Introduction
Haglöf Sweden AB is a family business running in the fourth generation with Stefan Haglöf as general director.

Everything started over 60 years ago with the increment borer. The name Haglöf is completely linked with increment borers, and it is still an important product for us. But the company today is very different from what it used to be some decades ago.

Just to give an idea how the information technology has affected us as a company:

Sales and production of borers and other manual (mechanical) instruments stood for about 90% of the turnover in the company only 15 years ago.

Today systems, software and electronic instruments are over 90% of our turnover and only about 10% generates from manual instruments sales.

These facts have made us focus very hard on new technology and to have employees and partners that can meet our new needs.

Sales and marketing of increasingly complex systems make Haglöf Sweden focus on providing complete services including support and system training.

Ideas for our new products derive from our professional users on every specific market. We put great value in cooperating with forest universities and research institutes around the world. We get unique expertise that is crucial for us, and it helps us to reach our goal of having operator friendly measuring solutions for each specific country or company.

We consider it an advantage to maintain a small organization, and to keeping our development and production in-house. This way, we can afford to be flexible enough to try new things. Sometimes they turn out really well!

1. Harvester Calibration and bucking to value
The cut-to-length method is commonly used in northern Europe. In fact, all commercial cuttings in Scandinavia today are made with harvester machines.

Working in the forest demands a lot from the operators. They must not only be able to drive and service heavy machinery under rough conditions. They also have to handle a great deal of information technology. Some people say that a harvester machine operator takes more decisions every day than a pilot.
The new efficient technique opens up possibilities that no one could even imagine only 10 years ago.

Cut-to-length method basically means that trees are cut in the forest - in the right length and according to current pricelist in the merchandise computer. Harvesters truly harvest forests, and in large volumes.

Stakes are high in this business. It is extremely important to have accurate and calibrated systems - or the gains can be lost.

Traditionally in Sweden a forest owner gets paid for the timber once the timber has been control measured by the industry.

Many times this can happen months after the contact has been signed.

With accurate measuring systems and better routines for keeping the harvester systems calibrated, both value and volume are known already when cutting.

Forest owners, harvester operators and the very industry itself all gain on improved routines to keep the measuring systems well calibrated.

The measuring heads on the different brands of harvester machines are more or less accurate today. But varying temperatures, different forest types and the actual field and weather conditions make it necessary to have strict routines for the calibration.

In fact, Swedish forest companies demand that contractors have both the knowledge and the equipment to calibrate the length and diameter system in their harvesters. Almost 100% of harvesters in Finland and Sweden are calibrated with a computer calliper. The applications can vary, but are getting more and more complex.

At Haglöf Sweden we focus on exactly this area: simplifying and enhancing each operator’s efficiency. Decision makers on all different levels in the industry benefit from this.

When we developed our new Digitech Professional calliper we needed to think beyond regular caliper user areas like inventory and scaling. We wanted to make a multi purpose device for all field work.

At the moment, we are performing the last tests on our new electronic measuring tape. The tape communicates with the calliper. It will make a huge difference in the measuring process and most of all to the person using it.

Most development work is done in our programming production department. We have developed software applications for every field activity you can think of.

The keywords are value optimisation and efficiency increase.
2. “Gator Eyes”

Foresters face totally different realities depending on where they are. Climate, undergrowth, wildlife and tree sizes and types are examples of things that vary a great deal.

In certain parts, for example in the state of Mississippi where our US Sales office is located, it can be hard to get to a tree because of bushes or snakes. There may be poisonous plants, mud or water in the way.

Throughout the years, we have also had several requests on a product to measure upper stem diameter without climbing or using poles and sticks. We simply needed to find a way to measure tree diameters from a distance.

The Gator Eyes is actually an add-value add-on. If you have a Mantax Precision Blue caliper or a Digitech Caliper, all you need to buy are the jaws with pre-mounted laser pointers, and at a very reasonable price.

Can be used in different working situations and user areas.

3. NILS

NILS is the first Swedish inventory programme that includes all terrestrial environments. Agricultural land, forests, wetlands, riparian zones, mountains as well as urban environments are inventoried. Information from NILS contributes to our understanding of how man’s use of nature affects biodiversity. Results show the state of, and changes in, the distribution and area of different biotopes in the landscape as well as the occurrence of different small-scale features and landscape elements such as ditches, stone walls and solitary trees. The inventory also includes the occurrence of individual species.

NILS covers the effects of land use change, where results are implemented for prognostication and consequence assessments.

Environmental objectives
Following up the national environmental objectives is an important aim of the NILS programme. NILS provides figures for international reports as well as for other monitoring programmes. Data are also used in environmental research.
NILS comprises inventories of:
- landscape composition
- biodiversity
- aspects of cultural heritage
- Natura 2000 biotopes

The inventories are performed using both aerial photo interpretation and field-based methods.
Within the NILS- project many different side projects are included and last year a new inventory and monitoring was started. This is the project that I will talk a little about since it was very new for us and an inventory that was out side of the normal tree inventories that we are used working with.

This new project was an inventory of butterflies and bumblebees in pasturage and meadow land. For the first time a full scale inventory was made were different species of butterflies and bumblebees was recorded over all of Sweden. The inventory would be done in June and July and the weather needed to be sunny and the temperature over 17 degrees Celsius, the dreams work for everyone.

Since we already had good contacts with the Swedish university and also were involved in the NILS project from the beginning we where asked to join the competition to provide a solution for this new inventory.

After some meeting we found out that some things were very important for our clients:
- Easy to use because the personal is contracted and could be changed from year to year
- Solid and resistant because this inventory also includes inventory of large trees and this can be done even if the weather is bad!
- **Possible to use with one hand** since they are using a butterfly net in the other
- Safe storage of collected data
- Battery capacity
- Support

Based on these facts we offered the following solution.

The DP field computer had everything that they requested and the solution works like this. Explain how they are working in the field!

The software solution that was specified is just as important as the hardware. It must be easy to work and be secure.

### 4. The SCA project

GIS and mapping are becoming increasingly important. With better positioning systems and receivers, easy-to-carry systems are now interesting to everyone.

In 2004 we initiated a large project with SCA (Swedish Cellulose AB, Sweden’s leading forest owning company with 2.6 million hectares of land.)

The project goal was to develop a flexible field system for buying forests from private landowners.

A reference group from different parts of the SCA company was assigned to decide what hardware platform to use.

SCA Forest has five different management units in Sweden. Each management unit is organized to buy cutting rights from landowners.
The importance of these management units has grown a lot for the past 10 years. SCA’s own forest land is not enough to supply the mills with timber and pulpwood. About 35% of the supply is purchased outside the company.

The big challenge for us was to find a suitable system that could be accepted by all five management units and the 50 foresters that were used – and quite content with - working with manual instruments.

After various tests with particular instruments and entire equipment sets, we came up with a system that could be suitable.

Everything is based on a rugged field computer with Windows operating system and built in Bluetooth for communication with external instruments such as GPS receivers.

Different instruments for collecting field data were added, such as distance and height measurers, electronic callipers and a special designed carrying belt.

The software application for inventory made it possible to capture data using different methods, depending on what data accuracy that was requested.

The software application enables data to be entered by radio from the calliper to the field computer. No cables are needed and the typing process is minimized. Error sources were reduced and the operators could continue working with gloves-on, ever so important in our part of the world.

Since the system also works with a GIS application, every input is connected to a position. This enables the operator to navigate to his stand and to edit important data directly in the field. The operators were particularly pleased with the short learning process, which was actually a result from their own involvement in the project. Apart from operator satisfaction, the principal SCA were pleased with the quality improved information flow from field to office.

**Company benefits**

1. Better inventory accuracy with high efficient instruments for data capture
2. Easier to calculate and to present an offer in-field to the landowner
3. Possibility to recycle data to other parts of the company for deforestation, pruning, thinning etc.
4. Reliable data on exact location of streams, roads and nature preservation areas can be used for control and to minimize damages generated by heavy machinery.
5. Initiate the cutting where the correct timber and spicy are located.
6. Revisit sites for follow-up work, suitable also for long-time study projects of sites.

**5. VertexLaser**

Instrument for height and distance measuring is something that we have focus on for more than 10 years. Always trying to make the measuring more accurate but still keeping the user friendliness above all!
The Vertex III has set standard for height measuring around the world and it is an instrument that we are very proud of. The instrument has gone through quite a lot of changes over the years but the measuring technique has always been the same.

In 2003 we developed a new instrument for height and distance measuring that actually was requested from the New Zealand market in the first place during meetings in 2001. This new instrument combined laser technique and ultrasound in a small combined instrument with the weight of only 260 gram.

Both these instruments will very soon be available with built-in blue tooth!

The new Vertex IV is available for deliveries from the second quarter 2007. The new L400BT and VL400BT will be available for deliveries in the 4th quarter 2007.