VIAVI Solutions

Application Note

Creating and Playing Back KML Files with the GPSG-1000

KML Files

The Kml directory contains files generated from the application Google Earth in Kml format on a PC, which have then been imported onto the GPSG-1000. The GPSG-1000 compiles the Kml files into either Trajectory data files with a .gdt extension in CSV format or into Route data files with the .rte extension.

Kml files are plotted routes, created in Google Earth, that are intended to follow a selected path. To be used in the GPSG-1000 the files must meet certain criteria; the altitude must be expressed in absolute terms, navigation points must be properly positioned for the speed and turning radius of the simulation can be met by the GPSG-1000 as the KML files is converted to .gdt or .rte format.

It is generally not suitable to convert recorded routes from a GPS receiver in to Kml files for simulation in the GPSG-1000 due to the proximity of the data points and error induced by the GPS receiver. Recorded routes should be loaded to the GPSG-1000 as Nmea Files for playback. See Application Note, GPSG-1000 Recording and Playing Trajectory Files for more information regarding the trajectory playback method.

KML files converted into .gdt files are in the following format:

```
Notes,Date,Time,Latitude,Longitude,Alt,Desc
$GDT,20000101,000144.00,38.9425699612859,-94.7561817577427,0.000000,3D,*16
$GDT,20000101,000145.00,38.9425695029864,-94.7561783124509,-0.000004,3D,*3F
$GDT,20000101,000146.00,38.9425681280874,-94.7561679765759,-0.000018,3D,*34
$GDT,20000101,000147.00,38.9425658365869,-94.7561507501185,-0.000039,3D,*39
$GDT,20000101,000148.00,38.9425626284821,-94.7561266330799,-0.000069,3D,*37
$GDT,20000101,000149.00,38.9425585037686,-94.7560956254621,-0.000106,3D,*35
$GDT,20000101,000150.00,38.9425534624409,-94.7560577272674,-0.000150,3D,*3E
$GDT,20000101,000151.00,38.9425475044924,-94.7560129384988,-0.000200,3D,*34
$GDT,20000101,000152.00,38.9425406299151,-94.7559612591597,-0.000254,3D,*3F
$GDT,20000101,000153.00,38.9425328387000,-94.7559026892542,-0.000312,3D,*3A
$GDT,20000101,000154.00,38.9425241308367,-94.7558372287867,-0.000371,3D,*34
$GDT,20000101,000155.00,38.9425145063137,-94.7557648777623,-0.000431,3D,*3F
$GDT,20000101,000156.00,38.9425039651181,-94.7556856361865,-0.000489,3D,*30
```

Figure 1, .gdt file example

KML files converted into .rte files are in the following format:

```
<Route>
    <Waypoint Longitude="-77.88420000000001" MaxAcceleration="0" MaxClimbRate="0"
    Name="HESKU" Latitude="37.14982222222222" Altitude="1524" TargetSpeed="53.64466666666667"
    TurningCircleRadius="108.5658611334349"/>
    <Waypoint Longitude="-78.80005277777778" MaxAcceleration="0" MaxClimbRate="0"
    Name="RFLAT" Latitude="38.20028888888889" Altitude="1524" TargetSpeed="53.64466666666667"
    TurningCircleRadius="131.3646919714563"/>
    <Waypoint Longitude="-78.83963333333332" MaxAcceleration="9.800000000000001"
    MaxClimbRate="-3.048" Name="RIVKE" Latitude="38.24149166666667" Altitude="1249.68"
    TargetSpeed="53.64466666666667" TurningCircleRadius="100"/>
    <Waypoint Longitude="-78.88314444444444" MaxAcceleration="9.800000000000001"
    MaxClimbRate="-3.048" Name="BEEDY" Latitude="38.28670277777778" Altitude="944.88"
    TargetSpeed="53.64466666666667" TurningCircleRadius="100"/>
    <Waypoint Longitude="-78.95743055" MaxAcceleration="9.800000000000001" MaxClimbRate="-3.048"
    Name="RW33" Latitude="38.363725" Altitude="355.092" TargetSpeed="53.64466666666667"
    TurningCircleRadius="131.3646919714563"/>
    <Waypoint Longitude="-79.13772222222222" MaxAcceleration="9.800000000000001"
    MaxClimbRate="3.048" Name="MOL" Latitude="37.86372222222222" Altitude="1828.8"
    TargetSpeed="75.99661111111111" TurningCircleRadius="183.4763053155051"/>
</Route>
```

Figure 2, Route file format

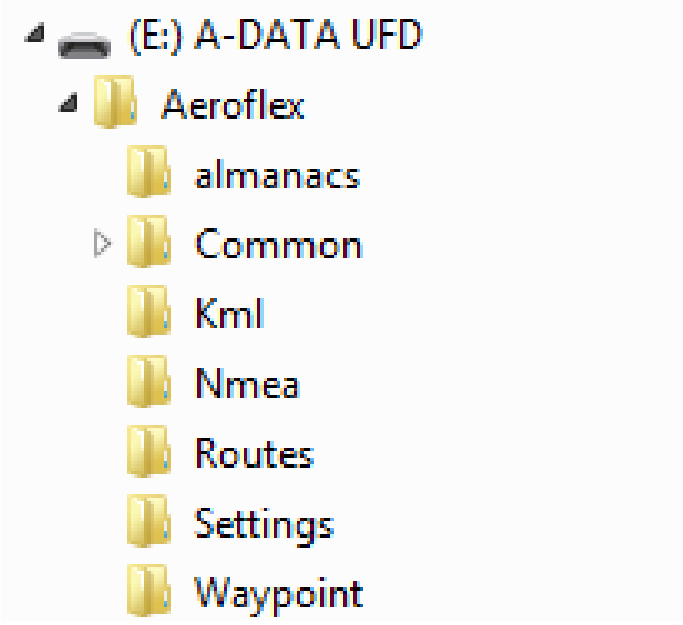
For more information on GPSG-1000 file types and properties see Application Note GPSG-1000 File Properties or the GPSG-1000 Operation Manual.

USB Memory Device Requirements

VIAVI recommends USB Memory Device pn: 67325 available for purchase from the VIAVI AvComm Customer Help Desk at 1-316-522-4981 or email avcomm.sales@viavisolutions.com.

VIAVI recommends that the USB Memory Device used to transfer files to and from the GPSG-1000 be dedicated to that function only.

The USB Memory Device should have the following directory structure.



Where Drive E: is the USB Memory Device in this instance.

The directory structure may be created by the GPSG-1000 automatically by using the Export function. See Application Note GPSG-1000 USB Memory Device Format Compatibility for more information.

Save the file in the Kml directory location.

Transferring KML files to the GPSG-1000

Insert the USB Memory Device in to one of the USB ports on the top of the GPSG-1000 and wait a few seconds for the GPSG-1000 to recognize the drive.

On the GPSG-1000 Side Menu, select the down arrow to display the lower half of the menu. See Figure 3.

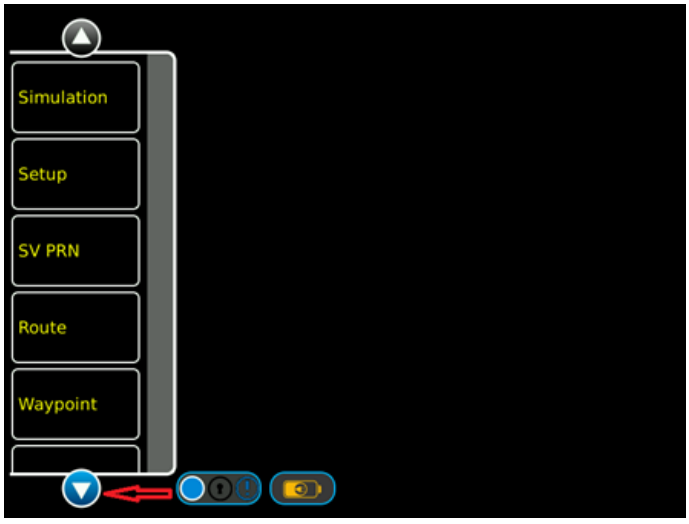


Figure 3. GPSG-1000 Side Menu

Select File. See Figure 4

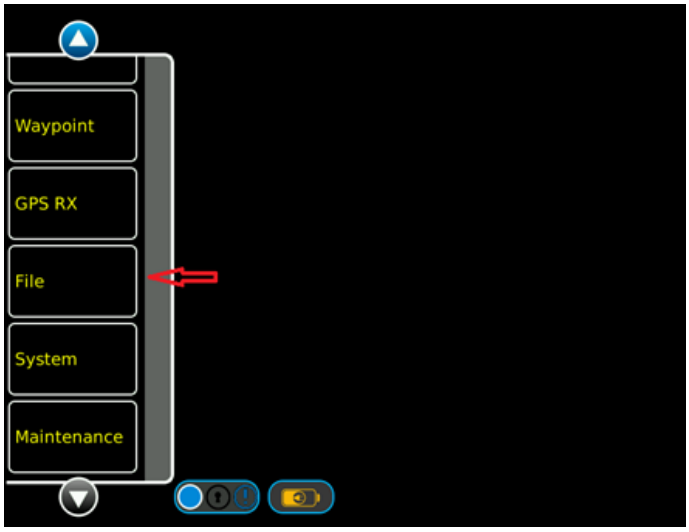


Figure 4. GPSG-1000 Lower Side Menu

In the File screen, select the KML tab. Then select 'Import From USB'. See Figure 5.

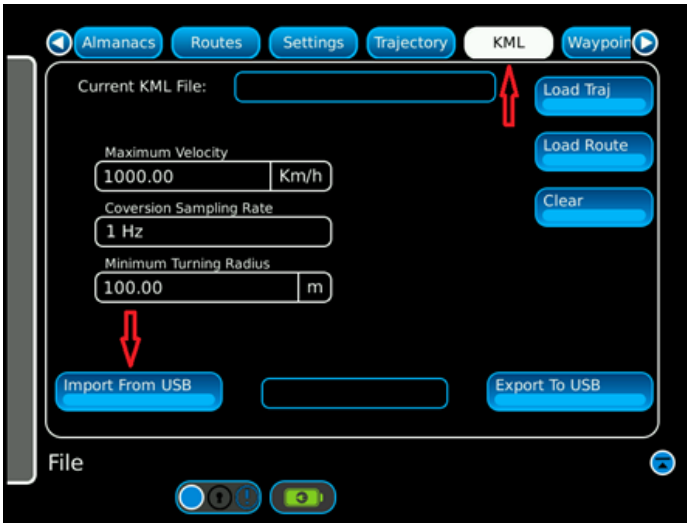


Figure 5. GPSG-1000 KML File Screen

A window will appear to confirm that you wish to proceed. Select 'Yes'. All KML files will be imported and a message will appear 'KML Import Successful'. See Figure 6.

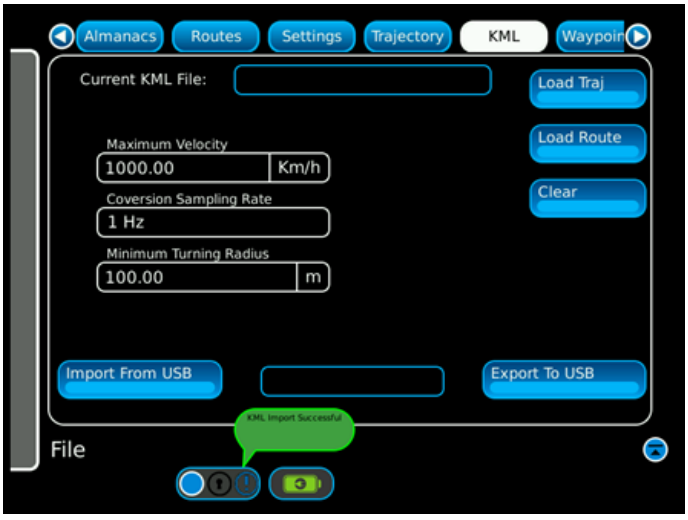


Figure 6. KML Import Successful

Playing a KML File as a Trajectory

Note the fields for Maximum Velocity, Conversion Sampling Rate, and Minimum Turning Radius. When loading the KML file, the motion properties will conform to these settings and by the motion model selected in the Setup page. If errors occur, adjust settings to appropriate.

In the KML File screen, select 'Load Traj'. The window 'Load KML File' opens. Select the file you wish to load and press 'Open'. See Figure 7.

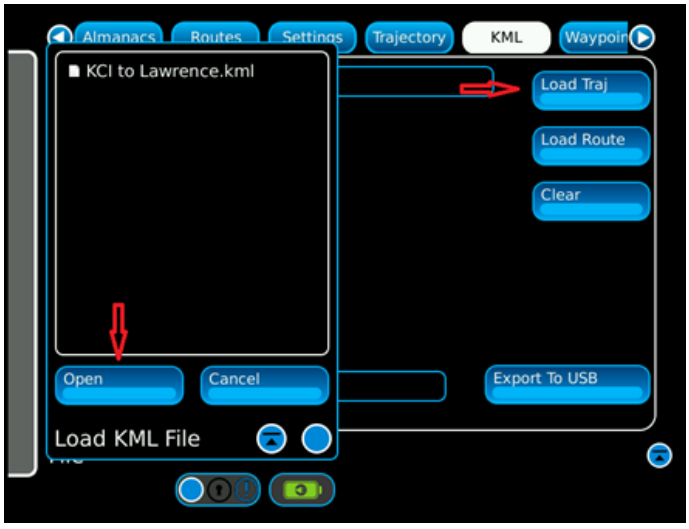


Figure 7. Load KML File Window

A message will appear 'KML Load Successful'. See Figure 8.

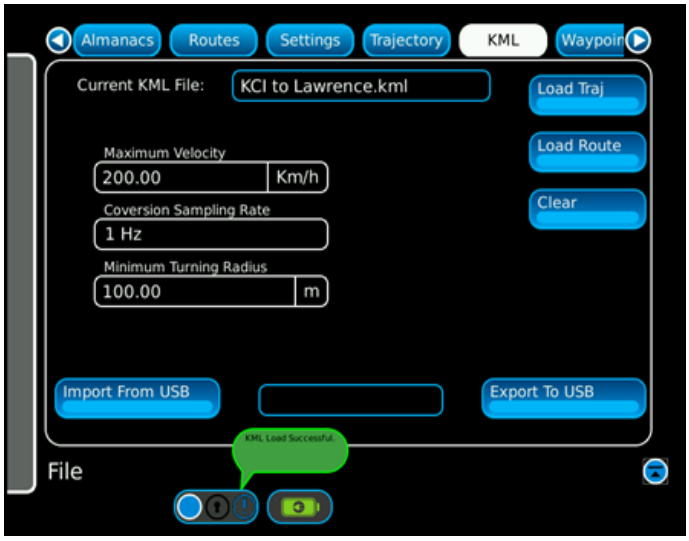


Figure 8. KML Load Successful

Close the KML File Screen. From the Side Menu Select 'Setup'. See Figure 9.

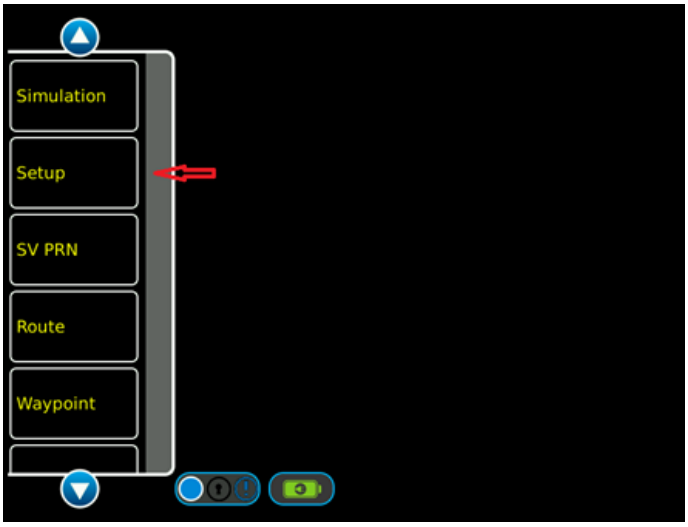


Figure 9. GPSG-1000 Side Menu

In the Setup - Simulation Screen, select the 'Simulation' drop down menu and select 'Trajectory'. See Figure 10. Setup all other parameters as per your simulation requirements. The PRN Signal should remain 'Fixed' as the Google Earth KML path does not impart PRN signal data. In this type of simulation the Clock setting is not used. A Trajectory file is played as a snapshot in time, the GPSG-1000 will pull the clock information from the recorded file. Since the .kml file created from Google Earth has no Time Stamp information the GPSG-1000 will default to the User Setting for the Simulation Start Time.

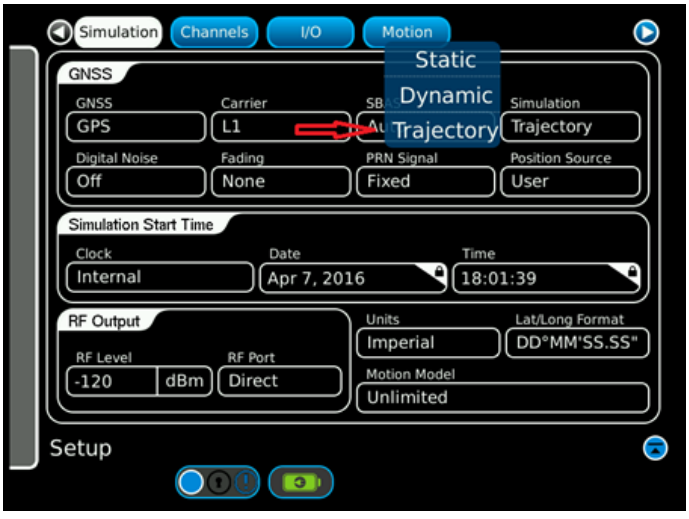


Figure 10. GPSG-1000 Setup - Simulation Screen

Close the Setup - Simulation Screen. From the Side Menu, select 'Simulation'. See Figure 11.

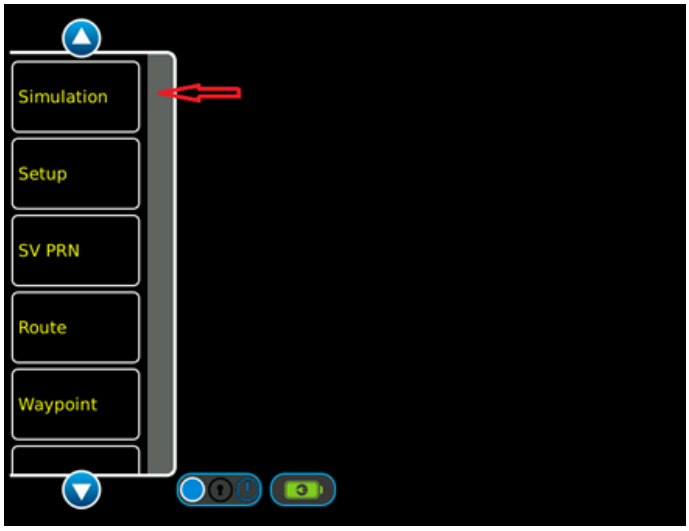


Figure 11. GPSG-1000 Side Menu

In the Simulation – GPS screen select 'Run'. See Figure 12.

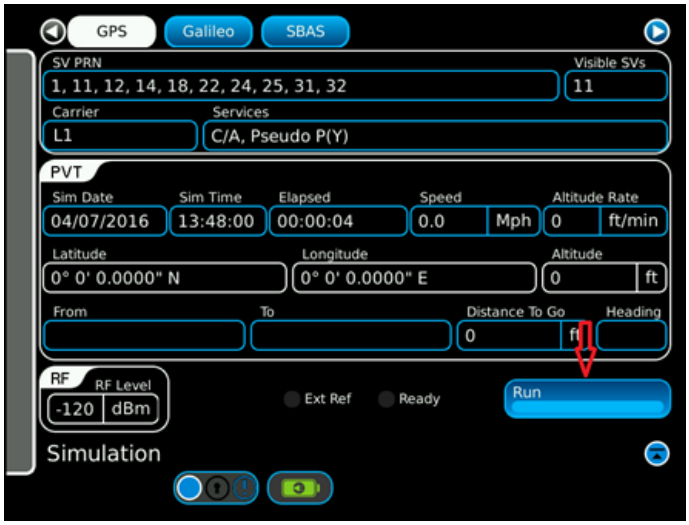


Figure 12. GPSG-1000 Simulation - GPS Screen

The GPSG-1000 will display 'Configuring' then 'Running'. See figure 13. Note the PVT fields are displaying the positional, speed, and time information.

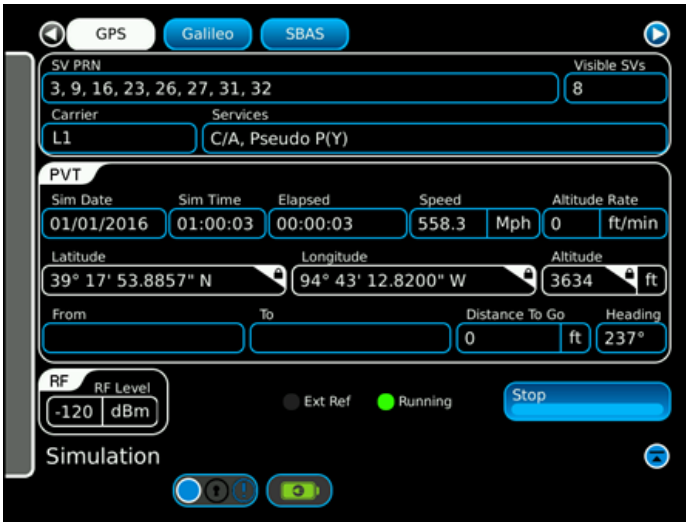


Figure 13. GPSG-1000 Simulation Running

When the simulation is complete, a message appears 'Trajectory simulation completed successfully'. See figure 14.

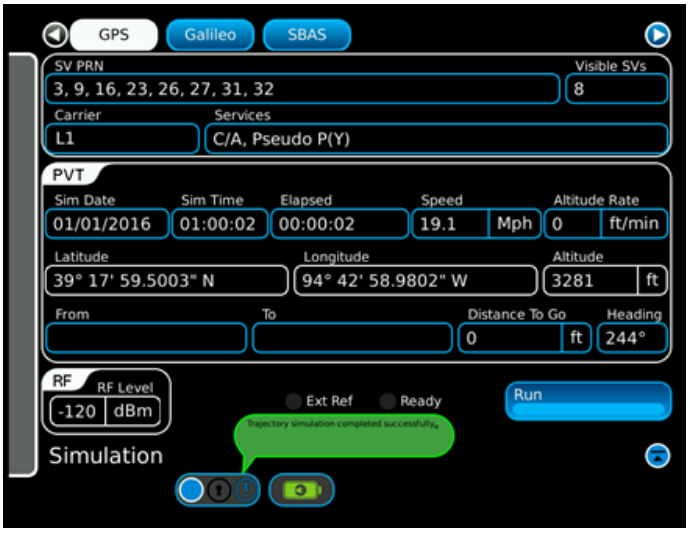


Figure 14. GPSG-1000 Trajectory Simulation Complete

Playing KML File as a Route

On the GPSG-1000 Side Menu select the down arrow to display the lower half of the menu. See Figure 15.

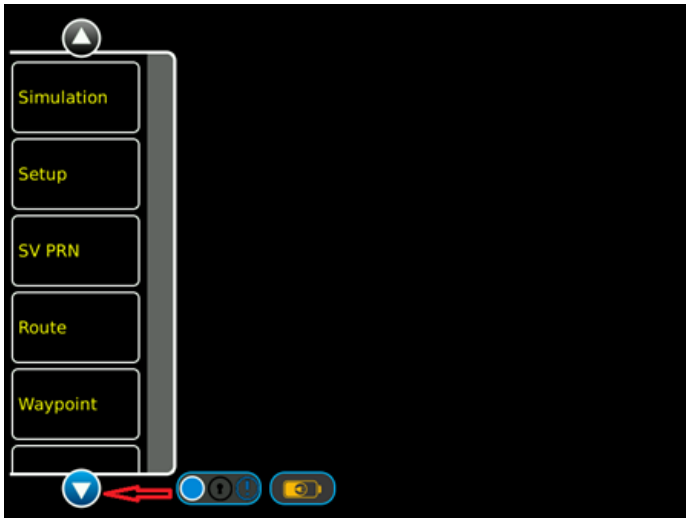


Figure 15. GPSG-1000 Side Menu

Select File. See Figure 16.

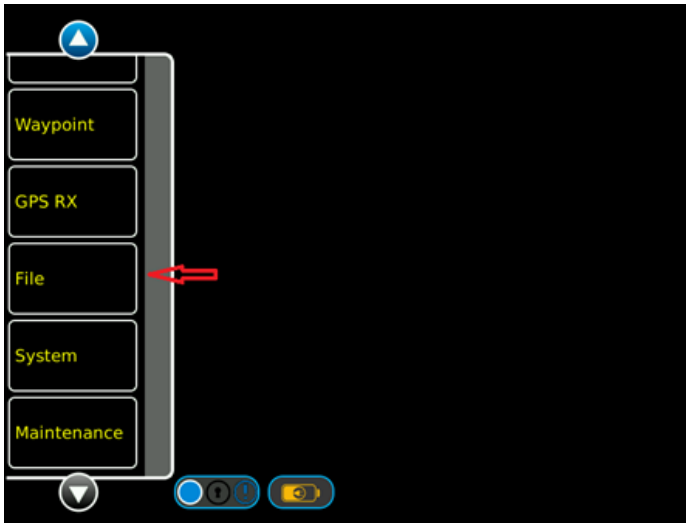


Figure 16. GPSG-1000 Lower Side Menu

In the KML File screen, select 'Load Route'. The window 'Load KML File' opens. Select the file you wish to load and press 'Open'. See Figure 17.

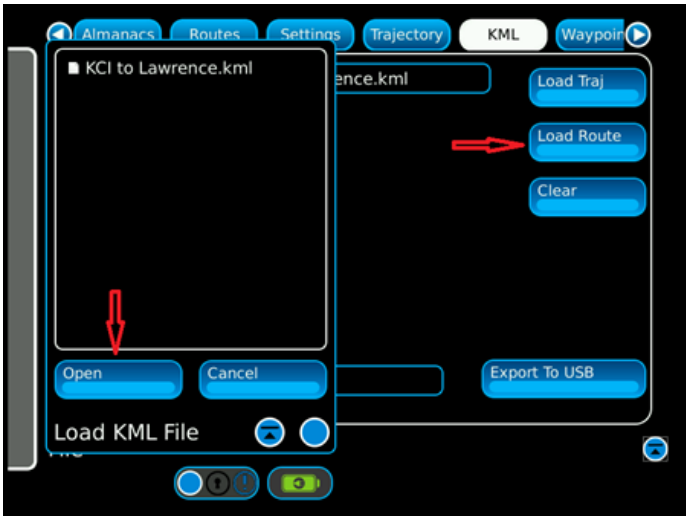


Figure 17. Load KML File Window

A message will appear 'KML Load Successful'. See Figure 18.

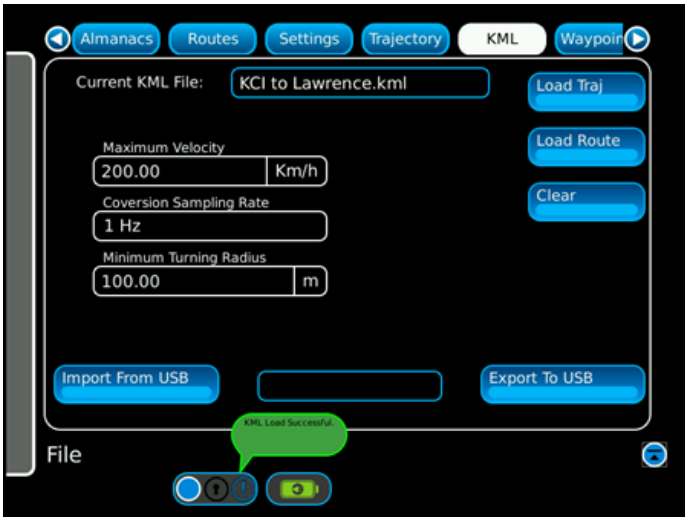


Figure 18. KML Load Successful

Close File – KML Screen. To view the created Route data, from the side menu select 'Route'. See Figure 19.

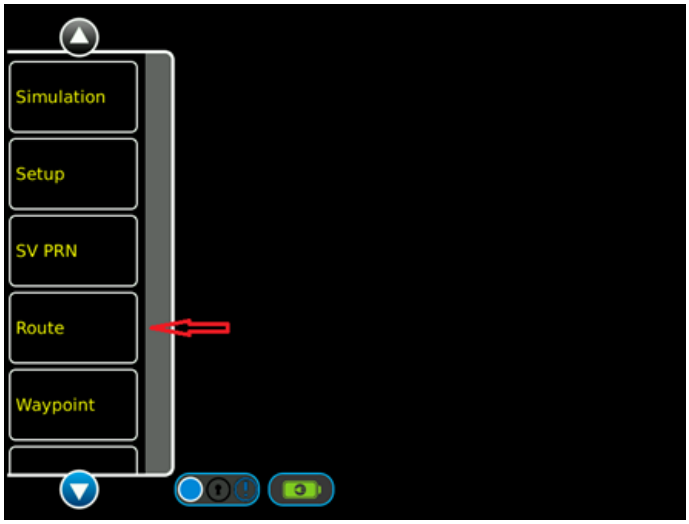


Figure 19. GPSG-1000 Side Menu

In the Route Screen, note the route points are listed. To validate the route and check for errors, select 'Validate'. A message appears 'Route is Valid'. See Figure 20.

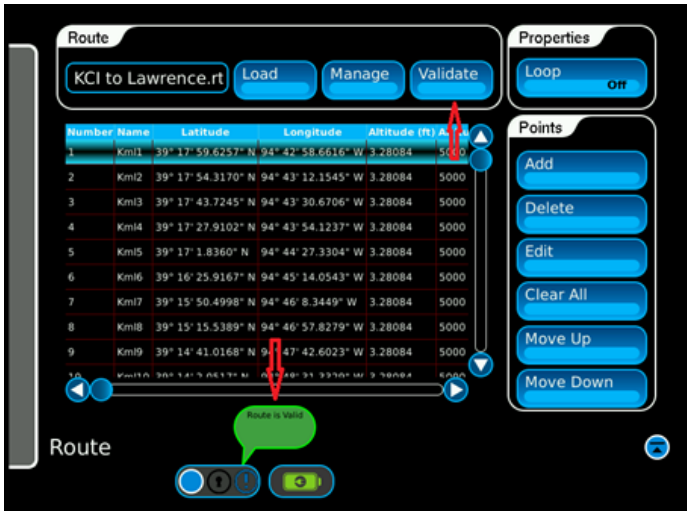


Figure 20. GPSG-1000 Route Screen

Selecting a Route Point and then selecting the Edit button on the right side of the screen will open the Route Edit screen and display the data for that Route Point. Some data is transferred from the KML file and some is generated by the GPSG-1000 as per the selections made in the KML File menu and the selected GPSG-1000 motion model.

The KML file transfers the Latitude and Longitude information as well as the Altitude. The GPSG-1000 generates the Route Point Name, Altitude Rate, Speed Acceleration, and Turn Radius. See Figure 21.

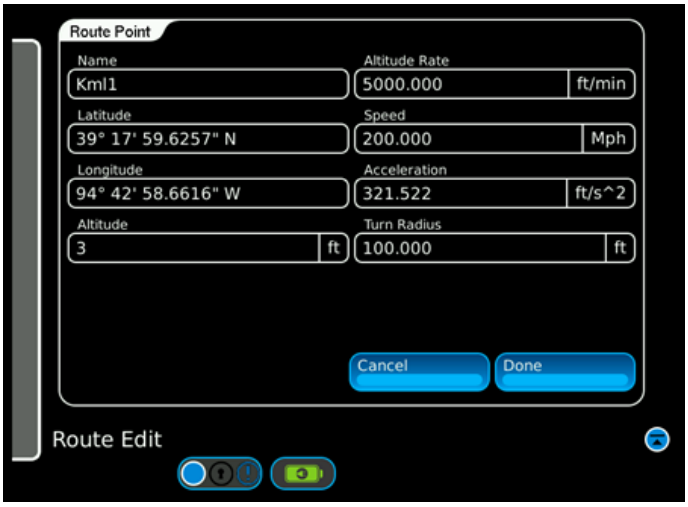


Figure 21. GPSG-1000 Route Edit Screen

To return to the Route screen or to save any changes made to the Route Point information, select "Done".

Close the Route Screen. From the Side Menu, select 'Setup'. See Figure 22.

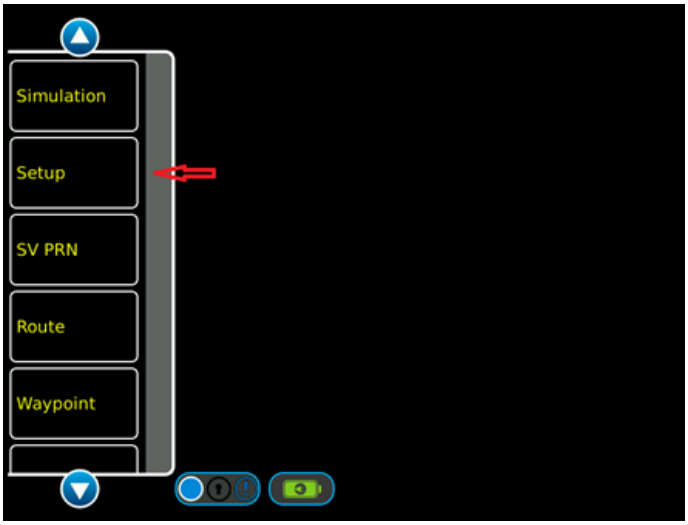


Figure 22. GPSG-1000 Side Menu

In the Setup – Simulation Screen, select the 'Simulation' drop down menu and select 'Dynamic'. See Figure 23. Setup all other parameters as per your simulation requirements. When playing back a Route file, the GPSG-1000 will use the clock data as selected in the Setup – Simulation Screen. In this case the Clock is set to Internal.

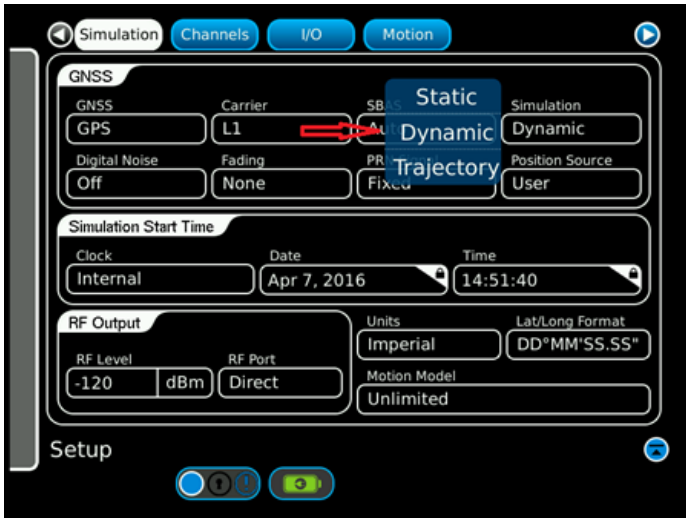


Figure 23. GPSG-1000 Setup - Simulation Screen

Close the Setup – Simulation Screen. From the Side Menu select 'Simulation'. See Figure 24.

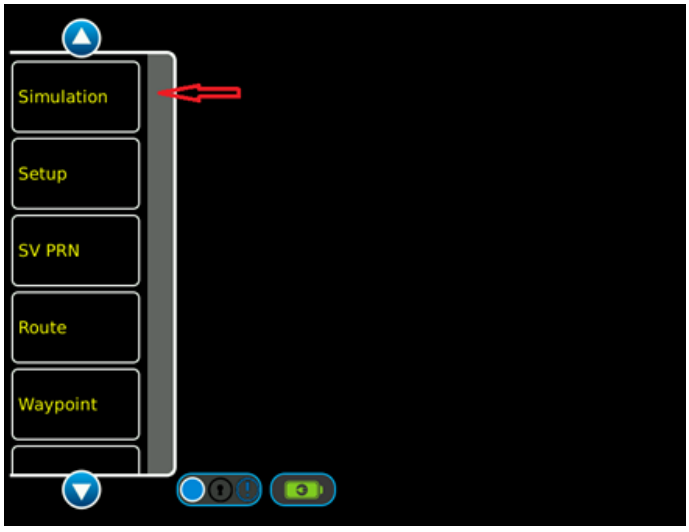


Figure 24. GPSG-1000 Side Menu

In the Simulation – GPS screen select 'Run'. See Figure 25.

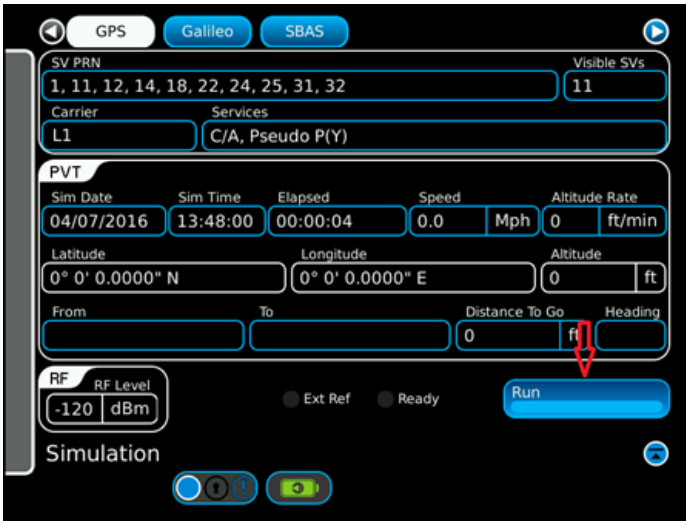


Figure 25. GPSG-1000 Simulation - GPS Screen

The GPSG-1000 will display 'Configuring' then 'Running'. See Figure 26. Note the PVT fields are displaying the positional, speed, and time information.

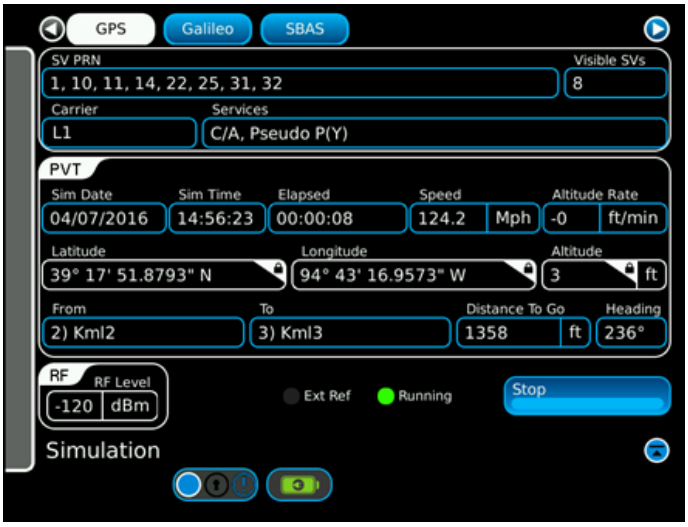


Figure 26. GPSG-1000 Simulation Running

When the GPSG-1000 reaches the end of the Route the simulation will stop.

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To reach the VIAVI office nearest you, visit viavisolutions.com/contact

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