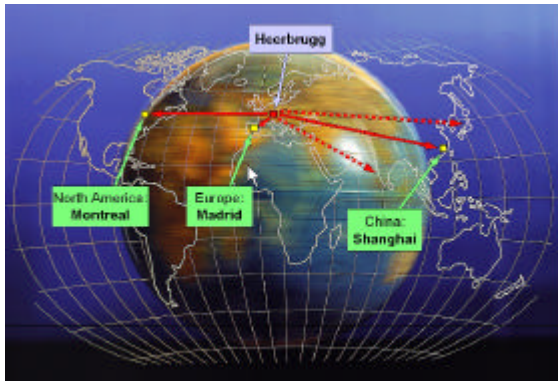## LEICA SWDCs

A **LEICA SWDC** is a LEICA **S**oftware **D**evelopment **C**entre - there are currently 3 based around the world.

The SWDC in **Montreal** (Canada) serves the **Americas**, the SWDC in **Madrid** (Spain) serves **Europe** and **Africa** and the SWDC in **Shanghai** (China) serves **Asia** and **Australia**.

Each SWDC is run by the SWDC Manager and employs a number of software development engineers.

This Newsletter gives an overview of the role of the SWDCs, the application programs and software they have produced and why they are so important to System1200 instruments.

The Roles of the SWDC

The SWDCs were established in order to quickly respond to individual customer's survey needs and requirements.

Leica Heerbrugg (the headquarters of Leica based in Switzerland) develop the survey instruments themselves and the software and application programs which run on the instruments. This software is developed to meet the survey needs for the whole world.

However, because the applications for which survey instruments are used and even the way the instruments are used can vary significantly around the world (even within a country itself) it was recognised that it was necessary to be able to quickly react to individual country's and even individual customer's needs – hence the SWDCs were created.

The SWDCs were established around 2 years ago and have developed many new application programs, converters, routines, protocols and new features for the full range of Leica instruments - including digital levels, TPS300, 400, 700, 1000 and 1100 – and of course recently, System1200.

All application programs, manuals and other software produced by the SWDCs is available on a CD – one CD is produced by each SWDC: Europe - article no. 734531, Americas - article no. 73452 and Asia – 734533. Note, some application programs on the CDs are protected and need a license key to be used.

All software on the CDs will also soon be available on the SWDC download sites – this will be announced in a future newsletter.

Loadable Application Programs and System1200

The concept of **individual loadable application programs** on System1200, which are separate from the main instrument firmware, is the same as the approach used on the TPS1100 instrument. For example, **Stakeout**, **Reference Line** and **RoadRunner** are all loadable application programs on System1200.

This is different to System500 GPS where all application programs were fully integrated into the "main" system firmware.

The advantage of the System1200 concept is that additional application programs can be produced or existing programs can be improved at any time and loaded onto System1200 instruments – there is no need to wait for a complete new firmware release.

Remember that all loadable application programs will appear in the **Program**" menu - press the **PROG** button at any time, or choose **2 Programs…** from the main menu. Remember also that these programs can be put in the **USER** menu, onto a hot key or can even be

configured to start automatically when the instrument is turned on (more on configuring System1200 instruments in a future newsletter).

It is this flexibility of System1200, which allows the SWDCs to quickly react to customer's needs and write the required application program, which can then be immediately loaded and used onto the instrument.

Programs Already Created by the SWDCs

The SWDCs were busy working on System1200 application programs and related software before the instruments were launched and are of course currently working on new programs. Listed below are the programs which have already been produced.

Note, even if the programs will not help you in the way you work with System1200, they will give you some idea of the programs that the SWDCs can produce. If you need a program writing for a specific application or use of System1200, then the SWDCs may be able to help you…. More on this later.

Offset+ (TPS1200)

This application program allows the coordinates of a point to be computed where the actual point itself cannot be directly measured. The possibilities are shown below.
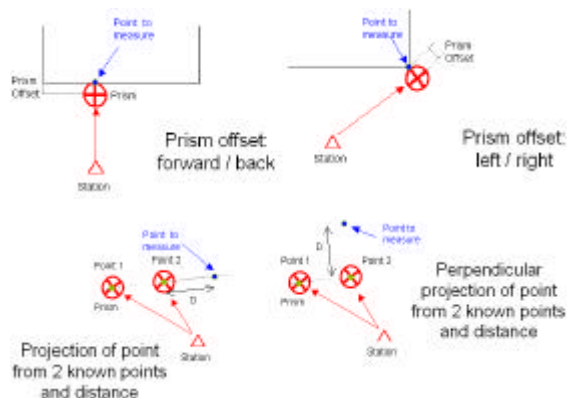
Remember, this program can be put on a hot key such that any time you need to measure

an inaccessible point, it is then only one keystroke to start the **Offset+** routine.

This program was originally requested by France (article no. **740501**).

VIP Coding (GPS1200 and TPS1200)

This application allows the TPS1100 VIP coding routines to also be used on System1200 instruments.

VIP coding originated on the VIP total stations (many years ago!) and allowed individual and "customised" codelists to be created such that when used in the field a menu system and other textual prompts would help the user in coding.

This method of coding was also very popular in certain countries on TPS1100 and is now possible to be used on System1200 (both TPS and GPS).

Note, the software produced by the SWDC also includes a converter, which converts the original .cod files into a format which can be used on System1200. Again, assign the VIP coding application to a hot key on the System1200 instrument and the VIP coding routine can be accessed at any time.

This program was originally requested by UK and France (article no. **740500**).

Traverse (TPS1200)

The Traverse application program allows a traverse to be measured and the closing error to be calculated. Points within the traverse can be selected from the job if already stored, or can be measured directly.

This program was originally requested by USA (article no. **734170**).

RoadRunner Data Converters (TPS1200 and GPS1200)

The SWDCs have also been busy writing converters, which allow data from CAD or road design packages to be used on System1200. These converters are then used within the **LGO Design to Field** tool.

In addition to the standard **Land MXL** and **GSI** converters, the following converters are also available: **REB** (Germany), **CartoMap** (Spain), **Clip** (Spain), **Ispol** (Spain), **Genio (MOSS)** (UK), **Mulitipiste** (France), **Modelo Digital** (Spain), **SDRMap/SDRVarin** (several countries), **SierraSoft** (Italy), **TCP** (Spain), **Trazado** (Spain).

Clearly, even if you do not use one of these software packages, but you need a converter, then it may be possible for the SWDCs to create a converter for you…

Japanese Sets of Angles (TPS1200)

The "Japanese" Sets of Angles program is similar to the "normal" TPS Sets of Angles, but with some functionality specific to the Japanese way of working.

This application was of course requested by Japan (article no. **741680**).

Japanese Coordinate Transfer (TPS1200 and GPS1200)

This application is to convert measured coordinates stored in a job some specific Japanese formats - APA, SIMA and ASC. Similarly, data can be imported from these file formats into a System1200 job.

Again, although this format is probably unique to the Japanese markets, converters to particular formats can be easily created.

This application was also of course requested by Japan (article no. **741681**).

Programs Currently Being Developed

Listed below are the programs which are currently being produced and will be available soon.

ATK – Alignment Tool Kit (GPS1200 and TPS1200)

This application program allows road, rail, pipeline and other alignments to be created onboard System1200 instruments in the field.

These horizontal and vertical alignments and related cross-sections to be converted to a Road Job, which can then be used in the RoadRunner application program - see Newsletter no. 3 for an introduction to the flexibility and functionality of the RoadRunner software. Alignments can then also later be edited if necessary.

The USA and several other countries originally requested this program - it is currently undergoing final testing and should be available later this summer.

COGO Line and Arc Calculations (TPS1200 and GPS1200)

This program will extend the existing System1200 COGO functionality.

It will allow lines and arcs to be defined from which the coordinates of points can be computed relative to this line or arc, or points can be measured and the position of this point relative to the line or arc will be computed. The existing graphical functionality and flexible log file functionality within COGO will also be available for the line and arc extensions.

These COGO extensions were requested by USA, Germany and Australia. The development is currently being completed and after testing should be available in early autumn. This functionality will be added to the existing COGO application program (article no. **738484**).

TPS Hidden Point (TPS1200)

This program will allow a "hidden point rod" (such as already used with TPS1100) to be used to measure the coordinates of inaccessible points – such as the bottom of drains or difficult to reach corners.

2 or 3 prisms are mounted onto the hidden point rod (or marks are simply made onto any rod and then reflectorless measurements can be made) from which the hidden point can be computed.

This program was requested by Germany and is currently being completed and after testing should be available in early autumn.

XML / PDF Protocol Format (GPS1200)

This converter converts data output from the GPS1200 instrument into a specific pdf format required by the German Cadastre authorities.

It is currently undergoing final testing and will be available very soon (article no. **741546**).

Although this format is probably unique to the German Cadastre, the concept of creating particular formats is proven and can easily be adapted to create other formats.

Other "Services" Provided by the SWDCs

It is not only System1200 loadable application programs that the SWDCs create - they also develop "off-board" converters, format files and other tools.

Background Maps

The SWDCs also developed the converters which allows "maps" to be viewed on System1200.

Using the LGO Design to Field tool, dxf files can be converted to a normal job and viewed in map view.
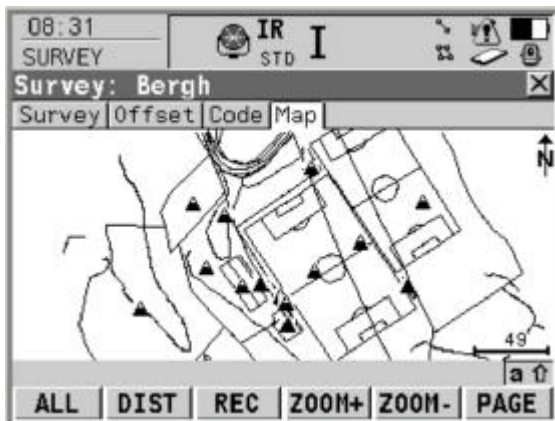
The map can then be used simply as a "background map" for orientation or as an "active map" where points can be selected for stake out directly from the map.

Remember that pressing **shift F2(CONF)** in the map views allows the map view to be configured – amongst other things, whether to show point Ids, heights, point codes or CQs, whether to show the map toolbar on the left hand side of the screen and in which datum (local or WGS84) the map should be viewed.

Geoid Model Reader

This PC application allows a geoid model to be read from an ASCII file and converted to a .gem file – this file can then be used on a System1200 instrument (or System500) or can be used to calculate the geoid-ellipsoid separation within LGO (or SKI-Pro).

This means that if a country, a mapping agency, or even an individual customer wants to create and use his only geoid file then this is now easily possible.

All that is required is an ASCII file containing the geoid separation values and information about the spacing of the grid – the SWDC tool will then create the necessary file. Previously, it was necessary that a user had to write an executable file – this was not always so easy.

Format Files

Format files are used to export data within jobs to an ASCII format.

Using format files, it is possible to created virtually any data format – additionally on System1200, it is also the format file which allows logfiles (such as report about the points and stakeout differences during the use of the Stakeout program).

The SWDCs have created a large library of format files which are available on the SWDC CDs and soon, on the Leica web page. Supported formats include a whole host of GSI formats, csv formats, fbk formats, rw5 formats and many others. If you need a particular format file and are not sure how to make your own, then maybe the SWDCs have already made it for you!

Making Use of the SWDCs

If you have a need for an application program, tool or converter which will make your life even easier with System1200, then maybe the SWDC can help.

You should contact your local Leica Selling Unit, Dealer or Representative who will discuss your needs and ideas with you. They will contact the SWDC and maybe the SWDC can create the functionality you need – it is their job to support Leica users!

Remember

Using the concept of loadable application programs on System1200 means that new applications can be created, or existing applications can be extended at any time.

The software already created by the SWDCs is available on CDs which can be obtained through you local Leica representative and also very soon on the Leica web page.

SWDCs were established in order to quickly meet the local demands of Leica users.

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.