Module 8D: Data Exchange

After completion of this lesson, the student should be familiar with some of the GNSS and Traverse data types utilised in MAGNET Tools and the different methods of importing and exporting them into a project.

Introduction

Because of the varied applications of MAGNET Tools, there are many data types and formats that can be imported, exported, and used within the software. In this course, we will be focusing on GNSS and Traverse and so data relevant to that application will only be explained in this lesson.

The data types that we will be working with in this course can be categorised into the following headings:

1. **Coordinate Data *(TS and GNSS)***
2. **TS Observation Data**
3. **Raw GNSS Data**
4. **GNSS Observation Data**

The table below describes and lists comprehensive and acceptable data formats for each of the abovementioned data types. Note that not all data formats are listed.

Data Type	Description	Formats	
Coordinate	E, N, Z, C style single coordinate files	**.txt**	.xyz
		.csv	**.pt3**
		.xml	.html
TS Obs Data	Raw TS observation information	.rw5	**.gts6**
		.raw	**.gts7**
		.sdr	.xml
Raw GNSS Data	Raw GPS occupation information (Static or Kinematic)	**.tps (Topcon)**	**.sp3 (Ephemeris Data)**
		.pdc (Sokkia)	**RINEX**
		.dat (Trimble)	**RINEX3**
		.mdb (Leica)	**Compact RINEX**

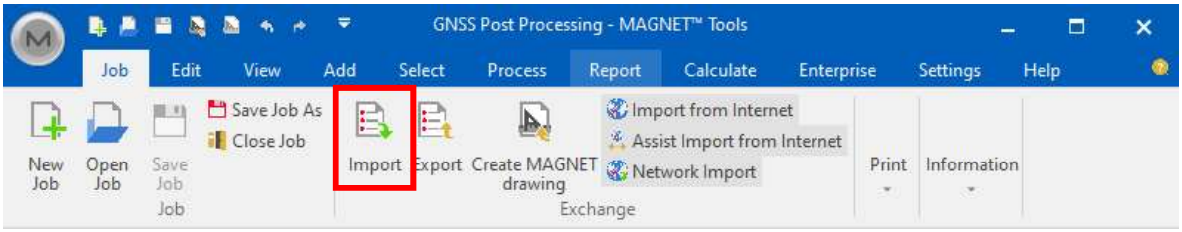
GNSS Obs Data	Vector information, relative GNSS position data	**.xml** **.rw5 (Carlson)** .sdr (Sokkia)	**.tvf (Topcon)** .jxl (Trimble) .raw (TDS)

Data Import

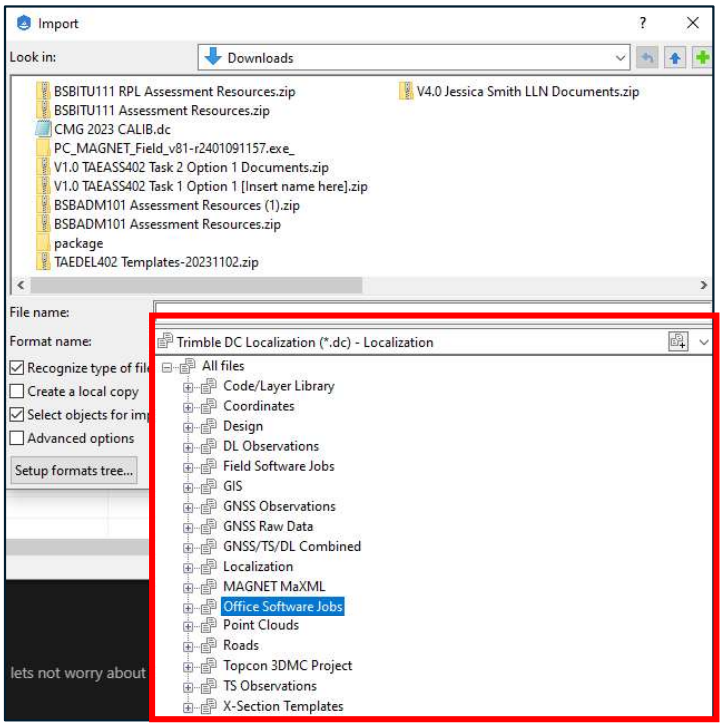
There are different options for importing data to a project. The option you choose will depend on what and where the data is that you need to import.

Import From Files

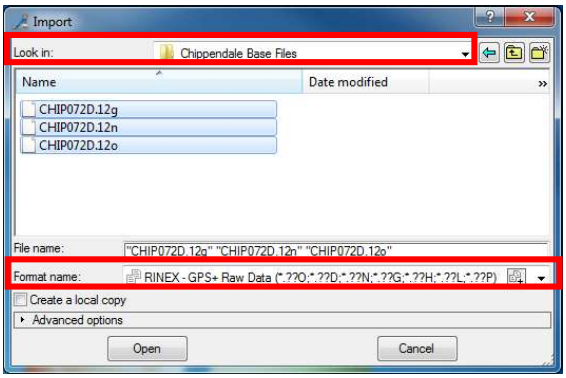
A common method for exchanging files is to import them from a location on the computer's hard drive or a removable storage media such as a USB stick. To do this, click **Import** in the Exchange Group under the Job Tab.



After clicking the icon, the **Import** window will display, allowing you to select the type and format of the data you want to import on the project.



In the **Look in** combo box, you can select the corresponding destination folder where the required data is stored. In the **Format Name** field, select the desired format. The Import window will only display files with the extension which relates to the selected file format. Then select the required files and click Open to start importing the files to the job.



MAGNET Tools displays a progress bar to indicate the completeness of the import. It is beside the status bar located at the bottom right of the screen. Wait for this to finish before attempting to use other options in the software.

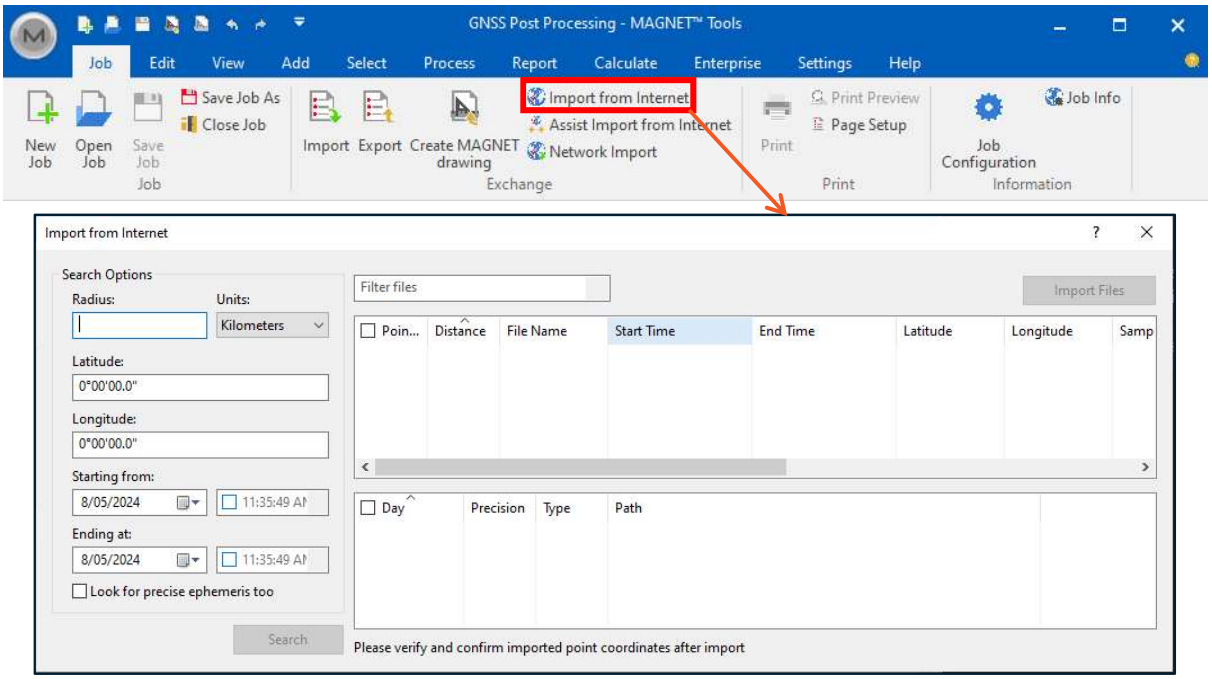
Import From Internet

The Import from Internet option can be useful for GNSS post-processing projects. This functionality allows you to find RINEX files (with broadcast/precise ephemeris) from the Internet according to your request and to download the files to the current job.

Once you have some raw GNSS occupation information in the MAGNET Tools project, the Import from Internet option search the web for data related to the area and time of your survey. Two data types that can be found by using this option include:

- **Raw GNSS Occupation Data** – from a selection of published base stations
- **Precise Ephemeris Data** – correct minor orbit errors inherent in the satellite broadcast ephemeris

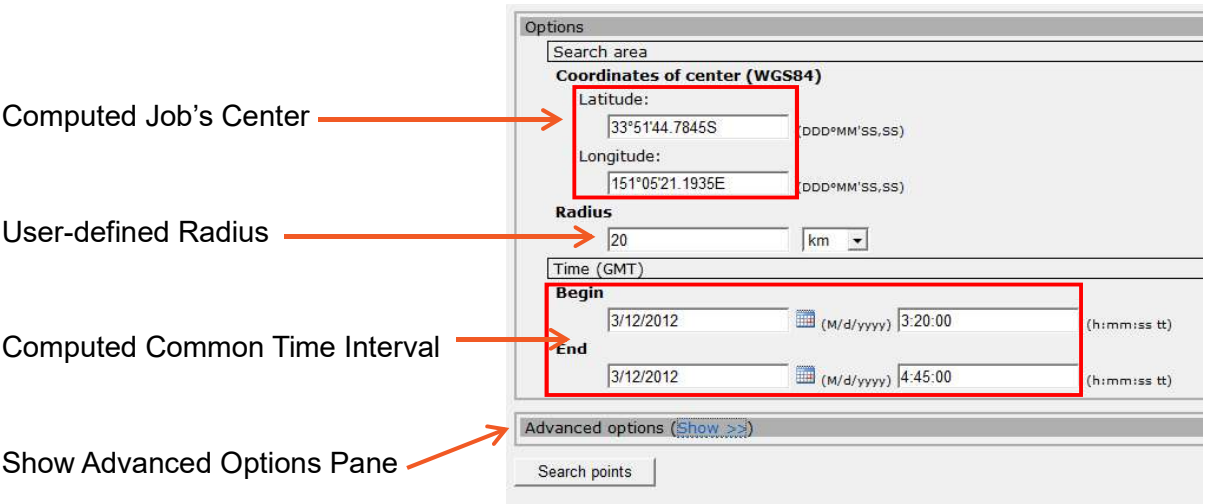
To do this, simply click on the **Import from Internet** in the Exchange Group under the Job Tab. After clicking the icon, MAGNET Tools automatically requests the Topcon Server. Then this server generates the **Web Import** page, and the page is displayed in MAGNET Tools.



*The Web Import Page consists of two pages: (1) **Search Options** page (as shown above)and (2) **Results** Page (as shown on p.24).*

The type of the Web Import page depends on the version of Topcon server's software and can be updated regardless of MAGNET Tools version.

After receiving the request, MAGNET Tools analyses the station coordinates of the job and start/end time of GPS occupations. Using this information, MAGNET Tools calculates and sends the coordinates of the job's geometric center and common time interval for all GPS occupations of the opened job to the Web Import page. Also, this page contains a field to enter the radius from the center of the job to search for reference stations.



You can also include additional search parameters using the **Advanced Options** pane. You can set the sampling rate using the drop-down list, select searchable networks, and whether you would like to search for precise ephemeris (in SP3 file format). The default values for these criteria are shown in the image below.

Set desired record interval

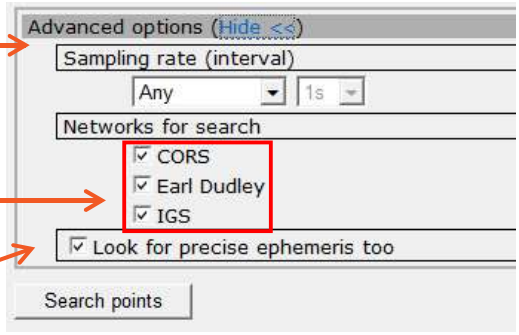
for RINEX data files

Select where software search for

RINEX data files

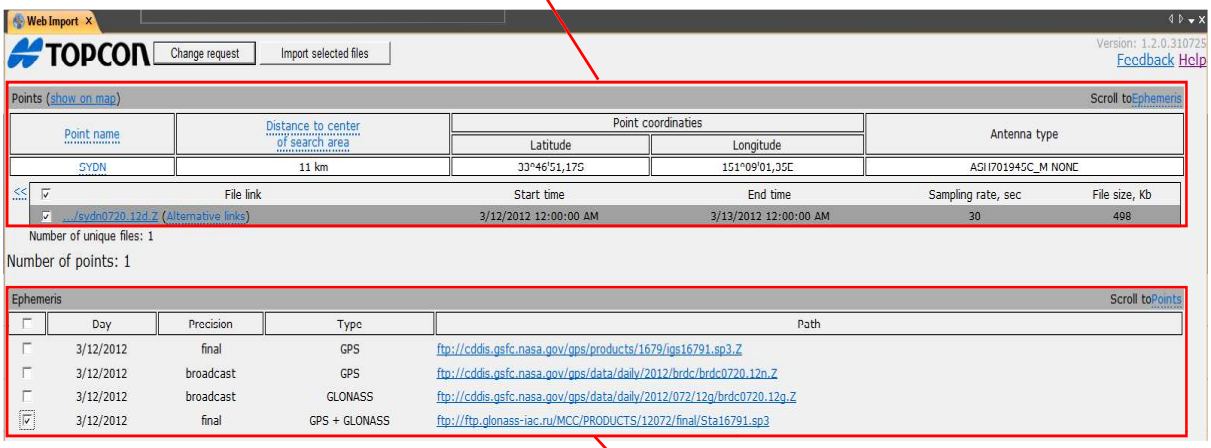
Use this tick box to toggle on/off

search for precise orbits



To run the process of finding the desired station(s) based on the search parameters, click the **Search Points** button. This closes the Search Options page and opens the Results page, listing all reference stations/points which meet the user's request by distance from the job's center, and available ephemeris data.

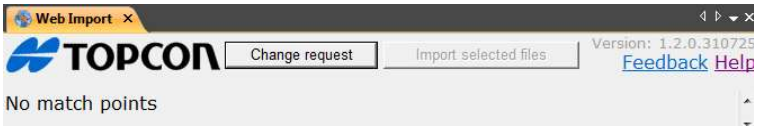
Points List Information



List of Available Ephemeris Data

Use the check boxes to select which files you would like to import and then select **Import Selected Files**. Same as Importing from Files, status of data import is shown on the progress bar (see p.22 Import from Files). Wait for this to finish before attempting to use other options in the software.

If the software does not find a station, '**No Match Points'** message will appear on the Web Import page. Then the user can change the request and re-run search stations.



In case Web Import page becomes idle for more than 20 minutes, then, for continuation of program work, it is necessary to restart the Import from Internet option. Otherwise, the following alarm message will appear: **'Service Error: The server method 'FindPoints'/'FindEphemerides' failed'** when you click Search Points.

*In Australia, the use of this option to source base station data is limited. However, there are some "**IGS**" base stations that you may be able to use.*