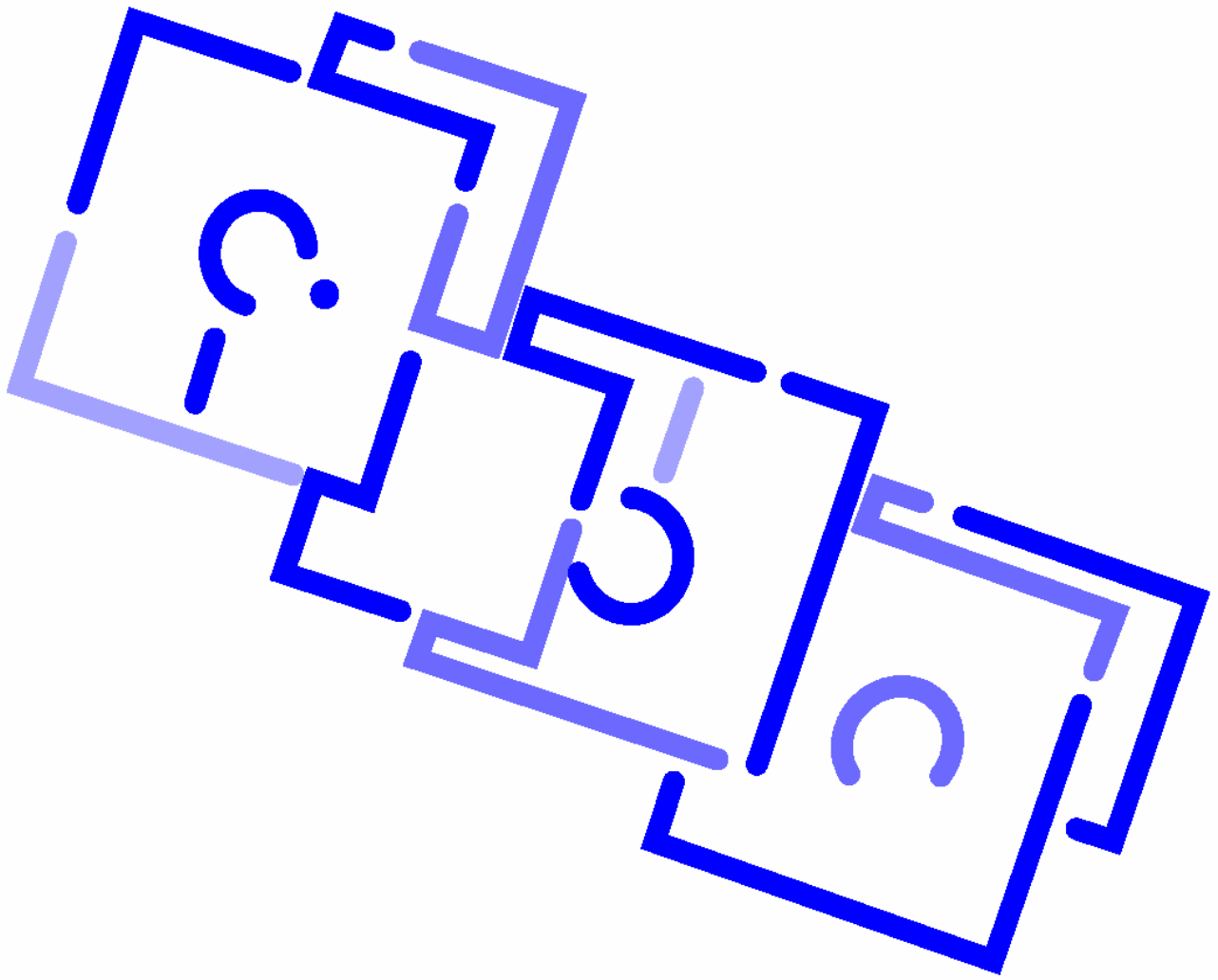
MOTOROLA

SCOUT

TETRA network air interface monitoring and recording software for Windows



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Software User Manual

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Revision History

Issue	Date	Author(s)	For SCOUT release
2.0	11.11.2003	U.Heinrich	2.0
2.1	11.10.2004	U.Heinrich	2.1
5.6	1.06.2005	U.Heinrich	5.6.x
5.12	1.12.2005	U.Heinrich	5.12

Terms Used

AACH	Access Assignment Channel
CMCE	Circuit Mode Control Entity
Cx	C1 / C2 TETRA Path loss Parameters [dBm]
GGA	Global Positioning System Fix Data
GPS	Global Positioning System
GSSI	Group Short Subscriber Identity
LA	Location Area
LAID	Location Area Identity (Number)
MCC	Mobile Country Code
MCCH	Main Control Channel
MER	Message Erasure Rate
MLE	Mobile Link Entity
MM	Mobility Management
MNC	Mobile Network Code
NMEA	National Marine Electronics Association
NMEA-0183	General Sentence Format
PCMCIA	Personal Computer Memory Card International Association
PDU	Protocol Data Unit
RMC	Recommended minimum specific GPS/Transit data
RSSI	Radio Signal Strength Indication
SSI	Short Subscriber Identity
STCH	Stealing Channel
TCH	Traffic Channel
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus
WGS84	World Geodetic System 1984

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1 SCOUT software user license agreement

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2 Introduction

This document describes the Motorola SCOUT software (hereafter called SCOUT in this document).

SCOUT is a software application that runs on Microsoft Windows. This document does not describe how to use Windows.

This document assumes that SCOUT users are familiar with the following basic operations.

- **Mouse operations such as clicking, dragging, dragging and dropping**
- **Menu operation using the mouse**
- **Character entry using the keyboard**
- **Window operation using Windows**

Read the instruction manual of your PC and Windows for these basic operations.

All operations on this manual are described for Windows 2000.

This document assumes that users are familiar with the operation of a GPS receiver and the respective requirements. Please refer to GPS manufacturer's documentation or third party publications.

This document assumes that you are familiar with Microsoft MapPoint software.

Microsoft MapPoint is not a part of SCOUT. SCOUT uses an existing installation of MapPoint to display data. Please refer to the MapPoint documentation on how to use these features.

3 How to read this manual

Operation conventions

All operations on this manual are described for Windows 2000.

The description assumes that a mouse is used.

Display screens

The display screens in this document are from Windows 2000 and may differ slightly from other versions of Windows®.

Note that the display screens used in this document may differ slightly from the actual screens, but this does not mean that the contents will be different.

4 Overview

SCOUT is a Motorola designed application that is used with a Motorola TETRA radio, enabling users to monitor and record information that is transmitted / received by the radio through the air interface. Data is collected during a recording session and is stored in log files, which can be accessed later during a playback session and displayed in various windows for analysis.

The application is menu driven and has a comprehensive graphical user interface (GUI) displaying the data received by the application during the recording session.

Several filtering options can be used to hide unwanted PDUs and provide uncluttered screen presentations.

SCOUT is protected by a hardware key (dongle), which is available either as parallel port or USB port version. This key is necessary to operate the SCOUT software and needs to be present during runtime of SCOUT.

DO NOT remove the hardware key at runtime. Make sure that the dongle is connected safely and will not shake loose during operation. SCOUT will abort recording, playing, etc. and halts with an error message.

5 Features

- Serving cell data display
- Foreground cell data display
- Adjacent cell data display
- Radio status information
- Two Microsoft Access type databases for location aliases and TETRA subscriber aliases.
- Selectable automatic append of new TETRA aliases to database during monitoring or record.
- Call state information
- RSSI / Cx of serving cell and adjacent cells
- Estimated radio Tx power
- MER (Message Erasure Rate)
- RDC (Radio Downlink Counter)
- GPS location data, speed, altitude in different formats (UTM, GK, …; km/h, m/ph, …; m, ft)
- Colored trace of RSSI or MER (if Microsoft MapPoint is installed)
- 'Voice Notes' audio recording during the test drive to remember occurrences.
- Full decoding of PDUs listed in the Radio Status window.
- Monitoring of the TETRA air interface without creating log files.
- Data Export to various formats.
- Scrolling forward and backward through the loaded file by simply clicking and dragging the timeline of the RSSI / Cx graph display.
- Cell Reselection Simulator to understand the mechanism of TETRA reselection process.
- 'Microeditor' integrated database editor (if Microsoft Access is not available)
- Link failure balloon display in MapPoint
- Floating average of MER
- Export of MER
- Floating average of RDC (Radio Downlink Counter)
- Export of RDC (Radio Downlink Counter)
- Group call generator
- New ETSI V+D recommendations 300 392-2 V2.4.2(2004-02)
- DMO PDU decode (partially)
- Line in record (VoiceNotes record triggered when radio enters call)
- Selectable recording sample rate for VoiceNotes
- Single instance of SCOUT (Double click .atp file from Explorer plays file in single instance of SCOUT)
- Cell reselector 2 (latest Motorola features included. I.e. changes in service level calculation, different neighbor cell parameters taken into account)
- Quality indicator display.
- TETRA Power control display in Radio status window
- TETRA Network Time display in Radio status window
- Traffic slots display in PDU decode window
- 'New file' button for manual start of a new data file (Marker function if no GPS is available. Implements the ability to split the dataset into known segments)
- 'New file and pause' button for manual start of a new data file and pause recording until pressed again to continue
- 'Set marker' button for manual set of up-counting marks into the recorded file.
- Export of markers
- One touch record (To continue a stopped recording session simply press and hold down the record button for at least one second, recording starts after release of button. Recording doesn't start if you have left the button area before release)

- Decoding of MTH800/MTM800 GPS event messages (list)
- Display of MTH800/MTM800 GPS radios position in MapPoint map
- Support of MTP850
- Automatic detection of connected radio.
- Radio info window (type, serial, TEI, model no., software ver, codeplug ver.)
- Selectable startup configuration file
- Use of radios GPS
- Save from / to position in loaded file.
- fix GPS timing delay fixed.
- fix Sizing of RSSI and Cx windows re-established.
- new adjustable MER values in Map plot settings
- new adjustable MER values in Data export settings
- new Handover Marker selectable in .txt and .csv export format
- new Data export restructured and new options (Cell reselect info...)
- enh Quality indicator is now 'Levelbars' and moved to the Radio Status window
- new Levelbars parameters adjustable (Configuration, Display Options)
- new Alias and Location database imports data from .csv or txt file
- new Custom icons and bitmaps in MapPoint
- new Service level and cell status can be announced (Configuration, Voice settings 1)
- new Quick record (Ctrl-Q) starts immediate recording. Picks filename from date and time.
- new Drag ‘n’ Drop files (Radio Status, Adjacent Sites, Data export source file line)
- new ‘Save Basestations’ event at closing of MapPoint window now with a dialog. Saving can be cancelled now.
- fix Several minor bug fixes, enhancements of error handling.
- fix Cx graph doesn't scroll if width is less than RSSI graph
- fix Paint problem in RSSI graph if level drops below -120dB
- fix No car icon, no line, only reselect icons after reselection
- fix Missing PDUs (not listed) when transmitted together with downlink acknowledge (BL-ACK)
- fix .dxf file export fixed. Now compatible with AutoCAD 2000, too.

5.1 New features, fixes and enhancements in current SCOUT release

- new Point and click base-station entry from MapPoint map.
- new Custom colors at MapInfo .mif export.
- new Custom pen width selectable at .mif and .dxf export.
- new Accurate time display (based on slot timing) in PDU list with time advance measurement.
- enh Improved Location Database import with selectable coordinate system.
- enh Bugfix comma/dot issue at database editor entry. Improved editing capabilities.
- new Integrated compression of data files (zipping).
- new New installation and setup software for easier updates
- new Automatically search for updates (if enabled)
- new Play button with drop down list of last played files (selectable)
- new Coodinate system and zone selectable/changeable at Easy GPS window.
- fix Lots of minor fixes in decoding, window behaviour and design.
- fix LST display issue fixed
- fix Wrong display if cell is priority cell
- chn Separation of voice files from installation package

6 System requirements

6.1.1 Computer

The SCOUT application runs on any PC that fulfils the following minimum requirements:

- IBM compatible Intel Pentium 3 or AMD K7 at 500 MHz
- Memory size according to operating system recommendation.
- One serial communication port for radio connection; 115200 baud.
- Sufficient disk space to store the recorded data (this depends on the duration of the monitoring period, approx. 2.6 MB per 10 minutes of recording.
- For GPS support, depending on the brand and model, additional serial interface, PCMCIA slot or USB port is required.
- One USB port or parallel port for SCOUT hardware protection key.

6.1.2 Radio

- Motorola TETRA radio. MTx500/650/700/750/800/850 and newer radios.

6.1.3 GPS

Any GPS receiver supporting NMEA standard data interface.

Recommended (tested) GPS receivers:

- **GARMIN GPS35** available as USB, Serial and PCMCIA version. Verify your computers capabilities regarding the amount of USB ports, serial ports.
- **Trimble Pathfinder®** Series.
- **Socket** cordless GPS Bluetooth receiver.

6.1.4 Software

- Microsoft Windows 2000, Microsoft WindowsXP.
- SCOUT software version 2.1 or later.
- Microsoft MapPoint 2002 (or later) software for map plotting and navigation.

It is strongly recommended to shutdown any other application affecting the processing performance of the computer.

This is antivirus software, schedulers or any other gadget software running as background tasks.

6.1.5 Test system

The basic requirements for a test drive set-up with GPS feature are:

- Motorola TETRA radio.
- Suitable data cable, radio to PC. (Model dependant. This is Motorola accessory)
- A GPS receiver supporting NMEA message format.
- USB or parallel port for SCOUT hardware protection key. (dongle)

Figure 1: Sample configuration of a SCOUT measurement system

7 Installation

To install the application, proceed as follows:

From disc:

Put the disk into your drive. If autostart is enabled the installation will start automatically. Otherwise go to the disks root directory and run **Setup.exe**.

From download:

Extract the zip–file into a temporary subdirectory and run the Setup.exe or .msi file. This file starts the installation of the necessary hardware key driver and the SCOUT software.

Make your decisions regarding location and drive. After successful installation you find a shortcut in the START menu of Windows and on the desktop. Additionally a subfolder in your Programs tree called ‘Motorola’, ‘SCOUT’, is installed where you find a shortcut to the SCOUT Users Manual.

If you use Microsoft MapPoint:

It is recommended to install the **full** Microsoft MapPoint 2002 (or later) software (refer to Microsoft’s instructions). If the full installation is not performed, the map MapPoint CD has to be present in the drive. During drive access the SCOUT application may be delayed until MapPoint has the necessary data loaded. **This is serious during a SCOUT recording session**. Messages from the radio are not received on time and a receive buffer overflow may occur.

8 Updates

Updates are available **FREE OF CHARGE** from the Motorola webpage.
http://www.motorola.de/scout

This webpage is in german, but don't worry, you will find these links at the top of the page.

Download SCOUT installation 17MB
Download additional voices 24MB
Download SCOUT update 6MB
Release notes

The upper link is the full installation package.
The second link lets you download the additional voice file from Microsoft
The third link lets you download the upgrade file if you already have a SCOUT 5.x installation.
The fourth link shows a text file with the enhancements, fixes and changes.
Click the appropriate link and save the zip file to a temporary location of your choice.
Unzip and run the setup.exe file for installation.

9 Radio configuration for recording

Although there are no special requirements for the radio hardware and any radio can be used with SCOUT, a radio that has been configured for use with SCOUT should be used solely for that purpose. It should not be used for normal radio communications.

The following actions should be done in order to get messages from the radio:
1. Turn the radio on.
2. Access the test page by pressing in sequence:

MTH500	Volume down button, Keypad <1>, Menu button, Keypad <2>, Menu button, Keypad <3>.
MTP700 MTP750	Smart button 2, Keypad <1>, Menu button, Keypad< 2>, Menu button, Keypad <3>. **Hint: Smart button 2 is the one below the PTT, marked with one dot**
MTM700 MTM800	Cursor right button, Keypad <1>, Menu button, Keypad <2>, Menu button, Keypad <3>.
MTH650	Smart button 2, Keypad <1>, Menu button, Keypad< 2>, Menu button, Keypad <3>. **Hint: Smart button 2 is the one below the PTT**
MTH800 MTP850	Keypad <*> (Asterisk), Keypad <#>, Menu button, Cursor right button.

3. On the test page, Select <Data Svc>. Select <AirTracer>. Select <AirTrc On>.
4. Go back to default screen.

Note: You will need to make arrangements with Motorola for any radios which are to be used with SCOUT to have the correct code plug setup as this can only be done with CPS with "Lab Access".

10 Radios internal GPS

The MTH800/MTP850 and MTM800 are equipped with an internal GPS receiver. It is possible to use this receiver with SCOUT instead of an external GPS receiver. However, care must be taken when using this feature.

ATTENTION!

When using the internal GPS, under no circumstances any GPS events have to be enabled in the GPS section of CPS. The radio MUST run with an enabled GPS only. Again, no events have to be programmed. Otherwise the radios internal requests to the GPS chip and the external requests from SCOUT will interfere. This may lead to an unpredictable behavior and malfunction of the radio.

The GPS chip in the MTH/MTP radios has a very powerful energy saving functionality that is being used during the normal operation mode of the radio.

If the GPS is used by SCOUT, this power saving feature is disabled to get accurate position fixes every second as from any other common GPS receiver.

This ‘constant-on’ mode increases the power consumption of the radio. Be aware that the battery will last only the third of the time than usually.

IMPORTANT!

SCOUT does NOT re-set the GPS chip back to the energy saving mode. The chip continues to run on full power after it was enabled by SCOUT. You have to power the radio off and on again to have the GPS chip reinitialized properly.

Be aware that when using the internal GPS the GPS button of SCOUT has a different behavior. You have to establish a data connection to the radio first. This is done by entering either the recording or monitoring mode. Turn on recording or monitoring then press the GPS button.

11 Functionality

The SCOUT functionality consists of:

- The AirTracer task in the radio, which sends raw data via the UART interface of the radio
- The SCOUT application, which receives and records the data from the radio, then parses the information and displays in different windows.

12 Database files

Two Microsoft Access databases are used by the application.

- The Alias.mdb, table Addresses – contains alias information for SSI, GSSI, phone numbers.
- The Locations.mdb, table LA - contains the site location information, color assignments and notes.

These files are loaded by default when SCOUT is started, unless you have specified different files and saved in the Default.cfg configuration file.

12.1 Alias database

The Alias database contains subscriber numbers, group numbers as well as phone numbers and the associated names. This data is used to display the name instead of the number.

Use the default database as a template to create your own database for additional networks. Rename the database filename with one of your choice and modify the new one according to your requirements.

Load the appropriate database before you start recording or monitoring.

If you save a configuration of SCOUT a reference to the currently selected databases is stored in the configuration file.

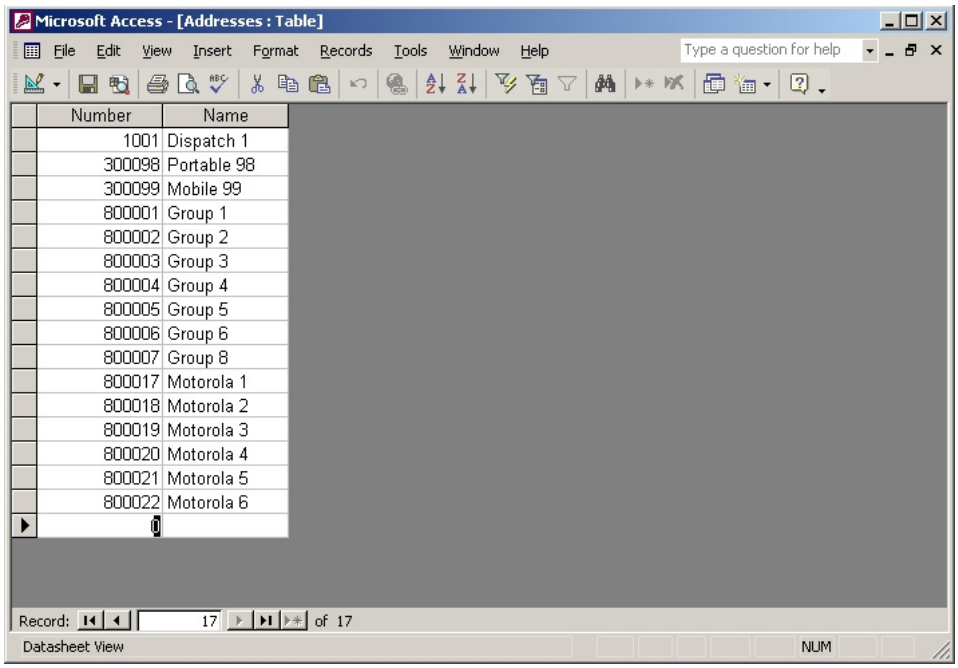


Figure 2: Example of alias database

12.2 Locations database

A TETRA base site is identified at least by the TETRA RF-Channel. Additional information like location area id, channel number and color code refine the identity of a site.

Since the information the radio receives consists of the channel number, the location area id and the color code only, this database is utilized to fetch the individual name of a site and display it in the windows of the SCOUT application. If Microsoft MapPoint is installed the site coordinates are taken to display a site icon. The Easy GPS feature 'Distance to sites' takes the coordinates to calculate the distance from the current location to the serving site and sites currently in foreground scan.

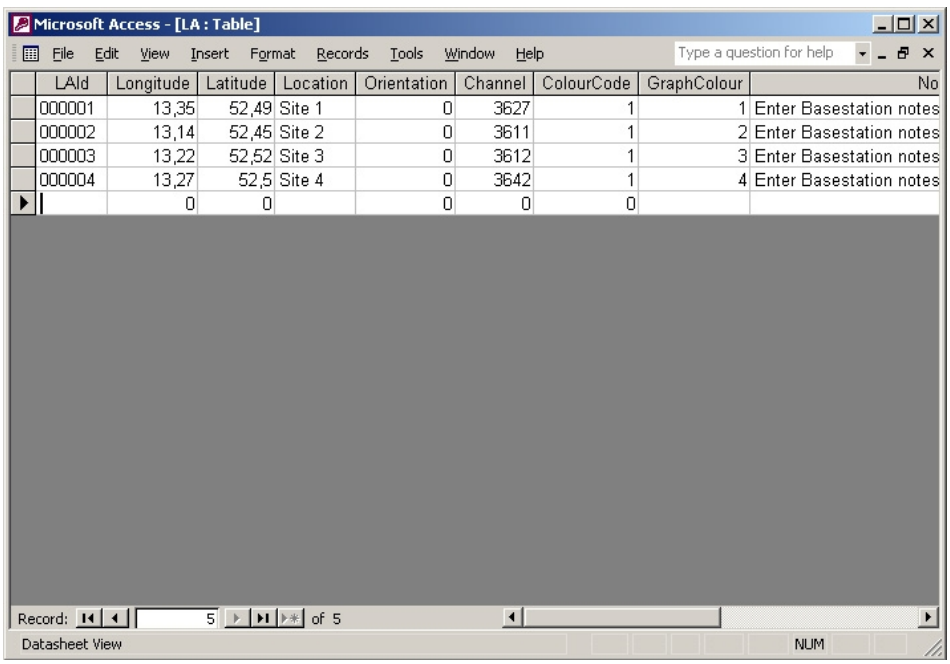
Database entries:

- LAId: Holds the location area id number of the site. When entering data into these fields, the location area Id must be entered as a six-character hexadecimal string. For example, location area C07 must be entered as 000C07; i.e., leading zeros must be used to expand entries to six characters.
- Longitude, Latitude: Site coordinates in WGS84 and decimal format. (11.12345, 51.67890)
- Location: The name of the site to be displayed in SCOUT
- Orientation: Future versions of SCOUT display the antenna direction in the map. Not used.
- Channel: The TETRA channel number
- Color code: The sites individual color code
- Graph Color: Color index number of the line color of the RSSI graph and Cx graph.(See the Configuration menu, Display)
- Notes: Additional site notes displayed in the MapPoint window as balloon information. This database entry works in both directions. If you enter the information in the database then it will be displayed in the balloon at MapPoint. If you modify the balloon entry in MapPoint the database will be updated at program exit or closing of the MapPoint window.

Use the default database as a template to create your own database for additional networks. Rename the database filename with one of your choice and modify the new one according to your requirements.

Load the appropriate database before you start recording or monitoring.

If you save a configuration of SCOUT a reference to the currently selected databases is stored in the configuration file.



LAId	Longitude	Latitude	Location	Orientation	Channel	ColourCode	GraphColour	No
000001	13,35	52,49	Site 1	0	3627	1	1	Enter Basestation notes
000002	13,14	52,45	Site 2	0	3611	1	2	Enter Basestation notes
000003	13,22	52,52	Site 3	0	3612	1	3	Enter Basestation notes
000004	13,27	52,5	Site 4	0	3642	1	4	Enter Basestation notes
	0	0		0	0	0		

Figure 3: Example of location area database

13 PDUs supported by SCOUT

MM Downlink	MM Uplink
D-ATTACH-DETACH-GROUP-IDENTITY	U-ATTACH-DETACH-GROUP-IDENTITY
D-ATTACH-DETACH-GROUP-IDENTITY-ACK	U-ATTACH-DETACH-GROUP-IDENTITY-ACK
D-AUTHENTICATION	U-AUTHENTICATION
D-Authentication Demand	U-Authentication Demand
D-Authentication Reject	U-Authentication Reject
D-Authentication Response	U-Authentication Response
D-Authentication Result	U-Authentication Result
D-CK-CHANGE-DEMAND	U-CK-CHANGE-RESULT
D-DISABLE	U-DISABLE-STATUS
D-ENABLE	U-ITSI-DETACH
D-LOCATION_UPDATE-ACCEPT	U-LOCATION-UPDATE
D-LOCATION-UPDATE-COMMAND	U-MM-STATUS
D-LOCATION-UPDATE-REJECT	U-OTAR
D-LOCATION-UPDATE-PROCEEDING	U-OTAR CCK Demand
D-MM-STATUS	U-OTAR CCK Result
D-OTAR	U-OTAR GCK Demand
D-OTAR CCK Provide	U-OTAR GCK Result
D-OTAR GCK Provide	U-OTAR SCK Demand
D-OTAR SCK Provide	U-OTAR SCK Result
D-OTAR GSKO Provide	U-OTAR GSKO Demand
D-OTAR Key Associate Demand	U-OTAR GSKO Result
D-OTAR Newcell	U-OTAR Key Associate Status
	U-OTAR Prepare
	U-TEI-PROVIDE
CMCE Downlink	**CMCE Uplink**
D-ALERT	U-ALERT
D-CALL-PROCEEDING	U-CALL-RESTORE
D-CALL-RESTORE	U-CONNECT
D-CONNECT	U-DISCONNECT
D-CONNECT-ACK	U-FACILITY
D-DISCONNECT	U-INFO
D-FACILITY	U-RELEASE
D-INFO	U-SDS-DATA
D-RELEASE	U-SETUP
D-SDS-DATA	U-STATUS
D-SETUP	U-TX-CEASED
D-STATUS	U-TX-DEMAND
D-TX-CEASED	
D-TX-CONTINUE	
D-TX-GRANTED	
D-TX-WAIT	
D-TX-INTERRUPT	
MLE Downlink	**MLE Uplink**
D-NETWORK-BROADCAST	U-PREPARE
D-NEW-CELL	U-RESTORE
D-PREPARE-FAIL	
D-RESTORE-ACK	
D-RESTORE-FAIL	

Broadcast PDUs

D-MLE-SYSINFO

D-MLE-SYNC

14 Main application window

Figure 4: Title bar, menu bar, control and status bar

The main window of the SCOUT application contains a series of sub windows that can be displayed individually, moved and scaled within the main window.

The main window has four areas:

1. The title bar shows the application name, version and the current filename in use.
2. The menu bar displays the available menus.
3. The control and status bar contains the buttons and status information of the application.
4. The windows area contains the various sub windows:
    - The serving cell data window
    - The adjacent sites data window
    - The radio status window
    - The RSSI/Cx graph window
    - The Easy GPS window
    - The AACH information window
    - The PDU decode window
    - The MapPoint map window (if Microsoft MapPoint is installed)
    - Database editor
    - Data export
    - Cell reselection simulator
5. The bottom status bar show the available free space on the used disk and the power status of the computer. (AC or Batt. and the remaining capacity)

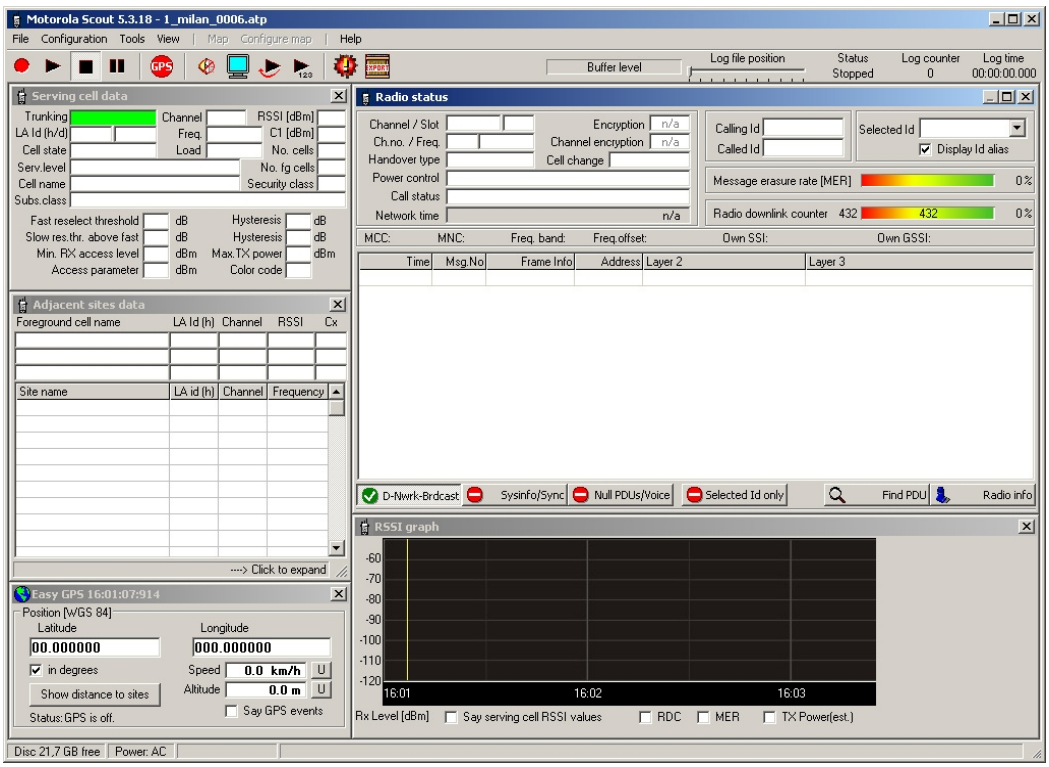


Figure 5: Main application window

15 Control and status bar

Figure 6: Control and status bar buttons

Clicking buttons on the toolbar works in the same way as if the corresponding command is selected from the menu.

This document mainly describes how to select commands from the menu bar.

1 [Record] button
2 [Play] button
3 [Stop] button
4 [Pause] button
5 [GPS] button
6 [Sound] button
7 [Monitoring] button
8 [Play again] button
9 [Play in order] button
10 [Cell reselection simulator] button
11 [Data export] button

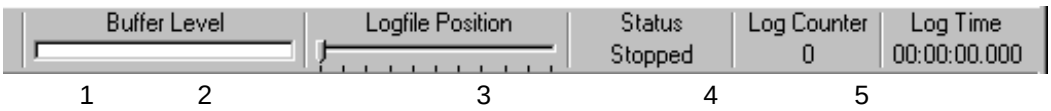


Figure 7: Control and status bar indicators and control

1 Buffer level
2 Logfile position slider
3 Application status display
4 Log counter
5 Log time

1. The buffer level progress bar gives you during record and monitoring an indication of the radios serial interface input buffer. Usually the bar should remain mostly unseen or occasionally flash to the middle of the scale. If the bar remains at the right side or close to the right end, your computers speed is either too low or the computer is busy with other tasks. **This is serious**. The messages from the radio will not get the proper time stamp and an input buffer overflow may occur.
2. The logfile position slider is functional as soon as file is loaded. Move the slider to scroll through the loaded file. After selection of the slider by a mouse click use the left and right arrow keys of the keyboard to step message by message through the loaded file.
3. The status display shows what status SCOUT is currently in. The display changes between ‘Stopped’, ‘Recording’, ‘Playing’, ‘Monitoring’ and ‘Pausing’.
4. The log counter is a line (message) counter of the loaded file or, during record, counts the number of received messages from the radio.
5. The log time displays the time stamp of the currently selected message. At record the display shows the current computer time.

16 The menu bar

16.1 File

16.1.1 Record (Ctrl-R)

This starts a recording session, same as pressing the record button.
See Page 50.

16.1.2 Quick record (Ctrl-Q)

This starts the recording session session immediately.The filename is derived from date and time.
See Page 51

16.1.3 Monitoring (Ctrl-M)

This starts the monitoring session, same as pressing the monitor button.
See Page 51.

16.1.4 Play (Ctrl-P)

This replays a previously recorded file, same as pressing the play button.
See Page 52.

16.1.5 Play again (Ctrl-A)

This replays a previously recorded file again, without Open File dialog.
See Page 52.

16.1.6 Play files in order (Ctrl-O)

This replays a previously recorded sequence of files; select the first file to start with.
See Page 52.

16.1.7 Pause

Playing is paused.

16.1.8 Stop (Ctrl-S)

Any recording, monitoring or play is stopped.

16.1.9 Save file part from start to log file position as…

Move the log file position slider, click the PDU list or move to a location in the graph display to select a position within the loaded file. Data from the beginning to the current position is saved into a new file.

16.1.10 Save file part from log file position to end as …

Move the log file position slider, click the PDU list or move to a location in the graph display to select a position within the loaded file. Data from the current position to the end of file is saved into a new file.

16.1.11 Load configuration

Load your favorite configuration file.

16.1.12 Save configuration

This saves your current configuration. The configuration file saves the following parameters:

Database filenames:	Locations and alias database currently loaded.
Database keys:	Key to retrieve the site name from database.
Filter button state:	Filter button state of the radio status window.
Main window state:	Size and position of the main application window.
Active windows:	Size and position of currently active windows.
Display options:	Width and no. of columns of the PDU-list in radio status window.
Communication ports:	Assigned serial port and baud rate for radio and GPS.
Type of recording:	Timed or message related
Log file size:	Selected number of messages per file.
Number of log files:	Selected number of files per recording session.
Time per log file:	Selected max. record time per file.
MM filters:	Selected mobility management filters.
CMCE filters:	Selected circuit mode control entity filters.
MLE filters:	Selected mobile link entity filters.

All settings for the MapPoint Navigation window and map plot settings are stored in the Microsoft Windows registry.

16.1.13 Create default configuration file

This option resets SCOUT to default parameters and creates a new Default.cfg file.

16.1.14 File info

Shows the header of the currently loaded SCOUT data file.

16.1.15 Print active window

Prints the selected (highlighted) sub window. (Screen copy)

16.1.16 Exit

This closes the SCOUT application.

16.1.17 Last files played

Up to five filenames are listed here for faster selection and replay.

16.2 Configuration

This section provides information on how to set-up various parameters of the SCOUT application.

16.2.1 Log options

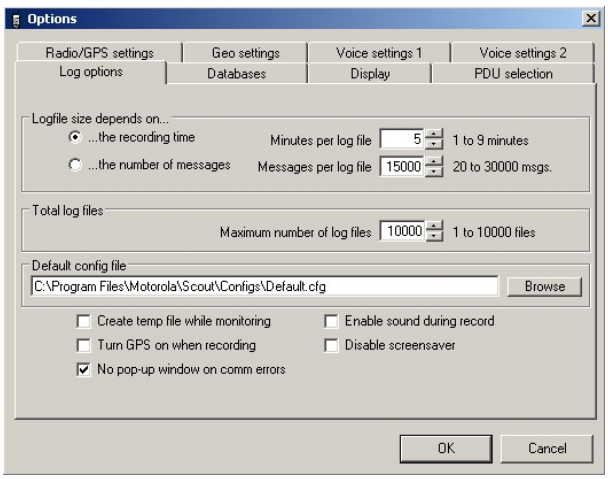


Figure 8: Log options

Log file size depends on…

…the recording time - Select if you want a time or number-of-messages related recording.

Adjust the maximum time recorded in each log file.

Range: 1 minute to 9 minutes

…the number of messages - Adjust the maximum number of messages recorded in each file.

Message range: 20 message to 30000 messages

Total log files

Maximum numbers of log files - Adjust the maximum number of log files per session. By default it's the maximum.

Log file range: 1 log file to 10.000 log files

Note: If message related recording is selected and the maximum time of nine minutes is reached, a new log file is created even if the amount of messages received is less than selected.

Default config file – Select the configuration file that will be loaded at next start of SCOUT.

Create temp file while monitoring - Mark the checkbox if you want to have a temporary file created while monitoring. If checked a file named **'Monitoring.atp'** is created in the current log file directory. The log file size depends on the previously described selections. The difference is that no new file is created when the condition for creating a new file is met. The file **'Monitoring.atp'** will be overwritten. (Loop recording)

Enable sound during record - Mark the checkbox if you want to have always sound during record.

Turn GPS on when recording – Check this box if you want to turn GPS automatically on when you start a recording.

Disable screensaver – If checked the current Windows screensaver is disabled during SCOUT runtime and enabled again after SCOUT application is closed.

No pop-up window on comm errors – Disables the nagging 'No data from radio' and 'No data from GPS' window.

Use file compression – This feature zips the atp files by 80 percent to save disk space.

Don't forget to save the changes you've made to a configuration file.

16.2.2 Database files and keys

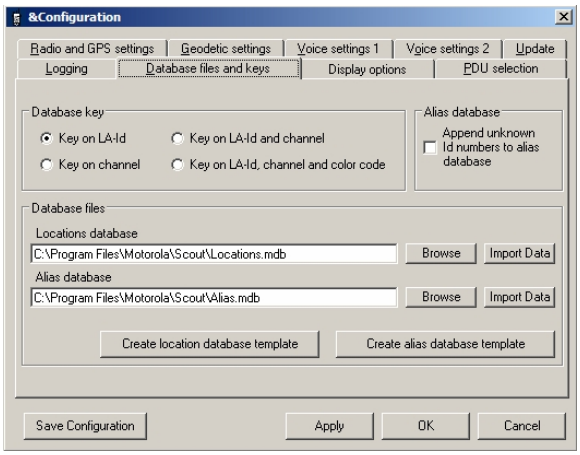


Figure 9: Database files and keys

Database Key - A TETRA site is identified by at least the frequency (channel) or the location area identity (LAid). Depending on the networks topology, frequency reassignment or size of location areas it is necessary to select a combination of individual features for the exact identification of a site.

Select which key(s) SCOUT will use to retrieve a site name from the database.

Alias database - If you want to have your alias database extended during record or monitoring, mark the box and SCOUT will add new entries to your database. The state of the checkbox is not saved and has to be set every time because SCOUT can not determine if the currently loaded database has to be extended with information from the monitored network. By default the box is unchecked. The entries in the database are the received id number and the name field is ‘new’. During replay the entry ‘new’ is ignored and the number is displayed even if ‘Display id aliases’ in the radio status window is checked. Use Microsoft Access or the ‘Micro edit’ of SCOUT to update the entries.

Database files - Select the databases you want to use for recording, monitoring or replay of files.

The buttons for creating a template are making a copy of the currently loaded database. The new database files are located in the same directory as the loaded ones. Use these files to create new databases for other networks or groups.

The import data button lets you select a text or Excel .csv file to update, expand or create a new Location database or Alias database.

Don’t forget to save the changes you’ve made to a configuration file.

16.2.3 Display options

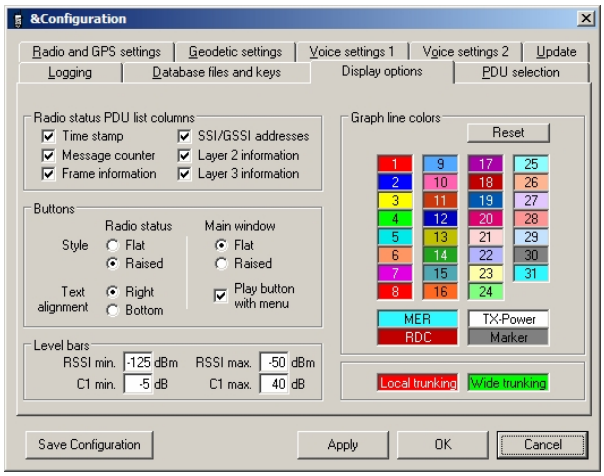


Figure 10: Display options

Radio Status - Select which columns are displayed in the PDU list of the Radio status window.

Buttons - Select the text orientation and the style of the filter buttons in the Radio status window. Select the button style of the main window.

Level bars – define the boundaries of the level bars displayed above the MER and RDC bar.

Don't forget to save the changes you've made to a configuration file.

Graph line colors - Customize the color of the graph lines by clicking the colored box and assign a new color from the color select dialog. Color index number of the line color of the RSSI graph and Cx graph.Adjust the entry in the locations database file to point to the corresponding color.

Select the color for local site trunking and wide trunking.

The color information is stored immediately in the windows registry. There is no need to save a configuration file if changes are made here.

16.2.4 PDU selection

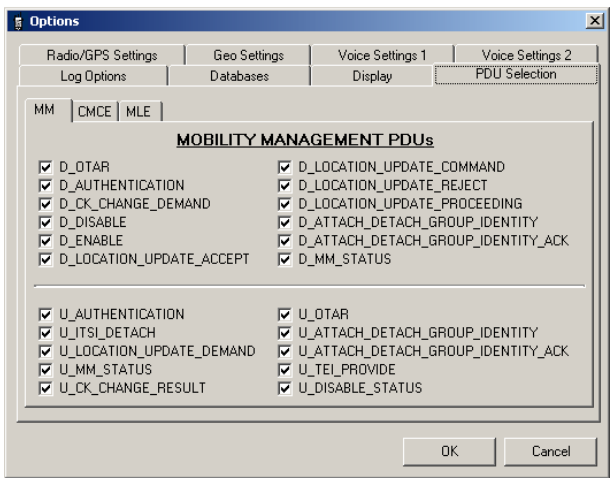


Figure 11: PDU selection

Select which PDUs are filtered during record, monitoring or replay from the PDU list of the radio status window.

Don't forget to save the changes you've made to a configuration file.

16.2.5 Radio and GPS settings

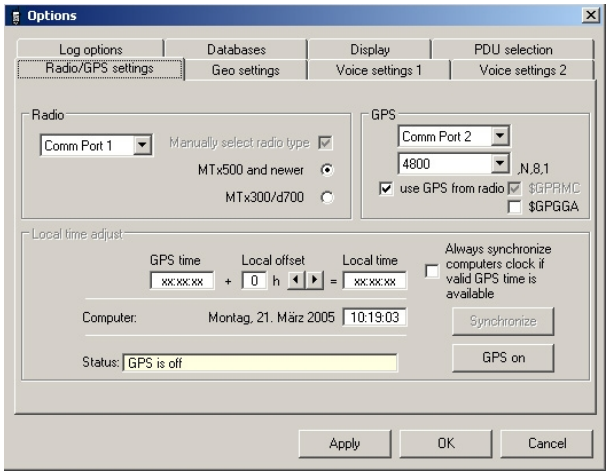


Figure 12: Radio and GPS settings

Radio - Select the serial interface the radio is connected to.

Choose if SCOUT will try to auto-detect the connected radio or select manually the radio type.

GPS - Select the serial interface the GPS receiver is connected to.

SCOUT uses the standard NMEA-0183 protocol with standard communication parameters, 4800 Baud, no parity, 8 data bits, 1 stop bit. Additionally you can select the baud rate used by the receiver. SCOUT uses any available message to decode the latitude, longitude, time information and validity of coordinates. The GGA message gives additional altitude information.

Use GPS from radio - check this box if you have a Motorola radio with GPS support attached and you want to use this receiver for location information.

Local time adjustment - turn GPS on and off with the button. As soon as you get a valid GPS position fix, the Status line shows you the number of satellites being tracked and the 'Synchronize' button is enabled. Now you can synchronize the computers clock to GPS time.

Don't forget to save the changes you've made to a configuration file.

16.2.6 Geodetic information

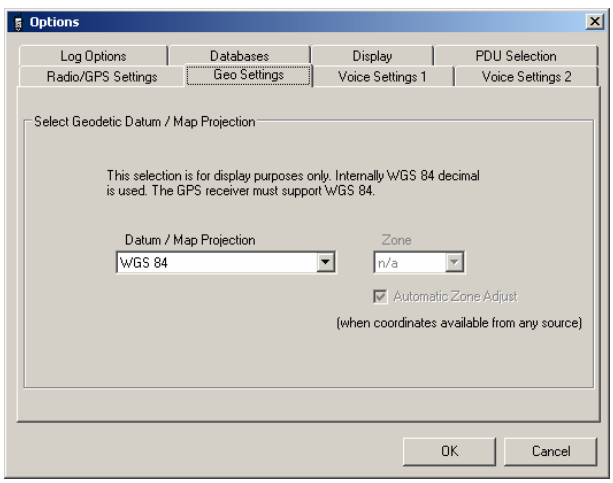


Figure 13: Geodetic information

If you want to use a different geodetic datum or map projection displayed, select here your preferred system. By enabling the Auto Zone Adjust checkbox, SCOUT determines the right zone of the selected geodetic datum as soon as a valid coordinate is present. This can be either from the GPS or during replay of a recorded file.

16.2.7 Voice settings 1

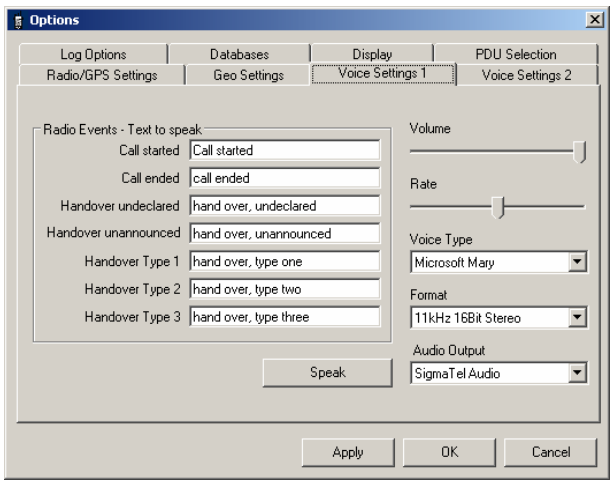


Figure 14: Voice settings 1

SCOUT uses the Microsoft Speech Engine for audible events. Here you can edit and test the associated text spoken. Select the voice type and the audio quality as well as the volume and speech rate (speed).

16.2.8 Voice settings 2

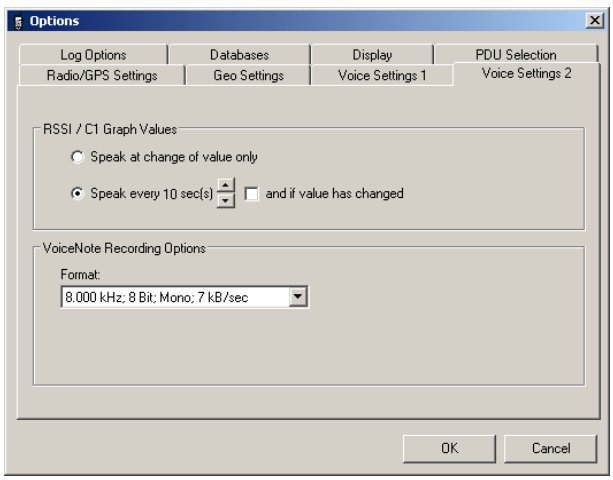


Figure 15: Voice settings 2

- Select /adjust the interval the RSSI or C-value is spoken.
- Select /adjust the recording format of the VoiceNotes audio recorder.

16.2.9 Update

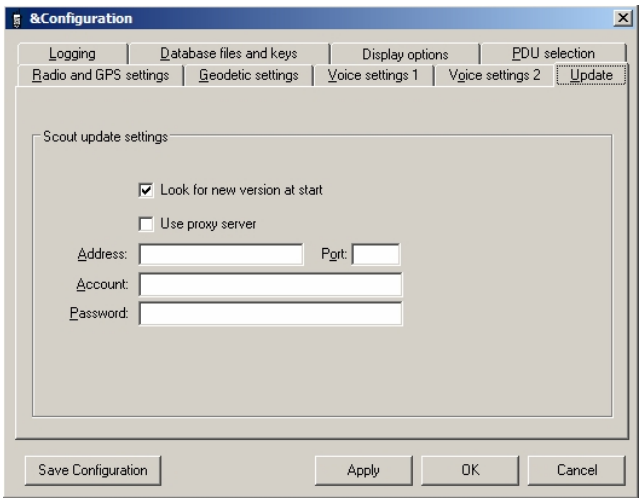


Figure 16: Update

If you want Scout to look for new version make your selection accordingly.

16.3 Tools

16.3.1 Data export

Make your selections from the top to the bottom and from left to right.

- Select the file format you want to have the data exported to.
- Select the geodetic datum / map projection.
- Select the export values.
- Select your preferred data separator.
- Select the data you want to have exported in each line.
- Select the data input. If either a single file has to be converted or a sequence.
- Select the data output. The data export will go into one single file or sequential files are kept separate.
- Select the source/start file.
- If you want to have the data into a different directory as the source data, change the target directory.
- Press Start Export and watch the progress bar.

Options that are not available are greyed, depending on the selected export format.

Supported formats:

.txt simple line output
.csv Excel csv file
.dxf AutoCAD® import/export file format
.mif MapInfo interchange format
.mre MapPoint re-import. This creates a file for faster file loading into MapPoint.
.s3d Combo data format

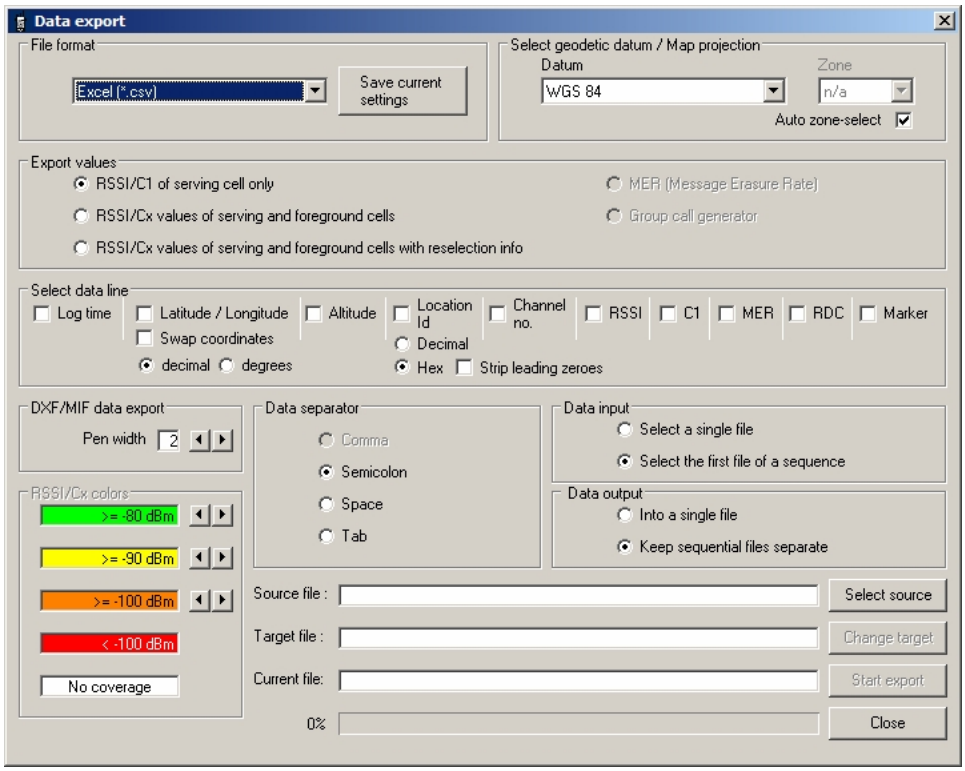


Figure 17: Data export

Some examples:

Text file format (txt)
Selection: RSSI/C1 if serving cell only
Data separator : Semicolon
Data line: Logtime, Latitude,Longitude, Location id, Channel, RSSI, C1

This is the resulting line:
07:43:51:011;13.2952890;52.5765970;000003;3612;-96;14

Selection: RSSI/Cx values of serving and foreground cells
Data separator : Semicolon
Data line: Logtime, Latitude,Longitude, Location id, Channel, RSSI, C1

This is the resulting line:
07:43:51:011;13.29528 …. -96;14;000001;3627; -96;14;000002; 3611;-101;9;000004;3631; -101;9

The data line is extended by three blocks of foreground cell information each formatted in the order:
Location id(1);Channel no.(1);RSSI(1);Cx(1);
Location id(2);Channel no.(2); RSSI(2);Cx(2);
Location id(3);Channel no.(3);RSSI(3);Cx(3)

Selection: RSSI/Cx values of serving and foreground cells with reselection info
Data separator : Semicolon
Data line: Logtime, Latitude,Longitude, Location id, Channel, RSSI, C1

This is the resulting line:
07:43:51:011;13.29528 …. -96;14;0;000001;3627; -96;14;000002; 3611;-101;9;000004;3631; -101;9

The line is extended by the “Reselection information”, three blocks of “foreground cell information”, "Type", "CurrentChannel", "Timeslot", "LogChannel".
Reselection is either “0” or “1” to indicate a cell reselection event
Type is the reselection type. (undeclared, unannounced,Type1,Type2,Type3)
CurrentChannel is the actual TETRA channel the radio is using.
Timeslot shows the used time slot.(1, 2, 3, 4)
LogChannel shows the logical channel (MCCH, TCH, FACCH, SACCH)

RSSI;C1;Reselection;LocID(1);….;Type;CurrentChannel;Timeslot;LogChannel
… -103;7;1;000005;3612;-99;9;000002;3611;-101;9;000004;3631;-102;8;Undeclared;3612,1,MCCH

16.3.2 Database editor.

If you do not have Microsoft Access installed on your computer you can use this editor to modify the currently loaded locations database or alias database.

Select the tab to select either the locations database or the alias database.

Click the header, then right click to sort the entries.

Press the Import Data button to open a dialog window for data import.

The files have to be text format and the same structure as the database.

The selected font size is saved and present the next time the window is opened.

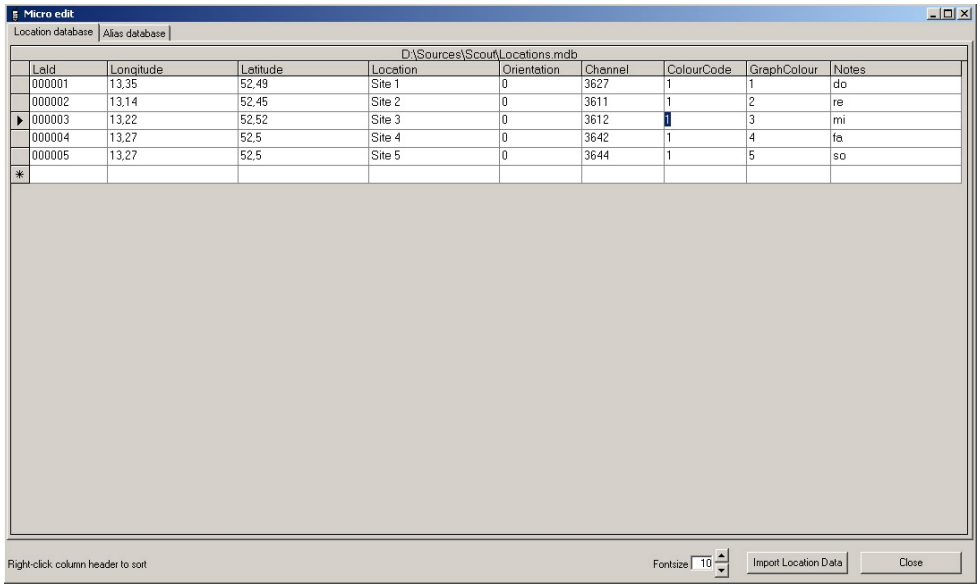


Figure 18: Database micro editor

16.3.3 Database import

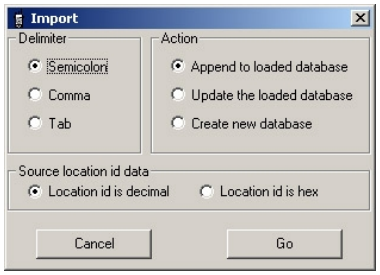


Figure 19: Database import

Select the delimiter of your input file. Semicolon, comma or tab.

Select the action to be done.

- Append the data to the currently loaded database. CAUTION! Duplicate entries causing an import error. Make sure that the appended data are different.
- Update the loaded database.
- Create new database.

Specify if the source location id data are decimal or hexadecimal.

Press to <Go> button to continue. If you selected to Create a new database a file save dialog appears where you have to enter the filename. Be aware that the currently loaded database cannot be overwritten with this new file.

16.3.4 Cell reselection simulator

This tool gives you the opportunity to simulate cell reselection offline and to understand the cell reselection behaviour of TETRA radios.

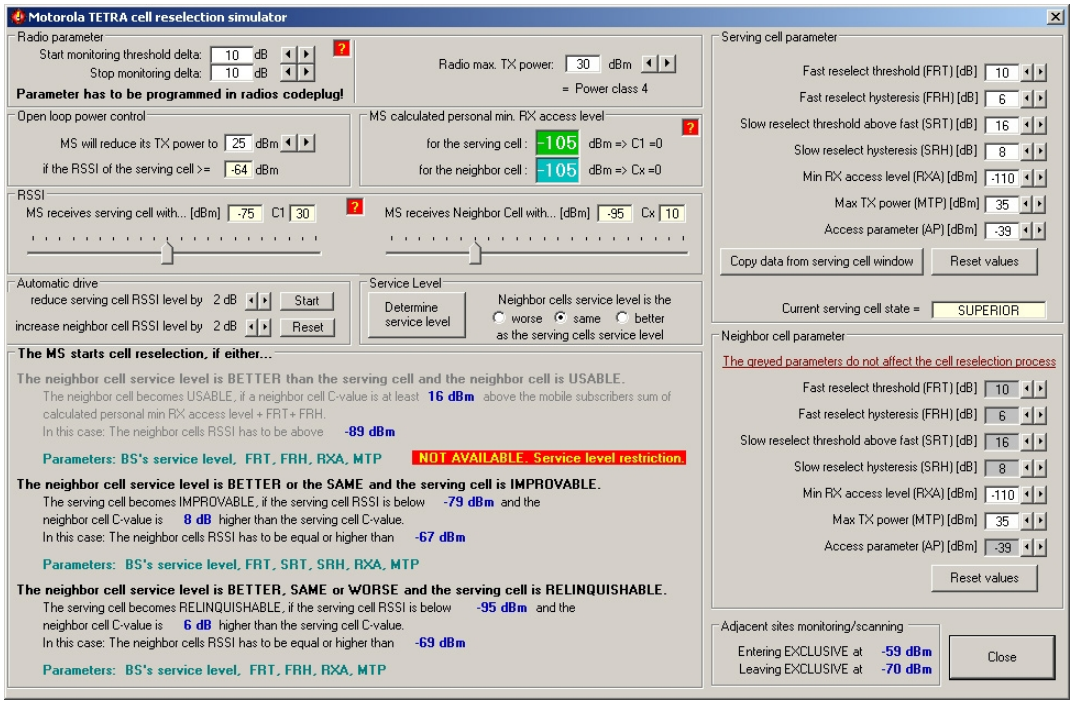


Figure 20: Cell reselection simulator

The Serving cell parameters shows at start always the Motorola standard system parameters. Use the <Pick data from serving cell window> button to copy the entries from the serving cell data window. This works only if data are present.

The Neighbor cell parameters section lets you select the service level relationship of the serving cell and neighbor cell. You will see that, depending on your selection - better, same, worse - the availability of reselection options, shown at the bottom in the **MS's cell reselection decision section**, is restricted.

If you want to determine by detail the service lLevel, press the 'Determine service level' button. A dialog window opens where you can select the status of the serving cell and the neighbor cell. At the bottom of this window you will see the result of your selection immediately and the main cell reselector window is updated, too.

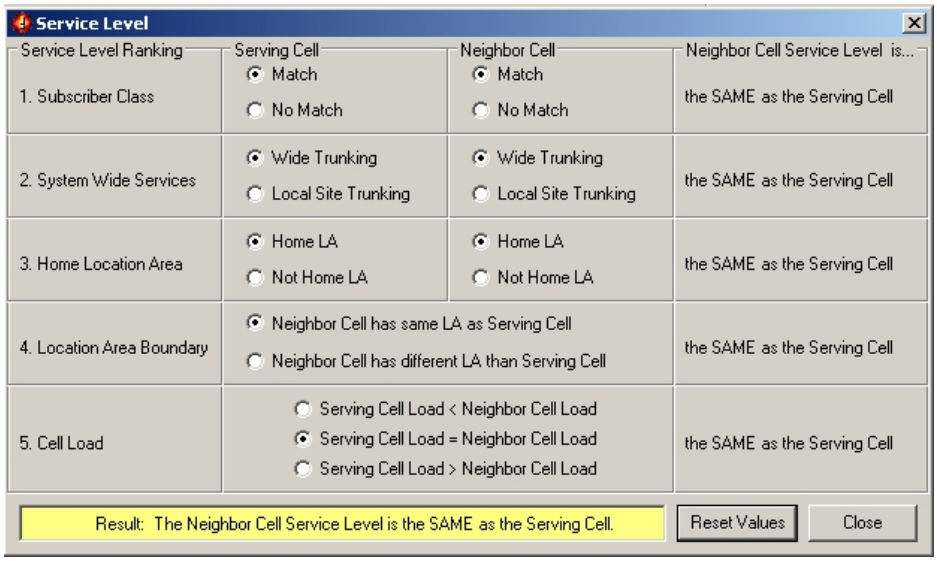


Figure 21: Service level

The mobile subscriber parameters section lets you select the maximum TX power of the radio.

The value is usually 30 dBm for a portable and 35 dBm for a mobile.

Depending on the parameters entered at the serving cell parameters section the MSs personal MinRXAccessLevel is being calculated. This value is affected by the serving cell parameters MinRXAccessLevel and MaxTXPower and the radios own Max TX Power.

This parameter equals C1 = 0 for the radio. TETRA sites received with this RSSI level or less are ignored. Change the MinRXAccessLevel and MaxTXPower values to see when the radio starts monitoring cells and how the radios TX power affects this parameter.

The <MS's reduced power> selector and the <MS will reduce power at…> are related to each other. According to the serving cells AccessParameter the radio will reduce its TX power to the value you have entered at <MSs reduced power> if the RSSI level of the serving cell is above the value shown at <MS will reduce power at…>. This shall show you the influence of the Access Parameter value and the open loop power control of the radio.

The two sliders <MS receives serving cell with…> and <MS receives neighbor cell with…> let you simulate the RSSI levels from the serving cell and the first scanned neighbor.

MSs cell reselection decision

This part shows the three reselection options available according to the shown levels.

Play with the threshold and hysteresis parameters in the serving cell parameters section at the top and see the values changing and as well the conditions for a cell reselection. Move the sliders to find a reselect condition. The corresponding type is highlighted in green.

The c**urrent serving cell state** indicator shows you the relationship of the serving cell to the neighbor cell.

These states are:

Exclusive:

The RSSI level of the serving cell is higher than the sum of:

*Fast Reselect Threshold + Slow Reselect Threshold Above Fast + Start Monitoring Threshold Delta + Stop Monitoring Delta**

The radio does not monitor neighbor cells because the received RSSI from the serving cell is more than sufficient.

* The start monitoring threshold delta and the stop monitoring delta values are programmed in the radios code plug.

Being in EXCLUSIVE mode and the RSSI is less than:

Fast Reselect Threshold + Slow Reselect Threshold Above Fast + Start Monitoring Threshold Delta

The radio starts monitoring for neighbor cells.

Superior:

This state is determined when none of the level criteria shown in the reselection condition part is met.

Usable:

If the levels required for the USABLE type reselection are met.

Improvable:

If the levels required for the IMPROVABLE type reselection are met.

Relinquishable:

If the levels required for the RELINQUISHABLE type reselection are met.

Read the text of the reselection options to understand when and what levels are necessary to fulfill the respective reselection condition.

Click the green boxes with the question mark to get some help text for the section related parameters.

16.3.5 Group call generator

The group call generator is pushing the PTT. Enter a value for the duration of how long the PTT is pressed and a time for the pause in between. Select at the radio a suitable talk group and start monitoring or recording.

Right-click the colored text fields ‘Successful’, ‘Unsuccessful’ or ’No Service’ to select a different color for display. The same color is used in the MapPoint window to paint the trace. The color values are stored in the windows registry after the color select dialog is closed.

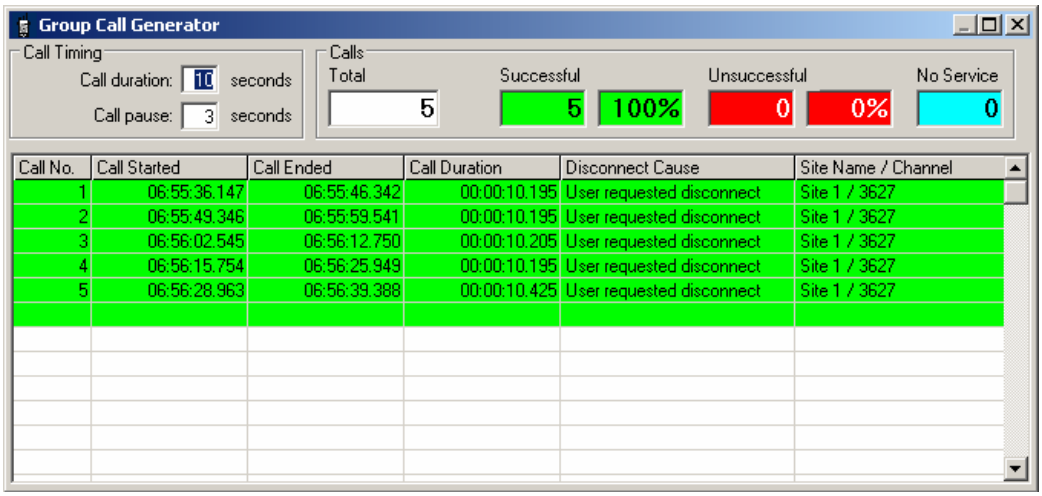


Figure 22: Group call generator

16.4 View

Opens and brings to front the selected sub window. You can use the short keys F5 to F9 and F11, F12 to do the same. This is useful if some window is hidden or partially overlapped by another.

Caution: Do not use the menu bar during record. As soon as you select a menu topic Windows stops all background activity. This includes the radio message reception and decoding. Use the function keys F4 to F9 and F11, F12 instead.

16.5 Map

(Only available when Microsoft MapPoint is installed and activated)

16.5.1 Standard

Toggle the visibility of the Microsoft MapPoint standard menu.

16.5.2 Navigation

Toggle the visibility of the Microsoft MapPoint navigation menu.

16.5.3 Drawing

Toggle the visibility of the Microsoft MapPoint drawing menu.

16.5.4 Location and scale

Toggle the visibility of the Microsoft MapPoint location and scale menu.

These four menu items are part of the Microsoft MapPoint application and made accessible through SCOUT. Please refer to the MapPoint documentation for details.

16.5.5 Import data file

The files written as MapPoint re-import .mre from the SCOUT data export section are loaded here. The format is a standard text format and has to met these conditions:

Latitude;Longitude;RSSI
52.4599200;13.3620230;-93
52.4599200;13.3620200;-93
52.4599220;13.3620180;-93
52.4599220;13.3620170;-93

First line text contains ‘Latitude;Longitude;RSSI’
Then data as text separated by semicolon.

This function imports RSSI values only.

16.5.6 Load MapPoint map

Load a previously stored map.

16.5.7 Save MapPoint map

Store the currently displayed map with all entries shown, plots, base station, labels, etc.

16.5.8 Copy map to clipboard

Copy the currently displayed map to the Windows clipboard. The map can be pasted into other applications from here.

16.5.9 Print map

Open a printer dialog window where you can select your preferred printer, print orientation and paper size. Print a hardcopy of the currently displayed map.

16.5.10 Zoom in, Zoom out, Last view

You can zoom here even if the MapPoint window has not the focus.

Last view gives you, the last zoom factor and position of the map.

16.5.11 Status bar

- Visible

Toggles the status bar at the bottom of the MapPoint window on and off.

The status bar gives you information of the current speed, the GPS location, the selected geodetic datum / map projection and the geographical position where the mouse cursor is pointing at.

By double-clicking on the latitude panel or longitude panel you can toggle the coordinates display between decimal format and degrees, minutes, seconds (DMS) format.

- Coordinates

Select your preferred display decimal or degrees.

- Speed

Select your favored unit; km/h, miles, knots, mach.

16.6 Configure map

(Only available when Microsoft MapPoint is installed and activated)

16.6.1 Plot settings

- Set plot color for range of RSSI values. Click on the desired color box. A color dialog appears where you can select your favored color. The color selection is saved when you close the Plot settings dialog with the OK button.
- Set range of RSSI values. Use the up and down buttons to change.
- Set plot color for range of MER values.
- Select if you want to plot a trail with selected colors in the map or not.
- Adjust the line thickness of the plotted trail.
- Select the plot type RSSI or MER.
- Set the minimum line segment length of the plotted line. The shorter the line segments are, the more information has to be storedand managed by MapPoint. This will decrease the speed of painting if you play many log files in sequence or during a long drive test. Use longer segments to increase painting speed. This will not affect the accuracy. The points in between are stored anyway and are available at replay.
- Select if the map shall be re-centered when the car icon leaves the map screen.
- Select the icon for the car and the different base station states.
- Select if markers at reselect locations, link failure locations, are displayed in the map.
- Markers from the ‘Set Marker’ function
- Marker and balloon from a GPS location from a radios SDS message

16.6.2 Load base stations(s)

This is basically the same as loading a different database in the <Configuration> <Database> menu.

The current icons are erased, the new data is loaded, and the base station icons are painted to the map.

16.6.3 Delete base station(s)

Erase all base station icons from the map.

16.6.4 Find base station

Opens a dialog where all loaded base stations are listed. Highlights the selected station in the map.

16.6.5 Point and click base station add

Opens a dialog where easy adding of base stations to the database can be done. Point on the map and copy the location to the data field by a click. Fill the additional data and save them to the currently loaded database.

16.6.6 Delete trace

Erase all plotted traces from the map.

16.6.7 Delete hand over markers

Delete the handover marker in the map.

16.6.8 Delete link failure markers

Delete the link failure marker in the map.

16.6.9 Delete trace and markers

Erase all plotted traces and handover marker in the map.

16.6.10 Show base station labels

Toggle the display of name labels of the base stations.

16.6.11 Save the base station notes

Manually save then added notes.

16.7 Help

16.7.1 Help

Open the SCOUT help file.

16.7.2 Report a problem

Open your e-mail program for sending a problem report, questions and comments.

16.7.3 Ask for support

Open your e-mail program to cry for help.

16.7.4 Look for new version

Connect to the Motorola Scout webpage to verify if a new version is available.

16.7.5 SCOUT internet page

This opens a link to the Motorola SCOUT webpage. Check for updates here.

16.7.6 About

Show the logo button with the SCOUT version information.

17 Application sub windows

The following section describes the various parameters shown in each of the sub windows. When applicable, reference is made to the relevant standards (ETSI 392.2, TETRA).

17.1 Serving cell

The serving cell data window displays information about the cell the radio is currently attached to. These parameters are displayed in the serving cell data window.

- Trunking: (wide or local site trunking)
- Location area id in hexadecimal and decimal
- RF-Ch.: the MCCH channel number (MCCH: Main Control CHannel)
- Frequency calculated from the channel number and system information
- Cell name (as entered in locations database file Location field)
- RSSI and C1 levels
- The cell state of the serving cell (Exclusive, Superior, Usable, Improvable, Relinquishable)
- The cell load (unknown, low, medium, high)
- The service level (Better than neighbor, Same as neighbor, Worse than neighbor)
- The current security class of the serving cell
- The subscriber classes allowed on the serving cell
- Fast reselect threshold
- Fast reselect hysteresis
- Slow reselect threshold above fast
- Slow reselect hysteresis
- Minimum RX access level
- Maximum TX power
- Access parameter
- Number of currently scanned foreground cells
- Number of adjacent cells

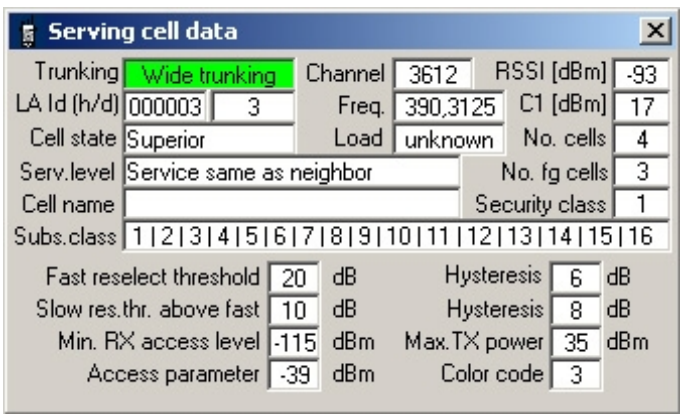


Figure 23: Serving cell data

17.2 Radio status

The Radio status window displays information about the status of the radio and the Layer 2 and Layer 3 PDU information.

The following parameters and related information are displayed in the Radio status window:

- The physical channel currently assigned, i.e. ‘MCCH’, ‘TCH’, STCH
- The assigned timeslot
- The assigned RF channel
- The frequency of the RF channel
- The cell reselection type
- The cell change status
- Current radios call state, i.e. ‘Idle’, ‘Ringing’, ‘Connecting’
- Encryption mode of the radio
- Encryption of the used traffic channel
- MER Message Erasure Rate
- RDC Radio Downlink Counter
- Calling Id
- Called Id
- Selected Id
- Display numbers / alias checkbox
- MCC – Mobile Country Code
- MNC – Mobile Network Code
- Freq. band - TETRA frequency band.
- Freq. offset - TETRA frequency offset.
- Layer 2 and Layer 3 PDUs. (The messages displayed and their interpretations are fully described in ETS 300 392-2, ETS 300 392-7).
- Filter buttons to suppress frequent messages
- Display a selected Id only
- Info about the attached radio

If you want to use the filtering of Ids, type the SSI or GSSI in the ‘Selected Id’ box or choose from the drop down list. This list reflects the contents of the alias database. Activate the ‘Selected Id only’ button at the filter bar.

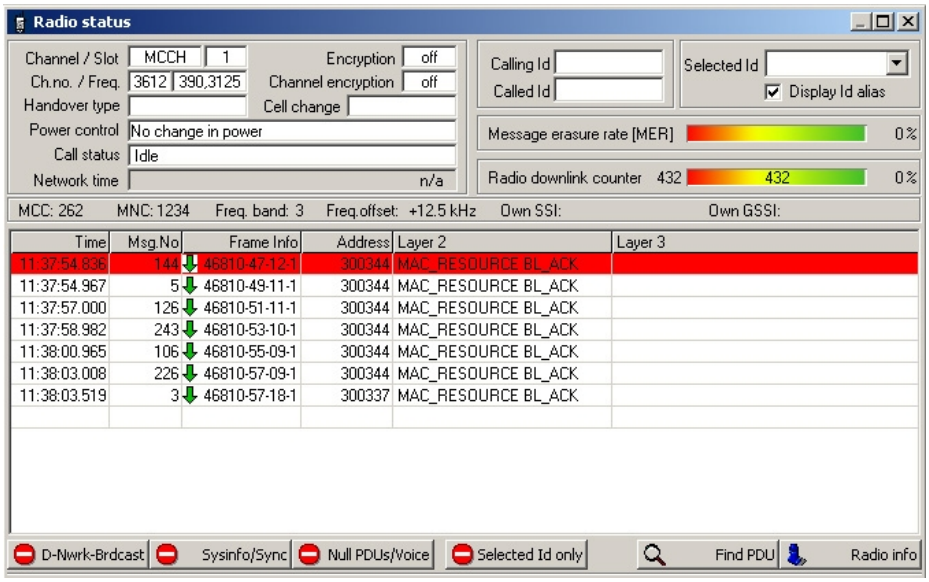


Figure 24: Radio status

17.3 PDU decode

The Layer 2 and Layer 3 PDU information can be decoded to display the full information of a message.

Click the PDU list to select a message.

All other windows are updated, reflecting the state of the radio at the selected time.

Double-click the line to display the decoded PDU in a separate window or press the <Enter> key alternatively to open the PDU decode window.

Click a different line of the PDU list. The PDU decode window contents are updated if possible.

Use the up and down arrow keys to scroll through the list.

The PDU decode window has six buttons at the top.

From left to right:

- Exit — Close the PDU decode window.
- Save — Save the currently displayed text in the window to a text file.
- Copy — Copy the contents of the window to the clipboard.
- Print — Print the contents of the window.
- Left, Right Arrow — Select and decode the previous or next message from the PDU list.

Press <Esc> alternatively to close the PDU decode window.

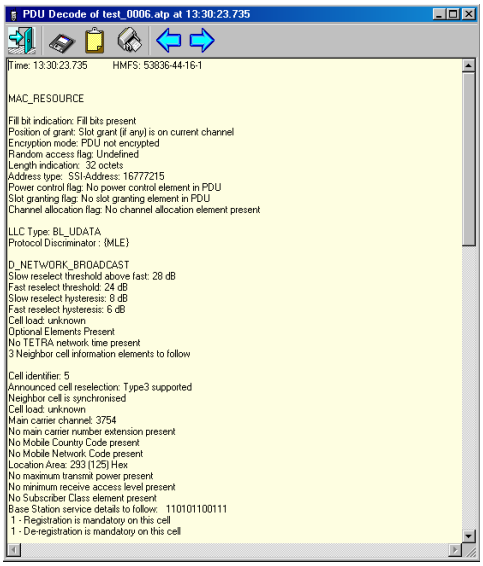


Figure 25: PDU decode

17.4 Find PDU

The Find PDU button at the bottom of the radio status window can be used to search the list for a specific PDU. When clicked, a window (Find PDU) is opened. This window is used to navigate and find PDUs that are listed in the current table. The search can be done forward (Find Next) or backwards (Find Previous).

The Goto Timestamp feature allows you to jump to a specific time in the layer 2 / layer 3 PDU information log.

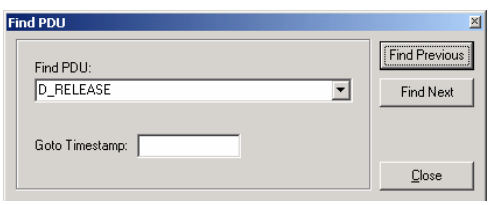


Figure 26: Find PDU

17.5 Adjacent sites

This window displays foreground and adjacent cell information.
The following parameters are displayed in the adjacent sites data window.
Foreground cells (upper three rows)

- Cell name (if available from locations database)
- Location area Id
- MCCH channel number
- RSSI and Cx level.

Adjacent cells (lower list)

- Cell name (if available from locations database)
- Location area Id
- MCCH channel number
- MCCH Frequency
- Min Rx Access Level
- Max Tx Power*
- MCC(Mobile Country Code)*
- MNC(Mobile Network Code)*
- Main Carrier Extension(Band, Offset, Duplex space)*
- Subscriber classes*
- Security class*
- Color Code of first foreground cell*
- in extended view

Green entry: Site available in wide area trunking.
Red entry: Site off or in local site trunking.

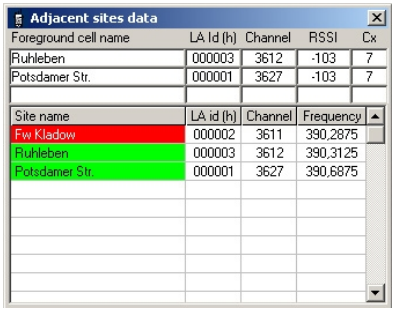


Figure 27: Adjacent sites data

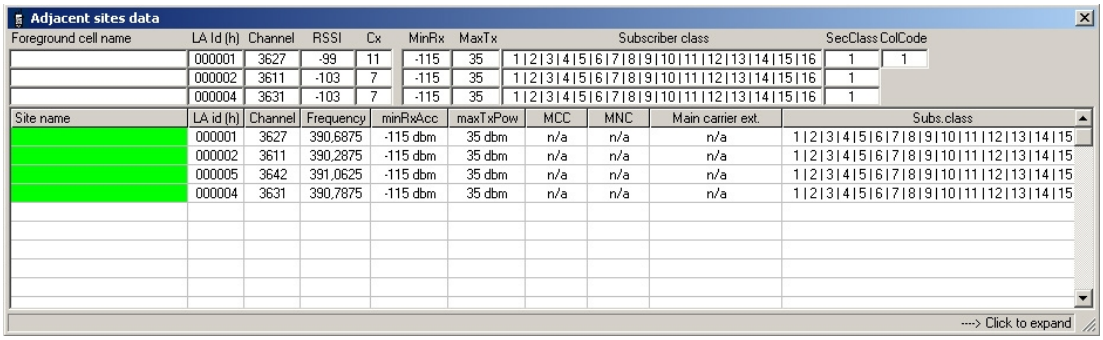


Figure 28: Extended adjacent sites data

Extended view can be activated either by resizing the window manually, or double click into the Neighbor Sites list (the lower list). Double click into the list again to resize to the previous window size.

17.6 RSSI / Cx Graph

The RSSI window opens when you select it from the view menu or by pressing F8.

The Cx window opens when you select it from the view menu or by pressing F9.

These windows are displaying graphically the received signal strength (RSSI) or path loss (C) of the serving cell and the foreground cells. The color at the bottom of the graph indicates the current serving cell. All other colors correspond to cells that are in foreground scan. The calculated (estimated) transmit power for the radio can also be displayed in this sub window.

You can activate or deactivate the display of the estimated TX-power of the radio anytime. This line is derived from calculation of received TETRA parameters, NOT from measured data or messages from the radio. (The white line)

The activation of the MER box gives you an indication of the Message Erasure Rate along the driven route. (The cyan line at the bottom)

The colors of the graph lines can be selected at the <Configuration>, <Display> window.

After loading a file, click into the graph area to synchronize the PDU list of the Radio Status window.If you hold down the mouse button the cursor changes to a double arrow. Move the cursor to the left or to the right to scroll through the loaded data.

The screen is updated, reflecting the state of the radio at the selected time.

You can use as well the keyboard to navigate the graph.

Use the left/right arrow keys to move in small steps. Pressing and holding down the CTRL key while using the arrow keys increases the size of the steps. Pressing and holding down the CTRL and SHIFT keys while using the arrow keys increases the size of the steps again.

Use the PgUp, PgDown, Home or End keys to scroll two minutes to the left or right, or jump to the beginning or end of the graph.

This feature is not available during record or monitoring.

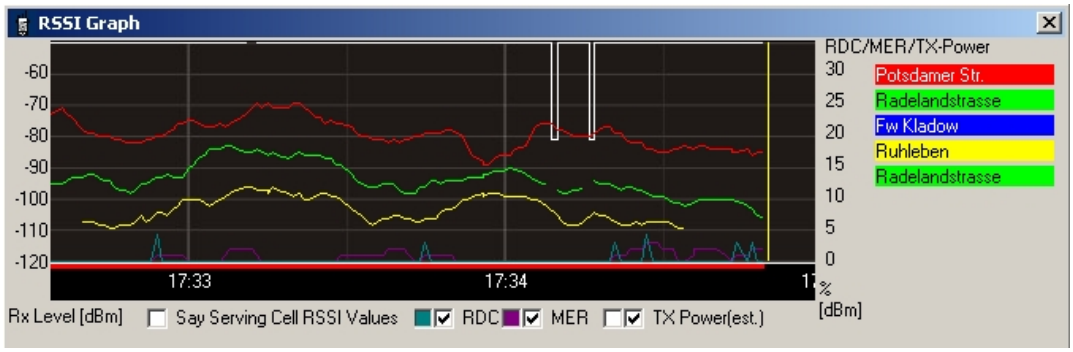


Figure 29: RSSI graph

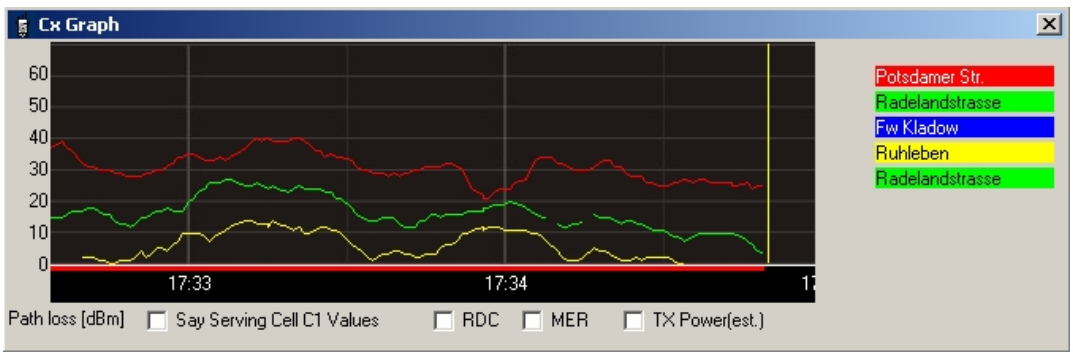


Figure 30: Cx graph

17.7 Access assignment channel (AACH)

The content of the window shows the timeslot dependant information of the AACH.

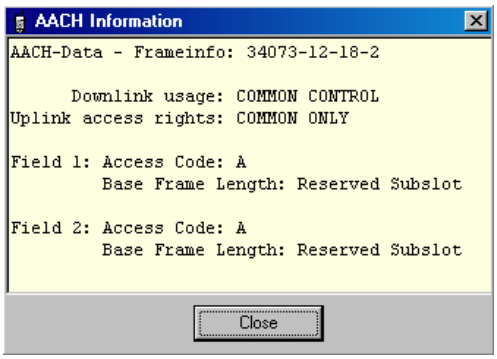


Figure 31: Access assignment channel (AACH)

17.8 Easy GPS

The easy GPS window opens when you select it from the view menu or by pressing F11.

The window consists of an upper and a lower part.

If you press the <Show distance to sites> button, the upper part is visible. Press the button again to hide the upper part.

The upper part of the window:

Here are the distances to the current serving cell and scanned foreground cells displayed. The distance is calculated using the latitude, longitude entries of the locations database and the current coordinates when a valid GPS fix is available. The site names are taken from the Locations database, too.

The lower part of the window:

The header shows the currently used geodetic datum. See <Configuration>, <Geodetic Datums>.

On obtaining a valid coordinate (either from a locked GPS received or from a recorded trace) the background color changes from red to green.

You can select decimal display or degrees, minutes, seconds by marking the DMS checkbox. The status line gives you information about the current status of the GPS receiver.

Click the 'U'(nit) button or the speed label to scroll through the different units. I.e. km/h, miles, knots, mach.

The altitude information is only available if your GPS receiver supports the GGA message.

Click the 'U'(nit) button or click the altitude label to toggle the display between meters and feet.

The selected units are stored immediately and are present at next application start.

The x,y button rotates through the available coordinate systems.

The ||| button selects a different zone if available.

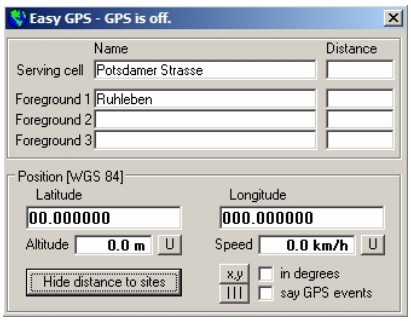


Figure 32: Easy GPS

17.9 VoiceNotes (Ctrl-V)

The VoiceNotes feature gives you the opportunity to record short voice notes to remember incidents, landmarks or circumstances along the drive test. SCOUT does NOT check the settings of your computers audio system. Verify that the microphone is selected as the recording source and that the recording level suits your requirements. You can record some test notes in advance before you go to a drive test. Read SCOUT in STOP mode paragraph below.

Check the 'Stay On Top' box to prevent VoiceNotes from being hidden by other windows.

The Record trigger let you select to start the recording manually with the space bar or buttons or by radio. If you select >by radio< you have to ensure that SCOUT 'knows' the attached radios ISSI and GSSI. Press the PTT once or change the group during record. Now SCOUT records as long as the radio is part of a call.

It's the responsibility of the user to establish a suitable interface from the radios audio connector to the computers line-in input and to set up the computers record source properly.

SCOUT just starts and stops the recording the selection of the proper input has to be done by the user.

17.9.1 SCOUT in RECORD mode

Press the VoiceNotes RECORD button to start the recording of your voice note and the VoiceNotes STOP button to halt.

The status display shows either 'Stop' or 'Rec'. You can use alternatively the SPACEBAR to start and stop the recording. The first press starts the recording, the second press stops. The SPACEBAR function is only available during record mode.

The VoiceNotes PLAY and REPEAT buttons have no function while SCOUT is in record mode.

The voice note is saved in the Windows '.wav' format. The filename consists of the current recorded filename and a counting number starting from zero and is stored in the same directory as the SCOUT data file.

The SCOUT data file records a reference to the recorded voice note file. You must have the VoiceNotes files and the corresponding SCOUT data files in the same directory while replaying a data file. During replay the notes are played back when the VoiceNotes window is open. If the VoiceNotes window is closed the playback of audio is disabled.

17.9.2 SCOUT in PLAY mode

To listen to the recorded voice notes the VoiceNotes window has to be opened and visible.

If the VoiceNotes window is closed no voice notes are played.

17.9.3 SCOUT in STOP mode

Click the RECORD button to record a voice note. Enter a filename for the note at the FILESAVE dialog. After clicking the dialogs SAVE button the recording starts. Click the STOP button to halt the recording.

Use the PLAY button to play the notes you have previously recorded. Select from the FILEOPEN dialog window the audio file you want to play. Use the REPEAT button to play the last note again.

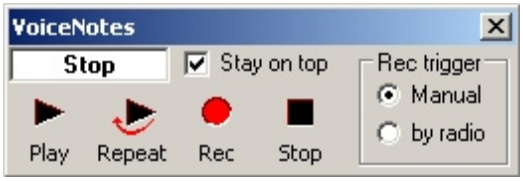


Figure 33: VoiceNotes

17.10 Levelbars (Ctrl-L)

The former Quality indicator window became a Level bars window and is now part of the Radio Status window showing RSSI and C1 level of the serving cell.

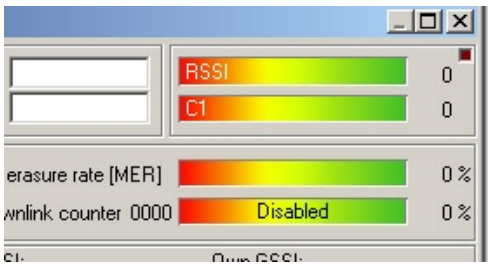


Figure 34: Level bars

17.11 New file buttons (Ctrl-N)

The New data file window lets you start a new file during a recording session and/or to set markers.

If you have to record in areas where no GPS is available (i.e. subway) you can split the files in segments according to predefined landmarks (train stations).

This window is always on top. Move it to your desired location on the screen and use the buttons either with mouse or keyboard.

Figure 35: New file buttons

- The >New file< button starts immediately a new data file and increments the index number.

- The >New file and pause< button does the same but additionally pauses the recording. The button text changes to >Continue< . After pressing this button again the recording continues with a new data file.

- The >Set marker< button sets a mark into the data file and into the RSSI graph and Cx graph display. The markers are numbered and are a set within a recording session. If you continue a recording, SCOUT is looking for the last markers index number and continues up-counting.

The markers are exported, too. (See Data export window)

17.12 GPS events monitor (Ctrl-E)

The GPS events monitor window lists the decoded GPS SDS messages of Motorola radios
Click a line of the list to synchronize with PDU list.

Program an attached radio as target for SDS messaging to capture data from moving radios. The location is shown in the MapPoint window, too.

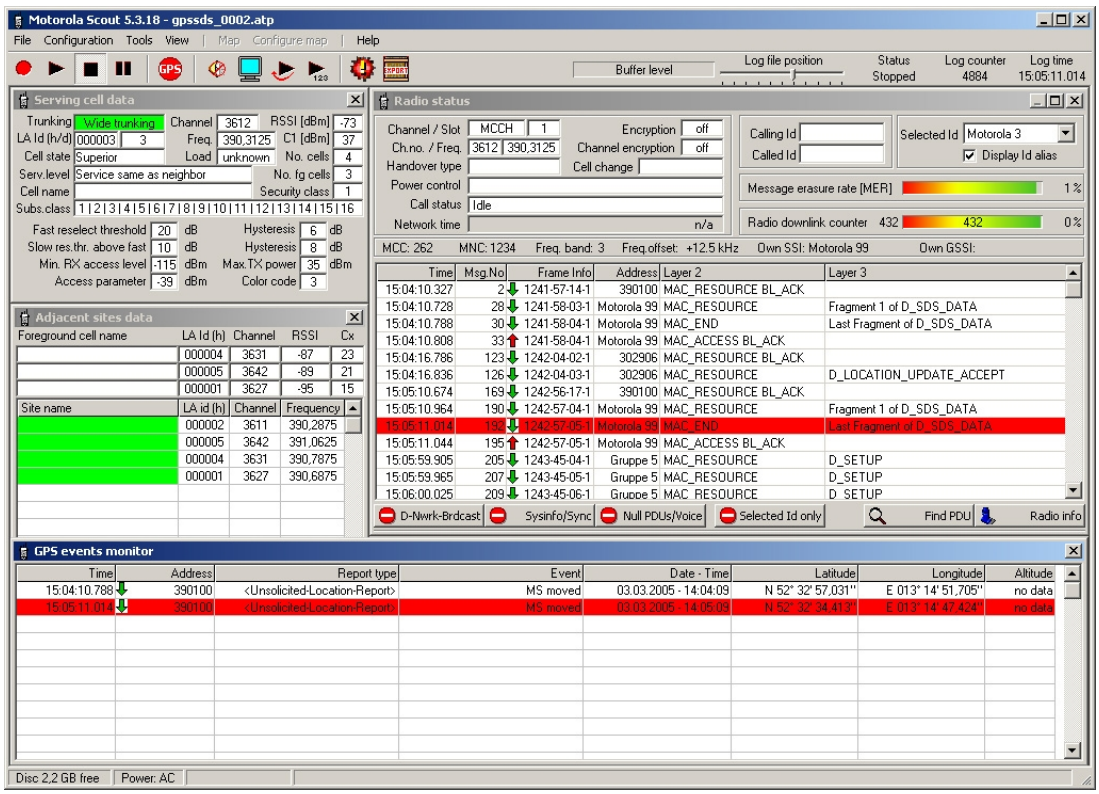


Figure 36: GPS events monitor

17.13 Radio info (Ctrl-I)

This window shows detailed information about the connected Motorola radio.

Figure 37: Radio info

17.14 Microsoft MapPoint (F12)

Microsoft MapPoint is a standalone product with its own documentation. Please refer to the MapPoint manual or any third party publication.

The displayed or selected menu bars are part of MapPoint and therefore the explanation out of the scope of this document.

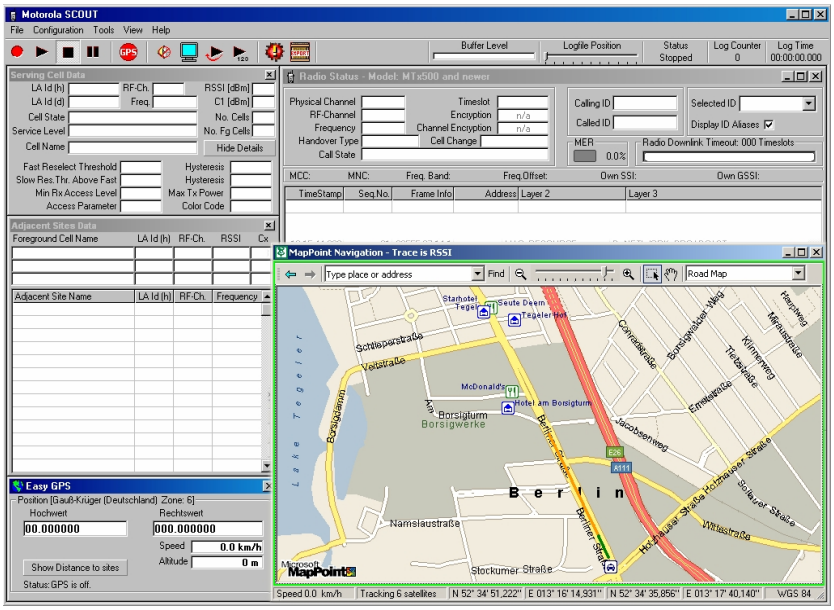


Figure 38: Main window with MapPoint

The bottom status bar of the Microsoft MapPoint window is showing from the left to the right:

1. Vehicle speed
2. Y - Coordinate of the GPS.
3. X - Coordinate of the GPS.
4. Currently used geodetic datum / map projection.
5. Y - Coordinate of the cursor.
6. X - Coordinate of the cursor.

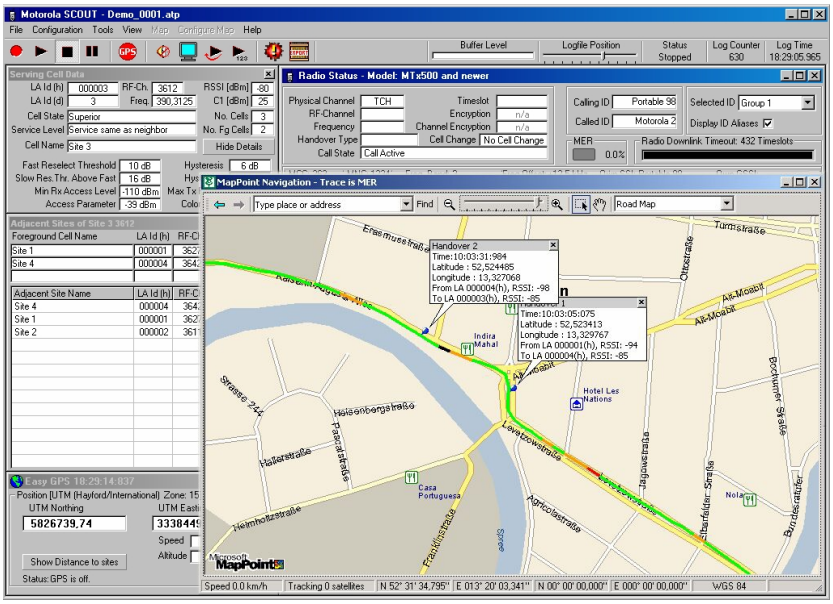


Figure 39: Map window showing MER and reselection marker

17.15 Map plot settings

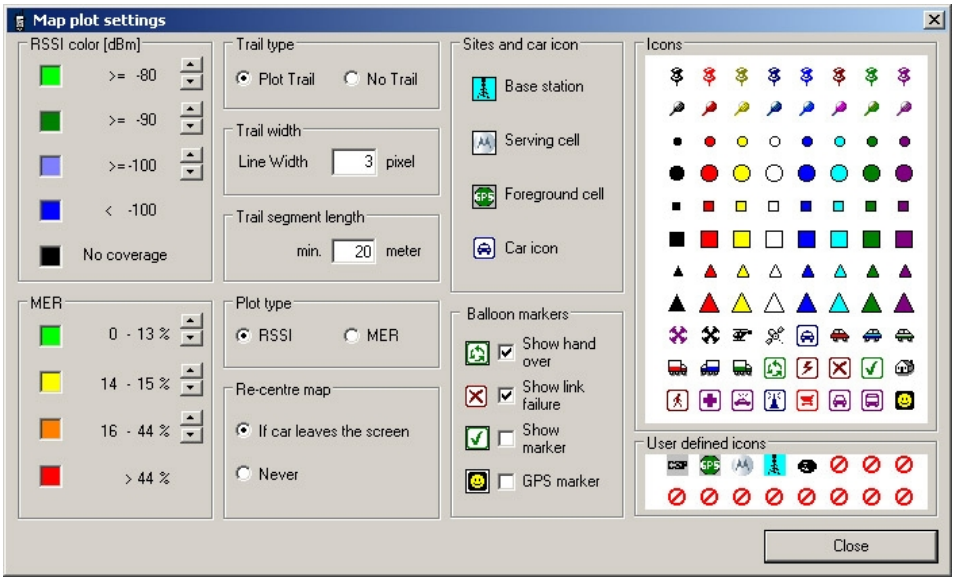


Figure 40: Map plot settings

- Set the range of RSSI values. Use the up and down buttons to change.
- Set the plot colors for the range of MER values.
- Select if you want to have plotted a trail in the map with selected colors or not.
- Adjust the thickness of the plotted line.
- Select the plot type RSSI or MER.
- Set the minimum line segment length of plotted line. The shorter the line segments, the more information have to be handled by MapPoint. This will decrease the speed of painting if you play many log files or during a long drive test. Use longer segments to increase painting speed. This will not affect the accuracy. The points in between are stored anyway and are available at play.
- Select if the map has to be re-centered when the car icon leaves the map screen.
- Select the icon for the car and the different base station states.
- Select if markers at handover locations are displayed in the map.
- Select if markers at link failure locations are displayed in the map.
- Select if markers at marked locations are displayed in the map.
- Select if markers at GPS locations from sent SDS messages are displayed in the map.

18 Quick start guide

18.1 Recording

DO NOT remove the hardware key at runtime. Make sure that the dongle is connected safely and will not shake loose during operation. SCOUT will abort recording, playing, etc. and halts with an error message.

Prepare the radio as described in section 6.3. Connect the data cable to the radio and the PC. Go through the configuration section of SCOUT and verify all adjustments if they meet your requirements. Make sure you have set-up and selected the radio and GPS receiver interfaces properly.

Press the GPS button at the toolbar.

The Easy GPS window will give you information about the received satellites and quality of position.

If the receiver has a valid position fix, the latitude and longitude display changes from red to green.

If the receiver lost satellite reception, the latitude and longitude display changes from green to red.

Wait for the display to become green. This may take some time, please refer to the GPS manufacturers users manual.

Press the RECORD button.

A file dialog opens where you have to enter the name of the current recording session.

You don't need to type the extension, SCOUT appends automatically.

You don't need to type the index number of the filename, SCOUT appends automatically.

If you want to continue a sequence of files after having a pause, just double-click one of the filenames of the sequence.

SCOUT looks automatically for the last filename of the sequence and creates a new one with the next available index number.

IMPORTANT

Since SCOUT is not able to determine the GSSI of the attached radio on its own, it is recommended to press the PTT of the radio once, or change the talkgroup back and forth. SCOUT reads these information from the exchanged PDUs and displays in the Radio Status window the 'Own SSI' and 'Own GSSI'.

Now SCOUT is able to display the Call State of the radio properly.

Press the STOP button to halt the recording.

During record information are stored in the file only. What you see on the screen are the last events. You have to load a file to analyse the data and scroll through the file. By simply pressing the PLAYAGAIN button you will load the last recorded file into memory.

To prevent accidental shutdown of the SCOUT application, the usual termination keys, like the main windows <x> button, CTRL+F4, and <Exit> from the <File> menu, are disabled. Termination of SCOUT is only possible when SCOUT is in Stop mode.

One touch record

To continue a stopped recording session simply press and hold down the record button for at least one second, recording starts after release of button. Recording doesn't start if you have left the button area before release.

Quick record

Press Ctrl-Q to start recording immediately. The filename is composed from the date and time.

(i.e 20051101_135521_0000.atp)

18.2 Monitoring

DO NOT remove the hardware key at runtime. Make sure that the dongle is connected safely and will not shake loose during operation. SCOUT will abort recording, playing, etc. and halts with an error message.

IMPORTANT

Since SCOUT is not able to determine the GSSI of the attached radio on its own, it is recommended to press the PTT of the radio once, or change the talkgroup back and forth. SCOUT reads these information from the exchanged PDUs and displays in the Radio Status window the 'Own SSI' and 'Own GSSI'.

Now SCOUT is able to display the Call State of the radio properly.

Press the MONITORING button when you want to have a quick look to the radio and the network without recording the information to a file. Press the button again to STOP or use the STOP button.

To prevent accidental shutdown of the SCOUT application, the usual termination keys, like the main windows <x> button, CTRL+F4, and <Exit> from the <File> menu, are disabled. Termination of SCOUT is only possible when SCOUT is in Stop mode.

18.3 Playing

DO NOT remove the hardware key at runtime. Make sure that the dongle is connected safely and will not shake loose during operation. SCOUT will abort recording, playing, etc. and halts with an error message.

To prevent accidental shutdown of the SCOUT application, the usual termination keys, like the main windows <x> button, CTRL+F4, and <Exit> from the <File> menu, are disabled. Termination of SCOUT is only possible when SCOUT is in Stop mode.

18.3.1 Play

Press the PLAY button at the toolbar; select the file you want to play back. Wait for the file to be loaded into memory. You may PAUSE or STOP anytime.

18.3.2 Play again

Press the PLAYAGAIN button to play the last loaded file again. If you have no file loaded, the file open dialog appears. You may PAUSE or STOP anytime.

18.3.3 Play files in order

Press the PLAYINORDER button, select the first file of a sequence or a file from within a sequence to play this and the following files. You may PAUSE or STOP anytime.

19 Help

Bug Reporting and Questions please mail to: RNBPE@Motorola.com