

SAVONIA

University of Applied Sciences

THESIS – BACHELOR'S DEGREE PROGRAMME
CULTURE

LA-8 SEAPLANE INTERIOR AND EXPERIENTIAL DESIGN

Revitalizing an old way of travelling

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THESIS Abstract

This thesis presents the unique LA-8 amphibious aircraft interior concept, which was produced in collaboration with Italian and Finnish universities by Jekta Switzerland SA. It can be implemented for the comfortable movement of private and corporate clients. These clients often have to move within a radius of up to 3200 kilometres and to areas with no aviation infrastructure. The operation of this seaplane is possible in both fresh and salty tropical climate water.

The concept of an amphibious aircraft includes a VIP version for business flights, and an adventure version for customers focused on outdoor activities in hard-to-reach places. The developed interior design should meet the client's needs and provide individual travel experiences depending on the chosen aircraft configuration and customer preferences. Moreover, it should make a unique trade offer to persuade potential clients in favour of the LA-8 seaplane over its closest competitors on the market.

The innovative concept of the LA-8 seaplane was developed through consumer market research, benchmarking, ergonomics and aircraft cabin components research, and by determining user experience based on an analysis of the estimated set of users, interviews, function analysis, unique research of the amphibious aircraft compared to the customer and competitors in the market.

Savonia university of applied sciences -

FIELD OF STUDY

Culture

DEGREE PROGRAMME

Degree Programme in Design

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TITLE OF THESIS

LA-8 Seaplane Interior and Experiential Design

DATE

1.12.2022

PAGES

86

CLIENT ORGANISATION /PARTNERS

Jekta Switzerland SA

KEYWORDS

#aircraft #seaplane
#interior #concept
#design

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1. Introduction -

1.1 DESCRIPTION OF THE BACKGROUND AND STARTING POINT

This thesis presents the unique LA-8 amphibious aircraft interior concept, which was made in collaboration with Italian and Finnish universities for Jekta Switzerland SA.



FIGURE 1. Torcolacci 2021

The era of the seaplane is now a subject of the past, and there have been very few aircraft designed specifically to land on water in the last fifty years. The majority of aircraft manufacturers specialize in air transportation. In order to meet the needs of customers, aircraft are available in a variety of shapes and sizes. Nevertheless, there is still room to develop new models, which cater to a select clientele based on their lifestyle and social status. In order to travel to hard-to-reach places without changing transport types during the trip or wasting time on the road, a new amphibian aircraft was developed.

A plane's journey from a drawing to a serial production aircraft takes many years and includes engineering and design work both inside and outside the aircraft. LA-8 is a well-designed two-engine amphibian aircraft that has the advantage of being able to land on a variety of runways. It requires 400 meters of flat field or lake surface for take-off and landing, and its cruising speed is 300 km/h. Including the pilot, six people can travel comfortably over a distance of approximately 3000 kilometres. The distinctive features of the LA-8 aircraft are the boat-like bottom and the existence of landing gear.¹ This enables the aircraft to stay in freshwater while fishing, or to land in a meadow for hunting, or for any other purpose.²

1 Aerovolga s.a.

2 Aerovolga 2022

Introduction -

1.2 SIGNIFICANCE OF THE THESIS AND ITS LINK WITH WIDER CONTEXTS

In the wake of the pandemic, private jet travel became the new standard of luxury travel. The results of an internal study indicated that 79% of ultra-high-net-worth individuals (UHNWIs) had travelled by private jet more often than before the COVID-19 pandemic.¹ Since June 2020, 71% of bookings have been made by passengers who have not previously used business aviation services.² As a result, attitudes toward travel have changed since the pandemic, and a major focus of aviation, in the long run, will be on travellers seeking exclusive travel opportunities, restorative natural immersion, and wellness experiences throughout the world.

COVID-19 caused people to choose smaller, more personalized transportation options. Compared with commercial flights, exposure to potential pollutants is significantly reduced on private flights. This is because they have an average of 20 touchpoints in comparison to 700 on commercial flights.³ As a result, private aviation has the potential to serve as a more sustainable mode of transportation as well. In addition, the private aviation industry supported passengers and businesses during the pandemic, enabling maximum access to travel services around the world. Consequently, it is regarded as a more reliable and safer alternative to other modes of transportation.⁴

1,2,3,4 Liang-Pholsena 2021

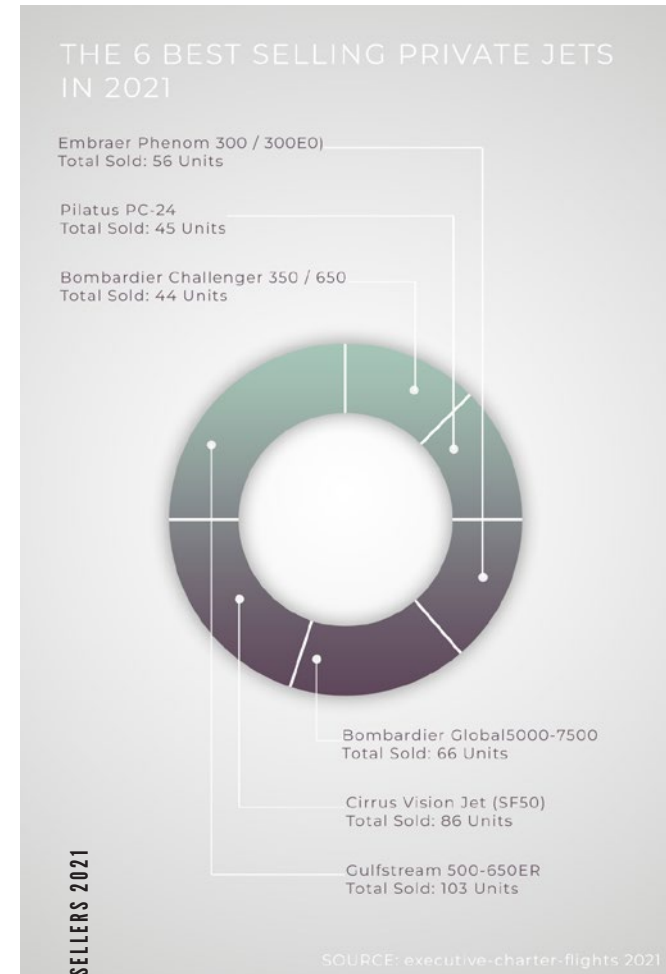


FIGURE 2. Björn 2022

Introduction -

1.3 PURPOSE, GOALS, AND RESEARCH QUESTIONS

This study aims to develop interior concepts for both the VIP and Adventure configurations of the LA-8 aircraft. VIP stands for a very high-end version of a cabin, which provides privacy, comfort, and safety for 1 or 2 pilots and, respectively, 4 or 5 passengers. In order for passengers to feel safe on board, they must have their own space and be able to interact easily with other crew members. A configuration suitable for adventure should be convenient and practical for use in hot climates. Effective design must meet the needs of travellers, be associated with adventure, and evoke feelings of freedom and excitement in the traveller. The seat design should also be developed in accordance with the concepts of VIP and Adventure configurations and consider the preferences of the intended user groups.

Keeping the interior design of LA-8 simple, but functional is the goal of the concept. The authors understand interior design as a combination of technical and visual solutions, which provide a new generation of aircraft. Additionally, the thesis provides an overview of passenger accommodation and entertainment on board the LA-8.

Additionally, the thesis aims to enhance professional skills in the area of industrial design, as well as expanding the authors' perspective and gaining experience in conceptual design, such as improving research, sketching, modelling, rendering, and conceptualizing skills. It was also imperative for the authors to acquire comprehensive knowledge regarding the aviation industry, in particular seaplanes and small aircraft, as well as relevant trends and innovations.

GOALS

This project aimed at clarifying and creating two interior concepts that are significantly different in content and meaning, namely one concept that would provide luxurious accommodations for passengers in premium class cabins, and one concept that would enhance the travel experience and motivate people to take part in adventures. Designed based on research studies, the VIP and Adventure concepts of the LA-8 seaplane provide a comfortable and ergonomic environment for long flights of up to three and a half hours. This study aims to improve the quality of LA-8 seaplane cabins in order to meet all modern aviation standards for quality and safety.

RESEARCH QUESTIONS

- How can the VIP version of the LA-8 seaplane accommodate six passengers in the most ergonomic manner?
- In order to accommodate the maximum number of passengers and all equipment on board, how can the LA-8 Adventure configuration be ergonomically configured?
- In what way is the interior design of the LA-8 cabin intended to reflect indoor and outdoor activities?
- What makes the seaplane the most unique option for high-budget travellers in comparison with other types of aircraft?
- What is the significance of ergonomic seating and how should it be designed to suit both seaplane configurations?

2. Research -



2.1 SEAPLANE

FIGURE 3 Pxhere 2017

2.1 SEAPLANE

"A seaplane is a type of airplane that can take off or land on water."¹

1 Collinsdictionary s.a.

Seaplanes are very versatile aircraft that are ideal for short-range travel and can be used to visit various locations intertwined with nature.¹

Air transportation can be improved through the use of amphibious aircraft. This is because they do not require runways and are able to land on rivers, lakes, and coastlines, thus reducing travel time.

Seaplanes cater for the most adventurous and curious passengers, for those who want to visit areas of nature that are difficult to reach by land.²

Tourists from all over the world dream of flying aboard seaplanes, especially if they are taken to remote and exotic locations around the globe, which makes them even more appealing. A seaplane flight is a unique experience. The pleasure of flying in the sky and sailing on the water can both be experienced during the same flight, which is its exclusive advantage.

1 McMahon 2022

2 Gimeno & Endrest 2021

According to technological characteristics, seaplanes are typically split into two groups: floatplanes (FIGURE 4) and flying boats (FIGURE 5).

FLOATPLANE

"A floatplane is a seaplane having landing gear consisting of one or more floats";¹

1 Collinsdictionaryb s.a.



FIGURE 4. Collins s.a.



FIGURE 5. Articleseahorse 2018

SUBHEAD

"A flying boat is a seaplane in which the fuselage consists of a hull that provides buoyancy in the water";¹

1 Collinsdictionary s.a.

Flying Boat LA - 8



2.1.1 FLYING

FIGURE 6. Björn 2022

2.1.1 FLYING BOAT LA-8

A distinguishing feature of the LA-8 aircraft is its boat-shaped bottom and the existence of landing gear.¹

1 Aerovolga 2022

LA-8 was designed as a flying boat. Underwing floats and landing gear provide the aircraft with stability on the water up to the height of 0.5 meters of waves.¹ Therefore, the aircraft is suitable for fishing in freshwater, or for landing in the meadow for hunting or other purposes.

Using a folding ladder, passengers and crew access the cabin through the main door at the tail of the fuselage.² This ladder can be used underwater or by swimmers to climb back aboard.³ The standard set of necessary equipment for aircraft operation consists of tools for securing the aircraft including tie-down ropes and a boat hook, towing and anchor ropes, moorage ropes, and an anchor.⁴ The aircraft has a composite airframe.⁵ The details as well as the internal metal knots are made of aluminium alloys and steel that are coated with a strengthened anti-corrosive coating. The chassis is made of corrosion-resistant steel.⁶ The LA-8 is an amphibian aircraft that has a three-point chassis with forward support and a high fixed wing. The aircraft is equipped with a system designed to maintain horizontal flight in the case of one engine failure.⁷

1,2,3,4,5,6,7 Aerovolga s.a.

Around the Polar Circle -

FACTS

- 20K 20,960km
- 10K Over 10,000 nautical miles
- 42 Forty-two days
- 9 Nine countries
- 7 Seven persons



FIGURE 7. Авиация России 2018

2.1.2 AROUND THE POLAR CIRCLE

The expedition started on 3 July from Krasny Yar airfield in Samara. The route includes nine countries and over 10,000 nautical miles, which pilots flew for the first time ever in Arctic conditions in three amphibious aircraft (two LA-8 and one Borey).¹ The scientific mission is to investigate the ecological condition of the northern territories and to study climatic changes.²

For 42 days the amphibian planes flew 20,960 km. Much of the route was in the Far North, both in Russia and in the USA and Canada.³

In Canada, the crews encountered problems with fuel and inclement weather, and in Greenland, with low clouds and fog.⁴

The expedition route, over 20,000 km long, ran through Russia, the American state of Alaska, Canada, Greenland, Iceland, the Faroe Islands, Norway, Sweden, and Finland. The expedition then returned to the Samara region via Veliky Novgorod, Pskov, and Yaroslavl.⁵

1,2,3,4,5 Авиация России 2018

History -

2.2 HISTORICAL BACKGROUND

Seaplanes represent a fascinating chapter of the technical and human progress of aviation.¹

1 Velaemotore 2020

Seaplane history has been intertwined with the history of aircraft since the beginning of aviation. March 1910 marked the first successful attempt to take off from water.¹

It was not due to the romantic notion of combining water and sky in a single hybrid machine.² Instead, it was much more practical considerations that led to the invention of the seaplane.³ At the beginning of the twentieth century, a few airfields were equipped with landing strips, and among those few, there was only a strip of lawn for landing.⁴ It is no coincidence that many landings result in the aircraft being rolled over when a chassis wheel slips into a deeper hole.⁵ It was therefore advantageous to take off and land on the water for two primary reasons:

- No fixed structure was needed;⁶
- The manoeuvre was safer if the environmental conditions were favourable;⁷

1,2,3,4,5,6,7 Velaemotore 2020

Of course, these advantages come at a price.¹

The chassis had to be replaced by a bulky floating system, whether it was represented by one or more floats with a particular shape fixed under the wings or the fuselage or incorporated into the body of the plane giving the cabin an appropriate shape.²

The First World War forced the industrial machine to develop rapidly and adapt to war life.³ The planes were transported by ships and lowered into the sea with a crane.⁴ After the war, technical development resumed with racing vehicles for participation in the Scheider racing, and with increasingly larger aircraft for commercial aviation.⁵ The Do-X was the largest seaplane built by Claude Dornier in 1926.⁶

1,2,3,4 Velaemotore 2020

5,6 NFNPA Archaeology s.a.

Dornier Do X



FIGURE 8. Bundesarchiv 1932, CC BY-SA



FIGURE 9. Bundesarchiv 1929, CC BY-SA

EXTERIOR

Dornier Do X



FIGURE 10. Bundesarchiv 1930, CC BY-SA



FIGURE 11. Bundesarchiv 1930, CC BY-SA

INTERIOR

GHG Emissions -

2.3 AVERAGE GHG EMISSION OF DIFFERENT LONG-DISTANCE TRANSPORT

The transport sector has a significant influence on the processes of greenhouse gas emissions on the planet.

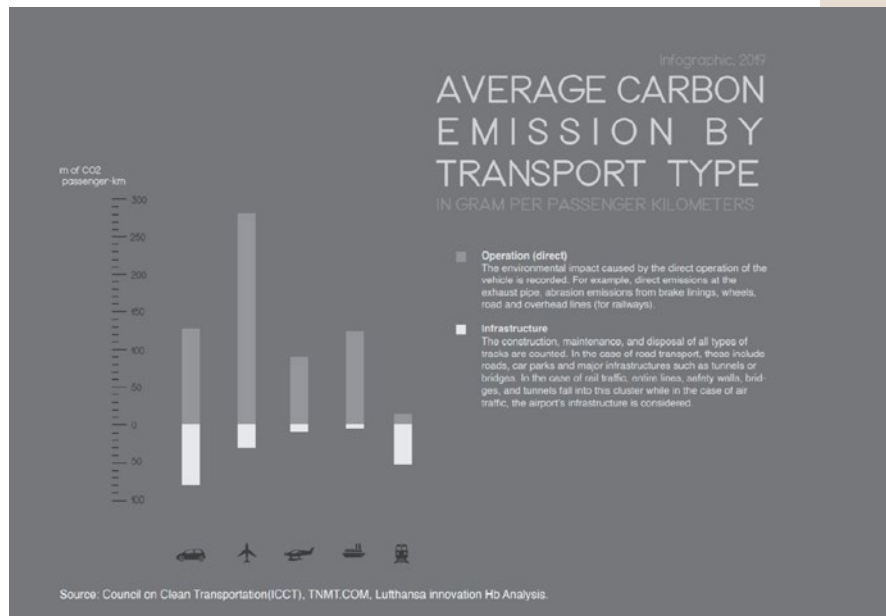


FIGURE 12. Torcolacci 2021

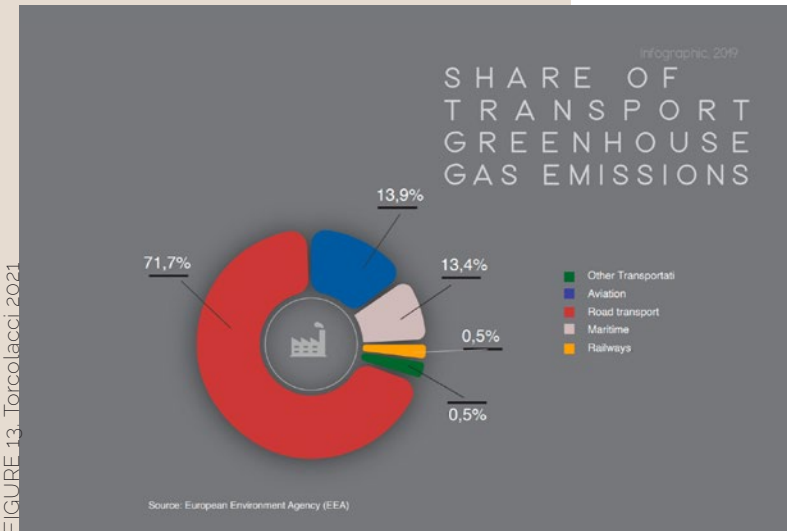


FIGURE 13. Torcolacci 2021

CARBON FOOTPRINT

Transport is a major contributor to CO₂ emissions, with wheeled transport contributing 71.7%, air and sea transportation each contributing 13%, and rail transportation contributing 0.5%.¹

1 Eea.europa.eu s.a.

GHG Emissions -

OVERVIEW

Emission data from the European Environment Agency (FIGURE 13.) only consider fuel emissions and do not take into account emissions generated by transport infrastructures. Not having a clear picture of the CO₂ emissions that are released, the authors are left to think that transport infrastructure, being more efficient and effective than road transportation, is a way to reduce climate change. But its development and maintenance are the leading causes of CO₂ emissions.¹ Emission data are provided in grams of CO₂ per passenger-kilometer (gCO₂/km), indicating the environmental impact caused by the direct operation of the vehicle, as well as the construction, maintenance, and disposal of all tracks. According to the infographic, the aviation sector ranks second in CO₂ production (FIGURE 13.) and first in terms of pollution in gCO₂/km (FIGURE 12.).

1 TNMT 2021

At the level of direct operation, it is among the most polluting. Infrastructure does not consume as much energy as railways and roads. Based on the infographic, infrastructure contributes to environmental pollution. It would be better to make short-distance journeys with means of transport that do not need infrastructure to land and take off.

The seaplane is a possible alternative for short distances, consumes less than an aircraft, and does not need significant infrastructure for take-off and landing, being a universal vehicle that can land on lakes, coastlines, and grassy slopes.

3. Marketing Research -

3.1 TRENDS

The research analysed information provided by luxury travel companies that specialize in eco-tourism: Jacada Travel, PURE Life Experiences, and Ultima Thule Lodge.



FIGURE 14. Volk 2019



FIGURE 15. Darnv, 2017

OVERVIEW

All the trips listed by the above-mentioned travel agencies are personalized, authentic, and follow responsible travel principles. Among the most common forms of adventure travel are travelling to remote and wild destinations, marine adventures, safaris, family trips, experiential trips, and gastronomic routes. It would be interesting to figure out the favourite luxury adventures that are possible to realize by seaplane and whether they are even more convenient for high-budget travellers.

Trends -

3.1.1 ADVENTURE TRENDS

SHORT AND INTENSIVE VACATIONS

Career, social life, and family responsibilities consume people's lives like never before, and many people are finding it difficult to set aside a week or two for themselves.¹ The frenetic timetable of Americans and Chinese pressures them to visit lots of places during their brief holidays.² While these workers have a lot of money to spend, they have limited time to travel compared to Europeans.³ The trend of squeezing as much as possible into two or three days is very popular on the Chinese travel market. Nowadays, it has become easier to travel in a relatively short period of time, if budget is not a problem, and modern air companies provide travellers with various services that can meet any client's requests.

Seaplanes are especially suitable for short and intensive trips, because they significantly save travel time, as there is no need to change transport types during the trip or to plan trips considering airports and other aviation infrastructures. Amphibian aircraft is the most suitable for luxury travellers who are seeking a way to make their journeys less difficult.

1 Trip-withus 2020

2,3 Endres 2021

MULTI-COUNTRY TRIPS

Multi-country trips are a new trend in luxury travel. There is a notable increase in voyagers planning trips to see two neighbouring countries or taking off to points scattered all over the globe within a single holiday.¹ Occasionally, it is a combination of cities and countryside, or it can be several radically different cultures that are located close to each other.²

1,2 Trip-withus s.a.

TRAVELING IN A GROUP

The luxury traveller is still planning trips with groups of like-minded friends to reunite and explore a specific common interest, whether it is hunting, scuba diving,¹ shallow water fishing, or outdoor explorations that can be accomplished with an amphibious aircraft. Luxury travellers prefer to celebrate special events and participate in custom-designed private tours. According to a TripAdvisor survey, there is an increasing trend towards family-friendly trips to celebrate a specific occasion or milestone, some examples of which might include a memorable birthday or a special anniversary or even a luxury date with a marvellous lunch somewhere out in the mountains.²

1 Trip-withus 2020

2 Endres 2021

Trends -

SUSTAINABILITY

"Environmental sustainability will be the mark of luxury as we move into the future, with discerning customers demanding that the businesses they patronize do everything possible to mitigate their impact".¹

Luxury travellers are increasingly searching for eco-friendly companies. As a result of the pandemic, travellers are changing their mindsets, and sustainable travel is becoming more popular.² It seems ecotourism is moving from an expensive niche market to a new standard.

The industry and its customers are beginning to realize that the future of this business will be cut short without attention to the environmental impact of its activities. A sustainable tourism approach involves engaging travellers and the travel industry as a whole in the support of the environment, climate change, and economic development goals for communities affected by tourism.³

As a result of previous studies on the environmental impact of long-distance transportation, amphibious aircraft are considered to be a more environmentally friendly option, as they emit a lower amount of carbon dioxide and less pollutants than commercial aircraft. As a result, seaplanes might be more appealing to this group of customers who are environmentally conscious. Perhaps if everyone was able to afford it, and they all began using amphibious aircraft for short-distance travel, the carbon footprint might be reduced.

1 Shankman 2017

2 Hederer 2022

3 Stone 2022

FOOD-CENTRIC TRAVEL

Due to their higher income levels, luxury travellers place a greater emphasis on food-oriented travel, which goes beyond Michelin-star restaurants.¹ The food-centric travel industry can offer cooking classes taught by celebrity chefs, wine-tasting experiences in wineries throughout the world, and unique farm-to-fork restaurants.² Food tourism is more than a meal: according to Melanie Endres's interview, a culinary experience, especially in Italy, is something many people desire.³

Food tourism is more than just a meal.⁴ Many people value a culinary experience, especially when they travel to Italy.⁵ The combination of wine tastings, coffee tastings, champagne tastings, and everything related to food, but in a difficult-to-reach location, has a special appeal.⁶ Travelling by road in Argentina, for instance, will take a long time.⁷ However, Argentina is renowned for its delicious national cuisine and is definitely worth a visit. In this case, seaplanes offer faster stops and give clients the opportunity to experience a unique culinary experience in a foreign country without needing to drive long distances.⁸ This is always a highlight for wealthy people.

1,2 Trip-withus 2020

3,4,5,6,7 Endres 2021

Trends -

EXPERIENTIAL TRAVEL

A generation of millennials is reshaping the luxury travel industry by demanding authentic experiences.¹ They are looking for authenticity which lies in local cultural traditions and the environment.

According to statistics, 72% of millennials prefer to invest their money in experiences rather than material implications.² That is why luxury travellers increasingly prefer to take advantage of local guides and opportunities to immerse themselves in specific areas of interest.³ For the money they spend, they expect more than just comfort.

Luxury travellers want to travel where no one else can. A lot of people are looking for exclusive experiences, like meeting unique folklore groups, or meeting artists, painters, designers, or, in some cases, unusual individuals.⁴ Having the opportunity to meet celebrities, idols, or famous chefs can enhance the appeal of an itinerary.⁵

1,2,3 Editorial Team 2021

4,5 Endres 2021

WOW-FACTOR

In order to impress themselves and their friends on social media, high-net-worth travellers look for extraordinary details and experiences¹, such as staying in an ice hotel in Sweden, renting an underwater villa in the Maldives, renting a treehouse in Thailand, or travelling around the world by seaplane. On social media, such visually unique itineraries look outstanding.

1 Luxury Columnist 2022

REMOTE AND UNDER-THE-RADAR DESTINATIONS

The Skift survey indicates that 65% of travellers would rather experience something unique during their vacation rather than return home feeling rested and relaxed.¹ The destinations themselves are the most telling.

A growing number of travellers with a higher budget are seeking relatively unknown destinations or those where the local culture and environment seem relatively untouched by the tourism industry.² Like remote Altai (FIGURE 14.) or Laos (FIGURE 15.). It may be impossible to travel there by road, due to a lack of road and air transportation infrastructure. For this purpose, amphibious aircraft are even more appropriate.

1 Luxury Columnist 2022

2 Trip-withus 2020.

The travel market's offers partially or completely coincide with the logistic capabilities of the LA-8 aircraft. In this way, travel companies are able to successfully implement it in the field of tourist air travel. In some cases, it may even improve the quality of the offered programs by replacing road transportation, avoiding airports, and decreasing travel time. In addition, the integration of amphibious aircraft into tourism allows agencies to broaden their range of services and enhance their luxury tours with new options and opportunities. Additionally, compared to private jets, there is an element of exclusivity and an exciting sense of adventure that makes it so attractive.

Marketing Research -

3.1.2 EXPERIENTIAL TRENDS

In order to increase their user base, brands are implementing new technologies and innovative ways to organize travel experiences.



FIGURE 16. Pilar 2018



FIGURE 17. Clip from YouTube video, service

OVERVIEW

Travel brands use new technologies and innovative methods to make the travel experience unique and sophisticated for a wide range of consumers who want to enjoy nature using environment-friendly technologies.

Luxury quality standards include modern and advanced designs, as well as trends towards clean colour palettes and rich and interactive experiences through virtual and augmented reality experiences, air gesture control, and assistive technologies.

Trends -

HUMAN-CENTRED TECH

Implementation of human-centred technology has become one of the most significant trends. Being able to control lights, temperature, and electronics with a single smartphone app is a welcome innovation for the luxury segment of customers.¹ Individuals with high budgets expect to experience an enhanced level of service through the latest technology. Fundamentally, this refers to using technology in such a way as to facilitate clients' attainment of their goals and needs in the most efficient manner possible.

1 Trip-withus 2020

FIRST-CLASS EXPERIENCE

Luxury-budget travellers are unwilling to compromise on the comfort of their accommodations.¹ A growing number of people are seeking extra touches in every aspect of their lives. This includes spacious moving areas, extra comfortable seats, premium leathers, exclusive detailing, excellent ergonomics, extra safety, and flexible services. Those who can afford it may find that the enhanced comfort and exclusive perks of first-class travel are well worth the higher expense.

1 Trip-withus 2020

BUILD-IN ACCESSIBILITY

Accessibility should get more attention in design. In line with the World Health Organization's estimate that 15% of the world's population has a disability, businesses and services should increase accessibility, since these features can benefit not just people with disabilities, but other groups as well.¹ The principles of design for accessibility, usability, and integration are closely related, and their guidelines, standards, and regulations are very similar.²

1,2 Malviya 2020

FRICTIONLESS TRAVEL

Frictionless travelling is a combination of smart technologies that provide travellers with a seamless travel experience and necessary information in real-time, and also with the safety of flight tracking and real-time incident alerts.¹ In addition to enhancing the comfort and safety of passengers, technology simplifies the tasks of airport and airline personnel, as well as immigration and security officers.² As a result of a more predictable schedule and reduced gridlock, passengers have less stress and more time to rest.³

1 Luxury Columnist 2022

2,3 IDEMIA 2022

FLEXIBILITY OF TRAVEL

Due to the COVID-19 pandemic, luxury travellers are looking for flexibility and a can-do attitude for the extra money.¹ No-fee cancellations, warranties, early check-in, late check-out, and flexible itineraries are in demand. Such flexibility reassures travellers that they will not be affected by force majeure situations.

1 Luxury Columnist 2022

FOCUS ON INCLUSIVE DESIGN

Truly inclusive design considers the ages, races, ethnic backgrounds, and needs of people rather than simply designing to fit stereotypical males or females.¹ Inclusive product experiences foster a sense of belonging among users by understanding their backgrounds and abilities.²

1 The BIO Agency 2022

2 Joyce 2022

CREATING RESTRAIN SIMPLICITY

Yearning for simplicity is the manifestation of the 2022 trend. The pandemic has also changed the way people look at interior design.¹ Consumers are becoming increasingly aware of how their environment affects their mood, mental health, and even relationships.² Instead of deep and dark colour palettes, the subtle use of light and colour creates modern and fresh interiors.³

1,2,3 Matlow 2021

FINDING THE FUN

People are looking for some escapism and light-hearted fun during their trip.¹ Ideally, the design should encourage play and engagement without complicating interactions and foster deeper emotional connections between the customer and the product.

1 The BIO Agency 2022

EXTENDING REALITY WITH AR AND VR

The use of AR (Augmented Reality) and VR (Virtual Reality) technologies as a way of interacting with the environment could be used for better visual recognition, education, or higher emotional attachment in marketing or advertising, or as an additional resource for information.¹ For example, AR solutions can replace in-flight safety demonstrations or show interior key features or other highly personalized content.

1 Zumko 2018

GESTURE RECOGNITION TECHNOLOGY

The trend of gesture control involves controlling a user's phone, television, or other smart devices through gestures, e.g. BMW gesture control. A growing number of companies are incorporating gesture control into their products. This can be attributed to advancements in technology and digital devices in industries such as automotive, mass-market electronics, and medicine.¹ Gesture control technology can also be used in the field of Virtual Reality and Augmented Reality.²

1,2 Future Market Insights 2022

ASSISTIVE TECHNOLOGIES

A smart assistant, with its voice technology, is a helpful tool for daily routines. Smart voice assistants have earned their popularity due to the variety of functions and tasks they can manage, which might be especially welcomed in private aviation.

Essentially, digital transformation and connectivity are the fusion of all experiential trends. Without technology, people's lives would not be sustainable. Almost any modern design requires the installation of smart technologies and services in order to achieve maximum performance for the user.

Marketing Research -

3.1.3 AIRCRAFT INTERCHANGE AGREEMENTS

In order to understand the conditions and characteristics of seaplane operations in the coming years, it is necessary to determine the trend in the organization and operation of non-commercial aircraft.



FIGURE 18. Zvereva 2019



FIGURE 19. Vladimir Vasiliev 2019

OVERVIEW

The configuration of the cabin as well as the organization of space and ergonomics will be determined by the use of the aircraft and the number of passengers. Material selection and colour schemes will be determined by the intended use of the aircraft, as well as the preferences of its intended users.

The main trends in the operation and organization of non-commercial aircraft are club ownership, co-ownership, fractional ownership, and full ownership.

CLUB OWNERSHIP

It was indicated in the interview with Stas¹, a member of the Flying Club in San Diego, California, that club ownership allows access to any aircraft in the club if the pilot has the appropriate qualifications at a relatively low cost. A person does not need to be the owner of an aircraft in this instance. Clubs are usually non-profit organizations that aircraft owners join in order to reduce the cost of maintaining their aircraft. Once a new aircraft has been added to the club's system, its price is set by the owner. Consequently, for aircraft owners who are members of the club, this is a business activity. Thus, if a person purchases a plane for himself, he is required to spend a certain amount on it. By joining a club, the aircraft owner is also entitled to certain benefits, such as reduced maintenance costs.

Nowadays, private jets are no longer an exclusive luxury. As a hobby or as a means of business travel, small planes are becoming increasingly affordable to people with average incomes. It is relatively expensive to purchase and maintain an aircraft for this segment of customers. At the same time, these individuals desire to reduce the cost of flying, but they do not wish to fly from morning to evening. In this case, the ability to place the aircraft in the club allows owners to reduce the cost of maintaining the aircraft. When the owner places the aircraft in the club, all expenses become business expenses. The club is then responsible for paying taxes and maintaining airworthiness, as well as maintaining the aircraft. If a member of the club does not own an aircraft, membership in the club provides them with the opportunity to fly on different aircraft, enabling them to determine how each aircraft best suits their needs and choose the one that most closely suits

1 Записки Пилота 2020

their preferences. Because of high competition among owners within the club, even some expensive aircraft can be rented for an hourly rate. Membership fees are fixed and a fixed cost per month applies. Since aircraft are used by a large number of individuals, club ownership is a convenient and environmentally friendly method of using aircraft.

CO-OWNERSHIP

As noted in the Vladimir Vasiljev interview with Ilja¹, co-owner of Cirrus aircraft, California, there is also a simpler method of owning aircraft, namely joint ownership. This form of ownership is more suitable for novice pilots who have just received their licenses. They do not have a lot of experience of purchasing and operating personal aircraft, insurance. Several questions arise, such as how much maintenance, regular inspections, insurance, and parking cost. In addition, investing a significant amount of money when it is not clear what will happen next, or what the ultimate cost of owning an aircraft will be, is not always a viable option.

It is therefore possible to find several partners and share the costs of the plane among them. As an example, the Cirrus company has a forum for pilots and owners of its aircraft - COPA (Cirrus Owners & Pilots Association) - where members can post advertisements looking for potential co-owners. As well, such a system for purchasing an aircraft enables its members to calculate the budget, and, if necessary, sell their shares or attract an additional candidate to share ownership. To summarise, co-ownership is a very simple concept. It means that two or more people share the obligations associated with owning an aircraft. The costs of aircraft ownership decrease when they are spread over multiple owners.

1 Записки Пилота 2020

FRACTIONAL AIRCRAFT OWNERSHIP

A common practice is for corporations or commercial associations to own planes.¹ Rather than owning an aircraft, it is more profitable to form a partnership. It is advantageous to share aircraft costs among several individuals rather than assuming the full burden on one individual.² A shareholder's travel needs must be taken into consideration when determining how much their travel expenses may be. The majority of people who are part owners of an aircraft are pilots, but this is not always the case.³ If the purpose of co-ownership is to engage in recreational activities, then downtime due to maintenance is not an issue. When a business trip is unexpectedly cancelled, however, it requires a different method of evaluation.⁴

It is generally expected that maintenance costs will increase by about 15% per decade of the aircraft's age, so in terms of accessibility, it is more advantageous to choose a brand-new aircraft.⁵ It is also the most cost-effective to choose a relatively new aircraft as it offers lower maintenance costs. An aircraft is expensive, but by sale time it can be resold for a fair price. A plane is one of the most valuable purchases one can make in today's market.⁶

The agreement should typically run for a given period of time or be updated as conditions change, regardless of whether the aircraft is owned for recreational or commercial purposes.⁷ Designed for individuals who fly more than 50 hours per year, fractional jet ownership allows users to purchase equity in a specific aircraft. As a result, hours are allocated based on the amount of aircraft that the user owns. The fractional ownership of a private jet provides access to a variety of cabin sizes.

1,2,3,4,5,6,7 Västervik Airport ESSW 2019

AIRCRAFT RENTAL

According to Ilia¹, co-owner of Cirrus aircraft, California, renting a plane is the next popular method for novice pilots. It is difficult to find a suitable configuration and condition of the aircraft in this case, and many brand-new models are difficult to rent. For those who are learning to fly, renting an aircraft is an excellent option. However, renting an aircraft from a school is fraught with issues. It is more common for schools to sell their older aircraft than to lease them out and provide an overwhelming number of unnecessary services on them. It is an expensive and uncomfortable option.

1 Записки Пилота 2020

FULL OWNERSHIP

According to the interview with Ilia¹, co-owner of Cirrus aircraft, California, the easiest option, when there are enough funds, is to buy a personal aircraft. In this case, the aircraft will be used by a minimum number of users. This will enable its full customization and finishing at the request of the client, as well as ensure the privacy and security of the owner.

1 Записки Пилота 2020

Consequently, the adventure version of LA-8 may be more popular with club members or potential co-owners due to its wider range of features and lower stock prices. This configuration is suitable for a wide range of users of different ages. Therefore, the cabin of the adventure version should have a more versatile design than the VIP version. And the VIP version, in turn, should be optimized for private ownership.

Marketing Research -

3.2 SEAPLANE QUALITATIVE ANALYSIS

COMPANY¹

Jekta Switzerland SA.

MISSION³

The mission of Jekta is to build a safe, efficient, and sustainable

MODEL CHOSEN²

Business to Business;

Business to Consumer;

amphibian aircraft with unique capabilities based on acquired knowledge and experience.

1,2,3 Jekta Switzerland SA 2022

JEKTA

FIGURE 20. Jekta Switzerland SA 2022



FIGURE 21. Ann HS, 2012

OVERVIEW

VISION¹

Jekta aims to establish itself as the world's leading manufacturer of amphibious aircraft in order to create a new era of sustainable and affordable transportation on a global scale.

PRODUCT BRIEFING²

Redesigning the interior of the LA-8 seaplane, including a VIP version for business flights and an adventure version for experiential tourism that lets people travel to remote and wild destinations.

1,2 Jekta Switzerland SA 2022

3.2.1 UNIQUE SELLING POINT

TARGET GROUPS AND THEIR NEEDS

INDIVIDUALS

- Wealthy middle-aged;
- Wealthy cultural elite;
- Rich Millennials;

INDIVIDUAL NEEDS

Individual needs are speed and flexibility of travel, high-end comfort, visual aesthetics, and easy exploitation. In addition to status symbols, budget customers are also seeking attention to their status.

COMPANIES

- Rental companies,
- Travel agencies;
- Fractional aircraft ownership;
- Timesharing;

COMPANIES NEEDS

It is important for companies to offer fast and flexible travel, high-end comfort, easy maintenance, functional and attractive design, as well as the option of giving their clients a unique travel experience.

COMPETITIVE ADVANTAGE

The uniqueness and customisation of the product give it a competitive advantage, allowing customers to customize their vehicle options. In order to achieve optimal outdoor and indoor travel experiences, aircraft modifications can be fine-tuned for different levels of comfort and adventure types.

VALUE PROPOSITION

The interior design of LA-8 consists of VIP- and Adventure versions. Based on the aircraft configuration chosen according to customer preferences, the interior is designed to meet the high-budget client's needs and provide a customized travel experience. The VIP configuration is equipped with a mini-bar and wardrobe, and the adventure configuration is equipped according to activities such as scuba diving and fishing.

The interior of both versions is made with certified high-quality materials and incorporates innovative technologies and smart devices that enrich passengers' in-flight experience and provide safety, and flexibility of travel.

UNIQUE BENEFITS

- Low operational cost;
- Configuration variety (VIP and ADV);
- Contributes adventure tourism;
- Customisable cabin;
- Unique travel experience;
- Flexibility in use;
- Sustainability;
- Fastest access to hard-to-reach geographical locations;

SWOT -

3.2.2 SWOT

A SWOT analysis helps to determine what Jekta does best in terms of its business and travel experience and to develop a successful positioning strategy for the LA-8 seaplane.

SWOT ANALYSIS OF TRAVEL EXPERIENCE

STRENGTHS

- Technical expertise in manufacturing high-quality and reliable amphibious aircraft;
- Ability to produce sustainable accessible products;
- Established global sales network and partners;
- Brand awareness in their niche market;

OPPORTUNITIES

- Ability to fulfil a growing demand for small and flexible aircraft;
- Possible exploration of further niche markets and geographical areas;
- Year to year market growth in alternative transport vehicles segment;
- Low level of competition;

WEAKNESSES

- Limited production capacity;
- Selected outsourced production processes; (Reliance on Critical Suppliers);
- Inability to use the aircraft in winter;

THREATS

- Fossil (aviation fuel) or biologic fuel only;
- Markets are not yet ready for full sustainability and electric propulsion;
- Niche market;

SWOT ANALYSIS OF THE LA-8 SEAPLANE

STRENGTHS

- Ability to land and take off on a large variety of surfaces;
- Capable of landing and take-off at functional airports;
- Ease and flexibility of use;
- Possibility to access hard-to-reach geographical locations;
- Transport employs composite material for lighter more durable properties with low corrosion;
- Transport employs composite material for lighter more durable properties with low corrosion;

OPPORTUNITIES

- Growth of the luxury travel market in the adventurous sector;
- Create a greater comfort in an adventurous experience;
- Offer of various solutions for clients based on their preferences, creating custom made experiences;

WEAKNESSES

- Premium pricing rates limit accessibility to a wider client base.
- Selected outsourced production processes (Reliance on Critical Suppliers);
- Use only in warm regions limits niche market development

THREATS

- Limited passenger capacity of an aircraft causing customer dissatisfaction;

3.2.3 STRATEGIC POSITIONING

When penetrating a luxury adventure tourism market, it is vital to note that other similar solutions are already present and are being used by the VIP client base. However, the technical specification of the aircraft should be tailored to such an extent as to differentiate it from the models currently on the market. This can be achieved by the use of innovative technological solutions which in turn result in an aircraft that is more appealing to the clients due to its comfort, design, and lower carbon footprint.

SEAPLANES MAPPING

Overview of amphibious aircraft selection in relation to seaplane and transport operators for experiential tourism.

2 Seaters

- Dornier aviation S-ray 007
- Lisa Akoya
- Icon A5
- Aeroprakt A-24 Viking

4 Seaters

- Glasair Aviation, sportsman
- Murphy aircraft moose
- Seawind 300G

5 Seaters

- Grumman G44

6 Seaters

- Murphy aircraft moose
- Gweduck Aircraft
- Cessna turbo stationair
- Beriev BE-103

7 Seaters

- Discovery aviation 201

10 Seaters

- Cessna 208 caravan
- Quest Kodiak 100

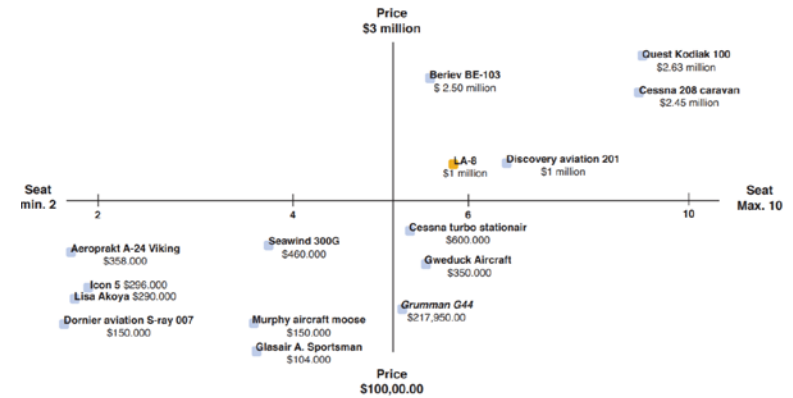


FIGURE 22. Torcolacci 2021

TRAVEL OPERATORS

Overview of travel operator selection in the experiential tourism sector.

- Ultima Thule Inc.
- Jacada Travel Ltd.
- PURE Life Experiences
- Seaplane Experiences
- Trans Maldivian Airways (Pvt) Ltd.
- Scandinavian Seaplanes Oy
- Kenmore Air Harbor, Inc

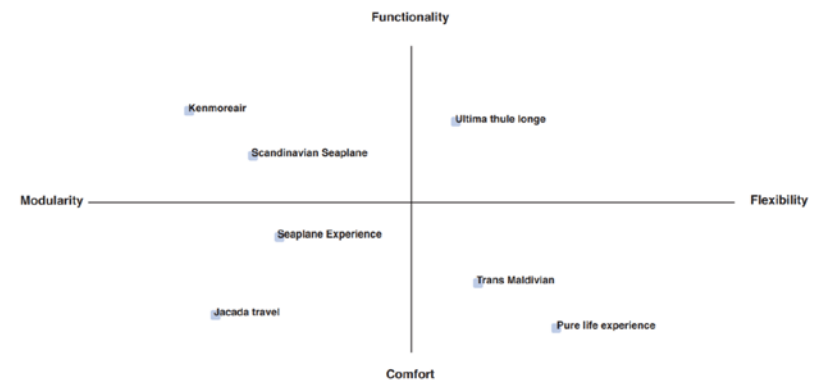


FIGURE 23. Torcolacci 2021

Marketing Research -

3.3 COMPETITORS BENCHMARKING

In this data analysis, top-performing companies in the sector have been shortlisted and leading products screened, with the best parameters identified and extracted as a list of common factors.



FIGURE 24. JTG Aviation Spotter 2021



FIGURE 25. Goclocklow, 2013

OVERVIEW

Jektas' competitors are the most famous companies that have great results in transportation segments of luxury tourism. By using a functional and competitive benchmark analysis, the authors identify products that have an intangible value and are positioned in the premium-price range.

The products analysed are Yachts, VIP aircraft, Campervans, and Luxury recreational vehicles with a passenger capacity of 4-6 people.

3.3.1 YACHTS

PERSHING 7X

Passengers: max 16 | Price: \$1 890 000¹

DESIGN²

- Sporty and smooth-lined design
- Pale and muted décor;
- Hard edges, flat planes, and a preponderance of stainless steel;
- Detailing quality;
- Solid fit-out;

MATERIALS³

- Ultralight materials, in particular, carbon;
- Opulent leathers;
- High-quality textiles;
- Wooden flooring;

BENEFITS⁴

- All-round view from the main deck;
- 2m high ceilings;
- Functional outside areas;
- Sun-lounging area;
- Spacious seating area;
- Top-class boat speeds, max 50knots;
- Dynamic Positioning System allows the boat to hold its position even in strong winds or currents;
- Shower in owner's suite;

1,2,3,4 Harper 2021

AMEL 60

Passengers: 5-6 | Price: \$1,650,000¹

DESIGN²

- Modern shapes and lines;
- Powerful design focused on performance;
- Rectangular hull portlights;
- Tinted wraparound windscreen;
- Comfort and secure interior layout;
- Modern styling throughout the accommodation;
- Stylish angular and sharp feel grab handles;
- Warmth and refinement lightning creates a chic, open, and bright atmosphere;

MATERIALS³

- Carbon;
- Light oak or walnut finishes;
- High-quality textiles and leathers;

BENEFITS⁴

- Carbon mast reduce weight;
- Wide, open space after deck suitable for sunbathing or stowing a dinghy;
- Clutter-free side desk provide maximum safety and secure moving;
- Higher solid rails around the entire deck;
- Real and perceived security in the centre cockpit;
- Good all-round visibility of cockpit;
- Easiest engine room access;
- Each cabin is equipped with its own shower and heads;
- High level of detail and the comprehensive fit-out
- Contain an icemaker, a wine cooler, and a second deep freeze;

1,2,3,4 Sheahan 2020

3.3.2 VIP AIRCRAFT

BEECHCRAFT BONANZA G36

Type: single turboprop | Passengers: 5-6 | Range: 920 nm | Price: \$890,000¹

DESIGN²

- Riveted metal and low-wing exterior design;
- Cabin elegant and ergonomic design;
- Adjustable headrests and lumbar support;
- Variable density foam backsides;
- Good lighting fixtures;
- Smooth leather details and seats, elegant shapes;
- Center console integrated with two retractable cup holders;

MATERIALS³

- High-quality leathers, light composite materials, metal;

BENEFITS⁴

- Smoke grey window tint reduces glare, provides UV protection, and reduces noise;
- Climate control;
- LED lights throughout the interior and exterior provide better longevity and visibility;
- Cabin accessibility. Entry and exit from the aircraft cabin are quick, simple, and safe thanks to the wide rear passenger door;
- Fully removable, rotatable, and foldable seats provide quick cabin reconfiguration;

THREATS⁵

- It is potentially dangerous if an accident takes place without a left-side cabin door;
- Captain's seat can only be accessed by climbing onto the wing and sliding through the cockpit;

1,2,3,4,5 Bergqvist 2013

PIPER M600 SLS

Type: single turboprop | Passengers: 5-6 Range: 1,484 nm | Price: \$3,12m¹

DESIGN²

- Elegant interior and exterior;
- Interior design provides a spacy cabin feel;
- Aimed at the owner-pilot;
- Powerful design focused on performance;
- Well-thought-out panel;
- Easy-to-reach circuit breakers, and electrical-system controls;
- Black-and-silver paint schemes look stunning;

MATERIALS³

- Carbon composite material;
- Steel, nickel-cobalt leading;
- Deluxe leather options;

BENEFITS⁴

- Low operational cost;
- Halo Safety System with Autoland gives passengers a true safety net;
- Hypoxia recognition incorporated into the emergency descent mode;
- Cabin environment provides safety and protection;
- Variety of interior colour pallets;
- Interior customization options;
- Moved outward landing gear improves ground handling;

THREATS⁵

- Narrow fuselage, passengers need to sit knee-to-knee;

1,2,3,4,5 Boatman 2021

Aircraft -

DORNIER SEASTAR

Type: 2 turboprop engines | Passengers: 7-12 Range: 900 nm | Price: \$7,21m

DESIGN¹

- All-composite airframe;
- Wide fuselage;
- Spacious cabin;
- Leather seats with armrests;
- Large windows;
- Customizable interior;
- Glass cockpit;
- Carpet flooring;
- Natural lighting;
- Integrated tables;
- Classic interior;

MATERIALS²

- High-quality leathers, composite materials, glass fibers, aluminum mesh;

BENEFITS³

- Easy access from the cabin to the baggage compartment;
- Lavatory in VIP configuration;
- Wide flat floor in corporate configuration;
- Synthetic vision system;
- Configuration variability;
- Optional TV-screens;

THREATS

- Old fashioned interior;
- Lack of smart technologies;
- No LED lighting inside the cabin;

1,2,3 Mees 2009

EMBRAER PHENOM 100 EV

Type: single turbofan | Passengers: 4-6 Range: 1,730 nm | Price: \$4-5m

DESIGN¹

- Executive interior design;
- Side-facing seats with armrests;
- Signature askew headrest;
- Dual-execute writing tables;
- Light and airy space;
- Upscale automotive-style accents;
- LED lighting;
- Single-piece sidewalls and headliners;
- Integrated storage nooks, AC power outlets, headset jack points, lighting and temperature controls, MP3 plugs, and speakers;
- Carpet flooring;

MATERIALS²

- Composite, deluxe leathers, glossy wood;

BENEFITS³

- Optional small refreshment center;
- Genuine airstair door;
- Audio and radio on demand;
- Belted lavatory;
- Wide retractable cup holders;

THREATS⁴

- Fit-and-finish issues;
- Uncomfortable seat;
- Unpleasant noise level of environmental-control system fans;
- Inequality trim pieces;
- Various cabin issues;
- System problems;

1,2,3,4 Huber 2018

Aircraft -

CESSNA 400 CORVALIS TT

Type: Diesel engine | Passengers: 4 Range: 756 nm |
Price: \$ 644,000¹

DESIGN²

- Quality designed;
- Comfortable cabin environment;
- Cup holders;
- Nicely executed doors;
- Leather straps on doors for shorter pilots;
- Hand-stitched leather seats;
- Lumbar support;
- Detachable, fully lined cabin walls;

MATERIALS³

- Composite, leather;

BENEFITS⁴

- Air conditioning;
- Outstanding cabin comfort;
- Synthetic vision;
- Digital environmental-control system;

THREATS⁵

- No parachute;
- Small 10.4-inch diagonal screen;
- No tables;

1,2,3,4,5 Henderson 2021

DAHER TBM 940

Type: single turboprop | Passengers: 5-6 Range: 1,730
nm | Price: \$2.4m¹

DESIGN²

- Customizable design;
- Extended colour palette;
- Access the cockpit through the side door;
- Headset stowage hooks;
- Clothes hangers;
- Central console integrated with cup holders;
- Tablet device holder;
- Optional quick-change storage unit;
- Dimmable dome lighting;
- Integrated table system;
- Carpet flooring;

MATERIALS³

- Composite, leathers;

BENEFITS⁴

- Six colour choices are available for seat coverings and side panels, more wood trims, three new floor carpet colours;
- 40 additional colors available;
- Extended large storage cabinet;
- Cabin, baggage compartment and stair lighting;

THREATS

- Not detected;

1,2,3,4 Devereux; Goyer 2020

Aircraft -

LILIUM JET

Type: single turboprop | Passengers: 6 Range: 756 nm
| Price: \$4.5m¹

DESIGN²

- Simple futuristic design;
- Spacious cabin;
- Variously configurable interior;
- Gel-filled seats;
- Beautiful wooden veneers on the walls;
- Leather seats;
- Integrated tables with cup holders;
- LED lighting;

MATERIALS³

- Composite, premium leathers, wood;

BENEFITS⁴

- Vertical take-off and landing (eVTOL);
- Sustainability, pollutants free;
- Low noise level;
- High-tech communications;
- Individual entertainment systems;

THREATS⁵

- Many reduced items;
- Short range;
- No hand rests;

1,2,3,4,5 Verdon 2022

CIRRUS VISION SF50

Type: single turboprop | Passengers: 6 Range: 1,200
nm | Price: under \$3m¹

DESIGN²

- Spacious cabin;
- Premium style;
- Accent lighting;
- UV-tinted panoramic windows;
- Central entertainment display;
- Premium leather seats with an ample legroom and generous recline;
- Handcrafted interior upholstery;
- Personal tables;
- Easy access to built-in USB ports, power outlets, cup holders, overhead lights and air vents;

MATERIALS³

- Composite, leathers, Carbon Fiber;

BENEFITS⁴

- Unique safety systems (parachute and safe return, infrared camera);
- Pressurized cabin;
- Climate control system;
- Wi-Fi;
- Customizable colour palette;
- Transformative cabin;

THREATS⁵

- No cabin access to luggage area;
- no bathroom or galley on board;
- No shaded windows;

1 Finlay 2022

2,3,4,5 Stawski 2022

3.3.3 RECREATIONAL VEHICLE

EARTHROAMER HD

Type: recreational vehicle | Passengers: 6 | Price: \$1,900,000

DESIGN¹

- Massive design;
- Luxurious living area;
- Well-appointed galley area;
- Wooden upholstery;
- Leather appointments;
- Hardwood flooring;
- Granite countertops;

MATERIALS

- Carbon Fiber monocoque vacuum-formed shell;²
- Wood, leather, granite, stainless-steel;³

BENEFITS⁴

- Customizable cabin and upholstery materials;
- central CZone digital control system;
- 12-volt refrigerators;
- Completely lithium-battery and solar-powered vehicle;
- Stand-alone bedroom;
- Integrated washer, dryer, stand-alone shower compartment, stainless-steel sink;
- Over 200 gallons of fresh-water storage;
- 125 gallons of black-water storage;
- Hydraulic levelling system;

THREATS

- Too big dimensions;

1,3,4 Jones 2021

2 Barthel 2021

MERCEDES-BENZ MARCO POLO

Type: campervan | Passengers: 4 | Price: \$77,420

DESIGN¹

- Sport or AMG exterior trims;
- Luxurious leather-lined interior;
- Glamorous, high-quality design;
- Spacious passenger space;
- Full-on kitchen and dining area;
- Privacy blinds included;
- Hidden foldable table;
- Coloured ambient lighting;

MATERIALS²

- Yacht-style wooden flooring;
- Carbon Fiber;
- Leathers;

BENEFITS³

- Two bedrooms;
- Gas hob, sink, fridge, and water supply;
- Soft-close storage places;
- Customizable upholsteries and paint colours;
- Rising roof with a second sleeping place;
- Adjustable seat firmness;
- MBAC (Mercedes-Benz Advanced Control) system;
- MBUX (Mercedes-Benz User Experience) system;
- Three-zone climate control system;
- Rotatable front seats;

THREATS⁴

- No option of a fully digital driver's display;
- Old-styled control panel;

1,2,3,4 Ashraf 2022

VOLKSWAGEN CALIFORNIA 6.1

Type: campervan | Passengers: 4 | Price: £72,980.00

DESIGN¹

- Functional interior;
- Hidden chairs and fold-out table;
- Hanging rail in the cupboard;
- High-quality fixtures and fittings;
- Rotatable front seats;

MATERIALS²

- High-quality leathers, light composite materials, metal;

BENEFITS³

- Customizable exterior colouring;
- Two bedrooms;
- Kitchen with built-in fridge;
- Motor-driven pop-up-roof;
- Additional roof-tent;
- Hidden chairs and fold-out table;
- Hanging rail in the cupboard;
- Bike rack;
- Washable floor;
- Pull-out blinds;
- Mini dustbin in the driver's door;
- Three-zone climate control;
- Heated seats;

THREATS⁴

- Light-coloured seats;
- Problems with driver's seat rotation;
- No child seats storage and associated kit;
- Auxiliary heater without an air-conditioning unit;
- Not the best fit and finish;

1,2,3,4 Ingram 2019

OUTPUT

Comparing top adventure vehicles, the following trends can be observed: the interior design is functional and made of high-quality materials such as wood, carbon, leather, stainless steel, and composite. A composite material is popular in aviation because of its lightness, whereas wood, metal, and even granite are used in other industries. Light colours and natural shades are most often used in luxury interiors, although pollutants-resistant shades of upholstery and seats are welcome in versions for active tourism. Most interiors feature water-repellent wood flooring, as well as carpets, which offer elegance, comfort, and durability.

Usually, premium segment transports have custom interiors and exteriors that are tailored to the client's preferences, as well as all necessary amenities and accessories.

A special emphasis is placed on lighting, it also enhances the design of the interior and gives it an extra sense of value.

Premium-class interiors are designed with the most modern and environmentally friendly technological solutions to ensure passenger and crew comfort and safety.

Among the unique features of premium vehicles are their numerous built-in accessories, which are also responsible for the maximum comfort of passengers. Another advantage of VIP transport is its ability to offer special features not available from competitors. Each business offers unique benefits that can influence a customer's decision to purchase a particular vehicle.

4. Final Users -

4.1 USER PROFILE

The purpose of conducting an analysis of potential customers is to determine which group of consumers will bring the greatest benefit to Jekta.



FIGURE 26. Makashin 2020



FIGURE 27. Placquadro 2020

OVERVIEW

A study of target audiences and their behaviour patterns is intended to increase consumer demand and attract potential customers. First of all, it is aimed at meeting the needs and desires of consumers.

Identifying potential customers may help Jekta expand its customer base, provide them with the products and services they require, and determine which group of consumers will be of greatest benefit to Jekta in the future.

The thesis then assessed consumer groups of high-net-worth individuals (HNWIs): their status, lifestyles, habits, desires, thoughts, and behaviours.

User profile -

4.1.1 WEALTHY MIDDLE-AGED

WHO ARE THEY?

Target demographic is the middle-aged populace in the 45-60 age group. These individuals live in an affluent society with palatial homes, and expensive automobiles, and take extravagant vacations. They are university-educated married couples with kids who also plan to attend universities.¹ Having highly paid jobs in the social sciences, arts, management, and business, their households exhibit above-average income of around \$227,000 per annum.²

These people take pleasure in showcasing their success by having elite golf club memberships, attending high-profile sporting events, having on-call chefs preparing gourmet meals at their homes, and holding large stock portfolios. However, they are not wasteful in their financial management and often take their family on all-inclusive resort vacations and do not shy away from fly economy class as part of the vacation packages.³ They travel all over the world, from Australia and China to Italy and France, as they are able to allocate time for active pastimes and travels to their desired locations. However, it must be observed that these individuals often suffer from pseudo affluence.

HOW DO THEY THINK?

Middle-aged wealthy individuals enjoy living life to the fullest, both emotionally and physically. Their priority is to maintain a healthy lifestyle and to find fulfilment at work.⁴ It is a group of individuals who are committed to building an estate through saving and preserving a legacy.⁵ It is imperative for them to make an impression on other members of the community.⁶ As part of their priorities, they place a high level of importance on social acceptance, extravagant consumption, and appearance.

1,2,3,4,5,6 DePoe 2017

They are interested in the latest technology, novelty, and aesthetics, and they tend to purchase items that are both stylish and comfortable. The majority of this group is interested in searching for, evaluating, and purchasing goods and services aligned with their interests and hobbies.¹ An average middle-aged individual who is wealthy defines financial success as holding a steady job for a long period of time, moving up the corporate ladder, and building an adequate retirement fund at the end of their working lives.²

1,2 DePoe 2017

4.1.2 WEALTHY CULTURAL ELITE

WHO ARE THEY?

The average age of wealthy cultural elites ranges from 45 to 74 years old. The lowest category consists of individuals with a net worth between €10 and €30 million. The highest category consists of individuals with a net worth between €300 million and €1 billion.¹ The majority of individuals have a net worth between 30 million and one billion euros. Most of them come from middle-class backgrounds and are self-made business tycoons.² They are often the children of business owners, entrepreneurs, or even farmers, whose parents are typically not rich but do not hold salaried positions.³ It is pertinent to note that these immensely wealthy individuals did not consistently attend universities and were not always successful in their academic pursuits. They are primarily business owners and investors.⁴ It is evident that visible consumption is declining among wealthy members of the cultural elite, while unobtrusive consumption is taking its place. In order to attain their wealth, these individuals worked hard. Their income is further determined by the level of training they have received as well as the skills they have acquired.

1,2,3,4 Claire 2018

User profile -

HOW DO THEY THINK?

The cultural elite recognizes the importance of social, natural, and interpersonal awareness as the most significant sources of social capital.¹ As a result, they invest in non-visible, deeply expensive goods and services that allow them to build social capital and pass it on to their children.² Cultural elites value wealth and business above all else, which is consistent with their ideology; therefore, security is also highly valued.³

They understand the connection between freedom and independence, and their view of wealth is self-efficient. In terms of objective standards, they used to take more risks. The ability to manage risks is a key component of successful business and wealth.⁴ The majority of them are involved in competitive sports or business activities.⁵ Furthermore, they are not afraid to take risks and act against the norm when it comes to investing and conducting business.⁶ Their preference is to make their own way.

Their approach to failures and crises is not to blame external factors or other individuals, but rather to identify the root cause of the problem.⁷ It is not common for the affluent elite to consider themselves victims of fate or rivals.⁸ Despite all the challenges, they accept full responsibility. As well as finding ways to overcome defeats, they are also looking for opportunities. Consequently, they never worry about things they cannot change; instead, they focus exclusively on solutions that are achievable.⁹

1,2,3,4,5,6,7,8,9 Claire 2018

4.1.3 RICH MILLENNIALS

WHO ARE THEY?

This generation of people was born between 1980 and 2000, and they belong to the millennial generation

Those between the ages of 23 and 37 with a net worth of over \$1 million are considered to be millennial millionaires.¹ Wealthy millennials inherit their parents' family businesses. In response to the unconventional choices made by this generation, the functioning of the market has changed.² Among their weaknesses is the fact that they keep their money in a variety of accounts and locations that could easily be targeted by hackers. As their professional and personal lives are intertwined, they are motivated to consider working more rather than planning for retirement in the future.³

HOW DO THEY THINK?

This generation is more concerned with themselves, their way of life, and finding a purpose for a reason to live.⁴ The millennials are more likely to be attracted to travel, goods, services, and anything that offers them a novel customer experience. It is not common for them to gamble and their approach to their finances is rather pragmatic.⁵ Nevertheless, some have a keen interest in investing in resources such as cryptocurrency and real estate in other countries rather than owning their residences.⁶ In comparison to their parents, millennials are more concerned with making smart investments that will benefit their social and financial interests, such as investing in environmentally-friendly technology or supporting charities.⁷ Financial stability and financial independence are top priorities for this generation.⁸ There is a strong desire among millennials to get involved in something meaningful with their lives and with their money pursuits and to find innovative ways of making a positive impact on society.⁹

1 Hoffower 2019

2,3,4,7,8 RBC Wealth Management s.a.

5,6 FORBES INSIGHTS 2021

9 Leins 2019

User profile -

It is common for them to use and rely heavily on technology.¹ According to the ideology of the Millennial generation, success is more about appreciation than it is about earning.² They are open to exploring the modern world despite having no restrictions. Additionally, 71% of millennials intend to work in some form after retirement, which is a higher percentage than previous generations.³ Compared to their parents, they are more adventurous. Typically, millennial elites prefer to live closer to nature and lead healthier lifestyles. They place a high value on their health and wellness, so they prefer to be in close proximity to fitness facilities and yoga studios.⁴

1,2 RBC Wealth Management s.a.

3 FORBES INSIGHTS 2021

4 Leins 2019

OUTPUT

Jekta products have been shown to be of interest to three solvent groups:

- Wealthy middle-aged - age 45-60 y.o.
- Wealthy cultural elite - age 45 to 74 y.o.
- Millennials - age 23 to 37 y.o.

Accordingly, wealthy elites are likely to be most interested in the VIP configuration of the LA-8 aircraft, while middle-class and wealthy millennials more inclined to participate in outdoor activities and atypical adventures will find the adventure version appealing.

4.2 DEMAND ANALYSIS

Many high-budget travellers, also known as "The Big Spenders", wish to travel and experience the wonders of the world. In spite of the great impact caused by the COVID-19 pandemic, they will be the first to be

able to afford high levels of comfort and higher safety standards.

According to a study inserted and published in the XXIV Edition of the Report on Italian Journalism, by 2025, there will be 450 million luxury buyers, up from 390 million in 2019.¹

This growth can be attributed to a growing middle class, especially in Asia. It is most likely that they will choose Italy as their destination.²

Psychophysical well-being is considered to be the most important aspect of luxury travel, followed by the level of personalization of service. Consumers are increasingly seeking experiences related to the spiritual and emotional realms. Big Spenders prefer luxury experiences over personal luxury goods and acquire innovative, unusual, and exotic experiences. According to Melanie Endres, itinerary designer, these customers have a limited amount of time for holidays and want to see a wide range of attractions during that time. Users with a urgent need for travel are numerous, and this fact should be taken into consideration. As Endres describes in her interview, the US market does not have 30 days of vacation, and it is preferable to short itineraries, and they also want to see a lot. This is the market where there is less time, and less vacation, but there is enough money to travel.³

It is also important to consider a customer who is seeking atypical experiences with a large economic turnout, as well as young consumers. Customers who experience luxury tourism have three important factors in common: the search for large spaces, the aesthetics of the product, and the quality of the service.⁴

1,2 Guerrini 2021

3 Endres 2021

4 Gimeno 2021

User profile -

The psychosocial sphere is also important since the client needs to appear, confirm their high status, and identify themselves with well-defined and elite social groups. Additionally, clients feel the need to share their experiences through their smart devices. Millennials should not be underestimated, representing 20 % of international tourists, who will likely serve as the lifeline of luxury travel operators in the new phase of the post-pandemic restart,¹ reinforcing at the same time the concept that the way in which travel packages are offered must necessarily change in order to meet the changing needs of users, according to the researcher of CNR-Iriss.²

1,2 Morvillo & Becheri 2020

4.3 EXPERT INTERVIEWS

In order to gain a better understanding of the niche market for the LA-8 seaplane, interviews were conducted with professionals in the luxury travel industry. Additionally, the information can be used to identify the end user and their preferences, and this information can be used to determine what amenities, equipment, and smart devices the seaplane should include on board. The interviews were conducted by Ilaria Torcolacci in 2021.

4.3.1 GONZALO GIMENO

CEO Elephant Travel & CMO Oceansky Cruises

1. Based on your experience in luxury travel, my first question is: if we look at the future of air travel, what kind of perspective do you see for luxury seaplane travel? How could we push these people to make them understand the PERCEIVED VALUE of this journey?

People love to travel to remote places first of all. There are three elements to consider when it comes

to luxury travel. The first factor is the space, for instance, a suite in a hotel costs more than a standard room since it's bigger and has more space. There is a perception that remote locations are more expensive because they offer the luxury of being alone "you have space". Second, is the aesthetic, luxury has the component of beauty, the design (we can talk about the different ways of expressing luxury in design and the different aesthetics we might see in the Asian market, in Finland, or in North America). Third, the service is to be available for luxury travel. Putting them all together, what can you fit there? In order to understand the luxury market, you have to realize that people are willing to pay premium prices. Since seaplanes can land almost anywhere, for instance in Canada, they have a lot of space and can reach remote locations. The seaplanes are neither small nor large and can be used for short private trips. Due to a seaplane's rarity, you can charge a premium for its service, since it is not very used, as opposed to a helicopter. To bring them to the main market, you need to make people feel special. If you pay a premium, you must set up the service.

2. Where do I see the seaplane in the future in travel?

In this case, let's look at luxury travel in Alaska or Canada, where remote and hard-to-reach locations are common. The company "Ultima Thule Lodge" organizes extreme adventure trips to places you can't even see on a map. If you decide to fly with them, you'll have access to their private plane with their private pilot. And you can change the wheels to land in a variety of locations. They adapted the plane to the customers' needs.

4.3.2 MELANIE ENDRES

Head of Sales at Oceansky Cruises

1. Based on your experience in luxury travel, my first question is: if we look at the future of air travel, what kind of perspective do you see for luxury seaplane travel? How could we push these people to make them understand the PERCEIVED VALUE of this journey?

I think that the future of luxury travel is something unique and not accessible to everyone. People can go and see unreachable places. And the seaplane is the perfect vehicle for getting to different places by land or water. Luxury tourism has no limits on financial reinforcement. They're looking for uniqueness. I think it's perceived that travelling to unique places adds value to the itinerary.

I think the perceived value in terms of the itinerary is to fly to some unique places. I think outdoor activities might be in the adventure category. The seaplane can be used for outdoor activities such as steam- or fly-boarding, which are luxury trends that millennials and the wealthy can enjoy. So, I see the hiking group looking for more adventure... Clients in this group will find a wide range of adventure activities affordable, I think I see a lot of adventures like "uhhhh" different activities [...].

With the seaplane experience, you can visit three different Nordic countries, and do things like hiking and dolphin watching, etc. Otherwise, you cannot make so many stops, in such a short period of time. With the other aircraft, an airport is necessary. A seaplane is the only way to combine so many places in one trip. There seems to be more adventure than they expected (client). As compared to a seaplane vacation, the client thought luxury glamping was

more outdoor-oriented. [...] A lot of people would like to have a culinary experience, especially in Italy. Wine tastings, coffee tastings, champagne tastings, or anything related to food in an unusual spot can all be part of the itinerary. For example, if you travel by road, Argentina is a very large country. While the trip will take a long time, the food is amazing. Seaplanes could offer much quicker stops combined with the culinary experience that is always the highlight of the country.

2. If we can try a seaplane in Italy, can we combine it with Italian cuisine? What else can we do to make tourists happy?

I think a lot of people are looking for authentic experiences, like local meetings for folklore groups or meeting artists, painters, designers, or in some way, meeting people who are odd of the great. When it comes to an itinerary, you can get access to celebrities, idols, or famous chefs you don't get from other places.

3. Looking at sustainability and green-friendliness, what is YOUR OPINION ABOUT THE MARKET? Can seaplane flights be considered environmentally sustainable? If yes, in which way?

This is what we also did. We flew with 100% biofuel. To fly only on biofuel is a big advantage and a plus - that's part of the energy part. Despite all the average things we can do, we must remember this is the future.

4. Is it better to expand into a broader market or to remain within the luxury tourism niche when it comes to seaplane travel?

If you use a seaplane, you don't have to stay in the luxury hell, but in the wild niche.

User profile -

A wild niche is a group of people who have money. I'm officially in Panama, for example, and there's a long checklist for seaplane experiences. Even if I jump from Panama City to a remote log on an island I couldn't reach otherwise, it will be so expensive. It would not appeal to people on a general budget. Compared to a domestic flight for \$200 and a road trip for \$100, the difference in cost for a seaplane will be at least \$4-5,000 (1:30h). But I don't have a backdrop of operating costs. The Panama log-in made me think of that. If it only offered point-to-point stops, it would still be more than a luxury client hell. Maybe instead of a private jet, you could offer a tour of a beautiful island, a picturesque lake, or a beautiful place for lunch for the embassy officials. You wouldn't necessarily be looking for elegant people on a seaplane, I think the adventurers and those who want to explore new places have money, but not the typical "Channel" types. Seaplanes are for those people and for young people with money too. A seaplane tour isn't affordable, it's an uncommon experience. If you want to make the seaplane more affordable, perhaps you could do a tour around the lake. Because seaplanes are limited to 8-16 passengers, it's always a small group and the cost usually won't be cheap. I think it's more for luxury tourists. Good in that that there is a range of clients, from top travellers to those who want to transfer from one point to another, or those who want a date with a transfer, or a luxury date with a luxury lunch in the mountains. I think people can spend \$1,000 per day on the whole trip and for the experience they get (compared to taking a helicopter).

5. Considering the market, do you see it as interesting to invest in operational flexibility of the vehicle? For example, the satisfaction of landing in a lake or on the sea where there is no vehicle arriving.

We already discussed that (see the answer above) the seaplane can land wherever no other plane can land, so you can do many things in a short time that would otherwise take you several days or a long drive. Seaplanes allow you to travel from north to south Italy easily and experience different cuisines. To combine all those different experiences, you can travel once a week. There is something unique about being able to reach remote places where there is no airport, infrastructure, or people in a short period of time. US travellers do not have 30 days of vacation, they like crumb itinerary, they want to see a lot of things like the Chinese, this is the market where they have less time, less vacation but they have the money...I think that the inside experience of the seaplane is secondary. This is related to the adventure chapter.

6. How many benefits should I put inside?

Depending on how you are planning to use the seaplane, the advantages will vary based on different scenarios. For example, if you are going on a date tour or making a transfer, you won't need many advantages. In the end, you need luggage space, which is very significant because that is always the weight of the helicopter if you want to compare them. It is a wise idea to provide a storage area for the luggage that will be needed for a long trip. If you plan on bringing extra chairs and tables inside, this is especially relevant. Due to the fact that seaplanes fly to remote locations, you have to consider what you will need in an area where there are no amenities. For snacks or for writing, I think you need some kind of table. Some headphones, something that will allow you to communicate with the pilot.

4.3.3 CARL-OSCAR LAWACZECK

CEO and Founder at OceanSky Cruises

1. In light of your experience in luxury travel, my first question is: if we look at the future of air travel, what kind of perspective do you see for luxury seaplane travel? What can we do to make them understand the PERCEIVED VALUE of this journey?

We made it very easy to manage, very spacious, and comfort means space. Oceansky has seaplane experience, and the idea is that seaplanes have similar characteristics to aircrafts. Seaplanes don't need infrastructure. There is a lot of impact in building the airport, and seaplanes don't need it, [...] [...]. Instead of using fossil fuels, the best thing we can do is to use biofuels that aren't harmful to the environment, and to land as much as possible on lakes instead of using other infrastructure.

"Oceansky" targets a luxury market. Why is that? Due to new technology, there are many risks, costs, and high investments. There are many costs associated with the development of new technologies at the beginning, not just the cost of the technology itself. However, nobody invests in them. We look to the luxury market to offset this high fossil cost. They already have high service costs, so if you want top-luxury you need top food, chef, hotel, and experience all of this "top luxury service" around, so the extra cost is necessary to make it sustainable. This is because today, biofuel is almost four times more expensive than fossil fuels, so we have marginalised this extra cost as "sustainability". A client doesn't really care if it costs 1 or 2% more because of biofuel or if we care 5% more about sustainability than another airline. Look at the other spectrum, for example, transportation is all about reducing costs. [...]

4.3.4 ALESSANDRO CERUTI

Associate Professor at the University of Bologna (UNIBO) where he teaches Aerospace and Mechanical Engineering classes.

1. What is the direction Europe is trying to take in the world of aeronautics?

Europe has been blocked by COVID-19. We've talked about the environment and green aviation before. With COVID-19, everything is blocked. At the level of research in aeronautics, there are a lot of fashionable new configurations, not the classic wing shape that we used to see in all airliners, but the closed wing, the elliptical wing, the delta shape, the three-surface wing. Then electric and alternative sources, then hydrogen on planes, solar on planes, and electric on planes. The hottest topics were these. When it comes to solar, if you have a light plane (not a seaplane), you've got to watch the weight. It's critical to see if the weight gain from solar films compensates for the energy captured. Before COVID-19, they were pushing the hydrogen discourse for transport planes a lot. It seems to have the highest energy density, but then it stopped. There was a problem with passengers with COVID-19, and the big commercial planes lost interest. Obviously, if one of the 580 passengers on an A380 has a virus, the whole plane needs to be quarantined. The post-covid scenario is for smaller planes. There's a trend toward smaller planes to avoid too much contact and the spread of infection. Other times are green, trajectories are optimized, and the wind is exploited at high altitudes to enhance speed. (As airliners follow airways, which are not the shortest route to go from one point to another, there has been a lot of study on air traffic management, especially on synchronizing landings at airports). In order to land, the planes must wait in the "loiter" stand above the runway.

So many studies on how to optimize aircraft entry into the airport's expertise area to minimize downtime and fuel burn. The themes are propulsion, trajectory, and light structure. Cortis is the website of the EU, which calls for "clean skies". The EU initiative and the ICAO (international civil aviation organization) are working together to make aviation less impactful. In it are all the slogans we want to make sure there will be X% less impact from aviation by 2030.

2. Is a plane more impactful than a boat?

It depends on the boat. Sure, if it's a sailboat. If it's a cruise ship, no. Since cruise ships have a crew member for every two passengers, they have a very strong environmental impact. It needs food space. You carry a lot of structure with you. Like the pool, it tries to think about how much it weighs, and all this mass uses energy. The cruise ship impacts the environment a lot, but the sailing ship doesn't. There are small sizes, and a staff that contributes to management, and you can sail without negatively affecting the environment. There have been some articles written about how cruise ships impact the territory more than plane trips.

3. Why is the market pushing towards smaller planes?

Previously, I was referring to the smaller dimensions of the Airbus A380. They will no longer sell it, but instead, A320, which can hold 120/130 passengers. In the case of COVID-19, we hope to have smaller numbers in the future so as to block fewer people.

There's a thousand technical problems with the seaplane, so it's not efficient. With boats you have more resistance, you have lower performance, and take-off and landing are more difficult, so accidents are more common.

Catching the waves at the right spot isn't easy. Landing without a track is an advantage. There's a problem with hull planes. The fuselage of a conventional plane can be shaped so that you have minimal resistance; with hull seaplanes, the fuselage has to be shaped so that in the water, it is directional, and then it is inefficient in the air.

In addition to many presentations, "Clean Sky" brings you a vision of the future of aeronautics even at ICAO. In the air, it's very trendy to talk about planes like Lilium, which work like helicopters. Then there are the Chinese, who released the quadcopter Ahang 184. It is a drone that transports people. There are many options, but electric and reduced consumption are the keywords. While there are rules for understanding the state of the lake and sea from an aircraft, much depends on the pilot's experience. By looking at the colour or whether it has ripples, they know if it's wavy.

4.4 FUNCTION ANALYSIS

These infographics (FIGURE 28 and FIGURE 29) outline the main activities that can be enjoyed inside and outside a seaplane during and after a flight. Some outdoor activities, such as picnicking, hiking, scuba diving, shallow fishing, and paddle boarding, require special equipment that should fit inside the seaplane. The activities selected for this list have been suggested by travel companies, Seaplane Experiences, Ultima Thule Lodge, Jacada Travel, and Pure Life Experiences, or are based on interviews and user profile research.

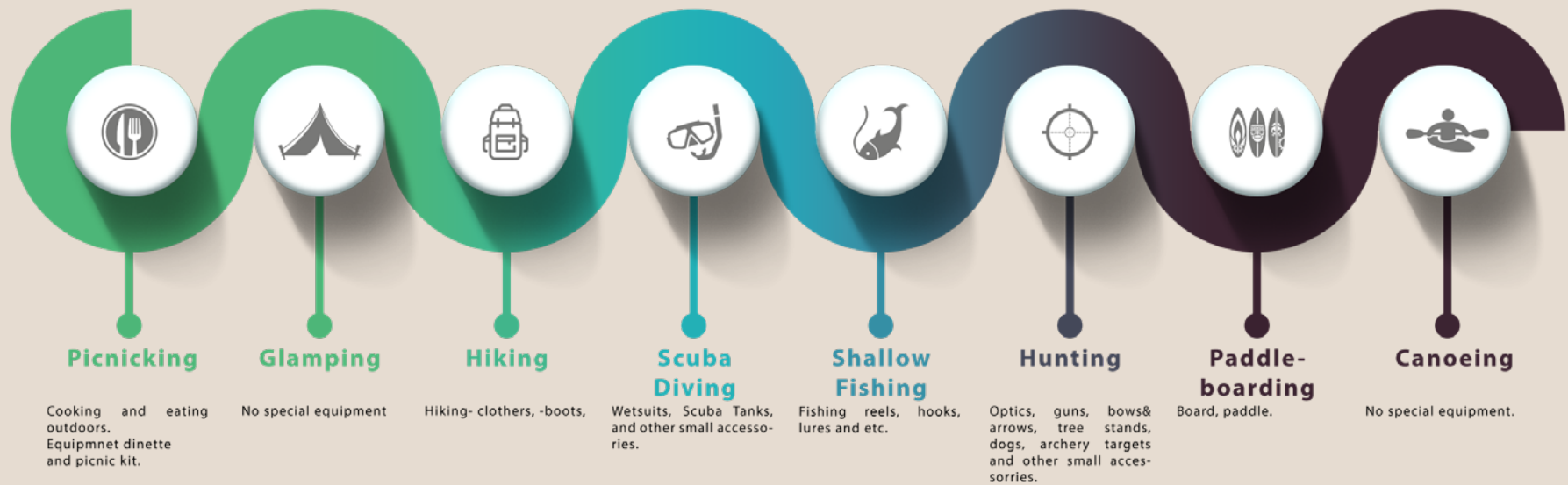
Onboard Activities:

during up to 4h flight



Function: #snacking, #drinking, #playinggames, #watchingtv, #reading #landscaping, # communicating, #working

Outdoor Activities: after flight



Function: #picnicking, #glamping, #hiking, #scubadiving, #shallowfishing
#hunting, #supsurfing, #paddleboarding #canoeing

5. Project Brief -

5.1 ERGONOMIC STUDY

To determine the correct ergonomics inside the cabin, the seating areas of VIP and Adventure configurations were analysed.

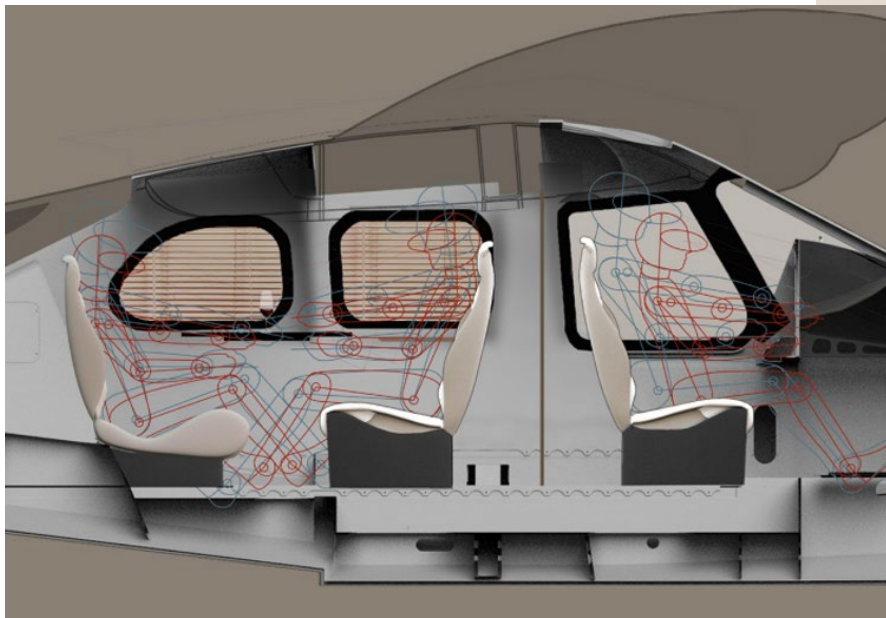


FIGURE 30. Torcolacci 2021

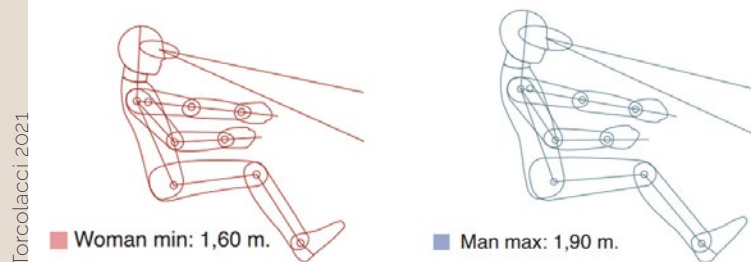


FIGURE 31. Torcolacci 2021

PURPOSE

A perfectly ergonomic aircraft seat was identified, along with an acceptable tilt angle. Based on this data, the seating area was modelled in accordance with the average proportions of female and male bodies.

Additionally, based on the developed model of the seating area, the proper height, size, and position of the table were determined.

Ergonomic study -

5.1.1 ERGONOMIC RESEARCH

The majority of people spend their day sitting, both at work and at mealtimes. Almost all activities are performed while seated. Design chairs are supposed to provide comfort and efficiency in performing their tasks while welcoming the human body in the most ergonomic way possible. The archetypal chair shape has been the subject of numerous studies. Nevertheless, the chair remains a regular object that has to fulfil a few, but essential functions: providing comfort to the human body's curves and providing support for the lumbar area, while not overburdening the body.¹ Not all seats are for everyone and not all seats can satisfy all situations. Travel seats should be adjustable due to the fact that they have to accommodate the needs of all sizes of people, such as in an automobile or an office.²

Throughout the trip, passengers on an aircraft should maintain a proper seated position. When it comes to travellers, it is not only about comfort but also about reducing fatigue caused by prolonged stay in one place.³ In the plane, there are no lateral accelerations as in an automobile, however, there are vertical (from top to bottom). Due to this, the contour of the seat should not be hugging; instead, it should be flat.

In order to ensure maximum accident resistance, the legs, which serve as the supporting base for the seat shell, should be constructed with maximum rigidity. Geometric shapes like triangles or groups of triangles must be formed while maintaining the lightness of the individual parts and structures. All of these requirements must be met by the aircraft seat.⁴

1,2,3,4 Romli, Aminian 2018

5.1.2 DESCRIPTION OF ERGONOMIC AIRCRAFT SEATS

PERFECTLY ERGONOMIC AIRCRAFT SEAT¹

- Lightweight seats;
- A solid foundation;
- Supports the abdomen and lower back with Lumbar-Dorsal Support (LDS);
- Support for the thorax;
- A headrest that provides neck and skull support;
- Since each individual's height is different, users should be prepared to alter the LDS's peak;
- Designed to accommodate tall users and provide space when space is limited (e.g., light propeller aircraft);

AIRCRAFT SEAT ERGONOMIC ADVANTAGES²

- Comfortable seating enhances the flight experience;
- Users are able to sit down and get up easily and quickly from their seats, which is especially important in case of an emergency evacuation;
- The ergonomic design of an aircraft seat increases the amount of space available within the cabin;
- Reduce the risk of health complications, such as Deep Vein Thrombosis (DVT);
- Reduce the risk of backbone injuries;

1,2 Romli, Aminian 2018

Ergonomic study -

5.1.3 PASSENGERS' ERGONOMIC NEEDS

The majority of activities that passengers can conduct inside the cabin are performed while seated. That is why all areas of the cabin must be accessible with minimal effort while remaining as comfortable as possible. This principle was applied in designing the coffee table, which was positioned in a way that maximized the comfort of the passenger, and other items were placed within the radius of arm movement in order to minimize the amount of effort required on the passenger's part.

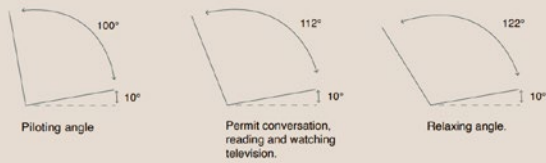


FIGURE 32. Torcolacci 2021

- When the seat angle is less than 15° and the backrest angle is more than 30°, the body tends to slide forward, resulting in poor posture. It is only possible to endure this for a short period of time;¹
- A high level of seat pressure at the front edge of the seat slows down blood circulation in the legs;²
- The greater trochanters of the thigh bone are rotated by a deep soft cushion, resulting in tension in the hip muscles;³
- The seat angle selected is 112°. In order to provide maximum comfort to the passenger, the seat must measure between 39 and 47 cm in length;⁴

1,2,3,4 Diffrient, Tilley, Harman & Joan 2017



FIGURE 33. Torcolacci 2021

5.1.4 MEASUREMENT TEST

In order to determine the right measurement inside the cabin, the maximum and minimum human dimensions were used.

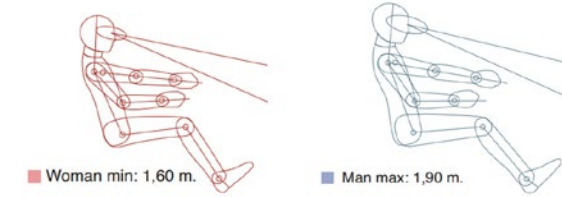


FIGURE 34. Torcolacci 2021

VIP Configuration

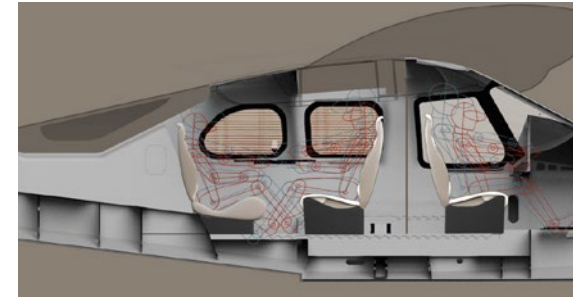


FIGURE 35. Torcolacci 2021

ADV Configuration

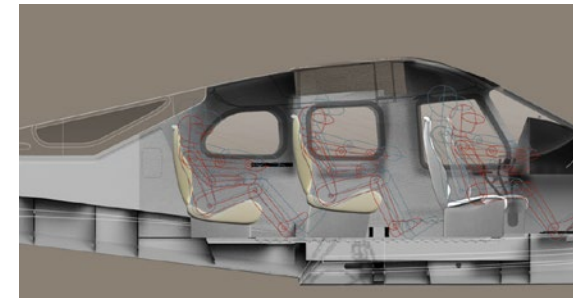


FIGURE 36. Torcolacci 2021

As a result, the correct seating positions for the VIP and Adventure configurations of the aircraft were identified according to the body types of the passengers.

The VIP version of the seaplane feels quite cramped in the leg area due to its limited cabin space. Moreover, there were no alternative options to improve seating positions due to the low height of the ceiling. However, the Adventure version looks spacious.

5. Project Brief -

5.2 COLOUR CONCEPT

This section examines the meaning of colour in the interior and how colour affects the perception of the interior overall.



FIGURE 37: Björn 2021

OVERVIEW

Each colour conveys a different message. Figure 30 illustrates how colour affects the mind of a person. The word "happy" appears quite normal on a yellow background, but what about a grey background?

Thus, a colour scheme may also affect passengers' attitudes and behaviours. A person may feel calmer and less stressed when surrounded by one colour, or they may feel more adventurous, masculine, and adrenalized when surrounded by another colour. By altering the amount of visible space inside a cabin, a colour scheme can affect the perception of space and comfort.

Despite the fact that aircraft cabins often have set, small dimensions, the illusion of space can be achieved by using contrasting or accent colours. The selection of colours is however based on the client's preferences and current design trends.

Colour palettes for aircraft cabins can be categorized into three categories: cold light, warm natural, and dark shaded. In the following sections, a colour palette benchmarking analysis is presented in more detail.

5.2.1 COLOUR PALETTE BENCHMARKING

LIGHT & COOL COLOUR PALETTE

A cool, light colour scheme on the walls and ceiling maximizes the reflection of light. In cramped or small spaces,¹ it creates the appearance of a wider, more open space.² The use of white colours can give a sense of order and grace, but it does not quite make a room appear cosy. Interiors painted in a single colour are considered dull and monotonous. Furthermore, monochrome interior conveys the impression of a futuristic, soulless environment.



FIGURE 38. Björn 2021

WARM NEUTRAL COLOUR PALETTE

The warm neutral colours create a cosy and homely atmosphere, yet the area appears smaller than it actually is. As a result, the atmosphere on board may be more conducive to interaction and conversation between passengers. Moreover, this palette of colours enhances individuals' productivity and comfort during flights, which helps reduce tension. A room with a low ceiling or side walls can appear larger by using light colours on the side walls and ceilings.¹ Furthermore, applying a darker shade to an end feature wall makes the wall appear closer, which diminishes the perception of depth within the cabin.



FIGURE 39. Björn 2021

DARK COLOUR PALETTE

A dark colour palette contributes to the spa's relaxing and cold atmosphere, as well as its appearance of luxury and style. In this way, a sense of self-importance and superiority is created. This effect can be employed to designate formal areas that are primarily used as chat rooms. Dark colour schemes may even appear aggressive and dynamic depending on the interior. When the bottom part of the walls is painted or covered with a darker colour, the height of the walls is significantly reduced.¹ All of these factors result in a cramped and small appearance of the space. This colour scheme is commonly found on larger aircraft.



FIGURE 40. Björn 2021

5.2.2 VIP CONFIGURATION COLOUR PALETTE

VIP VERSION A

During the flight, passengers can enjoy the panoramic view through large windows constructed into the fuselage of the LA-8 seaplane. Based on this information, the palette should be selected in accordance with changing lighting conditions. Cabin colours should focus passengers' attention on the landscape. Dark colour palettes create further contrast between nature and the cabin of the aircraft. Through the panoramic windows, nature appears even brighter and more colourful when the walls are dark.

Project brief -

The authors also examined Japanese interior design in order to demonstrate the philosophy of clean, open space that is prevalent in Japanese design. Natural and pure designs are calming and give the impression of a spa and relaxation. The interior with wooden floors, dark walls, and ceilings is also an appropriate variant for the LA-8 design. Bonseki-sand pictures can be used to highlight interior elements, such as walls or even seats. As well as adding value to the interior, this pattern can serve as a link between the parts of the composition. A natural colour scheme appears rich and beautiful.



COLLAGE 1. Björn 2021

#DARK #LUXURY #NATURAL #RELAXING #COOL

VIP VERSION B

A light colour palette with warm tones, accented by panoramic windows, creates a soft and airy atmosphere. In an aircraft cabin, sunshine envelops the space and provides a sense of spaciousness and safety.

Typically, light beige colours can be found naturally in deserts, for example, a variety of sand colours, bright and light reflections, and pale brown woods and stones. With its monochromatic colour scheme and natural lighting, this minimalistic setting appears to be very stylish. By using light tones, a room appears to

be spacious, and a peaceful atmosphere is created. In contrast to a cooler, pale floor, warm tones of walling and furniture create a more welcoming and cosier feeling.

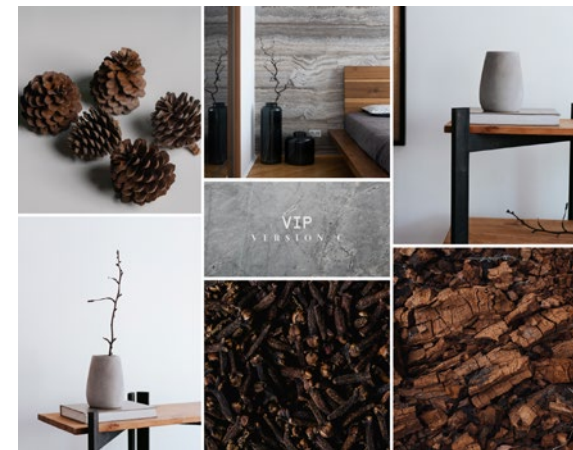


COLLAGE 2. Björn 2021

#LIGHT #CLEAN #NATURAL #SOFT #WARM

VIP VERSION C

It is always fashionable and attractive to use natural middle tones. They maintain a clean appearance and offer a wide range of colours and materials. When the interior is painted in this shade, it appears modern and elegant. Colours will change gracefully depending on the lighting. Gray pastel tones provide a sophisticated edge, elegance, and refinement to a room.



COLLAGE 3. Björn 2021

#MIDDLETONE #ELEGANT #NATURAL #NEUTRAL

Project brief -

5.2.3 ADVENTURE CONFIGURATION COLOUR PALETTE

ADV VERSION A

This aesthetic look is more luxurious and adventurous. Moreover, the use of light shades with wood textures is quite appealing. Adding metal elements to a design gives it a stylish finish and makes it look so attractive. The colour mood board also includes a few subtle blue details that are reminiscent of azure seas and clear blue skies. Combining steel with wood refreshes the composition and provides a welcome contrast. Its shape and pattern are reminiscent of tech fashion. Despite its simplicity, it is eye-catching. These designs evoke images of extreme sailing, strength and courage, luxury sports, and overcoming nature's forces. This moodboard is characterized by a clear and graphic colour palette.

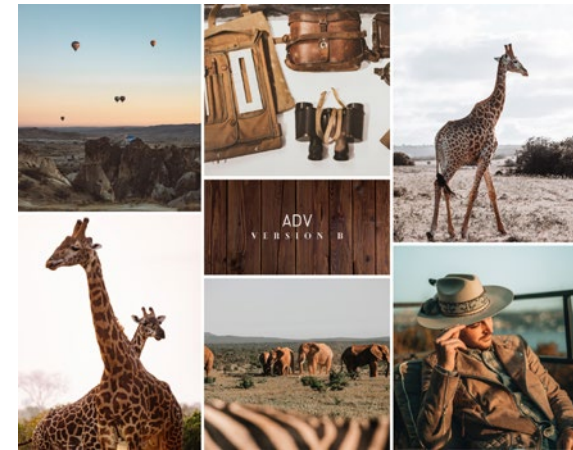


COLLAGE 4. Björn 2021

#EXTREME # ADVENTUROUS #FRESH #BRIGHT

AVD VERSION B

Safaris, deserts, scorching suns, and savannahs come to mind when considering this variant, but not the sea and sky. This moodboard appears rough and extreme. The colour scheme is also warm and sandy. These colours express freedom and success, making them ideal for safaris, hunting and similar types of adventure. Leather with a rough texture and wooden accents create a masculine look.



COLLAGE 5. Björn 2021

#WARM #SANDY #NATURAL #MASCULINE

ADV VERSION C

In terms of sea adventures, this variant is the most common. It contains all the most common stereotypes of what a sea adventure looks like. The colour palette is soft and natural, with metallic highlights, wood textures, and rough textiles. It evokes the feeling of bravery, pirates, and treasure hunting. Furthermore, this moodboard reflects the finest traditions of the adventure genre.



COLLAGE 6. Björn 2021

#MARINE #ADVENTURAL #SEA #ROUGH #NATURAL

5. Project Brief -

5.3 SEAT CONCEPT

The following section describes the VIP and Adventure seats of the LA-8 seaplane, as well as their key characteristics.

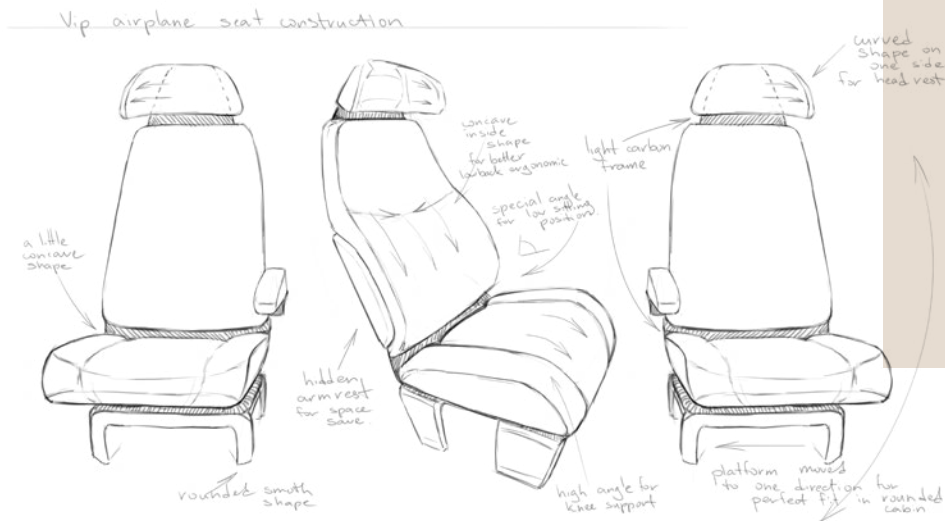


FIGURE 41. Björn 2022

OVERVIEW

Aircraft seats should be slim and light, but ergonomics are also crucial since passengers must maintain the correct posture while seated.

The VIP cabin is equipped with a three-point seatbelt that is attached to the ceiling, as in a car. To enhance passenger comfort during long flights, the seatbelt is softly padded in the middle. As an option, the ADV-version may be equipped with either an inverted Y-shaped three-point seatbelt or a H-shaped four-point seatbelt that will be attached to the ground. It is also padded with soft cushions on the sides and in the middle of the seatbelt for comfort and style.

In addition, the same shell was used for both versions of the LA-8 cabin in order to reduce manufacturing costs. Only the cushion patterns were customized for each version.

Because of the possibility of contact with water, Boxmark's water-resistant leather was chosen as the basic material for both seat versions. To maximize the amount of space available in the cockpit, the armrest is hidden and integrated only on the outer side of the seat shell.

5.3.1 THE SEAT DEVELOPMENT PROCESS

The shell I used to create the seats was provided by Max Pinucci, CEO of MBVision and Professor of Product and Communication Design at ISIA Firenze). Designed to meet existing standards, as well as the ergonomic and weight requirements of the light aviation industry, this seat shell is a universal solution for the cabin of the LA-8 seaplane. The seat shell consists of a monolithic carbon structure, which is the lightest and most durable material. In an emergency, this structure is the safest and can withstand a weight of ten times the body weight of an individual.

During the development of the seat model, only a unique pattern for the cushions was designed and the appropriate finishing material was selected. As part of the design process for the cushions, it was imperative to consider the placement of seams in order to ensure that they were not placed under sensitive parts of the body, such as the back of the thighs, the area under the knees, the area under the forearm, or the area where the back is most closely connected to the seat back.

Different types of leather were used in the seat trim, including premium perforated and smooth leather, as well as contrasting stitched seams. As part of the selection process, water resistance and dirt repellency of the material were also considered. This is because the seaplane is designed for operation in direct contact with water and on unprepared surfaces.

In order to ensure the quality of the sketching process, each stage was reviewed with the customer and the project manager, Max Pinucci. All necessary additions and changes were agreed upon by the project manager.

The first step was to create a sketch of the seat, which was then approved by the customer. Further details were developed, including the definition of colour, the texture of the material, and the proportions, as well as the functional details of the seat. In this way, several seat variations were created, from which the customer selected the most suitable for his needs and the design of the aircraft cabin interior.

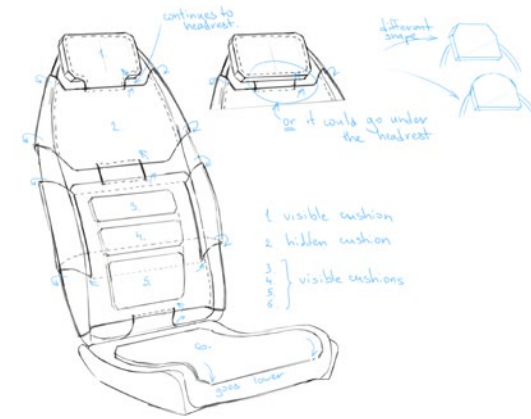


FIGURE 42. Björn 2022

VIP configuration seats have upholstery that completely covers the seat frame, providing a premium appearance. In turn, the ADV seats are upholstered partly over their carbon shell (FIGURE 42) in order to provide a more adventurous look and feel associated with adventure sports.

Throughout the design process of the VIP seat, the authors drew inspiration from famous luxury sports cars such as Ferrari, Lamborghini, Porsche, Bentley, and Bugatti. Likewise, the ADV seat configuration was influenced by the silhouette of the Aston Martin DBH SUV and the Aston Martin DB11 AMR models. ADV seats feature an open Carbon Fiber back, which is further reinforced by a special Carbon Fiber insert in the middle, which has an integrated LCD and a pocket for personal items (COLLAGE 7).

VIP Seat -

5.3.2 VIP SEAT CONCEPT

The VIP seat design is simple, yet functional. It should be both comfortable and attractive. Clean lines form a modern and minimalistic silhouette, which is complemented by a variety of leather textures.

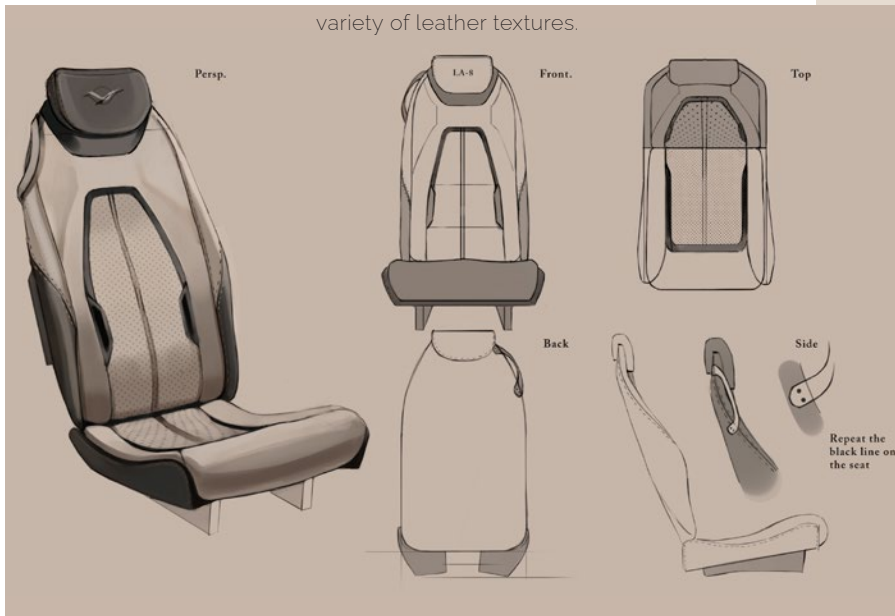


FIGURE 43: Björn 2022

OVERVIEW

VIP seats are fully upholstered in high-quality leather. Dark-shaded leather is used on the lower portion of the seat (FIGURE 42) in order to minimize seat pollution. The reason is that passengers move inside the plane and their clothing can rub against the outside of the seat upholstery, thus causing external seat contamination.

The cushions also have leather coverings. At the places where cushions contact the human body while seated, perforated leather is used to improve ventilation. Furthermore, the indentations in the cushions in the lumbar area provide even better ventilation, which is especially important if the seaplane is used in an area with a hot climate.

To ensure passengers' safety, the seat is equipped with a handle located on the outer corner of the seat. The handle can be attached to any corner of the seat shell, making production more efficient.

The seat curve of the shoulder area provides extra comfort to the passenger. VIP seat is equipped with an adjustable headrest which is covered with dark-shaded leather that prevents the headrest from polluting rapidly.

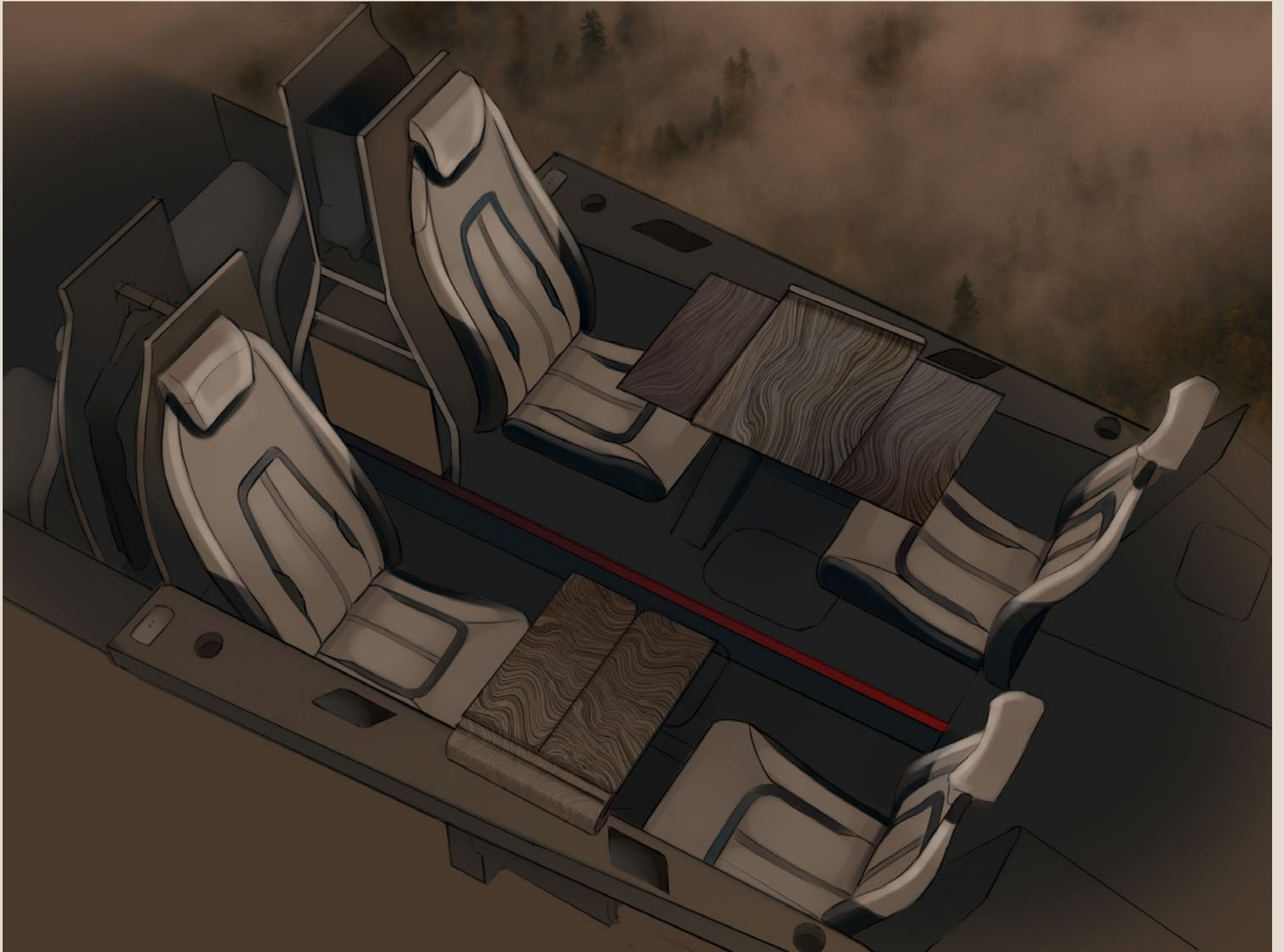


FIGURE 44. Björn 2022

Adventure Seat -

5.3.3 ADVENTURE SEAT CONCEPT

Ideally, the adventure seat should be visually rough and convey a sense of adventure. The construction should be light, and durable, and provide passengers with a small storage for personal belongings.



FIGURE 45. Björn 2022

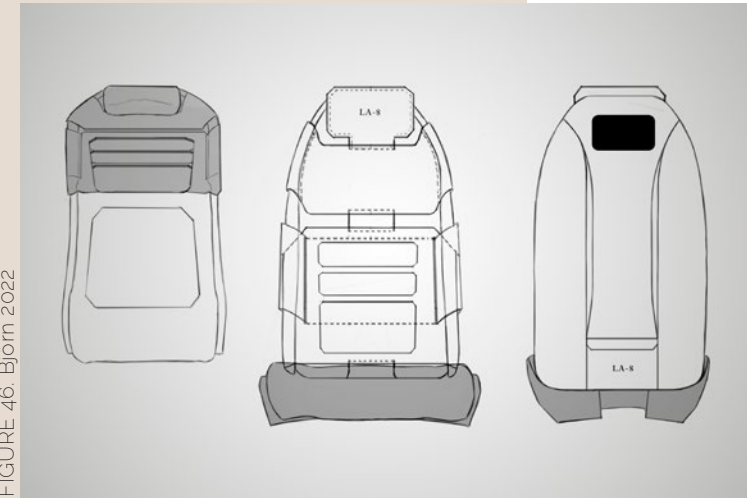


FIGURE 46. Björn 2022

OVERVIEW

An adventure seat has a visible carbon shell. A masculine touch is achieved by leather wrapping with coarse stitching. The lumbar cushions are also partially visible and covered with perforated leather. In accordance with the adventure concept, the back side of the seat is exposed and contains an integrated LSD screen as well as a pocket for some small stuff.

A carbon shell may be finished in either a matte or glossy finish. The glossy one is easier to make, but it may look too contrasting when combined with leather. The matte finish may look better, more adventurous, and more stylish, but it is more difficult to achieve. Additionally, it is more prone to scratching.

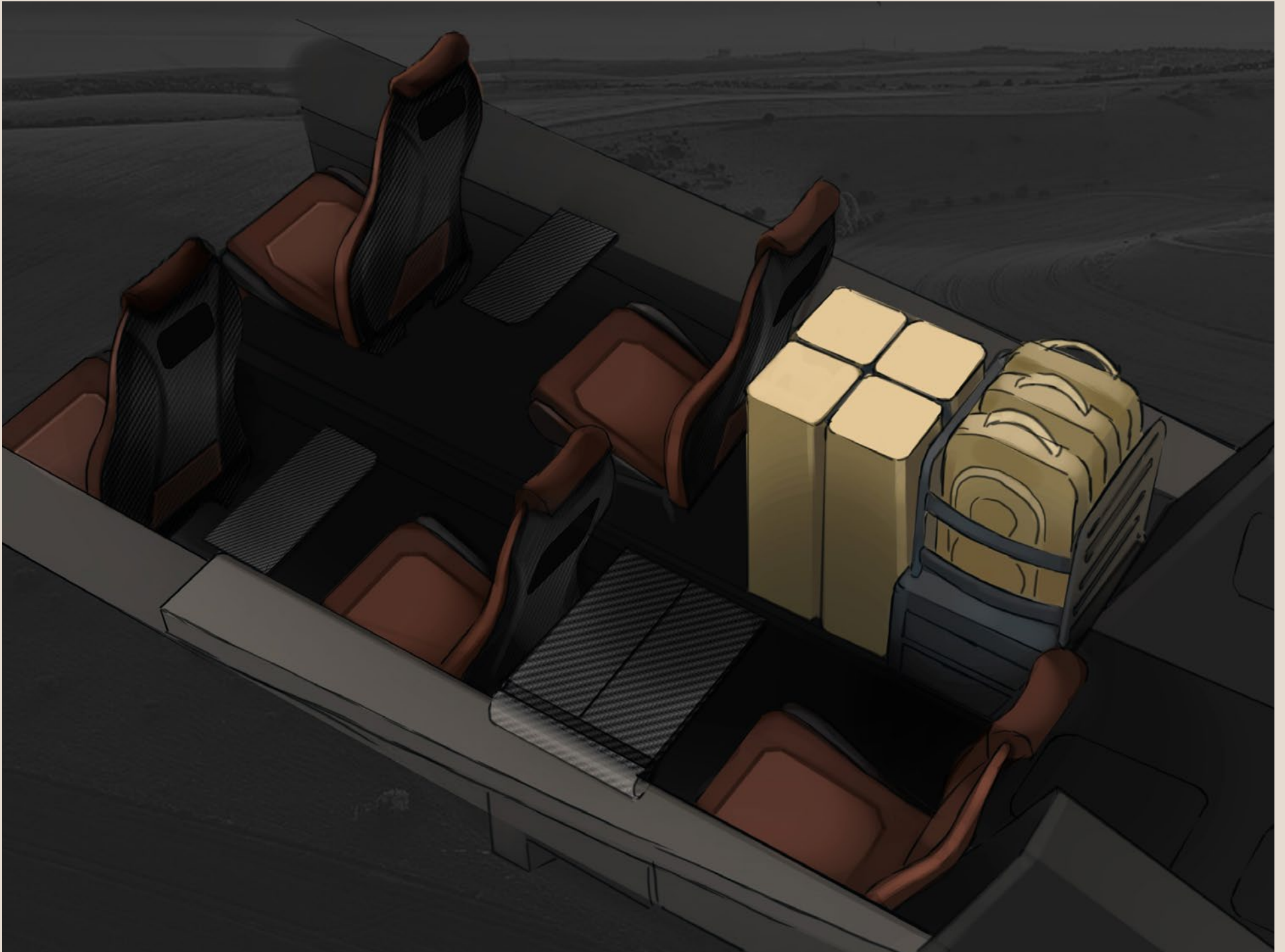
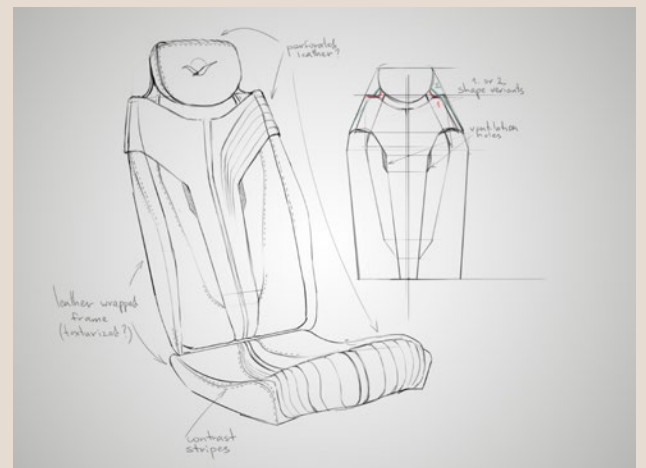
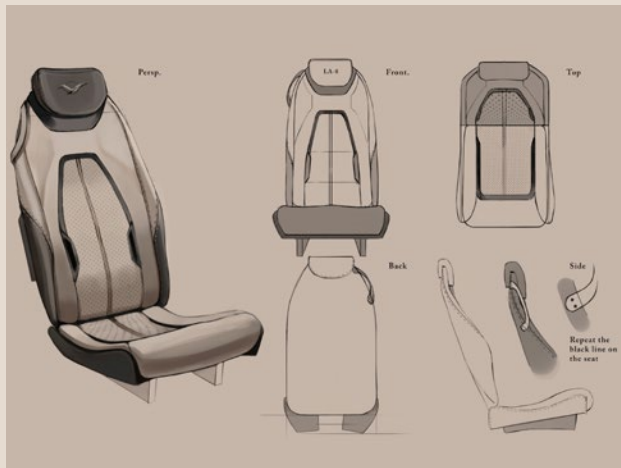
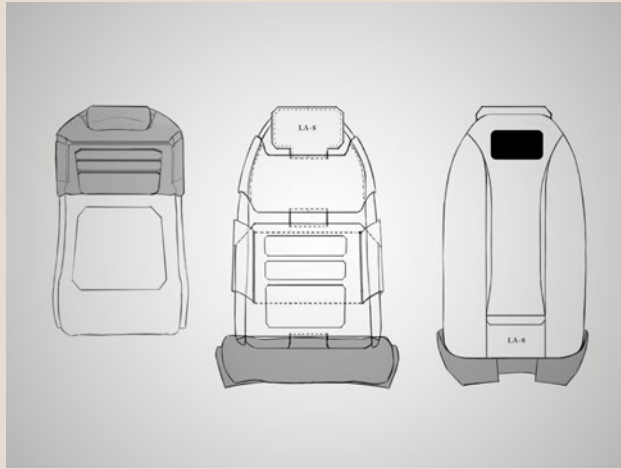
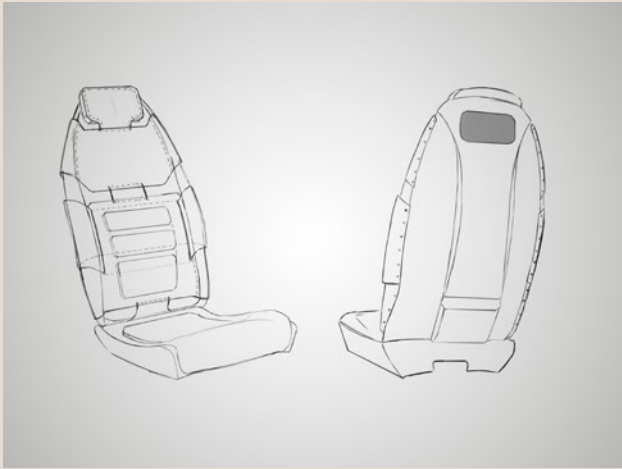


FIGURE 47. Björn 2022



5. Project Brief -

5.4 INTERIOR CONCEPT

The authors describe in this section what the VIP (FIGURE 47) and Adventure (FIGURE 48) versions of the LA-8 seaplane are intended for, and what their purposes are.

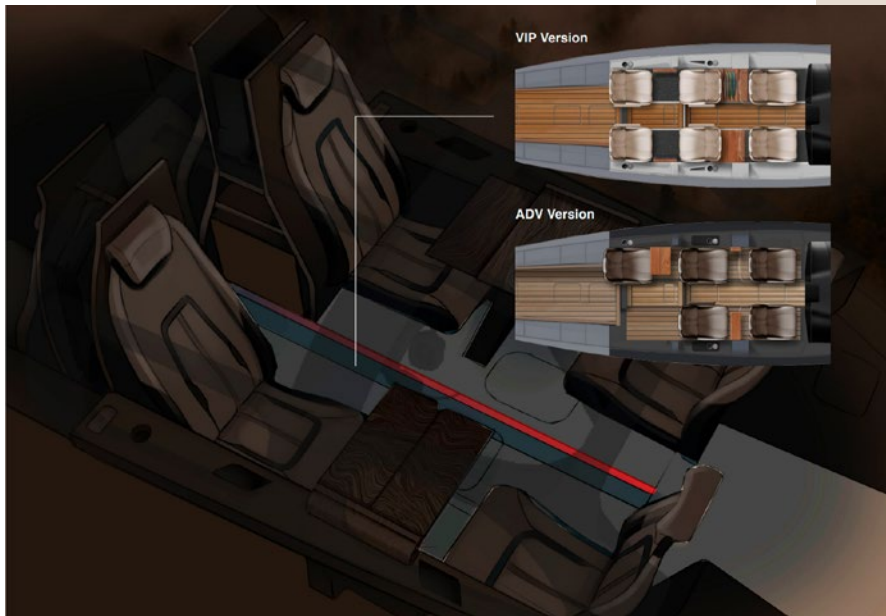


FIGURE 48. Torcolacci 2022

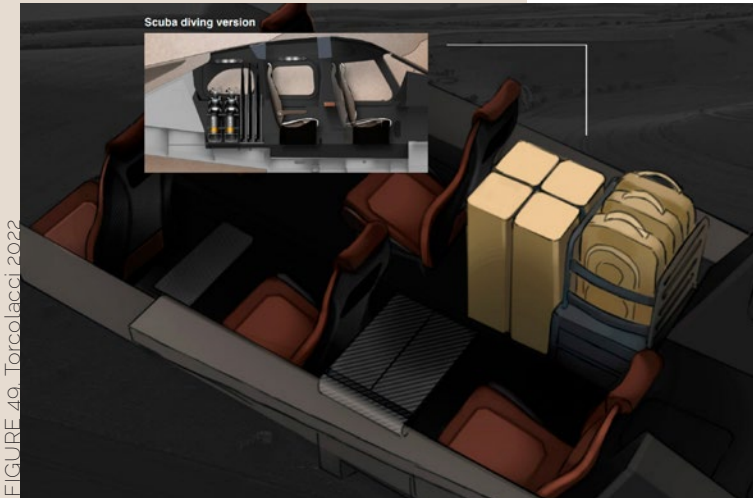


FIGURE 49. Torcolacci 2022

OVERVIEW

VIP configurations of the LA-8 are equipped according to the preferences of business travellers and offer many of the advantages associated with a premium business aircraft.

Adventure configurations are designed to provide an experiential travel experience. The equipment of the cabin is selected based on the preferences of adventure enthusiasts.

Project brief -

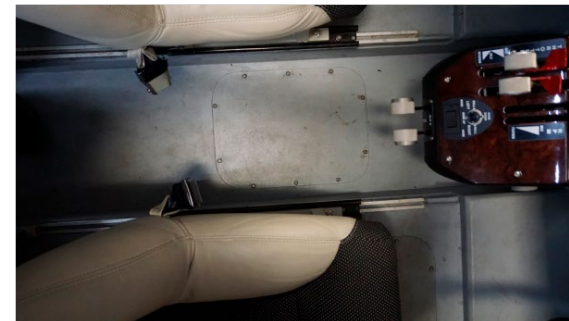
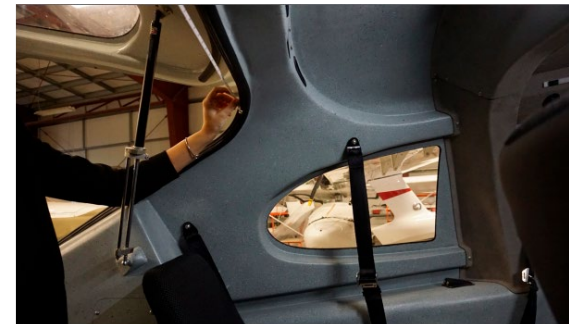
5.4.1 STARTING POINT

The starting point was the original LA-8 interior (COLLAGE 8). The cabin of the plane looks ordinary and resembles the cabin of a basic minibus, not designed for a luxury customer base. The seating arrangement is classical. The interior looks visually cluttered and untidy. Textures and colours are monotonous. The seating pattern is primitive. In terms of physical size, the cabin is extremely small, and it appears dark due to the lack of additional lighting sources. An axe stands out in stark contrast to all this monotony. Even though it serves a functional purpose, it should be positioned much more delicately.

Based on the available photographs, the primary design problem could be a protruding fuselage rib in the middle of the cabin. Based on the earlier ergonomic study of the seating area, it may be challenging to arrange the seats inside the cockpit. Further, the protruding part of the rib on the ceiling makes it impossible to place the seat high enough off the ground since a tall passenger will rest their head on this rib.

It is important to note that the plane has panoramic windows, which means that passengers should be protected from ultraviolet radiation and the sun.

As a result, the seating arrangements should be revised in accordance with ergonomic guidelines. Material textures and colour palettes should be soothing and relaxing. Additionally, the interior should correspond to the luxury segment and provide extended functionality. It is also necessary to redesign the console and equip it with the necessary elements for operation.



COLLAGE 8. MBVision s.a. (for internal use only)

5.4.2 CONCEPTUAL BASIS

An LA-8's cabin includes a storage area for personal items, a minibar with a coffee maker, a closet, and a luggage compartment. Comfortable, exclusive seats and leather covers ensure that passengers can fly safely and in comfort. The interaction system provides information regarding flight progress and the ability to control various cabin functions and multimedia. Interaction systems inform passengers about flight progress and allow them to control various cabin and media functions. The concept involves accommodating 1-2 crew members and 4-5 passengers who can easily interact during a friendly conversation or during a business meeting.

Discovering the world's horizons, exploring hidden places around the world, and sharing the experience with friends and family - all these things are possible with the special adventure configuration of LA-8. This purpose was specifically addressed in the design of its interior. From 1 to 2 crew members and 3 to 4 passengers can comfortably fit in the cabin. With one seat removed, it was possible to expand the area for inventory and equipment. Seats are covered with durable leather and equipped with monitors that provide current information about the flight. Each seating area was set up with a personal table.

An amphibian aircraft is equipped for the varied needs of its passengers. This enables a person to scuba dive in the ocean, fish in the rivers, or enjoy a breathtaking view of the outside. An advantage of travelling by amphibious aircraft is the opportunity to share a different story upon return.

5.4.3 DESCRIPTION OF THE CONCEPT

FOLD-OUT TABLE

As a means of increasing the use of cabin space, the authors chose a foldaway table that is concealed within the console body. This table has mechanical springs for assisted deployment and is manufactured by Bucher aircraft interior solutions. In the VIP version, there are two tables with double flaps and in the ADV version, there are two tables with double flaps and two smaller tables (FIGURE 49). The authors propose to equip the table with a special metal plate that will anchor the magnetic wine glasses, according to their concept. This will ensure enhanced safety during flight while maintaining the elegance of luxury travel.

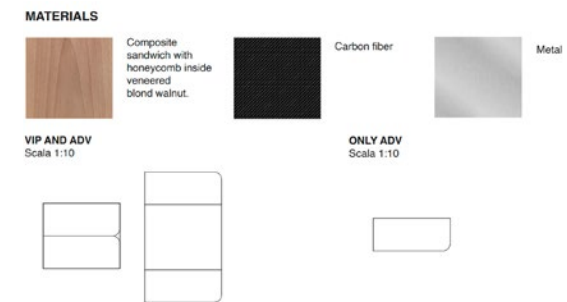


FIGURE 50. Torcolacci 2022

It would be possible to prevent liquids from spilling by using high-resistance magnetic wine glasses. This technology provides stability and safety for passengers, and it is already in use on boats and yachts. Magnets are integrated into the stem of those glasses and they are fastened to stainless-steel boards. As an example, Royal Stabilis offers luxury no-spill wine glass solutions.

Project brief -

MINIBAR

In the VIP version of the aircraft, the minibar meets the primary needs of passengers during the flight. The minibar is located opposite the wardrobe, between the pilot seat and the passenger seat. It consists of a coffee machine, a minifridge, two drawers, one shelf, a wine glasses storage compartment, a snack bar.

WARDROBE

The VIP version of the seaplane is equipped with a mini wardrobe apartment, providing passengers with additional storage space for their clothing and shoes.

MATERIALS



COMPOCEL WF
double-face plywood sandwich made of
PVC foam



Aluminum

FIGURE 51. Torcolacci 2022

FLOORING

Since seaplanes are often in contact with water, their flooring should be similar to teak used on boats in terms of both appearance and waterproof properties. Materials should be chosen based on their lightness, ease of cleaning, and environmental friendliness. A long search led to the discovery of an Italian company, GRANORTE, that produces ultra-light, environmentally friendly cork flooring materials. In the VIP version, the floor will only be partially covered by this material. While the adventure model's floor, which requires more floor maintenance, will be entirely protected by cork material. In order to make the VIP model more comfortable for passengers, the remaining flooring under the passenger seats will be finished with bamboo carpets.

VIP MATERIALS



GRANORTE
Seasoned teak



LUXURY CARPET
Moquette

ADV MATERIALS



GRANORTE
Weathered teak

FIGURE 52. Torcolacci 2022

CEILING

As the central corridor is located below the level of the seats, passengers are able to move more freely within the cabin. Each passenger has their own storage space on the sides of the ceiling. An ADV version is equipped with cargo nets (FIGURE 53) which adds an adventurous touch to the cabin look, while the VIP version has more elegant leather pockets (FIGURE 53) that give the cabin a high-end finish.



FIGURE 53. Torcolacci 2022

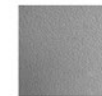
CONSOLE

The console contains the minimum amount of equipment necessary to support each passenger during the flight. The integrated LCDs are used to control various functions of the cabin, such as lighting modes, window tinting, and air conditioning. Each console is equipped with two LCDs, two cup holders, two headphone sockets, and a refrigerator for chilled beverages.

VIP MATERIAL



Gray Leather



Gray Plastic

ADV MATERIAL



Black Leather



Gray Plastic

FIGURE 54. Torcolacci 2022

Project brief -

LIGHTING

Light plays a fundamental role in determining the spaciousness of a cabin. The lights not only illuminate the area but also give a sense of spaciousness to passengers by giving them the impression that they are in a much larger space. By placing lights parallel to each other on either side of a cabin, the perception of a wider space can be created. Additional clearance above the seats is created by the location of the personal light on the ceiling near the air vent. There is an urgent need to minimize shadows and brighten small airplane cabins in order to reduce the feeling of claustrophobia.

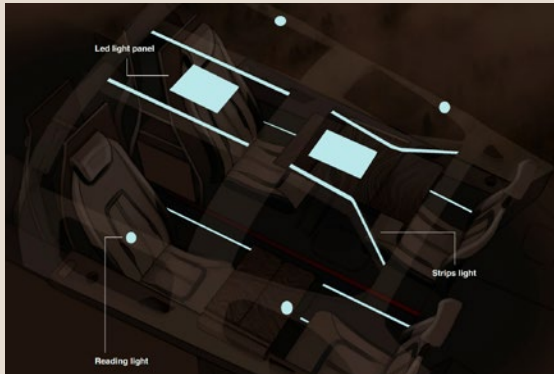


FIGURE 55. Torcolacci 2022

AVIATION HEADSET

Since this product is among the highest quality available, a Bose A20 Aviation Headset with Bluetooth was selected for the clients. A plane like the LA-8 does not have a hermetic fuselage since it flies in a low attitude and the turbines produce a considerable amount of noise. The passengers must wear noise-cancelling headphones and noise-cancelling headsets in order to avoid yelling all the time and to protect their ears.

ADVENTURE CONFIGURATION EQUIPMENT

Adventure cabin configuration is provided with a storage area for fishing, hiking, or scuba diving equipment. One seat was removed in order to make this possible. The space can accommodate up to four oxygen tanks and three wetsuits on hangers.

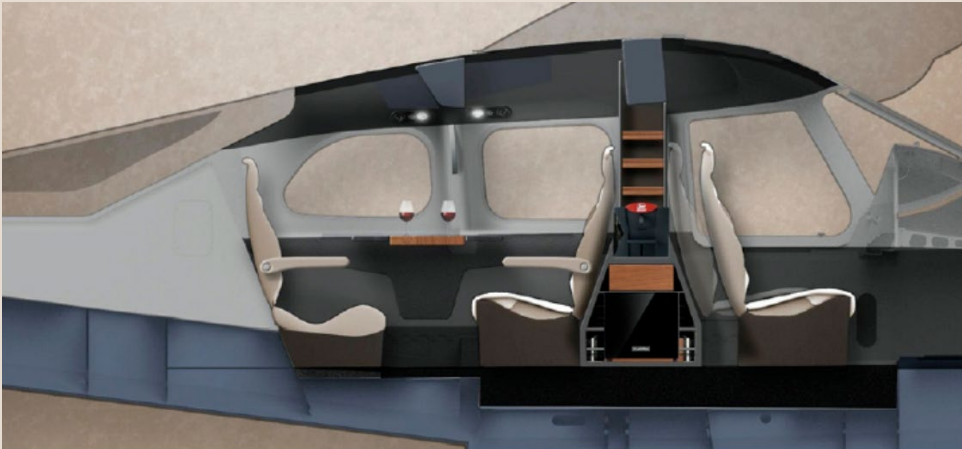
ACCESSORIES

The VIP cabin configuration provides each passenger with a personal iPad, which is secured by an iPad clamp mount. The device can be mounted in a position that is most comfortable for the passenger or even moved to the side. In order to save space, the iPad arm hook can be inserted into the cup holder on the console. In addition, a leather bag can be located beneath each seat for the purpose of storing some personal items.

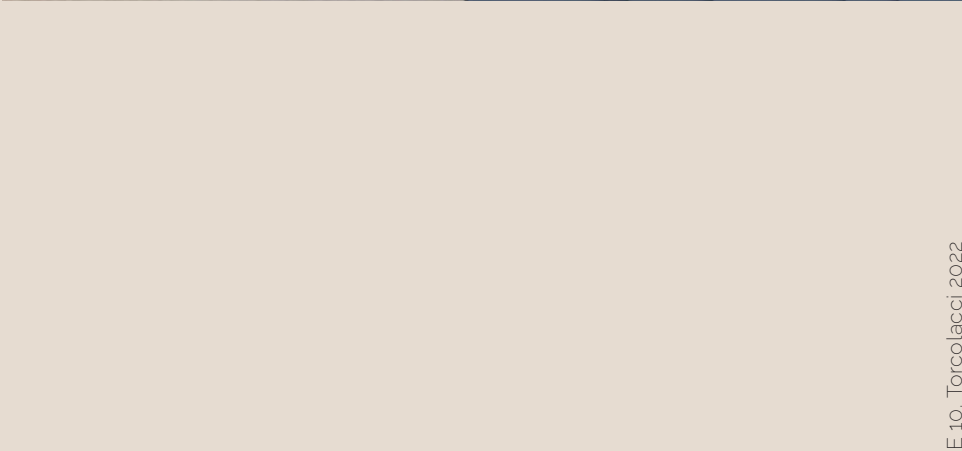
WINDOW TINT

OnGlass technology allows the glass to be tinted without the need for old-fashioned curtains. Electrochromic glasses are made from lightweight glass that is suitable for use in aviation. This solution enhances the cabin's functionality and provides the possibility of creating a customized environment. This technology enables a visually clean and minimalist cabin appearance as well as effective UV protection. As a whole, this solution is both modern and unique, which is in itself a positive attribute.

Further, the authors present side plans and top views of VIP- and ADV configurations of the LA-8 seaplane cabin, created in Adobe Photoshop, along with 3D renderings from RhinoCeros of both aircraft configurations.



COLLAGE 9. Torcolacci 2022



COLLAGE 10. Torcolacci 2022





FIGURE 56. Torcolacci 2022



FIGURE 57. Torcolacci 2022



COLLAGE 11. Torcolacci 2022



COLLAGE 12. Torcolacci 2022

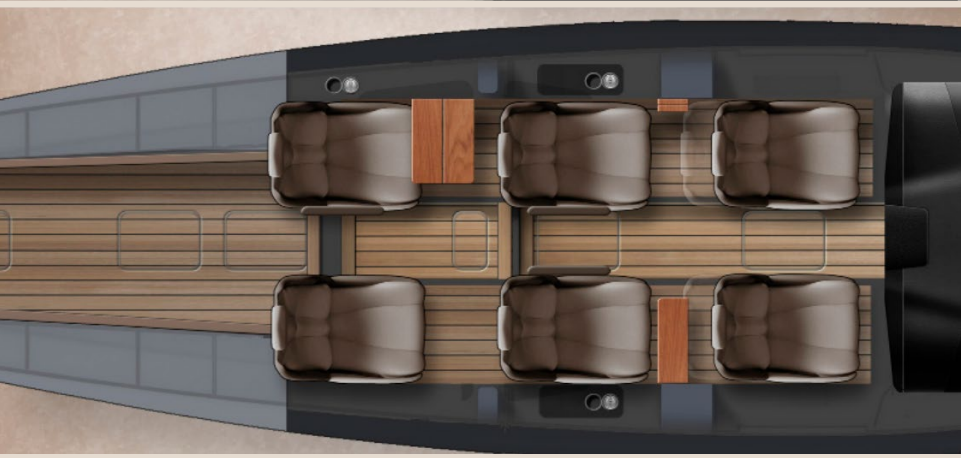




FIGURE 58. Torcolacci 2022



FIGURE 59. Torcolacci 2022

6. Disclosure -

6.1 REFLECTION

For my design-oriented thesis, I investigated aviation infrastructure that targets luxury consumers.

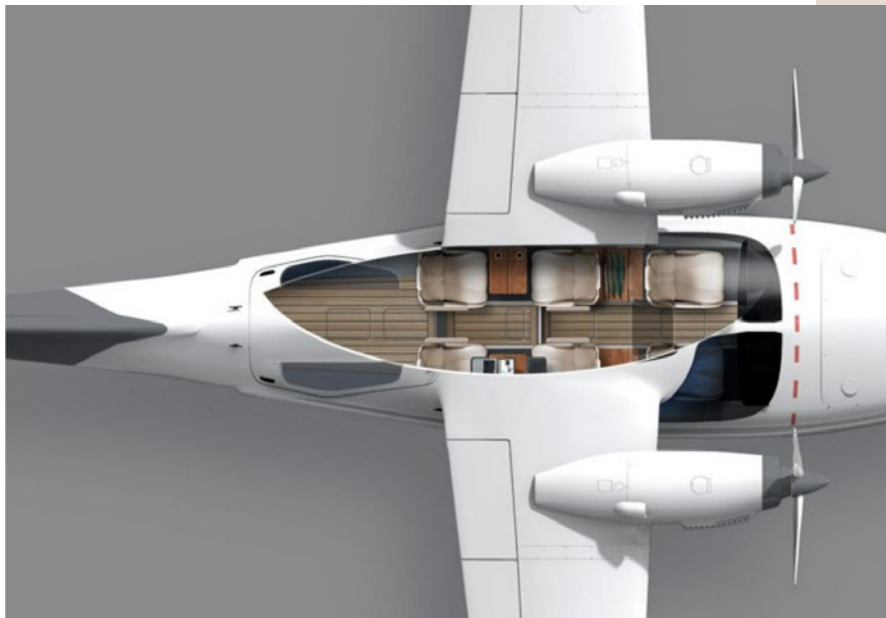


FIGURE 60. Torcolacci 2022



FIGURE 61. Torcolacci 2022

OVERVIEW

Throughout the thesis, it was emphasized that product development (seaplane cabin) must meet the requirements of the end-user and compete with the unique selling point of the aviation industry.

ADV and VIP versions of seaplane cabins must meet aviation quality, safety, and ergonomic requirements. It is important to design these versions in accordance with their intended use. An adventure configuration is appropriate for extreme tourism and recreation, while a VIP configuration is appropriate for business flights.

Disclosure -

The purpose of the work has been achieved. The developed solutions are unique, innovative, functional, ergonomic, and efficient in use. During the writing process, I completed a number of tasks (visualization of ergonomic airplane seats, a combination of functional elements with aesthetic appeal). Further, interviews with people working in the luxury tourism industry were conducted in order to analyse the final customer's needs. Based on the characteristics specified for the LA-8 seaplane, various features have been identified that indicate the use of waterproof materials so that this aircraft can be fully used in various conditions, on land, on water, and in the air.

My goal is to design seats that meet the needs of luxury passengers. They want a seat to be comfortable, safe, and stylish. The general trend is to use environmentally friendly and aesthetically pleasing products. Throughout the flight, the seats are designed to ensure the comfort and safety of passengers. Despite having the same shell, the seats can be customized with additional cushions and upholstery. By simply changing the upholstery, this type of seat can be reused and, possibly, converted into a different model. The seat shell itself is universal and meets aviation quality, safety, and ergonomic standards, since it is made of carbon that is one of the strongest and lightest materials used in the manufacture of lightweight seats.

In choosing and researching the colour palette, I learned about its impact on passengers' moods. Using this information, I selected three colour palettes for the each aircraft configuration. Additionally, it depends on the purpose of the operation (business or adventure). In choosing and researching the color palette, I learned about its impact on passengers' moods. Using this information, I selected three colour

palettes for the each aircraft configuration. Additionally, it depends on the purpose of the operation (business or adventure). For the interior of this aircraft, we have developed bold, original, and universal concepts. This is due to the fact that there is currently no other competitive offer for this type of aircraft. My only regret is that the idea we presented has not yet come to realization and we have not begun to implement it. The reason for my regret is also my inability to communicate with a variety of people related to this industry (luxury vehicle owners/co-owners/rentals, engineers and technicians, etc.). With this knowledge, we would be able to gain a better understanding of the seaplane possibilities associated with our project.

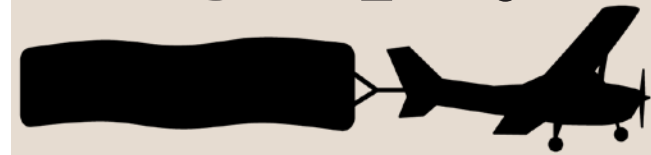
If the product I developed is commercialized, a great deal of work will be required. To ensure the safe use of the product, the connections should be examined and checked for strength, a prototype should be created, and the necessary changes should be made. It is necessary to estimate the cost of production of a product and to locate the manufacturer of the product, conduct marketing research on the target market, and determine whether the market is interested in the product. A marketing plan and a commercial availability strategy must be developed and implemented so that the product will be available on the market within a reasonable timeframe. The benefits of the project "LA-8 Seaplane Interior and Experiential Design" and the company Jekta Switzerland SA are hard to evaluate within the thesis. We have presented the most effective ways to use the LA-8 seaplane based on the results of this study. Among the advantages of this project is its conceptual nature, which combines practical knowledge and various design methods to create a brand-new, original product.

Disclosure -

During the course of my thesis research, my personal goals were to learn more about industrial design, its methods, and its tools. In addition, I wanted to clarify my own identity as a designer and where I intended to go after graduation. I gained a great deal of knowledge about aircraft design and industrial processes, in particular the technical, ergonomic, and functional aspects of design.

Designing and planning a product is not always an easy process and we had to refer back several times to different research steps. I was not mentally prepared for it, but I liked the idea. The project was unique, and it was not easy for us. I also often wondered if I was competent enough for this kind of job. This is because I felt like I did not know enough about things like designing an airplane interior concept. At first, it was difficult to identify the main problems and where to start the design process. When we overcame these difficulties and found the key points of the research, our work became productive. Although we lost half a year on it. Even though we live in different countries, we have learned to work effectively in teams and divide roles and responsibilities in the workplace. And also at this time, we came closer and became friends. We are happy with the final result of our teamwork, and we appreciate our efforts.

7. Sitography -



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- FIGURE 5. <https://www.pexels.com/photo/dried-cloves-in-close-up-shot-6087276/>
- FIGURE 6. <https://www.pexels.com/photo/a-ceramic-vase-on-top-of-a-book-8251755/>
- FIGURE 7. <https://www.pexels.com/photo/textured-background-of-dry-tree-bark-on-land-4577525/>

COLLAGE 4. Björn, Daria 2021. ADV Version A Moodboard. Photo collage. 17.11.2021

- FIGURE 1. <https://www.pexels.com/photo/man-in-black-and-white-jacket-and-blue-denim-jeans-standing-on-white-boat-4934674/>
- FIGURE 2. <https://www.pexels.com/photo/black-rope-on-brown-wooden-table-4934523/>
- FIGURE 3. <https://www.pexels.com/photo/white-sail-boat-on-sea-4934618/>
- FIGURE 4. <https://www.pexels.com/photo/blue-and-white-fishing-rod-4934508/>
- FIGURE 5. <https://www.pexels.com/photo/white-sail-boat-on-sea-4934614/>
- FIGURE 6. <https://www.pexels.com/photo/gray-rope-on-brown-wooden-surface-4934672/>
- FIGURE 7. <https://www.pexels.com/photo/person-wearing-white-nike-sneakers-4934668/>

COLLAGE 5. Björn, Daria 2021. ADV Version B Moodboard. Photo collage. 17.11.2021

- FIGURE 1. <https://www.pexels.com/photo/hot-air-ballooning-in-cappadocia-14524976/>
- FIGURE 2. <https://www.pexels.com/photo/brown-and-white-giraffe-11760840/>
- FIGURE 3. <https://www.pexels.com/photo/brown-binoculars-camera-and-bag-kit-2282479/>
- FIGURE 4. <https://www.pexels.com/photo/close-up-of-wooden-plank-326311/>
- FIGURE 5. <https://www.pexels.com/photo/elephants-on-a-field-4577544/>
- FIGURE 6. <https://www.pexels.com/photo/giraffe-walking-in-savannah-4577111/>
- FIGURE 7. <https://www.pexels.com/photo/man-in-brown-leather-jacket-and-brown-hat-7848220/>

COLLAGE 6. Björn, Daria 2021. ADV Version C Moodboard. Photo collage. 17.11.2021

- FIGURE 1. <https://www.pexels.com/photo/paper-ship-on-an-old-map-8969168/>
- FIGURE 2. <https://www.pexels.com/photo/man-sitting-on-the-ship-5022678/>
- FIGURE 3. <https://www.pexels.com/photo/close-up-photo-of-rope-298846/>
- FIGURE 4. <https://www.pexels.com/photo/close-up-photo-of-a-rope-5949197/>
- FIGURE 5. <https://www.pexels.com/photo/shallow-focus-photography-of-black-and-silver-compasses-on-top-of-map-1203808/>
- FIGURE 6. <https://www.pexels.com/photo/close-up-of-coins-on-table-325154/>
- FIGURE 7. <https://www.pexels.com/photo/rope-dew-brown-beige-39279/>

COLLAGE 7. Björn, Daria 2022. Seat Sketching Ideas. Photo collage. 1.12.2021

COLLAGE 8. MBVision s.a. Date unknown. For internal use only. Accessed 3.12.2022

COLLAGE 9. Torcolacci, Ilaria 2022. VIP Side View. Date unknown. Accessed 3.12.2022

COLLAGE 10. Torcolacci, Ilaria 2022. VIP Top View. Date unknown. Accessed 3.12.2022

COLLAGE 11. Torcolacci, Ilaria 2022. ADV Side View. Date unknown. Accessed 3.12.2022

COLLAGE 12. Torcolacci, Ilaria 2022. ADV Top View. Date unknown. Accessed 3.12.2022