




Development of Mobile Cadastral Surveying System for Korean Cadastral Resurvey Project

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Munich, Germany, FIG 2006 Congress-October 12

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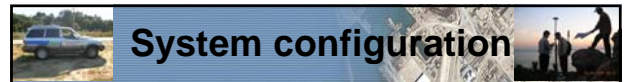


Objective

- Mobile RTK GPS survey system prototype development.
- A large output RF modem (PDL) communication field test.
- Field data processing module development.
- Modernization of current cadastral survey working skill.
- Increasing productivity to adapt digital cadastral map.
- Increasing company's competitive strength with marketing.
- Reinforcing company's reliability.

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System configuration

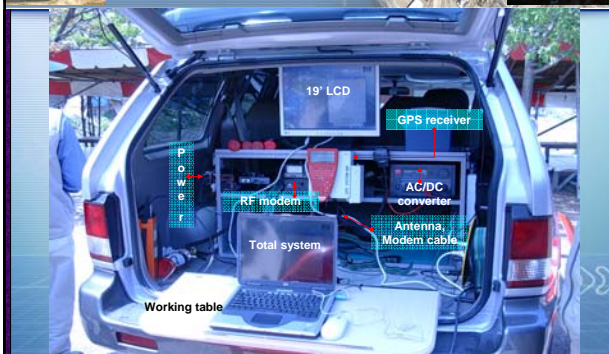
- RTK-GPS 1set : Base, Rover.
- RF modem PDL, Whip Antenna, AC/DC Power Supply.
- Total system(Mapping S/W : Developed in KCSC), 19' LCD.
- 4 wheel drive Vehicle(Mobile Platform).

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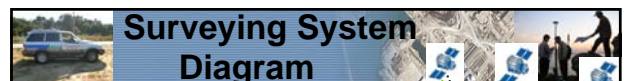


System Diagram



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Surveying System Diagram

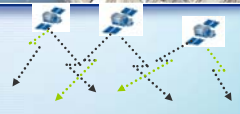




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RTK-GPS Principal

- ✓ Improved Kinematic.
- ✓ Real time processing.
- ✓ Base station transmits correction data.(RF modem, CDMA)
- ✓ GPS Initialization. (Ambiguity Fix)
- ✓ Dual frequency GPS for simultaneous initialization.
- ✓ Suitable for topographic, Cadastral survey application.

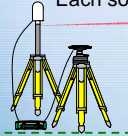




Base Rover


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Correction data transmission

Two type of GPS correction data transmission.
Each solution should follow the field situation.



RF modem



CDMA

CDMA Base

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Test project to support real field work

❖ Objective

- ❑ Mobile System performance analysis doing real field work.
- ❑ Comparison with typical survey procedure.
- ❑ Complete mobile survey application development.

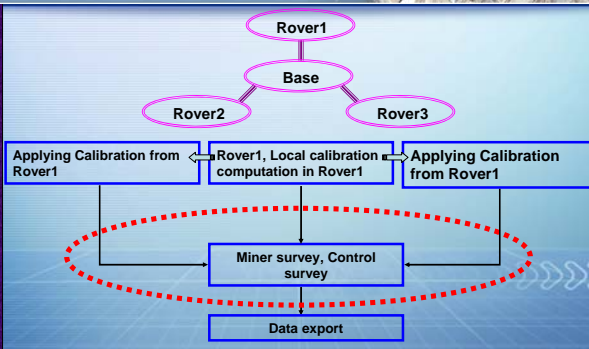
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Field work supports

- ❑ Muhwak2 GyodongMyon KangHwaGun, large land arrangement project.
 - Miner survey support for boundary confirmation.
 - Equipment : RTK-GPS 4Set(GSR2600, Sokkia), 1 Mobile Vehicle.
 - Local calibration using four cadastral auxiliary control points.
- ❑ Island control point survey, ChungChung NamDo sea shore.
 - 320 Cadastral control points support in WonSanDoRi BoRyong.
 - Equipment : RTK-GPS 4Set (GSR2600, Sokkia), 1 Mobile Vehicle.
 - Local calibration using seven cadastral auxiliary control points.



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Testing Method



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Test application(cont.)

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Test application(cont.) - Checking Data & Sorting -

The screenshot displays the 'Field Book Editor' window with a table of field data. The table has columns for 'Field No.', 'Field Name', 'Area', 'Perimeter', 'Method', and 'Status'. Below the table is a 'Field Book View' window showing a grid of field boundaries.

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Test application(cont.) - Data Input for mapping -

The screenshot shows a map view with a data input window overlaid. The data input window contains a table with columns for 'Field No.', 'Field Name', 'Area', 'Perimeter', 'Method', and 'Status'. The map view shows a grid of field boundaries.

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Test application(cont.) - Mapping 1 -

The screenshot shows a map view with a red outline of a field boundary. The map view shows a grid of field boundaries.

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Test application(cont.) - Mapping 2 -

The screenshot shows a map view with a red outline of a field boundary and a data input window overlaid. The data input window contains a table with columns for 'Field No.', 'Field Name', 'Area', 'Perimeter', 'Method', and 'Status'. The map view shows a grid of field boundaries.

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Test application(cont.) - Overlapping analysis -


The screenshot shows a map view with a red outline of a field boundary and a data input window overlaid. The data input window contains a table with columns for 'Field No.', 'Field Name', 'Area', 'Perimeter', 'Method', and 'Status'. The map view shows a grid of field boundaries.

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Benefit

- Optimization of working procedure. Minimize labor, Maximize working performance, Setting up the moving field office.
- Full coverage in the large working field.
- Efficient survey performance in large project.
- Cost saving.
- Improving mobility, company advertisement effect.


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Future development Objective

- ❖ Real time data transmission using wireless communication.
- ❖ New antenna development, best fit in forest and field.
- ❖ Development Mobile survey system using Network RTK reference.
- ❖ Reinforcing data processing S/W module.
- ❖ Publication Working standard.

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Thank You for Your Attention

QUESTIONS ??

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