V3
Debug - Guide

RAZR

Table of contents

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	9. June 2005	L. Heide

1.0 Preamble

This document was created to assist analyzers when fixing problems on Motorola GSM Phones. All information was collected during the repair in the Repairentitlement Group Flensburg.

2.0 Some basic tips

2.1 Software upgrade
- always use the latest Software available for the phone (Software-   bugs are excluded)

2.2 Visual inspection
- check for liquid damage (water indicator)
- check for missing, broken or unsoldered parts
- check for mechanical damage (board twisted, tracks defect etc.)

2.3 Cross check
- before beginning to replace/change parts or soldering anything
  try to consider the failure from all sides.

2.4 Solder process
- the soldering process of lead-free products always must be done   with the aid of a bottom-heater and flux for lead-free soldering
- always cover sensitive parts with shields

3.0 Top 10 Defects

- Fig. 1 shows a analysis-summary of the phones repaired in NPI-   process related to the first repair works at all.
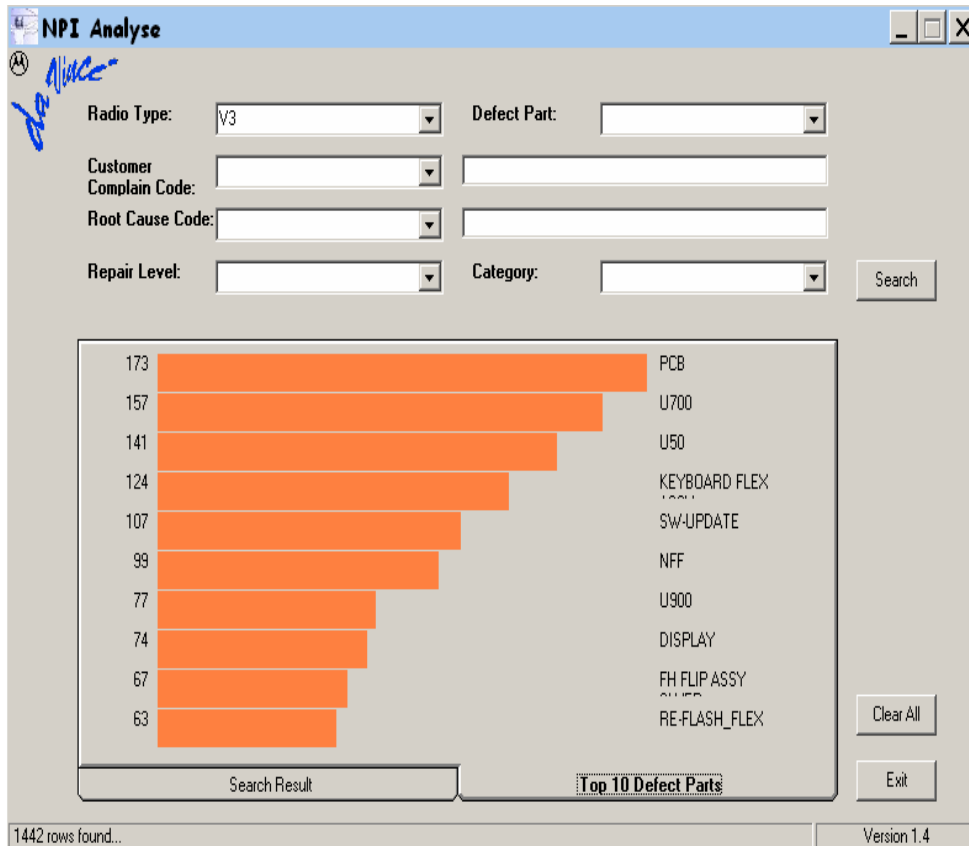

Fig. 1

4.0 Most frequent failure-codes - related root causes

TON -
U700, U800 ,U900, Keyboard Flex Assy ,J Keyboard, Y900, Y805

MKP -
Keyboard Flex Assy, J Keyboard

CHG
U900

CPR -
U50, U800

DIM -
Display, Keyboard Flex Assy, J Keyboard

DIS -
Display

ALT -
U900

AUD -
J41, U900

BAT -
U50

5.0 U700   Flash-Part / EE-Prom / SRAM

Customer complaint
  - TONxx

1. Check the phone with a test battery. When the phone turns on, check the customers charger and battery.
2. Disassemble the phone and try to boot the PCB with EMU connector if the phone starts up, check the customers housing.
3. If the phone starts in flash-mode (yellow status) when connecting with the EMU connector, try to reflash with 1FF-flash file. If this is not successful replace U700.
4. When the phone starts in blank- mode (yellow status)when connecting with the EMU connector, try to make a reflash with an Image-flash file. If is this not successful replace U700
5. If the phones current drain is ~55mA (red status) and decreases after a few seconds to ~6mA when connecting with the EMU connector also replace U700.

5.1 U50   Power-Amplifier (Eagle-IC)

Customer complaint
  - CPRxx / TONxx

1. Connect the phone with the EMU connector while monitoring the current drain. If U50 (PA) is defect, you could have a short to ground (board does not start/disconnects immediately). Occasionally the PA draws slightly more than the nominal current (check nominal current with a reference-board ~40mA). If the PA gets hot, replace the PA (U50).
2. Check TX-output spectrum by setting the phone in TX-mode using the spectrum-analyzer. Compare level and shape of the spectrum with a reference-board if the level is to low or the spectrum looks bad replace U50.
3. Also check to the time mask with a GSM-Test-Set. If the signal does not conform to specifications, replace U50.

5.2 Keyboard Flex Assy

Customer complaint
  - MKPxx / DIMxx / TONxx / DISxx

1. If some or all keys are not working or power up is impossible with the on/off key, then perform a cross check with reference-housing. When all keys are working, replace the Keyboard Flex Assy.
2. When the keyboard backlight is defect or intermittent, make a cross check and if necessary change Keyboard Flex Assy.
3. If the display shows strange symbols or nothing at all also make a cross check and replace Keyboard Flex Assy if it is necessary.

5.3 U900   PCAP 3

Customer complaint
  - TONxx / ALTxx / CHGxx

1. If the multi-media ring tones are not working, replace U900.

2. When the charging process is not working, U900 could be defect.

3. Check these voltages, if the phone has a power up problem. Connect PCB with EMU Connector and check the current drain. If the current drain is only ~ 0.6 mA, measure following voltages:

VBoost	~ 5.8V	at C921
VBuck	~ 1.9V	at L920
RF 5V REG	~ 5,0V	at C933

   Please refer to Fig. 2

If these Voltages are not present change U900.

VBuck ~ 1.9 V

VBoost ~ 5.8 V

RF 5V REG ~ 5 V

Fig. 2

5.4 U800   Processor (Neptune)

Customer complaint
- TONxx
1. If all the voltages of PCAP 3 are present, the crystals
   (Y805 and Y900) begin to oscillate and the flash-part has previously been
   replaced, a defect U800 could cause the problem too.

5.5 Display

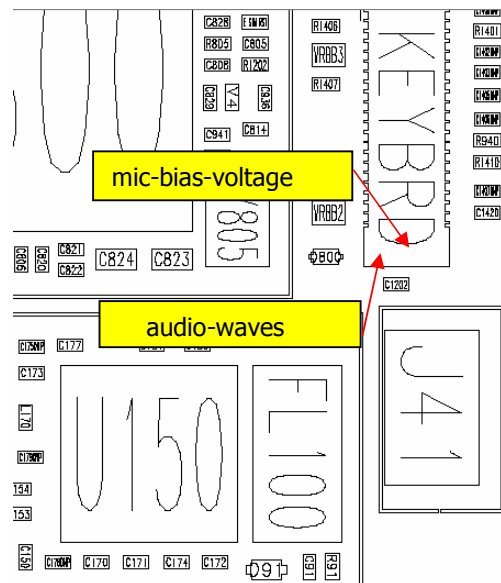Customer complaint
- DISxx / DIMxx

1. If the display has missing pixels or a missing line replace it.
2. If the secondary display shows only backlight or is completely dead, change the display.
3. If the display shows strange symbols, make a cross check with a reference-housing and a reference-flip and act accordingly.

5.6 J41   MIC

Customer complaint
- AUDxx

1. If TX-audio is missing, buzzing or is to low set PCB in audio loop mode and check at C1202-2 mic bias voltage ~ 2.15 V from PCAP (Fig. 3). If the bias voltage is present, measure using an oscilloscope measure at C1202-1 int-micp ~1V. While speaking into the microphone check for audio signals on your oscilloscope.

5.6 J-Keyboard

Customer complaint
- DIMxx / TONxx / MKPxx

1. If this fault could not be localized with a cross-check, check the Keyboard-Connector. Often the Connector is poorly soldered or has a dry joint.
   Sometimes J-Keyboard is broken (look with microscope).
   If the above mentioned does not apply, the fault is most probably PCB-related.