Local Service Organization Service Manual

BE INSPIRED

AX75

Release	Date	Department	Notes to changes
V1.0	06.06.2005	COM D CCQ SLI APAC	New Documents

Our innovation shapes the future

Table of Contents

1   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.
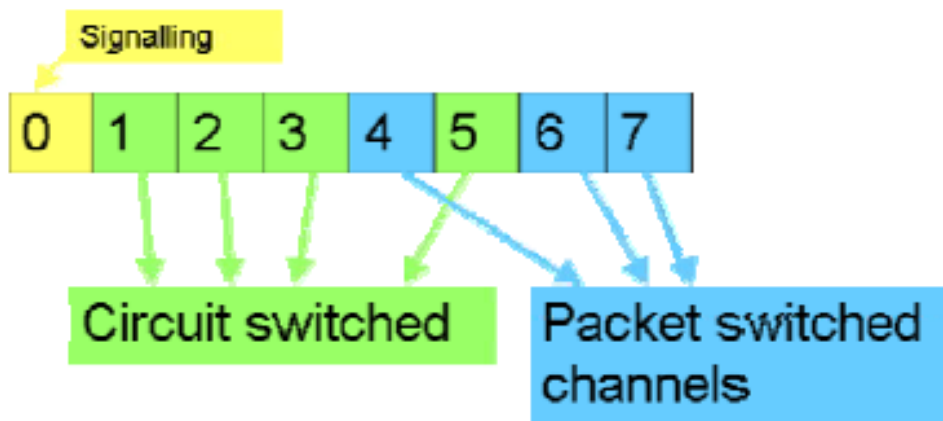

Figure1. Example of GPRS data transmission

Example: Cell with 1 Frequency channel:
1 physical channel for signaling, 4 physical channels for Circuit switched and 3 physical channels for Packet switched.

2   Key Features

Bands	• Triple Band E-GSM 900 / GSM 1800 / GSM 1900 • EGSM Phase 2 / phase 2+ • GPRS Multi Class 8
Battery	• Li-Ion Battery Pack • Nominal Voltage : 3.7V • Nominal Capacity : 600 mAh • GSM Capacity: 580 mAh • Power Input: 2.0 A (0.6 ms) / 0.25 A (0.4 ms) • Cut-off Threshold 3.2 V
Stand-by Time	• up to 220 h (standard battery)
Talk Time	• up to 300 min (standard battery)
SIM Card	• Small ("Plug In") 3V SIM card (Phase II) • To insert the SIM card, the battery pack must be removed.
GSM Antenna	• Integrated triple band antenna for EMEA/APAC.
Dimensions	• 101 x 44 x 20 mm (L x W x H)
Weight	• Approx. 80 g
Charging time	• < 2 h for 100%
Receiver Sensitivity	• GSM 900: -102dBm (Specification, static & with fading) • GSM 1800/1900: -102 dBm (Specification, static & with fading) Receiver sensitivity must comply with the corresponding GSM recommendations in all operating conditions (temperature, battery level, etc)

Transmitter Power	• GSM 900: nominal 2W (Specification: Class 4 Mobile phone) • GSM 1800/1900: nominal 1W (Specification: Class 1 Mobile phone) Transmitter output characteristics is according to GSM 11.10 specification implying all specified operating conditions (temperature, battery level ...). Transmitter set points will be specified for GSM and PCN when typical values and statistical values become available.
Speech Codec	• Half Rate, Full Rate, Enhanced Full Rate and Adaptive Multi Rate speech coders are available as standard.
Temperature Range	• -10^0C to $+55^0$C (Normal operation) • -30^0C to $+85^0$C (Storage capability)

Display	• Type: Full Graphic • Resolution: 130 x 130 Pixel • No. of colours: 65K • Technology: C-STN • Active area: 27.3mm x 27.3mm • Pixel size: 0.21mm x 0.21mm. (1 Pixel consists of 3 sub-pixels in red, green and blue) • Illumination: White (3 LEDs integrated) • Frame Rate: 15 frames/sec
12-Block Keypad	• IMF technology • 12-key-block (0-9, #, *) • two function keys (SEND, END) • ON/OFF key combined with the END key; the symbol ☉ (I inside O) is used as a symbol for ON/OFF. • 4 way-navikey • 2 soft-keys for different SW-enabled functions • tactile finder on key "5" • 6 amber LEDs for keypad
Acoustics	• Three-in-one-earpiece for handset, handsfree and ringing tones • Omnidirectional microphone • Loud signal emitter (soundringer) (>100dB(A) SPL @5cm, 'Hongkong-Spec.') only for rectangular sound signals (NOT POSSIBLE for Soundringer melodies) • Polyphonic ringer tones 16 voices • Different selectable volume levels for handsfree, handset and ringer mode (for the amount see SW product description)

3   Comparison with Previous Product

Feature	A65	AX75
Supported Systems	Triple Band EGSM900/GSM1800/GSM190 (EMEA, APAC)	Triple Band EGSM 900/GSM1800/ GSM1900 (EMEA, APAC) GSM 850/GSM1800/ GSM1900 (LAM)
Stand-by Time	Up to 250 h	Up to 220 h
Talk Time	Up to 5h	Up to 5 h
Battery Technology Battery Capacity	Li-Ion Battery Pack Nominal Cap.: 700 mAh	Li-Ion Battery Pack Nominal Cap.: 600 mAh
Weight	74.8 g	Approx. 80 g
Volume	71.8 cm^3	Approx. 74.6 cm^3
Length	100.7 mm	105.6 mm
Width	44.7 mm	46.75 mm
Thickness	19.3 mm	17.5 mm
SIM	Plug-In 3V	Plug-In 3V
Antenna	Integrated	Integrated
Antenna Performance FBT EMEA/APAC TRP freespace (avg) 29dBm @900MHz 26dBm @1800MHZ 26dBm @1900MHZ TIS freespace (avg) -102dBm Head SAR < 0.8 W/kg (1g)	29.4 dBm @ 900 MHz 26.4 dBm @ 1800 MHz 27.8 dBm @ 1900 MHz -103 dBm @ 900 MHz -104.5 dBm @ 1800 MHz -103.7 dBm @ 1900 MHz SAR = 0.79 W/kg (1g)	AX70 EMEA/APAC 29dBm @ 900 MHz 26dBm @ 1800 MHz 26dBm @ 1900 MHz -102dBm SAR < 0.80 W/kg (1g)
Antenna Performance FBT LAM version 28dBm @850MHz 26dBm @1800MHz 27.5Bm @1900MHz TIS freespace (avg) -102dBm Head SAR < 0.8 W/kg (1g)		AX7X LAM 28dBm @ 850 MHz 26dBm @ 1800 MHz 26dBm @ 1900 MHz -102dBm SAR < 0.80 W/kg (1g)
Half Rate	Yes	Yes
Enhanced Full Rate	Yes	Yes
AMR	Yes	Yes
Fax/Data	No	Yes
GPRS	Yes (Class 8)	Yes (Class 8)
Keypad Illumination	Yes (amber)	Yes (amber)
Display / Display Illumination	CSTN 4k colours (101x80 dots)	Main: CSTN 64k colours (130x130)
Camera	No	No
Connectivity	Serial	Serial, IRDA
Ringer volume level	Min. 100 dB(A) @ 5cm Typ. >103 dB(A) @ 5cm	Min. 100dB(A) @ 5cm (only for rectangular sound signals)

4   Accessories

For AX75, the following accessories will be available.

Description	Part number
Belt Case FCL-600	L36880-N7101-A120
Tour Case FCT-650	L36880-N5601-A149
Headset Purestyle HHS-610	L36880-N7101-A500
Headset HHS-510	L36880-N5601-A108
Headset Basic HHS-500	L36880-N5601-A107
Li-Ion Battery 750mAh EBA-660	L36880-N7101-A111
Travel Charger ETC-500	L36880-N5601-A104
Travel Charger ETC-510	L36880-N5601-A105
Car Charger Plus ECC-600	L36880-N7101-A109
Desk Top Stand EDC-500	TBC
Car Charger ECC-500	TBC
Car Kit Easy HKP-700	TBC
Car Kit Portable HKP-500	L36880-N5601-A109
Car Kit Easy Upgrade HKO-700	TBC
QuickPic Camera IQP-500	L36880-N5701-A109
Data Cable DCA-500 (RS232)	L36880-N5601-A110
Data Cable USB DCA-510	L36880-N5601-A111

Note: Visit the Communication Market for updated accessories:
https://communication-market.siemens.de/

4.1 AX75 Interface to accessories

There are no specific mechanical interfaces to the car cradle. The car cradle is designed to fit the existing design. The I/O-Connector (Lumberg-slim-connector) is in use. The compatible interface is suitable to use the travel charger.
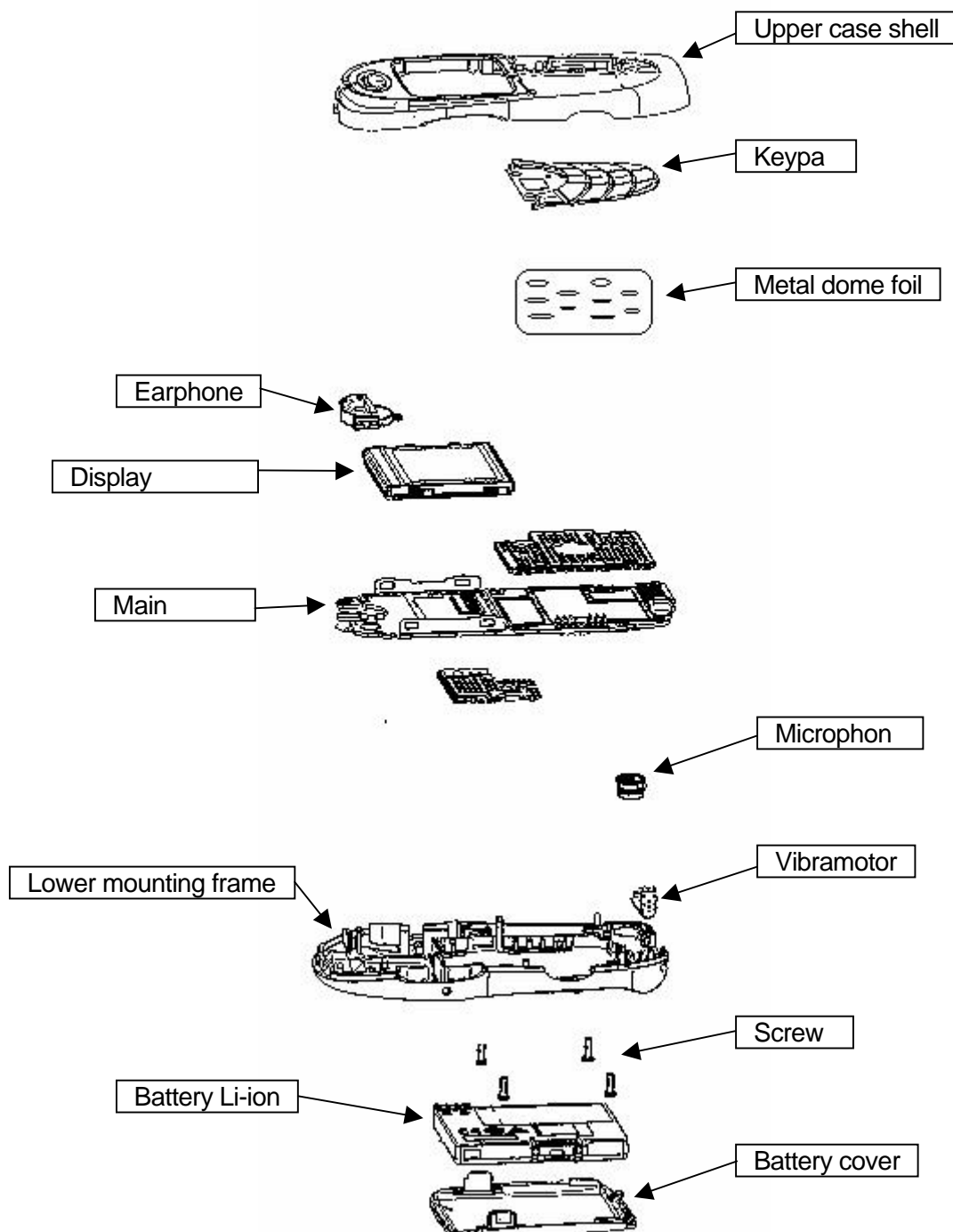
Slim Lumberg I/O Connector

5 Unit Description of AX75

The AX75 Pegasus is designed as a Mono Block with non-exchangeable housing. The Upper case, lower case and battery cover are painted parts (1k; 2 colours). IMD Lens will be mounted by Ultrasonic, Display, 130X130(modified from Hera, only mechanical modification); semi-bridgeless keypad, 4-way Navi-Key, 12 keys block; IMD lens (1 pcs only); IRDA window; No ID concept will be realized on Battery cover.

5.1 Exploded View of AX75

Upper case shell

Keypa

Metal dome foil

Earphone

Display

Main

Microphon

Vibramotor

Lower mounting frame

Screw

Battery Li-ion

Battery cover

6   Disassembly of AX75

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. This could lead to damage or destruction of the E-Gold pins.

It is a requirement for the service personnel to observe ESD protection rules while performing servicing the AX75.

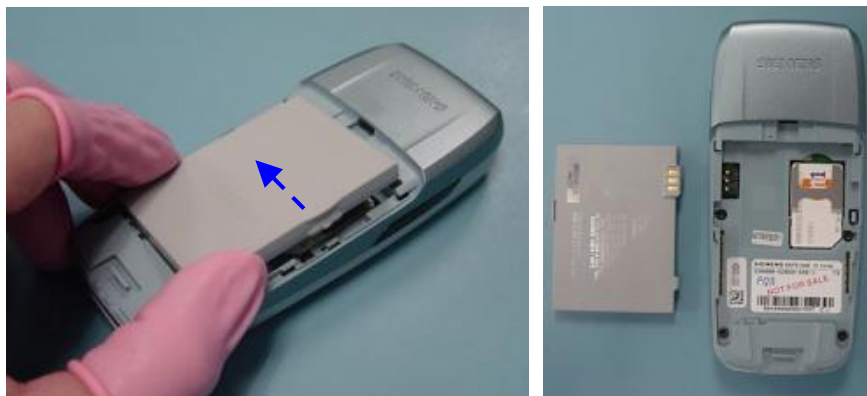| Step 1	Step 2
Front view of the AX75	Back View of the AX75

Step 3

Remove Battery cover.

Step 4

Remove Battery

Step 5

Remove SIM Card

Step 6

Remove the 4 screws (as indicated) with T5 Plus screw driver.

Step 7

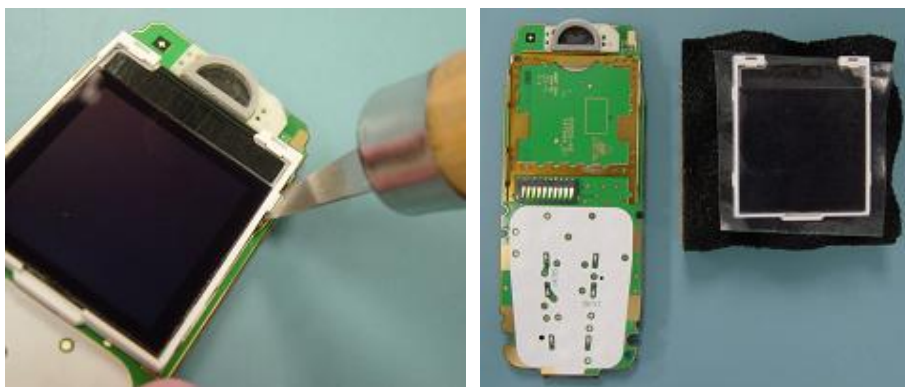Remove Vibramotor

Step 8

Remove Microphone

Step 9

Remove Main board.
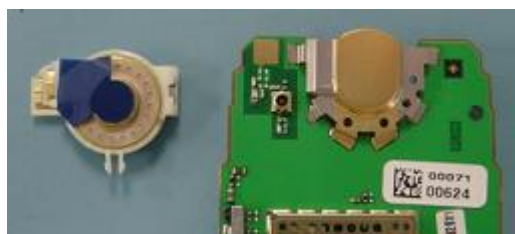
Step 10

Remove Display module. Place foil over Display module for protection

Step 11

Remove Earphone

Step 12

Remove Keypad

Step 13
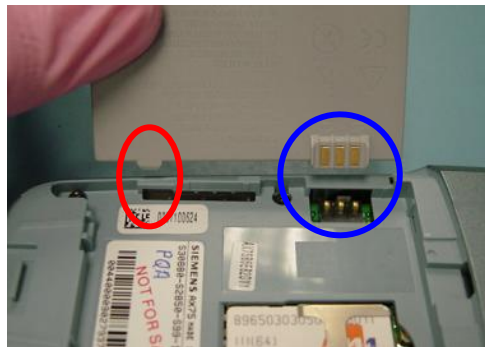

Fully disassembled AX75

7   Reassembly of AX75

For the reassembly of the AX75, reverse the disassembly procedures from Step 12 to Step1. However there are some areas to be taken note of during reassembling of the phone.

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.

Installation of the SIM card

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

When placing the screws, set Torque to 17cNm.

8   Mobile Software Programming

The common mobile software available is divided into language groups. However, this software does not contain the specific settings, such as ringing tones, greeting text, and short dial list etc., required by the operator or service provider. Therefore, it is common to have some menu item(s) differ in different variants or are not visible at all. These settings are stored in different memory area of the mobile and will be activated depending on the customer specific model or variant of the phone by a separate test step during the production process.

Due to this separation of common mobile software and customer specific initialization, it is possible to fulfil the demands of the market requiring customization and flexibility. As a consequence the software programming process in the LSO is divided into two different steps as followed:

- Software update to actual version and appropriate language group

- Programming of CUSTOMER SPECIFIC INITIALIZATION

Usage of GRT is mandatory!! For more detail check GRT User manual
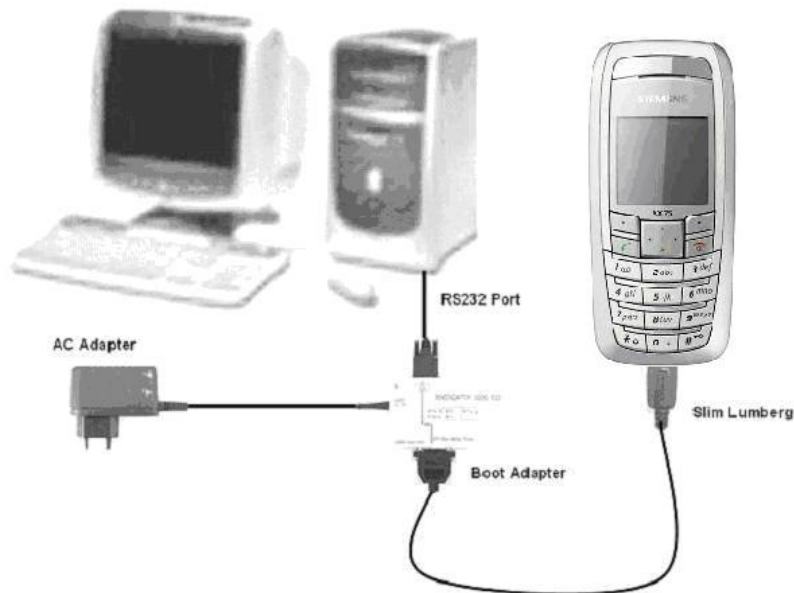

Figure 1. AX75 Software Programming Setup
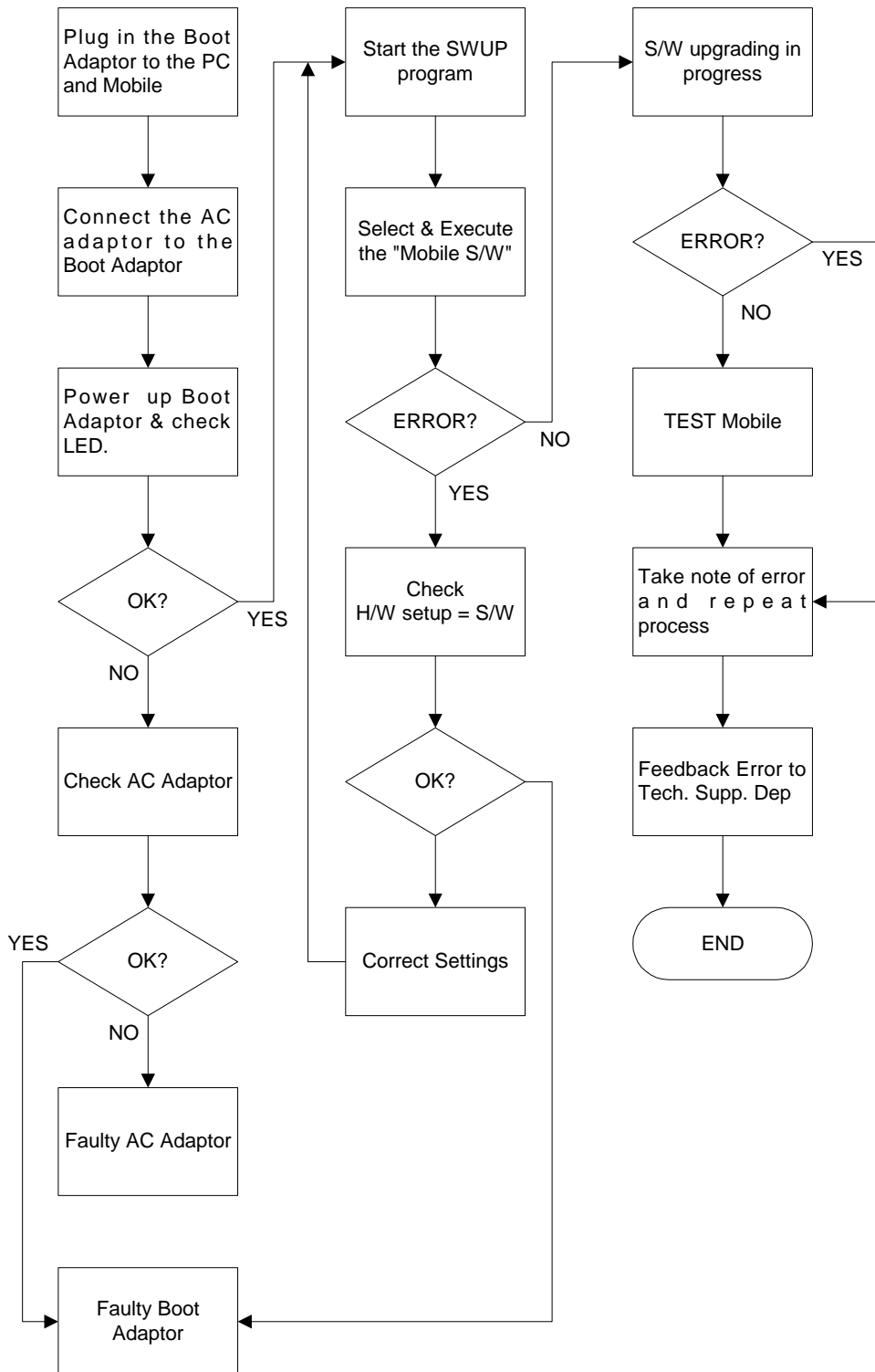
8.1 Mobile Software Updating

The software of the 75 series mobiles, is loaded from a PC directly. Hardware interconnection between the mobile and the PC is shown in Figure 1. Because of the new type of external connector used since 55 series (Slim-Lumberg type) an additional adaptor cable between mobile and boot adaptor is required. Table 1 listed all the hardware requirements

If you use the battery dummy, make sure that the power supply voltage is correctly adjusted.

Description	Part No.
Bootadapter 2000 incl. AC-Adapter, serial cable and mobile connection cable	L36880-N9241-A200
IBM Compatible PC – Pentium	-
Adapter cable – Slim Lumberg to Old	F30032-P226-A1

TABLE 1. EQUIPMENT LIST FOR SOFTWARE PROGRAMMING

8.2 Flow Chart for Software Upgrading

```
┌──────────────────┐        ┌──────────────────┐        ┌──────────────────┐
│ Plug in the Boot │        │ Start the SWUP   │        │ S/W upgrading in │
│ Adaptor to the PC│───────▶│ program          │───────▶│ progress         │
│ and Mobile       │        └──────────────────┘        └──────────────────┘
└──────────────────┘                 │                            │
         │                           ▼                            ▼
┌──────────────────┐        ┌──────────────────┐              ◇ ERROR? ◇──── YES
│ Connect the AC   │        │ Select & Execute │                  │ NO
│ adaptor to the   │        │ the "Mobile S/W" │                  ▼
│ Boot Adaptor     │        └──────────────────┘        ┌──────────────────┐
└──────────────────┘                 │                  │ TEST Mobile      │
         │                           ▼                  └──────────────────┘
┌──────────────────┐            ◇ ERROR? ◇──── NO               │
│ Power up Boot    │                 │ YES                       ▼
│ Adaptor & check  │                 ▼                  ┌──────────────────┐
│ LED.             │        ┌──────────────────┐        │ Take note of error│
└──────────────────┘        │ Check            │        │ and repeat        │
         │                  │ H/W setup = S/W  │        │ process           │
         ▼                  └──────────────────┘        └──────────────────┘
     ◇ OK? ◇──── YES                 │                            │
         │ NO                        ▼                            ▼
         ▼                       ◇ OK? ◇             ┌──────────────────┐
┌──────────────────┐                 │              │ Feedback Error to│
│ Check AC Adaptor │                 ▼              │ Tech. Supp. Dep  │
└──────────────────┘        ┌──────────────────┐    └──────────────────┘
         │                  │ Correct Settings │             │
         ▼                  └──────────────────┘             ▼
YES ──◇ OK? ◇                                            ( END )
         │ NO
         ▼
┌──────────────────┐
│ Faulty AC Adaptor│
└──────────────────┘
         │
         ▼
┌──────────────────┐
│ Faulty Boot      │
│ Adaptor          │
└──────────────────┘
```

FLOW CHART FOR S/W PROGRAMMING PROCESS

9 Siemens Service Equipment User Manual

Introduction

Every LSO repairing Siemens handset must ensure that the quality standards are observed. Siemens has developed an automatic testing system that will perform all necessary measurements. This testing system is known as:

Siemens Mobile Service Equipment

**All mobile Phones have to be tested with the GRT-Software.
The Service Partner is responsible to ensure that all required hardware is available.**

For additional Software and Hardware options as well as the supported GRT equipment, please check the GRT User manual

10   JPICS (*Java* based Product Information Controlling System)

Overview

The following functions are available for the LSO:

- General mobile information

- Generate PINCODE

- Generate SIMLOCK-UNLOCK-Code

- Print IMEI labels

- Lock, Unlock and Test the BF-Bus

The access to the JPICS server which is located in Kamp-Lintfort is protected by chip card and in addition using secure socket layer (SSL) connection.

The JPICS server is only available for authorized users with a specially coded chip card. These chip cards and the administration of the JPICS web server and the PICS database-server can only be provided by the JPICS-TRUST-Center of the responsible department in Kamp-Lintfort.

In case of any questions or requests concerning chip cards or administration of the databases please ask your responsible Siemens Customer Care Manager.

Installation overview

The following installation description assumes that a web browser is already installed. JPICS is tested with the following browsers

1. Internet Explorer Version 5.5 and higher

2. Netscape Version 6 and higher

For further information regarding supported browsers, browser version and supported

operating systems, see the Sun FAQ's.

Here is a step by step instruction to install all the required components:
It is necessary to follow this order!

1. Card reader (Omnikey)

2. CardOS interface (Siemens)

3. JPICS Certificates

4. Java Plugin JVM/JRE (Sun)

5. Java additional components

Every user is responsible for a proper installation matching the license agreements.

For installation and further access you need the following:

1. The JPICS Installation-CD

2. A chip card. Chip cards can be ordered via your responsible Customer Care Manager within Siemens.

3. A supported chip card reader (Smarty or Siemens B1) in order to access your chip card.

Remark:

We recommend using Siemens B1 reader. Similar device to B1 is Cardman 9010.

Generate Codes

In the module "**Generate Codes**"you can choose to generate:

- Master – Phonecodes

- Simlock Unlock – Codes

Master - Phonecodes

The **Master – Phonecode** is used to unlock blocked mobiles.

Master – Phonecodes can only be supplied for mobiles which have been delivered in a regular manner.

Simlock Unlock - Code

The **Simlock-Unlock-Codes** can only be generated if the following conditions are given:

- Mobile must have an active **Simlock** inside.

- The user must be given the authorization to obtain **Simlock Unlock- Codes** for the variant of the operator to which the mobile was delivered last time.

Printing IMEI label

The module "**Print IMEI label**" offers the possibility to re-print IMEI labels for mobiles again.

You are able to print 1 label in just one step.

To prevent that misaligned labels are being printed, the setting "Print test labels = ✓" is activated as default. After having printed a well-aligned test label you can uncheck the setting and print the correct label.

Hint:

For correct printing of IMEI labels you must have a **Zebra – label printer** with special material that fits for label printing. This printer has to be connected to local LPT1 printer port (also see Installation of IMPRINT) and MUST feature a printing resolution of 300dpi.

11   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.

The part number for the AX75 is L36880-N2850-xxx-x where the last 4 letters specify the housing and software variant.

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

On this IMEI label, Siemens has also includes the date code for production or service, which conforms to the industrial standard DIN EN 60062. The date code comprises of 2 characters: first character denotes the Year and the second character denotes the Month.

For example: **M3**

CODE	YEAR	MONTH	CODE
M	2000	MARCH	**3**
N	2001	APRIL	4
P	2002	MAY	5
R	2003	JUNE	6
S	2004	JULY	7

TABLE 2 DIN EN 60062 DATE CODE

To display the IMEI number, exit code and SW/HW version, key: *#06#.

12 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 <u>function</u> of all **keys** including **side keys.**

   - Check the **display** for error in <u>line and row</u>, and for <u>illumination.</u>

   - Check the **ringer/loudspeaker** acoustics by individual validation.

   - Perform a **GSM Test** as described on page 30.

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 900/GSM1800 or GSM1900 test cases if not performed by the mobile phone.

Internal Antenna			
Test case	**Parameter**	**Measurements**	**Limits**
1 Location Update	• GSM900 • BS Power = -55 dBm • middle BCCH	• Display check	• individual check
2 Call from BS	• low TCH • PCL 5 • BS Power = -55 dBm • middle BCCH	• Ringer/Loudspeaker check	• individual check
3 TX GSM900	• low TCH • PCL 5 • BS Power = -55 dBm • middle BCCH	• Frequency Error • Phase Error RMS • Phase Error Peak • Average Power • Power Time Template	• GSM Spec.
4 Handover to GSM1800 Including Handover Check			
5 TX GSM1800	• low TCH • PCL 0 • BS Power = -55 dBm • middle BCCH	• Frequency Error • Phase Error RMS • Phase Error Peak • Average Power • Power Time Template	• GSM Spec.
6 Handover to GSM1900 Including Handover Check			
7 TX GSM1900	• low TCH • PCL 0 • BS Power = -55 dBm • middle BCCH	• Frequency Error • Phase Error RMS • Phase Error Peak • Average Power • Power Time Template	• GSM Spec.
8 Call relaese from BS			

External Antenna

Test case	Parameter	Measurements	Limits
9 Call from MS	• GSM900 • high TCH • PCL 6 • BS Power = -55 dBm • middle BCCH	• Keyboard check	• individual check
10 TX GSM900	• high TCH • PCL 6 • BS Power = -55 dBm • middle BCCH	• Frequency Error • Phase Error RMS • Phase Error Peak • Average Power • Power Time Template	• GSM Spec.
11 RX GSM900	• high TCH • BS Power = -102 dBm • 50 Frames • middle BCCH	• RX Level • RX Qual • BER Class Ib • BER Class II • BER Erased Frames	• GSM Spec.
12 Handover to GSM1800 Including Handover Check			
13 TX GSM1800	• high TCH • PCL 1 • BS Power = -55 dBm • middle BCCH	• Frequency Error • Phase Error RMS • Phase Error Peak • Average Power • Power Time Template	• GSM Spec.
14 RX GSM1800	• high TCH • BS Power = -102 dBm • 50 Frames • middle BCCH	• RX Level • RX Qual • BER Class Ib • BER Class II • BER Erased Frames	• GSM Spec.
15 Call relaese from MS			

16	Handover to GSM1900 Including Handover Check			
17	TX GSM1900	• high TCH • PCL 1 • BS Power = -55 dBm • middle BCCH	• Frequency Error • Phase Error RMS • Phase Error Peak • Average Power • Power Time Template	• GSM Spec.
18	RX GSM1900	• high TCH • BS Power = -102 dBm • 50 Frames • middle BCCH	• RX Level • RX Qual • BER Class Ib • BER Class II • BER Erased Frames	• GSM Spec.
19	Echo Test	• high TCH • PCL 1 • BS Power = -70 dBm • middle BCCH		• individual check

Final Inspection:

The final inspection contains:

1) A 100% network test (location update, and set up call).

2) Refer to point 3.3.

3) A random sample checks of:

      - data reset (if required)

      - optical appearance

      - complete function

4) 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.

Annex 1

Test SIM Card

There are two different "Test SIM Cards" in use:

    1) Test SIM Card from the company **"ORGA"**

        Pin 1 number: 0000
        PUK 1   :   12345678

        Pin 2 number: 0000
        PUK 2   :   23456789

    2) Test SIM Card from the company **"T-D1"**

        Pin 1 number: 1234
        PUK   :   76543210

        Pin 2 number: 5678
        PUK 2   :   98765432

May 2005
Internal Use Only

Annex 2

Battery Date Code overview

Varta
Date code example ————————▶ N 9 A VA

Year (N:2001, O:2002...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)

Hitachi / Maxwell
Date code example ————————▶ N 9 A MX

Year (N:2001, O:2002...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)

Sanyo
Date code example ————————▶ N 9 A SY

Year (N:2001, O:2002...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)

NEC
Date code example ————————▶ N 8 A NT

Year (N:2001, O:2002...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)

Panasonic
Date code example ————————▶ O N A PAN

Year (N:2001, O:2002...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)

Sony
Date code example ————————▶ P N A SO

Year (O:2002, P:2003...)
Month (1:Jan, 2:Feb,…9:Sep, O:Oct, N:Nov, D:Dec)
Revision Letter (A, B,…)

Supplier Code
(Maker's marking)