

# Small Aircraft Revolution



Kurt Sillén

Philip Månsson

**BLACKWING**  
SWEDEN

# RED DOT Design award



reddot award 2016  
best of the best



# Best UL Aircraft 2016, 2019



Speed 400 km/hr

Landing/Takeoff distance 150m

Range 10 hrs

Fuel consumption < 0.5L/10km

Safety & Comfort



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Landing/Takeoff distance 150m

Range 10 hrs

Fuel consumption < 0.5L/10km

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## KEY ENABLERS:

Aerodynamics

Aircraft Design

Carbon Fibre



# Aerodynamics

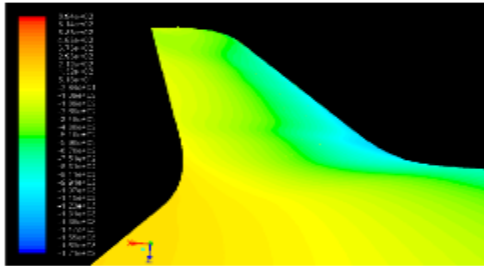


Figure 19 Static pressure coefficient on the surface of the wing at  $\alpha = 8^\circ$

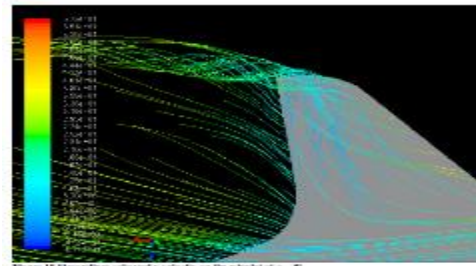


Figure 18 Streamlines colored by velocity on the winglet at  $\alpha = 8^\circ$

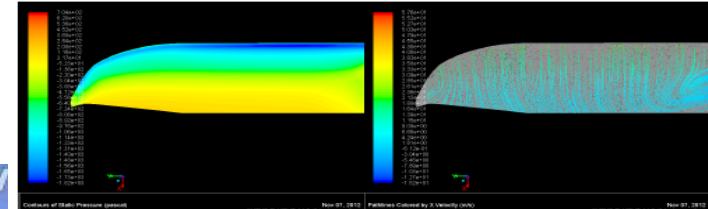
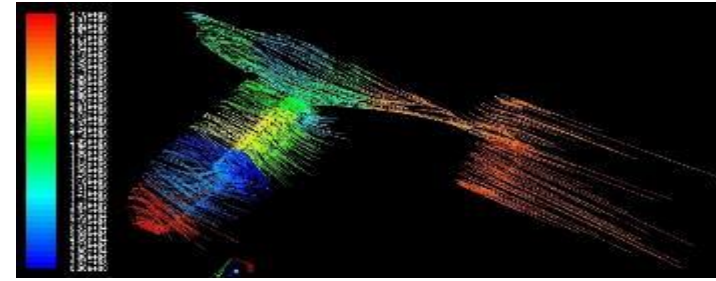


Figure 29 With winglets, toe-out=  $\alpha=10(h)$

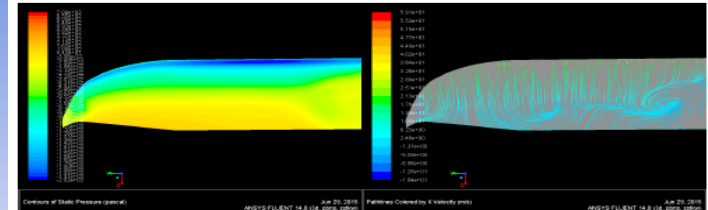


Figure 30 With winglets toe-out=  $\alpha=12^\circ$

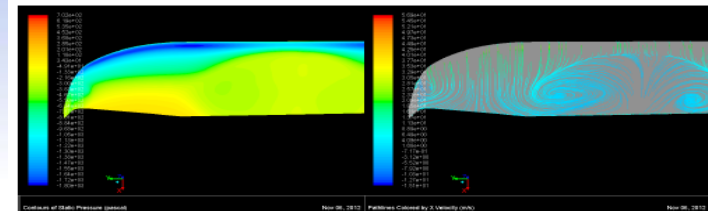
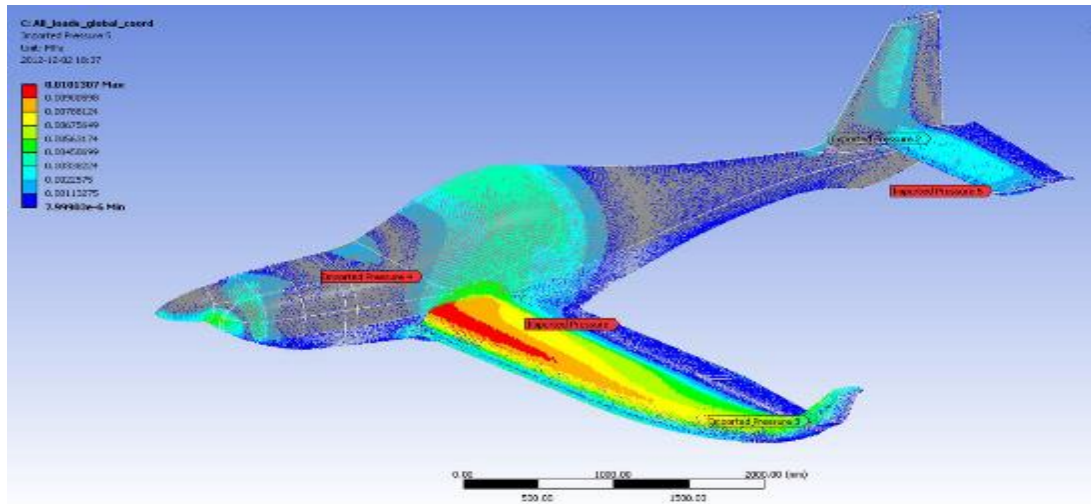


Figure 31 With winglets, toe-out=  $\alpha=14$



C:\AE\_Jeakn\_global\_\aerod  
 Scattered Pressure 1  
 Unit: Pa  
 2012-12-02 16:37

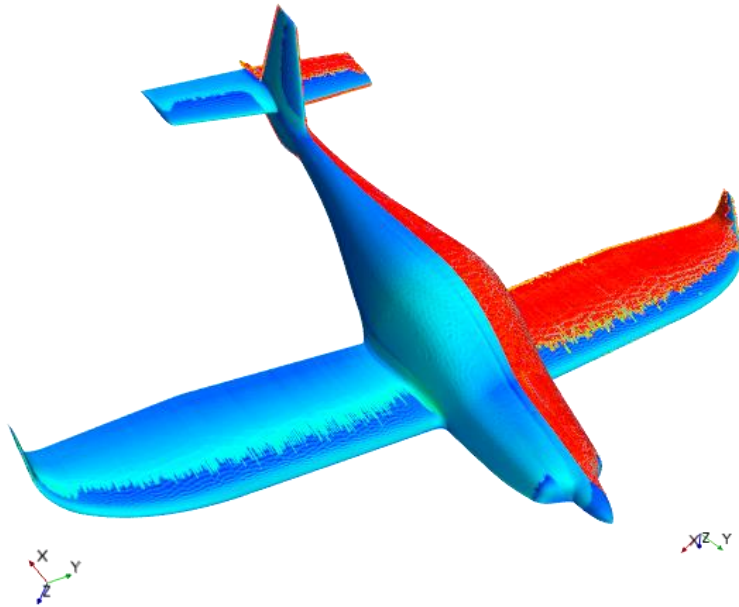
0.8103207 Max  
 0.0000000  
 0.00700024  
 0.00607549  
 0.00560124  
 0.00450099  
 0.00300074  
 0.0022575  
 0.00115275 Min

0 500 1000 2000 (mm)

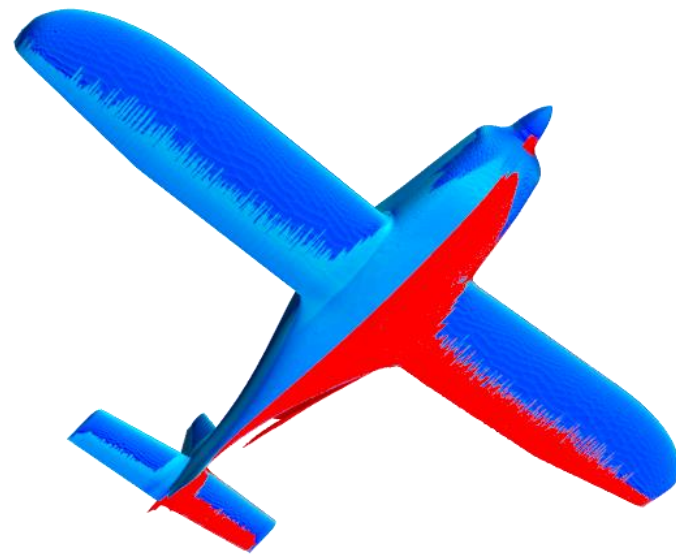
# Aerodynamics

Regions of laminar, transitional and turbulent boundary layers.

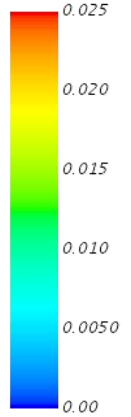
STAR-CCM+



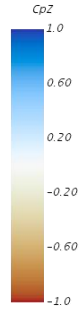
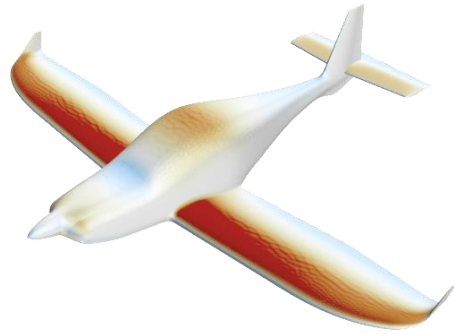
STAR-CCM+



Skin Friction Coefficient

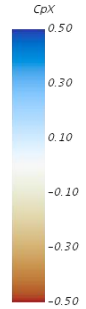
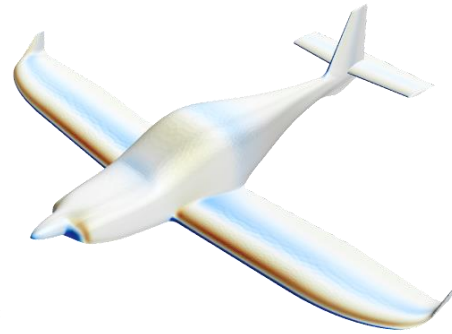


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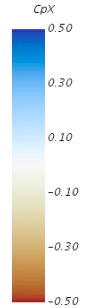
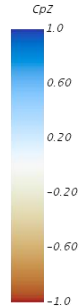
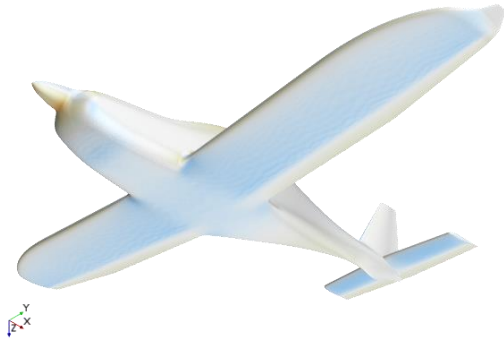


STAR-CCM+

STAR-CCM+



STAR-CCM+




$C_{pZ}$ : showing regions of lift(red)/downforce(blue) generation of the BW600-RG. The scales have been modified for highlighting and ease of comparison

$C_{pX}$ : showing regions of drag(blue)/thrust(red) generation of the BW600-RG



# Aircraft Design





Skåne 18.34

# Carbon Fibre



Strength, Precision, Quality, Production, Automation, Light Weight, Environment, ...



# Pilot Perspective

UL/LSA Pilot Report

BlackWing Sweden

## HOT ROD

AUS DEM KALTEN NORDEN



Autofors Gerhard Marzahn

Schweden steht für Qualität. Für Autos, über die Elefanten laufen können – jedenfalls in der Volvo-Werbung. Saab baut Militärjets. Jetzt bringt ein junges Start-up-Unternehmen in Lund ganz in dieser Tradition ein UL der Premiumklasse, die BlackWing.

Flygutprovning med Blackwing



Multiaxes - pendulaires - hélicos légers - autogires - construction amateur

DEPUIS 1986

# Pilot

Blackwing - nytt svenskt flygplan



www.fliegermagazin.de

CONTACT » ULM multi

Nr. 7 | Juli 2016 | Deutschland 5,50 €

# flieger

magazin

Leserreise Norwegen  
**Wetterglück am Nordkap**

Klassiker-Porträt:  
Fuji FA-200  
Unterschätztter Alleskönner

Gratiz landen  
5 Gutscheine im diesem Heft



Blackwing Sweden Ultra FG

## Das Renntier

Schnelles, edles Carbon-UL aus Schweden im Pilot Report

Special Avionik! Upgrades richtig planen • Megatrend vernetztes Cockpit

# VOL

moteur

LE MAGAZINE DU PILOTE ULM & LSA

TEST Blackwing

L'ULM Suédois

AVANT-PREMIERE

» Hélico léger Syton AH 13

» Carnet de Pendule

» AVEF Namibie

» Blois 2015

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ULM suédois



UL-LSA-Dreilächer - Gyrocopter - Trikes - e-flight

# Flügel

Das Magazin für Piloten



Test BLACKWING

AMFIEBFLYET ICON A5 TAR VERDENS PILOTER MED

TEMA: TAP AV KONTROLL - DET FARLIG

# Flynn

BLADET FOR LUFTSPORT OG LUFTFART

## BLACKWING

- setter ny standard for mikroflyt!



DRONENE SVIRRER!

# EAA

#3

NYT

MEMBERSHIPS FOR EAA SWEDEN • #3-4/2015 • ÅRGANG 48

Flygutprovning med Blackwing SE-VUE



# Testimonials from flying



“The flight sensation is fantastic. Only small rudder movements are needed to get a quick and precise response. I feel this plane is excellent for advanced flying. The view is fantastic, making it enjoyable looking at the surroundings as well as flying.”

*Rolf Björkman, KSAK Royal Swedish Aero Club, secretary-general*



“This is an appealing aeroplane, very stable and responsive. Take-off run is short and climb rate is impressive. The reclined seating is very comfortable and the canopy provides a panoramic view. Blackwing is an excellent aircraft for travelling.”

*Harald Ahlberg, former SAS captain and military fighter pilot*



“The flight evaluation left me with a very good impression that this aircraft should have a bright future as a fast and economic aircraft for not only travel and fun, but also as a good trainer. The stability around the three axes is excellent and maneuvering is just a joy.”

*Ove Dalén, professional test pilot*

# Aero 2019 - Friedrichshafen



CHANGING  
THE  
RULES

BLACKWING  
SWEDEN

Kašpar

**Why are General Aviation Pilots  
"upgrading" to a Light Aircraft ?**



HOCHWERTIGE WERKSTOFFE

AERODYNAMIK IN IHRER REINSTEIN FORM  
LEBENSWEILE PERFEKTION BIS INS ALLERKLEINSTE DETAIL

## Easy to fly

- Start/Stop (self check)
- Safe user experience



# Safety

- Short field landings at 35 knots
- Lots of accessible airfields
- Built in Aircraft Parachute
- +12G/-8G



# Aircraft Parachute

- Standard equipment in Blackwing



Not Blackwing on image, but similar parachute



## Performance

- 70% less fuel consumption
- Outperforming in speed and range



BLACKWING  
SE-VUE

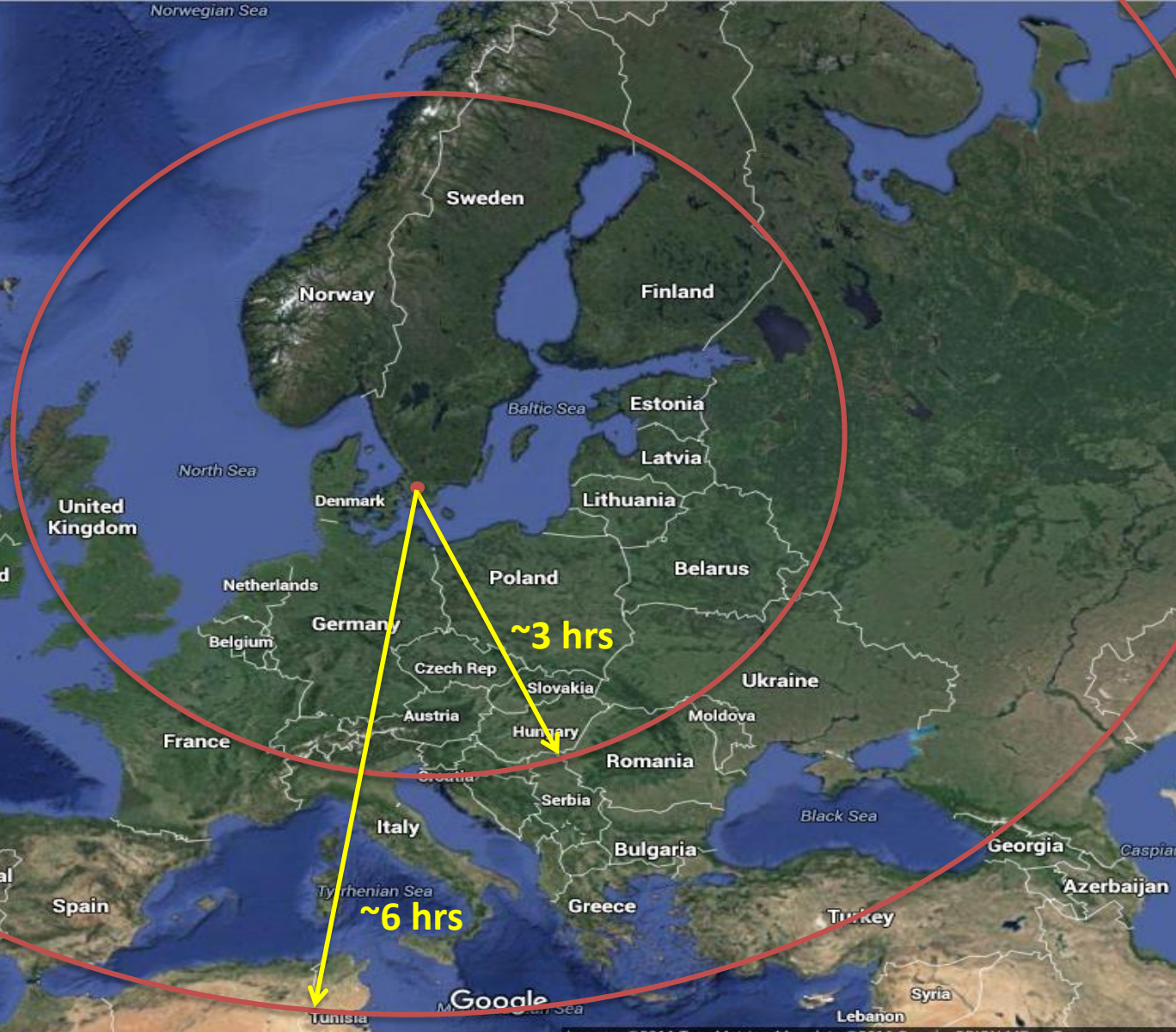
SE-VUE





## Range & Speed

- To destination and back without refueling
- Travel up to 3500 km and reach over 6000 airfields in a day





# Electric possibilities

- Aircraft tested and certified for 600 KG, 750KG possible with simple modification
- With batteries 200 WH/KG we have 2 hours airborne at 300 km/hr
- 400+ WH/KG batteries not so far away

# Questions ?



**BLACKWING**  
SWEDEN

<http://www.blackwing.aero>

<https://www.facebook.com/blackwing.aero>