

Tuesday, June 7, 2011

## SkyVision Xtreme

**ADS-B, here and now**

*By James Lawrence*

We've been promised and warned it's coming. Now, ADS-B (Automatic Dependent Surveillance-Broadcast), cornerstone of NextGen navigation, is here. You're not legally mandated to have this equipment aboard until January 1, 2020, but that hasn't stopped SkyVision

([www.skyvisionxtreme.com](http://www.skyvisionxtreme.com)) from bundling its Xtreme Vision portable touch-screen display into what the company calls the first ADS-B in-and-out product that supports both 1090 ES and 978 MHz modes. (The standard

for ICAO, and for aircraft flying in the flight levels in the U.S., is 1090 ES; 978 MHz is the FAA standard for U.S. airspace up to 18,000 feet, which supports weather and traffic-information broadcast-in services.) But if a certified ADS-B system won't be required for 10 years, why install one now?

"Because we can take advantage of the ADS-B 'in' features, like traffic [advisories] right now," says Victor Steel, co-founder with Harry Sanders of Asheboro, N.C.,-based SkyVision. "There's no penalty to equip now and be ready for 2020."

Another bonus is that the 978 MHz mode delivers free NexRad weather, as the pair showed while demonstrating the system to Plane & Pilot in Steel's C-182 during Sun 'n Fun.

The system has its genesis in Sanders' experience with a passive traffic-alert device he tried out in his Seneca a few years ago. "I was getting so many false alerts and so many inaccuracies in the position reports that my wife said, 'I'm not flying with you if you fly with that anymore,'" Sanders said.

An electrical engineer with a background in manufacturing and product development, Sanders began designing a better solution in 2008. He and Steel, also an electrical engineer, met through their wives. In 2009, they debuted and



***The portable touch-screen display supports both 1090 ES and 978 MHz modes for ADS-B.***

sold their first portable cockpit display at Sun 'n Fun, and have since refined their unit with a better processor, larger display and improved software, while adding features like audio traffic alerts.

The bundled ADS-B system has two primary components: SkyVision's proprietary software, driving the Xtreme Vision touch screen; and a non-certified NavWorks AD-600B UAT transceiver, from which the software gets the data for its traffic and weather displays. Traffic using the 1090ES standard is rebroadcast to 978 UAT systems, including SkyVision by ADS/B ground stations.

The UAT unit in Steel's Skylane rests on the floor just forward of the rear bulkhead. The system's hardwired plumbing consists of a belly-mounted UAT antenna the size and shape of a transponder blade, two coaxial cables—one connected to the UAT antenna, the other to the GPS antenna that drives the panel-mounted Garmin 430—and a power cable. The power drives the UAT, the GPS provides positioning data, and the UAT antenna communicates with the ground-based transceivers.

A Bluetooth dongle connected to a serial port on the transceiver sends its signals to the portable display in the cockpit. A hardwired serial cable also can feed the display in lieu of the Bluetooth. And though the UAT is uncertified, Steel says NavWorks will provide buyers with kits to upgrade their UATs to certified units for permanent installation once available, at no charge.

Steel mounts his Xtreme Vision display unit on the airplane's left yoke, but for the demo, he put it on a Ram ball mount affixed to the right side of the windshield, so I could see it clearly from the right seat. Driven by a Windows.net operating system, an on-off bottom on the top side of the display engages the unit.

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**PLANE&PILOT**

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After a self test, three screens appear: setup, program and hardware settings. The setup screen enables users to set traffic alert and display parameters, from the distance and relative altitude ranges at which the unit issues traffic alerts, to the size of the fonts for METARs and text information. The geek-oriented hardware settings controls the operating system. The meat of the Xtreme Vision system resides in the program screens, which provide traffic and weather displays and text data.

The target-rich airspace around Lakeland offered a good test area for the system's traffic-spotting capability, while the Garmin 496 in Steel's Skylane would provide a comparison test for the Xtreme Vision's WSI-processed NexRad weather display.

Lockheed Martin won't finish building out the ground-based transceiver network that feeds data to equipped aircraft until late next year, but much of the country is already covered, and Steel says many locations can get weather and traffic services on the ground. Climbing out of LAL, Steel's installation indicated UAT connection established at about 800 feet MSL.

Choosing the weather display, a map of the southeast U.S. appeared, overlaid by the red-streaked splotches of a large, violent weather system. Touch-screen controls give quick access to zoomed-in and -out views. We brought up the equivalent XM Weather-fed display on Steel's Garmin 496, and the images were almost identical. (Two days later, the depicted weather system spawned the storm that destroyed dozens of aircraft at Sun 'n Fun.) TAF, METARs, Sigmets, Airmets, Pireps, Notams and winds aloft are among the text weather data available.

Traffic can be displayed in either a top-down, 360-degree view, or a "3-D" display that provides a through-the-windshield perspective spanning 160 degrees. The system has a 100-mile range; eight miles is the default distance within which traffic is shown. In 3-D view, the basic display is simply a horizon line bifurcating the display with a green circle in the middle of the screen, representing the operator's aircraft. The circle moves up and down relative to the horizon line reflecting climbs and descents, and the horizon line tilts to depict when the aircraft is banked.

In 3-D View, as the conflicts get closer, the relative size of depicted aircraft grow dramatically, adding a sense of urgency to conflict resolution. Weather and traffic screens also can be displayed as small insets, for example showing a reduced size depiction of traffic while displaying NexRad weather.

Our flight was punctuated by aural traffic alerts: "Warning: Traffic, seven o'clock; seven-point-seven miles, three-hundred fifty feet low." Flying the Lake Parker Arrival back into LAL, we followed a C-172 about 2.7 miles ahead, the Xtreme Vision making it easy to know and see exactly where it was.

Along with its Xtreme Vision display unit, SkyVision sells the other elements of the ADS-B system at the manufacturers' prices. The Xtreme Vision display and software is \$999 (software alone is \$799). The NavWorks UAT is \$2,495 and the Bluetooth Dongle, \$79. Steel estimates installation costs for a setup like his is about \$800-\$1,000.

"There's a lot of apprehension about equipping today because of uncertainty about the technology and the

regulations," Sanders said. "We've been flying with it for a couple of years. We know the benefits are there, and it all works as advertised. The biggest message we want people to understand is that there's no downside to equipping today."

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