

## LEICA Geo Office

**LEICA Geo Office (LGO)** is the new office software, which was introduced together with GPS and TPS System 1200. It supports all measurement types (TPS, GPS and level data) and is the ideal tool to view, process, quality check and archive data before exporting it to virtually any format required by subsequent mapping or engineering packages.

LGO is built on the strengths of SKIPro 3.0 and LevelPak-Pro 1.5, but was improved for all System 1200 instruments. Additionally, LGO also supports the existing range of instruments including GPS System 300 and 500 as well as the TPS series 300, 400, 700, 1000, 1100 and the DNA instruments. Leica offers one consistent office software package for whichever instrument you are using!

If you have already used SKIPro or LevelPak-Pro, you may already be familiar with some of the strong points of LGO. If you only currently use TPS instruments, you will quickly realise that LGO is more than just a series of tools.

This Newsletter summarises the main features of LGO. Future newsletters will focus on particular features and functionality in more detail.

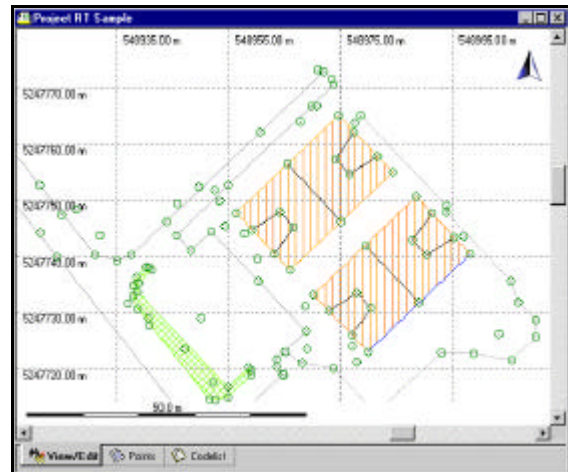
## Graphical and Intuitive User Interface

LGO is based on an intuitive graphical user interface making it very easy to learn and use.

The different management components for projects, coordinate systems, report templates etc. provide a clear overview and enable you to manage your data easily.

All data can be inspected and various quality checks can be made. Thematical data is visible and all line and area objects that have been collected with a TPS1200 or GPS1200 instrument can be displayed in the **View/Edit** component of the project.


You can view your survey, check for completeness and inspect the quality of your results.



## Reporting

Within LGO, reporting is based on HTML and allows modern and professional reports to be created.

All reports can be customised - the contents can be defined, the layout can be adapted and it is even possible to include your own logo in your reports.

  
**Report on Mean Coordinates and Differences**

Processed: 07/09/2004 10:08:54

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**Project Information**

|   |                     |
|---|---------------------|
| Project name:                           | rts1200             |
| Created:                                | 07/01/2004 14:36:14 |
| Time zone:                              | 1h 00'              |
| Coordinate system name:                 | Swiss with geoid    |
| Application software:                   | LEICA Geo Office    |
| Average limit (Position):               | 0.0750 m            |
| Average limit (Height):                 | 0.0750 m            |
| No. of Points with Avg. limit exceeded: | 0                   |

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## Combining GPS, TPS and Level Data

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LGO handles GPS, TPS and Level data in a similar way with a standardised dataflow.

If you import data from a TPS or GPS instrument averages are automatically built and you can view the complete picture of your survey.

Using the LGO **Coordinate System Management** you can always easily convert between WGS84 and local coordinates.

The **Network Adjustment** module of LGO allows the combination of all types of measurements in a rigorous least squares adjustment computation in order to obtain the best possible set of consistent coordinates.

The computation is based on the powerful **MOVE3** kernel, which adjusts all observations in a truly three-dimensional frame. This is unlike some competitor's software, which forces the user to treat position and height separately! Inside LGO, GPS observations, TPS traverse and height networks and level lines will all be adjusted in one processing run. When combining GPS and TPS the transformation parameters can be estimated simultaneously by holding control points fixed.

The adjustment kernel also includes extensive statistical tests to identify blunders and outliers and also a utility to automatically calculate all loop misclosures in your project. Simple tools to quickly check the consistency of your data!

Data collected with LEICA digital levels can also be processed easily in LGO using different settings. The Adjustment module will include the height differences of the level lines into the least squares computation.

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## GPS Post-Processing

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LGO also includes a GPS post-processing kernel, which guarantees the highest reliability possible today for static and kinematic baselines.

This kernel uses the same strategy, algorithms and techniques that are implemented in the

field for the System 1200 RTK rover (see also Newsletter No.1), and is additionally optimised for post-processing.

Unlike all other competitor software packages which use the whole duration (the period over which raw data was logged) for one valid ambiguity set, LGO repeats the ambiguity resolution and confirms the correctness every 30-180 seconds. This means that ambiguities are continuously monitored over the entire observation period and results in the highest reliability possible for GPS processing today.

The table below shows a comparison that has been carried out against a competitor product on baselines of up to 200km length under relatively high ionospheric conditions.

**The summary shows that LGO fixed all baselines correctly, whereas the competitor product (in yellow) could not fix 2 baselines, and from the baselines, which were claimed fixed, four were not correct.**

|                            | LGO  | Competitor |
|----------------------------|------|------------|
| <b>Fixed baselines</b>     | 14   | 12         |
| <b>Not fixed baselines</b> | 0    | 2          |
| <b>Wrong fixes</b>         | 0    | 4          |
| <b>Processing time</b>     | 36 s | 1:11 min   |

You may recall that similar results were shown in Newsletter No. 1 when comparing System1200 RTK against a competitor's RTK in the field – **again; the competitor produced a significant number of wrong results.**

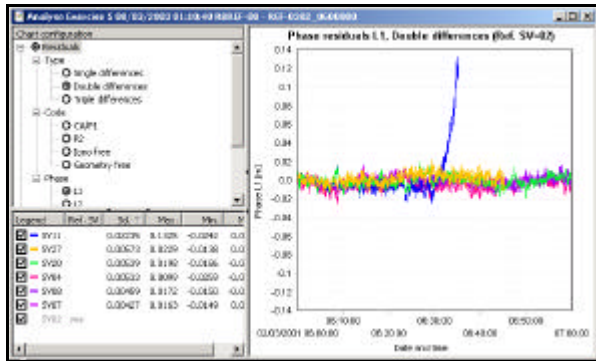
Higher reliability immediately means increased productivity. No need to go out again to re-visit the points and no incorrect solution. This is when you start enjoying the post processing. Overall it is simpler to use, more reliable and faster than most of the competitor's software.

## Additional features for the expert

Post-processing GPS data within LGO is extremely simple and a complete network can even be processed with a single mouse-click. However, the expert or advanced user also has a lot of additional functionality and flexibil-



ity at hand. Advanced processing parameters allow the post-processing kernel to be fine-tuned and steered, HTML reports provide complete detailed information of the processing run and a graphical analysis tool allows the results of particular baselines to be examined or investigated.



## Exporting Data

But what use are the most powerful processing tools help if you cannot get the data out in the format you need? Here is another of the strong points of LGO.

Whereas some competitors have concentrated on supporting a series of pre-defined, but fixed formats, LGO offers a much more flexible tool.

Besides some standard export formats, the **Custom ASCII Export** is available in LGO. The **Format Manager** allows format masks to be created, which can then be used to output virtually any data contained in the database in virtually any format you require.

And if there is a format, which still cannot be achieved using a format mask, LGO includes additional functionality for such cases. During the Custom ASCII Export routine, you can choose to use an executable file (this file is called with the filename of the ASCII file as the first parameter). This can be utilized to further fine-tune your export to the required format. Basically, you can simply “plug in” your own executable and then any format can be achieved.

Various examples are already available including special reports in HTML or PDF.

The **LEICA Software Development Centres** (SWDCs – more on these in the next newsletter) can help to further customise your export.



## Exporting to DXF – Lines and Areas

Export to DXF is possible also directly and has been improved to include the lines and areas collected with System 1200 instruments.

LGO contains functionality to define styles, colours and the thickness of lines and area borders during the export.

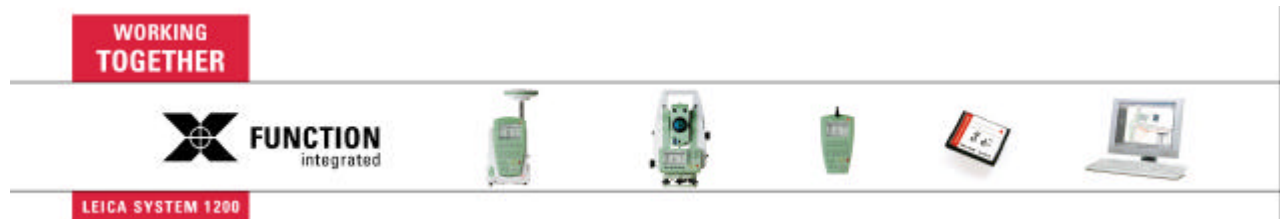
## Dataflow to the Instrument

It is not only the export of data into other software packages, which makes LGO the central tool for the dataflow to and from your instruments. All database objects such as projects or coordinate systems can easily be transferred to your instrument. Conversions into the database structure of your instrument are automatically taken care of.

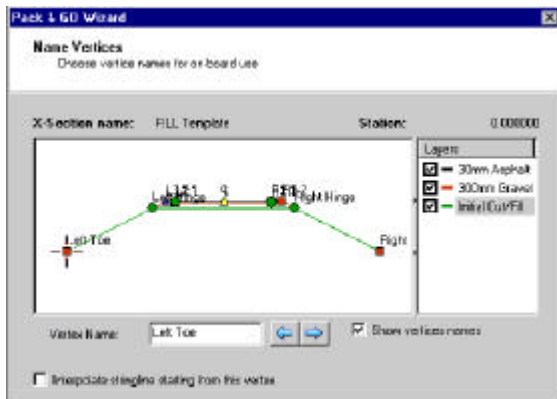
Additionally, LGO includes a new component - **Design to Field** – which allows converting data from many design packages to prepare it for use onboard a TPS 1200 or GPS 1200 instrument.

**Road alignment** files can be converted to Road Jobs, **DTM files** can be converted to DTM Jobs and **points, lines and areas** in a DXF drawing can be converted to “normal” System1200 Jobs. Design to Field interfaces to your design package and guarantees a seamless dataflow to application programs on the instrument.

During the conversion process the **Pack&Go!** wizard will guide you where necessary - for example when converting road designs:



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Many converters can be added easily and plugged into the Design to Field component. Various such converters are already available and it is quite likely your design package is supported already. LGO is supplied as standard with DTM and point, line and area converters – additional road alignment converters can be found on the LEICA download web site:

<http://downloads.leica-geosys-tems.com/downloads/areas/zz/off/leicageoffice/lgoimporters/roadimporters/index.htm>

## Summary

**LEICA Geo Office** is the perfect partner for your TPS and GPS instruments and ensures you will get the best results.

You can view and manage GPS, TPS and level data in an integrated way using only one software package. It includes a graphical and intuitive user interface, flexible reporting tools, powerful post-processing and adjustment kernels and completely flexible export routines. Despite all this functionality, LGO is easy to learn with the same operating concepts in all components.



Please contact your local Selling Unit or local Leica dealer if there are specific topics you would like covered in these newsletters.

We welcome all suggestions for TPS1200, GPS1200, specific applications or LGO. We look forward to receive your idea.

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