

# Local Service Organization Service Manual

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BE INSPIRED

*A 55 / 56 / 52*

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SIEMENS COMMUNICATIONS UNLIMITED

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Our innovation shapes the future

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## 1 Cellular Communication

The cellular systems are made up of numerous transmitting and receiving sites, whose individual coverage areas partially overlap. The concept of frequency reuse, same frequency is used by several sites, allows a high traffic density in a wide area. Due to the limited transmission range of the terminals, cellular systems are based on a large number of base stations on the infrastructure side, scattered over the area to cover, with each covering a fairly small geographical zone called cell. Cells are often represented by hexagons (see figure 1.1).

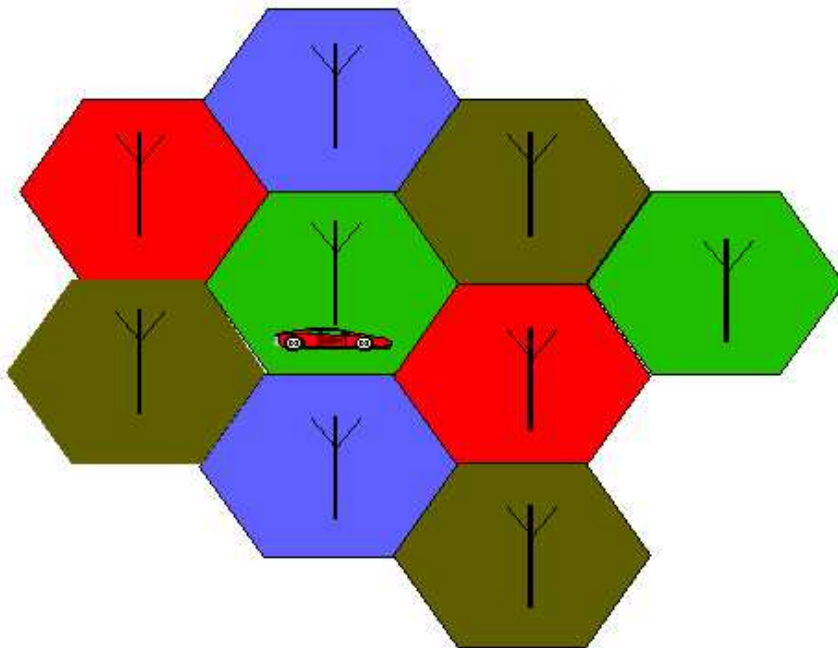


Figure 1.1 Cellular coverage representation.

### GSM Net Architecture

GSM network can be broadly divided into three broad parts, namely:

1. Mobile Station (MS) carried by the subscriber,
2. Base Station Sub-system (BSS) which controls the radio link with the mobile station.
3. Mobile Switching Centre (MSC) which performs the switching of calls between the mobile users, and between mobile and fixed network users.

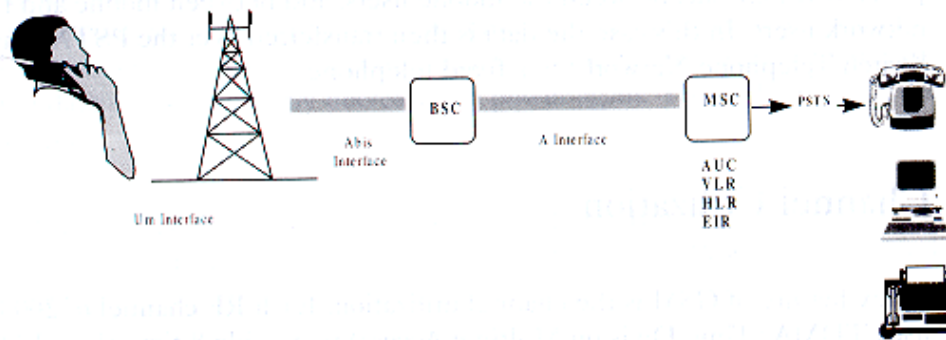


FIGURE 1.2 GSM ARCHITECTURE

Each mobile station is given a unique identity. As soon as the mobile phone is turned on, it registers with the network and is authenticated; as such the network could always find the mobile phone.

Larger amount of data is being exchanged to and from the following functional blocks in the MSC:

### *Visitor Location Register, VLR*

Stores information about mobile subscribers that enter its coverage area, which is associated with the geographical area where the mobile is currently roaming. When there is an incoming call for the mobile, the HLR is interrogated about the present address of the VLR.

### *Home Location Register, HLR*

A database that contains all data concerning the subscription of the mobile subscriber, i.e. their access capabilities, subscribed services, and supplementary services. It also contains information about the VLR that is handling the mobile station currently. When the mobile changes location, the HLR is updated accordingly. It also provides the MSC with information about the MSC area where the mobile is actually located to allow incoming calls to be routed immediately to the called party.

### *Authentication Centre, AUC*

Stores information that is necessary to protect communication through the air interface against any intrusions. The legitimacy of the subscriber is established through authentication and ciphering, which protects the user information against unwanted disclosure.

### *Equipment Identity Register, EIR*

An option the network operator can use to enforce security. With this feature the network can identify defective or stolen mobile that may not be used in the network.

## 1.1 Subscriber Identity Module (SIM)

SIM is a smart card, which has a computer, and memory chip that is permanently installed in the mobile equipment. It comes in either the size of a credit card or smaller version known as the plug-in SIM.

### **SIM card using 5V technology is not supported.**

The subscriber information, which includes a unique number called the International Mobile Subscriber Identity (IMSI), is stored in the SIM card. SIM card identifies the subscriber to the network.

To protect the SIM card from improper use, a security feature, a four digits personal identification number (PIN), is built in. The PIN is stored in the SIM card and can be changed by the subscriber. PIN2 is required for additional functions available with a special SIM card (Consult the operator for more information about the PIN 2).

A code (PUK) is provided for unlocking the SIM card if the SIM card is blocked



**To deactivated SIM locked, due to wrong PIN entry,  
Get the unblock code from the operator.**

### SIM Application Toolkit

This is a new GSM feature that has been integrated into the GSM standards in Release 96, with further enhancements added as part of the Release 97 feature set. This feature came about because of a desire by Network Operators to offer differentiated services, without the need for the Mobile Manufacturers having to build different variant for different customers. The unique service offered by the Operator is placed as an application on the SIM and that could work on any mobile that supports the Toolkit feature.

There is a distinct set of commands between the mobile and the SIM specifically for the Toolkit that allows the SIM Toolkit and the mobile to communicate independently of the GSM communication between the SIM and the mobile. Henceforth, the SIM Application Toolkit and

GSM functionality on the SIM are separated logically. The Toolkit can interact directly with the mobile itself and adding itself to the mobile menu.

Currently, Toolkit application on the SIM and its “other half” communicate by using the Short Message Service (SMS). “Proactive SIM” is a mechanism whereby the SIM can initiate actions to be taken by the mobile. These actions include:

- Display text from the SIM on the Mobile display
- Send short message
- Set up a voice call to a number held by the SIM
- Set up a data call to a number and bearer capabilities held by the SIM
- Send a Supplementary Service (SS) control or Unstructured Supplementary Services Data (USSD) string
- Play a tone in the mobile’s ear piece or ringer
- Initiate a dialogue with the user
- Provide local information from the mobile to the SIM.
- Data download to the SIM from network
- Call control by the SIM.

SIM Applications Toolkit (SAT) allows the flexibility to update the SIM, to change the services and download new services over the air. In the SAT specification, the short message service is a key mechanism for personalizing the SIM in each user’s GSM phone. It is designed as a client-server application. C45 series supports SAT Class 3 specification.

When active, the name of the service may appear in the menu, and there will be sub-menu if more than one application is active. Figure 1.4 is the SAT icon.



FIGURE 1.4 SAT ICON

### *Extended GSM 900, E-GSM*

This is a new standard that allows Network Operators to increase their capacity through an extended frequency. The frequency range of E-GSM is as follows:

- Mobile Transmit: 880,2 - 914,8 MHz
- Mobile Receive: 925,2 - 959,8 MHz

A55 is a GSM Phase 2 / Phase 2+ Dual band E-GSM / GSM 1800 mobile phone.

## 2 Wireless Application Protocol, WAP

Wireless Application Protocol takes a client-server approach that uses the in-built micro-browser to make a request, in wireless mark-up language (WML), for information or service. The request is passed to a WAP Gateway, which then retrieves the information from an Internet server, in HTML format, and translates it into WML. The requested information is then sent to from the WAP Gateway to WAP client (mobile) using the available and most appropriate mobile network bearer services.

### *Wireless Protocol Stack.*

Wireless Application Environment (WAE)
Wireless Session Protocol (WSP)
Wireless Transaction Protocol (WTP)
Wireless Transport Layer Security (WTLS)
Wireless Datagram Protocol (WDP)
Bearers e.g. Data, SMS, USSD

TABLE 1.1 WAP PROTOCOL STACK

#### 1. Wireless Application Environment

Defines the user interface on the phone. WAE contains the WML, WML script and the wireless telephony application (WTA).

#### 2. Wireless Session Protocol

Link the WAE to two session services – one connection oriented operating above the WTP and a connectionless service operating above WDP.

#### 3. Wireless Transaction Protocol

Runs on top of the datagram service and part of the standard suite of TCP/IP protocols, to provide a simplified protocol suitable for low bandwidth mobile station.

#### 4. Wireless Transport Layer Security

WTLS incorporates security features that are based upon the established Transport layer Security (TLS) protocol standard, that include data integrity checks, privacy on the WAP Gateway to client leg and authentication.

#### 5. Wireless Datagram Protocol


Allows WAP to be bearer independent by adapting the transport layer of the under-laying bearer. WDP presents a consistent data format to the higher layer on the WAP stack.

WAP Internet access via the A55 is possible with the inclusion of Wireless Application Protocol (WAP) browser 1.2.1



## 3 Key Features

General:	<ul style="list-style-type: none"> <li>• EMS</li> <li>• WAP 1.2.1</li> <li>• Exchangeable Housing</li> <li>• Hands free</li> <li>• Amber Backlight for Display</li> </ul>
Battery	<ul style="list-style-type: none"> <li>• Li Ion Battery Pack from L55 Platform (C55/2128 and S55/57)</li> <li>• Nominal Capacity: 750mAh</li> <li>• GSM Capacity : 700mAh</li> <li>• Power Input : 1.8A (0.6ms) / 0.2A (4ms)</li> <li>• Cut-off Threshold : 3.2V</li> </ul>
Stand-by Time	<ul style="list-style-type: none"> <li>• Approx. 250 h / Li Ion (measured at BSPAMFRMS = 9; number of neighbouring cells = 0)</li> </ul>
Talk Time	<ul style="list-style-type: none"> <li>• Best case approx. : 5 hours (lowest output level with DTX)</li> <li>• Worst case approx. : 2.5 hours (highest output level with DTX)</li> </ul> <p>Condition for DTX : 40% user talk time</p>
SIM Card	<ul style="list-style-type: none"> <li>• Small (=“Plug In”) 1.8V or 3V SIM card (Phase II)</li> <li>• To insert the SIM card, the battery pack must be removed</li> <li>• The SIM reader coding will be realised by lower case</li> </ul>
Speech Coder	<ul style="list-style-type: none"> <li>• Full Rate, Enhanced Full Rate, Adaptive Multi Rate and Half Rate speech coders are available as standard.</li> </ul>
Temperature Range	<ul style="list-style-type: none"> <li>• -10°C to +55°C (Normal operation)</li> <li>• -30°C to +85°C (Storage capability)</li> </ul>

<p>Display</p>	<ul style="list-style-type: none"> <li>• Type: Full Graphic</li> <li>• Resolution: 101 x 64 Pixel</li> <li>• Technology: FSTN</li> <li>• Pixel size / mm: 0.277 x 0.297</li> <li>• Pixel distance / mm: 0.015</li> <li>• Active area / mm: 29.5 x 20.0</li> <li>• Visible area / mm: 33.0 x 23.2</li> <li>• Illumination: Amber (approx: 590nm)</li> </ul>
<p>Keypad</p>	<ul style="list-style-type: none"> <li>• 12-digit block (0-9, #, *), small letters</li> <li>• Two function keys (SEND, END)</li> <li>• ON/OFF key combined with the END key; the symbol  (I inside O) is used as a symbol for ON/OFF</li> <li>• 2 way navigation key up &amp; down</li> <li>• 2 softkeys on left &amp; right position</li> <li>• Amber as illumination colour</li> <li>• Orientation at the housing in the area between keys “5” and “8”</li> </ul>
<p>Acoustics</p>	<ul style="list-style-type: none"> <li>• Comfortable earpiece with optimal acoustics</li> <li>• Unidirectional microphone (similar to SL45 with modified rubber gasket)</li> <li>• Loud signal emitter (sound ringer) (&gt;100dB(A) SPL @5cm, 'Hongkong-Spec.')</li> <li>• Different call melodies (for the amount see SW product description). All melodies with increasing volume because of the danger of acoustic shock. Additional measures to protect from acoustic shock see SW product description.</li> <li>• Different selectable volume levels for handset and ringer mode (for the amount see SW product description)</li> </ul>

## 4 Comparison with Previous Product

Feature	A50	A55
Supported Systems	Dual Band E-GSM 900 / GSM 1800	Dual Band E-GSM 900 / GSM 1800
Stand-by Time	Up to 200 h	Up to 250 h
Talk Time	Up to 5 h	Up to 5 h
Battery Technology Battery Capacity	Ni-MH Battery Pack Nominal Cap.: 550 mAh	Li-Ion Battery Pack Nominal Cap.: 750 mAh
Weight	approx. 106 g	approx. 84 g
Volume	approx. 82 cm <sup>3</sup>	approx. 75 cm <sup>3</sup>
Length	108,9 mm	103,1 mm
Width	42.0 ... 46.0 mm (Panth)	max. 46 mm
Thickness	19.0 ... 23.0 mm (Panth)	max. 21.7 mm
SIM	Plug-In 1.8V/3V	Plug-In 1.8V/3V
Antenna	Integrated external RF connection	Integrated no external RF connection
Antenna performance in comparison to S35:	-0,5 dB @ 900 MHz -0,3 dB @ 1800 MHz	-0,8 dB @ 900 MHz -0,5 dB @ 1800 MHz
SAR	?	< 1.0 W/Kg
Half Rate	Yes	Yes
Enhanced Full Rate	Yes	Yes
AMR	No	No
Fax/Data	No	see the SW production Description
GPRS	No	No
Keypad Illumination	Yes (amber)	Yes (amber)
Display / Display Illumination	FSTN full dot matrix, 5 lines graphic amber	FSTN full dot matrix, 5 lines graphic amber
Ringer volume level	Min. 100 dB(A) @ 5cm Typ. >103 dB(A) @ 5cm	Min. 100 dB(A) @ 5cm Typ. >103 dB(A) @ 5cm

## 5 Accessories

**Note:** Due to the changes on the connector from “Lumberg” to “Slim Lumberg”, accessories using the previous “Lumberg” connector are unable to be used on the “Slim Lumberg” platform.

For the A55 Piranha the following accessories will be available.

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**SIEMENS**

Original Accessories

**Piranha - Accessories**

Piranha Accessory Program

	Basics	Car Solutions	Innovations	Data / Applications
Carrying case	DeskTop Stand single slot	Mono Headset w/b PTT*	Mobile Holder 1)	Basic Car Pack
Covers CLIPit	DeskTop Charger dual slot	Mono Headset with PTT		Car Kit Portable
Wrist / Neck Strap	Li-Ion Battery Tuna	Headset ++		
	Travel Charger	Car Charger		

No Antenna-Connector  
Slim Lumberg Connector  
M3 ca. 04/2003

compatible to L55 and future products
  Piranha only
  bundling INAFAC only

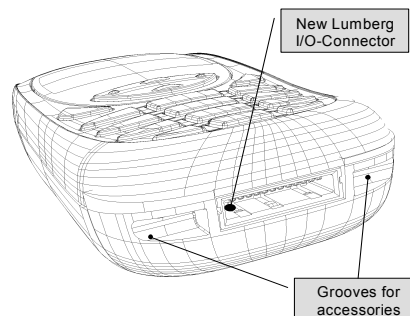
1) Same product as L55 Mobile Holder.

Issued by: ICM MP CCQ ASP/ASC    18 Jul 02    Confidential

### 5.1 Interface A55 to accessories

The phone has got a fully compatible interface to accessories.

The I/O-Connector (new Lumberg-(slim)-connector) is in the same position as in the L55 TUNA and MARLIN but without RF-Connector, all three phones can be used with the same accessories except Piranha is not useable in car kit with external antenna.



### 5.2 Accessories Part Number

L36145-K1310-X250	Battery Li-Ion C55/C56/CT56/S55/S56/S57/A56/A55
L36145-K1310-X251	Battery Li-Ion 2128/A55 CHN
L36280-Z4-C404	Power Supply EU C55/S55/S57/A55/SL55
L36280-Z4-C405	Power Supply C55/S55/A55/SL55 UK
L36280-Z4-C407	Power Supply C55/C56/CT56/A56/S55/S56/A55 TAI
L36280-Z4-C408	Power Supply C55/A55 CHN
L36880-N5601-A100	Battery Li-Ion 700mAh S55/S57/C55/C56/A55/A56
L36880-N5601-A101	Desk Top Charger C55/S55/S57/A55
L36880-N5601-A104	Travel Charger EU C55/S55/S57/SL55/A55
L36880-N5601-A105	Travel Charger UK C55/S55/S57/A55/SL55
L36880-N5601-A106	Car Charger C55/S55/S57/A55/SL55
L36880-N5601-A108	Headset PTT C55/S55/S57/A55/SL55
L36880-N5601-A109	Car Kit Portable C55/S55/S57/A55/SL55
L36880-N5601-A118	Basic Car Pack C55/S55/S57/A55/SL55
L36880-N5601-A137	Leather Holster FCL-510 C55/S55/S57/A55
L36880-N5601-A138	Belt Case FCL-520 C55/S55/S57/A55
L36880-N5601-A139	Loop Case FTC-500 C55/S55/S57/A55
	L36880-N5601-A140 Tour Case FCT-550 C55/S55/S57/A55



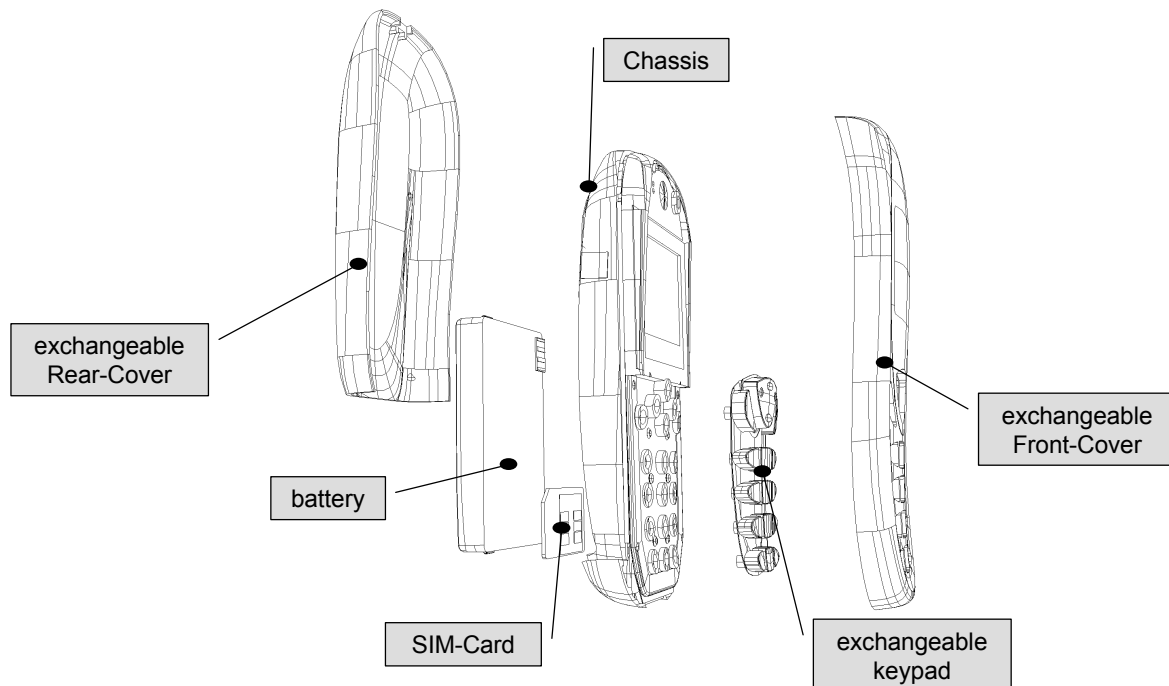
**The valid list is available in the communication market. This is the only reference and replaces this list above**

## 6 Unit Description A55/56/52

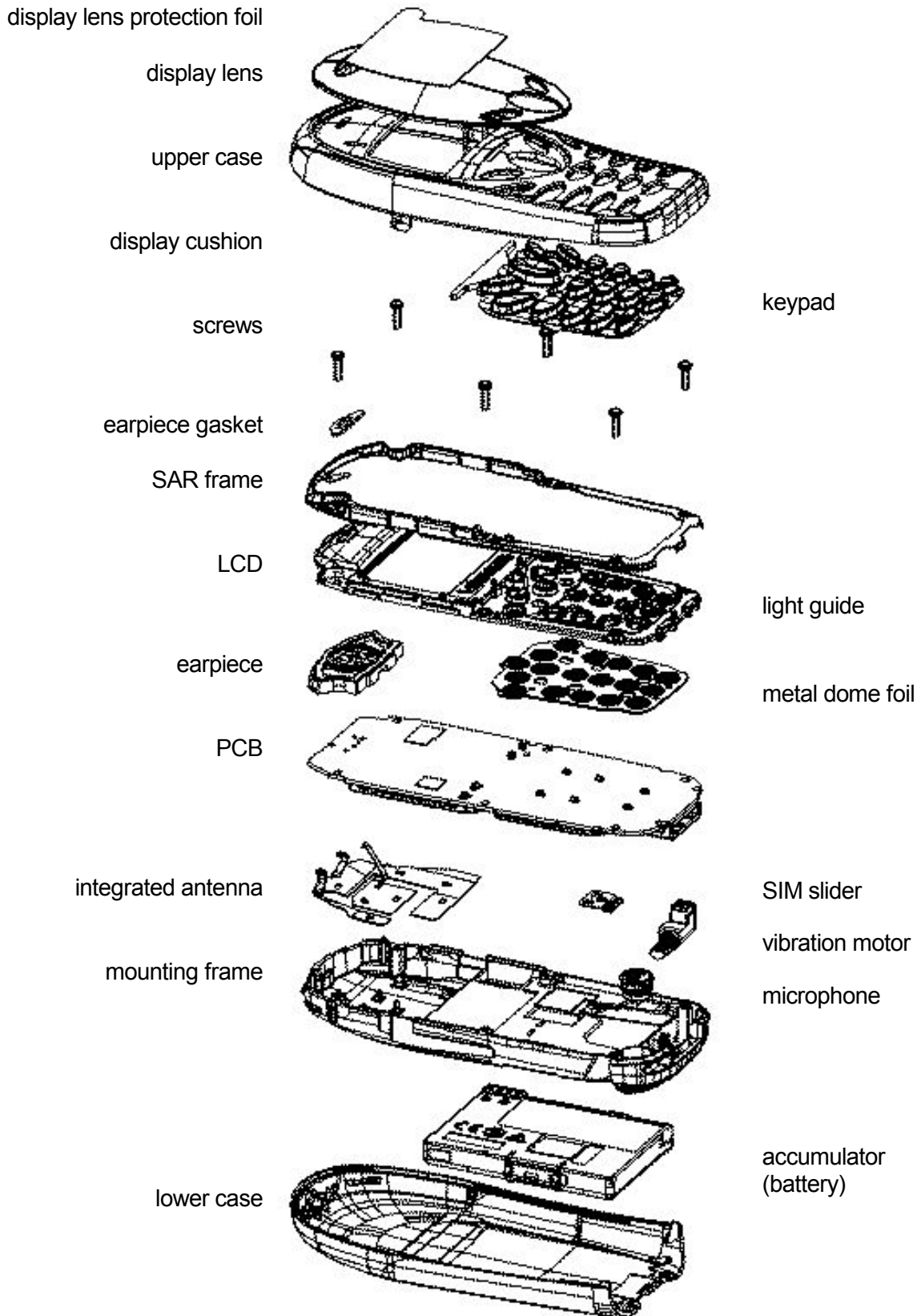
A55 Piranha is designed as single-PCB phone with exchangeable covers and exchangeable keypad. Upper and lower covers are designed as bi-coloured parts - realized in 2-shot-moulding technology.



### Assembly concept for the customer



**6.1 Exploded View of A55/56/52**










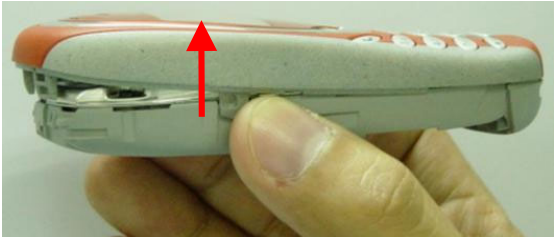
## 7 Disassembly of A55/56/52

**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 EGold pins.

It is a requirement for the service personnel to observe ESD protection rules while performing servicing the A55.

<p><b>Step 1</b></p>  <p>Front view of the A55</p>	<p><b>Step 2</b></p>  <p>Back View of the A55</p>
<p><b>Step 3</b></p>  <p>Remove the back cover by pushing it upwards as indicated by the arrow.</p>	<p><b>Step 4</b></p>  <p>To remove the battery, release the catch, located at the side, by pressing with the finger tip.</p>
<p><b>Step 5</b></p>  <p>To remove the SIM card, push the metallic catch upwards as indicated by the arrow.</p>	<p><b>Step 6</b></p>  <p>To remove the CLIPit cover, gently push the cover upwards from the side of the phone.</p>



### Step 7



The keypad can be separated from the CLIPit cover.

### Step 8



To remove the MMI Board with Display from the phone, unscrew the 6 screws (as indicated) on the front with a Torque Plus screw driver.

### Step 9



The RF board (PCB) can be seen after removing the MMI Board with Display.

### Step 10



Separate the PCB from the Lower Mounting Frame of the phone. The antenna is built-in on the Lower Mounting Frame.

### Step 11

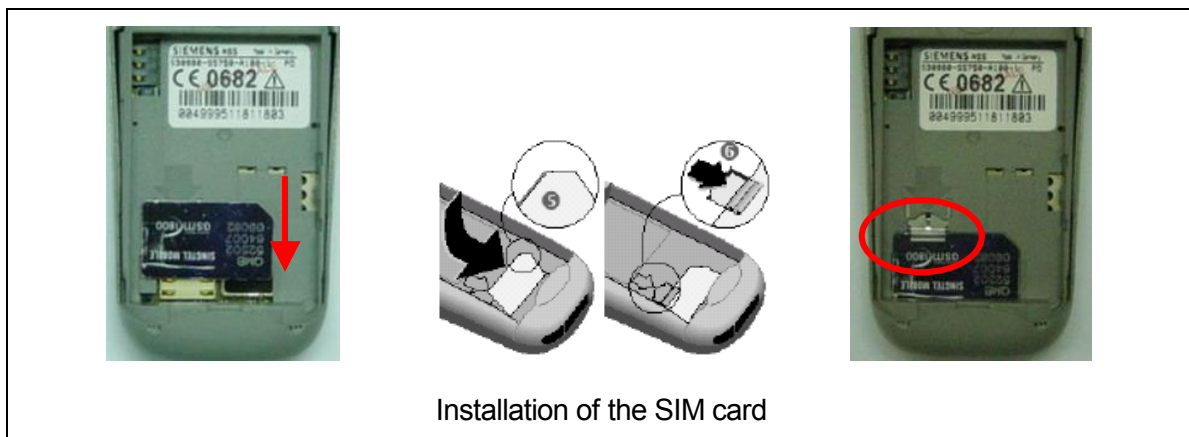


Fully disassembled A55

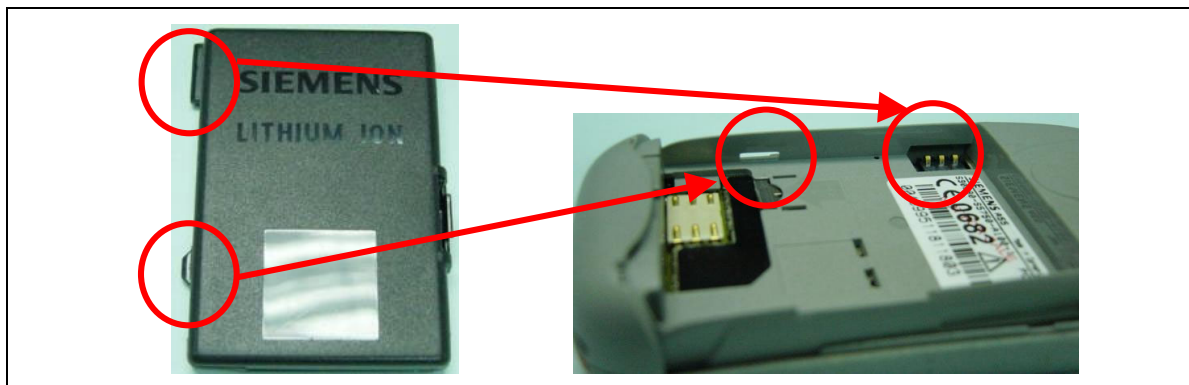
## 8 Reassembly of A55/56/52

For the reassembly of the A5x, simply reverse the disassembly procedures from Step 13 to Step 1. However there are some areas to be taken note 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 backwards. Push the metallic catch downwards to lock the SIM card into position.



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.



## 9 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, short dial list, etc required by the operator(s) or service provider(s). 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 areas 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 follows:

- Software update to actual version and appropriate language group
- Programming of Customer Specific Initialization.

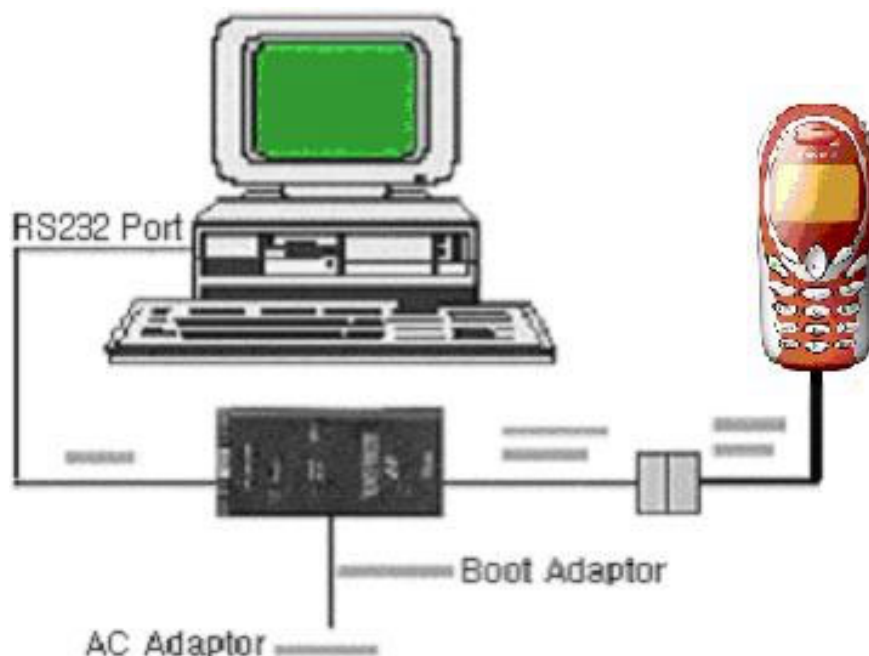


Figure 2. A55 Software Programming Setup

## 9.1 Mobile Software Updating

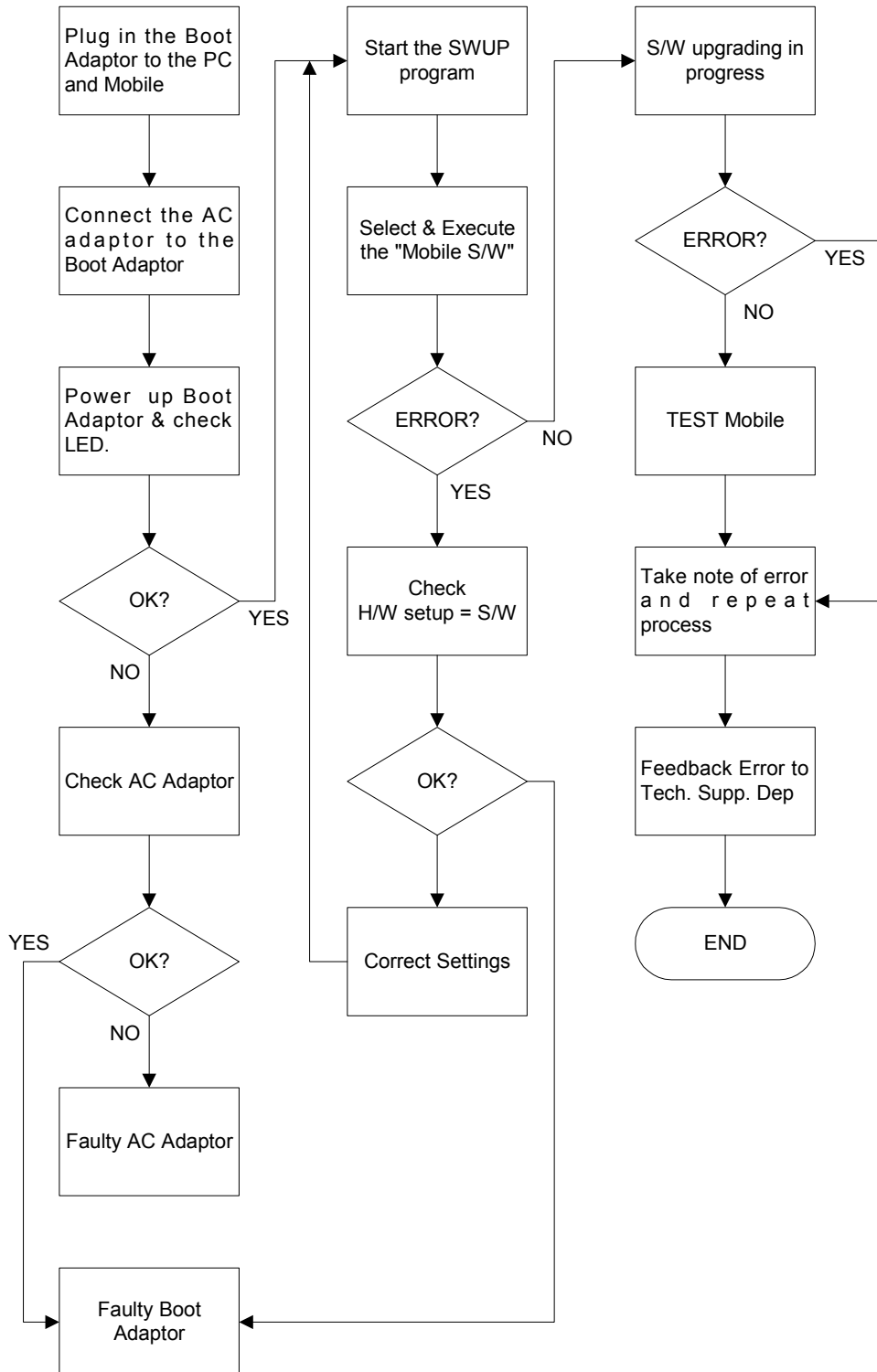
The software of the mobile phone is loaded directly from a PC. Hardware interconnection between the mobile and the PC is shown in Figure 2. Because of the new type of external connector used in L55 series (Slim-Lumberg type) an additional adaptor cable between mobile and boot adaptor is required. Table 2.1 listed all the hardware requirements

If the battery dummy is used, ensure 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	F30032-P226-A1

TABLE 2.1 EQUIPMENT LIST FOR SOFTWARE PROGRAMMING

**9.2 Flow Chart for Software Upgrading**



**FLOW CHART FOR S/W PROGRAMMING PROCESS**

## 10 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

Using this system vastly simplifies the repair of the phones and will make sure that:

1. All possible faults are detected
2. Sets, which pass the test, will be good enough to return to customer.

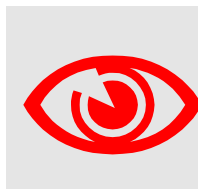
Starting from the P35 Series, Siemens will introduce a simpler and faster testing platform for testing a repaired Siemens mobile phone. The testing platforms are either base on R&S CMD 53/55 or CTS55 GSM test set or CMD200 with a software called (CTS, CMD, or CMU-GO).

There is also test software available for testing with the Willtec 4201S the 4107 and the 4400 GSM test set called (CATS 4200 or CATS4400).



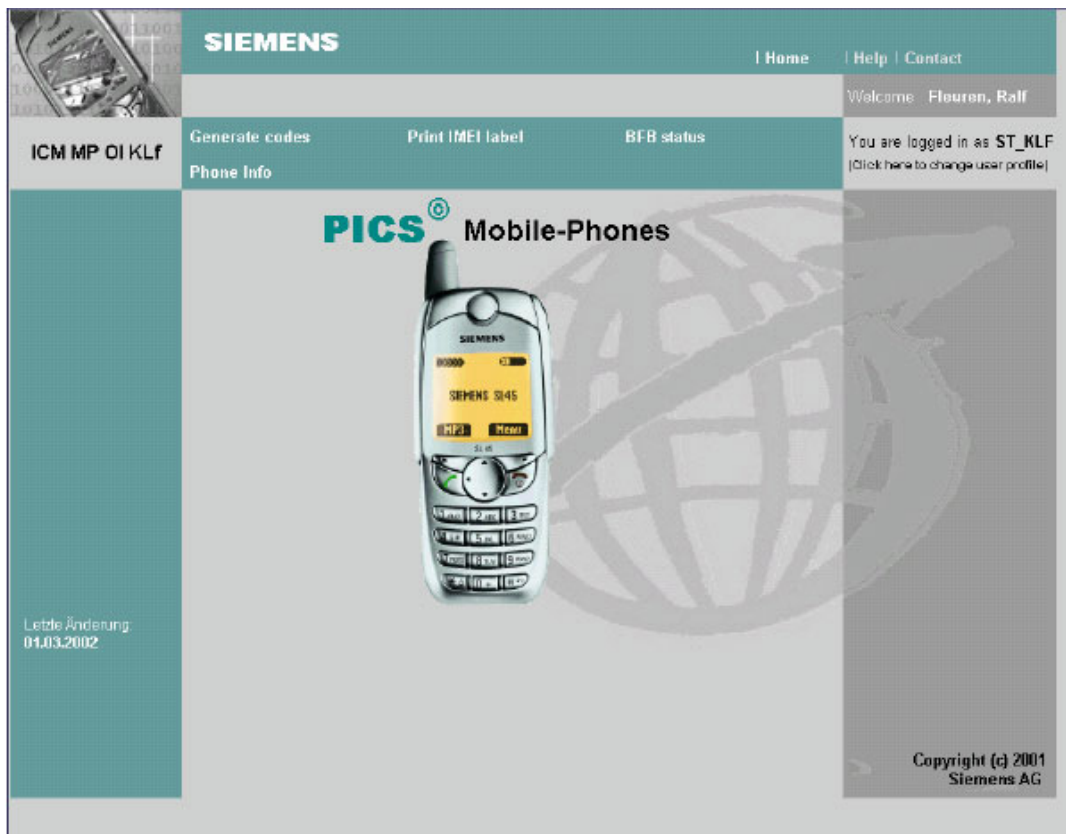
**THE LSO WILL HAVE TO PURCHASE THE SYSTEM, CHOOSING BETWEEN THE COMPLETE PACKAGE OR SUB-SET OF IT.**

***A FULLY AUTOMATIC TEST PROCEDURE IS ONLY POSSIBLE IF THE COMPLETE SYSTEM IS INSTALLED.***



***Make sure that your CTS firmware is Version 3.01 or higher. For CMD 55 it must be Version 4.03 and higher. Please check with the Service Info SB\_0500 for the CTS/CMD Hardware Options.***

## 11 PICS Internet



### Overview

The following functions are available for the LSO

- Generate **PINCODE**
- Generate **SIMLOCK-UNLOCK-Code**
- **Print IMEI labels**

The access to the server which is located in Kamp-Lintfort is protected and will only be granted to authorize users being supplied with a special coded chipcard.

Chipcards and the administration services of the PICS database are provided by *PICS-TRUST- Center* at department **ICP MP OI Kamp-Lintfort**.

In case of any questions or requests concerning chipcards or administration of the database please ask your responsible Siemens Customer Care Manager.

## Installation for Windows 95 / 98 / NT / 2000

### Requirements

In order to use the PICS-Internet websites you need a fully configured internet access with a 32bit NETSCAPE-Browser.

#### Remark:

Microsoft Internet Explorer and Netscape versions above 4.7x cannot be used!

There is a 90-day-trial-version of Netscapes Navigator 4.6 in English or German available on the PICS installation CD provided by Siemens.

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

For installation and further access you need the following:

1. The Installation-CD which contains:

- the SETUP program for the InterSEC plugin
- the **trial version** of Netscape Navigator 4.6 (German / English)
- the German / English documentation

2. A chipcard which is authorized by ICP MP OI KLF in order to decode the protected PICS Websites (and a password which gives you access to your chipcard). Chipcards can be ordered via your responsible Customer Care Manager within Siemens.

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

#### Remark:

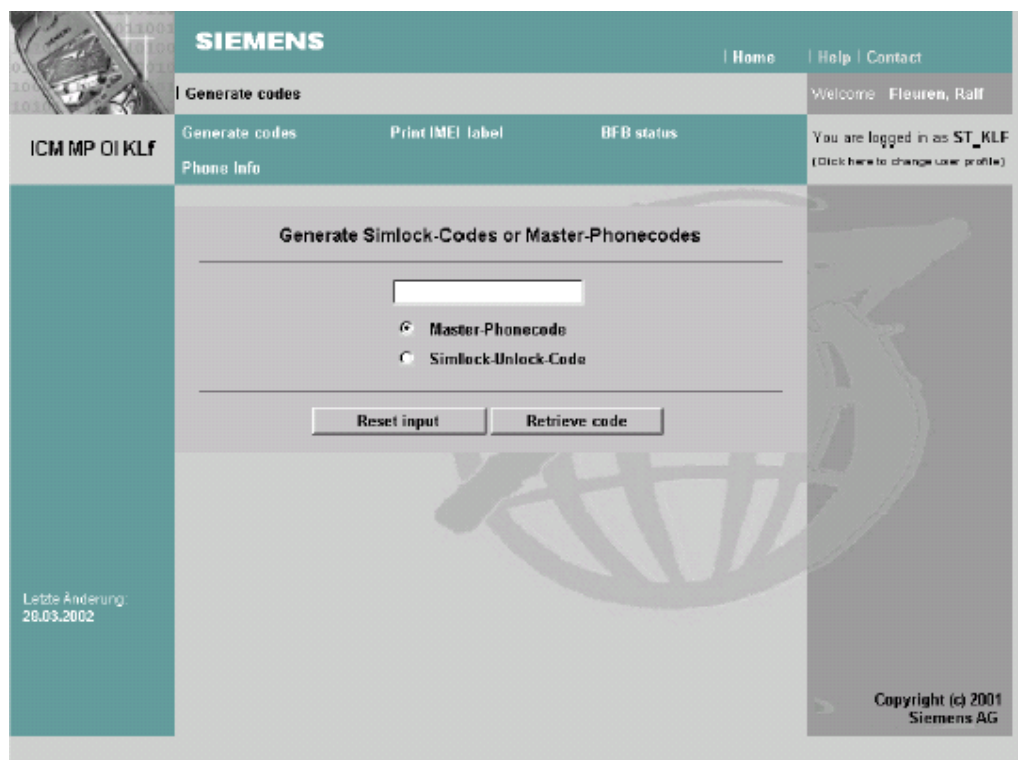
We recommend using the Siemens B1 reader. Similar device to B1 is Cardman 9010.

### 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.


### Master-Phonecode

	<b>IMEI-No.:</b>	449197520214
	<b>Partnumber</b>	S30880-S4100-A100-22
	<b>Delivery Note</b>	DA62178875
	<b>Delivery Date (MM-DD-YYYY)</b>	14.08.2000
	<b>Software version</b>	005
	<b>Master Phonecode</b>	*#0003*11564237#

## 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.




The screenshot shows a web interface titled "Simlock-Unlock-Code". On the left is a small image of a mobile phone. To its right is a table with the following data:

IMEI-No.:	445229518498560
Partnumber	S24859-C2700-A20-10
Delivery Note	290/01870
Delivery Date (MM-DD-YYYY)	03.05.1996
Software version	----
Network-Code	19246230
Network Master-Code	*#0000*06944218#
Serv-Provider-Code	89092430
Serv-Provider-Master-Code	*#0001*19919834#

Below the table is a button labeled "New query".

### Hint:

If there's no such authorization you'll get the following screen:

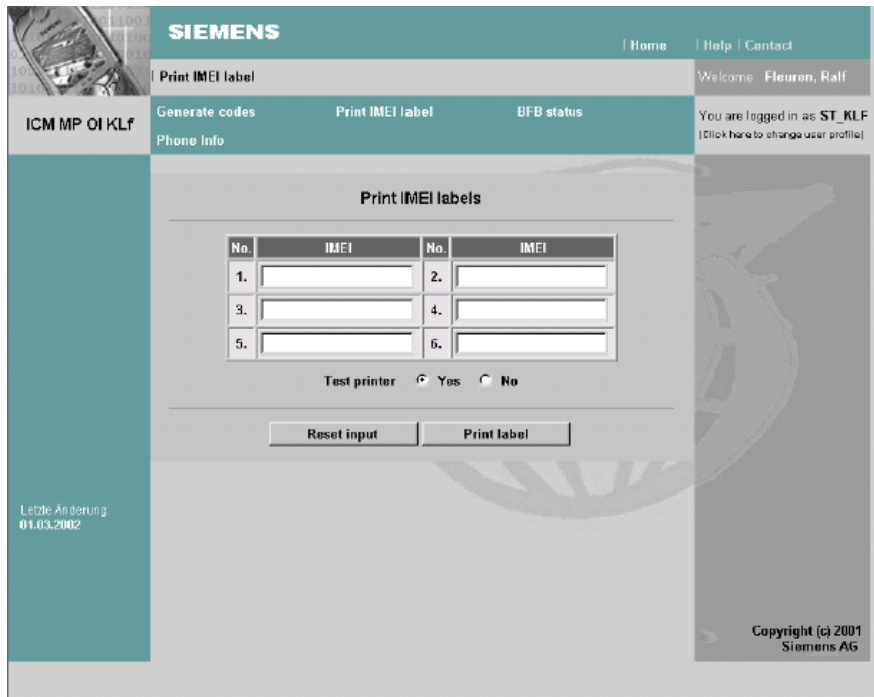


The screenshot shows the same "Simlock-Unlock-Code" interface as above, but with an error message. The "Info" field is highlighted in red and contains the text "Access denied!". The "IMEI-No.:" field still shows "445229518498560". The "New query" button is still present at the bottom.

In this case please contact your responsible Siemens Customer Care Manager.

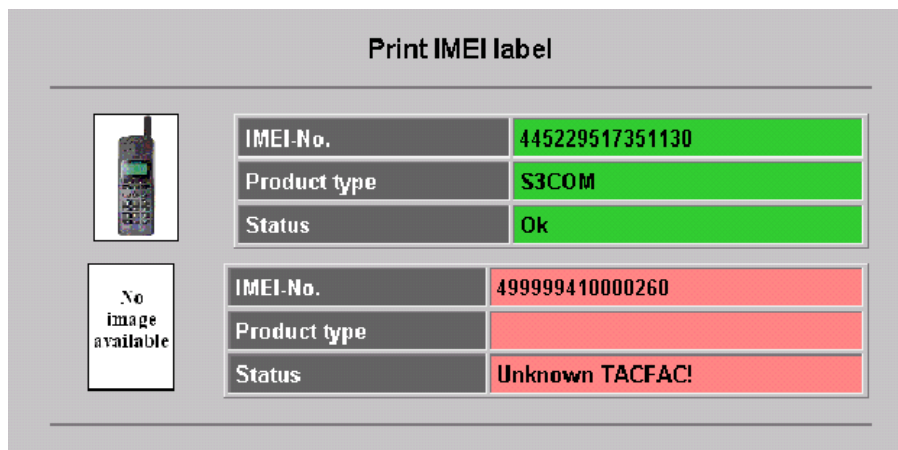
## Printing IMEI label

The module “Print IMEI label” offers the possibility to print IMEI labels for mobiles again.



You are able to print up to six labels in just one step.

To prevent that misaligned labels are being printed, the setting "test printer = Yes" is activated as default. After having printed a well-aligned test label you can switch setting to "No" 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.

## 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.

The part number for the A55 is S30880-S5750-Axxx where the last 4 letters specify the housing and software variant.

C45 series IMEI label is accessible by removing the battery.

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, the IMEI above show date code **M3**.

Year	Date Code	Month	Date Code
<b>1999</b>	<b>L</b>	<b>December</b>	<b>D</b>
2000	M	January	1
2001	N	February	2

TABLE 2.3 DIN EN 60062 DATE CODE

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

## 13 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.
  - 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.

### 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	<ul style="list-style-type: none"> <li>• GSM900</li> <li>• BS Power = -55 dBm</li> <li>• middle BCCH</li> </ul>	<ul style="list-style-type: none"> <li>• Display check</li> </ul>	<ul style="list-style-type: none"> <li>• individual check</li> </ul>
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>	<ul style="list-style-type: none"> <li>• Ringer/Loudspeaker check</li> </ul>	<ul style="list-style-type: none"> <li>• individual check</li> </ul>
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>	<ul style="list-style-type: none"> <li>• GSM Spec.</li> </ul>
4 Handover to GSM1800 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>	<ul style="list-style-type: none"> <li>• GSM Spec.</li> </ul>
6 Handover to GSM1900 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>	<ul style="list-style-type: none"> <li>• GSM Spec.</li> </ul>
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 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 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 100% network test (location update, and set up call).
- 2) Refer to point 3.3
- 3) A random sample check 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 2 different “Test-SIM-Cards” in use

a) Test SIM from the company “**ORGA**”

Pin 1 No: 0000  
PUK 1: 12345678

Pin 2 No: 0000  
PUK 2: 23456789

b) Test SIM from the company “**T-D1**”

Pin 1 No: 1234  
PUK 1: 76543210

Pin 2 No: 5678  
PUK 2: 98765432