

# SOARING TECH

BY BILL COLLUM

## TOURING MOTORGLIDERS

This month, Soaring Tech takes a look at a class of aircraft that few pilots, even glider pilots, know much about. Did you know that, with a valid glider license and a logbook endorsement, you can fly a powered aircraft with performance equal or superior to some two-place trainers or sport planes?

Recently, I was able to sample a variety of these so-called "touring motorgliders." I'll provide you with my impressions of each in a few moments, but first let's take a look at what defines a touring motorglider as opposed to a powered sailplane. A powered sailplane typically has a propeller mounted on a folding mast located behind the cockpit. For soaring, the engine is stopped and the mast is retracted. When the engine is retracted, a powered sailplane is virtually as aerodynamically efficient as an unpowered sailplane. When extended, however, the engine and propeller exact a huge drag penalty, reducing glide performance significantly. Most (but not all) such aircraft are single-seat sailplanes to which an engine package has been added as a factory option. Some powered sailplanes have engines which do not have sufficient power for self-launching, but which can be used to extend flight once airborne for an self-retrieve capability. Most such aircraft are sailplanes first and foremost, and are primarily intended for soaring flight with minimal engine use.

Unlike most powered sailplanes, a touring motorglider is designed to spend extended time in powered flight. A touring motorglider usually has two seats (although single seat variants do exist) and is intended for sustained powered flight with occasional periods of engine-off soaring. A touring motorglider will often have significantly more power, be able to takeoff and climb quicker, and cruise faster than a powered sailplane, but does so at the expense of aerodynamic efficiency and soaring performance.

Since the distinction between a powered sailplane and a touring motorglider can be subtle and a little fuzzy, I'll provide my own arbitrary definition of a typical touring motorglider:

1. A powered sailplane having two seats and a useful load sufficient to carry two adults, some extra luggage or gear and a minimum of 2 hours of fuel.
2. Fixed, non-retracting engine with a featherable or folding propeller.
3. A maximum takeoff run at full gross weight of 1000 feet (at standard temperature and pressure).
4. A non-powered L/D ratio of at least 25:1 (with prop feathered or folded).
5. A powered cruising speed of at least 90 knots.

With these thoughts in mind, let's take a close look at a few of the touring motorgliders that can be found on airfields around the USA:

### Blanik L-13SE Vivat

Built by Aerotechnik, a Vivat is basically a Blanik L-13 with a modified forward fuselage. Beginning with standard L-13 wings, tail and aft fuselage, the Vivat adds a two-place side-by-side cockpit behind a front-mounted engine and tractor propeller. Even though, like the unpowered L-13, the Vivat has a single central retractable main gear, the addition of retractable wing-tip wheels and a steerable tailwheel provide for good ground handling capabilities.

My first impression of the Vivat was that it looked like a vintage military aircraft. With its metal construction, beefy structure, huge bubble canopy and no-nonsense cockpit, I knew from the first glimpse that this was a serious airplane. The well thought-out control layout and professional-looking switch gear contributed to this impression.

Entering the cockpit is relatively simple, but takes a bit of practice in order to do gracefully. Once inside, the cockpit

is roomy enough for two full-sized (read "middling large") people with plenty of leg room. With the canopy closed, I had plenty of head room (I'm 6'2") even when wearing a ball cap and an aviation headset.

Starting and run-up was simple and trouble-free, but the inverted Mikron engine is relatively cold-blooded and requires monitoring of the choke and oil temperature during warmup. Taxiing was easier than I had anticipated despite the lack of differential brakes, with the huge rudder and steerable tailwheel providing plenty of authority.

Takeoff with two on board and full fuel felt, well, leisurely. But even though we were operating from a grass strip that hadn't been mowed in a while, we still managed to be off and climbing after about 1,000 feet of ground roll. In relatively still air, we soon settled on a climb rate averaging 400-500 fpm. Once at altitude we shifted the 2-speed Hoffman prop into cruise pitch. After a few moments, we were motoring along at a little less than 90 knots.

Shutting down the engine and feathering the prop, we quickly and easily transformed the Vivat into a sailplane. Controls were well balanced and responsive, and the big Blanik felt like a much smaller aircraft. Thermalling performance was good, but not great, and felt about equal to a standard L-13. After spending an hour or so bouncing back and forth among thermals of 3 to 6 knots, restarting the engine was a non-event. The reliable Mikron started quickly and easily, and we motored back toward the field.

Approach and landing was uneventful. The Vivat is a very stable platform and tracks well under power. While holding a slight crab into the wind with spoilers fully deployed, modulating the engine provided a well-controlled descent rate right down to the touchdown point. Pulling the throttle back to idle while raising the nose to flare arrested the descent smartly, and booting the rudder to take out the crab provided a drama-free two-point touchdown. Wings remained level until our ground speed dropped below 20 knots, at which point the downwind wing rocked gently down onto its tip wheel.

The bottom line: The Vivat is an honest airplane with few surprises for the experienced glider pilot. With reasonable performance under power and soaring characteristics similar to its unpowered variants, the Blanik L-13SE is a good choice for a pilot looking for a solid touring airplane which can be soared effectively under all but the weakest conditions.

having the stick in their right hands and the throttle in their left (like me).

The 95-horsepower VW-derived Grob-built engine starts easily and produces enough power to motivate what is, after all, a fairly substantial airplane. Differential brakes make ground handling a breeze, but since this is a tail-dragger with exceptionally long wings the pilot must be aware of the

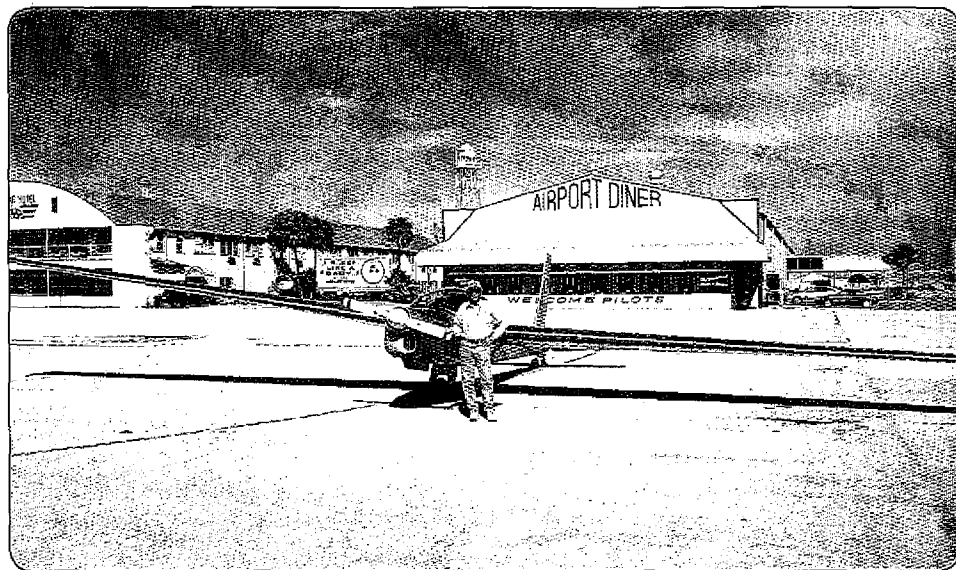
country platform. Once we shifted the prop into cruise mode, the Grob settled down to a respectable 94 knots.

Engine off and prop feathered, the Grob turns into a pretty entertaining sailplane. It is heavy, though, and control inputs need to be somewhat exaggerated to get the desired effect, but handling at low speeds is not bad and thermalling in the Grob was a pleasant experience. You will not, however, want to soar the Grob on weak days. In such conditions, leave the engine running and "power soar" using the available lift to augment the sometimes meager climb capability.

The Grob is an honest airplane to land, with no hidden tricks or quirks. Any pilot with tail-dragger experience will find no surprises here. In fact, the judicious use of the big effective spoilers make landing the Grob even easier than most tailwheel sport planes.

On one approach, I was cut off on short final by a wayward student on his first cross-country, requiring a rapid re-configuration into go around mode. This caused not a moment of concern, and the Grob behaved as I would have expected it to: honestly and competently.

The bottom line: Any power pilot will quickly become good friends with the Grob 109B. It feels more like an airplane than a glider, although soaring performance is actually pretty good for such a large aircraft. Yes, the Grob is a compromise between power and gliding performance, but it's a compromise that seems to work.



Lew Adams and his Blanik L-13SE Vivat. Photo by Bill Collum.

### Grob 109B

The venerable Grob 109 has probably trained more American motorglider pilots than any other aircraft. Looking more like a sport plane than a motorglider, the sleek German designed and built Grob provides a front engine layout, conventional tailwheel gear, and a side-by-side cockpit.

Entering the Grob is no more difficult than climbing into most other low-wing general aviation aircraft. Generously-sized doors on both sides of the cockpit make entering the aircraft, if not as easy as falling off a log, less than the acrobatic exercise required of some other aircraft. Once settled in place, I found the cockpit to be bright and roomy with excellent visibility. Leg room and head room were generous and, after about 3 hours of flying, I was still comfortable and ready for more.

Basic control layout is excellent but, since these are older aircraft, instrument and switch placements can be a little haphazard. The auxiliary throttle handle in the upper left corner of the panel will be appreciated by left seat pilots used to

wind direction and constantly fly the aircraft while taxiing.

We were operating right at maximum gross weight. Takeoffs were brisk but not exciting, and initial climb rate averaged in the neighborhood of 500 feet per minute. The Grob provided a smooth ride to altitude and felt like it would be a very stable and comfortable cross-



J.P. Ducos' Grob 109B in Hondo, Texas. Photo by Bill Collum.

## Urban Air Lambada

At first glance, the Urban Air Lambada ([www.urbanairusa.com](http://www.urbanairusa.com)) looks like an updated version of the Vivat. This isn't surprising since both the Vivat and the Lambada were designed and built in the same neighborhood in the Czech Republic. Unlike the Vivat, however, the Lambada has a composite airframe making use of carbon, aramid, and glass fiber construction. This light-weight modern construction pays big dividends in carrying capacity and performance.

Cockpit entry was the easiest of all the motorgliders I tried. Tall pilots can basically just throw a leg over the cockpit sidewall and sit down. Shorter pilots might have to use the built-in step indented into each fuselage side.

Cockpit room is the Lambada's Achilles' heel. While the wide cockpit should be more than adequate for pilots of average height or shorter, taller pilots will feel cramped by the relatively short cockpit, and the lack of in-flight adjustable seats or rudder pedals can be an issue. With the canopy closed, I found head room to be in short supply.

Pilots taller than about 6'2" will probably be uncomfortable enough to want to consider alternative aircraft. I was able to squish myself into a more-or-less comfortable position, but the lack of leg room bent my knees in a way which would probably become uncomfortable after an hour or two.

Performance is where the Lambada really shines. This was by far the sportiest of the motorgliders I sampled. With good power, great useful load, and impressive climb performance, the Lambada felt like much more airplane than its size and looks implied. If not quite fighter-like, the 100 hp Rotax provided more than enough power to make the Lambada feel like a sports car with wings.

With a conventional tail-dragger layout ground handling is straightforward. Without differential brakes, however, turns have to be anticipated and rudder applied before the turn point is reached. With a little practice, this becomes second nature.

Once we lined up on the runway and applied full power, things happened pretty quickly. Even with full fuel, both

seats filled, and 20 or 30 pounds of odds-and-ends in the baggage compartment we were still significantly under max gross weight. The tailwheel rapidly came off the ground almost before we started to move, and after a ground run of less than 500 feet we were airborne and climbing at more than 1,400 feet per minute. I was so impressed with the takeoff performance of the Lambada that I deliberately tried a takeoff with the spoilers fully deployed. I hardly noticed the difference except that after breaking ground the climb rate was only about 600 fpm until the spoilers were retracted.

Cruise performance was impressive, with 100 knots or more possible at higher power settings. When speed like this is combined with its generous useful load, cavernous baggage compartment, and a panel full of the latest electronic goodies it's easy to see how the Lambada could be a great cross-country cruiser for weekend (or longer) trips.

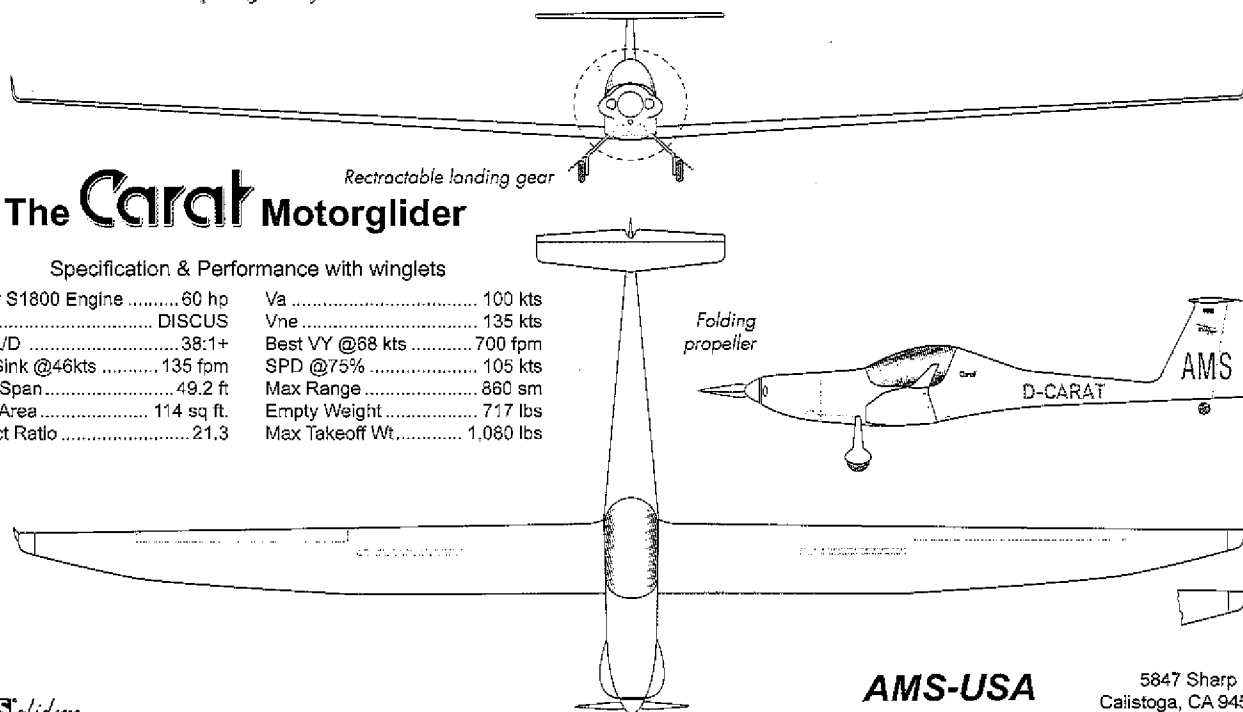
Registered as a "Light Sport Aircraft," the Lambada does not have an in-flight adjustable propeller. This prevents the engine from being used to its best

*freedom of flight*

## The Carat Motorglider

### Specification & Performance with winglets

Sauer S1800 Engine .....	60 hp	Va .....	100 kts
Wing .....	DISCUS	Vne .....	135 kts
Max L/D .....	38:1+	Best VY @68 kts .....	700 fpm
Max Sink @46kts .....	135 fpm	SPD @75% .....	105 kts
Wing Span .....	49.2 ft	Max Range .....	880 sm
Wing Area .....	114 sq ft	Empty Weight .....	717 lbs
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advantage, and probably somewhat increases fuel burn and reduces maximum cruise speed. The positive side of this, however, is that the prop automatically feathers when the engine is stopped, and un-feathers when it is restarted, without further input from the pilot.

With the engine shut down and the prop feathered, the Lambada soared like, well, a sailplane. The responsive controls, good low speed handling, and tight turning radius made the Lambada a joy to thermal. In addition to its great climb and cruise performance, with a claimed L/D of about 31 to 1 the Lambada makes a pretty respectable glider.

With the engine restarted, we headed back to the field to try a few landings. On my first approach, I had an awkward moment when the ailerons didn't feel quite in sync with the rudder. I'm still not quite sure what happened; perhaps the Lambada was such a joy to fly that I unconsciously expected a bit more in terms of roll performance than the airplane could deliver at approach speeds. Regardless, after a few moments of adjustment subsequent approaches were uneventful and I found landings to be easy and trouble-free.

The bottom line: A thoroughly enjoyable airplane with up-to-the-minute features, like ultra-lightweight construction, available glass cockpit, and a rocket deployed parachute.

Unless you're built like an NBA center or an NFL lineman, you'll quickly be seduced by the Lambada's blend of soaring performance, cruise speed, and load carrying capability. The great performance overshadows the somewhat uncomfortable (at least, for someone my size) cockpit, and the Lambada would be my pick for an afternoon of local fun flying.

#### **Grupo Aeromot Ximango**

Perhaps the prettiest of the aircraft I sampled for this review, the Ximango is arguably the one that feels most "professional." Designed by legendary French designer Rene Fournier and built by Grupo Aeromot of Brazil, the Ximango is offered in the USA by Ximango USA ([www.ximagousa.com](http://www.ximagousa.com)). With its long thin folding wings, gracefully tapering fuselage, and wide fighter-like retractable main gear, the Ximango makes a serious impression on the ramp.

The giant bubble canopy made climbing into the Ximango easy. The comfortably wide cockpit provided plenty of head and leg room, although the enormous instrument panel might somewhat restrict forward visibility for shorter pilots (a cushion or two would probably solve that problem). The unadorned military-looking panel (the Ximango is designated "TG-14" by the USAF and used as a trainer) has plenty of room for the latest electronic goodies and can even accommodate duplicated

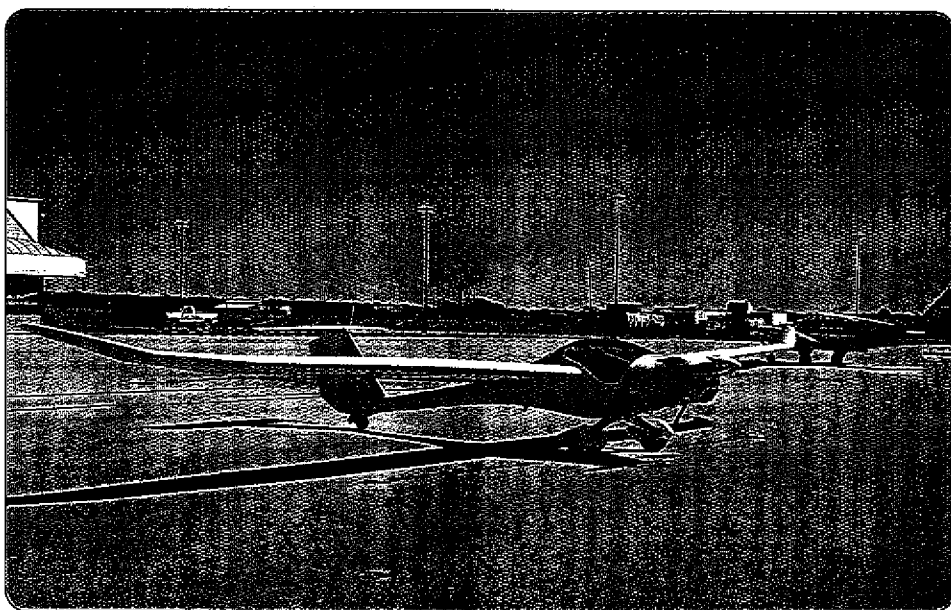
left and right instrument packages. Control layout is best described as "professional" and was a welcome change from the sometimes random layout found in some other aircraft. There was, however, one discordant note in this symphony of ergonomics: the lever that controls the prop pitch is located in just the right spot to do serious damage to the passenger's left knee if the pilot activates it without warning.

The folding wings (which fold "Navy-style" over the fuselage) are a great feature and can be folded or unfolded by one person in about a minute. The folding wings and extra-wide stance (the main gear have almost a 9-foot track) make taxiing the Ximango no more difficult than taxiing any other tail-dragger despite its enormous wingspan. With the wings folded, the Ximango fits within the confines of most general aviation airport taxiways, and can be taxied, without too much concern over lights or signage taking out a wingtip. Forward visibility is excellent (assuming that you're tall enough to see over the panel) and no S-turns are required while taxing.

With full fuel and two people aboard we were close to the Ximango's maximum takeoff weight. Even so, ground roll was something less than 1,000 feet and initial climb approached 1,000 feet per minute.

In flight, the Ximango had a stable, solid feel reminiscent of a Beechcraft Bonanza. Controls were firm, but responsive, with little lag or "slushiness." Handling was superb, with no sign of adverse yaw despite the almost 58-foot wingspan. The roll rate could best be described as "brisk" with a well-harmonized and very effective rudder. The Ximango also exhibited the highest cruise speed of the motorgliders I sampled, topping out at a very airplane-like 121 knots.

The comfort of the cockpit, the great handling, the relatively high cruise speed and the top-notch ergonomics make the Ximango my top-choice for a long cross-country flight. The somewhat limited useful load, however, means making tradeoffs in fuel or cabin capacity that I'd probably find hard to live with if I used



*Urban Air Lambada owned by Salsa Aviation, Boerne, Texas. Photo by Bill Collum.*

the Ximango primarily for powered travel.

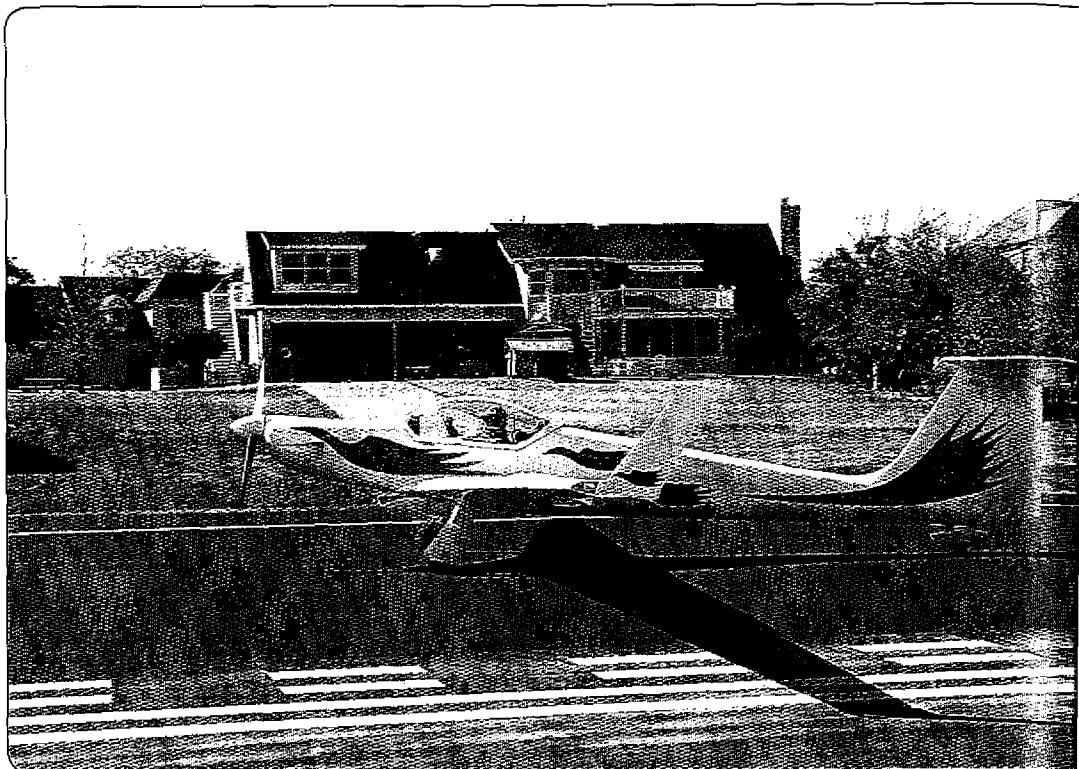
In addition to its power-on performance, the Ximango makes an excellent soaring sailplane. Low speed handling is good and light stick forces make thermalling very entertaining. With good up-wind penetration, low sink rates, and a generous L/D, the Ximango is a true sailplane and can be soared effectively in almost any conditions that would keep a two-seat glider like a Grob 103 airborne.

Landing the Ximango was a treat. The balanced controls, wide stance, long fuselage, and steerable tailwheel put the Ximango near the top of my list of pussycat tail-draggers. I don't think any pilot with

tailwheel experience will be surprised or disappointed by the Ximango.


The bottom line: If not the "Porsche" of the group (that title might reasonably

be claimed by the Lambada), the Ximango is certainly the "Cadillac" comfortable cockpit, great performance and drama-free handling should p



Horst Stratman's Ximango. Photo by Bill Collum.

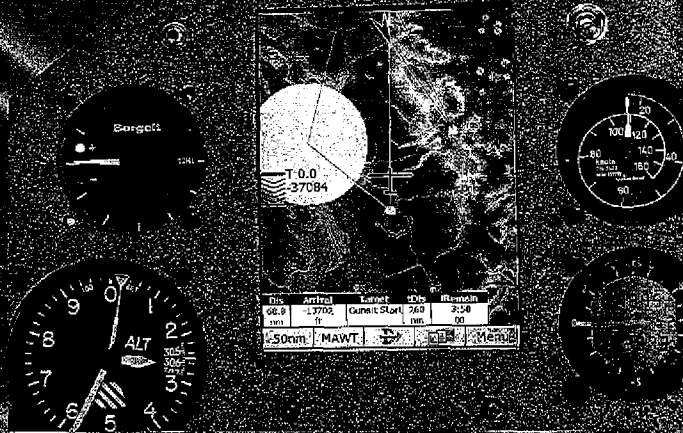
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Ximango on the top of the list for motorglider pilots that plan to do some serious cross-country touring but still want good soaring performance. If Grupo Aeromot could find a way to increase the useful load

by a 150 pounds or so, this could very well be my vision of an ideal touring motorglider.

A number of folks were very generous in offering me their aircraft for this review. I'd like to offer my special thanks to SSA member Lew Adams of Austin, Texas for the use of his gorgeous Vivat, the "Silver Swan". I'd also like to thank J.P. Ducos of Hill Country Motorgliding and Soaring in Hondo, Texas for the use of his Grob 109B. Any glider pilot seeking to earn a motorglider endorsement could probably benefit from a few hours flying with J.P. who

Aircraft	Engine	Horse Power	Wing Span (ft)	Empty Weight (lbs)	Useful Load (lbs)	Takeoff Roll (ft)	Max Cruise (kts)	Stall Speed (kts)	L/D
Blanik Vivat	Mikron III	65	56'	1040	480	721	94	33	25:1
Grob 109B	Grob 2500	95	57'2"	1362	512	645	102	40	28:1
Urban Air Lambada	Rotax 912uls	100	49'	628	670	325	105	38	30:1
Ximango AMT-300	Rotax 912a	115	57'7"	1390	485	570	121	42	32:1
Cessna 150M	Cont. O-200	100	33'4"	1111	490	735	102	42	7:1

fies the Grob like he was born in it. I'd also like to offer my sincere thanks to Dave White of Salsa Aviation in Boerne, Texas. Dave is one of the nicest guys around, and Salsa is the Urban Air dealer for the central US. Give Dave a call if you'd like to experience the Lambada for yourself, but bring your checkbook: if you fly one you'll want one. Special thanks also to Horst Stratman, of Austin, Texas, who offered me his personal Ximango for an afternoon, and to Chuck Cheeseman of Ximango USA who spent what seemed like hours on the phone with me answering my interminable

questions.

We'll look at some other motorgliders in upcoming issues of Soaring. As always, if you have questions or comments on this article or on any other edition of Soaring Tech, I'd be glad to hear from you. Drop me a note at [soaringtech@ssa.org](mailto:soaringtech@ssa.org). Be sure to include the words "DO NOT PUBLISH" on the subject line if for some reason you don't want to see your words printed in a future edition of *Soaring*.


See you on the porch,  
—Bill




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