Ramblings of a used sensor broker

Written by Patrick McConnell, President, ClearSkies Geomatics Inc.

My marketing director has been pushing me for over 6 months to write this article. So today I am putting keyboard to bits and bytes to write something that will hopefully engage the reader to participate by adding comments either for or against my position.

Why consider purchasing used aerial sensor equipment? There is risk involved, right? What should I do to ensure the investment (ROI) would be successful?

Purchasing used aerial survey equipment can be a scary thing to do. The biggest benefit of considering used equipment is that often, the equipment sells for a fraction of the new equipment available to the market. What is scary about the process? Well, if it were my money, my concerns would be whether or not the system comes complete (no missing parts or software), is the system still serviceable by the manufacturer, is the software transferable, is there a warranty, will the system deliver the expected specification to my end user, are there export restrictions etc.… As a broker of such systems, it's my job to make sure all of these questions are answered to ensure a deliverable that meets the buyer's expectations. If there are no surprises, then I feel like I have done my job in an ethical and professional way.

First off, when considering the purchase of any piece of equipment, it is important to understand your end user needs and this must be done in a way that satisfies most of your end client needs. I have yet to see any equipment that satisfies *all* the possible needs of different end users so the goal has to be to meet as many scenarios possible. From an aerial camera perspective, consideration of image quality and swath are very important. From a LiDAR perspective, points per meter, avoiding shadows and swath width seem to be the most desired features.

In the years that I have been in the business of marketing aerial survey equipment, the most significant change I have seen is the market has been two fold for both the camera and LiDAR markets. First, swath of the data has in most cases doubled while image quality has improved but not at the same rates as swath growth. Secondly, software workflow and tools have improved greatly by the advent of greater computing power and better tools to fix data. Both of these factors affect efficiencies so the bigger the jobs, the more money you potentially save by adopting a newer sensor. From a qualitative perspective, passive sensors like cameras, have improved (better radiometry, smaller pixels, better signal to noise ratios) but not to the point where older sensors (10 year old) have become obsolete. I have noticed that from a geometry perspective, in general, the improvements have been relative to the improvement of image quality. So, some improvement, but nothing like footprint improvement. Also, the geometry generated from these older systems meet most specifications required by the end user. There are a greater number of these older sensors in operation today than newer sensors and this is because the data generated from these older cameras continue to meet the end user specifications from a qualitative perspective. For active sensors, the number of clean points per square meter is the big driver for this market. To achieve this, these sensors are capable of generating more usable point than ever, while pushing the envelope on swath width. So there are fewer older active sensors still operating in the market today because of the end user desire to have a denser point cloud.

What to look for in buying used equipment? First, you want to make sure that this equipment has been well taken care of during its tenure with the current owner. Is the equipment clean? Has it been maintained by the manufacturer? When was it last used successfully? Has it been bench tested, or air tested? Can it be set up in an airplane for viewing and testing? What are the acceptance criteria? If needed, what would it cost to have the manufacturer test the system? Is the post processing software transferable? Are there any restricted items such as IMUs and how does this affect you? All of these factors play out in pricing of the system.

Why would someone sell his or her own equipment? The simple answer is that the manufacturers will not usually buy your system back unless it's on a 'trade in' for something newer. If you have ever purchased a new car and traded in an old one, then

you know what that experience will be like… One of the things manufacturers do to hold you 'captive' is they do not restrict the sale of the sensor, but they restrict the transfer of the software making it nearly impossible for you as a seller to control your asset sale to a third party. It's akin to buying a Tesla, and allowing for the resale of that car, but without the software included. Without allowing the transfer of the software in a Tesla, the value of this car results in in a parts only value unless the transfer is done 'under the table'. Try getting service on that car after this happens… This is why in most industries, when you buy an asset, the license of that asset belongs to you, to do as you wish provided you do not reverse engineer the software. In a lot of cases, in our industry, this is not the case. You can sell the hardware with no problem, but the software must be repurchased at exorbitant prices. This fact should be considered when purchasing new equipment. It is something that should be a negotiating point when purchasing new equipment, otherwise you will be stuck with an unsellable asset later on. In short, why spend a million + on a new system today if 5 years down the road you will not have control of the sale of the *full* system?

Why use a broker and not sell your equipment on your own? Selling equipment through a broker has certain advantages. You can flow the contract through a broker and avoid any potential litigation with the end user if the system is not delivered as promised. Exporting restricted items can be tricky and a good broker should be licensed with the Department of State to do these activities. Shipping of the equipment is not always straightforward and having a broker organize this on your behalf can be a real value. Finally, good brokers have worldwide reach thus increasing your chances at getting top dollar for your asset.

The morale of this narrative is that if you can, use a broker to help guide you through this process. Advice is mostly free…

Thank you.