

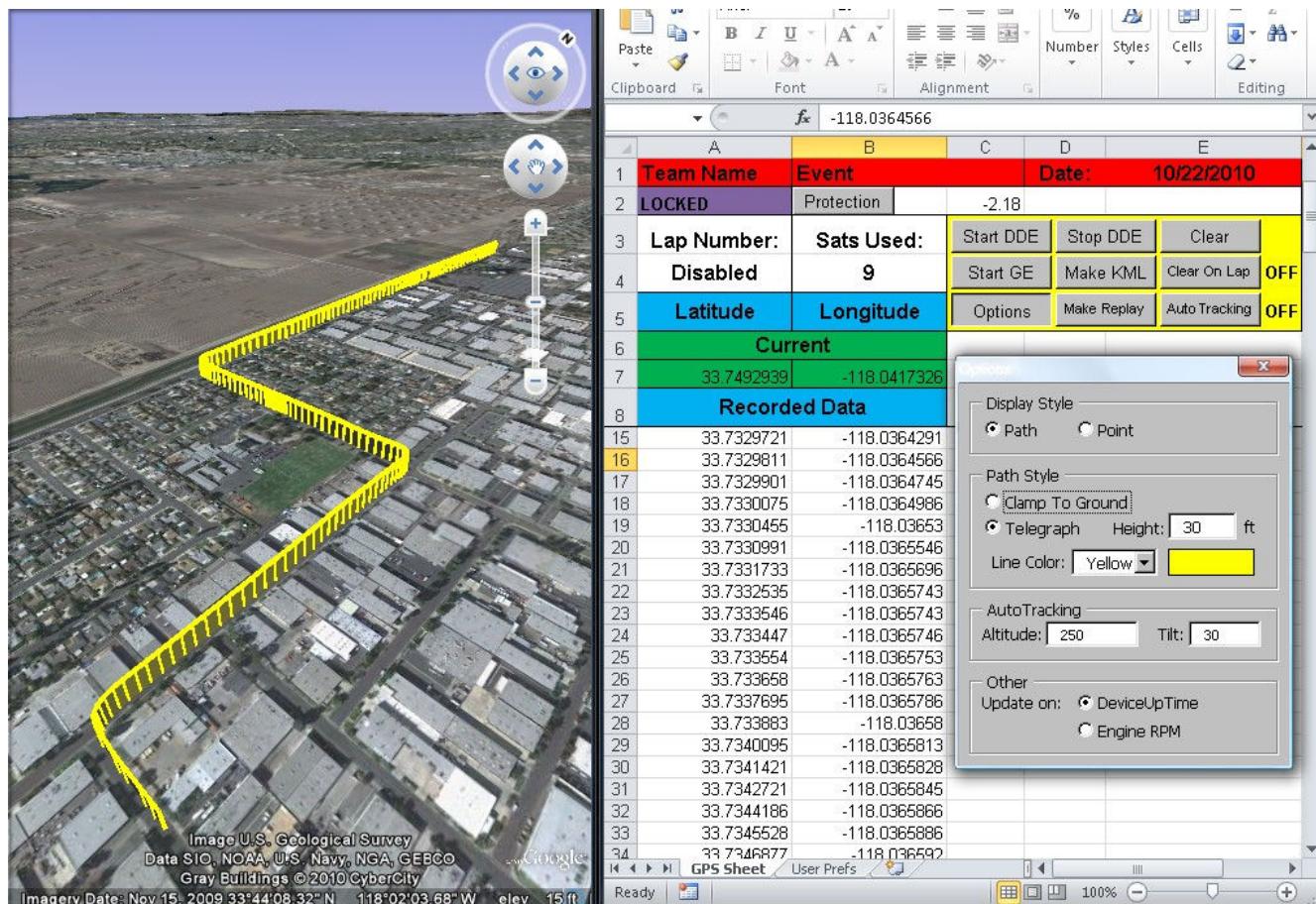
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|-----------------|---------------------------------------|-------------|-----------------|
| Document Number | RG_TN-0003                            |             |                 |
| Title           | Google Earth Telemetry Utility - GETU |             |                 |
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| 1.0             | 10/20/2010                            | Tim Munn    | Initial release |

## Introduction to GETU

The Google Earth Telemetry Utility - GETU - is an Excel spreadsheet designed to transfer GPS positional data in Google Earth. The GETU receives GPS coordinates via the MoTeC Telemetry Monitor and draws a path in Google Earth in real time.

## Features

- AutoTracking option lets you keep the view of Google Earth centered on the current location of the vehicle.
- Option to automatically clear data on end of lap to avoid overlapping paths.
- Watch the live vehicle's path as it traces a prior saved path.
- Save KML files to keep a record of your vehicle's path for viewing at a later time.
- Save replay files to later watch the vehicle's playback around its path.
- Customize the path with two display styles and several colors.
- Compatible with MoTeC ACL and ADL3 with Telemetry Monitor version 2.3 or later.



## Logger Setup

### Setup "Latitude(2)" and "Longitude(2)"

#### If you have the "GPS for Google Earth" Template:

- a. Depending on your logger manager software, find the "Communications" menu item under either "Inputs or "Connections."
- b. Select the "GPS for Google Earth" template into the RS232 slot, or if using a STC choose one of the empty CAN slots. If you already have a GPS template, replace it with this new one. Note the "Select" button requires the template to be saved in the default comms directory, otherwise use the "Advanced" button and then click "Load" to select the template if saved elsewhere.

#### If you do not have the "GPS for Google Earth" Template:

- a. Navigate to the "Communications" menu item
- b. Select the existing GPS input template and select the "Advanced" button.
- c. Under the "Received Channels" tab find the "GPS Latitude" channel and select "change", note the value of the "variable field". Go back and click "Add" selecting the "GPS Latitude (2)" channel. Set the value in the "variable field" to the value you noted above. Be sure that the decimal format is "As Received."
- d. Repeat Step c for "GPS Longitude"/"GPS Longitude (2)"

### Generate channels "GPS Lat Small" and "GPS Long Small"

- a. Navigate to "Calculations" | "Channel Maths"
- b. Add a new expression, selecting "GPS Latitude (2)" as the input channel. Be sure the operation drop down menu is set to "none."
- c. Under "Output" click select. Choose a general purpose, unitless (0dps) channel and rename it "GPS Lat Small." Click "Ok."
- d. Repeat steps a-c for "GPS Long Small" using "GPS Longitude(2)"

### Generate channels "GPS Lat Large" and "GPS Long Large"

- a. Navigate to "Calculations" | "Advanced Maths"
- b. Add a new expression. For the output channel choose a general purpose, unitless (0dps) channel and rename it "GPS Lat Large."
- c. Type in this expression:  $(\text{GPS Latitude}(2)[\text{deg}] * 10000000) / 65536$
- d. Select "Ok"
- e. Repeat steps a-d for "GPS Long Large" using "GPS Longitude(2)"

### Adding GPS Channels to Telemetry

- a. Navigate to "Functions" | "Telemetry"
- b. Select "Add"
- c. Under the search tab, add these channels to the telemetry list:
  - "GPS Lat Small"
  - "GPS Lat Large"
  - "GPS Long Small"
  - "GPS Long Large"
  - "GPS Sats Used"
  - "Engine RPM" or "DeviceUpTime"
  - "Lap Number" (Optional: for use with ClearOnLap function)

## Telemetry Setup

Open your MoTeC Telemetry Monitor. Navigate to "Settings" | "Communications" | "DDE"

Check the box "Send Telemetry Data via DDE" with the delay set to 1 second.

## Using GETU

### GETU Controls:

#### **Start DDE:**

Starts the link to Telemetry Monitor and begins receiving GPS data.

\*\*\* Note: Have Telemetry Monitor running before starting DDE \*\*\*

#### **Stop DDE:**

Pauses the input of data from Telemetry Monitor.

#### **Clear:**

Removes all data in the spreadsheet. (Be sure to save your KML file if you do not wish to lose your Google Earth path)

#### **Start GE:**

Opens Google Earth and loads your KML file.

#### **Make KML:**

Creates a KML file from the data in the spreadsheet.

#### **Make Replay:**

Creates a Replay KML file from the data in the spreadsheet.

#### **Clear On Lap:**

This option when active will clear the data each lap based on an update of the channel called "Lap Number".

#### **Auto Tracking:**

This option when active will cause the viewport in Google Earth to track the front of the GPS path. The altitude and tilt of the camera can be adjusted under the Options menu. Activating this option will open Google Earth.

#### **Options:**

##### **Auto Tracking:**

###### **Altitude:**

Specify the height at which to view the path.

###### **Tilt:**

Specify the viewing angle at which to view the path.

##### **LineStyle:**

###### **ClampToGround:**

The line of the path is drawn directly on the surface of the Earth.

###### **Telegraph:**

Each point of data creates a "telegraph pole," using the specified height, which are connected via a wall extending down from the path. This option makes the path easier to see at a distance.

###### **Line Color:**

Changes the color of the path.

#### **Other:**

##### **Update On:**

For the spreadsheet to update correctly, at least one updating channel is required on the worksheet. Most common will be "Engine RPM." It could also use "DeviceUpTime" if you are not sending "Engine RPM" through Telemetry.

## **Tracing A Pre-Run Track Path**

Have GETU running when you make your pre-run. Once finished, save the KML file and open it in Google Earth. Now clear the data in GETU and when you run it live, you can watch your vehicle overlap the pre-run path in real time. It is recommended to make the paths different colors.

## **Notes On KML Files:**

Google Earth uses Keyhole Markup Language (KML) files to display placemarks and paths. Google Earth can have many KML files open at the same time. The KML file that the "Make KML" button produces is exactly the same as the one used while the GETU is running. Load this file whenever you wish to see the path run by your vehicle. The KML file produced by the "Make Replay" button is different in that it allows the user to watch the vehicle run its course like a movie with controls to play, pause, and rewind.

## **Troubleshooting**

### **I click Start DEE and the GETU doesn't show any data.**

Make sure your logger is configured as above:

Are the GPS channels being created correctly?

Are the GPS channels named exactly as above?

Are the GPS channels coming through telemetry?

Check to make sure DDE is turned on in Telemetry Monitor.

### **I click Start GE and nothing happens.**

Your Google Earth executable may be in an abnormal directory.

Correct directory: "C:/Program Files/Google/Google Earth/client/googleearth.exe"

If you experience this problem you can load the "GoogleEarthRefresher.kml" file manually from the "C:/motec" directory.