Local Service Organization Service Manual

BE INSPIRED

C55 / 2128

WHICH SIDE ARE YOU ON?

Our Innovation Shapes the Future

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1 GPRS (GENERAL PACKET RADIO SERVICE)

G PRS 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.
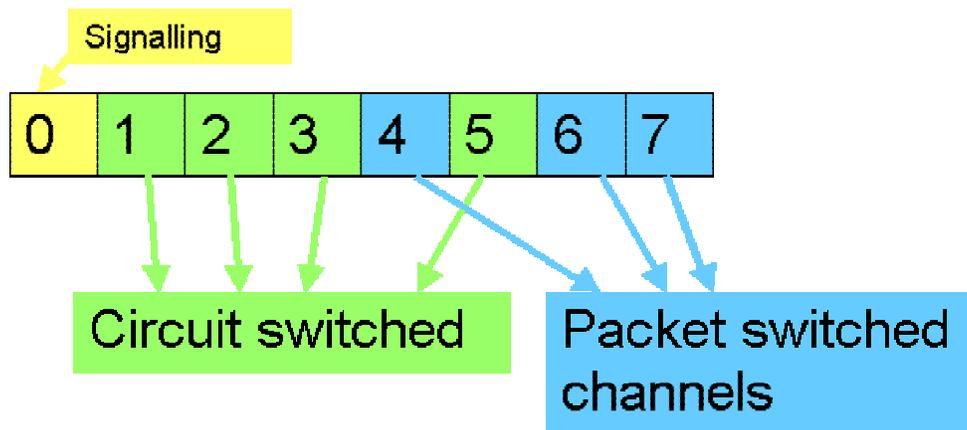
Figure1. Example of GPRS data transmission

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

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2 K-JAVA APPLICATION

Java-based game system		
Java Application Manager (JAM)	Application launcher and download manager. Supports HTTP-based OTA download of applications over GPRS and CSD.	yes
RAM for Java applications	Available RAM for Java applications (ie. program code and data) during application runtime: Minimum: 100 Kbyte (Has to be taken as working assumption for application development.) Goal: 145 Kbyte as SL45i (not committed)	yes
MIDP 1.0, CLDC 1.0	As SL45i, including performance optimizations from SL45i-Infusio.	yes
'OEM extensions'	Proprietary API extensions as SL45i. Including 'Siemens Game API'	yes
HTTP API over GPRS	SL45i: only over CSD	yes

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3 KEY FEATURES

General:	• Hands free • Flash file system • New sound concept with polyphonic ringing tones / social noises • Kjava (identical to K45-Manta)
Battery:	• LiIon Battery Pack 700 mAh • Power Input: 1.8 A (0.6 ms) / 0.2 A (4 ms) • Cut-off Threshold 3.2 V
Stand-by Time:	• approx. 250 h measured at BSPAMFRMS = 9; number of neighbouring cells = 0
Talk Time:	• Best case approx. 5 hours (lowest output level with DTX) • Worst case approx. 2.5 hours (highest output level without DTX) • Conditions for DTX: 40% user talk time
SIM Card:	• Small (="Plug In") 1.8 V or 3 V-SIM card (Phase II). • To insert the SIM the battery pack must be removed. • The SIM reader coding will be realized by lower case.
Speech Coder:	• Full Rate, Enhanced Full Rate, Adaptive Multi Rate and Half Rate speech coders are available as standard.
Display:	• Type: Full Graphic • Resolution: 101 X 64 Pixel • Illumination: Amber
Keypad:	• 12-digit block (0-9, #, *), small letters • two function keys (SEND, END) • ON/OFF key combined with the END key; the symbol ① (I inside O) is used as a symbol for ON/OFF. • 4 way navigation key as centered rocker type (up&down / 2 softkeys on left & right position) • amber as illumination colour • orientation at the housing in the area between keys "5" and "8"
Acoustics:	• comfortable earpiece with optimal acoustics • unidirectional microphone (similar to SL45 with modified rubber gasket) • loud signal emitter (soundringer) (>100dB(A) SPL @5cm, 'Hongkong-Spec.') • different call melodies (for the amount see SW product description). Realized with DSP firmware sound solution. All melodies with increasing volume because of the danger of acoustic shock. Additional measures to protect from acoustic shock, see SW product description.

	• handsfree mode
	• different selectable volume levels for handsfree, handset and ringer mode (for the amount see SW product description)

4 OTHER FEATURES

- Games (Java Based)
- Voice command/dialing
- Integrated handsfree
- Calling Images: Download a photo of your friend and link it to his phone book entry
- Greetings (Reminder of important dates)
- Get in touch (Conference Call) & SMS to group
- Text modules (SMS)
- Diary (appointments, notes)
- Flexible Memory
- PIN protected screensaver & notes
- Various animations (menu, welcome)
- Silent Alert
- Various user profiles
- Intelligent Typing (T9) + Libraries
- Mobile Internet Access (WAP 1.2.1)
- Built in data & fax modem @ 9.6 kbps
- Moon phase screensaver (**2128 only**)
- VOIP Predial
- Integrated sound concept (polyphonic melodies with up to 16 voices) for:
    - MMI
   - Ringer melodies
    - Recordable sounds

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5 COMPARISON WITH PREVIOUS PRODUCTS

Feature	K45 Flipper	L55 Tuna	Improvement
Supported Systems	Dual Band E-GSM 900 / GSM 1800	Dual Band E-GSM 900 / GSM 1800	Same
Stand-by Time	Up to 200 h	Up to 250 h	+20% stand-by time
Talk Time	Up to 5 h	Up to 5 h	Same
Battery Technology Battery Capacity	Ni-MH Battery Pack Nominal Cap. : 550 mAh	Li-Ion Battery Pack Nominal Cap.: 750 mAh	Li-Ion first time as standard in C-segment
Weight	Approx. 106 g	Approx. 84 g	-20% weight reduction
Volume	Approx. 82 cm^3	Approx. 69 cm^3	-16% volume reduction
Length	108,9 mm (Panther)	100,9 mm	8 mm shortening
Width	42.0 ... 46.0 mm (Panth)	41.0 ... 44.0 mm	1.0 mm … 2.0 mm width reduction
Thickness	19.0 ... 23.0 mm (Panth)	17.9 ... 20.8 mm	1.1 mm … 2.2 mm thickness reduction
SIM	Plug-In 1.8V/3V	Plug-In 1.8V/3V	Same
Antenna	Integrated	Integrated	Same
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	
Half Rate	Yes	Yes	Same
Enhanced Full Rate	Yes	Yes	Same
AMR	No	Tbc	New in C-segment
Fax/Data	Yes	Yes	Same
GPRS	No	Yes	New in C-segment
Keypad Illumination	Yes (amber)	Yes (amber)	Same
Display / Display Illumination	FSTN full dot matrix, 5 lines graphic	FSTN full dot matrix, 5 lines graphic	Same
Ringer volume level	Min. 100 dB(A) @ 5cm Typ. >103 dB(A) @ 5cm	Min. 100 dB(A) @ 5cm Typ. >103 dB(A) @ 5cm	Same

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6 ACCESSORIES

Due to changes on the connector from "Lumberg" to "Slim Lumberg", accessories using the old "Lumberg" connector will not be able to be used on the new "Slim Lumberg" platform.

C55 Original Accessories
EMEA Portfolio

SIEMENS
Mobile

Basics			Car Solutions		Innov.	Data	
Carry Set FCS-500	Li-Ion Battery EBA-510	Desk Top Charger EDC-510	Car Kit Prof. Voice HKV-500	Mobile Holder HMH-500		Data Cable DCA-500	Data Cable USB DCA-510
CLIPit Covers	Headset PTT HHS-510	Travel Charger ETC-500 ETC-510	Car Kit Comfort HKC-500	Mobile Holder Antenna HMH-510		SyncStation DSC-500 (Desk Top Stand, Y-Adapter, Data Cable)	
Carrying Cases		Car Charger ECC-500	Car Kit Portable HKP-500	Car Kit Upgrade HKO-500			
			Basic Car Pack HKB-500	Car Kit Upgrade HKO510			
				Car Handset HKO-550			

compatible to L55 and future products

C55 and S55 only

C55 only

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6.1 Accessories Part Number

Accessories

|	
L36104-F3090-X903	Handsfree Loudspeaker S45/ME45/C45/M45/C55/S55
L36146-A2053-D	Con.Cable Battery Install. Comfort GPS/rat C35/C35
L36254-Z6-C95	Handsfree Microphone aktiv S45/ME45/C45/M45/C55/S5
L36880-N4501-A135	HKO-520 Push-To-Talk-Key
L36880-S4501-A300	E-Box Carkit Voice S45/ME45/C45/M45/C55/S55 german
L36880-S4501-A301	E-Box Carkit Voice S45/ME45/C45/M45/C55/S55 englis
L36880-S4501-A302	E-Box Carkit Voice S45/ME45/C45/M45/C55/S55 french

7 UNIT DESCRIPTION L55 TUNA

The L55 Tuna is designed as a single-pcb phone with exchangeable covers and exchangeable keypad. The upper- and lower-cover are designed as two-coloured parts, which is realized in 2-shot-moulding technology.

7.1 Assembly Concept for the Customer
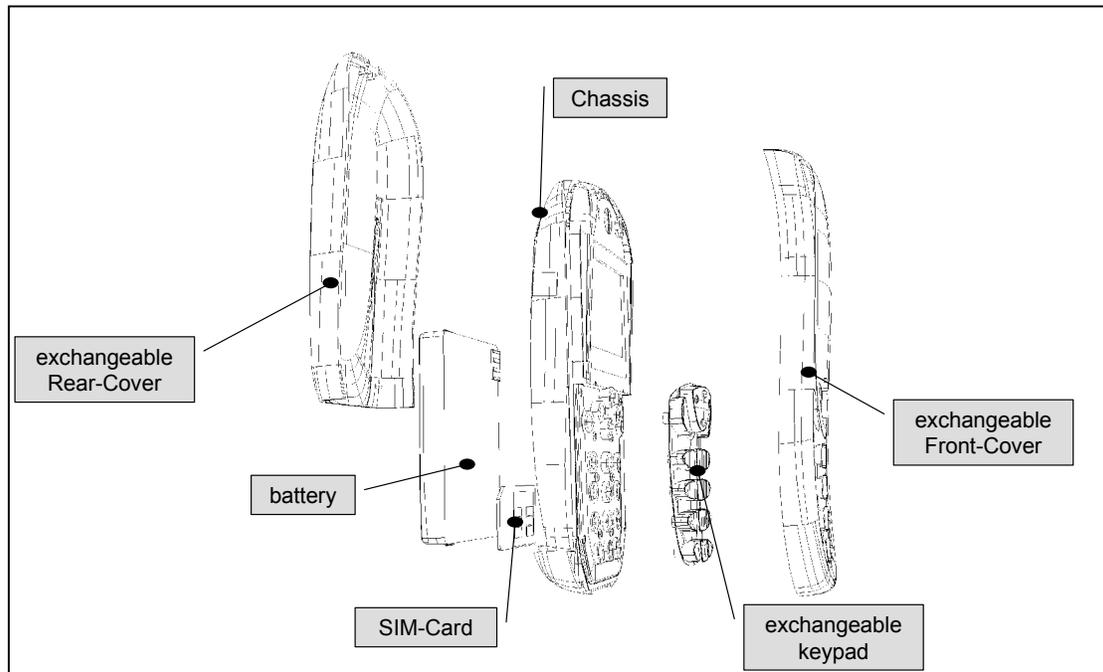
The C55 is the first Siemens Mobile phone that enables the customer to freely customize the outlook of their phone via the means of exchangeable Front/Rear covers as well as keypad.

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7.2 C55 / 2128 Mechanical Diagram

Display-Window

Upper-Case

Keypad

SAR-Frame

SAR-Absorber
(optional)

ESD-Frame

Speaker-Gasket

LCD

Lightguide

Speaker

Metaldome-Foil

PCB

Vibra-motor

Antenna

Microphone

Mounting-Frame

Battery

Lower-Case
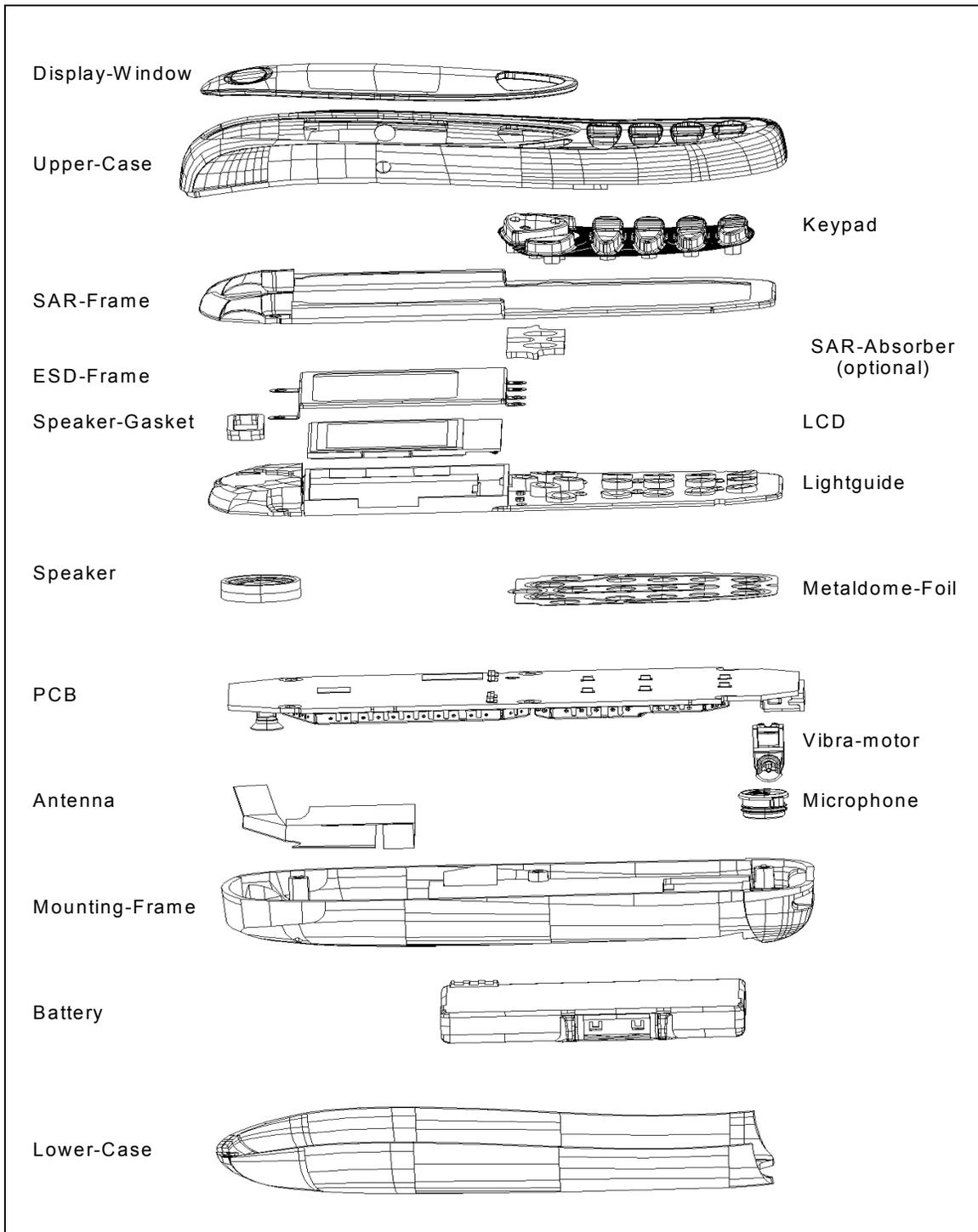
7.3 PCB top-side
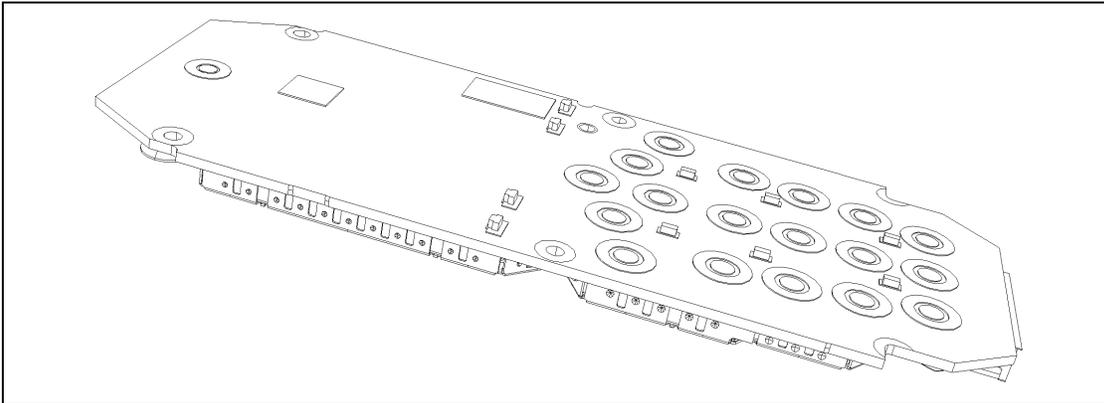
7.4 PCB bottom-side
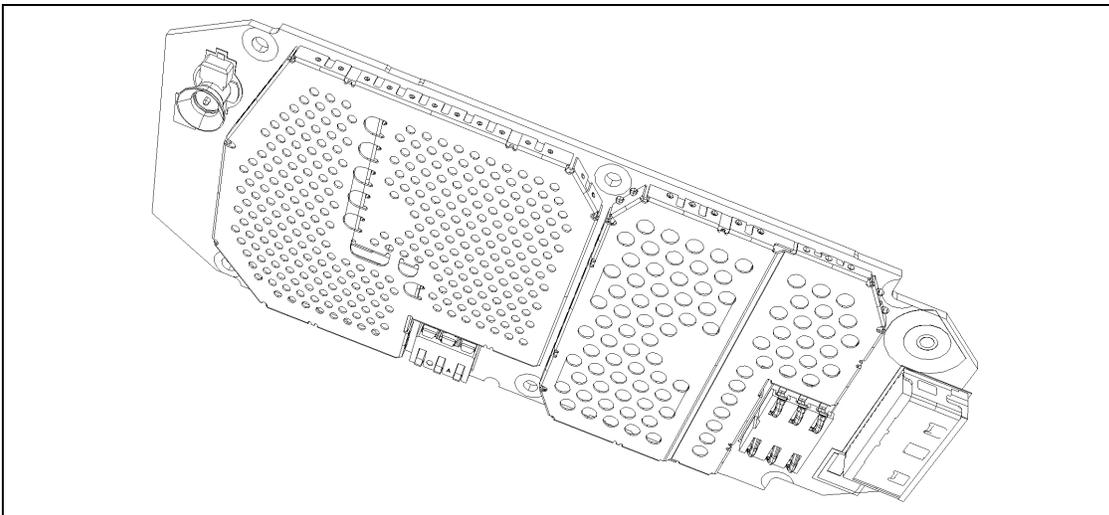
The C55/2128 assembly concept differs from the previous models (P35 & K45 series) slightly. The C55/2128 is no longer employing the concept of "No Screws". Instead of the previous upper & lower mounting frame to hold the PCB and the housing together, the C55/2128 uses six screws to hold the light guide, PCB and the mounting frame together.

As seen from the mechanical diagram, the C55/2128 also uses two other different techniques from the previous models (P35 & K45 series). (1) The use of a light guide on the front panel to disperse the light evenly throughout the keypad & display area. (2) The use of a metal dome foil as keypad contact as opposed to the carbon/metallic contact keypads used in the P35 & K45 series.

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8 DISASSEMBLY OF C55/2128

|	
Step 1 Front view of the C55/2128	**Step 2** Back view of the C55/2128
Step 3 Remove the battery cover by pushing it upwards as indicated by the arrow.	**Step 4** The C55/2128 comes with a hinge on the top part of the phone for customers to hang their accessories.
Step 5 Wit to rem on the 	**Step 6** With the battery removed, you would then be able to see the SIM card, which is held down by a metallic catch.
Step 7 Once the catch has been removed, the SIM card would pop up from the holder automatically.	**Step 8** Proceed to remove the front cover by pushing it up lightly.
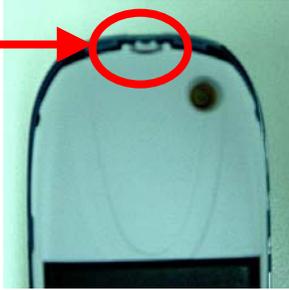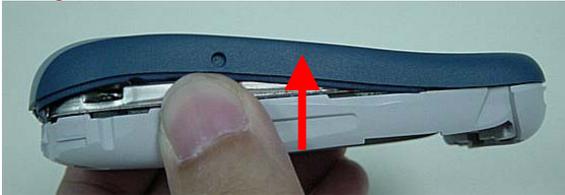
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|	
Step 9 Once the front cover has been removed, proceed to remove the 6 screws on the front with a "T6" screw driver; as indicated by the red circles.	**Step 10** Once the screws has been removed, you would be able to see the internal single PCB.
Step 11 Once the screws has been removed, the PCB can also be seperated from the back casingof the phone. The antenna is built-in on the back case.	**Step 12** As it can be seen from the photo, the keypad can also be separated from the front casing.
Step 13 Fully disassembled C55	

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9 REASSEMBLY OF C55/2128

For the reassembly of the C55/2128, simply reverse the disassembly procedures from Step 13 to Step 1. However there are some things to note on the reassembly of the phone.

During the installation of the SIM card, ensure that the SIM card is properly locked in. If not, it would result in card error, as the SIM card will not be properly held in place.

Ensure that the SIM card is fully inserted and that the metallic lock is pulled down.
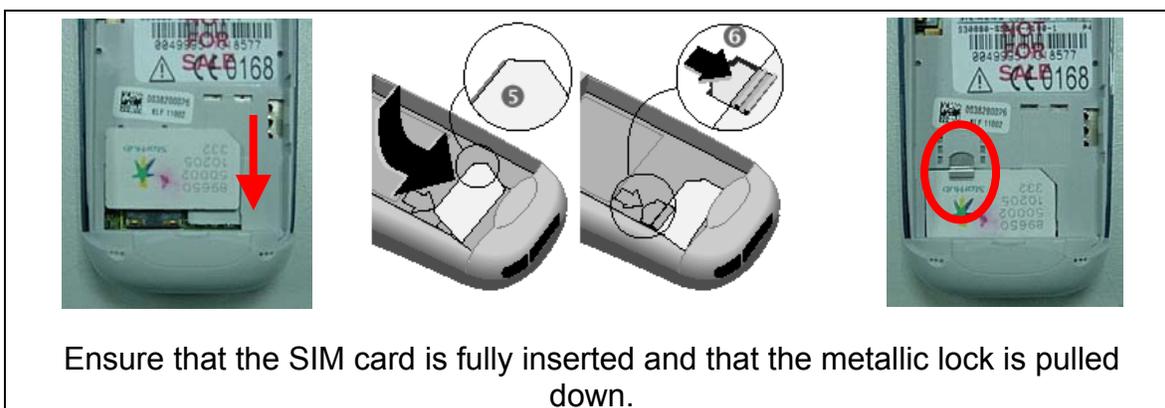
During the installation of the battery, ensure that the hinges are properly in place. Otherwise the battery will not be able to fit into the phone properly.

Ensure that the hinges are properly fitted before fixing in the battery.

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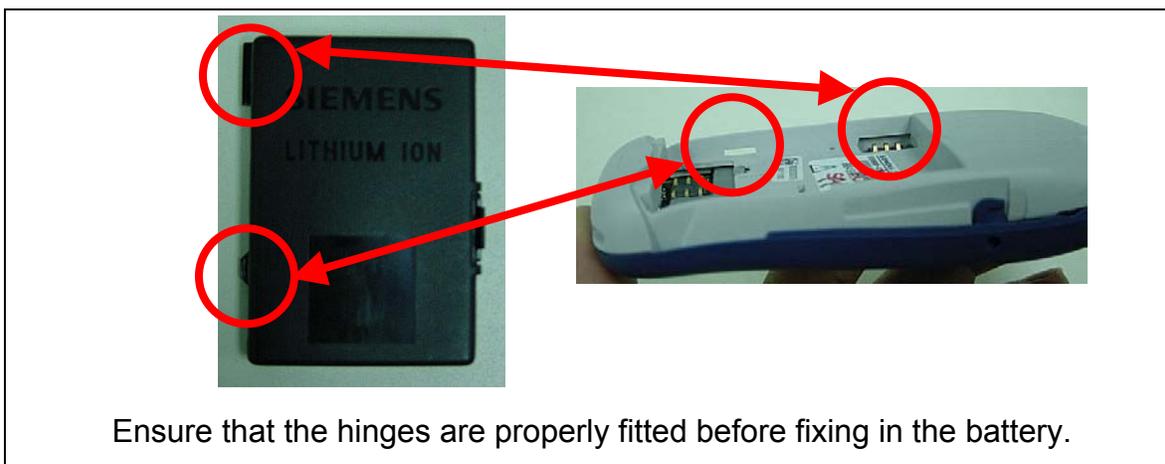
10 SPARE PARTS & PART NUMBERS

Level 1
L36158-A102-B600   Keypad C55/C56

Level 2.5
L36197-F5005-F782 Display LED blue MT50/M50/M46/C55
L36334-Z93-C272   Antenna Connector C35/C35i/S35i/M35i/SL45/ S45/ME4
L36334-Z97-C160   Battery Connector S45/ME45/C55/S55
L36840-L2055-D670 Display LED Amber S35i/S45/ME45/C45/M50/C55/C56
L36840-L2056-D670 Keyboard LED Amber S35i/S45/ME45/C45/S46/M50/MT50/

Level 2.5E
L36120-F4223-H   Resistor Temp_Resistor
L36145-F102-Y8   Quartz EGold/Logic (B1 lay.)
L36145-G100-Y96   Z850 Filter 1LO_VCO
L36145-K260-Y41   Z851 Filter Filter_BALUN
L36820-C6047-D670 Diode / Transistor Tran._Switch
L36820-L6105-D670 D800 Digital Integrated Circuit (IC) Transceiver I
L36830-C1097-D670 Diode / Transistor
L36840-C4049-D670 Diode / Transistor Tran._VCXO_Ampl.
L36840-D5049-D670 Diode / Transistor Feedback_Diode
L36840-D61-D670   Diode / Transistor Capa_Diode
L36851-Z2002-A59   Z900 Filter Power_Amplifier
L36851-Z9105-Z981 Diode / Transistor

11 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 not uncommon 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 fulfill 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
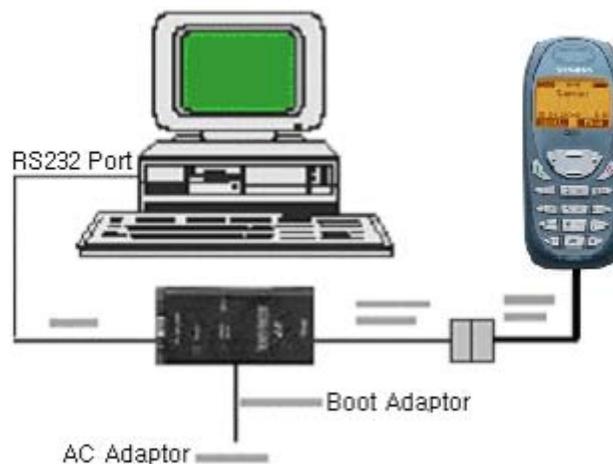
FIGURE 2.24   C55 SERIES SOFTWARE PROGRAMMING SETUP

11.1 MOBILE SOFTWARE UPDATING

The software of the mobile, L55 series, is loaded from a PC directly. Hardware interconnection between the mobile and the PC is shown in Figure 2.24 Because of the new type of external connector used in X55 series (Slim-Lumberg type) an additional adaptor cable between mobile and boot adaptor is required. Table 2.1 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	-

TABLE 2.1   EQUIPMENT LIST FOR SOFTWARE PROGRAMMING.

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11.2 Flow chart for S/W 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│                │
│ adaptor to the  │        │ the "Mobile S/W"│               NO
│ Boot Adaptor    │        └─────────────────┘                │
└─────────────────┘                │                  ┌─────────────────┐
        │                          ▼                  │ TEST Mobile     │
┌─────────────────┐              ◇ ERROR? ── NO       └─────────────────┘
│ Power up Boot   │                │                           │
│ Adaptor & check │               YES                 ┌─────────────────┐
│ LED.            │                │                  │ Take note of error│
└─────────────────┘        ┌─────────────────┐        │ and repeat      │
        │                  │ Check           │        │ process         │
       ◇ OK? ── YES        │ H/W setup = S/W │        └─────────────────┘
        │                  └─────────────────┘                │
       NO                          │                  ┌─────────────────┐
        │                          ▼                  │ Feedback Error to│
┌─────────────────┐              ◇ OK?                │ Tech. Supp. Dep │
│ Check AC Adaptor│                │                  └─────────────────┘
└─────────────────┘        ┌─────────────────┐                │
        │                  │ Correct Settings│              ( END )
  YES  ◇ OK?               └─────────────────┘
        │
       NO
        │
┌─────────────────┐
│ Faulty AC Adaptor│
└─────────────────┘

┌─────────────────┐
│ Faulty Boot     │
│ Adaptor         │
└─────────────────┘
```

FLOW CHART FOR S/W PROGRAMMING PROCESS

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12 SIEMENS SERVICE EQUIPMENT USER MANUAL

12.1 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:

12.2 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.

There is also test software under development for testing with the Wavetek 4201S and the 4107 GSM test set.

A Level 2.5 service software is also under development for more elaborate testing for the repair for the P35 series mobile phone.

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.

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12.2.1   R&S CMD55 Test Station
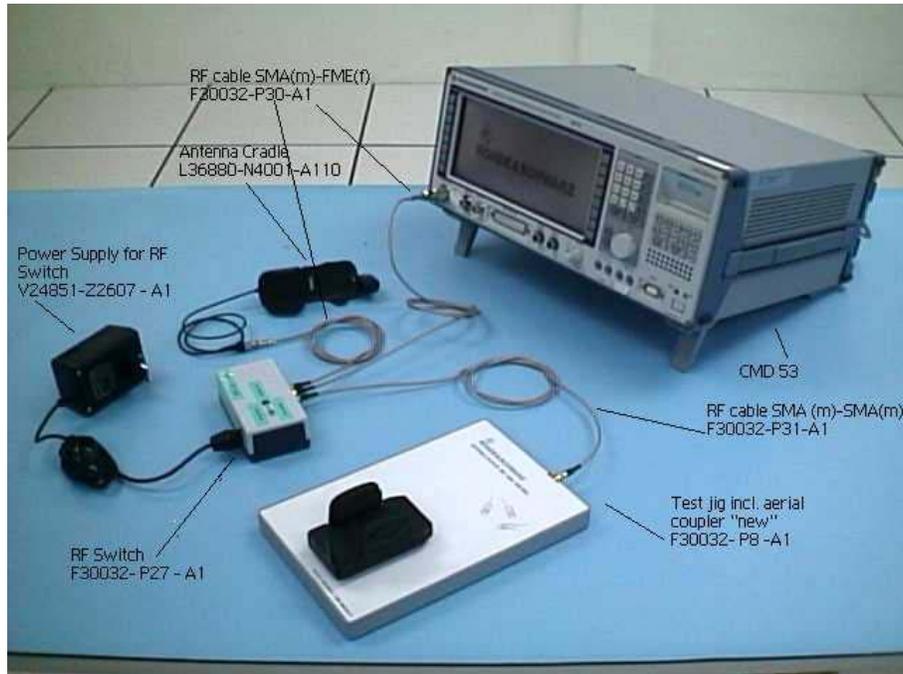
12.2.2   R&S CTS55 Test Station

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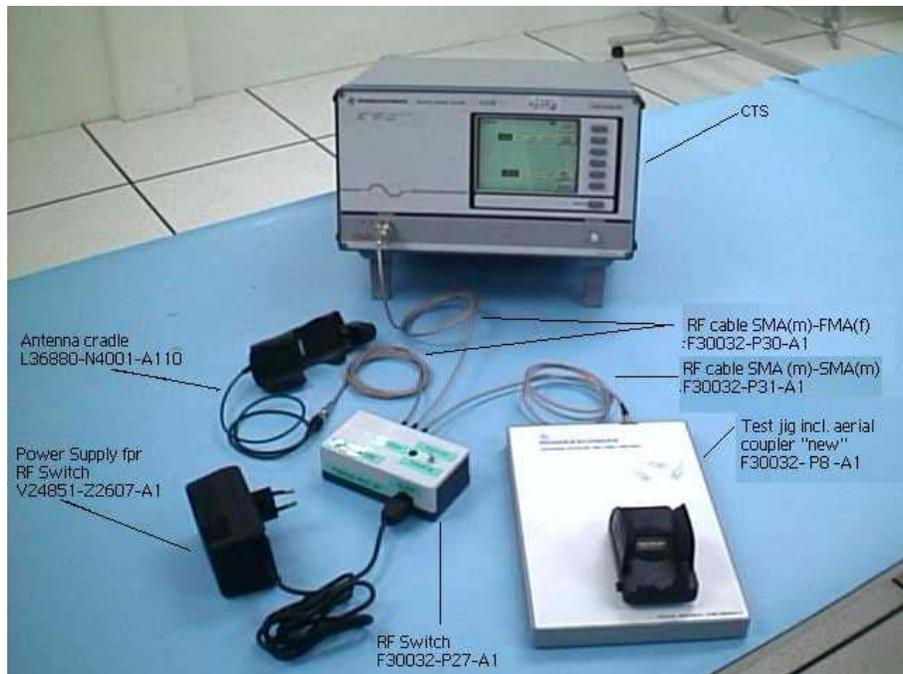
12.2.3 Wavetek 4201S Test Station

12.3 Other Equipment

One Pentium MMX Window 95/98 PC with a serial port to connect to the GSM test set through the PC serial cable provided for the GSM test set.

One Test SIM card and a fully charged battery for used with the mobile phone model.

Additional RF connector will be needed for setup using Wavetek 4107 test set and Wavetek Antenna Coupler.

For LSO Test Station setup base on the Wavetek 4107 test set, you need a TNC (male) to SMA(female) connector. For the Wavetek Antenna Coupler, you need a TNC (female) to SMA(female) connector. The part number for the connectors will be announced soon.

For Wavetek GSM test set

For Wavetek Antenna Coupler

12.4 Software Installation

Before executing the test software, it is important to ensure that the software configuration matches that of the hardware set up. Each GSM Tester will have specific test software. The test software is named CMD_GO, CTS_GO and for Wavetek test set, CAT4200 respectively.

First, copy the installation software for the specific GSM tester to a temporary directory on the harddisk of the Window PC and then Run the Setup from the first sub directory – Disk1 for CMD_GO test software.

After the installation for the test software, RUN the Test software and check the configuration setting for the Serial port.

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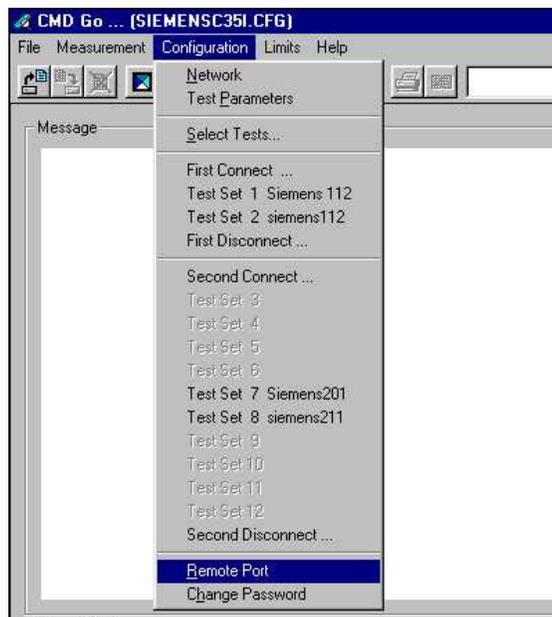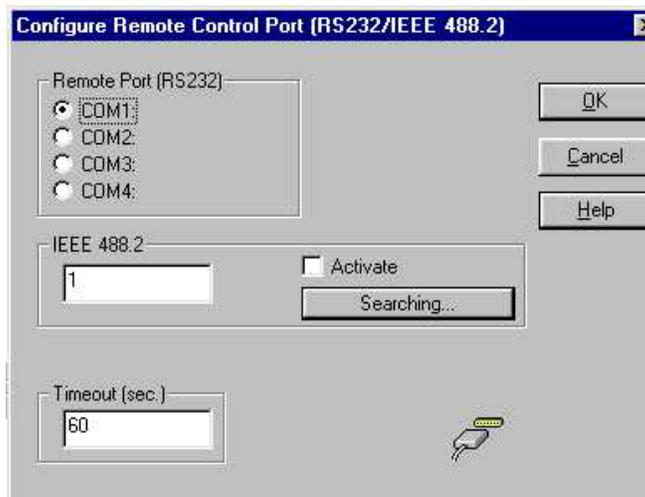
12.4.1 Configuring the test software

For each model of the L55 series mobile phone, Siemens will distribute the testing configuration file for the specific test station. For testing the phone, just go to the File menu and select Load Configuration.
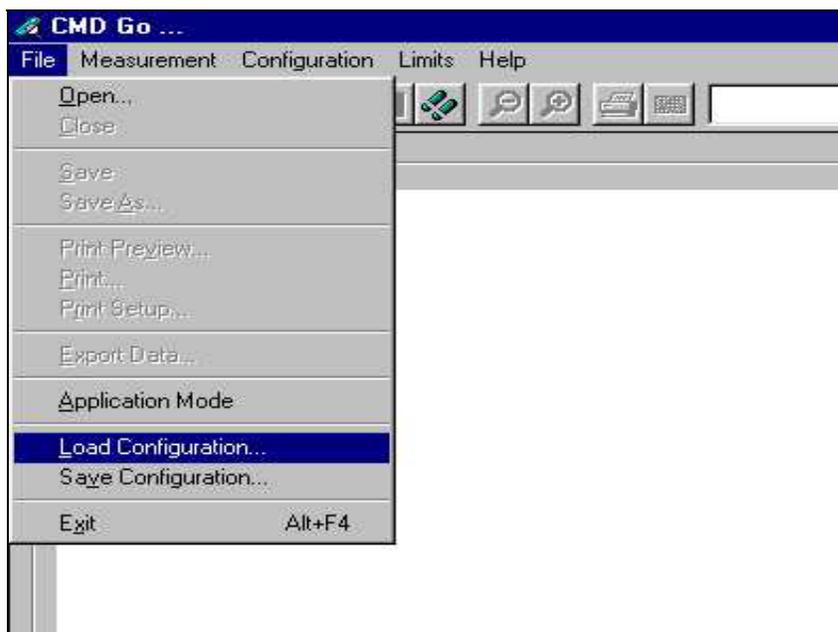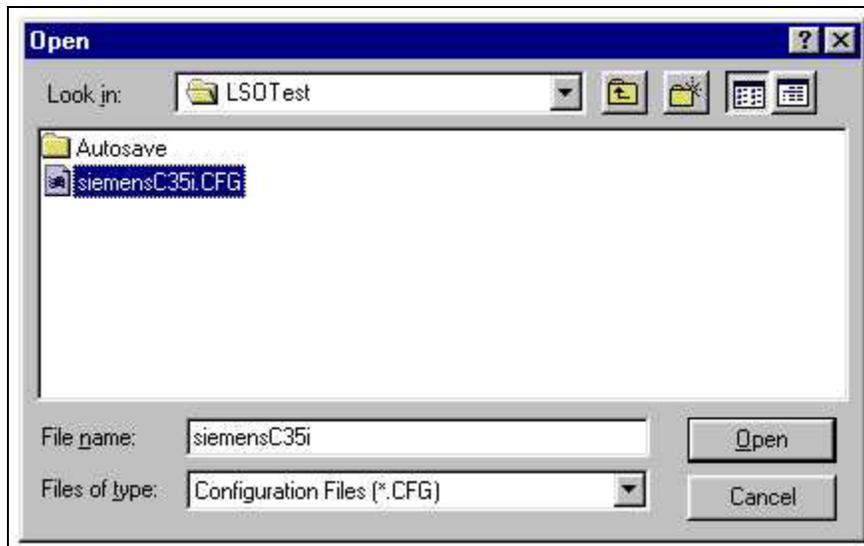
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> **Make sure that your CTS firmware is Version 3.01 or higher. For CMD 55 it must be Version 4.03 and higher. Please check with the Service Info SB_0500 for the CTS/CMD Hardware Options.**

12.4.2   Running the test sequence

Insert a Test SIM card and a fully charged battery into the Siemens mobile phone and place it onto the phone holder on the Antenna Coupler. Switch the RF switch to INT ANT position and select the Start button to run the test sequence in the configuration file.

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Follow the instruction on the screen and switch on the phone. The mobile phone will start Network Search and doing Location Update to the GSM test set through the off-air signal from Antenna Coupler.
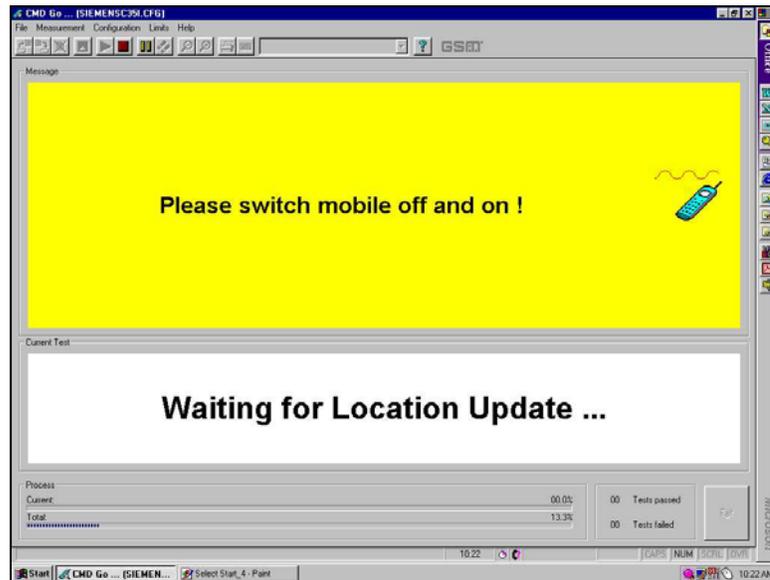

Next, the GSM test set will initial a call to the mobile phone through the Antenna Coupler. Press the Call key when the mobile phone ring, and the GSM test set will start Tx Power measurements on the GSM and GSM1800 channel specified by the configuration setting.
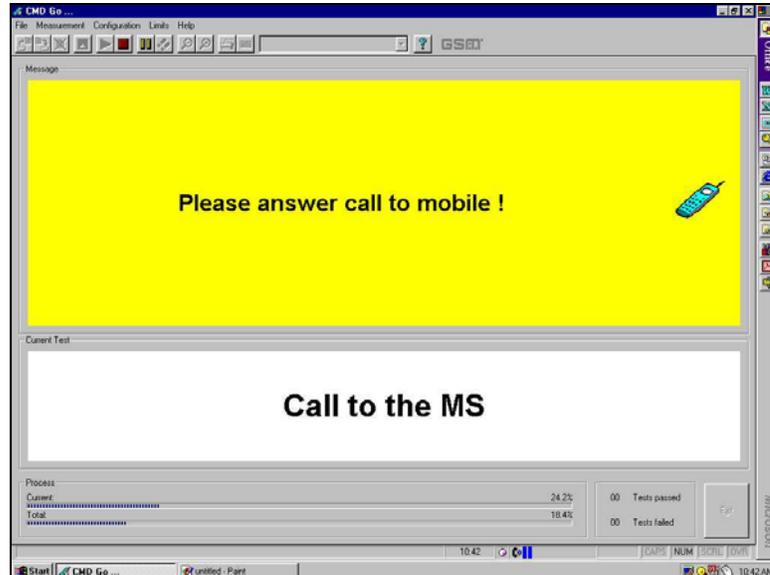
Next, the GSM test set will end the call to the mobile phone and the screen will prompt for Dialing from the mobile phone. At this test step, please move the mobile phone to the Antenna Cradle and switch the RF switch to EXT ANT position. Once the mobile phone logs onto the GSM test set, dial 1234 and the Send key.


The GSM test set will make Tx Power measurements, Rx BER measurement, Echo Loop test on the GSM and GSM1800 channel specified by the configuration setting. There will be an Echo Loop Back test for checking the speech quality. Speak into the mobile phone when prompted and listen the voice after approx 1 second and check the speech quality. If not O.K, it may be microphone or the earphone defective.

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The last test is Disconnect Call from the mobile phone. Press the End Call key and the test sequence will end.
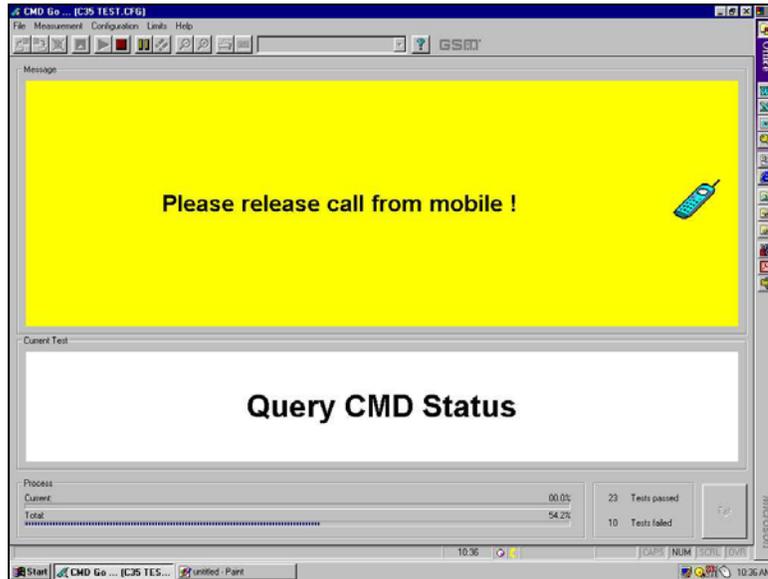
A measurement report screen will show up and a hardcopy can be printed if a printer is connected to the PC. To close the measurement report screen, click the third button from the left.
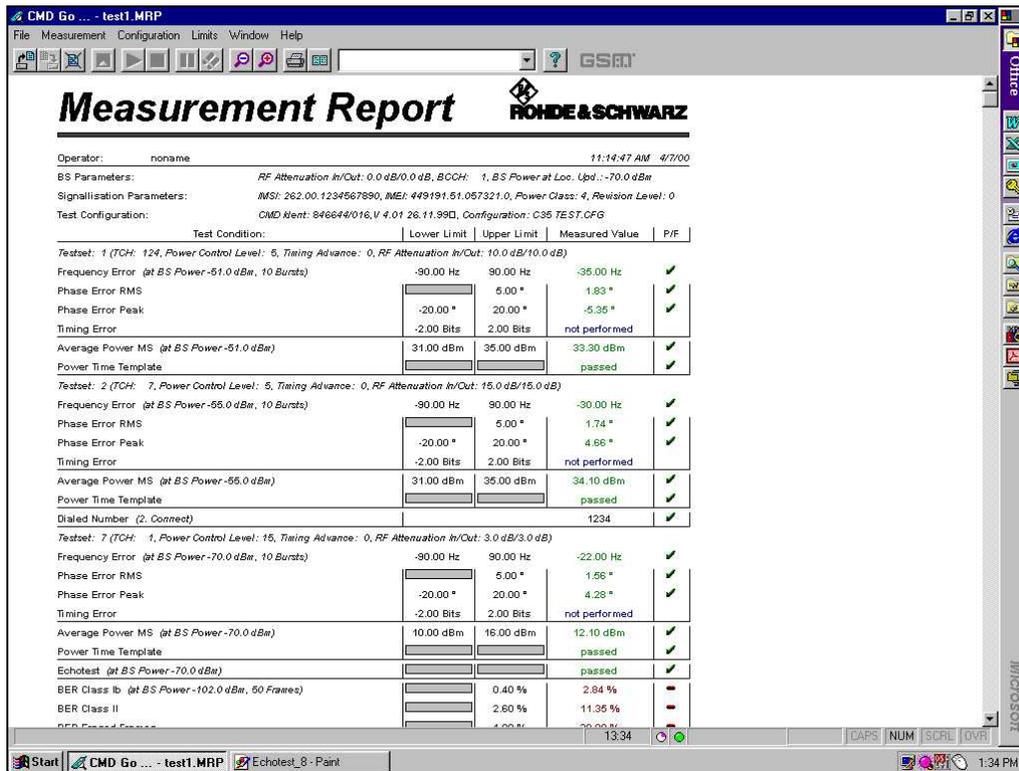
Once the mobile phone pass all the test steps, please make a check for all keys and the display. After this we can confirm on the proper functioning of the mobile phone after repair and return the phone back to the customer.

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