

Sky Arrow 600 Sport

An Italian light sport auditions for local law enforcement

BY ALTON K. MARSH PHOTOGRAPHY BY CHRIS ROSE

ou're not the only ones kicking the tires of the new light-sport models, checking financing plans to see if you can make the payments and still buy food, electricity, and, there was something else, oh yes, college for the kids. Light

Sport

SKY ARROW 60

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The Sheriffs' Association of Texas is exploring the 100-horsepower, tandem-seat Sky Arrow 600 Sport and a whole bunch of other models, including powered parachutes, to see if it can provide aerial capability to law enforcement agencies that have tiny budgets. The association got a grant from the U.S. Department of Justice (DOJ) to explore the use of high-wing light sport aircraft for Texas sheriff's departments such as Val Verde County, which often has only two deputies on patrol at any one time, but 3,400 square miles to cover. It takes 1.5 hours to drive across the county.



The association got the grant from DOJ's Office of Science and Technology in Washington, D.C., and bases the aircraft near Washington, D.C., at Bay Bridge Airport on Maryland's Eastern Shore, where the research effort is managed for the association. When you see Segway scooters used by police in airport terminals, know that it was this same DOJ research agency that got them there. Some of the DOJ science and technology officials are convinced that the new light-sport aircraft category may be the avenue to aviation assets for smaller law enforcement units and have designed a research program to find out.

Duties for the Sky Arrow include search and rescue on land or water; there are many lakes in Texas but the smaller sheriff's departments do not own boats. Other uses are: border patrol flights to aid in the location of staging areas for illegal immigrants; fire watch for brush and grass fires; marijuana eradication; and photography or surveillance of critical infrastructure.

The \$75,500 Sky Arrow 600 Sport is nearly identical to the FAA-certified \$110,000 Sky Arrow seen in *AOPA Pilot* in 2000, (see "Sky Arrow: Yes, It's a Real Airplane," March 2000) but at 1,433 pounds, the FAR Part 23 aircraft was 110 pounds overweight for the light sport class. The engineers at Iniziative Industriali Italiane in Rome scratched their heads and started tossing things out. The carbon-fiber airframe didn't change, but the canopy is made of thinner plastic; the panel is smaller; the vacuum system is gone and with it, the heading indicator; there is only the single 17-amp alternator on the Rotax 912 ULS engine rather than the additional 40-amp alternator required on the certified Sky Arrow, since no night operations are allowed under light sport rules. (Police may be able to get an exemption for night operations.)

On the certified aircraft the wing struts have heavy metal bars in them

Cockpits can be easily equipped with the latest moving-map and electronic flight information displays. A panel behind the rear seat (above) allows visual checking of fuel levels in the single tank, which requires only a single fuel drain. **Refueling requires** a stepladder.

for rigidity (not structural strength), but those have been eliminated on the Sport model. (The certified Sky Arrow used a two-blade prop, but there was engine vibration that shook the wing struts, so bracing bars were added to the fuselage. With the use of a threeblade prop on the Sky Arrow Sport, the vibration was eliminated, and the bracing bars were not needed.) The brakes are lighter and a few frills, like shelves in the front seat and a tail support to keep the aircraft from tipping when parked, are gone.

Of all the aircraft evaluated so far, Sheriffs' Association of Texas Technical Assistance Division Director Joe Peters likes the 94-KTAS Sky Arrow Sport the best. Although not a pilot, yet, as a selfdescribed "street cop" he knows what he needs, and that is visibility. Even better visibility for police work is available from a powered parachute, but it can't fly in whipping winds. The Sky Arrow can fly in those winds, as you'll see in a video of my takeoff in a 70-degree, 14-knot crosswind on *AOPA Pilot* Online (www.aopa.org/pilot/skyarrow). Watch for the 20-knot gust.

The aircraft I flew was a prototype, and there were a few improvements yet to come from the factory, although deliveries have started. The gear had been designed for heavier weight, resulting in a pigeon-toed look that was wearing out the edges of the tires. That was to

be changed by the end of 2006. Howard Hawkins, the San Diego-based Sky Arrow dealer, said he was not happy with the toe brakes and indicated that the model might be converted to fingertip brakes like those of the Part 23 Sky Arrow. In two of the early Sky Arrow 600 Sport aircraft, including the one I flew, there had been a problem with the flaps locking in the down position and not retracting. The problem was found to be a loose actuator and was repaired.

The strongest selling point is the 600 Sport's "armchair in the sky" view. The pilot's arms rest on two ledges, and the in the side of the aircraft makes that easy enough, but once there you are nowhere near the dipstick. Now place a foot on the back of the front seat to give yourself another 2-foot boost. That puts most people about waist high with the cabin roof, where you'll lift and place one knee on the roof. If you failed to fully open the engine cooling baffle on top of the engine that hides the oil port, better get back down and do that. It is on the right side of the front cockpit, back down there.

So there you are, one knee on the cabin roof, and the dipstick is beneath

The challenging oil-checking procedure is mostly a problem caused by the location of the engine, and it doesn't detract from the otherwise clever Italian engineering of the aircraft. Descending back to the ground, you'll notice there is only one fuel drain to bother with, and it is on the lower left of the fuselage some 4 feet below the engine. (The tank runs behind the rear seat where there is a window in the tank to observe the fuel amount.) You're well assured of tapping the lowest point of the tank to look for water or contaminants.

Since it is a Rotax, you not only can,

To get to the engine the pilot lowers the tail, but checking the oil requires a climb using the back seat. The rear seat (right) pulls forward to reveal a storage area, but pack lightly.

but should, burn less expensive auto gas or mogas. Some who operate this Rotax 912 ULS on other aircraft models suggest you use 100LL only a third of the total flying hours if you want to keep overhaul costs down. My demonstration flight was flown with 100LL, but here is what the FAA says: Use standard specification fuel for automotivespark engines, and use 100LL only if automotive fuel is not available, because 100LL has higher lead content and therefore. "the wear of the valve seats and deposits in the combustion chamber will increase." It should be noted that most airports do not sell mogas, and your airport may not want you to store mogas in your hangar.

You have to look hard to find something to criticize about this aircraft.

controls fall exactly under his hands. (While the seat doesn't move, the rudder pedals can be adjusted fore and aft to accommodate pilots of various sizes.)You need only wrist and hand movement to fly the aircraft. The side stick is operated by the right hand, and the throttle/carb heat controls are under the left. From a form, fit, and performance standpoint you have to look hard to find something to criticize about this aircraft.

Preflight

But you don't have to look long: Checking the oil level during preflight is a pain. OK, follow me through the procedure. The engine is up there, on top of the cabin, so you'll first need to stand in the backseat. A convenient toe step

the top-right side of the engine, but the opening is blocked by metal bracing. You still need to poke a finger in that opening, though, to flip a panel forward that hides the oil port. Now, with the oil cap exposed, and using the left hand only, reach down through the top-left opening of the engine, thread your hand to the right, and unfasten the oil cap. The stubby little dipstick is resting inside.

While you are up there, you might as well fuel the airplane too, because the gas cap is under your knee. Although the airplane can be fueled from a ladder, you'll need the aforementioned Mount Everest climbing procedure to check the oil. The aircraft uses standard motorcycle oil, and in the nose, a standard motorcycle battery. See you at Sears.

The aircraft tail easily lowers to the ground using only 10 to 12 pounds of down force, and stays there perfectly balanced while you check elevator and rudder hinges. Ground handling is very easy, and before one of my flights the wind moved the aircraft along the ramp before brakes were set using a knob on the right side of the cockpit armrest.

Worried about avionics theft? Unscrew the thumb screws of the instrument panel, unplug it, and take the whole panel home with you, where it is out of the summer heat or freezing cold. It is unlikely a thief would steal an airplane that has no panel. Security for the airplane is not impressive. You lock the pilot's air vent to keep anyone from reaching in to unfasten the canopy.

Taxi

The Rotax starts quickly like a car engine and in warm weather does not need the choke, which is located on the left armrest. The aircraft has a castering nosewheel, and some pilots prefer a steerable one, but even when maneuvering out of high grass in the parking spot I hardly noticed whether the wheel was steerable or castering. I had been warned that, given the high winds blowing 70 degrees to the runway, I would find that the large tail surfaces would make taxiing difficult. However, while taxiing slowly I didn't find it a

problem. On a later flight with lower winds but quartering from the rear left, I had more difficulty turning.

Runup is at 4,100 rpm (it's a Rotax, after all) and cruise flight is flown at 5,000 rpm. With the engine above and behind the occupants, normal conversation is possible in the event of an intercom failure, such as the one that occurred after I missed a checklist step calling for the generator half of the master switch to be turned on prior to takeoff. The battery died but we circled awhile to charge it, gaining back our radio and transponder, before re-entering heavily controlled Washington-Baltimore ADIZ, where Bay Bridge Airport is located.

Takeoff and flight test

Rotation occurs at 45 to 50 KIAS. The procedure preferred by volunteer instructor Tim Adelman, an Annapolis attorney with an office just across the Chesapeake Bay Bridge from Bay Bridge Airport, requires the stick to be full back for the start of the takeoff roll. Once weight is off the nose, the stick is brought quickly forward to prevent the nose from rising too high. Climbing at 65 KIAS, the climb rate was 1,500 fpm with two fairly large men and half a tank of fuel aboard. A full tank would have put the aircraft over maximum gross weight.

A cruise speed check showed the aircraft getting 94 KTAS, although Adelman usually flight plans for 90 knots. Not a blazing speedster, but speed is not needed for fun flying, observation, and training. Adelman has flown this Sky Arrow Sport from Maryland to Oshkosh and enjoyed every mile, mainly because it is hands-off stable.

The usual test of stalls and steep turns revealed a docile aircraft. I was surprised to discover, while trying to make it break cleanly in a full stall, that it climbed even while shuddering from the onset of a stall. Only light control forces and small movements were required of the ailerons, elevator, and rudder to maneuver. I did notice from time to time an uncommanded slight movement of the ailerons, a gentle side-to-side push. I didn't welcome it during the formation flight to take photos for this article, although the Sky Arrow Sport was effortlessly held in position 35 feet from the aircraft carrying *AOPA Pilot* photographer Chris Rose.

Hawkins said the same tendency was noticed in the fully certified Sky Arrow and small vertical tabs were permanently fixed to each aileron to stop the movement. There was no danger of control flutter at the speeds flown by the Sky

he Sky Arrow Sport used in AOPA Pilot's pilot report offered a rare chance to look inside a Department of Justice program that currently is testing smaller aircraft for use by rural law enforcement units needing aerial capability. But it is based at Bay Bridge Airport on Maryland's Eastern Shore, and that means it lies not only under Class B airspace, but also in the Air Defense Identification Zone (ADIZ) that has restricted the Washington-Baltimore region for several years. To show the aircraft's potential use, police surveillance, we would have to show it monitoring targets of interest to terrorists like the nearby Chesapeake Bay Bridge, ships, and even a nearby football stadium. Any flight over the bridge would take coordination, since motorists are naturally skittish, not to mention the bridge police and the FAA. What I did was to arrange coordination with two agencies prior to the flight. Potomac Approach, which has responsibility for the area, was contacted days before

the flight and then phoned minutes before takeoff. An ADIZ flight plan was filed for each aircraft in the photo formation flight of two aircraft. The lead aircraft carried AOPA Pilot photographer Chris Rose. FAA controllers, in turn, coordinated with defense officials who sit in the FAA control facility. It didn't end there, of course. In the event that motorists on the bridge got concerned, Marsh also phoned the public information officer of the Maryland Transportation Authority Police (the bridge police) a few minutes before takeoff. As it turned out, no motorists were concerned enough to call police when the formation appeared over the bridge. However, bridge police have in the past stopped and questioned motorists just for photographing the bridge structure as they crossed the five-mile span from the Eastern Shore to Annapolis.

You can't be too careful when it comes to flights in sensitive areas.

-AKM

The strongest selling point is its "armchair in the sky" view.

Sky Arrow 600 Sport Base price: \$66,600 Price as tested: \$75,500

Specifications

Powerplant100-hp Rotax 912 ULS		
Recommended TBO1,500 hr		
PropellerWarp Drive, 3 blade composite,		
ground adjustable pitch		
Length24 ft 10 in		
Height8 ft 5 in		
Wing span		
Wing area145 sq ft		
Wing loading9.8 lb/sq ft		
Power loading14.3 lb/hp		
Seats2 tandem		
Cabin length7 ft 8 in		
Cabin width1 ft 5 in to 2 ft 4 in		
Cabin height2 ft 7 in to 4 ft 3 in		
Empty weight840 lb		
Empty weight, as tested		
Max gross weight1,320 lb		
Useful load480 lb		
Useful load, as tested483 lb		
Payload w/full fuel		
Payload w/full fuel, as tested		
Max takeoff weight1,320 lb		
Max landing weight1,320 lb		
Fuel capacity18 gal (17.8 gal usable)		
108 lb (107 lb usable)		
Oil capacity2.8 qt		
Baggage capacity		
66 lb beneath rear seat		

Performance

Takeoff distance, ground roll.......470 ft Takeoff distance over 50 ft obstacle890 ft Max demonstrated crosswind component ... 15 kt Rate of climb, sea level1,100 fpm Cruise speed/endurance w/45-min rsv (fuel consumption), 2,000 ft

Limiting and Recommended Airspeeds

V _x (best angle of climb)	60	KIAS
Vy (best rate of climb)	65	KIAS
V _A (design maneuvering)	93	KIAS
V _{FF} (max flap extended)	67	KIAS
V _{NO} (max structural cruising).	104	KIAS
V _{NE} (never exceed)	132	KIAS
V _R (rotation)	45	KIAS
V _{S1} (stall, clean)	44	KIAS
V _{SO} (stall, in landing configura	tion)	
and the second se	20	VIAC

For more information, contact Pacific Aerosystem Inc., Gillespie Field, 1870 Joe Crosson Drive, Suite 100, El Cajon, California 92020; telephone 800/844-1441; www.skyarrowusa.com; e-mail info@skyarrowusa.com.

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted. Arrow Sport, he noted, but he said the factory may consider adding the same tabs to the already-approved Sport model's ailerons.

Landing

You want to know if this aircraft will make you look good to your passenger and to those watching at the airport. The answer is ves. Adelman suggested 3,500 rpm when abeam the touchdown point, and 10 degrees of flaps at 67 KIAS or less. With the full 30 degrees of flaps, you'll touch down at about 45 KIAS or less, after coming across the numbers at 55 to 60 KIAS, meaning it is a slow process with plenty of time to make corrections. I landed in the 14-knot crosswind mentioned above, touching down about 6 feet left of the intended centerline, while Hawkins claims to have put it safely on the runway with more than 20 knots of crosswind. Without wind on a later flight, three of four landings were greasers.

If you're just up taking pictures, you're likely to come back with some good shots because the curve of the remarkably clear canopy allows few reflections to spoil the photo. Or have someone else fly and take out the easily removed rear window—no reflections at all, guaranteed.

The Sky Arrow Sport is perfectly designed for its mission, and that is to have fun. Or perhaps soon, if the aircraft passes inspection by the Sheriffs' Association of Texas, another mission will be to make the bad guys have less fun.

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Links to additional information about the Sky Arrow and Sky Arrow Sport may be found on AOPA Online (www.aopa.org/pilot/links.shtml).

Join AOPA Pilot Senior Editor AI Marsh in the skies over the Chesapeake Bay as he learns about the flying characteristics of the Sky Arrow. www.aopa.org/pilot/skyarrow **Two years**

Just Aircraft Highlander

Fantasy Air Allegro 2000

and counting

Training is less expensive, but what about the airplanes?

wo years ago the Light-Sport Aircraft (LSA) category began with a promise of inexpensive pilot certificates after only 20 hours of training, and less expensive 1,320-pound, twoplace, 120-knot airplanes that can be flown on a driver's license in place of a medical. Has the promise been kept? And is the market demand big enough for the new indus-

try to succeed? Dealers, engine manufacturers, pilots, flight school operators, two FAA officials, aircraft manufacturers (including those still deciding whether to enter the market), and industry leaders were interviewed to find out.

The overall answer is that even airframe manufacturers are having a hard time predicting the market demand for light sport aircraft, and factual data on numbers of pilots and airplanes lag behind reality, making a true picture of this new industry difficult to determine. But here's a quick answer. Most of those interviewed think two things are needed for the light-sport industry to succeed: Cessna Aircraft Co. must decide to bring its Cessna Sport LSA to market, and hundreds more flight schools, perhaps 1,000, must offer and promote sport pilot training.

BY ALTON K. MARSH

The promise

Let's start with price. The promise of a \$60,000 airplane is easily found in aviation and business magazines, not to mention Web sites published by industry leaders, from 2002 through 2004. The reality? Now, out-the-door prices (not the base prices) of most best-sellers reach and often exceed \$100,000. Today's light sport aircraft are generally purchased by buyers of means, not bargain hunters. A light-sport examiner in Florida said the higher price has "discouraged" many ultralight pilots used to paying \$10,000 to \$20,000. What happened?

Today, 25 of the 33 manufacturers that make the 46 LSA models now available to you are in Europe, where economies are based on the euro. The exchange rate for the dollar punishes buyers in the United States and can account for at least \$20,000 to \$30,000 of the cost. Additionally, manufacturing capacity is now so low that demand easily outstrips supply, so manufacturers have no need to negotiate the asking price. Adding to the cost is consumer demand for high-tech glass cockpits—in low-cost airplanes. You can't have both.

The sport certificate

Although only two or three manufacturers offer a true \$60,000 airplane,

the promise of an inexpensive pilot certificate is coming true, as evidenced by the experience of a flight school in Missouri. The St. Charles Flying Service at St. Charles Airport, has offered LSA training in the Czech-built Evektor Sportstar since July 2005—one of 15 flight schools using the Sportstar—and has graduated 29 sport students. St. Charles offers a 25-hour package (five more hours than the FAA requires) for \$2,860, and nearly all students finish for less than \$3.500.

Dennis Bampton of St. **Charles Flying Service said** the average age of the students is 55, adding that 22 of the 29 had no previous aviation experience and none had held a pilot certificate. About threefourths of the students were worried about passing an FAA medical exam.

The Sportstar rents for \$81 an hour (\$12 more than his Cessna 152) and operates for about \$52 an hour including gas, oil, maintenance, and engine reserves.

Dan Johnson, chairman of the board of directors of the Light Aircraft Manufacturers Association (LAMA), who keeps track of the LSA market online (www.bydanjohnson.com), said only 40 to 50 flight schools in the United States have an LSA trainer. A light sport aircraft is not required to offer sport pilot training. "Although many of them are still not aware, every CFI and every flight school can immediately start sport pilot training, bringing several thousand outlets into play. But to solo a sport pilot student, those schools will require an approved light sport aircraft. As production increases, many flight schools could have one in a year or two," Johnson said.

The present

The LSA movement is here, but the infrastructure to support it is not, according to Tom Peghiny, president of Flight Design USA (dealer for the German CT aircraft) and a director of LAMA. "The market is there for any organized company to sell as many airplanes as it can produce right now. However, we need

more flight instructors, more dealers, service people, and mechanics. I think that is the bottleneck of the industry," Peghiny said.

The number of pilots currently in the sport category has disappointed two LSA dealers interviewed for this article. The best available numbers come from the FAA. Larry Clymer, manager of the FAA's Light

Sport Aviation Branch in Oklahoma City, said there were 1,226 light-sport pilots at the end of December 2006, including all categories of aircraft. Surprisingly, powered-parachute pilots outnumbered fixed-wing LSA pilots 478 to 440. Clymer said he was "totally amazed" by that. However, the FAA receives no information on how many certificated pilots have simply stopped renewing their medicals and now fly light sport airplanes.

Clymer said in February that there were 2,003 light sport aircraft in the lightsport fleet (including fixedwing, powered parachutes, weight-shift aircraft, gliders, and rotorcraft). New lightsport deliveries totaled about 400 aircraft of all types in 2006; but 82 percent of those were built by just 10 of the present 33

manufacturers. The leader was the Flight Design CT with 92 deliveries, followed by the American Legend Cub with 59 and the Fantasy Air Allegro with 41. A shakeout is predicted in the next year or two that could reduce the 33 companies to 10 or fewer.

Edwin Miller, president of Kappa Aircraft in the United States (dealer for the Czech-built Jihlavan Kappa), said he is concerned about insurance costs. New mom-and-pop flight schools with less than two years of experience could face insurance premiums \$10,000 per year higher if they include light sport aircraft in their fleets, compared with long-established, larger flight schools, he said.

One insurance company at first refused to insure light sport training aircraft at St. Charles Flying Service, but backed down when threatened with the loss of the school's entire 26-aircraft fleet. Greg Sterling of the AOPA Insurance Agency said, "Insurance carriers have slightly loaded their LSA rates. As these aircraft are new to the market, their repair costs are still not well defined."

The future

The light-sport industry is waiting to see whether Cessna Aircraft Co. will enter the market with its Cessna Sport. "[From] last August through January of this year we show an increase in fleet

size based on the FAA registry of 10 percent a month of growth in LSAs. That rate is something Cessna would pay attention to," predicted Tom Gunnarson, president of LAMA. However, he noted that an artificial spike in the LSA fleet will occur by January 31, 2008, the deadline for registering present ultralight aircraft in the Experimental Light

Sport Aircraft (ELSA) category. It is expected that 3,500 existing ultralight aircraft will register.

Larry Werth, FAA light-sport program manager in the Small Airplane Directorate in Kansas City, Missouri, and Directorate Manager Kimberly Smith said ultralight owners must understand that no ELSA certificates will be issued after January 31. The larger

What is it like to take sport pilot training?

Richard Baalmann, 71, of Kirkwood, Missouri, is not only a proud new sport pilot, but also a very enthusiastic one. When he got his certificate from St. Charles Flying Service near St. Louis, his first passenger was his daughter. She liked the ride so much she began training to become a private pilot.

Baalmann had 40 hours of training in a Cessna 170 50 years ago, courtesy of the United States Air Force ROTC, but it did not include a private pilot certificate. After college he built a chain of Ace Hardware stores but had neither time nor money for flight lessons. Then along came the new sport pilot certificate, and he had both time and money.

He stuck it out through nearly 40 hours of training that cost

between \$3,500 and \$4,000. "I thought it was going to be simpler than it turns out to be," Baalmann said. "Twenty hours is very minimal." he added.

"I had difficulty with crosswind landings. In 1956, the Cessna 170 had crosswind landing gear that just straightens out the aircraft, and there were criss-crossing runways at the airport so that you never had crosswinds of more than 40 degrees.

"Using the radio and learning the airspace were other challenges," he said. Early this year he took delivery of a Flight Design CT tricked out with a glass cockpit, Garmin GPSMap 496, and even an autopilot. Yes, an autopilot. "I had no idea of the capability that was available," the proud owner said. -AKM ultralights flown after that date will have so many limitations on them that they will be nearly useless, Smith said.

What will Cessna do?

Cessna has 270 pilot centers in the United States (280 worldwide), all of which might add a Cessna Sport to their fleet if Cessna decides to proceed with production. "I can't overemphasize the importance the 'Big C' brings to the marketplace," said Bill Canino, the dealer for the Czech-built StingSport (14 deliveries last year). "Successful LSAs must have Cessna-like dealerships, training, parts, service, quality control, resale prices." Cessna officials briefed *AOPA Pilot* on February 27 about the status of their plans.

During this briefing Cessna Light Sport Aircraft Project Engineer Neal Willford admitted he was still not at liberty to say much. But after a 90-minute interview asking tough questions and reading body language, here are some best guesses on what Cessna might do. Enthusiasm within Cessna and from the public nearly screams for the project to continue, like the gentleman who sent Willford \$200 as a deposit and begged that it not be returned. (It was.) A second prototype will be built, assuming a positive decision is made, and it may look close to the one flying on the day of the interview. That decision is likely to be announced at this year's EAA AirVenture. It most certainly will be powered by a 100-horsepower engine, and the possibility is strong that Cessna will stick with the Rotax, even though "voice of customer" surveys often indicate buyers would rather see an American engine. Only Continental is proceeding with a light sport engine and Lycoming continues to survey the market. Cessna is searching overseas for manufacturers that can help keep the cost down. The price will be "competitive" with today's market, Willford said, and he indicated his belief that most light sport aircraft today are at the \$100,000 mark, "...plus or minus \$20,000.

Cessna has its eye on the training market to make the Cessna Sport a success, and has positive feedback from Cessna Pilot Centers.

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Links to additional information about light sport aircraft may be found on AOPA Online (www.aopa.org/pilot/ links.shtml).