Digital Airborne Imaging Solutions

WB/FIG Land Governance, responding to new Challenges Washington
Private Vendors and Universities, March 10, 2009; 08:30 – 10:00 am, MC Room 10-100

Kurt Schibli
Vice President EMEA
Leica Geosystems AG, Switzerland
Digital Airborne Imaging Solution

the workflow:

capture → reference → measure → analyze → present

spatial information
Baseline Data collection

- Earth Resources
- Agriculture
- Environment
- Forestry
- Defense
- Urban
- Transportation
- Topographic Mapping

Spatial Resolution:
- 100 m
- 10 m
- 1 m
- 0.1 m
- 0.01 m

Spectral Resolution:
- Panchromatic
- Multispectral
- Hyperspectral

- when it has to be right
Airborne Solutions
Leica has a wide & complete solution offering

- Imaging Sensors: ADS80 SH81, ADS80 SH82
- Supplementary Solutions: Flight Planning, Flight Control, Position and Attitude System, Sensor Mount, 39MP Camera, Application Software (Leica LPS, Terrasolid)
- Lidar Sensors: ALS60, ALS CM
- Imagery Workflow
Leica ADS80 Airborne Digital Sensor
the 3rd Generation

SH81 / SH82 + CU80 / MM80 + Leica XPro

= Most complete Digital Airborne Imaging Solution

- when it has to be right
Leica ADS80 Digital Airborne Imaging Solution

<table>
<thead>
<tr>
<th>Average GSD with ADS80</th>
<th>Map Scale</th>
<th>x-y accuracy RMSE</th>
<th>contour interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 – 10 cm</td>
<td>1:500</td>
<td>0.125 m</td>
<td>0.25 m</td>
</tr>
<tr>
<td>10 – 15 cm</td>
<td>1:1000</td>
<td>0.25 m</td>
<td>0.5 m</td>
</tr>
<tr>
<td>15 – 20 cm</td>
<td>1:1500</td>
<td>0.40 m</td>
<td>0.75 m</td>
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<tr>
<td>20 – 30 cm</td>
<td>1:2000</td>
<td>0.50 m</td>
<td>1 m</td>
</tr>
<tr>
<td>25 – 35 cm</td>
<td>1:2500</td>
<td>0.60 m</td>
<td>1.25 m</td>
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<tr>
<td>30 – 50 cm</td>
<td>1:5000</td>
<td>1.25 m</td>
<td>2.5 m</td>
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<tr>
<td>40 – 60 cm</td>
<td>1:10000</td>
<td>2.50 m</td>
<td>5 m</td>
</tr>
<tr>
<td>50 – 70 cm</td>
<td>1:20000</td>
<td>5.00 m</td>
<td>10 m</td>
</tr>
<tr>
<td>50 – 80 cm</td>
<td>1:25000</td>
<td>6.25 m</td>
<td>12.5 m</td>
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<tr>
<td>50 – 100 cm</td>
<td>1:50000</td>
<td>12.5 m</td>
<td>20 m</td>
</tr>
<tr>
<td>50 – 100 cm</td>
<td>1:100000</td>
<td>25 m</td>
<td>50 m</td>
</tr>
</tbody>
</table>
Leica ADS – Airborne Digital Sensor
samples of resolution
Digitally match the best resolution possible with film
3-centimeter spatial resolution ~ 1:500 and 1:1000 mapping
Leica ALS60 Airborne Laser Scanner
performance without compromise

A new paradigm:
the point density you want,
the accuracy you need,
even at 200 kHz pulse rate
Leica IPAS20 Inertial Position & Attitude System
System integration and optimal workflow

Benefits of positional and attitude information
- Provides a significant reduction in the production time and cost of airborne sensor data allowing efficient and automatic data processing
- Increases productivity of geospatial data collection and processing allowing fast turn around of mapping projects
- Eliminates the need for aerial triangulation (AT) for a wide range of photogrammetric mapping projects, especially in areas where it is difficult to access or perform an AT
- Reduces the need for ground control and facilitates data QA/QC
- Provides reliable and accurate results, better use of flying conditions for more productivity and shorter field operations

Features of the IPAS20
- Delivers direct georeferencing to airborne sensor data
- Calculates position, velocity, roll, pitch and heading at high data rates and accuracies
- The high accuracy, real-time attitude improves the real-time application performance when used as input to a Leica PAV gyro-stabilized mount
- A scalable system which can grow with your future needs for system compatibility, upgrade, replacement and improved technology
Leica IPAS20
stand-alone or integrated:

**Flight planning**
- Flight planning
- Flight plan optimization
- Project management
- Cost estimation

**Flight evaluation**
- Check of completeness
- Quality control
- Project management
- Cost calculation

**Georeferencing**
- Computation of trajectory
- Event interpolation
- Blending GNSS and IMU data
- Camera orientation

**Flight execution**
- Guidance information during approaches and turns
- Real-time solution direct georeferencing
- Guidance information and sensor release along the line
- Automatic drift control of sensor mount

**Data logging**
- Flight data
- GNSS/IMU raw data
- Sensor events

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Workflow - film based and direct digital

Film based workflow RC30
- Film
- Film processing in darkroom
- B&W
- Color
- FCIR
- Stereo plotter
- DSW700 scanner
- Films used alternatively

Direct digital workflow ADS80/40
- Mass Memory
- Ground processing
- Archive system
- Digital workstation
- Printer
- All spectral channels simultaneously

- DTM
- Orthophotos
- Mapping
- Revision
- Visualization
- Image analysis
- Classification

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Leica Geosystems
just a few applications:
Photogrammetry - Reference

Multi Sensor data ingestion

Triangulation (Georeferencing)

Ortho Photo or Orthophoto Mosaic

DTM Extraction and Edit

Feature Extraction

Photogrammetry - Reference
PingYao
China

Leica ADS40 – 1st Generation
PingYao
City Mapping, Photogrammetry, Cadastre, Archaeology
Flood Plane Mapping
Sample of a Dual Sensor Integration
Hardware – ADS40 and ALS50 in Pilatus PC-6
THANK YOU FOR YOUR ATTENTION

For further information, please contact:

Kenneth Smillie
Sales Director Airborne Sensors EMEA & Asia
Digital Imaging, Leica Geosystems AG
Kenneth.smillie@leica-geosystems.com
Phone: +41 71 727 3688
or download information from
www.leica-geosystems.com