

1000 miles in the Europa Motor Glider

By Bud Yerly



I've always had a love hate relationship with the Europa Motor Glider (MG). I've assisted owners in building five sets of glider wings myself. In comparison to the XS short wing, I felt the MG wings were too long (at 46 feet) for a standard hangar, they are quite heavy (at nearly 150 pounds per wing), the roll stick force is higher, the roll rate lower, and the cruise speed is lower. Besides; who in their right mind would shut down a perfectly good engine on purpose. But I love the fact that it takes off like a U-2, where it typically achieves sufficient altitude before the end of a 3000 foot runway to glide to a safe landing in the event of an engine failure. It maneuvers well, has a benign stall, cruises rock solid at 127 KTAS sipping 5 gallons per hour (or a little less) of car gas. The glide ratio can turn an engine out situation into a nuisance, and most importantly, requires no medical to fly, only a glider rating and motor glider endorsement. After assisting so many owners in building their gliders, and only getting short local hops to test fly them, before handing them to the owner, I was itching to evaluate one on a cross country. Dave Stanbridge, of Swift TG, was looking to show the Europa MG at Sun-n-Fun 2009 in Lakeland, Florida. I asked Homer Baker

if he would fly his Europa XS Tri-Gear Motor Glider, N419PL, to the show for use as a display aircraft. N419PL, was two years old now and Homer took the plane from the shop and flew off the 40 hours in Kansas. He told me the now needed some avionics troubleshooting, the engine needed the turbo and AD's looked at. Upon arrival at my shop, Homer and I gave the engine, airframe and prop a thorough going over. The wheel pants and bugs needed to be cleaned off and some touch ups were needed due to wear and tear. The Blue Mountain EFIS One (an early generation one system) needed some data upgrade/calibrating and the Falcon standby attitude indicator had died in its first few hours. The panel only requires a half an hour to remove, so we pulled the 40 pound panel to attend to the avionics. We repaired some cracks in the wheel pants, and sent the airframe to Johnny's Body Shop for the touchup. Sun-n-Fun was approaching fast, and the turbo still needed some attention so we made the decision to take the plane to Lockwood Services for the engine work after the show. Homer was obligated to return home before we could get into Lockwood for the repairs, so I asked if I could ferry it home for him to insure all the upgrades to the

avionics and engine were completed satisfactorily. It was an opportunity to get away from the shop and fly longer than a 45 minute test hop and take a look at some performance numbers for the MG in real world conditions.

After Kerry at Lockwood spiffed the engine up, I test flew the aircraft for an hour locally to evaluate the avionics and engine and all seemed well in that department. I also had the opportunity for a photo shoot for some future advertising and did some gliding tests during the photo shoot. On both flights, the engine temps were higher than I remembered ever seeing in climb for a 914 equipped Europa I built. After some looking and poking around, I changed back to the ethylene glycol mixture and the temps came down by over 10 degrees. Now it was up to the weather to get N419PL back home to Edgerton, Kansas.

The weather fronts were unkind. The proposed route was covered by thunderstorms from 10:00 AM in the morning until midnight for a month. When the sun was out, temperatures soared near 100 degrees Fahrenheit, and the humidity was unbearable. I monitored the

weather and saw a break may begin on Monday, July 20th, 2009. I did a quick test hop on Saturday afternoon in record heat, in between rain squalls. All seemed well, but the oil and cylinder temps in full power climb were still exceeding 240F when climbing at 75 KIAS. Undaunted, I prepped for a Monday departure.

The weather man had predicted the front that covered the Central US would push East and leave me with a three or four day window to fly the plane back to the Kansas City area. The distance was only 1000 miles, but a direct route was not prudent due to thunderstorms and I would be bucking about 25 knots of headwind most of the way. Monday dawned bright, hot and humid. The preflight of the MG went well and with the extra parts and books all strapped in, I grossed at 1420 lbs, and 60.9 inches CG. (Note to self, cut the G load to 3.2 and add 5 KIAS to stall and approach/maneuvering speeds.) The sight gauge said I had 15 gallons on the main side (17.5 total) and my flight plan said I would need 12 gallons to get to Panama City, Florida (a good stop for coming out of Tampa). I was airborne out of Plant City Airport on time, climbing in full turbo at 1400 fpm to check the climb temperatures. After three minutes, I notice the

temperatures climbing toward redline so I lowered the nose to 90KIAS to get more cooling air, pulled the throttle to 34 inches and set the Airmaster prop to climb at 5500 RPM. The temps stabilized just below redline. Not wanting to stress the engine, I pulled the throttle back to 31 inches and the prop to 5000 RPM and the temps came down quickly, as the cooling airflow was more than sufficient at that speed. At 90, while waiting for the temps to stabilize, I noticed I was still climbing at 3-400 FPM at 5000/31. Once the temps came down to about 210F I reset the throttle to 34 inches and the Airmaster back to Climb setting at 5500. Passing 3000 MSL I hacked the clock. I held 90 KIAS, to keep the engine compartment cool, as the outside temperature was still hovering at 90F. I also had every air vent open trying to get cool air into the cockpit. The next thing I knew, I was leveling at 8500 feet. N419PL averaged 800-900 FPM from 3000 to 8500MSL at 90KIAS. Total time to altitude from takeoff was 10 minutes and distance to altitude was 15 miles. Not too shabby considering I was a wee bit (50 lbs) over gross and leveled for a couple minutes to let the engine cool.

I trimmed the plane for cruise, based on the handbook figures of 75%

power at 5000 RPM and 31 inches. The airspeed settled at 127 KTAS according to the Blue Mountain, engine temps were comfortable at 210F. According to the fuel sight gauge, I had burned only a gallon or two from takeoff. From altitude I could see the rain showers and cumulous buildups predicted dead ahead. The forecast was for the bases of the clouds to be at 4500 MSL and since I did not bring my oxygen bottle, I wouldn't be able to go above the tops estimated at 11,500. It was time to settle in, check divert fields, check in with flight following, hack the clock and note fuel burn rates over the next hour. From over Zephyr Hills I figured an hour to Perry Foley and that would be a good fuel and ground speed check.

Typically the Rotax 914 and Airmaster combination is quite efficient between 8-12,000 feet cruising, and I searched for a sweet spot. I define the sweet spot as the point where the RPM and Manifold Pressure gives the smoothest engine running sound and feel. That occurred at 4900 RPM and 30 inches. The speed dropped to 124 KTAS and the plane felt and sounded terrific. The air vents installed in N419PL are the Ultimate Ventilators (UVs) purchased through Aircraft Spruce. They are located just forward of the canopy bow

and give a great cross flow of air through the cockpit. There was enough cross flow from the UVs that map reading required two hands at times. This plane was also equipped with a NACA duct in the tail and tubing from the tail to the overhead where vents were installed. The overhead vents worked well, but without the Ultimate Ventilators, it would have been pretty hot even at 8500 feet.

Approaching Perry, I had been level for an hour and the fuel used was about 5 gallons according to the sight gauge. Weather was approaching and a reduction of power to 20 inches was made to establish a 500 foot per minute descent. Perry was obscured by showers, and at 4500 feet, I was just under the cloud bases. There I noted a sunny patch on the ground and only light rain just to my West. I proceeded to reduce my speed to 90 Kts in case it became bumpy and drove through the rain. Soon the red warning lights began to flash and the oil and cylinder temps began to peg out, followed by the oil pressure and fuel pressure dropping to zero. The engine still sounded great, I was trailing no smoke or oil, and Perry airport was 2 O'clock for 5 miles with a tail wind en-route. Then the EFIS One lost all heading, attitude and nav data. Normally my butt

would be sucking up seat cushion at this time, but from 4000 feet, and a glide ratio in excess of 25 to one, I could easily make it to Perry. Good news was N419PL is also equipped with a second set of senders and gauges for oil temp, oil pressure and cylinder head temp just in case this type of failure happened. I cross checked them and found the oil pressure fluctuating at 50 PSI, the oil temp pegged, but the cylinder head steady at 180F. I knew that when these gauges were added, a terminal strip was placed on the passenger foot well to tie in the 12 volt power, ground and sender wires for the additional oil pressure and temp gauge. What would be the chance that the terminal strip got wet and 12 volts was leaking into my ground system. From my panel building experience I knew a bad or crossed up ground when I saw one. I was clear of the rain and it was sunny on the North side of the rain showers and I headed for clear air near Perry at reduced power. As the plane dried out the secondary gauges all showed normal and steady so I turned off the EFIS One and waited 30 seconds. I turned on the EFIS One again and it would not boot up, warning me the G meter was in need of calibrating. No problem, I pulled out the key board and changed the damping ratio to 50% on the G meter, and

it was happy to boot up. (Note to self, test reboot capability in-flight with all EFISs in the future.) On reboot, thankfully, all the temps and pressures indicated normal on the Blue Mountain also. Clear of the weather, I climbed back to 8500 MSL and put Perry behind me. (Another Note to self, power strips belong behind the panel, no matter how long it takes...No shortcuts.)

Just south of Tallahassee, Florida, I could see more buildups ahead. I checked in with Tallahassee Approach and confirmed that isolated thunderstorms were pushing toward Panama City. I checked fuel and my divert options should I not be able to get into Panama City. I was down to nearly 5 gallons on the main side and knew I had 2.5 in the reserve side so I had some ability to hold. It was time for some mental gymnastics. My planning said I could make Tallahassee with a 2.5 gallon reserve if I left Panama City with 3 gallons in the main from 5000MSL. I had a 20 Kt headwind and 50 miles to go to PCF. Time to save gas! I plotted a shallow descent of 300 FPM at 100KIAS. This is a significant power reduction in the motor glider. From previous experience, level flight at 4000RPM and 20 inches MP holds 80KIAS and the fuel burn is about 2.5GPH. In the descent, I

estimated I was now burning less than 2 gallons an hour and had 30 minutes to fly. The descent would put me at the airport at pattern altitude using only a gallon or so. I was handed off to Tyndall Approach control and was advised that Panama City had heavy rain and lightning and was asked what my intentions were. At 5000 MSL I could hear that approach wasn't busy, and Tyndall AFB was in the clear. So was an old friend's private grass strip just North of the Airbase, but it was sandy and would play havoc with the low slung wheel pants. I could land at Tyndall if I had to, and pull out my military ID and get some gas, but that is bad planning. I told Tyndall I would hold with Tyndall Tower North of the field. My descent only cost me one gallon so I could easily hold at 75KIAS over Sandy Creek, where at 4500 feet I was pulling minimal power. I held for 10 minutes and contacted Panama City tower for an update. A voice came over the headset reading off exactly what Tyndall told me, so I asked him to "Look out the window and tell me if it is clearing from the North". A more mature voice came over the radio and told me the rain was now very light, the winds were 5 knots from the South and it was clearing from the North. I checked out with Tyndall and proceeded to land at Panama

City. Taxiing into parking the long wings do not allow a quick spin behind other aircraft and I was glad I had my tow bar to push the plane back into my tie down spot. I screwed in some custom tie down hooks I made with Homer and opened the cowl door to look at the power strip. A quick trip to the FBO maintenance found a young A&P working on his personal experimental aircraft and I soon had some contact cleaner and a spray can of dielectric contact grease to coat the assumed errant voltage leak. I filled the tank and was amazed I only put in 10.0 gallons after 2.5 hours of flying. I called John Bolyard, who is building a motor glider, just to say hello and offer a flight, but storms were approaching fast so John offered to put me up. Soon we were relaxing in Panama City. I asked John if he wanted a flight in the morning, weather permitting. He said sure, if the weather Gods allow.

John and I went to the airport the next morning and checked the weather. After chatting with locals who wanted to know about the plane, I made my way back to the FBO and looked at the weather radar and began planning. More storms were coming down from the North. I would have to make a dash along the coast if I were to get out at all. I would also be bucking 20

knots on the nose again. I asked John if he wanted a quick ride, and he told me to get out of there while I still could. I loaded my gear and gave a departure climb showing getting to 400 feet before the intersection of the runways. I then did a push over to 90KTS and reduced power, cooling the engine, and dodging clouds and rain in the climb. Engine temps were fine, and the rain very light and thankfully, despite the soggy departure, the electronics worked great. The familiar Eglin Bombing Ranges were just South of me so I proceeded West along my flight plan toward Hammond, Louisiana, now 200NM on the nose. Approaching Hammond I would make the decision based on fuel and winds whether to continue on to Baton Rouge where fellow Europa owners Jeff and Mary Behrnes (XS Trigear) live as well as George Reed (XS Trigear MG). I figured if I were to break down, at least I'd be among friends.

The forecasted line of thunder storms were forming just in front of me and all to the North of my flight path. John had told me the beach corridor was best in these conditions, so with approach controls assistance, I proceeded South, past the ranges and followed the coast. Weather at 8500 was clear and although forced to zig zag around some

buildups, generally fine until just West of Gulf Port, Mississippi. Here is where I found out just how fast the motor glider could climb in a thermal. I looked ahead and noted two buildups just about level. I figured I'd stay on course rather than deviating well south and slow to 90 and ride over the tops or in between the trough of the two buildups. Over the smallest buildup I caught an updraft that lifted me 500 feet in about 30 seconds. I was informed by approach I was off my altitude, and I calmly told him I was in a motor glider and I would descend when the updraft allowed me to. He was silent. By now the deviations due to weather caused me to be nearly 20 minutes behind my flight plan. I was blocked by sizeable buildups and moderate rain all along the beach. I was approaching Lake Ponchartrain Bridge and could see a break in the rain to the Northwest directly towards Hammond. My fuel was nearing 5 gallons remaining on the main side and I began quickly changing map scales on the EFIS One to check on my options when the EFIS locked up due to my over exuberant knob turning. I turned off the EFIS and attempted a reset. Attempt one failed to acquire any nav data. I took my handy chart out and finger plotted a heading and distance to Hammond. Just to check, I

pulled my old Garmin 90 out of my flight bag and turned it on. It eats batteries, but works. My trusty Garmin told me I was over Valdosta, Georgia some 350 miles behind me. I tossed the Garmin over my shoulder and grabbed my Sportys handheld SP200 Nav Com and dialed in Hammond VOR. I estimated a bearing of 320 and it locked on to the VOR on that bearing. I began to plot my letdown point when the EFIS One came back to its senses and confirmed my DR and VOR navigation. The long slow fuel saving descent took me back down into the ultra hot and sticky skies of Hammond, Louisiana. My chart was old and I could not raise the Unicom, so I flew over the field, checked the windsock and landed to the North. I fueled up with 10.5 gallons after 2.7 hours airborne. I closed my flight plan, and flight service notified me that they started a phone search for me since I was over-do by 30 minutes. I asked if the ETA plus 30 was the norm verses the ETA plus 1 hour of the past and why they didn't try Houston Center or the Gulf Coast approaches. Not their procedure was the answer. I asked for forgiveness and to give me the weather for the next leg. All looked well to the West, but not to the North.

The local flight school was well equipped, with the

latest computers, but out of charts for New Orleans. I contacted Flight Services and we both were looking at more buildups just North of the field and parallel to my flight path moving South. I asked him for some com frequencies to update my chart and we then agreed that from Hammond a straight shot to Alexandria then to Shreveport was the best corridor. I was filed and out of there as quick as I could go. A quick takeoff to the north and an immediate turn put me clear of approaching weather and I proceeded on course. A few zigs and zags were necessary, but it was easy to stay well clear of the thunderstorms. Finally, in the clear, I was able to cruise and check TAS and fuel usage in steady, non maneuvering flight for nearly 200 miles. This plane is very efficient at altitude. Flying at exactly 5000 RPM and 31 inches MP I was again flying at 127 KTAS and the fuel consumption was about 5 gallons per hour. At 4800 RPM and 28 inches the cruise dropped to 120 KTAS and the fuel flow dropped to 4.6. At 4900 and 30 inches the fuel flow was 4.8 and 124 KTAS. I was suspect of the fuel flow measurements, so I elected to stay at the reduced power setting for the next hour to do 30 minute checks then compute averages. The storms passed by my right wing, and I could see it was finally clear to the North.

The winds also were swinging more from the north, and flight watch confirmed the winds 100 miles north near Fort Smith were 35 knots from the north. I counted on my fingers and toes and knew I could make another 60 to 100 miles past Shreveport even with the headwind. I contacted flight watch approaching Shreveport and extended my flight plan 60 more miles to Texarkana.

Texarkana is a beautiful airport with great service. We refueled with 10 gallons again after 2.5 hours airborne. It was now getting late afternoon and I looked at the weather near Kansas City. They currently had a line of showers and thunderstorms so I decided to bed down for the night. Dave Stanbridge had been doing computer flow calculations on the motor glider wing and wasn't pleased with the results of the stall computations at the tips. He called and left a message while I was en-route. I actually did a text message to Dave (my son would be proud) indicating I would do a tuft test when I arrived in Kansas.

The next day I called Homer and told him my plans to land and refuel at Joplin, Missouri which was just south of the front then pick the best route into Edgerton, Kansas. The weather was

clear, but strong headwinds of 35 knots and turbulence made the climb rough to get data on. The outside temperatures were finally normal (only 90 degrees) and when I leveled at 8500 feet, it was cool and comfortable. I decided to only monitor flight watch and just enjoy a quiet airplane. The Ozark Mountains appeared on the nose and with the strong headwinds I got to look at the scenery for a while. I descended into Joplin, Missouri and gassed up quickly. I checked the weather and if I left soon, I could deviate Northeast and skirt the southern line of showers then fly Northwest toward Edgerton, Kansas staying dry all the way. With a high scattered ceilings and light rain, visibility would not be a problem and I would miss any significant rain, but the turbulence was reported as light to moderate making for a bumpy ride. I slowed to 90 twice to ease the ride and stress on the plane. The strong headwind became a quartering wind as I passed the front and soon I was looking for K34 or Gardner Airport, Kansas. Luckily, Homer told me to look for the red hangars, because the runway is basically a sidewalk (35 foot wide runway about 3000 feet long) along the buildings. I did a lot of map study and GPS twiddling looking for the field, and sure enough, the

red T hangars showed the way.

Once on the ground, Homer drove me to Walmart to purchase some yarn and tape for a quick tuft test. I applied the tape and tufts, accomplished a load check to put the test weight at 1370 lbs, I made an air show takeoff in full turbo to assure everyone the turbo was fixed. Once three mistakes high I accomplished a stall series, doing a video of the tufts for David to assess. As I have seen before, the stall is uniform. The tufts confirmed that the stall progresses from the root starting at 55 kts IAS and progresses uniformly to the tip at the 50% chord point, but the actual stall where the tufts at 25% chord break, occurs with a noticeable shudder at 50 KIAS. The break is straight ahead unless the ball is not centered, then it breaks to a wing drop away from the ball. Recovery is straight forward. I idled the engine back and spiraled to the field. I slowed to 70 KIAS on final and decided to go around and come in for a short field approach. I set up a 65 KIAS final as my weight was about 1350 pounds. At that speed you are definitely not behind the power curve, but you are heavy. I used $\frac{1}{2}$ airbrake on short approach and still floated about 100 feet. Touchdown was bouncy and hot at 60, so I was punished with a 2000

foot roll out down the runway. Homer and I pushed the plane into the hangar and called it a day without refueling.

That evening, Homer and I cross checked the log book entries and I had a great home cooked meal thanks to his lovely wife Sharon. Total distance flown was 1300miles. I logged 6 hops including the test hop totaling 12.3 hours. The logged time airborne on the first four hops was 10.3 hours (from Plant City Florida to Jopling Mo.) consuming 40.2 gallons according to the fuel truck meters. Homer

and I never checked the fuel from the last two flights. Sadly, the next day I was on an airliner flying back home as it was time to get my plane in the air for some LSA tests.

Final thoughts:

The Europa Tri-Gear Motor Glider, with clean low drag wheel pants and transition fairings makes for a comfortable, efficient cruising aircraft. Excellent control response and stability make it ideal for cruising. The tricycle landing gear is rugged and takes windy, gusty, fully fatigued pilot landings and makes

them a non event. Higher altitude cruising is very comfortable and with the additional climb rate possible, very efficient at getting to cruise altitude. The glide ratio, with propeller feathered makes it a descent glider plus adding additional options in an engine out emergency. Soaring is possible even with two aboard. It seems I now feel as most owners of these motor glider aircraft feel, I consider the Europa Tri-Gear Motor Glider, more of a "Motor Cruiser", and wonder what to do with the short wings other than mild aerobatics and quick dashes.





Performance Data accumulated on the flights in the Motor Glider

Performance Data Notes:

Tests made without calibrated test instruments, although pitot and static instruments were calibrated by a certified instrument shop. Installation and calibration errors are less than 3 knots or 50 feet.

Aircraft Description:

Europa XS Trigear Motor Glider with tips modified for Whelen Strobes. Tri Gear Speed kit and standard MG wing fairings. Avionics: Blue Mountain EFIS, backup A/S, Alt, engine instruments, Becker Radio Transponder, Falcon Attitude indicator, landing/taxi and second alternator. Powered by Rotax 914UL with Airmaster AP332 Propeller at 64 inch diameter Loaded CG is 60.9 inches at 1370lbs (Note: CG empty APS 60.3 inches at 1100lbs, yea, it's a fattie!)

Observed Data:

Max Speed Full Power at Sea Level: Aircraft as equipped will exceed redline (127KIAS) easily. (So not attempted) (Note: The same has been observed for aircraft powered by the 912S)

Rate of Climb at sea level: 1200-1300 FPM at 75KIAS, Max Continuous Power (5500RPM/ 34 inches)

Best Angle of climb at sea level: 65KIAS

Cruise : 127 KTAS 8500 MSL 75% Power , 5.0 GPH

(Conditions tested hotter than standard by 8C, Indicated A/S 106 KIAS, 5000 RPM and 31 inches)

Sink Rates observed: Engine off, prop feathered from one test flight:

90 Kts	400fpm
80Kts	300fpm
70 Kts	300 fpm

65 Kts 250 fpm
55 Kts 350 fpm trimmed nearly full aft.

Airbrakes:

With engine at idle, full airbrake and 70KIAS, glide paths of 8 degrees are achievable. At 80KIAS, 10 degree glide paths are achievable with full airbrake. Airbrakes are deployable up to 127KIAS but require higher force to deploy. A tendency to flutter in the first few degrees of deployment is noticeable above 90 KIAS, but stops once deployed beyond ¼ travel.

My recommended pattern speeds at full gross weight:

Pattern entry:	80 KIAS
Airbrakes Closed	
Downwind and final turn:	80 KIAS
Airbrakes as Required	
Final:	70 KIAS
Airbrakes as Required	
Short final (Over overrun):	65 KIAS
Airbrakes Closed	
Touchdown speed typical:	55 KIAS
Speeds above can be lowered about 2 kts for each 50 lbs below gross.	
Float distance:	4-500 feet
Float distance increased 500 feet with an additional 5 KIAS	
Observed stall speed:	50KIAS at 1370 lbs out of ground effect
Lowest touchdown speed observed 45 KIAS	

Landing Qualities:

Rudder, pitch and aileron control in the flare are positive. The long wings have considerably more momentum and rudder control must be used to keep the fuselage aligned in turbulence.

Side slips are very effective and comfortable down to 70KIAS. Below 65KIAS the MG requires larger control movements to hold and recover from a slip and were discontinued.

Sink rates with airbrakes open can exceed 1000 fpm at 80 KIAS. A significant nose down pitch moment occurs when the airbrakes are fully deployed. Opening the airbrakes to ½ deflection requires little force, and little trim change. The effort to hold the airbrake full open is noticeably higher above 70 KIAS. Until greater proficiency is acquired, airbrakes should not be deployed when in the flare or at low speed (below 70) near the ground as the nose down pitch moment and rapidly bleeding airspeed, may leave the pilot with little room for error. I've observed a full airbrake 60KIAS approach results in a nose down low speed mushy sink. As the nose is raised to flare, the speed bleeds off quickly which results in a nose low high sink impact as ground effect doesn't allow for a clean stall burble. Due to low airspeed the tail force is not sufficient to pull the nose up in these conditions with airbrake open. Power application and airbrake retraction is the only way to recover. When equipped with an Airmaster propeller, the final approach speed of 70 KIAS can be maintained by the propeller drag alone on a 2.5 degree glide path. Speed bleeds off nicely in the flare to touchdown without excessive float. Therefore I recommend once stabilized on final at 65-70 Kts, lock the airbrake closed. This provides a slow speed bleed off and easy control of the aircraft resulting in a gratifying nose high low speed touchdown. In ground effect, the observed touchdown speeds have been as low as 45KIAS, but typically 50-55KIAS.

**Personal Rules of thumb
For flying the Europa Tri-Gear Motor Glider**



Cruise Planning:

Max Range for planning (no wind) 360 NM:

(This leaves ½ hour (2.5 gallon) reserve plus slop
(Full power climb, 75% cruise power,
and 300 fpm descent for pattern entry.)

Normal Range 240 NM: (Leaving 1 hour plus
reserve (7.5 gallons) for divert planning.)

Plan flights for 120 KTAS Cruise (2 nautical
miles per minute)

**Plan descents for a maximum of 500 foot per
minute or 250 foot per mile:** (As speed builds
quickly without airbrakes.)

Engine out planning: 3 nautical miles per 1000
feet AGL to set in your EFIS nav computer for
emergencies (engine windmilling). Feathered
prop can give 4 nautical miles per 1000 feet AGL

Emergency Planning:

The glide ratio of the Europa Motor Glider
gives options to the pilot faced with an engine
out conditions only a glider has. In my tests,

with the engine in idle, from 400 feet AGL, I can
easily make a 180 degree turn and align with
the runway environment. However, on takeoff
leg, the plane climbs so fast to 400 feet that this
may not leave sufficient runway after the 180
degree turn to land. Straight ahead is still an
excellent plan from 400 feet above the runway.
A 360 degree pattern (high key for overhead
flameout pattern) of 600 feet with engine at
idle is a good starting point for new pilots to
practice, then adjust accordingly. (For practice,
a 400 foot AGL downwind, with engine at idle,
displaced 1250 feet, a short base and 1000 foot
final is easily done using airbrakes as required
on base and final.)

Engine out maneuvering should be
accomplished at no less than 75 KIAS. Min sink
speed is 65KIAS

Takeoff emergencies:

Takeoff roll is normally between 5-600 feet at full gross.

Engine failures should be planned to abort or land straight ahead.

Note: The climb angles possible with the 914 engine are quite steep. It will require an immediate push over of some 25 degrees should the engine suddenly fail on take-off, in order to maintain a suitable glide speed. This push over needs to be quite aggressive at 75 KIAS as the speed bleeds off quickly due to the high deck angle.

Maneuvering in Emergencies:

The roll rate and adverse yaw is similar to other gliders. You should lead your turns with the rudder for normal roll rates until proficient. Do not attempt a 180 turn to land until practiced and no lower than 400 feet to start. Propeller feathering and un-feathering, takes a long 15 seconds, so plan accordingly. In an emergency, don't attempt feathering the prop low to the ground unless in non maneuvering flight and sufficient time is available. In a low altitude emergency, fly the plane first.

