meters of truth, compared to 100-meter accuracy for GPS alone. GPS/GLONASS used with radio technical committee maritime differential correction techniques yields accuracies up to 50 centimeters.

The system also is beneficial in obstructed operating environments such as in cities, mountainous areas, under tree cover or in other areas where satellite signals can be blocked.

“When you’re trying to do a point-position solution the more [signals] you have coming down from satellites the quicker you can get the solution,” Hunter added. “If you have twice the number of satellites available to you, you can come into these urban canyons between buildings . . . and get point solutions as if you’re using GPS by itself out in the middle of Kansas.”

Civil War Battlefield Mapped Using GPS/GIS

In a pilot project that could lead to the development of new archaeological processes, the National Park Service (NPS), Washington, D.C., collaborated with URS Greiner, San Francisco, and GeoResearch Inc., Bethesda, Md., to use photogrammetric, Global Positioning System (GPS) and GIS technologies to spatially position events and cultural features at Antietam National Battlefield in Maryland. Casualties there in 1862 totaled more than 23,000 in the Civil War’s bloodiest battle.

According to Stephen R. Potter, chief archaeologist for the NPS’ Capital Region, he and his associates developed an idea for using GIS and GPS technologies to orthorectify historical imagery in the field at Antietam. To implement their idea, Potter contacted URS Greiner, which has an indefinite-quantities contract with NPS for archaeological services. In turn, the company brought in GeoResearch as a subcontractor.

The newly formed research team then obtained the earliest available visual images of the battlefield, including ground photographs and a war correspondent’s battle sketch from 1862, as well as an aerial photograph from 1936. The team rasterized, registered and rectified the images for use in field computers with GPS positioning and data collection capabilities, then assigned coordinate points to historical features. Current photographs of the battlefield also were scanned and registered.

The team selected similar points from the historical and current photographs, calibrating the two sets of images and creating a 3-D dataset. Team members then queried the historical features for their data coordinates, generating a 3-D digital object for each chosen cultural feature. The researchers superimposed the two sets of images, rendering the locations of each cultural feature in the field.

After the sites were located, an inspector used GeoResearch’s GeoLink GPS/GIS field mapping system to display both image sets in the field, walking the sites to verify that the images lined up correctly. Archaeologists then joined the project to discover whether the historic features were where the research team had indicated they would be.

Potter said he hopes the project will aid in the development of “a quick and inexpensive process to locate historical features that are difficult to find on the ground today,” serving as a “manual [or] handbook” for future studies.

ESRI, Convergent Group Offer GDS Migration Option

Convergent Group, Englewood, Colo., announced a nonexclusive, cooperative business agreement with ESRI Inc., Redlands, Calif., intended to strengthen Convergent Group’s ESRI-based software integration capabilities and to provide another migration strategy for Convergent Group customers using GDS and MicroGDS products from affiliate Graphic Data Systems Corp. (GDSI), Englewood. Convergent Group previously had established an agreement with Smallworld Systems Ltd., Englewood, to provide Smallworld migration options. According to Ginger Juhl, vice president of marketing and corporate communications for Convergent Group, the ESRI agreement was influenced by Convergent Group’s decision to curtail investments in GDS (see “GDS Slashed in Convergent Group Reorganization,” GIS WORLD, April 1997, page 12).

“With the decision not to market GDS products any longer, our relationship with the GIS software industry has opened up dramatically,” Juhl said. “It’s a nonexclusive relationship [with ESRI], but we are working together to identify mutually beneficial opportunities to migrate strategically identified GDS customers from the GDS platform to an ESRI platform.”

The agreement with ESRI focuses on solutions for customers in the transportation, telecommunications and utilities markets. Convergent Group plans to work with all components of the ESRI product suite, including ArcView, Arc/Info, MapObjects and Spatial Database Engine. Although no developments have been announced, ESRI will merge GDS software research and development efforts into future product releases, and GDS-to-ESRI migration services will include database design and the development of prepackaged macros.

Although ESRI systems will be recommended to certain customers, Juhl stated that each account will be approached individually to find the platform best suited for that customer. Convergent Group will support the GDS product line for a minimum of three years.

In related news, Convergent Group agreed to sell MicroGDS software development and marketing rights to Informatix, Tokyo. Informatix will form a Cambridge, United Kingdom-based subsidiary to continue developing and marketing MicroGDS worldwide, building on MicroGDS’ current global distribution channels. Convergent Group also will subcontract continued maintenance responsibilities to Informatix for GDS and its associated products. Informatix previously was a 15-year GDS business partner, responsible for distributing MicroGDS and GDS in Japan.