FLY IN ATMOSPHERE BY DRAG FORCE – EASY THRUST GENERATION

- NEXT GENERATION TECHNOLOGY -

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Abstract : This paper aims to present to the science community another way to fly in atmosphere, a way which is much more cheaper, efficient, safe and easy. Over the years scientists have been trying to find a way to built the vertically taking off vehicles but there have been no satisfactory success(what have been found was very expensive), Even aircrafts we know now need very sophisticated and expensive engines and not efficient enough. This way of flying may help our governments to spend less money on technologies and will help people to travel at very low prices so that, it may be a solution to the crisis which the world faces nowadays. In other words, it is my proposal to the next generation technologies we was looking for for years because everything can fly from the car to the trucks, the spaceships and even the hotels maybe constructed and fly as we construct the ships which sail in the oceans. My way of flying will have many applications in all the aspect of travel as it is going to be explained.

Index terms – Flying like a Bird, Flying using drag force, easily Flying in atmosphere, Aircraft Engine based Physics, Easy Thrust Generation, Next generation technology,

Introduction

I'd like to introduce a way to navigate In atmosphere using the drag force, this will replace the existing technologies which are energy consuming and inefficient. Over 50 years of research, scientists was unable to find a satisfactory solution to a vertically takeoff flying car which have been looked for over the years. This flying vehicle is really needed and will solve a lot of problems and will give us so many benefits. Let's take for example the case of natural disaster as a problem: In time of disaster, everybody may take his car and drive, the problem may be where to drive? The Roads will be crowded and nobody will move! This will result in the death of everybody, if it is a deadly disaster. But if it is a vertically flying vehicle, everybody will fly in his vehicle as the atmosphere is too big, everybody will find his place. And the good news is that, it will be so cheap and everybody will buy as if he were buying a normal car! And even cheaper! Also, it will move very fast horizontally and will have ability to move conveniently in all directions so that it can avoid collisions with others and obstacles. As benefit, we all know that nowadays everybody needs to drive, but how will be the traffic in coming 10 years? This is an everybody concern. Let than the vertically takeoff flying vehicle come to our rescue! In case you may have a construction issue, just let me know. I will explain everything A to Z! In this paper, I did all necessary demonstrations and calculations needed accompanied by necessary graphics.

Thrust Calculation

The law of physics I'd like to consider is the drag force, the drag force is the force opposed to the objects moving in the fluids, it is really a big force which depends on the speed square of the object, and at high speed, this force becomes really really big and tends to stop the vehicle.

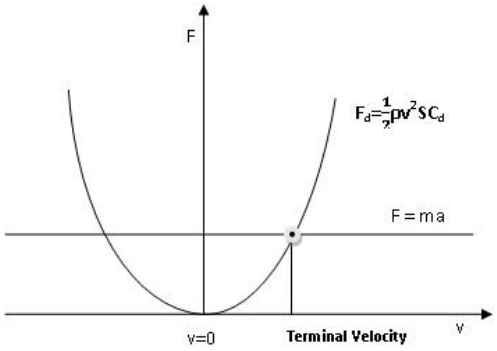
The drag force's expression is: $F=\frac{1}{2}\rho v^2 S C_d$

Where F_d is the drag force
ρ is the density
v is the speed
S is the big surface perpendicular to the motion
C_d is the drag coefficient

As this expression shows: - The drag force is directly proportion to the speed square,
- The surface which Is the entire section perpendicular to the motion
- The drag coefficient which represents all the factors such as the aerodynamic design and so on.

This force is really big as it is directly proportion to the speed square, it opposes to the movement and at a certain point it can block the object from moving.

Consider the following curve:

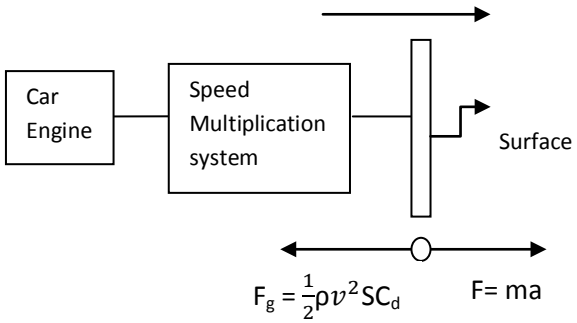


As we can see on the graphic, if we apply acceleration to our object, there will be a time when the force resultant to our acceleration equals to the drag force, at this time, the object will not accelerate anymore but it will have a uniform motion. After this point, the drag will be much bigger than the force we are applying to the object itself.

<u>This property of the atmosphere can be used to move objects instead</u>, it is very simple:

Consider a surface big enough and try to move it in the atmosphere, perpendicularly to the movement, if we increase the speed, the drag will become big and the surface will tend to stop, to see this effect clearly, try to move the surface suddenly at high speed, the surface will not move ,instead an enormous force will block it. To feel this force clearly, take an umbrella and move it up and down suddenly, you will feel a big force which tend to move it up , and if the umbrella is not strong enough it will break apart.
How then can we use this property to speed up objects in atmosphere?

The Process :



$F = F_g$
$ma = \frac{1}{2}\rho v^2 SC_d$

$$\mathbf{a = \rho v^2 SC_d / 2m}$$

The speed achieved by the aircraft is:

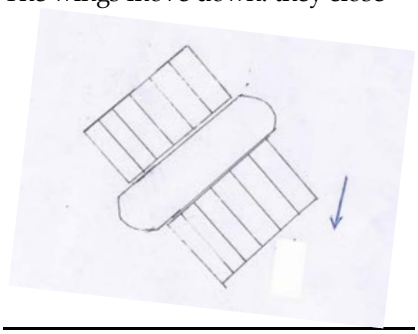
$V_a = at = \mathbf{\rho v^2 SC_d t / 2m}$

$$\mathbf{V_a = \rho v^2 SC_d t / 2m}$$

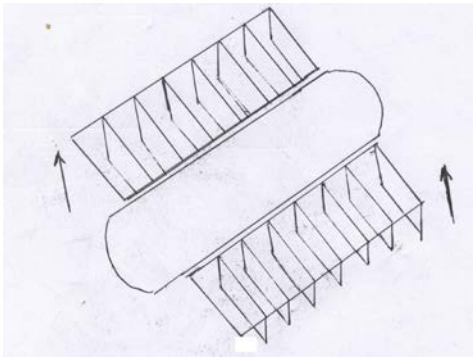
Where V_a is the aircraft Speed
v is the engine speed

Consider the following image:

The wings move down: they close



The wings move up : they open



When the wings move up, they open automatically and the drag is minimized to zero, that time the drag is approximately equals to zero

$F_d \approx 0$;

When the wings move down, they close automatically, and the drag becomes:

$F= \frac{1}{2}\rho v^2 SC_d$

You can see the drag is maximized. And because the wings will close suddenly, the drag force will block them from moving down and the vehicle body will move up. Also a special design will move the wings faster when they go down, and move slowly when they go up. This is exactly how the birds fly if you analyze closely, but this may be more efficient. We can see that, it is possible to increase the surface to have a big drag force, or we can increase the speed, which option is batter? I think to increase the speed is better as we need a smaller vehicle which may not occupy more space and because we may need to cover the wings as well. Another benefit is that we may need to generate electric power from the engine which moves the vehicle up, because as the engine turns faster, it can generate more electric power. This power will be needed to move the vehicle horizontally and to use it in other functionalities which need electricity.

Try to do an example:

Consider the speed of 3000 km/h (I demonstrated how to achieve this speed in previous publication), this speed is: (3000 x 1000m)/3600s = (3000000/3600) m/s = 833.33 m/s (we will need to use ceramic material because of the heat, as the speed is too high)

Let's take a surface of $4m^2$, as we have two wings , the surface become $8m^2$.
The drag force becomes:
$F=\frac{1}{2}\rho v^2 SC_d = (1.117x(833.33)^2x8x2.1)/2 =$
$(1.117x694438.88x8x2.1)/2 = 6\ 515\ 781.20$ N
Here let's calculate the resultant force:
F = 6515781.20 N – 20000 N = 6495781.20 N (if the vehicle mass is 2000 kg)
This force is really enormous.

We can then calculate the acceleration it can take when moving in the atmosphere vertically:
ma = 6495781.20 N (Second Law of Newton) => a = (6495781.20 / 2000) = 3247.89 m/s^2 with this acceleration, our vehicle can achieve a speed of : 3247.89 x10 = 32478.9 m/s in ten Seconds! Can you imagine that?

As we can see, a really high speed can be achieved with only the use of the drag property of the fluids. Will we use the rockets for the space exploration again?

The speed needed for the vehicle to take off

Let's take m as the mass of the vehicle, at the time the vehicle takes off the drag force equals the force of attraction.

$F_d = F_g$
$\frac{1}{2}\rho v^2 SC_d = mg;$
$\rho v^2 SC_d = 2mg;$
$v^2 = \frac{2mg}{\rho SCd};$

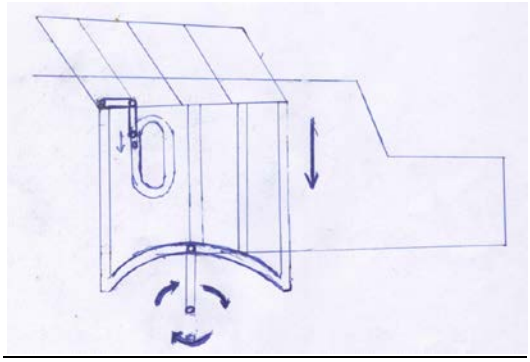
$$v = \sqrt{\frac{2mg}{\rho SCd}}$$

For example, let's take the mass of 2000 kg, v = $\sqrt{\frac{2000x10}{1.117x8x2.1}} = \sqrt{\frac{20000}{1.117x16.8}} = \sqrt{1065.77}$ m/s = 32.64 m/s

At the speed of 32.64 m/s the vehicle can start to take off.

This speed equals (32.64x 3600)/1000 = 117.52 km/h

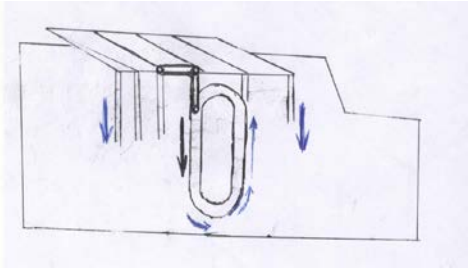
How to make the wings to go down faster and make them go up slowly



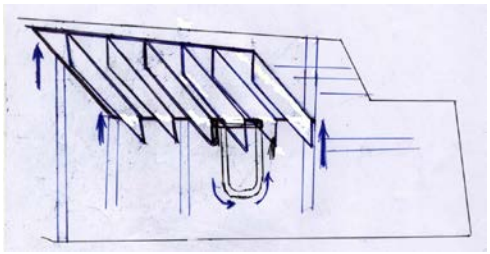
How to construct an automatic opening and closing system for the wings

It is possible to let the system open and close the wings automatically. In this section, I demonstrate how:
Consider the following figure:

The wings move down: they close

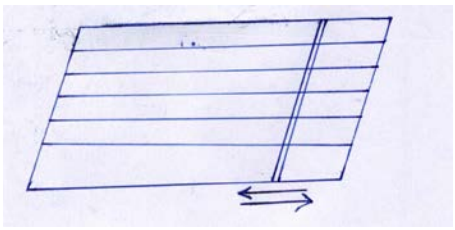


The wings move up: They open

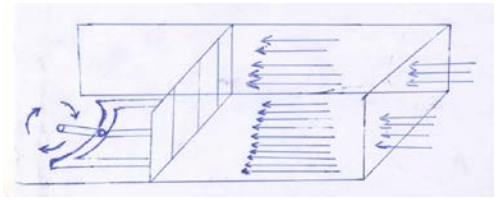


How the vehicle can stabilize itself in atmosphere

This is very easy, we can place a mass in the top of the vehicle, and when the vehicle inclines in one direction, the mass will cause the wing to grow a little bit in this direction. Or we can place an electronic sensor in the vehicle which can detect inclination and the wing can grow or shrink accordingly. This can be done manually as well, when you feel inclination you can adjust the vehicle yourself in the direction you feel the vehicle is inclined in using a manual lever.



How the vehicle move forwards



To move forwards, the vehicle needs another system similar to the one which moves it upwards. For this we will need a smaller surface, because to move forwards, it doesn't need a big force as in case of moving upwards.

a. A system which can replace an airplane engine.

What is needed is the force which will move the system forwards. Here when the surface goes forwards it opens, and when the surface goes back it closes. Let's take for example a surface of 2m long and 2m wide.

- The drag force for this surface when moving at 300 km/h is:

$F=\frac{1}{2}\rho v^2 SC_d = (1.117x(83.33)^2x4x2.1)/2 = (1.117x6938.8x8.4)/2 = 32\,553.1$ N

This force is so big so that the system can move forwards at extremely high speed.

Let's calculate the biggest acceleration it can achieve: a = 32 553.1 / 2000 = 16.27 m/s² (if the system weights 2000 Kg). This is the biggest acceleration the vehicle can achieve when the engine turns at the speed of 300 km/h. This acceleration is really big. With this acceleration, the vehicle can achieve the speed of 1627m/s in 100 seconds which is 1627 x 3600 /1000=5857.2 km/h which is hypersonic speed.

- The drag force for this surface when the engine is turning at 100 km/h is:

$F=\frac{1}{2}\rho v^2 SC_d = (1.117x(27.77)^2x4x2.1)/2 = 3617.88$ N

Let's calculate the biggest acceleration it can achieve: a = 3617.88/ 1000 = 3.6m/s² (if the system weights 1000 Kg)

With this acceleration, the vehicle can achieve the speed of 360 m/s in 100 seconds which is 360 x 3600 /1000 = 1296 km/h in 100 seconds.

b. Another system which can be used is the electrical power.

For the system which moves the vehicle upwards, the speed is constantly high so that it can be used to generate electricity. What we need to do, is to put many batteries in the vehicle which will be recharged by the power generated by the engine which moves the vehicle upwards. So to move forwards, the vehicle will use this electrical power to move the surface in the direction of the motion. This power will also be used in all other systems in the vehicle.

How can the vehicle take brake

The vehicle can take brake using the system which moves it forwards. It is very simple, we only need to stop the system which opens and closes the system, and the vehicle will be stopped by the air resistance. And by reversing the operation of opening and closing, it can stop quickly. The time it was opening it closes and the time it was closing it opens. This can be achieved by reversing the electrical power, where it is positive we put negative, and where it was negative we put positive.

How can the vehicle go backwards

The vehicle can go backwards using the system which moves it forwards. It is very simple, we only need to reverse the operation. The time it was opening it closes and the time it was closing it opens. As the system uses the electric power, we may reverse the power: Where it was positive we put negative, and where it was negative we put positive the vehicle will move backwards.

How the vehicle can turn left or right

In fact, when the vehicle moves forwards, there is air flow from the front to the back. If you want to turn right or left, you just need to turn the air entrance in the direction you want the vehicle to move in. or you can turn the air exit right or left, the vehicle can turn as well.
If the vehicle is not moving, the airflow from the wing and exiting from the tail can rotating the vehicle horizontally.

How can the vehicle move up and down

To move up, we need to accelerate the system which moves it up, to move the system down we need to decelerate the system a little bit. This can be done suddenly, so that this can be used to solve the problem of the aircrafts which prevent them to avoid obstacles when travelling at high speed. Another way to move the vehicle up and down is to use the vehicle tail, We can install a small wing on the tail, As it uses electrical power, we can also reverse the power so that the tail can move up and down, in doing so, the vehicle can move up or down when it is in motion.

How to displace the vehicle towards left and right

To displace the vehicle horizontally is to make another small system which will move horizontally using the electric power, so that you can displace the vehicle horizontally in all sense.

Applications:

1. A flying Car:

A flying car will use the same system by using smaller wings and make it a little bit lighter. Here not only the car can fly but also the trucks, the buses, any vehicle will fly! Let's take for example the wings of two meters long and one meters large. Let's take the speed of 2000 km/h (assuming that the engine has the capability to move at 200km/h and we multiply it by 10). Which is ((2000x1000)/3600) m/s = 555.55 m/s

The drag force is: $F=\frac{1}{2}\rho v^2 SC_d$ = (1.117x(555.55)^{2}x4x2.1)/2 = 1447934 N. (the wings surface become 4 as we have two wings of 2 m^2 each)

If the car weights 1000 kg, the resultant force is : 1447934 N – 10000N = 1437934 N
The highest acceleration resultant: a = 1437934 / 1000 = 1437.934 m/s^2
Unbelievable! This car has the capability to carry 1437934 / 1000 = 1437 people assuming that one person has a mass of 100 kg.

Calculation of the speed at which the car will take off:

$$v = \sqrt{\frac{2mg}{\rho SCd}}$$

$v = \sqrt{\frac{2x1000x10}{1.117x4x2.1}} = \sqrt{\frac{20000}{1.117x\,8.4}}$ = 46.16 m/s = (46.16 x 3600) / 1000 = 166.20 km/h
At the speed of 166.20, the car will start to take off.

2. Air planes:

The airplane will use the same system like above, from the small to big airplanes; the only difference will be the engines capabilities. The small airplanes may use smaller engines like motorbike engines or small cars engines and automatic transmission is preferable, and the big airplanes may use very big and powerful engines like truck engines. Here the benefits will be the cost which will be greatly reduced; it means the cost of construction and the cost of transport. The security will be greatly improved as we saw it in above discussions. The airplane will be very flexible, so that it can avoid other planes easily or obstacles it can encounter when flying. For the design we can keep actual design with the wings but for the thrust, we can use the system which moves the vehicle forwards as we saw above.

An airplane doesn't need to have the fans, it doesn't need to have the external engines either, the surface moving inside is enough. Let us calculate the thrust of a surface of 5 meters wide and 2 meters long can generate if the engine inside the plane moves at 200 km/h:

$F=\frac{1}{2}\rho v^2 SC_d$ = (1.117 x (55.55)^2 x 10 x 2.1)/2 = 1 795 015.6 N

If the aircraft has a mass of 30 000 kg, the acceleration would be: a = 1795015.6 / 30000 = 59.83 m/s^2

It means that the aircraft will have the speed of 598.3 m/s in 10 seconds which is 598.3 x 3600 /1000 = 2153 km/h

This is a Supersonic speed for an aircraft which has a mass of 30000 kg.

3. Hypersonic flights

From above discussions, hypersonic speeds are very easy to achieve, all depends on the speed you move the system in. To have extremely high speeds we can combine engines as I demonstrated in previous publication

4. Space Exploration:

To move in space, all we need is to attach the wings to the space craft so that we can move it at any speed we want. The most important is to make sure that the wings are solidly fixed to the vehicle and the wings are very compact and light so that they can resist to the weights of the spacecraft.

5. Boats.

As water is also a fluid, the same system is applicable to objects moving in water. Here we do not need high velocities as the water density is far bigger than the air density. Here I would point out that, if this system existed at the time of titanic, the accident would not happen as the system can take brake suddenly and turns right and left suddenly.

6. Pumps:

The same system can be used to move the water and this system is more powerful and efficient than existing systems.

7. **Powerful tunnels:** When moving the system, a powerful wind can be generated

8. **Military Equipments Acquisition:** Using this system, we can construct a vertically takeoff flying vehicle which is powerful ever! A vehicle which can transport extremely big weights. As I'm writing this paper, at Darpa, a such vehicle is needed, But I can't participate as they said that only Americans will participate. The same system, will many millions of Dollars, when my system may only cost not even 1 million of dollars. This system would be the best as it can move anywhere even in the bushes, it can have smaller wings which can be covered as well. It can make any movement in atmosphere, it can go fast even at hypersonic speed.

The benefits of the new system in Society.

1. **Noise reduction**
The actual airplanes are very noisy, but if you observe the normal car, it doesn't produce much noise like an aircraft, so as the new system will use the normal car engine, there will not be much noise as before.

2. Safety

If the engine has a problem in flight, the electric power generated can be used. So that the vehicle can remain in flight.

3. The future housing

In the future, we do not need to construct houses with entrances. Just people may fly to their homes doors and park their vehicles up there. This will have a big impact on the security and convenience as well. So when constructing houses, we will need to leave a small parking in front of the apartment door where the owner can park his car.

4. **Roads**
With this system, everybody will be able to fly in the atmosphere, so we will no need to construct the large roads anymore. So this space will serve for other purposes. Construction, agriculture and so on. As I demonstrated above, even the buses, the very big trucks all can use this system to move.

5. **Security**.
From above we can see, when everybody can park his car in front of his house, there will be no need to make entrances so every household will be secure because the robber could not jump to the top of the house.

6. **Lands**.
This result to the above point. When everybody will be able to move in atmosphere, there will be much space available for construction, agriculture and other activities.

7. **Control**.
For control, each vehicle may have a chip incorporated inside in the secret place so that when the vehicle moves in the region, it will send all of its information to the nearby police station so that each vehicle may be identified easily. The local police may have all the records saved in the database so that any vehicle passed in the region may be identified.

8. Transportation

The transportation cost will be reduced considerably, to move from one continent to another, it will cost less money than before, for example, from china to US, we may spend only 200 USD when we are spending more than 1000 USD. This is because; we can use normal engines which require less energy. The cargo transportation will also be greatly improved as we can construct powerful aircrafts which can carry very big weights.

9. Time saving

The time will be greatly saved, for example, the time we was taking to go to offices, will be greatly reduced, because, as we will fly at low cost, and high speed, everybody can buy a car and fly to the office very quickly. Also the business will be done conveniently and the time will be gained as well, this will contribute to the world development.

10. Convenience

As we will be able to fly, convenience is absolute! We can park our cars anywhere we want, we can move anywhere we want, we can move as we want, we can make any maneuver in atmosphere, we can go fast and slowly, we can take brake in atmosphere, go back, turn left by 90 degrees, Everything will be possible.

11. Pollution reduction.

I don't say that the pollution will completely be removed, but it will be reduced. Take an example of the space rocket when a space craft is sent to space. The amount of smoke it emits. By associating the wings to our space crafts, the gas emissions will be greatly reduced.

12. No need of airports control

Because the air vehicle will be very flexible and easy to maneuver, it can avoid other vehicles easily, it can take brake, it can go up suddenly, go down suddenly, turn right and left suddenly, as it is small in size, it can fly anywhere so that the pilot can do everything by himself.

13. Expenses Reduction

This is evident, you can save the construction expenses. They will be reduced considerably and I may say even by 90 percent! This will affect the transportation expenses as well. Another factor which will reduce the transportation expenses is the energy consumption, if you compare the airplane engine and the normal engine you can find out.

14. A response to the world crisis

Take as example of governments expenses on constructing bombers in military equipment acquisition; they spend billions and billions of dollars. But if this system is used, the money can be saved and it can be used for other purposes. Also, the population will profit as the travel tickets will be cheaper, people will save more money and could invest in more projects which the government may profit in. Business will be increased as well, more people will move to visit other countries so that exchange between countries can be greatly increased.

Conclusion

The ball is now in your camp! Outweigh the benefits and disadvantages of this system and the existing ones. Which one worth to be used? The cheaper ones or the expensive ones or say that the convenient one or the difficult ones? God gave us everything; he gave us the brain so that we may do anything from what he gave us. Anything is possible, we only need to collaborate and we will win!