Service Manual

Gigaset 4010/ 15 Classic base station,
Gigaset 4010/ 15 Comfort base station
Gigaset 4000 Classic handset,
Gigaset 4000 Comfort handset

Level 2.5

1 Table of contents

2 Additional features and differences to Gigaset 3000

4000 Classic:
- Improved standby time up to 200 h (NiCd)
- Alphanumeric display (12 digits plus 2 lines for pictograms)
- Handset operation controlled via menu
- Date and time functions with protection against power failure
- Alarm call/ date reminder on display
- LED on top of the handset signalling MWI and incoming calls
- Directory with memory for 20 names plus numbers

4000 Comfort:
- Improved standby/ use time up to 350/ 23 h (NiMH: 1600 mAh)
- Large graphical display with 5 lines x 16 characters (101 x 61 pixel)
- Navigation key
- Tel.book for max. 200 entries
- Date and time functions with protection against power failure
- Alarm call/ date reminder on display
- LED on top of the handset signalling MWI and incoming calls
- Walky-Talky mode with second 4000 Comfort handset
- Handling of AM via handset like a mobile phone (4015 base station necessary)
- 14 display languages

4010/ 15 Base stations:
- 4 different base stations (4010/15 Classic and 4010/15 Comfort)
- New features/ differences on Comfort base station: - Transmission of texts (SMS)
  - 4015: Voice dialling of 20 names + 3 commands
  - 4010/15: no ringer
  - 4015: no loudspeaker

No more PIN-Code for handsets existing.
A difference to G3000 systems is that the **handset has to be registered** to the base station by the customer. Therefore the customer has to insert the handset in the base station and wait until the handset is regsitered. A handset that has been registered on another base station has to be registered manually (similar to G3000). Therefore a paging key is existing under the base station.

2.1 DECT-specific details

Number of channels:	120
Radio frequency range:	1880 MHz to 1900 MHz (altered for certain countries)
Duplex method:	Time-division multiplexing, 10 ms frame length
Channel grid:	1728 kHz
Bit rate:	1152 kBit/s
Modulation:	GFSK
Voice coding:	ADPCM (32 kBit/s)

3 Procedures

This chapter shows the hidden service procedures for Gigaset 4000 Classic, 4000 Comfort and 4010 base stations.

Note: The service procedures are confidential.

3.1 Service procedures for Gigaset 4000 Classic

Reset to factory defaults (customer procedure):
This procedure resets the handset to factory defaults.
Press softkey "**menu**", **9 3** and confirm with **o.k.** (see user guide).

Displaytest:
Press 1, 4 and 7 simultaneously and hold down while you switch on.
Press any key to toggle between the displayed signs. Afterwards switch handset off.

To get into the service procedures you need to press 1,4 and 7 simultaneous and hold down while you switch on, afterwards press 76200.

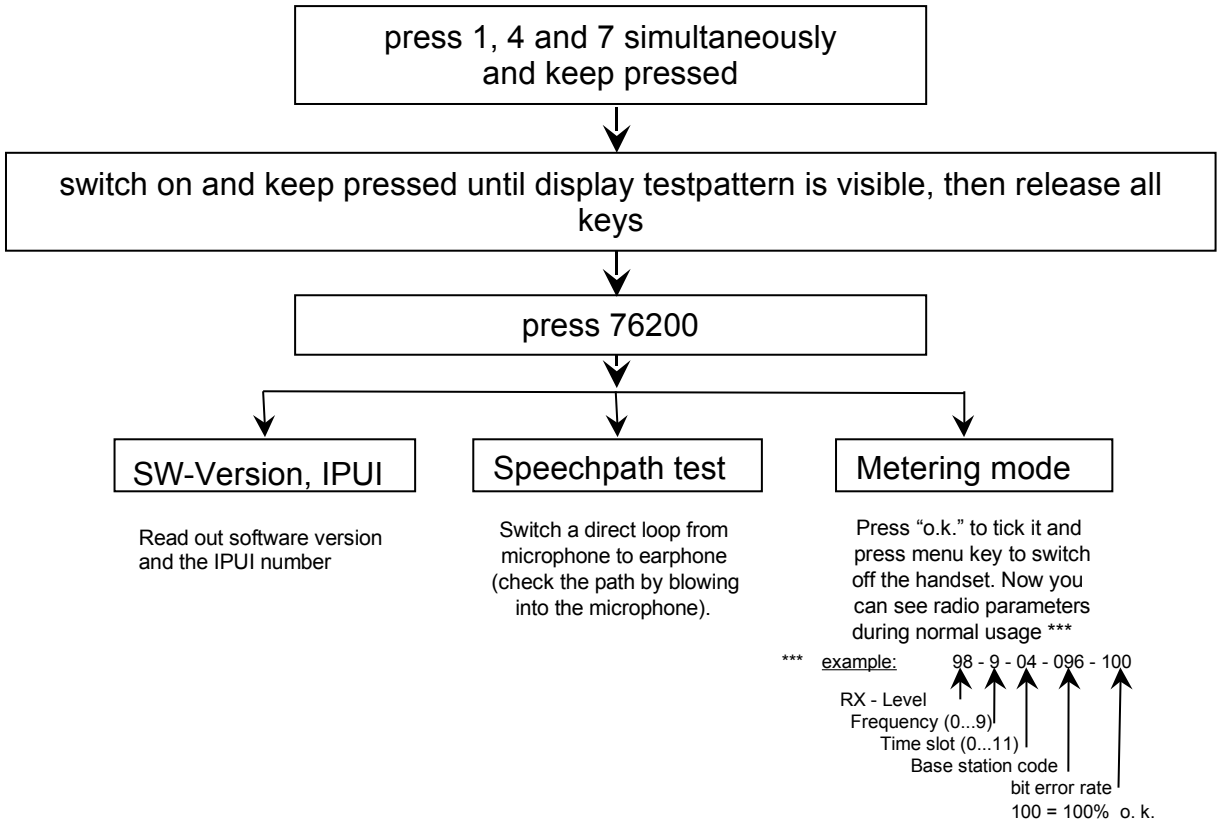
1. SW-Version and IPUI:
On the left upper corner the number of the menu is shown (here menu 1).
At first the **SW-version** is displayed. The digits above the 2. arrow show the version (e.g. 16).
When scrolling down with the "arrow down key" the **IPUI** number is displayed.
The I on the left side indicates that this is the IPUI.

2. QS data:
This data is only important for the production, not for service purposes.

3. Speechpath-test:
You can select this item when you want to check the speechpath by blowing into the microphone and checking this noise on the earphone (without beeing registered to a base station).

3.2 Service procedures for Gigaset 4000 Comfort

Displaytest, Software-Version & IPUI, Speechpath test and Metering mode:



The items QS-Data,Batt mode and DSP parameters have been implemented for development and production purposes and are not needed in service.

3.3 Service procedures for Gigaset 4010/ 15 Classic/ Comfort base station

Note: For parameters X, Y, option see table below.

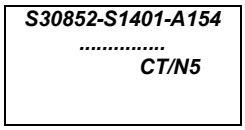
Press: "menu-key", 8, 9, X, 76200 (only if X=3 or 4), Y, select option, o.k.
A pos. acknowledge (rising sequence of notes) indicates that the procedure has been accepted.

Feature	X	76200	Y	Option
Pause after signal-key	1	-	2	1 = 800 ms 2 = 1600 ms 3 = 3200 ms
Automatic attenuation correction (dependant on country)	1	-	3	0 = off 1 = on
Time for end of call identification (to distinguish between 2 ringing pulses of one call with long pauses between pulses and 2 separate calls)	1	-	4	0 = 4 sec. 1 = 5.5 sec. 2 = 7 sec. 3 = 11 sec.
Hook-flash-prevention (cradle switch identification) (short press on cradle switch-key is extended by SW to prevent that it is interpreted as a press on the flash-key)	1	-	5	0 = 800 ms 1 = 2000 ms
Pause after line seizure	1	-	6	1 = 1 sec. 2 = 3 sec. 3 = 7 sec. 4 = 2.5 sec.
System PIN reset	3	76200	-	-
Programming data on an address	4	76200	1	Specific code needed
Read out SW-version	4	76200	2	Example: 01002_….. 01 = SW-variant 002 = SW-version
Range of ringing frequency recognition	4	76200	3	0 = 23- 54 Hz 1 = 20- 60 Hz 2 = 15-75 Hz
Dial pulsing: pulse pause ratio	4	76200	4	0 = 1.5 : 1 1 = 2 : 1
CLIP activation	4	76200	5	Select 0 (on) or 1 (off)
Off-hook CLIP activation	4	76200	6	Select 0 (on) or 1 (off)
Approval test	6	76200	6	-

only Gigaset 4015 Classic/ Comfort:

Feature	X	76200	Y	Option
Select speech 1 for AM phrases (tones)	2	-	1	-
Select speech 2 for AM phrases	2	-	2	-
Select speech 3 for AM phrases	2	-	3	-
Select speech 4 for AM phrases	2	-	4	-

4 Info sticker/ lasered imprint and sticker on microprocessor

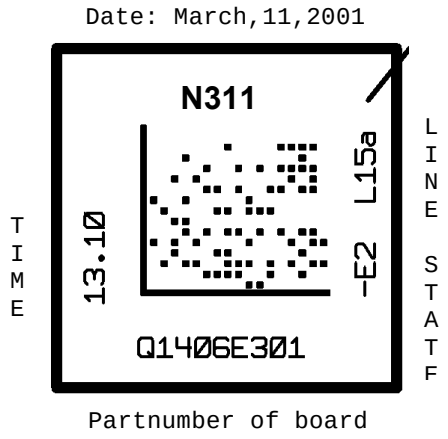


These are the 2 important numbers on the info sticker.
The first number shows the type of the phone.

Example:
- S30 means new component
  S36 means swap component
- 852 means Gigaset family
- S14xx means 4000 family
- The following 2 characters indicate the country.
  B1 means Germany (Siemens); A1 means Germany (PTT)
  C1 Austria
  C4 Australia
  .....
- The following character shows you the variant.
  Euro-PTT-Version, Base with Classic-/ Comfort handset...
- The last character indicates the colour.

The second number indicates the date of production.
CT stands for Bocholt.
The next character shows the year of production.
N = 2001
The last character shows the month of production.
1-9 = January to September
O = October
N = November
D = December

Sticker on Microprocessor:



5 Fault codes

Code	Symptom	Cause	
D 1	No key function	N 10	Not soldered
D 2	No ringing function	N 11	Cold soldered
D 3	Charging problems	N12	Electric fault
D 4	Display problems	N 13	Mechanic fault
D 7	Breaking off calls	N 17	Missing component
D 9	Poor call quality (humming, noises)	N 34	Dirty component
D 11	No outgoing call possible	N 37	Loose component
D 12	No registration/ no call setup	N 38	Humidity damage
D 13	Answering machine problems	N 39	Lightning stroke damage
D 14	Problems with use of „hands-free“		
D 15	Range too short		
D 16	Mechanical fault		
D 18	Miscellaneous		
D 19	SLR (microphone-path faulty)		
D 20	RLR (earpiece-path faulty)		
D 25	No failure found		
D 26	No function		
D 28	Diverse procedures programmed wrong		
D44	AC-Adapter faulty		
A04	Stand-by time/ battery problems		
A27	Keypad faulty		

6 Fault diagnosis and elimination

There are different faults that could appear.
Not all incoming components or systems have to be faulty.
The customer could have problems with the operation of the phone or could have placed it close to a device (PC...) that affects it.
So you won't identify a fault.
It could also happen, that there is a loose connection in the phone (due to a cold soldering joint or something else).
So the fault won't appear each time you test the phone.

There are different possibilities to test a phone depending on the information you received with the phone.

6.1 Functional Test

There is an incoming and an outgoing test.
The difference between them is that in the outgoing test you make a reset on the component after testing in case of swap (to deregister, reset PIN and set to factory defaults).

Outgoing test (system):

1) Displaytest 4000 Classic:
   Mobile unit is switched off.
   Press 1, 4 and 7 simultaneous and hold down while switching on.
   Press any key to alter pattern.

2) Charging-test:
   Mobile unit is switched off.
   Put mobile unit into charging cradle.
   One segment of the battery display has to start blinking automatically when putting in.

3) There are 2 possibilities of testing the fundamental functions of the telephone:
   1) Test with PBX (private branch exchange):
   a) Ringer test (not for Comfort base stations)
   b) Dialling test
   c) Audible test of telephone in transmit and receive direction (speech) with the help of a second phone connected to the PBX.

2) Test with telephone tester, if existing (e.g. WPG 1000):
- Ringer test (not for Comfort base stations)
- DC resistance and isolation resistance (only for base station test)
- Testing the dial information (only for base station test)
- Testing the flash hookswitch (signal key) (only for base station test)
- Audible test of telephone in transmit direction (SLR)
- Audible test of telephone in receive direction (RLR)

4) Make a fundamental reset on the base station you want to test in case of swap:
Disconnect mains.
Press paging key under the base station and hold down.
Plug in AC- adapter.
Hold key pressed for 25 seconds. Release paging key.
The base station is now set to factory defaults.
The system code is set to 0000 and all mobile units are deregistered.

5) Reset handset to factory defaults in case of swap:

Incoming test: only step 1 to 3

6.2 Recognition of typical customer problems

This chapter shows the incoming department which fault code refers to which problem and which component is faulty.
Some problems concerning the mobile unit (not possible to switch on; not possible to register; acoustic problems; charging problems ...) could be caused by humidity.
So you will have to open the mobile unit (opening tool) and look for tracks of a humidity damage.
Many problems concerning the base station could be caused by lightning stroke.
So you will have to open the base station and look for tracks of a lightning stroke.

Problem 1:
The customer can‘t hear the other subscriber during a call
(or hears his speach at a low volume).
When he blows into the microphone he **can‘t** hear his noises on the earpiece.
Fault code: **D 20** (RLR)
Faulty component: Mobile unit

When he blows into the microphone he **can** hear his noises on the earpiece.
Fault code: **D 20** (RLR)
Faulty component: Base station

Problem 2:
Other subscribers can‘t hear the customer during a call
(or hear his speach at a low volume).

When he blows into the microphone he **can‘t** hear his noises on the earpiece.
Fault code: **D 19** (SLR)
Faulty component: Mobile unit

When he blows into the microphone he **can** hear his noises on the earpiece.
Fault code: **D 19** (SLR)
Faulty component: Base station

Problem 3:
The customer can‘t switch on his mobile unit.
→ Check the batteries and insert new ones for testing.

Fault code: **D 26** (no function)

Faulty component: Mobile unit

Problem 4:
The customer can't call or/ and can't be called (no ringing).
His mobile unit seems to work properly.
→ Check the **AC-adapter** first.

Fault code: **D 1** (no key function), **D44** (AC-Adapter faulty)
or **D 11** (if **only** no outgoing call possible and AC-Adapter ok)

Faulty component: AC-adapter or base station

Problem 5:
The segment of the battery display doesn't start blinking when charging.
→ Check the batteries and insert new ones for testing.
→ Check the charging cradle (golden device).

Fault code: **D 3** (charging problems (if batteries are o.k.))

Faulty component: batteries or mobile unit or base station/ charging cradle

Problem 6:
The mobile unit or the base station doesn't ring.
→ Check AC-adapter (if base station) or batteries and insert new ones for testing.
The 4010/15 Comfort base station doesn't have a ringer.
Classic base station must ring.

Fault code: **D 2** (no ringing function)

Faulty component: Mobile unit or base staion

Problem 7:
Some characters are not visible or only sometimes visible.

Fault code: **D 4** (Display problems)

Faulty component: Mobile unit

Problem 8:
The customer has caused visible mechanical damages.

Fault code: **D 16**

Faulty component: Mobile unit or base station

Problem 9:
There can be various possibilties.
Example: The client claims that he can't set up an outgoing call or the ringing volume is too low. Check the programmed procedures (see chapter Procedures).

Fault code: **D 28** (diverse procedures programmed wrong)

Faulty component: Mobile unit or base station

Problem 10:
The customer claims that the connection breaks off if he tries to go away from the base station. Inside buildings the range should be up to 50 m, but if there are ferroconcrete-walls between mobile unit and base station the radio contact can break off due to absorbtion and reflections at the wall.
Test the range by picking up the handset and going away from the base station for the desired distance (no walls between).
If there is still a problem check which component is faulty by using a golden device.
Note that 50 m is the maximum range inside buildings. Depending on the design of the device and how the customer holds it (hand close to antenna and between base station and antenna decreases range) the range could decrease. The different Gigaset models have slightly different ranges (best range has the Pocket handset).

Fault code: **D 15** (Range too short)

Faulty component: Mobile unit or base station

Problem 11:
The connection breaks off sometimes during a call.
→ Check the batteries and insert new ones for testing.
If they are o.k. and there is still a problem use a golden device to find out which component is faulty.

Fault code: **D 7** (Breaking off calls)

Faulty component: Mobile unit or base station

Problem 12:
The customer claims that there is a poor call quality or that there are noises audible during a call (humming...). The noises could also be audible on the earphone of the other subscriber when problems in transmit direction. Check the call quality.
If the customer was right take a golden device to identify the faulty component.

Fault code: **D 9** (Poor call quality (hummung, noises))

Faulty component: Mobile unit or base station

Problem 13:
The customer claims that his mobile unit doesn’t ring (incoming call) or he claims that he can’t set up an outgoing call.
The mobile unit doesn’t ring when pressing the paging key.
The display-sign referring to the radio connection is blinking.

→ 4000 Comfort: Press menu and select "handset settings", then choose "select .base". If there is no tick on any base station the handset is not registered.

→ The mobile unit has no connection or has lost the connection to the base station. Try to register the mobile unit to the base station.

Problem 14:
The customer claims that there is no function when pressing any key.
There could also be problems when pressing some keys.

Fault code: **D 1** (No key function)

Faulty component: Mobile unit

6.3 Check of complete system with fault description of customer

Try to reconstruct the fault using the description of the customer.
Check the batteries and the AC-adapter.
Find out whether the customer has programmed something wrong
by checking the procedures concerned.
If that was not successful make an **incoming test**.
If there is a fault try to find out which component is faulty by registering on a
golden device and testing again (deregister it from the golden device after testing).
Register swap component to customer component.

6.4 Check of complete system without fault description of customer

Check the batteries and the AC-adapter if existing.
Make an **incoming test**.
If there is a fault try to find out which component is faulty by registering at a
golden device and testing again (deregister it from the golden device after testing).
Register swap component to customer component.

6.5 Check of component with fault description of customer

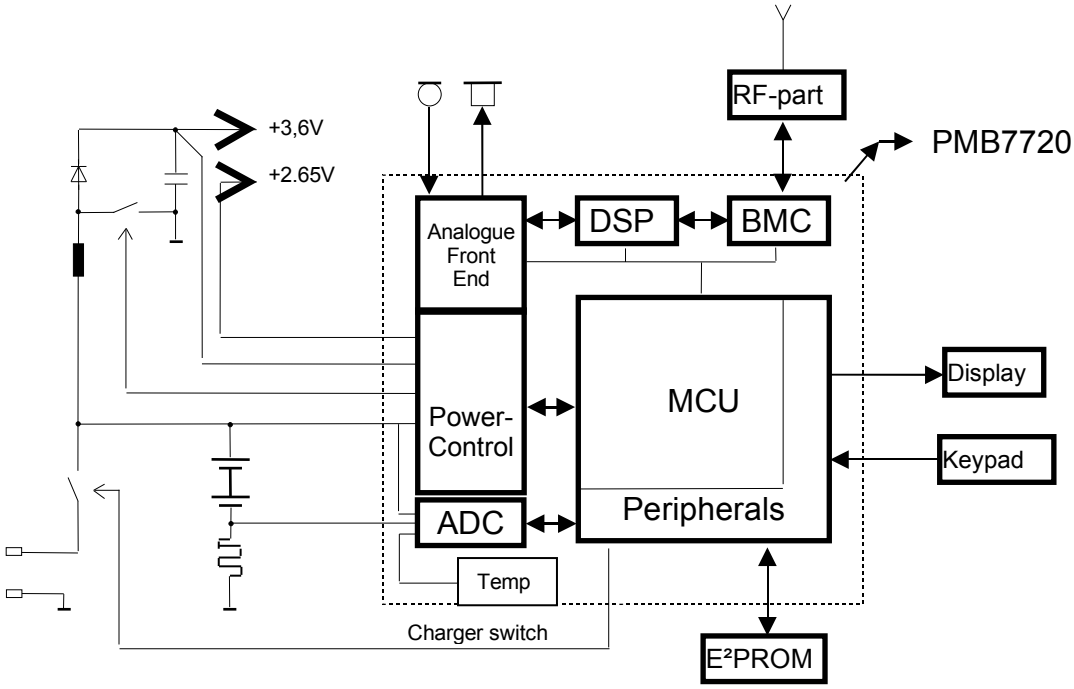
Register component to golden device.
Try to reconstruct the fault using the description of the customer.
Check the batteries (handset) or the AC-adapter (base station).
Find out whether the customer has programmed something wrong
by checking the procedures concerned.
If that was not successful make an **incoming test.**
Deregister customer device from golden device after testing.

6.6 Check of component without fault description of customer

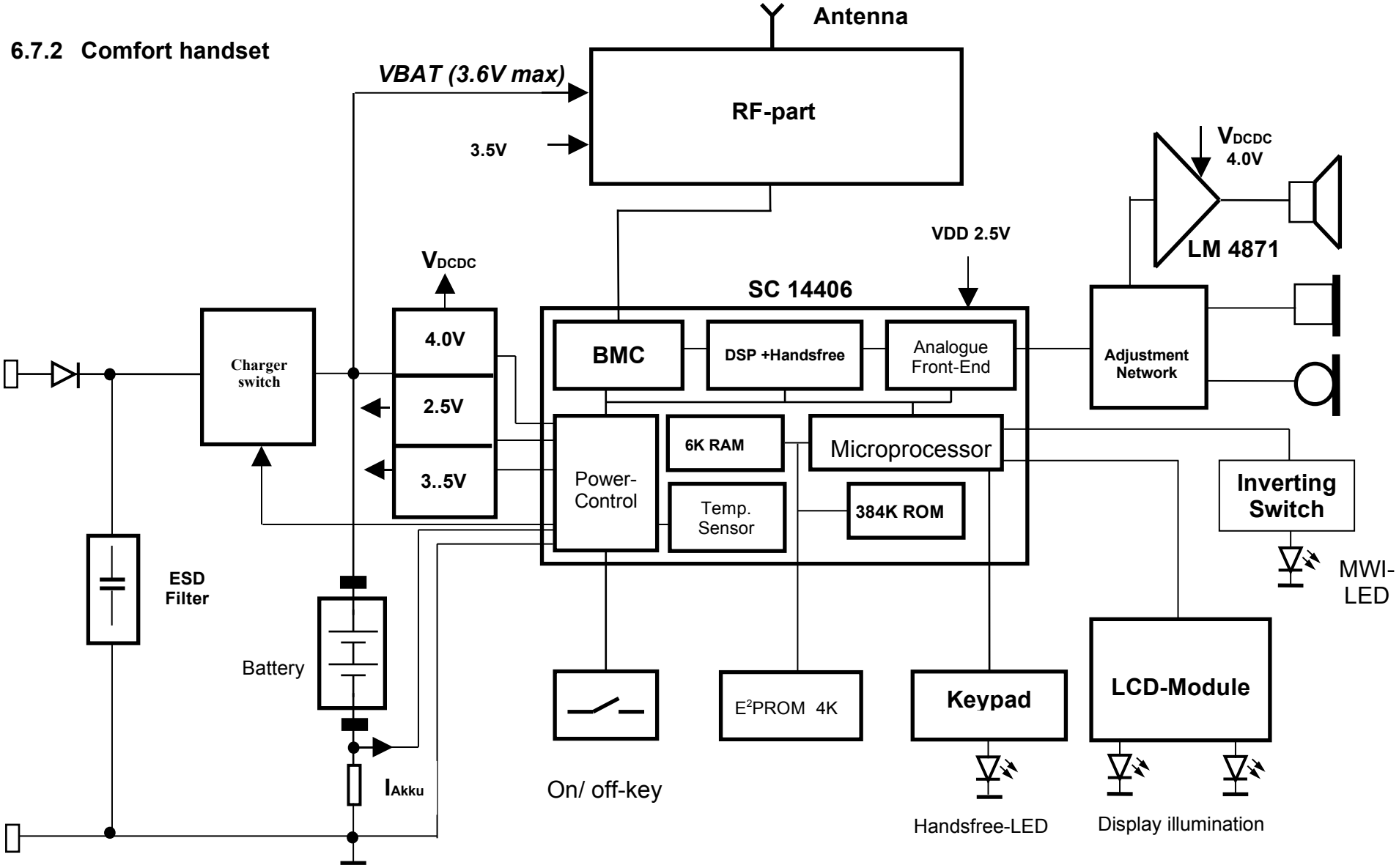
Register component to golden device.
Check the batteries (handset) or the AC-adapter (base station).
Make an **incoming test**.
Deregister customer device from golden device after testing.

6.7 Block diagrams of handsets

6.7.1 Classic handset



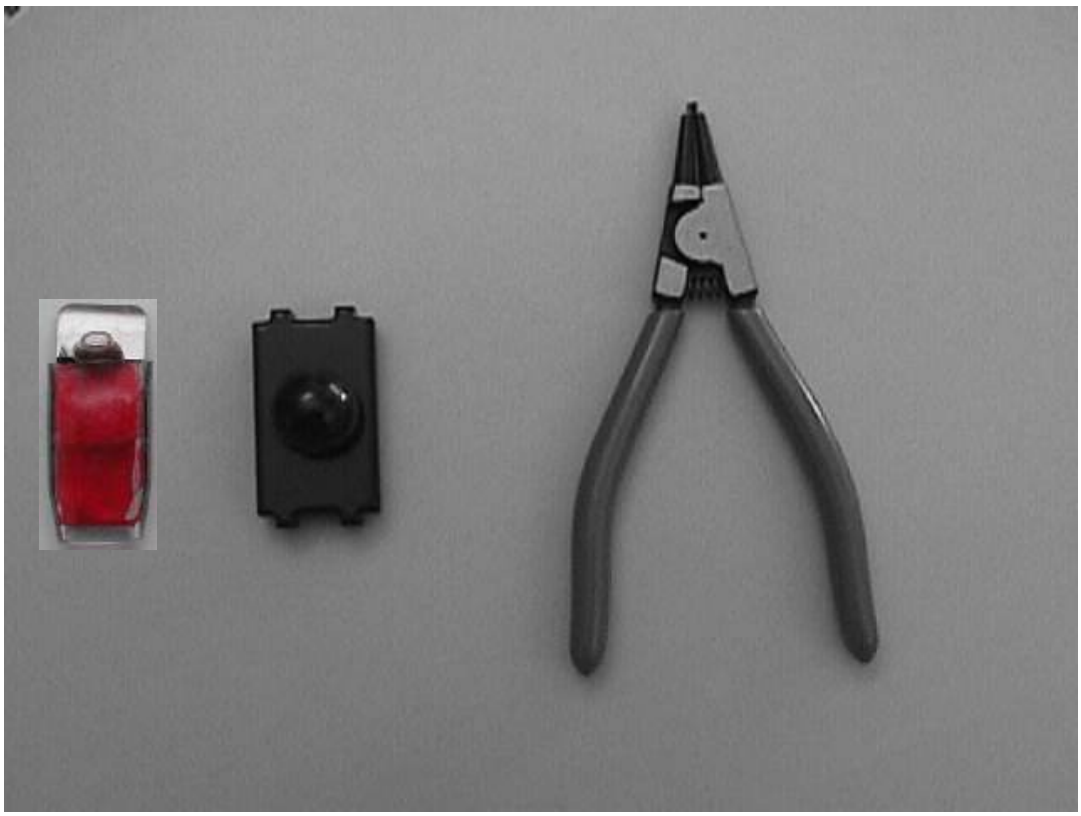
6.7.2 Comfort handset



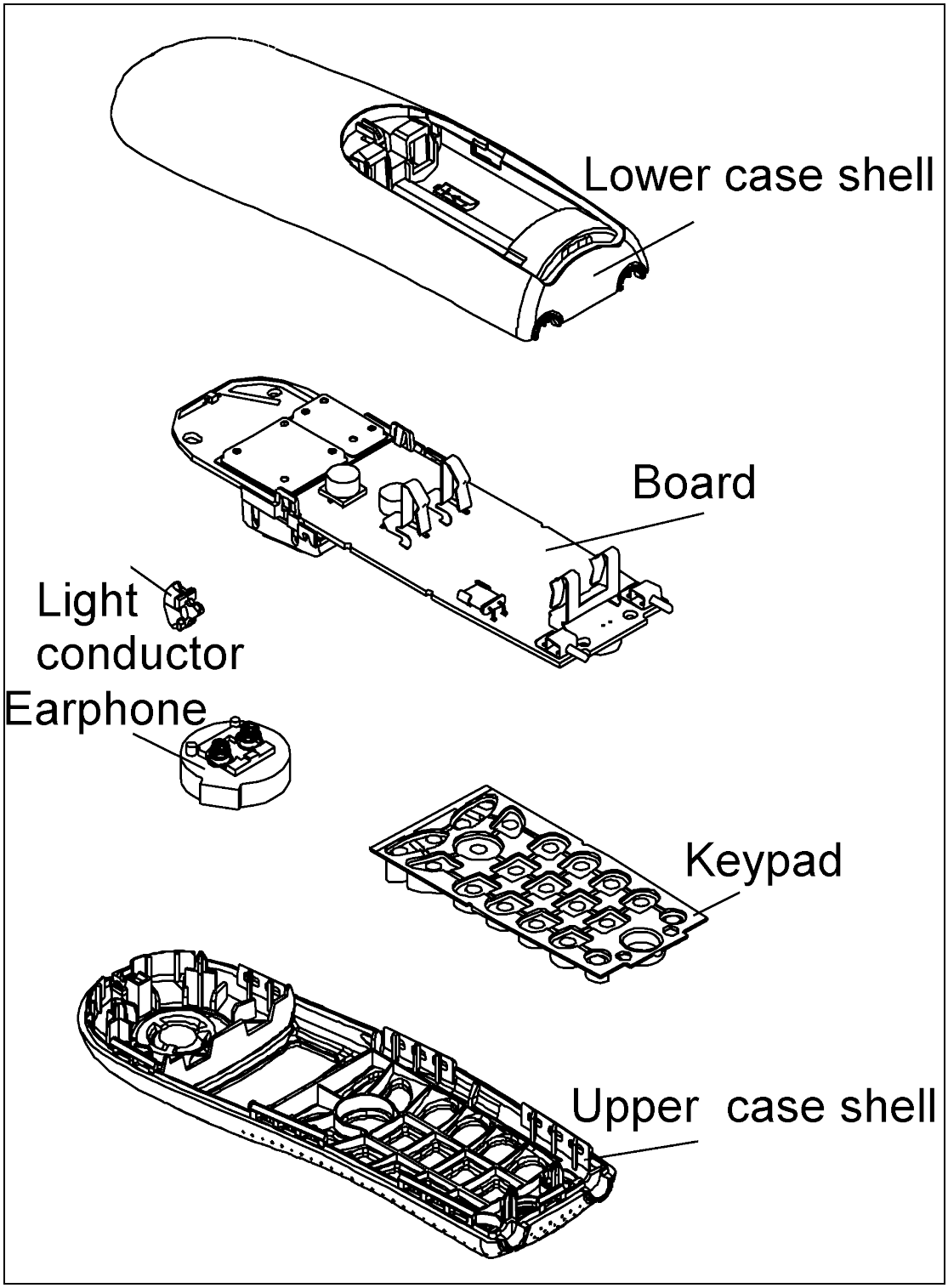
6.8 Repair of mobile unit Gigaset 4000 Classic and Comfort

Special equipment (same tools as for G2000 & G3000):

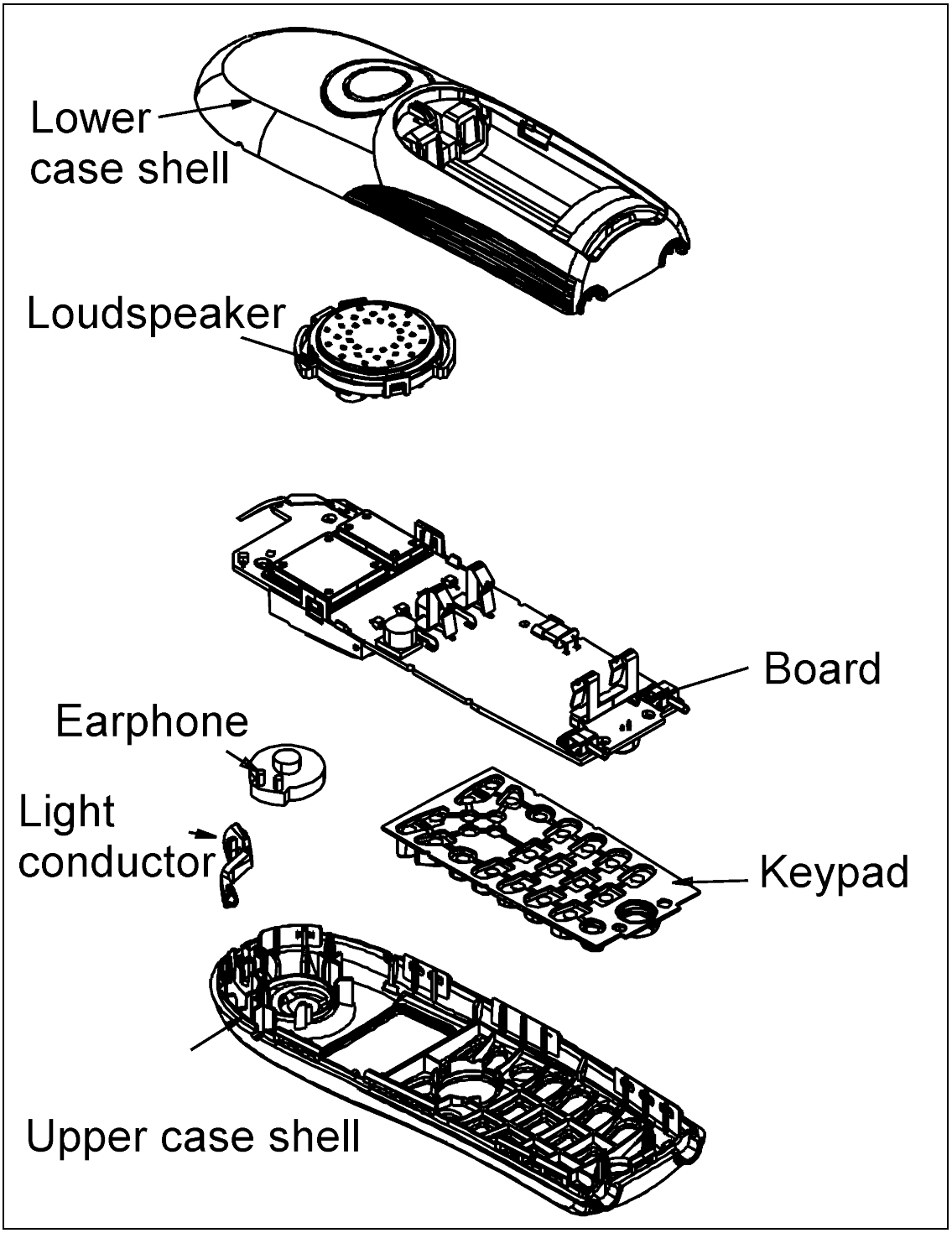
Opening-tool G2000 (left), G3000 (modified pliers) and Battery-dummy G3000:



6.8.1 Exploded view G4000 Classic



6.8.2 Exploded view G4000 Comfort



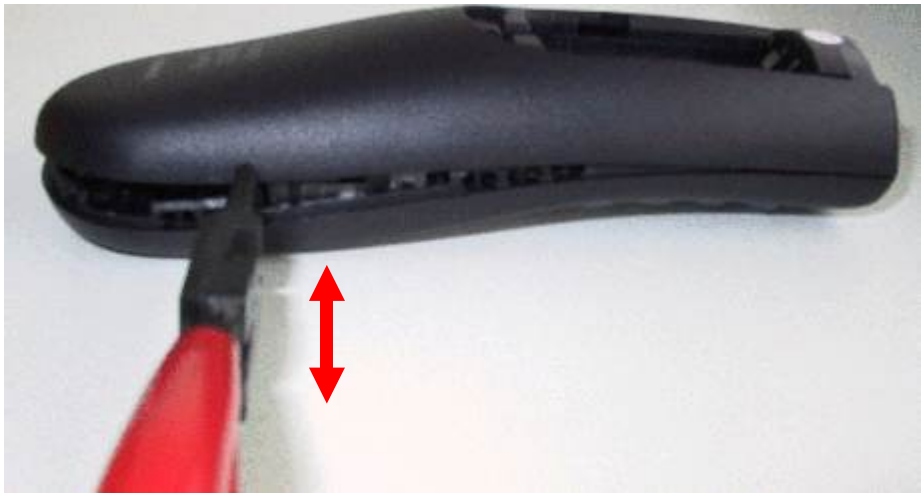
6.8.3 Disassembling

ESD regulations have to be followed !

6.8.3.1 First alternative (valid for both handsets)

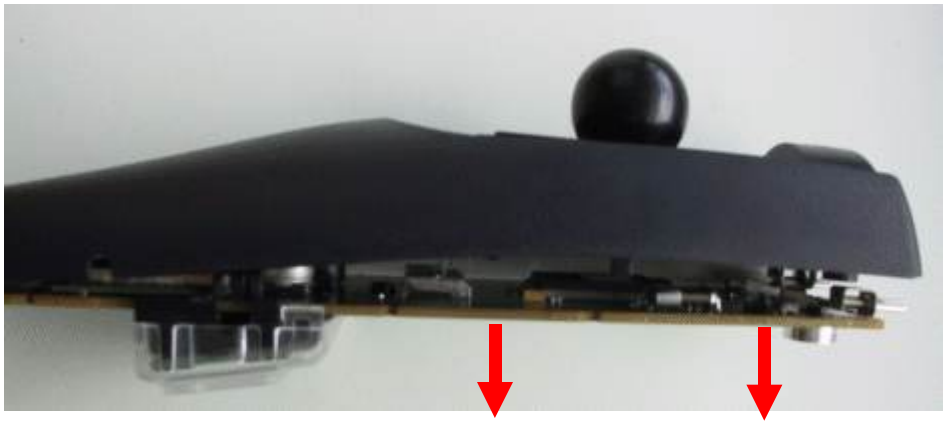
First and recommended opening procedure (fast; housing will be destroyed):

Needed material: Opening-tool Gigaset 3000 and battery dummy Gigaset 3000



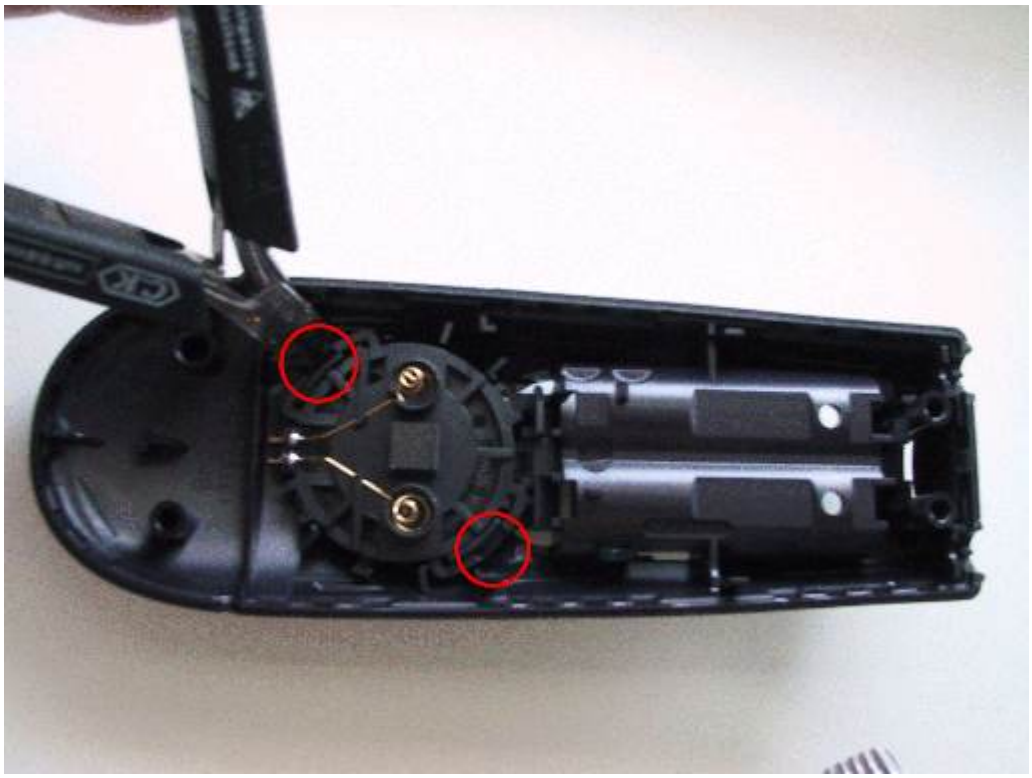
Insert pliers in belt-clip-hole and press to open upper part of the housing.
Do the same in the other belt-clip-hole.

Insert pliers in charging-contact-hole and press to open lower part of the housing.
If necessary do the same in the other charging-contact-hole.



Insert battery dummy G3000 in battery compartment.
Pull the board evenly in order to get upper and lower spring at the same time out of the battery compartment.

The loudspeaker of the Comfort handset can be reused when using new case shells.



Just remove snap hooks (red circles) with a sidecutter and lift loudspeaker.

6.8.3.2 Second alternative (Comfort handset)

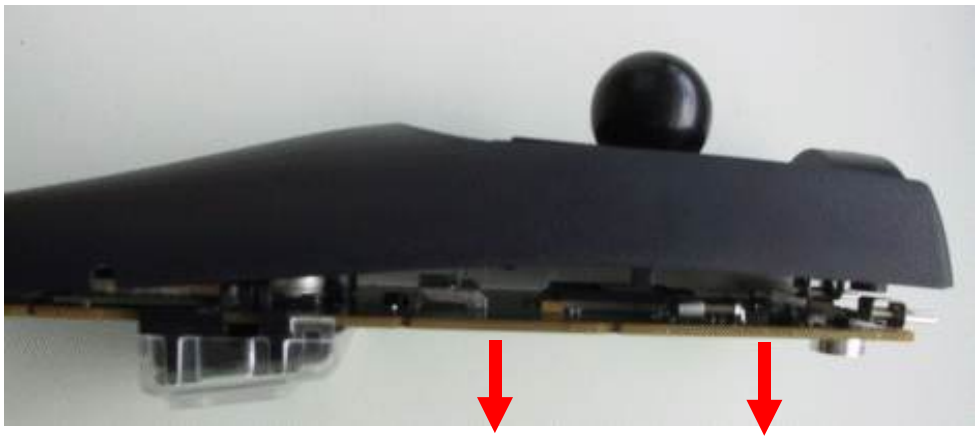
Second alternative with G2000 opening tool (slow, but **housing could possibly be reused** (not for swap); please check hooks on the housing carefully after opening).

The location of the hooks compared to Classic is different (especially belt clip hook).

Insert opening tool G2000 in the above described position between both hooks (red rectangles). After inserting push the tip of the tool downwards (red arrow) and press the other end down (green arrow) in order to lift the upper case shell. If necessary insert a second opening tool G2000 in the hook area (red rectangles) and try so to lift the upper case shell.
Do the same on the opposite side of the handset.

Insert the tool in the above described position and try to disengage the belt clip hook.
Do the same on the opposite side of the handset.

Pull on both case shells in order to open the handset.



Insert battery dummy G3000 in battery compartment.
Pull the board evenly in order to get upper and lower spring at the same time out of the battery compartment.

6.8.3.3 Second alternative (Classic handset)

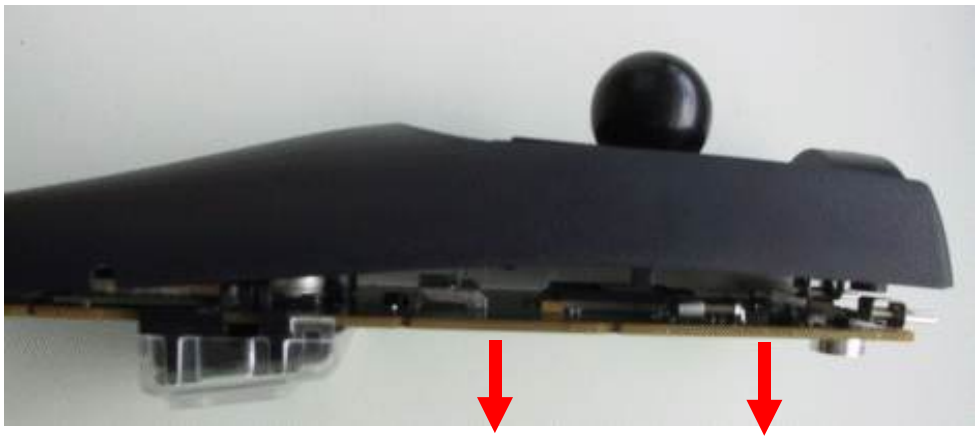
Second alternative with G2000 opening tool (slow, but **housing could possibly be reused** (not for swap); please check hooks on the housing carefully after opening).

Insert opening tool G2000 in the above described position between both hooks (red rectangles). After inserting push the tip of the tool downwards (red arrow) and press the other end down (green arrow) in order to lift the upper case shell. If necessary insert a second opening tool G2000 in the hook area (red rectangles) and try so to lift the upper case shell.
Do the same on the opposite side of the handset.

Insert the tool in the above described position and try to disengage the belt clip hook (red circle) by pressing it downwards.

Do the same on the opposite side of the handset.

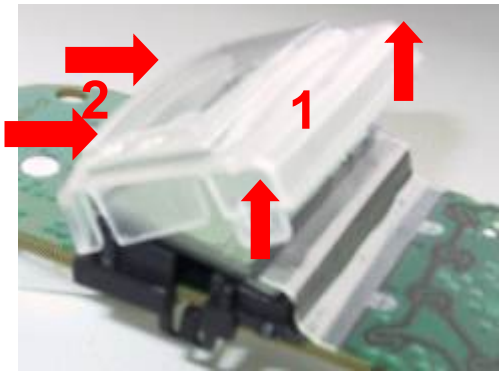
Pull on both case shells in order to open the handset.



Insert battery dummy G3000 in battery compartment.
Pull the board evenly in order to get upper and lower spring at the same time out of the battery compartment.

6.8.3.4 Replacement of display covers

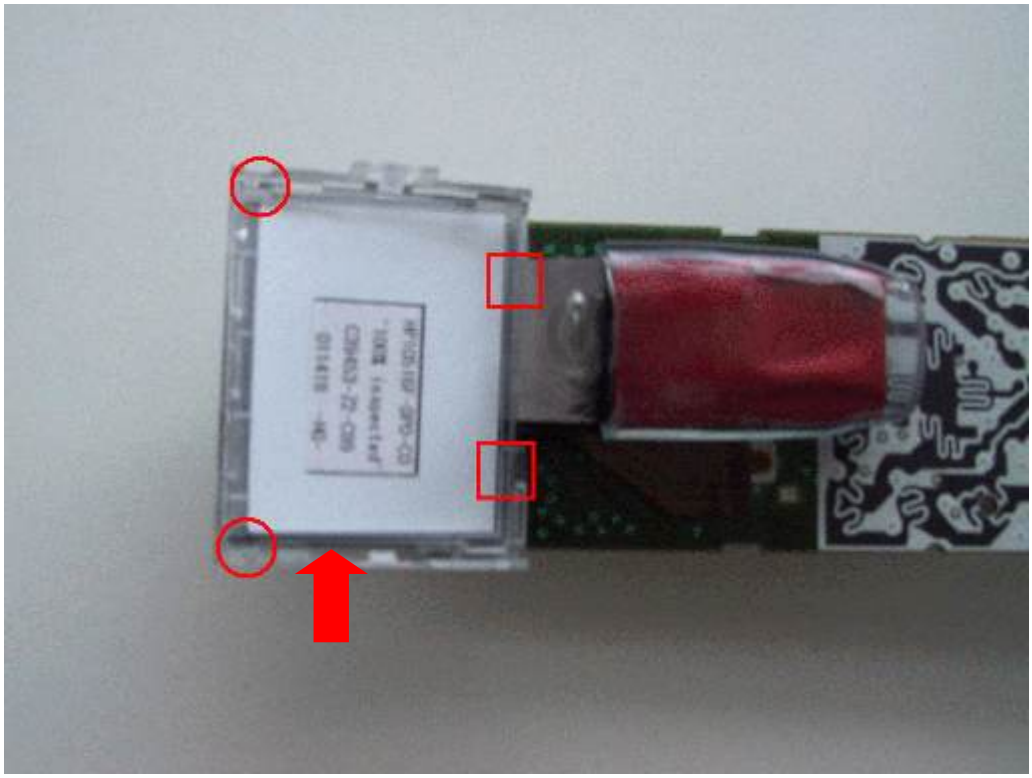
1. Classic display:



Snap the 2 hooks on the bottom open (1).
Then lift the display carefully until the 2 snap hooks on the top open (2).

To reassemble the display you just need to press the new cover gently on its place.

2. Comfort display:



Insert the opening tool G2000 between both plastic parts (cover and bottom) and press down in order to open the first hook (red rectangle).
Do the same on the other side.
Insert the tool on one of the sides (red arrow) between both plastic parts and press down to open the other hooks (red circle).
To reassemble the display you just need to press the new cover gently on its place so that all 4 hooks engage.

6.8.4 Assembling

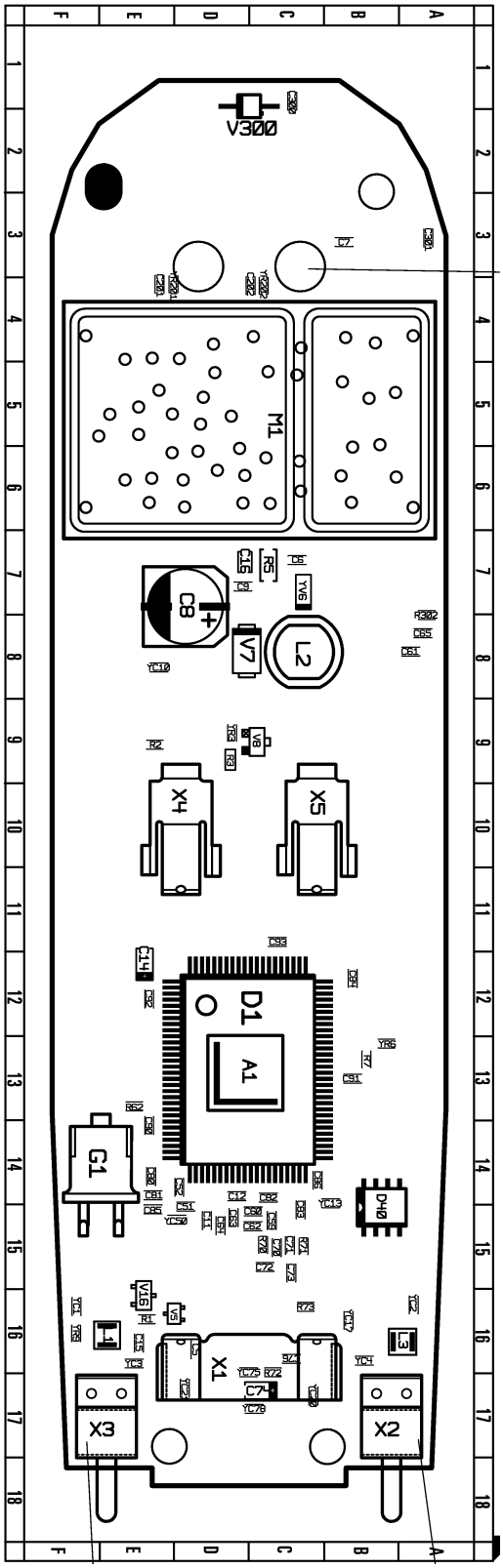
ESD regulations have to be followed !

Needed material: none

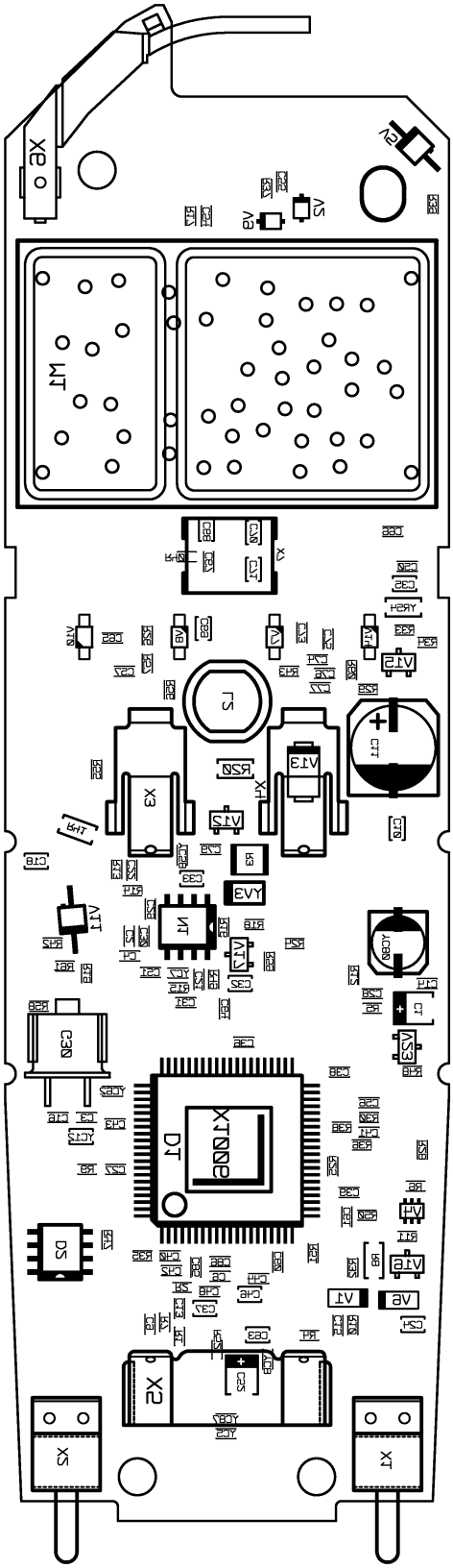
Use the exploded view as a help to see how and where the components are located.

Insert keypad, earphone and light conductor in upper case shell.
Insert board in upper case shell (note that earphone and keypad is fixed correctly).
If necessary fix the loudspeaker (only Comfort) in lower case shell.
Close handset with lower case shell by pressing both case shells together with your hands.
Pay attention on the battery contact springs on board.
Make an optical inspection of the battery contact springs afterwards.
Put in batteries and check spring tension.
Switch the handset on to check correct function of battery contact springs.

6.8.5 Board Layout Gigaset 4000 Classic



6.8.6 Board Layout Gigaset 4000 Comfort



6.8.7 Mobile unit faulty due to humidity

Note: Due to some measures in order to reduce humidity damages (coating on the board (keypad side), keypad optimised...) the scrap criteria for humidity damages changes.

- Boards with oxidation on the keypad side do not have to be scrapped any more because a coating on the board prevents that humidity gets to the other layer.
- Boards with humidity damages on the component side still have to be scrapped.

Look at all electronic components on the back side. Do not open the RF-Part. Remaining flux on the component side could look similar to a humidity damage (white deposits) but it will disappear when heating it up with a hot air blower.

Recommendation:
When you are not sure whether deposit is humidity or flux, heat the area concerned with a hot air blower and scrap the unit only when deposit doesn't disappear.

6.8.8 SLR (microphone-path faulty)

Fault code: D 19

Affected unit: Gigaset 4000 Classic/ Comfort

Components:
Microphone

Needed equipment:
Soldering iron

Working material:
Desolder wick
Solder

Diagnosis:
The diaphragm of the microphone is affected by humidity or nicotine with increasing age or the microphone could be electrically faulty. There will be a higher attenuation when measuring SLR (sending loudness rating). In most cases the microphone is defective.

Repair by component exchange:
Remove the microphone by desoldering the 2 solder joints.
You can also heat up both pins simultaneously with a broad soldering iron tip and turn the board upside down, letting the microphone fall out.
Clean pads with desoldering wick and replace it by a new component afterwards.
Attention: Avoid excessive heat (2 seconds maximum)!

Test:
Put the repaired board in a testhousing.
Make a sidetone check by blowing into the microphone and checking the volume of the noise on the earphone.
If there is a telephone tester with acoustic testhead make a SLR-test and check whether the attenuation is o.k..

6.8.9 RLR (earphone-path faulty)

Fault code: D 20

Affected unit: Gigaset 4000 Classic/ Comfort

Components:
Earphone

Needed equipment:
Multimeter

Working material:
none

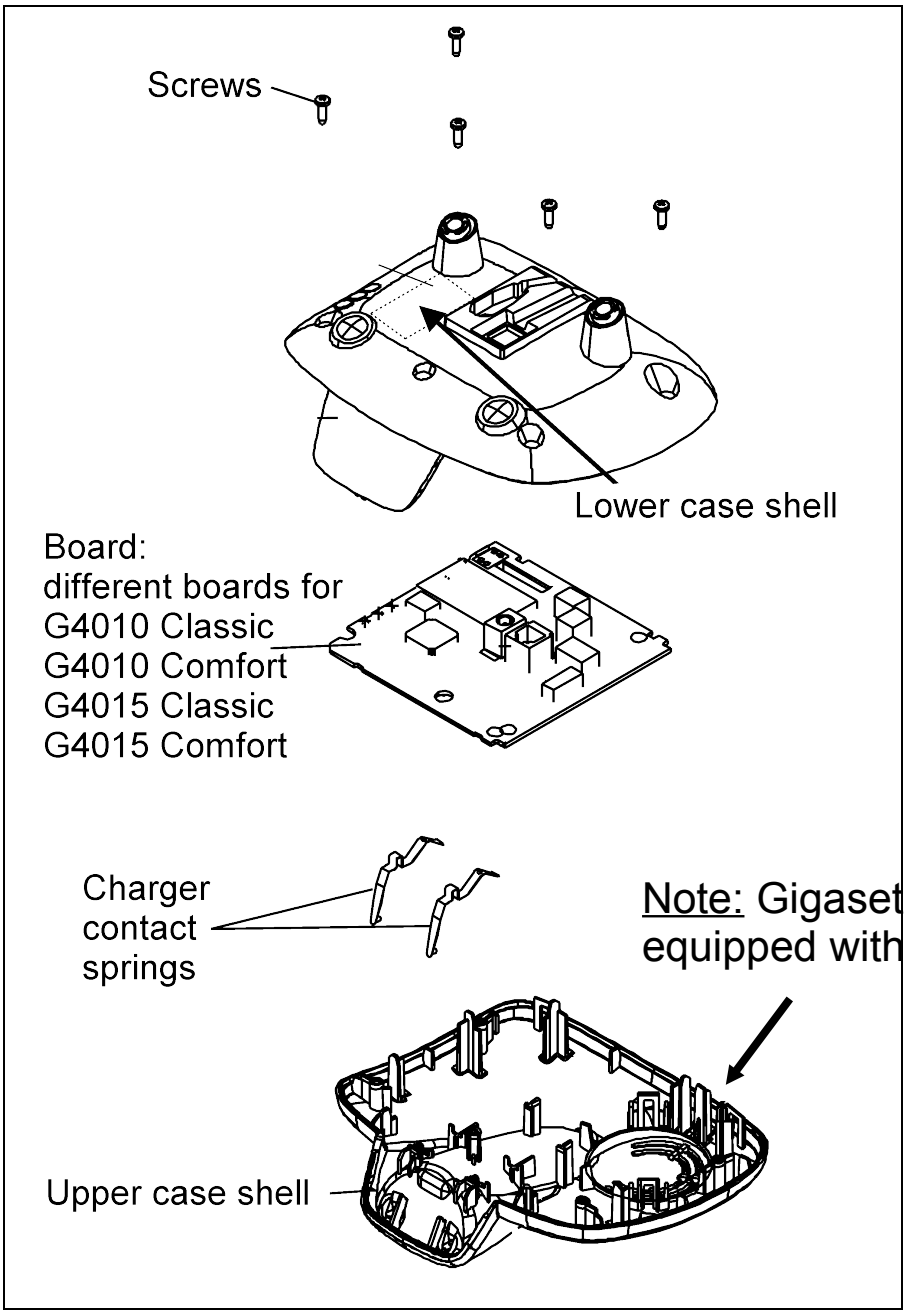
Diagnosis:
The diaphragm of the earphone could be affected by deposits with increasing age.
There will be a higher attenuation when measuring RLR (receiving loudness rating).
In most cases the earphone is defective.
If there is no noise audible on the earphone when making a sidetone check it's also possible that the wire of the coil is cut off.
Check the resistance of the coil with a multimeter.
If you measure a nearly infinitely high resistance, the wire may be cut off.

Repair by component exchange:
Use new earphone capsule.

Test:
Put the repaired board in a testhousing.
Make a sidetone check by blowing into the microphone and checking the volume of the noise on the earphone.
If there is a telephone tester with acoustic testhead make a RLR-test and check whether the attenuation is o.k..

6.9 Repair of basestation Gigaset 4010/ 4015 Classic/ Comfort

6.9.1 Exploded view



6.9.2 Disassembling

ESD regulations have to be followed !

Needed material: suitable screw driver with cross recess

Unscrew the 5 screws on the lower case shell.
Lift lower case shell.
The loudspeaker of 4015 Classic is fixed with 2 snap hooks.
In order to get it out insert a screwdriver in the loudspeaker part of the hook and press the plastic part of the base station to disengage the hook. Then lift the loudspeaker and get with the screwdriver between both plastic parts of the other hook and turn it to disengage the hook. Then take out the loudspeaker.

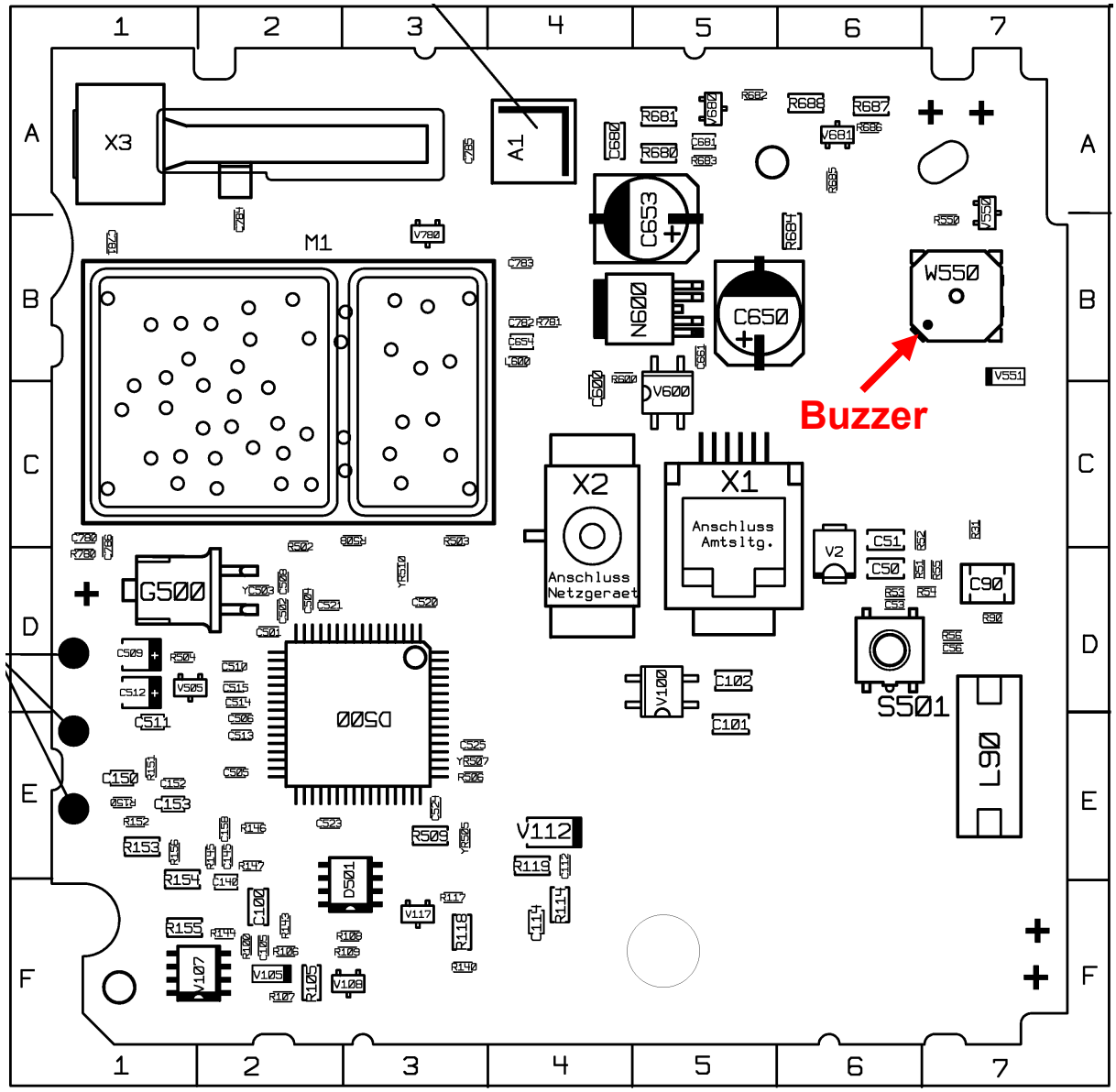
6.9.3 Assembling

ESD regulations have to be followed !

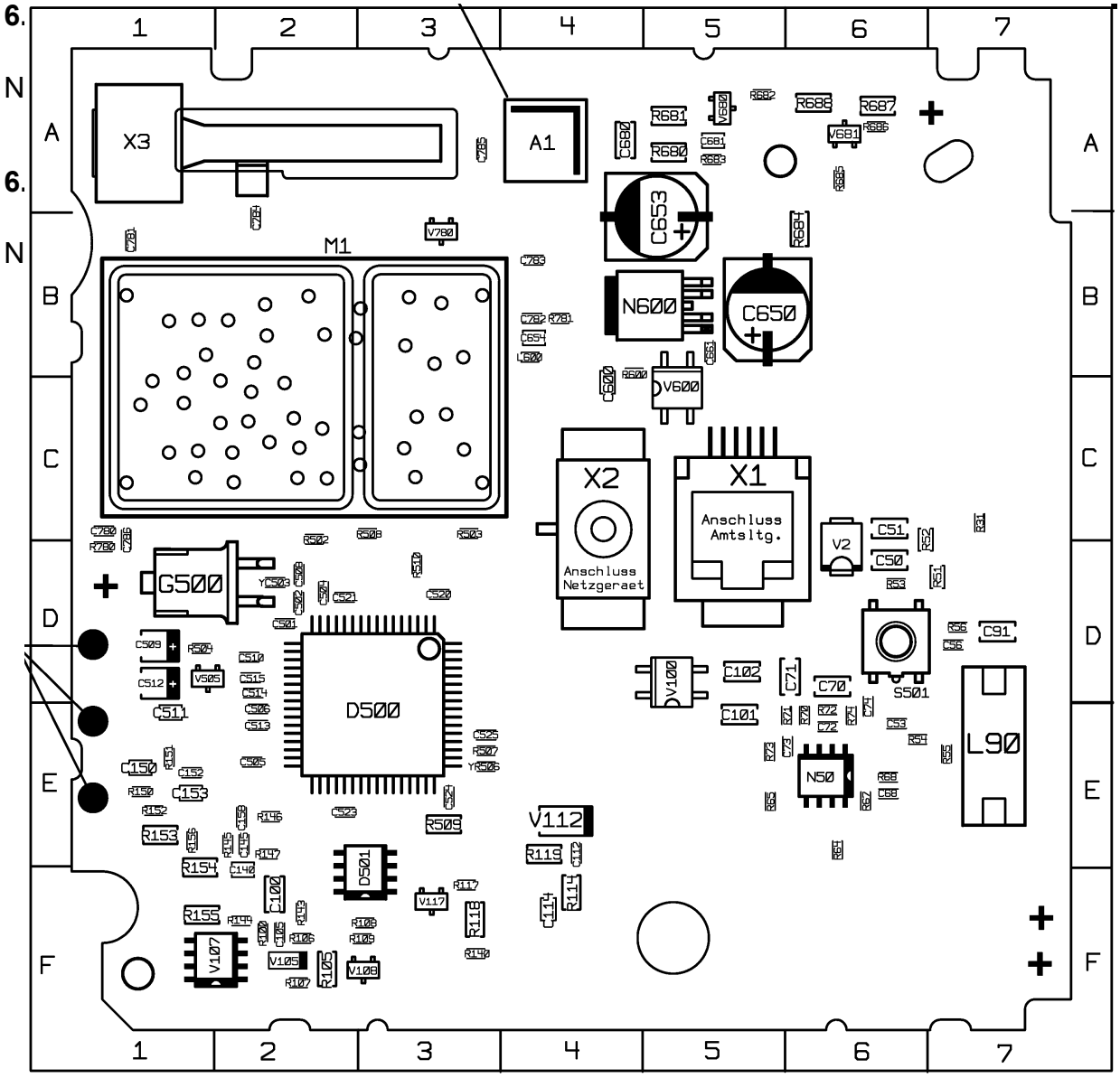
Needed material: suitable screw driver with cross recess

Put charger contact springs in upper case shell.
Insert board in upper case shell. **Be careful with the antenna**, because it could be bent (or even the pad could be lifted) when it is pressed against the housing
Insert loudspeaker (only G4015 Classic).
Attach the other case shell and close the device by screwing the 5 screws in the lower case shell.
Make sure that the charging contact springs are fixed correctly.

6.9.4 Board Layout Gigaset 4010 Classic (EU1 version)



6.9.5 Board Layout Gigaset 4010 Comfort (EU1 version)



6.9.8 Charging problems

Fault code: D 3

Affected unit: Gigaset 4010/ 4015 Classic/ Comfort base station

Components:
charger contact springs
charging joints/ pads

Needed equipment:
Soldering iron
Glass fibre pen

Working material:
Desolder wick
Solder

Diagnosis:
The battery segment on the handset display doesn't start blinking when charging.
Inspect the charging joints/ pads looking for small black holes on the surface.

Repair by cleaning/ soldering joint/ pad and component exchange:
Roughen the surface with a glass fibre pen.
Solder the charging joints so that there is a thin deposit of new solder on the joints.
Suck away surplus solder with desolder wick.
Roughen the surface with a glass fibre pen.
Use new contact springs.

Test:
Assemble the base station.
Check if battery segment on display starts blinking when charging.

6.9.9 Base station faulty due to lightning stroke

The pictures are taken from a Gigaset 2010 base station.

Inspect the board with your eyes.
The components on the photos have been damaged by lightning stroke.