Programmes After Market Services
NSB-5 Series Transceivers

Service Software

Contents

WinTesla NSB-5 Service Software

The service software test functions send test and measurement messages from PC to mobile station (MS). The results of the test and measurement messages are shown on the PC display.

The WinTesla service software requires a DESKey software protection device to be connected to the PC's parallel port. The PKD-1 and and Point of Sale POS Flash device (FLD-2D) fulfill this requirement. The POS flash device (TDF-4) Prommer is required for flashing SW. Having a PKD-1 installed on the printer's parallel port allows access to the tuning functions for testing and tuning of the NSB-5 MS.

NOTE: If this software is to be run on laptops, the power-saving feature MUST be switched off. If this is not switched off, you need to re-establish connection to the phone after power-saving has been active.

WARNING: Do not install the FLS-2D on the parallel port with the PC powered up.

Hardware Requirements for Windows 3.1x

The recommended minimum hardware standard to run WinTesla service software is any computer that is an Intel 80386 33 MHz or greater with at least 4MB of memory and a VGA-type display (640 x 480). This assumes that only the WinTesla service software is active (i.e., other Windows packages are not running in the background).

Hardware Requirements for Windows 95, 98, and NT

The recommended minimum hardware standard to run WinTesla service software is a PC with a Pentium processor with available memory of 8MB. The PC also must meet the hardware requirements recommended by Microsoft.

Software Environment of the Support Modules

The WinTesla service software user interface (UI) is intended for the following environments: Microsoft Windows 3.1x and Windows 95 running in enhanced mode; Windows 98; and Microsoft NT 3.51 or later. Windows 2000 is not supported. As a Windows application, the user interfaces with the process via selections made from menus, text entry, pushbuttons, and shortcut keys. Selections are performed by using the keyboard and/or mouse inputs. The status bar displayed at the bottom of the main menu window contains information about current actions.

Required Servicing Equipment

1. Computer: At least IBM 80386 or compatible with one unused serial port (COM1 or COM2)*, one parallel port (LPT1), 20Meg of free hard disk, 3.5-inch floppy disk, and 4Meg of RAM.

2. Operating System: Win 3.1 or later.

3. Display: Minimum monochrome graphic display with 640 x 480 resolution

4. One of the following protection keys:

- Software protection key PKD-1 (Product code: 0750018)
- Software protection key PKD-1CS (Product code: 075Y002)
- Software protection key PKD-1D (Product code: 0750053)
- Software protection key PKD-1NS (Product code: 075Y001)

5. RS-232 Serial Cable (DSUB-9) female AXS-4 (Product code: 0730090)

6. Service MBUS Cable (DAU-9P). Product code: 0730109

7. Service MBUS Cable (DAU-9S). Product code: 0730108 (two required)

8. Service Cable (SCH-5). Product code: 0730098

9. Modular T-adapter. Product code: 4626134

10. WinTesla software version 6.43 or later

11. Service software for NSB-5 version 271.03.03 or later

12. DESKey driver

13. FPS-4 support SW if using the Prommer

14. FLS-X support SW if using the POS flash device

*NOTE: A number of PCs of an older generation use the Intel, National Semiconductor, or United Microelectronics IC 8250 as the serial port UART. This is a comparatively inefficient circuit for current purposes and does not necessarily support the M2BUS adapter at 9600 baud. The newer UARTs (NS16450 and NS16550AF) from National Semiconductor offer solutions for these problems.

Testing and Tuning With Covers Off

DC Cable PCS-1 (Product Code: 0730012)

Either:

Module Jig JBS-19
SIM Card holder CAH-1 (Product Code: 0770112)

Or:

Light Module Jig JBT-1

Warranty Transfer (phone to phone)
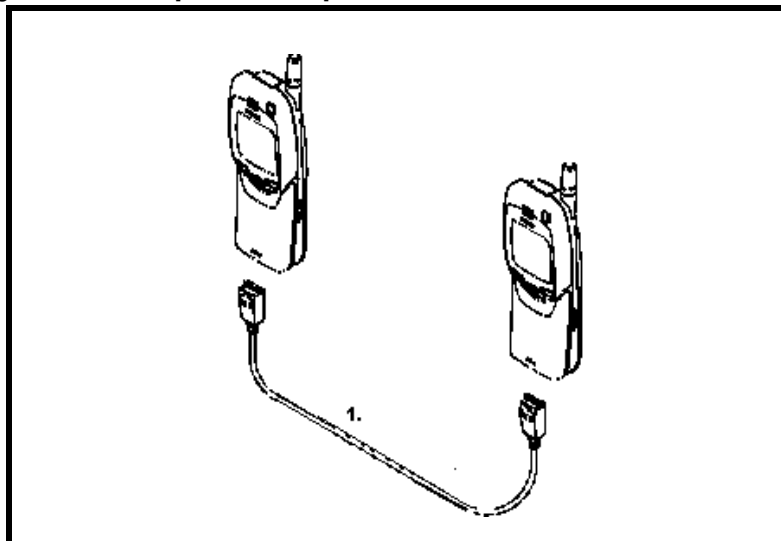
Item	Service Accessory	Type	Product Code
1	Warranty Cable	SCH-6	0730099

Audio test equipment (optional)

- Audio cable ADS-1 (Product Code: 0730011)
- Service Audio Box JBA-4 (Product Code: 0770094)
- Function Generator (Sine-wave, 0-500mV, 1kHz)
- Oscilloscope
- Multimeter
- Headset HDC-0 (Product Code: 0694093)

RF Test and Tuning Equipment

- GSM/PCN Signal generator and tester (e.g., Rhode & Schwartz CMD 55)
- External Antenna Cable XRC-1B (Product Code: 0730128)

Extra Equipment (for added accuracy on RF tuning):

- RF generator
- Pulse power meter
- GSM/PCN spectrum analyzer
- Attenuator and branching unit

Energy Management Calibration

- DC power supply capable of delivering 10.5VDC
- Service battery BBD-3 (Product code: 0775071)
- DC charger calibration cable SCB-3 (Product code: 0730114)

Infrared Test Equipment:

- Infrared test module JLP-1 (Product code: 0750079)
- Combox TDC-4 (Product code: 0630119)
- One of the following travel chargers:
    Travel charger ACH-6E (Euro) (Product code: 0270381)
    Travel charger ACH-6U (USA/Japan) (Product code: 0270382)
    Travel charger ACH-6X (UK) (Product code: 0270380)

Flash Programming Equipment:

Either:

- Point of Sale Flash Adapter FLS-1 (Product code: 075T000)

or (the following can also be used instead of Combox TDC-4):

- Flash Security Box TDF-4 (Product code: 0770106)
- Flash Prommer sales package FPS-4S (Product code: 0085095)
- Service battery BBD-3 (Product code: 0775071)

One of the following travel chargers:
- Travel charger ACH-6E (Euro) (Product code: 0270381)
- Travel charger ACH-6U (USA/Japan) (Product code: 0270382)
- Travel charger ACH-6X (UK) (Product code: 0270380)
- DC power cable PCC-1B (Product code: 0770053)

Equipment Setup

Caution: Make sure that you have switched off the PC and printer before making connections!

Connect the M2BUS service cable (DAU-9P) to the serial port (RS-232) of the computer. Attach one end of the service cable to the PC serial port and the other end to the service box (JBA-4). For servicing the phone with covers in place, the service box should always be used. When the phone covers are removed, the jigs should be used.

For audio measurements, connect the audio cable (ADS-1) as follows:

- EAR line to AF INPUT of test equipment
- MIC line to MOD GEN OUTPUT of test equipment

Equipment Setup for Tuning a Phone without Removing Covers
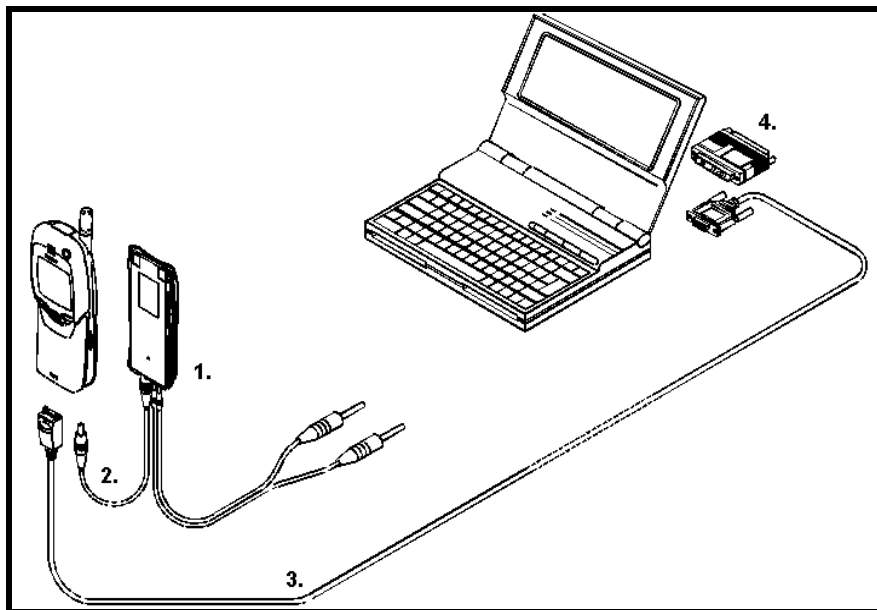
Item	Service Accessory	Product Code
1	Service battery (BBD-3)	0775071
2	DC cable (SCB-3)	0730114
3	Service MBUS cable (DAU-9P)	0730109
4	Software protection key (PKD-1)	0750018

Heavy Flash Concept for NSB-5
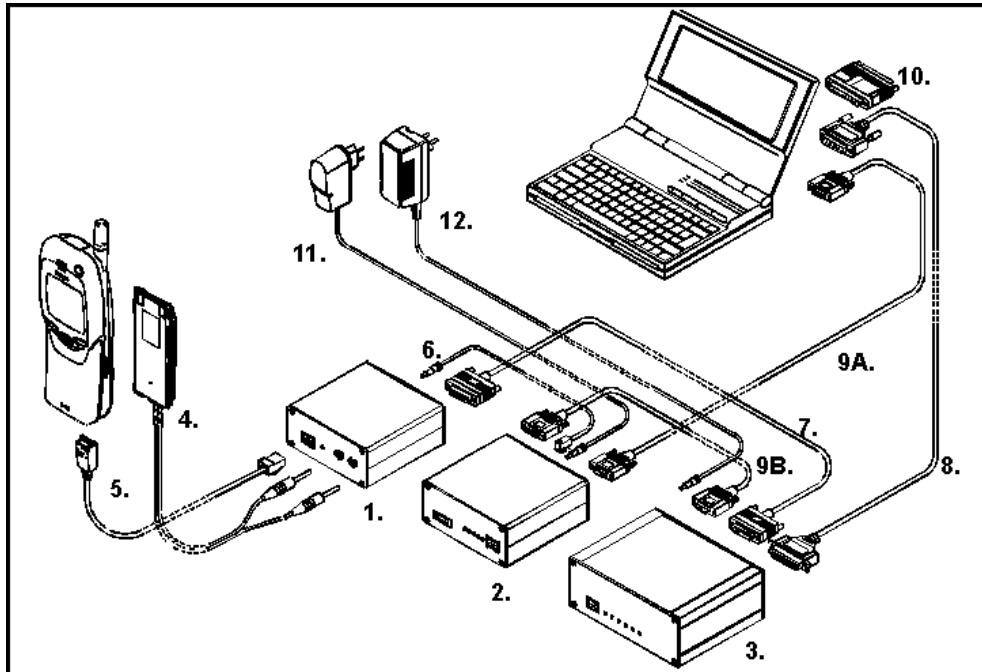
Item	Service Accessory	Product Code
1	Flash loading adapter (FLA-5)	0080178
2	Flash security box (TDF-4)	0770106
3	Prommer (FPS-4S)	0085095
4	Service Battery (BBD-3)	0775071
5	Service cable (SCH-5)	0730098
6	DC Cable (PCC-1B)	0730053
7	D15 - D15 cable (AXS-5) *	0730091
8	Printer cable *	0730029
9A/B	D9 - D9 cable (AXS-4) *	0730090
10	Software protection key (PKD-1)	0750018
11.1	Travel charger ACH-6E (Euro)	0270381
11.2	Travel charger ACH-6U (USA/ Japan)	0270382
11.3	Travel charger ACH-6X (UK)	0270380
12	AC charger (ACL-3E) *	0680015

* Included in FPS-4 sales pack.

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PAMS Technical Documentation

Tuning With Covers Off (Using Test Frame JBS-19)
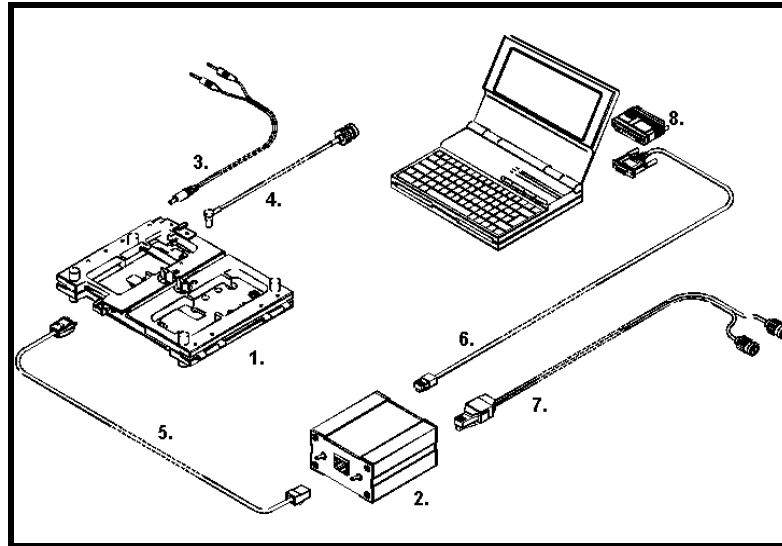
Item	Service Accessory	Product Code
1	Module Jig (JBS-19) *	0770098
2	Service audio box (JBA-4) **	0770094
3	DC cable (PCS-1)	0730012
4	External antenna cable (XRC-1B)	0730128
5	Service cable (SCH-5) **	0730098
6	Service MBUS cable (DAU-9S) **	0730108
7	Audio cable (ADS-1)	0730011
8	Software protection key (PKD-1)	0750018

* The nominal operating voltage for JBS-19 is 3.6V. The supply voltage for JBS-19 must never exceed 5.0V.

** SCH-5, JBA-4, and DAU-9S can be replaced with DAU-9P.

Tuning With Covers Off (Using Light Jig JBT-1)
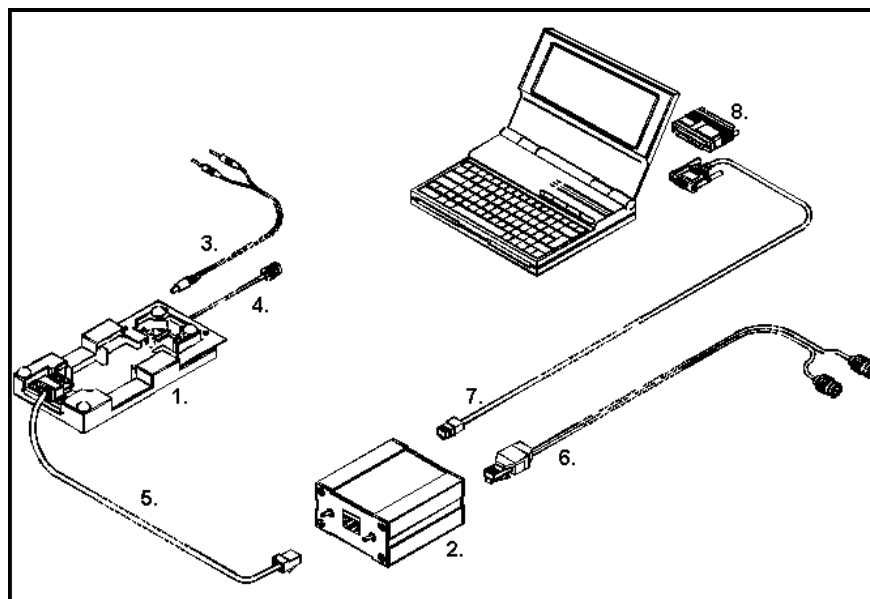
Item	Service Accessory	Product Code
1	Light Module Jig (JBT-1) *	0770109
2	Service audio box (JBA-4) **	0770094
3	DC cable (PCS-1)	0730012
4	External antenna cable (XRC-1B)	0730128
5	Service cable (SCH-5) **	0730098
6	Service MBUS cable (DAU-9S) **	0730011
7	Audio cable (ADS-1)	0730108
8	Software protection key (PKD-1)	0750018

* The nominal operating voltage for JBT-1 is 3.6V. The supply voltage for JBT-1 must never exceed 5.0V.

** SCH-5, JBA-4, and DAU-9S can be replaced with DAU-9P.

Installation

Mechanical Connections

The software controls the phone via an MBUS adapter connected to the serial port of the PC and to the MS M2BUS (DAU-9P). The DAU-3 data cable is not a suitable substitute for the DAU-9. Attach the dongle (PKD-1) to the parallel port (25-pin female D-connector) of the PC. When connecting PKD-1 to the parallel port, be sure that you insert the computer side of the PKD-1 to the PC (male side). If you use a printer on parallel port 1,

install the PKD-1 between the PC and your printer cable. The PKD-1 should not affect devices working with it. If errors occur (errors in printing are possible), please try printing without the PKD-1. If printing is okay without the PKD-1, please contact your dealer.

Basic Hardware Configuration
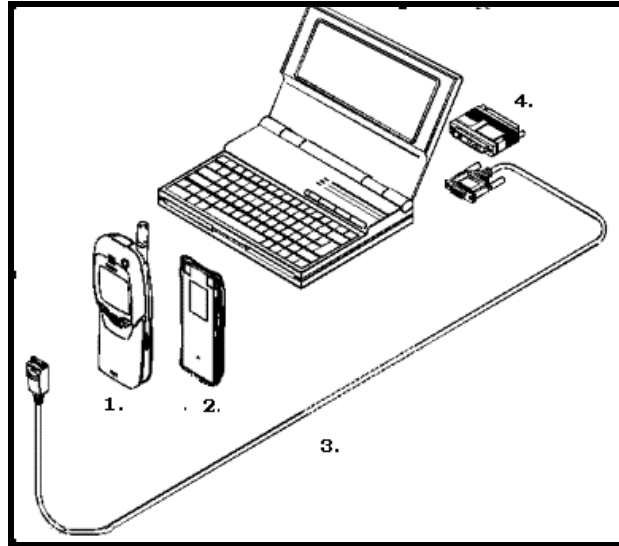
Installing the Software on PC Hard Disk

The program is run protected by a DESKey SW protection device called a dongle. The DESKey type PKD-1 provides access to the full tuning, flashing, and maintenance utilities provided by WinTesla. A dongle must be present in parallel port when using the service software.

First Time Installation of WinTesla

The following table lists the software required for a new installation using the POS flash device. The SW is available on the Nokia PAMS page (http://www.nmp.nokia.com/pams). The installation order of the SW is not critical, but installing the SW in the order of the items listed in the table is suggested. It is not necessary to restart the PC after each driver, but the PC must be restarted eventually. WinTesla will not sense the dongle until the PC has been restarted. WinNT users must be logged on with Administrator's rights to install drivers.

Item	Description	Part No.	EDMS	Version
1	WinTesla wt_inst.exe	0774046	00040156	6.43
2	NSB-5 Service SW Wt_nsb5.exe		8402075	271.03.03
3	HD955 Product SW Nsb5AS330.exe			3.30
3	DESKey Driver Bdk2wn32.exe	31197		4.36

Item	Description	Part No.	EDMS	Version
4	PortIO Driver Port95nt.exe	26855		1.0.0.1
5	POS, FLE-5 Driver 192Fle5drv.exe	31262		1.92
6	POS, FLS License Util 139FlsLic.exe	47216		1.47
7	FPS Fps_inst141.exe		8400599	1.41

Common Properties of the User Interface

When the Service Software application is invoked, the Login dialog box is displayed on the screen. The User Interface can be mouse-driven or used without the mouse.

Login Dialog

When the Service Software application is invoked, by checking on the Service Software icon, the Login dialog box is displayed on the screen.

Figure 1: Login Dialog

Nokia logo and application name bitmap (-)

Displays Nokia logo and name of the application.

Application version static text (-)

Contains the name and version of the application.

Copyright notice static text (-)

Copyright is informed as: "Nokia Mobile Phones (c) 1995-1999. All Rights Reserved."

Login Box edit box (-)

The user Login ID edit box, where the user enters his faultlog user name. (See Faultlog

User Guide).

OK button (default key)

> The user name is stored in memory and the dialog box is closed. When the dialog box is closed, the application starts.

Cancel button (ESC)

> The Dialog box is closed and application is started, but the Faultlog feature is disabled.

Help button (F1)

> Activates the Windows Help application and displays context-sensitive help.

Main Window
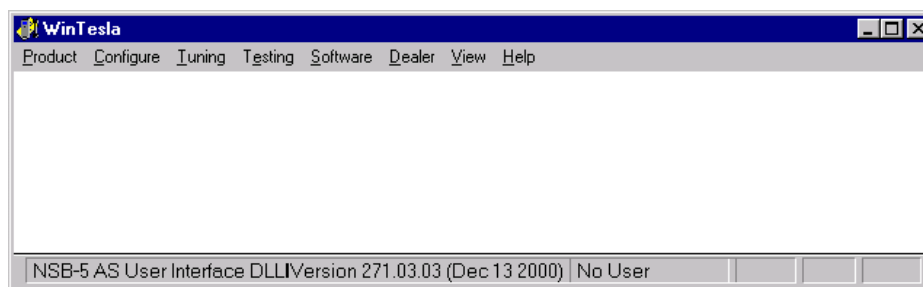
Figure 2: Main Window Panel

Title Bar

> The title bar is located at the top of the window. A title bar contains the following elements:

> - Application Control-menu button
> - Name of the appliction
> - Minimize button
> - Maximize button
> - Exit button

Menu Bar

> The menu bar is below the title bar and contains all available menu selections. The menu bar is a dynamic element and is dependent on the DESKey software protection dongle type fitted, and whether a phone is connected.

> Underlined characters in menu names and options indicates that the menu selection can be chosen by pressing **Alt** + underlined character. Options also can be selected by activating menu bar with **Alt** key (or F10) and using arrow keys to highlight the desired menu. In the latter case, selection is made by pressing **Enter**. Menus also can be selected by using the mouse.

Status Bar

> The status bar is displayed at the bottom of the Service Software main window. The status bar contains information about the latest detected/selected phone type, the software

version of the product support modules, ongoing events, and includes a set of status indicators.

The left area of the status bar describes the latest detected/selected phone type and gives the version of the product support modules.

The status bar texts are explained in detail in the description of each command. The right areas of the status bar indicates which of the following keys are latched down:

Indicator	Description
USER	Entered Login ID
CAP	The Caps Lock key is latched down.
NUM	The Num Lock key is latched down.
SCRL	The Scroll Lock key is latched down.

Menu

The Service Software package will have two menu bar configurations. The first is an abbreviated version that contains the minimum number of menus and allows package configurations when a phone is NOT connected or NOT detected.
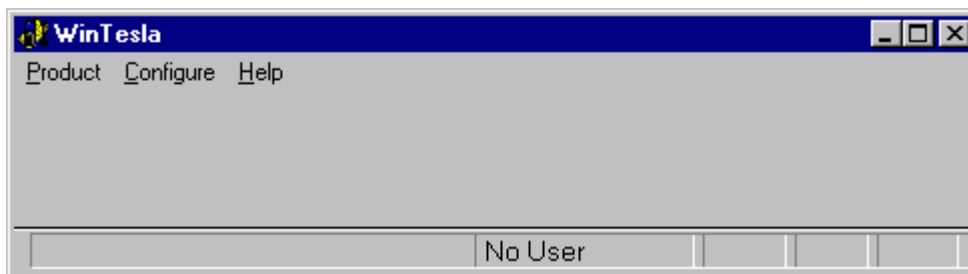
Figure 3: WinTesla Common Without a MS Connected Dialog

The second configuration is described below. The menu bar contains the following menus for the Service Software package when a phone is connected with a PKD-1 SW protection device:

Product*
Configure*
Tuning
Testing
Software
Dealer
View
Help*

* always displayed, even if no phone is connected.

A menu is broken down into sections that are indicated with menu separators. Each sec-

tion identifies a logical difference from itself and other sections (i.e., between transmitter and receiver). The menu lists will use the Microsoft symbol after an item name to indicate that selecting that item will NOT initiate an operation immediately (i.e., a dialog box will be displayed for the user to select options or type in data and press the **OK** button before the operation is performed).

Product

The Product menu contains the following menu items:

New (CTRL+R)
Open
Close
Initialize
       Normal Mode (F5)
       Local Mode (Shift+F5)
Band
       GSM
           PCS
Faultlog
       Faultlog...
FastNAM - F8 (Disabled)..
FLS-X Remote Update
Exit
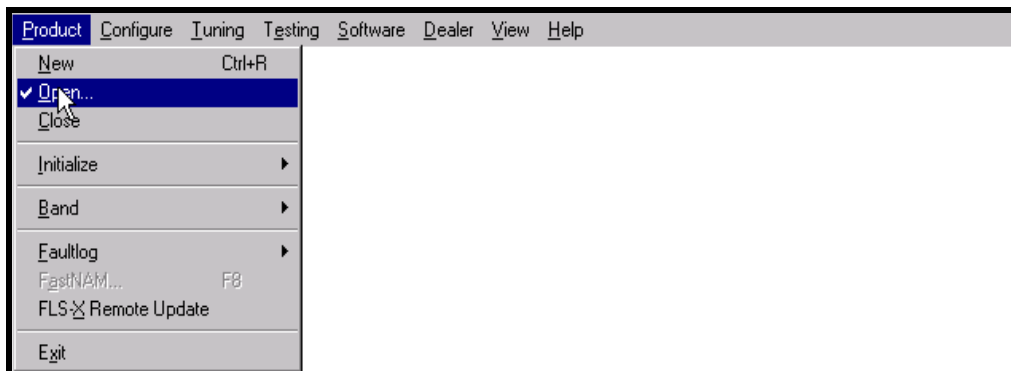
Figure 4: Product Menu Pop Up Items

Configure

The Configure menu contains the following items:

Options...
Users... (Disabled)
Buses
Directories...
Faultlog...
FastNAM (Disabled)
GPIB Instruments (Disabled)
MPWS Swap
FLS-X

Figure 5: Configure Menu Pop Up Items

Tuning

The Tuning menu contains the following menu sections:

RX Calibration...
Tx Power...
Tx I/Q...
Energy Management Calibration...
Contrast...
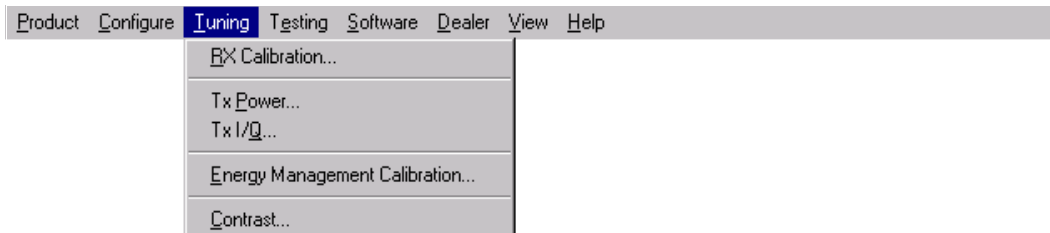
Figure 6: Tuning Menu Pop Up Items

Testing

The Testing menu contains the following sections:

RF Controls...
RSSI Reading ...
Self Tests...
ADC Readings...
Audio
 -Internal
User Interface...
Call Simulation...
Noise Sensitivity...
 IR Test...
Vibra Test...
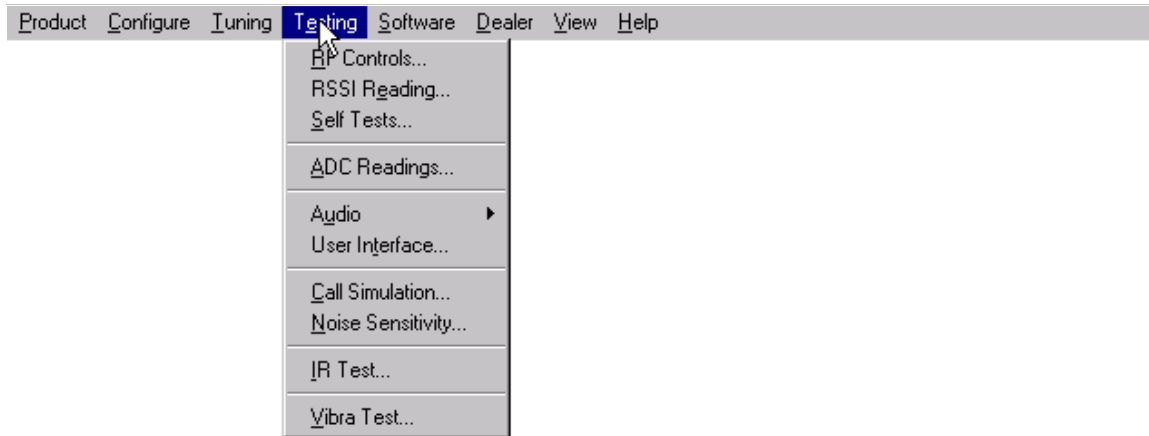
Figure 7: Testing Menu Pop Up Items

Software

The Software menu contains the following menu sections:

Product Profile...
Start Up Self-tests...
Set Factory Values
Phone Identity...
Warranty State..
Production Data Edit...
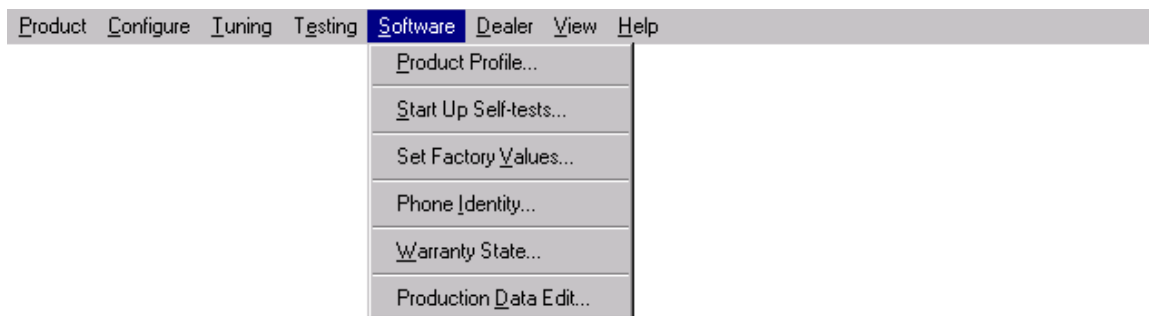
Figure 8: Software Menu Pop Up Items

Dealer

The Dealer menu contains the following menu sections:

User Settings...
User Settings & Data Transfer...
Restore User Defaults...
Set UI/DEV Default Values ...
Operator Settings...
IWR Swap...
Flash Phone...
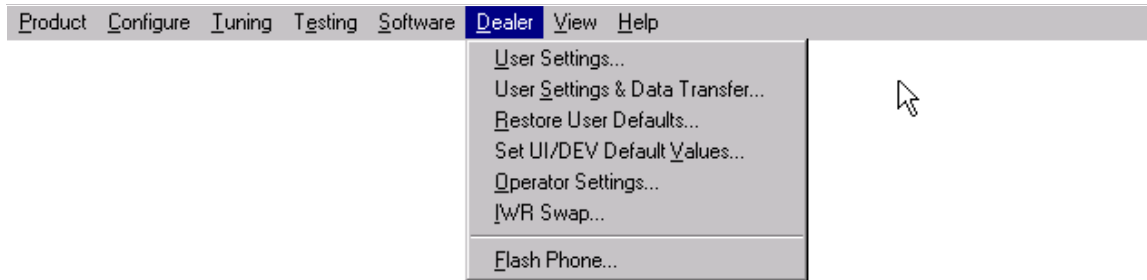
Figure 9: Dealer Menu Pop Up Items

View

The View menu contains the following sections:

Quick/RF Info...
Phone Information...
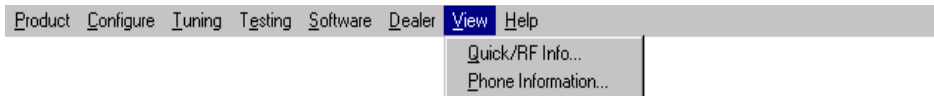
Figure 10: View Menu Pop Up Items

Help

The Help menu contains the following menu items

Index
General Help (F1)
Using Help
About WinTesla
About AS Locals

Figure 11: Help Menu Pop Up Items

Mouse Cursors

The standards Windows pointer is used as the mouse cursor.

During time-consuming tasks (e.g., communication to phone) an hourglass is shown informing the user that a task is in progress. The application uses the hourglass cursor to inform user that the application has taken the control and any actions from user will be ignored. When a function is initiated, the hourglass will be displayed and when the function has finished, the mouse pointer will return to normal.

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Reserved Keys

The following Hot keys and Short Cut keys are reserved either as Microsoft standard keys or as part of the Common Look and Feel.

Short Cut Function Keys

Key	Description	Defined by
F1	Context Sensitive Help	Microsoft
F5	Normal Mode	NMP
Shift+F5	Local Mode	NMP
F8	FastNAM (disabled)	NMP
F9	Activate Faultlog	NMP
F10	Goto Menu Bar	Microsoft
Ctrl+F4	Close Active Window	Microsoft

Alt Hot Keys

Key	Description	Defined by
Alt+F4	Exit Active Application	Microsoft
Alt+H	Help	Microsoft
Alt+P	Product Menu	NMP
Alt+P,N	New	NMP
Alt+P,O	Open	NMP
Alt+P,C	Close	NMP
Alt+P,I	Initialize Pop-up	NMP
Alt+P,I,N	Normal Mode	NMP
Alt+P,I,L	Local Mode	NMP
Alt+P,B	Band Pop-up	NMP
Alt+P,B,G	GSM	NMP
Alt+P,B,P	PCN	NMP
Alt+P,F	Faultlog Pop-up	NMP
Alt+P,F,A	Activate Faultlog	NMP
Alt+P,F,E	Edit Faultlog	NMP
Alt+P,N	FastNAM	NMP
Alt+P,1	FLS-1 Remote Update	NMP
Alt+P,X	Exit Application	NMP
Alt+C	Configure	NMP
Alt+C,O	Option	NMP
Alt+C,B	Buses	NMP
Alt+C,D	Directories	NMP

Alt+C,F	Faultlog	NMP
Alt+C,N	FastNAM	NMP
Alt+C,G	GPIB instruments	NMP
Alt+C,M	MPWS Swap	NMP
Alt+T	Tuning Menu	NMP
Alt+T,R	RX Calibration	NMP
Alt+T,P	Tx Power	NMP
Alt+T,Q	Tx I/Q	NMP
Alt+T,E	Energy Management Calibration	NMP
Alt+T,D	Display Contrast Adjustment	NMP
Alt+E	Testing Menu	NMP
Alt+E,R	RF Controls	NMP
Alt+E,E	RSSI Reading	NMP
Alt+E,S	Self Tests	NMP
Alt+E,A	ADC Readings	NMP
Alt+E,U	Audio Pop-up	NMP
Alt+E,U,I	Audio Internal	NMP
Alt+E,V	Vibra	NMP
Alt+E,T	User Interface	NMP
Alt+E,C	Call Simulation	NMP
Alt+E,N	Noise Sensitivity	NMP
Alt+E,I	IR Test	NMP
Alt+S	Software Menu	NMP
Alt+S,P	Product Profile	NMP
Alt+S,S	Start-up Self Tests	NMP
Alt+S,V	Set Default Values	NMP
Alt+S,I	Phone Identity	NMP
Alt+S,W	Warranty state	NMP
Alt+S,D	Production Data Edit	NMP
Alt+D	Dealer Menu	NMP
Alt+D,U	User Settings	NMP
Alt+D,R	Restore User Defaults	NMP
Alt+D,V	Set UI/DEV Default Values	NMP
Alt+D,O	Operator Settings	NMP

Alt+D,I	IWR Swap	NMP
Alt+V	View Menu	NMP
Alt+V,Q	Quick/RF Info	NMP
Alt+V,P	Phone Information	NMP
Alt+H	Help Menu	Microsoft
Alt+H,I	Index	Microsoft
Alt+H,G	General Help	Microsoft
Alt+H,U	Using Help	Microsoft
Alt+H,A	About WinTesla	NMP
Alt+H,B	About AS Locals	NMP

Ctrl Hot Keys

Key	Description	Defined by
Ctrl+N	File - New	Microsoft
Ctrl+O	File - Open	Microsoft
Ctrl+P	File - Print	Microsoft
Ctrl+R	Product - New	NMP

Shift Hot Keys

Key	Description	Defined by
Shift+F5	Local Mode	NMP

Help Functions

The Help User Interface is the standard Windows help tool called WinHelp.

The context-sensitive help is activated with the F1 key. Help also contains Using Help, which gives a list of help indexes. Refer to the Microsoft Windows manual for detailed description of Window help.

Dialog Boxes

The Service Software application uses many different dialog boxes. Dialog boxes are used to display data and prompt the user for input.

Dialog boxes are opened from menus or with shortcut keys. Dialog boxes have different properties; however, some features are common.

Most service dialog boxes are modal; that is, the user is not able to start another operation without first closing the present dialog box.

All dialog boxes contain the following entities:

- **Help** button
- Title bar
- At least one button other than Help
- Application **Close**-menu Button

Common Dialog boxes

This section describes the common dialog boxes used in the Service Software package, and the context in which they are used.

Warning and Exclamation Message Box

When the user has made an illegal selection, a *Warning and Exclamation Message Box* dialog will be opened and message text is displayed. The size of the dialog box may vary. This box is recognized by the **!** icon.

The dialog box also contains an **OK** button and sometimes a **Cancel** button.

OK button (default key): Acknowledges Warning / Exclamation and continues. The dialog box is closed after selection.

Cancel button: Abandons the function and closes the dialog box

Information Message Box

When the program has some information for the user, an Information Message Box dialog will be opened and a text message displayed. The size of the dialog box may vary. This box is recognized by the **i** icon.

The dialog box also contains an **OK** button.

OK button (default key): Acknowledges information and closes the dialog box.

Query Message Box

Confirmations and questions are asked in *a query message box*. A query dialog box is recognized by the **?**-icon.

The dialog box contains a **Yes** button, a **No** button, and a **Help** button.

Yes button (Alt+Y or Y) (default key):
Accepts confirmation or question.

No button (Alt+N or N):

Denies confirmation or question.

Help button (Alt+H):
Opens context-sensitive help as F1-key does.

The buttons may also be labeled **OK** and **Cancel**.

Error Message Box

Error message dialog boxes use the Error icon. When a "Error"-dialog box is shown, the current operation is terminated.

The dialog box has a description about the failed operation and reason. Pressing the F1 key (Help) application opens the appropriate help topic that gives information about recommended actions.

The dialog box also contains an **OK** button and sometimes a **Help** button.

OK button (default key):
Acknowledges displayed information and terminates current operation. The dialog box is closed after selection.

Help button (Alt+H):
Opens context-sensitive help as does the F1 key.

Custom Dialog boxes

All custom dialog boxes will contain the predefined buttons as defined n the following section - *Buttons.*

The buttons are mainly positioned down the right-hand side of the dialog boxes. The default action will be **OK**, except where that default action could result in an irretrievable failure.

All tuning dialogs that contain tuning results will display the old tuned data read from the phone before the tuning was performed, as well as the newly tuned data.

List boxes will be used to display lists of data, such as tuning data, test results, etc.

The use of radio buttons defines the number of possible choices available to the user.

Buttons

All buttons are of the Microsoft style.

In general, the default button is the (**action)** button, the **Close** button, or the **Yes** button, but this depends on the context of the dialog box with which the button is associated.

(action) button:
Accepts and validates entered settings and values, and closes the dialog. If the values have not been changed, then no action will be taken. The status bar will reflect the status. The user is only queried if the settings or values accepted will overwrite data that CANNOT be reproduced.

A greyed **action** button indicates that settings selected by the user are not acceptable.

Close button:
Closes the current dialog box. Does not send or store anything and closes the dialog. The **Close** button is only used for dialogs that do not set or change any data.

Cancel button (Esc):
Cancels the operation. Does not send or store anything and closes the dialog box.
A greyed **Cancel** button indicates that it is not possible to quit from this dialog box.

Yes button (ALT+Y or Y):
Replies Yes to a question asked of the user.

No button (ALT+N or N):
Replies No to a question asked of the user.

Help button (ALT+H):
Opens context-sensitive help as F1-key does.

Reporting Status

The status bar is used to report the present status to the user. When a feature is initiated, the status bar will be updated with a brief description of the function. The status bar will also be updated at key points in a time-consuming function.

If an error is to be reported to the user, it is displayed in the status bar as well as displayed in a common error dialog box. This means the user is not delayed from progressing on to the next operation unless an error occurs; in which case, the user will have to acknowledge the error by pressing the **OK** button.

NSB-5 Features

Product

Figure 12: Product Menu Dialog

New command

Activation	Status Bar Text
Alt+P, N	Scanning for product...
Ctrl+R	

If phone is changed (with same phone type only serial number is changed) phone will be initialized to normal mode. If phone is changed to different phone type, the current DLLs are unloaded and new ones are loaded for that phone.

If the Quick/RF Info view is open, window will be automatically updated. If Phone Information view is open, it will be automatically updated.

Open... command

Activation	Status Bar Text
Alt+P, O	Changing product support modules

Phone is set to normal mode.

Initialize... command

Activation	Status Bar Text
Alt, P, I	

Opens a submenu

Normal Mode

Activation	Status Bar Text
Alt, P, N	Initializing normal mode..,
F5	

When normal mode has been activated or program has been started, self-test results will be requested from MCU. If any fault was found in the tests, an error message is

shown. If normal mode has been set successfully (no self-test error has been found), and paging listening has been started, the used AFC value is requested from MS. Initialization routine checks the phone's cellular type and, if unsupported phone is detected, application unloads the DLLs.

The After Market SW automatically sets the MS state to local mode when needed. If phone identification view is open, the window will be automatically updated. Also, if the RF Information Window is open, it will be replaced with the quick info view.

Local Mode

Activation	Status Bar Text
Alt, P, L	Initializing local mode....;
Shift+F5	

Selection will change the MS-state to local.

Band command

Activation	Status Bar Text
Alt, P, B	

Opens a submenu

GSM

Activation	Status Bar Text
Alt, P, B, G	

Selects the GSM band on the MS.

PCS

Activation	Status Bar Text
Alt, P, B, P	

Selects the PCS band on the MS.

Faultlog command

Activation	Status Bar Text
Alt, P, F	

Opens a submenu. Only enabled when a user has logged in.

Activate Faultlog

Activation	Status Bar Text
Alt, P, F, A	
F9	

Activates the faultlog. Only enabled when a user has logged in.

Edit Faultlog

Activation   Status Bar Text
Alt, P, F, A

Allows user to edit faultlog entries. Only enabled when a user has logged in.

FastNAM command

Activation   Status Bar Text
Alt, P, N
F8

This menu is only enabled when FastNAM functionality is included in Win Tesla.

Exit command

Activation   Status Bar Text
Alt, P, X

Exits the WinTesla application.

Tuning

General

All tuning operations of the NSB–5 are carried out using the service software. The service software sets the MS into the local-mode, in which the MS can be remotely controlled via the MBUS interface. The POS flash device does not allow access to the tuning menus. Tuning is based on the software communicating with the D/A and A/D converters of the MS. In some instances, the MS processor will also calculate the required correction parameter. The tuning values of the MS reside in the emulated EEPROM. The contents of the emulated EEPROM can be read by the service software and saved as a file. Saving the tuning data to a file is advisable when there is need to retain that information (e.g., in view of repair or replacement of the circuit in question). The program also allows using the default parameters on the emulated EEPROM, in which case all tuning steps should be carried out.
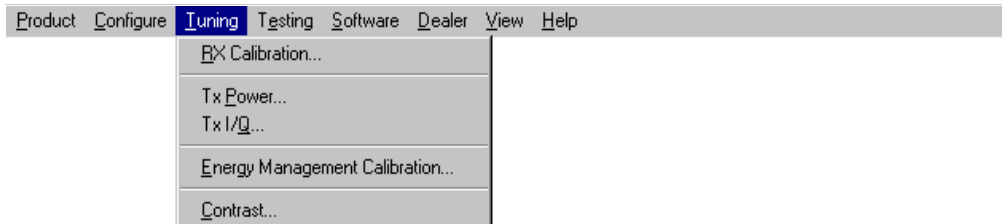

Figure 13: Tuning Menu Dialog

RX Calibration... command

A GSM/PCN signal generator and an antenna cable is needed for the calibration. Before starting the RX Calibration the active band must be set to the GSM band.

Activation   Status Bar Text

Alt, T,R   Initializing local mode...;

Starts RX calibration.

The next automatic selections are made when this tuning function is activated:

Phone is set to local mode
Update RF information window

The calibration is started automatically when RX calibration is entered.

The calibration is done in the following steps:

      User is requested to put signal generator to high input level (read from TESLA.INI file).

Figure 14: RX Calibration - Set RF High Reference

When the user acknowledges by pressing the **OK** button, the calibration with high input level is executed.

      User is requested to put signal generator to low input level (read from Tesla.INI file).

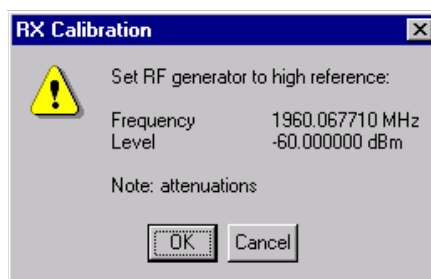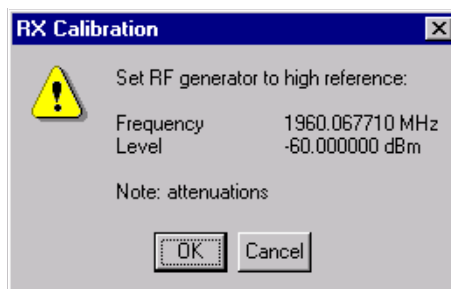**Figure 15: RX Calibration - Set RF Low Reference**

When the user acknowledges by pressing the **OK** button, the calibration with low input level is executed.

      The **RX Calibration** dialog will be shown when the previous steps are completed. Select the **Save** button to store the calibration in the phone.

      User is requested to change the signal generator to high input level (Read from

Tesla.INI file).
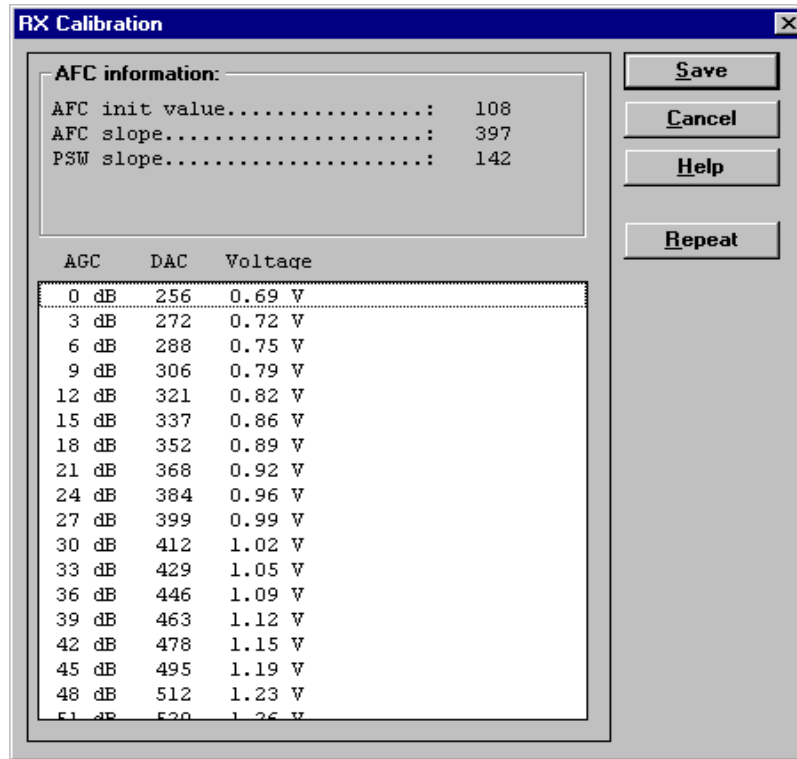
The RX Calibration dialog will be shown when these steps are done. Select the **Save** button to save the calibration in the phone.

During tuning, proceed as follows:

-Take care not to damage sensitive measuring instruments with excessive RF power.

-Carry out all tuning steps in the shortest possible time to avoid excessive heating of RF units.

-Perform all tuning steps in the order presented.

-Never try to mask a fault by tuning it out!

After the tuning has finished, the software reports the following: -AFC init value

-AFC slope

-PSW slope

-AGC DAC values and the corresponding voltages for each gain step (0 - 57dB)

-Limits for the reported values

If everything went well, the reported values should *approximately* be the following:

Parameter	Low limit	High limit
AFC init value	-80	80
AFC slope	135	230
PSW slope	250	350
AGC 0 dB	175	325
AGC 57 dB	440	740

Difference between the two neighbor AGC steps: 10   20

Troubleshooting

If the calibration is unsuccessful, the software normally reports "Unable to read data from phone" or "Failed to set high reference" or "Failed to set low reference". In any case, check first the basic functionality of the receiver chain: Verify that the RF generator frequency and level are set as in the calibration (e.g., to the high reference value). Next, go to the RSSI reading menu (under RF controls). If the reading is very low, there is something broken in the receiver and it must be found by measuring voltages and signal levels at different points (information on these can be found elsewhere in this manual).

If the RSSI reading seems to be within 5 to 10 dB of the RF input level, check that the VCTCXO (G701) frequency is close enough to the required frequency. The easiest way to check this is by measuring the UHF VCO (G702) frequency, because the absolute value of the deviation is largest there. At the GSM1900 mid-channel, the UHF VCO frequency should be 1473.0 MHz. If the deviation is larger than about +/−20 kHz, it is probable that the VCTCXO is not operating correctly.

If both of these (RSSI reading and the frequency) seem to be correct and calibration still fails, the most probable reason is that there is a lack of gain somewhere or that the AGC gain control slope in N600 is out of limits. This can be verified by varying (up and down) the generator reference levels fromthose stated in the calibration procedure in 1-dB steps. If the calibration only goes through some reference levels, the corrective action is most probably changing N600 or N700.

Dialog mode: **modal**

RX Calibration dialog has the following items:

AFC information box:
Shows AGC,DAC voltage.

AGC List box (ALT+A):
AGC, DAC, Voltage and Difference. The difference column shows the difference between tuned DAC values and mean straight line calculated from part slopes in dBs (see /1/). This can be calculated when all measurement results have been received from phone.

Repeat button (ALT+R):
The measurement can be started again by pressing this button.

Save button (ALT+S):
Dialog is closed and tuning *is saved* to phone.

Cancel button (ESC):
Dialog is closed and tuning *is not saved* to phone.

When calibration has ended, the DAC value checking is done and, if it is not successful, an error message is shown.

When exit is made, the next selections are set to the values which were selected before this adjustment.

> Operation Mode
> Update RF Information window

The exit and the use of AGC control values is done same way as exit from power level tuning and power coefficient use.

Tx Power... command

An antenna cable, a GSM/PCS signal tester, and either a Pulse Power Meter or a spectrum analyzer along with a 10dB attenuator is needed for the tuning. If the tuning is performed with an external voltage source, it shall be set to 3.6 V.

Select PCS band on the GSM/PCS signal tester or GSM/PCS Power Meter. Select the GSM band in WinTesla (under Product, Band menu).

Compensate for antenna cable loss on the GSM/PCS signal tester or GSM/PCS Power Meter. Typical values for a standard RF cable is 0.8 to 1.0 dB of loss.

Select measurement of average burst power on the GSM/PCS signal tester or GSM/PCS Power Meter.

Select the menu Testing, RF Controls.
Set: TX as the Active unit; TX Data Type: Random

Select the menu Tuning, Tx Power.
Select power level 15. Adjust the signal to 0 dBm (according to GSM specifications)
Select power level 8. Adjust the signal to 14 dBm (according to GSM specifications)
Select power level 7. Adjust the signal to 16 dBm (according to GSM specifications)
Select power level 0. Adjust the signal to 29.75 dBm (according to GSM specifications)

Select Calculate to make WinTesla find the rest of the power level values.

NOTE: Calculated values can be checked after the calculation and fine tuned if needed in the same manner as previous power level tunings.

Save the TX power levels in the phone by pressing the **Save** button.

During tuning, proceed as follows:

-Take care not to damage sensitive measuring instruments with excessive RF power.

-Carry out all tuning steps in the shortest possible time to avoid excessive heating of RF units.

-Perform all tuning steps in the order presented.

-Never try to mask a fault by tuning it out!

It is recommended that all the power levels are measured and verified separately, even though it is possible to align four and calculate the rest. This is due to the fact that the calculation may not be accurate enough, especially for the lowest power levels in the PCS band, where the target power levels are NSB–5 specific.
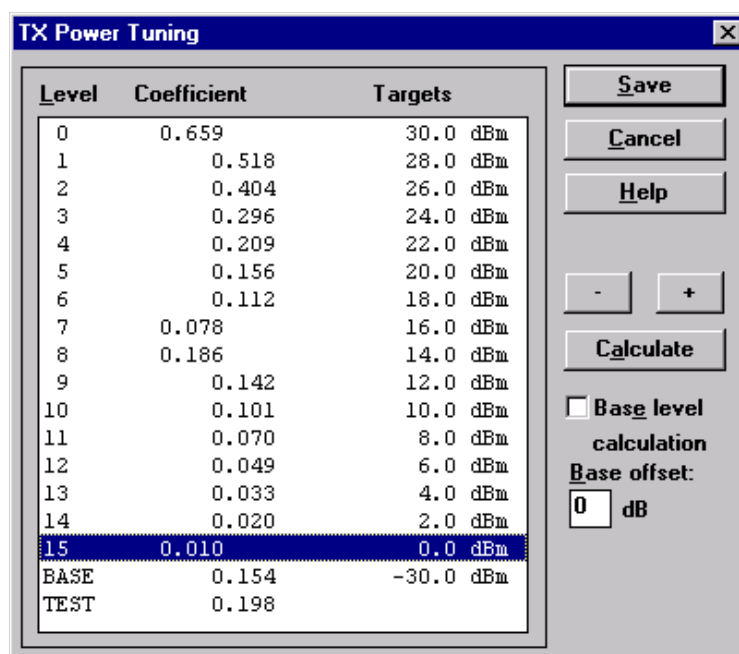
Figure 16: Tuning - TX Power Tuning Dialog

Dialog mode: **modal**

The "TX Power Tuning" dialog box has the following items:

Power Level & Coefficients list box (ALT+L):
The power is presented in PCS Power Control Level values. The Base power is derived automatically when the dialog is opened. The Test value is not saved to the EEPROM. The Test value can be changed during tuning (the same as other power coefficients) and the program remembers its value when tuning function is activated again later.

Only four power coefficients (0, 7, 8, 15) need to be tuned (left-justified Coefficients); and the rest are calculated.

The tuning position is highlighted and can be adjusted using the +/- keys or the left/right

cursor keys.

Calculate button (ALT+A):
The calculation is activated with this button. The power coefficients, which are calculated from the tuned coefficients, are displayed on the different as right-justified values in the list box. All values can be tuned if needed.

Base level calculation check box:
If this box is checked, the Base level is calculated.

+/- buttons (+/- and left/right cursor keys):
The **+** and **-** buttons will change the power in 0.25 dB steps. When these keys are used, the coefficient value is updated in the tuning window.

Save button (ENTER):
Dialog is closed and tuned values are *saved* to phone.

Cancel button (ESC):
Dialog is closed and tuning *is not saved* to phone.

When selections are made, the power value checking is done and if it is not successful, an error message is shown. The test checks that all power coefficients are in descending order (same order as power levels).

If the power tuning function is ended and EEPROM values are not received or an EEPROM fault is noticed, an error message is shown.

When all power coefficients have values that don't cause error messages, a Save can be made. The last used tuning power is in use after exit.

The next automatic selection is made and the RF information window is updated when the next tuning function has ended:

Active Unit	= RX
TX Power Level	= (Off)
Operation Mode	= Burst

Tx I/Q... command

A GSM/PCS signal tester or a GSM/PCS Spectrum analyzer and an antenna cable is needed for the tuning. Before starting the Tx I/Q tuning, the active band is set to the GSM band.

| Activation	Status Bar Text
Alt, T, Q	Initializing local mode...;
	Setting RF Defaults...;
	TX I/Q Tuning; Setting tuning on...;

This function is used for tuning TX I and Q branch DC offset, amplitude difference, and

phase difference.

The TX I/Q tuning is performed in the following seven steps:

1. Connect the GSM/PCS signal tester or spectrum analyzer to the phone antenna connector. **When using spectrum analyzer:** The recommended spectrum analyzer settings are: Span 200 kHz, Resolution Bandwidth 10 kHz, Video Bandwidth 1 kHz, Sweep 500 ms, Input Attenuation 30 dB.

2. Select PCS band on the GSM/PCS signal tester or GSM/PCS Spectrum analyzer. Select the GSM band in WinTesla (Product, Band menu).

3. Select the menu Tuning, Tx I/Q.

4. Choose the option EEPROM values to tune the TX I/Q values in the phone, and select the **OK** button.

5. Adjust the TX I DC Offset **and** TX Q DC Offset stepwise until the carriers are suppressed as much as possible (refer to the drawing below). When tuning, slowly adjust the values step-by-step.
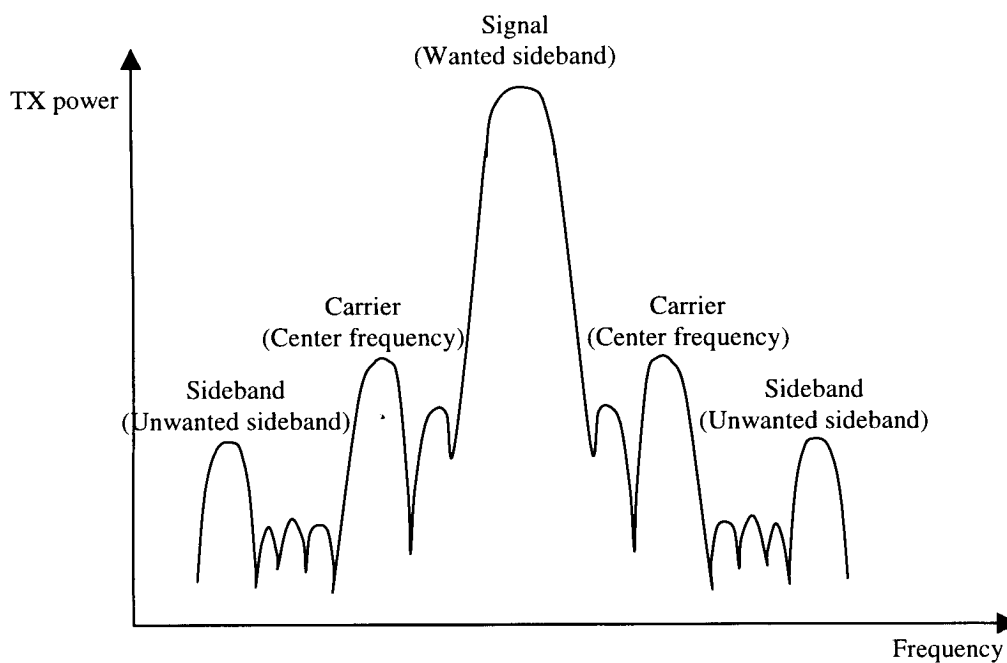
6. Adjust the Amplitude difference and the Phase difference stepwise until the side bands are suppressed as much as possible (Refer to the drawing above). When tuning, slowly adjust the values step-by-step.

7. Store the selected values to the phone by pressing the **OK** button.

During tuning, proceed as follows:

-Take care not to damage sensitive measuring instruments with excessive RF power.

-Carry out all tuning steps in the shortest possible time to avoid excessive heating of RF units.

-Perform all tuning steps in the order presented.

-Never try to mask a fault by tuning it out!

Tuning targets:

The level of the carrier (center frequency CHF) should be at least **30 dB** below the wanted sideband CHF - 67.71 kHz. The level of the unwanted sideband at CHF + 67.71 kHz should be at least **35 dB** below the wanted sideband CHF - 67.71 kHz.
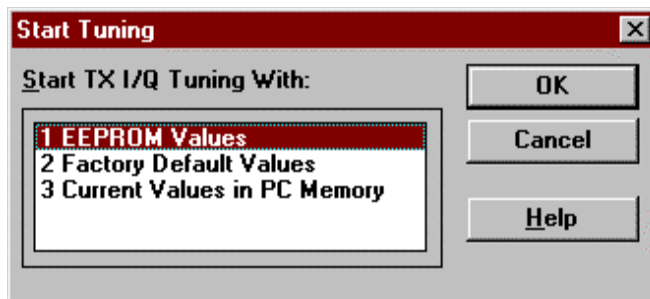

Figure 17: TX I/Q Tuning Menu

Dialog mode is modal

The "Start Tuning" dialog box has following items:

Start Tuning with list box (ALT+S):
EEPROM values
-Tuning values are loaded from the phone's EEPROM.

Factory Default Values
-Tuning values are loaded from phone's Flash.

Current Values in PC Memory
-Tuning values are loaded from program's internal memory.

OK button (ENTER):
Selects the memory where the start values for the tuning are placed, closes the dialog box, and continues with the TX I/Q dialog.

Cancel button (ESC):
Closes the dialog box and cancel TX I/Q tuning.

Help button (ALT+H):
Context-sensitive help.

The next automatic selections are made, and the RF Information window is updated when this function is activated:

-Band= GSM1900
-Active Unit= TX
-TX Data Type= Cont1
-TX Power level= 15
-Operation Mode= Burst

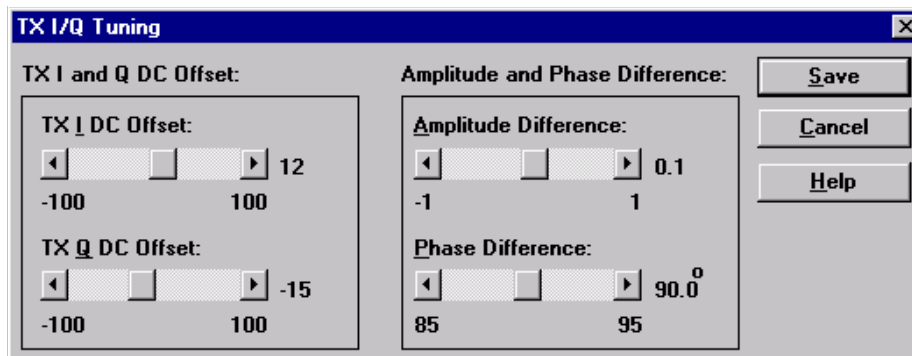The "TX I/Q Tuning" dialog box is opened.

Figure 18: TX I/Q Tuning Menu

Dialog mode: **modal**

The "TX I/Q Tuning" dialog box has following items:

Tune TX I DC Offset scroll bar (ALT+I):
The DC Offset is shown as percents (%) from the ± maximum value. 0% means that there is no DC. The value range is -100%...100%. The value is rounded to the nearest integer value.

Tune TX Q DC Offset scroll bar (ALT+Q):
The operation of this function is the same as one above, except with this selection the Q branch DC Offset is tuned. The value range is -100%...100%. The value is rounded to the nearest integer value.

Amplitude Difference scroll bar (ALT+A):
When this selection is made, the user can increase or decrease the amplitude difference within 0.1 dB steps. The value range is -1...1.

Phase Difference scroll bar (ALT+P):
When this selection is made, the user can increase or decrease the phase difference within 0.5° steps. The current phase difference is shown on the tuning window with numbers and bar figure. The value range is -85...90.

Save button (ENTER):
Dialog is closed and tuning *is saved* to phone.

Cancel button (ESC):

Dialog is closed and tuning *is not saved* to phone.

After each value change the new value is sent to the phone.

The next automatic selections are made, and the RF Information window is updated when the TX I/Q tuning function is ended:
-Band= GSM
-Active Unit= RX
-TX Power level= (Off)
-Operation Mode= Burst

Energy Management Calibration... command

This command opens the "Energy Management Calibration" dialog box:
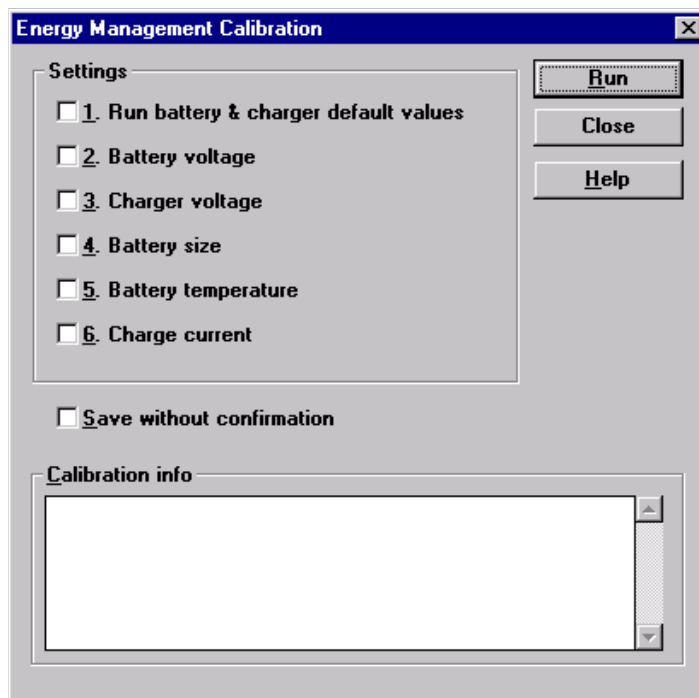
Figure 19: Energy Management Calibration Dialog

A DC power supply, a service battery, and a 3-wire charger calibration cable is needed for this calibration.

NOTE: The Energy Management Calibration process in WinTesla should only be used when the factory calibration for some reason is no longer valid in the phone. The factory calibration of the phone energy management parameters are more precise, thus it is possible to obtain better battery performance when the calibration has been performed in the factory.

Activation	Status Bar Text
Alt, T,E	Initializing local mode...;

The Energy Management Calibration is performed in the following steps:

DC power supply is set to 10.5 Volts.

Mount the service battery on the phone *and* connect the service battery with the phone by the charger calibration cable.

Connect the service battery to the DC power supply.

Select the menu "Tuning and Energy Management Calibration".

The following dialog box appears:
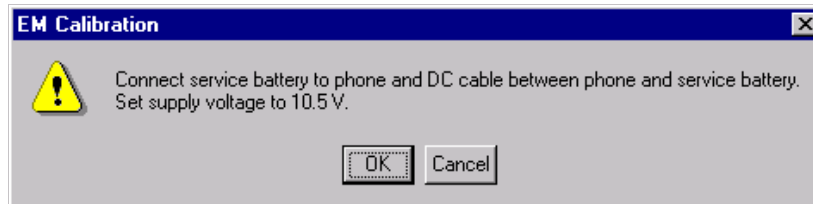
Select the **OK** button. The phone is set to local mode, and the energy management dialog pops up.

Select settings:
2. Battery voltage
3. Charger voltage
4. Battery size
5. Battery temperature
6. Charge current

Press **Run**. (If the setting "Save without confirmation" is also selected, then steps 7 to 11 are not applicable.)

The following dialog box appears:

Select the **Yes** button.

The following dialog box appears:

Energy Management Calibration

Save charger voltage calibration value to phone?

Yes   No

Select the **Yes** button.

The following dialog box appears:

Energy Management Calibration

Save battery size calibration value to phone?
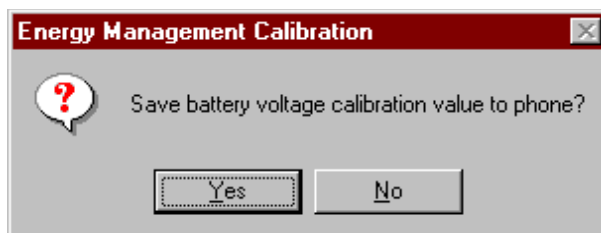
Yes   No

Select the **Yes** button.

The following dialog box appears:

Energy Management Calibration

Save battery temperature calibration value to phone?

Yes   No

Select the **Yes** button.

The following dialog box appears:

Energy Management Calibration

Save charge current calibration value to phone?

Yes   No

Select the **Yes** button.

When the previous steps are done, the phone energy management is calibrated. Press the

Close button to end the calibration process.

The "Energy Management Calibration" dialog box contains the following options:

Run button (ALT+R):
Energy management calibration is performed,

Close button (ENTER):
The dialog box is closed without performing energy management calibration. When closing the dialog. the user is prompted to adjust the power supply to 8.0 Volts:

Contrast... command

This function is used for adjustment of the display contrast. No special equipment is needed for display contrast adjustment.

NOTE: Cancelling the dialog will restore the original contrast setting of the phone.

Activation   Status Bar Text
Alt, T,D

The command opens the "Phone Display Contrast Adjustment" dialog box.

Figure 20: Phone Display Contrast Adjustment Dialog

The Display Contrast Adjustment is performed in the following steps:

Select menu item <u>T</u>uning and <u>C</u>ontrast. Fine adjustment settings in the Edit box (normally 15).

Press the **Apply** button.

NOTE: Alterations to the contrast setting can be undone by pressing the **Cancel** button.
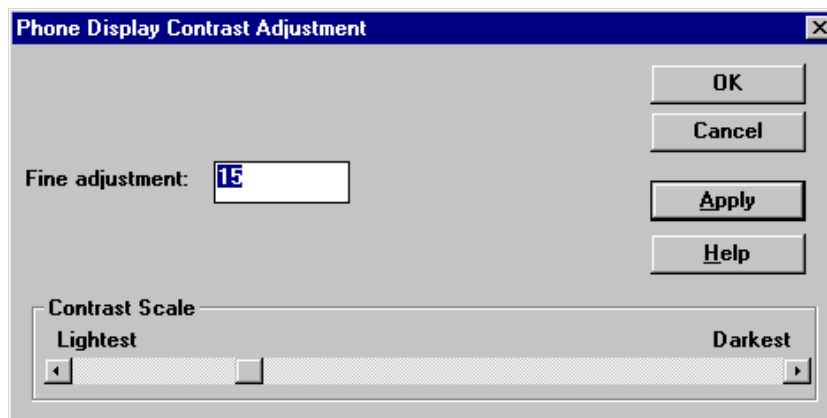
Now use the scroll bar to fine-tune the contrast by using the left/right arrow keys to adjust the contrast step by step. Do this slowly to allow the changes to be reflected in the phone.

When adjustment is finished press the **OK** button to end the adjustment.

Dialog mode: **modal**

The "Phone Display Contrast Adjustment" dialog contains the following items:

Basic adjustment edit box:

Fine adjustment edit box:
This is the fine setting of the display contrast. Valid values are between 0 and 63.

Contrast Scale scroll bar:
The user can stepwise adjust the display contrast, by use of the left/right arrow keys.

OK button:
Applies contrast settings to the phone and closes the dialog box. The contrast setting can no longer be undone.

Cancel button:
Closes the dialog box without applying the contrast value to the phone.

Apply button (ALT+A):
Applies the entered values to the phone.

Help button (ALT+H):
Context-sensitive help.

Testing

The Testing submenu offers functions for ME testing.

A GSM/PCS tester and an antenna cable is needed for this test.
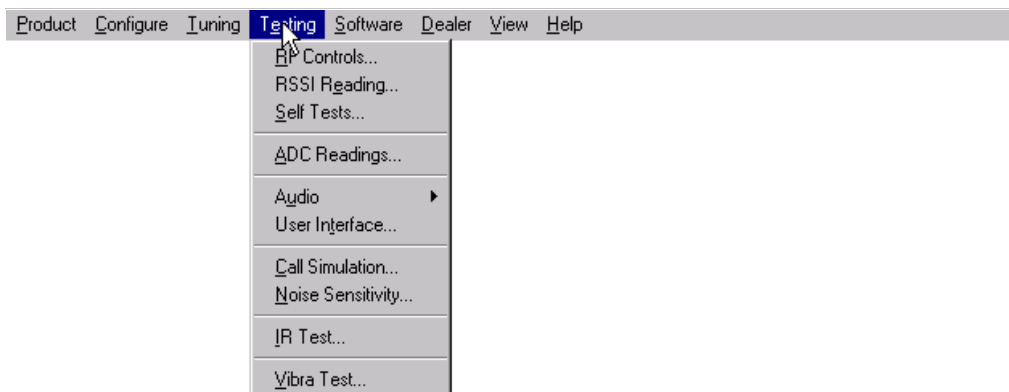
Figure 21: Testing Menu Dialog

RF Controls... command

Activation	Status Bar Text
Alt, E,R	RF Controls; Set test on...;

This function is used for RF testing.

The command opens the "RF Controls" dialog box, which contains data for testing and adjustments.
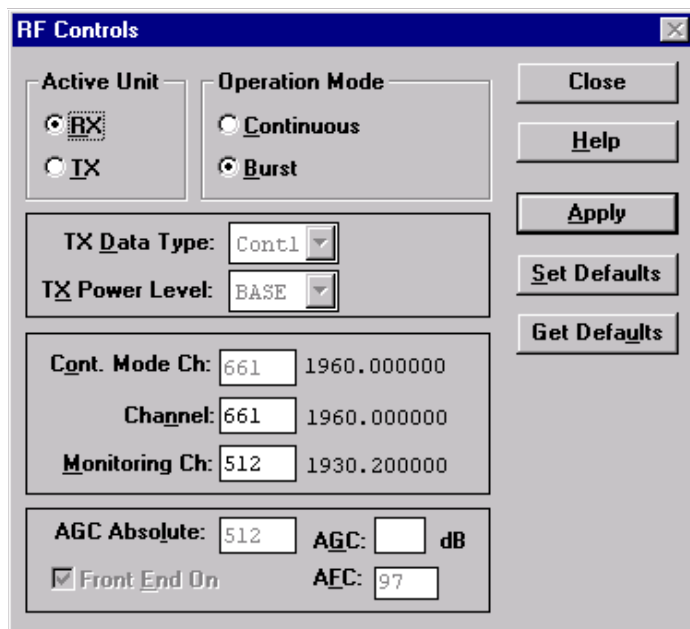

Figure 22: RF Controls Dialog

Dialog mode: **modal**

The "RF Controls" dialog box has following items:

Active Unit group:

RX radio button (ALT+R):

When *RX* is selected, the next functions are made:

Data transmission is deactivated
-TX power is deactivated
-Rf operation mode is continuous,
-AGC is controlled
-RX continuous mode channel is activated
-RF Information window is updated

The RX value is always given as default.

NOTE: Function is activated immediately; the **Apply** button is not needed.

TX radio button (ALT+T):
When *TX* is selected, the next functions are made:
-Data transmission is activated
-If operation mode is continuous,
Operation mode is set to burst
-RF Information window is updated

Continuous mode radio button is disabled.

NOTE: Function is activated immediately; the **Apply** button is not needed.

Operation Mode group:
Continuous radio button (ALT+C):

When *continuous* selection is used,
-synthesizer is set to constant frequency
-synthesizer channel number is as given with Continuous Mode Channel selection
-transmitter power is not connected
-if Active Unit is RX, AGC is controlled

NOTE: Function is activated immediately; the **Apply** button is not needed.

Burst radio button (ALT+B):
When *burst* selection is used,
-synthesizer is controlled by using receiving/transmission/measuring synthesizer control sequence
-synthesizer channel numbers are as given with Channel/Monitoring Channel selections
-if Active Unit is TX, data (selected with TX Data Type) is sent and the TX power is connected

NOTE! Function is activated immediately; the **Apply** button is not needed.

TX Data Type drop list (ALT+D): With this value the data transmission pattern can be

selected. Possible options are:

-Random pattern
-Continuous zeroes
-Continuous ones

The TX Data Type is greyed when the active unit is RX.

TX Power Level edit box (ALT+X):
With this value, it is possible to change the transmission power. The user can give the needed power value or select the test value, which is tuned with TX power tuning function. The test value is found at the end of the list.

TX Power has a value *OFF* and is disabled (*greyed*) when active unit is RX. When the TX power is tuned with test value (smallest value) the TX Power has the value *TEST.*

Channel edit box (ALT+N):
Here the user can enter the channel number that is used for both transmission and receiving. The frequency of the selected channel is shown after selection. The channel edit box is disabled (greyed) when the operation mode is continuous.

Monitoring Channel edit box (ALT+M):
This field selects neighbor monitoring channel. The frequency of the selected channel is shown after selection. The monitoring channel edit box is disabled (greyed) when the operation mode is burst.

Continuous Mode Channel edit box (ALT+O):
To this edit box, the user can type continuous mode channel, which may have all channel numbers. The continuous mode channel edit box is disabled (greyed) when the operation mode is burst.

The used frequency depends on the Active Unit. If Active Unit is RX, then RX frequency is used, else TX frequency is used. The frequency of the selected channel is shown after selection.

AGC Absolute edit box (ALT+L):
This selection allows user to edit AGC absolute value (value from A/D converter).

When AGC Absolute value is changed, the AGC dB value will be calculated, depending on the AGC Absolute value. The AGC Absolute edit box is disabled (greyed) when the operation mode is burst.

Front End On chec box: (ALT+E)
This selection allows the user to change whether the Front End amplifier is On or Off. The Front End On check box is disabled (greyed) when the operation mode is burst.

AGC edit box (ALT+G):
This selection allows the user to edit AGC value in dB.

AFC edit box (ALT+F):
This selection allows the user to edit the AFC slope in DAC values.

AGC value is shown only when its value is controlled by PC. When Active Unit has value RX and Operation Mode is continuous, AGC is controlled by PC except when next adjustment functions are activated:

RSSI Calibration
AFC Diagram

Apply button (ALT+A):
Accepts entered values and validates them. After validation, the application sends corresponding messages to ME, closes the dialog, and updates Info Window.

NOTE: Active Unit and Operation mode are not send with because they are activated immediately.

Set Defaults button (ALT+S):
Sets the current values as default Rf Control values.

Get Defaults button (ALT+U):
Gets default Rf Controls values as current values.

The next automatic selection is made when Quick testing function is ended:

Active Unit = RX
Update RF Information window

The next table shows the dialog's properties on different situations:

ACTIVE UNIT = TX:
      TX Data Type: Updated
      AGC values: Greyed
      Monitoring Channel: Greyed
      OPERATION MODE = BURST:
      TX Power Level: Updated
      Continuous Mode Channel: Greyed
      Channel: Updated

ACTIVE UNIT = RX:
      TX Data Type: Greyed
      TX Power Level: BASE, Greyed
      Operation Mode = Burst:
      AGC values: Greyed
      Continuous Mode Channel: Greyed
      Channel: Updated
      Monitoring Channel: Updated

OPERATION MODE = CONT:
> AGC values: Updated
> Continuous Mode Channel: Updated
> Channel: Greyed
> Monitoring Channel: Greyed

RSSI Reading... command

A GSM/PCS signal generator and an antenna cable is needed for this test.

Activation	Status Bar Text
Alt, E,E	RSSI reading from ME...

Command opens the "RSSI Reading" dialog box.

Dialog mode: **modal**

RSSI value is read continuously until the user presses the <ESC> key or **Close** button to cancel reading.
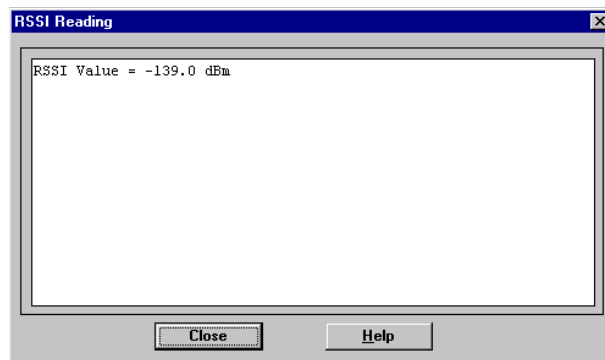
The "RSSI Reading" dialog box has following items:

Close button:
Closes the "RSSI Reading" dialog box. Does not send anything to phone.

Help button:
Context-sensitive help.

Self Tests... command

Activation	Status Bar Text
Alt, E,S	MCU Self-tests; Reading from ME...

Command is used for reading self test results and running self tests.

When the selection is made, the test result is read from ME. The test result will be shown

to the user within the "MCU Self tests" dialog box.

Figure 23: MCU Self tests Dialog

Dialog mode: **modal**

The "MCU Selftests" dialog box has following items:

Tests list box (ALT+T):
The field "(p)" in the screen example means that the test is also run in power up. The field "(/s)" means that this test is the selectable one.
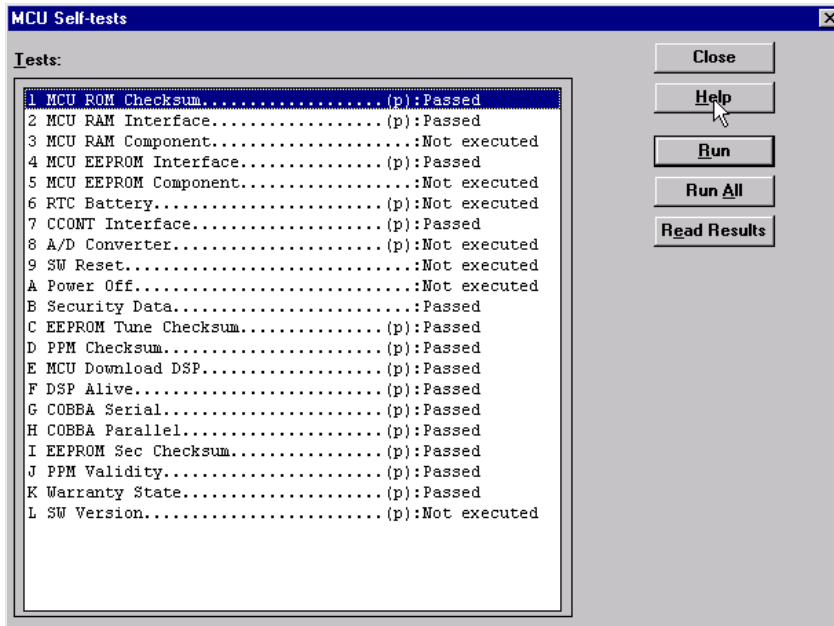
Test states are updated according to results received from the phone. Possible test states will be one of the following:

Passed
Failed
No response
Not executed
Not valid
RUNNING....

NOTE: The power-off test has no values, because if the test has been passed, power has been turned off. If power-off test fails, a special error message window is shown. If no response is received to power off test message in a few seconds, the user is informed by a special info window, where user is asked to turn the power on and then press the **Return** key.

NOTE: The power-off test (if passed) turns power off and power should be reconnected by using the phone's keypad after the successful test. After the power has been connected to phone, the normal start-up routines are made and the self-test results are shown in the "MCU Self Tests" menu (i.e., all other than power-up self-tests are in *Not*

executed state after the power-up routines).

Run button (ALT+R):
User can select desired test from list and select the **Run** button. When user selects test to be run, the text *RUNNING...* is shown in test state field and test is run. When results are received, the test state field is updated according to the result.

If no response was received in the defined time, an "Error Message" dialog box will be shown and the test state is changed to *No response*. Phone is set to local mode if it is not already there.

Run All button (ALT+A):
User can run all listed tests. The text *RUNNING...* is shown in test state field and test is run. When results are received, the test state field is updated according to the result. When state field is updated, application moves to next test and repeats previous cycle. Phone is set to local mode if it is not already there.

Supported Self Tests

The following tests are available:
1 MCU ROM Checksum................
2 MCU RAM Interface...............
3 MCU RAM Component...............
4 MCU EEPROM Interface............
5 MCU EEPROM Component............
6 RTC Battery....................
7 CCONT Interface................
8 A/D Converter..................
9 SW Reset.......................
A Power Off......................
B Security Data..................
C EEPROM Tune Checksum...........
D PPM Checksum...................
E MCU Download DSP...............
F DSP Alive......................
G COBBA Serial...................
H COBBA Parallel.................
I EEPROM Sec Checksum............
J PPM Validity...................
K Warranty State.................

ADC Readings... command

Activation	Status Bar Text
Alt, E,A	ADC Readings; Set test on...
	ADC Readings; Reading from ME....

Command is used to read and show A/D values from phone.

Command opens the "ADC Readings" dialog box. New reading are made on approximately a one-second cycle time. The PC performance will be extremely slugglish while the readings are being made. So, be prepared to click and wait!
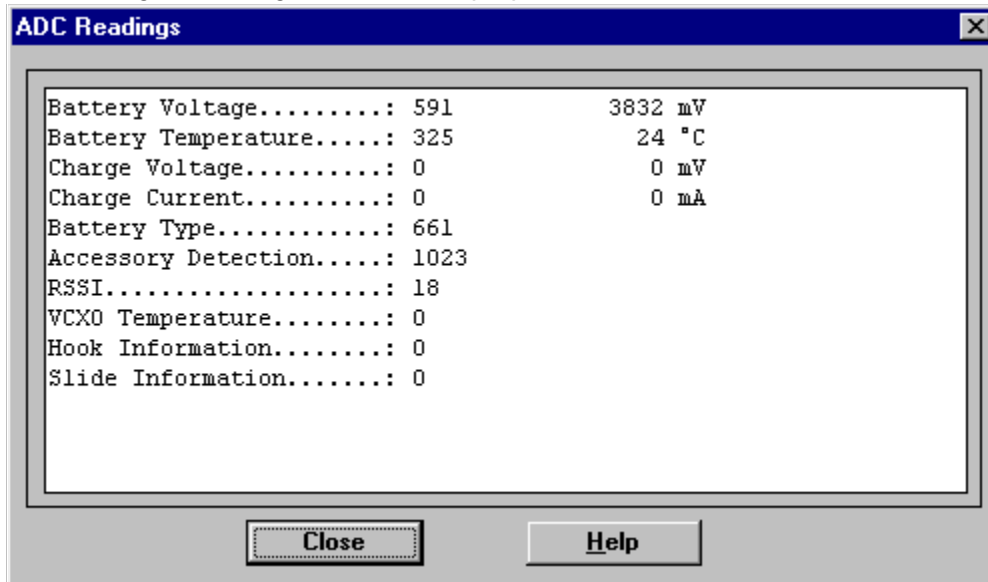
```
ADC Readings                                                    [X]

  Battery Voltage.........: 591          3832 mV
  Battery Temperature.....: 325            24 °C
  Charge Voltage..........: 0              0 mV
  Charge Current..........: 0              0 mA
  Battery Type............: 661
  Accessory Detection.....: 1023
  RSSI....................: 18
  VCXO Temperature........: 0
  Hook Information........: 0
  Slide Information.......: 0




          [    Close    ]          [    Help    ]
```

Figure 24: ADC Readings Dialog

Dialog mode: **modal**

The "ADC Readings" dialog box has a static text field where measurements are updated to the window every second.

The "ADC Readings" dialog box has following items:

Close button:
Closes the "ADC Readings" dialog box. Does not send anything to phone.

Help button: (ALT+H):
Context-sensitive help.

The following A/D readings are measured:

-Battery Voltage.........
-Battery Temperature.....
-Charge Voltage..........
-Charge Current..........
-Battery Type............
-Accessory Detection......
-RSSI...................
-VCXO Temperature........
-Hook Informaton........
-Slided Information......

Audio... command

Activation	Status Bar Text
Alt, E,U	

Opens a submenu which contains following options:

Internal Audio Loops

An audio cable, a function generator, an oscilloscope, a multimeter, a headset and an audio box is optional equipment for the audio tests.

Activation	Status Bar Text
Alt, E,U,I	Initializing local mode....

Internal Audio Loops; Set test on....

Command is used for making internal audio loop tests on the "Internal Audio Loops" dialog box.

Figure 25: Internal Audio Loops Dialog

Dialog mode: **modal**

The "Internal Audio Loops" dialog box has the following items:

Buzzer Volume group:

Next three different values can be selected for Buzzer volume:

Volume On radio button (ALT+V):
Turns buzzer on.

Volume Off radio button (ALT+O):
Turns buzzer off.

Level drop down list (ALT+L):
Sets level of a buzzer. Allowed range 0...127

Frequency edit box (ALT+Q)
Sets the sound frequency in Hz

Internal Audio Loop group:

Input group:

Next two different values can be selected for input:

Internal radio button (ALT+I):
Turns internal input.

External radio button (ALT+E):
Turns external input.

Headset radio button (ALT+A):
Turns headset input.

Output group:

Next two different values can be selected for output:

Internal radio button (ALT+T):
Turns internal output.

External radio button (ALT+X):
Turns external output.

Headset radio button (ALT+D):
Turns headset output.

Loop group:

Next two different values can be selected for loop:

Off radio button (ALT+F):
Turns audio loop off.

On radio button (ALT+N):
Turns audio loop on.

When dialog is closed, the Buzzer Volume is switched off. Also the internal audio loop is

turned off.

<u>V</u>ibra......command

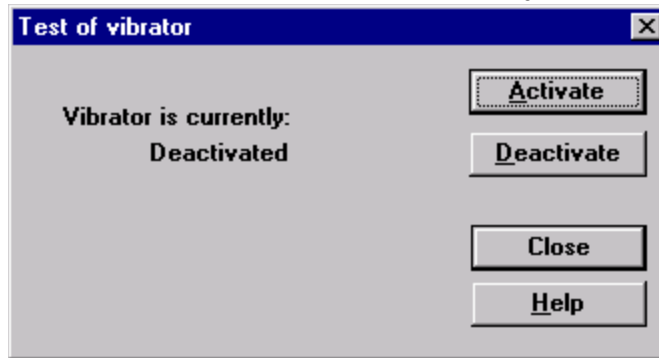| <u>Activation</u>	<u>Status Bar Text</u>
Alt, E, V	Initializing local mode....

Command used to test vibrator functionality

Figure 26: Test of Vibrator Dialog

Dialog mode: **modal**

Ther "Test of vibrator" dialog has following items:

Vibrator is currently status text:
Displays the current status of the vibrator. Possible statuses are:

-Activated
-Deactivated

Activate button (ALT+A):
Activates the vibrator.

Deactivate button (ALT+D):
Deactivates the vibrator.

Close button (ESC):
Deactivates the vibrator, sets the phone in normal mode, and closes the dialog box.

Help button (ALT+H):
Context-sensitive help.

User In<u>t</u>erface... command

<u>Activation</u>	<u>Status Bar Text</u>
Alt, E,T	User Interface Test; Set test on

Command is used for making display tests in the "User Interface Test" dialog box.
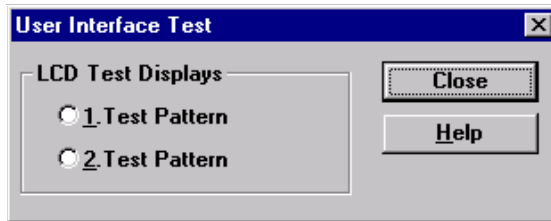
Figure 27: User Interface Test Dialog

Dialog mode: **modal**

The "User Interface Test" dialog box has following items:

1. Test Pattern radio button (ALT+1):
In test display 1, the display is filled with chessboard letters.

2. Test Pattern radio button (ALT+2):

In test display 2, the display is filled with inverse chessboard letters.

Close button (ENTER):
Clears the display and closes the dialog. To get normal display, set the phone in normal mode.

Help button (ALT+H):
Context-sensitive help.

Call Simulation... command

Activation	Status Bar Text
Alt, E, C	Initializing local mode
	Setting RF Defaults
	Call Simulation; Set test on

Command is used for making call simulation. The function opens the "Call Simulation"
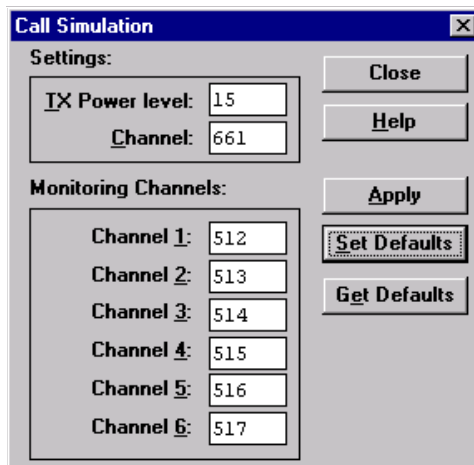
dialog box.

Figure 28: Call Simulation Panel

Dialog mode: **modal**

The "Call Simulation" dialog box has following items:

TX Power Level edit box (ALT+T):
All power levels can be selected. This updates same parameter as "TX Power Level" in the "RF Controls" dialog box. Note that TEST value cannot be selected. If TEST value was in use when Call simulation menu selected, power level is changed to smallest value.

Channel edit box (ALT+C):
This provides the normal operating RF channel number. Normal GSM/PCS channel numbers can be selected.

Same channel is used both for transmission and receiving. This updates same parameter as "Channel" in the "RF Control" dialog box.

Channel 1,2,3,4,5,6 edit box (ALT+1,2,...):
Channels for monitoring are specified with these six selections. All GSM/PCS channel numbers can be used. If more than one selection has same number, the monitoring channel list (neighbor list) will have less than six selected channels. The minimum number of monitoring channels is one (all channels have same value). The monitoring channel can also have same value as normal operating channel.

The first monitoring channel updates same the parameter as "Monitoring channel" in the "RF Controls" dialog box.

Apply button (ALT+A):
Validates and sends entered data to ME.

Set Defaults button (ALT+S):
Sets current values as default Call Simulation values.

Get Defaults button (ALT+G):
Gets default Call Simulation values as current values.

Noise Sensitivity... command

A GSM/Signal generator and an antenna cable is needed for this test. The active band must be set to the GSM band.

Activation	Status Bar Text
Alt, E, N	Initializing local mode...;
	Noise Sensitivity; Set test on...;

Command is used for noise sensitivity measurement.

The next automatic selections are made when this tuning function is activated:

-Active unit	= RX
-Operation mode	= Burst
-AGC value	= 81 dB

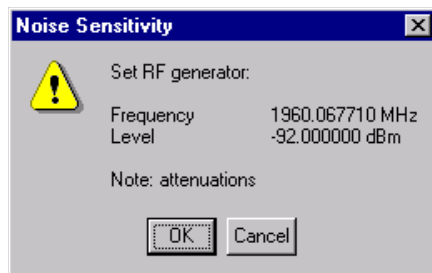Before the function opens, the "Noise Sensitivity" appears:

Figure 29: Noise Sensitivity - Set High Reference Level Dialog

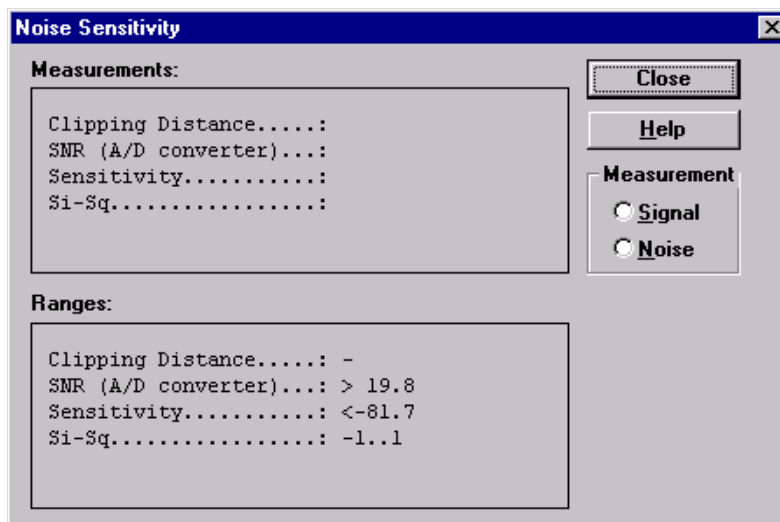Then the application opens the "Noise Sensitivity" dialog box.

Figure 30: Noise Sensitivity Measurements & Ranges Panel

Dialog mode: **modal**

The "Noise Sensitivity" dialog box has the following items:

Measurements group:
Clipping distance is the difference to the signal clipping value.

SNR is measured in an AD converter.

Sensitivity is a calculated value based on the measured SNR value.

The last value on the display is signal power difference between I and Q branch.

The numbers are shown in 0.1 dB accuracy. The error message, "*OUT OF RANGE*", is shown only if the SNR and/or amplitude difference values are not acceptable.

Signal/Noise radio button (ALT+S/ALT+N):
When button is pressed, the RX I and Q burst data is asked, text "*SIGNAL MEASURING...*" or "*NOISE MEASURING...*" appears in the measurement group window. The power level value should be -92 dBm during signal measurement.

When signal data is received, distance to clipping signal level is shown as dBs on the display. When either signal or noise measurement results are received, the "*MEASURING*" text is removed and measurements are updated to the screen. When both measurements (signal and noise) are done at least once, the signal-to-noise relation and difference are also shown on the display.

When exit is made, the next selections are set to the values which were selected before this adjustment.

-Active unit
-Operation mode
-AGC value

IR Test... command

A Combox and an infrared test module is needed for this test.

Activation	Status Bar Text
Alt, E,I	IR test; Set test on...;

Command is used for making IR module test.

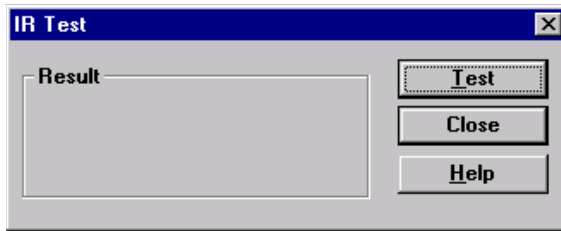This function opens the "IR Test" dialog box:

Figure 31: IR Test Dialog

Dialog mode: **modal**

IR Test dialog has following items:

Result box:
Result can be OK/FAILED

Test button (ALT+T):
Starts IR Test.

Close button (ENTER):
Closes the IR Test dialog.

Help button (ALT+H):
Context-sensitive help.

Software

Figure 32: Software Menu Dialog

Product Profile... command

Activation   Status Bar Text
Alt, S,P   Product Profile; Reading from ME...
Function is used for making product profile settings.

When command is activated, the product profile information is read from EEPROM and

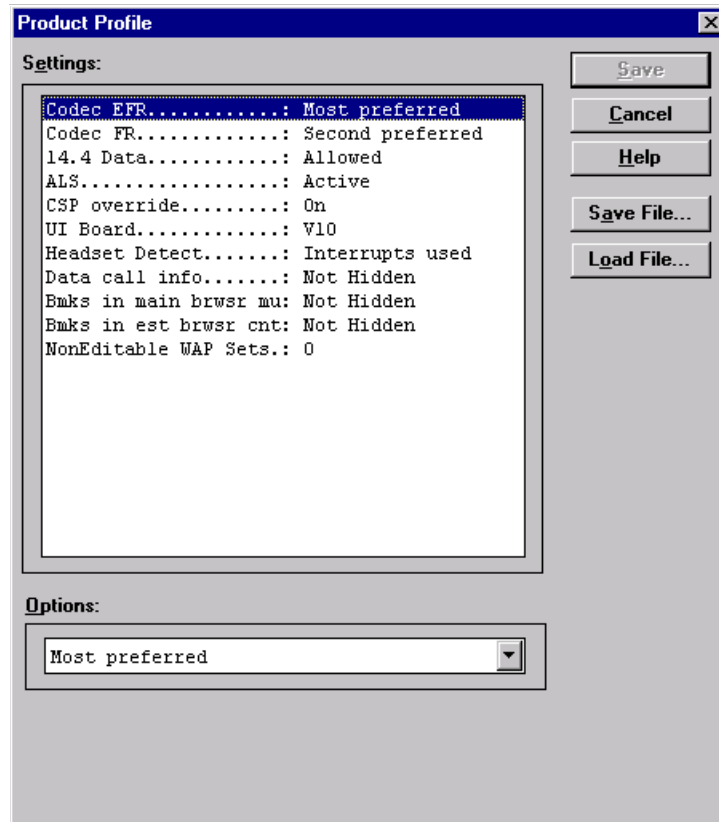the "Product Profile" dialog box is opened.

Figure 33: Product Profile Dialog

Dialog mode: **modal**

The "Product Profile" dialog box has following items:

Settings list box (ALT+E):
A list where user can select desired setting.

User can change settings in the Options drop-down list.

Options drop-down list (ALT+O):
List allows user to set options to each settings which are listed in **Settings** list box.

Save button (ENTER):
Selections are accepted and saved to EEPROM.

Cancel button (ALT+C):
Selections are ignored and control is returned back to main menu.

Help button (ALT+H):
Context-sensitive help.

Save File... button (ALT+A):

Save settings to a file on the PC.

Load File... button (ALT+O):
Load settings from a file on the PC.

Start Up Self-tests... command

Activation	Status Bar Text
Alt, S,S	MCU start Up Self-Tests.

Function is used for changing the state of the EEPROM selectable tests in the "MCU Start Up Self-tests" dialog box.
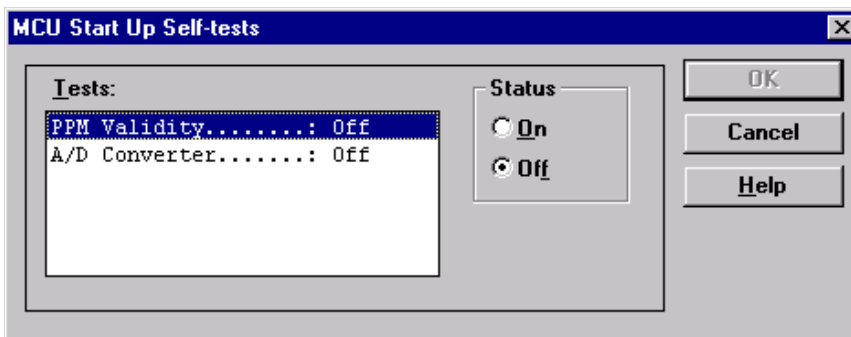

Figure 34: MCU Start Up Self-tests Dialog

Dialog mode: **modal**

The "MCU Start Up Self-tests" dialog box has following items:

Tests list box (ALT+T):
When the dialog is opened, the previous values will be read from the MCU EEPROM and shown on the list box.

Status group:
When radio button **On** is selected, the test will be run every time when automatic start up self-tests are activated (e.g., in power up).

OK button (ENTER)
Selections are accepted and saved to EEPROM. A power-up routine is made to phone.

Cancel button (ESC)
Selections are ignored and control is returned back to main menu.

Selectable Start-Up self tests:
-PPM Validity
-A/D Converter

Set Factory Values... command

Activation	Status Bar Text
Alt, S, V	Setting

Default Factory Values; Initializing normal mode...;

Application does not require confirmation. The "Default Factory values" dialog box displays:
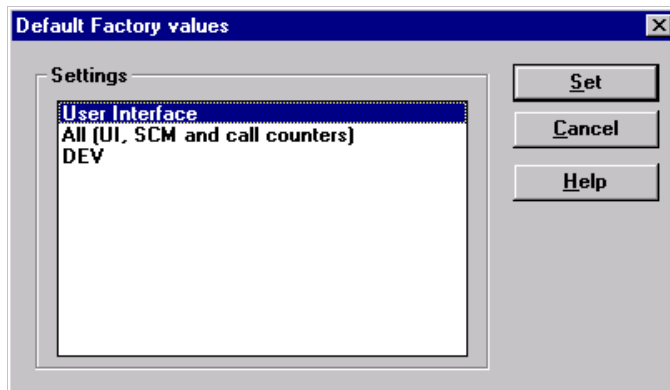

Figure 35: Default Factory Values Dialog

Dialog mode: **modal**

The "Default Factory values" dialog box has the following items:

Settings list box:
Contains the selectable factory values.

Set button (ALT+S)
Sets the selected factory value to phone. Before setting, the software asks confirmation:
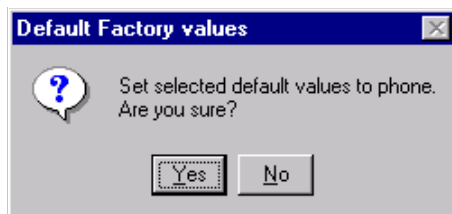
Cancel button (ALT+C)
Closes the "Default Factory Values" dialog box.

Help button (ALT+H):
Context-sensitive help.

Phone Identity... command

Activation	Status Bar Text
Alt, S,I	Phone Identity: reading from ME...

Function is used to edit phone identity. With this dialog, IMEI or SIM locks may be changed in the following manner:

Current phone information is read from phone

- user edits User Name (and IMEI, Product Code and Product Id, if they were not read correctly from phone)
- dialog information is saved to file, which is sent to secure place where actual programming information may be constructed
- programming information is received from secure place in another file, which is loaded to dialog
- program checks input values and, if they are correct, programming information is written to phone

This function opens the "Phone Identity" dialog box:
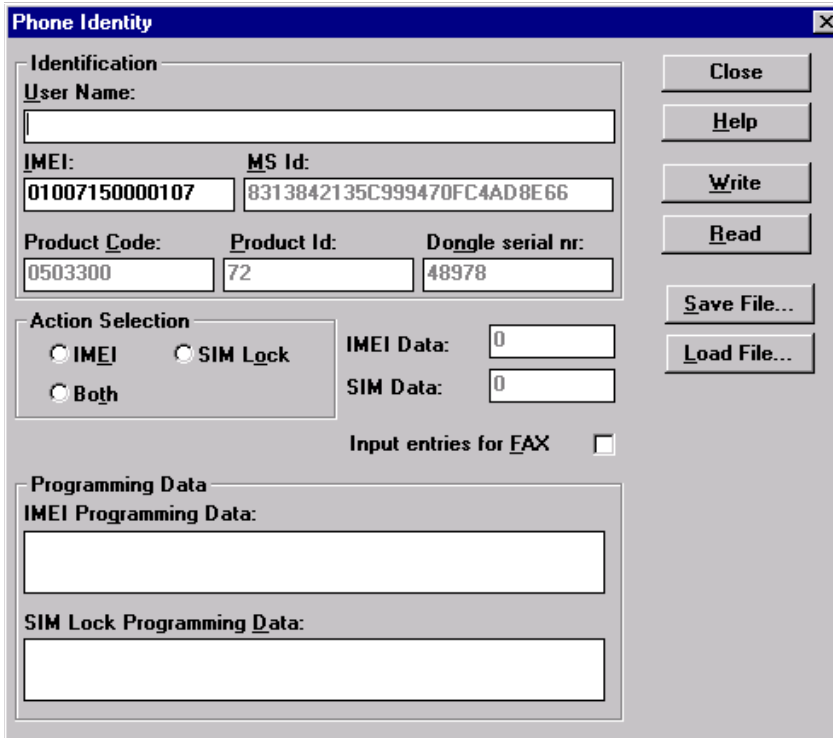
Figure 36: Phone Identity Dialog

Dialog mode: **modal**

The "Phone Identity" dialog box has the following items:

Under Name edit box (ALT+U):
Field where user can enter user identification.

IMEI edit box (ALT+I):
Field where user can enter IMEI value. Field can contain up to 40 digits.
This field is automatically filled, if ME is connected to the PC when dialog is loaded.

Product Code edit box (ALT+P):
This field is automatically filled, if ME is connected to the PC when dialog is loaded. If it is not correct then it is necessary to go to the Software | Production Data Edit dialog and edit the Product Code there.

MS Id edit box (ALT+M):
This field is automatically filled, if ME is connected to the PC when dialog is loaded.

Product Id edit box (ALT+R):
This field is automatically filled, if ME is connected to the PC when dialog is loaded.

Dongle serial nr edit box (ALT+N):
This field is automatically filled when opening the dialog box.

IMEI Data edit box:
This field is automatically filled, when file is loaded or data is saved.

SIM Data edit box:
This field is automatically filled, when file is loaded or data is saved.

IMEI radio button (ALT+E):
File and ME operations contains only IMEI data.

SIM Lock radio button (ALT+O):
File and ME operations contains only SIM Lock data.

Both radio button (ALT+T):
File and ME operations contains both IMEI and SIM Lock data.

IMEI Programming Data edit box (ALT+G):
IMEI programming data is read from file and posted to this field.

SIM Lock Programming Data edit box (ALT+D):
SIM Lock programming data is read from file and posted to this field.

Close button (ESC):
Cancels all edits and does not save values to phone.

Help button (ALT+H):
Opens a help text.

Write button (ALT+W):
Writes programming data to phone. Actions are selected with Action Selection radio button.

Read button (ALT+R):
Reads identification data from phone and shows it in dialog controls. Needed data is selected by Action Selection radio button.

Save File... button (ALT+S):
Writes a file containing data needed by security place application to create needed programming data. File is selected with the "File Save As" dialog.

Load File... button (ALT+L):
Reads a file containing data needed to program selected data. File is selected with "File Open" dialog.

Warranty State... command

Activation	Status Bar Text
Alt, S, W	Initializing local mode

Warranty State; Reading from ME...

Command used to read warranty information from MS.
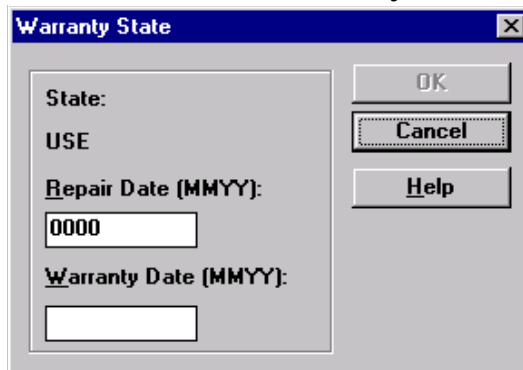
Figure 37: Warranty State Dialog

The "Warranty State" dialog box has the following items:

State indication:
This is a status on the warranty of the phone. Possible states are:

 -USE
 -DEFECTED

In **USE** state the repair date can be edited.

In **DEFECTED** state the warranty date can be edited.

Repair Date edit box (ALT+R):
Shows the latest date of repair in month and year format.

Warranty Date edit box (ALT+W):
Shows the date the phone was found DEFECTIVE.

OK button (ENTER):
Saves the entered date in the phone and closes the dialog

Cancel button (ESC):
Closes the dialog without saving dates in the phone.

Help button (ALT+H):

Context-sensitive help.

Production Data Edit... command

Activation	Status Bar Text
Alt, S, D	Production Data Edit; Reading from ME...

This command is used for programming the HW version to phone. Function opens the "Production Data Edit" dialog box:
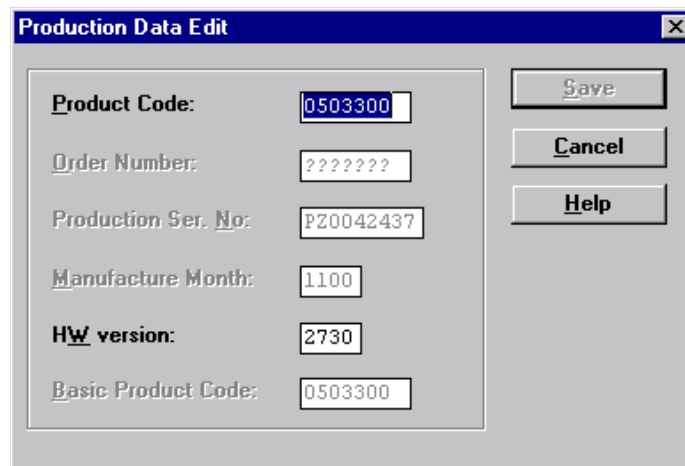
Figure 38: Production Data Edit Dialog

Dialog mode: modal

The "Production Data" dialog box has the following items:

Product Code edit box (ALT+P):
Displays production code, and enables the user to change it.

Order Number edit box (read only):
Displays order number.

Production Ser. No edit box (read only):
Displays production serial number.

Manufacture Month edit box (read only):
Displays manufacturing month.

HW Version edit box (ALT+W):
User can edit HW version.

Basic Product Code edit box (read only):
Displays the basic product code.

Save button (ALT+S):
Closes the dialog box and writes HW version and Product code to ME.

Cancel button (ALT+C):
Closes the dialog box and *does not* write HW version nor Product Code to ME.

Help button (ALT+H):
Context-sensitive help.

Dealer

The Dealer submenu offers functions for ME settings for dealers.
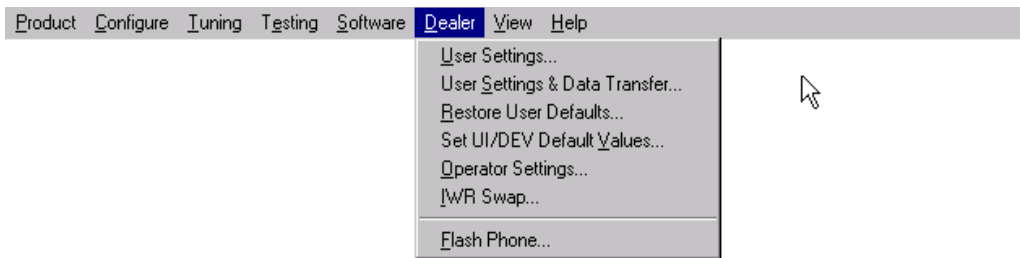
Figure 39: Dealer Menu Dialog

User Settings... command

Activation   Status Bar Text
Alt, D, U   User Settings and Values; Reading from ME...

This command is used to edit user settings.

Figure 40: User Settings and Values Dialog

When activating this function, the user is prompted if he wants to read the user settings and values stored in the phone. The Wake-up Message Graphics is a monochrome black and white bit map graphic (96 pixels wide by 65 pixels high).

Dialog mode: **modal**

The "User Settings" dialog box has following items:

Save File... button (ALT+S):
User can save user settings to file.

Load File... button (ALT+L):
User can load user settings from file.

Edit... button (ALT+D):
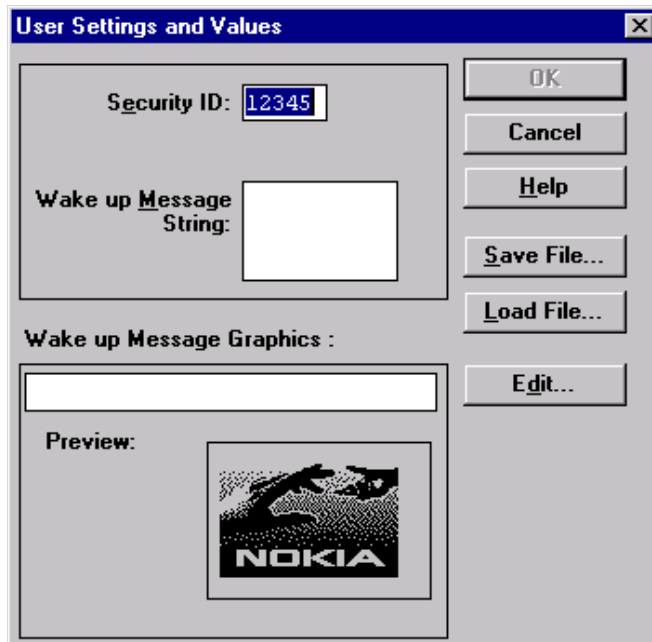Start Windows Paintbrush to edit loaded or saved graphical Wake-up message.

Preview picture:
Shows graphical Wake-up message.

OK button (ENTER):
Writes user settings to phone.

Cancel button (ESC):
Closes the dialog box

Help button (ALT+H):
Context-sensitive help.

User Settings & Data Transfer... command

Activation	Status Bar Text
Alt, D, S	User Settings & Data Transfer; Reading data from ME...
	User Settings & Data Transfer; Writing data to ME...

This command is used to get user settings and data from phone to file and vice versa. The following information is loaded/saved with this dialog: all user settings, graphical/text wake up message, phone number directory, SMS'es, alarms, calendar items, CLI logos, and user profiles. The same selections that were made during the save process must be selected during the restore operation.

When data is written or read, the phone-waiting dialog is shown to the user.
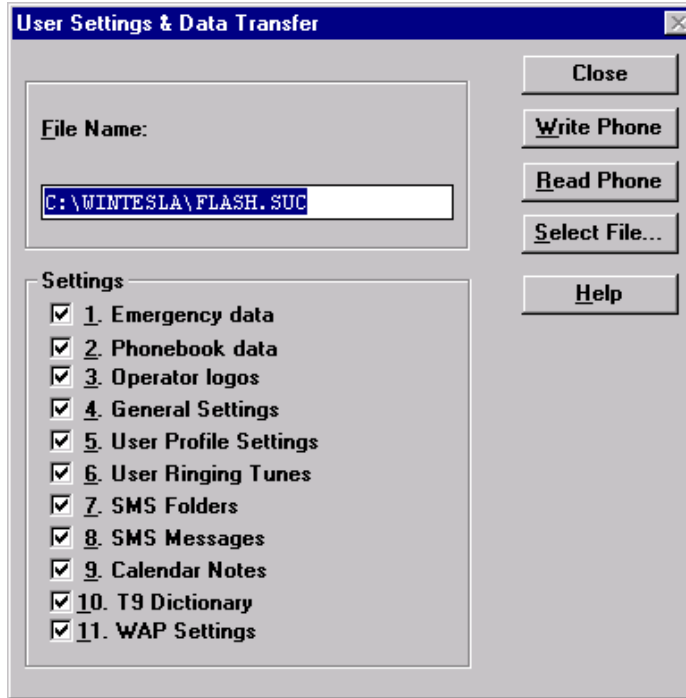
Figure 41: User Settings & Data Transfer Dialog

Dialog mode: **modal**

The "User Settings & Data Transfer" dialog box has the following items:

File Name edit box (ALT+F):
The user can edit file name or select file with the **Select File...** button. When dialog is opened, it contains name of the previously saved or loaded file.

Write Phone button (ALT+W):
Loads settings from file and writes them to phone.

Read Phone button (ALT+R):
Reads settings from phone and writes them to file.

Select File... button (ALT+S):
Opens Open File dialog, with which user can select the file that contains the data to be loaded to ME or file to which data is saved from ME. If user selects the **OK** button, the name of selected file is copied to File Name edit field.

Close button (ESC):
Closes the dialog box.

Help button (ALT+H):
Context-sensitive help.

Restore User Defaults... command

<u>Activation</u>	<u>Status Bar Text</u>
Alt, D, R	Initializing local mode...;
	Setting RF defaults...;

Command is used to restore the user settings of the selected market area of the MS.
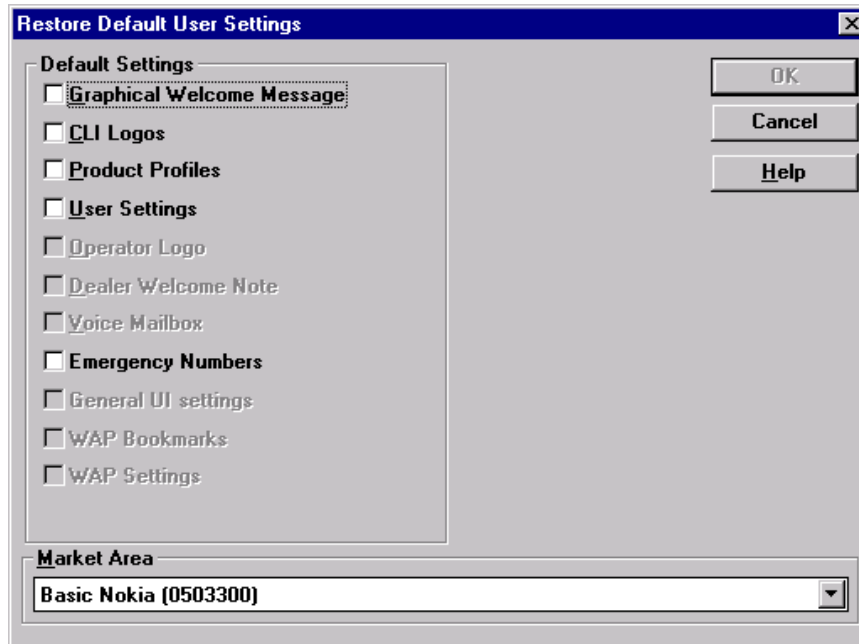
Figure 42: Restore Default User Settings Dialog
<u>New dialog reflecting entry of new "Emergency Numbers" checkbox added.</u>

Dialog mode: **modal**.

Default Settings group are the enabled check boxes in the preceding figure.

The "Restore Default User Settings" dialog box has the following items:

Contains the possible files and settings to download in the phone.

Graphical Welcome Message check box (ALT+G):
When checked, the Wake Up Graphics display is stored in the phone.

CLI Logos check box (ALT+C):
When checked, the Calling Line Identification graphic images are stored to the phone.

Product Profiles check box (ALT+P):
When checked, the standard product profiles are stored in the phone.

User Settings check box (ALT+U):
When checked, the default user settings are stored in the phone.

Operator Logo check box (ALT+O):

When checked, the operator logo is stored in the phone.

Dealer Welcome Note check box (ALT+D):
When checked, a dealer welcome note is stored in the phone.

Voice Mailbox check box (ALT+V):
When checked, the voice mailbox settings are stored in the phone.

VAS Settings check box (ALT+A):
When checked, the value=added service settings are stored in the phone.

Emergency Numbers check box (ALT+A):
When checked, the Emergency Numbers are stored in the phone.

Market Area drop list (ALT+M):
Enables the user to select the market area where the phone is to be used. Depending on what settings are relevant to a market area, the Default Settings check boxes will be enabled. They are all disabled (greyed) as default.

OK button (ENTER):
Stores the selected settings in the phone and closes the dialog.

Cancel button (ESC):
Closes the dialog without storing anything to the phone.

Help button (ALT+H):
Context-sensitive help.

Set UI/DEV Default Values... command

Activation	Status Bar Text
Alt, D, V	Setting UI defaults...
Initializing normal mode...	

After selection, the application asks for confirmation: "Are you sure you want to set UI to factory settings?" If the **Yes** button is selected, the default settings are reset to phone.

Figure 43: UI/DEV Factory Settings Confirmation Dialog

Dialog mode: **modal**

Operator Settings.......command

Activation	Status Bar Text

Alt, DO   Operator settings: Reading from ME.....

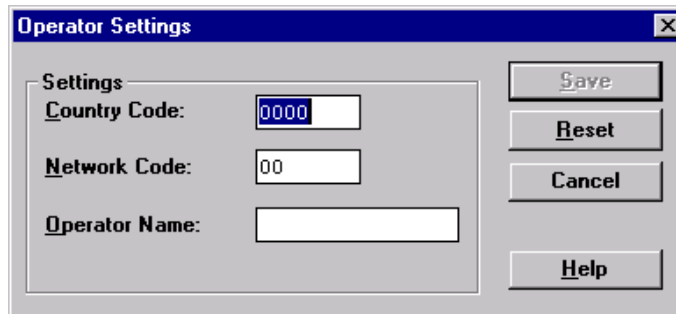Command is used to set the operator settings to the MS.

Figure 44: Operator Settings Dialog

Dialog mode: **modal**

The "Operator Settings" dialog box has the following items:

Displays the current operator settings.

Country Code edit box (ALT+C):
Allows the user to change the country code.

Network Code edit box (ALT+N):
Allows the user to change the network code.

Operator Name edit box (ALT+O):
Allows the user to change the operator name.

Save button (ALT+S):
Saves the data in the phone and close the dialog.

Reset button (ALT+R):
Resets the data to default values and saves it to the phone.

Cancel button (ESC):
Close the dialog without saving settings in the phone.

Help button (ALT+H):
Context-sensitive help.

Flash Phone... command

A full set of flash programming boxes and a service battery or the Point Of Sale flash adapter is needed, together with the MCU software package (including the NSB-5.INI file), to perform a flash programming of the phone.

NOTE: If using a Point Of Sale device, remember to enable it from the FLS-X dialog box in the Configure menu.

Activation   Status Bar Text
Alt, S, F   Flash PPM; Reading from ME...
Flash Phone; Reading from ME...

This command is used for flashing new software into the phone. This function opens the following "Flash Phone" dialog box. When flashing is started, a waiting window is showed that tells the user approximated flashing time.
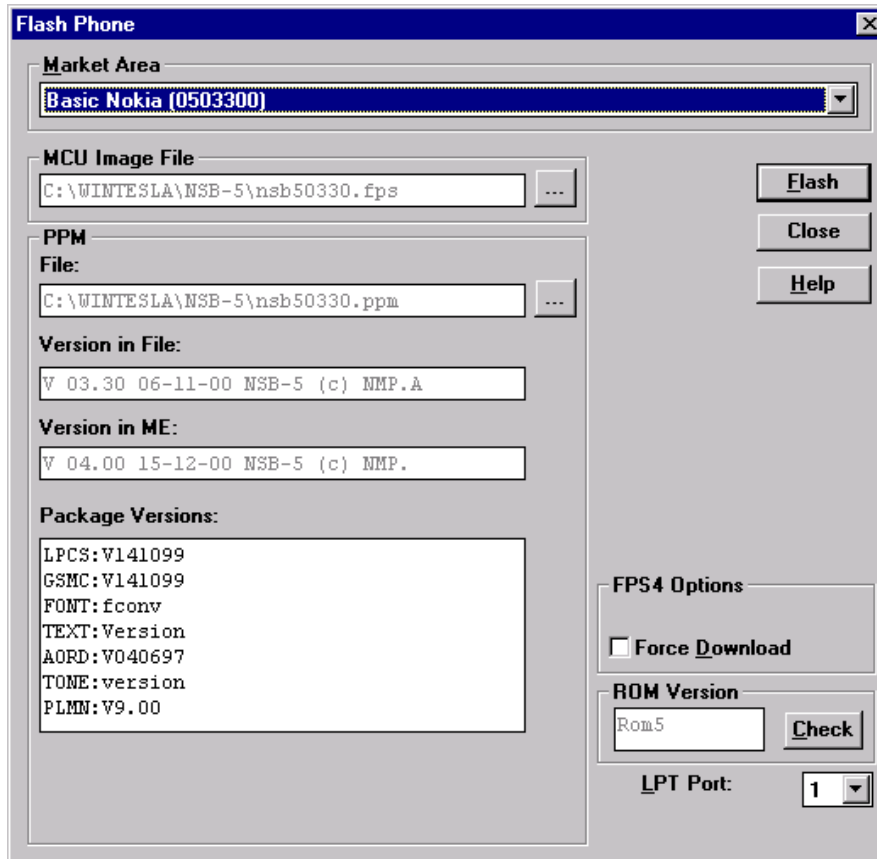
Figure 45: Flash Phone Dialog

Dialog mode: **modal**

Flash dialog has the following items:

Market Area drop list (ALT+M):
Allows the user to select the market in which the phone is to be used.

MCU Image File:
Here the selected MCU SW image file, *.FPS is displayed. The... button allows the user to change the file selection.

PPM File:
Here the selected PPM file, *.PPM is displayed. The... button allows the user to change the file selection.

PPM Version in File: edit box (read only):

Display the selected PPM file version.

Version in ME: list box (read only):
Displays the version of the SW in the ME.

Package versions:
Display the version information the elements included in the PPM file.

ROM version group:
Gives the user information on the phone ROM version.

ROM Version edit box (read only):
Displays the ROM version of the connected phone.

ROM Check button (ALT+C):
Enables the user to force a new reading of the ROM version of the connected phone.

LPT Port drop list (ALT+L):
Enables the user to select the parallel port to which the flash programmer is connected.

Flash button (ALT+F):
The user is asked if he wants to save User Settings to a file. Then, the flash is erased according to the erase settings. Afterwards, the flash on the connected phone is programmed with the selected files.

Close button (ESC):
Closes the dialog and does not start flash programming.

Help button (ALT+H):
Context-sensitive help.

After the ME has been programmed, and the FPS and PPM files downloaded and validated, the current PC time is set to the phone. Note that if the date and time fail to set, the flash process is completed regardless. Only the market area needs to be reprogrammed.
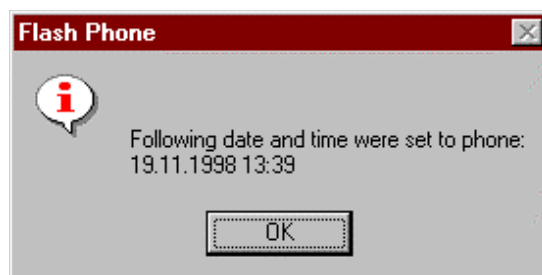

Figure 46: Flash Phone - Setting Time and Date Dialog

Then the command for setting of the standard user interface settings is activated (refer to the "Restore User Defaults command").

IWR Swap Command

Activation	Status Bar Text
Alt, D, I	Scanning for product

Command is used to view and modify swap data from a damaged phone to a replacement phone.
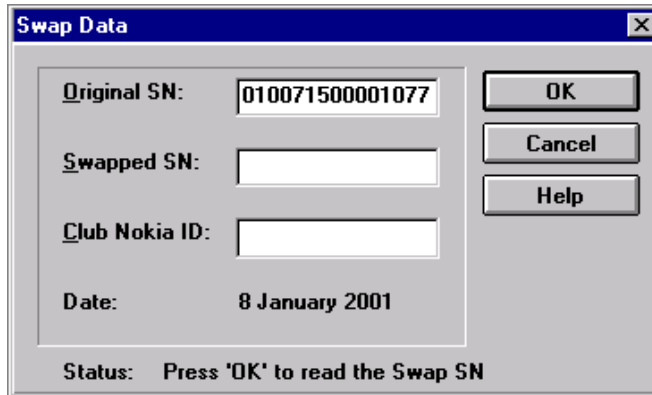
Figure 47: IWR Swap Data Dialog

Dialog mode: **modal**.

The "Swap Data" dialog box has the following items:

Original SN edit box (read only):
User can view the connected phone's original serial number.

Swapped SN edit box (read only):
User can view a possible serial number from this phone when it has replaced another phone in the warranty period.

Club Nokia ID edit box (ALT+C):
User can enter the Club Nokia ID.

Status text:
Displays information on user actions to be performed or requests currently being serviced.

OK button (ENTER):
Reads the phone serial number or saves entered Club Nokia ID.

Cancel button (ESC):
Closes the dialog without reading or storing data in the phone.

Help button (ALT+H):
Context-sensitive help.

View
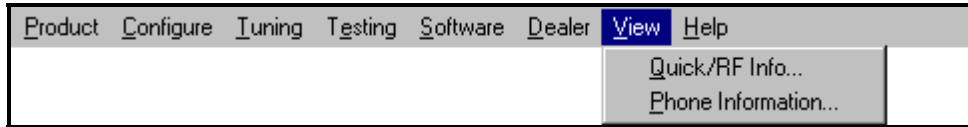
Figure 48: View Menu Dialog

Quick/RF Info... command

Activation | Status Bar Text
Alt, V,Q | View Quick/RF information.

If the phone is in *normal* mode, the following"Quick Info" dialog box is shown:

Figure 49: Quick Infor Dialog

If the phone is in local mode, the following "RF Information" dialog box is shown. Information is shown in a modeless dialog, which may be left open during other operations. It is also updated whenever needed.

Figure 50: RF Information Dialog

Phone Identity... command

Activation	Status Bar Text
Alt, V,P	Phone identity information. Reading from ME...

This command opens the "Phone Identity Information" dialog box, which shows identification information. The information is displayed in a modeless dialog, which may be left open during other operations. It is also updated whenever needed.

```
Phone Identity Information                              [X]

MCU SW....................: V 04.00 15-12-00 NSB-5 (c) NMP.
MCU SW Checksum...........: 0AC9
PPM Version...............: V 04.00 15-12-00 NSB-5 (c) NMP.
PPM Package Version.......: A
DSP Internal SW...........: 5
DSP External SW...........:  B29.5.712W05p  10-Aug-00 NSB-5 (c)
System ASIC...............: G-03
COBBA.....................: =31
Serial Number.............: 010071/50/000107/7
HW........................: 2730
Original Serial Number....: 010071500001077
Production Serial Number..: PZ0042437
Manufactured (MM YY)......: 1100
Purchase (MM YY)..........: - Warranty not available
Order Number..............: ??????
Product Code..............: 0503300
PCI Version in Phone......: 0540
Basic Production Code.....: 0503300

          [ Close ]        [ Help ]
```
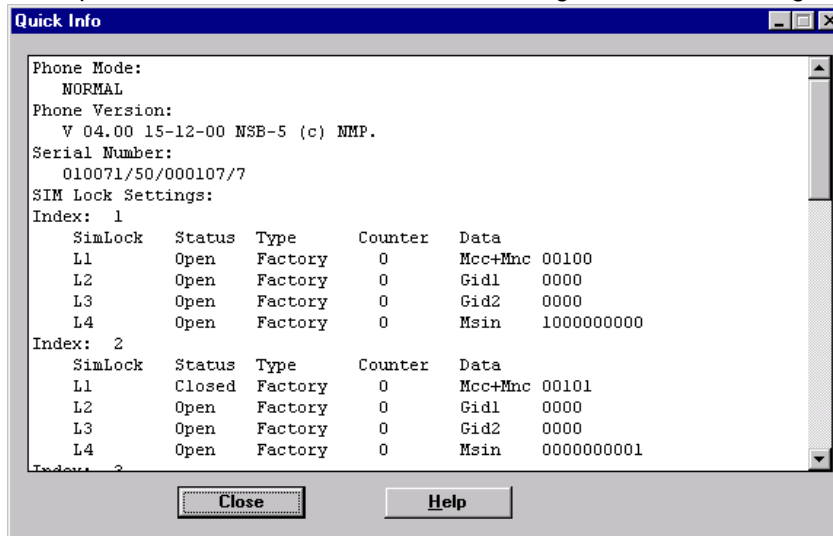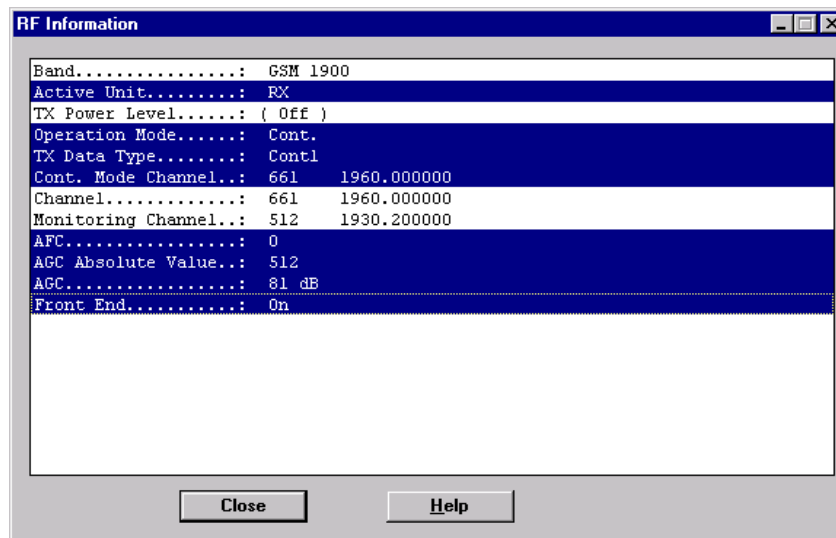
Figure 51: Phone Identity Information Dialog

Appendix A: Vocabulary

Abbreviation	Description
ASIC	Custom circuit which for instance controls communication between MCU and DSP
BBD-3	Service battery
CLF	Common Look and Feel
CLI	Calling Line Identification
COBBA	Common Base Band Analog
DATA	DATA interface module
DAU-9S/P	MBUS/FBUS cable
DLL	Dynamic Link Library
DSP	Digital Signal Processor which controls radio interface and speech coding/decoding
EEPROM	Memory for adjustment parameters (Electrically Erasable and Programmable Read Only Memory)
FLS-X	Point Of Sale Flash programming device.
FBUS	Fast serial bus
IMEI	International Mobile Equipment Identification code
IR	Infra Red Transmitter/Receiver
M2BUS	Serial communication bus which can be connected to accessory devices and used to test PC
MCU	Master Control Unit processor
MDI	MCU DSP Interface; message interface via ASIC registers
ME	Mobile Equipment
MODAL	A modal dialog box requires the user to complete (dialog box) interaction within a dialog box, and close it before continuing with any further interaction outside the window.
MODELESS	A modeless dialog box allows the user to interact (dialog Box) with

other windows and applications.

MS	Mobile Station
PC	IBM PS/AT or compatible personal computer
PCI	Phone Controlling Interface SW for PC
PKD-1/1NS/1CS	Hardware protection key (DESKEY DK2) for protecting service software from illegal copying and use. The software will not work without this key!
RF	Radio Frequency parts
RTC	Real Time Clock
SW	Software
TDF-4	Flash security box
UI	User Interface

Appendix B: Flashing Software into 7190 MS

Make sure you flash a different software version into the phone; otherwise, this procedure will not work. That is, if you have 3.12 SW now, you cannot flash 3.12 SW back into the phone. You must first flash another SW, such as 3.11 then 3.12.

DO NOT FLASH A PHONE WHEN A BATTERY CHARGER IS PLUGGED INTO THE PHONE!

If you want to save your phone settings, then run WinTesla. Select Dealer -> User Settings & Data Transfer menu. Select the items you desire to back up and make note of which ones you select. You will need to identify only those items you selected when restoring the settings!

1. Make sure the SIM card is not installed. Power on the phone. You should see "Insert SIM card" on the phone display.

2. Run WinTesla (c:\WinTesla\WinTesla.exe).

3. Select Product -> New. The phone should reset amd the WinTesla panel should change to a white background. There will now be a Dealer menu item. The Dealer menu should contain about eight items. If only the Flash menu item is visible, then the connection to the phone may be wrong or the phone is dead. Perhaps there is a corrupted flash image, or Palm pilot has the com port....

4. Select Dealer -> Flash Phone to see the "Flash Phone" dialog box. Select the desired Market Area <last used is defaulted>, MCU Image, and PPM files. Click the Flash command button to continue. The "Version in ME" is read from the phone while "Version in File" is read from the MCU image file (*.fps file).

5. Having clicked the **Flash command** button, the "Flash Phone" dialog box message "Do you want to save user settings to file?" appears. This gives you the opportunity to back up the user data. This process takes awhile but it is advised if you have the time. I'll assume no at this time...

6. The "Flash Phone" dialog box will display to inform you about the number of flash licenses that remain. If you are below the default limit of 100, you must register the FLS2-D with Melbourne, FL to get additional licenses. If you haven't already done so, read the paperwork and fax the registration in! Then pressing the **OK** button.

7. The "Flash" dialog box displays and asks you to power on the phone. A momentary push is all that is needed. You have 30 seconds to accomplish the power-on step. Having sensed the power-on cycle, the flash process begins, erasing memory, downloading the MCU and PPM software, and finally validating the downloaded SW. When the download is complete, a dialog box appears, requesting you to once again power-on the phone.

8. Wait for the upper 2Mb erase to complete its task. You should hear an approximately 1 second tone (beginning about 20 seconds after powering up the phone), followed by a

shorter tone about 10 seconds later. If you do not hear this, you must reflash the phone, possibly with a different SW version.

9. At this point, you have completed the flash process. All that remains to be done is to set the market varient. WinTesla should now display the "Restore Default User Settings" dialog box. When this happens, disconnect the phone from the communications cable. You may also get a warning message about date/time not setting. If so, dismiss it.

10. Insert a SIM card. Issue factory reset *#7370# into the phone. The password is "12345".

11. Reconnect the phone.

12. From the "Restore Default User Settings" dialog box, select the "Market Area" you need and modify the "Default Settings" as desired. Then click the **OK** button. Disconnect the phone from the communications cable.

NOTE: If you saved the user settings in Step 5, the settings will automatically be restored in Step 10.

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