



## ATLANTIC RANGER PROJECT

Long range utility aircraft proposal

atlantic ranger



Invitation to Northern Atlantic procurement agencies Spring 2014 from Navig Aero



*15m exSTOL from ocean, snow, ice, sand, rough terrain, bog, catapult, platform.*

## Contents

- P Preface
- 1 Mission
- 2 Teamwork
- 3 Safety
- 4 Service-Life
- 5 Performance
- 6 Practicality
- 7 Specification
- 8 Navig Aero
- 9 Project
- 10 Summary



sea-snow-land-plane | dual independent propulsion | glides 22:1 | all round view | hard-points | low emissions | safety cell  
fast cruise yet low stall speed | low maintenance workhorse | exSTOL 15m anywhere | defence capability | 4000km range



atlantic ranger

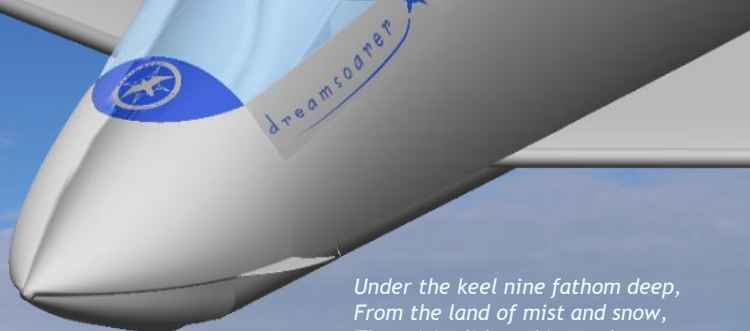


# PREFACE

The North Atlantic and connecting seas are savagely beautiful. The islands and coastlines that defy the onslaught of storms are homes to people who we are bound by responsibility to protect and supply.

Current long distance small aircraft present a high risk and costly option for transport, service and communication. The Atlantic Ranger project sets out to redefine light aircraft as long range, low cost and low risk - even when crossing vast tracts of lonely dark ocean, ice floes and brutally unforgiving terrain.

This proposal is made to agencies in;  
Canada, Norway, Denmark, United Kingdom, Iceland, Sweden, Ireland.



*Under the keel nine fathom deep,  
From the land of mist and snow,  
The spirit slid: and it was he  
That made the ship to go.  
The sails at noon left off their tune,  
And the ship stood still also.*  
Extract "Rime of the Ancient Mariner", Coleridge



sea-snow-land-plane | dual independent propulsion | glides 22:1 | all round view | hard-points | low emissions | safety cell  
fast cruise yet low stall speed | low maintenance workhorse | exSTOL 15m anywhere | defence capability | 4000km range



atlantic ranger 

# MISSION

In the 1940's the UK's RAF had a fleet of seven hundred Catalina aircraft - a quantity that now sounds incredible - but reflected the ubiquitous flexibility of seaplanes during peace and war. In today's straitened times, the taxpayer will not tolerate such excess, yet the requirement for coastal communication and ocean watch remains.

Recent events saw nations collaborate searching for MH370 with less than ideal aircraft and methods. This reminds us of the need to maintain aircraft capable of covering huge swages of water and land tracts in remote districts. The P-3 Orions used predominantly in the search were consuming 30,000\* litres of Jet-A per sweep with only a short time on station before heading home. Visual searching was made using binoculars peering through tiny windows facing one direction only.

Navig Aero is proposing to develop two closely related aircraft, the OceanStormer (two seater) and AtlanticRanger (four seater) long distance utility aeroplanes capable of landing almost anywhere and fulfilling a range of functions for individuals, state and private agencies.

We are using this document to invite you to support this development. The project begins with small steps and a modest budget - but leads to change in flying long distances and accessing remote areas by light aircraft.

By approaching several agencies in seven countries simultaneously, we can share cost and co-operatively agree specifications that match need. Because this development underwrites Navig Aero's existing general aviation development program, we can offer unrivalled development-cost-value-for-money.

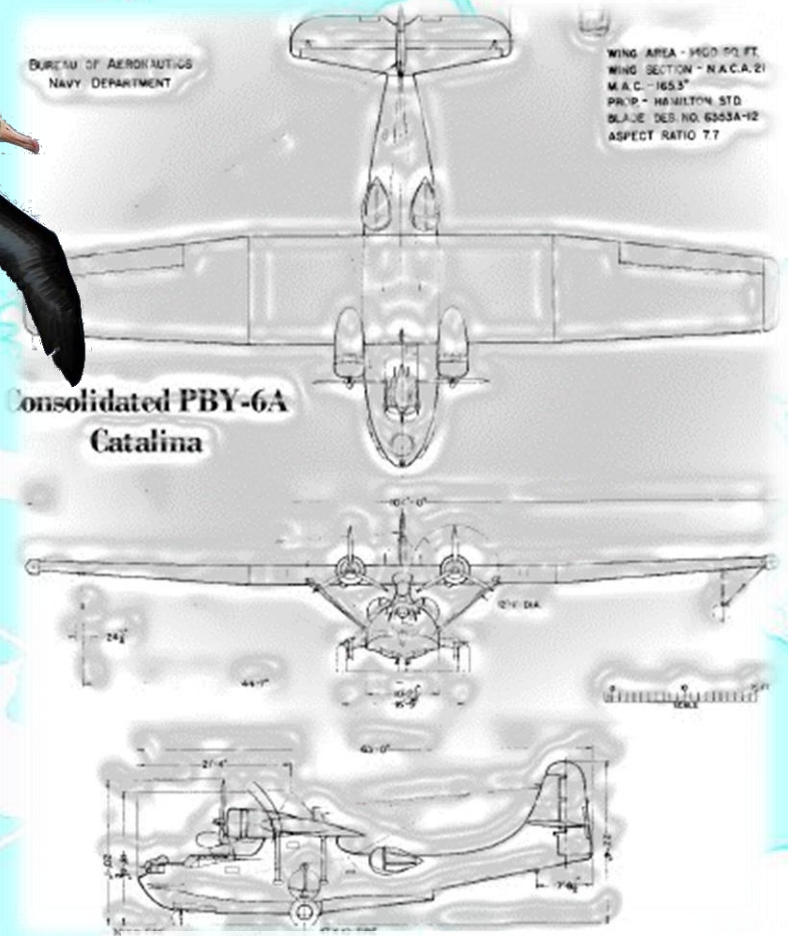
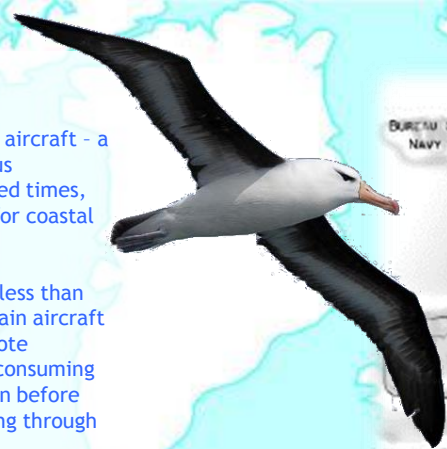
The first *feasibility phase* of the project is a €30,000 shared toe-in-the-water, so risk is low to individual agencies.

Even the second *ground prototype phase* of the project is modestly budgeted at €120,000. Navig Aero will develop these concepts as your partners at extremely low returns, so that we ourselves can take an idea into reality and make a good relationship with future potential customers. Costs will be split between participating agencies, with manufacturing jobs created also distributed equally according to the spread of participants.

The AtlanticRanger and OceanStormer aircraft are based on practical manufacturing choices yet also groundbreaking polymorphic wing technology to increase flying performance and an adaptive undercarriage to eliminate any requirement for landing area preparation.

*The total cost of the Atlantic Ranger ground prototype is the same cost as a few P-3 Orion search flights.* Help us to help you.

\*[http://www.reddit.com/r/MH370/comments/21n871/any\\_estimations\\_as\\_to\\_the\\_total\\_cost\\_of\\_this/](http://www.reddit.com/r/MH370/comments/21n871/any_estimations_as_to_the_total_cost_of_this/)



Unsuitable aircraft and searching techniques hunting MH370



sea-snow-land-plane | dual independent propulsion | glides 22:1 | all round view | hard-points | low emissions | safety cell  
fast cruise yet low stall speed | low maintenance workhorse | exSTOL 15m anywhere | defence capability | 4000km range



atlantic ranger



## TEAMWORK

Navig Aero is making an approach to the procurement agencies of seven countries with both extensive coastline and modest coastal watch budgets.

By creating an aircraft that will be cheap to maintain and purchase, yet fly long distances reliably, together we can create a better value and more effective coastguard and watch over the wild Atlantic Ocean that we share.

Once Navig Aero has collated responses to our presentations to be given to the various procurement agencies in the seven countries in June, we can see who is “in” and what the split on the first phase of development (€30k) is for each party. Funding for the second phase (€120k) is sought only after phase one is presented and universally approved.

Creating a new benchmark workhorse aircraft that can be trusted across inhospitable regions in bad weather is an enormous technological and economic challenge that individually nations and their taxpayers would have trouble to justify. Yet just like Aesop’s bundle of sticks, we are stronger together and can make this succeed.

Navig Aero’s contribution in time and energy to the project is at base cost because this project underpins the creation of the Navig Aero family of small aircraft. Everybody wins.



Country	Coast km	Seas and Oceans	Overseas and distant territories
Canada	202,000	North Atlantic, Arctic and Pacific Ocean	Baffin, Victoria, Ellesmere, NewF.
Norway	100,000	North Sea, North Atlantic, Arctic Ocean	Svalbard, Jan Mayen, (Finnmark)
Denmark	52,500	N. Atlantic, Arctic Oc., Baltic, Kattegat, N. Sea	Greenland, Faroe Islands
UK	22,000	North and South Atlantic, Antarctic Ocean, East and West Mediterranean, Caribbean, South Pacific, Indian Ocean	Falklands & SG, BAT, Berm., St Hel, Asc, TdC, Caribbean (various), Gibr., Akrotiri, Pitcairn, Chagos, Brit. Ant.
Iceland	5,000	North Atlantic and Arctic Ocean	n/a
Sweden	3,200	North Sea, Baltic, Kattegat	Gotland, Öland
Ireland	1,500	North Atlantic Ocean, Irish and Celtic Sea	n/a

Source [http://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_length\\_of\\_coastline](http://en.wikipedia.org/wiki/List_of_countries_by_length_of_coastline)



sea-snow-land-plane | dual independent propulsion | glides 22:1 | all round view | hard-points | low emissions | safety cell  
fast cruise yet low stall speed | low maintenance workhorse | exSTOL 15m anywhere | defence capability | 4000km range



atlantic ranger 

## SAFETY

Aside from performance, there are two main considerations when choosing an aircraft for a public service utility - with safety uppermost.

- 1) Safety of the occupants
- 2) Service life-cost

When analysing aircraft accidents, we see that most are either avoidable or their severity could be mitigated through; slower landing and take-off, better pilot vision and controls, better structure, lower stall threshold, belt and braces fuel level indication. By applying the following design and equipment Navig Aero aircraft become exceptionally safe when measured against general aviation competitors.

**Dual independent propulsion systems** means that total (both) propulsion failure is extremely unlikely. This is also a legal requirement to fly over many urban areas. **Gliding down at 22:1**, Navig Aero aircraft do not need propulsion during landing, meaning even if both propulsion systems failed, landing would not be compromised. **Very low stall speed** of 25 knots means that any problematic take off or landing happens literally in slow motion assisting pilot recovery and minimising severity. **Cushioning long travel landing gear with full sized wheels** for easy landing on all kinds of terrain means any clumsy dumping of the aircraft is no big deal. **Extreme STOL @15-25m** makes landing and take off easy almost anywhere. **Combination-ski-wheels** means soft terrain is equally acceptable as a landing surface. **Full encapsulation and boat hulling** of the fuselage means excellent buoyancy tolerating most wave conditions, *waterborne landing and take-off is encouraged*. **Full occupant safety cage** protects against impacts and provides energy absorption. **Full uninterrupted forward vision** gives clear sighting of air and ground for the pilot. **The firewall separates fuel and powertrain** behind the occupants. **Fuel is located in the centre** of the airframe affording the best possible protection. **Bullet proof and high impact tolerant** 5mm polycarbonate surrounds the occupants. **4000km range** means flight plans can tolerate surprise headwinds for easier ETOPS. **Soaring performance** uses prevailing wind to assist or allow climb without propulsion. **Physical fuel level is displayed visually** and forms part of the ground check. **CLP variant uses Jet-A**, a relatively low flammability fuel. **Each tank has two fuel meters**. **Ballistic parachute system**.

## UNBEATABLE

The AtlanticRanger and OceanStormer offer unrivalled safety standards for public and private service employees. This level of safety is essential to give people the confidence to traverse desolate terrain or ocean.



## LAND - ANYWHERE

Ocean or lake, sand or gravel, rough ground or snow, the Navig Aero undercarriage has no conventional restrictions. This is combined with extreme short take off and landing - made possible by polymorphing wings - to create an aeroplane with unrivalled landing capability getting close to the flexibility of a helicopter. This makes a huge difference to how we think about aeroplanes which are currently shackled to airfields and landing facilities. Soon we could be free to put down virtually anywhere, door to door, whatever the region. Transport in remote regions will be revolutionised, opening accessibility and improved life quality for people living there. Forgiving landing gear and slow speed also means take off and landing become much less stressful - for the pilot, passengers, owner and the airframe.

## RANGE

A key element in traversing of oceans safely is range, largely determined by weather, but weather is unreliable in direction and ferocity. To make journeys both practical and comfortably-safe, long range ability is prerequisite.

Long range is achieved in three ways,  
i) conventional higher overall efficiency  
ii) unconventional flying possibilities  
iii) deflating long range tank bags (150L)

i) Higher efficiency is achieved through :  
a) Propulsion comprising slow contra-rotating paddles - where slow paddles and contra rotation are both well known for improving efficiency with variable thrust.  
b) One stroke engine innovation - a linked piston engine and Reviflow two stroke cycle combine to create a one stroke engine - the ultimate in piston efficiency.  
c) Polymorphing wings means lift profile and wing drag stay closer to ideal whether cruising, climbing or landing.

ii) Unconventional flying  
Polymorphing wings allows Navig Aero aircraft to fly unconventionally when conditions permit. No propulsion is required to land, as the aircraft glides at 22:1 with wing polymorphing arranged for maximum lift. With a favourable jet stream and a skillful pilot, the aircraft can also lift without propulsion - even a half-favourable jetstream allows the pilot assisted part-throttle lift.  
*In this way the aircraft can climb, soar and land in similar way to a seabird.*



## SERVICE - LIFE

As darkness descends and the majestic island you left grows more distant with every minute, you are relying totally on the competency of the aircraft design, servicing and original manufacture. Reliability is critical and performance essential to carry you a vast distance across ominous seas in tough environmental conditions.

The AtlanticRanger is built as a rugged aircraft from cost-realistic materials using advanced manufacturing techniques to get the best from each component. With rugged design we can avoid unnecessary maintenance routine on most components, even if that means we lose some technical finesse.

For example, the landing gear spring and damping system comprises a single elastomeric component, but using smart-cavities we are able to impart good damping and spring rates in a service-free, fit-and-forget, lightweight and economical component. *This elastomeric damper captures the ethos of building a workhorse utility aircraft.*

By far the biggest area for maintenance will be the propulsion system and electrical system. Navig Aero will outsource the entire avionic and electronic system to a world class supplier - which leaves the propulsion system as the main mechanical service item.

By building rugged aircraft we create dependable transport. For example a journey across central Norway on 80kmh limited roads may wind its way through 250km and take three hours by vehicle. The journey as the crow (and Navig Aero) flies is 100km and completed in half an hour door to door, using land-almost-anywhere capability. During the flight only five litres of fuel are burned. So not only faster, but cheaper and greener than driving.

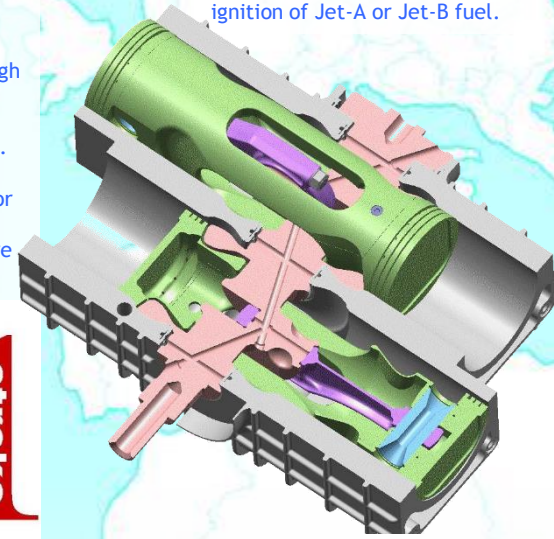


912iS CAD model above, and Rotax 912iS benchmark off-the-shelf engine above right. [PDF](#)

The one stroke engine (left) is a high risk track - but one with the potential for 4000 km range and a breakthrough in engine technology. One of the main attractions of the one stroke is fewer moving parts for a more reliable and smoother operation. The other reason is more efficiency, increasing range.



The CLP one stroke uses turbocharged compression ignition of Jet-A or Jet-B fuel.



Navig Aero proposes a two track solution to the powertrain.

- A) *main track* uses the Rotax 912iS certified 75kW flat four engine - 2000 hour TBO.
- B) *idealised track* uses the CLP & [reviflow 1 stroke engine](#) - unproven 75kW.

This leaves us with the chance to pursue in parallel an incredible step forward in combustion efficiency in a concept that has lain dormant for twelve years - whilst also safeguarding the project with a tried and trusted superb engine with a similar packaging envelope.



# PERFORMANCE

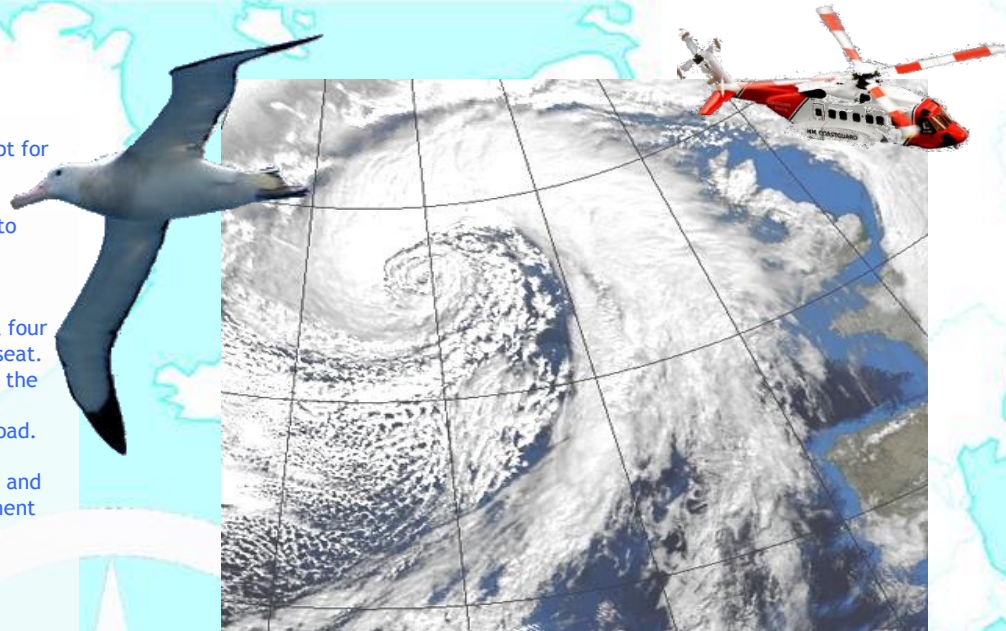
There are two very closely related aircraft proposed herein, which are identical except for cockpit layout and changes in aerofoil section and empennage detail.

The OceanStormer has a narrow two seater pillion cockpit and slimmer wing sections to reflect the higher Vmax with less frontal area - and also the lower payload and lift requirement. With lower drag, range is extended versus the AtlanticRanger.

The AtlanticRanger has three very similar cockpit layouts, a two+0, a two+2 and a full four seater. The two+2 and two+0 are identical except for deleted or included occasional seat. All the AtlanticRanger variants have identical wing profiles. The wider frontal area on the cockpit blunts performance versus the OceanRanger but gives a preferred seating arrangements for most pilots and thicker aerofoils generate more lift for greater payload.

Because of the modular construction of the Navig Aero family, changes in wing profile and cockpit width affect very few components - so much so we can consider the development of the two aircraft / four variants as one project.

This creates a choice of aircraft - which in terms of service and operation are near identical - to form the backbone of a fleet of aircraft as the go-to-utility transport.



## Summary of drive efficiency comparison

Drive system	Engine	Transmission	Propulsion	Cruise wing profile polymorphing drag reduction	Engine efficiency	Transmission efficiency	Propulsion efficiency	Accumulative efficiency	Accumulative efficiency inc. drag reduction	Relative fuel efficiency improvement	litres per hour
Industry contemporary	2x BRP Rotax 912iS 4-stroke	2.6:1	Single propeller	0%	35%	96%	65%	22%	21.8%	100%	30.28
Navig Aero main track	2x BRP Rotax 912iS 4-stroke	2.6:1	Contra-propellers	15%	35%	95%	75%	25%	28.7%	131%	23.06
Navig Aero concept track	2x CLP-75 1-stroke	9:1	Contra-paddles	15%	52%	92%	82%	39%	45.1%	207%	14.66



- Polymorphing wings
- One stroke turbo CI CLP Reviflow engine
- SuperFroude propulsion
- Accumulative RESULT

## OCEAN CROSSING

VW's XL1 car sips one litre of fuel per 100km, that demonstrates exceptional economy is possible with the right focus. The OceanStormer follows the same route of obsessional attention to efficiency which collectively adds up to the tables estimated 100+% increased efficiency. We shall see which proves to be true - but that is our target.

This also backs up the name and claims that this will be an ocean crossing light aircraft, to change the way we think about range and personal air travel and possibilities for people in remote locations.

The AtlanticRanger has slightly blunted performance statistics, but is still outstanding versus contemporaries and focuses on moving more people and carrying greater loads as a primary utility.

## Navig Aero ocean ranging aircraft 2014-2023

Type of aircraft	Power kW	Abbreviation	Family Name	Variants and occupants			
				Narrow cockpit	Short wide cell	Short wide cell	Long wide cell
Race & intercontinental	150	OS	OceanStormer	2			
Intercontinental	150	AR	AtlanticRanger		2	4	4



sea-snow-land-plane | dual independent propulsion | glides 22:1 | all round view | hard-points | low emissions | safety cell  
fast cruise yet low stall speed | low maintenance workhorse | exSTOL 15m anywhere | defence capability | 4000km range



atlantic ranger



## PRACTICALITY - The 21st Century Transport Utility

The AtlanticRanger solves a missing puzzle piece, somewhere between a P3-Orion, helicopter, boat and observation light aircraft. The long range of the Orion but slashing hourly cost whilst also making an excellent observation platform. Almost matching the landing flexibility of a helicopter but increasing v<sub>max</sub> and much greater range. Some waterborne capability of the boat yet with the speed and flexibility of an air platform.

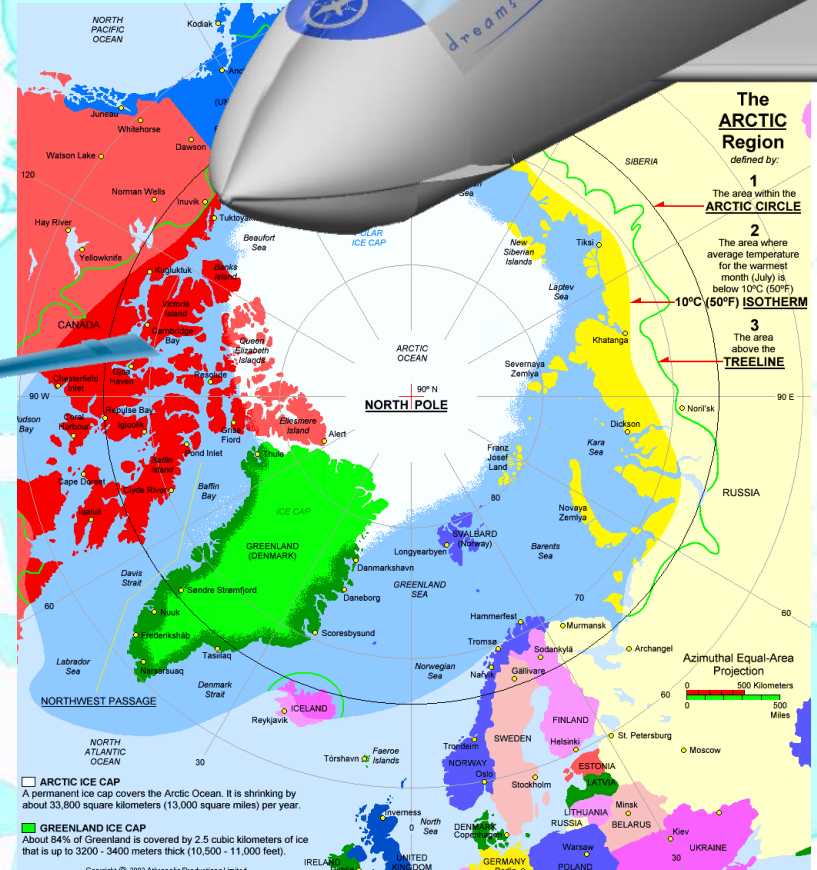
The Atlantic Ranger aims to become the benchmark utility vehicle of the 21st century in the same way the light truck and helicopter symbolised go-to-utility transport of the early and late parts of the 20th century respectively. Sixteen hardpoints are provided on a rugged geodetic airframe for: Surveillance equipment, lighting, life-rafts, package delivery, armaments, humanitarian supplies, logistics, crop spraying, oil dispersion, postal drops and collection, fire control.



## DEFENCE CAPABILITY

New enemies to the free world in the 21<sup>st</sup> century are varied, with many threats infinitely less sophisticated, generally land or sea based - yet equally deadly. Electronic equipment, munitions and even threats, are constantly downsizing requiring only a modest airframe to deliver payload. Low purchase and service cost, allows formations of AtlanticRangers and OceanStormers for greater coverage of search and rescue or to tackle swarm-threats.

- Hard-points can attach; missiles, torpedoes, transponders, cameras, surveillance radar.
- Polymorphing wings allow high lift wing profiles to increase payload when required.
- The OceanStormer is a light strike platform or could be adapted to perform as a drone.

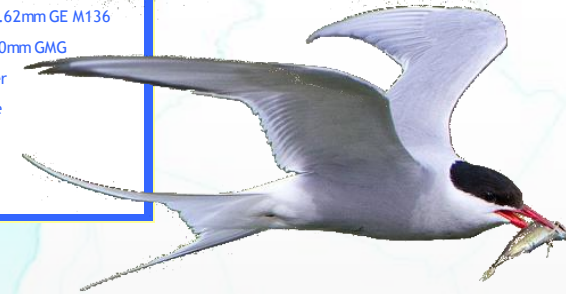


### Defence roles

- General utility transport
- Communication platform
- Humanitarian support
- Submarine tracking
- Search and Rescue
- Reconnaissance
- Light strike
- Medevac
- Trainer
- Supply
- Patrol

### Armaments

- 1x belt fed 12,7mm HMG L1A1
- 1x belt fed 7.62mm GE M136
- 1x belt fed 40mm GMG
- 1x Sidewinder
- 2x Brimstone
- 1x FASGW(L)
- Chaff
- Flare



sea-snow-land-plane | dual independent propulsion | glides 22:1 | all round view | hard-points | low emissions | safety cell  
fast cruise yet low stall speed | low maintenance workhorse | exSTOL 15m anywhere | defence capability | 4000km range



atlantic ranger

# AtlanticRanger and OceanStormer Specification

Performance (estimated)	OceanStormer	AtlanticRanger +0	AtlanticRanger +2	AtlanticRanger Quadra
Primary Function	Extreme range two person utility light aircraft	Long range two person utility light aircraft	Long range four person utility light aircraft	Same as +2
Occupants	One pilot & passenger or two pilots	One pilot & passenger or two pilots	1 pilot & 3 passengers or 2 pilots and 2 passengers	Same as +2
Seating	Pillion	Side by side staggered, luggage behind	Side by side staggered, occasional for two behind	Side by side staggered, two behind
Test flight	May 2017	2018	2019	2018
Operational	2019	2020	2021	2022
Unit Cost	£70k, €85k, NOK700k, SEK770k.	£80k, €97k, NOK800k, SEK880k.	£85k, €103k, NOK850k, SEK940k.	£90k, €109k, NOK900k, SEK1000k.
Engine	2x CLP Turbocharged CI (Jet A) or 2x Rotax 912iS (Mogas)	Same	Same	Same
Fuel	Jet A (CLP) or Mogas (Rotax)	Same	Same	Same
Max weight	700 kg	1000 kg	1000 kg	1000 kg
Weight dry, no pilot	300 kg	340 kg	360 kg	380 kg
Weight wet, one pilot, fully fuelled	500 kg	540 kg	560 kg	580 kg
Payload one pilot, wet	200 kg	460kg	440 kg	420 kg
Payload full occupancy (100kg pp)	100 kg	160 kg	140 kg	120 kg
Climb	250m/min	210m/min	200m/min	180m/min
Observation cruise (2 occupants)	40 knots	45 knots	48 knots	55 knots
Economy cruise	120 knots	90 knots	90 knots	87 knots
Journey cruise	150 knots	120 knots	120 knots	110 knots
VMax	200 knots	160 knots	160 knots	150 knots
Stall	25 knots	30 knots	32 knots	35 knots
Final approach speed	40 knots	45 knots	47 knots	50 knots
Fuel consumption economy cruise	8 litres per hour	8 litres per hour	8 litres per hour	8 litres per hour
Fuel consumption journey cruise	15 litres per hour	15 litres per hour	15 litres per hour	15 litres per hour
Ceiling	4,000 metres	4,000 metres	4,000 metres	4,000 metres
Range economy cruising	4,000 km	3,400 km	3,200 km	3,000 km
Range journey cruising	3,000 km	2,500 km	2,400 km	2,300 km
Range soaring	unlimited	unlimited	unlimited	unlimited
Glide ratio	25:1	Same	Same	Same
Fuel capacity	2x 40 = 80 litres	Same	Same	Same
Optional bag tanks	2x 75 = 150 litre	Same	Same	Same
Max fuel load	230 litre / 175 kg	Same	Same	Same
Landing gear travel	500 mm	Same	Same	Same
Take-off short dry grass (2 occupants)	15 m	18 m	18 m	18 m
Take-off lake (2 occupants)	40 m	50 m	50 m	50 m
Landing short dry grass (2 occupants)	10 m	12 m	12 m	12 m
Landing lake (2 occupants)	8 m	10 m	10 m	10 m

## Civilian roles

18/04/2014 BC

Crime prevention, detection and pursuit  
Agriculture, stock and crop monitoring  
News gathering and traffic reporting  
Forest fire detection and control  
Private flying and flight training  
Pipe and power line patrol

Photographic platform

Environmental survey

Customs surveillance

Illicit crop detection

Personal transport

Search and rescue

Crowd control

Organ express

Medevac

Trainer

Air-taxi

Hobby

## Fixtures

BC

Humanitarian supply

Water bombs / fire control

Infra red heat searcher

Crop spraying modules

Detergent sprayers

Inflatable dinghy

Lighting rigs

Dinghy

Flares



## USPs

- Clean sheet polymorphic wing design.
- Realistic repeatable manufacture technique.
- Land anywhere door to door ability.
- Efficient cruise, low stall, xSTOL.
- Stunning aesthetics.
- Exceptional range.



sea-snow-land-plane | dual independent propulsion | glides 22:1 | all round view | hard-points | low emissions | safety cell  
fast cruise yet low stall speed | low maintenance workhorse | exSTOL 15m anywhere | defence capability | 4000km range

8

atlantic ranger



# NAVIG AERO

Navig Aero is a start-up aircraft manufacturer introducing a single seat deregulated (SSDR) *soarcerer* (powered glider) and *dreamsoarer* (self launching sailplane) aircraft in 2017 and 2018 respectively. More information on the [website](#) and [plan](#).

These planes form part of a larger aircraft family of GA variants to be expanded annually until the late-twenties. The architecture of each plane remains the same but in each case using “logical commonality” the individual component, thicknesses etcetera, are configured according to function, which keeps operational performance high and choice wide, yet costs low.

Four aces in Navig Aero’s architecture create exceptional performance at modest cost:

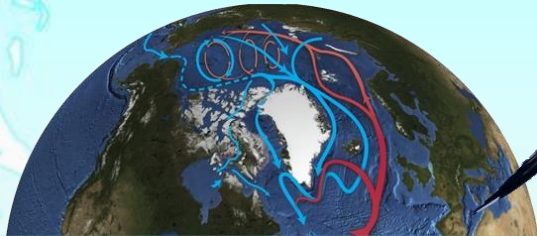
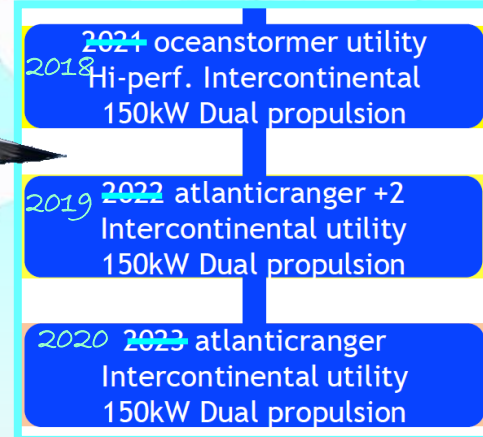
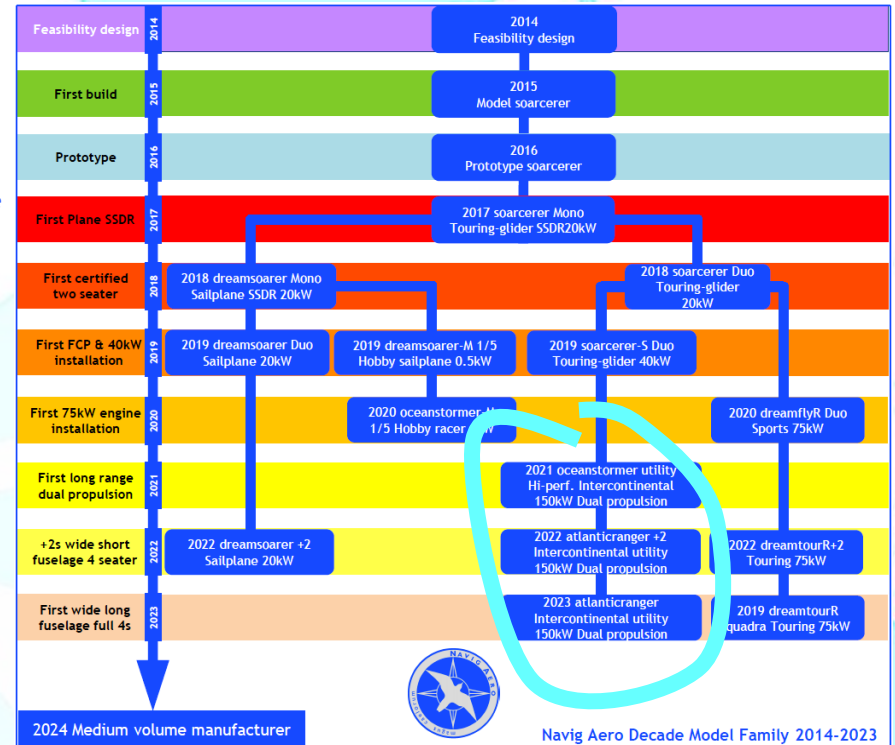
- a) new airframe construction technique
- b) **Superfroude** optimised propulsion
- c) adaptable undercarriage
- d) polymorphic wings

The Atlantic ranger +0, +2, Quadra and OceanStormer are planned as the latter part of the family of aircraft proposed by Navig Aero. This family will be developed with the help of the “**DreamTeam**” forum - a consortium of twenty engineers, pilots, experts and enthusiasts to drive the program forwards.

However there is an alternative and preferential development strategy proposed herein - the “AtlanticRanger Project”. That starts with the most advanced aircraft in the family - The AtlanticRanger and OceanStormer. This inverts Navig Aero’s development program and suddenly the rest of the family gets much easier to create in an accelerated decontent-program - we can also consider five and six seater variants before 2025.

Pursuing the AtlanticRanger and OceanStormer as a working group creates excellent links to potential customers with relatively strong buying power - especially when buying together. This circumnavigates Navig Aero’s tricky issue of how to establish a sufficiently large first order and start production. This project also provides those potential customers with ideal aircraft that they themselves helped to define. Hence the very low design rate per hour offered by Navig Aero in the project costing. Everybody wins.

It is in your interest to have a long distance and dual propulsion price-accessible aircraft. It is in Navig Aero’s interest to develop this at cost price to underwrite their program.



sea-snow-land-plane | dual independent propulsion | glides 22:1 | all round view | hard-points | low emissions | safety cell  
fast cruise yet low stall speed | low maintenance workhorse | exSTOL 15m anywhere | defence capability | 4000km range



atlantic ranger

## PROJECT - Phase One PoC €30K

This project proposal to agencies in seven countries, is simple and straight forward - fund an ambitious aircraft development which will have far reaching positive benefits for your own service and general aviation. The funding request itself is very modest, especially if shared. The funding is *quid pro quo* - results are provided before funds are released.

This page is the contract describing the first *proof-of-concept-feasibility* stage of the project, which you are invited to take part in as benevolent partners.

The total phase 1 cost is €30,000.

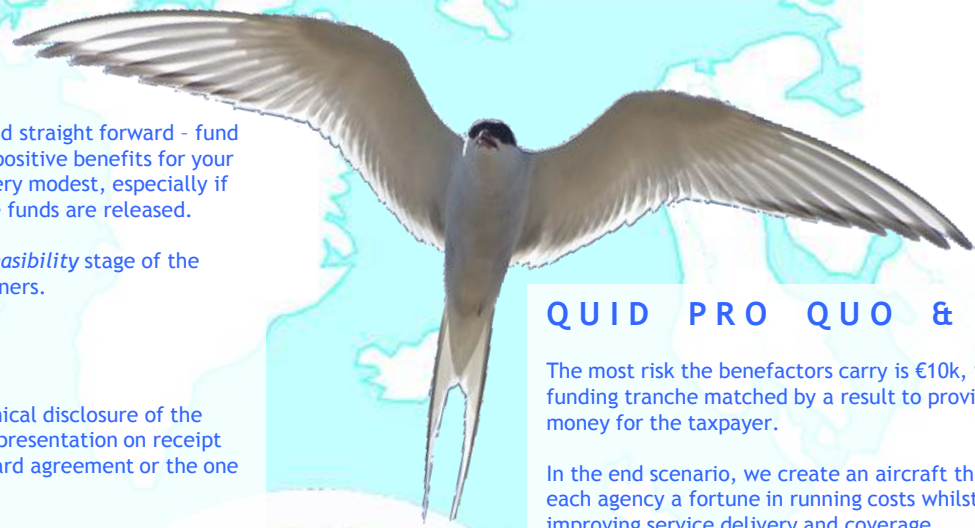
*However many partners are involved, costs are split equally.*

Navig Aero would like to make a personal presentation and technical disclosure of the AtlanticRanger, but if that is not possible, we can email a video presentation on receipt of a signed non-disclosure agreement, either your office's standard agreement or the one available [here](#).

After project kick-off, we will then invite you to become part of the design team with a login for the DreamTeam design [forum](#), where you will set forward any ideas and requirements for the aircraft and participate in the design discussion - should you wish to.

Navig Aero will eventually manufacture the aircraft with "open book" finance with a 20% profit versus turnover target, thereby protecting our customers and the taxpayer from exploitation, but allowing Navig Aero commercial prosperity.

Right now though, we concentrate on the first step, feasibility-PoC for €30k in three tranches of €10k. An 18 month €120k ground prototype program will be proposed in January 2015 once this €30k feasibility phase is completed, evaluated and approved by benefactors. Participation in the first phase does not assume further participation.



## QUID PRO QUO & JOBS

The most risk the benefactors carry is €10k, with each funding tranche matched by a result to provide value for money for the taxpayer.

In the end scenario, we create an aircraft that will save each agency a fortune in running costs whilst also improving service delivery and coverage.

Job creation in the project will be split by proportion and according to participation. Manufacturing portions such as CLP engine, Superfroude propulsion, airframe, wings, electrical harness and final assembly can all be distributed internationally.

AtlanticRanger Project : quid pro quo funding PHASE ONE					
20th Apr 2014 Ben Collins					
Step	Title	Funding	Result required	Funding	Funding Dates
Presentations June	Benefactor recruitment	€ 10,000	Technical disclosure made in June	€ 10,000	July 1 2014
July, Aug, Sep	Feasibility	€ 10,000	Interim drawing suite	€ 10,000	July 1 2015
Oct, Nov, Dec	Model & proof of concept	€ 10,000	Detail drawing suite & 2x 1:5 models	€ 10,000	Dec 15 2014
<b>Total</b>		<b>€ 30,000</b>		<b>€ 30,000</b>	<b>&gt;Dec 2014</b>

AtlanticRanger Project : quid pro quo funding GROUND PROTOTYPE					
20th Apr 2014 Ben Collins					
Step	Title	Funding Needed	Result required	Funding	Funding Dates
A : 2014 second half	Proof of concept	€ 30,000	Detail drawings, 2x 1:5 models	€ 30,000	July 1 2014
B : 2015 first half	Detailing	€ 20,000	Manufacturing drawing suite	€ 20,000	Jan 1 2015
C : 2015 second half	Prototype build	€ 72,000	Build it / detail design	€ 72,000	July 1 2015
D : 2016 first half	Ground development	€ 28,000	System and ground testing	€ 28,000	Jan 1 2016
<b>Total</b>		<b>€ 150,000</b>		<b>€ 150,000</b>	<b>&gt;Dec 2016</b>



sea-snow-land-plane | dual independent propulsion | glides 22:1 | all round view | hard-points | low emissions | safety cell  
fast cruise yet low stall speed | low maintenance workhorse | exSTOL 15m anywhere | defence capability | 4000km range



atlantic ranger 

## SUMMARY

When you are regularly flying across miles and miles of featureless ocean, you need an aircraft you can trust. It must have dual independent propulsion, be efficient enough to power through storms and flexible enough to land on ice, snow, ocean, lake, sand or rocky terrain - whilst also being capable of huge distances.

Right now there is no such small economical aircraft like that, but the OceanStormer and AtlanticRanger will fulfil the role of ocean traversing utility aircraft. A versatile air-platform capable of performing everything from search and rescue to whale tracking, submarine hunting and climate analysis. Capable of taking a doctor to treat a patient on board ship or a removing a sick patient quickly from a remote location. A workhorse that can do the mundane like deliver post, to more urgent duties like collecting and supplying donor organs.

A simple yacht collision in the mid-Atlantic with debris such as a semi submerged container can result in rapid sinkage and a Mayday distress call. Out of range of a helicopter, the OceanStormer can arrive quickly and deliver a heavy duty life raft and supplies. In acceptable swells, an AtlanticRanger can land and bring out survivors.

If the location of the emergency is not known, a formation of AtlanticRangers and OceanStormers gets to the search field quickly and flies slowly sipping fuel and combing the area at low level - or even soaring on the breeze if that is more than 25 knots.



## INVITATION

This is the beginning of an ambitious project with a host of technical challenges to work through. With the right step by step approach this can be achieved. Despite the high performance, construction is cost-realistic, comprising predominantly aluminium fabrications, extrusions, foams, GRP and plastics.

Naturally the characteristics promised by the AtlanticRanger are attractive to pretty much every general aviation craft, not just in the North Atlantic theatre. We see this aircraft establishing a new benchmark in practicality thereby increasing living quality for citizens in remote areas and for the state agencies that support those citizens. The AtlanticRanger and OceanStormer are aircraft that will shrink the world - truly *magus caelorum*, the magician of the skies.

You are invited to make an equal contribution to the first phase of the project clearly and contractually defined according to the previous page as €30,000. For example if three agencies are interested, that means a total cost of €10,000 each.

At the beginning of 2015 we can evaluate the project status and see who would like to be part of the following step - the ground prototype, total cost €120,000.

This is a great value opportunity to create widely beneficial aircraft technology. [Navig Aero](#) awaits your response before Jun 20th 2014 - [email](#) or +46 727 447422. We are ready and waiting to present the aircraft technical disclosure.



sea-snow-land-plane | dual independent propulsion | glides 22:1 | all round view | hard-points | low emissions | safety cell  
fast cruise yet low stall speed | low maintenance workhorse | exSTOL 15m anywhere | defence capability | 4000km range

10

atlantic ranger 



END



atlantic ranger 

Long range utility aircraft proposal

[www.navlgaero.com](http://www.navlgaero.com) | [www.atlanticranger.com](http://www.atlanticranger.com)