



Introduction to Business Concept

“Modification of Single or Double – Seated Training Gliders & Motor Gliders to Autonomous and Manually Radio Controlled Aircrafts for Student Pilot’s Safety in Solo Flights”

ABSTRACT:

The best way of obtaining basic skills of flying an aircraft and becoming a pilot is soaring. Commonly “Glider Pilot Training” starts at the age of 14 in most countries in the world. Although it is the right age for starting such a training, it always comes with the consequences.

“First Solo” is a milestone for any pilot candidate no matter the type of the aircraft. Most of the time, first solo flight comes with intense stress which causes uncontrollable fear and anxiety which leads to unpredictable mistakes. They can evolve to major ones and start a domino effect ending with fatal accidents. The reason that generates this anxiety is the non – existence of the instructor pilot in the cockpit which makes the student pilot think “If anything goes wrong up in the air, there is no experienced person who can take the controls of the aircraft and make a safe flight and landing since it is a solo flight.

The idea of “Make no mistake or die” is imposed during the whole training of the students with the expectation of a better concentration to the flights. In most cases this philosophy works in first solo, but sometimes above mentioned domino effects get started and end up with unwanted incidents.

The solution of avoiding such cases; is making the “First Solo Student” confident by telling them that anything can go wrong in solo flight, can be corrected by the instructor who monitors the flight from the screen of a Ground Control Station that can control the aircraft on the ground immediately. This new application of UAV technology will help train better pilots without casualties of rookie pilots and valuable aircrafts.



Commercial Opportunities & Potential Clients:

There are twenty three Gliding Associations in the world which is listed in Wikipedia. https://en.wikipedia.org/wiki/List_of_national_gliding_associations There is 32,920 register gliders in the world. Although the number of Gliding Clubs are unknown, a rough estimation will be above 1,500 clubs. In other words, there are potential of 1,500 customers as gliding clubs. If it is considered that average number of double seated gliders are two aircrafts per club, the potential of the business can be estimated. If single seated gliders are also counted, the potential will be more clearly seen.

Motor Gliders are also potential aircrafts that can be modified. These gliders technically more complex to modify.



Technical Details of Some Aircrafts:

Similar systems have been manufactured and applied by some companies.

UAVOS - Albatross 2.2

<https://www.uavos.com/products/fixed-wing-uavs/albatross-2-2/>



Specifications

Wingspan	14.97 m (49.1 ft)
Length	6.5 m (21.32 ft)
Height	1.82 m (6 ft)
Cockpit width	1.12 m (44 in)
Aspect ratio	18.3
Empty weight	300 kg (661 lb)
MTOW	550 kg (1210 lb)
Fuel capacity	150 lt (40 gal)
Max payload	250 kg (551 lb)
Parachute	Ballistic

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Performance

Cruising speed (75% power)	205 km/h (127 mi/h)
Range distance	2255 km (1401 mi) with 30 min reserves
Nominal endurance	11 hours, with 30 min reserves
Maximum endurance	20 hours
Service ceiling	7,200 m (23600 ft)
Max load factor permitted (x 1.8)	+4 g - 2 g
Fuel consum. at cruise speed	13 l/hour
Engine	ROTAX 912IS
Generator	3kW - 12V



PIPISTREL – Surveyor

<https://www.pipistrel-aircraft.com/special-missions/#1680717339675-b6d1143d-a61a1680811899143168088441915716812301282791681235244618>



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TECHNICAL DATA PIPISTREL SURVEYOR		
MODEL	LASE (Low Altitude, Short Endurance)	LAME (Low Altitude, Medium Endurance)
Wingspan	12.4 m	15 m
Removable wingtips	NO	YES
MTOM	600 kg @ 4.0 g	600 kg @ 4.0 g
MZFW	530 kg	530 kg
Fuel capacity	2 x 30 litres each tank	2 x 50 litres each tank
Undercarriage	nose wheel type	nose wheel type
Certified engine	Rotax 912 A2,	Rotax 912 A2,
	80 hp, 2 Carb,	80 hp, 2 Carb,
	V3 engine gearbox and governor	V3 engine gearbox and governor
Propeller	Pipistrel 2-blade, non-certified carbon fibre mechanical variable pitch & feathered	Pipistrel 2-blade, non-certified carbon fibre mechanical variable pitch & feathered
Baseline certification	Structure and system according to ASTM F2564.	Structure and system according to ASTM F2564.



PERFORMANCES/LIMITATIONS		
Max altitude	12,000 ft	12,000 ft
Typical operating altitudes	2,000 – 12,000 ft	2,000 – 12,000 ft
Speed in transfer to/from work area	110 KTAS	100 – 110 KTAS
Loitering speed	70 – 90 KIAS	50 – 75 KIAS
Endurance at transfer speeds	Up to 4 hours	Up to 6 hours
Endurance at loitering speeds	Up to 6 hours	Up to 8 hours
Gust load speed (turbulence penetration)	90 KCAS	86 KIAS
Airspeed limitation with equipment carried on external pods*	108 KCAS	108 KCAS

These aircrafts are modified from the other models of these companies with a purpose of air cargo operations, in other words these aircrafts are UAV Cargo Drones. They are not suitable for manned flights.

Our goal is to modify any glider with RC & Autonomous system so manned flight still will be possible, in other words these aircrafts will not be UAV's, they will be **Interfereable Manned Aerial Vehicle** with UAV technology. It can be named as **IMAV**.



Breakdown of Expences:

Duration of the Project will be one year. At the end of Research and Development period, one single seated, one double seated and one motor glider will be modified as IMAV. Breakdown of Annual Expences is given on the table below.

Breakdown of Expences		QTY	Unit Price	Total Price
1	Setting up 1000 m ² Workshop	1	\$30,000.00	\$30,000.00
2	Annual Rent and Expences for Workshop	12	\$10,000.00	\$120,000.00
3	Transportation Expences for Personnel	12	\$5,000.00	\$60,000.00
4	Engineers and Staff	12	\$18,000.00	\$216,000.00
5	Office and Software Expences	12	\$3,000.00	\$36,000.00
6	Single Seated Glider	1	\$90,000.00	\$90,000.00
7	Double Seated Glider	1	\$120,000.00	\$120,000.00
8	Double Seated Motor Glider	1	\$160,000.00	\$160,000.00
9	Transportation and Custom Expences for Gliders	1	\$150,000.00	\$150,000.00
10	Necessary Electronics for installations	1	\$120,000.00	\$120,000.00
11	Government Approvals of any kind	1	\$100,000.00	\$100,000.00
			Grand Total	\$1,202,000.00



Raising of Funds & Investments with Inverstors:

- This Project will be funded by investors. An contract will be done by the investors and a legal share will be given as agreed from each sales after R/D phase completed.
- Know How will be shared to the investors. Any personnel will be trained from investors side for their own companies.
- Government Companies and Associations are also potential investors like private sector inverstors.
- Donations will be exepted with contract
- The Project will not be started until 40 % of the budget is reached.
- Any product or aircraft belongs to the company after it is purchased.