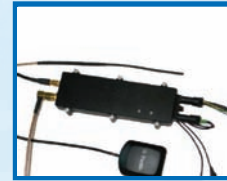


# VTS

## Vehicle Tracking Systems



# TSU INDEX

## Vehicle Tracking Systems

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2	7302	GPS Vehicle Tracking System
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4	7304	Container Tracking System
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6	7306	BTS Cell Site Information Software
7	7307	Covert RF/GPS Vehicle Tracking System
8	7308	Covert RF/GSM/GPRS/GPS Vehicle Tracking System

# VEHICLE TRACKING SYSTEM WITH MAGNET BASE

## Model 7301

Model 7301 is a professional GPS location system for monitoring and tracking of uncooperative target vehicles.

The development of the Model 7301 was the result of a cooperative effort between Elaman and members of the intelligence community. Utilizing tracking system design and manufacturing experience, Elaman developed the Model 7301 based on requirements from real world intelligence professionals, for a system with a rapid deployment capability. The result was a complete, highly flexible system with a wide range of options for the collection, transmission and electronic map display of geographic position data that can be installed quickly and covertly.

The system consists of:

- The Model 7301 remote unit is a self-contained tagging device. It has a magnetic mount for fast and easy installation. The internal and not rechargeable high capacity battery, combined with the low power consumption of the remote unit, supports extended deployments without operator intervention. The Model 7301 remote unit can store up to 300,000 positions between downloads.
- The 7301 Management Software interface provides control of the following Model 7301 remote unit functions:
  - *Localization* - real-time reporting or historical log download of geographic position via GSM or GPRS
  - *SMS transmission* - time schedule, time intervals or alarm activation for reporting of the geographic position via SMS to a mobile phone or a PC with a GSM wireless modem card enabled for SMS
  - *Low Power Consumption* – Motion Sensor



The 7301 Management Software stores the information sent from the Model 7301 remote unit and manages the display of data seamlessly on raster, MaPoint maps or Google Earth.

### FEATURES:

- *separate power supply for GSM* and GPS modules: the remote unit can get points according to parameters chosen by the user and keeps the GSM module off, thus prolonging battery life
- *alarm loss GPS position*: in case of lack of GPS position after a certain chosen time, the device sends an alarm SMS with the last fixed position
- *sends GSM position*: in case of lack of GPS signal and with a movement the device sends an SMS with the information regarding the primary GSM cell to which it is registered
- *SMS sending to two different SIM numbers*: the information can be sent to two preset GSM numbers
- *forced wake up*: it is possible to keep the unit in a dormant status to conserve the battery and it is possible to set a forced wake up cyclically or one shot
- *geo fence*: it is possible to manage two independent rectangular areas. Entering or exiting from an area generates an SMS to the preset GSM numbers

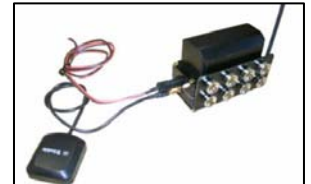
# VEHICLE TRACKING SYSTEM WITH MAGNET BASE

## Model 7301

### MODEL 7301 REMOTE UNIT WITH NON-RECHARGEABLE BATTERY

GPS receiver with memory and digital data transmission through GSM modem 900/1800, 850/1900 or GPRS

power supply	3.6 V dc
	5 V – 36 V with Model 7301 Interface
memory	300.000 points
acquisition modes	time or space
GPS received channels	16
high capacity battery (not rechargeable)	SAFT LSH 20 13.0 Ah (Li-SOCl <sub>2</sub> ) D Size cell
weight (g) without magnetic base and battery	140
dimensions (mm)	85 x 38 x 47



### MODEL 7301 INTERFACE FOR DOWNLOADING TO A PC AND CONNECTION FOR AN EXTERNAL POWER SUPPLY

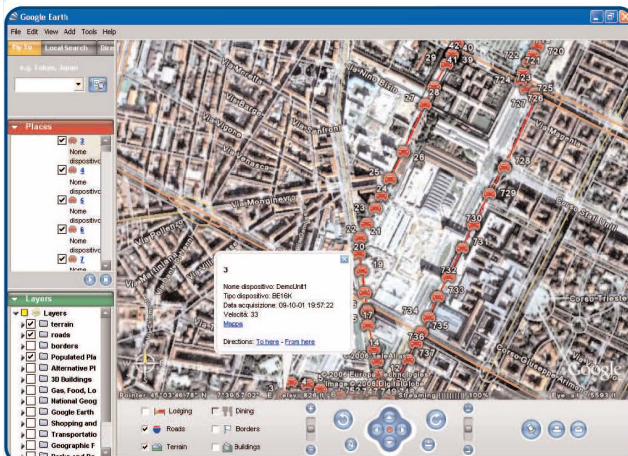
power supply	4.75÷35 V d
output	USB
dimensions (mm)	85 x 38 x 11



### MANAGEMENT SOFTWARE

Compatible with Windows 2000/XP

- developed for Windows 2000/XP
- management of all models of Elaman's remote units
- management of a remote unit book, with different settings for each remote unit
- total control of remote unit functions
- usage of different communication channels (serial cable, GSM-data)



**Model 7301 Software license - dongle for serial port**



**Model 7301 Software license - dongle for USB port**



# GPS VEHICLE TRACKING SYSTEM

## Model 7302

The Model 7302 is a covert real-time tracking, locating and monitoring system for uncooperative mobile targets. The Model 7302 is the newest revolutionary advancement in the well established line of Elaman Tracking Systems. The Model 7302 is the result of a cooperative effort utilizing the extensive design and manufacturing experience of Elaman and the real world knowledge of intelligence professionals. It is a complete, extremely flexible system with a wide range of options for the collection, transmission and electronic map display of geographic position data.

The system consists of:

- The Model 7302 remote unit, which is concealed on or inside the target vehicle. The Model 7302 includes a connection for two remotely selectable microphones for audio monitoring that can be hidden in different areas inside the vehicle. It communicates with the monitoring station over the cellular network (GSM/GPRS or CDMA). The Model 7302 built-in memory stores up to 300,000 positions, which provide a downloadable historical tracking record in situations when real-time communication is not possible.



The 7302 Management Software interface can set the following Model 7302 remote unit operating options via the cellular link:

- Call type – select between the voice, data or GPRS communications modes
- Audio monitoring – enable/disable and control audio monitoring of target vehicle
- Localization – control the real-time or historical download of geographical position data via GSM/GPRS or CDMA communications link
- Alarm activation – set movement, VOX, entrance/exit from a predefined area (geo-fence), digital commands, device operating conditions
- SMS transmission – set a time schedule, timed interval cycle or alarm activation condition for reporting the geographical position to a mobile phone or to a PC with a GSM or CDMA wireless modem card enabled for SMS
- Energy saving – utilization of special hibernation states, and programming the remote unit to turn on and off at specific times or for alarm events

## TECHNICAL FEATURES

### MODEL 7302 REMOTE UNIT

GPS receiver, track memory and data transmission via the GSM 900/1800, GSM 850/1900, GPRS or a CDMA network, as specified at time of order

power supply	4.75÷35 V dc
consumption	fFrom 70 microA to 200mA @ 12V
memory	300.000 points
acquisition period	1 sec to 18 hours
digital & analog input and output	5
GPS received channels	16



# GPS VEHICLE TRACKING SYSTEM

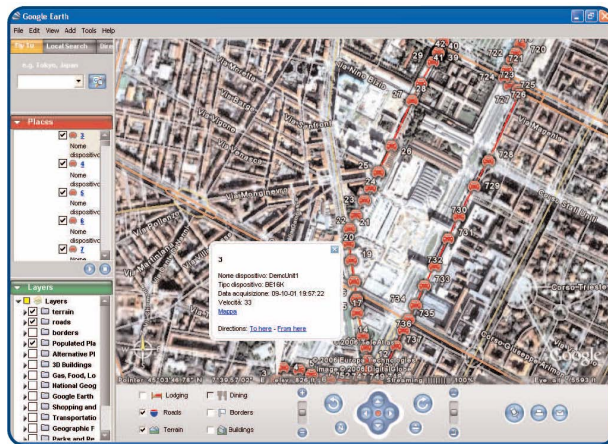
# Model 7302

audio microphones	2 mono, remotely selectable
Weight (gr). with magnetic base	280
Weight (gr). without magnetic base	100
dimensions (mm)	135 x 50 x 14

## MANAGEMENT SOFTWARE

Compatible with Windows 2000/XP or higher

- developed for Windows 2000/XP
- management of remote units
- management of a remote unit book
- total control of remote unit functions
- usage of different communication channels (serial cable, GSM-data, GSM-voice, GPRS, radio)
- management of database recorded tracks, with time-base analysis



**Model 7302 Software license - dongle for serial port**



**Model 7302 Software license - dongle for USB port**



## COMPUTER NOTEBOOK

### Features

- Screen: 10.4" XGA (1024 x 768 Pixel)
- Intel Pentium M (753)
- CPU – 1100 MHz
- RAM: 512/ Max
- RAM: 1024 MB
- HDD: 40 GB
- DVD/CD-RW Combo
- Graphic Card: Intel 855 GM
- Graphics memory: Shared Memory
- Slot Extension: PC- Card Type I
- PCMCIA SM Modem
- Pre installing of client SW

### Accessories

- MS02 – Magnetic mount for the 7302 remote unit
- PK01- Rechargeable external battery pack with magnetic mount
- DP - Dual port PCMCIA adaptor for Notebook PC
- PM GSM - PCMCIA GSM modem for Notebook PC



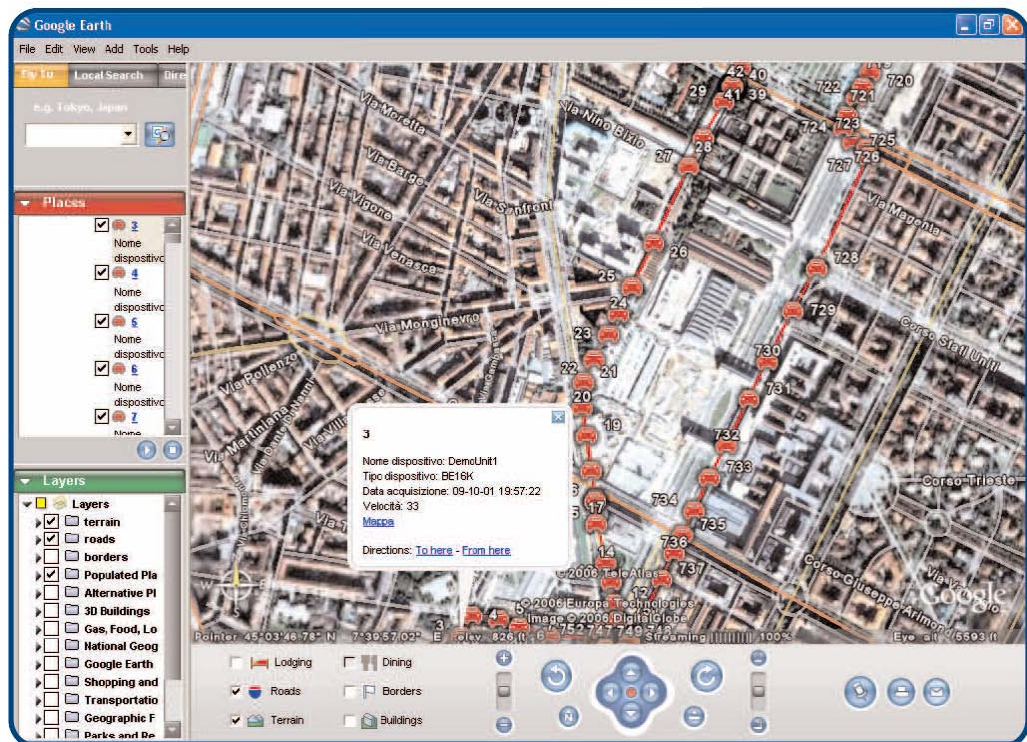
# VEHICLE TRACKING MANAGEMENT SOFTWARE

## Model 7303

### MANAGEMENT SOFTWARE

Compatible with Windows 2000/XP

- Developed for Windows 2000/XP
- Management of all models of Elaman's remote units
- Management of a remote unit book, with different settings for each remote unit
- Total control of remote unit functions
- Usage of different communication channels (serial cable, GSM-data)
- Management of database recorded tracks, with time base analysis
- Compatible cartography: raster maps and vectorial Windows MapPoint based maps
- Internal software able to georeference raster maps
- Possibility to use Divitech maps
- Possibility to load raster maps format GEOTIFF
- Integration with Google Earth - it is possible to visualize the fix in real-time and the downloaded tracks on the maps of web tool Google Earth

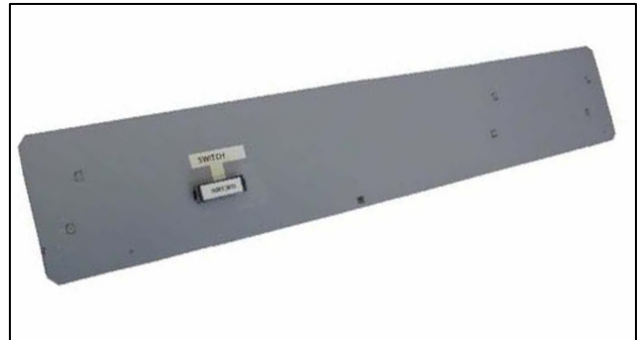


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## CONTAINER TRACKING SYSTEM

## Model 7304

Model 7304 is a professional GPS tracking system designed for covert deployment on a cargo shipping container. The physical appearance of the unit remote's steel case resembles the undulations of a cargo container. The Model 7304 remote unit is designed to be welded onto the shipping container so that the container can be tracked during transport. The Model 7304 remote is a stand alone unit that can be used to monitor the movement of goods transported in a shipping container by truck, rail or sea. The unit communicates with the monitoring station, via the GSM network, to provide both geographic position data and audio surveillance capability. If the container moves to an area without GSM coverage, the remote unit stores up to 300,000 geographic positions, which can be downloaded when communications are re-established.



The system consists of:

- The Model 7304 remote unit composed of a sealed steel case with 4 individually selectable microphones – one on each side. The remote unit has a rechargeable battery and a magnetically activated power on/off switch
- The Management Software interface provides control of the following Model 7304 remote unit functions:
  - *Call* – via the data channel of the GSM network
  - *Localization* - real-time reporting or historical log download of geographic position via GSM network
  - *SMS transmission* - time schedule, time intervals or alarm activation for reporting of the geographic position via SMS to a mobile phone or a PC with a GSM wireless modem card enabled for SMS
  - *Energy saving* – utilizing special hibernation states and programming the remote unit to turn on and off at specific times and events

The Management Software stores the information sent from the Model 7304 remote unit and manages the display of data seamlessly on raster, MaPoint maps or Google Earth.

The Management Software programs the functions of the remote unit, has the flexibility to handle the varied needs of different customers, and is password protected to prevent unauthorized use.



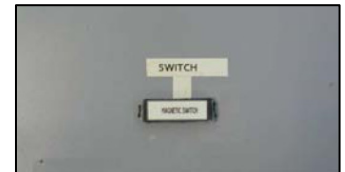
# CONTAINER TRACKING SYSTEM

## Model 7304

### MODEL 7304 REMOTE UNIT

GPS receiver with memory and digital data transmission using an internal GSM modem (either a 900/1800 MHz or 850/1900 MHz)

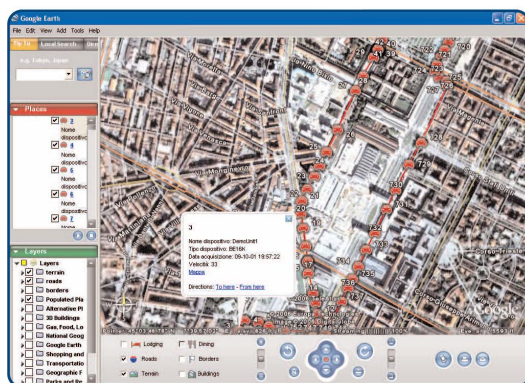
power supply	in-built battery
consumption	from 70 microA to 400mA @7.2 V
memory	300,000 points
acquisition modes	1 sec. to 18 hours
GPS received channels	16
audio microphone	4 mono, remotely selectable



### MANAGEMENT SOFTWARE

Compatible with Windows 2000/XP

- developed for Windows 2000/XP
- management of all models of Elaman's remote units
- management of a remote unit book, with different settings for each remote unit
- total control of remote unit functions
- usage of different communication channels (serial cable, GSM - data)
- management of database recorded tracks, with time-base analysis
- compatible cartography: Raster maps and vectorial windows MapPoint based maps
- internal software able to georeference raster maps (settable by customer)
- possibility of using topographic and professional aerial photos
- possibility of using third party cartography software to receive GPS data



**Model 7304 Software license - dongle for serial port**



**Model 7304 Software license - dongle for USB port**



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## TRACKING VIA SMS FINDER

## Model 7305

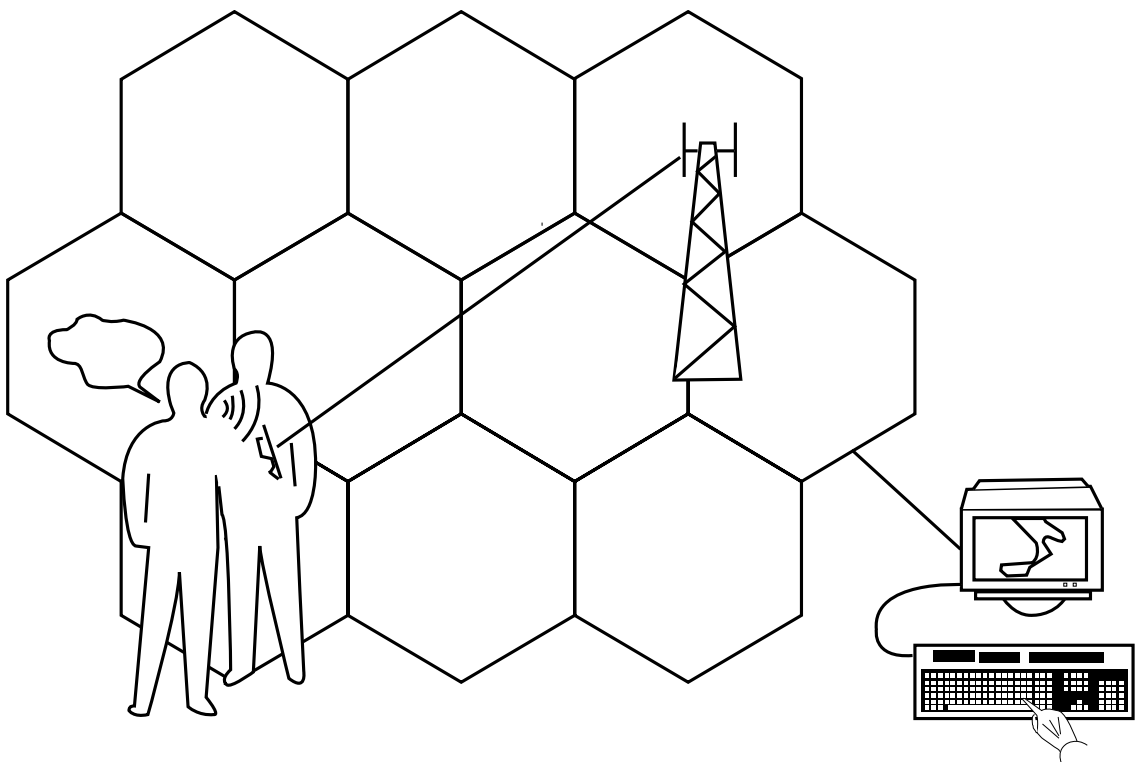
Elaman is proud to introduce a new generation of GSM tracking systems with the Model 7305, a versatile tool with a wide range of audio monitoring and tracking application possibilities:

- it can easily be hidden virtually anywhere, or on anything, and can communicate its position via the GSM network to the monitoring station, which provides a display of its location on dedicated maps
- it is equipped with a variable gain microphone for audio monitoring in situations where it is not possible to use conventional RF transmitters
- Its operating configuration is programmed using SMS messages. There are many functions that can be programmed, including alerting the monitoring station when the unit has entered a predefined area and audio monitoring control
- It also includes a micro switch, which when pressed, initiates a call to a previously designated phone number that can also be used as a duress alert.



The device has been totally redesigned using the latest generation components to provide major performance enhancements:

- *Quadriband*: The new GSM module allows Model 7305 to operate on 850, 900, 1800 and 1900 MHz frequency bands, enlarging its use to several countries
- *Half dimensions*: the already compact dimensions of the previous version of Model 7305 have been reduced almost by half, enabling easier concealment
- *Reduced power consumption*: the stand by power consumption has been reduced by a factor of 10 to provide a longer battery life



# TRACKING VIA SMS FINDER

# Model 7305

## TECHNICAL FEATURES

compatibility	GSM 850/900/1800/1900
power supply	3,6÷4,5 V
microphone	one, with sensitivity adjustment
stand-by consumption	0,3 mA @ 3,6 V (with inside motion sensor)
digital outputs actionable with SMS	2
external input	1
weight (gr)	25
dimensions (mm) without antenna and power supply cables	45 x 35 x 8

## VISUALIZATION

The information on the target location sent by the Model 7305 can be processed and reported on maps using SMS Machine software, which displays the area associated with the BTS(s), where the device is located (Time Advance location estimation).

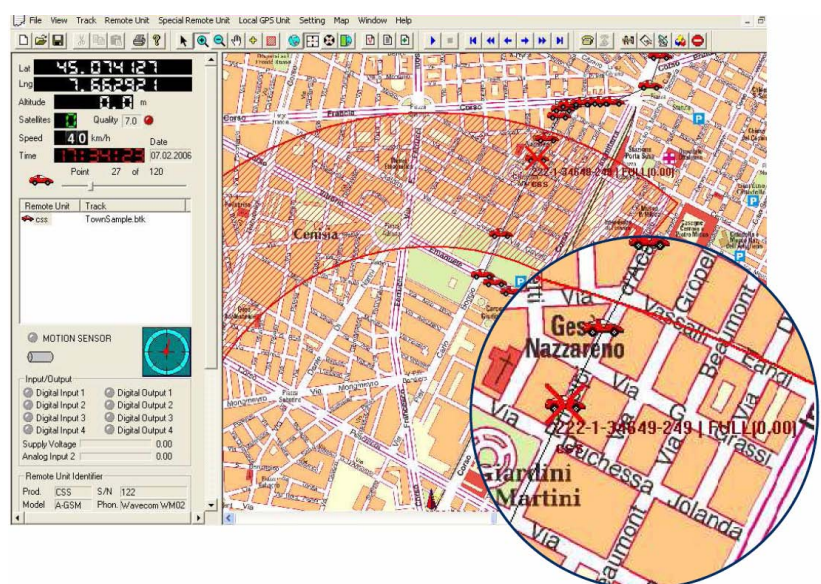
When no database of the BTS position is available, it is possible to create the GSM map of an area using the BTS cell information software, thus tracking targets without GPS availability.

BTS cell information software is a useful tool for all customers who use the Model 7305 for the GSM tracking because it provides more precise target localization than Time Advance estimation alone can.

The BTS cell information software system is composed of a collector unit, which acquires the GPS positions for an area and then correlates them to those of the BTS sites of the different provider, and by a software that manages the download of the collector unit, processes the recorded data and generates a database for display of the surveyed locations on the appropriate map.

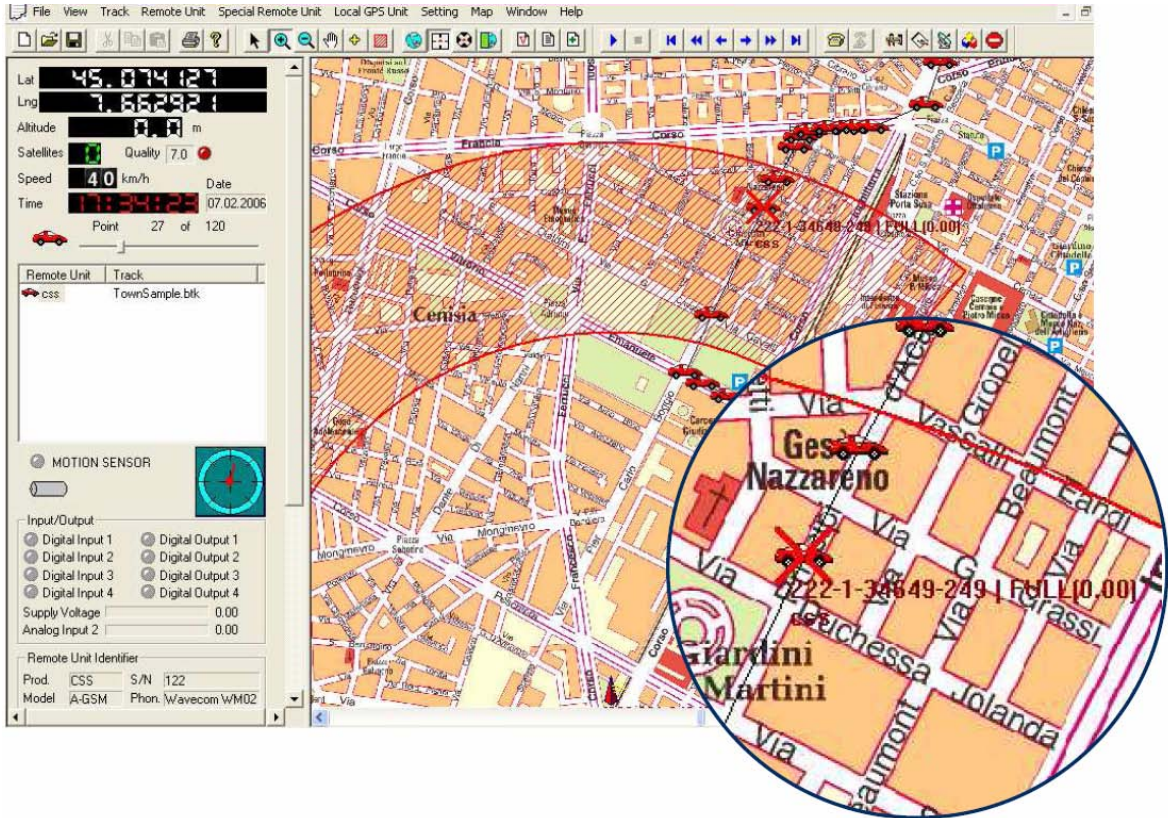
The information sent by the Model 7305 is compared with data stored in the database and the most likely target positions are visualized on the mapping display.

When the BTS location database is available from the service provider, the estimated target location area, based on Time Advance, is also displayed.



# BTS CELL SITE INFORMATION SOFTWARE

Model 7306



The BTS cell site information software is a new system that allows the GSM map of an area to be created, thus tracking targets without a GPS localizer.

The system is composed of:

- The collector unit that acquires the GPS information of an area and correlates it to those of the BTS sites of the different local providers
- The software, to manage the unit to download the recorded data and show it on the map.



## OPERATING MODE

During the survey phase, the collector unit records a set of information about the main BTS to which it is registered and of its adjacent cells.

The unit acquires one provider at a time, according to the SIM card installed.

The recorded data is downloaded on the PC via a serial cable and managed by a flexible and reliable database (PostgreSQL extension GIS).

The information sent by the SMS finder is compared with that stored in the database and the most likely target position is visualized on the mapping display.

When the BTS location database is available from the service provider, the possible target location area based on Time Advance is also displayed.

# COVERT RF & GPS VEHICLE TRACKING SYSTEM

**Model 7307**

The unit is an RF tracking and GPS location system built into one easy-to-use package. The equipment fits into one suitcase and can be deployed onto any tracking vehicle in less than 5 minutes.

## FEATURES

- Installed and ready to use in under five minutes
- RF tracking signal and live GPS fix transmitted back to tracking vehicle
- Maps on a Laptop PC display GPS fixes of both target and tracking vehicle
- Automatic adjustment of averaging reduces the influence of multi-path bearing
- Single page controller display shows all tracking information including beacon status
- Audible tone varies according to range for ease of use
- Audible alarms may be triggered by changes in beacon status
- Built-in transmitter commands Elaman's beacons
- Digital signal processing removes need for operator tuning and improves sensitivity

The unique feature of the unit is the benefit of adding live GPS data to the tried and tested RF tracking capability of the previous generation.

This provides the operator with the best of both worlds.

## DEPLOYMENT OF THE DIRECTION FINDING SYSTEM

1. Place the beacon and GPS antenna on the target vehicle
2. Connect the unit to the car's cigarette lighter
3. Connect Laptop to the unit
4. Place the antenna pod on the roof (arrow pointing towards the front of the car)
5. Connect antenna pod to the unit and switch on

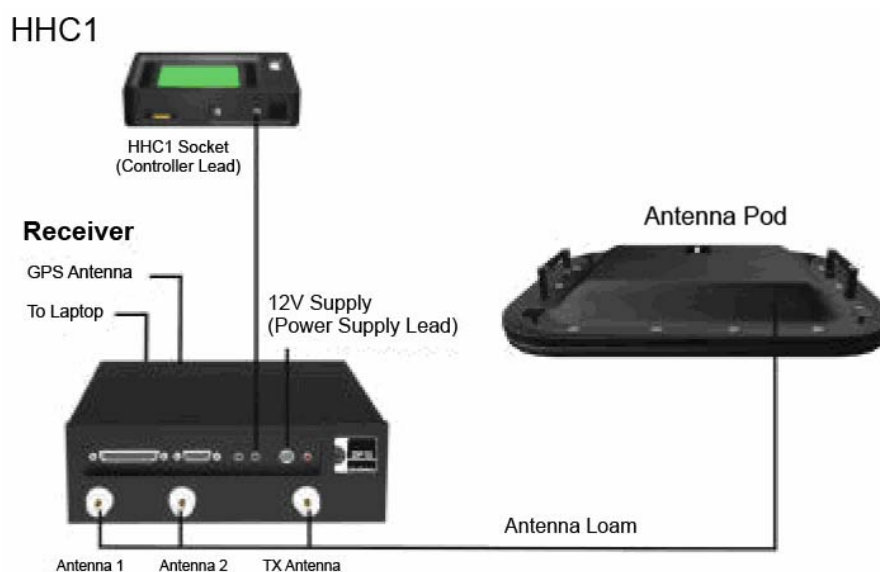


Figure 1: Deployment of the Tracking System

# COVERT RF & GPS VEHICLE TRACKING SYSTEM

**Model 7307**

## SIMPLICITY FOR THE FIELD OPERATOR

Once deployed, the field operator can use the hand-held controller to locate and follow the target. The direction to the target is displayed as a pointer. Simple icons display the status of the beacon (parked, stopped or moving, and the state of the sense input). The relative signal strength is shown as a bar graph. Both the direction and signal strength are displayed numerically. The audio tone increases in frequency as the unit gets closer to the target, giving a clear warning of a close encounter.

Simultaneously, GPS fixes of both target and tracking vehicle can be displayed on a digital map on a laptop PC. The display also gives an indication every time there is a valid GPS fix. The live GPS signal from the target vehicle is transmitted back to the unit via the RF link (up to 3 kilometres).

For long-term operations the Elaman series of beacons can be commanded by the unit. This allows the beacon to be deployed on the target and then put to sleep and woken up, as the operation requires.

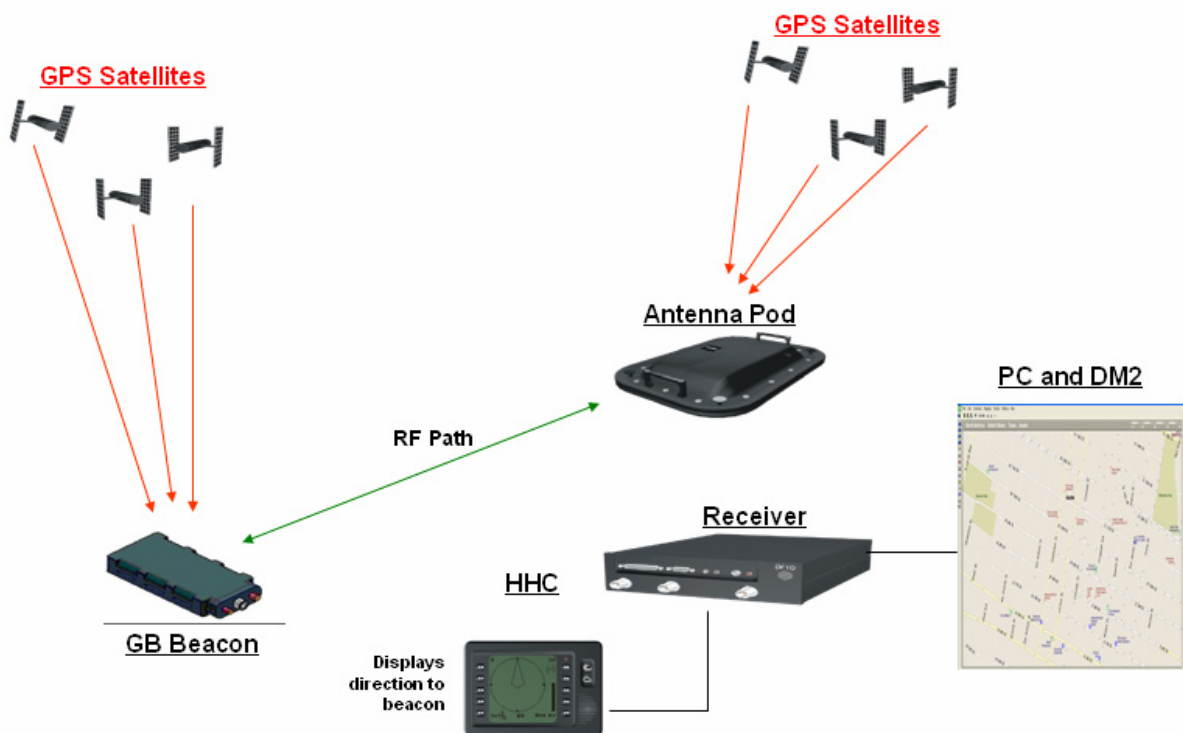
## SIMPLICITY FOR THE FIELD STATION CONTROLLER

A field station controller may have many beacons at different frequencies and of differing types to control. The unit can be programmed with 26 channel frequencies, which can then be linked to specific beacons.

Once this has been done, the unit need only be told to select, say beacon 1 and it will automatically configure and optimize itself to that beacon.

## THE MODEL 7307 SIMPLY ADDRESSES ALL TRACKING REQUIREMENTS

Whether your requirement is for a single beacon, or numerous implant beacons deployed at any one time, the unit responds to your needs.



# COVERT RF/GSM/GPRS/GPS VEHICLE TRACKING SYSTEM

## Model 7308

This unit is a fully integrated tele-commandable GPS beacon with both RF transmitter and GSM/GPRS back-link facilities. Its features and functionality are optimized for use with Elaman's RF/GPS tracking systems and takes GPS tracking to new levels of performance. Powerful behavior modes allow the operator to live track and command over RF, GSM and GPRS links. This combination offers the ultimate in flexibility and range allowing the operator to respond to operational threats and opportunities to maximize mission life and minimize the possibility of beacon compromise.

### FEATURES

- Real-time GPS tracking and command over RF, GSM Data, SMS and GPRS
- Full beacon functionality
- SMS alert functions
- Fast logged data download over RF or cellular back links
- Microphone input for audio over the GSM link
- Combined SMS tracking and audio transmission
- Combined RF and SMS tracking
- Trigger sensing input and output switch
- Zone dependent behavior linking the beacon's behavior to its geographical location
- Mapping and beacon configuration application available for PC
- External power connection for user's preferred power supply
- Compact size maximizing deployment possibilities

### TRACKING MODES

The beacon can be programmed or commanded into any of the tracking modes. Furthermore, the beacon can be programmed to operate in different modes, according to its geographic location or level of threat.

#### Tracking Mode:

The unit pulses and GPS location is transmitted over same RF.

#### GPRS Tracking Mode:

GPS location transmitted over GPRS link.

#### Town Mode:

The beacon transmits GPS positions at distance intervals instead of time intervals with RF Pulses on.

#### GPRS Town Mode:

The beacon transmits GPS positions at distance intervals, instead of time intervals over the GPRS link.

#### Highway Mode:

For high-speed tracking where GPS data is transmitted at long distance intervals and at highway exits.

#### GPRS Highway Mode:

For high-speed tracking where GPS data is transmitted at long distance intervals and at highway exits.

#### Transponding Mode:

Only the unit pulses are transmitted, but GPS location can be requested by RF command.

# COVERT RF/GSM/GPRS/GPS VEHICLE TRACKING SYSTEM

## Model 7308

### Roaming Mode:

Only beacon status information is transmitted (ID number, motion status and logging status).

### Mute Mode:

All RF output is switched off, but GPS location can be requested by RF command.

### GSM Ready Mode

No GSM transmission, but GSM module is powered up ready to receive either an incoming CSD connection, or an incoming SMS command. This mode can be used during normal tracking.

### GPRS Ready Mode

Whilst the beacon is awake, it will maintain a GPRS connection to the network. No tracking data will be transferred, to allow timely response to commands from the control point.

## TECHNICAL SPECIFICATIONS

<b>RF Transmitter</b>	
Center Frequency Range:	150 - 180 MHz or 390 - 420 MHz
Power:	0.3W $\pm$ 1.5dB (normal power)/ 1W $\pm$ 1.5dB (high power mode)
Channels:	16 users defined in 5MHz band
Spurii:	<-60dBc
Stability:	Stable up to SWR 1:7
Output Impedance:	50 $\Omega$
RF Antenna Connection:	SMA
Transmission Modes:	6
Data Rate:	38400 Bits per sec nominal
<b>Receiver</b>	
Frequency Range:	150 - 180 MHz/390 - 420MHz
Customer Retuneable Band:	$\pm$ 2.5MHz from chosen center frequency
Channels:	16 user defined in 5MHz band
Type:	4kHz FSK
Sensitivity:	+5 to -120dBm
IP3:	-28dBm @ 25°C, -33dBm @ 60°C, -44dBm @ -30°C,
Blocking:	65dB @ 25°C, 59dB @ -10°C, 56dB @ -30°C
<b>GPS Module</b>	
TTF:	<60 seconds average from a cold start
Antenna:	3.3V SSMA connector
Logging Modes:	4
Number of data points:	532,480