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NOKIA 3660

NHL-8



4096 colors display



65536 colors display

Transceiver Features

- VGA Camera
- High-resolution, full-color display
- 5-way scroll key
- Symbian operating system
- Midi and WAV ringing tones
- Ringing tone composer
- Video playback: RealOne player
- MMC memory card
- Infrared
- Bluetooth
- Support for Java MIDP 1.0
- Voice dialing
- Voice recorder
- Integrated handsfree speaker
- XHTML browser over GSM data, HSCSD, and GPRS
- GSM 900/1800/1900 networks

Transceiver with BL-5C Li-ion 850mAh battery pack

Talk time	Standby	Note
Up to 2h-4h	Up to 150h- 200h	Depends on network parameters

SERVICE MANUAL

Service Level 1&2

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CHANGE HISTORY

Status	Version No.	Date	Comments
Draft	0.1	19.09.2003	Initial draft
Approved	1.0	28.10.2003	approval
Approved	2.0	03.11.2003	Approval, SPL Update
Approved	3.0	11.11.2003	3660 added
Approved	4.0	20.11.2003	changes in Greek and Russian Keymat



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1. INTRODUCTION

The purpose of this document is to help Nokia service levels 1 and 2 workshop technicians to carry out service to Nokia 3650 and 3660. This Service Manual is to be used **only** by authorized Nokia service partners, and the content of it is **confidential**. Please note that Nokia provides also other guidance documents (e.g. Service Bulletins) for service partners, follow these regularly and comply with the given instructions.

While every endeavor has been made to ensure the accuracy of this document, some errors may exist. If you find any errors or if you have further suggestions, please notify Nokia using the address below: mailto:cc-ts-rc.documentation@nokia.com

Please keep in mind also that this documentation is continuously being updated and modified, so watch always out for the newest version.

Warnings and Cautions

Please refer to the phone's user guide for instructions relating to operation, care and maintenance including important safety information. Note also the following:

Warnings:

- 1. CARE MUST BE TAKEN ON INSTALLATION IN VEHICLES FITTED WITH ELECTRONIC ENGINE MANAGEMENT SYSTEMS AND ANTI-SKID BRAKING SYSTEMS. UNDER CERTAIN FAULT CONDITIONS, EMITTED RF ENERGY CAN AFFECT THEIR OPERATION. IF NECESSARY, CONSULT THE VEHICLE DEALER/MANUFACTURER TO DETERMINE THE IMMUNITY OF VEHICLE ELECTRONIC SYSTEMS TO RF ENERGY.
- 2. THE HANDPORTABLE TELEPHONE MUST NOT BE OPERATED IN AREAS LIKELY TO CONTAIN POTENTIALLY EXPLOSIVE ATMOSPHERES EG PETROL STATIONS (SERVICE STATIONS), BLASTING AREAS ETC.
- 3. OPERATION OF ANY RADIO TRANSMITTING EQUIPMENT, INCLUDING CELLULAR TELEPHONES, MAY INTERFERE WITH THE FUNCTIONALITY OF INADEQUATELY PROTECTED MEDICAL DEVICES. CONSULT A PHYSICIAN OR THE MANUFACTURER OF THE MEDICAL DEVICE IF YOU HAVE ANY QUESTIONS. OTHER ELECTRONIC EQUIPMENT MAY ALSO BE SUBJECT TO INTERFERENCE.

Cautions:

- 1. Servicing and alignment must be undertaken by qualified personnel only.
- 2. Ensure all work is carried out at an anti–static workstation and that an anti–static wrist strap is worn.
- 3. Ensure solder, wire, or foreign matter does not enter the telephone as damage may result.
- 4. Use only approved components as specified in the parts list.
- 5. Ensure all components, modules screws and insulators are correctly re–fitted after servicing and alignment. Ensure all cables and wires are repositioned correctly.
- 6. All PC's used with NMP Service Software for this produce must be bios and operating system "Year 2000 Compliant".



Electrostatic discharge can easily damage the sensitive components of electronic products. Therefore every Service Supplier has to take care of all precautions, which are mentioned in the service level related "Service Partner Requirements", available on Nokia Partner Web Site. Also see ESD Protection Requirements in this Service Manual.

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2. GENERAL REPAIR INFORMATION

IN THIS SECTION THE TECHNICIAN WILL GET SOME GENERAL HINTS HOW TO CARRY OUT REPAIRS:

- To familiarize oneself with Nokia 3650 / 3660 read the tutorials or user guide on <u>www.nokia.com</u> -->Support--> Phones, by selecting the Phone Model.
- o Before starting the repair you must take care of ESD precautions like being in your ESD Protected Area and connecting your wristband.
- Use gloves to avoid corrosion and fingerprints.
- o Protect windows and displays with a film to avoid dust and scratches.
- When cleaning the pads you have to use a soft cloth/ESD brush and Isopropanol. It is not allowed to use a glass fiber pencil because it scratches the surface and will lead later on to corrosion.
- Mechanical parts (except shielding lids), which didn't repair the failure, can be reused, if they are not soldered.
- When removing the shielding lids make sure to replace them with new ones, otherwise the high-frequency leakage can have an influence on the device.
- Use always original Nokia spare parts.
- Check the soldering joints of the parts which are concerned regarding the indicated error (e.g. soldered connectors or switches) and resolder them if necessary (Level 2 only).
- o Remove redundant soldering flux after repair.
- Meet the torque requirements when assembling the unit (see also the document "torques for transceiver assembly" on Nokia Partner Web Site).
- Always use your own equipment for testing where you are sure that it works. E.g. if the customer complains about charger function, please test the phone with your own charger to be sure if phone or charger causes the malfunction.
- When doing the Faultlogger entries, always note the Item code, which caused the malfunction. Also, fill in the appropriate part code from the assembly, if needed.
- Please be aware that some malfunctions could be software related and solved by an update.

These mention Service Bulletins have to be followed:

Original Nokia Accessories
Don't try to repair prototypes (indicated on Type Label).
Be sure that you have minimum hardware requirements in place.
Handling of liquid damages.
Return the defective part, if one of your service tools causes malfunction.
Service Policy for packaging serviced products
Check these guidelines when refurbishing products.
Improvements to Faultlog Reporting Tool
Packing Material
New structure of General Bulletins
Service handling of PWBs and PCBs during repair process
New barcode for future products
NMP Global Symptom Codes
NMP Global Fault Codes (Level 1&2)
NMP Standard Toolkit

Please check Nokia Partner Web Site (PWS) for latest news and files on a regular basis.

New swap phone cartons

Spare Parts SB-004:

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3. PATHFINDER FOR WORKSHOP STAFF

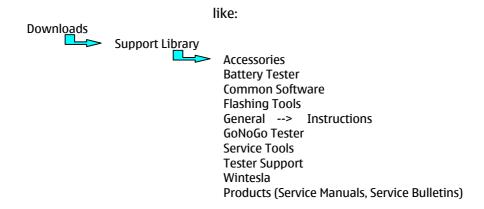
In addition to the information in this Service Manual, there are several instructions and information, which have to be followed.

Main documentation database is <u>Nokia Partner Website</u>, which refers also to <u>Nokia Care Point</u> with the purpose of serving different multimedia content, like video clips or interactive tutorials.



It is mandatory to watch for newest technical and organizational information on a daily basis to be updated as required (see "Latest Updates in support Library"). Every new information has to be processed and implemented as soon as possible.

When logged into PWS you can also find needed information to different headlines respectively tools



To spare server bandwidth it is recommended to download newest version of huge files like videos, Phoenix packages or Service Manuals only once and distribute it internally for further use.

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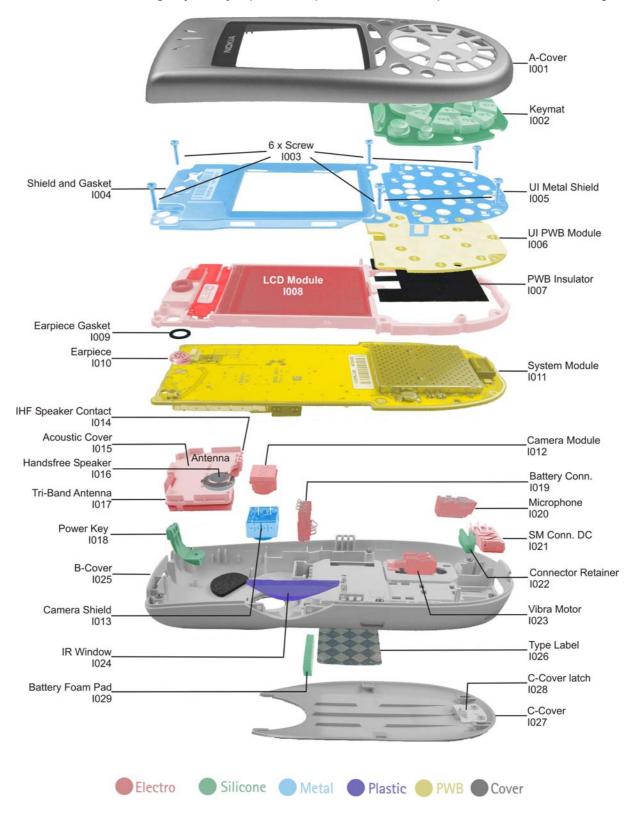
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4. EXPLODED VIEW AND COMPONENT DISPOSAL

Recommendation for the ecologically friendly disposal of components. Colorized components show the different categories.



Description: See corresponding ITEM/CIRCUIT REF of the SPL (Spare Parts List)

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5. SPARE PARTS LIST

MECHANICAL PARTS 3650 / 3660

ITEM/ CIRCUIT REF.	QTY	PART NO	PART NAME
I001	1	XXXXXX	A COVER
I002	1	XXXXXXX	KEYMAT
1003	6	6150091	SCREW M1, 6X8,5 TORX T6
I004	1	9480895	SHIELD AND GASKET
1005	1	9560252	UI METAL SHIELD for Nokia 3650
1005	т	9560302	UI METAL SHIELD for Nokia 3660
1006	1	9481128	UI PWB MODULE for Nokia 3650
1000	_	9481166	UI PWB MODULE for Nokia 3660
1007	1	9452603	PWB INSULATOR
1008	1	9458985	LCD MODULE
1009	1	9470260	EARPIECE GASKET
I010	1	5140251	EARPIECE
I011	1	-	CS7 CAMERON SYSTEM MODULE
I012	1	4858005	CAMERA MODULE
I013	1	9560234	CAMERA SHIELD
	1	9480892	ANTENNA MODULE
I014	2	-	IHF SPEAKER CONTACT
I015	1	-	ACOUSTIC COVER
I016	1	-	HANDSFREE SPEAKER
I017	1	-	TRI-BAND ANTENNA
I018	1	9452463	POWER KEY
I019	1	5400287	BATTERY CONNECTOR
I020	1	5140275	MICROPHONE MODULE
I021	1	5460101	SM CONN DC JACK+HS/HF SPR
I022	1	9470264	CONNECTOR RETAINER
I023	1	6800057	VIBRA MOTOR
I024	1	9470266	IR WINDOW
I025	1	-	B COVER
I026	1	-	TYPE LABEL
	1	XXXXXX	C COVER MODULE
I027	1	-	C COVER
I028	1	-	C COVER LATCH
I029	1	9470265	BATTERY FOAM PAD

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SOLDERING COMPONENTS ONLY FOR LEVEL 2

ITEM/ CIRCUIT REF.	QTY	PART NO	PART NAME
F380	1	5119019	SM FUSE F 1.5A 32V 0603
G190	1	4700129	BATTERY LITHIUM 0.1MAH 3V
S130	1	5209001	SM SW TACT SPST 12V 50MA SIDE KEY

VARIANT PARTS 3650

ITEM/ CIRCUIT REF.	QTY	PART NO	PART NAME
I001	1	9458717	A COVER BLUE
I001	1	9458531	A COVER YELLOW
I001	1	9458528	A COVER STAY SILVER
1002	1	9790661	KEYMAT LATIN
	1	9458715	C COVER BLUE
	1	9458523	C COVER YELLOW
	1	9458521	C COVER STAY SILVER

VARIANT PARTS 3660

ITEM/ CIRCUIT REF.	QTY	PART NO	PART NAME
I001	1	9453606	A COVER RED
I001	1	9453607	A COVER BLUE
I002	1	9791139	KEYMAT LATIN
I002	1	9791140	KEYMAT RUSSIAN
I002	1	9791141	KEYMAT GREEK
I002	1	9791144	VODAFONE KEYMAT
	1	9453605	C COVER RED
	1	9453604	C COVER BLUE

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SWAP UNITS 3650

QTY	PART NO	PART NAME
	0076268	NHL-8 N3650 SWAP UNIT EUROPE&AFRICA
	0076629	NHL-8 N3650 SWAP UNIT FRANCE
	0076810	NHL-8 N3650 SWAP UNIT SOUTH AFRICA
	0076269	NHL-8 N3650 SWAP UNIT POLAND
	0076270	NHL-8 N3650 SWAP UNIT TURKEY
	0076628	NHL-8 N3650 SWAP UNIT CZECH
	0076627	NHL-8 N3650 SWAP UNIT RUSSIA
	0079356	NHL-8 N3650 SWAP UNIT UKRAINE

SWAP UNITS 3660

QTY	PART NO	PART NAME
	0050892	NHL-8 N3650 SWAP UNIT EUROPE&AFRICA
	0050898	NHL-8 N3650 SWAP UNIT FRANCE
	0050897	NHL-8 N3650 SWAP UNIT SOUTH AFRICA
	0050893	NHL-8 N3650 SWAP UNIT POLAND
	0050894	NHL-8 N3650 SWAP UNIT TURKEY
	0050896	NHL-8 N3650 SWAP UNIT CZECH
	0050895	NHL-8 N3650 SWAP UNIT RUSSIA
	0050899	NHL-8 N3650 SWAP UNIT UKRAINE

SERVICE TOOLS

ТҮРЕ	QTY	PART NO	PART NAME
		0080541	FLS-4S SALES PACK E&A (INCLUSIVE 0680032)
		0680032	UNIV. POWERSUPPLY ACF-8
ACCESSORY		0273558	BL-5C BATTERY PACK LI-IO
ACCESSORY		0272169	AC TRAVEL CHARGER ACP-8E (EURO)
ACCESSORY		0272172	AC TRAVEL CHARGER ACP-8X (UK)
ACCESSORY		0271467	HDC-5 HEADSET
		0770582	FLA-48 POS FLASH ADAPTER
		0730218	XCS-1 SERVICE CABLE
		0770524	MJS-93 SOLDERING JIG
		0770526	SRT-7 CAMERA REMOVAL TOOL
		0772040	STANDARD TOOLKIT
		0770450	FLA-48 TESTPINS (10 PCS)

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6. SERVICE TOOLS



ACF-8

Universal Power Supply is used to power FLS-4S.

FLS-4S incl. Driver and User Guide

is a dongle and flash device incorporated into one package, developed specifically for POS use.



XCS-1

Service Cable is used to connect FLS-4S to FLA-48.



Internal Battery BL-5C

Inserted under the back cover, this Li-ion battery provides power in a lightweight package.



Travel Charger ACP-8E/ACP-8X

Lightweight multi-voltage charger for charging your phone battery.



Headset HDC-5

An easy and convenient handsfree solution with remote control.



FLA-48

POS Flash Adapter is used in POS (Point of Sales) environment for software updating. It provides controlled supply voltage and necessary connections between the phone and the Flash Device. It substitutes for the phone's standard battery during the software update.



SRT-7

Camera removal tool.



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MJS-93

Soldering Jig (for Level 2 or higher service level supplier)



Test Pins

for POS Flash Adapter FLA-48

NMP code 0772040



Content

- Nokia opening tool SRT-6 Nokia No. 0770431
- Tonichi torque driver Nokia No. 6901525
- Hoya micro fibre cloth MX304
- Dastex gloves S, M, XL
- Artilux goggles AH166
- Wera bit T5 867/4TX 5x50
- Wera bit T6 867/4TX 6x50
- Wera bit T6 PLUS® 867/4TX 6IP
- Facom side cutter 416E
- Facom T5 driver SP.14032
- Facom T6 driver SP.14033
- Facom slot screwdriver AEF. 2x35.E
- Wetec tweezers 7abb SA-ESD
- Wetec tweezers 22 SA-ESD
- Wetec tweezers 13 SA-SMD ESD
- Wetec tweezers PSF SA-ESD
- Wetec ESD brush E1211
- Kaiser Fototechnik airbrush 6315
- Wetec dental tool DEM83266/0
- RS Components Scissors 323-5732

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7. SW UPDATE

To use FLS-4S Flash Dongle you have to follow the user guide inside the sales package. Please check always the latest version of flash software, which is available on Partner Web Site. **Flash Concept – (Point of Sales)**



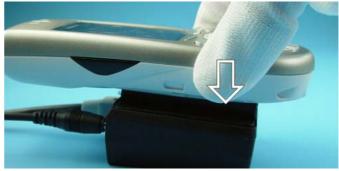
Standard installation for software update.

It is very important to follow this insertion and removal procedure, otherwise the contact pins of Flash Adapter will be damaged.

Note: software for 3660 (64k color) devices will not run on 3650 devices!



Insert the Flash Adapter FLA-48 like a battery, start at the battery connector site.



Now, push down the bottom side of the phone, do not use too much force.



When removing the Flash Adapter, always start from the bottom side of the unit.



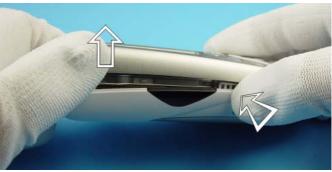
Take away the unit now.

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8. DISASSEMBLY INSTRUCTIONS (ALSO SEE THE VIDEO CLIPS ON CARE POINT)



Press the Release Button before removing A-Cover.



The A-Cover is attached with hooks at both sides. To remove it, press B-Cover carefully as shown in the picture.



Press the latch before removing C-Cover.



Always protect Camera Window with protection foil to avoid dust and scratches.



Unscrew the TORX PLUS® screws size 6, using the order shown. For assembly, take reverse order and torque of 15Ncm. Use always new screws for assembly.



Take the modules from B-Cover.



Use SRT-6 to open the Connector carefully.
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Separate the UI Module from Radio Module.

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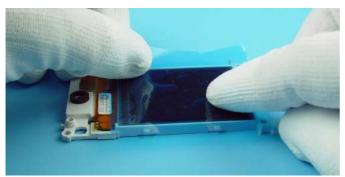
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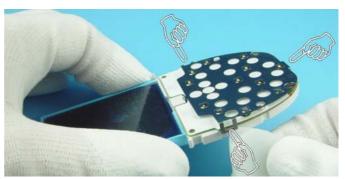
Open the shield snaps on both sides with SRT-6.



Remove the Shield and Gasket.



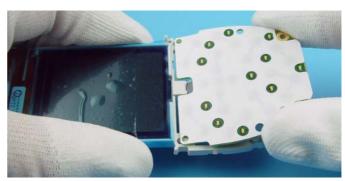
Always protect LCD with protection foil to avoid dust and scratches.



Open the UI Metal Shield snaps with SRT-6.



Remove UI Metal Shield.



Remove UI PWB Module.



The speaker is attached with double-sided adhesive Gasket. To remove it, push it with Torx driver carefully.



Antenna drops out when turning B-Cover.



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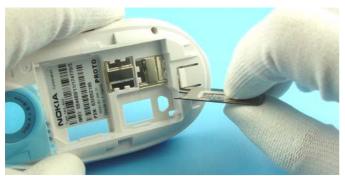
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Remove IR Window as shown in the picture.



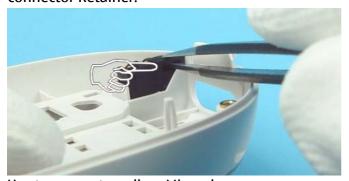
Remove the Vibra Motor from its guidance.



Move SRT-7 through this gap of B-Cover to remove Connector Retainer.



Turn B-Cover let System Connector with Connector Retainer drop out.



Use tweezers to pull up Microphone.



To remove the Battery Connector, use SRT-6 Opening Tool.



Remove Power Key.

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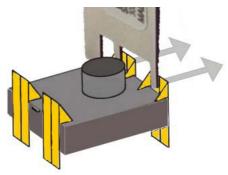
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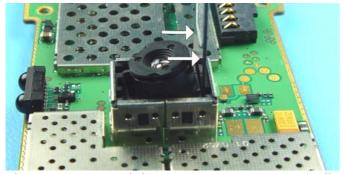
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Remove Camera Shield if you need to clean contacts or change Camera Module.



Camera Module is attached with four snaps onto Camera Connector. Place the SRT-7 as shown in the picture and carefully move the snaps to the right.

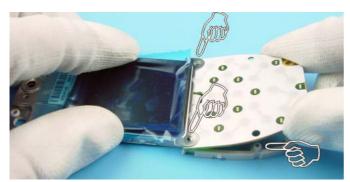


The Camera Module comes up automatically when snaps are released.



Remove the Camera Module carefully. Note the guiding pin when doing assembly.

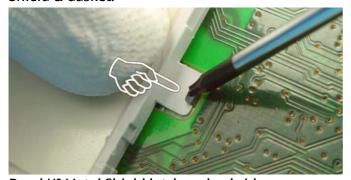
9. ASSEMBLY OF NEW UI-PWB MODULE AND UI METAL SHIELD



Place UI-PWB Module between LCD Module and Shield & Gasket.



Mount UI Metal Shield.



Bend UI Metal Shield latch on backside.



Attach the PWB Insulator and take care of the markings.

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10. IMPORTANT PRODUCT RELATED SERVICE BULLETINS

SB-012: CORRUPTED PERMANENT MEMORY MANAGER (PMM)

11. LEGEND FOR QUICK TROUBLE SHOOTER

This legend is valid for all parts of the **Quick Trouble Shooter**

Follow the steps until the problem is solved. If this doesn't help, you are not authorized to go forward. Only underlined components (e.g. <u>1002</u>) can be changed.				
Fault symptom	The start point of repair activities regarding the appeared fault symptoms.			
→	Follow the arrows step by step			
	Pads or contacts: Check optical and mechanical condition particularly regarding to corrosion. Clean if necessary.			
£@Ĵ	Measure component for electrical functionality and change, if needed. (Level 2 only)			
E500	Pads or contacts: Check optical and mechanical condition particularly regarding to corrosion. Clean with ESD brush only, if necessary.			
Service Level 3/4	No more actions possible send product to the appropriate service partner with higher service level.			

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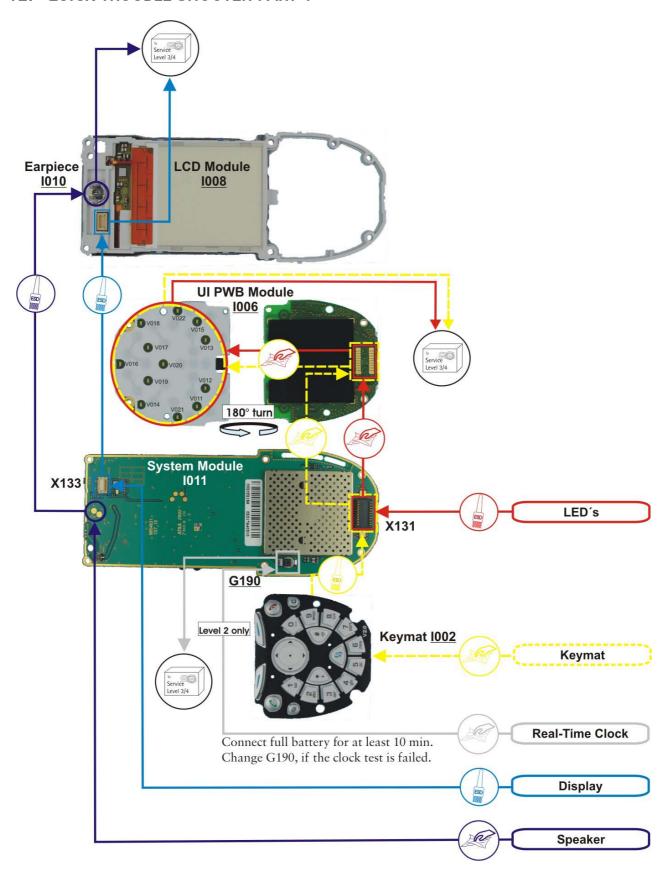
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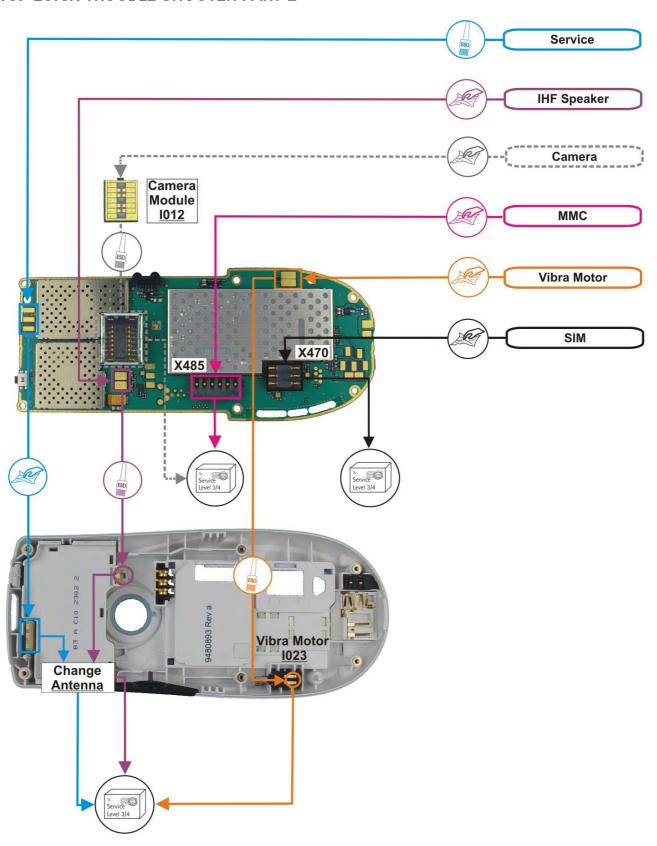
12. QUICK TROUBLE SHOOTER PART 1



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13. QUICK TROUBLE SHOOTER PART 2



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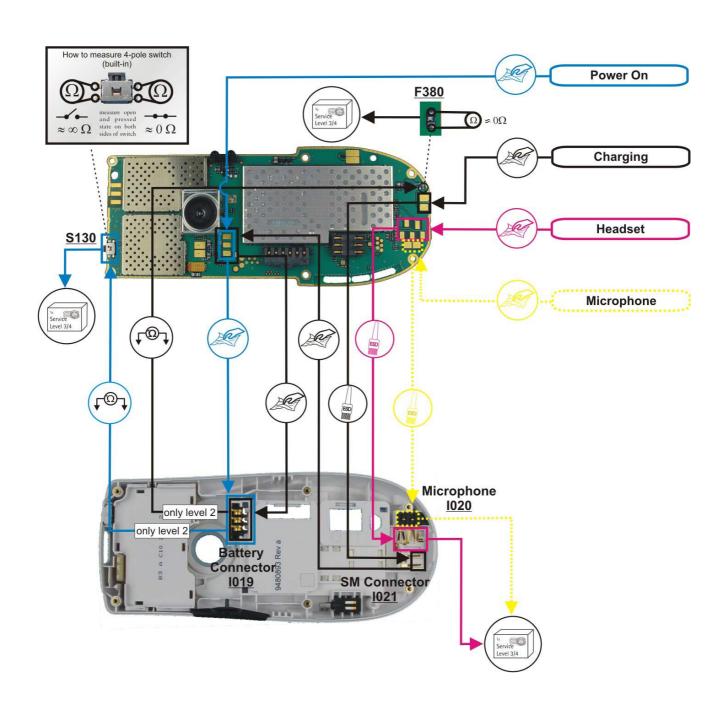
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14. QUICK TROUBLE SHOOTER PART 3





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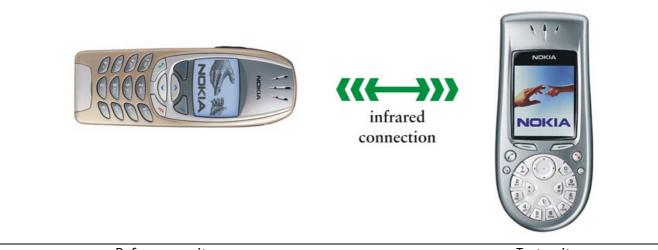
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15. INFRARED GONOGO TEST

You need another infrared device (e.g. 6310i) to do a GoNoGo test. The infrared windows of the devices must be directed to each other and should have a distance of approximate 15 cm. Make sure that infrared is activated in receiver device.

Warning: Do not point the IR (infrared) beam at anyone's eye or allow it to interfere with other IR devices. This device is a Class 1 Laser product.



Test unit Reference unit

Settings on the test unit:

- o From Home Menu, select key. This displays **Contacts** entries. If phone and SIM memory is empty, create one new entry.
- o Choose one phonebook entry.
- Select **Options**
- Select **Send**
- o Select Via infrared
- o Press **OK** for **Selected detail only** (optional).
- You get this message **Connecting via infrared.**
- If sending of business card fails and you get message **Unable to connect**, make sure again, that infrared windows are directed to each other and infrared is activated in reference device **biol** Then try again sending.
- o Test is successful, if you get this message on receiver device



- o You will get a confirmation on sender device, too.
- o Press \infty for Home Menu.



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16. CAMERA GONOGO TEST

Before starting the GoNoGo test, check that camera window in B-Cover is clean. If not, clean the window with cloth.

If camera lens is dirty, do not use cloth or brush for cleaning, use compressed air only.

Exchange of Camera Module will not improve picture quality!



- o From Home Menu, select Camera.
- ⁰ To take a picture, press 🕒 button.
- o This image will be saved automatically.
- o Test is successful, if the image appears on your display. The camera is ok.
- o Select **Options**
- o Select **Delete**
- O Select **YES**
- o Press of for Home Menu.
- o If test fails, see Quick Trouble Shooter.

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17.BLUETOOTH GONOGO TEST

You need another Bluetooth device (e.g. 6310i) to do a GoNoGo test. Make sure that Bluetooth is activated in the reference unit. The distance of the devices should be not more than 5m from each other.





Test unit

Reference unit, Bluetooth activated

Setting on the test unit:

o From Home Menu, push the Menu key 🌯.



- Select Games
- o Select Snake EX
- o Select **Option**
- o Select Play 2-player
- Select Via Bluetooth
- Select **Client**
- o Select **Yes**, if Bluetooth is not already activated, otherwise go to next step.
- o Search window appears, if all Bluetooth devices in range will be displayed, the test is successful!
- o Press of for Home Menu.

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18. GONOGO TEST

After the optical check a GoNoGo test has to be carried out if the unit has been unscrewed to guarantee the functionality of the phone.

Please refer to the actual information on Partner Web Site and Nokia Care Point. When using delivered tester support files, take care of the right setup according to the tester type and product type.

Please refer to "Recommended Service Equipment" on Nokia Partner Web Site.



Mobile Phone Tester

19.BATTERY TEST

A battery tester lets you test the capacity of Nokia batteries.

Please refer to the actual information on Partner Web Site.



http://www.astratec.co.uk/



http://www.cadex.com/

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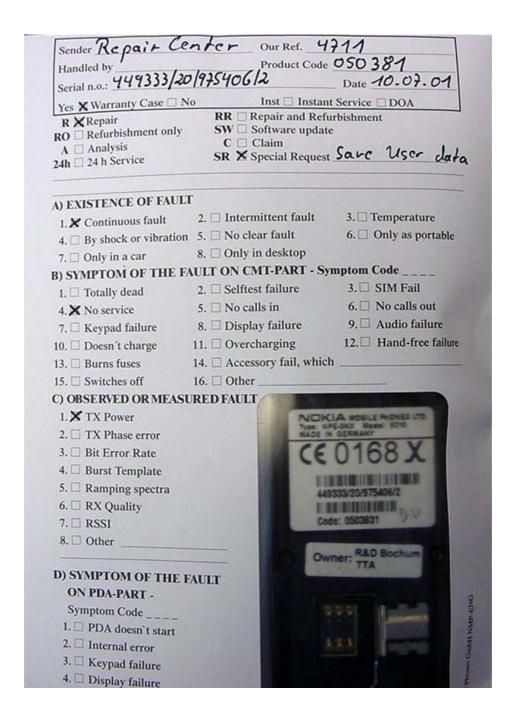
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20. SERVICE NOTES

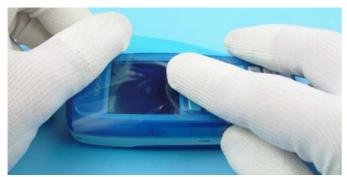
We recommend using Service Notes when shipping phones to other Service Partners. It prevents the product from scratches, it is ESD-neutral and has the possibility to give valuable feedback of the fault symptom through a structured form. Please refer to the document **Service Notes for faulty NMP transceiver** on Partner Web Site to get further information.



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21. FORWARDING OF REPAIRS TO SERVICE LEVEL 3 OR 4 SUPPLIERS

We recommend using the offered swap phone cartons as described in Spare Parts SB-004.



Always Protect the window with a protection film.



Put the unit under the stretch film.



Add repair documentation e.g. filled-in service note into the swap carton.



Fold the swap carton as shown in Spare Parts SB-004.



There are two different sizes of swap cartons for common mobile phones.

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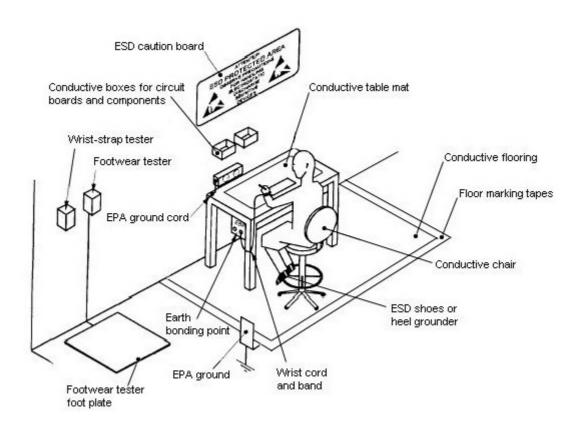
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22. ESD PROTECTION REQUIREMENTS

Please refer to the Partner Web Site document **Service Partner Requirements** in folder General instructions.



USE Conductive bags and boxes

USE ESD compatible service tools

USE Conductive wastebaskets

USE ESD gloves when handling PWBs/PCBs

USE Cleaning material without changing el. Characteristics

USE Grounded service equipment, i.e. soldering station

USE ESD clothes such as coat or frock

NO Smoking

NO Drinking

NO Eating

NO Dust

NO Useless Items

NO Normal pressured air for cleaning modules/displays



The video covers general issues concerning Electro-Static Discharge (ESD) source: Nokia Care Point