



Ukrainian Valor

Spectrum Aircraft's A-22 enters the homebuilt market.

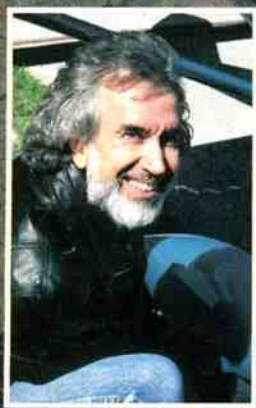
By Howard Levy

At 75% power, the 1000-pound A-22 cruises at 100 mph with an 80-hp Rotax 912.

John Hunter will be marketing the A-22 in kit form.

Dual controls are provided, and the throttle quadrant is between the seats. Pushrods for the flaperons rise behind the seats.





John Hunter, 45, started flight training in 1972 and moved into ultralights in 1986. He has private, multi-engine and BFI (basic ultralight flight instructor) tickets, and his logbook shows more than 4000 flight hours amassed in 60 different aircraft. Hunter has also been an airplane builder, and his projects have included 15 Drifters and a Leza-Lockwood AirCam. He has 300 hours of banner towing with a Drifter MU (Marine Utility) and was a Drifter tour pilot in Mexico. From 1994 to 1998, he worked with Leza-Lockwood as director of marketing and AirCam demo pilot.

Hunter is now involved with a series of small Ukrainian-designed and -built airplanes that he will be marketing in kit form. This came about as the result of a meeting at Sun 'n Fun '98 with the head of Gulf Aircraft Technologies of Dubai, United Arab Emirates.

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The cockpit's removable doors provide a shoulder width of 4.25 feet.

Main gear legs are a milled titanium plate with fabric fairings.

GAT, which procures aircraft and parts for a number of Middle East countries and bought two AirCams at the show, had learned of a small company, Aeroprakt Limited, in Kiev, Ukraine, that was developing a number of light aircraft. Although Aeroprakt was new at design and fabrication of light aircraft, it had a background of producing components for transports developed by the Antonov Design Bureau. Aeroprakt engineers and employees came from other earlier well-established USSR aircraft manufacturers.

Aeroprakt's first production airplane was the A-20, and it went into production in 1993. It was a tandem two-place, high-wing ultralight, with a 50- to 80-hp Rotax pusher. It



had a metal wing and tail and a composite fuselage pod. The A-22 followed, and the prototype first flew in November 1996. It was of all-metal construction, except for fabric-covered control surfaces. It, too, was a high wing, but with side-by-side seating for two, and an 80-hp Rotax 912 on its nose.

GAT purchased a number of both aircraft but also commissioned Aeroprakt to design a twin-engine version of the A-20. Designated A-26, the airplane was designed, first flown in November 1996, and delivered to Dubai all in a four-month period. The three models have now been in the hands of customers in Europe and Africa for as long as two years, and may be considered thoroughly tested and proven. With a variety of engines and wingspans on these three models, customers have a choice of 14 different airplanes.

Meeting the Machine

Hunter was invited to Dubai to see the Aeroprakt airplanes and liked what he saw. The result was that Spectrum Aircraft Corporation was formed in partnership with GAT, with Hunter heading the U.S.-based



The fixed tail surfaces are aluminum, and the control surfaces are fabric-covered aluminum.

operation. "We decided on the name Spectrum because it denotes the wide gamut of aircraft that we will have available," Hunter said. Hunter first received two A-22s, which he named Valor, noting, "I will be giving names to each model, as it will be easier to remember and differentiate between models." The two A-22s were shipped to AirVenture '99, one requiring just assembly, and the other in kit form, which was to be built and demonstrated to the FAA for 49/51% determination.

Unfortunately, the kit was damaged in shipment, so Hunter is awaiting another. He assembled one Valor at Oshkosh, displayed it statically, and after the close of the show, test-flew it at Fond du Lac, and then proceeded to fly it to his Sebring, Florida home base. However, after flying 400 miles and landing at Salem, Indiana, for fuel, he could not restart the engine. Not being well acquainted with the airplane, and rather than take any chances, Hunter accepted an offer to transport the airplane from someone at the FBO who was headed to Florida with an empty truck. The problem later proved to be insignificant.

Practical Airplanes

Aeroprakt translates to "practical aero." Yuri V. Yakolev, the organization's chief designer, (no relation to the big Yakolev group that produces Navy V/STOLs, large trans-

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ports, and a series of business and general aviation types) points out that the aircraft are a new generation ultralight class designed on the basis of rationality and efficiency. Aero-prakt commenced the A-20's design in the early 1990s and first flew the prototype in July 1993. When production was underway, the A-22 was conceived, and the prototype made its initial hop in November 1996.

Hunter's A-22 Valor carries serial No. 6, and it arrived with 30 flight hours as it had been employed as a company trainer and demonstrator. Aero-prakt has delivered a mixed batch of 45 airplanes to date, including 12 A-22s (one to Czechoslovakia, one to Hungary, several to Germany, and the remainder to GAT). The A-22 was designed primarily for flight training and sport flying and is being certified under German BFU95 requirements. Hunter reports that BFU95 is similar to the FAA's Sport Aircraft category and would be reciprocal, enabling factory-finished fly-aways in the U.S., but there will also be kits. Aero-prakt airplanes also adhere to JAR/VLA regulations.

The standard Spectrum kit will be a quick-build, which should go together in 300 hours. It will be complete and include control columns (yokes are optional), flight instruments, engine gauges, disc brakes, wheelpans and the 100-hp Rotax 912S with the three-blade Aero-prakt propeller. Cabin heat and the ballistic chute will be options. "Three people working on it full time can have a painted Valor flying in two weeks," Hunter said. The kit price is targeted for the low \$30,000s.



The flaperons are slotted and constructed like the wing with a leading-edge D-box. Each spans 13 feet and deflects 10° and 20°



The engine mount and nosegear are installed on the load-carrying No. 1 frame structure.

Kit Construction

The A-22's aluminum structure riveted wing employs a Russian R-3a-15 airfoil of 15.5% thickness, has a constant chord of 4 feet 7 inches, and is swept forward 2.5°. Its

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mainspar, which plugs a 0.0157-inch skin D-box, is positioned 13.5 inches behind the leading edge and is built up as an I-beam with a 0.0315-inch web and extruded angle caps. The wing trailing edge uses a 0.0159-inch-thick J-channel false spar. Each panel contains 15 ribs that are stamped in a truss configuration from 0.0157-inch sheet aluminum.

The fabric-covered full-span flaperons are slotted and constructed like the wing with a leading-edge D-box

of 4.75-inch chord and 15 stamped ribs. Each spans 13 feet and has a 16.5-inch chord. Pushrods, activated by an overhead lever in the cockpit, deflect the flaperons 10° and 20°. In aileron mode, they move +13/-20°. A total of 24 gallons of fuel is carried in two wing tanks. The wing is braced by 3.5-inch wide streamlined aluminum struts attached to the spar. A wing-folding system is not provided, but two people can remove them in 10-15 minutes. Each panel requires the release of two pinned castle nuts, another on the flaperon, and the bolts on the strut.

As with the wing, the fixed tail surfaces are all aluminum, and the control surfaces are fabric-covered aluminum structures. The 2-foot-2-inch chord fin has a load-carrying doubler equipped U-channel trailing edge and three stamped ribs. The stabilizer has a similar trailing-edge spar and contains six ribs per side. The rudder uses a D-cell leading edge and V-channel trailing edge and five ribs. It stands 4 feet 4.5 inches tall and has a 1-foot-5-inch constant chord.

Rudder control is via cables, with a 21° right and left movement. The stabilizer and elevator have an equal 9-foot-10-inch span. Like the rudder, the elevator incorporates a D-cell leading edge and V-channel trailing edge. The one-piece elevator has

11 ribs, and pushrods provide a 25° up and down motion. It is also fitted with a 3-foot-10-inch span, 3-inch chord trimtab, centered and trailing the trailing edge. A cable activates it from 20° up to 30° down.

The fuselage is basically monocoque, with a wide, comfortable cockpit and near all-around visibility. The cockpit area's prime structure is welded steel for crashworthiness, plus riveted bent sheet aluminum of 0.0591- to 0.0787-inch thickness. Aluminum of 0.0315-inch thickness is used to form the near monocoque tailboom. Four of the fuselage's bulkhead frames are pressed aluminum sheeting, but a fifth—the No. 2 frame at the forward part of the fuselage—is fabricated in bent sheet parts. The engine mount and nosegear are installed on the load-carrying No. 1 frame structure. Skins of 0.0315-inch are used in the cockpit area, although those on the top and bottom are corrugated for added stiffness.

Removable bulged doors on each side of the 3-foot-10-inch high cockpit provide a shoulder width of 4 feet 3 inches. Dual controls are provided, with the throttle quadrant between the seats, which are height-adjustable. Pushrods for the flaperons rise vertically behind the seats. Our subject A-22 is also fitted with a jointly developed German-Russian ballistic chute installed in the top glazing behind the seats. Aeroprakt customizes its fly-aways and kits, and so will replace any amount of glazing with skins to meet customer desire. A 32-inch zippered nylon bag located on the c.g. behind the seats holds flight goodies and is easily accessible.

The A-22 Valor is currently flying with an 80-hp Rotax 912, but Hunter is awaiting a 100-hp Rotax 912S to replace the 80 hp. In fact, he plans to go to a higher power engine on all of the Western Hemisphere-marketed Aeroprakt model aircraft as standard. The composite, scimitar-



The riveted wing's main spar is positioned 13.5 inches behind the leading edge and is built up as an I-beam and extruded angle caps.

blade, 67-inch ground-adjustable propeller is also an Aeroprakt product and has an 11° pitch.

Landing gear is a fixed-tricycle type with a rod-controlled steerable nosewheel that provides a 30.5-foot turning radius. The landing gear has a telescoping steel-tube-and-rod leg with a fiberglass spring connection for shock absorption and a torque link. Vertical travel is about 3 inches. Maignear legs are a milled titanium plate with fabric fairings and aluminum wheels with disc brakes that mount to 5x6.00 Deli tires—the same size wheel and tire as on the nosegear. A 6-inch spoked wheel is installed in the tail ventral fin for protection in event of excessive pitch during takeoff or landing. Wheel-pants, engine cowling, fairings and wingtips are fiberglass.

Performance

Hunter's A-22 presently has an empty weight of 572 pounds, and that probably won't change with the 100-

hp 912S. Gross weight is 1000 pounds. GAT is flying a 100-hp A-22 in the UAE, and since the Spectrum kits will include the 912S, the performance numbers are for that A-22. "With the additional

20 hp, builders can expect a bit of all-around performance improvement," Hunter said, "but most noticeably a 300 fpm boost in climb and an additional 15 mph in cruise." The V_{NE} is 125 mph, and on the lower end, solo stall speed in landing configuration is 25 mph. Takeoff run at gross weight is 250 feet at 40 mph, followed by a 1200 fpm climb at 60 mph. At 75% power and 7500-8500 feet, cruise is 100-mph IAS with fuel consumption of 4 gph.

The range is about 450 miles including a 30-minute reserve. With a 60-mph cruise and a 2.3-gph fuel burn, endurance can be extended to 10 hours. Approach is made at 80 mph downwind, 70 mph on base, and final at 60 mph, followed by a 35 mph touchdown. For short-field operations, Hunter recommends a minimum approach speed of 50 mph. The airplane stalls at 34 mph clean at gross weight and at 28 mph with maximum 20° flaps. Rollout distance is the same as the takeoff: 250 feet. "I have operated the airplane in 25 mph headwinds and 90° crosswinds at close to 20 mph without any problem," Hunter said. "Flaps are pretty much a must except when faced with considerable crosswinds because the airplane is fairly clean and will normally float on landing." **KP**

Spectrum's A-22 Valor

Wingspan	32 ft. 10 in.
Wing chord	4 ft. 7 in.
Aspect ratio	7:1
Overall length	19 ft. 8 in.
Overall height	7 ft. 11 in.
Load factor	+4/-2 G
Wing loading	6.77 lb./sq. ft.
Power loading	10 hp/sq. ft.
Wing area	147.63 sq. ft.
Total flaperon area	37.98 sq. ft.
Fin area	22.59 sq. ft.
Rudder area	6.24 sq. ft.
Stabilizer/elevator area	26.90 sq. ft.
Elevator area	13.99 sq. ft.

FOR MORE INFORMATION, contact Spectrum Aircraft Corporation, P.O. Box 1381, Sebring, FL 33871; call 941/314-9788; fax 941/314-0285; e-mail jhunter@strato.net.

US Cells → wires = x 3.7883 = 15 wires