

NOKIA 1600 NOKIA 1110

RH-64

RH-70



Transceiver characteristics:

- **Band:** Dual-band phone for GSM 900/1800MHz or 850/1900MHz (depends on Sales Area)
- **Display:** High resolution color display with up to 65,536 colors (128 x 128 Pixels)
Inverted black and white display (Nokia 1110 Only)
- **Vibra Alert:** Onboard Vibra motor
- **Connector:** Easy Flash connector

Transceiver with BL-5c 900mAh Li-Ion battery pack

Talk time	Standby	Note
Up to 5h	Up to 18days	Depends on network parameters

Environmental characteristics:

- Lead-free soldered

SERVICE MANUAL

Service Level 1&2

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CHANGE HISTORY

Status	Version No.	Date	Comments
Draft	0.1	07.06.2005	Initial draft
Approved	1.0	23.06.2005	Approval

1. INTRODUCTION

The purpose of this document is to help NOKIA service levels 1 and 2 workshop technicians to carry out service to NOKIA products. This Service Manual is to be used **only** by authorized NOKIA service suppliers, and the content of it is **confidential**. Please note that NOKIA provides also other guidance documents (e.g. Service Bulletins) for service suppliers, 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. Use only approved components as specified in the parts list.
4. Ensure all components, modules screws and insulators are correctly re-fitted after servicing and alignment.
5. Ensure all cables and wires are repositioned correctly.



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 Online. Also see ESD Protection Requirements in this Service Manual.

2. GENERAL REPAIR INFORMATION

In this section the technician will get some general hints how to carry out repairs:

- To familiarize oneself with NOKIA product read the tutorials or user guide on www.nokia.com -->Support--> Phones, by selecting the Phone Model.
- 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.
- Protect windows and displays with a film to avoid dust and scratches.
- When cleaning the LCD Module any lint-free cloth can be used (e.g. Micro-Fibre cloth).
- 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 and bent parts), 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.
- Always use 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).
- Remove redundant soldering flux after repair.
- Meet the torque requirements when assembling the unit (see also the document "torques for transceiver assembly" on NOKIA Online).
- 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.
- A SIM card is needed for all GoNoGo tests.
- When doing the fault log 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.

- There are several documents available on NOL, which have to be followed:
- First, take care for the latest content pages of Service Bulletins, which are always available for each folder on NOKIA Online. This is also important to recognize, if existing documents have become invalid.
- The service level indicator at the bottom of each document tells the appropriate destination.

Example:

Downloads > Support Library >

1. Instructions
 2. General Service Bulletins
 3. Product related documents
 4. Spare Part Service Bulletins
 5. Service Tools Service Bulletins
 6. Common Software Service Bulletins
- etc,...

Please also check NOKIA Online (NOL) for latest news and files on a regular basis.

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 [NOKIA Online](#) 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 files in Support Library**"). Every new information has to be processed and implemented as soon as possible.

When logged into NOL you can also find needed information in different folder like:

Support Library



Phones



Service Manuals
Service Bulletins
Software
Repair Information

Level 1&2 e-learning (former NOKIA CarePoint) on NOKIA Online

Former NOKIA CarePoint content, such as	• Online Troubleshooting • Product information • Videos – Disassembly/Assembly	can be found on NOKIA Online
NOKIA Online ↓ Care Services ↓ Training ↓ Phone Models		

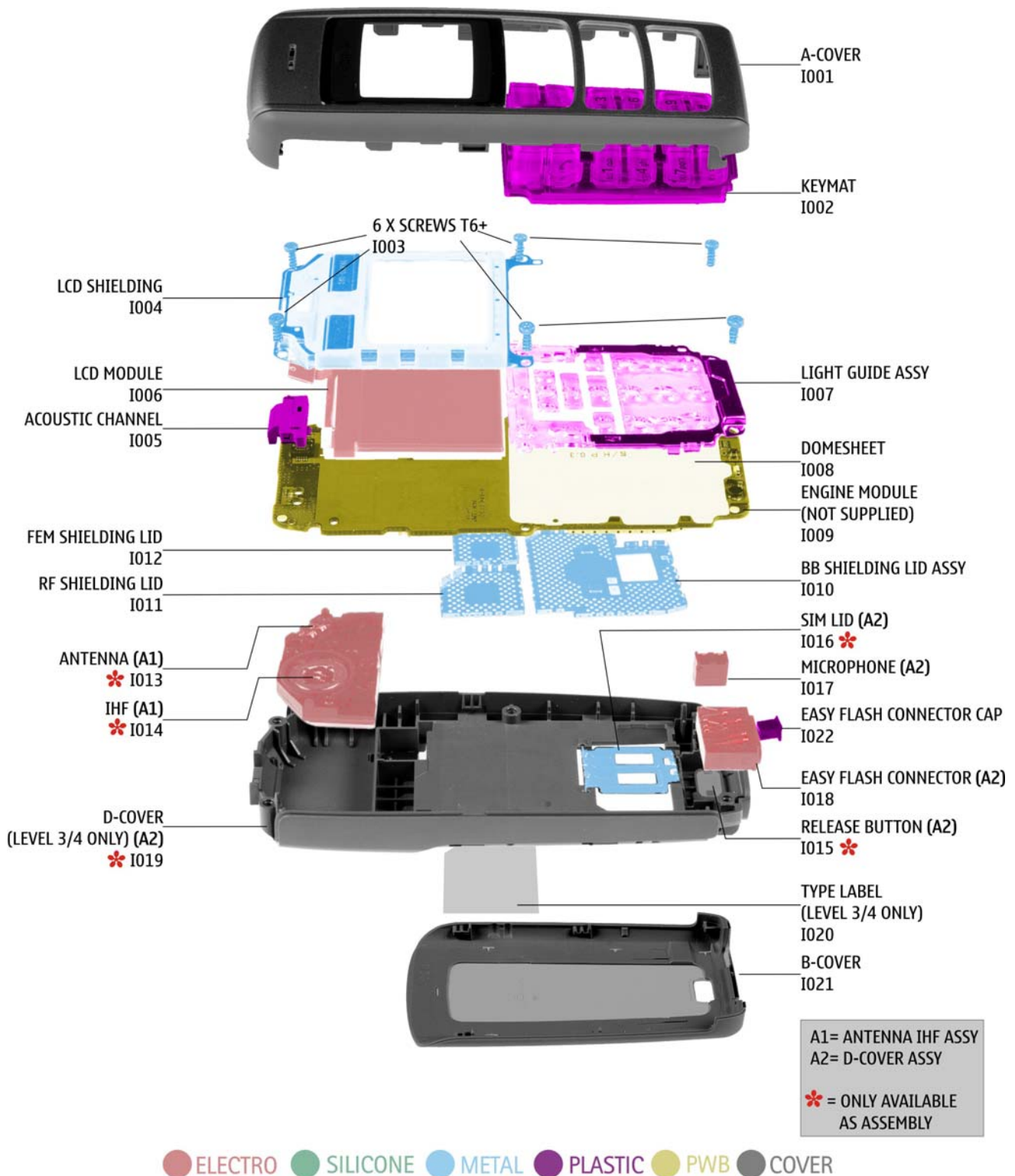
Level 1&2 e-learning courses offer a quick overview of the NOKIA phone and support for how to repair and use the phone:

Overview & Guides Basic information about the phone, features and technologies	Disassembly & Assembly Instructions how to disassemble and assemble the phone	Troubleshooting Step-by-step instructions on how to locate and repair the most common problems with the phone
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To reduce the server traffic 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.

4. EXPLODED VIEW AND COMPONENT DISPOSAL

Recommendation for the ecologically friendly disposal of components. Colorized components show the different categories. See corresponding ITEM/CIRCUIT REF in the Spare Parts Service Bulletins on NOL.



5. SPARE PARTS OVERVIEW

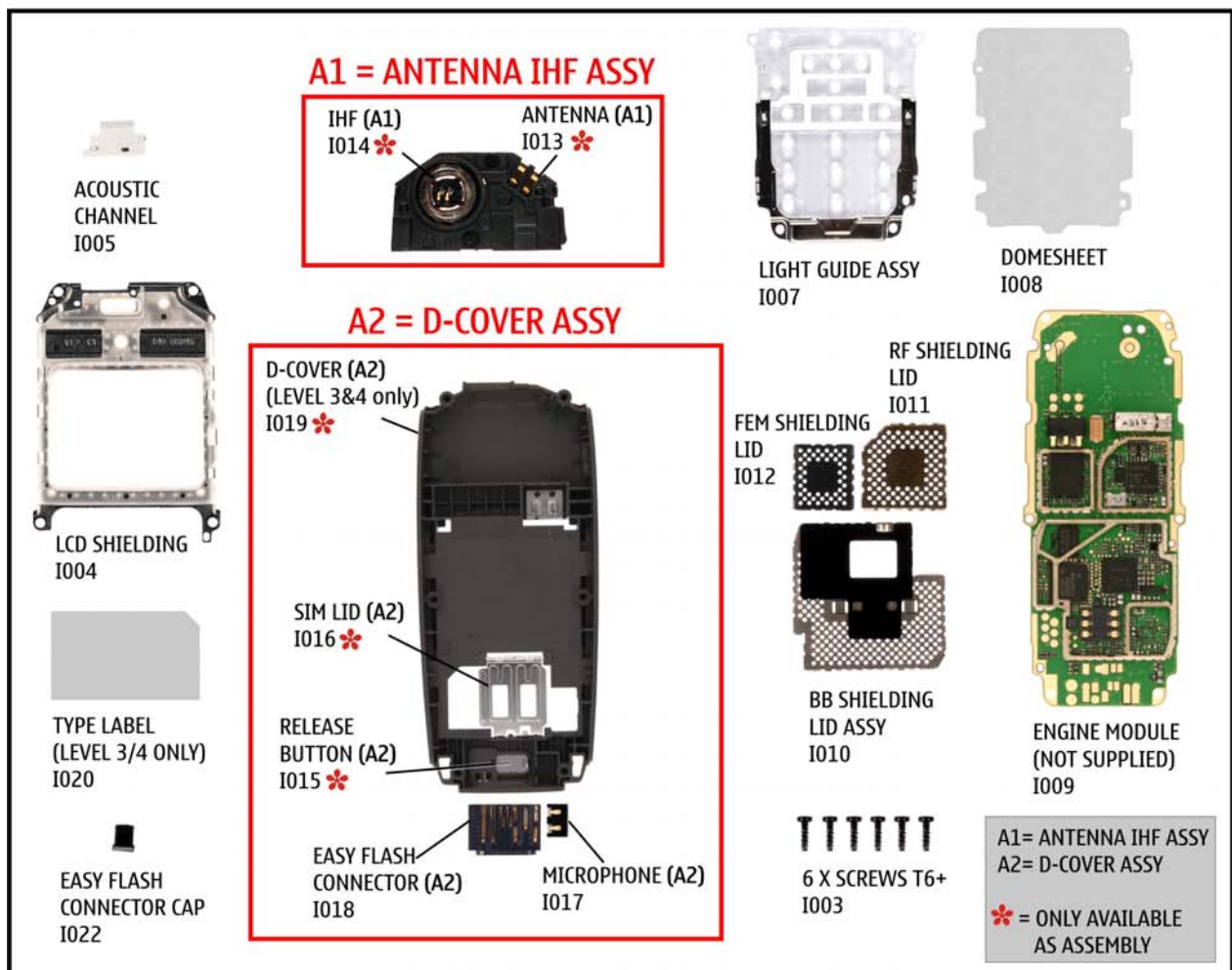
1600 RH-64



1110 RH-70



COMMON



6. SPARE PARTS LIST

Please exchange this page (placeholder) with latest corresponding Service Bulletins (spare parts, SWAP units and service tools) from NOL!

This will ensure, that you are using up-to-date order codes only.

Therefore Service Bulletins have to be checked from NOL on daily basis.



Nokia Online

[Home](#) | [User](#) | [Sitemap](#) | [Log Out](#)



CONNECTING PEOPLE

Care Services

Support Library

Warranty Info

Service Points

Training

Support Library

Browse files

[Latest files](#)
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Select category:

Phones

Select subcategory:

XXXX XXXX (XXXX)

Select subcategory

Service Bulletins

Date range

from

Month

/

Day

/

Year

until

Month

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Day

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Year

Search

Files for Service level 2

Date: 03.02.2005

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Files for Service level 1

Date: 16.02.2005

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7. SERVICE TOOLS

	FLS-4S incl. ACF-8, Driver and User Guide Dongle and flash device incorporated into one package, developed specifically for POS use.
	Internal Battery BL-5C Inserted under the back cover, this Li-Ion 900 mAh battery provides power in a lightweight package.
	Travel Charger ACP-12 Small and lightweight charger for fast charging of your phone battery.
	Headset HS-7 Comfortable handsfree operation with a remote control button for answering and ending calls makes this headset convenient and easy-to-use.
	XCS-1 Service Cable is used to connect FLS-4S to SF-10 .
	SF-10 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.



Test Pins
for Flash Adapter SF-10



RJ-79
Soldering Jig



Lead-free Solder Wire
Mandatory for lead-free products (Level 2 only).



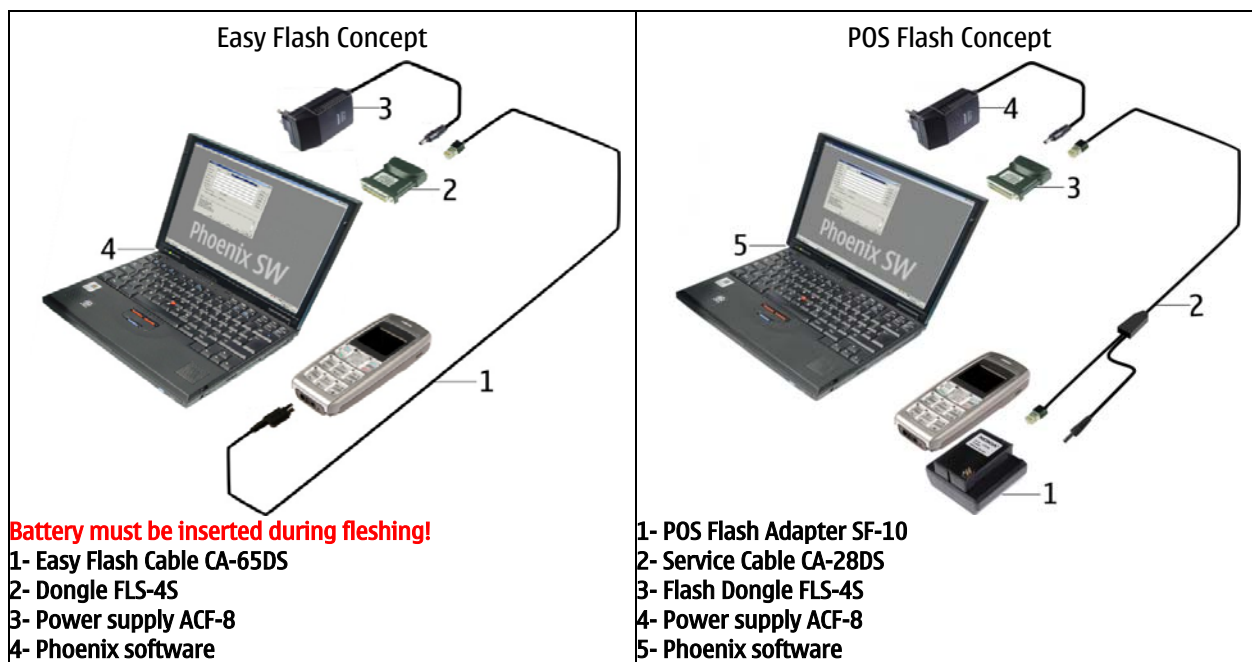
0772040 NMP Standard Toolkit

- NOKIA opening tool SRT-6 NOKIA No. 0770431
- Tonichi torque driver NOKIA No. 6901525
- [Hoya](#) micro fibre cloth MX304
- [Dastex](#) gloves S, M, XL
- [Artlux](#) goggles AH166
- [Wera](#) bit T5 867/4TX 5x50
- Wera 867/4 6IP; 50mm (Torx 6 PLUS®)
- Wera bit T6 867/4TX 6x50
- Wera 867/1 5IP; 25mm (Torx 5 PLUS®)
- 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

8. SW-UPDATE

Flash Concept – (Point of Sales)

To use FLS-4S Flash Dongle you have to follow the user guide inside the sales package. Please check always for the latest version of flash software, which is available on [NOKIA Online](#).



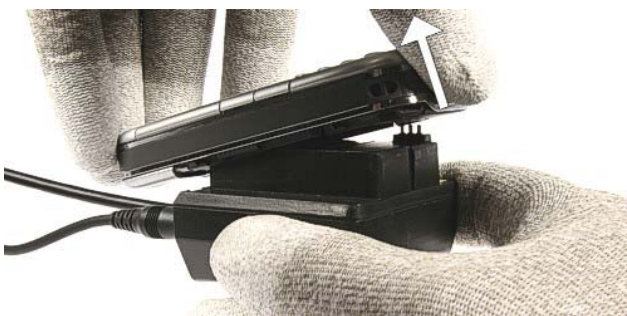
It is very important to follow this insertion and removal procedure, otherwise the contact pins of Flash Adapter will be damaged (only for POS Flash Concept).



Insert the Flash Adapter SF-10 like a battery, start at the Battery Connector side.



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



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



Now, take the unit away.

9. DISASSEMBLY INSTRUCTIONS



1.) Needed tools for disassembly and assembly.



2.) Protect the window with a film.



3.) Press the **Release Button** and remove the **B-Cover**.



4.) Use the SRT-6 to unlock the **A-Cover** on both sides.



5.) Remove the **A-Cover**. **Always start on the top side of the device when re-assembling the A-Cover.**

For Nokia 1600 only!



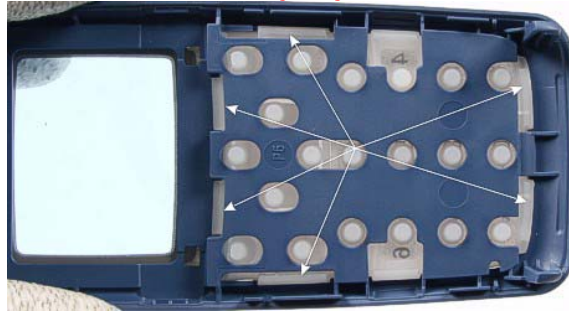
6.) Remove the **Keymat** and protect the inner side of the window with a film.

For Nokia 1110 only!

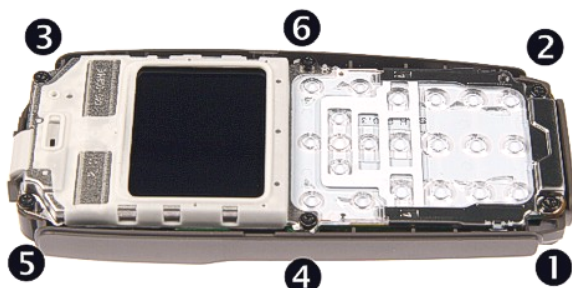


7.) Use SRT-6 to remove the **Keymat** and protect the inner side of the window with a film.

For Nokia 1110 assembly only!



8.) Fit the **Keymat** to the **A-Cover**, paying attention to its correct position.



9.) Unscrew the six, Torx Plus® size 6 screws in the shown order. **For assembly, use the reverse order and a Torx Plus® size 6 driver with a torque setting of 24Ncm.**



10.) Lift the **LCD Shielding** while pressing on the **LCD Module** with a clean cloth carefully.



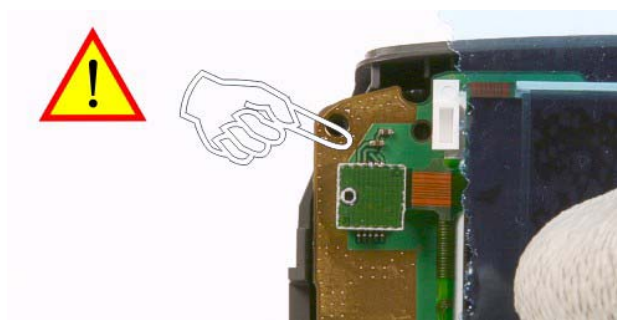
11.) Remove the **LCD Shielding**.



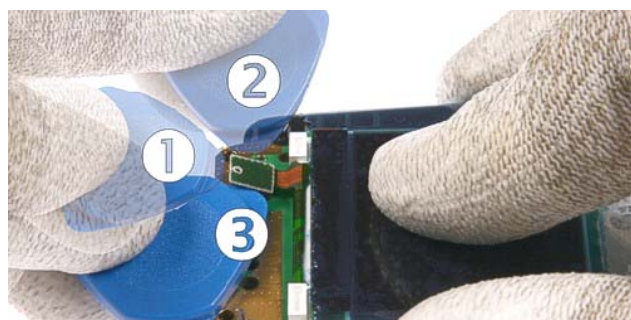
12.) Remove the **Acoustic Channel**.



13.) Protect the **LCD Module** with a film.



14.) Take care to the surrounding components when opening the **LCD connector**.



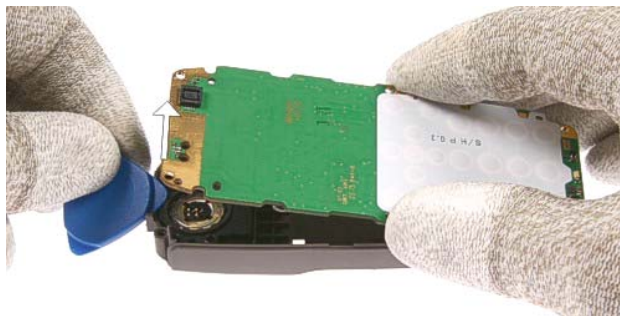
15.) Use the SRT-6 to open the **LCD connector** in the order shown. Take care to the flex foil of the **LCD Module**.



16.) Remove the **LCD Module**.



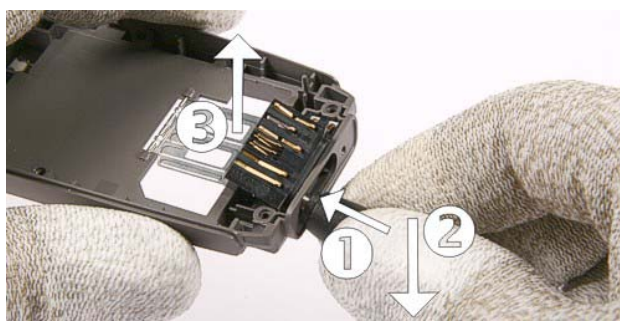
17.) Remove the **Light Guide Assy.**



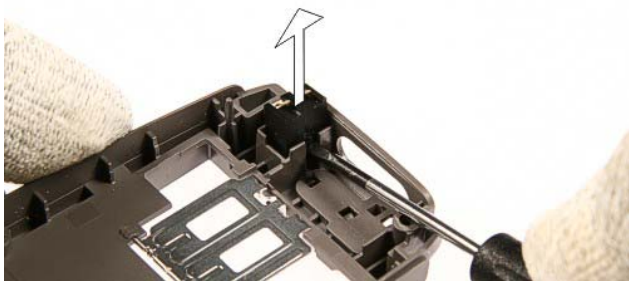
18.) Lift the **Engine Module** a bit with the SRT-6 and remove it from the **D-Cover Assy.**



19.) The **Antenna IHF Assy** drops out when turning the **D-Cover Assy.**



20.) Press out the **Easy Flash Connector** by using the DC-plug.



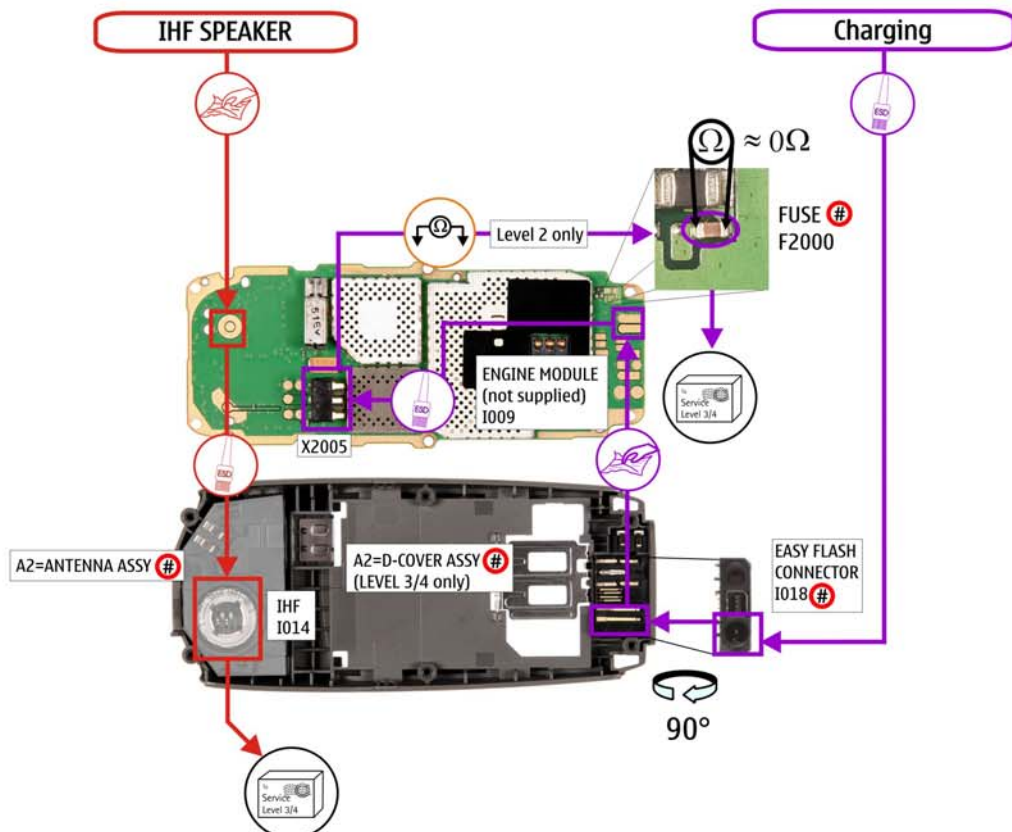
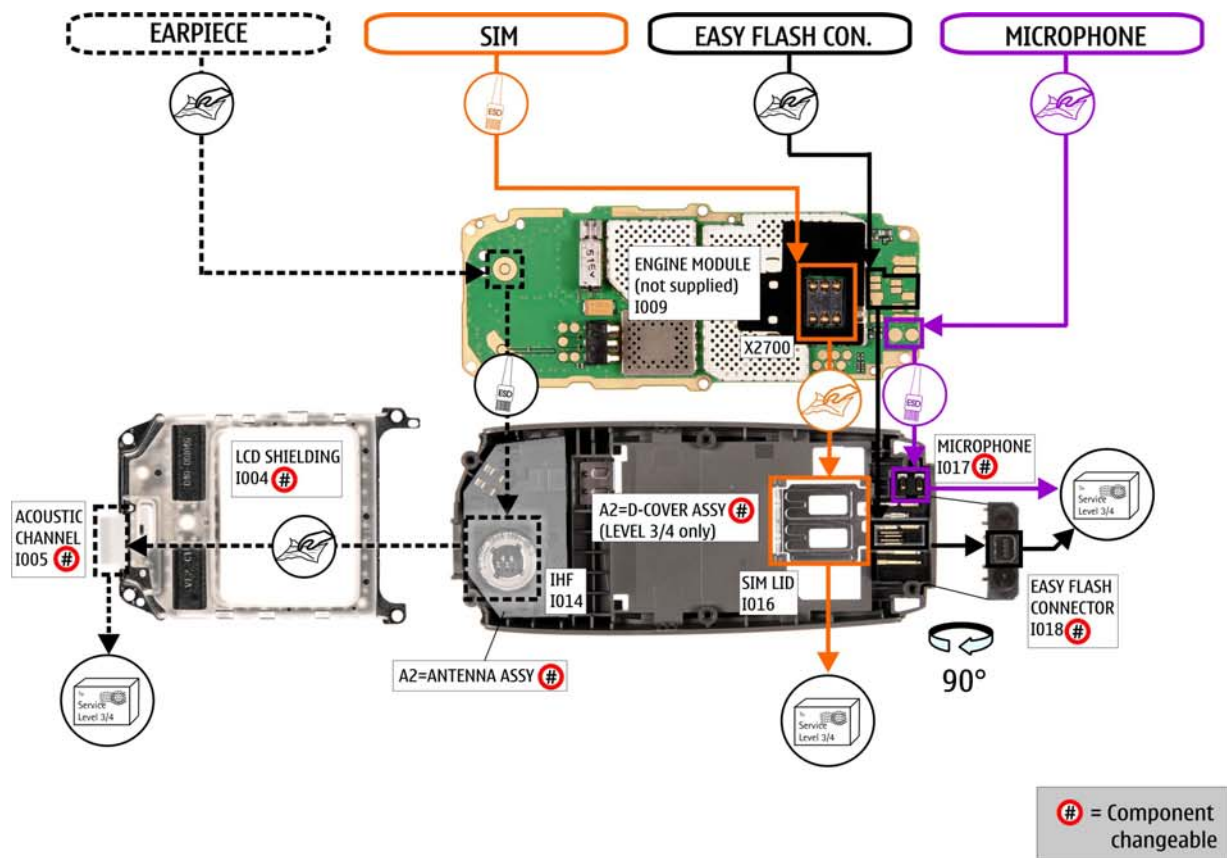
21.) Remove the **Microphone** with the slotted screwdriver.

10. LEGEND FOR QUICK TROUBLE SHOOTER

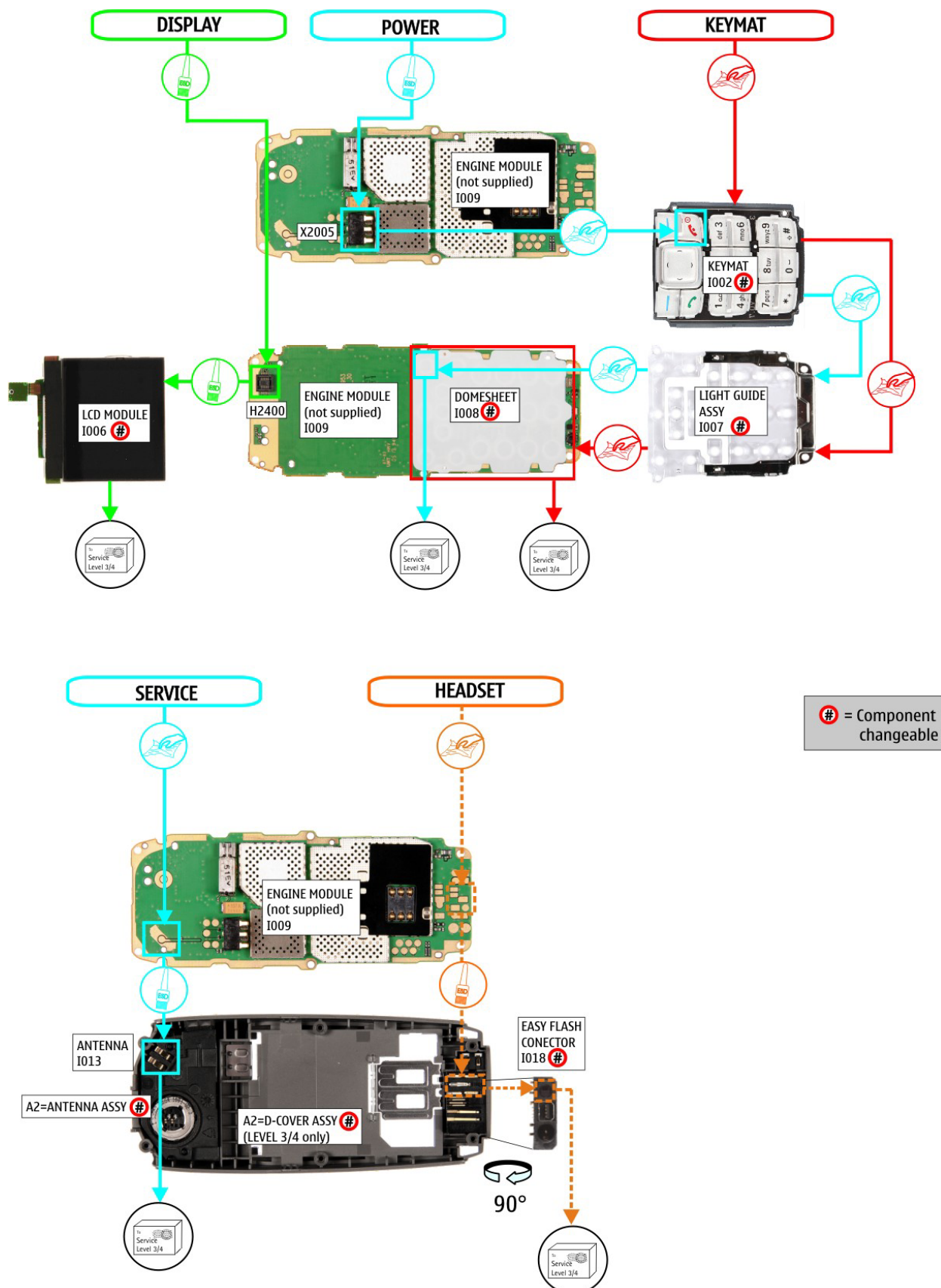
This legend is valid for all parts of the **Quick Trouble Shooter**

Follow the steps until the problem is solved. If this doesn't help, you are not authorized to go forward.	
	Only marked components (e.g. I002 ) 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.
	Measure component for electrical functionality and change, if needed. (Level 2 only)
	Pads or contacts: Check optical and mechanical condition particularly regarding to corrosion. Clean with ESD brush only, if necessary.
	No more actions possible send product to the appropriate service supplier with higher service level.

11. QUICK TROUBLE SHOOTER PART 1



12. QUICK TROUBLE SHOOTER PART 2

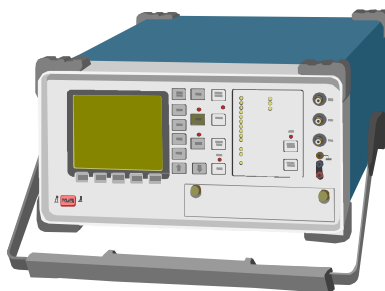


13. GONOGO TEST

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 NOKIA Online. 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 Online.



Mobile Phone Tester

14. BATTERY TEST

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

Please refer to the actual information on NOKIA Online.



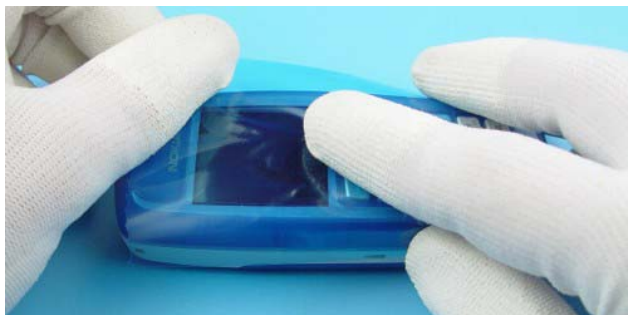
<http://www.astratec.co.uk/>



<http://www.cadex.com/>

15. FORWARDING OF REPAIRS

When it is necessary to forward of repairs to appropriate service supplier with higher service level 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.



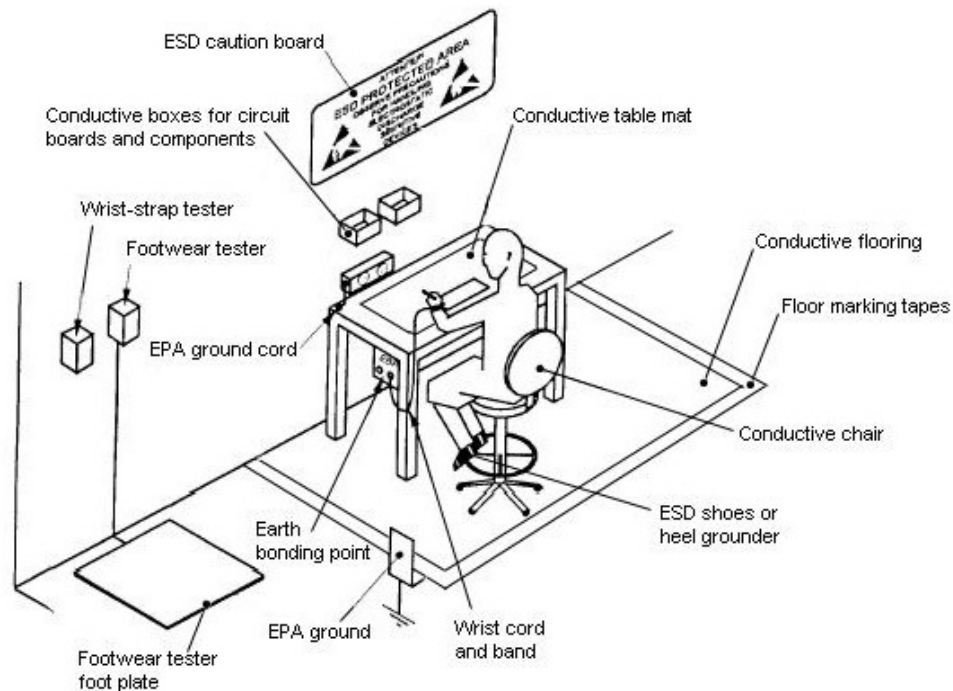
Add repair documentation e.g. filled-in service note into the swap carton.



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

16. ESD PROTECTION REQUIREMENTS

Please refer to the NOKIA Online document [Service Supplier 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

Service Schematics

Introduction

NOKIA
1110/1600
RH-70/RH-64

Exploded view and component disposal

IMPORTANT:

This document is intended for use by authorized NOKIA service centers only.

“Service Schematics” was created with focus on customer care.
The purpose of this document is to provide further technical repair information for NOKIA mobile phones on Level 3/4 service activities.
It contains additional information such as e.g. “Component finder”,
“Frequency band table” or “Antenna switch table”.
The “Signal overview” page gives a good and fast overview about the most important signals and voltages on board.
Saving process time and improving the repair quality is the aim of this document.
It is to be used additionally to the service manual and other training or service information such as Service Bulletins.

All measurements were made using following equipment:

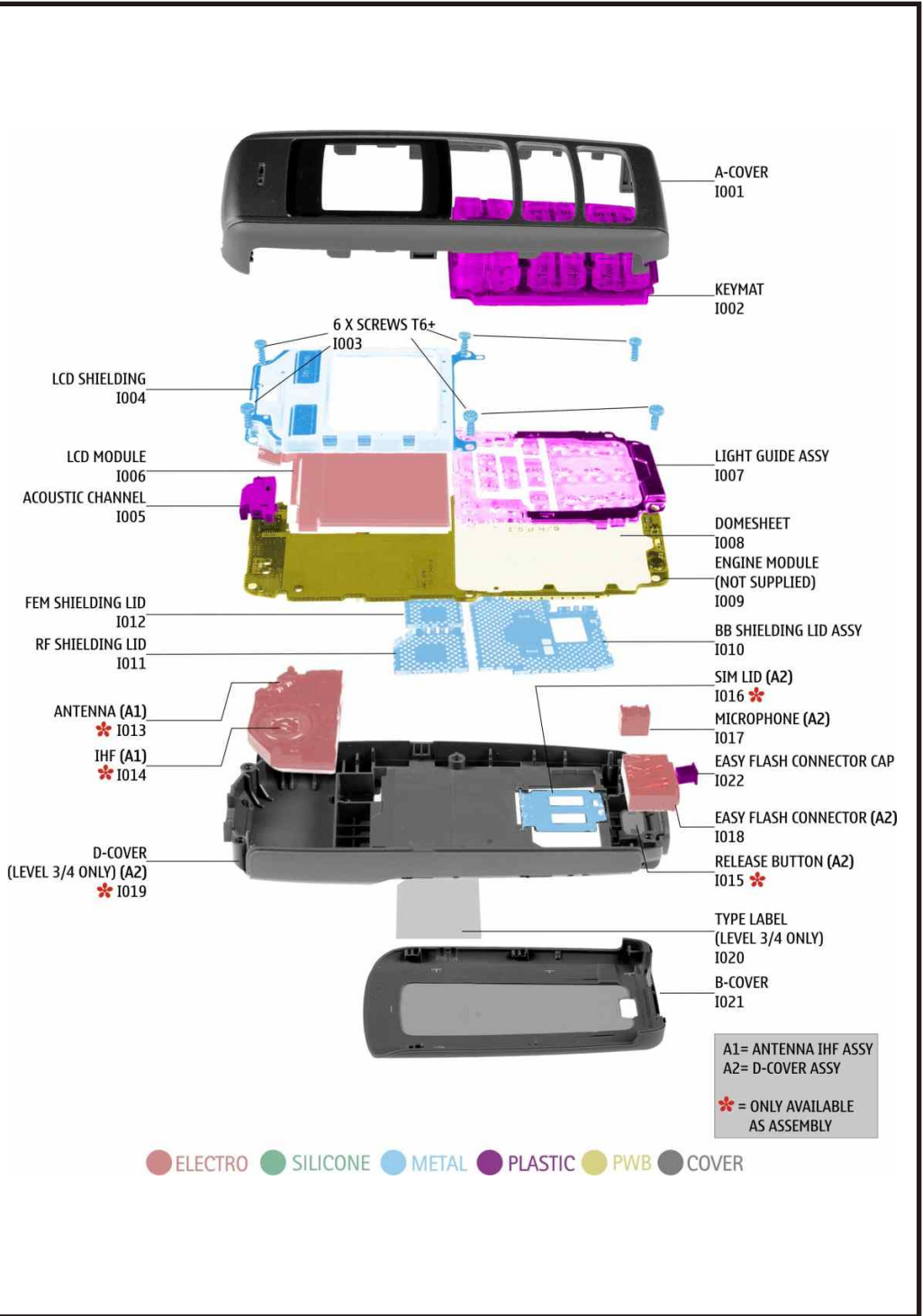
Nokia repair SW	: Phoenix version 2005.12.5.90
Oscilloscope	: Fluke PM 3380A/B
Spectrum Analyzer	: Advantest R3162 with an analog probe
RF-Generator / GSM Tester	: Rhode & Schwarz CMU 200
Multimeter	: Fluke 73 Series II

While every endeavour has been made to ensure the accuracy of this document, some errors may exist. If the reader finds any errors, NOKIA should be notified in writing.

Please send E-Mail to: training.sace@nokia.com



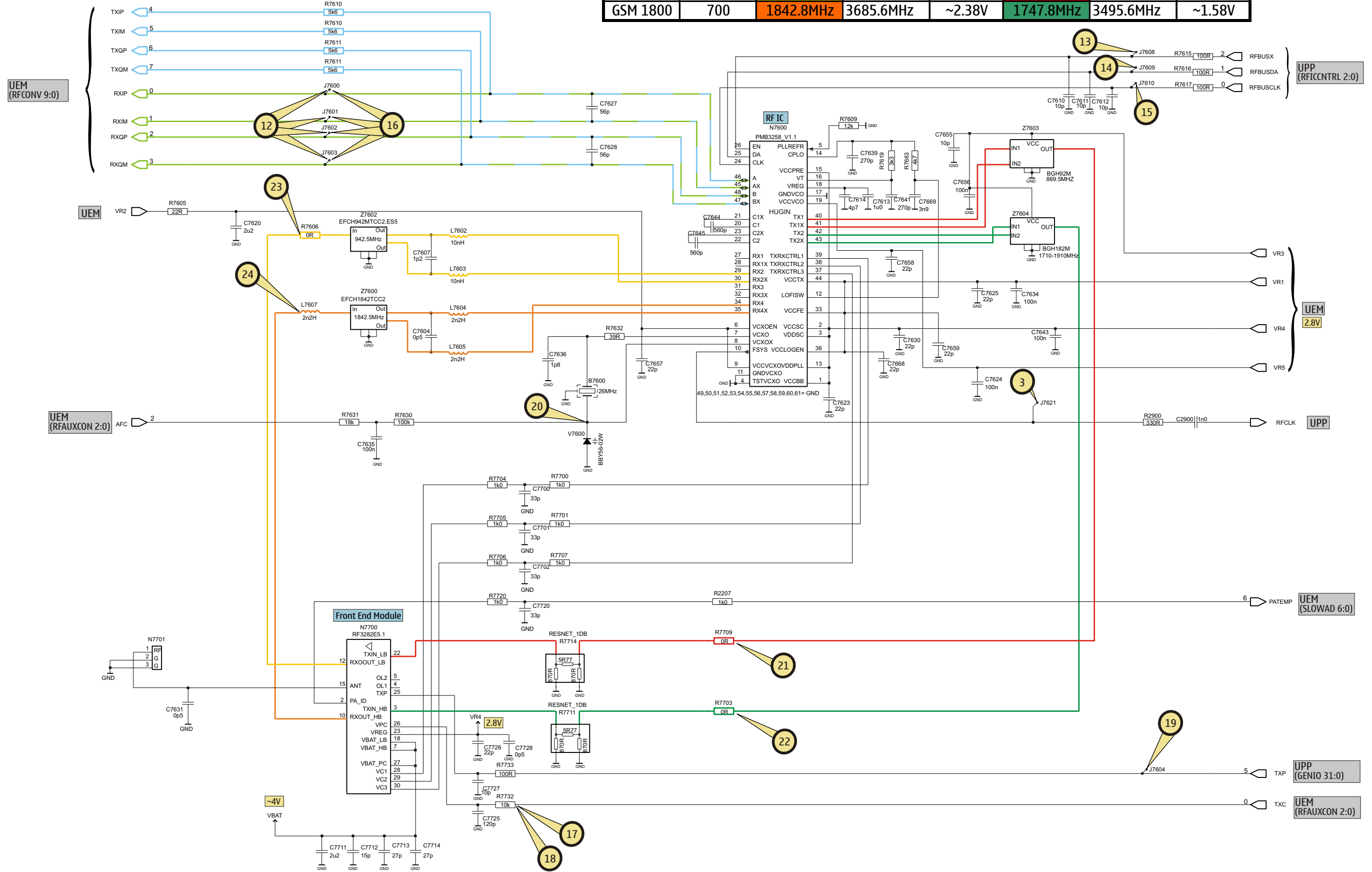
Table of Contents	Page
Frontpage	1
UPP, UEM, Combo memory, Radio, SIM	2
UI, Keyboard, Audio	3
RF part	4
Signal overview	5
Component finder	6

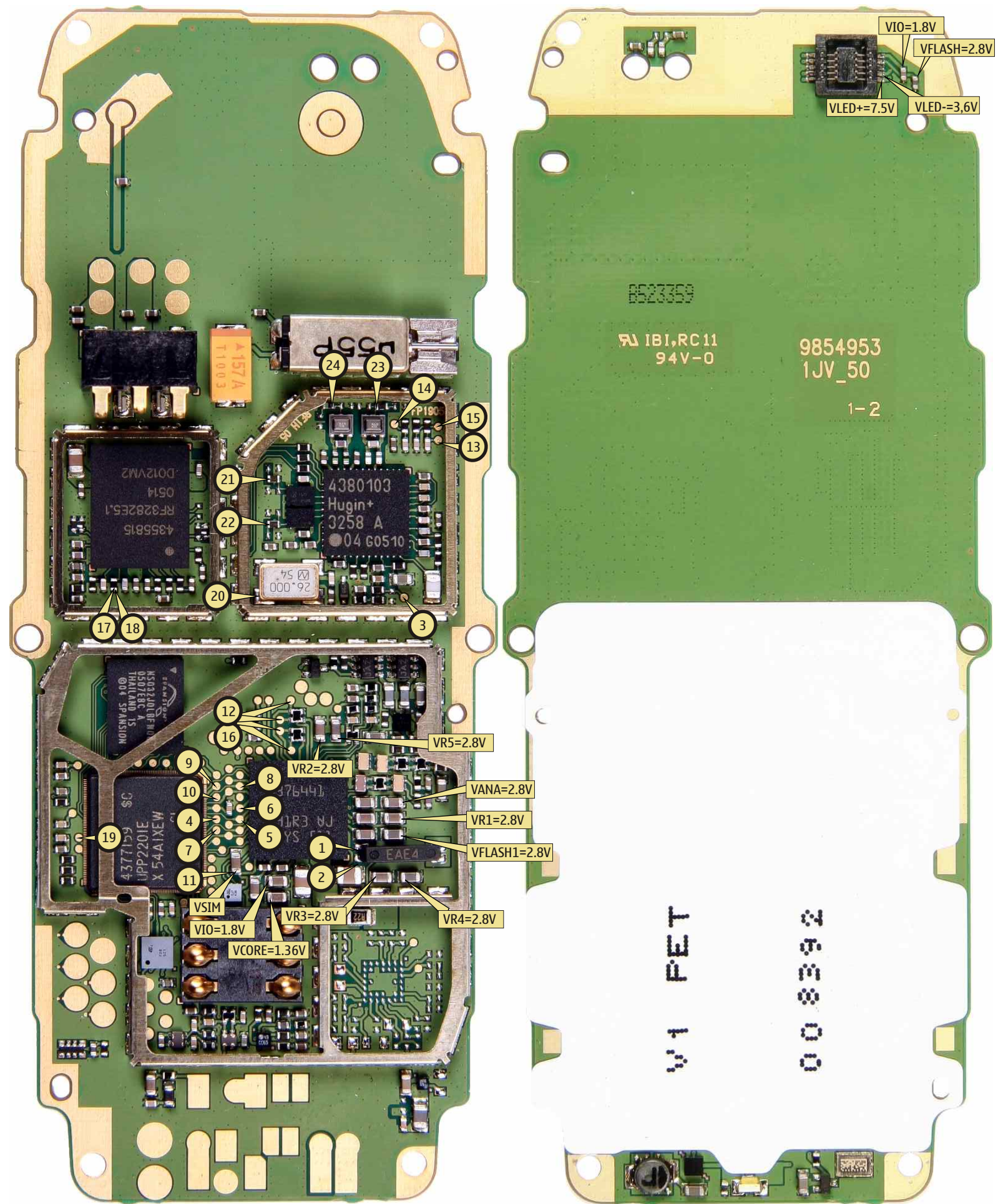
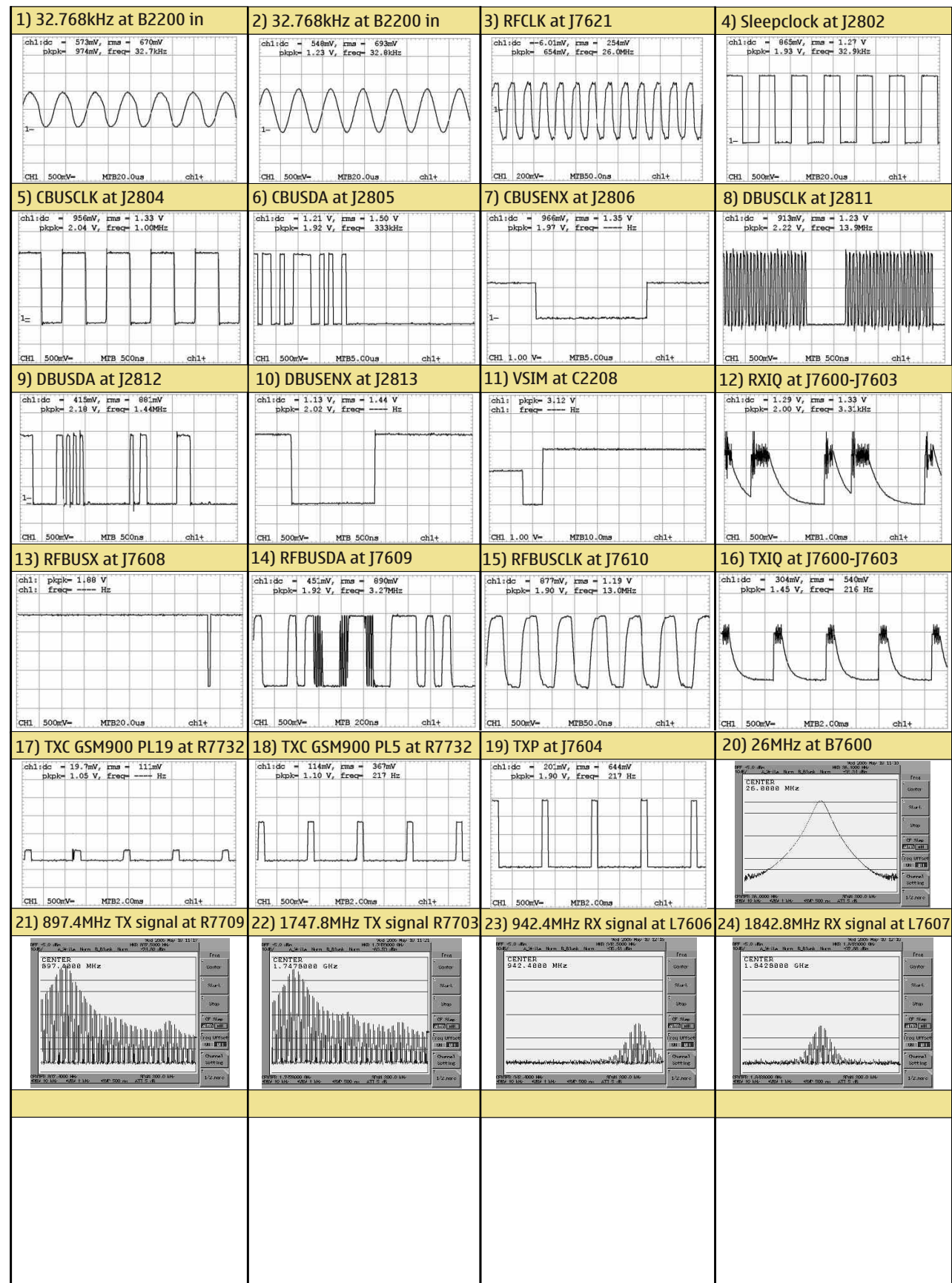


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Band	Channel	RX	VCO/RX	VC/RX	TX	VCO/TX	VC/TX
GSM 900	37	942.4MHz	3769.6MHz	~2.7V	897.4MHz	3589.6MHz	~1.98V
GSM 1800	700	1842.8MHz	3685.6MHz	~2.38V	1747.8MHz	3495.6MHz	~1.58V





B		C2239	P5	C7644	J7	J2207	N4	J8808	M6	R2154	N7	V	
B2200	07	C2240	M6	C7645	I7	J2208	N4	J8810	M6	R2155	L6	V2000	S7
B7600	K5	C2241	M6	C7655	I5	J2209	N4	J8813	M6	R2156	07	V2160	L6
C		C2242	M6	C7656	J5	J2210	N4	L		R2158	N7	V2400	U5
C2000	G3	C2261	P6	C7657	K7	J2800	N4	L2000	T7	R2159	N7	V2401	U3
C2001	G2	C2287	M5	C7658	J7	J2801	N4	L2001	R3	R2160	L6	V7600	K6
C2002	G4	C2330	G2	C7659	I6	J2802	04	L2002	R4	R2171	N8	X	
C2003	S5	C2331	P5	C7668	I6	J2803	N4	L2170	S3	R2200	P6	X2005	G3
C2004	R5	C2332	P5	C7669	K8	J2804	04	L2180	M7	R2202	M7	X2060	T3
C2005	R5	C2400	U4	C7700	K3	J2805	04	L2181	M7	R2203	M7	X2700	Q4
C2006	R5	C2401	U6	C7701	K3	J2806	04	L2182	B6	R2204	M6	Z	
C2007	S7	C2402	C2	C7702	K4	J2807	04	L2183	B6	R2205	M6	Z2400	Q3
C2008	R4	C2403	C2	C7711	I2	J2808	04	L2400	U6	R2206	M7	Z7600	H6
C2009	R4	C2405	P5	C7712	I4	J2809	04	L7602	I7	R2207	L4	Z7602	H7
C2010	R5	C2700	R4	C7713	I2	J2810	04	L7603	I7	R2400	U5	Z7603	J5
C2011	S3	C2880	04	C7714	K3	J2811	N4	L7604	I6	R2406	02	Z7604	J5
C2012	R4	C2881	P3	C7720	K4	J2812	N4	L7605	I6	R2407	P2		
C2013	R3	C2882	P3	C7725	K3	J2813	N4	L7607	H6	R2408	P2		
C2017	G5	C2883	02	C7726	J2	J2814	N3	M		R2409	T4		
C2151	N7	C2884	02	C7727	K2	J2815	N3	M2000	G6	R2700	P4		
C2152	S3	C2885	P3	C7728	K2	J2817	N3	N		R2900	K7		
C2153	B6	C2886	P3	D		J2818	N3	N2150	M7	R3030	02		
C2154	B7	C2887	02	D2200	05	J2823	N4	N2160	L7	R7605	K7		
C2155	N6	C2900	K7	D2800	03	J2840	P4	N2161	L7	R7606	H7		
C2157	08	C3030	N2	D3000	M3	J2841	P4	N2400	T6	R7609	K6		
C2159	N7	C3031	N2	F		J2842	P4	N7600	J7	R7610	M5		
C2161	N8	C3032	N2	F2000	T7	J2843	P4	N7700	J3	R7611	M5		
C2164	N6	C7604	I6	H		J2844	P4	R		R7615	H8		
C2165	N7	C7607	I7	H2400	C3	J2845	P4	R2000	G3	R7616	H7		
C2171	N8	C7610	I8	J		J2846	P4	R2001	Q3	R7617	H7		
C2180	N7	C7611	I7	J2000	F2	J2847	04	R2002	R5	R7619	J8		
C2181	M7	C7612	I7	J2001	F3	J2848	02	R2003	R5	R7630	K6		
C2182	M7	C7613	I7	J2002	F3	J2849	02	R2004	R5	R7631	K7		
C2200	07	C7614	J7	J2003	F2	J2850	M4	R2005	S5	R7632	K6		
C2202	07	C7620	K7	J2004	F3	J2992	M5	R2006	R5	R7633	K2		
C2203	07	C7623	J7	J2010	T6	J3361	P5	R2007	R4	R7635	K2		
C2204	P5	C7624	J8	J2011	U4	J6161	Q7	R2008	S4	R7663	K8		
C2205	P5	C7625	J6	J2012	T6	J6162	Q7	R2009	R4	R7700	I5		
C2208	P4	C7627	J5	J2060	Q2	J7600	M5	R2010	S3	R7701	I5		
C2220	M7	C7628	J5	J2063	Q2	J7601	M5	R2011	R4	R7703	J5		
C2222	P7	C7630	K6	J2102	T4	J7602	M5	R2013	R5	R7704	K3		
C2223	07	C7631	D3	J2103	S4	J7603	N5	R2020	R5	R7705	K3		
C2225	M6	C7634	I7	J2150	N4	J7604	02	R2027	R5	R7706	K3		
C2226	P7	C7635	K6	J2200	N5	J7608	I8	R2068	S2	R7707	I5		
C2227	M6	C7636	K6	J2201	N5	J7609	H7	R2069	S2	R7709	I5		
C2230	07	C7637	K2	J2202	N5	J7610	H8	R2070	S2	R7711	J4		
C2233	07	C7638	K2	J2203	N4	J7621	K7	R2150	N7	R7714	J2		
C2235	M7	C7639	J7	J2204	M5	J8805	M5	R2151	M7	R7720	K4		
C2236	M5	C7641	J7	J2205	04	J8806	N2	R2152	N7	R7732	K2		
C2237	M5	C7643	K6	J2206	04	J8807	04	R2153	N7	R7733	K2		

