



## Enhanced Vision Systems

The General Aviation Joint Steering Committee (GAJSC) feels Enhanced and Synthetic vision technology can significantly improve GA utility and reduce the chance of accidents during night and IMC operations. We'll take a look at available technologies and GA options.

### Enhancing Vision?

As humans, we're always looking for ways to improve our vision, especially in the aviation arena. Weather, night, smoke and other obstructions to vision can compromise safety, especially when flying close to the ground. Enhanced Vision System (EVS) technology can improve safety in these situations and can help reduce GA accidents .

### Enhanced Vision

EVS technologies fall into two categories, Enhanced Vision (EV) and Synthetic Vision (SV). EV systems use sensors to provide a better view of the outside world. These sensors can be something like infrared or radar, each of which have their own advantages and disadvantages. Of course it's nice to be able to see wildlife and other obstructions on the



runway, but they're also quite useful in depicting terrain in bad weather or on a dark night. A word of caution though. Enhanced vision technology takes some getting used to. You'll have to make the transition to visual reference at some point and that can be a challenge — especially if you're not viewing the world through a Head Up Display or HUD.

### Synthetic Vision

SV differs from EV in that it doesn't use sensors to "see" outside. Instead SV relies on GPS information and a database to create a virtual representation of the world outside .

Using information from navigation databases we can create a picture of the flight environment and overlay that picture with aircraft instrumentation and weather information to create a single image that contains all of the information necessary for safe flight operations.

One key advantage is that SV can be "installed" in many aircraft with very minimal expense or effort.

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## Display Choices

Almost as important as what you are displaying is how you are displaying it. A Head Up Display (HUD) is an ideal way of displaying EV/SV information but these are expensive and fairly rare in most of GA.

Most GA systems are displayed through a cockpit Multifunction Display (MFD) or Primary Flight Display (PFD). No

matter which display method you use, be sure you train with it enough to be proficient before taking it out “in the soup.”



## Cautions

Enhanced vision created from real-time onboard data sources can be used tactically. You know you have the latest information to act on because it's generated from sensors on your airplane; you are seeing what's actually in front of the aircraft.

Synthetic vision — especially when depicting weather events — will be driven by data that is at best five minutes old. That's usually good enough to get the big picture, but inadequate if you want to pick your way between thunderstorms. So if you're not radar or storm scope equipped, you're better off to give convective weather a very wide berth. This is because the information you are seeing is based on outside sources and databases, not direct observation. Obviously you'll need to keep your software and databases up to date.

You'll also want to make sure that you understand how your systems work, what all of the graphical indications mean, and what failure modes look like.



Finally, be sure to maintain proficiency in all flight evolutions, equipment use, and programming. Periodic training with a CFI who's proficient on the equipment in your airplane will give you the confidence to use all of your equipment effectively.

## Resources

- FAA Advisory Circular 90-106 *Enhanced Flight Vision Systems*  
<http://1.usa.gov/1NsnJSZ>
- T=Terrain Avoidance: What Does It Take to Use NVGs? *FAA Safety Briefing* Nov/Dec 2015 p. 28  
<http://1.usa.gov/1OIJd4>
- Brushing Back the Dark: A Look at the Latest in Night Vision Technology. *FAA Safety Briefing* Jan/Feb 2014 p.20  
<http://1.usa.gov/1PA1EUJ>

