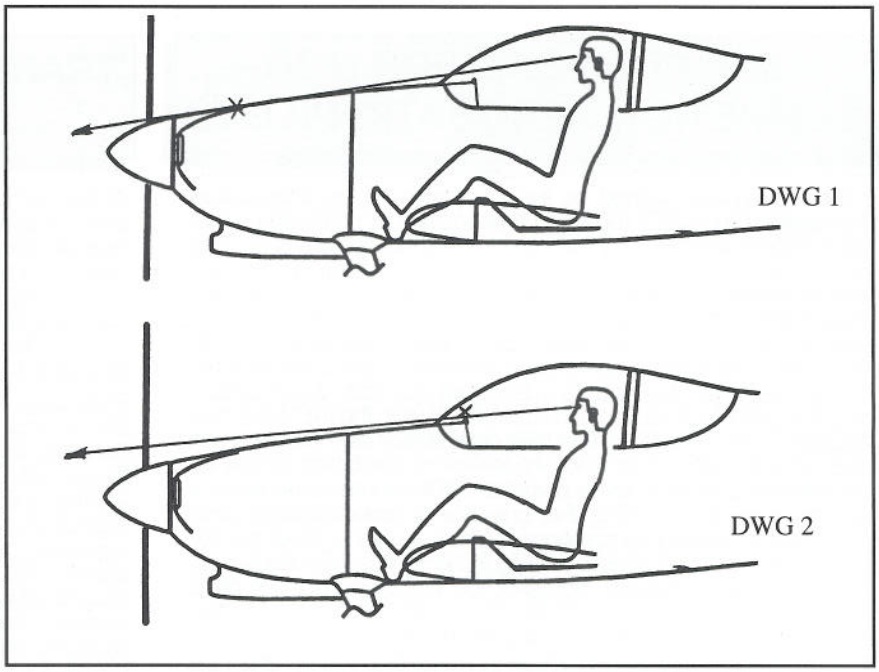
FORWARD VISIBILITY

DON'T LEAVE HOME WITHOUT IT

Van

Good forward visibility is an unquestioned safety attribute of any aircraft. Extreme examples of the lack of good forward visibility include Lindbergh's "Spirit of St. Louis" where it was completely non-existent, sacrificed to a huge fuel tank needed for the trans-Atlantic flight, and the Concorde SST where the entire stiletto nose must pivot down so the pilots can see the runway for landing. The opposite extreme, I would imagine, is a powered parachute where the only obstacle to forward visibility would be the pilot's proboscis.

For all forms of VFR flight, outside visibility is paramount. It can be said that flying an airplane consists of manipulating the controls so as to make the airplane go where you want it to. True, but to be effective, you must be able to see where you want to go. While this seems intuitively obvious, it is not always practiced. Some aircraft designers have compromised cockpit forward visibility in the interest of performance or styling. Other than when selecting an aircraft to build and/or fly, the pilot has little control over these design constraints. What he does have control of, and sometimes forgoes, is full use of the visibility designed into the airplane. He does this by sitting too low in the seat—not adding seat cushions to elevate his line of sight to the highest practical level. Drawings #1 and #2 illustrate this.



People come in all shapes and sizes, so it is important to adjust the sitting position in the airplane to give a good view. As you can see, a pilot sitting high can sight directly over the spinner, while one sitting too low sees only the edge of the glareshield above the panel. Proper sitting height allows a pilot to "gunsight" the airplane's position much more accurately.

While the actual field of view in example #2 has not changed much in terms of the percentage of the horizon or runway ahead, the frame of reference has. In #1, the pilot can align the forward extremity of the cowl with the horizon reference. In #2, all that he has available for reference is the dash above the top of the instrument panel. Those among you familiar with the use of firearms know that a long barrel rifle can be aimed much more accurately than a short barrel pistol, for much the same reason.

When I first flew sailplanes some 35 years ago, I was at first puzzled at the ease of making very smooth landings despite the fact that the landing wheel was small, quite hard and mounted directly to the fuselage structure with no spring or shock absorber of any sort. It seemed like everything was working against the pilot, so why were good landings the norm?

Several reasons contributed: The landing speed was low, the pilot sat low to the ground and had a very good forward and downward view. He could see the ground nearby and could focus on it because it was not speeding by in a blur. He could thus finesse his control movements to easily position the aircraft within inches rather than feet.

Later, I noticed similar "easy" landing qualities of my RV-5, which also landed slow and had superb forward visibility. To varying degrees, I have experienced this on other aircraft. The better the visibility, the better were the landings. One notable exception was the first and last landing I made piloting a "Breezy". While it had unobstructed forward visibility, it also had no forward reference point on the airframe; thus no "gun site" for aiming or positioning. The ground directly below was a blur as it rushed by. As a result, it was one of the most intimidating landings I can remember, including several in disabled aircraft.

OK, enough war stories. I hope you get the idea. If not, next time you're out flying, temporarily remove part of your seat cushion stack, or scrunch down in the seat so that the top of the dash becomes your visual reference point. Experience the difference. Try holding precise altitude while doing 360 or 720 turns by attitude reference only. I won't suggest you try a landing (though pilots do) with this impaired visibility and attitude reference. Within the RV family of aircraft, this is of most importance in the RV-6 (or RV-9) because of their relatively higher instrument panel dash and their wide nose. In an RV-4 or 8, the over-the-nose-visibility is so good that one has to go to extremes to seriously affect visibility. In an RV-6 or other wide airplanes, the over the nose visibility can be significantly changed by moderate variations in seating height.

"Don't leave any money on the table." Sit as high as practical. We find that about 1 inch clearance (the thickness of a flat hand) between top of the head and canopy is adequate to avoid bumping under normal flying conditions. Particularly when flying new or different airplanes, optimizing the seating height should be an essential pre-flight checklist item. A 2 inch thick "booster" cushion can make a big difference in visibility and safety.

This seems so obvious that perhaps I shouldn't be wasting time and space discussing it. Yet, I see many pilots taxi out and fly while sitting low in the saddle. I also see many imperfect landings, and we get far too many reports of RVs damaged on landing. I can't help but wonder??

What do you think would lead to better landings? Above: a seating height that takes full advantage of available headroom allows the pilot to see the horizon in the landing attitude. Below, sitting just 2 1/2" lower where the glareshield blocks the view.