

## STORYTELLING APPROACH FOR VIDEO DEMONSTRATION OF VRS SERVICE

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### ABSTRACT:

This paper will introduce to you the process and purpose of making demonstration video for promoting the VRS (Virtual Reference Station) service in Finland area. VRS service provides possibility to make high-accuracy, RTK (Real-Time Kinematic) GPS positioning, without setting up a reference station to known control point first. In Finland service is provided by Geotrim Ltd. and it is based on Trimble's VRS™ system. Since VRS service is still fairly new system in Finland, it needs to be promoted among the surveyor students in different levels and the current users of normal RTK applications. Therefore we students decided to prepare a demonstration video in cooperation with Geotrim Ltd., which clearly describes the major advantages and the potential of this new VRS system. Starting point for this video is to demonstrate how easy and fast this new VRS service is compared to the traditional methods of RTK GPS positioning.

The project started in the beginning of August 2005, when the idea for the demonstration video emerged. The first phase was to establish the idea in storytelling form, formulate manuscript for the story, make a production plan and find suitable actors for it. All the material was filmed during four days in the beginning of September, by using Sony DRS-PD150P MiniDV -camera. Editing and postproduction took place in three different phases during the four last months of year 2005.

The final version of the demonstration video was released in the beginning of year 2006. It will be now used for various educational purposes in different educational levels and among the users of the traditional RTK GPS measurements. Some smaller parts of this video will be used for promoting our surveying profession in other contexts as well. All the makers of this video are current students of the Department of Surveying in TKK (Helsinki University of Technology).

### 1. INTRODUCTION

VRS (Virtual Reference Station) service is fairly new system in Finland. As a new method, service and its' capabilities need to be promoted to potential user groups. For instance surveyor students and current users of RTK applications form important groups of potential users of VRS service in future. Therefore we decided to prepare a demonstration video of VRS service in cooperation with Geotrim Ltd. to increase general awareness of the service in Finland area.

Instead of using direct marketing methods we decided to use longer storytelling approach in our demonstration video. Basically there were two reasons for that. First of all we thought it would be more effective to show the viewers concrete examples of how much easier things can be done by using VRS service. Instead of just listing technical details and accuracies of the system we decided to concentrate more on efficiency of this new system and tried to do it all in humorous way. After all, this was supposed to be a marketing video, trying to arouse interest in using product in Finland area.

On the other hand we thought that this kind of filming project might be good change to produce suitable video material for

other purposes as well. The same material can be used for educative purposes as well, when demonstrating RTK and VRS based measurements for students in various education levels. Nowadays it is not so self evident for people that what land surveyors are doing in society. Therefore it's also good to have some practical examples of basic surveying activities, when introducing our profession to others. In the long run this kind of documentation can also work as a picture of surveying methods of the current time.

### 2. DESCRIPTION OF VRS SERVICE

VRS is a network RTK (Real Time Kinematic) system, developed by Trimble Ltd. In normal precise GPS measurements you need at least two receivers. By using VRS service you can make same measurements with only one receiver, and still receive same accuracy. VRS system consists of several GPS-network stations, which are located about 50 to 100 kilometres from each other and they collect GPS-data continuously. Each of stations sends received GPS-data to a main computer once a second. The main computer calculates then corrections for various errors caused by for instance atmosphere, ephemeris and multipath reflections. Then

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combined model for all these errors will be created, (Landau et al, 2002).

### 2.1 Surveying with VRS-RTK method

Surveyor must have RTK-GPS-receiver, modem (internal or external) and license to be able to use VRS-RTK method. When receiver has been turned on, it takes a while until receiver has found a sufficient number of satellites. After this user takes connection to the VRS-server for example via internet using GPRS (General Packet Radio Service).

VRS-server gets approximate location from RTK-receiver and calculates virtual base station nearby surveyor. Then server begins to send virtual GPS-data to RTK-receiver and surveyor can start measurements, like there would be a real base station nearby. Therefore surveying is just same to traditional RTK-measurement except you do not have to put up your own base station at first (Landau et al, 2002).

### 2.2 VRS service in Finland

In Finland VRS service is provided by Geotrim Ltd. and it is based on Trimble's VRS™ system. At the present moment service consists of some 90 base stations in Finland area and it is not dependent on users' location or a specific type of equipment.

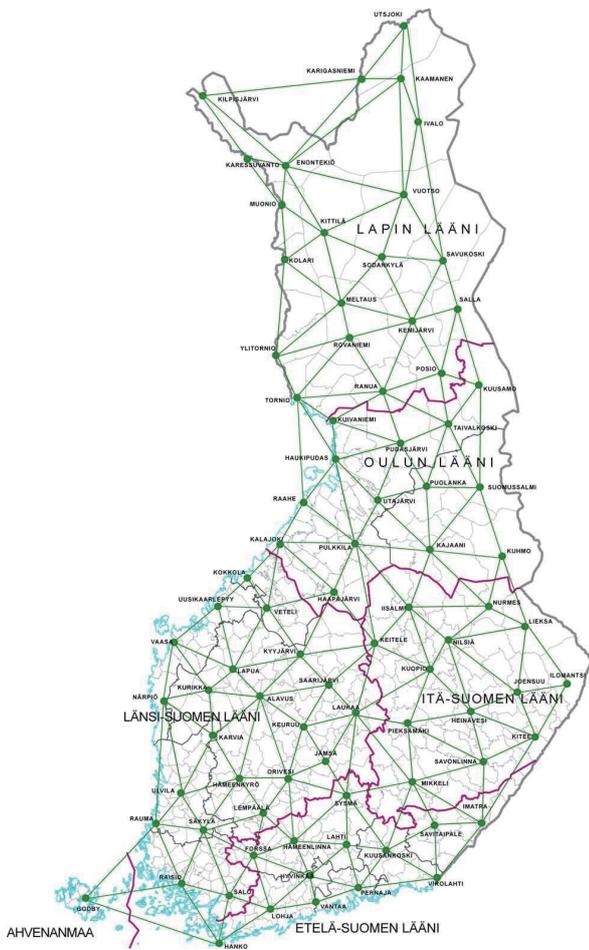


Figure 1. VRS-GPS Network stations in Finland, from 50 to 100 kilometres from each other (www.gpsnet.fi)

### 2.3 Accuracy of VRS-RTK method

Finnish Geodetic Institute researched accuracy and usability of VRS-RTK method in Finland. They found out that VRS-RTK measurements can be done in centimetre level if certain factors are taken into account. In same research they found out that the choice of equipment is irrelevant, (Häkli, 2004).

VRS service can also be used in DGPS measuring. DGPS operates in same way than VRS-RTK-System. Surveyor uses modem to lock in service and gets correction data from server. DGPS-corrections can be also calculated afterwards by using internet service. Accuracy of VRS-DGPS is in one meter level (Häkli, 2004).

National Land Survey of Finland, some of the municipalities and private companies have started to use VRS-service in RTK measurements in Finland.

## 3. STORYTELLING APPROACH AND FILMING ARRANGEMENTS

In this chapter we will go through preparations before and during filming process.

### 3.1 Aim survey

The whole production started with aim survey. From the very beginning the basic idea of the demonstration was quite obvious – to make comparison between VRS service and traditional way of making same measurements with RTK GPS positioning. Before starting preparations and actual action phase it was important to first prepare a written production agreement including detailed information of budget, schedule and properties as well as extent on the end product.

### 3.2 Manuscript

When we had agreed the main contents and storyline of the video with Geotrim Ltd., it was time to write more detailed manuscript for it. Storyline consists of three parts: 1) preparations, 2) fieldwork and 3) processing of measurements. Throughout the video we tried to bring out the better productivity and cost efficiency of the VRS system. We also tried to include quite much humour in our story to make it catching.

### 3.3 Casting of the characters

Casting is always quite important part, when trying to make film believable and make it follow desired atmosphere. This time we had two main characters in our story and the actors could be found from our fellow surveyor students from TKK (Helsinki University of Technology).

### 3.4 Production planning

After production agreement, manuscript and casting were done we still needed to a make production plan before we could carry on towards actual filming process. In practice this production planning included detailed lists of what, where and when we should do? Which equipments we should have with us, how to handle logistics? And how to manage everything within planned budget?

We also prepared some backup plans, if something would have gone wrong during shooting. Luckily everything went just fine. For example weather happened to be just fine during whole filming season.

### 3.5 Filming arrangements

Filming session took place in the beginning of the September 2005, which lasted four days. Most of that time we spent at summer cottage and surrounding areas in place called Lohjansaari. This place is located in southern part of Finland, about 70 kilometres west from Helsinki. We also spent one filming day in Vuosaari harbour area in Helsinki, (<http://www.vuosaarensatama.fi>).

We used Sony DRS-PD150P MiniDV video camera, which turned out to be very suitable for this kind of production. In some sequences we had to use additional external microphone and PD150P camera model made it possible to record two soundtracks simultaneously when needed. The actual microphone of the camera proved out to be very effective by itself. Video camera worked well in twilight circumstances as well.

Some of the takes needed to be recorded up to ten times, but most of them were done with 2-3 takes. Altogether we filmed about six hours of raw material, from which we finally edited 15 minutes long video in postproduction phase.

## 4. POSTPRODUCTION OF THE VIDEO

When all the material was filmed, it was time to move to postproduction phase, which formed definitely the largest part of the project. When filming was carried out mainly during four days, the postproduction phase took almost four months. Of course we did not work as intensively during these following months, but as conclusion we might say that postproduction took almost 80 percent of the whole time spent on this project, when preparation and filming phases took 10 percent both.

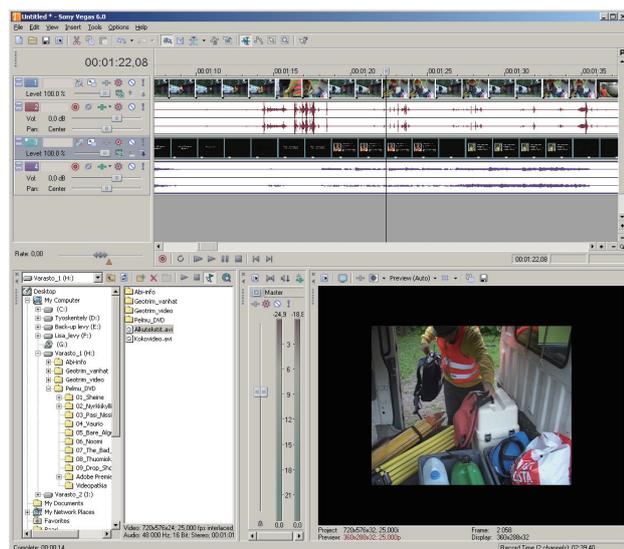


Figure 2. Sony Vegas 6.0 was used for video editing

Most of the postproduction work consisted naturally of actual film editing. First part of the editing was choosing of the best takes from several alternatives. Then these takes were first

combined into individual sequences and further into entire story following manuscript. Editing was done with Sony Vegas 6.0 software, which provided good selection of different editing tools, transitions, colour adjustment tools and things like that needed for this kind of project, figure 2.

Postproduction was divided into three different parts to secure that we would stay in the schedule.

### 4.1 Primary production control

This phase followed right after the filming and in it we prepared some edited example scenes of the video for the representatives of the Geotrim Ltd. This way they could get a better idea of how this demonstration video would look like when it would be ready. It was also a control for the quality of the video and how we had succeed with filming part. Representatives of the company were satisfied with the results. They gave us some comments and suggestions and together agreed to continue editing to next phase.

### 4.2 Editing whole story

After the primary control, where we had only a few of selected and edited scenes of the film ready, we now concentrated in building the whole story. Still we did not finalize all the scenes into final shape and length, but tried to at first assemble all the separate sequence together. This way we hoped to be able to create more continuous and harmonious atmosphere for the whole video.

This seemed to be a good decision, as we shortly noticed that some sequences worked just fine as separate pieces, but they did not quite fit into the whole project as such. We made some modifications inside individual sequences and also rearranged the order of sequences defined in original manuscript. But altogether we did not have to make any big changes for original plans during the editing process.

Once again we presented our accomplishments to personnel of Geotrim Ltd.. They gave us some change suggestions and we continued into the final part of the postproduction.

### 4.3 Final editing, soundtrack design and DVD creation

In the final editing phase we did the last adjustments for the individual sequences and decided the definitive structure of the story. In many cases this meant simplifying things even further and removing unnecessary repetition. Some texts were also added to clarify the actions of the characters and to give more technical information of the VRS service.

Soundtrack is also very important part of the movie and it gives a lot of bearing, structure and character for it. Therefore we paid extra attention for the music and sound effects of our film. Music is self composed by using Propellerhead's Reason 3.0 software, controlled by keyboard via midi interface, figure 3.



Figure 3. Reason 3.0 was used for composing soundtrack

Some of the bird singing effects were bought from the archive of the YLE (Finland's National Broadcasting Company). When video and soundtrack were combined together and mastered with Sony Vegas 6.0, it was time to convert the whole product into DVD format. This operation was done Sony Architect 3 software, figure 4.

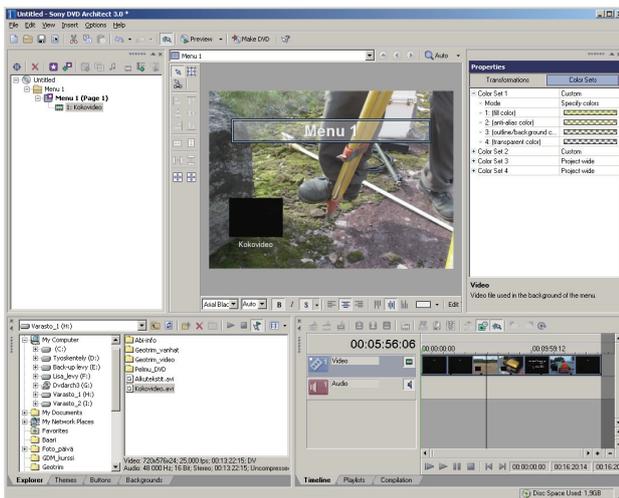


Figure 4. DVD presentation was compiled with Sony Architect 3 software

Also the cover material was designed for the DVD. This work was done with Adobe Illustrator.

## 5. CONCLUSIONS

In this paper we have described the main phases of making a demonstration video of VRS service. Hopefully we have managed to give you sufficient description of the system itself, used methods as well as equipment and software used in this project. Of course the best way to determine how well we have succeed with the project is to watch to our demonstration video. And then consider if you can understand the essential facts and advantages of using VRS service from it.

Because the original language of the demonstration video is Finnish, we had to prepare subtitles in English for international version of the video as well. This translation work was carried out by translator student from University of Turku.

After all this has been a great opportunity for us students to approach our profession by using quite uncommon method. This project has especially taught us good project planning and management. As well as working in cooperation with various associates. It will be interesting to see what kind of reactions our video will bring out among the representatives of different cultures.

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