

Assembling a low-cost aerial survey system in the Alaskan wilderness



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Survey manager Eric Stahlke and his team from Alaska's Tanana Chiefs' Conference were trying to solve a problem that had plagued them for years: how to conduct low-cost, three-dimensional aerial surveys for isolated Native villages? Their solution: assemble a low-cost, high-definition 3D aerial survey system using a leased helicopter, an off-the-shelf digital camera, and Topcon's new PI-3000 software.

Founded in 1962, Tanana Chiefs' Conference is a non-profit corporation based in Fairbanks, Alaska. It is a partnership of 42 Indian villages located in an area of 235,000 square miles. The primary work of the Tanana Chief's surveyors is the surveying of the boundaries of tribal lands. "To get a good survey of the boundaries of one of the villages we piled into a helicopter to make a number of flight lines to ensure we could obtain the needed coverage. Each shot was followed by another of the same area with a slightly different central focal point to produce a stereo-pair of photos that would be used to generate a three-dimensional image using Topcon's PI-3000 software."

"We chose the best 14 photos of the part of the village to be surveyed. The stereo-pair photos were then loaded into the PI-3000 which registers all stereo pairs and indexed them with the coordinates of aerial targets. The next step was to define the digital terrain model (or DTM) boundaries and break-lines in a set of stereo images created by the software. Four hours later we had a high resolution ortho-rectified image of the village, as well as a three-dimensional model that could be zoomed, rotated and examined in computer space."

"The ortho photo from PI-3000 was then downloaded into AutoCAD and new subdivision boundary lines were created that matched the village markup. By day's end the subdivision was finished. We couldn't have hoped for better results as the combination of in-house digital photography and PI-3000 produced the perfect solution to a very difficult problem. An added benefit was a significantly reduced cost and time investment for this survey compared with our normal methods."

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