

DT Research's Dual-Boot Tablet: Have Your Android and Windows, Too

By Steve Wilent

Any forester contemplating the purchase of a smartphone or tablet for working in the woods faces a key question: Which of the three main modern mobile-computer operating systems (OSs) is best: Google's Android, Apple's iOS, or Microsoft's Windows? The answer depends largely on the software the forester wants to use. Those accustomed to their Windows desktop computers may be inclined to take the desktop version of Windows into the field, but there are fewer Windows apps for data collection and mapping compared to Android or iOS. DT Research (DTR, www.dtresearch.com) offers the best of two worlds: a dual-boot tablet that gives you Android and Windows 7 or 8.1 (see Figure 1).

Dual-boot desktop computers have been around for years. Many desktop users can choose to start their machines with either Windows or Linux, and with some technical savvy, it is possible to create a machine that can run Apple's desktop OS or Windows. Dual-boot tablets that can run either Android or Windows are available from a few manufacturers, but as far as I know, DTR's DT395GS is the only dual-boot tablet rugged enough for field foresters.

I hadn't heard of DTR until I visited the company's booth at the 2015 SAF National Convention in Baton Rouge. There, Mario Gosálvez, business development manager for GNSS tablet products, showed me the DT395GS and other models, including the DT391GS tablet, which DTR says is capable of half-meter accuracy when using SBAS (see "Tech Notes from

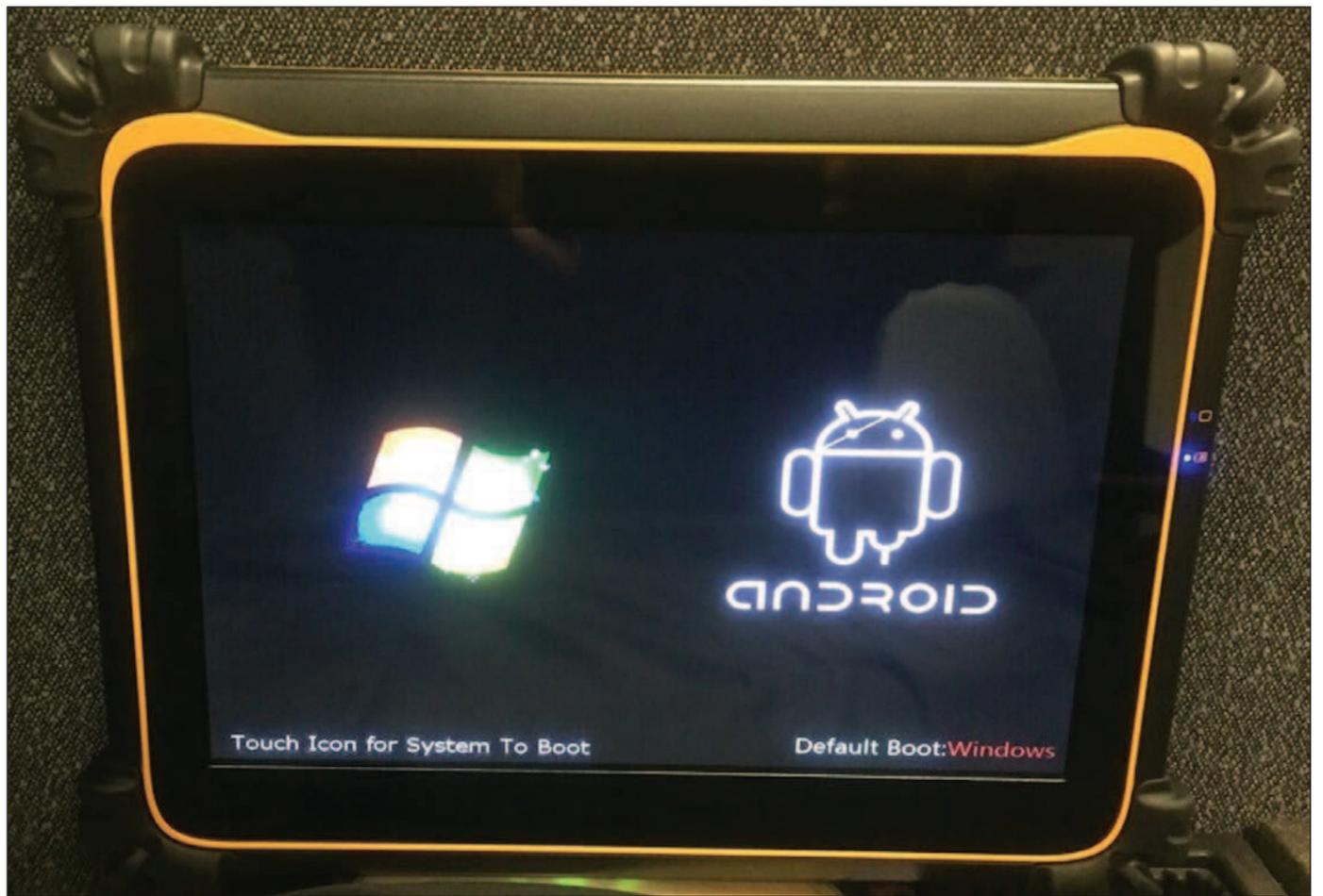


Figure 1. The DT395GS tablet, from DT Research, is available in dual-boot models.

the Convention," *The Forestry Source*, December 2015). A couple of months after the convention, DTR sent me a DT395GS with the Android 4.4 OS; unfortunately, a dual-boot instrument wasn't available at the time so I couldn't test the dual-boot feature.

The DT395GS hardware is capable of handling either OS with ease: It comes with an Intel Celeron Dual Core CPU, 4GB of RAM, and a solid-state drive (SSD) with storage capacities of 64GB, 128GB, or 256GB. You can choose Windows 7 Professional or 8.1 Pro Industry to go along with Android 4.4. Prices range from \$1,498 for an Android-only device

to \$2,048 for a dual-boot model with a 256GB SSD. In addition to the standard Wi-Fi feature, communications options include 3G or 4G LTE wireless modules (\$228 each).

Aside from being dual-bootable, the DT395GS is a fairly typical tablet, although it has a nine-inch LED touchscreen that is larger than many other rugged tablets. As for ruggedness, DTR rates the DT395GS as IP65 in water and dust resistance, which is less protection than the IP68 and IP67 ratings for Cedar Tree's CT4 and CT7, respectively, which are waterproof (reviewed in October 2015). I used my loaner DT395GS in light to moderate rain with no problem, other than having to wipe the screen now and then to clear away raindrops.

In my tests, the DT395GS's battery seemed to discharge faster than those of other tablets I've used. After very light use over one day and 22.5 hours, with most of that time spent in sleep mode, the tablet reported that its battery had 16 percent of its power remaining. During this period, the display was set to shut off after two minutes without use, a typical power-conservation setting. One day I took the device to the field for GPS testing, beginning with the battery fully charged. After using it constantly for 60 minutes (taking GPS positions, working with Google Maps, taking photos, and e-mailing four photos via Wi-Fi back at the office), the battery level dropped to 78 percent. At this rate, I would need at several backup batteries for a full day in the field. Replacing the internal battery requires shutting down the tablet and removing the battery compartment panel, which requires removing four tiny screws. Drop a screw in leaf litter

, and you might as well say good-bye to it. Fortunately, DTR offers external, snap-on, hot-swappable battery packs for \$143, and six-bay external-battery chargers for \$523. The availability of a six-bay external-battery charger is one sign that the DT395GS is a power hog.

The DT395GS weighs 2.87 pounds, making it a heavyweight compared to smaller tablets, such as the one-pound Nautiz X8 (reviewed in May 2015). A rubber hand strap on the back of the unit allows for a secure hold. Rubber bumpers at the corners serve as shock absorbers. I didn't have an external battery pack, but adding one to the back of a DT395GS would add to its weight and perhaps make it a bit less easy to hold, because it would take up some of the space under the hand strap.

Global Positioning System

The DT395GS comes with a U-Blox M8 GNSS receiver module that, according to DTR, is capable of 2.5-meter accuracy, or 2.0-meter accuracy when using SBAS (space-based augmentation system) satellites. The U-Blox M8 can receive US GPS, Russian GLONASS, and Chinese BeiDou GNSS broadcasts, as well as signals from a range of SBAS satellites.

To test this GNSS receiver, I visited two National Geodetic Survey (NGS) points in my area. I mentioned these points in the November 2015 review of the Garmin GLO receiver; each of these survey monuments has been located with survey-grade GPS gear with accuracy of about one centimeter. After allowing the DT395GS's receiver to collect position data for a few minutes at these sites, I

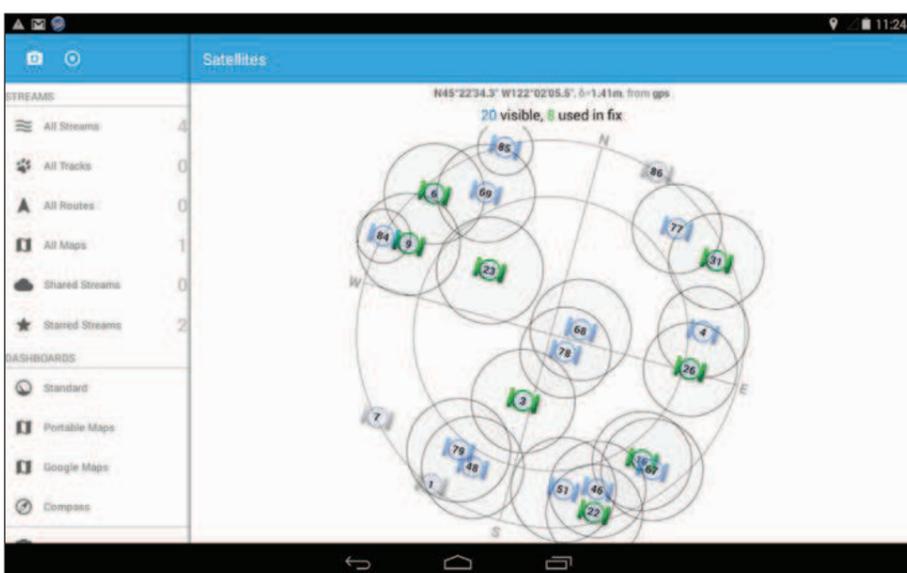


Figure 2. The DT395GS recorded an accurate position (within 1.4 meters), despite poor position dilution of precision (PDOP). As shown in this example, 16 of the 20 satellites in view are relatively low on the horizon, and three are very close to the horizon (numbers 1, 7, and 86, in gray). Three SBAS (space-based augmentation system) satellites were visible (numbers 46, 48, and 51). GPS signals from satellites low on the horizon are more prone to error than those closer to directly overhead, because of the greater distortion caused by having to travel a longer distance through the atmosphere. In this example, the free GPS Essentials app (not included with the DT395GS) used signals from only eight of the satellites—those with the strongest signals—to calculate the position coordinates.

TABLET
■ From Page 14

recorded the latitude and longitude and later calculated the difference between the NGS coordinates and the tablet's coordinates. The results were differences of 2.4 meters and 1.3 meters, respectively.

Although the NGS points were wide-open to the sky, the GNSS satellite geometry on the day I conducted the tests was poor (see Figure 2). In both cases, the accuracies calculated by the GPS Essentials app (which I downloaded from the Google Play store) were very close to the figures I calculated. In using the DT395GS under moderate-to-heavy forest canopy—a stand of 150-foot-tall, 110-year-old Douglas-fir—GPS Essentials reported accuracies of 2.5 to 5 meters, which is about what one would expect from a receiver of this type.

Dual-Boot Options

The single-OS DT395GS compares well in functionality, ruggedness, and price to other tablets in its class. However, the flexibility of dual-boot version puts it in a class by itself, and its price seems quite good in comparison to single-OS devices, some of which cost more. In my view, the DT395GS is well worth the cost, even

with the extra batteries you'll need.

With the power available in small, rugged handhelds these days, it may make sense for other manufacturers to offer dual-boot machines. Devices such as the Handheld Group's Nautiz X8, (reviewed in May 2015), are available with either Android or Windows Embedded Handheld 6.5. Perhaps some enterprising company will one day offer a handheld or tablet that comes with both. This would have the advantage of letting Windows Embedded Handheld users continue to have their legacy apps, while also letting them take advantage of the myriad Android apps on the market. This could help extend the useful life of software built for Windows Embedded Handheld, an older OS that Microsoft has no interest in upgrading. What about a triple-boot tablet? Or a dual-boot Android and iOS device? I'm not a tablet engineer, but I reckon these things could be done.

In my view, tablet and handheld manufacturers that offer operating-system flexibility can capture a larger share of the market than those who rely on single-OS devices. Their customers, perhaps even the most technophobic of foresters, will reward them for providing the options and flexibility that multiple OSs provide. **ES**



DT Research's DT395GS tablet boasts a nine-inch diagonal touchscreen and is water-and-dust resistant.

Share Your Forestry Story in Photos

The Forestry Source welcomes submissions of recent photographs that illustrate important natural processes or good forest-management practices—or forest practices that aren't so good. If you have a photo or photographs that tell a compelling story, please send them to the e-mail address below, along with a paragraph or two (no more than 500 words, please) that explains where and when they were taken and what story they tell.

How to submit photos for consideration: Send single photos or up to three related images in JPEG or TIFF format at the highest resolution available (300 dpi preferred), to wilents@safnet.org. If you are not the original photographer, please include a note from the photographer or copyright holder granting SAF the right to publish them, along with the photographer's name, address, phone number, and e-mail address.

A forest of snags. In 2008, the Gnarl Ridge Fire burned 3,280 acres on the northeast flank of Mt. Hood, on the national forest in Oregon named for the mountain. Aside from hazard trees along a main road through the burned area, which is popular with hikers and tourists, most of the dead trees have been left standing, as shown in this 2015 photo by Source editor Steve Wilent.

PHOTOS OF THE MONTH

A Sign of Good Forestry

New Jersey SAF member Bob Williams, CF, president of Pine Creek Forestry LLC, encourages his clients to let him install signs on recently harvested areas to help inform the public about the purpose of management activities.

"I have done this occasionally over the years, but am getting more into these signs now," said Williams. "We must try these kinds of things. Forestry is quite rare here, so when tree removal starts, people jump to the conclusion that houses or a new Walmart is coming. The signs help ease those concerns. Many folks who stop by typically don't understand why trees have been cut, but when we speak with them, they get it—and most are OK with this kind of forestry. And the landowners are always proud of their land and happy to let people know they are and what they are trying to do."

Williams designs the signs and has a professional sign-maker build them.

"I plan to place more of these signs where thousands of people will see them," he said. "I want to try and counter the hundreds of signs advocating preservation—we need to broaden the perspective of what true conservation and stewardship really is."



Father-and-son-landowners: Steve Lee III Steve Lee IV. Photo by Bob Williams, CF.

