Active Safety System Technologies INC
Business Plan

Active Safety System Technologies INC
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Active Safety Systems that Save Lives

Executive Summary

Active Safety System Technologies INC (ASST) is a subsidiary within the UK-based Advanced Blast & Ballistic Systems Limited (ABBS) group.

ASST has an exclusive license agreement to exploit all ABBS technologies in the USA and Canada and have access to the systems, patents and expertise of ABBS. ABBS has the required technical expertise and resources to carry out the necessary R&D in the UK. ASST will be responsible for marketing and contracting with other parties across North America.

The ASST Mission

ABBS develop proprietary technologies that protect American soldiers and citizens - both on the battlefield and here at home.

We offer products in aerospace for eVTOLs and for armored vehicles that we expect to supply to the US Army:

1. Safety Eco-System and Emergency Landing System for electric Vertical Take-Off and Landing (eVTOL) Aircraft
2. A Full Suite of Armored Vehicle Protection Systems

The ASST Vision

- ASST is the final step in the commercial exploitation of the amazing protective technology developed in the UK over the last 13 years.
- The US represents 50% of the global market for armored vehicles and eVTOLs.
- ABBS in the UK has developed and patented unique technical solutions to critical safety issues for both armored vehicles and eVTOL aircraft.
- Solutions are now ready for final development in the UK and certification in the USA.
- Working at the highest levels in our markets, with the Pentagon, the US and UK armies, the FAA, EASA, the UK CAA and world-leading eVTOL projects.
- We aim to make ABBS' leading-edge patented technologies the unique go-to solutions for the major safety issues in the military and eVTOL markets globally.
- Success in these objectives will maximize returns for shareholders on exit

Investment Required

We are raising up to $250,000 based on a $6m valuation of ASST to finance marketing and ongoing administration costs. Marketing will primarily be aimed at the eVTOL Safety Eco-System initially focussing on the growing delivery drone market. This will be complemented by appearances at forthcoming armored survivability conferences and the re-arranged

Technology Discovery Event organised by the Pentagon in autumn 2022, to promote the various technologies to the North American market, where we anticipate to secure grants and R&D funding from the US Army and Pentagon Rapid Reaction.

Our Board

We have a strong technical, legal, military and business expertise across the ASST Board.

Roger Sloman
Chief Executive Officer

- British Inventor and serial entrepreneur, introduced carbon fiber into F1 motor racing in 1975 and sold for $60M+ in 2004.
- Identified Active Mine Protection concept in 2008 and eVTOL safety system in 2013.

Brigadier (Ret'd) Ian Cameron-Mowat
Chairman

A senior military officer in the UK Army with a wide range of contacts and current activities in the defence market.

Don Szkubiel
Chief Operating Officer

With over 30 years working with the US Department of Defense, Don has excellent contacts with the US Army Ground Vehicles Survivability Centre and US Special Forces.

Dr. David Field
Director

Strong technical background in Materials Science and Metallurgy combined with considerable skills in strategic market research, sales, sales management and analysis; plus bid writing.

Rich Mellor
Governance Officer

Former UK lawyer with 20+ years experience as controls engineer, website programmer and contracts manager. Deals with shareholder communications, managing contracts and our publicity.

We also have a strong advisory board to support the Officers

Our Advisory Board

Robert J. Kmiecik
Military Consultant and Lead Investor

With over 30 years of military service, attaining the rank of Colonel, Rocky is the Former Director of Mounted Requirements at the Maneuver Center of Excellence at Fort Benning GA, where new military vehicle designs are specified.

"(ASST) can provide a holistic package of protection for a vehicle.... I think the future is exciting."

David Staveley
Chairman of Advisory Board

International business background. Leads and supports on negotiations and commercial arrangements.

Brian Coaker
Technical Consultant

Chartered Engineer & Scientist, expertise in Safe/Arm and sensor/control and initiation systems.

Simon Flear
Finance Consultant

Chartered Accountant, specializes in forensic accounting, advises companies and prepares forecasts.

Larry Williams
Ballistics Advisor

Chief Executive Officer & President of Aviation Safety Resources, Inc (ASR), with over 20 years personal experience in the aviation safety industry. ASR designs, tests, and produces emergency parachute recovery systems designed to bring down the entire aircraft in the event of an in-air emergency.

Our Products

ABBS provide the following range of products, which will be marketed by ASST across North America.

Product 1: Safety Eco-System and Emergency Landing System for electric Vertical Take-Off and Landing (eVTOL) Aircraft

Although eVTOLs (drone-like aircraft) have multiple safety systems, they cannot autorotate to a safe landing like helicopters following a potentially catastrophic event such as a large bird strike.

Emergency Descent Arrest System for eVTOL Aircraft

- Co-operation with leading US ballistic parachute system supplier
- We are currently quoting on rocket motors for launching the parachute system

Look-Down System to automatically identify emergency landing sites

- Co-operation with a UK based Artificial Intelligence company to develop a system using video and Artificial Intelligence to continuously view the ground under the flight path to identify the best current landing sites.
- The system can also report back via 5G to central control to update the latest status of both pre-designated emergency landing sites between Vertiports and ad-hoc landing sites.
- R&D project supported by advice from Vertical Aerospace, Volocopter, and a major flight control system supplier.
- All four of the Civil Aviation Authorities we approached were positive about the concept some noting that it will be essential for fully autonomous eVTOLs (i.e. no pilot on board).
- A $1.4m funded R&D proposal has been submitted to the UK Future Flight program.

Both systems can be applied equally to un-manned delivery drones

Stroking Crashworthy Seats

- Stroking seats have long been used in helicopters and offshore racing power boats to absorb the energy from vertical movement and protect the occupant.
- ASST has an agreement with a leading Israeli supplier with many years of experience in designing energy-absorbing seats with a focus on ergonomic designs and the very best protection levels against high-G loading scenarios which can cause spinal injuries.
- These seats will be marketed to eVTOL aircraft manufacturers, offering an exceptional patented energy absorbing mechanism to protect against the rapid deceleration created during a hard landing or crash. The seat will be manufactured from advanced materials using a unique manufacturing process that the company developed in-house.

We anticipate selling our eVTOL Safety Eco-System to both the civilian and military eVTOL and drone manufacturers for multi-million $ contracts after it is certified.

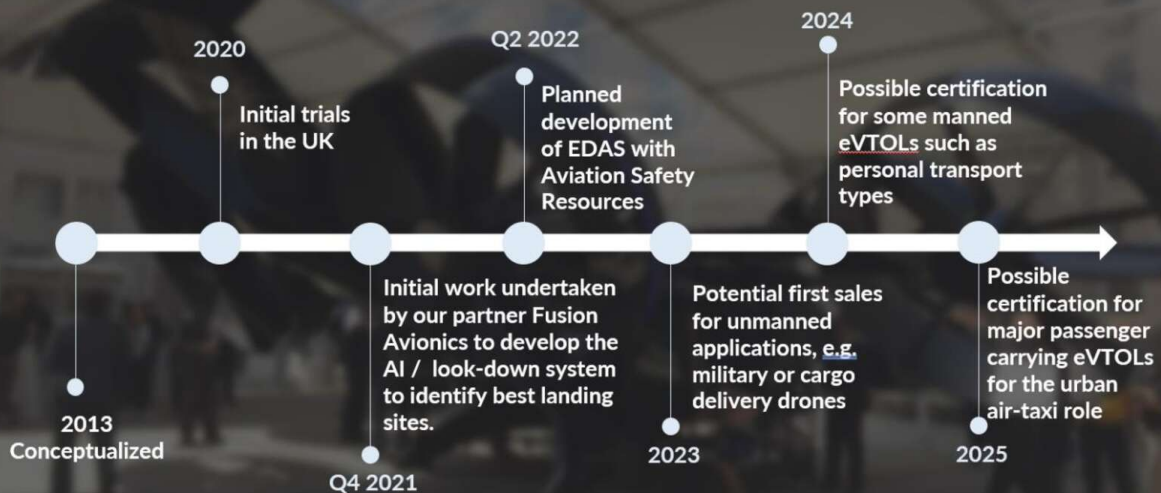**Potential $200M p.a. market when EDAS and other systems are certified.**

Customer or Market	2020	2021	2022	2023	2024	2025
Current ASR Ballistic Parachute Recovery System			Development of Rocket Motors	Commercial Sales of "Tractor" Motors for use on light Aircraft		
Emergency Descent Arrest System (EDAS)	Initial UK Trials	Development and Testing		Sales for Un-manned drones	Certification for Manned Applications	
Video/AI Emergency Landing Site Location System				Video/AI Look-Down Development	Testing/Certification and Production	
Video/AI Military GPS Denial of Service Mitigation System				Video/AI Look-Down GPS Development	Testing/Certification and Production	

ABBS in the UK are already in talks with our US partner to offer the "Tractor" motors to extract parachutes when required.

The same video/AI system can be used to provide both a look-down emergency landing site recognition system and mitigate the loss of military GPS.

Safety Eco-System for eVTOL - Timeline

2020
Initial trials in the UK

Q2 2022
Planned development of EDAS with Aviation Safety Resources

2024
Possible certification for some manned eVTOLs such as personal transport types

2013 Conceptualized

Q4 2021
Initial work undertaken by our partner Fusion Avionics to develop the AI / look-down system to identify best landing sites.

2023
Potential first sales for unmanned applications, e.g. military or cargo delivery drones

2025
Possible certification for major passenger carrying eVTOLs for the urban air-taxi role

Patent Approved 19th November 2021: Emergency landing of aircraft (United States Application US20200369391)

Product 2: Full Suite of Armored Vehicle Protection Systems

When a vehicle hits a mine or IED it is often accelerated very quickly up into the air. The occupants can be killed or severely injured just by the rapid acceleration upwards.

Vehicle Global Acceleration Mitigation (VGAM™)

- Our systems counteract the mine blast forces and can prevent all injuries.
- Patented high impulse rocket motors keep the vehicle on or near the ground to prevent fatal or disabling spinal injuries.

Carbon Fiber Reinforced Belly Plates

- Carbon Fiber reinforced belly plate to minimize deformation – up to 30% reduction in deformation compared to an equivalent weight all-steel design. This is an important parameter for the overall vehicle design which can reduce weight and cost.
- The belly plate design incorporates energy absorption materials which may reduce secondary shock effects. The Graphene Composites ballistic materials may have a role here.

Active Floor Systems

- Two different automatically re-setting active floor systems to suit different vehicle designs.

Stroking Blast Seats

- Stroking seats have long been used in armored vehicles to absorb the energy from vertical movement and protect the occupant.
- ASST has an agreement with a leading Israeli supplier with many years of experience in designing energy-absorbing seats with a focus on ergonomic designs and the very best protection levels against high-G loading scenarios which can cause spinal injuries.
- These seats will be marketed to armored vehicle manufacturers, offering an exceptional patented energy absorbing mechanism to protect against the rapid deceleration created during a mine blast. The seat will be manufactured from advanced materials using a unique manufacturing process that the company developed in-house.

Graphene Based Ballistic Protection Material

- ABBS has an agreement with Graphene Composites Ltd (GC) in the UK to collaborate on exploring the opportunities to incorporate the graphene reinforced ballistic protection materials they have developed in ABBS systems.
- GC also has a substantial operation in the USA focused on various applications for their ballistic materials so with the close relationship with the US Army that ABBS has developed, which will continue through ASST, there is some scope for mutual benefit in working together to find suitable applications.

We anticipate selling our VGAM system to the US military for multi-million $ contracts after it is certified.

Our main target customers are the US and Canadian armed forces but the potential is worldwide.

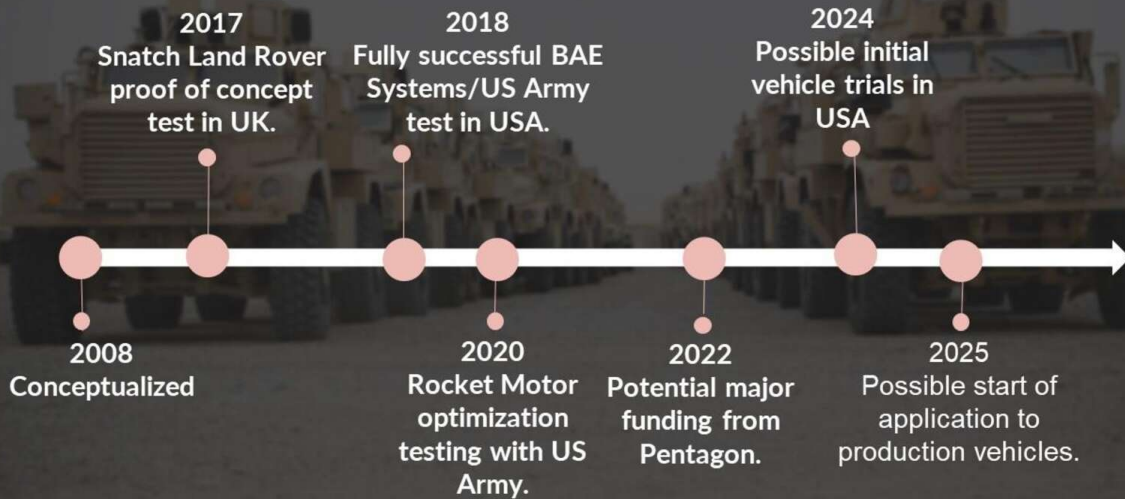Potential $100M p.a. market when system is certified ➡ US Army long term target

Customer or Market	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
US Army	Motor Testing under 6 year R&D agreement is ongoing					Specific Vehicle Certification?		Potential Production		
Toyota Hilux Mine Protection	Proof of Concept Testing (£219K) completed		Development for Special Forces, UN Aid/Mine Clearance etc.					Large Scale Production?		

We can also sell it to aid agencies and other non-governmental bodies operating in war zones and former war zones.

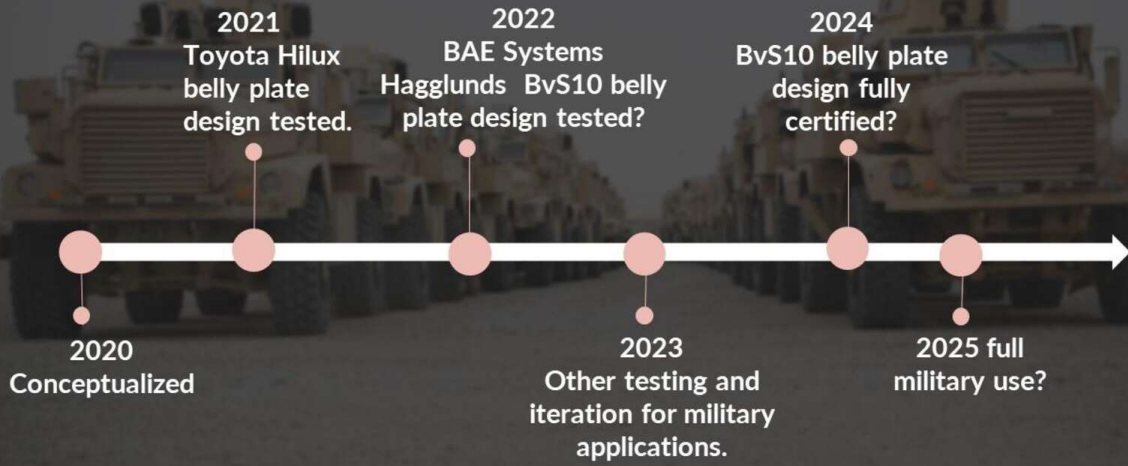| Customer or Market	2020	2021	2022
UK MOD (£43K) Project completed Nov. 2021	Project to evaluate the benefit of adding carbon fiber to steel belly plates. Further proposal being made including a belly plate for a specific European vehicle.		
US Pentagon Rapid Reaction Technology Office	Winter 2021/Spring 2022 – Technology Discovery Event – ASST Invited to demonstrate all technologies.		

ABBS in the UK is pursuing major armored vehicle programmes in the UK and Europe.

VGAM™ System Development - Timeline

2017 Snatch Land Rover proof of concept test in UK.

2018 Fully successful BAE Systems/US Army test in USA.

2024 Possible initial vehicle trials in USA

2008 Conceptualized

2020 Rocket Motor optimization testing with US Army.

2022 Potential major funding from Pentagon.

2025 Possible start of application to production vehicles.

Registered Patents: Reducing acceleration-induced injuries in occupants of vehicles subject to explosive events (patent number 10782105) Distortion Sensor System (patent number 10119789), Rocket Motors and their use (patent number 9989013)

Carbon Fiber Reinforced Belly Plate - Timeline

2020
Conceptualized

2021
Toyota Hilux belly plate design tested.

2022
BAE Systems Hagglunds BvS10 belly plate design tested?

2023
Other testing and iteration for military applications.

2024
BvS10 belly plate design fully certified?

2025 full military use?

Patent Pending: Carbon Fiber Reinforced Belly Plate (application number 16/637701)

Product 3: GPS Denial of Service Attack Mitigation

Many US Army, UK and NATO armored vehicle systems rely on GPS, and not just for location. It is very easy to disrupt or jam the GPS signal and adversaries have powerful systems to do this.

We are developing a GPS-DOS System to mitigate this risk.

GPS-DOS System

- Our look-down eVTOL system designed to identify landing sites is easily adapted to provide both GPS location and situation awareness.
- A $150,000 project proposal will shortly be submitted to the UK MOD to develop this system.
- In due course ASST will pursue similar funding and development opportunities with the US Army.
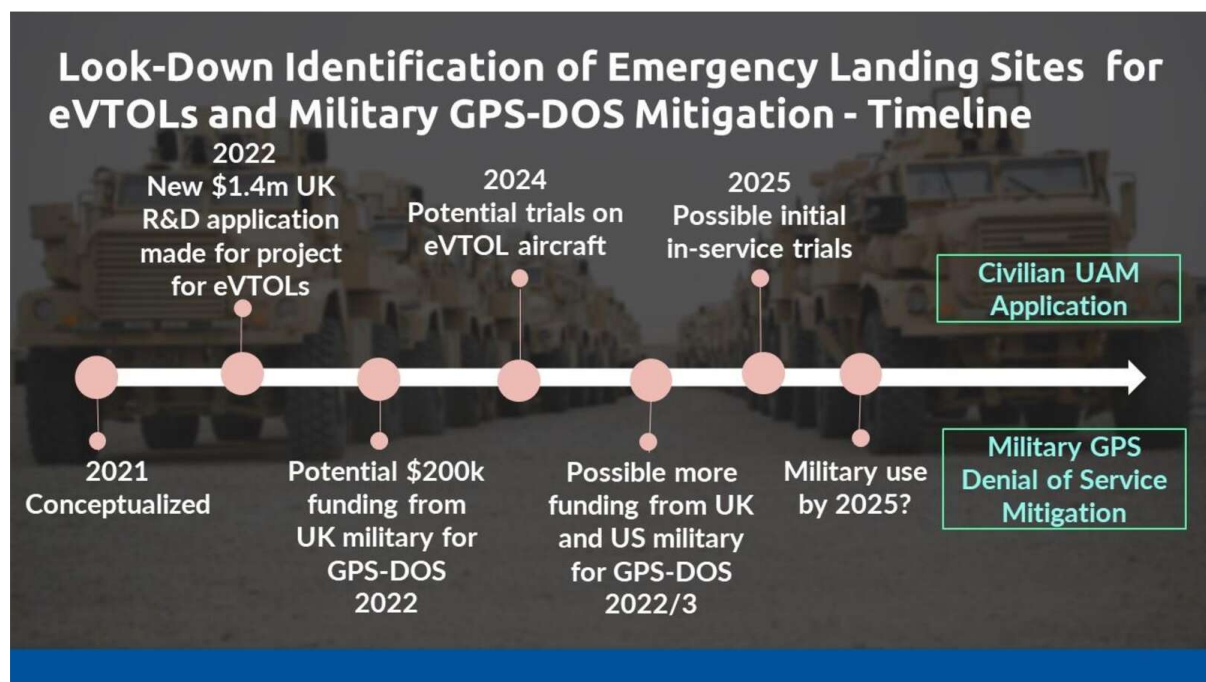
The Market

Safety Eco-System and Emergency Landing System for eVTOL Aircraft

Our first products are likely to be the motors used by our partner, Aviation Safety Resources (ASR) to extract their ballistic recovery parachutes in the event of an emergency. They have already supplied a range of these ballistic recovery parachute systems to light aircraft and eVTOL manufacturers.

https://www.aviationsafetyresources.com/

We will also target the burgeoning delivery drone market for our look-Down System to automatically identify emergency landing sites, as this is not only essential for safety, but also to help identify accurately whether a drone can land in the designated area.

Logistics companies such as Amazon, UPS and Alphabet are developing logistics drones. With remote or even automated piloting, and the potential of 1000s of these drones flying in and over urban areas at any one time, there is an urgent need to protect the population on the ground in the event of one of these drones needing to land in an emergency.

According to the latest report "Delivery Drones Global Market Report 2022", the global delivery drone market is expected to grow from $1.26 billion in 2021 to $1.47 billion in 2022 at a compound annual growth rate (CAGR) of 17.3%. The market is expected to reach $3.74 billion in 2026 at a CAGR of 26.2%.

https://www.reportlinker.com/p06241264/Delivery-Drones-Global-Market-Report.html
1st March 2022

According to an earlier report (2020-2021) by Fortune Business Insights, this estimate is conservative, with the global drone package delivery market projected to grow from $1,522.4 million in 2021 to $31,188.7 million by 2028 at CAGR of 53.94% in forecast period

North America Drone Package Delivery Market Size, 2017-2028 (USD Million)

https://www.fortunebusinessinsights.com/drone-package-delivery-market-104332
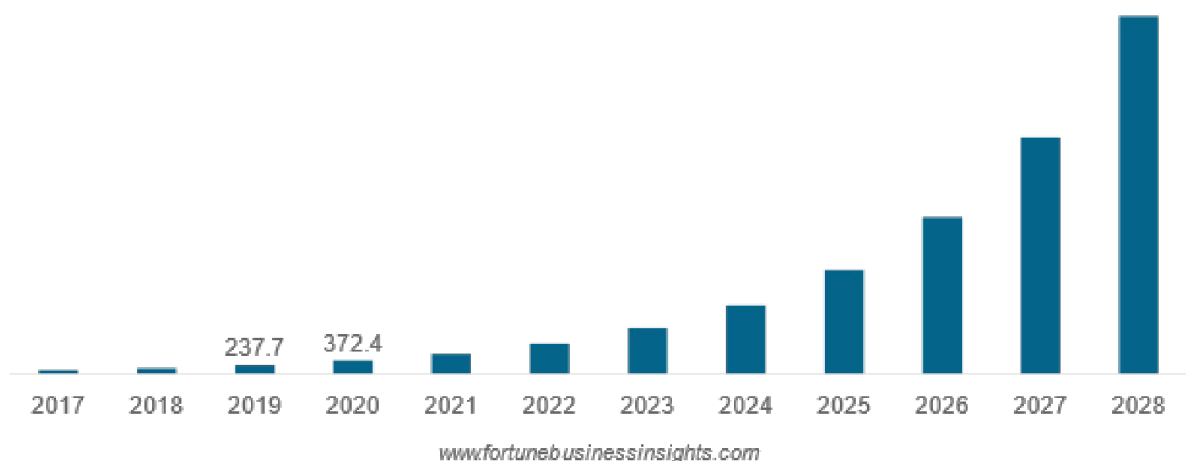
The delivery drone market is already beginning to take shape:

On October 18, for the first time in the United States, a drone completed a scheduled commercial residential delivery. The drone delivery was conducted by Wing Aviation, in collaboration with FedEx Express, as part of the U.S. Department of Transportation's Unmanned Aircraft Systems Integration Pilot Program (IPP). The FedEx Express package delivery to a home in Christiansburg, Virginia marks the launch of the first scheduled, commercial residential drone delivery service and the first scheduled e-commerce delivery via drone delivery trial in the United States.

For the duration of the trial, Wing drones will transport select FedEx packages to qualifying homes in Christiansburg, demonstrating the benefits of drone delivery for last-mile delivery service. Wing received an expanded air carrier certificate from the FAA earlier this year so it could demonstrate safe commercial operation in the larger Blacksburg-Roanoke area. Meanwhile, the FAA Approved UPS as Drone Airline for Commercial Deliveries, making UPS the first official drone airline with a full Part-135 FAA certification.

https://transportup.com/headlines-breaking-news/operators/alphabet-wing-fedex-drone-delivery-service/
24th October 2019

Since 2019, FedEx has continued to make progress and have recently announced that they are teaming up with Elroy Air who are developing an end-to-end autonomous vertical take-off and landing (VTOL) aerial cargo system

https://transportup.com/headlines-breaking-news/vehicles-manufactures/fedex-to-test-autonomous-drone-cargo-delivery-with-elroy-air/
6th April 2022

In Europe, German Airways has signed a joint letter of intent with the German manufacturer Wingcopter, the companies have agreed to purchase 17 Wingcopter 198 delivery drones and acquire options to order an additional 115 drones in two further tranches by the end of 2023. The aircraft are to be deployed from the second half of 2024 – initially offshore, for example for the delivery of spare parts to wind farms. It is noted thatAs the delivery drones must be able to land with pinpoint accuracy on a moving ship, their use will be technically demanding.

Armored Vehicle Protection Systems

ABBS has generated $3.3M in revenue to date before commercialization and almost $2m new R&D funds are expected to be won in the UK over the next 3 months before any Pentagon/US Army funding decision.

We expect sales from ASST to ramp up over the next 3 years as our UK-based R&D reaches the final stages, systems are certified in the USA, and production for ASST begins.

Qualification of either major system (VGAM or EDAS) for a single large production run of vehicles would lead to massive financial upside.

ASST has multiple opportunities in two huge markets.

● Sales (mainly Pentagon/US Army funding for VGAM development) ● Net Income

Y1	$0.5M
Y2	$1M
Y3	$2M

Y1	$60K
Y2	$160K
Y3	$320K
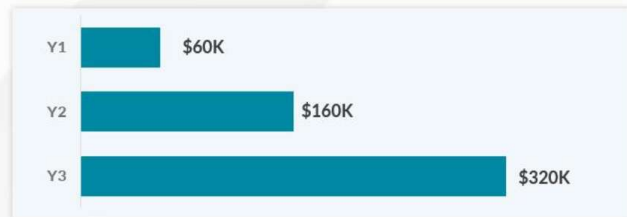
Note:- All sales previously made by ABBS ($900,000) direct to the US Army from the UK will now be made by ASST.

Forward-looking projections cannot be guaranteed.

Strength in Patents

The strong US, Canadian and worldwide portfolio of granted patents protects both our eVTOL and Armored Vehicle systems.

ASST will be granted exclusive rights to exploit the patents in the US & Canada (over 50% of the global market)

Valued by Inngot October 2019:

$6.3m to $9m
on a 'value contribution basis'

$11m to $12.2m
on an 'invested value basis'

3 Registered US Patents:

1. Reducing acceleration-induced injuries in occupants of vehicles subject to explosive events (Patent number 10782105)

2. Distortion Sensor System (Patent number 10119789)

3. Rocket Motors and their use (Patent number 9989013)

2 Pending US Patents:

1. Carbon Fiber Reinforced Belly Plate (Patent number 16/637701)

2. Emergency landing of aircraft (Patent number 16/757717) (Approved 19th Nov. 2021)

This investment is in Active Safety System Technologies Inc - references to the UK based parent ABBS are intended by way of illustration of the potential market and technologies which will be marketed by ASST Inc in the USA and Canada only.