

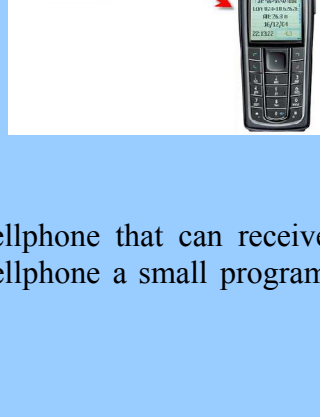
MobiTrack 1.0

GPS software for cellphones

Instructions for Use

Bluetooth Your GPS and Cellphone

This page describes the use of *MobiTrack* with a Bluetooth GPS receiver and a Bluetooth cellphone to transmit GPS data to the cellphone and from the cellphone to a server connected to the Internet. The cellphone can receive, display, and store GPS data -- and, in addition, it can send the data to an Internet server. This makes it simple to track in real time vehicles and people on foot, using existing and cost-effective technology. The data sent to a server can be displayed on maps using office or field computers that can connect to the Internet. For example the program OziExplorer together with NetGPS can take data from the Internet server and display it in real time, using a wide variety of commercial, free, and even your own maps (possibly scanned in the office). Alternately, you can use the data with other software or your own custom software, since the data is kept on the server in a standard text format. The upshot is that it is possible to have a powerful, low-cost GPS tracking system that works in real time.



The procedure requires a GPS receiver that can send data using Bluetooth and a modern cellphone that can receive Bluetooth signals from the GPS. In addition, you will need to acquire and install on the cellphone a small program called *MobiTrack*.

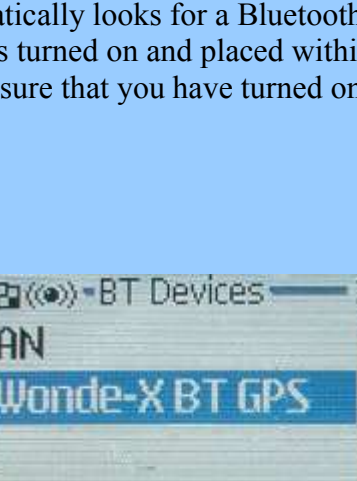
The key to the system is the program called *MobiTrack*.

What Is the MobiTrack Program?

MobiTrack is a small program that installs on your cellphone. It is written in the Java programming language. The program makes it possible to work with the GPS -- to receive, display, store, and transmit GPS data to an Internet server.

Here is a guide to using the program. First, be sure to turn on your cellphone's Bluetooth system.

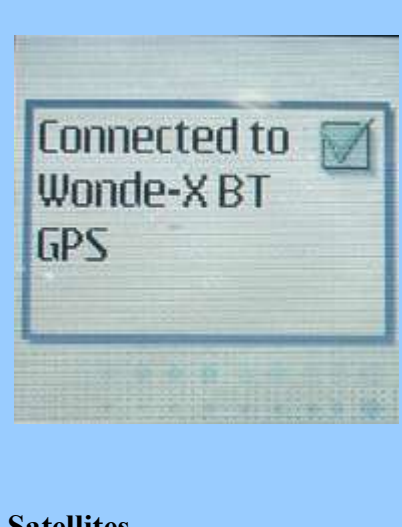
Program opening screen.



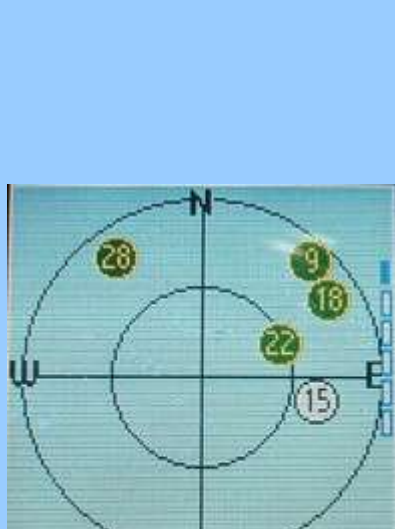
The program automatically looks for a Bluetooth GPS receiver. Be sure that your GPS is turned on and placed within range of the cellphone. Also, be sure that you have turned on your cellphone's Bluetooth.



Next, select your GPS receiver from the list of Bluetooth devices listed.



The program will then ask you to confirm that you want to connect to the GPS receiver. Select "Yes" from the bottom of the screen.



The system will respond that a connection has been established between the GPS receiver and the cellphone.

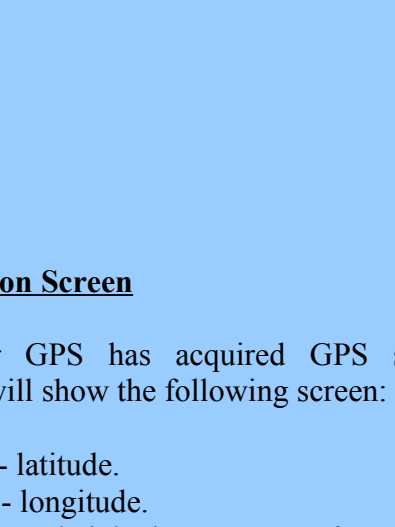
1. Display of GPS Satellites

This screen shows which GPS satellites are being received by the GPS. The green color signifies GPS satellites whose signals are being received and processed. The white color means the satellites are being received too faintly to be used. Their signals are not processed.

The bottom left portion of the screen will show either "2D" or "3D."

2D means that a two-dimensional space will be displayed. (longitude and latitude).

3D means that signals are being received from enough satellites to show information in three dimensions (longitude, latitude, and altitude).



The lower right corner displays other information:

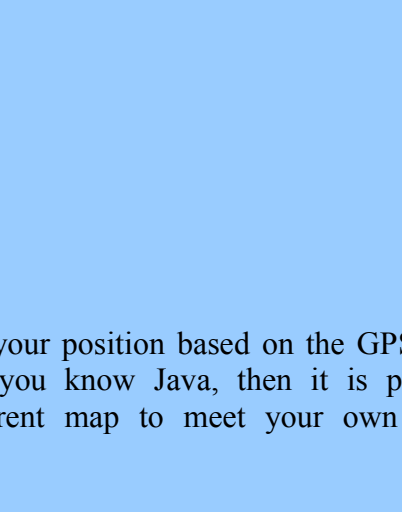
SPS - Standard Positional System (provided for civilian use).

DGPS - Differential GPS. This is a high-precision system that uses land-based differential signals.

PPS - Precision Position Service (available to the US Defense Department).

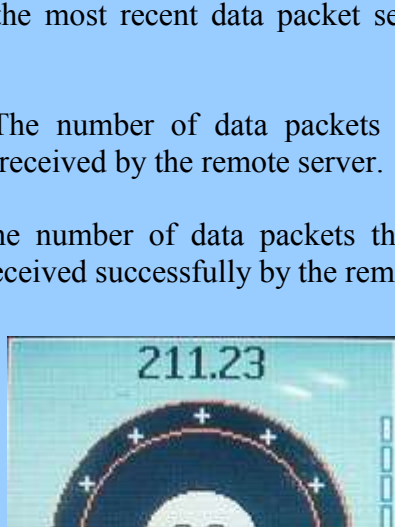
2. Navigation Screen

Once your GPS has acquired GPS signals, the cellphone will show the following screen:



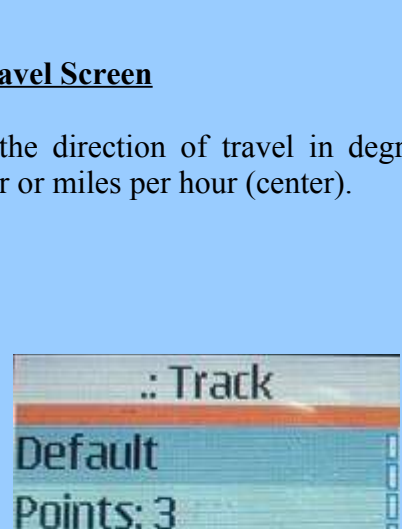
Line One -- latitude.
Line Two -- longitude.
Line Three -- height in meters or feet from Earth's geoid.
Line Four -- today's date based on GMT (Greenwich Mean Time) in the format dd/mm/yy.
Line Five -- GMT on the left, and HDOP (Horizontal Dilution of Precision) on the right. The HDOP number shows the level of degradation in precision along the horizontal plane -- the lower the number, the greater the precision.

Note: The red color means that there are not enough GPS satellites visible for accurate 3D data (i.e., altitude).



3. Map Screen

This page shows your position based on the GPS signals. It uses a general map. If you know Java, then it is possible for you to substitute a different map to meet your own needs. Inquire if interested.



4. Data Transmission to Web Page

This screen shows information about the transmission of GPS data over the internet to a server. This screen is displayed only if you have chosen to make such transmissions.

Last code - The HTTP code received from the remote server for the most recent data packet sent from the cellphone.

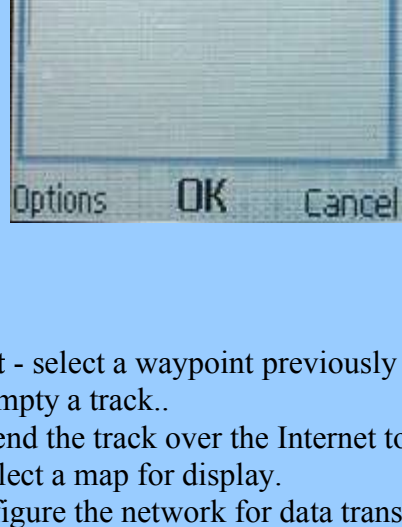
Success: The number of data packets successfully sent to and received by the remote server.

Failed: The number of data packets that were not sent to or received successfully by the remote server.



5. Direction of Travel Screen

This page shows the direction of travel in degrees (top); speed in kilometers per hour or miles per hour (center).

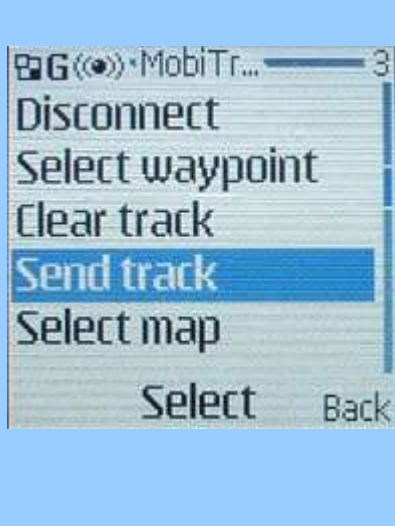


6. Track Recording Screen

First Line -- Track name.

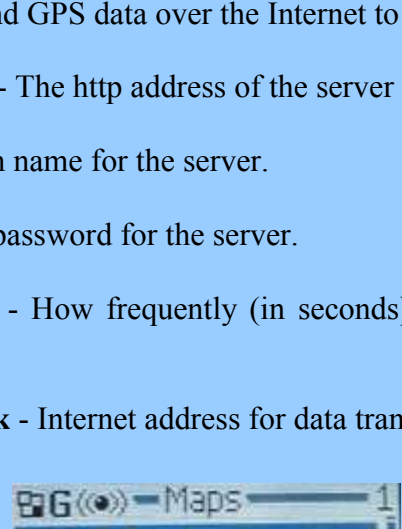
Second Line -- Number of points in the track.

Third Line -- Total length of the track.



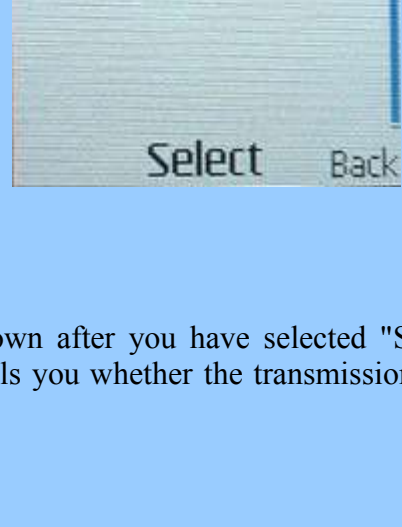
7. Track Plot Screen

This screen plots the points in the track. You can increase/decrease the scale by pressing the cellphone center button to the left or right: 100m, 1km, 10km, 100km. The plot can also be shown in miles.



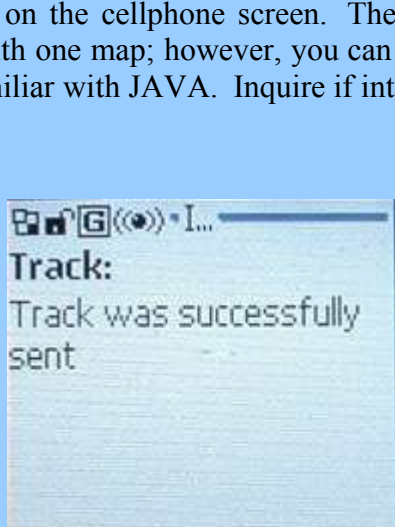
8. Waypoint Annotation Screen

Press the * on the cellphone to bring up this screen. You can give a name or brief description to the waypoint.



Main Menu

1. **Select waypoint** - select a waypoint previously saved.
2. **Clear track** - Empty a track.
3. **Send track** - Send the track over the Internet to a server.
4. **Select map** - Select a map for display.
5. **Network** - Configure the network for data transmission.
6. **Settings** - Configure the program.
7. **Help** - Brief help and instructions.
8. **Disconnect** - Disconnect from the GPS and exit the program.



Configuring the Network

Use NetGPS - Check this box if you want the GPS/cellphone combination to send GPS data over the Internet to a server.

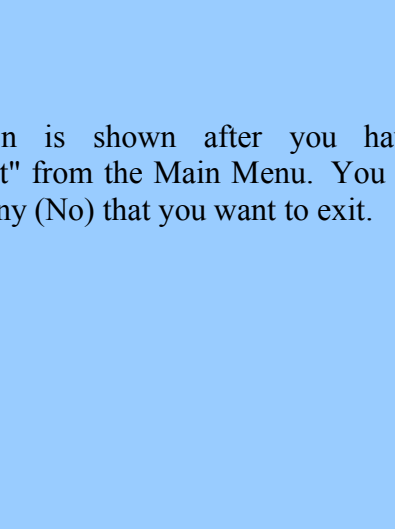
Address NetGPS - The http address of the server that receives data.

Login - Your login name for the server.

Password - Your password for the server.

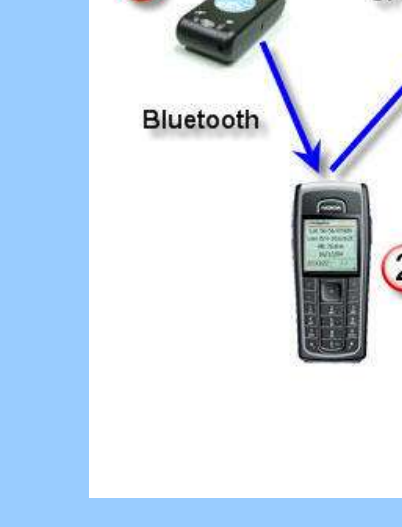
Interval, seconds - How frequently (in seconds) you want to send data to the server.

Address NetTrack - Internet address for data transmission.

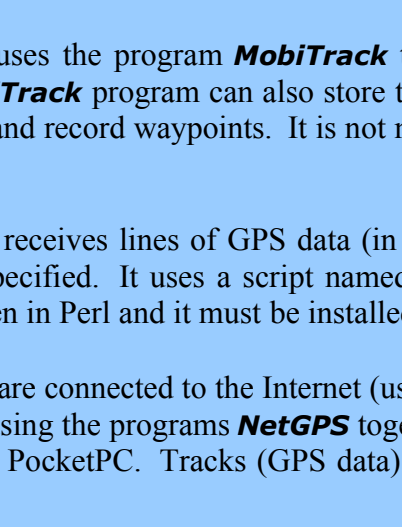


Map Selection

This page allows you select the map you wish to use for display on the cellphone screen. The program is supplied with one map; however, you can add maps if you are familiar with JAVA. Inquire if interested.

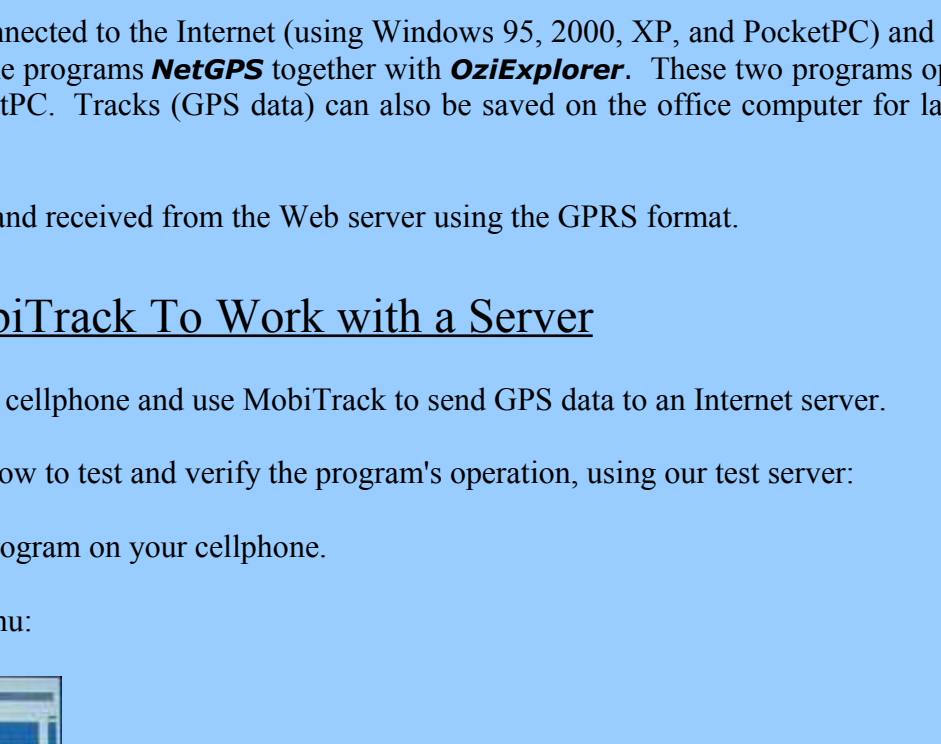


This screen is shown after you have selected "Send Track" on the Main Menu. It tells you whether the transmission was successful or failed.



This screen is shown after you have selected "Disconnect" from the Main Menu. You can confirm (Yes) or deny (No) that you want to exit.

How Online Tracking Works



1. The GPS receives signals from the worldwide network of GPS satellites and transmits that data to a cellphone, using Bluetooth. Signals from GPS satellites are offered at no cost by the US, Russian, European Union, and other national governments. The GPS receiver both receives the GPS signals and sends them to the cellphone via Bluetooth.

2. The cellphone uses the program *MobiTrack* to receive the GPS data and send it over the Internet in standard GPRS format. The *MobiTrack* program can also store track data on the cellphone, display direction and speed information on the cellphone screen, and record waypoints. It is not necessary to send data over the Internet -- it is still available for viewing on the cellphone.

3. The Webserver receives lines of GPS data (in standard NMEA-0183 format) and writes it to a file in any directory you have previously specified. It uses a script named *netgps.pl* to do that. This script is provided as part of the *MobiTrack* system. It is written in Perl and must be installed on the server under CGI-bin.

4. Computers that are connected to the Internet (using Windows 95, 2000, XP, and PocketPC) and can access and display the data in real time, using the programs *NetGPS* together with *OziExplorer*. These two programs operate under Windows 95, 98, 2000, XP, and PocketPC. Tracks (GPS data) can also be saved on the office computer for later viewing and/or further analysis.

5. Data can also be sent and received from the Web server using the GPRS format.

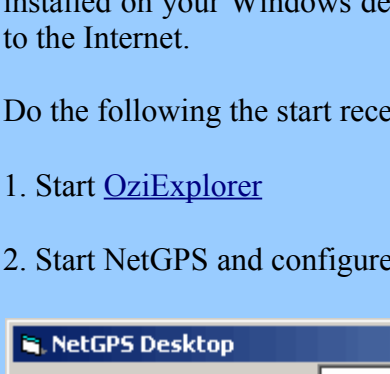
Configuring MobiTrack To Work with a Server

It is simple to set up your cellphone and use MobiTrack to send GPS data to an Internet server.

First, follow the steps below to test and verify the program's operation, using our test server:

1. Start the MobiTrack program on your cellphone.

2. Enter the Network Menu:



3. Check the box labeled "Use NetGPS."

4. For "Address NetGPS" enter <http://www.unteht.com/cgi-bin/netgps.pl> This is the address of our test server.

5. Use the Login shown at the top of screen at <http://www.unteht.com/mobitrack/>

6. Password: Your choice.

7. Interval, seconds: Your choice, but not less than 5 seconds.

8. Address NetTrack: <http://www.unteht.com/cgi-bin/nettrack.pl>

9. Reply OK when asked whether to save the data in **Options** -> **OK**

Use the following address to test the transmission/reception of data by the server: <http://www.unteht.com/mobitrack/>

Documentation to set up your own server can be found at the [NetGPS](http://www.unteht.com/netgps) site.

Displaying GPS Data on Your Desktop or Notebook Computer

To receive the GPS track sent via the cellphone through the server, you need to have the programs *OziExplorer* and *NetGPS* installed on your Windows desktop or notebook computer. In addition, the desktop or notebook computer must have access to the Internet.

Do the following to start receiving and displaying GPS data from server..

1. Start *OziExplorer*

2. Start *NetGPS* and configure it as in the following diagram:

3. Press the Start button at the bottom of the screen. At this point *OziExplorer* will start automatically and display the GPS data sent from the cellphone.

For technical support, please send questions to henson@unteht.com