A NEW GENERATION OF SEA CRAFT

TRANSAquatis®

TRANSAquatis®

Cat. B WING IN GROUND EFFECT CRAFT

In accordance with IMO MSC 1054

SPEED, SECURITY,
COST EFFECTIVENESS,
GREEN TECHNOLOGY.

TransAquatis® is one of the actors of a revolution in the transportation field.

The Wing in ground effect crafts (WIG) offer the cheapest cost per passenger and per nautical mille on the market, as well as providing comfort and time saving.

Our numerous years of research on the WIG Technology allow us to launch a first 6 seater advanced type B WIG Craft, and to forecast commercial and military vessels from 15 to 50 places and more...

www.transaquatis.com

ABOUT WIG CRAFT

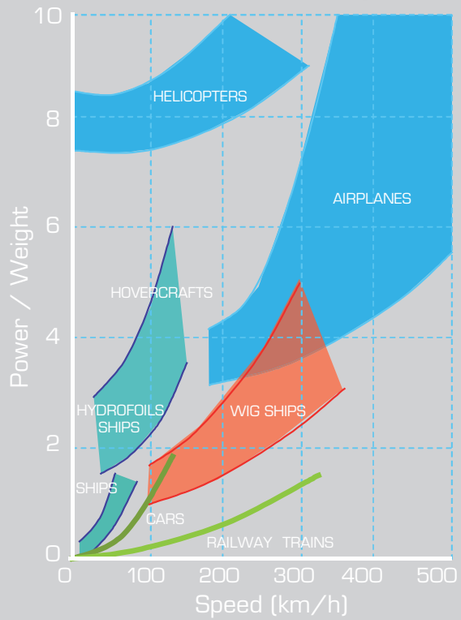
Our society is about to undergo major changes. Starting from now, we will have to take into account the consequences of our choices and actions on our environment. We will have to consider economic as well as ecological, technical and strategic aspects in our choices.

Indeed, the saturation of the airports and land infrastructures in general, is the economic indicator of the changes which we will have to anticipate. We will also have to find more environment friendly solutions. Less polluting while respecting economic constraints will obviously consider solutions with smaller power requirements for same payload.

Nevertheless, we will accept these changes in our transportation means only if we have advantages in our travels, in particular in terms of time saving.

Today, the WIG technology offers the opportunity to change our vision of transportation means, and particularly about maritime transports.

Comparison between different transport technologies



Indeed, the solution comes from the maritime field. Obviously the WIG technology is not able to meet all the needs, and in particular transport on very long distances where jets stay a good solution. But for all the short and middle distances near shored there is no better answer than WIG Craft. And we know that, in the world, the major part of the traffic is concentrated around our shores.

TRANSAquatis®

WIG CRAFT BENEFITS

The main advantage of WIG technology is the ratio between needed power and speed. This allows us to shorten the transport duration on coastal traveling without dramatic increase in transport cost, or more generally, to find the best compromise between speed and cost.

The following maps show the typical civil applications of WIG Craft.

For comparison, you will find below the travel time on typical transport applications with a classical boat and with a TransAquatis® WIG Craft.

The excellent ratio between speed and consumption makes WIG technology a natural answer to military and parapublic needs.

When it is interesting to cover a large area in patrol, to intercept a fast target, to project forces far and discreetly… The best answer is WIG Craft.

From / To	Time with classical boat (18 Knots)	Time with TransAquatis WIG Craft (100 knots)
Monaco / Bastia	6 h 15	1 h 07
Barcelona / Palma	5 h 46	1 h 02
Naples / Palermo	8 h 39	1 h 33
Palermo / Tunis	10 h 34	1 h 54
Doha / Dubai	11 h 33	2 h 05
Dubai / Abu Dhabi	4 h 03	0 h 44
Chicago / Norton shores	5 h 11	0 h 56
Toronto / Rochester	6 h 05	1 h 06
Detroit / Cleveland	6 h 35	1 h 11
Cleveland / buffalo	8 h 04	1 h 27

HISTORY

The WIG (Wing-in ground) effect, discovered by the Wright Brothers, was the subject of advanced work in the USSR during the Cold War.

After perestroika, even if Russians had real know how in WIG Technology, some people in Asia and the west understood that this technology had all the characteristics of a technological breakthrough for transport of the third millennium.

Several projects, civil or military, scientific or industrial, were born in the world and some of them are today already marketed.

During this time, a specific regulation was initiated by IMO (International Maritime Organization) defining a frame to design and use this new type of vessels.

In today's world, rules, analysis, competitors, some governments and more generally a large community of specialists and enthusiastic people, constitute the perfect environment to develop the WIG technology worldwide.

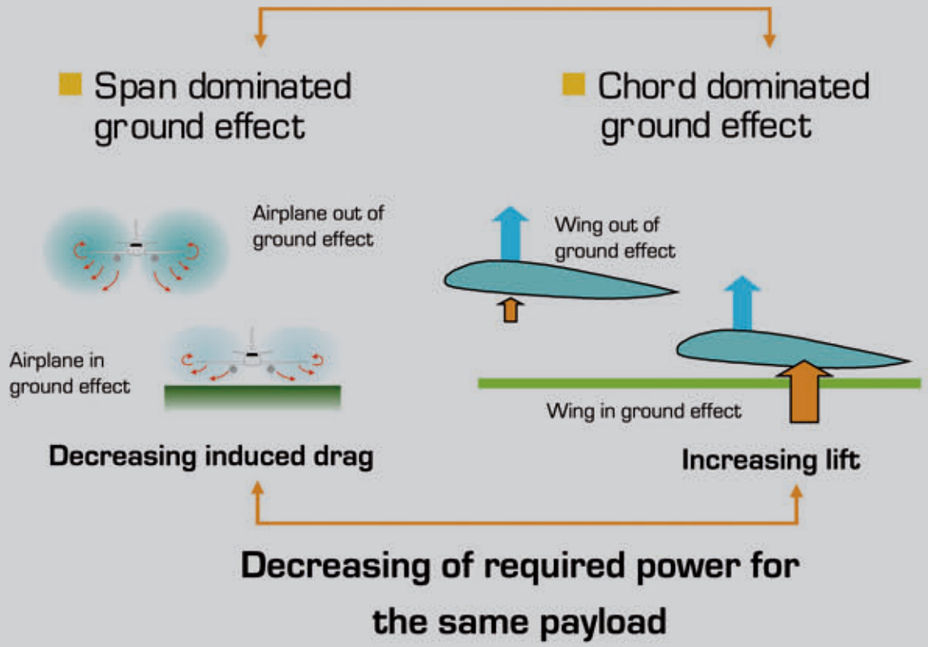
KM (Caspian Monster)
> 270 Kts - 500 Km/h

ORLIONOK
240 Kts - 450 Km/h

WIG CRAFT TECHNOLOGY

The benefits of WIG Technology is the result of the combination between two aerodynamic effects called Ground effect. The first well known by aircraft pilots, reduces the drag when the plane is near the ground and the second increases the lift. The combination of both decreases dramatically the needed power and so, consumption and pollution.

However, this second effect changes the repartition of aerodynamic loads, and, associated to the integration of high speed hulls constraints, require a specific design.



WIG CRAFT REGULATION

After discussion to determine if WIG Craft are boats or planes, the choice is definitely done.

Except in Type C, where WIG are more seaplanes than real boats, WIG are considerate to be BOATS.

With less limitation of use, Category B is the most interesting category, but some Type A WIG are today in service, taking advantage of a very simple design, and replacing advantageously hovercrafts or hydrofoils boats.

TYPE	OPERATING MODE	AUTHORITY CONCERNED
HSC (High Speed Craft)	**Fast boat** Use ground effect but keeping permanently contact with water	**IMO**
WIG Type A	**Ground effect boat** Cannot operate without ground effect	**IMO**
WIG Type B	**Ground effect boat** Can operate temporarily out of ground effect but staying under the security level fixed by ICAO : 150 meters	**IMO**
WIG Type C	**Ground effect craft** (boat / aircraft) Can operate permanently out of ground effect and over the security level	**IMO / ICAO**

TECHNOLOGY

The main objectives of our team was from the beginning to design a very safe and easyway to use a WIG craft.

A research program, partially financed by French government, allows us to determine the best compromise between aerodynamics, sturdiness of design and safety.

During these four years of research, helped by CFD calculation, experimentation and scaled models, and in partnership with some prestigious partners like ONERA (the French aerospace lab), we evaluated the stability and performance of several configurations, including some of several competitors, and our own innovative design.

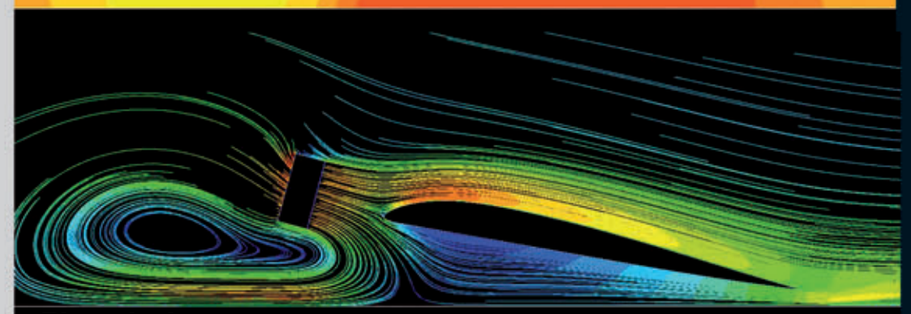
We define new options in term of control devices, control laws, sensors and inboard systems.

And we also define some unique design criteria in order to obtain a very safe configuration.

One of the main security aspects of TransAquatis® WIG Craft is the choice of twin engines with a sufficient power reserve, allowing to complete mission in case of one engine failure (OEI mode).

For example, the TransAquatis® T-6 is equipped with two 100 hp engines interconnected. This configuration is unique on the market and provides incomparable benefits in term of safety.

Pressure



Blowed wing

TRAINING PROCESS AND QUALIFICATION

Officers on a WIG craft should preferably have a base qualification attained under either the international maritime or aviation qualification systems. As defined in the Interim Guidelines for a WIG craft - MSC/Circ.1054, this qualification should preferably be marine qualifications. However, aviation base qualifications can be accepted if the candidate possesses the required knowledge and skills.

In addition to the base qualification, officers on a WIG craft should undertake training and have demonstrated appropriate knowledge and skills and the special qualification which takes into account the particular features of Type B WIG craft.

Future TransAquatis® officers should have satisfactorily completed a course of training provided in the TransAquatis® training center, located in Saint Mandrier (Var, South of France). This is the only authority authorized to issue the special qualification authorizing a pilot aboard of a TransAquatis® WIG craft.

At the issue of training, officers receive a 2 years periodic certificate, according to the requirements of the 1978 STCW Convention. This certificate must be renewed every two years, following a recurrent training course of control, which will be performed by an approved TransAquatis® training center.

ADDITIONAL ASPECTS

Type rating covers the following areas:

- WIG craft aerodynamics and hydrodynamics
- WIG craft structure, construction and maintenance
- WIG craft seamanship
- High-speed, low altitude navigation
- Displacement, transitional and planning modes
- Take-off and landing in various conditions
- Cruise flight in ground effect mode
- Ramping and amphibian mode (for amphibious WIG craft)
- Berthing and towing
- Distribution of weight (passengers/ cargo, inertia, and stability)
- Extreme situations
- Propulsions, engines and machinery of WIG craft
- WIG craft instrumentation (flight, navigation, communications, engines, etc.)
- WIG craft systems (fuel, electrics, hydraulics, air conditioning, plumbing, etc.)
- WIG craft life-saving and emergency systems and procedures
- Human factors in WIG craft operation (alertness, anticipation, risk awareness, etc.)

SAFETY, SECURITY AND USE ASPECTS

Sea conditions in cruise:

The sea condition do not impact directly the security of type B WIG Craft. Indeed, the type B WIG Craft can increase the flight level up to 150 meters (IMO Limitation). Strong weather conditions will involve a light increase of consumption by obligation to fly at a not optimized altitude, but this does not decrease safety.

Floating objects:

TransAquatis® travels without contact with the sea. consequently, it do not exist collision risk with floating objects, Cetaceans, small blocks of ice, and flying over marshy zones or sand banks are naturally possible.

Capacity to complete mission:

TransAquatis® technology offers an unique capacity to achieve the mission in one engine inoperative mode. Indeed, the needed power for takeoff is twice the cruising one. So, the power of only one engine is enough in cruise. An interconnecting device allows to maintain the cruising power on both propeller even with one engine failure, and so to complete mission and to land in perfect conditions in protected areas.

MAINTENANCE & GROUND HANDLING

Maintenance aspects:

All the mechanical parts are concentrated in the hulls and one access panel on each side is enough for daily maintenance operations and more. The folding wing device and major parts of flight controls are located in the same area in hulls, therefore inspection is a simple operation, and in particular directly from a pontoon. Only the inboard system is located in the fuselage to avoid risk of contact with water.

The engines are of reliable and strong technology and the design of each part take into account the constraints of uses.

Ground handling:

An under carriage can be fitted to the hulls to allow the ground handling and to go in and out off water by way of a single slope.

Harbor navigation and taxiing:

In harbor, the main engines are stopped. Auxiliary electrical motors allow taxiing without noise and in total security due to propellers stop.

COMPANY

OUR COMPANY

Located in the south of France, in the old aero-naval base of Toulon - Saint-Mandrier, our company benefits at the same time of an exceptional site and infra-structures perfectly adapted to WIG development and production.

Our numerous years of research in the WIG field and our partnership with research centers, design offices, specialists in several domains (composite manufacturing, inboard systems, power plant, energy, propellers…) offer the best way to develop and manage the production of TransAquatis® WIG Craft.

TRANS Aquatis®

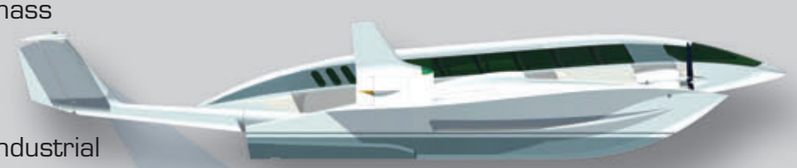
OUR STRATEGY

Our strategy is built around four steps, to manage the company growth as well as funding and partnerships. The two first steps are already launched.

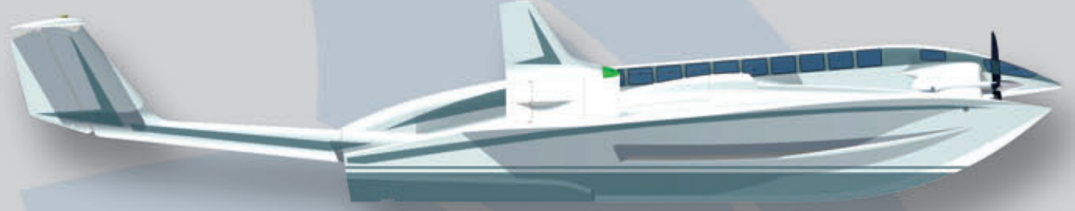
Step 1:
TransAquatis® T-6 development completion, prototype and sea trials. Homologation in Cat B, industrialization and mass production launching.

Step 2:
TransAquatis® T-6 military development completion, prototype and sea trials. Industrialization and mass production launching

Step 3:
TransAquatis® T-17 development (civil and military version), prototype and sea trials. Homologation in Cat B, industrialization and mass production launching.



Step 4:
In collaboration with industrial partners: TransAquatis® T-48 development (civil and military version), prototype and sea trials. Homologation in Cat B, industrialization and mass production launching.



TRANSAQUATIS PRODUCTS RANGE

TRANSAquatis® T-6

TWIN ENGINE LIGHT WIG CRAFT

T-6 is the first product of TransAquatis® Range.
This versatile WIG craft is mainly dedicated to taxi and corporate applications.
A military and parapublic version can be adapted from civil T-6. The T-6 military current applications are mainly homeland security and coast guard, due to a strong autonomy and large range capacity, but applications like emergency medical service or interceptions and special operations are also forecasted.

MAIN FEATURES

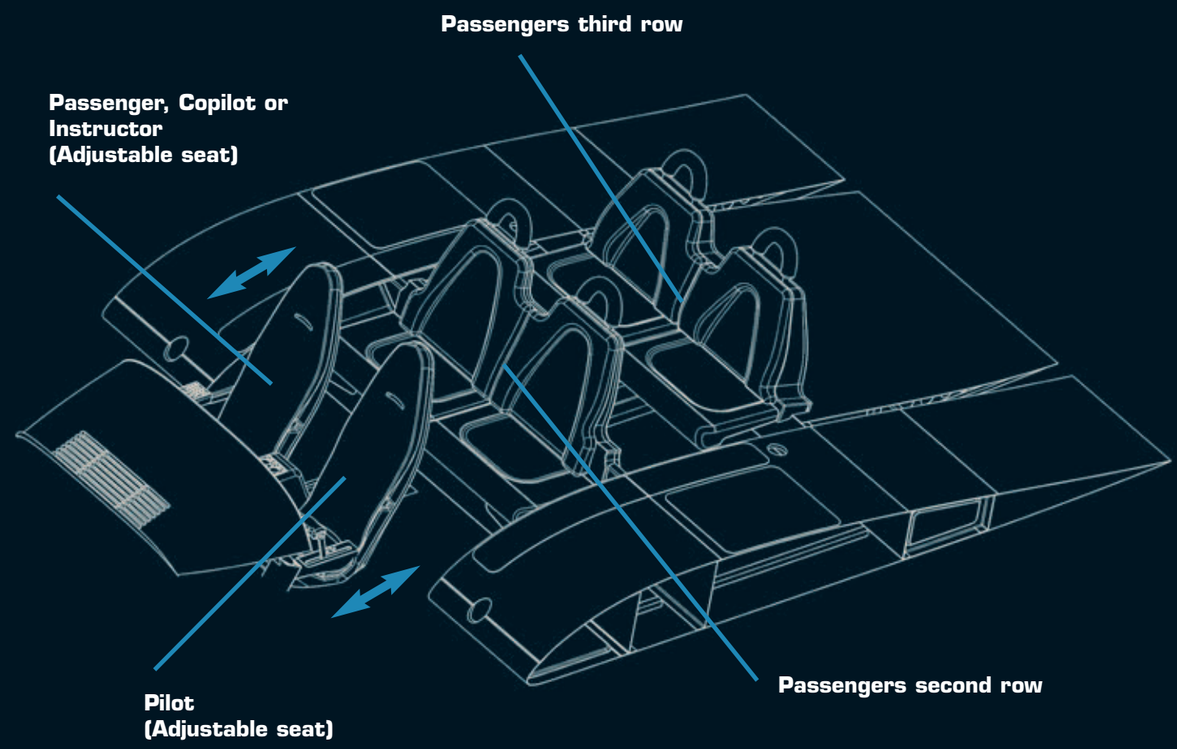
Seats:	**6**
Length:	**9.15 m/30 ft**
In flight width:	**9.77 m/32 ft 1 in**
Harbour width:	**4.50 m/14 ft 9 in**
Draft:	**0.22 m/8 in**
Height:	**1.56 m/5 ft 1 in**

CONFIGURATION

The cabin repartition in T-6 is in three rows of two.

The first row is dedicated to pilot and one passenger. In instruction mode, the second place is occupied by the instructor. The double control handles allow training with any standard machine.

The second and third rows are dedicated to passengers, with one door by passenger. The stability of the catamaran architecture allows passengers to walk safely on the main wings from cabin to pontoon. No skid surfaces are placed on the walking way.



INBOARD EQUIPMENT & SYSTEMS

A resolutely modern inboard system offers at the same time, safety and comfort in use.

In addition to conventional instruments , the instrument panel is equipped with two large screens. One 12 " screen (15 x 27 mm) is dedicated to flight information (speed, flight level, limitations…). One 18 " screen (23 x 40 mm) located in the center of the instrument panel, displays all the navigation information (Maps, Radar, AIS…).

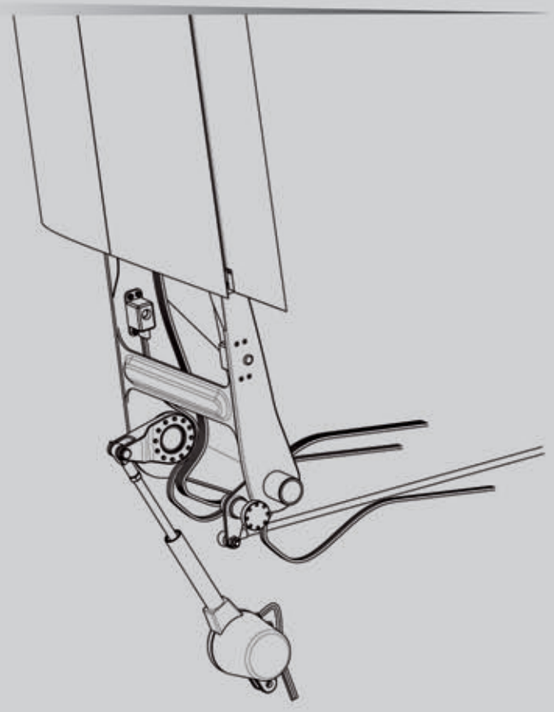
The center console is dedicated to communication devices, engine panels, and failures indicator.

Due to a very open system, the mission can be prepared at home with a simple laptop and the data transferred in the T-6 just before starting.

FOLDING WINGS

To allow putting the hulls directly in contact with the pontoon and so facilitate the boarding, the external wings are folding.

The folding action is powered by electrical actuators and a locking device avoids interpretive folding. The pilot action to fold external wings is possible only with main engines off, to avoid human fault. So this system, perfectly safe, offers easy usage of TransAquatis® T-6.



TRANSAquatis® T-6

TECHNICAL & PERFORMANCE FEATURES

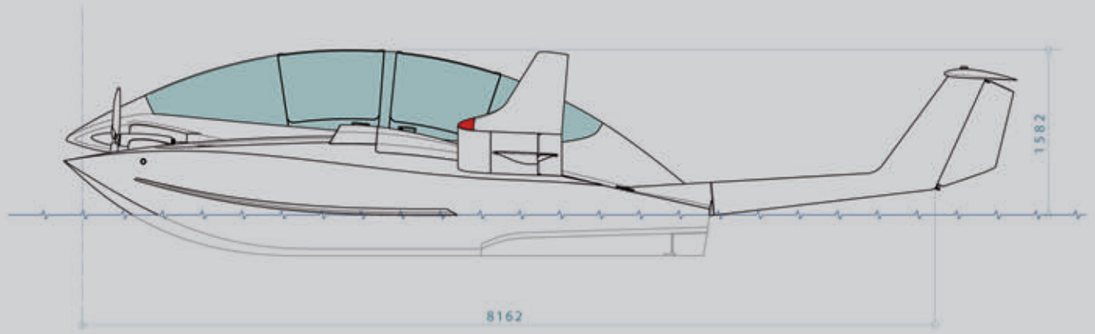
Optimal altitude: 1.80 m / 6 ft
Max altitude: 150 m / 500 ft
[IMO Limitation]

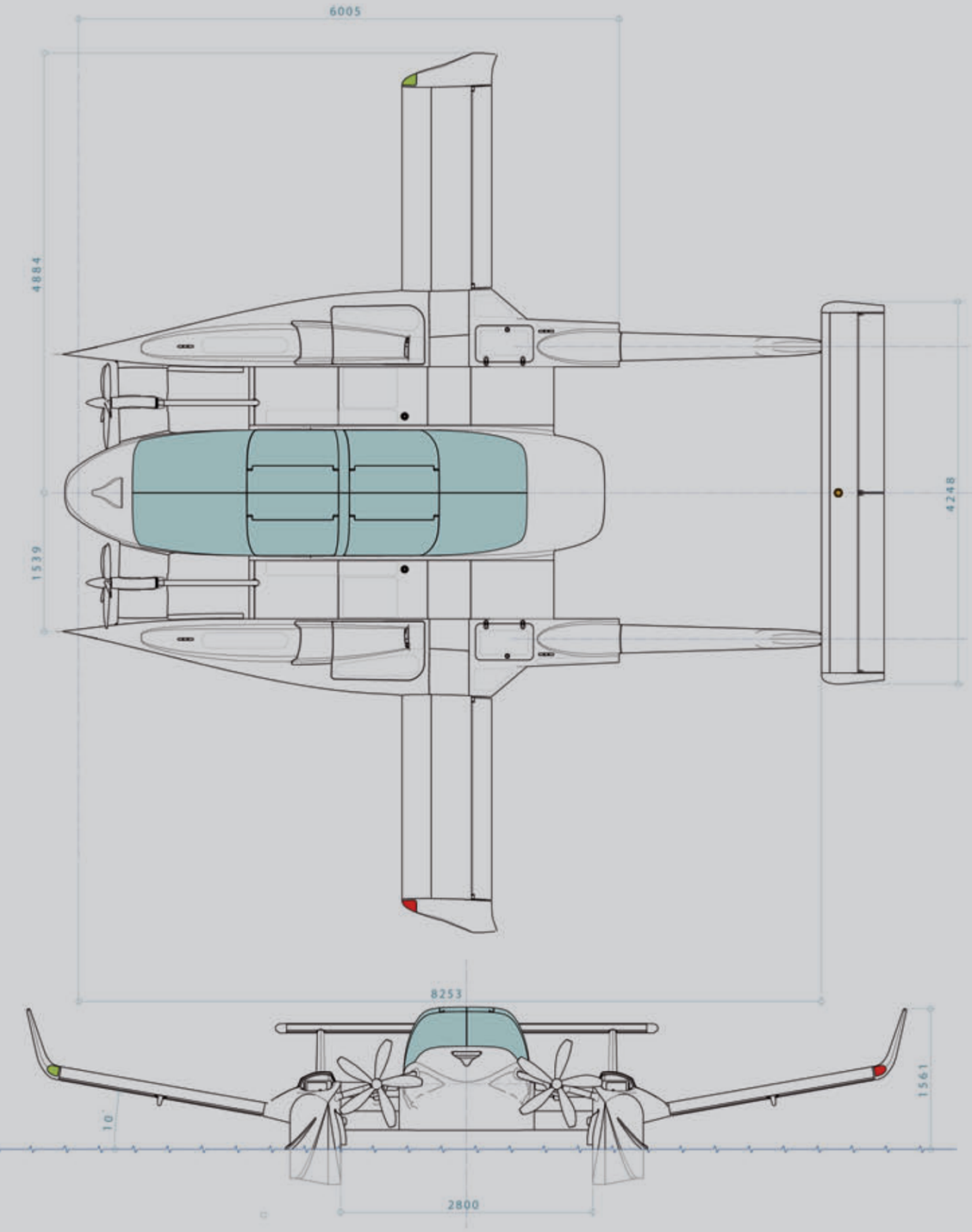
Cruise speed: 175 Km/h / 95 Kts
Max speed: 210 Km/h / 115 Kts

Safety: Capacity to complete mission with one engine inoperative.

TransAquatis T-6 - TR122 E Version
Engines: 2 x 100 hp Unleaded

Empty weight: 750 Kg / 1 400 lb
Max. Weight: 1 400 Kg / 3 086 lb
Range at Max. Weight:
1 345 Km / 726 nm





TRANSAquatis® T-6

MILITARY & PARAPUBLIC VERSION

TransAquatis® T-6 in TR522 version, is well adapted to several military missions or parapublic missions and typically:
Police, coast security and border control, rescue, EMS (Emergency Medical Service), Homeland security, coast guard, mine clearance, ASW (Anti Submarine Warfare) & surface warfare, patrol, interception, protection against traffickers and piracy…

For this, specific equipment can be added to a standard version, itself equipped with all capabilities like reinforced parts and structure for weapons. In terms of cabin arrangement, the second and third seats rows can be eliminated and replaced by specific mission equipments, weapons fixed parts or fuel.

The main military missions equipments are:

Machinegun from 12.7 to 20 mm
Specific radar and FLIR
Torpedoes (2 x 230 Kg each)
Sonobuoys
Sea to Sea missiles
(2 to 4 x 100 Kg each)
Specific detection systems and sensors
Additional fuel tank
…

TR522 with 12.7 mm machinegun

TR522 with 230 Kg torpedoes

TR522 with radar and sea to sea missiles

TRANSAquatis® T-17

TWIN ENGINE VERSATILE WIG CRAFT

TR 142
CIVIL VERSION

Typical missions:

Passengers transport, leisure, diving, freight and fast shipping, perishable goods transport, Offshore oil-rigs, archipelagos link…

MAIN FEATURES

Passengers:	15 to 20
Crew:	1 / 2
Length:	19.72 m / 64 ft 8 in
In flight width:	19.54 m / 64 ft 1 in
Harbour width:	9.06 m / 29 ft 8 in
Draft:	0.70 m / 2 ft 3 in
Height:	2.80 m / 9 ft 2 in

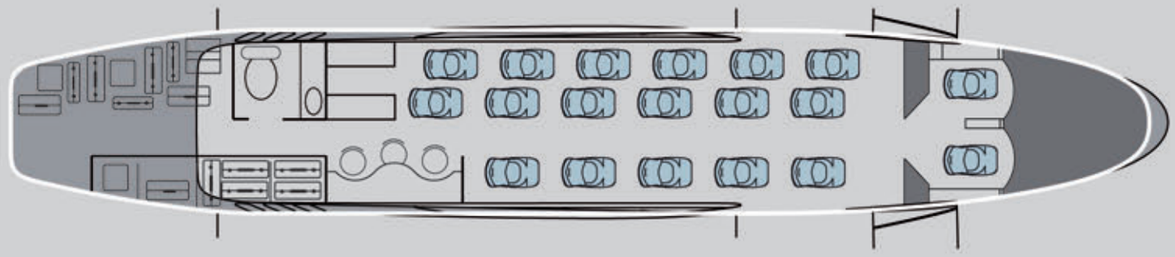
TECHNICAL FEATURES

Optimal altitude:	3.40 m / 11 ft
Max altitude:	150 m / 500 ft [IMO Limitation]
Cruise speed:	195 Km/h / 105 Kts
Max speed:	230 Km/h / 125 Kts
Engines:	2 x 550 hp Diesel
Empty weight:	3 218 Kg / 7 094 lb
Max. Weight:	5 800 Kg / 12 787 lb
Range at Max. Weight:	1 903 Km / 1 028 nm

Safety: Capacity to complete mission with one engine inoperative.

CONFIGURATION

Typical 17 passengers configuration.



TR 542 MILITARY & PARAPUBLIC VERSION

Typical missions:

EMS (Emergency Medical Service), police, coast security and border control, rescue, …

Homeland security, coast guard, ASW & surface warfare, patrol,

Special operations, protection against traffickers and piracy…

TRANS Aquatis® T-48

TWIN ENGINE MEDIUM WIG CRAFT

TR 162 CIVIL VERSION

Typical missions:

Passengers transport, leisure, diving, freight and fast shipping, perishable goods transport, Offshore oil-rigs, archipelagos link…

MAIN FEATURES

Passengers:	38 to 50
Crew:	2 / 4
Length:	36.82 m / 121 ft
In flight width:	39.06 m / 128 ft
Harbour width:	18.28 m / 60 ft
Draft:	1.35 m / 4 ft 5 in
Height:	5.62 m / 18 ft 5 in

TECHNICAL FEATURES

Cruise speed: 210 Km/h / 115 Kts
Max speed 250 Km/h / 135 Kts

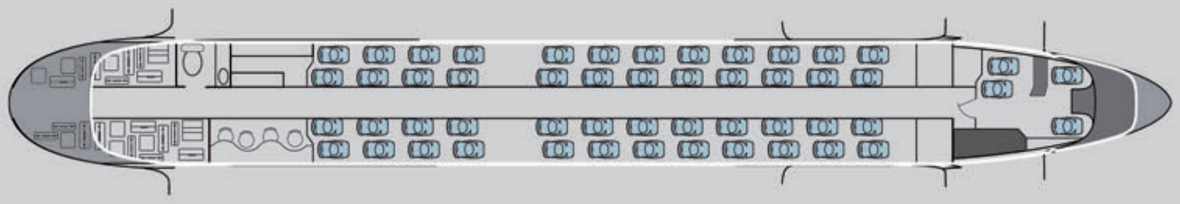
Engines: 2 x 2 380 hp Diesel

Empty weight: 10 640 Kg / 23 457 lb
Max. Weight: 16 240 Kg / 35 803 lb
Range at Max. Weight:
2 074 Km / 1 120 nm

Safety: Capacity to complete mission with one engine inoperative.

CONFIGURATION

Typical 48 passengers configuration.



TR 562 MILITARY & PARAPUBLIC VERSION

Typical missions:

EMS (Emergency Medical Service), rescue…
Patrol, special operations, logistic transport…

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