more.
Note that you have to write back phone data and retune phone values after changing D301!

CCONT Interface failed

Probably faulty CCONT N201 or broken solderings under it.
Replace CCONT with µBGA soldering machine, run energy management calibration.
If not ok after reworking the CCONT, MAD or PCB faulty in all probability.

COBBA parallel/serial failed

Check Vbb 2.8V at C119 and VCOBBA 2.8V at C116/117
Check COBBAClk at J317



Probably COBBA N100 faulty or broken solderings under it – change COBBA.
If fault remains MAD or PCB faulty.

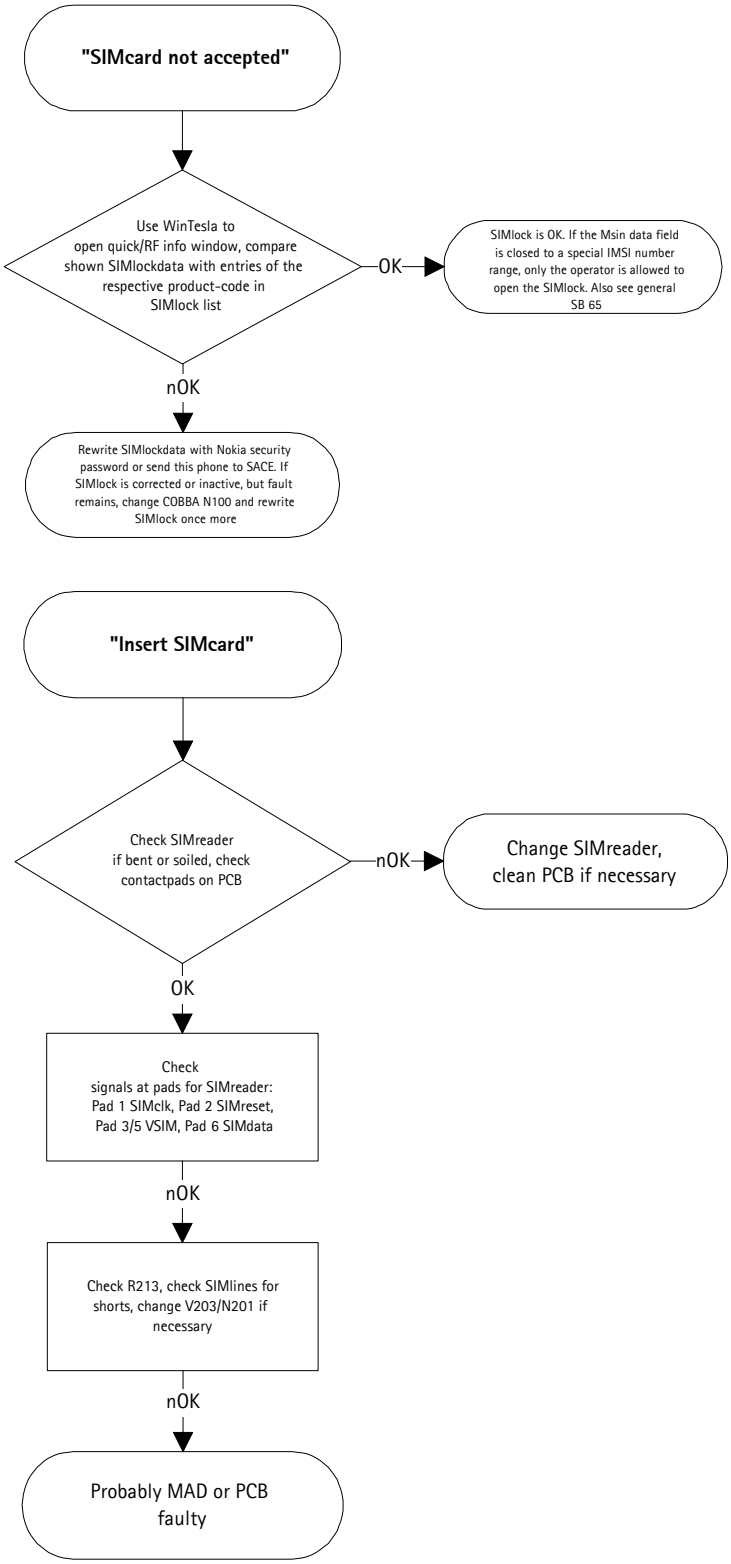
DSP Alive Test failed

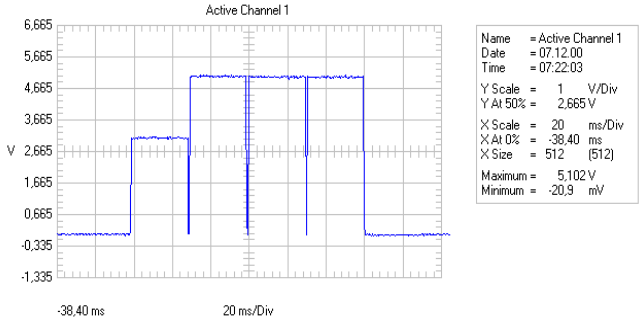
In most of all DSP alive selftest failures MAD is faulty, which is not changeable.

Eeprom sec/tune checksum failed

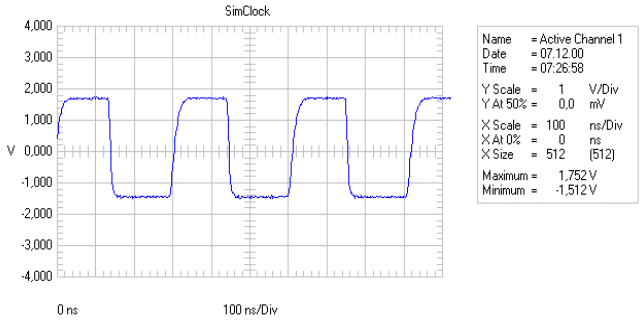
Use WinTesla to check if phonedata like IMEI, product-code or PSN are corrupted.
If phone data is ok, try to reset the phone. If phone data is not ok or fault remains after reset, change D301, write back phone data and retune phone values after changing D301!

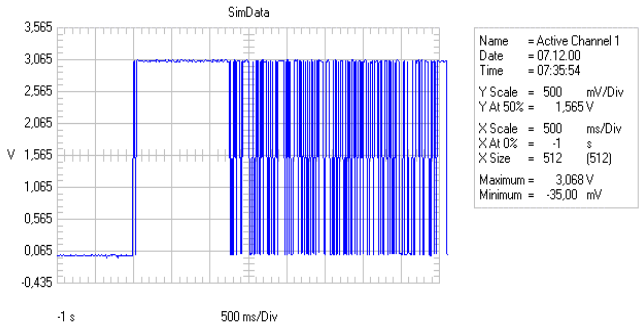
SIMCARD FAULT



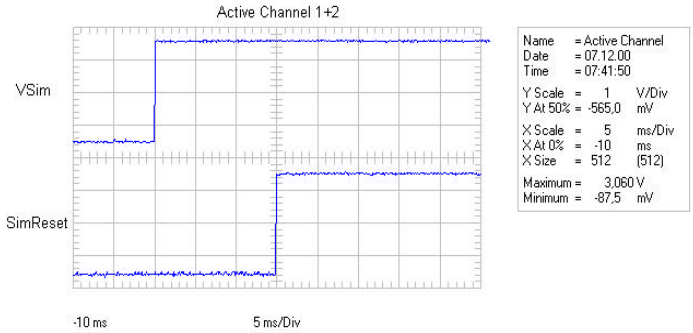


VSIM after switching on the phone without SIMcard. CCONT pulses up VSIM for four times, the first time the amplitude is 3 Volt, the next three times it is 5 Volt.
If the phone is switched on with SIMcard VSIM stays on the level with which the SIMcard will work, expected that SIMcard is not dirty or damaged.





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.

SIMcard-Reader

Check if bent or soiled, change if necessary
make sure that SIMreader´s pads on PCB are clean

V 203 faulty

Check resistance of SIMlines to ground, values shouldn't decrease 200kΩ.
Also check C221/222/224/225.

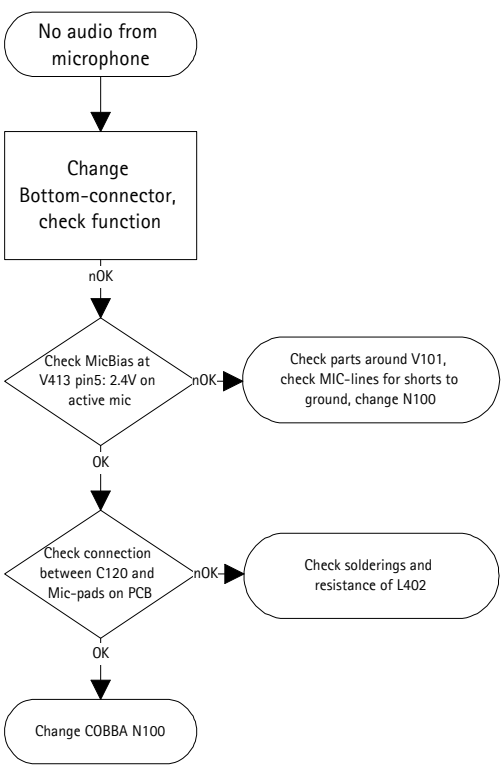
N201 CCONT faulty

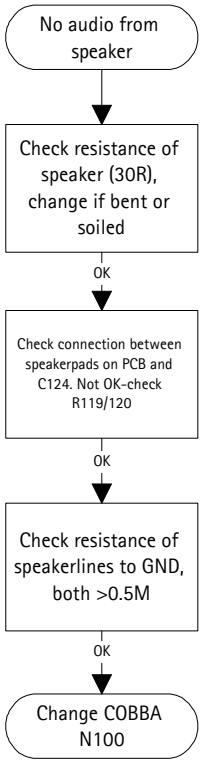
Check if VSIM rises to 3/5Volt after switching on the phone. If VSIM is ok but phone
does not recognize SIMcard, check SIMlines for shorts to ground or disconnections,
also check mechanical appearance of SIMreader.
If VSIM does not rise to its intended value, change CCONT N201. If fault persists after changing CCONT, probably MAD or PCB faulty.

N100 COBBA faulty

If "SIMcard not accepted" appears on LCD, but SIMlock-settings are ok or no SIMlock is set,
it is necessary to change COBBA N100.
Note that you have to rewrite SIMlock-data and tune Rx/TX-values of the phone after changing the COBBA.

AUDIO FAULTS





Speaker faulty

Check resistance of speaker (30 Ω)
Check mechanical appearance of speaker if audio signal is too quiet or distorted.

Speakerlines short circuited to GND or disconnected

Check resistance of R119/120 (22 Ω).
Check resistance of lines to GND (> 0.5MΩ).

Microphone doesn't work

Check/change microphone,
make sure that pads for microphone on PCB are clean.
Check microphone voltage at V413 pin 5, 2.4 V on active micro.
Check connection between Mic-pads on PCB and R120, change COBBA N100 if necessary.

USER INTERFACE FAULTY

Display failure

Check mechanical appearance of display assy, change if necessary.
If LCD does not work after changing display assy check Vbb 2.8V DC at C409/413.
Voltage at C410/412 is normally 8V DC, check capacitors for shorts if voltage is not ok.
Check that voltage at J314 is 2.8V DC (LCDReset) – if line is short circuited to ground LCD does not work. Also check that voltage at both sides of R306 is 2.8V DC.
If above mentioned values are ok but LCD does not work, probably MAD or PCB faulty

Keypad malfunktion

Check that contacts for keys on display assy are clean, make sure that PCB is not dirty
Check resistance of ROW and COL lines between the keys,
probably MAD faulty

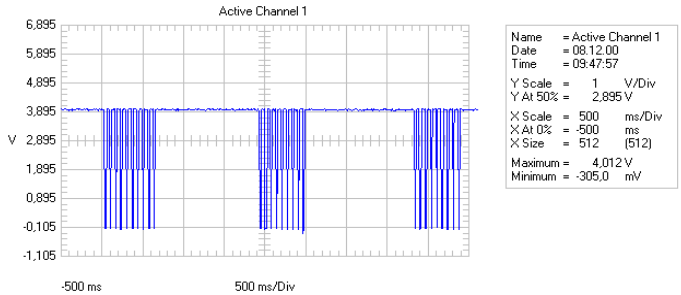
Backlight failure

Check Vb 3.6V DC at anode of keypad/display-LED´s .
Check Vbb 2.8V DC pin 2 and Vb 3.6V DC pin 1 of N400.
Check resistance of R403 and R404.
Check signal KBlights 2.8V DC at pin 7/15 of N400. If voltage is ok but illumination does not work change N400. If no voltage is measurable there may be a disconnection between D300 and N400 or MAD is faulty.

If backlight switches itself on after assembling battery to the phone even though the phone keeps switched off, check R406/407 for shorts to ground. This fault occurs often in connection with liquid damages.

Vibra failure

Check contact springs of vibramotor, make sure that pads for vibramotor on PCB are clean.
Check Vb 3.6V DC at vibrapad located to the edge of the PCB, at the other pad and pin 16 of N400, you can check vibrasignal with a scope (waveform depends of chosen ringing-tone!).
Check also R401.



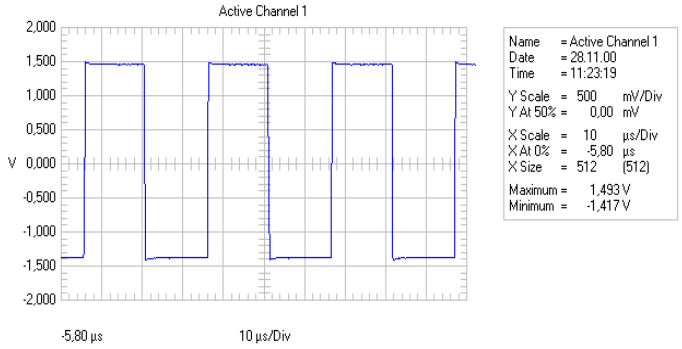
Check Vb 3.6V DC at pin 1 and Vbb 2.8V DC at pin 2 of N400.
Check vibra_cnt at pin 19 of N400. If signal is ok but vibra does not work, change N400, else there is a disconnection between D300 and N400 or MAD is faulty.

Buzzer failure

Check mechanical condition / contact springs of buzzer
Check Vb 3.6V DC at E401
Check PWM- signal at E400 and pin 6 of N400.
Check Vb 3.6V DC at pin 1 and Vbb 2.8V DC at pin 2 of N400.
Check buzzer_cnt signal at pin 3 of N400. If signal is ok but buzzer does not work, change N400, if signal is not ok, there may be a disconnection between D300 and N400, or Mad is faulty

Clock time problems

Clock time has to be corrected in short periods:
In case of this fault check amplitude and frequency of sleepclock-oscillator at C220,
should be 3Vpp squarewave at 32.768kHz.
If amplitude or frequency is not ok, change crystal B200. If fault persists, check parts around B200 like R211/212/214 and C229/230.



32.768kHz measured at pad of C220 located towards crystal B200.

NO SERVICE / No or too low TX power GSM 900

First of all: Try to calibrate RX/TX values of the phone to define the fault
Use Wintesla to set phone in following mode: Initialise/ Local mode// Testing/ RF Controls/ active unit TX, Ch.38

Check 26MHz reference oscillator at G502 pin 3, 1Vpp, frequency deviation < +/-100Hz
Check TXI/Q signals at R541/548, refer to signals shown on next pages.
If not ok, check values at COBBA N100 (see below).
Check 897.6 MHz at L514. If not ok, check signals at HAGAR N500 (see below)
Check 897.6 MHz at C605. If not ok, check parts like T504, Z503 or V601.
Check 897.6 MHz at N502 pin 6. If not ok, check/change C600, R550 or N502.
Check 897.6 MHz at J502 (Antenna pad). If not ok, check L515 in & out, also check signal at Z502 in & out and TXVGSM, 2.8Vpp squarewave at L509 (sets Z502 to GSM TX-mode).

COBBA N100 faulty

Check Vbb 2.8V DC at C119 and VCOBBA 2.8V DC at C116/117.
Check 13MHz COBBAClock at J317 (see diagram in chapter "Contact Service")
probably faulty COBBA N100 or broken solderings under it. Remove COBBA, replace it with µBGA soldering machine, retune RX/TX values of the phone and rewrite SIMlock data.

HAGAR N500 faulty

Check voltages at HAGAR :
- VCTCXO 2.8V at C518
- Vchp 4.8V at C505
- Vsynte 2.8V at C501/504
- Vrxrf 2.8V at C500
- Vref_2 1.35V at C536
- RXREF 1.2V at R507

Check 26MHz reference oscillator at G502 pin 3, 1Vpp, frequency deviation < 100Hz
Check TXI/Q signals at R541 and R548
Check Sdata at R300, Sclk/Sena at R301, check HAGAR Reset at C540, also check TXC at C542 and TXP at J503 (diagrams on next pages).
Check frequency of SHF oscillator – TX Ch.38: 3590.4MHz.
If all values are ok but no TX signal is measurable at T504, probably faulty HAGAR or broken solderings under it.
Remove HAGAR, replace it with µBGA rework machine and align RX/TX values of the phone.

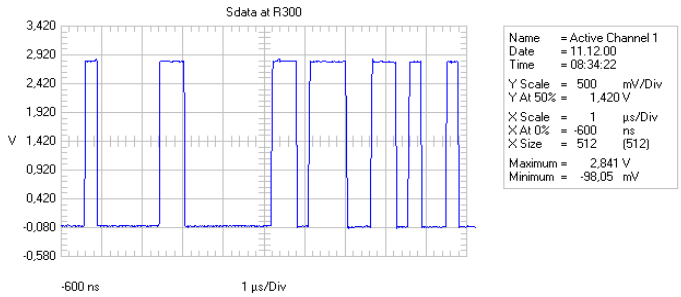
G502 26MHz reference oscillator faulty

Check Vcc 2.7V at G502 pin 2 and Vcont (varies between 0.03V and 2.3V, typically 1.3VDC) at C552
If frequency deviation is higher than ± 100 Hz, it is necessary to change the oscillator.

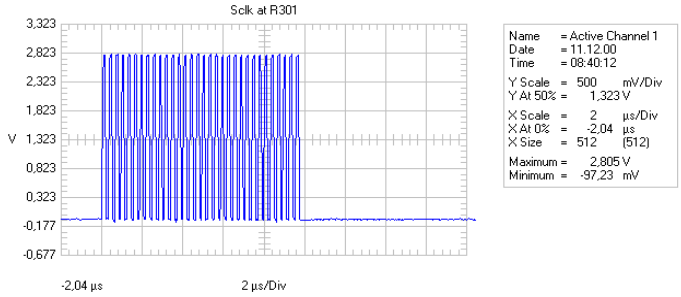
G500 SHF oscillator faulty

Check (if possible) the frequency of G500 at T502 pin 3/4 – refer to frequencies worksheet
If you have no possibility to check frequency, you can check if oscillator works by measuring Vcos 2.7V DC at C522 and voltage which adjusts G500 at C558, which varies between 1.2V DC and 3.2V DC.
If voltage at C558 is 4.8V the oscillator doesn't work in all probability or control loop is open.
Another possibility to check G500:
Activate phone to RX burst mode Ch38, do NOT connect RF generator to the phone. Now check 942.6MHz (SHF-frequency divided by 4) at both sides of L504, amplitude is approximately –90dBm.

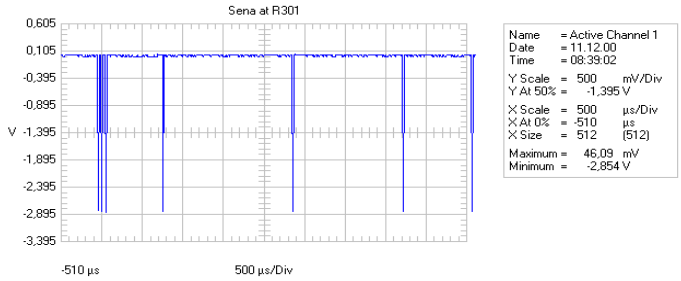
SDATA measured at R300 (normal mode)



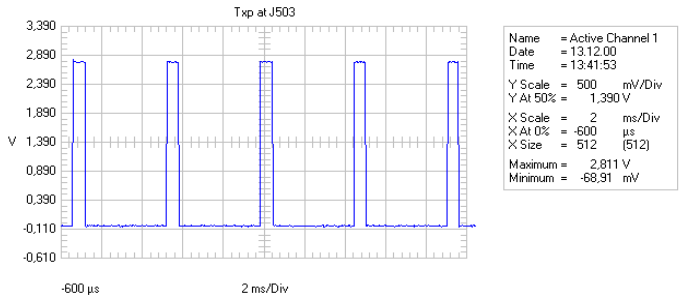
SCLK measured at R301 (normal mode)



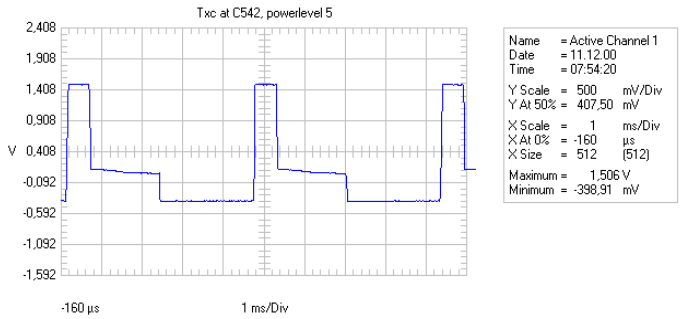
Sena measured at R301 (normal mode)



TXP measured at J503 (active unit TX)

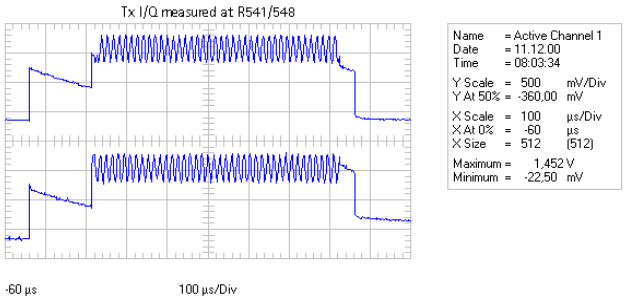


TXC measured at C542 (active unit TX, powerlevel 5)

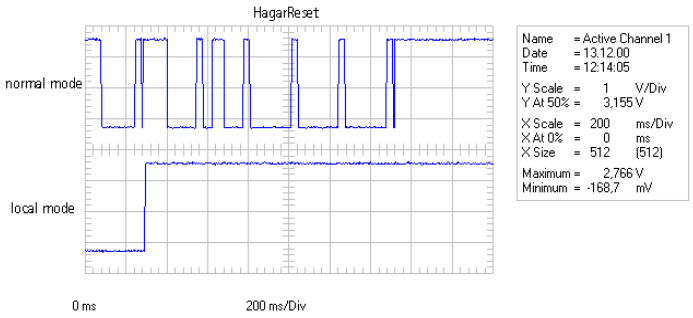


The amplitude of TXC depends on the chosen powerlevel. It varies between 0.6Vpp on powerlevel 19 and 1.9Vpp on powerlevel 5.

TX I/Q signals
measured at R541/548
Active unit TX



HAGARRESET
Measured at R516



While HAGAR Reset pulses from 0V to 2.8V in normal mode, it stays on 2.8V in local mode after being low for some milliseconds.

N502 power amplifier faulty

Check TX power signal at C605.
Check Vapc at R532 (1.4Vpp- 2.6Vpp squarewave, depending on powerlevel)
Check Vbatt 3.6V DC at pin 4 and 5 of N502.
If all values are ok, but still there´s no or too low TX power measurable at N502 pin 6, change poweramplifier.
Note: 3 different PA and resistors (R311 and R312, see MAD schematics)

Z502 Diplexer faulty

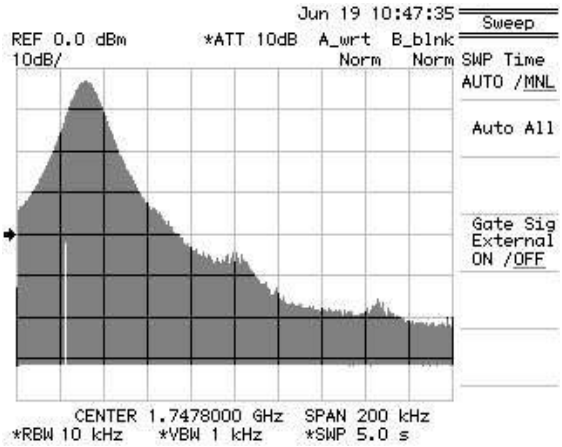
Check TX power signal at Z502 pin 8
Check TXVGSM 2.8Vpp squarewave at Z502 pin 16
If signals ok but no or too low TX power signal at Z502 pin 4 measurable, change diplexer

No or too low TX power GSM 1800

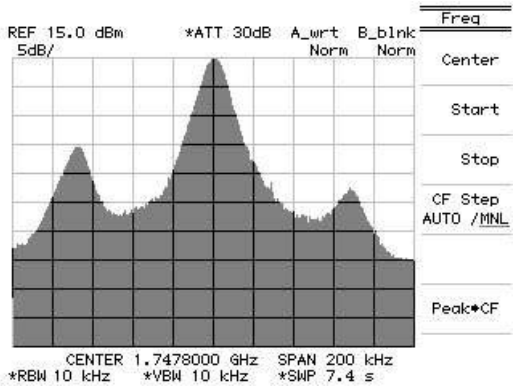
Use WinTesla to set phone in following mode:
Initialise/ Product/ Band/ PCN/ Testing/ RF Controls/ active unit TX Ch.700

To find a fault in GSM 1800 TX mode you can proceed almost the same way as described for GSM 900:
Check 26MHz reference oscillator at G502 pin 3, 1Vpp, frequency deviation < 100Hz
Check TXI/Q signals at R541/548. If not ok, check signals at COBBA N100 (Vbb 2.8V DC at C119,
VCOBBA 2.8V DC at C116/117 and COBBACLK at J317)
Check 1747.8 MHz at L512. If not ok, check signals at HAGAR N500
(Vtcxo 2.8V at C518, Vchp 4.8V at C505, Vsynte 2.8V at C501/504, Vrxrf 2.8V at C500, Vref 1.35V at C536)
Check 1747.8 MHz at C566. If not ok, check/change T503.
Check 1747.8 MHz at N502 pin 3. If not ok, check/change R542/N502
Check 1747.8 MHz at C593. If not ok, check L515 in & out, check also signal at
Z502 in & out and TXVDCS 2.8Vpp squarewave at L508 (sets Z502 to TX-mode)

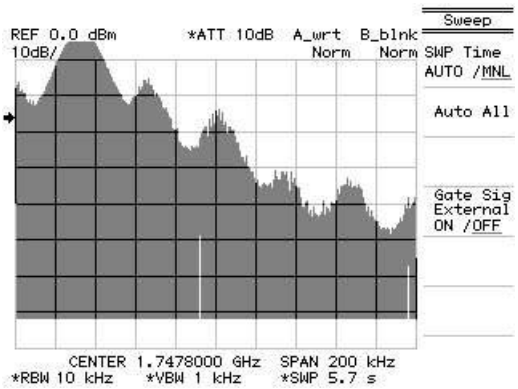
Faulty spectrum



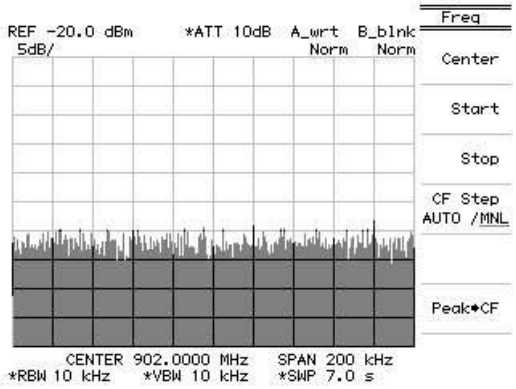
1) Normal spectrum



2) Spectrum of faulty COBBA



3) Spectrum with broken solderings under CCONT
Spectrum turns to picture 1 if CCONT is pushed careful with some nonmetalled item.



4) Spectrum of faulty oscillator G500

No RX calibration GSM 900 possible

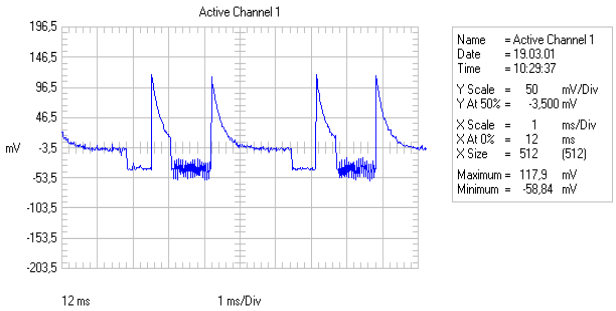
Use Wintesla to set phone in following mode: Initialise/ Local mode// Testing/ RF Controls/ active unit Rx Ch.38 burst mode. Set RF- Generator to a high RF- Level output, eg –40dBm

Check 26MHz reference oscillator at G502 pin 3, 1Vpp, frequency deviation < 100Hz
Check 942.6MHz at Z502 pin 14. If not ok, check C593 or change Z502.
Check 942.6MHz at C545. If not ok, check C556 or change Z501.
Check 942.6MHz at C534. If not ok, check voltage at V501 pin 3 (0.4V DC) and pin 4 (0.9V DC).
Check 942.6MHz at both sides of L504. If not ok, check C520/528, T501 or change Z500.
Check RxIQ signal at R504. If not ok, check signals at HAGAR N500 (See below)
If signal at R504 is ok but still no RX-calibration possible, check signals at COBBA N100 (Vbb 2.8VDC at C119, VCOBBA 2.8VDC at C116/117 and COBBACLK at J317)-change COBBA if necessary.
Probably MAD faulty

N500 HAGAR faulty

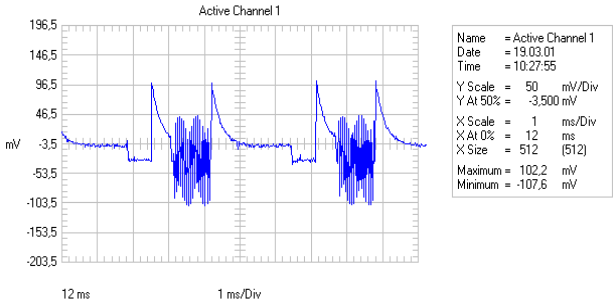
Check voltages at HAGAR:	Vtcxo	2.8V at C518
	Vsynte	2.8V at C501/504

Check 26MHz reference oscillator at G502 pin 3, 1Vpp, frequency deviation < 100Hz
Check 942.6MHz at both sides of L504
Check Sdata at R300, Sclk/Sena at R301 and HAGARReset at C540, refer to diagrams in section TX-faults
Check 67.708kHz at the four pads of C512 located towards G502 (burst mode, input level-65dBm)

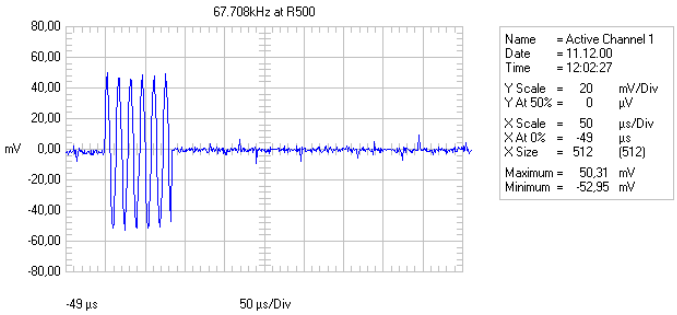


If signal is not ok, check Vrxrf 2.8V at C500, also check Vchp 4.8V at C505 and frequency of G500 at T502 pin 3/4 (RX Ch.38: 3770.4MHz) or change HAGAR N500.

Check 67.708kHz at the four pads of C512 located towards N500 (burst mode, input level -65dBm)

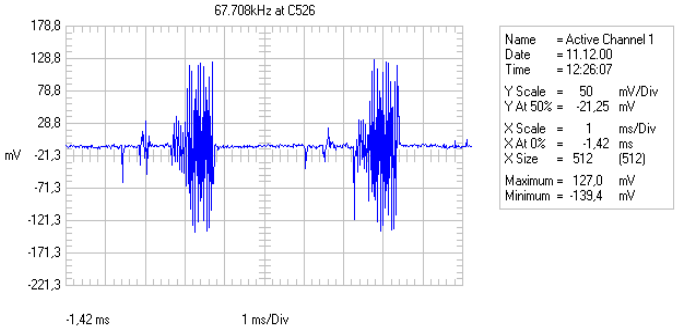


Check 67.708kHz at R500 (burst mode, input level –65dBm)

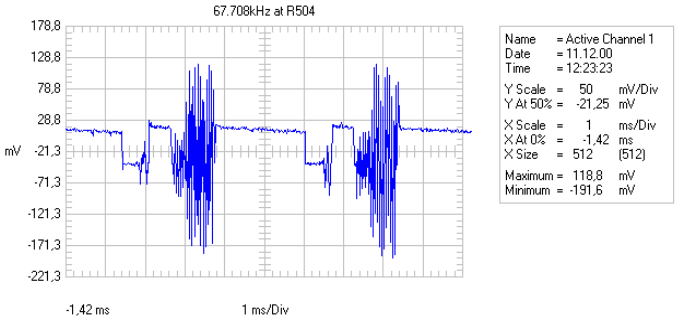


If signal is not ok at R500, check C508 for shorts to ground, check resistance of R500 (4 * 100Ohm) or change HAGAR N500.

Check 67.708kHz at C526 (burst mode, input level –65dBm)



Check 67.708kHz at R504 (burst mode, input level –65dBm)



If signal is not ok at R504, check Vref 1.35V at C536, check also C514/526 if broken or cold soldered, change HAGAR N500 if necessary.

Poor service or no network coverage, C508 faulty

In case of this fault combined with a RX-calibration which works, but whose values are not ok (incorrect stepwidth as shown in the picture below), check signals at R500 and R504. The signals below were measured in Rx-burstmode with an input level of –65dB. Channel 1 shows the signals of a proper working phone while Channel 2 shows the same signals of a phone in which C508 is faulty. R500 contains four resistors, so that you have to measure all four lines. It could happen that you will get the signal shown in channel 2 more than once, that means that more than one of the four capacitors in C508 are broken.

OK

AFC information:

```
AFC init value.................:    35
AFC slope......................:   263
PSW slope......................:   214

Nro  Gains(Q6)
  0    31.13
  1    41.13
  2    51.13
  3    60.13
  4    70.13
  5    80.08
  6    89.80
  7    99.88
  8   109.36
```

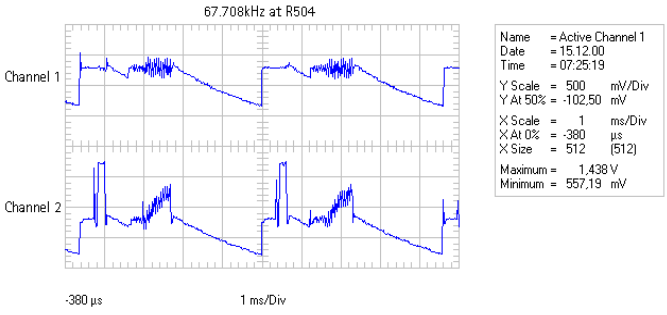
Not OK

AFC information:

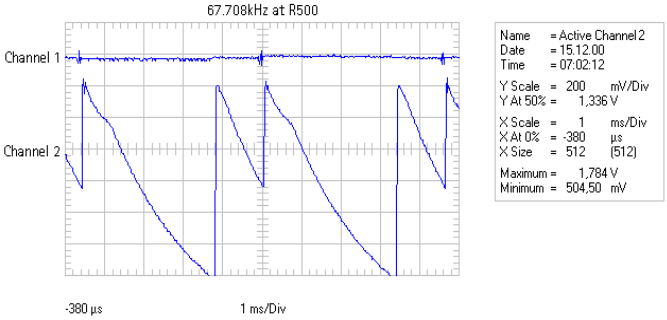
```
AFC init value.................:     9
AFC slope......................:   264
PSW slope......................:   214

Nro  Gains(Q6)
  0    31.08
  1    41.08
  2    51.08
  3    60.08
  4    70.08
  5    80.97
  6   111.55
  7   111.86
  8   112.77
```

Signals measured at R504 (RX burstmode, input level –65dBm)



Signals measured at R500 (RX burstmode, input level –65dBm)



COBBA N100 faulty

Check Vbb 2.8V DC at C119 and VCOBBA 2.8V DC at C116/117
Check COBBAclk at J317 (see diagram in chapter "Contact Service")
Probably faulty COBBA N100 or broken solderings under it . Remove COBBA, replace it with µBGA rework machine and retune Rx/TX values of the phone.

G502 26MHz reference oscillator faulty

Check Vcc 2.7V at G502 pin 2 and Vcont (varies between 0.03V and 2.3VDC, typically 1.3VDC) at C552.
If frequency deviation is higher than ± 100 Hz, it is necessary to change the oscillator.

G500 SHF oscillator faulty

Check if possible the frequency of G500 at T502 pin 3/4 (refer to frequencies worksheet at page #28).
If you have no possibility to check frequency, you can check if oscillator works by measuring Vcos 2.8V DC at C522 and voltage which adjusts G500 at C558, which varies between 1.2V DC and 3.2V DC.
If voltage at C558 is 4.8V the oscillator doesn't work in all probability or control loop is open.
Another possibility to check G500:
Activate phone to RX burst mode Ch38, do NOT connect RF generator to the phone. Now check 942.6MHz (SHF-frequency divided by 4) at both sides of L504, amplitude is approximately –90dBm.

No RX- calibration GSM 1800 possible

Use WinTesla to set phone in following mode: Initialise/ Product/ Band/ PCN// Testing/ RF Controls/active unit RX Ch.700, burst mode.
Set RF- Generator to a high RF- Level output, eg –40dBm.

To find a fault in GSM 1800 Rx mode you can proceed almost the same way as described for GSM 900:

Check 26MHz reference oscillator at G502 pin 3, 1Vpp, frequency deviation < 100Hz
Check 1842,8MHz at Z502 pin 12. If not ok, check C593 or change Z502.
Check 1842,8MHz at C525. If not ok, check C510/547 or change Z501.
Check 1842,8MHz at C519. If not ok, check voltages at V500:pin 3 (0.4V DC), pin 4 (0.9V DC), pin 5/6 (0.7V DC), pin 8 (0.13V DC), change V500 or N500 if necessary.
Check 1842,8MHz at both sides of L500. If not ok, check C507/515, T500 or change Z500.
Check RxIQ signal at R504. If not ok, check signals at HAGAR N500
If signal at R504 ok but still no Rx-calibration possible, check signals at COBBA N100
probably MAD faulty

FREQUENCY LIST

Channel	TX MHz	RX MHz	VCO - TX MHz	VCO VC at C603 VOLT	VCO - RX MHz	VCO VC at C603 VOLT
975	880,2	925,2	3520,8	1,46	3700,8	2,66
1023	889,8	934,8	3559,2	1,7	3739,2	2,81
1	890,2	935,2	3560,8	1,7	3740,8	2,81
38	897,6	942,6	3590.4	1,9	3770.4	2,93
60	902	947	3608	2,01	3788	3
124	914,8	959,8	3659,2	2,34	3839,2	3,2
512	1710,2	1805,2	3420,4	0,84	3610,4	2,03
700	1747,8	1842,8	3495,6	1,3	3685,6	2,36
885	1784,8	1879,8	3569,6	1,77	3759,6	2,66

CHANGE HISTORY

Originator	Status	Version	Date	Comment
CC-Training-Group	Draft	0.1	14.02.2001	First draft version for the repair group
CC-Training-Group	Draft	0.5	02.03.2001	Remarks of Repairgroup added
CC-Training-Group	Draft	0.6	05.03.2001	Chapter “Flash update not possible” added.
CC-Training-Group	Draft	0.7	19.03.2001	Remarks of Repairgroup added
CC-Training-Group	Draft	0.8	23.03.2001	Flowcharts and Frequency list Improved
CC-Training-Group	Approved	1.0	27.03.2001	First approved version