

The Flying Journal

Edition 1

Aerodynamics Lab



MESSAGE



Gp. Capt. V Rajan
Head of the Department
Aeronautical Engineering Department

I am extremely proud of the staff and students of Aeronautical department whose proactive and enthusiastic approach in bringing out this exceptional Newsletter in such short span of time, since the inception of the department speaks volumes of their capability and concerted team effort.

The various technical content outlined in the Newsletter provides a wholistic approach towards Aeronautical engineering and is envisaged to broaden the vision.

I would like to exhort the readers to forward their valuable suggestion to enable us further improve the quality of the newsletter. I convey the heartiest congratulation for the newsletter team for their stupendous effort



EDITORIAL TEAM



FACULTY COORDINATOR

Gp. Capt. V Rajan
Prof Deepa M.S
Prof T Paramesh

STUDENT COORDINATOR

Deepak B.S V Sem AE
Dhanush G.J V Sem AE
Manoj M VII Sem AE
Sahil D.R VII Sem AE

EVENTS

1. Gp Capt. V Rajan participated in NPTEL workshop conducted on 18.03.2016 at SJGIT Chikballapur..
2. Our faculties had attended a two day Workshop on “Engineering Pedagogy” on 15th and 16th March 2016.
3. All faculties have successfully completed one day training in ”COMPUTERIZED SUBSONIC WIND TUNNEL(600mmX600mm)” on 22nd Feb. 2017.
4. Prof Praveen N attended three days workshop on “MARS Summit - 2017” from 21st - 23rd Feb at ACS college of Engineering, Bengaluru.
5. Prof Deepa M.S and Prof T Paramesh attended two days workshop on “Computer Aided Aircraft Drawing” on 27 Feb 2017 at AIT, Bengaluru.
6. Few students of IV & VI Sem have participated in the Two-day All India Seminar on “Aerostats and Airships” on 4th & 5th March 2017 at East West College of Engineering, Bengaluru.
7. Prof Deepa M.S attended a two day all India Seminar on “Methods of computations in fluid flow, Heat and Mass Transfer problems” on 14 - 15 March 2017 at AIT Bengaluru.
8. Few students of VI Sem have participated in the Two-day All India Seminar on “Methods of Computations in Fluid Flow, Heat and Mass Transfer Problems” on 14-15 March 2017 at AIT, Bengaluru.
9. We Conducted a Guest lecture on “Design and Development of Aircraft Power Plants for Fighter Aircraft - A Challenge” on 7th April 2017.
10. Our students of IV Semester had Industrial visit to ASTE, Bangalore and HAL museum on 19th April 2017 accompanied by faculty coordinators Prof. Vigneswaran CM, Prof. Rohith L.G, Prof. Chandrika M.B.
11. Established Department level Technical club “PRAVEGA” under which students are encouraged and trained on all aspects related to Aeronautical and Aerospace.

GUEST LECTURE

“Design & Development of Aircraft Power Plants for Fighter Aircraft - A challenge” 7th April 2017

The lecture started with a brief introduction of the guest Dr. R.K Mishra from CEMILAC (DRDO) by Gp. Cpt. V Rajan, HOD, Aeronautical Engg., SJGIT.



The topic on “Design & Development of Aircraft Power Plants” started with the brief introduction of a simple gas turbine engine, its component, functions and different methods of thrust augmentation.

The topic also covered the evaluation of gas turbine engine with different generations, arrangement of multi-spool, applications, classification of gas turbines, methods of improving part-load performance, matching procedures for twin-spool engines, transient behavior of gas turbines and principles of thrust augmentation. Furthermore the guest discussed about different types of nozzles such as ejector nozzles variable area nozzles etc. The lecture concluded with the topic covering the recent trends and future of Aircraft

Propulsion and ended with vote of thanks given by Prof. M S Deepa, Dept. of Aeronautical Engg SJGIT.

INDUSTRIAL VISIT

“Air Force Technical College, Jalahalli, Bangalore” 19th April 2017



AFTC was established on 4th July 1949. The aim of the college is to train engineers on the current technologies of aircraft, weapon, communication systems and operated by Indian Air Force and also instill qualities of military leadership and managerial skills for Technical officers and cadre of the Indian Air Force.

The college in addition to training engineers of Indian Air Force and its sister services has also trained officers of DRDO, HAL, Air India and many personnel from friendly foreign countries in South East Asia and Middle east.

The students of Sixth Semester were allowed to visit the Hanger, Structures Lab and Propulsion lab of AFTC. Thus helped the students to gain in depth knowledge on structures and various Engine components and systems in aircraft.

The students also visited the central Library of AFTC and got an awareness of various text books related to Aeronautic Engineering. Further the students had the opportunity to observe and understand some of advanced fighter aircraft like MIG 23BN, MIG21MF and helicopter like Chetak positioned at the hanger. Facilities’ like ground running of aircraft, cut section of fuselage, wings, tail plane of MIG 21 AC were of immense value.

INDUSTRIAL VISIT

“ASTE, BANGALORE ”
19TH APRIL 2017



Aircraft and systems Testing Establishment (ASTE) is a premier establishment in Indian Air Force which conducts flight testing of aircraft, airborne systems and weapon stores prior to their induction into the Indian Air Force (IAF). Flight testing is one of the most demanding, challenging & exacting professions in the world. Additionally ASTE undertakes flight testing of airborne systems designed & developed by agencies such as DRDO for IAF

The students of IV sem Aeronautical Engg. had a chance to visit the Air force establishment on 19th April including the test facilities available at ASTE, Bangalore.

Thus helped the students to gain knowledge on

- Telemetry and aircraft instrumentation
- Ground Test facilities
- Avionics
- Aircraft hanger
- Weapon Test Facility.

They had the opportunity to observe sum of the most modern generation fighters like MIG 24, Jaguar, Mirage Aircraft and Helicopters like MIG-17V, ALH etc., Ground Test facilities and Avionics lab had a number of Test Equipment where aspects like periodicity of testing, calibration, snag analysis etc., were covered in depth. The student had been taught about modern instruments fitted in fighters, transport aircrafts and helicopters like Air Data Computer, HUD, HDD, Cockpit instruments, system instruments on health monitoring etc.

EVENTS

12. We Conducted 2 Days Aeromodelling Workshop on “Fundamentals of flight” on 29th and 30th April 2017.
13. Our students of VI Semester had Industrial visit to AFTC, Bangalore on 19th April 2017 accompanied by faculties coordinators Prof. V. Rajan, Prof. Deepa M.S, Prof. Paramesh .T.
14. Conducted two days Intercollegiate Tech fest “AVION 2K17” at 3^d and 4th May 2017.
15. Mr Manoj J VIth sem student has presented a paper on “ Speech Input Controlling of Unmanned Aerial Vehicles” at IET 2017.
16. VI Sem students accompanied by faculties attended a half day program on “PATENTING OF ENGINEERING PRODUCTS”



अवियन 2017



Department Club – PRAVEGA, was set up with a motto to improve the practical awareness of the students which included designing and building of Aircraft working models and operating them. To encourage and guide students to participate in various competitions held in our college and other colleges. To guide students in their final year projects and for paper presentation.

The above objectives of the club, took shape during the college technical for Manthana -2017 and then AVION 2K17, an Inter collegiate Technical Fest of the Department of Aeronautical Engg. was organized on 3rd and 4th of May 2017

A team of enthused students willing to volunteer as coordinators was formed under the supervision of HOD, and faculty Members. then students were informed about the events/competitions which can be conducted under Aeronautical branch.

The coordinators came up with a schedule for the event and it was decided to have 7 events for AVION -2K17 as follows:

DAY 1

1. Aircraft Sketching
2. Paper presentation
3. Hydro Rockets

DAY 2

1. Gliders
2. Black Box
3. Poster Presentation
4. Techno-Quiz

The Event Management committee students also contacted various companies for sponsoring the events, which resulted in receiving the sponsorship amount and the main sponsors for the events were

- M/s New Tech Engineers – suppliers of Aeronautical and Mechanical Lab Equipments
- M/s Genesis Technologies – Suppliers of computer hardware's
- M/s Happy Landings India - Aeromodellers
- M/s Ind Lab Equipments – suppliers of Aeronautical, Mechanical and R&D Equipment

Intercollegiate Tech Fest, AVION 2017 started on 3rd May 2017, following with registration for all the events.

Pradeep V and Leo Peter Charles were invited to judge “The Best Glider Design” made by the participant. Prizes and Certificate were distributed at end of the program making it a grand success.



WHAT'S NEW ??

ELECTRIFYING !!!!!



This 12-Seater Electric Airplane Could Fly You on Short Trips—One Day Does an electric flight from New York to Boston for \$70 sound too good to be true? That's the promise being made by the electric-airplane startup Zunum Aero—and it's one that you certainly shouldn't dismiss out of hand.

Zunum has already made its plan to shake up the air transport industry known, and its ambition has earned the company backing from both Boeing and JetBlue. But today Zunum has revealed more details about how, exactly, it plans to do it. Most intriguing are the details about the airplane, shown in the concept image above, which it plans to have zipping through the skies by 2022.

Crucially, it's not all-electric, because battery technology still isn't advanced enough to power a 12-seater airplane like this. Instead, it's a hybrid that uses a combination of jet fuel and wing-loaded batteries to push itself along.

What's smart is that it's been designed so that the fuel tank can be shrunk, or even removed, as batteries improve in quality, so it could become all-electric in the future. In its hybrid form, the plane should cruise at 340 miles per hour and be good for a 700-mile trip.

Zunum's business model is interesting, too: it plans to make use of underutilized airports in the U.S. in order to provide more efficient regional travel—a kind of bus service in the air. That means it wouldn't fly from, say, JFK to Logan airport, but instead will shuttle between obscure airports like Republic, which is in the suburbs outside New York City, and Hanscom Field outside of Boston. That won't necessarily be convenient if you need to be in the city, but the idea is to provide flights from numerous sites around urban areas, closer to where many people actually live. It also promises to make that Hanscom-Republic trip in an hour and 44 minutes, and for just \$70.

There are, clearly, still barriers for Zunum to overcome—not least of which is building the actual plane. And it remains to be seen if the firm will hit that ambitious 2022 deadline. But it and other companies are all pushing hard to build electric aircraft, so the notion of cleaner, quieter flights isn't quite as far-fetched as it once sounded.

SOURCE: ZUNUM
IMAGE CREDIT: ZUNUM AERO

Travel with Light SPEED

WARP DRIVE

Warp Drive May Be More Feasible Than Thought, Scientists Say.

A warp drive would manipulate space-time itself to move a starship, taking advantage of a loophole in the laws of physics that prevent anything from moving faster than light. A concept for a real-life warp drive was suggested in 1994 by Mexican physicist Miguel Alcubierre; however, subsequent calculations found that such a device would require prohibitive amounts of energy.

Now physicists say that adjustments can be made to the proposed warp drive that would enable it to run on significantly less energy, potentially bringing the idea back from the realm of science fiction into science.

"There is hope," Harold "Sonny" White of NASA's Johnson Space Center said here Friday (Sept. 14) at the 100 Year Starship Symposium, a meeting to discuss the challenges of interstellar spaceflight.

Warping space-time

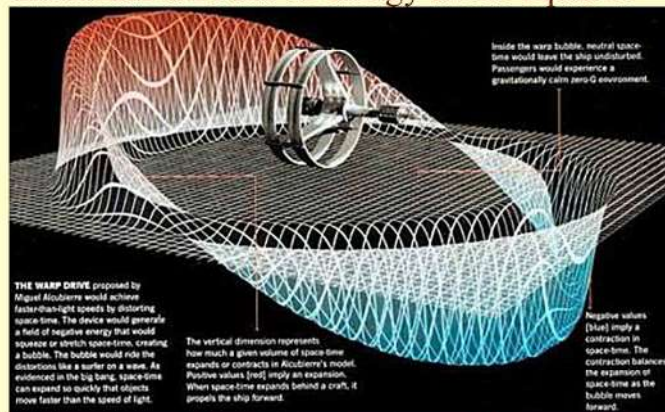
An Alcubierre warp drive would involve a football-shaped spacecraft attached to a large ring encircling it. This ring, potentially made of exotic matter, would cause space-time to warp around the starship, creating a region of contracted space in front of it and expanded space behind

Meanwhile, the starship itself would stay inside a bubble of flat space-time that wasn't being warped at all.

"Everything within space is restricted by the speed of light," explained Richard Obousy, president of Icarus Interstellar, a non-profit group of scientists and engineers devoted to pursuing interstellar spaceflight. "But the really cool thing is space-time, the fabric of space, is not limited by the speed of light."

With this concept, the spacecraft would be able to achieve an effective speed of about 10 times the speed of light, all without breaking the cosmic speed limit.

The only problem is, previous studies estimated the warp drive would require a minimum amount of energy about equal to



A ring-shaped warp drive device could transport a football-shaped starship (center) to effective speeds faster than light. The concept was first proposed by Mexican physicist Miguel Alcubierre.

the mass-energy of the planet Jupiter. But recently White calculated what would happen if the shape of the ring encircling the spacecraft was adjusted into more of a rounded donut, as opposed to a flat ring. He found in that case, the warp drive could be powered by a mass about the size of a spacecraft like the Voyager 1 probe NASA launched in 1977.

Furthermore, if the intensity of the space warps can be oscillated over time, the energy required is reduced even more, White found.

By Clara Moskowitz, SPACE.com Assistant Managing Editor

Cross Word Puzzle

FUN FACTS

1. Pilots eat a different meal

There are various rules which are imposed by different airlines. However, there is one rule which is common to the vast majority of them. It is the rule that pilots must be fed the same multi-course meal given to those in the first and business class whilst the co-pilots are encouraged to eat different entrees to guard against cases of food poisoning.

2. Each engine on a Boeing 747 weighs almost 9,500 pounds

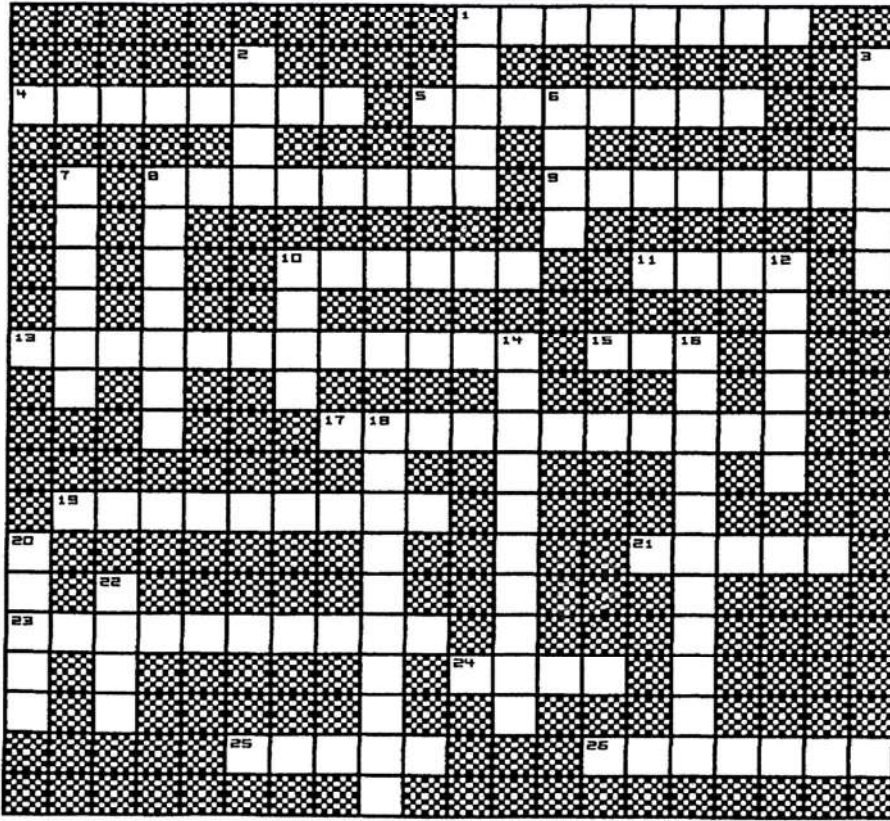
Another interesting fact about a Boeing 747 concerns its engine weight. This aircraft is one of the most popular and beautiful airliners in the sky. A Boeing 747 is made up of six million parts and one of them is its engine which weighs almost 9,500 pounds (4,300 kg) and costs about 8 million USD.

3. The average age of a commercial aircraft

The lifespan of an airliner is not truly measured in time. Instead, it is counted based on pressurization cycles. Each time an aircraft is pressurized during a flight its fuselage is subjected to stress. The "lifespan" of an aircraft is reached when there are certain metal fatigues and cracks which may pose danger. The "service life of 20 years" is generally expressed by approximate figures of 51,000 flight hours and 75,000 pressurization cycles for most aircraft. If an aircraft is used on long haul routes it experiences relatively few pressurization cycles in its "life" and can remain airworthy far beyond 20 years.

4. The world's most frequent flyer

Tom Stuker has taken the term "frequent flyer" to completely new heights this year, logging just over 1,000,000 miles in 2012 all on United, all in first class. Generally, he has travelled over 10 million miles. The 59-year-old Chicago native and New Jersey resident says he's flown a total of 13 million miles, much of that in his capacity as an independent consultant and sales trainer for automobile dealerships around the world.



ACROSS CLUES

DOWN CLUES

1. The resistance to relative motion between two surfaces in contact.
4. The rate of motion in a particular direction.
5. The difference in ? gives an airfoil lift.
8. Indicates the height above sea level.
9. Is how fast the air is moving past an airfoil.
10. The downward force on a plane.
11. A force generated by an airfoil which acts perpendicular to the incoming flow.
13. The science that deals with the motion of air and the forces it produces on an airfoil.
15. The side to side motion of an airplane.
17. A line depicting the flow path of a particle of air.
19. The distance from one wing tip to the other.
21. When the air flow separates from the airfoil reducing the lift.
23. Irregular motion of air; uneven currents of air.
24. The motion of an airplane caused by the use of ailerons.
25. The straight line from the leading edge to the trailing edge of an airfoil.
26. Part of an airplane that causes it to roll.

1. A push or pull exerted on an object.
2. The force that counter acts the weight of an airplane.
3. The part of an airplane that controls the yaw of the airplane.
6. The distance from one wing tip to the other.
7. The measure of the curvature of the airfoil.
8. A streamlined surface designed in such a way that air flowing around it produces useful motion
10. A three dimensional object that moves through the air and can generate lift.
12. The force the engine supplies to the airplane.
14. The point on an airfoil that separates the upper and lower streamlines.
16. A facility where an airstream is forced across an airfoil to study aerodynamics.
18. The curve described by a projectile in flight.
20. The up and down motion of an airplane controlled by the elevators.
22. The force that opposes thrust.



Department of Aeronautical Engineering
S.J.C Institute of Technology
 P.B No: 20, B.B Road, Chickballapur - 562101, Karnataka
 Ph: 080-263181-84/Fax:263180
 Email: sjcit@rediffmail.com Web: www.sjcit.ac.in