

# **A Report on LSA for Aerial Photography from the U.S. Sport Aviation Expo**

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## **LSA and Aerial Photography**

Can a S-LSA be used for aerial photography?

No.

This is the short answer into the changing market and technology dynamics of aerial photography. An analysis of this issue was presented at the PAPA regional conference in Atlanta in September 2005 and a presentation will be given on this and more at PAPA in Orlando in February 2006.

There are significant reasons to seek to use S-LSA (Special – Light Sport Aircraft) for aerial photography. Certainly two are the low operational costs and the ability to purchase a new aircraft. Yet, one has to understand the history of the evolution of LSA and the position that aerial photography occupies vis-à-vis FAA regulation to understand why the answer is no.

Yes, we understand there has been a debate in PAPA whether aerial photography is a commercial activity with an aircraft. There is no uncertainty at the FAA. As was passed out at Atlanta, the FAA has stated in a determination letter that aerial photography, sold as a business, is a commercial use of an aircraft and requires a commercial pilots license.

As found out in Sebring, FL at the U.S. Sport Aviation Expo, the industry sought to allow the use of LSA for commercial purposes. The industry wanted it deleted from the draft regulations and the FAA reinserted it. In the comments on the regulation, effective September 1, 2004, which appeared in the Federal Register in July 2004, the FAA stated its position.

“The FAA intends that experimental and special light-sport aircraft be limited to activities generally considered to be sport and recreation. The operating limitations for experimental and special light-sport aircraft will generally prohibit these aircraft from being used for commercial purposes.”

Thus, there is a linkage between aerial photography and LSA based on commercial activity which precludes the use of LSA.

## **Impact of LSA on GA and Pilots**

It is also both important and interesting to observe the impact that LSA are having on aviation. Little of this is reported on and should be of interest to the PAPA members. We also comment on aerial photography aircraft at U.S. Sport Aviation Expo, in Sebring, FL.

The EAA has pushed for 10 years to open a new category of pilot licensing and aircraft. The industry has been in a morbid state in terms of growth and innovation and activity was needed to change this. Europe led the way with its sport aircraft 10 years earlier. With the publication of the LSA rule in July 2004 there was great hope that growth would again return to general aviation. A cornerstone to increasing the number of pilots was the barrier posed by the medical examination. But the original intent of a “drivers license” qualification for the sport pilot was changed at the last minute when attorneys inserted the requirement that a sport pilot could not have failed a prior FAA medial exam.

The net effect of this, and the market developments in LSA, has been profound. We spoke with a number of individuals at U.S. Sport Aviation Expo to better understand the forces shaping LSA.

LSA pilots today are senior pilots who want to continue to fly. There has been little activity in licensing new pilots.

The unwritten pilot rule among senior pilots is:

If one thinks they may fail a medical do not take it and become a sport pilot.

Flight training schools have little incentive to train sport pilots because the costs are less for the aircraft, different aircraft are required and less money is earned. When we spoke with a firm training sport pilots the instructor stated that there are few new pilots, most being senior pilots

S-LSA Aircraft sales are also going to senior pilots flying on a sport pilot license. These are typically individuals with ready funds seeking to have an aircraft they can fly just as in their earlier days of flying.

Hansen AirGroup, distributors of the Techam LSA, stated that of the 16 aircraft they have sold 2/3 have been of the IFR version. The reason is that the senior pilots are accustomed to flying at night and IFR and they want the same in a LSA.

It is also important to note that LSA are regulated by the industry and not the FAA. This has huge impacts on the cost of aircraft and their modification. The centerpiece of this approach is the use of a consensus standard. As the LSA rule states:

Consensus standard means, for the purpose of certificating light-sport aircraft, an industry-developed consensus standard that applies to aircraft design, production,

and airworthiness. It includes, but is not limited to, standards for aircraft design and performance, required equipment, manufacturer quality assurance systems, production acceptance test procedures, operating instructions, maintenance and inspection procedures, identification and recording of major repairs and major alterations, and continued airworthiness.

As a result the industry met under the ASTM to draft standards. The manufacturer only has to certify using the FAA Form 8130-6 that it meets the standards.

### **LSA Night Flying and IFR**

The use of LSA at night and IFR seems inconsistent, ;given that sport pilots cannot use the aircraft under these conditions, but this is an area of significant activity for the reasons cited above – senior pilots

Rotax, the dominant engine manufacturer for LSA, stated to the industry that most aircraft which use its engine were not designed to fly at night. Thus, given that there are no standards for night flight, Rotax effectively precluded LSA aircraft with its engine from flying at night. Rotax has two versions of its popular 100HP engine, Rotax 912 ULS, and the Rotax 912 S. Engines with the UL are not certified and thus are not to be flown at night while certified engines can. However, at Sebring it was learned the Rotax has agreed that even its uncertified engines will qualify under the night standards being worked at the ASTM.

The EAA has posted a notice on its web site about LSA night and IFR flying:

[http://www.sportpilot.org/news/051013\\_ifr.html](http://www.sportpilot.org/news/051013_ifr.html)

Beginning in October 2005 the industry consulted on how to create standards for night and IFR. Currently there is an effort underway to draft an ASTM standard for LSA night flying. Virtually nothing has been written about this in the press. To date there have only been comments created by the members of the committee. There is not even yet a draft standard and, thus, the process has barely begun. It will be at least 6 months before a standard emerges, with a complete standard possibly by the end of 2006.

The effort on a standard for IFR has been postponed until the night flying work is complete. The view is that this is much more complex and a standard could take 12 – 24 months to complete.

What is odd, is that today, there are LSA being sold as IFR. This seems inconsistent but there is logic around what is taking place.

The instruments for IFR are stated in FAR 91.205 and these are frequently cited as the basis for IFR. However, from a manufacturer's perspective, it is FAR 23 which sets the qualifications for flight.

The Tecnam P92 Echo Super LSA is derived from the certified P92 JS which complies with IFR certification. As a result, when the P92 is sold in an IFR configuration, the manufacturer states it fulfills the intent of Part 23 certification. The base LSA aircraft is approximately \$80k while the IFR LSA aircraft is \$120k.

The Zodiac 601XL LSA is derived from the AMD Alarus, which is a Part 23 IFR certified aircraft. For IFR the Zodiac costs approximately \$30,000 more at \$110k.

How can LSA be sold as IFR when there are no ASTM standards for LSA IFR? Again this is up to the manufacturer. There is a risk claiming it is IFR because when the standards are released the aircraft could become “disqualified” if it does not fulfill all the requirements. However, non-LSA aircraft certification centers on FAR 23 and thus, when the standards come out they will show a close tie to Part 23.

What then makes Part 23 so onerous?

As stated at Sebring there are at least two reasons:

Certified aircraft require a paper trail of traceability to show compliance with both the aircraft and its parts which supports certification and

The testing to assure compliance.

Consider one example – Lightning strikes. The FAR section below illustrates the requirements. Note that (c) (2) does not dictate a solution but only the end result. It has been stated that the Cirrus aircraft has wires embedded in its composite structure to dissipate the impacts of a strike, with the assumption that it is meeting 23.867. To assure that (c) (2) is met would require testing, and thus contribute to the cost of the airframe.

23.867 Electrical bonding and protection against lightning and static electricity.

- (a) The airplane must be protected against catastrophic effects from lightning.
- (b) For metallic components, compliance with paragraph (a) of this section may be shown by -
  - (1) Bonding the components properly to the airframe; or
  - (2) Designing the components so that a strike will not endanger the airplane.
- (c) For nonmetallic components, compliance with paragraph (a) of this section may be shown by -
  - (1) Designing the components to minimize the effect of a strike; or

(2) Incorporating acceptable means of diverting the resulting electrical current so as not to endanger the airplane.

If the FlightDesign CTSW or the SportAir StingSport are to comply with the intent of this rule it could well mean the redesign of the aircraft, given their use of composite materials. In this respect metal aircraft are in a better position to fulfill some of the potential IFR standard requirements.

One has to only review FAR 23 to understand the complexity of the requirements that will likely flow into the IFR LSA standard.

Thus, even in this short outline, the market forces, including the buyers of today's LSA, are having an impact on the early LSA market as it is evolving.

### **Impact of LSA on GA**

It was stated earlier that LSA would have a significant impact on GA. Consider the following.

One had to only walk the tarmac at Sebring to note the obvious – US based aircraft companies are missing. In conversations it was stated that this could radically change in the next 18 months. Two major GA aircraft companies are seriously considering entering the market. They have watched LSA evolve and have now made a determination that LSA is a serious market.

It should be noted that the price of US S-LSA would likely be about or even less than the aircraft built outside the US. One factor is the \$4,400 shipping fee, which would be significantly less in the US and possibly zero from a manufacturer's perspective if the aircraft is picked up by the buyer.

Further, much of the avionics are being installed in the US and not shipped to the aircraft plant and then returned when they are packed in the airplane.

Cirrus has changed the market with its new aircraft and especially the use of composite materials. We see similar trends in LSA with the FlightDesign CTSW and the SportAir StingSport. For example, the StingSport has wings made of carbon fiber with carbon composite spars. Yet, there is a downside. We were told that one StingSport had a hard landing and it literally totaled the aircraft. Thus, it remains to be seen how durable these new aircraft are and how well they retain their value. It should be noted that when we asked are the materials used in the Cirrus similar to those in the S-LSA, the response was emphatic. Cirrus is in a different league with much higher quality materials and technique/technology.

Certainly a major contribution of LSA is the way in which they are certified. One potential impact would be to enable more manufacturer standards based

certification beyond the light sport category. This would have the impact of lowering the cost of certified aircraft and bringing more competition to market. However, one should assume that this prospect is well into the future, if it ever happens.

### **Aerial Photography at U.S. Sport Aviation Expo**

Sebring also touched on aerial photography.

The Sky Arrow 600 sport is basically an aerial photography platform but to LSA standards. It has a Part 23 certified version, the Sky Arrow 650. The base price of the 600 is only \$66.8k while the IFR 650 is \$110k.

<http://www.skyarrow.com/>

This same aircraft is also used by the Italian Air Force as a drone for aerial photography. Photography is typically done in the rear seat. Verticals can be taken and the two rear windows can be easily removed. Since the Sky Arrow 650 is certified it does not have limitations on the areas it can cover but it requires two on board.

The Leza AirCam was being flown and shown.

<http://www.leza-aircam.com/>

This is also known as the National Geographic aircraft as it was designed and used to photograph the Amazon. In kit form this costs \$82k and assembled by a professional would cost \$134k. Typical build time is 3,000 hours. Being experimental the Leza AirCam falls under FAR 91.319 and thus restricted in the areas it can cover.

91.319 Aircraft having experimental certificates: Operating limitations.  
(c) Unless otherwise authorized by the Administrator in special operating limitations, no person may operate an aircraft that has an experimental certificate over a densely populated area or in a congested airway. The Administrator may issue special operating limitations for particular aircraft to permit takeoffs and landings to be conducted over a densely populated area or in a congested airway, in accordance with terms and conditions specified in the authorization in the interest of safety in air commerce.

### **Summary**

The light sport category of aircraft and pilot rules have the potential of significantly changing GA. Unfortunately, the ability of S-LSA to do the same for aerial photography is unlikely.