

## The new FLI-MAP 400 system... exceeding expectations

*In summer 2008 the first test flights were made with the new FLI-MAP 400 system. Main goal of these tests were to evaluate the new possibilities of the LiDAR scanner. Especially the Multiple Pulse in Air technique (MPIA) of the scanner was further developed. The high scan rate of FLI-MAP 400 (150 KHz) was currently limiting the maximum flight altitude above ground level as an emitted pulse needed to be returned to the scanner before the next pulse could be emitted. The MPIA technique makes it possible the scanner sends out a next pulse even before the previous has returned. This makes it possible to increase the altitude while maintaining the high scan rate.*

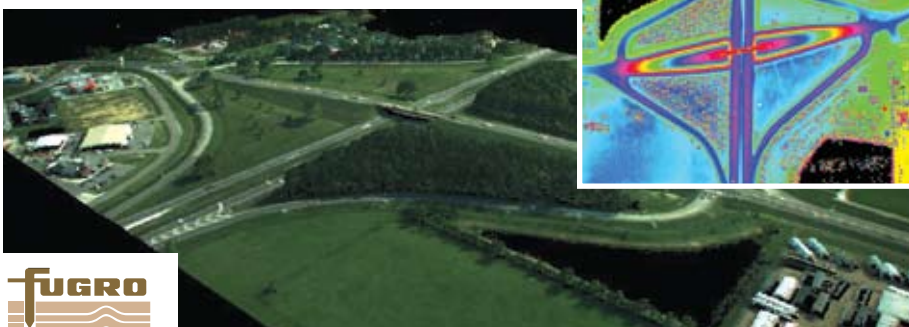


The test flights both with the helicopter and fixed wing proved it was possible to collect data up to a flight altitude of 1000 m without problems using the MPIA technique. This increased flight altitude does not compromise the accuracies that FLI-MAP 400 is famous for. During the first flight tests also the real-time laser point RGB encoding was tested. This new feature of the system will allow for direct on the fly encoding of RGB color values for each laser point. This will allow the operator to have a better view on the data during the survey flight and after the flight the color attribute data is directly available without the need for additional processing.

Another new option for the new FLI-MAP 400 system is the increased scan rate of 250 KHz. This will make it possible for the system to fly faster or higher while maintaining a high point density. The combination of higher scan-rate with the MPIA technique will cause hardly any compromise on point density while flying at maximum flight altitude.

The new FLI-MAP 400 system will also be equipped with a dual camera configuration offering higher image resolution. This set-up will allow us to provide high resolution imagery at even high survey altitudes of 800 - 1000 m above ground level.

*Intersection I80 in the USA; One single flight pass and a corridor width of more than 1000 m was being captured*



Real-time RGB-coding enables an immediate check of the captured data

## Personalia

Marcin Matusiak graduated in 2007 with specialization on Photogrammetry and Cartography at Warsaw University of Technology in Poland. In 2006 he tasted the challenging world of Fugro when he did his internship in 2006 at Fugro Survey. After graduation, his desire to work in an international leading geospatial service provider made him apply for a position at Fugro Aerial Mapping. As data processor he is now challenged to extend his knowledge and skills on the wide range of opportunities FLI-MAP offers. Getting used to Holland is not easy, but not impossible. The company language and written communication is English; but his colleagues speak mainly in Dutch to support his ambition to learn the Dutch language. Luckily he finds great support from his wife Gabriela Oliwia, who joined him in Holland after their marriage.



## CALENDER

### 6th International FLI-MAP Partner Day

Date: 29 September

Location: Bremen - Germany

### Intergeo 2008

Date: 30 September - 2 October

Location: Bremen - Germany

Booth: Number 5.315 Hall 5

### Waterbouwdag

Date: 7 October

Location: Breda - The Netherlands



Linea, FLI-MAP partner for Hungary

# FOCUS

## Olympic Gold for China data processing team!

The increased number of large projects and the demand for very detailed end-deliverables result in the need for more human resources on the data processing of the FLI-MAP LiDAR data. To meet this need for processing capacity, in close co-operation with Fugro Geospatial Services Hong Kong a group of 20 data processors has been trained in China.

After an intensive course on cross cultural business practice, Bob Valten (operations manager) and Richard van Gils (project manager data processing) went to Qinhuangdao (QHD). In the two weeks training course the data processors have been introduced to the Fugro Aerial Mapping specifications for LiDAR data processing and the unique features of the FLIP7 software.



Some of the new FLI-MAP LiDAR data processors

In the whole of the training course the local project managers take a key role, they are the first contact and translate the course into Chinese. It was of great advantage that these project managers have worked earlier on LiDAR projects for other Fugro companies and are technically well educated, experienced and understand the detail of the specific FLIP7 processing methodology. During the course the various topics were translated one by one into Chinese and only after the subject was understood clearly by all data processors the local project manager continued to the next topic. In this way it was secured that all participants were closely involved and no misunderstanding occurred due to language problems or participants nodding "yes we do understand", but meanwhile missing information.

In the evening Richard van Gils prepared a PowerPoint presentation based on the processing results of the example data and presented both the good as well as the incorrectly processed data. Although this type of straightforward presentation is generally not common, the openhearted way Richard presented and explained, resulted in an even higher involvement and motivation of the participants who started to ask questions using dictionaries.

"It is clear that they are very motivated and also very good in what they do,

I see a lot of potential for the future" according to Richard van Gils. Obviously we continuously monitor the delivered data quality, for which a special "tracking and tracing" methodology is being used. This enables us to define the problem area and take corrective measurements. By appointing four of the best of the Chinese processors as local quality controller, the quality of the data send to The Netherlands is already of high quality level. Although we see a continuous increase of the delivered data quality a final quality control in The Netherlands will always be executed.

Within the Fugro organization there are worldwide more then 100 experienced data processors that can process FLI-MAP laser data and investments are made to double this number in the near future.



Richard van Gils demonstrating the Flip7 software

## New members of the Fugro group of companies

### Fugro-BKS Limited

#### BKS Surveys Ltd becomes Fugro BKS

Late April Fugro acquired 'BKS Surveys Limited', Northern-Ireland, a leading supplier of aerial mapping services and products. The company employs over 100 people and owns and operates its own survey aircraft which is fitted with an Intergraph Z/I Imaging® DMC® Digital Mapping Camera. BKS has already been for many years partner for the FLI-MAP laser altimetry system in the United Kingdom and Ireland.

#### NPA Satellite Mapping becomes



#### Fugro NPA

Nigel Press Associates is the longest established satellite mapping specialist in Europe, founded by Nigel Press in 1972. NPA specializes in the interpretation of satellite imagery for exploration, geo-science and geospatial applications, and in recent years has developed particular expertise in the exploitation of satellite radar imagery for offshore exploration and onshore geo-hazards investigation. In addition NPA has developed a new satellite service to accurately determine vertical movement of the earth's surface. NPA has about 30 employees and will continue to operate from their current location in the UK near Gatwick.

**We welcome our new colleagues with whom we have already executed many challenging projects.**



# FOCUS

## Detailed and Accurate Wide Area Surveys

When approximately 10 years ago the surveys of the national height model in the Netherlands started, the areas were surveyed with “high level” LiDAR – 1 point per 16 square meters with a typical vertical accuracy of 15 – 25 cm. In the following years gradually the requirements were set higher at 1 point per square meters, but still with the same vertical accuracy.

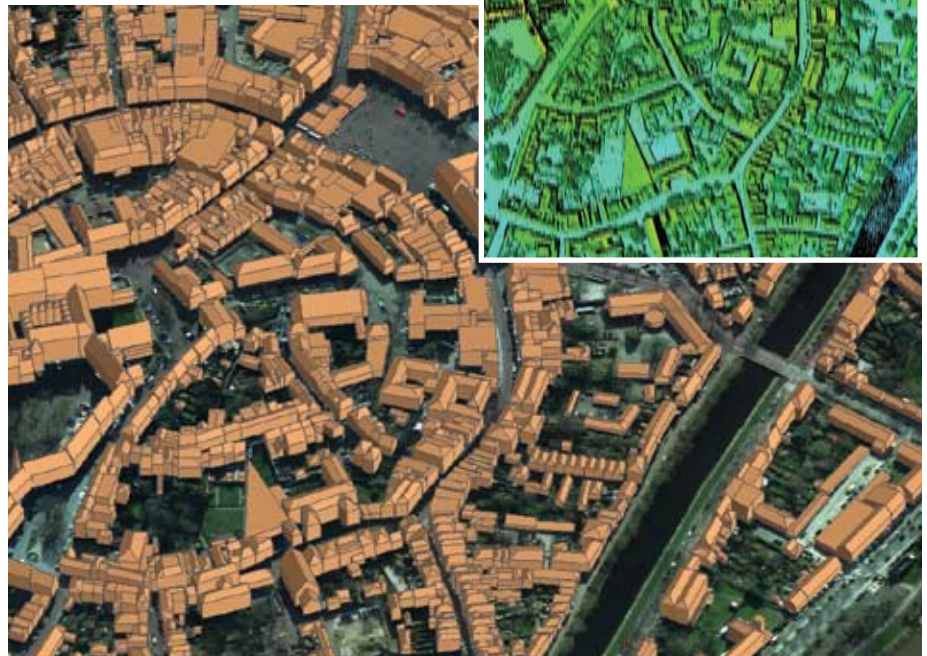
Fugro enhanced the quality for a new version of the Dutch National Height Model (AHN2) with a pilot for the Water Board “Zeeuwse Eilanden” in The Netherlands in 2007. The result is that the new height model covers the South West of the Netherlands with 10 points per square meter and an absolute height accuracy of 5 cm. An RGB line-scanner was also utilised, enabling the point cloud to be delivered as a photo-realistic coloured multi-purpose product.

Apart from the elevation data that makes up the new national height model, the detailed data now can be used for various applications;

- Water Boards to manage their waterways and levees in order to verify dike positions and calculate accurate profiles
- Road Authorities to evaluate future new routes
- Road Authorities to determine the crossovers, lamps, signs and general street furniture
- State Authorities for flood defense and environmental impact studies
- State Authorities and municipalities for general urban planning
- Municipalities to determine paved and unpaved areas
- Municipalities for volume calculations of the buildings
- Public Works to determine and to actualize the routing of their network
- Archaeologists to trace ancient artefacts

The above mentioned advantages are far from complete, as continuously new applications are being created by the users. Knowing that in the past different survey techniques were required to obtain all this data, it is obviously that a substantial cost reduction can be achieved by the authorities to extract all this valuable information from one and the same survey. The successful pilot resulted early 2008 in the award of the biggest project ever to be executed with FLI-MAP. Three helicopters were used simultaneously to survey an area of

more than 7500 km<sup>2</sup>. More than 23000 kilometers were flown and more than 98 billion laser points were collected. The process of ground filtering is successfully executed in China and the complete project is expected to be finished within the deadlines.



Middelburg: 3D city modelling and 0,5 m grid presentation

## Busy busy business

In the first nine months many interesting projects for a wide range of clients were executed in The Netherlands, Germany, Ireland, United Kingdom, Belgium, France, Republic of Serbia, Poland, Spain and Bulgaria.

In the Netherlands the survey of 7500 km<sup>2</sup> with 10 pts/m<sup>2</sup> and 5 cm accuracy requirement, which has been surveyed using three FLI-MAP 400 systems, was a challenging project. For the survey of the quays along some major rivers at low tides, very precise planning was required considering the fact that based on statistics the required low water level occurs only once per 2 years. Furthermore various existing and newly designed pipeline and power line corridors have been surveyed in Belgium and Germany. Many other European clients in various markets have been served; from power line projects in Spain, Poland, France and Ireland up to archeological and city modeling projects in Ireland and the United Kingdom. The high accuracy road survey in Serbia was another milestone in the continuous search for pushing the possibilities/capabilities of accurate LiDAR survey. On the other hand surveying 10,000 km of power lines in Bulgaria is also a logistically challenging and exciting project.

## Contact us:

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