USV, A Smart Way to Survey

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Hi-Target Overview

Established in 1999
Guangzhou HQ
Stock code: 300177

- Subsidiaries: 18
- Branches: 28
- Partners: 100+
- Staff: 2000+
Enrich the Business Layout

**Instrument**
- Total station
- 3D Laser & mobile mapping
- RTK
- GIS
- UAV
- Marine survey

**System Integration**
- GBAS
- Track detection
- Mother board
- Mechanical control
- Precision agriculture system

**Data Service**
- Indoor localization
- Data service
- Underground Space information
CONTENTS

01 INTRODUCTION
Challenges & Limitation

02 CASE I
In a Heavy Traffic Channel

03 CASE II
In Hun River

04 CASE III
Integration
Challenges

Easy to be stranded

Dangerous
Limitation

Inefficient and Inaccurate

Cliff area
Dams and reservoirs

Lakes on islands within lakes

Hard to put a ship into it!
CASE ONE

In A Heavy Traffic Channel

- Security challenge
Case in a Heavy Traffic Channel

Project background

• 89.5km long channel

• More than 10M population, 25+ big bridges

• Thousands of big factories depending on the channel

• 30+ ports, 45M cargo volume and 70,000 boundings

• 3000t level vessel transportation, daily 800 vessels
Case in a Heavy Traffic Channel

Goals

• To finish a bathymetric survey within 20 cm accuracy
• The pipeline planed to cross 5 paralleled waterways

Challenges

• Cross section survey is easy to slow down the busy heavy traffic and even causing accidents
• Impossible to survey the shallow area
• High cost for periodically channel survey
Case in a Heavy Traffic Channel
Survey Solutions——iBoat BM1 USV

- Up to 12 hours continuous working
- Auto pilot function
- Auto sail back function with multiple home points
- Water plant proof design
- Realtime camera and auto detour safety systems
Case in a Heavy Traffic Channel
Composition of iBoat Surveying System(Hardware)

iBoat

- Vessel body
- Excellent Echo sounding module
- Positioning module
- Communication module(rover)

Ashore base system

- Control & monitoring center(PC)
- Controller
- Communication module(base)
Case in a Heavy Traffic Channel
Composition of iBoat Surveying System (Hardware)
## Case in a Heavy Traffic Channel

### Composition of iBoat Surveying System (Software)

<table>
<thead>
<tr>
<th>Pilot software</th>
<th>Hi-Max hydrographic software</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Multiple home points setting function</td>
<td>• Sounding and GNSS receiver control</td>
</tr>
<tr>
<td>• Planning lanes and auto-pilot engine</td>
<td>• Surveying automatically</td>
</tr>
<tr>
<td>• Controlling/steering</td>
<td>• Efficient post processing service</td>
</tr>
<tr>
<td>• Google Map</td>
<td>• Multiple universal format</td>
</tr>
</tbody>
</table>
Case in a Heavy Traffic Channel

First things first—project planning
Case in a Heavy Traffic Channel
First things first—project planning
Case in a Heavy Traffic Channel
First things first—project planning
Case in a Heavy Traffic Channel

First things first——project planning
Case in a Heavy Traffic Channel

Boat deployment

✓ Portable size of iBoat BM1 is convenient to be transported to survey zone.
Case in a Heavy Traffic Channel
Setup the base controlling system

- Handy deployment of base and quick configuration of auto survey mode.
- Flexible switchover between manual and auto mode in case of emergency.
Case in a Heavy Traffic Channel
Surveying
Case in a Heavy Traffic Channel
Post processing & Result
Case in a Heavy Traffic Channel

Post processing & Result
CASE TWO
In Hun River

- Time mattered
- Danger of being stranded
Channel Survey Project in Liaoning Province—Hun River

Application Background:

- Alliance with Institute of Geomatics in Liaoning Province
- Underwater topography survey at the scale of 1:2000 in Hun River
- Numerous shoals and dams
- With USV project completed on schedule
Project Background

Key Words:
- 80 Km long
- 20m—interval of cross section
- 1000Km survey mileage
- Complicated channel condition
Case in Hun River
Complicated survey condition

- Numerous dams
- Block between upstream and downstream
- Crowds of shoals in the downstream
- Shallow water and thick mud with much water grass
Case in a Heavy Traffic Channel

Solve the headaches

✓ Protected from twining of water plants and rubbish.
✓ No pressure to sail on shoals with shallow draft.
Case in a Heavy Traffic Channel

Manually control to handle the difficulties

✓ Manual survey in specific terrains with flexible propellers

✓ Auto-return to safe point while low battery or dropped signal
Case in a Heavy Traffic Channel

Efficient work

✓ Plan line designed at your demand and automatic task execution

✓ Real-time data transmission of Positioning data, Sounding data and Boat status.
Case in a Heavy Traffic Channel

Efficient work

- Real-time monitoring by HD video
- 360° Camera and ultrasonic obstacle-avoidance
Case in a Heavy Traffic Channel

Post processing

- Correct the false depth points by analog signal
- Manually sample feature points to get reliable proof
Case in a Heavy Traffic Channel

Result

Thanks to the reliability and efficiency of iBoat BM1, the Hun River hydrographic project was completed successfully!
CASE THREE

Integration

- Water and
- underwater integration
Case III Integration

Project overview

• Wujiang River in Guizhou Province expansion project:
Case III Integration
Device Installation

• Multi-beam installation:
Case III Integration

Device Installation

- Mobile mapping system installation:
Case III Integration
Data preprocessing

• POS solution: IE Calculation
Case III Integration
Multi-beam Data Processing

- Software: PDS2000
- Elevation: RTK Surveying without tidal observation
Case III Integration

Point Cloud Data

- Point cloud display on both sides of the river
- Underwater point cloud display
Case III Integration
Project Result
Case III Integration

Project Result
THANKS

For further information, please visit the website or Facebook.

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