Overview of GPS Logger/Tracker

1. Introduction

A GPS logger logs the position of the device at regular intervals in its memory. Some advanced models have additional chip to calculate the speed and direction of movement. Compare to other hand held GPS devices or GPS navigation devices, a GPS logger neither has basemaps stored in the unit nor has nice user interface and functions, but it is much smaller and cheaper. With support from other hardwares and softwares, a GPS logger can be quite versatile in many applications.

2. Hardware

Here is a comparison chart of some popular GPS loggers, it is a little bit old though:
http://spreadsheets.google.com/pub?key=pXRBadSQxMUKN3TXwc3zOeA

Important specs are:
* Type of Sensor (mostly SIRFstar III or MTK, MTKII is becoming popular with higher price tag). Here is a general comparison of different types of Sensors:
http://www.canadagps.com/KB_04.html
* Size of memory or # of locations can be stored
* Battery life and alternative power source
* Data port? USB? Bluetooth has become popular and proven to be very convenient when working with other devices.
* Logging modes: by time or by distance? Customizable time interval?
* Export format: GPX is a popular format.
* LCD with location/speed/direction display is new to GPS logger but important. It allows the GPS logger to be used independently, especially by hikers with Topo maps.

This overview will use Holux M.241 as an example to introduce various applications of a GPS logger/tracker. A brief introduction of Holux M.241 can be found here:
http://www.holux.com/JCore/en/products/products_spec.jsp?pno=341

3. Applications

- **Use as a handheld GPS device**

When being used alone, M.241 can show Lat./Long., Altitude, satellite time, speed and direction of movement on the LCD screen. It works as a minimalist alternative to hand held GPS device. GPS logger can keep track of locations by time or by distance with customizable interval up to one record per second or per 50 meters. With 3rd party software support, this unit can be turn into one record per 0.2s. You can read more about this on openstreetmap wiki:
http://wiki.openstreetmap.org/wiki/Holux_M-241

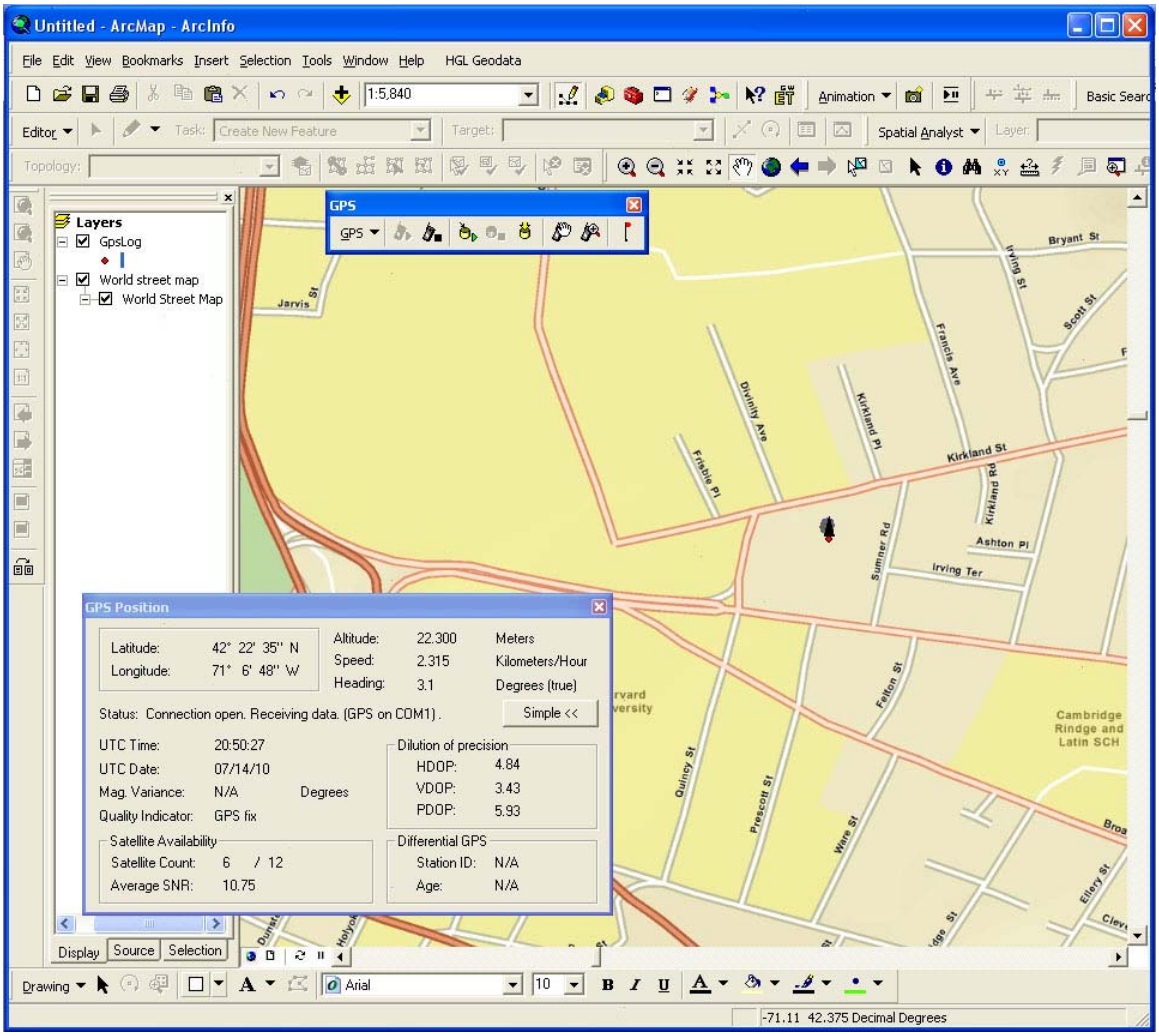
(From OpenStreet Wiki: http://wiki.openstreetmap.org/wiki/Holux_M-241)

- **Use as a GPS navigation tool**

With Bluetooth, M.241 can be easily connected to popular smart phones or other handheld devices such as ipod touch, and turns them into something similar to a GPS navigation tool. The sensitivity of the independent GPS logger usually outperforms those embedded GPS units in the handheld device. But in order to have full navigation functionality, you need to purchase navigation software like Tomtom, Navigon for iPhone/iPad/iTouch or Garmin Mobile for Blackbarry. There are also some free open source programs coming, such as xGPS project (http://xgps.xwaves.net/index.php/Main_Page).

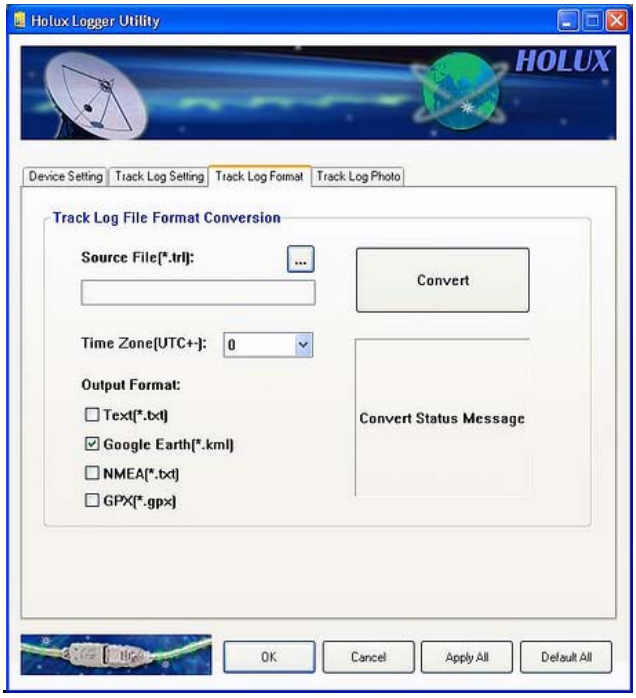
- **Use as a mapping tool with desktop GIS**

M.241 can be connected to a computer through USB or Bluetooth.It will transfer location info to programs that support GPS. For example, ArcGIS has a GPS toolbar that can log GPS readings into a linear or point shapefile directly. This means it can turn any laptop into a mobile GIS platform for serious field work..
Note: It seems that ArcGIS can only receive GPS info through COM1 or COM2. So user needs to modify port setting in system management in order to use external GPS properly in ArcGIS.

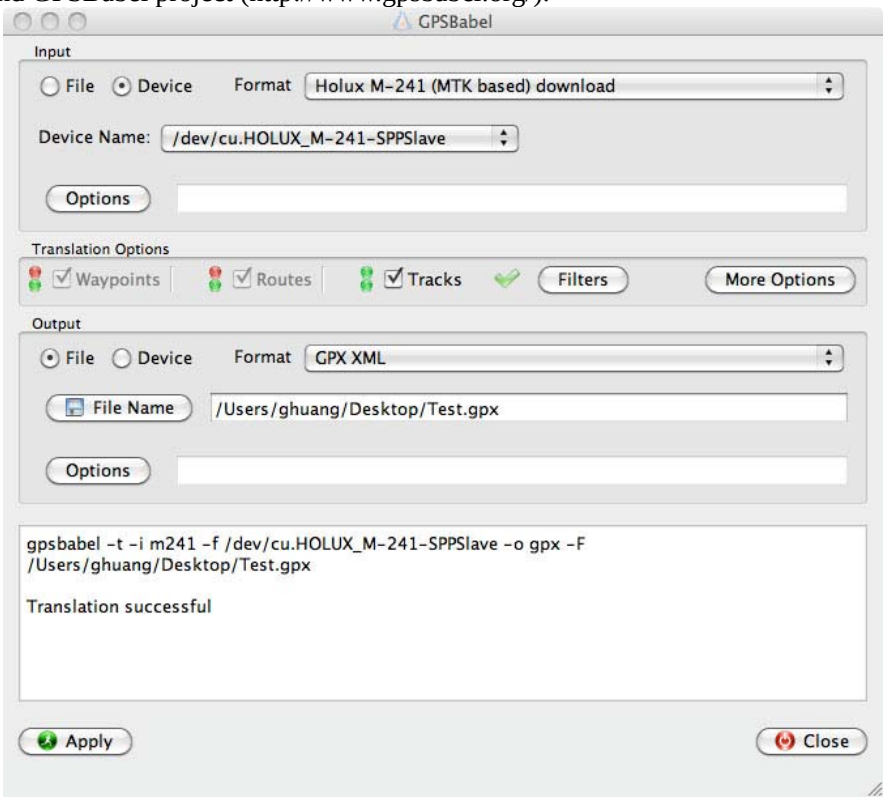


- **Use as a GPS logging tool**

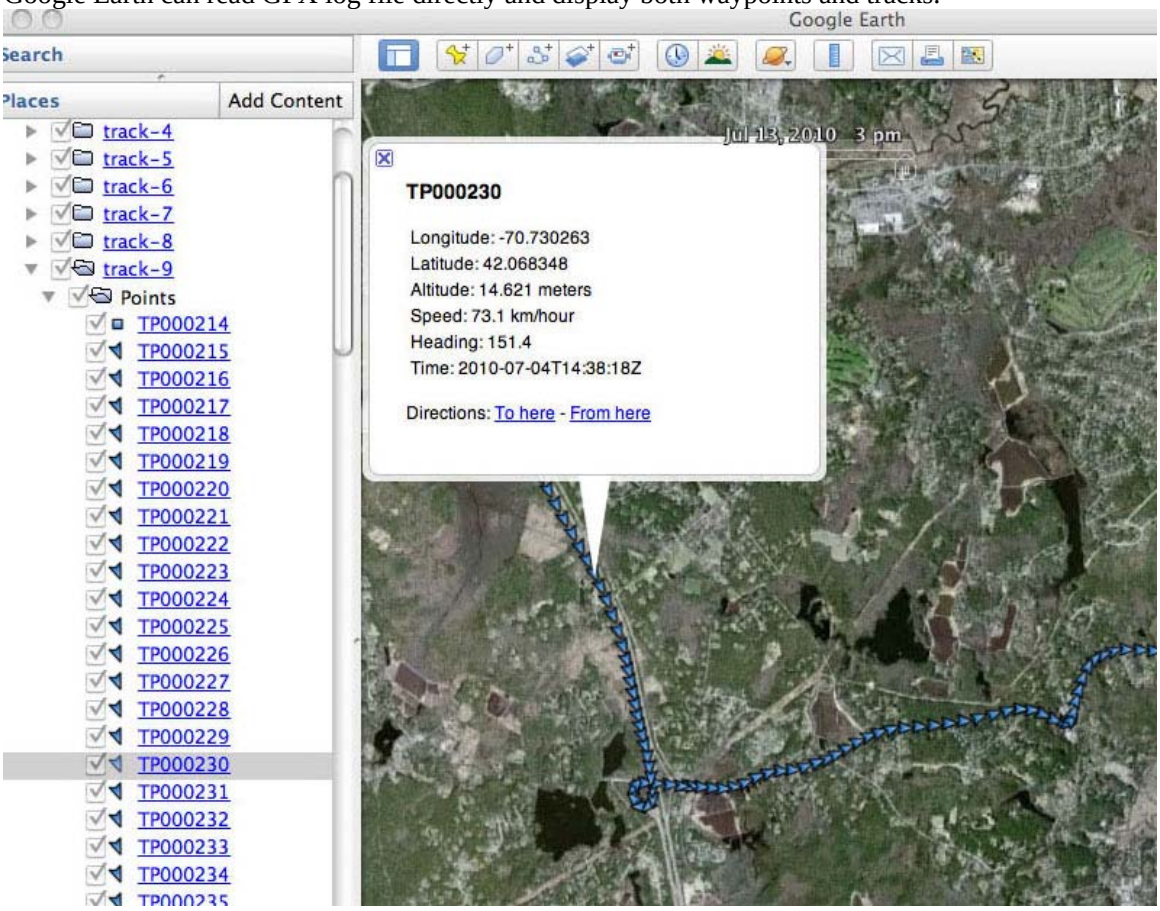
M.241 can store 100,000 location points with Lat/long, direction, speed, altitude, date, time info. Holux provides a program on Windows that can read all the info from M.241 memory and write into GPX/TXT/KML file.



M. 241 is also among a few GPS devices that have good support on MAC and Linux thanks to built-in Bluetooth and GPSBabel project (http://www.gpsbabel.org/).



Google Earth can read GPX log file directly and display both waypoints and tracks.

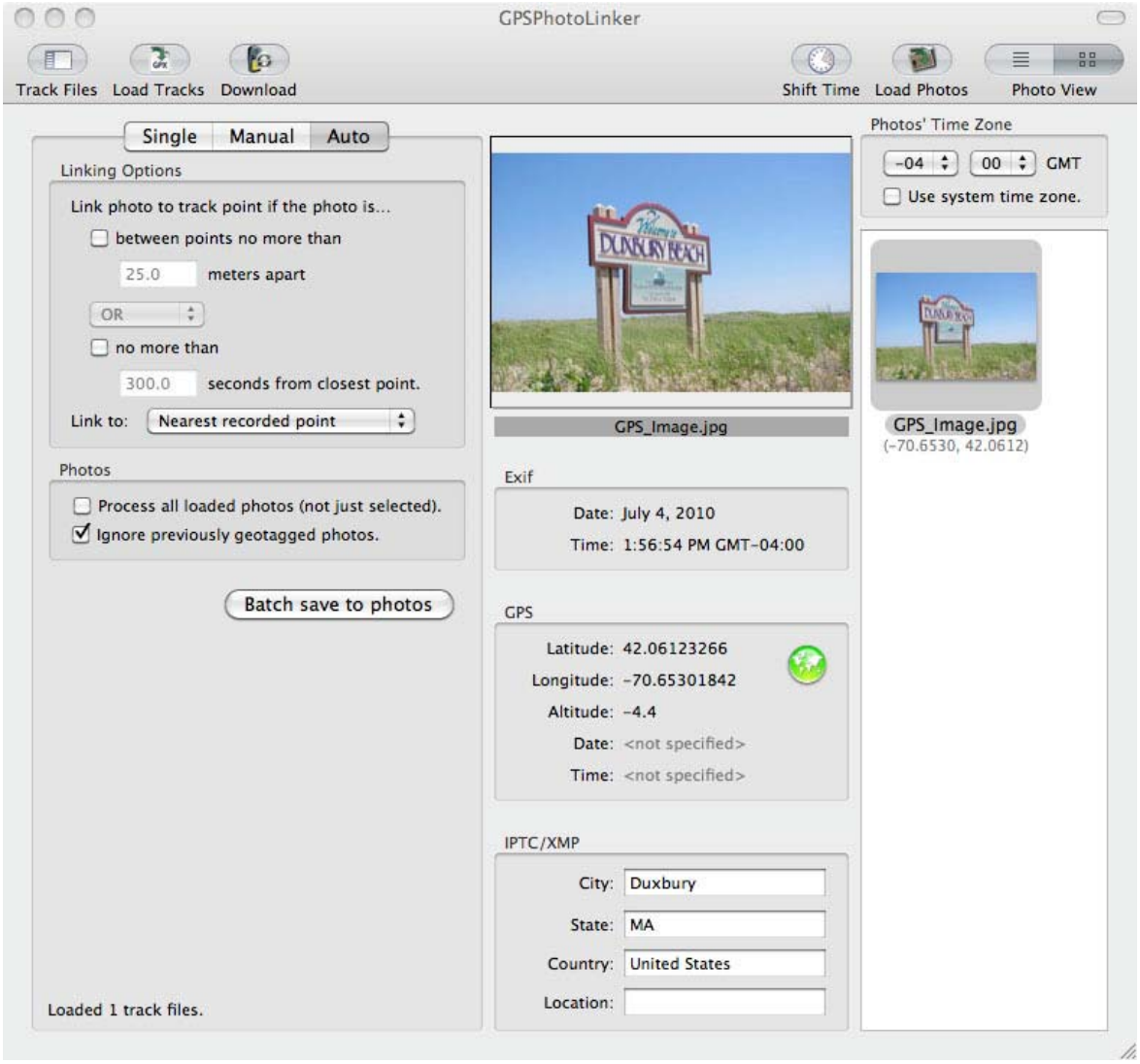


Because of popularity of GPS equipped smart phones, there are programs on mobile phones that can record locations into GPX file, for example Trails on iphone (http://trails.lamouroux.de/)

- **Use as a geotagging tool**

The program that HOLUX provides can geotag photos taken during a trip. On windows, there some programs such as geotag (http://geotag.sourceforge.net/) that has more functionalities.

On MAC, there is free GPSPhotoLinker and other programs available for geotagging. GPSPhotoLinker is able to write location info directly into photos' EXIF, and supports both JPG and RAW files from different cameras. User can choose geotagging method as "nearest recorded point" or "time weighted point". If there is discrepancy between satellite time from GPS and photo time from camera, the program also allows user to shift time.


GPSPhotoLinker
Track Files
Load Tracks
Download
Shift Time
Load Photos
Photo View
Single
Manual
Auto
Linking Options
Link photo to track point if the photo is...
between points no more than
25.0
meters apart
OR
no more than
300.0
seconds from closest point.
Link to:
Nearest recorded point
Photos
Process all loaded photos (not just selected).
Ignore previously geotagged photos.
Batch save to photos
Loaded 1 track files.
GPS_Image.jpg
Exif
Date: July 4, 2010
Time: 1:56:54 PM GMT-04:00
GPS
Latitude: 42.06123266
Longitude: -70.65301842
Altitude: -4.4
Date: <not specified>
Time: <not specified>
IPTC/XMP
City: Duxbury
State: MA
Country: United States
Location:
Photos' Time Zone
-04
00
GMT
Use system time zone.
GPS_Image.jpg
(-70.6530, 42.0612)