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FPNA CAPE TOWN

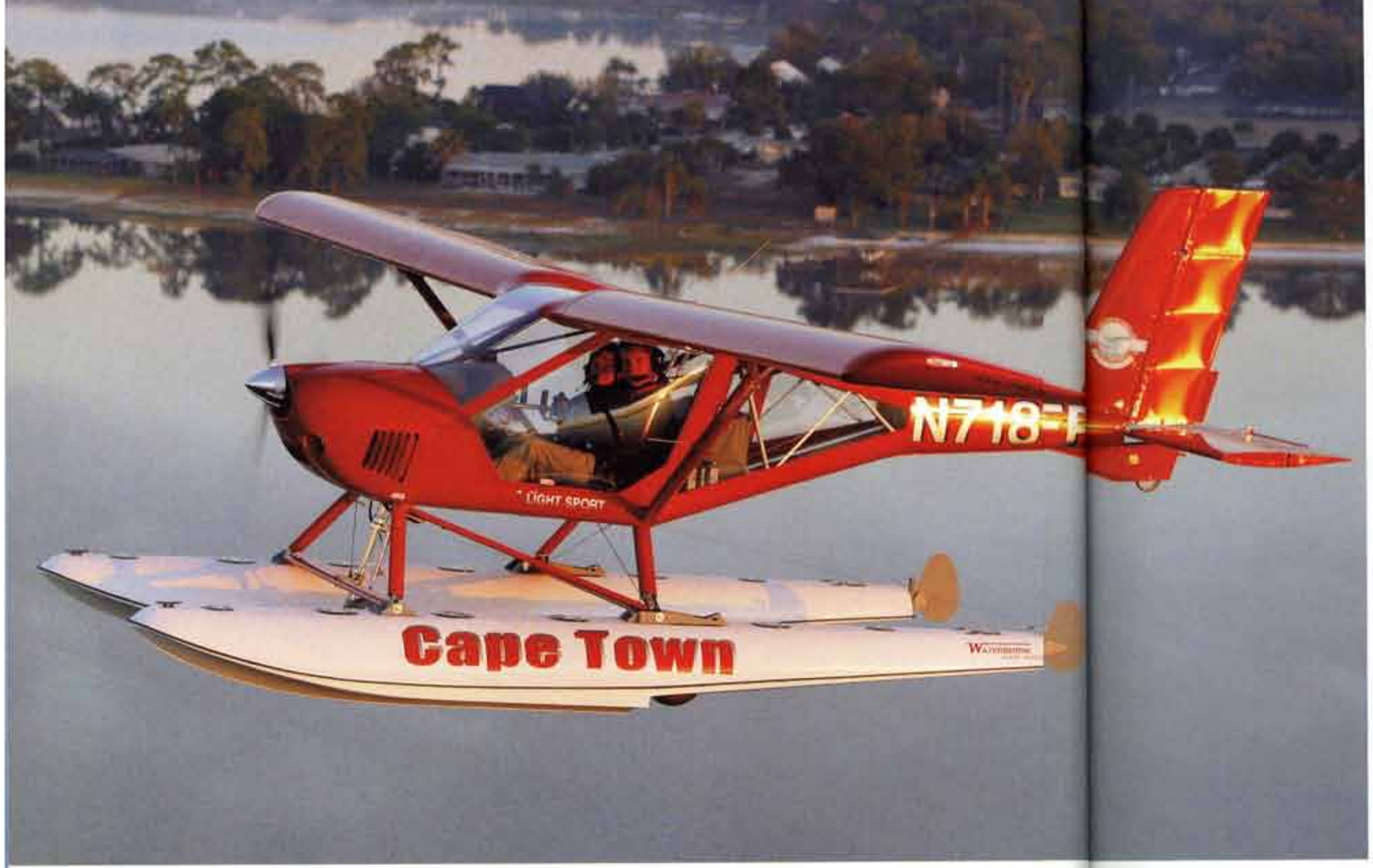
Fantastic fun on floats! Dave Unwin samples the amphibious Cape Town.

Splashing across the placid waters of Lake Jackson, it suddenly occurred to me that in many respects the Cape Town represents the real spirit of Light Sport Aircraft. Not only is it reasonably affordable to own and operate, and relatively easy to fly – it's just so much fun!

Although I've flown literally dozens of Light Sport Aircraft over the last few years, the only float-equipped machine (the Super Drifter) was more of a classic microlight than one of the new breed of LSAs. Consequently, when I saw the FPNA Cape Town I was eager to get it up into the air – and out on the water.

Upon approaching the aircraft, my initial impression was that it appeared to offer excellent visibility, as liberal use of Lexan has replaced many of the fuselage and door panels, and the doors actually bulge outwards. Closer inspection revealed the Cape Town to be intelligently designed and well made. I was particularly interested in the composite (E-Glass and Kevlar) amphibious floats, and noted that they feature 5 x 500 wheels, Grove hydraulic disc brakes and dual retractable water rudders, at the back of the floats. Sensibly, the nosewheel is also a 5 x 500. Interestingly, the wheels are extended and retracted using an electro/pneumatic system – not a hydraulic one.

The engine is the ubiquitous 100hp Rotax 912S, which turns a three-blade Warp Drive prop with a nickel leading edge. Water operations can really cane a prop, and I imagine that the extra protection provided by the



that the machine had an impressively low stall speed, and looking at the large flaperons I could clearly see why. I also spotted the sizeable slot between the trailing edge of the wing and the leading edge of flaperon, and wondered if this also allowed each of them to function as a sort of 'Fowler' flap when they were drooped. The aerofoil is a high-lift section and is rather unusual, in that it is quite deep with a cambered under surface. I subsequently read that it was developed by the famous Russian designer Oleg Antonov in the mid-1940s, for a Red Army observation aircraft.

All the fuel is carried in a pair of tanks located in the leading edge of the wing roots. The two tanks have a combined capacity of 90 litres, of which 87 is useable. Despite having wing tanks, as the A-22 was originally designed with folding wings (now discontinued, due to the weight penalty) the Cape Town can be de-rigged quite easily as the flaperons and fuel lines are connected with quick release fittings.

Moving towards the tail, I noticed a small, fourth wheel at the base of the ventral fin. I initially assumed that this was to aid in manoeuvring the tricycle version on the ground, but subsequently learned that (when flown as a landplane) the combination of an authoritative elevator, good power-to-weight ratio and a CG close to the mainwheels makes a tail-strike a bit too easy during the take-off ground roll.

The tail unit consists of a big sweptback fin and small ventral fin, large rudder and single-piece elevator. It is designed and constructed along the same lines as the wings, with the fin and rudder made from stamped aluminium ribs and covered with anodised aluminium sheets. Ceconite ▸

Top: The amphibious floats are mostly constructed from composites.

Above: The floats feature dual retractable water rudders.

The wheels are extended and retracted using an electro/pneumatic system. *(All Steve Fletcher)*

nickel covering greatly extends the prop's longevity.

Access to the engine bay is good. The composite cowling splits horizontally, with the top half secured by four Camlock fasteners, while the bottom is attached to the airframe with screws. The oil can also be checked via a small hatch.

The fuselage is mostly constructed of metal (riveted anodised aluminium), while the wings feature a metal leading edge, stamped aluminium ribs and fabric covering (Ceconite) aft of the D-box. An intriguing facet that I noticed is that the aluminium sheets used for the belly and underside of the empennage are 'fluted' – presumably to increase stiffness. Along with the cowling, composites are also used for the chamfered wingtips.

The strut-braced wings are interesting, as despite initially looking quite unsophisticated (they are constar chord, as is the tailplane) closer inspection revealed some interesting features. Firstly, they are swept forward by 2°, while the trailing edges are covered by full-span fabric covered 'flaperons'. These have three settings 'up', 10° and 20°, and are actuated by pushrods and torque tubes. Shawn Okum (FPNA CEO) had emphasised

Far Right: Liberal use of Lexan has replaced many of the fuselage and door panels.

The engine is a 100hp Rotax 912S. Note the Warp Drive prop's nickel leading edge.

Far Left: The aluminium sheets used for the belly and underside of the empennage are 'fluted'.

Left: Lots of Lexan!

The tail unit consists of a big sweptback fin, small ventral fin, large rudder and single-piece elevator. Note the small wheel at the base of the ventral fin.

The dual fuel valves are above and behind your head. They really should be in front of you.

covers the pushrod-driven elevator and cable-operated rudder. Pitch trim is provided by a cable driven tab on the elevator, there are also ground-adjustable trim tabs on the rudder and right flaperon.

Corrosion is a real problem for all waterborne aircraft. Sensibly, as well as use of composites were applicable, wherever possible the metal components are either anodised, chromated or treated with epoxy primer before assembly. The metal parts of the floats are also powder-coated for added protection, and all nuts and bolts are soaked and then treated with Corrosion X. Careful preparation of the components can have a considerable effect on the longevity of the service life, especially if the aircraft is operated from salt water.

Access to the cockpit is good. The sills are nice and low while the large gull wing doors open wide and are supported by well-damped gas struts. I particularly approved of the fact that they can be easily removed and that the Cape Town is approved for flight with them off. With my seat set and locked I began to strap myself down with the inertia-reel four-point harness. I had already got the impression that – for an LSA – the Cape Town boasts a remarkably spacious cabin. However, it was only when I swung the big door down that I really appreciated just how big it is. As I mentioned earlier the Lexan door panels are bulged outwards, and this means that at its widest point the Cape Town is an astonishing 132cm wide! This is not only impressive for an LSA – it is actually greater than many four-seat GA aircraft. For example, the maximum width of a Cessna 172 cockpit is only 100cm. The extraordinarily spacious sensation is enhanced by the considerable amount of glazing all around you – even behind.

Continuing my exploration of the cockpit, I found many features that I approved of, and a few that I didn't. For example, I liked the well-placed headset holders (above and behind your head) and the fact that the sockets for the jack plugs are located nearby. Not only does this keep the cockpit tidy, but also it keeps the headset's leads away from the controls.

However, I didn't like the dual fuel valves, which are also above and behind your head. Important controls like these should be in front of you, easy to both see and reach. To be fair, you can select either tank or both, but I'd also like to see a single fuel shut-off selector (maybe a guarded knob similar to that of a Robin 200) mounted either in the panel or centre console. I liked the location of the trim lever, but disapproved of the fact that there isn't any sort of position indicator. However, the one feature that I really took a dim view of was the master switch. This was one of those ghastly key-operated rotary units, which really are an extraordinarily bad idea. The first setting turns the electrics on – turn it further to the right and it cranks the engine. I've seen this arrangement on a few LSAs now – and I really don't care for it. You may argue that it is no different than a car – my riposte would be that cars don't have propellers! At least the Cape Town also has a separate battery isolator (a lever under the left seat). I did approve of the magneto switches, which are guarded fumblers.

The rest of the instrument panel is logically laid out, although I found the prominently sited 'ALT Static Source' selector somewhat curious, as the Cape Town is strictly VFR only. I thought the large air pressure gauge an intriguing anomaly, until I remembered that the wheels are operated by an electro/pneumatic system. Three blue lights, and three green indicate the status of the undercarriage. Initially, I was surprised that there wasn't a 'press to test' button. However the bulged windows make it possible to see if the wheels have retracted or not.

A small sub-panel extends down from the base of the instrument panel and carries dual fuel gauges, a neat row of tumblers for the electrical services and the mags, master/starter, a fuse box and a circuit breaker for the air pump. Extending aft between the seats the centre console contains levers for the throttle, brake and trim and water rudders. Further back are the parking brake, a large lever that releases the undercarriage's uplocks, and the choke. Behind the seats is a large fabric baggage bay, which can hold up to 20kg. As the seats, fuel tanks and baggage bay are all concentrated around the CG I would imagine that balance issues are unlikely to be a problem – an excellent safety feature.

The robust-looking rudder pedals are hinged to the floor. They operate the air and water rudders by cable and the nosewheel via pushrods. Up in the roof, the flaperon lever reminded me of that of an Auster. To lower the flaperons, you move it sideways (to unlock it) and then pull it to the desired setting. All of the controls were well placed. ▶

FPNA CAPE TOWN

▶ DIMENSIONS		
LENGTH	6.09m	20ft
HEIGHT	2.8m	9ft 2in
WING SPAN	10.11m	33ft 2in
WING AREA	13.93m²	150sq ft
▶ WEIGHTS AND LOADINGS		
EMPTY WEIGHT	340kg	750lb
MAX AUW	650kg	1,433lb
USEFUL LOAD	310kg	683lb
WING LOADING	46.6kg/m²	9.55lb/sqt
POWER LOADING	8.7kg/kW	14.3lb/hp
FUEL CAPACITY	90lit	19.8Imp el
BAGGAGE CAPACITY	20kg	44lb
▶ PERFORMANCE		
VNE	113kts	209km/h
CRUISE	87kts	161km/h
STALL	35kts	64km/h
CLIMB RATE	1,000ft/min	5.08m/s
SERVICE CEILING	12,000ft	3,775m

▶ ENGINE

Rotax 912S liquid-cooled flat-four, producing 100hp (74.57kW) a 5,800rpm

▶ PROPELLER

Warp Drive three-blade fixed pitch

▶ MANUFACTURER

FPNA, Sebring, Florida USA
Tel: 001 863 655 3770, Email: info@fpna.com
Web: www.FPNA.com

The steeply raked windscreen, bulged Lexan doors and rear transparency certainly provide excellent visibility.

The instrument panel is logically laid out - note the blue and green undercarriage position indicators and the large air pressure gauge.

Below: The robust-looking rudder pedals are hinged to the floor. They operate the air and water rudders by cable and the nosewheel via pushrods.

Below Right: The centre console contains levers for the throttle, brake, trim and water rudders. The large lever releases the undercarriage's uplocks.

although aesthetically I did think that the yokes looked a little crude.

With the Rotax idling away with its characteristic muted whine and Shawn in the other seat, I released the parking brake and set off towards the runway. The amphibious floats greatly increase the height of the cockpit, and the initial impression is very much that you are riding around 'on' something, as opposed to being 'in' it. Ride quality was good, with a very convincing workout for the suspension provided by a large lip that we had to cross on the way to the runway. Although I crossed it at a very slow speed, it still gave us a good thump! The nosewheel steering felt very precise and nicely weighted, and accurate taxiing was easy. However, I couldn't help but think that taxiing in a strong crosswind would be much trickier, particularly as the Cape Town does not enjoy the benefit of differential braking.

Although the extra weight added by amphibious floats, spreader bars and various other aquatic accessories adds an extra 23kg to the MAUW, the additional 20 horses supplied by the 912S mean that the Cape Town actually enjoys a better power-to-weight ratio than the Valor. Consequently, the acceleration is excellent and I had no difficulty keeping straight. As we climbed away from Sebring, my first thought was - as you'd expect - the Cape Town feels somewhat more ponderous than its more agile cousin. That's not to say that it is unwieldy - it isn't - just that it isn't quite as nimble. I suspect that the weight and position of the floats possibly has a sort of pendulum effect. Having released the over-centre downlocks, raised the undercarriage and checked for 'thre blues', I promptly set course for nea Lake Jackson. I'd already conducte my standard checks of the aircraft's general handling, stall characteristic and stick-free stability on the Valor (see box) and - to be honest - I just love water flying. The brief transit t only a few minutes and, having dou checked that the wheels and water rudders were 'up', I began to study the surface of the lake. Straightawa I could see that it wasn't going to b easy. The lack of wind meant there were no streaks or shadows to indic landing direction, while the absence of waves meant the smooth, glassy surface would make it difficult to ju our altitude. On the plus side, it's a nice big lake. I was slightly slow in raising the nose, and despite Shawn prompting the first splashdown was

ve: TtAbove: The roof-mounted flaperon lever is similar n Aus te an Auster's.

t: ThRight: The cabin is extremely wide.

athea rather untidy affair. I then dropped wathe water rudders and taxied about on lakthe lake to evaluate their effectiveness, ore before lining up and retracting them my for my first take-off. The surface had mora smooth, almost sullen appearance, ile twhile the water had a very viscous feel. icky 'Sticky' was how Shawn described it, d as and as I opened the throttle and pulled yo the yoke back, I could distinctly feel the ctiorsuction on the floats. Furthermore, the rm warm OAT (it was the hottest part of da the day) and the lack of wind would all rk awork against me.

fac In fact, I started to 'porpoise' on my t at first attempt. This is when the machine gins begins a rhythmic 'pitch and heave'. It n becan become dangerous very quickly allow if allowed to develop, and your best option is to chop the power, stop and then start again. If you try and chase it you invariably end up 'out of phase', with a potentially disastrous outcome. On the second try, I deliberately aimed across our wake to break the suction and eventually got us airborne. However, just like the first landing, I'll freely admit it was all rather ungainly.

However, practice makes perfect, and my second landing was much better. For the second take-off Shawn suggested setting the flaperons to the first notch, as this would help us to get off the water quicker. This proved to be the key, and although I did allow a small porpoise to develop on the fourth and final take-off, overall I was quite happy with its water handling, particularly as the ambient conditions were far from ideal. And anyway, I didn't mind that it took me a while to master the Cape Town, as I never get bored of float-flying - it really is just so much fun. Indeed, unless you're familiar with the delights of aquatic aviation, it's just about impossible to fully comprehend the unique sensations of operating from water, but you can take my word for it - it's fantastic.

Incidentally, while corresponding with Shawn after I got back to the

xam Air examination of its general dling handling revealed forceful eror flaperons an effective elevator a pi and a powerful rudder.

The Cape Town is perfect for flying out to quiet lakes for weekend fishing expeditions.

Aircraft like the Cape Town make great aerial SUVs.

UK, he told me that the floats have been redesigned, and now feature 'air channels'. These allow more air to be pushed on to the step during glassy water take-offs, which helps break the suction and greatly improves performance.

Cruising back to Sebring, I considered just how much fun my oldest son William (George is still a baby) and I could have with a Cape Town. I rapidly concluded that the only answer was 'lots' (as long as we lived in a seaplane-friendly country). It would be perfect for flying out to quiet lakes for weekend fishing expeditions.

Aircraft like the Cape Town make great aerial SUVs, so lets look at the numbers for range and payload. The useful load is a creditable 227kg, which needs to be divided between bodies, baggage and fuel. After all, it's pointless to plan an exciting camping trip to a remote lake if all you can't carry your camping gear. Firstly, if we assume the lake has no fuel source nearby, we'd better fill the tanks. I've always felt that the numbers for range and endurance are more important than speed when testing utility-type aircraft. Indeed, I always place particular emphasis on the aircraft's operational radius, as you must never assume there'll be suitable fuel obtainable. Consequently it is fundamental that any aerial SUV has the ability to go somewhere and back again on internal fuel only. Although the Cape Town can cruise as fast as 87kts, the extra drag penalty caused by the floats means that you have to use a lot of power. Maximum range (including VFR reserve) is an impressive 500 nautical miles. Full fuel weighs 65kg, and drops the payload to 162, so with William and I onboard, the limiting factor appears to be that the baggage bay can only carry 20kg.

The landing back at Sebring was perfectly straightforward. I knew that the difference in height between my eye-level and the mainwheels might make judging the flare slightly difficult, so rather than aim for a specific spot, I flared slightly high, carried some power and let it settle onto the rear wheels when it was ready.

In conclusion, I was very favourably impressed by both the Cape Town and Valor. The founding principles behind Light Sport Aircraft are that they should be both fun and affordable. Well, at only $89,000 for the basic version of the Valor, it is certainly affordable, while the Cape Town is just way too much fun.

Splashing across the placid waters of Lake Jackson, is just so much fun!

FLYING THE VALOR

Dave discovers the land-based Valor is almost as much fun as its amphibious cousin.

In the interests of a totally comprehensive report (and as I also like flying different aircraft) I also sampled the land-based version, the A-22. Known as the Valor in the US, the Foxbat in Australia and Britain, and the Sharik in the Ukraine (where it was designed) this is an interesting-looking machine that is also very capable. Designed by Yuri Yakovlev in the mid 1990s, the A-22 was built by Aeroprakt (literal translation – 'practical aero') of Kiev, with the prototype making its maiden flight in 1996.

The Valor is essentially the same as the Cape Town, except for the undercarriage, bigger engine and a few subtle differences in the cockpit. I liked the look of the undercarriage, which is conventional in both design and construction. The nosewheel is suspended from a telescopic strut, with shock absorption provided by a fibreglass leaf spring. The mainwheels are carried by legs made of hardened spring steel, and are fitted with large hydraulic disc brakes. All three wheels use the same size tyres, and are closely spatted.

With FPNA demo pilot Mike Agricola in the other seat we were soon taxiing across the rather rough grass to the active runway. The take-off is impressively brief, and I soon why saw the tailwheel is there. A clumsy student could definitely cause a tailstrike. Climbing out at around 1,000ft/min my initial impression was that the visibility really is very good. The steeply raked windscreen, bulged Lexan doors and rear transparency give it an airy feel. In fact, it might feel a little too exposed for some passengers. As Sebring was very busy with show traffic, we thought we fly over to Avon Park, which we knew would be quiet. As we cruised along it occurred to me that the Valor, which is somewhat 'boxy' in appearance, is actually faster than it looks. A high cruise speed of 87kts is perfectly achievable and sustainable, albeit rather noisy and thirsty. Around 75 is a more practical speed. An examination of its general handling revealed forceful flaperons an effective elevator and a powerful rudder. Breakout forces were low and control harmony mostly good, although the rudder is perhaps a little light while the flaperons are a touch on the heavy side. However the rate of roll is perfectly adequate, while visibility in every phase of flight is excellent. You can even see where you've been.

An examination of the stick-free stability revealed the Valor to be strongly positive longitudinally, as a ten-knot displacement from a trimmed speed of 75kts produced a low amplitude long wavelength phugoid that damped itself out after a single oscillation. Lateral stability is neutral but directional stability was – somewhat surprisingly – ne fin is quite big a[rg]h a long arm, the m[a]e adequate, and on re[la]er if perhaps the ru[d]elf-centre as it is not fit[ted] as. A very simple cu[t] increase the keel ar[ea] wheel spat aft of th[e] although to be fair it [is] issue, just me being pic[ky].

A[t] peed flight was int[er]as I've found with ma[ny] machines, the speed at[ta]ccelerated 1g stall oc[cu]t to determine as[ce]ccurate, due to po[or] he POH claims that wi[ng] ns drooped to 20° an[d] at idle the Valor sta[lls] 8kts. I have no re[as]pre this claim. The th[ing] was very mild, but is [a] high deck angle ev[en] what perhaps not Re[ar] it should be.

[Q]uick and easy, with little loss of altitude. I decided to hold the Valor in the stall, and with the yoke on the backstop it simply sank straight ahead in a very stable condition and a vertical speed of less than 500ft/min. You could ride it right down to the ground like this, and although you might burst the tyres you would definitely walk away. This is a very safe aeroplane.

I tried a few stalls in the turn, and the Valor responded by always rolling the wings level – an excellent trait. I also experimented with some gentle 90° turns just above the stall, and discovered that the flaperons work well even at such slow speeds. Again, I wondered if the slot between wing and flaperons functions as a 'Fowler' flap. A minor niggle was that I definitely ran out of aft trim at slow speed. However, to be fair, *slow* in the Valor is *really* slow. Operationally, I doubt it would be an issue.

Circuits at Avon were great fun, and as we had the place to ourselves I tried all sorts of permutations of flaperon and power settings. When I mentioned that the glide angle power-off was agreeable flat, Joe grinned and shut the engine down. This didn't faze me, so I simply flew a constant aspect approach slightly on the high side, then slipped off the excess height at the appropriate point. Great fun, and an impressive demonstration of Joe's confidence in the aircraft.

The take-off is impressively brief.

Access to the cockpit is good. The sills are nice and low while the large gull wing doors open wide and are supported by well-damped gas struts.

The Valor is essentially the same as the Cape Town, except for the undercarriage, bigger engine and a few subtle differences in the cockpit.

All three wheels use the same size tyres, and are closely spatted.

AEROPRAKT A-22 VALOR

DIMENSIONS		
LENGTH	6.09m	20ft
HEIGHT	2.40m	7ft 9in
WING SPAN	10.11m	33ft 2in
WING AREA	13.93m²	150sq ft
WEIGHTS AND LOADINGS		
EMPTY WEIGHT	271kg	599lb
MAX AUW	544kg	1,199lb
USEFUL LOAD	273kg	600lb
WING LOADING	39kg/m²	7.9lb/sq ft
POWER LOADING	9.1kg/kW	14.9lb/hp
FUEL CAPACITY	90lit	19.9Imp gal
BAGGAGE CAPACITY	20kg	44lb
PERFORMANCE		
VNE	113kts	209km/h
CRUISE	87kts	161km/h
STALL	28kts	51km/h
CLIMB RATE	1,000ft/min	5.08m/sec
SERVICE CEILING	13,000ft	3,962m

ENGINE

Rotax 912 liquid-cooled flat-four, producing 80hp (59.65kW) at 5,800rpm

PROPELLER

Warp Drive three-blade fixed pitch

MANUFACTURER

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