



Shared Horizons

U.S. - India Aviation Cooperation Program : “ Uddein Saath Saath - Together We Fly”



Inside



- ✂ Message from the Co-chairs
- ✂ Lockheed Martin's Sikorsky promotes M28[®] Turbo-Propairplane for passenger and cargo transport in India and Latin America
- ✂ Aviation Institute of Maintenance (AIM)
- ✂ A Blueprint for Success: Security Planning for the Next 20 Years
- ✂ Microcell[™] Carbon Foam (MCF) batteries
- ✂ Honeywell at Aero India 2017
- ✂ Keeping Passengers Safe
- ✂ Nurturing General Aviation In India

M28[®]

STOL TWIN TURBOPROP AIRCRAFT

www.m28aircraft.com



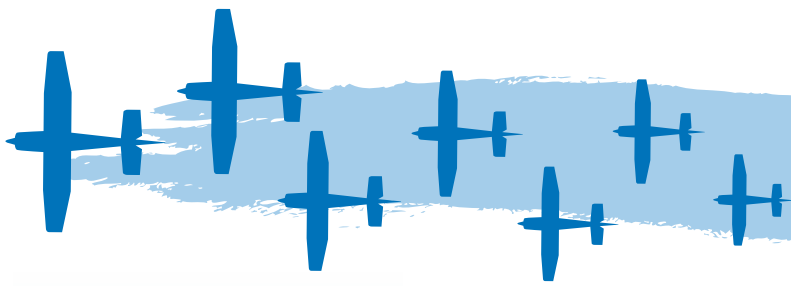
Safe, reliable operation from unpaved airstrips
Highest payload in its class

Well suited for remote area connectivity across India
Easily reconfigurable cabin for cargo, passenger, paradrop and medevac

High temperature - High Payload - High Range

Reliable in any conditions, operating from any type of runway including world's most inaccessible airstrips, unpaved, grass and gravel runways or high-elevation airfields.





Thomas M. Miller
ACP Co-chair (Government) &
FAA Senior Representative,
South Asia



Yash Kansal
ACP Co-chair (Industry) &
Country Manager-India/SAARC
Oshkosh Corporation (India)

PUBLICATION DATA

Edited & Published by
Sandeep Bahl
Program Director
Mobile: +91 97171-95197
Email: sandeep.bahl@us-indiaacp.com

Coordinated & Designed by
Nidhish Jain
Program Assistant
Tel: +91-11-2660-2302 (D)
Mobile: +91 98684-83500
Email: nidhish.jain@us-indiaacp.com
nidhish@iaccindia.com

US - India Aviation Cooperation Program (ACP)

PHD House, 4th Floor, Room no.403,
4/2 Siri Institutional Area, August
Kranti Marg, New Delhi - 110016
Website: www.us-indiaacp.com

Printed by
Armaan Prints
sanuprinter@yahoo.co.in

We are pleased to present to you the July – December 2016 issue of “Shared Horizons”.

The highlights of the period were signing of our Memorandums of Understanding (MOU) with Rajiv Gandhi National Aviation University (RGNAU) and with the National Skill Development Corporation (NSDC), which included our grant signing for the GPS Aided GEO Augmented Navigation (GAGAN) Extension Business Case.

On August 29, we held a roundtable with Ms. Lee Zak, USTDA's Director and other Senior USG officials visiting India for the US – India Strategic and Commercial Dialogue, which succeeded in strengthening bilateral aviation cooperation between the U.S. and India and created opportunities for ACP members.

We are very excited to welcome the latest new members to the ACP:

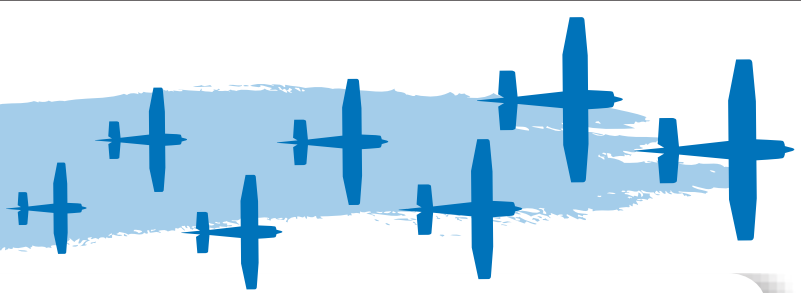
*Aviation Institute of Maintenance (AIM) and,
Kallman Worldwide, Inc.*

The ACP looks forward to discussing, designing, implementing and delivering additional civil aviation projects in 2017, as India makes its transition from legacy platforms to futuristic aviation systems and takes its place as a leader in the civil aviation sector.

On behalf of the entire ACP membership, we wish you great success and accomplishments in 2017!

(Thomas M. Miller)

(Yash Kansal)



ACP Milestones

2016

- Memorandum of Understanding Signing: ACP & Rajiv Gandhi National Aviation University (RGNAU)
- Grant Signing Ceremony: GAGAN Extension Business Case
- Memorandum of Cooperation (MOC) Signing: ACP & National Skill Development Corporation (NSDC)
- ACP project workshop with Ministry of Civil Aviation (MOCA)
- Memorandum of Cooperation (MOC) Signing: ACP & Bhogapuram International Airport Company Ltd., (BIACL)
- India Aviation 2016 at Hyderabad
- Grant agreement signed for Aviation Safety Technical Assistance Phase – II

2015

- Aero India 2015 at Bengaluru
- Grant agreement signed for ProVision Body Scanner System Pilot Project

2014

- India Aviation 2014 at Hyderabad
- Grant agreements signed for ASETEP & India Regulatory Oversight Assistance

2013

- Grant agreements signed for PBN, DGCA officers' training Phase-II and Airport GIS
- U.S. - India Aviation Security Seminar
- U.S. - India Aviation Summit, Washington D.C.

2012

- Grant agreement signed for Total Airspace and Airport Modeler (TAAM)
- India Aviation 2012 at Hyderabad

2011

- Grant agreements signed for DGCA officers' training Phase-I & launching GBAS at Chennai Airport
- U.S. - India Aviation Summit, New Delhi

2010

- Grant agreement signed for Helicopter Safety Technical Assistance
- Automatic Dependent Surveillance – Broadcast (ADS-B) & Ground Based Augmentation System (GBAS) Seminar
- India Aviation 2010 at Hyderabad
- Roundtable Discussion on Airport Regulatory & Financing Best Practices

2009

- Grant agreement signed for Aviation Standard Technical Training
- U.S. - India Aviation Partnership Summit, Washington D.C.

2008

- FAA conducts Air Traffic Management Training Program (ATMTP)
- AAI Air Traffic Control Officers (ATCO) Manpower Assessment Study
- Air Traffic Flow Management (ATFM) Seminar

2007

- MoU between: U.S. Department of Transportation, U.S. Trade & Development Agency and Ministry of Civil Aviation
- U.S. - India ACP Inaugural Session: ACP Formed
- U.S. - India Aviation Partnership Summit, New Delhi

2006

- Groundwork Meeting

2005

- ACP announced by Secretary Mineta and Minister Patel

ACP Milestones



DELIVERING SPEED IN CRITICAL SITUATIONS

When minutes count, depend on the power and performance of the Bell 429 or 429WLG for your search and rescue mission. The reconfigurable interior seats up to seven passengers plus a pilot, features large sliding doors for quick access and a 70+ cubic foot baggage compartment. The Bell 429 is ready to serve your operation by delivering 150 knot speed, as well as the safety and superior handling needed in critical situations.

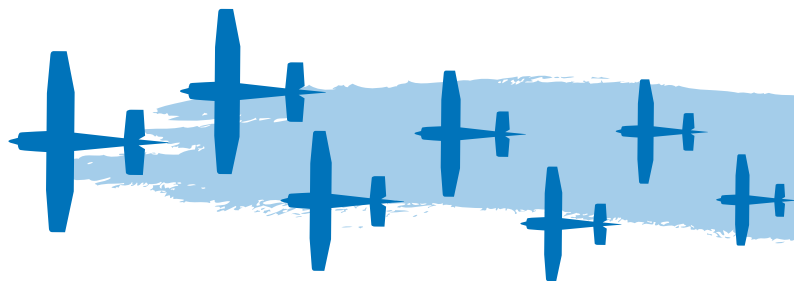
BELLHELICOPTER.COM



| Le Bell 429 avec train d'atterrissage non disponible en France.

On a Mission.

Bell helicopter®
A Textron Company



ACP In Partnership with



Ministry of Civil Aviation
Government Of India



**BUREAU OF CIVIL
AVIATION SECURITY**

ACP Past Successes

- Aviation Safety Technical Assistance Phase – I
- Technical, Management, and Operational Development Training (TMODT) Phase – I
- Total Airspace and Airport Modeler (TAAM)
- AAI Air Traffic Control Officers (ATCO) Manpower Assessment
- Helicopter Aviation Safety Technical Assistance
- Technical Training for Aerospace Industry

ACP Ongoing Projects

- Business Case for GAGAN Extension
- Aviation Safety Technical Assistance Phase – II
- ProVision Body Scanner System Pilot Project
- Airport Geographic Information System (GIS) for Indian Airport
- Aviation Security Equipment Testing & Evaluation Program (ASETEP)
- Technical, Management, and Operational Development Training (TMODT) Phase – II
- PBN (RNP-AR) at 3 Indian Airports
- GBAS Pilot project at Chennai Airport

ACP MISSION & OBJECTIVES

Mission

The U.S-India Aviation Cooperation Program (ACP) was established in 2007 as a public-private partnership between the U.S. Federal Aviation Administration (FAA), the U.S. Trade and Development Agency (USTDA), other US Government agencies and U.S. Companies.

The ACP supports the growth of the Indian civil aerospace sector by working directly with the Government of India (GOI) to identify and execute projects that encourage collaborations between US and Indian stakeholders, in the area of aerospace technology and best practices.

Objectives

- ✈ Promote greater engagement between US and Indian Government agencies and industry to enhance civil aviation in India.
- ✈ Undertake projects that advance Cooperation in domains such as aviation safety, security, regulatory oversight and management.
- ✈ Provide training and technical assistance to accelerate excellence in aviation operations.
- ✈ Within India, increase awareness of, and facilitate access to, US expertise, technology and best practices to assist India's aviation growth.

TRAIN IN THE USA. FIX JETS WORLDWIDE.



11 AIM CAMPUSES

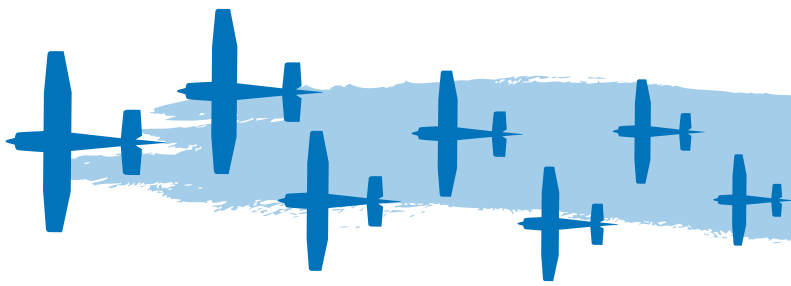
AVIATION INSTITUTE OF MAINTENANCE SERVES STUDENTS IN CAMPUSES LOCATED IN METRO AREAS ACROSS THE UNITED STATES!

Professional Aviation Maintenance Certification Course:

This course is designed to prepare you to successfully pass the General, Airframe and Powerplant written exams and the Oral and Practical portions in order to obtain your FAA Airframe and Powerplant Certification.

- ▶ **Prepare for an American FAA license in 5 weeks if you have 30 months of qualified practical experience!**
- ▶ Study in United States of America
- ▶ Approved Federal Aviation Administration (FAA) Institution
- ▶ Student housing is available

- ▶ **Contact La Vern Phillips**
- ▶ **Phone: +001 (757) 233-6542 Ext. 1271 | Email : USA@AIMschool.edu**



U.S. Commercial Service U.S. Department of Commerce New Delhi, India



The Commercial Section of the U.S. Embassy promotes U.S. exports and helps American companies do business overseas. Additionally, we promote foreign direct investment into the United States. As part of the U.S. Department of Commerce's global network with seven offices throughout India, over 100 offices in the United States and more than 80 other international offices, we have the trade and export promotion resources that you need to develop your business in the U.S. and Indian markets.

If you're a U.S. company, the Indian market - with its one billion plus population - presents lucrative and diverse opportunities with the right products, services, and commitment. You can connect with these opportunities through our trade counseling, market intelligence, business matchmaking, and commercial diplomacy. For more details, please go to: www.export.gov/india.

If you're an Indian company looking to invest in the United States or searching for U.S. suppliers, the U.S. Commercial Service can help you as well. For more details, please go to: www.buyusa.gov/india.

Services for U.S. companies

Gold Key Service

The Gold Key Service (GKS) arranges pre-screened one-on-one appointments with potential business partners. GKS services include: four to six appointments with pre-qualified sales representatives and partners, appropriate government officials, related associations and others; escort by a U.S. Commercial Service staff member for meetings; and assistance with travel and accommodation at preferred rates.

International Company Profile

An International Company Profile (ICP) is a due-diligence check that helps U.S. companies evaluate potential business partners. An ICP provides a detailed background report, based on a variety of research sources, including an on-site visit by a Commercial Specialist and listing of the company's senior management, comments from company references and banking and financial information and CS India insight on whether the prospective partner can meet your business needs.

International Partner Search

The International Partner Search (IPS) is designed to help identify suitable Indian companies and distributors, who are keen to represent U.S. firms in India. IPS offers: Company report on four to six potential qualified sales representatives, agents, distributors, joint venture partners, licensees, or franchisees that are interested in your products and services; key contacts of interested Indian companies; and feedback from our Commercial Specialist after speaking with the interested companies.

Customized Market Research

U.S. companies can benefit from customized market research that can provide input on market size, market entry requirements, regulatory issues, key competitors, pricing analyses and other vital information required. Commercial Service staff will work with you to identify a local market research company among our panel of market research and consulting companies, and will work with that firm to deliver a market report that fits your needs.



INDIA'S PARTNER
TODAY - TOMORROW - FUTURE



FROM BIG TO SMALL, ADS-B FOR ALL.



NXT[™]
ADS-B XPDR



LYNX[®]
TRAFFIC TRANSPONDER / WEATHER



NextGen ADS-B Avionics for All Aircraft

As the aviation industry turns to ADS-B to securely track and monitor air traffic, ADS-B pioneer L3 is there with a full line of mandate-compliant products for all types of aircraft:

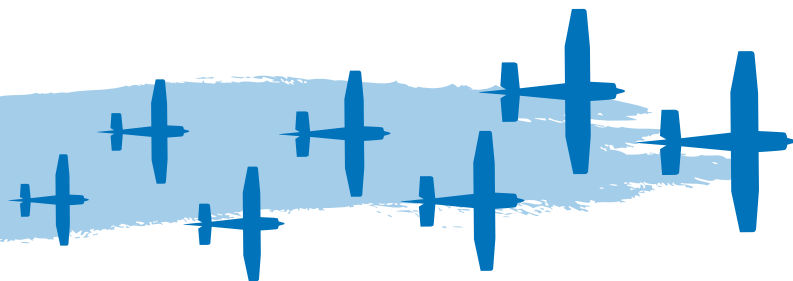
- First to certify fully compliant DO-260B ADS-B Out transponders for all aircraft markets
- First to market with SafeRoute[®]—a full range of ADS-B In applications for safety and efficiency
- Compliant to ICAO APAC regional Aviation Block System Upgrade Priorities
- Smaller, lighter, feature-rich Lynx[®] product line—ADS-B In/Out solutions for GA and helicopters

Whatever aircraft you fly, contact L3 for the right ADS-B solution. Visit L3 online at www.L3aviationproducts.com for more information.

Aviation Products

ACSS[®]
An L3 & Thales Company

L3T.com



Lockheed Martin's Sikorsky promotes M28® Turbo-Prop Airplane for passenger and cargo transport in India and Latin America

When Lockheed Martin purchased Sikorsky Aircraft in November 2015, the world's largest defense contractor acquired more than just a portfolio of top-of-the-line commercial and military helicopters.

Lockheed Martin also acquired an aviation asset in the form of the M28 short takeoff and landing airplane. With its powerful engines, and the ability to change between passengers and cargo roles at a moment's notice, the 7,500 kg (16,500 lb.) M28 has come to be viewed with growing interest around the world as a multi-role performer.

"The M28 twin turboprop is a versatile and uniquely qualified short takeoff and landing aircraft because of its maneuverability, reliability and safety," said Air Vice Marshall Arvind Walia (Retd), Sikorsky's Regional Executive for India & South Asia. "We believe this proven platform is a solid candidate for regional airline connectivity to India's Tier 2 and 3 cities."

Walia said the M28 aircraft is ready for airline operations in India,



The M28 short takeoff and landing airplane is a candidate for regional connectivity between India's Tier II and III cities. Built in Poland by Sikorsky affiliate PZL Mielec, the M28 is being prepared for an early 2017 demonstration tour of seven Caribbean and Latin America countries.

having received type certification in 2016 from India's Directorate General of Civil Aviation.

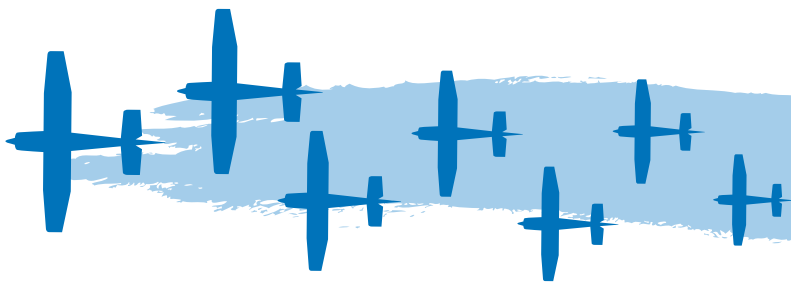
Brazil, EASA and the FAA also have given type certification to the aircraft. The U.S. Air Force has used the C-145A variant of the M28 for air cargo missions supporting deployed troops in Afghanistan.

More than 100 M28 aircraft currently operate worldwide in

both commercial and military configurations. Missions include passenger transport, humanitarian assistance, parachute training, border patrol and fisheries protection.

Proposed solution for India's regional connectivity

With close to 400 unpaved airstrips across India, connectivity remains difficult for Tier 2 and 3 cities.



Walia believes the M28 will be an ideal solution in the 19-passenger seat configuration. Besides a side entry door for crew, the aircraft cabin has a clamshell rear door for loading/unloading of passengers, baggage and cargo.



A large, easily reconfigurable cabin with rear cargo door enables operators to quickly reconfigure the M28 airplane for different transport requirements. With seating in airline configuration (not shown) the aircraft can carry 19 passengers.

Walia says the M28 aircraft's impressive flight maneuverability and cabin versatility means that commercial passengers and cargo can be quickly, safely and reliably transported to India's many remote or difficult-to-reach cities.

"M28 pilots around the world have demonstrated that the M28 is easy to handle," said Walia "Ease of piloting, and the ability to touch down and take off from unpaved or grassy airfields, gives Lockheed Martin high confidence to recommend the M28 aircraft for the Indian market."

He added that the M28 aircraft has the highest useful load in its class, and "will meet or exceed the expectations of prospective customers," whether airlines, transport companies or militaries.

"The M28 has exceptional range, payload capacity and multirole flexibility. And it's a proven, tough airplane that doesn't need much support to sustain flight operations," he said.

He added that the two M28 aircraft operated by Nepal were effectively used for disaster relief following the 2015 earthquake.

Latin America tour

Sikorsky and M28 manufacturer PZL Mielec will jointly launch a two-month, 13-city tour of the M28

across seven Caribbean and Latin American countries in early 2017.

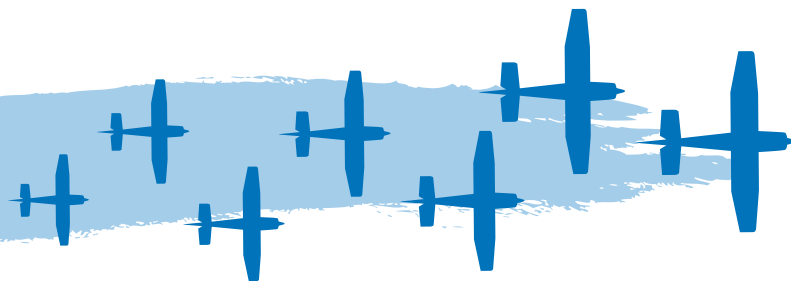
Sikorsky-PZL will fly the aircraft from Poland across the North Atlantic in late February 2017, flying from southern Poland to Denmark, Scotland, Iceland, Greenland, Canada and the United States before entering the Caribbean.

Flight and ground demonstrations starting mid-March in Trinidad and Tobago will extend to Brazil, Argentina, Ecuador, Colombia, Panama and Mexico through mid-May.

Sikorsky will invite commercial operators, government organizations, law enforcement agencies and military aviation commanders to observe the M28 in action, and to examine the highly configurable aircraft in a wide variety of operational and logistical roles.

Attributes of the M28

With its high-lift wing, thrust-reversing propellers and two 1,100 shp (820 kW) Pratt & Whitney Canada PT6-65B turboprop engines, the empty M28 aircraft can



take off and land on rough airstrips just 345 meters (1,000 ft.) long.

An M28 loaded with a 1,000 kg (2,204 lb.) payload offers a range of 1,592 km (860 nm) distance with safety reserve for 45 minutes of flight.



Short takeoff and landing capabilities and high mounted PT6 turboprops engines allow the M28 to take-off and land on rough strips just 345m long

With either 19 seated passengers or equivalent of 1840 kg (4,060 lb) cargo, the M28 can take off in just 548 meters (1,800 ft.) of runway length for a range of over 900

kilometers (490 nm).

Each engine drives five all-metal Hartzell five-blade constant-speed propellers with reverse thrust and feathering capability. The engine has a range of operation from -50 to +50 degrees C.

The 13,73 m³ (485 cu ft.) cabin also can be outfitted with a removable roller floor, optional cargo hoist, and heavy cargo restraints to either para drop or load/unload cargo from the full-width aft door.

Avionics

The M28 aircraft also is equipped with a suite of avionics including the Bendix King Gold Series (made by Honeywell), digital map display, standard VHF radios (2 each), Garmin's VOR/ILS/ GPS, MKR, DME, autopilot, ELT and the latest safety features such as TCAS II, EGPWS Mk VI, Cockpit Voice Recorder, and the Flight Data Recorder.

In its military configuration, PZL Mielec offers the M28 aircraft with a Rockwell Collins glass cockpit suite.

About PZL Mielec

Sikorsky, a Lockheed Martin company, purchased Poland's largest aviation company PZL Mielec in 2007.

Sikorsky immediately followed its purchase with investments to modernize the facility that today total almost \$200 million. Sikorsky also has boosted the Polish workforce to 1,670, and set up a completion line for assembly of the Sikorsky S-70i Black Hawk helicopter.

The PZL facility today is Lockheed Martin's largest aircraft manufacturing site outside the United States.





**WHEN THE WORST CASE SCENARIO CAN BE A DAILY EXPECTATION,
YOU'RE EXPECTED TO LEAD.**

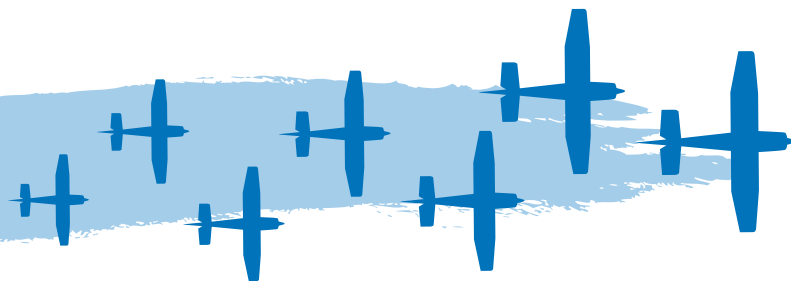
FOLLOW NO ONE.

An extreme world demands extreme performance. The completely redesigned Striker® helps you take control of the most volatile Aircraft Rescue and Fire Fighting threats, equipping you with all-new standards in fire suppression technology, chassis performance, visibility and overall safety.



www.oshkoshcorp.com

Oshkosh Corporation India Office
Unit 1 and 3, Grand Plaza, The Grand Hotel
Nelson Mandela Road, Vasant Kunj Phase II,
New Delhi 110070
Tel: +91-11-42890400
Email: ykansal@oshkoshcorp.com



Aviation Institute of Maintenance (AIM)



systems that make flight possible? It begins with basic maintenance training.

Aviation Institute of Maintenance (AIM) owns and operates eleven Aviation Maintenance Technician Schools (AMTS) certificated by the U.S. Federal Aviation Administration (FAA). AIM schools are located throughout the United States in the major metropolitan areas of: Atlanta, Dallas, Houston, Indianapolis, Kansas City, Las Vegas, Orlando, Philadelphia, San Francisco, Virginia Beach and Washington DC. As the world's largest trainer of these licensed technicians, we take safety seriously from the very beginning.

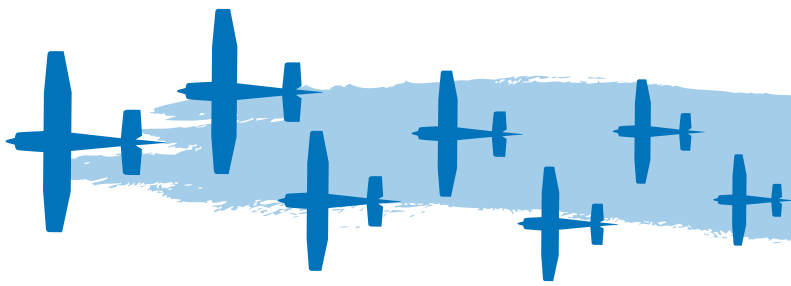
Students learn the hazards and dangers of working on and around aircraft. Throughout their training program, safe working practices are embedded into their training, to the point they become inherent.

To ensure that newly certificated (licensed) aviation technicians are properly trained, the FAA curriculum is defined in Federal Aviation Regulations (FAR) Part 146, Appendixes in three separate areas: General, Airframe and

The most important aspect of air travel is the safety of the passengers and the flight crew. Flight and cabin crew members receive current and recurrent training in the model flown on a regular basis. Passengers even receive a safety briefing before each and every flight. But who ensures that the aircraft itself is safe for flight? That's the job of the aircraft maintenance professional who makes his or her contribution to every flight taking place around the world. Safety begins with these

maintenance professionals and in the USA, they are known as FAA mechanics with a rating in airframe and powerplant, aviation maintenance technicians, or just A&Ps.

In Europe, and in other parts of the world, these same aviation professionals are called aircraft maintenance engineers, AMEs, or just engineers. Where do these maintenance professionals learn about safe maintenance practices and all the complex



Powerplant.

General Subjects: FAR 147, Appendix B

Basic Electricity; Aircraft Drawings; Weight and Balance; Fluid Lines and Fittings; Material and Processes; Ground Operations and Servicing; Cleaning and Corrosion Control; Mathematics; Maintenance Forms and Records; Basic Physics; Maintenance Publications and Mechanics Privileges and Limitations.

Airframe Subjects: FAR 147, Appendix C

Part I – Airframe Structures

Wood Structures; Aircraft Coverings; Aircraft Finishes; Sheet Metal and Non-metallic Structures; Welding; Assembly and Rigging and Airframe Inspections.

Part II – Airframe Systems and Components

Aircraft Landing Gear Systems; Hydraulic and Pneumatic Power Systems; Cabin Atmosphere Control Systems; Aircraft Instrument Systems; Communication and Navigation Systems; Aircraft Fuel Systems;



Aircraft Electrical Systems; Position and Warning Systems; Ice and Rain Control Systems and Fire Protection Systems.

Powerplant Subjects: FAR 147, Appendix D

Part I – Powerplant Theory and Maintenance

Reciprocating Engines; Turbine Engines and Engine Inspection.

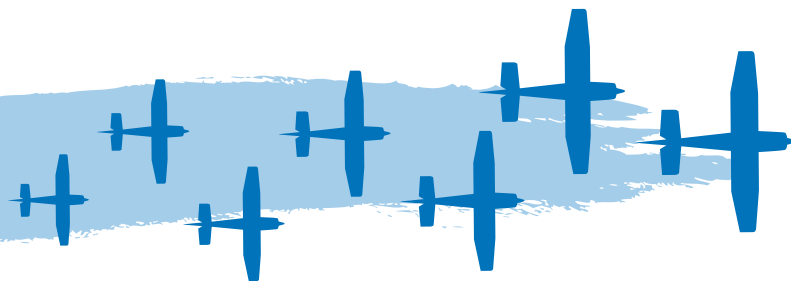
Part II – Powerplant Systems and Components

Engine Instrument Systems; Engine Fire Protection Systems; Engine

Electrical Systems; Lubrication Systems; Ignition and Starting Systems; Fuel Metering Systems; Engine Fuel Systems; Induction and Engine Airflow Systems; Engine Cooling Systems; Engine Exhaust and Reverser Systems; and Propellers.

Throughout the course of their instruction, students get hands-on, practical training of about 1,000 hours during their 21 months of classes. Classes are taught four days per week, six hours per day allowing Friday to be available for making up material missed during scheduled class time and for assisting those that may need additional practice or instruction, which is free of charge.

After 2,040 hours of classroom instruction, practice labs and actual return to service experience, students are prepared to enter the workforce and continue their training on specific model aircraft, engine or systems as needed by their employer. Before that happens, they need to obtain their FAA Mechanic's Certificate with a rating in Airframe and Powerplant. The FAA requires each applicant pass three written exams (General/



Airframe/Powerplant) and an Oral and Practical (O&P) Exam administered by a Designated Mechanical Examiner (DME), who is a representative of the FAA. The O&P is a full day exam that demonstrates the practical application of the knowledge, skills, and abilities learned at an AMTS. Once the DME is satisfied that the applicant is qualified, he or she receives their temporary license that day, and in about two weeks, they receive their official Mechanic's Certificate with the appropriate ratings.

AIM also assists graduates in obtaining employment after graduation. Airlines (major and regional); Maintenance, Repair and Overhaul (MROs); and repair stations begin to interview students weeks prior to graduation for entry level positions. The employer of the newly licensed technician provides the on-the-job-training (OJT) on specific aircraft models, or systems they manufacture or operate. Some international graduates find employment in the United States, but most return to their home country to seek employment. As members of the US-India Aviation Cooperation Program, AIM hopes

to work with the Civil Aviation Authority of India and industry members to help prepare the future generations of professional Aviation Maintenance Technicians, or as known in India, Aviation Mechanical Engineers (AMEs). As a potential employer of these returning FAA licensed graduates, you can choose to sponsor students during their training to ensure their employment with your company upon their graduation.

AIM also offers a short course to assist experienced engineers in attaining their FAA Mechanic's Certificate (license) with a rating in Airframe, Powerplant, or Airframe and Powerplant under Part 65 of the Federal Aviation Regulation. With documentation supporting work experience in at least 50% of the areas listed in FAR 147, Appendixes B, C and D, the FAA will provide authorization to take the required written exams and then the O&P required to earn an FAA license. AIM spends one week in review of each area: General, Airframe and Powerplant. After each week of classroom and lab, candidates take the FAA written exam and prepare for the O&P exams. Following the initial three

weeks of classroom review and testing, the final two weeks are for scheduled O&P exams conducted by the FAA's DME for the school location as listed on the FAA website.

Other aviation programs offered at AIM are: Aircraft Dispatcher (FAA license), Aviation Maintenance Technician – Helicopter (advanced turbine helicopters), Aviation Maintenance Technical Engineer (avionics) and an avocational course for Flight Attendant. Student visa and housing assistance is provided for full time students and for the experienced engineers seeking the FAA license. For additional information, please contact: La Vern Phillips, Phone +001 (757) 233-6542 Ext. 1271, Email: USA@AIMschool.edu.





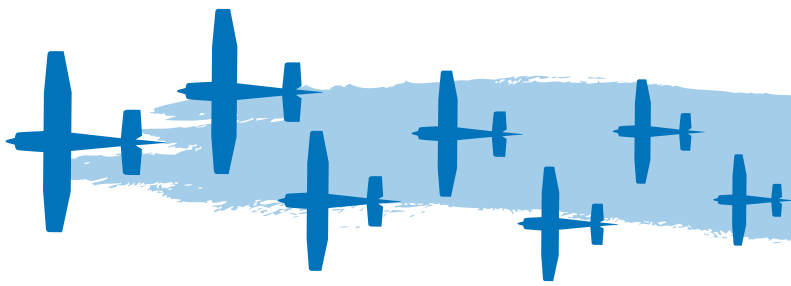
**Our ideas, like our
technologies, take light
over India everyday.**

More than 40 years ago Honeywell Aerospace began its investment in India with a vision to strengthen both our presence in India and our strategic vision with Indian industry. Today, our commitment to India continues, with thousands of employees focused on delivering new technologies that reduce lifecycle costs while improving safety and efficiency. Working with the government, we continue to deliver innovative new products, services and technologies designed to protect the nation.

Honeywell

© 2017 Honeywell International. All rights reserved.

For more information please visit
aerospace.honeywell.com/india.



A Blueprint for Success: Security Planning for the Next 20 Years

By Pravin Surana, Managing Director, Morpho Detection India

International Air Transport Association (IATA) forecasts predict that by 2035, India's commercial aviation traffic will grow to 442 million passengers – nearly tripling the number of passengers who flew in 2015. This rapid growth raises important questions:

- How do we grow security with increased travel demands?
- What can we do to make security infrastructure investments that are scalable to emerging threats and achieve maximum return on investment (ROI)?
- How can we leverage technology to provide a seamless, minimally invasive security screening process for passengers and baggage?

To answer these questions and invest in solutions for the next 20 years, Indian airports of all sizes have an opportunity to leverage field-proven, scalable technologies to screen passengers, baggage and air cargo for explosives.

With decades of experience and a

current presence at more than 500 global airports, including India's busiest aviation hubs, Morpho Detection works with airports to solve current and emerging security challenges, ensure regulatory compliance and plan for growth and future expansion.

Growing With Security – Scalability & Service

As airports look to expand their reach and grow internationally,

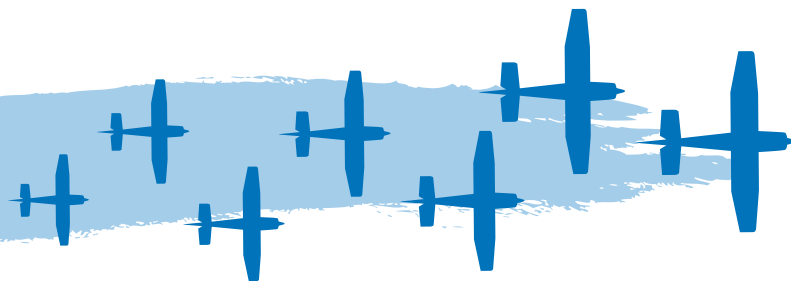
service. The result is a growing consensus on best practices and standards for long-term security infrastructure investments. One of the most important things airports demand, and Morpho Detection's solutions deliver, is scalability.

“Every time a new threat is identified or traffic increases, purchasing all new hardware is not a fiscally sustainable solution, said Pravin Surana, Managing Director, Morpho Detection India.



security is top of mind. Airports must comply with security practices in every destination country they

“Leveraging expandable detection libraries, Morpho Detection's CTX™ hold baggage explosives detection



systems (EDS) and desktop Itemiser® explosive trace detectors (ETD) can add new target substances to meet future security challenges and regulatory mandates.”

Scalability, combined with an onsite, proactive service program, ensures maximum operational life. Going beyond selling the system, airports should ask questions and work with a service provider that can point to examples of taking an airport where you want to be.

“Enlisting a trusted, field-proven service partner to protect and maximize the operational life of your investment is essential to ensuring the highest levels of detection, throughput and uptime,” Surana added. “Today, Morpho Detection is servicing systems that have been screening bags for more than 20 years.”

Hold Baggage Screening – Aligning Global Standards

In the U.S., all passenger-checked baggage is screened by computed tomography (CT)-powered EDS – the majority being Morpho Detection's CTX™ family of systems.

By utilizing CT technology, EDS are capable of producing high-resolution, 3D images to more efficiently identify threats and clear bags for travel.

The use of CT-powered EDS has resulted in the automation of the hold baggage screening process with decreased false alarms, system

2018 in the UK and 2020 in continental Europe. In addition to the U.S. and Europe, other nations including Canada, Japan, Turkey, United Arab Emirates (UAE) and Israel have or are in the process of moving toward CT-based EDS to screen all passenger-checked baggage.

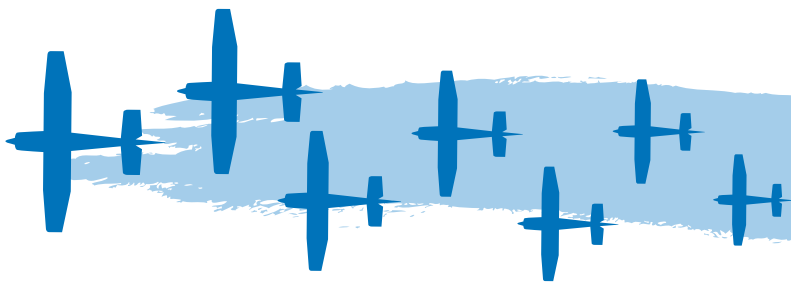


downtime as well as the time consuming and potentially dangerous manual inspections. This standard of detection, which is referred to in Europe as European Civil Aviation Conference (ECAC) Standard 3, is mandated for all hold baggage screening by September

“Aviation security isn't going backward – the global trend toward Standard 3 EDS will continue,” explained Surana.

Checkpoint Explosives Detection

Successful checkpoint screening



programs are multilayered and utilize leading-edge detection technologies to keep passengers moving. In response, airports throughout India are deploying Morpho Detection Itemiser® desktop explosive trace detectors (ETD).

Trace detection—the discovery and identification of microscopic particles and vapors emitted by explosives, narcotics and harmful substances—plays a key role in countering the increasingly complex aviation security risks posed by terrorism and other threats. Innovative trace technology can help close security

loopholes by reliably detecting residue from explosives and narcotics on skin, clothing, parcels, bags, cargo, vehicles and other surfaces.

“Through a simple, non-invasive swab, ETD systems accurately and reliably detect explosives and narcotics in seconds,” said Surana. “The use of ETD systems is rapidly expanding in India.”

Over the past year, Morpho Detection has won orders to supply and service over 200 Itemiser ETD systems at checkpoints and for cargo in more than 60 airports nationwide.

Staying Ahead – Growing in India

Morpho Detection is proud to have introduced Standard 3 EDS at major airports in India. Most notably, Indira Gandhi International Airport in Delhi has deployed Morpho Detection's CTX EDS to screen checked baggage in the new Terminal 3. Morpho Detection has also deployed CTX detection technology at Bangalore International Airport to screen checked baggage in the newly expanded terminal. Most recently,

Morpho Detection is excited for the opportunity to work with Cochin International Airport on a pilot project for deploying Standard 3 EDS at Level 1 for the first time in India.

As a result of investments in localized sales and service support, Morpho Detection has committed to working with all airports in India to upgrade and expand screening capabilities.

“Morpho Detection is ready to help airports in India navigate the complex process of upgrading screening infrastructure,” said Surana. “By planning for transitioning now, ahead of future mandates, airports can ensure they have the capacity and field-proven technologies to meet growing demand for domestic and international air travel.”

For more information, please contact Pravin Surana at pravin.surana@morpho.com or +91 9845130160. www.morphodetection.com





Mission

The General Manufacturers Association (GAMA) exists to foster and advance the general welfare, safety, interests and activities of the global business and general aviation industry. This includes promoting a better understanding of general aviation manufacturing, maintenance, repair, and overhaul and the important role these industry segments play in economic growth and opportunity, and in serving the critical transportation needs of communities, companies and individuals worldwide.

Vision

Our vision is to be recognized as the most effective trade association in business and general aviation, aerospace manufacturing, and in the maintenance, repair and overhaul domain through:

- Enhancing Safety through innovation and the promotion of quality training
- Facilitating improvements in certification, audit and regulatory processes
- Fostering sustainable general and business aviation growth
- Promoting the economic impact and societal benefits of general and business aviation
- Achieving organizational excellence

To learn more, visit www.GAMA.aero, and look for us on Facebook and LinkedIn.



*GAMA President and CEO
Pete Bunce*



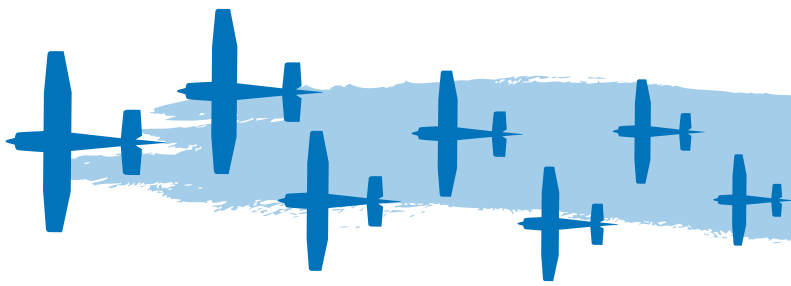
TOGETHER. **BUILDING THE FUTURE.**

Enabling aerospace skill development for frontline factory workers
in partnership with National Skill Development Corporation.

boeing.co.in



 **BOEING**



Microcell™ Carbon Foam (MCF) batteries

Technology improvement and infrastructure development has to go hand in hand for the betterment of a nation's economy. Both have to complement each other in order to strive for a better tomorrow. Today we have been hearing and reading how fast the solar energy harvesting is growing or any renewable energy. But when it comes to energy storage we still rely on same old lead acid batteries. It is been more than 160 years since the advent of lead acid batteries and it remains as the safest and the proven chemistry with a limitation in life. When it comes to lithium ion battery, we are limited in terms of cost and chemistry.

Firefly **Microcell™ Carbon Foam (MCF) batteries** offers a revolutionary new pathway to tap into the vast new global market for energy storage. Validated by demanding customers and third party testing, this product is commercially available worldwide. Its price and performance overcome the current barriers and offer a practical pathway to accelerate the explosive growth experienced by the global energy storage market.

MCF Batteries offer 2-3 times the life and lower life cycle cost compared to current **Deep Cycle Lead Acid batteries**. It is compatible with legacy battery management systems and can be recycled within the existing infrastructure. Firefly Batteries offers equal or superior performance compared to new and emerging battery technologies such as **Li-Ion, Lead Carbon and Ultra-cap** batteries at a fraction of the cost.

History of Firefly MCF batteries

Firefly's revolutionary battery technology was born in the Research and Development laboratory of Caterpillar, Inc., a world-renowned manufacturer of heavy equipment.

Caterpillar has long been a consumer of batteries for its many heavy equipment products. These equipment, by their very nature, put a severe strain on the batteries. Hot and cold extreme temperatures, severe vibrations and prolonged periods of disuse are standard operating conditions for these heavy equipment. Caterpillar found that normal lead-acid batteries could not withstand this strain and

with a new corporate focus on improving the performance and longevity of the batteries turned over this issue to their R&D arm who came up with Microcell Carbon Foam as the solution. This technology has been patented and allows for the exploitation of existing lead-acid chemistry to a much higher level and compete head-on with other advanced battery technologies, including the Lithium batteries. These batteries offer much higher efficiency and cycle life which in turn brings down the cost of ownership to a large degree.

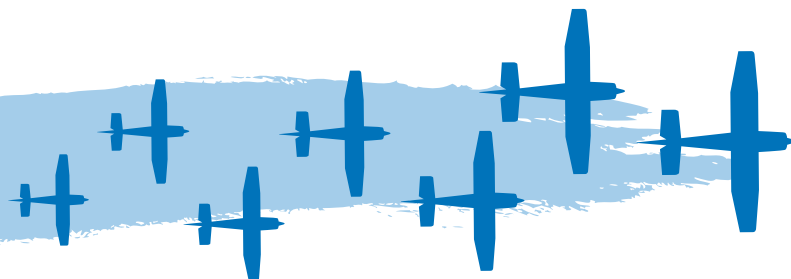
LEAD ACID BATTERY FAILURE MODES

To make an advance in battery technology that goes beyond evolutionary engineering

Improvements requires a paradigm shift to new materials and/or new processes. Some of the common failure modes found in the lead acid batteries are shown below.

Why carbon foam technology?

The signal advantage of Firefly's Microcell™ technology is that it



fundamentally changes the distribution of active materials within the lead acid cell due to its

Liquid diffusion distances are reduced from the traditional levels of millimeters over linear paths (the

battery causes extra strain, and each cycle robs the battery of a small amount of capacity. In lead-



Corroded positive grid from a conventional lead acid battery

Corrosion



Shedding



Sulfation

Figure 1. failure modes of lead acid battery

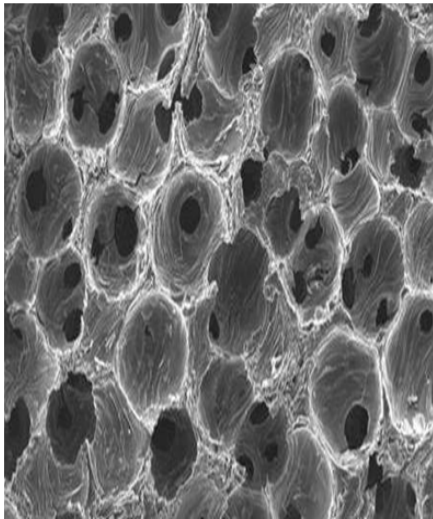
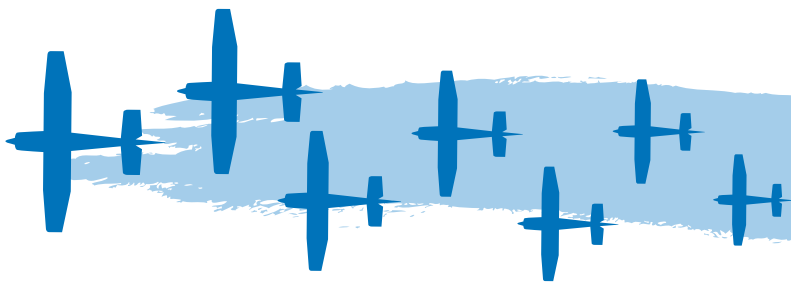
unique architecture. Overall, the Firefly composite foam electrode structure results in are distribution of electrolyte from the smaller separator reservoir to the pores of the foam plate(s), resulting in a 70/30 to 30/70% reversal, respectively, relative to conventional lead acid products. Each foam plate contains hundreds or thousands of spherical microcells (depending on the foam pore diameters). This leads to enhanced active material utilization levels, because each microcell has its full complement of sponge lead or lead dioxide and sulfuric acid electrolyte.

conventional "2D" diffusion mechanism found in the lead metal grid-based classic lead acid battery architecture) to the level of micron diffusion path lengths in the three-dimensional space within the discrete microcells that, collectively comprise a totally new type of electrode structure (what Firefly calls a "3D" electrode). Such a structure results in much higher power and energy delivery and rapid recharge capabilities relative to conventional lead acid products.

Dramatic Cycle Life Improvements

A full discharge of today's lead acid

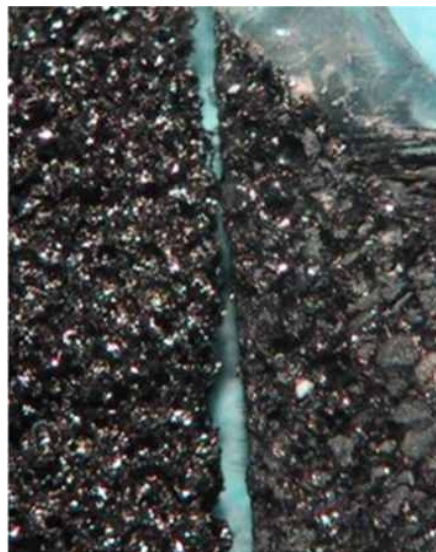
acid batteries, deeper discharges convert larger amounts of charged active-material into lead sulfate. Lead sulfate has a significantly larger volume (about 37% more) than the charged material, and this volume change stresses the electrode structures. This expansion induces mechanical forces that deform the grid, and ultimately result in the lead grid "disappearing" into the paste. The resulting expansion and deformation of the plates also causes active material to separate from the electrodes with a commensurate loss of



performance. Additionally, over time, sulfate crystals can grow together, resulting in large lead sulfate crystals that are difficult or impossible to convert back into the charged state. This wear-down characteristic also applies to other battery chemistries in varying degrees. To prevent the battery from being stressed through repetitive deep discharge, a larger lead acid battery and shallower discharge is typically recommended. Depending on the depth of discharge and operating temperature, the sealed lead-acid battery provides 200 to 300 discharge/charge cycles. Short cycle life also results from grid corrosion of the positive electrode, which undergoes extensive

oxidative stress during extended recharge conditions. These changes are exacerbated at higher operating temperatures.

In contrast, Firefly's Microcell™ composite plate technology provides a design which fully accommodates the volume changes of the active material during charge and recharge. Within each Firefly plate is contained a full complement of active materials,

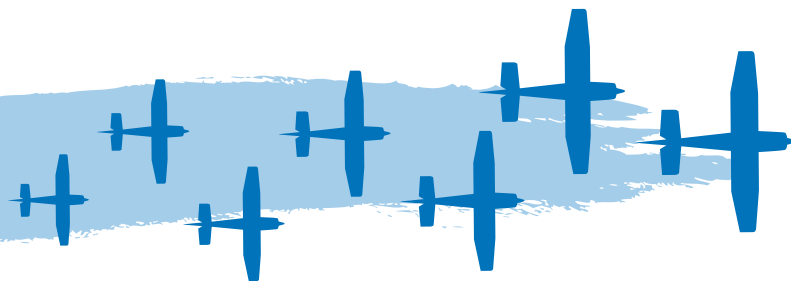


electrolyte, and volume which will allow complete discharge without causing physical stress on the plate itself. This results in an electrode plate which does not undergo volume change during deep

discharges. Firefly's electrode material is not reactive in the chemistry and so does not corrode. This is in part due to a natural stability of the base material, but is also due to the formation process used which maximizes exposure of the most chemically resistive surfaces and minimizes exposure of chemically less-stable surfaces.

The growth of large sulfate crystals is also restricted, resulting in a low incidence of crystals which are too large to recharge. The strong resistance of Firefly's electrode material to corrosion also severely reduces the deleterious effects of long recharges. Because of the removal of grid corrosion as a life-limiting factor, the Firefly approach offers significant improvements over conventional lead-acid technologies in both float and deep-cycle applications.

Cycling in irregular applications such as partial-state-of-charge (PSOC) regimes used in hybrid vehicles and photovoltaic energy storage are also well suited to 3D technology. This is because the conditions of partial or heavy sulfation of the negative plate -



a process that can render present-generation lead acid products unrecoverable - are easily reversed in 3D products, even after long periods of storage. Sulfation reversal is achieved because the nature of the lead sulfate deposits in 3D cells is fundamentally different from those in traditional lead acid cells. In the latter, lead sulfate is deposited on the surfaces of the plates in dense layers of relatively large crystals, somewhat remote from the lead grid members. Because the sponge lead active material in a 3D cell is deposited on the walls of the foam's many small pores in thin layers, and the surface characteristics of the foam result in relatively low current densities, the lead sulfate deposits are comprised of small, porous crystal structures (on the order of 3-10 microns, much smaller than in commercial products) that are easily dissolved on the subsequent recharge. Moreover, these very small crystal sizes grow only slowly over time. A final factor that facilitates recharge is the proximity of the carbon-graphite foam (as well as residual sponge lead) that can act as efficient current-carrying paths during recharge for the small, local

deposits of lead sulfate crystals. This resistance to the effects of sulfation make Firefly 3D batteries ideal for seasonal applications where devices and their associated batteries (electric lawn mowers, boats, RVs, motorcycles, etc.) may go unused for months on end, often in a partially or fully discharged state. Conventional batteries are difficult or impossible to recover from these conditions, and are often replaced far short of their potential life span. With 3D products this problem is greatly reduced.

"The" Photovoltaic energy storage battery



Figure 2. 4v 450 Ah MCF battery

Firefly has designed a 4V 450 Ah battery for energy storage application which overcomes the limitation of grid corrosion, active material shedding and sulfation. With traditional maintenance free

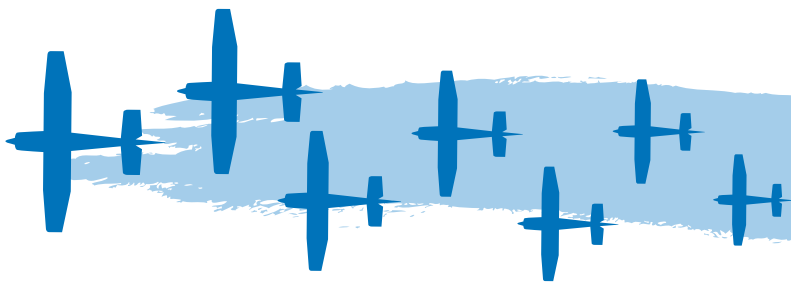
batteries basic building blocks are either 2V or 6V cells. 2V cells presents a disadvantage with respect to handling and manufacturing whereas in 6V, the cell in the middle always ends up with unequal charging and heating up. Firefly has found a right balance where the batteries contain 2 cells of 2V each. These batteries use 3D microcell carbon foam technology which counteracts the sulphation of plates.

The Microcell™ carbon foam uses a porous conductive schema where about 95% pores are interconnected. The surface area of the carbon foam is about 2000 times than that of prismatic plates. These 4V 450 batteries can be charged with a current of about 0.3C10 (120 A) to 0.5C10 (200 A) with a constant voltage for better results under partial state of charge (PSOC). Under partial state of charge MCF batteries have an unparalleled charge efficiency of >98%.

3D Performance Summary

In summary, then, the 3D cell architecture results in numerous attributes:

- Instantaneous Power (2 hours



- and faster run-time rates)
- Fast recharge capability
 - Continuous power through discharge process
 - Recovery to full capacity after off-season storage
 - Excellent cold temperature capacity utilization
 - High temperature resiliency
 - Recovery to full capacity after discharge

The remarkable attributes of the composite foam negative electrode noted above make certain applications possible or more favorable, as well as improving

many lead acid "weak points" such as sulfation recovery and active-material utilization limitations. At slow discharge rates, modest weight and volume improvements over existing lead-acid products (typically 15-20%) are achievable as well. For faster discharge rate applications (like HEV, Starting or UPS applications), the weight and volume saving can approach 50-75% or more.

Contact us:

Website:
<http://www.fireflybattery.in>

Email: contact@fireflybattery.in

Corporate Office: 199, Neelkanth Bungalows, Near D.P.S. School, Shilaj, Bopal Ahmedabad- 380 058, Gujarat (India)

Factory: Survey No.: 61/20, Opp. Supper Gas Plant, Balva Bagodra Highway, Village: Kalyangarh Taluka: Balva, Ahmedabad, Gujarat 382 240



firefly®



**The Only General Aviation
Company focused on East and
North East India**



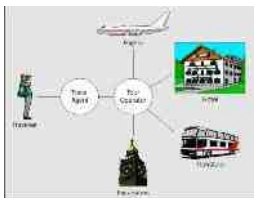
Our Initiatives:



Online Portal for
General Aviation in
India



Intra Regional Air
Connectivity



Intermediary between
travel agents and
charter operators



Representatives for
Medical Evacuation



Development of Low
cost Airports



Training of Aviation
Professionals

HEAD OFFICE

CD Aviation USA Inc
68-14 Fleet Street
Forest Hills, NY 11375

DELHI OFFICE:

CD Aviation (India) Pvt. Ltd.
M - 135 Greater Kailash 2
New Delhi 110 048

CORPORATE OFFICE:

CD Aviation (India) Pvt. Ltd.
20 Park Road
Jamshedpur
Jharkhand - 831001

REGISTERED OFFICE:

CD Aviation (India) Pvt. Ltd.
21, Old Court Street,
Kolkata- 700001

Ricky Surie, President, +1 609 936 9879 (USA), +91-989 940 0856 (India) rickysurie@cdaviation.com

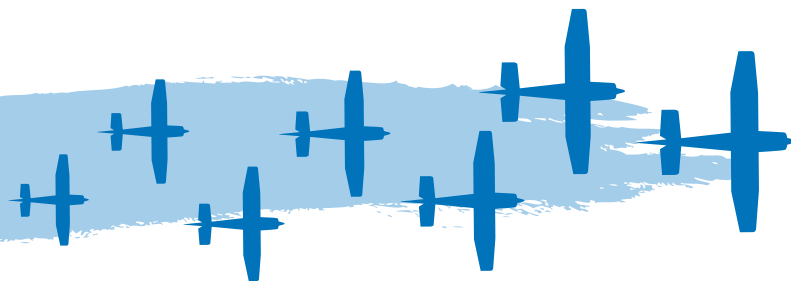
Gp. Capt. (Retd) Karl Bhesania, VP, +91-704 256 7555 (India) karl@cdaviation.com

Capt. Tejeshwar Naidu, AVP Operations, +91-957 315 5325 (India) tejesh@cdaviation.com

Dr. Amardeep Assar, Director, +1 347 993 3532 (USA) amardeep@cdaviation.com

Dr. Gita Surie, Director, +1 609 936 0878 (USA) gitasurie@cdaviation.com

www.cdaviation.com



Honeywell at Aero India 2017

At the 2017 Aero India event, visitors to the Honeywell booth - **Hall E, Stand No. E23**, can learn more about the following key technologies:

HTS900 Engine

The HTS900 is the newest addition to our family of helicopter engines, incorporating a next-generation dual-centrifugal compressor architecture. This technology increases power output, reduces fuel consumption and allows for future engine growth with the same compressor architecture. The engine utilizes a dual-channel full authority digital engine control (FADEC) system with a manual back-up provision to ease pilot workload and to facilitate engine maintenance planning and troubleshooting.

TPE331 Engine

Unlike any other turboprop engine in its class, the TPE331 delivers a variety of cost-saving solutions to keep your aircraft off the ground and in the sky. The TPE331 increases the power and lifespan of your aircraft without sacrificing time or money by replacing it with an engine that was built to give you the

versatility you need to get the job done – no matter the size.

The TPE331 is not your ordinary engine, with the mechanics to operate more efficiently at higher altitudes and shorter runways. With more than 14,000 TPE331 engines flying around the world today, it's no wonder why it's been the leading choice for aircraft owners for more than 50 years.

- Faster throttle response - single shaft design
- Better fuel efficiency – higher pressure ratio
- Lower cost of ownership - Conklin & de Decker
- Longer maintenance intervals – no need for special FAA program
- Quieter flyover - meets new German Airfield Noise Protection Order
- Higher gearbox rating
- Single exhaust
- Simpler to operate - automatic one-button starting, single red line, torque and temperature limiting
- No inlet particle separator - less hardware and much less performance penalty in icing conditions
- Clean installation – access to all LRUs for maintainability

T55 Engines

Our T55 family of military turboshaft engines began life, as its designation indicates, in 1955. To date, more than 6,000 T55 engines have been produced, logging some 12 million hours of operation on the Boeing CH-47 Chinook and MH-47 helicopters.

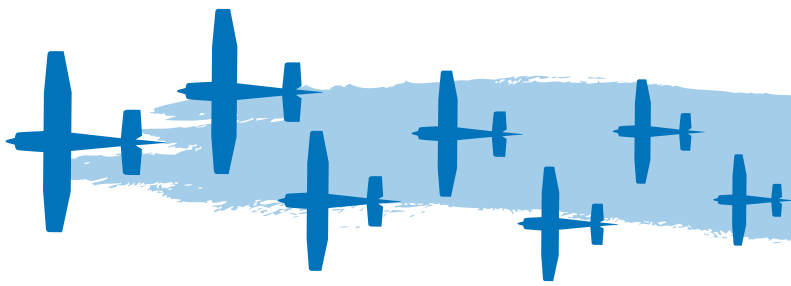
At its introduction, the T55 produced 1,600 shaft horsepower (SHP). Several decades and generations of development later, today's T55 produces 4,800 SHP and powers the CH-47 Chinook to a maximum speed of 196 mph (170 knots).

The latest configuration T55-714 delivers 22 percent more power and uses seven percent less fuel than its predecessor.

We are continually improving the T55 to meet military needs.

TALIN™

Honeywell has been at the forefront of inertial navigation system (INS) technologies for more than three decades. Our INS for land applications provides highly



accurate and reliable navigation and pointing capabilities to help users achieve their most critical missions.

TALIN™ family of land navigation and pointing systems have proven performance with more than 15,000 fielded systems on over 60 land-based platforms. Platforms include tanks, artillery, light vehicles and marine vessels, as well as other military and civilian applications where precision really counts. By marrying INS and embedded global positioning system capabilities, our TALIN INS/GPS solutions provide unprecedented levels of accuracy, durability and reliability, even in a GPS-denied environment. TALIN systems can hold direction longer than alternative systems, and don't require rotation.

Integrated Multi-Mode Receiver

For the latest in radio navigation capability, our third generation integrated multi-mode receiver (IMMR) is the air transport industry's only fully digital navigation receiver that integrates instrument landing systems (ILS), global positioning systems (GPS), GPS landing system (GLS) and VHF

omnidirectional radio range (VOR) functionality into a single receiver. Building on the success of our integrated navigation receiver (INR), which is standard equipment on the Boeing 787, the IMMR is designed to support current industry navigation standards as well as growth through simple software updates. This system reduces weight and eliminates the need for standalone VOR receivers, which reduces overall cost of ownership and improves growth capability for current and next generation navigation standards such as GLS CAT-III and multiple satellite navigation systems.

IntuVue

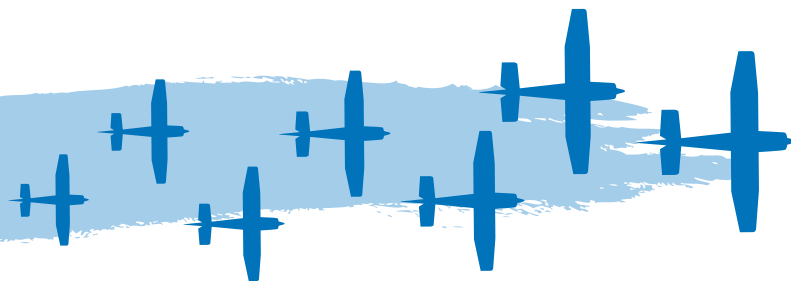
Honeywell has pioneered flight safety system development and our innovations continue with the IntuVue™ weather radar family. The RDR-4000 is the first member of this new radar family. As the first totally new design in onboard weather radar for commercial aircraft in 40 years, IntuVue improves strategic rerouting and tactical maneuvering using state-of-the-art technologies that allow pilots to find the most efficient route for improved fuel efficiency and passenger safety.

The IntuVue weather radar uses 3-D volumetric scanning and pulse compression technologies to provide a complete view of the weather from 0 to 60,000 feet across a 320 nm detection range. IntuVue's weather analysis tools help pilots better understand weather hazards and calculate the best strategic and tactical responses. The unique display capability combines both weather and terrain data to provide a more intuitive horizontal and virtual view of upcoming weather dynamics – reducing or eliminating unnecessary route deviations.

Pilots can select individual slices of the airspace; including specific range, azimuth or altitude displays, to make more informed routing and manoeuvring decisions. These features have demonstrated a 26% improvement in weather hazard detection over conventional radar systems.

SmartRunway/SmartLanding

Honeywell's SmartRunway addresses one of the National Transportation Safety Board's (NTSB) top 10 global safety concerns — runway incursions.



SmartRunway is the next generation of Honeywell's Runway Awareness and Advisory System (RAAS) which is a proven runway safety system.

SmartRunway includes new advisories and visual messaging and complements electronic flight bag (EFB) solutions, if installed, through 'heads-up' advisories and supports 'quiet' cockpits with graphical alerts. SmartRunway is a proven global solution for reducing runway incursions.

Honeywell's new SmartLanding improves flight safety and helps

reduce the risk of a runway excursion by alerting crew members if the aircraft is going too fast, too high or going to incur a long landing.

Retrofit, Modification & Upgrade (RMU) capabilities

We have a global network of service centers staffed with factory-trained technicians. They overhaul, repair and test all Honeywell mechanical and avionics products. As new products come to market, we keep our service centers up to date to provide continuous support. All equipment repair and test is

conducted in accordance with manufacturer's specifications.

Showcase of these products will be supported by innovative product displays including:

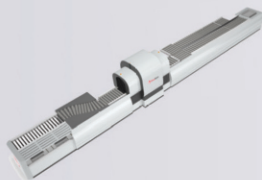
- Battlefield demo table
- Connected aircraft tower
- Virtual Reality Experience

Honeywell

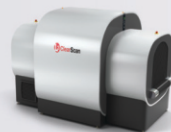
SECURITY, EFFICIENCY, CONVENIENCE. AVIATION CHECKPOINT SOLUTIONS.



Body Scanner



Automated Tray
Handling



Cabin Baggage



Trace Detection



Networking

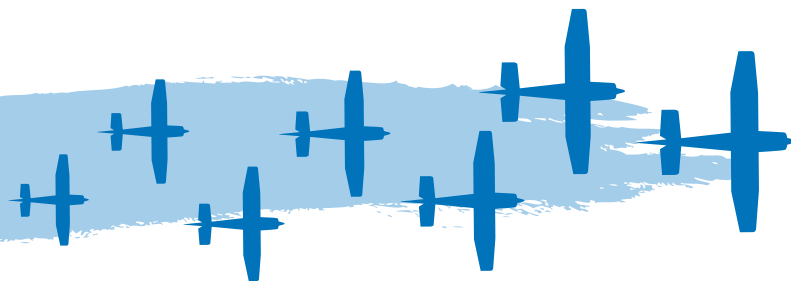
L3 Delivers Innovative Checkpoint Solutions for Optimal Screening Efficiency.

We help keep airport checkpoints running smoothly, with centralized, integrated security and detection systems for a range of airport functions. From screening passengers to cabin baggage, L3's leading solutions can add speed and efficiency to your security operations.

For more information, please visit L3T.com/sds.

Security & Detection Systems

  L3T.com



Keeping Passengers Safe

Ensuring aviation security is a wide-ranging enterprise aimed at protecting passengers, staff and assets on the ground and in the air. As passenger travel continues to grow, airports must keep passengers safe and moving through security quickly. Airports and regulators are demanding higher throughput even as the bar is raised on effective threat detection for people, their cabin baggage, checked bags, and air cargo. As security requirements and concerns continue to evolve in complexity, airports worldwide need to keep pace by protecting passengers and commerce while facilitating their movement. This requires high-throughput systems that are designed to align with the demands of busy checkpoints.

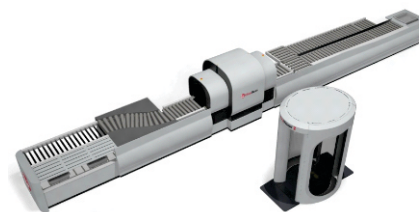
L3 Security & Detection Systems (L3 SDS) recently completed a trial at Delhi airport's Terminal 3. The body scanner installed for this trial is the same as the body scanners used in the United States. Only ProVision body scanners are approved for use in the US. These body scanners use safe millimeter wave technology, not X-rays of any kind. They are completely private, they do not generate any images of

the passengers.

Safe Checkpoints

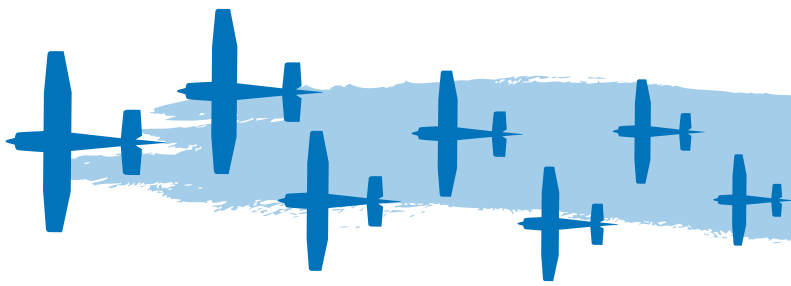
Effective checkpoints must ensure security, convenience and efficiency. Enhanced security is achieved with advanced detection algorithms for the identification of bulk and sheet explosives, as well as liquids, aerosols and gels (LAGs), homemade explosives (HMEs) and future threats; available risk-based screening options for passengers and baggage; and 2-D/3-D images for operator review. Improved passenger convenience is accomplished with the elimination of liquids and electronics divestment, parallel divesting at the conveyor to reduce wait times for travelers, and a quick, stationary body pose for passenger screening. Greater operational efficiency comes with compact, ergonomic scanning systems, remote and centralized screening, a high-speed concept of operations for passenger and baggage screening, and real-time system and screener performance data. While the goal clearly is security, an added benefit is that passengers move quickly through the

checkpoint, giving them more time to peruse shops and restaurants, catch up on job-related issues or simply enjoy their time traveling.



High-throughput systems are designed to align with the demands of busy checkpoints as shown here with the ProVision® 2 security scanner, the Mach-Secure® automated tray return system, and the ClearScan cabin baggage screener.

L-3 SDS' ClearScan™ cabin baggage explosives detection system (EDS) uses advanced algorithms to achieve enhanced threat detection. Dual-energy computed tomography (CT) technology delivers the highest level of explosives threat detection at a low false alarm rate, meeting the latest regulatory requirements without the need for divestment. ClearScan is in operation at numerous international airports, integrated with a tray return system and



screening cabin baggage. Also, at the checkpoint, the widely deployed ProVision® 2 millimeter wave passenger screener is a safe, image-free solution with advanced software that efficiently determines if the individual can be cleared through the checkpoint. When deployed together, L-3's next-generation ClearScan and ProVision 2 screeners deliver aviation security with the highest level of detection performance and throughput with the smallest footprints in their class.



Next-generation bag scanning systems, such as ClearScan™, eliminate the requirement to divest liquids and electronics, allowing them to be left in cabin baggage during the screening process.

Passengers expect security measures when traveling, but also value convenience. Next-generation bag scanning systems,

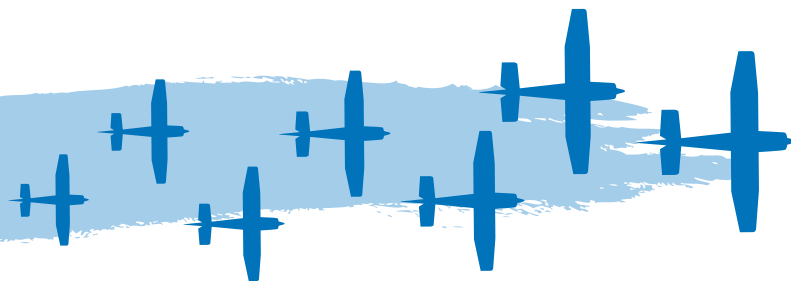
such as ClearScan, eliminate the requirement to divest liquids and electronics, allowing them to be left in cabin baggage during the screening process. This means fewer trays are needed. No longer is it necessary to pack small containers of liquids. For example, travelers can bring home a souvenir bottle of wine from vacation in their cabin bag. And, combined with a parallel divesting and tray return system, passengers save time and effort, helping to reduce bottlenecks. ProVision 2 millimeter wave people screeners add further convenience by requiring only a brief stationary body pose for scanning before clearing passengers for travel. Together, these technologies simplify the screening process while increasing passenger throughput and reducing or eliminating wait times.

While security and convenience are critical, airports are equally concerned with operational efficiency at the checkpoint. In order to truly optimize checkpoint security operations, a high-performance security solution should seamlessly tie together passenger and cabin baggage

screening with real-time operational data. To address this, L-3 has introduced IntelliCore™, a powerful suite of software solutions that delivers enhanced checkpoint security capabilities, including remote screening, real-time operational monitoring and reporting, image archive retrieval, and directed bag search.

IntelliCore Remote Screening accelerates cabin baggage review with innovative technology that combines advanced algorithms with 2-D and 3-D high-resolution imaging capability and powerful alarm resolution tools. For example, the laptop removal algorithm virtually separates the laptop from the rest of the bag, allowing an operator to securely clear a bag in less time. Remote screening multiplexes many operator viewing stations with ClearScan systems that are located together or in a distributed fashion, helping to optimize staffing and equipment needs and freeing up valuable checkpoint floor space.

The IntelliCore Command Center application provides real-time access to security operation



performance metrics, including screener performance, system health status and live image review from anywhere with a laptop or tablet. This gives supervisors the tools to more effectively monitor and manage workflow. They can quickly identify any problem areas with an intuitive user interface.

Secure Hold Baggage

The TSA-certified and EU Standard 3-approved MV3D[®] from L-3 is designed to meet the highest EDS standards today and into the future. The MV3D is in operation at airports in Europe and Asia. Featuring a non-rotating gantry design and a large tunnel, it generates the throughput and image quality of previous EU Standard 2 systems, while providing the detection performance required of EU Standard 3- and TSA-certified systems – all at a very high level of reliability. This powerful combination delivers increased throughput while reducing capital investment, staffing and maintenance costs over the life of the system.

Scanning up to 1,800 bags per hour (BPH), with a belt speed of 0.5 meters per second, and featuring a rectangular 102-centimeter-wide by 81-centimeter-high tunnel, the MV3D is ideally suited for easy integration with high-speed baggage handling systems worldwide.

Like its predecessor, the MVT-HR[®], the MV3D is designed for high reliability and ease of maintenance. The MVT-HR has been fielded since 2005, with hundreds of systems still in service worldwide. The fixed-angle, fixed-view projection design of the MV3D provides high-resolution 2-D and 3-D volumetric images and an extensive array of



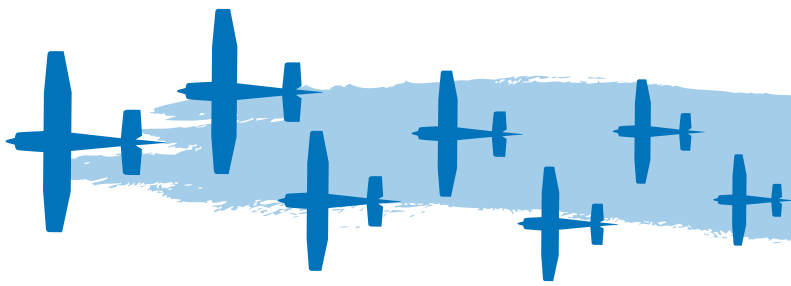
The MV3D[®] is deployed in European and Asian airports.

alarm resolution tools, allowing Level 1 and Level 2 operators to make faster, higher-confidence decisions.

Unique to the MV3D is a feature that lets the system scan bags even if they are stopped by downstream congestion. In all other screening machines such stoppages prevent proper analysis, so bags caught in the tunnel have to be rescreened, significantly slowing down throughput. The MV3D eliminates this problem.

The MV3D's innovative design provides advanced algorithms that utilize both high-resolution 2-D and 3-D image data. The system has dual-energy capability, and, coupled with multiple X-ray generators, allows for precise calculations of each object's mass, atomic number and density within the entire bag. This level of precision results in the MV3D detecting explosive materials while minimizing false alarms on harmless objects within the bag.

When utilized with L-3's OptiNet[™] networking solution, the MV3D links with other L-3 EDS systems, such as the eXaminer[®], over a secure network, enabling airports to maximize operational efficiency and realize the lowest possible staffing and operating costs. For



example, L-3 currently has more than 70 systems connected to over 60 workstations across three terminals at a major Asian airport.

L-3 SDS offers customers the broadest range of TSA-certified and EU-approved EDS solutions for every throughput class, from its compact eXaminer® SX (360 BPH) to the widely deployed eXaminer® 3DX (540 BPH) to the high-speed, dual-energy eXaminer® XLB (1,200 BPH). The MV3D enhances L-3's EDS lineup, enabling the company to offer a 1,800 BPH solution for airports requiring the highest level of throughput.

Screening Air Cargo

With today's evolving air cargo security challenges and regulations, the air freight industry needs reliable, high-throughput

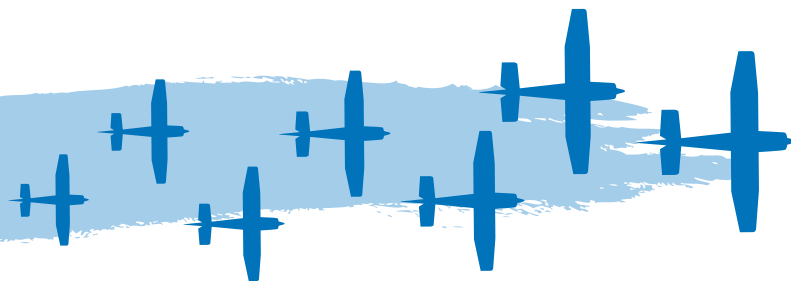
equipment that is cost-effective, attuned to a demanding logistics environment, and backed by an experienced team of trainers and support engineers. L-3 offers multi-view architectures, along with best-value, single-view X-ray scanning systems, in a variety of tunnel sizes. For example, with a 1.8-meter-high by 1.8-meter-wide tunnel opening, L-3's PX™ 18.18 eliminates the need to unpack contents for inspection, accelerating screening of consolidated cargo in skids, pallets and ULDs while maintaining the highest levels of security. With high-energy scanning, six-color imaging and operator-assisted detection capabilities, operators have the comprehensive information and flexible controls needed to identify explosives, weapons, drugs or misrepresented goods. The high-powered, multi-view X-ray systems are available in

200 and 320 kV configurations, ensuring best-in-class penetration and image quality.

Future-Proofed Solutions

Solutions offered by L-3 SDS address current security requirements with a software-based architecture that is upgradable to counter future and emerging threats and meet the most demanding customer expectations and regulator requirements. L-3 delivers superior detection, high throughput and outstanding reliability – all backed by one of the industry's largest and most experienced global service teams.





Nurturing General Aviation in India

General Aviation is defined as all aviation other than military aviation and scheduled commercial airlines. It includes both fixed-wing and rotary-wing aircraft (helicopters). This paper addresses the importance of nurturing General Aviation (GA) in India and goes on to address the elements of the ecosystem that must be put in place to enable this industry of the future to take wing and thrive in India.

To showcase GA's possibilities, it is instructive to look at the U.S. – the world's leading aviation market. In 2014, there were 211,084 civilian aircraft in the U.S., of which a scant 6,676 (3.2%) were owned by Scheduled Commercial Airlines, while the balance 204,408 (96.8%) were GA aircraft in active use (Source: U.S. Department of Transportation). While scheduled airlines served less than 400 airports, GA aircraft operated to over 5000 airports.

An Economic Impact Study conducted by PricewaterhouseCoopers (PwC) on behalf of the General Aircraft Manufacturers Association (GAMA) and seven other general aviation

associations in 2014 (using data available for 2013) concluded that in the U.S. General Aviation:

- SUPPORTED 1.1 Million Jobs (direct, indirect, induced and enabled)
- FACILITATED \$219 billion of Total Economic Output
- CONTRIBUTED \$109 billion to U.S. GDP
- GENERATED \$69 billion in Labour Income

(Source: The Wide Wings and Rotors of General Aviation)

Compared to the U.S., the Indian Aviation Market is in its infancy. There are about 1390 civilian aircraft in India (less than 0.7% of the U.S. total) of which about 440 (32%) are operated by scheduled carriers, and the balance 950 (68%) are accounted for by Non-Scheduled Operator Permit holders (N.S.O.P.s), training institutes, corporations, state governments and individuals (Source: B.A.O.A). Hence, there is potential for massive growth provided balanced policies are instituted to develop the GA Ecosystem.

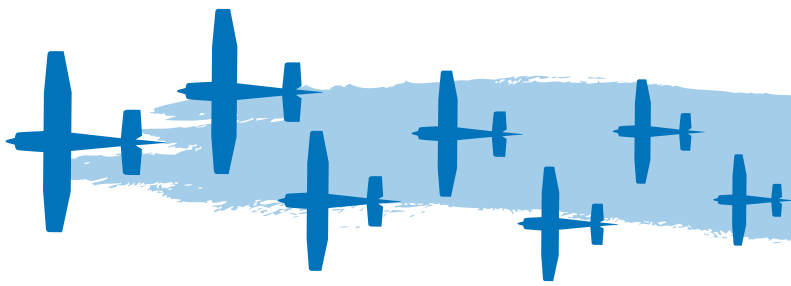
The concept of “an ecosystem” is

borrowed from natural science, and is recognized as a collection of plant and animal species, microbes, soil profiles, water resources and sunlight, with strong interconnections between biotic and abiotic components to form a strong, integrated whole that functions harmoniously.

In conceptualizing a General Aviation ecosystem that can develop rapidly, we have to look at ALL necessary elements such as equipment, fuel, airports, ground facilities, airspace and skilled personnel. Since passenger safety is a non-negotiable element of aviation, the sector is heavily regulated. These regulations impact all elements and must be explicitly addressed. Similarly, since aviation is capital intensive with high operating costs, availability of finance for each element must also be addressed explicitly. Let us look at each element in the Indian context.

Equipment

Currently no civilian aircraft – either fixed or rotary wing – are manufactured in India. Large passenger jets (such as Airbus 320s and Boeing 737s) are imported duty-free by scheduled air carriers.



Smaller aircraft imported by companies and individuals attract duties in excess of 20%, while a reduced rate of 2.5 to 3.0% is available to Non-Scheduled Operator Permit holders (N.S.O.P.s).

Kick-starting GA in India calls for a carefully calibrated multi-year import duty regime that makes it easier for all kinds of aspiring flyers to obtain equipment. Differential rates of duty could be considered for completed aircraft flown in compared to those that are assembled in India from imported components in consonance with the Government of India's overriding "Make in India" policy, with the requirements for indigenous content slowly ratcheted up over time as domestic industry capabilities develop. A huge government company like Hindustan Aeronautics Limited could conceivably ramp up assembly and manufacture of civilian aircraft. Given appropriate incentives private companies like Taneja Aerospace and Aviation, that assembled the six-seater single pilot P-68 and twin pilot, twin-engine nine-seater Viator in the 1990s, and major groups such as the Tatas, Mahindras and Larsen &

Toubro that have established facilities could become the nucleus of India's aircraft manufacturing industry.

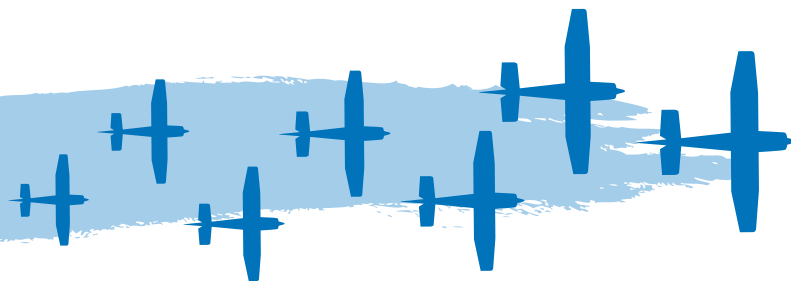
Fuel

After equipment, fuel is the highest cost component of aviation. Jets and Turboprop aircraft require Aviation Turbine Fuel (ATF), and Piston Engine Aircraft require Aviation Gasoline (AvGas). While the excise duty on petrol (raised from Rs. 9 per litre in 2014 to Rs. 21 currently) and diesel (raised from Rs. 3 per litre in 2014 to Rs. 17 currently) are important sources of Government revenue, it would be desirable for the Central and State Governments to exempt ATF and AvGas for General Aviation from all VAT, excise and other kinds of duties and taxes for at least 10 years. Given the low volumes, this will barely dent Government revenues, while stimulating demand will encourage national oil companies to invest in the production and distribution of ATF and AvGas.

Airports

In the U.S. scheduled carriers fly to just under 400 airports, while General Aviation aircraft touch down at over 5000 airports (Source:

GAMA). According to the Airports Authority of India (AAI), the erstwhile Government of India monopoly owner and operator of all Indian commercial airports, there are 449 airports and airstrips in India, of which AAI owns and manages 92 airports and 28 civilian enclaves at Defence Airports such as Jodhpur, Leh and Pune. A small number of airports are operated by private organizations such as Tata Steel in Jamshedpur, Jharkhand, and Taneja Aerospace & Aviation in Hosur, Tamil Nadu. Expanding General Aviation will require a massive expansion of airports throughout India. The magnitude of this task exceeds AAI's planning and execution capacity. Hence facilitating GA expansion calls for a policy to attract private investment into airports by viewing them as "businesses" and allowing them the freedom to operate as such, while carefully specifying parameters to guarantee flight safety and national security. Given the huge risk, the small initial revenues and the long ramp-up period, subjecting these airports to the same security standards specified by the Bureau of Civil Aviation Security (BCAS) for large airports would render them



unviable, as would fire-safety requirements. Hence, fresh standards will need to be formulated for GA airports.

Ground Facilities

Worldwide General Aviation is served by Fixed Base Operators (FBOs) who provide Refueling, Parking, Tie-down, Hangars, Flight Instruction and Ground Taxi services, and may also be involved in Aircraft Rental and Sales, Charter Services and Maintenance, Repair and Overhaul Services. Initially most flights will either originate out of or terminate at AAI airports, or the major privatized airports such as Bengaluru, Hyderabad, Kochi, Mumbai and New Delhi. The current population of firms that provide GA services (such as Freedom Aviation, Quick Aviation, SARC Aviation, SRC Aviation and Vision Aviation) are small and basic, and do not own / operate private terminals. Hence it is imperative to formulate a policy that permits establishing FBOs at ALL existing AAI and other airports and facilitates their growth and continued operations.

Airspace Management

Managing the “Highways in the Sky” is crucial to the growth of

General Aviation. This is a complex and demanding technical challenge. Indian authorities will have to come up with aircraft specifications for Required Navigation Performance (RNP) and Area Navigation (RNAV) and also design and implement the appropriate aviation infrastructure in Indian Airspace to allow for Performance Based Navigation (PBN).

Every attempt should be made to minimize “Special Flight Rules” over high-security areas such as New Delhi and sensitive government and civilian installations, such as Power Plants and Refineries, and “No Fly Zones” in the vicinity of military airports and defence complexes. Technologies to support the Flexible Use of Airspace need to be adopted. A joint Civil – Military Airspace Management Group needs to be constituted to allocate temporarily unrestricted airspace and provide an Airspace Allocation Plan to stakeholders on a daily basis.

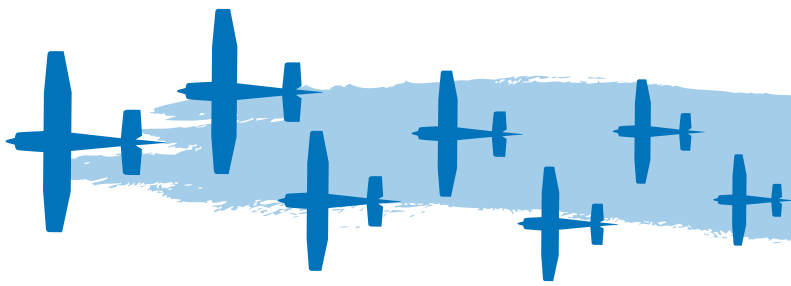
As the population of GA aircraft increases, the process of filing flight plans must be simplified and aligned with International Civil Aviation Organization (ICAO) standards.

Authorities can consider using U.S. Federal Aviation Administration (FAA) International Flight-Plan (Revision 7/2015) which appears on FAA Form 7233-4, to enable the use of Performance Based Navigation (PBN).

Skilled Personnel

Growth of Indian General Aviation will require a huge leap in the number of highly-skilled personnel – not only those associated with direct aircraft operations, such as pilots and mechanics, but also those associated with any part of the ecosystem such as Air Traffic Control (ATC), Maintenance, Repair and Overhaul (MRO), Fire Safety and Airport / FBO Management and Operations.

A totally novel educational approach and infrastructure will have to be devised unlike anything the approach today in most Indian colleges that promotes rote-learning of theory and facts in classrooms from textbooks. Curricula will have to blend classroom instruction with a huge amount of hands-on field experience and training. Basic qualification standards will have to be established and implemented rigorously. Certification processes



will have to be ruthlessly water-tight.

While a start has been made with establishing the Rajiv Gandhi National Aviation University in Fursatganj, Rae Bareilly, with associated institutes such as Indira Gandhi Rashtriya Uran Akademi (IGRUA) and those in Hyderabad and Thiruvananthapuram, a huge challenge lies ahead. A new perspective and approach has to be developed and implemented to support General Aviation with skilled personnel trained to the highest quality standards and certified using irreproachable testing and evaluation methodologies. This cannot be emphasized enough!

Regulations

Indian Commercial Aviation operates under Civil Aviation Requirements (CARs) and Aircraft Rules dating back to 1937. These have been modified on a piece-meal basis numerous times in response to emerging developments and requirements, both nationally and internationally.

CARs and their subsequent updates have been formulated largely in the context of scheduled commercial airline services. Promoting GA will

require re-visiting ALL aspects of regulations with a view to providing a solid regulatory foundation on which a vibrant GA industry can grow unfettered. GA must be governed by prudent oversight that ensures safety and security while ensuring that oversight is not so onerous that it stifles and chokes growth.

Enabling Finance

Since Indian GA is in its infancy, and participants involved are emergent and under-capitalized, the Government must institute policies that augment the availability both of equity capital and debt financing for this sector. Given its complexity and emergent nature, risk is perceived to be extremely high, and established GA financing sources in advanced markets such as U.S.A. and Europe are not available to Indian participants. If it desires this sector to develop rapidly and expand to its full potential, the Government must take bold steps to ensure institutional financial support. A parallel can be drawn with Renewable Energy such as Solar Power, Wind Energy and Biogas that are developing well solely due to strong Government sponsorship.

Conclusion

GA has the potential to act as an enormous “growth-multiplier” in India. Indirectly, it will stimulate growth of remote and relatively inaccessible areas by accelerating availability of market access to local inhabitants, industrial development and tourism. Directly, it will create tens of thousands of skilled high-paying jobs and kick-start a huge new manufacturing sector for aircraft and service equipment. GA will also provide hitherto unavailable services especially in the areas of dealing with medical emergencies and disaster management. In order to realize this potential, the Government of India must display the political will to adopt a “blank sheet of paper” approach towards GA and formulate and implement bold forward-looking policies. By orchestrating an approach that invites and encourages the participation of ALL constituents – existing Central Government entities, State Governments and Private Enterprise – and channeling their resources into this sector with concentrated energy and a tenacity of purpose, the Government can ensure that GA has a transformational impact on India.



US - INDIA AVIATION COOPERATION PROGRAM (ACP)

Public Members



Corporate Members



M28[®]

STOL TWIN TURBOPROP AIRCRAFT

www.m28aircraft.com



Safe, reliable operation from unpaved airstrips
Highest payload in its class

Well suited for remote area connectivity across India
Easily reconfigurable cabin for cargo, passenger, paradrop and medevac

High temperature - High Payload - High Range

Reliable in any conditions, operating from any type of runway including world's most inaccessible airstrips, unpaved, grass and gravel runways or high-elevation airfields.





BECAUSE THERE'S NO TIME FOR DOWNTIME.

As an experienced provider of explosive detection systems (EDS) and explosive trace detectors (ETD), we know how to implement leading-edge technology in every environment. From understanding what it takes for a smooth EDS installation or upgrade, to finding the right ETD to enhance your screening protocols, we have the security solutions and support you need.

Connect with us today to discover more about the products and benefits an experienced security provider delivers.



CTX 9800 DSI™**



temiser DX®**

Visit: morphodetection.com

Email: info@morphodetection.com

*The CTX 9800 DSI is European Civil Aviation Conference (ECAC) Std.3-approved, Transportation Security Administration (TSA) certified and on QPL, China Civil Aviation Administration of China (CAAC) approved, and Israel Security Agency (ISA) approved.

**The temiser DX is ECAC approved with TSA certification pending.

Keep moving with Morpho Detection.

 **SAFRAN**
Morpho Detection