AOPA INDIA

Aircraft Owners and Pilots Association-India

HANDBOOK ON GENERAL AVIATION

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FOREWORD

The potential for General Aviation in India has never before been as exciting as in the recent years. With India's rapidly increasing high net worth entrepreneurs and business organizations and a large youthful demographic population looking for new and exciting sports and adventure, General Aviation is poised to make rapid strides.

It has been long felt by the Indian GA Community that growth has been stifled due to poor infrastructure, lack of encouraging policies and rules that have not kept pace with changes in general aviation. There is also a lacuna in the knowledge and understanding of General Aviation, by many personnel in the regulatory bodies like the Directorate General of Civil Aviation, Airports Authority of India and the Ministry of Civil Aviation, Directorate General of Foreign Trade (DGFT) and Ministry of Home Affairs (MHA) all of who have interact with pilots and operators of GA aircraft in India.

The poor understanding of GA, quite often results in application or mis-interpretation of rules and regulations devised for the Scheduled Airlines, leading to inordinate delays, denials and frustration in licensing, flying and ownership of GA pilots and airplanes.

This handbook is published by AOPA-INDIA as a primer on the basics of General Aviation for use by its members and as a reference guide to the large number of officers, policy makers and regulators. This does not represent the present policies or regulations in India, but captures the essence of GA as is presently being viewed in most parts of the world.

Readers are requested to send in their comments, views and suggestions for incorporation into forthcoming editions of this handbook.

Ramesh Rao
President, AOPA-INDIA

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WHAT IS GENERAL AVIATION?

The diversity of general aviation is so great that the International Civil Aviation Organization(ICAO) defines it by exception: those flight activities not involving commercial air transportation or aerial work. These include activities like flight instruction, business travel, agricultural application, emergency medical services and sports and recreation.

The significance of general aviation becomes greater when it is realized that every airline and military pilot must begin their journey to professional competence in the cockpit of a general aviation aircraft.

The essential services provided to the public by general aviation for police, emergency medical services and search and rescue make lives safer and productive. Aerial survey, agricultural application and pipeline/powerline patrol add significantly to many aspects of the economy. And, for the many remote areas of the world, life and civilization would not be possible without the benefits provided by general aviation operations.

General aviation activities globally create hundreds of thousands of jobs and billions of revenue for the countries these activities serve. Without this activity essential transportation functions would be eliminated and the opportunities associated with them would be lost to the economies they potentially serve. Therefore, general aviation needs and desires should be taken seriously as a worldwide economic engine.

GA flights range from the simple glider and microlight to large, non-scheduled jet flights. The majority of the world's air traffic movements falls into this category.

Around the world, GA includes flying as diverse as a weekend visit back home and overnight package delivery; as different as emergency medical evacuation and a morning sightseeing flight in a balloon; as complementary as aerial application to keep crops healthy and helicopter traffic reports to keep drivers informed of rush-hour delays.

There are many similarities between how people use their automobiles and how GA pilots use their small aircraft. Like the family automobile, the family airplane (owned or rented) can provide mobility and pleasure, and it’s almost always a more enjoyable trip by air. In fact, it is no surprise how similar the family car is to an airplane. A common misconception leads some to think of personal or small business aircraft as only for the extremely wealthy.

Compare a family **car** with a typical **GA Aircraft**

In fact, many people of middle-class means fly airplanes less costly to acquire than a new family car.

More and more people are discovering that general aviation is fast, efficient, and safe, opening a whole new vista of travel opportunities. For both business and personal travel, general aviation means going where you want to go, when you want to go and in whatever degree of privacy you desire. The payoff is greater transportation flexibility and productivity than any other mode of travel can provide.

Of course many people fly for sheer sporting and recreational purposes just as others drive cars, ride motorcycles or go about in motor boats. Flying is a relaxing pastime and can bring a useful therapeutic benefit to busy people.

Learning to fly general aviation aircraft is well within the capabilities of the average person, intellectually and physically. Even some disabilities—deafness, for instance — need not keep a person who really wants to fly out of the cockpit. And general aviation has an excellent safety record.

More than 90 percent of the roughly 240,000 civil aircraft registered in the United States are GA aircraft. And of the nation's approximately 625,000 pilots, an estimated 500,000 fly general aviation airplanes. The UK has a thriving GA sector and contributes over £3.7 billion per year to the economy directly, employing over 50,000 jobs. It has approximately the same size as the turnover of a major UK airline and is of tremendous value to communities and society across the UK. There are over 12,000 active GA aircraft registered in the UK, with over 4.6 million GA movements each year.

USAGE OF GENERAL AVIATION AIRCRAFTS

Airplanes vary in size and speed because General Aviation (GA) does many, varied jobs. General aviation involves a wide range of aircraft types such as Business jets, trainers, homebuilts, aerobatic types, racers, gliders, warbirds, firefighters and medical transports.

MEDICAL

Saving lives with emergency patient evacuation, transport of vital transplant organs and life saving elements. Helicopter emergency medical evacuation is nearly doubling survival rates by getting accident victims to hospitals within the first critical 'golden hour'.

MAPPING AND SURVEYING

Aerial photography, mapping and surveying to produce the various maps people use today for driving, urban planning or infrastructure development.

FARMING

While rare in India, a majority of the world's crop dusting, fertilisation and planting are efficiently handled by air. Aerial surveillance of animals and fisheries boosts food production and keeps the food supply running smoothly.

BUSINESS

Keeping businesses profitable and competitive GA provides fast, efficient and safe transportation between different facilities, such as visiting factories and suppliers, meetings with customers, business partners, and distributors.

SEARCH AND RESCUE, EMERGENCY RELIEF

GA is invaluable for picking up injured hikers, mountain climbers, boaters and divers as well as evacuating people and delivering supplies to people affected by extreme weather such as floods.

FLIGHT TRAINING

Flying schools and freelance instructors teach others to fly. Student pilots become the future pilots of airlines, GA businesses, or aircraft for personal use.

PUBLIC SECURITY

Police operations and border control have been revolutionized by GA aircraft. Light airplanes and helicopters are commonly used to monitor national borders, highway patrol and as back up for ground units.

TV, FILM AND MEDIA

When speed is of essence news channels rely on GA aircraft to provide an eye view in reporting events and filming for cinema and television.

PERSONAL TRANSPORT

Visiting friends and relatives, holiday travel, access to hard-to-reach communities and outlying islands, people are discovering the affordability, speed and flexibility of GA aircraft.

ADVERTISING

Airships or blimps as they are called commonly are popular for commercial advertising and sports coverage. In recent years there is renewed interest in these airships as efficient cargo payload carriers.

ENERGY

Helicopters are the lifeline to offshore gas and oil rigs, providing transport, emergency evacuation and 24 hour operations support.

RECREATION

A mind boggling array of small airplanes are being designed and manufactured for pure recreational aviation enthusiasts who might just practice circuits and landings over small airports, travel cross country or participate in competitive air shows, air racing and aerobatics.

AIRCRAFT TYPE CLASSIFICATION

AIRCRAFTS ARE CLASSIFIED INTO TYPES BASED LARGELY UPON THEIR DESIGN, PROPULSION AND SIZE.

AIRPLANE

A fixed wing aircraft that contains at least one engine and whose primary function is sustained powered flight.

HELICOPTER

A rotorcraft that primarily depends on engine-driven rotors for motion.

AIRSHIP

A power-driven lighter-than-air aircraft.

UNMANNED AIRCRAFT

A new breed of aircraft to occupy the skies recently, the terms Unmanned Aircraft (UA) or Remotely Piloted Aircraft (RPA) are used to describe the aircraft itself, whereas the term Unmanned Aircraft System (UAS) is generally used to describe the entire operating equipment including the aircraft, the control station from where the aircraft is operated and the wireless data link.

RECREATION AND SPORTS AVIATION AIRCRAFT

The category of aircraft commonly considered to be light recreational aircraft has advanced significantly since their emergence in the 1970s, from rather basic fabric and wire ultralight aircraft to the sleek composite types we see today .

The performance of modern light recreational aircraft easily equals, and in many cases betters, the lower end of general aviation aircraft types. Recreational pilots are increasingly using this type of aircraft for extensive cross country flying throughout the world.

Sport aviation provides a wide range of activity options and an economical way to take part in aviation. It also offers a proving ground for new aviation concepts and technology. Sport aviation makes up a majority of the aircraft operating in the world.

Notably, many of these aircraft are not designed or built to any recognised civil aviation standard and many of the activities are only allowed through exemptions to the legislation. In many countries sport aviation operates under self administration.

This means that the Civil Aviation Authority sets the regulations and then works in close cooperation with established recreational organisations, like the British Microlight Association, the Experimental Aircrafts Association or Sports Aircraft Association of Australia to make sure the regulations are applied and enforced. These Associations provide specialist knowledge and insight into the sport aviation industry. Many of these organisations issue their own pilot certificates and ratings.

PARACHUTING OR SKY DIVING

Recreational parachuting has increased in popularity all over the world. While tandem jumps offer people the ability to experience parachuting without having to train for a solo jump, there is an entire community of licensed skydivers, tandem masters, instructors and video camera men, operating under the oversight of the British Parachute Association and the US Parachute Association. Countries like Spain and recently Dubai with their round the year fair weather conditions have become popular destinations and a boon to their tourism industry.

PARAGLIDERS

Paragliding began with soaring parachutists launching from hills in the early 1980s. A paraglider consists of a canopy attached to a harness. The canopy is made of two layers of fabric forming a wing-shaped bag. As the paraglider moves forward, openings at the front of the bag allow it to fill with air, pressurising it and making a standard aerofoil shape. To control the paraglider, the pilot holds a line in each hand and pulls the line depending on the direction they want to go.

HANG GLIDERS

Hang gliding first occurred in the early 1960s in the form of kites towed by boats . Since then the design and materials used in hang gliders has evolved significantly. Contemporary hang gliders may use materials such as tubing frame and sail cloth wing, or carbon fibre and epoxy for light weight strength. Hang gliders are generally controlled by the pilot shifting their body weight either back, forwards or to the side.

POWERED OR MOTORIZED PARAGLIDERS

Powered paragliding, also known as paramotoring, is a form of ultralight aviation where the pilot wears a motor on his back to provide enough thrust to take off. It offers the pilot the flexibility of launching from level ground after a brief run, without any assistance. Powered paragliders also come in trike buggy configurations and are easily transported by vehicles and are easily operated out of fields, beaches and open spaces. In many countries powered paragliding is minimally regulated and requires no license.

BALLOON

A non-power-driven lighter-than-air aircraft.

NONPOWERED GLIDER

A fixed wing aircraft that does not contain an engine and whose primary function is sustained nonpowered flight. Gliding originates from the earliest days of aviation. Modern gliders incorporate many technological advances, both in performance and innovative design features. Gliders are launched in a number of ways - a winch, aero-tow or self launched. The pilot's ability to locate and fly in currents of rising air allows the glider to remain aloft for a number of hours. Cross-country flight in gliders, covering long distances capitalising on weather conditions is usually known by the term 'soaring'.

POWERED GLIDER

A fixed wing aircraft that contains at least one engine and whose primary function is sustained nonpowered flight.

ULTRALIGHT / MICROLIGHTS

A microlight is an aeroplane, capable of flight in the same way as any other with one engine carrying no more than two people used in hobby or recreational flying. Typically they are restricted to 2 seats, must weigh around 265kg at most and must be able to fly at low speeds. Other than that, it's an aeroplane!

There are two main types of Microlight; the 3-axis (or fixed wing) type which looks more like a conventional aeroplane, and the flexwing type which consists of a delta wing similar to a hang glider with a 'trike' unit suspended underneath it.

Trikes rely on weight shift rather than the conventional three axis control . This means that there is no tailplane or control surfaces such as ailerons, rudder or elevator . The aircraft is controlled by the pilot shifting the aircraft's centre of gravity in relation to the wing.

LIGHT SPORTS AIRCRAFT:

With considerable advances in aircraft design and performance many countries around the world have now classified a new breed of microlights as light-sport aircraft. LSA is a small aircraft that is simple to fly and meets certain regulations set by a national aviation authority usually restricted by weight and performance. LSAs may have maximum gross takeoff weight of 450 to 600 kilograms. It must have a maximum stall speed of 45 knots; and a maximum of two seats; an unpressurized cabin; and a single non-turbine engine driving a propeller if it is a powered aircraft.

The enormous popularity of these machines and the significant advances in their design and performance has necessitated in several countries the easing of restrictions on licensing, medical requirements and maintenance. Aircraft which qualify as LSA may be operated by holders of a sport pilot certificate, whether they are registered as light sport aircraft or not. Pilots with a private, recreational, or higher pilot certificate may also fly LSA, even if their medical certificates have expired, so long as they have a valid driver's license to prove that they are in good enough health to fly and their medical certificate has not been denied or revoked. LSA also have less restrictive maintenance requirements and may be maintained and inspected by traditionally certificated Aircraft Maintenance Technicians, or by individuals holding a Repairman: Light Sport certificate, and (in some cases) by their pilots and/or owners.

AMATEUR-BUILT AND EXPERIMENTAL AIRCRAFT

Homebuilt aircraft, also known as **amateur-built aircraft or kit planes**, are constructed by persons for whom this is not a professional activity. These aircraft may be constructed from "scratch," from plans, or from assembly kits.

There are three basic routes from which to choose if you wish to build your own aircraft:

- Design and build your own aircraft from scratch
- Construct an aircraft from plans designed by someone else
- Assemble a kit

Homebuilt aircraft have gained a great deal of popularity with many aircraft companies providing detailed drawings, airplane parts and assembly information for the do-it-yourself pilot. Several of the kit manufacturers also offer workshops, and training for the builders and several thousands of home-builts are flying in the US, Canada and Europe due to the affordability of the kits.

GYROPLANE

A rotorcraft that primarily depends on rotors that rotate by action of the air. Modern light gyroplanes used by recreational flyers are generally small flying machines very different from the first gyroplanes developed in the 1920s .

Until recently, gyroplanes were mostly homebuilt. Now with increasing technological development, factory built light gyroplanes may be observed flying from established airfields and we may expect to see more of this type operating. Although gyroplanes derive lift from a rotor, they differ significantly from helicopters in that the air flows up through the rotor rather than downwards. Gyroplanes are in constant autorotation and may be considered to behave conventionally i.e. similar to a fixed wing aircraft, in the case of engine failure albeit with a steeper glide angle. Gyroplanes are not subject to the same stalling phenomenon as fixed aircraft and are considered to be safer in this respect.

WARBIRDS

The term warbirds generally refers to ex-military, replica and vintage or historic aircraft which are usually allowed to operate under a Special Certificate of Airworthiness or as experimental aircraft.

HYBRID LIFT

A heavier-than-air aircraft that is supported at vertical takeoff, vertical landing, and low speed flight by the dynamic reaction of the air against its rotors or thrust and in horizontal flight by the dynamic reactions of air against its wings (for example, the tilt-rotor aircraft). Many of these are in relative drawing and experimental stage.

THE BASIC TYPES OF PILOTS IN SUCCESSIVE ORDER OF QUALIFICATIONS INCLUDE

- Student Pilot
- Sport Pilot
- Recreational Pilot
- Private Pilot
- Instrument Rating
- Commercial Pilot
- Certificated Flight Instructor
- Airline Transport Pilots
- Designated Examiner

Pilots are certificated by the Aviation Administration of the country for particular types of flying activities together with a set of add-on ratings to specify not only what types of aircraft pilots may fly, but also whether they may carry passengers, fly for hire, or fly in certain weather conditions. In addition to a pilot certificate, pilots also must have a current medical certificate issued by a designated physician.

Pilot certificates are earned through the successful completion of ground school, written examination, oral examination and flight test. Access and enrollment to flying schools is quite easy in most parts of the world. There is no certification or entry test required to become a student pilot and anybody over the age of 14 years can start learning to fly. Even someone with physical impairments can fly with some modifications to control systems. Exams for Private licenses are conducted at various flight schools by the CFI or Examiners based there and results are given immediately to the candidates.

In order to reduce delays and costs of administration, many countries have devolved the administration and issue of pilot licensing to independent associations like the Microlight Association, the Light Aircraft Association or the Experimental Aircraft Association. Members of these associations get immediate and personal access to services like licensing, renewals and endorsements.

PILOT CERTIFICATE OPTIONS

STUDENT PILOT

All pilots start out as students. Student pilots learn to fly while working their way through the knowledge and flying skills needed to earn their sport, recreational, or private pilot certificate. A student pilot's flying privileges are very limited but provide enough freedom to allow them to learn all of the basics, including standard airport-to-airport cross-country flying skills and interaction with air traffic control (ATC).
When student pilots first start learning to fly, they complete all of their flights with a certificated flight instructor (CFI) on board. Once they've reached the age of 16, have a valid Class III medical, and have mastered the basic skills and educational topics of flight, they can solo.

Student pilots learn how to fly in good weather during the day and night. They also learn basic instrument flying skills, which teach them how to fly by reading the instruments in the cockpit and without visual reference to the ground. They are not allowed to carry any passengers, or to fly for hire.

PRIVATE PILOT

Almost all pilots work towards earning a traditional private pilot certificate. It has the fewest limitations and, with additional training, can be upgraded to include more advanced capabilities such as flying in bad weather, flying an airplane with two or more engines, or flying professionally. Private pilots comprise the largest group of pilots and are among the most active fliers. A private pilot—with appropriate training, ratings, and endorsements may carry passengers in any aircraft, day or night, good or bad weather. Private pilots may not fly for compensation or hire (no passenger or revenue services) but may share equally with their passengers the direct operating expenses of a flight—specifically fuel, oil, airport parking and landing fees, and aircraft rental charges.

RECREATIONAL PILOT

The recreational pilot certificate is a more limited form of the private certificate. It requires less effort and money to earn than the private; however, most people who start down this path eventually go on to earn the private certificate anyway. Additional training and experience allows a recreational pilot to easily upgrade to a private pilot certificate.

SPORT PILOT

The sport pilot certificate was introduced by some countries about a decade ago. Sport pilots fly smaller, lighter, less-complex, one or two seat airplanes. Sport pilots generally fly in aircraft that fly at low speeds—less than 100 mph. In many countries Sport pilots do not need a medical certificate to fly an aircraft. They may use their current driver's license as proof that

they are medically fit to operate low-speed aircraft. Sport pilots can only fly a special limited class of aircraft known as light sport aircraft (LSA). LSAs are popular around the world due to their affordability, ease of maintenance and superior performance for cross country flying, with the ability to operate from grass strips, short fields and runways.

INSTRUMENT RATING

This add-on rating allows a pilot to fly in weather with reduced visibilities such as rain, low clouds, or heavy haze. When flying in these conditions, pilots follow instrument flight rules (IFR). The instrument rating provides the skills needed to complete flights without visual reference to the ground, except for the takeoff and landing phases. All pilots who fly above 18,000 feet mean sea level (msl) must have an instrument rating. The instrument rating makes the use of aircraft more practical for routine transportation.

COMMERCIAL PILOT

As the name implies, commercial pilots can be paid to fly aircraft. They may fly for hire in accordance with applicable parts of the aviation regulations. Commercial pilots have stringent medical criteria and undertake regular flight review with a certified flight instructor (CFI).

CERTIFICATED FLIGHT INSTRUCTOR

A certificated flight instructor (CFI) is authorized by the Aviation Regulator to give instruction to student pilots and pilots taking recurrent training or preparing for additional certificates or ratings. They also may give flight reviews and recommend their students for flight tests. CFIs may earn a special instrument instructor rating, allowing them to teach instrument flying (operating an aircraft in the air solely by instrument indications without visual reference to the ground). An instructor with this rating is called a CFII.

AIRLINE TRANSPORT PILOT

This is the doctorate degree of piloting. Most ATPs have many thousands of hours of flight time. ATPs also must have a commercial certificate and an instrument rating. ATPs may instruct other pilots in air transportation service in aircraft in which the ATP is rated. They may not instruct pilots outside of air transportation service unless they also have an appropriate fight instructor certificate.

EXAMINER

If the airline transport pilot is the doctorate degree of piloting, then becoming a pilot examiner is the equivalent of mastering advanced post-doctoral work. These individuals are few and far between. As the name implies, these people have been designated to test or examine the performance of their fellow pilots. Examiners typically have decades of real-world experience and perform the majority of official checkrides or flight tests for everyone from new pilots to seasoned airline captains.

"AOPA–INDIA" is a part of The International Council of Aircraft Owners and Pilots Association (IAOPA) which is a nonprofit federation of 71 autonomous, non-governmental and national general aviation organizations. IAOPA has represented the international general aviation community for nearly 50 years.

AOPA-INDIA works to provide an open, supportive environment for affordable flying, enhanced skills and safety of pilots and is engaged in identifying issues and solutions of its small but growing general aviation community.

AOPA-INDIA is committed to dialogue, education and long-term engagement with regulatory bodies and government in order to realize the full potential of general aviation in India.

AOPA-INDIA, a not-for-profit body is run with the passionate involvement and support of volunteer pilots and enthusiasts whose dream is to build a vibrant and enduring future for general aviation in India.

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Aircraft Owners and Pilots Association-India

Secretariat: 971, 5th Cross, 12th Main, Indiranagar, Bangalore 560 008
Tel: +91-8 0-4157 2581 Email: info@aopa.in