

BE INSPIRED

# AP75



| Release | Date      | Department        | Notes to change |
|---------|-----------|-------------------|-----------------|
| R 1.0   | 5.09.2005 | COM D CCQ PS APAC | New Document    |
|         |           |                   |                 |
|         |           |                   |                 |

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## 1 Introduction

This document describes the process and procedure regarding the verification of the customers fault description of Siemens Mobile Phones.

### 1.1 Purpose

Purpose of the instruction is to avoid unnecessary repairs and to optimise repairs. Beside this, the instruction is made to give the Service Partners a general orientation where to find and where to get required documents.

### 1.2 Scope

This document is the reference document for all Siemens authorised Service Partners. It has to be used from the Level 0 onwards up to the maximum repair Level.

### 1.3 Terms and Abbreviations

#### 1.3.1 Terms

#### 1.3.2 Abbreviations

|     |   |                             |
|-----|---|-----------------------------|
| RTC | - | Real time clock             |
| LCD | - | Liquid crystal display      |
| DSC | - | Digital still camera        |
| CSD | - | Customer Service Department |

## 2 Remark

All instructions given in this document are valid for AP75.

## 3 GPRS (General Packet Radio Service)

GPRS is a new non-voice value added services that allows information to be sent and received across a GSM mobile telephone network. It supplements today's Circuit Switched Data (CSD) and Short Message Services (SMS). GPRS involves overlaying a packet based air interface on the existing circuit switched GSM network. This gives the option to use a packet-based data service. The information is split into separated but related "packets" before being transmitted and reassembled at the receiving end. Theoretically, maximum speeds of up to 171.2 kilobits per second (kbps) are achievable with GPRS using all eight timeslots at the same time. This is about 3 times as fast as the data transmission speed possible over today's fixed telecommunications networks and 10 times as fast as current Circuit Switched Data services on GSM networks.

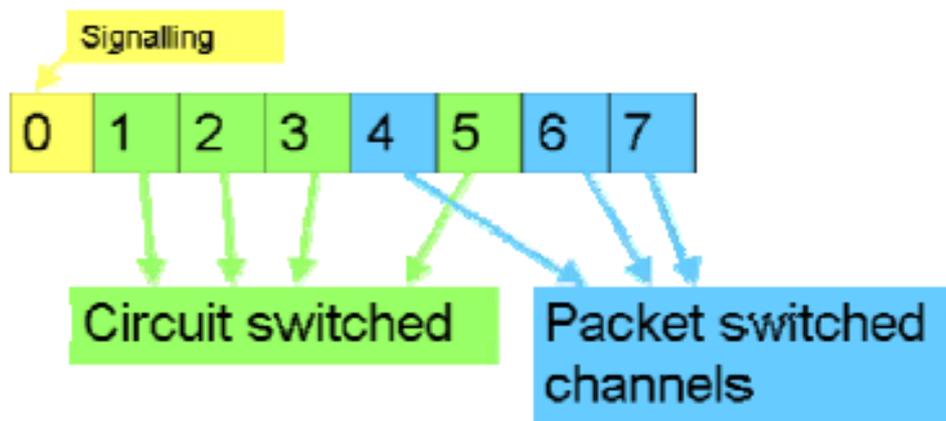


Figure1. Example of GPRS data transmission

**Example: Cell with 1 Frequency channel:**

**1 physical channel for signaling, 4 physical channels for Circuit switched and 3 physical channels for Packet switched.**

## 4 Key Features

|               |   |
|---------------|---|
| Bands         | <ul style="list-style-type: none"><li>• Triple Band E-GSM 900 / GSM 1800 / GSM 1900</li><li>• GPRS Multi Class 10</li></ul>   |
| Battery       | <ul style="list-style-type: none"><li>• Li-Ion Battery Pack</li><li>• Nominal Capacity : 760 mAh</li></ul>  |
| Stand-by Time | <b>TBC</b>  |
| Talk Time     | <b>TBC</b>  |
| Display       | <ul style="list-style-type: none"><li>• Resolution: 128 x 128 Pixel</li><li>• Display 65,536 true colours</li><li>• Technology: CSTN</li><li>• Size: 1.5 inch</li></ul> |
| Browser       | WAP 2.0   |
| Memory        | 500KB   |
| Camera        | <ul style="list-style-type: none"><li>• CIF 2x/4x digital zoom</li><li>• 3 continuous shooting</li></ul>  |
| PIM/Sync      | Basic organiser: event reminder, address book and calendar  |
| Connectivity  | <ul style="list-style-type: none"><li>• Bluetooth</li></ul>   |
| Ring tones    | <ul style="list-style-type: none"><li>• 16 chords polyphonic ringtones</li><li>• SMARF MIDI</li></ul>   |
| Dimensions    | 102 x 44 x 18 (mm)  |
| Weight        | 86g   |
| Messaging     | SMS, EMS, MMS   |

## 5 Accessories

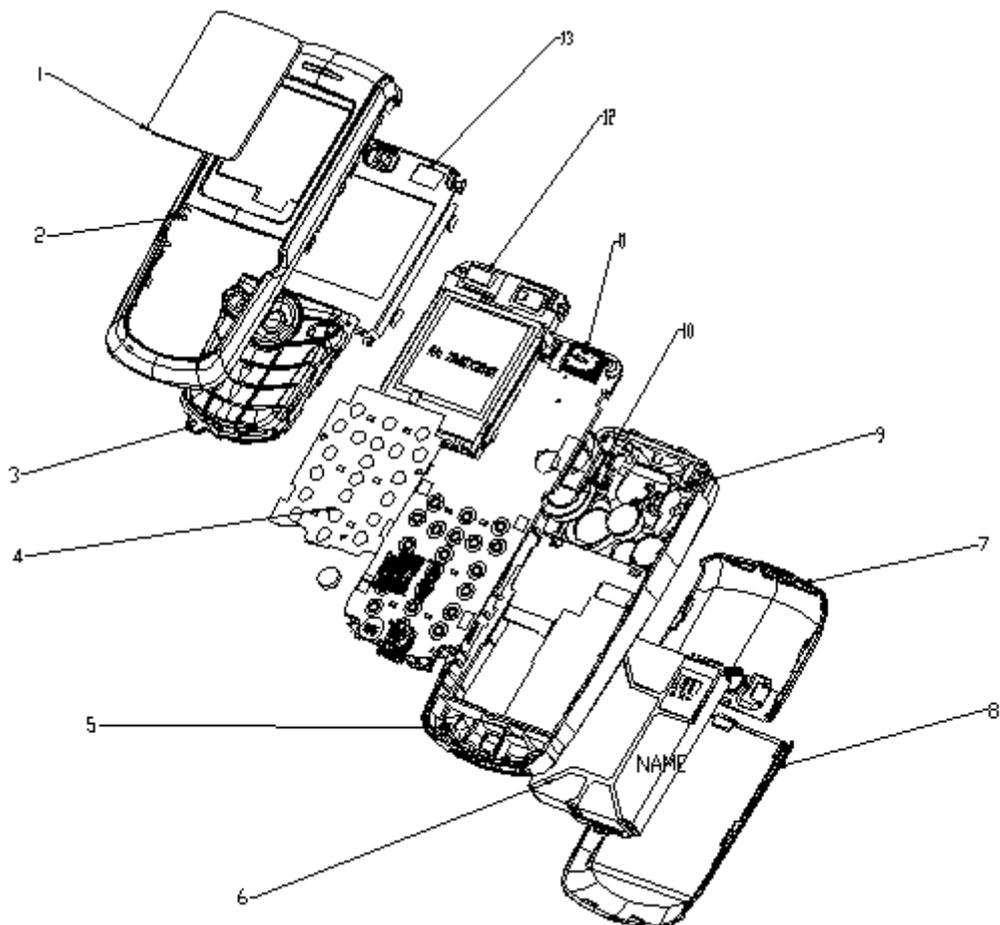
For AP75, the following accessories will be available.

| Description                     | Part number  |
|---------------------------------|--------------|
| Li-ion battery 760mAh PL-105    | 23.20107.101 |
| Travel charger C10137           | TBC          |
| Car charger C10678              | TBC          |
| BT Mono Headset BHM-100/BHM-035 | TBC          |
| Headset Basic HEM-100/HEM-102   | TBC          |

Note: Visit the Communication Market for updated accessories:

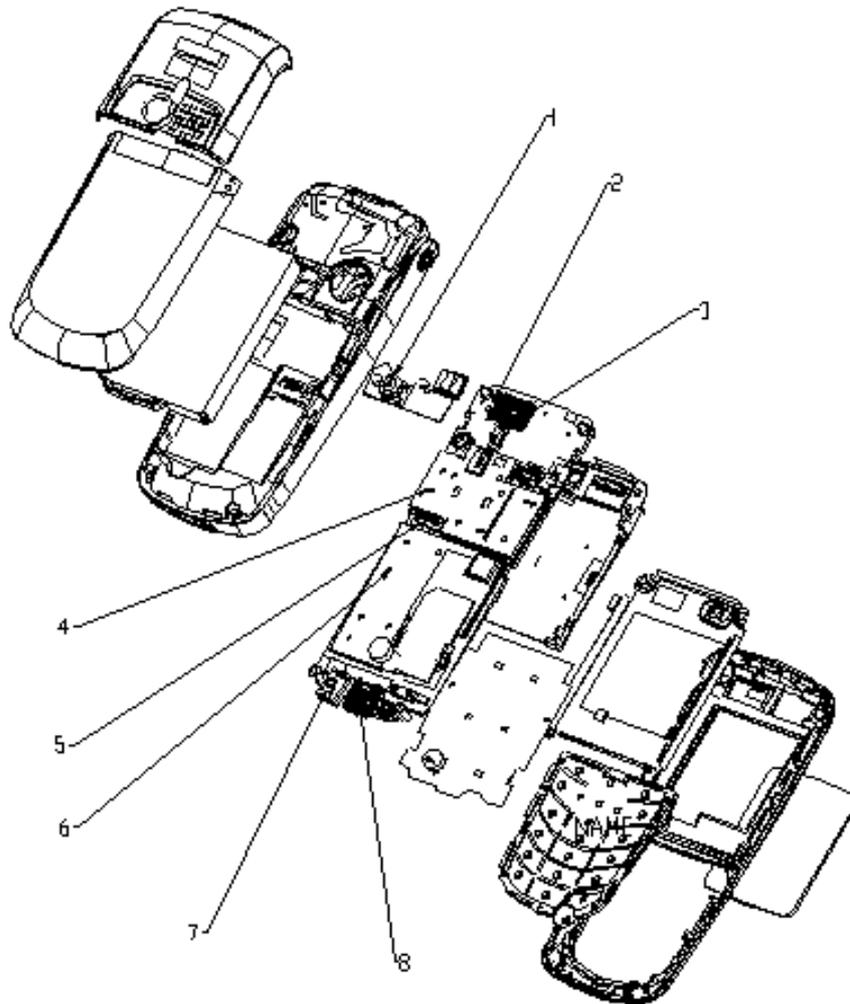
<https://communication-market.siemens.de/>

## 6 Exploded View of AP75 (Front view)



| Item | Part No.     | Description                 |
|------|--------------|-----------------------------|
| 1    | 42.67701.021 | LENS 56E11                  |
| 2    | 65.69703.001 | ASSY FRONT CASE 56E22       |
| 3    | 42.67707.001 | ASSY KEYPAD ENG BLACK 56E11 |
| 4    | 34.67705.001 | Dome 56E11                  |
| 5    | 65.69702.001 | ASSY REAR CASE 56E22        |
| 6    | 23.20107.001 | J11_BATTERY                 |
| 7    | 39.69708.001 | CVR ANT 56E22               |
| 8    | 39.69707.001 | CVR BATT 56E22              |
| 9    | 23.46070.001 | J11_B1_VIBRATOR             |
| 10   | 23.46770.031 | J11_SPEAKER                 |
| 11   | 23.45018.001 | RECEIVER                    |
| 12   | 56.07677.001 | LCDM 15 128*128             |
| 13   | 33.67701.013 | LCD FRAME 56E11             |

## 7 Exploded View of fAP75 (Back view)



| Item | Part No.     | Description                 |
|------|--------------|-----------------------------|
| 1    | 56.18677.001 | CAMERA MODULE CIT-JC-3640   |
| 2    | 21N0061.001  | CONN SPRING C362018M4-SM12  |
| 3    | 21N0029.001  | J11 B2A VIBRATOR CONN       |
| 4    | 60.67702.001 | ASSY SHIELD CASE RT         |
| 5    | 21N0037.111  | CONN SMT BATT CUC-2007-2434 |
| 6    | 65.69701.001 | ASSY SHIELD CASE BB         |
| 7    | 20.N2012.001 | CONN SMT JC PWR 2P R1 56188 |
| 8    | 21N0047.001  | CONN I/O XP AC1/916-1948    |

## 8 ESD Protection

**Note:** ESD concept; the internal circuits will be more susceptible to ESD because of the use of exchangeable housing. The construction of the internal block must be/is designed, in the best possible way, to protect the circuit against sparks.

The keypad must be completely closed to prevent any occurrence of an ESD disruptive discharge.

The SIM contacts may be open, thus reachable for ESD contact discharge.

It is a requirement for the service personnel to observe ESD protection rules while performing servicing the AP75.

Reference for ESD Protection is the manual:



"ESD Guideline.pdf"

ESD Guideline.pdf

The document is available via download from the C-Market

<https://market.benqmobile.com/so/welcome.lookup.asp>

## 9 Disassembly of AP75



| Name   | Part number    |
|--|----------------|
| Tweezer  | XXXXXXXXX      |
| Opening tool   | XXXXXXXXX      |
| Torque screw driver, T5 type, torque set to 1.5kg-cm | F30032-P228-A1 |

## Step 1



Front view

## Step 2



Rear view

## Step 3



Remove battery cover

## Step 4



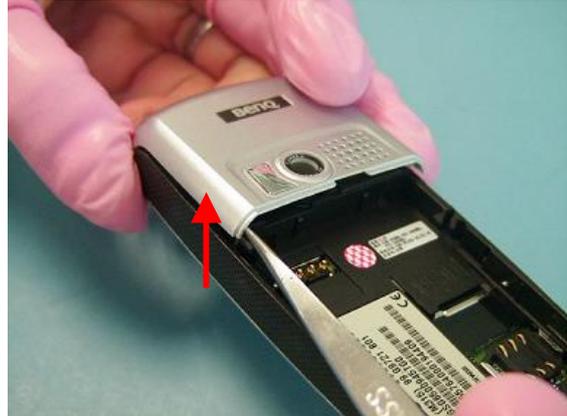
Remove battery

## Step 5



Remove SIM card

## Step 6



Push two corners of antenna cover upward to separate antenna cover from rear housing. After releasing the two latches, the antenna cover can be ply open using upward movements.

## Step 7



Release the two screws.

## Step 8



Use the opening tool to separate the front and rear case.

## Step 9



Separate the keypad from the front case

## Step 10



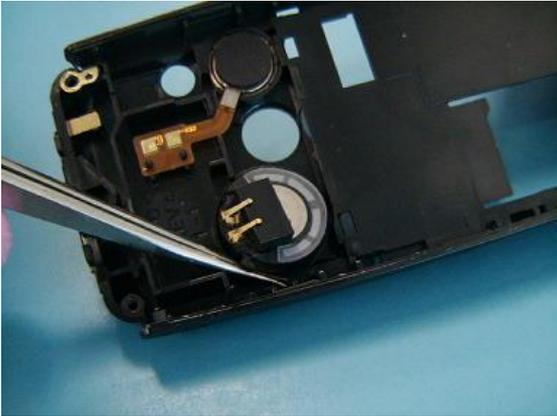
Release the two screws above the LCD display.

## Step 11



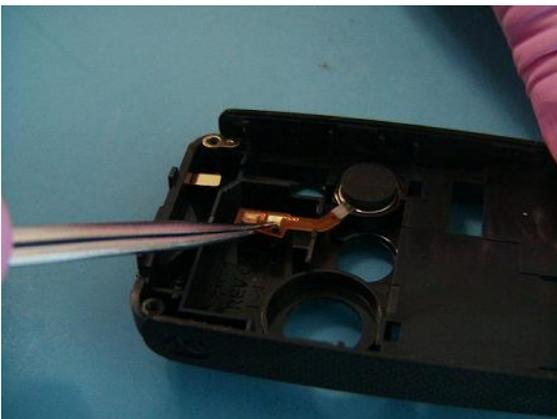
Separate the main board from the rear case by lifting it upward.

## Step 12



Remove the speaker from the rear case.

## Step 13



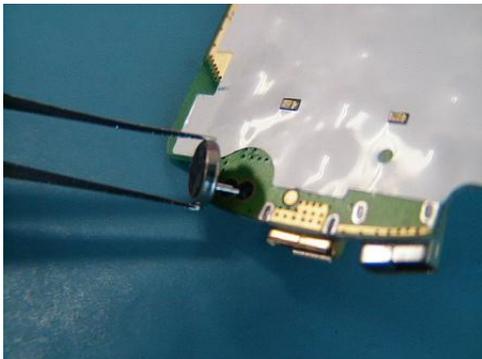
Loosen the flex cable from the two catch and remove the vibrator using a pair of tweezers.

## Step 14



Unplug the camera from the main board and remove it from the shield cover.

## Step 15



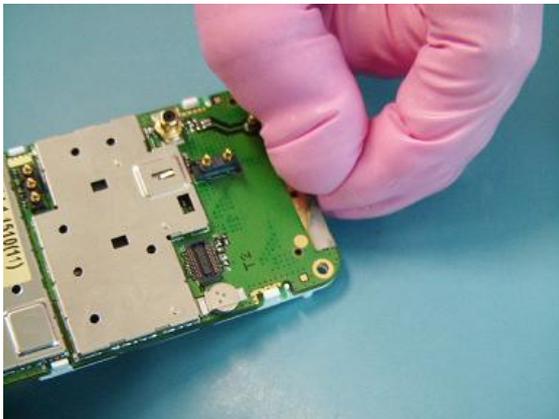
Remove the microphone from the main board.

## Step 16



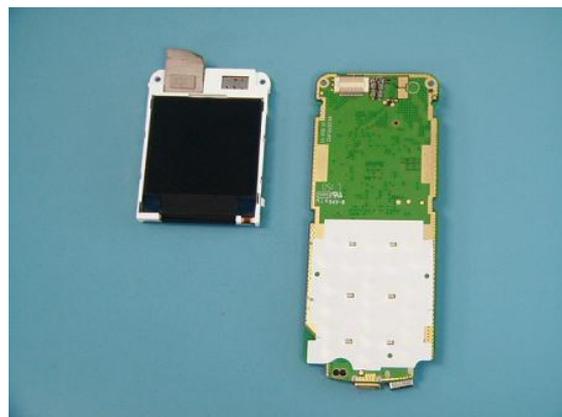
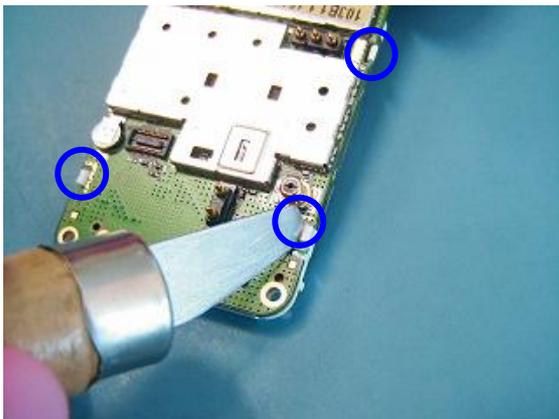
Unfasten the hooks of the LCD frame from the LCD module.

## Step 17



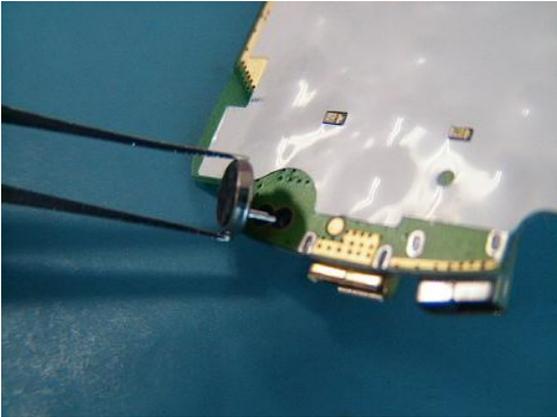
Peel off the tape and unplug the connector for the LCD module.

## Step 18



Unfasten the 4 hooks and remove the LCD module from the main board.

## Step 19



Remove microphone from the main board.

## Step 20



Fully disassembled parts.

## 10 Assembly of AP75

**For the reassembly of the AP75, reverse the disassembly procedures from Step 19 to Step 1.**

During assembly of the front and rear housing, ensure that the two latches on the front casing is hooked onto the latch on the rear casing.



During the installation of the SIM card, make sure that the SIM card is inserted properly and that the golden contact area is facing downwards. Insert the SIM card downwards to lock the SIM card into position.

During the installation of the battery, make sure that the hinges are properly in place. Otherwise the battery will not be able to fit into the phone properly.

## 11 Mobile Software Programming

The programming of the phone is done in two parts:

1) Program code:

The actual code to control handset. After download, program code would be stored in flash

2) Language pack:

Software load built separately from program code

- Data font bitmaps
- Prompt tables
- iTAP dictionaries
- Wallpaper / melody / icon / image
- Portion of text labels, mainly are descriptions of object content, the supported languages of these texts should be matched to the language pack
- other information
- Image, melody which belongs to Operator pack in J11

Tools and cables : See attached document or check latest version in **C-Market**

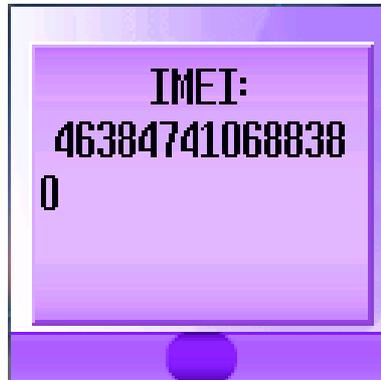


"TD\_SW

Download\_L1\_AP75\_(

## 11.1 MMI Test Function

### 10.2.1 \*#06# - Show IMEI

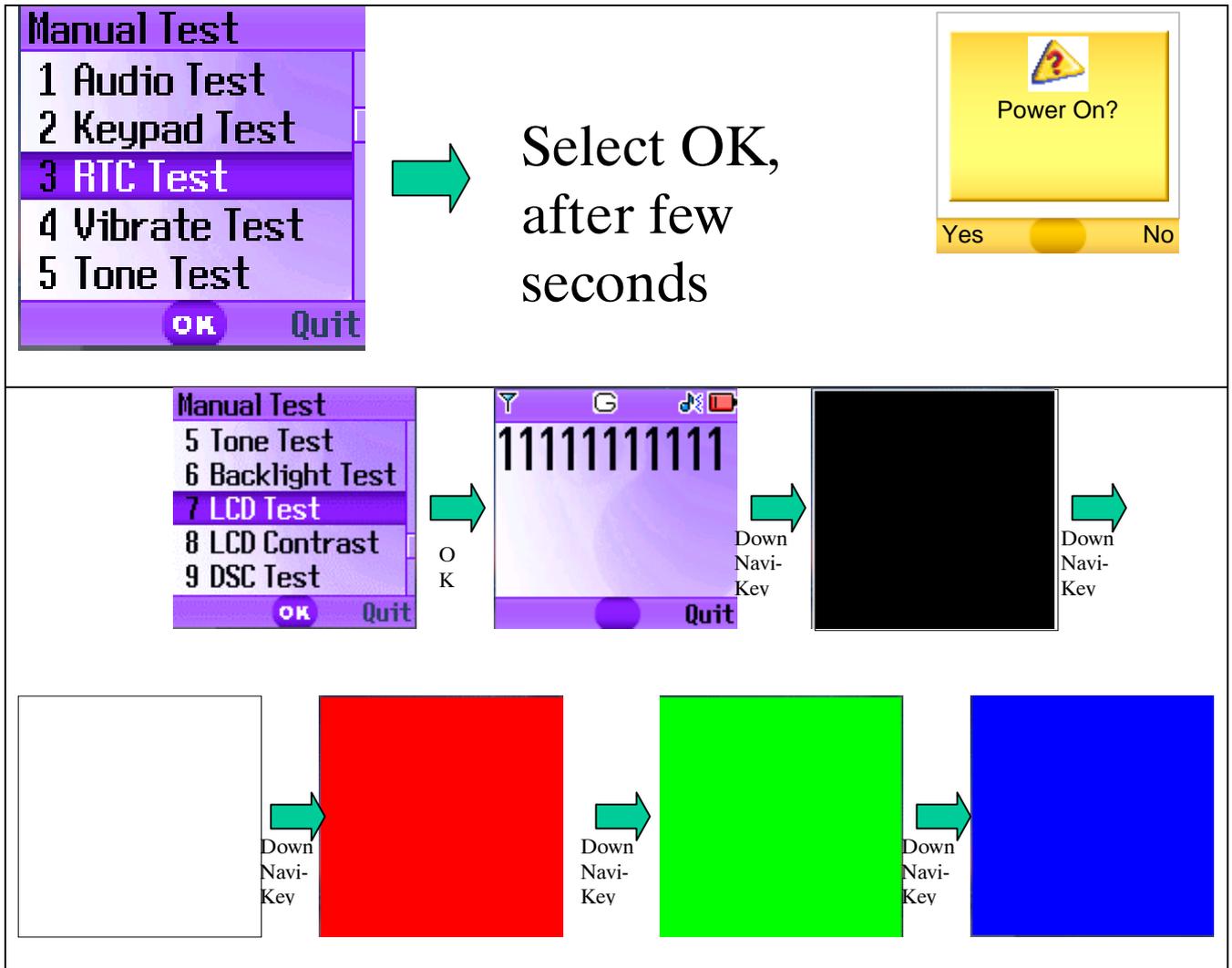


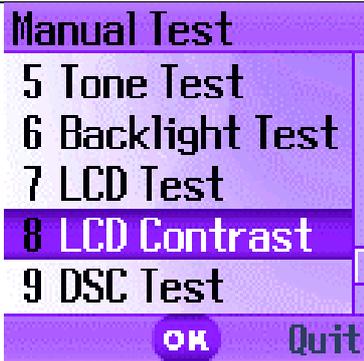
### 10.2.2 \*#300# - Show SW/HW information

## 10.2.3 \*#301#

### - Function test

(ie. Audio, keypad, RTC, vibra, backlight, LCD, DSC, BT)





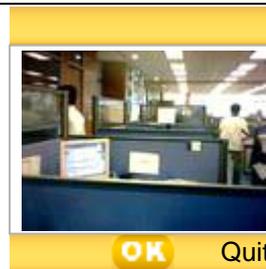
O  
K



Select Up/Down Navi-Key to adjust contrast, select OK to save



O  
K



## 12 International Mobile Equipment Identity, IMEI

The mobile equipment is uniquely identified by the International Mobile Equipment Identity, IMEI, which consists of 15 digits. Type approval granted to a type of mobile is allocated 6 digits. The final assembly code is used to identify the final assembly plant and is assigned with 2 digits. 6 digits have been allocated for the equipment serial number for manufacturer and the last digit is spare.

Re-use of IMEI label is possible by using a hair-dryer to remove the IMEI label.

For example: **R3 – March 2003**

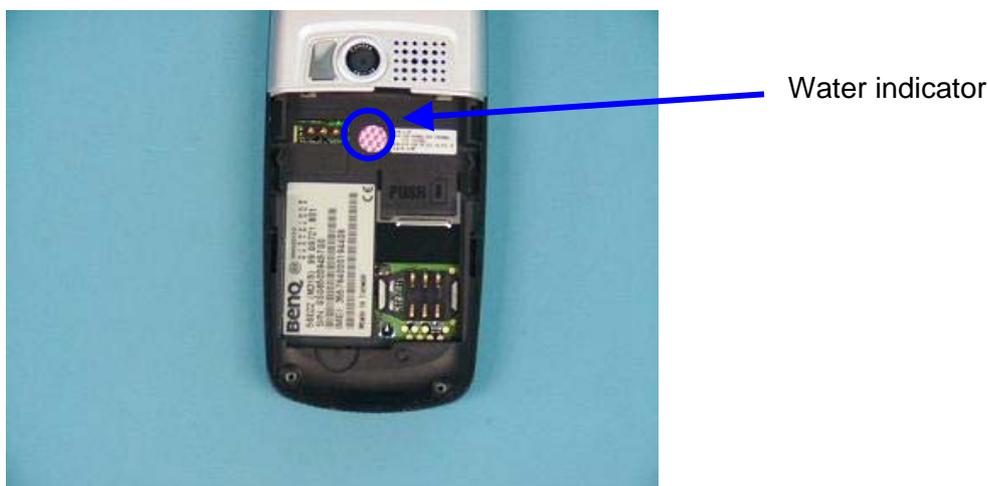
| Code | Year | Month | Code |
|------|------|-------|------|
| R    | 2003 | March | 3    |
| S    | 2004 | April | 4    |
| T    | 2005 | Oct   | O    |
| U    | 2006 | Nov   | N    |
| V    | 2007 | Dec   | D    |

TABLE 1 DIN EN 60062 DATE CODE

Label sample and description - **TBC**

## 13 Water Indicator

To identify if the mobile is moistened, a water indicator is pasted by the side of the contacts to the battery. Once in contact with moisture, the label will turn from white to pink and the spots pattern will become blurred.



## 14 General Testing Information

### General Information

The technical instruction for testing GSM mobile phones is to ensure the best repair quality.

### Validity

This procedure is to apply for all from Siemens AG authorized level 2 up to 2.5e workshops.

### Procedure

All following checks and measurements have to be carried out in an ESD protected environment and with ESD protected equipment/tools. For all activities the international ESD regulations have to be considered.

Get delivery:

- Ensure that every required information like fault description, customer data a.s.o. is available.
- Ensure that the packing of the defective items is according to packing requirements.
- Ensure that there is a description available, how to unpack the defective items and what to do with them.

Enter data into your database:

(Depends on your application system)

- Ensure that every data, which is required for the IRIS-Reporting is available in your database.
- Ensure that there is a description available for the employees how to enter the data.

Incoming check and check after assembling:

### **!! Verify the customers fault description!!**

- After a successful verification pass the defective item to the responsible troubleshooting group.
- If the fault description can not be verified, perform additional tests to save time and to improve repair quality.

Switch on the device and enter PIN code if necessary unblock phone.

Check the function of all keys including side keys.

Check the display for error in line and row, and for illumination.

Check the ringer/loudspeaker acoustics by individual validation.

Check the storage capability:

- Check internal resistance and capacity of the battery.
- Check battery charging capability of the mobile phone.
- Check charging capability of the power supply.
- Check current consumption of the mobile phone in different mode.

Visual inspection:

- Check the entire board for liquid damages.
- Check the entire board for electrical damages.
- Check the housing of the mobile phone for damages.

SW update:

- Carry out a software update and data reset according to the master tables and operator/customer requirements.

## Repairs:

**The disassembling as well as the assembling of a mobile phone has to be carried out by considering the rules mentioned in the dedicated manuals. If special equipment is required the service partner has to use it and to ensure the correct function of the tools.**

**If components and especially soldered components have to be replaced all rules mentioned in dedicated manuals or additional information e.g. service information have to be considered**

## GSM Test:

- Connect the mobile/board via internal antenna (antenna coupler) and external antenna (car cradle) to a GSM tester.
- Use a Test SIM.
- Skip GSM 850/900/GSM1800 or GSM1900 test cases if not performed by the mobile phone.

| Internal Antenna                                  |   |  |                    |
|---|---|--|--------------------|
| Test case   | Parameter   | Measurements   | Limits             |
| 1 Location Update                                 | <ul style="list-style-type: none"> <li>• GSM900</li> <li>• BS Power = -55 dBm</li> <li>• middle BCCH</li> </ul>                   | • Display check  | • individual check |
| 2 Call from BS                                    | <ul style="list-style-type: none"> <li>• low TCH</li> <li>• PCL 5</li> <li>• BS Power = -55 dBm</li> <li>• middle BCCH</li> </ul> | • Ringer/Loudspeaker check   | • individual check |
| 3 TX GSM900                                       | <ul style="list-style-type: none"> <li>• low TCH</li> <li>• PCL 5</li> <li>• BS Power = -55 dBm</li> <li>• middle BCCH</li> </ul> | <ul style="list-style-type: none"> <li>• Frequency Error</li> <li>• Phase Error RMS</li> <li>• Phase Error Peak</li> <li>• Average Power</li> <li>• Power Time Template</li> </ul> | • GSM Spec.        |
| 4 Handover to GSM1800<br>Including Handover Check |   |  |                    |
| 5 TX GSM1800                                      | <ul style="list-style-type: none"> <li>• low TCH</li> <li>• PCL 0</li> <li>• BS Power = -55 dBm</li> <li>• middle BCCH</li> </ul> | <ul style="list-style-type: none"> <li>• Frequency Error</li> <li>• Phase Error RMS</li> <li>• Phase Error Peak</li> <li>• Average Power</li> <li>• Power Time Template</li> </ul> | • GSM Spec.        |
| 6 Handover to GSM1900<br>Including Handover Check |   |  |                    |
| 7 TX GSM1900                                      | <ul style="list-style-type: none"> <li>• low TCH</li> <li>• PCL 0</li> <li>• BS Power = -55 dBm</li> <li>• middle BCCH</li> </ul> | <ul style="list-style-type: none"> <li>• Frequency Error</li> <li>• Phase Error RMS</li> <li>• Phase Error Peak</li> <li>• Average Power</li> <li>• Power Time Template</li> </ul> | • GSM Spec.        |
| 8 Call release from BS                            |   |  |                    |

| External Antenna                                   |  |  |                  |
|--|--|--|------------------|
| Test case  | Parameter  | Measurements   | Limits           |
| 9 Call from MS                                     | <ul style="list-style-type: none"> <li>• GSM900</li> <li>• high TCH</li> <li>• PCL 6</li> <li>• BS Power = -55 dBm</li> <li>• middle BCCH</li> </ul> | Keyboard check   | individual check |
| 10 TX GSM900                                       | <ul style="list-style-type: none"> <li>• high TCH</li> <li>• PCL 6</li> <li>• BS Power = -55 dBm</li> <li>• middle BCCH</li> </ul>                   | <ul style="list-style-type: none"> <li>• Frequency Error</li> <li>• Phase Error RMS</li> <li>• Phase Error Peak</li> <li>• Average Power</li> <li>• Power Time Template</li> </ul> | • GSM Spec.      |
| 11 RX GSM900                                       | <ul style="list-style-type: none"> <li>• high TCH</li> <li>• BS Power = -102 dBm</li> <li>• 50 Frames</li> <li>• middle BCCH</li> </ul>              | <ul style="list-style-type: none"> <li>• RX Level</li> <li>• RX Qual</li> <li>• BER Class Ib</li> <li>• BER Class II</li> <li>• BER Erased Frames</li> </ul>                       | • GSM Spec.      |
| 12 Handover to GSM1800<br>Including Handover Check |  |  |                  |
| 13 TX GSM1800                                      | <ul style="list-style-type: none"> <li>• high TCH</li> <li>• PCL 1</li> <li>• BS Power = -55 dBm</li> <li>• middle BCCH</li> </ul>                   | <ul style="list-style-type: none"> <li>• Frequency Error</li> <li>• Phase Error RMS</li> <li>• Phase Error Peak</li> <li>• Average Power</li> <li>• Power Time Template</li> </ul> | • GSM Spec.      |
| 14 RX GSM1800                                      | <ul style="list-style-type: none"> <li>• high TCH</li> <li>• BS Power = -102 dBm</li> <li>• 50 Frames</li> <li>• middle BCCH</li> </ul>              | <ul style="list-style-type: none"> <li>• RX Level</li> <li>• RX Qual</li> <li>• BER Class Ib</li> <li>• BER Class II</li> <li>• BER Erased Frames</li> </ul>                       | • GSM Spec.      |
| 15 Call release from MS                            |  |  |                  |

|    |   |   |  |  |
|----|---|---|--|--|
| 16 | Handover to GSM1900<br>Including Handover Check |   |  |  |
| 17 | TX GSM1900                                      | <ul style="list-style-type: none"> <li>• high TCH</li> <li>• PCL 1</li> <li>• BS Power = -55 dBm</li> <li>• middle BCCH</li> </ul>      | <ul style="list-style-type: none"> <li>• Frequency Error</li> <li>• Phase Error RMS</li> <li>• Phase Error Peak</li> <li>• Average Power</li> <li>• Power Time Template</li> </ul> | <ul style="list-style-type: none"> <li>• GSM Spec.</li> </ul>        |
| 18 | RX GSM1900                                      | <ul style="list-style-type: none"> <li>• high TCH</li> <li>• BS Power = -102 dBm</li> <li>• 50 Frames</li> <li>• middle BCCH</li> </ul> | <ul style="list-style-type: none"> <li>• RX Level</li> <li>• RX Qual</li> <li>• BER Class Ib</li> <li>• BER Class II</li> <li>• BER Erased Frames</li> </ul>                       | <ul style="list-style-type: none"> <li>• GSM Spec.</li> </ul>        |
| 19 | Echo Test                                       | <ul style="list-style-type: none"> <li>• high TCH</li> <li>• PCL 1</li> <li>• BS Power = -70 dBm</li> <li>• middle BCCH</li> </ul>      |  | <ul style="list-style-type: none"> <li>• individual check</li> </ul> |

Final Inspection:

The final inspection contains:

- 1) A random sample checks of:
  - Data reset (if required)
  - Optical appearance
  - complete function
- 2) Check if PIN-Code is activated (delete the PIN-Code if necessary).

Basis is the international standard of **DIN ISO 2859**.

Use Normal Sample Plan Level II and the Quality Border 0,4 for LSO.

**Remark:** All sample checks must be documented.