

Tools, Tips and Workflows Questions, Questions

LP360



Lewis Graham

April 2014

Revision 1.0



As we stand up our new small Unmanned Aerial Systems (sUAS) software and services subsidiary, we are exploring a wide range of technologies. So far, we have more questions than we have answers. We thought we would simply list some of these to give you an idea of our focus. We would be extremely interested in your viewpoints on some of these issues. Please send your comments to suas@geocue.com. Keep in mind that we are focused on the precision mapping and inspection applications for this technology, not intelligence, surveillance and reconnaissance (ISR).

1. What are the key characteristics in describing or comparing sUASs?

- a. Cost
- b. Payload capacity
- c. Max-speed
- d. Endurance, Range
- e. Cross-wind tolerance
- f. Launch/Recovery systems

2. Is there a benefit to having First Person View (FPV) capability for mapping purposes?

- a. Certainly there is for inspection operations

3. Vertical Take-off and landing (VTOL) or fixed wing? We think we know the answer to this one.

- a. Small, non-uniform mission – VTOL
- b. Inspection (but this is not mapping) – VTOL
- c. Area mapping – Fixed wing

4. How to place control – we need to do some experimentation. We have a lot of experience with classical photogrammetry.

5. How to measure control in a cost effective manner.

- a. We like the X90-OPUS but this approach requires 2 hours per point.
- b. RTK rovers with base station are ~30K which is not appealing to the small survey shop

6. Glider versus Delta wing for fixed wing solution

- a. Glider:
 - i. Higher payload capacity for similar motor, battery, flight duration
 - ii. Better performance in wind (we think)
- b. Delta Wing
 - i. Much easier to transport and assemble (more compact)

7. With what frequency can we expect Total Loss of Vehicle (TLV) events?

- a. Simply lost
- b. TLV as a result of bad landing, crash
- c. TLV due to water landing

8. For a one man or small surveying firm, what is their internal trade-off of cost versus convenience?

9. We think we have a very good handle on data processing for geometric analysis but we do need to continue to experiment with the various solutions to determine:

- a. Optimal image redundancy for various operational scenarios
- b. How well scale (without control) works for volumetrics
- c. How to minimize control

10. All of the point cloud solutions we have examined have poor orientations (“AT”) analysis tools. We need to find a solution to this.

11. How useful is Near Infrared from small, non-metric cameras (e.g. Canon Elph series, Sony NEX)?

- a. Can a useful Normalized Difference Vegetation Index (NDVI) be generated from this type of system (we think this is an emphatic “yes”)