A LECTURE NOTES ON HISTORICAL EVALUATION OF AIRCRAFT CONSIDERING ANCIENT AVIATION SCIENCE

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ABSTRACT:

This paper furnish and discuss about a detailed knowledge sharing about the Early air vehicles and classifications, concept of biplanes and monoplanes . which also discuss about the parameters of space elements such as Asteroid, Meteoroids and meteors its description and concepts . this paper would give a crystal environment about the atmosphere and will be helpful for the researchers and students in the world of art science and engineering

Key words: vimana , gyroplane , Ornithopters,

Early air vehicles and classifications, concept of biplanes and monoplanes

EARLY AIR VEHICLES AND CLASSIFICATIONS

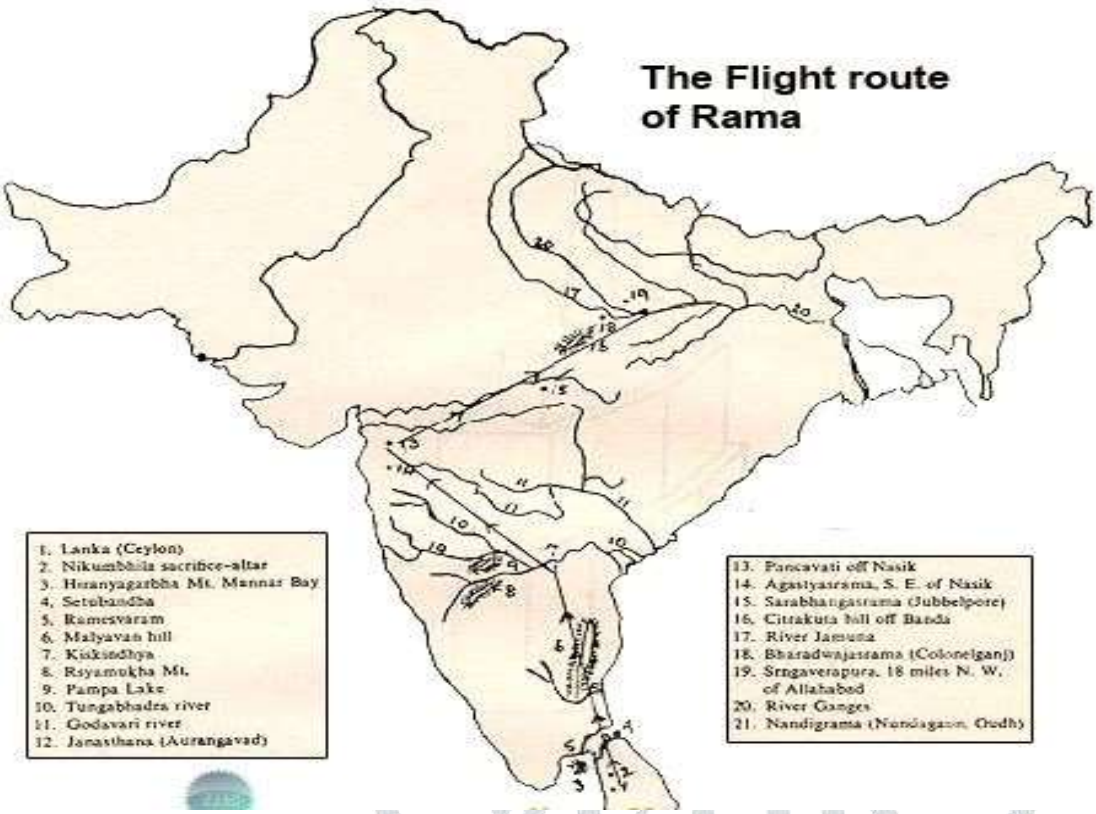
1. History of flight

In the Vedas and later Indian literature has detailed "vimanas" of various shapes and sizes: The word Vimana comprises of Vi, "the sky" and Mana,, "measure" = Vimana Indian legends have many concepts of Vimana.

In the Vedas: the Sun, Indra& several other Vedic deities are transported by flying wheeled chariots Pulled by animals, usually horses (but the Vedic god Pusan's chariot is pulled by goats). The "**agnihotravimana"** with two engines. (Agni means fire in Sanskrit.) , The "**gajavimana"** with more engines. (Gaja means elephant in Sanskrit.) Other types named after the kingfisher, ibis, and other animals.

Will have a review on PushpakaVimanas-The first flying airplane on earth!!???

In fact it was originated form Kubera, the Lord of Wealth, had an air plane according to Valmiki Ramayana , That was the earliest plane that the human beings knew, Ravana confiscated it from Kubera. After death Vibhshana, brother of Ravana, presented the air plane to Lord Rama. This was the fastest plane in those days. We know the secret of Lord Rama's plane (PushpakaVimana). Ram flew the plane by THOUGHT POWER! And it says this vehicle took ONE DAY to cover the distance between Sri Lanka and Ayodhya in Uttar Pradesh of India , Like modern planes it was in silvery white in colour (shiny)(solar cells) The distance between the two cities was approximately 3000 miles. plane flew low (unlike modern jet planes) only during day time ''Have a safe journey reach before sun set''. Vibhishana said the same to Rama. Refuses to believe Valmiki, "should at least give the credit of First Science Fiction writer in the world to Valmiki! "



2. Chinese kite flying

It was in vented in china possibly by 5th century BC by mozi and luban . Few are designed in early days with whistles to make musical sounds . After it introduced in india , further evolved in to kite fight , where abrasive liners are used to cut other kites In 6th century man carrying kites are used for both civil and military purpose . Even some time enforced as punishment

3. Balloon flight

- This was established by 1783 was the fantastic year for ballooning aviation , Between june 4 and December 1 five aviation programed in France, On June 4th the Montgolfier brothers demonstrated their unmaned hot air balloon at - france, On 27thaug Jacques charkes& Robert brothers launched the worlds first unmaned hydrogen filled balloon at paris, On 19th October the Montgolfier launched the first manned flight , balloon with humans on board at folietiton in paries, There is evidence that the chieses also solved the problems of aerial navigation using balloons 18th century

4. Ornithopters (Leonardo da vinci - 1485)

- It was originated from Leonardo - has developed more than 100 drawings on theories of flight, It was design created to show how man can fly , It's a aircraft heavier than air which flies like a bird The special features that lies in the wing which generate both lift and thrust

4.1 Design and method of an ornithopter

Aerodynamic machine with 2 working cycle (up & down stroke) In up stroke air flow hits the wing upper surface and at down stroke hits at bottom . Lift generated during the down ward stroke. Thrust is generated along the whole wing span during stroke motion it works similar to a propeller blade

5. Early airplane by wright brothers

This brothers build series of gliders and kite with the concept of controllability of A/C – 1900 to 1902. The first glider launched in 1900 it gives only about half the lift what they anticipated. Their second glider even performed very poorly . They corrected their testing and calculating procedure with thumb rules. The third glider with true three axis control they generated was far better than previous. They flew it more than 100 times successfully in 1902. The brothers not only made a powered aircraft they give advancement in science of aeronautical engineering

6. Rotorcraft

Types of such rotary blade vehicle are classified as Helicopter , Cyclogyro / cyclocopter, Autogyro, Gyrodyne / gyro plane, Rotorkite. All these are Known as rotary wing aircraft in fact Lift generated by rotary wings (no

fixed wing) Several rotor wings mounted on a single rotor mast .In some cases one or more rotor assembly will be mounted for better list and maneuvering some design includes additional static surfaces for lift, propellers ,thrust engines etc.,

6.1 Helicopter

Is a rotor craft whose rotors are driven by a engine through out the flight. It take off vertically, hover, fly forward , back ward , laterally and land vertically. In actually falls under the category called VTOL. Several configurations are their with one or more rotors.

6.2 Cyclogyro / cyclo copter

Rotorcraft rotor is driven by the engine through out the flight ,The blade rotates about the horizontal axis. Blade parallel to its camber

6.3 Auto gyro / gyro plane / gyro copter / rotor plane

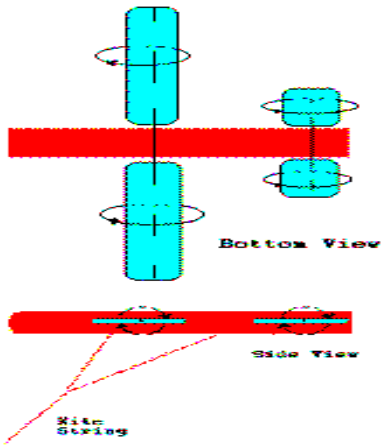
This vehicle is something interesting , All the above type utilize an unpowered rotor driven by aerodynamics forces , Tat rotor will generate lift, An engine powered propeller will be their to produce thrust

Gyrocopter in autorotation

6.4 Gyordyne

This vehicle also come under VTOL type aircraft Rotor generally driven by engine, Like a helicopter with anti- torque rotor, For forward flight one or more propeller mounted on short stub wing, After level flight thrust being provide by the propellers , the rotor receives less power just to over come profile drag and maintain lift

6.4 Rotor kite this Is an up powered rotary wing aircraft , The rotor kite has no wing at all, Being carried and dropped from another aircraft, Or by towed in to air behind a car or boat



7. Airships

This come under the category called Lighter then air aircraft, Can navigate through air under its own power, Get lift by large air bags filled with a lifting gas that is less dense than surrounding air .a) Rigid construction b) Semi rigid construction c) Non rigid construction

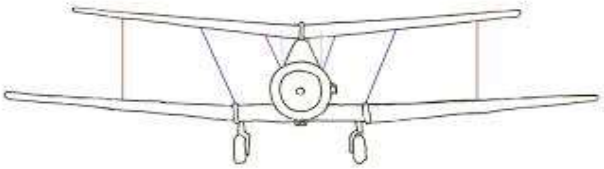
Aerostatic lift is the bouyant force acting on a body due to its lesser density than the air environment surrounding it. This force will keep lighter-than-vehicles airborne.

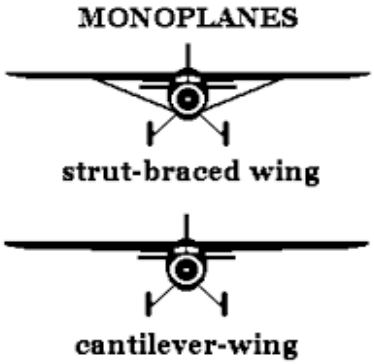
Aerodynamic lift acting on a body is the lift force that is generated as a result of velocity of thebody relative to the air environment. This force is useful to keep heavier-than-air vehicles airborne.

8. CONCEPT OF BIPLANES AND MONOPLANE

Biplane

A biplane is a fixed wing aircraft with two fixed wings stacked one above other , The wright flyer used such a biplane arrangement wing concept





Mono planes

Is a fixed wing aircraft with a single main wing , A mono plane has the highest efficiency and lowest drag og any wing configuration, Its easy and simple construction to build

Conclusion

The paper elaborate the study of aircraft and fly vehicle evaluation right from ancient aviation happened all over the globe and its fly its behaviour with respect to altitude and power plants . To one side from this paper give a brief concept about VTOL and other rotary vehicle in detailed view which gives a detailed on board understanding to the aerospace students and aerospace fertility

Reference:

[1] Ramesh P.S, J.V. Muruga Lal Jeyan "Mini Unmanned Aerial Systems (UAV) - A Review of the Parameters for Classification of a Mini UAV", International Journal of Aviation, Aeronautics, and Aerospace, published by Scholarly Commons Embry-Riddle Aeronautical University, Volume 7, Issue 3, Article 5 (2020)

[2] K. Sai Priyanka, J V Muruga Lal Jeyan, R. Sabari Vihar, "A Review on a Reassess Swot up on Airfoil Stall and Flow Separation Delay for a Range of Limitations Associated with Aerodynamics and Wing Profile", International Journal of Advanced Science and Technology, 29(06), 7659-7668, (2020)

[3] R. Sabari Vihar J. V. Muruga Lal Jeyan, K. Sai Priyanka, "A Review on Aerodynamic Parameters, Methodologies and Suppression Techniques Explored in Aircraft Wing Flutter", IJAST, vol. 29, no. 04, pp. 3494 -, Jun. 2020

[4] Balaji R, J V Muruga Lal Jeyan, Vijay Kumar singh "Review on influence of radiating and aerodynamic shock at hypersonic vehicle" Journal of Physics: Conference Series, volume/ issue 1473 march 2020 012004, IOP Publishing

[5] JV Muruga Lal Jeyan, Kavya S Nair and Krishna S Nair "Aerodynamics and flow pattern performance evaluation of off road vehicle for various velocity range and angle of incidence" Journal of Physics: Conference Series, volume/ issue 1473 march 2020 012001, IOP Publishing

[6] J V Muruga lal Jeyan,Krishna S nair , Kavya S nair "The Low Speed Aerodynamic Analysis Of Segmental Wing Profile "International Journal of Mechanical and Production Engineering Research and Development. Vol. 9, Issue 4, Aug 2019, 1303–1310,1 August 2019,

[7] J V Muruga lal Jeyan, M SenthilKumar,ArfajAhamed Anwar "Flight maneuvering and safe flight visualization with the aid of wide-ranging scrutiny and automation software "MATEC Web Conf. Article Number 01021Volume 272, 2019,13 March 2019, Pages 8

[8] J V MurugalalJeyan , Dr. M. Senthil Kumar, "Performance Evaluation of Yaw Meter With the Aid of Computational Fluid Dynamic" , International Review of Mechanical Engineering (IREME). ISSN: 1970- 8734, Vol No. 8,Issue 02 .

[9] J V Murugalaljeyan **,** Dr. M. Senthil Kumar , **"**Performance Evaluation for Multi-Hole Probe With the Aid of Artificial Neural Network**"** International Journal of Theoretical and Applied Information Technology (JTAIT). ISSN 1992-8645Vol No: 65 , Issue 3 , PP: 665 July 31, 2014