UNTRACEABLE PHONE

Nokia 5000d-2 / RM-362

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What Does the Phone Include?

- Ability to operate as a standard mobile phone
- Firmware modification that enables the phone to become untraceable
- Set of built-in commands for modifying and viewing interception related parameters
- Phone interception alerts
- Automatic or Manual phone IMEI (International Mobile Equipment Identity) change
- CrypToGo application for end-to-end encrypted SMS communication

Terms and Definitions

MITM:

A man-in-the-middle attack is a form of active eavesdropping in which the attacker makes independent connections with the victims and relays messages between them.

IMEI:

A 15 digit number (14+1) number, usually unique, that is used to identify valid 3GPP (as GSM) mobile phones that is sent by the phone to the network.

C2:

A cell-reselection criterion (-99 to 99 dBm).

Active equipment attack with C2 > 100.

BTS:

A base transceiver station is a piece of equipment that facilitates wireless communication between user equipment (UE) and a network.

C2 Value

The C2 (reselection criterion) value is used to determine if a new cell should be selected to camp-on. If the transmitted C2 value of a neighbor-cell is higher than the serving-cell for a period longer than 5 seconds, the phone will camp on the new cell (handover).

Active equipment, as the IMEI/IMSI catcher and GSM Interceptors, attack the C2.

- The nominal range of C2 is usually between -99 to 99 dBm.
- Active equipment C2 value is usually >100 (to force camping on).
- The untraceable (UT) phone has a C2 default value of 80; alerting if a larger C2 value is detected.

Ciphering

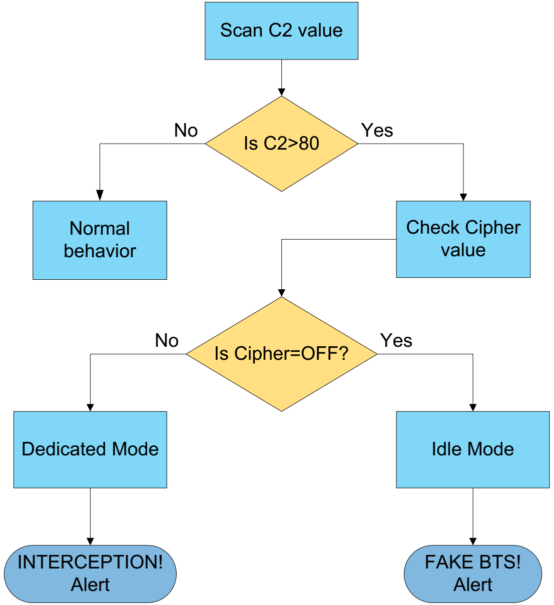
Ciphering algorithm for circuit-switched connection can be either A53, A52, A51 or “OFF”. This value is only set when the phone is communicating with the network (on a TCH).

Cipher value and conditions:

The UT phone uses a cipher value to determine weather in active call (Dedicated Mode) or if in Idle Mode.

- Phone is in Idle Mode when Cipher = OFF.
- Phone is in Dedicated Mode when Cipher = A50/A51/A52/A53.

Workflow



Scan C2 value

Is C2>80

No

Normal behavior

Yes

Check Cipher value

Is Cipher=OFF?

No

Dedicated Mode

INTERCEPTION! Alert

Yes

Idle Mode

FAKE BTS! Alert

MITM Attack – Alerts and Function:

FAKE BTS! Alert function:

Phone is connected to a fake network and there is NO call activity.

- Visual: FAKE BTS!
- Vibration: Constant

INTERCEPTION! Alert function:

Phone is connected to Active equipment AND there is a call activity.

- Visual: INTERCEPTION!
- Vibration: Intermittent

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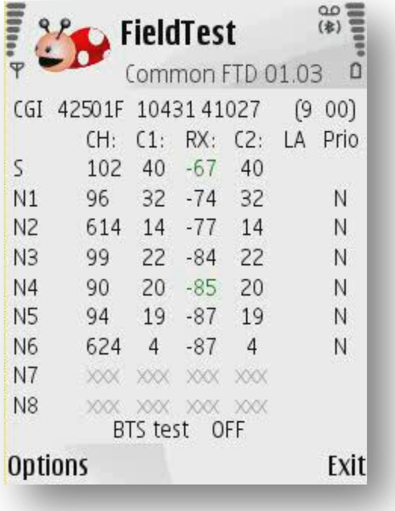
Neighbor-Cells and Measurements:

Detailed information about the Serving-Cell and its 8 Neighbor-Cells is presented in the following example-screen taken from a phone FieldTest (NetMonitor) application.



FieldTest

Common FTD 01.03

CGI 42501F 10431 41027 (9 00)

	CH:	C1:	RX:	C2:	LA	Prio
S	102	40	-67	40		
N1	96	32	-74	32		N
N2	614	14	-77	14		N
N3	99	22	-84	22		N
N4	90	20	-85	20		N
N5	94	19	-87	19		N
N6	624	4	-87	4		N
N7	xxx	xxx	xxx	xxx		
N8	xxx	xxx	xxx	xxx		

BTS test OFF

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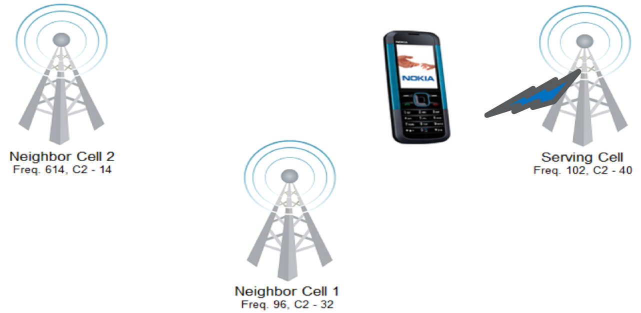
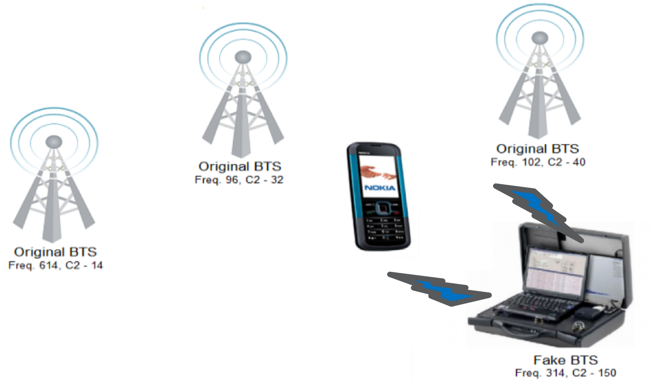
Network Behavior Illustrations

Normal condition



The handset is camped on channel 102 as it has the highest C2 value. The phone switches to a neighbor-cell when its C2 is higher than the Serving-cell.

Active GSM interceptor running its BTS



An active GSM interceptor is running its BTS, transmitting a C2 value of 150 and forcing the phone to camp on it. The phone will switch to fake-BTS with the highest C2.

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Type of Commands

The phone can receive two types of commands:

- View value command: *** # (CMD) #**
- Modify value command: *** # (CMD) * (NEW VALUE) #**

Giving the phone a command is performed by clicking the phone keypad according to the key letter and/or number (e.g. C2 is created by clicking 22).

List of Commands

The **CMD** can receive one of the following values:

<u>C2 (22):</u>

Get or modify the C2 value that the phone is set to (default is 80). Identifying a higher value than the set value will trigger the interception alert.

<u>C2NW (2269):</u>

Get the C2 value of the current cell.

<u>DEMO (3366):</u>

Manual call to the FAKE-BTS! INTERCEPTION! alert functions.

<u>MITM (6486):</u>

Display log information about the last MITM attack, including the elapsed time.

<u>MODE (6633):</u>

Display the current mode: IDLE/FAKE–BTS/INTERCEPTION

<u>IMEI (4634):</u>

Manually modify the IMEI number (14 digits). The phone will reboot once the command is acknowledged.

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CrypToGo Application

The CrypToGo application provides an end-to-end encryption solution for SMS communications between two UT phones.

The CrypToGo is a J2ME application.

- Encryption is carried out using AES in CFB mode with a random IV.
- The application is PIN protected, thereby preventing someone with short-term physical access to a user’s phone from opening the application and reading the encrypted SMS messages.

Unique Features and Capabilities

This untraceable (UT) phone provides a 3-layer protection, along with unique features.

- Alert in case of connection to active equipment
- Automatic and Manual phone IMEI change
- Option to set the C2 to any value, preventing vendors from trying to fool the UT phone by transmitting a C2 value that is lower than the set one.
- Ability to view a log of all previous attacks and the elapsed time
- Preinstalled CrypToGo application for end-to-end encrypted SMS communication