



Digest of Aircraft Accident Analyses

~ To Enjoy the Sky Safely ~

Safe Flight of Ultralight Planes, etc.

1. Preface	1
2. Statistics on Accident and Damage Occurrence.....	2
3. Tips for Safe Enjoyment of the Sky	
~Analyses of Factors That Probably Contributed to the Accidents~	6
4. Case Studies of Accidents.....	10
5. Summary (Conclusion)	14

1. Preface

The ultralight plane (see the photo on the back cover), which is popular for sky leisure (sports), is said to have started with an engine mounted on a hang glider. It is a one or two-seater aircraft with a simple structure equipped with a landing (on water) device and a power unit that can fly with the pilot in a seated posture. Gyroplanes and self-built aircraft are added to this category and are called "ultralight planes, etc." Although they enable people easily access to the sky, unfortunately, one to five accidents involving fatalities or injuries occur each year.

Of the 71 aircraft accidents in the last five years, 17 (24%) were accidents involving ultralight planes, etc., which is almost the same number as that of small aeroplanes (15 cases, 21%) and helicopters (16 cases, 23%) (see Figure 1).

In this JTSTB Digest, we will explore what is important for safe enjoyment of the sky through analyses of 54 accidents involving ultralight planes, etc. that were the subject of JTSTB's aircraft accident investigations between 2001 and 2021, and for which investigation reports have been published.

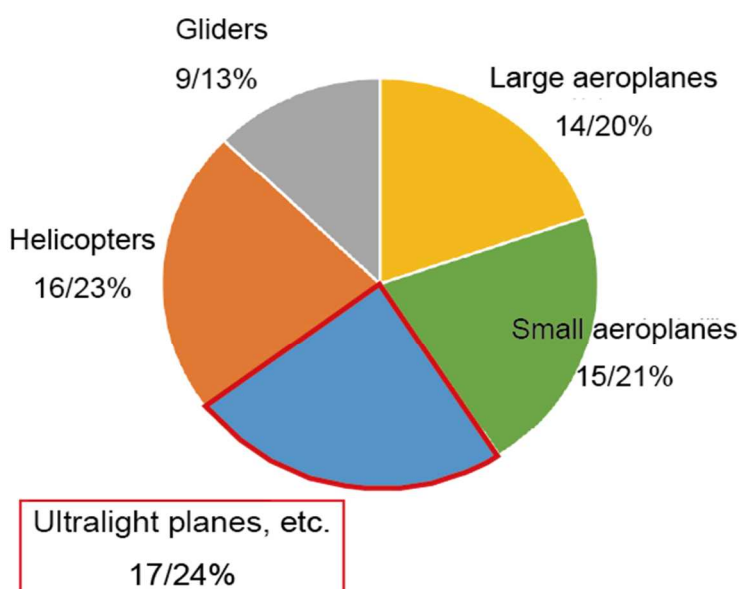


Figure 1 Number of Aircraft Accidents by Type of Aircraft (2017-2021)

2. Statistics on Accident and Damage Occurrence

1. Number of Accidents

Between 2001 and 2021, there were 55 accidents involving ultralight planes, etc., and when aggregated by year, except for 2005, between 1 and 5 accidents occurred each year (an average of approximately 2.6 accidents) (see Fig. 2).

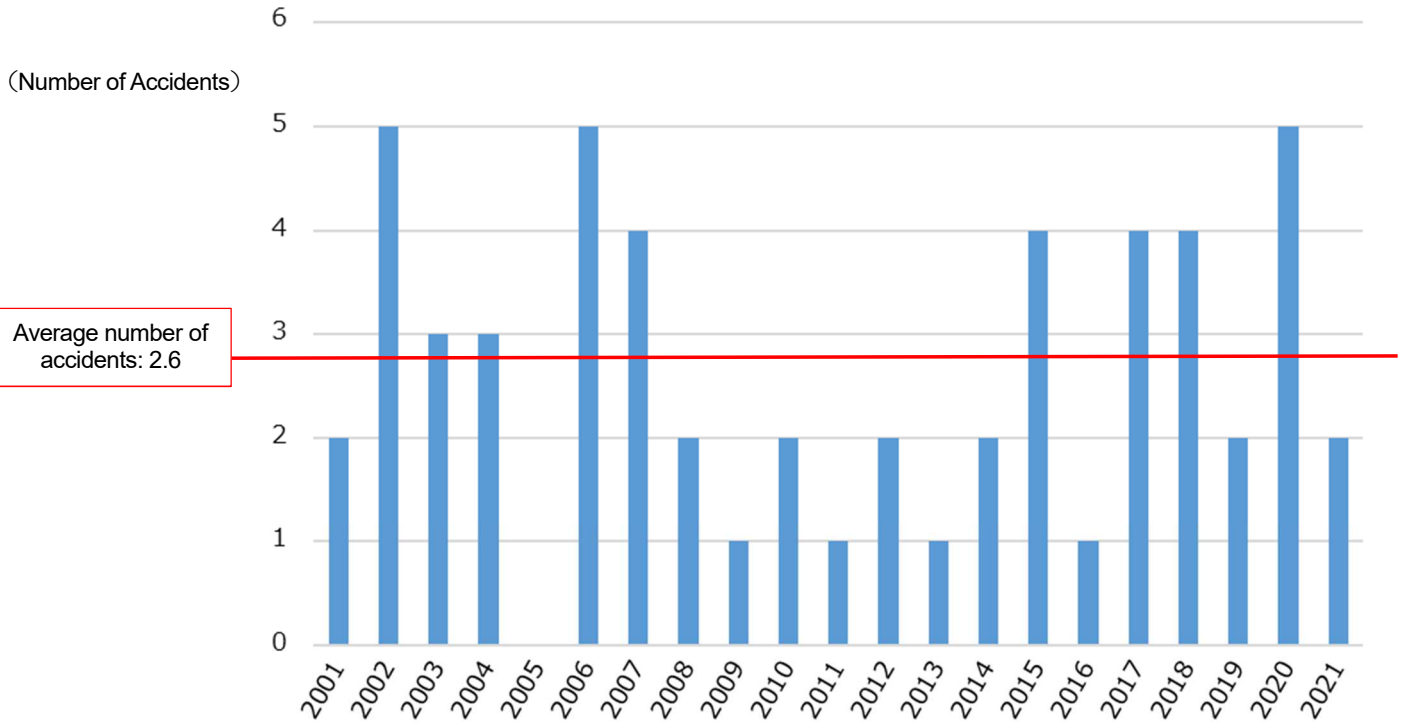


Figure 2 Number of Accidents by Year

Compared to the number of accidents by year for small aeroplanes and helicopters, the number of accidents for ultralight planes, etc. was higher for the three years from 2018 (see Figure 3).

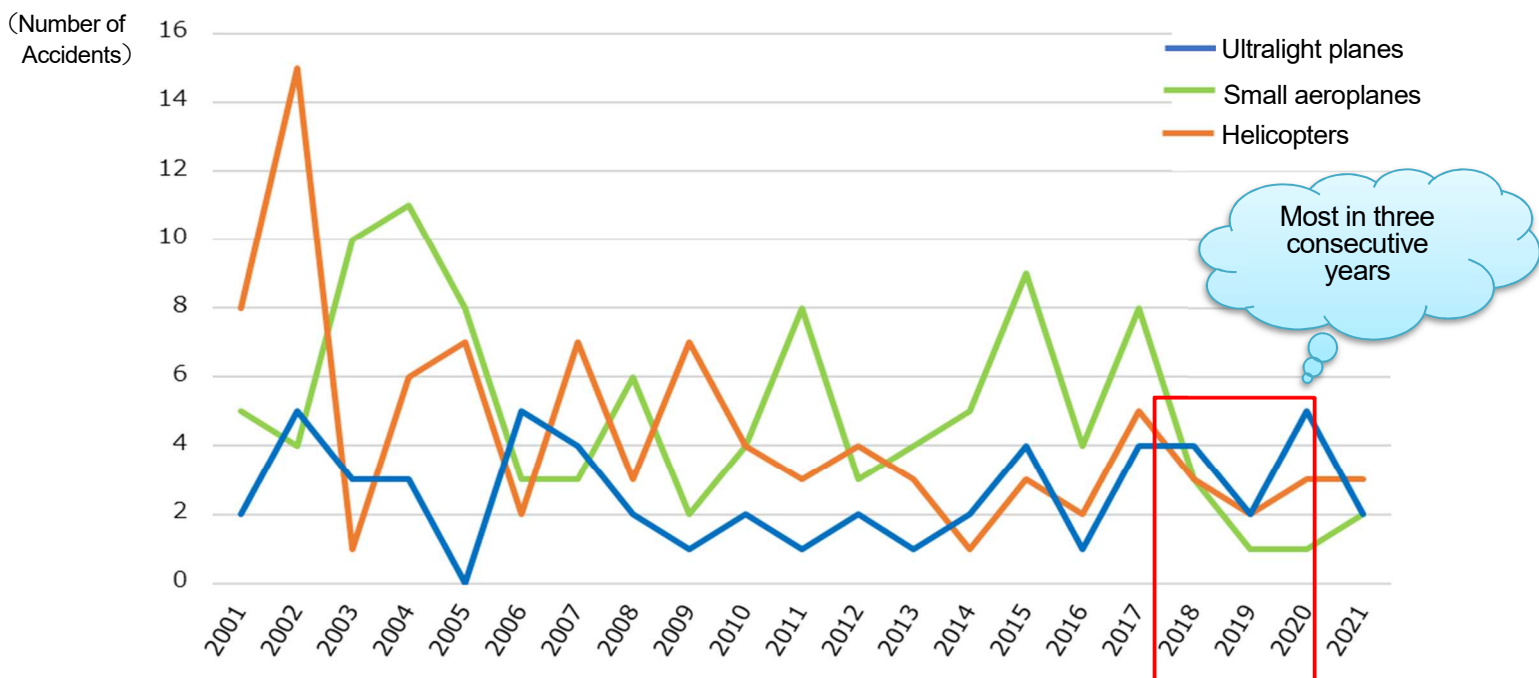


Figure 3: Number of Accidents (by Type)

2. Number of Accidents by Month and Day of Week

The monthly count of the number of accidents shows that May had the highest number with 9, followed by 7 in August. The four months from May to August accounted for 28 of the 55 cases, or about 50% of the total (see Figure 4).

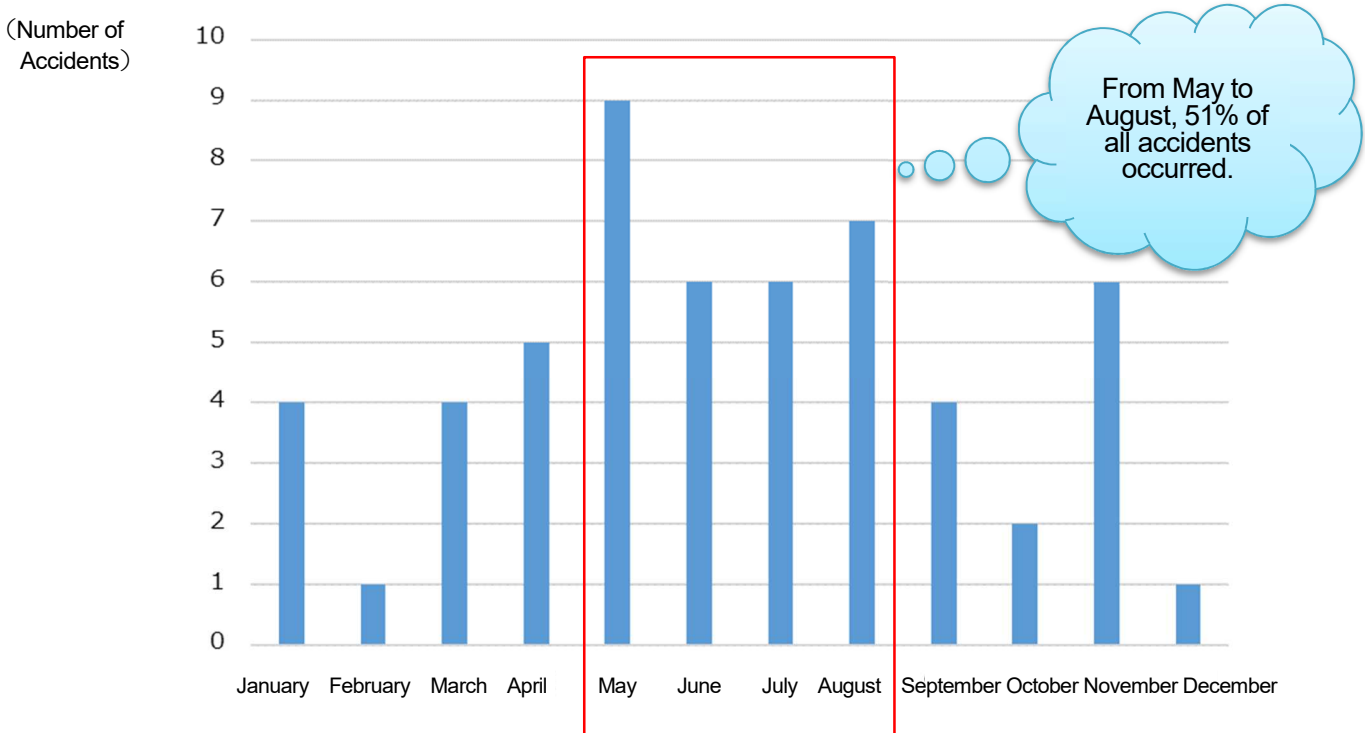


Figure 4 Number of Accidents by Month

When aggregated by day of the week, 42 of the 55 accidents occurred on Saturdays, Sundays, and holidays, accounting for nearly 80% of the total (see Table 1).

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of Accidents	2	6	6	2	2	13	24
Number of Accidents on holidays	1	1	2	0	1		

Number of accidents occurring on Saturdays, Sundays, and holidays (in yellow) : 42

76% of accidents are on holidays.

Table 1 Number of Accidents by Day of Week

Since ultralight planes, etc. are popular as sky leisure activities, many people enjoy them during seasons and holidays when it is easier to be outdoors, and accidents are likely to occur more frequently during such periods.

3. Accident Types and Occurrence of Casualties and Airframe

With regard to the 54 accidents for which investigation reports have been published, a breakdown by accident shows that "crashes and falls" accounted for 34 (63%), followed by "airframe damage during emergency landing" in 10 (19%), together accounting for 44 of the 54 accidents, or approximately 80% of all accidents (see Figure 5 on the next page).

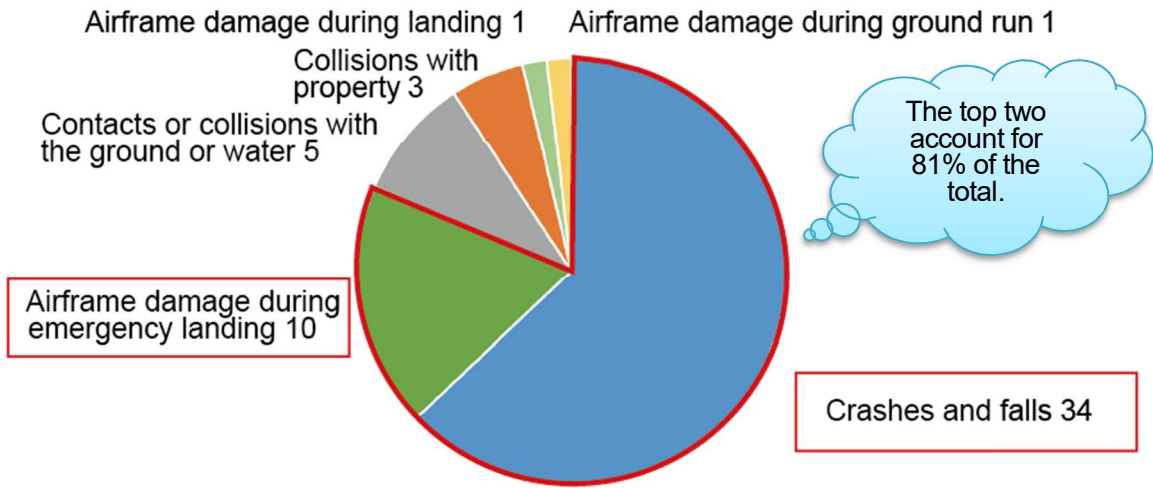


Figure 5 Occurrence by Accident Types

In terms of casualties, 15 accidents (28%) involved fatalities and 27 (50%) involved serious injuries, together accounting for 42 out of 54 accidents, or about 80% of the total (see Figure 6).

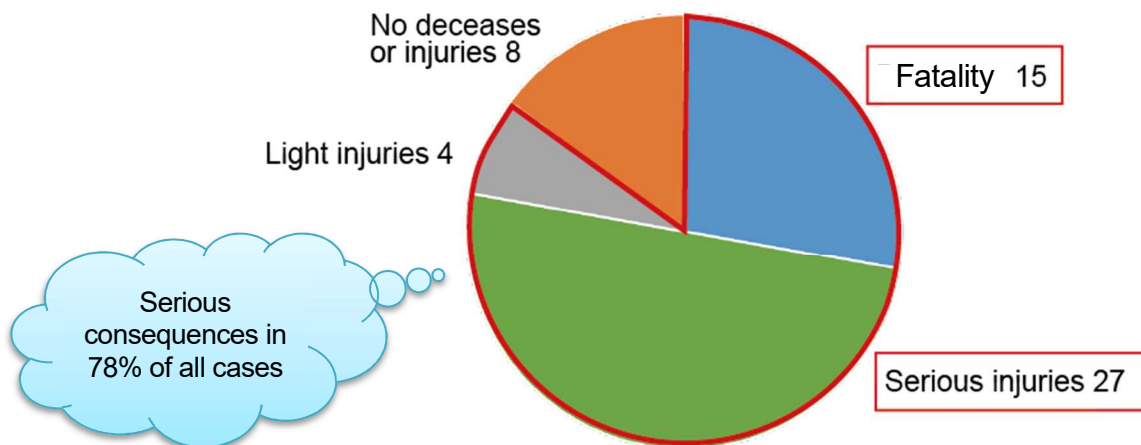


Figure 6 Statistics of Casualties

Regarding the damage to the aircraft, 39 (72%) cases of wrecks and 8 (15%) cases of medium damage occurred, together accounting for the greater part, nearly 90% of the total of 47 out of 54 cases (see Figure7).

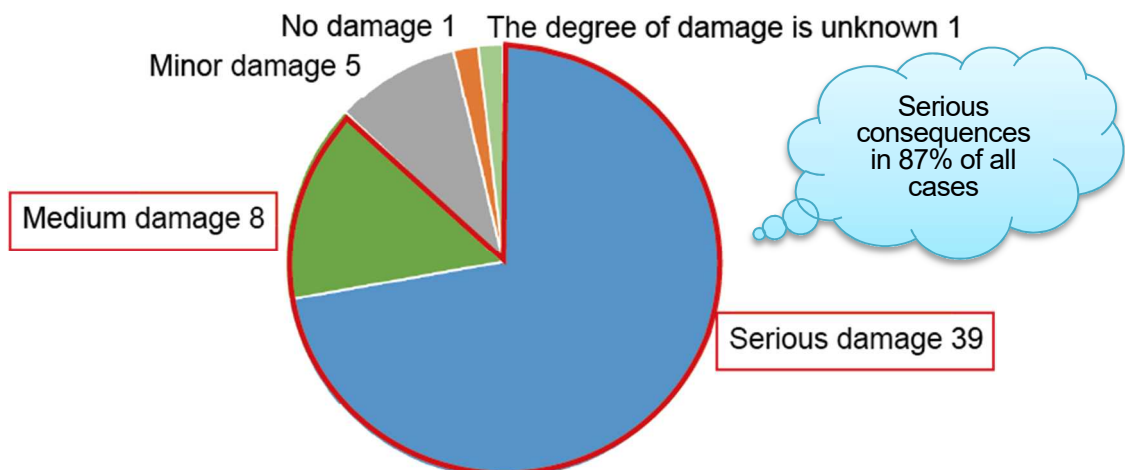


Figure 7 Damage Levels to Airframe

Of the 14 cases in which the flight altitude immediately prior to the accident was generally 10 meters or lower due to takeoff, landing, or jump flight, 12 (86%) involved fatalities or serious injuries, and 10 (71%) involved destruction of airframe, accounting for the vast majority of the accidents.

In addition, the proportion of accidents with fatalities, serious injuries, and destruction of airframe involving ultralight planes, etc., among accidents that occurred between 2001 and 2021 was higher compared to that of small aeroplanes and helicopters (see Fig. 8).

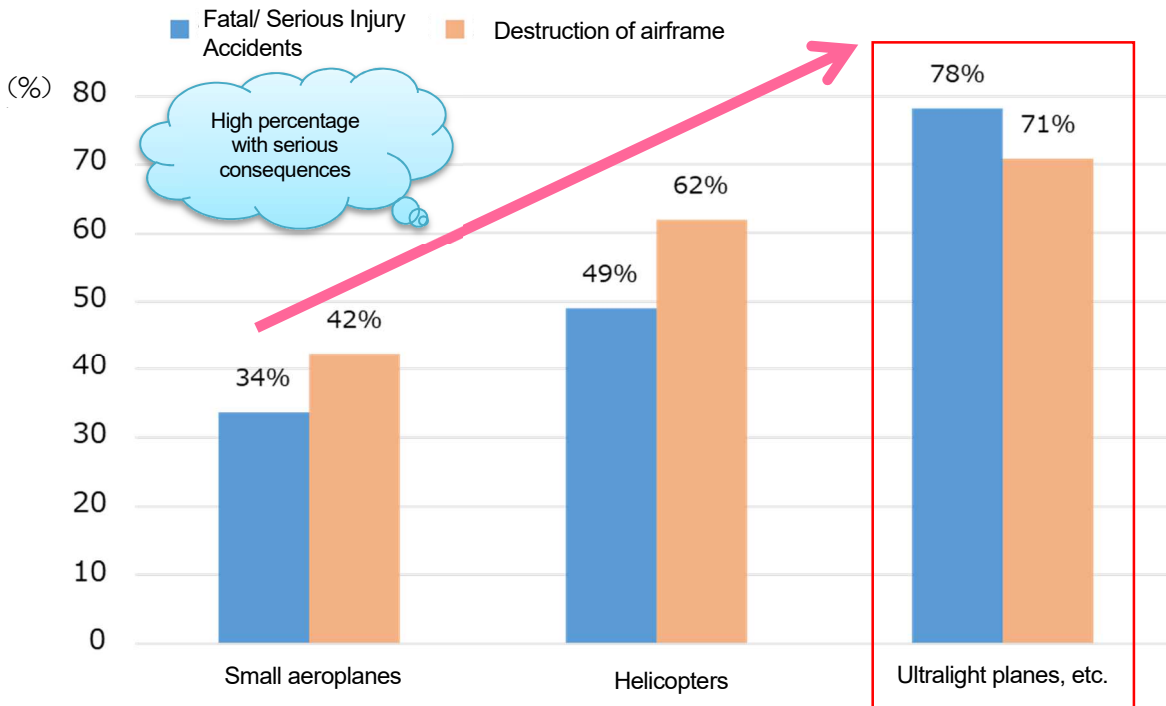


Figure 8 Comparison of Percentage of Fatal/ Serious Injury Accidents and Wrecks

These show that ultralight planes, etc. having a simple structure are often accompanied by serious damage if an accident occurs.

4. Statistics on Accidents by Age of

The ages of the 55* pilots ranged from 43 to 77, with 29 (53%) in their 60s and 8 (15%) in their 70s; those in their 60s to 70s accounted for about 70% of the total (see Fig. 9).

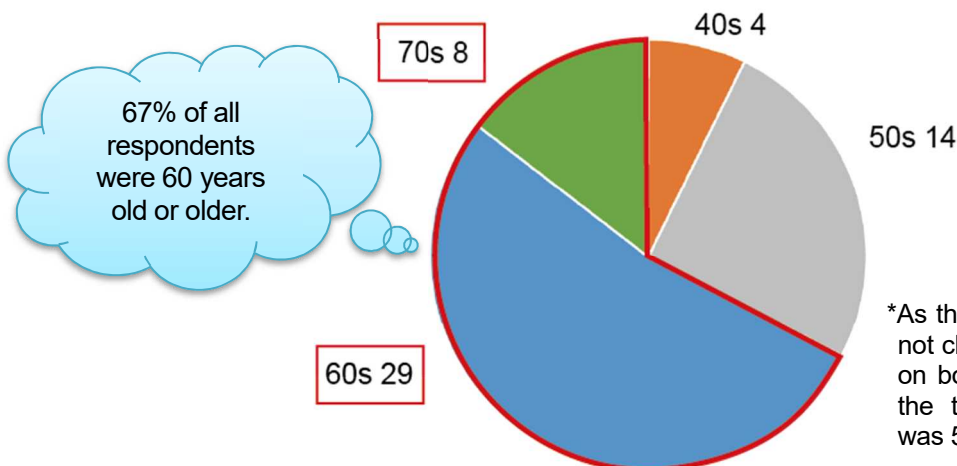


Figure 9: Age Composition of Pilots of Distressed Aircrafts

5. Causes of Accidents

Categorizing the direct causes of 54 accidents, "decrease in airspeed/stall" accounted for 16 (30%), followed by "contacts with property (during flight)" in 9 (17%) and "decrease in engine power/engine stop" in 7 (13%) (see Fig. 10).

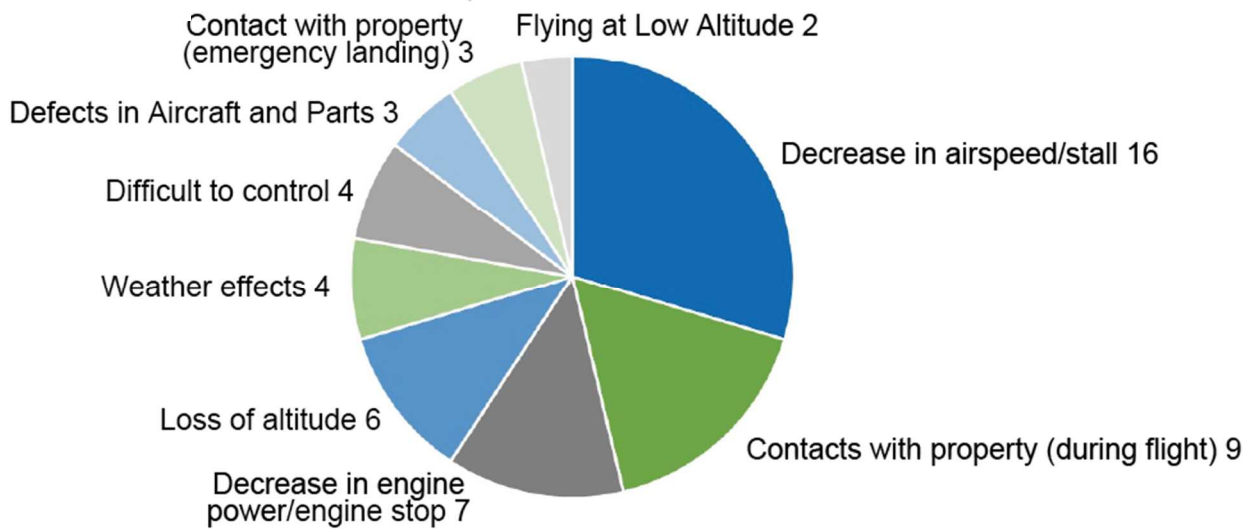


Figure 10 Causes of Accidents

3. Tips for Safe Enjoyment of the Sky ~Analysis of Factors That May Have Contributed to the Accidents~

To safely enjoy flying, it is enough to avoid the situation that caused the accident, but to do so, it is effective to focus on the factors behind the cause (safety risks) and take action to reduce those risks. It is also important to consider what needs to be done for safety from multiple perspectives, as a single accident may involve multiple factors.

In this chapter, we will consider what can be done to reduce risk during flight based on factors that may have had a role in the cause.

In the investigations of the 54 accidents analyzed in this study, 11 major factors were identified that may have played a role in the causes of the accidents (see Table 2). "Improper maneuvering" was a factor in 40 accidents, while "weather effects" and "lack of knowledge, skill, and experience" each accounted for 19 accidents. When several factors are involved in a single accident, the total is higher than the 54 accidents because the number of cases is counted for each of the several factors.

Improper piloting	40	Lack of Detection, Recognition and Knowledge	6
Weather effects	19	Flying at Low Altitude	6
Lack of Knowledge, Skill, and Experience	19	Deviation from Operational Limits and Lack of Checks	6
Defects in Aircraft and Parts	12	Flight Characteristics	3
Flawed Safety Management	11	Improper Assembly	2
Improper Inspection and Maintenance	9	Others	6

Table 2 Factors That Probably Played a Role in the Accidents

While reviewing the contents of these factors, we will consider ways to reduce safety risks, etc.

1. Improper Piloting

Improper maneuvering	
Response to and Control of Flight	12
Operation of Three Rudders (Rudder, Elevator Rudder, Auxiliary Wing)	10
Engine Operation	9
Sudden Maneuvering	5
Control of Speed	3
Others	1
Total	40

Forty accidents were identified in which improper maneuvering was a contributing factor.

Specifically, there were cases of inappropriate control of the aircraft, such as handling of attitude disturbance and deflection and excessive angle of descent; inappropriate pitch bank and throttle maneuverings; and operations that resulted in abrupt movements, such as steep turns.



Tips for Safety

- Maintaining a stable attitude and speed is a prerequisite for safety.
- Always keep the attitude of the aircraft and operate the throttle carefully, so as not to reach a condition that would require sudden maneuvering.

2. Weather (Wind)

Weather effects	
Tail Winds	6
Turbulent	5
Crosswinds	4
Gusts	1
Head Wind Speed Limit Exceeded at	1
Rainfall	1
Failure to Maintain Visible Weather	1
Total	19

Nineteen accidents were identified which has a metrological factor. Only two involved rainfall or clouds, and most were wind-related factors such as tailwinds, turbulent airflow, and crosswinds.



Tips for Safety

- Ultralight planes, etc. are more susceptible to the effects of wind due to their lighter airframe and slower flight speeds.
- Therefore, accurate understanding and prediction of unseen wind conditions are one of the most important factors for safe flight.



Tips for Safety (continued)

- Create a flight plan by gathering information on the wind conditions at the takeoff/landing site as well as the wind characteristics (including seasonal winds) in the area surrounding the takeoff/landing site. Always be aware of wind conditions while flying.

3. Lack of Knowledge, Skill, and Experience

Lack of Knowledge, Skill, and	
Lack of Familiarity with Aircraft	7
Insufficient Maneuvering Skills	5
Lack of Manual Checking	5
Lack of Knowledge Required for	2
Total	19

In order to properly operate the aircraft at all times, it is necessary to have the knowledge, skill, and experience appropriate to the stage of flight, and we were able to identify 19 accidents in which this was a factor.

Specifically, blanks in-flight experience, lack of familiarity with the new aircraft, insufficient pilot skills of trainees, and failure to check flight manuals and other documents were cited, as well as instances where trainees did not have access to manuals on flying and maintenance.

In addition, seven cases resulted in accidents due to unintentional takeoffs and ascents during jump flight training, etc.



Tips for Safety

- It is essential to read and understand the manuals issued by the manufacturer, etc., and to fly in accordance with the manuals, in order to protect your life.
- Trainees should be careful not to take off unintentionally.
- It is important for the flight instructor to plan the flight training by providing instructor-on-board training in the basic operations of the aircraft and by determining whether the trainee has the necessary skills for solo flight.
- Even after acquiring a certain level of skill, accidents can still occur when the pilot flying after a long time or operating an aircraft that the pilot has never operated before. Therefore, you should carefully check the aircraft's kinematics and other characteristics each time you fly, and plan your flight according to your recent flying experience and the weather conditions on the day of the flight to ensure that you have enough margin for safety.

4. Malfunction of Airframe or Parts, Improper Inspection or Maintenance

Defects in Aircraft and Parts		Improper Inspection and Maintenance	
Engine	4	Violation of Manuals, etc.	6
Airframe	3	Ignition System	1
Flight Controls	2	Propeller	1
Fuel System	2	Airframe	1
Propeller	1		
Total	12	Total	9

We were able to identify 12 accidents in which airframe or component failure was a contributing factor, and nine accidents in which improper inspection or maintenance was a contributing factor. Failures occurred in various parts of the aircraft, including the engine, airframe, flight controls, fuel system, and propeller.

In addition, there were 14 cases where modifications that did not conform to the manual were noted.



Tips for Safety

- As mentioned in Chapter 2, accidents involving ultralight planes, etc. often result in fatalities or serious injuries. Therefore, it is necessary to take all possible measures for maintenance on a routine basis.
- In addition to aircraft assembly work, works that do not conform to the official manuals, etc., as specified by the manufacturers, etc., such as failure to carry out inspections/maintenance work and regularly scheduled inspections, and repair work using substitute products, are one of the factors that may cause an accident.
- Gradual changes over time, such as corrosion of parts, wear and loosening of fasteners, can lead to accidents.
- Before and after the flight, carefully inspect and maintain the aircraft in accordance with the authorized manuals, paying close attention to even minor anomalies or changes in condition

5. Others

Other factors included failure to visually recognize obstructions such as trees, power lines, etc., and deviated or unidentified weight/center of gravity positions.



Tips for Safety

- In the case of ultralight planes, etc., deviation from the weight and center of gravity position may have a significant impact on flight characteristics. Check to see if the weight and center of gravity are within the proper range.
- Trees, power lines, etc., which are easily visible on the ground, are difficult to see during flight. Therefore, it is important to confirm the location of obstacles in advance with drawings, etc., and to monitor the outside of the aircraft carefully during flight.
- Observe the safety management regulations and properly wear seat belts, helmets, and life vests.

The report also pointed out many violations of laws and regulations, such as not obtaining the necessary Civil Aeronautics Law permits for flights of ultralight-powered aircraft, etc. (airframe (proviso of Article 11-1 of the Civil Aeronautics Law), pilot (Article 28-3 of the same), and takeoff/landing site (proviso of Article 79 of the same)) and not satisfied the permission conditions.

In the 54 accidents analyzed in this study, we were able to identify these observations in 39 cases (72%).



Tips for Safety

- These permits are not imposed merely as an obligation, but as a pathway to ensure safety for those who enjoy the sky. Be sure to obtain a permit and comply with the conditions of the permit.
- The application details required by the Civil Aeronautics Law are a concrete checklist to protect the lives of passengers. Follow the application items and make careful preparations for safe enjoyment of the sky.

4. Case Studies of Accidents

Based on what we have seen so far, let's take a look at accident cases. In the case studies, the causes are shown in red boxes, and the factors that probably contributed to the accidents are shown in orange boxes. Pay attention to not only the causes but also the factors, and think about what to do to prevent accidents.

Case 1: Improper Piloting

Date and Time of Occurrence: Around 15:25, September 11, 2010

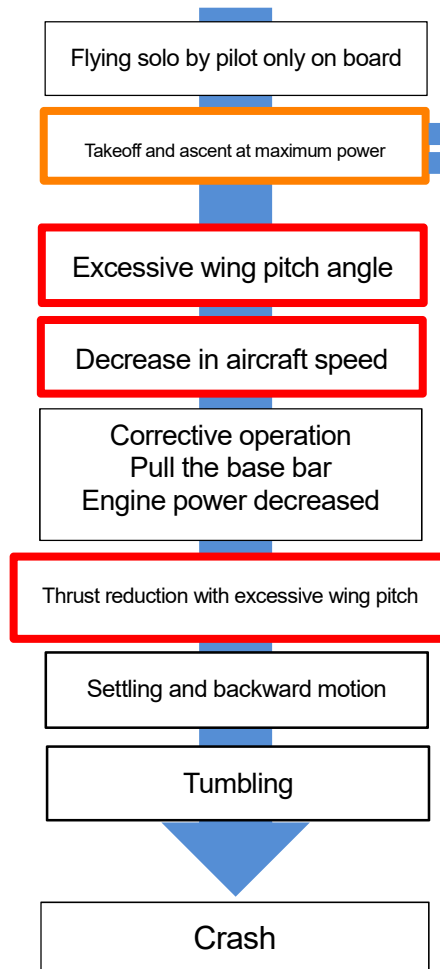
Type: AEROS AEROS2-R912 (weight transfer controlled ultralight plane)

Summary of the Accident: While ascending after takeoff from Temporary Airfield A with only the pilot on board, the aircraft went into a tumbling* and crashed due to thrust reduction under conditions of excessive wing pitch angle. The airframe was severely damaged and the pilot was seriously injured.

*Tumbling is an unstable flight condition that is difficult to recover from and causes the aircraft to fall while continuously rolling forward.

Flight conditions at the time of the accident

Description in manuals issued by the manufacturer



Minimum pilot weight in solo flight

At the minimum takeoff weight, about 2/3 of the maximum takeoff power is appropriate.

The maximum power output at minimum takeoff weight may exceed 45° angle of ascent.

Do not raise the pitch of the wings beyond 45° to the horizontal. A rapid ascent is dangerous and may result in a stall and rapid nose down.

Do not stall the aircraft by raising the nose beyond 45°. Movement beyond this limit is dangerous and may result in backward motion followed by tumbling.

Fig. 1 Estimated flight path map

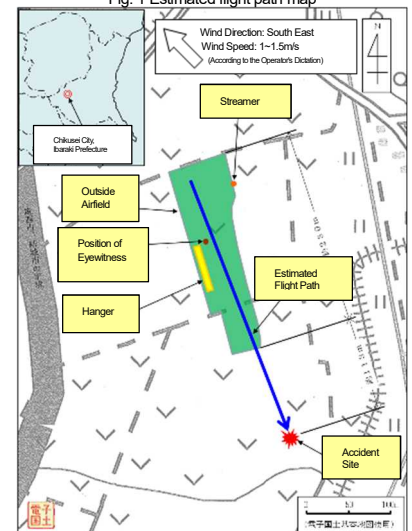
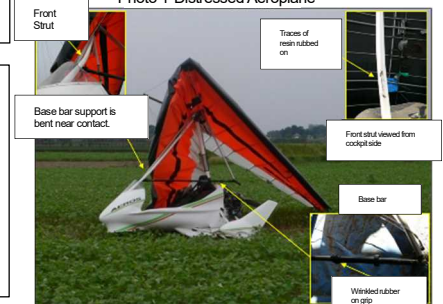


Photo 1-Distressed Aeroplane



【Probable Causes: Improper Piloting】

While ascending at the maximum engine power, the wing pitch became excessive and the speed decreased. The pilot pulled the base bar to correct the decrease in speed and subsequently reduced the engine power, which caused the aircraft to back off and rapidly drop the front of the wings, presumably resulting in tumbling and crashing.

【Factors: Lack of Knowledge, Skill, and Experience】

- It is presumed that the pilot, not fully understanding the meaning of the limitations and warnings in the manual issued by the aircraft manufacturer regarding the pitch angle and engine power for a single-passenger flight, took off and ascended at the maximum power that is restricted for use in a single-passenger flight.
 - In the case of a weight-transfer controlled ultralight plane, the tendency to turn the entire aircraft upward generally increases in response to growing thrust.
- Since the accident aircraft had an increased thrust due to the engine conversion, it is believed that the crew was unaware that this would result in excessive wing pitch angles.

Please view the accident investigation report for detailed findings. (issued on July 29, 2011)

<https://www.mlit.go.jp/jtsb/aircraft/rep-acci/AA2011-5-1-JR7423.pdf>

Case 2: Weather (Wind)

Date and Time of Occurrence: Around 13:04, July 27, 2014

Type : Beaver RX550-R503L (rudder surface controlled ultralight plane)

Summary of the Accident : During a familiarization flight with only the pilot on board at Temporary Airfield B, the aircraft was hit by a strong right crosswind upon landing. Due to the weathervane effect*, the aircraft was suddenly deflected to the right and crashed on the grassy area outside the airfield when it made its go-around.

The airframe was severely damaged and the pilot was seriously injured.

*Weathervane effect refers to the tendency of the nose of an aircraft to try to match the wind direction of the relative wind.

Flight conditions at the time of the accident

Pilot operation and judgment

See Figure 2 for (1) to (8)

Winds are forecast to increase around 15:00. Black clouds developing to northwest.

Takeoff at 13:00

Flying down wind

RWY30 to final approach route

Aircraft deflected to the right.

The nose suddenly deflected to the right (1).
Weathervane effect due to strong right crosswind

Nose-up attitude near stall speed

Flying with the right wing tip grazing the trailer (4)

The aircraft tilts sharply to the left.(5)

Left wing tip (6) and the nose (7) grounded.

Crash(8)

Plan to fly over airfield traffic pattern one time only

Grasping the change in wind direction and deciding to land

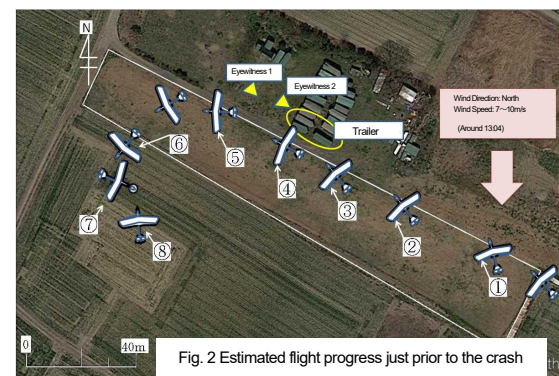
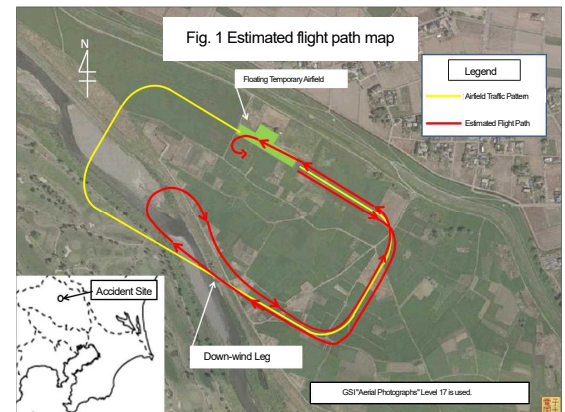
Step on left rudder → unable to correct properly
Considering go-around, but because the angle of approach was appropriate and altitude was decreasing, the approach was continued.

Step on left rudder → Nose direction not easily corrected (2)

Danger of colliding with a trailer
Decided to go-around

Increase engine power and pull back on the control stick (3)

Step heavily on left rudder to avoid collision



- When rudder is stepped heavily near the stall speed, the aircraft enters a spin in the direction of the rudder step.
- Since propeller rotation direction is clockwise when viewed from behind, nose tends to turn to the left due to increased engine power.

【Probable Causes: Flight Characteristics, Improper Operation】

During landing go-around, the pilot increased the engine power at a low nose-up speed near the stall speed. In this situation, the pilot stepped heavily on the left rudder, which probably caused the aircraft to lose altitude and tilt sharply to the left and to have crashed.

【Factors: Meteorology Effects, Improper Judgment, Flawed Safety Management】

- In a slow nose-up condition near stall speed, the pilot stepped heavily on the left rudder. It is probable that this was due to the pilot's attempt to avoid a collision with the trailer.
- The aircraft went close to the trailer, probably due to the pilot's inability to properly steer the aircraft, which was deflected to the right by a strong right crosswind.
- It is probable that the fact that the trailer was placed in an area which should have been free played a role in the go-around maneuver.
- Since large corrective maneuvers just before ground contact are dangerous, the pilot should have considered go-around when the nose deflected to the right.

Please view the accident investigation report for detailed findings. (issued on December 18, 2014)

<https://www.mlit.go.jp/jtsb/aircraft/rep-acci/AA2014-8-2-JR1096.pdf>

Case 3: Lack of Knowledge, Skill, and Experience

Date and Time of Occurrence: Around 09:33, August 1, 2020

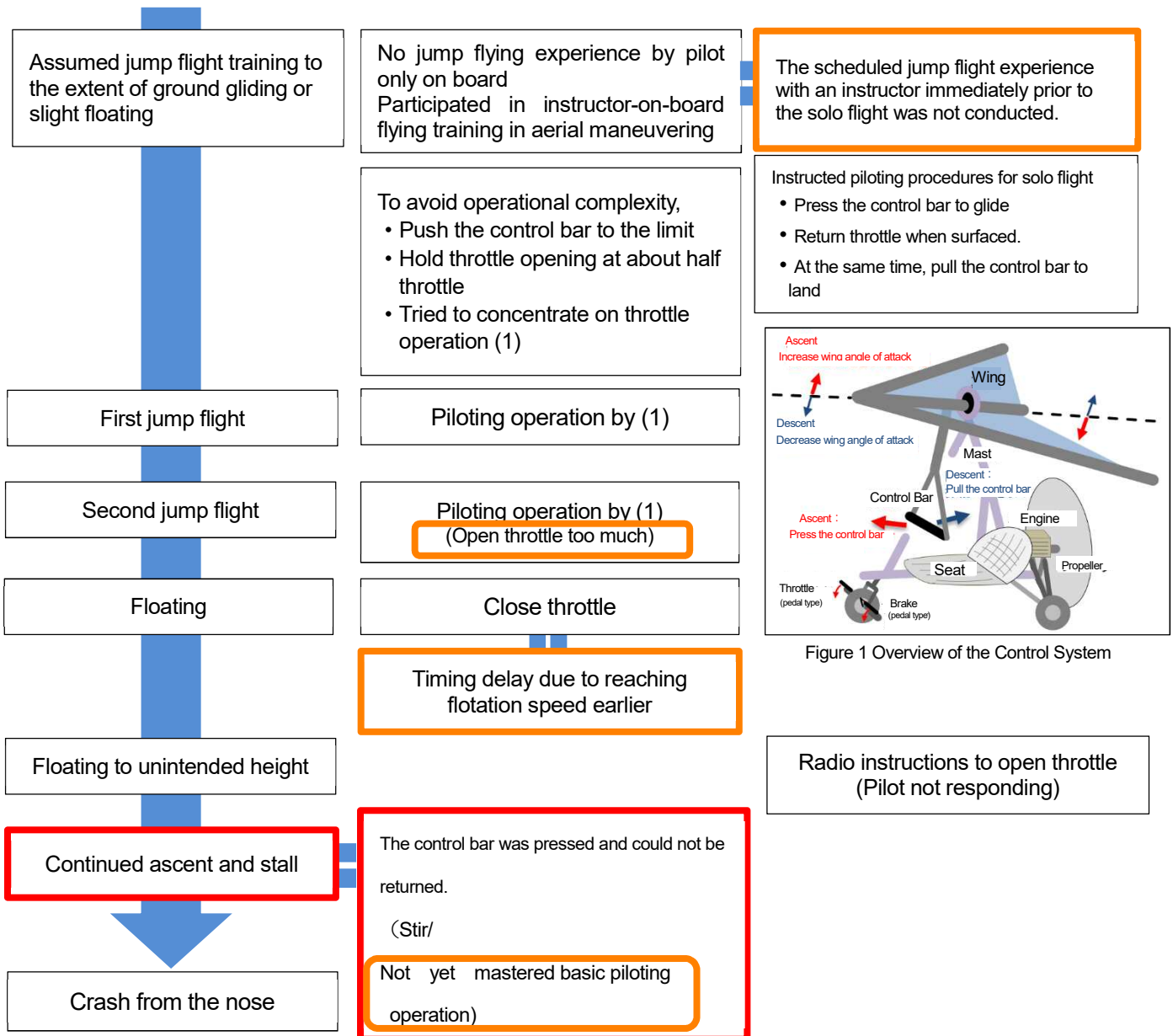
Type: New Wings MAX-R447/MAW (Weight transfer controlled ultralight plane)

Summary of the Accident: During a jump flight* at a temporary airfield with only one pilot on board for maneuver training, the aircraft unintentionally ascended and crashed from the nose shortly afterwards.

The airframe was severely damaged and the pilot was seriously injured.

*Jump flights are defined as flights made within the runway up to slight floating in the air (3 m altitude).

Flight conditions at the time of the accident Pilot training and operating conditions Piloting instructor's guidance and judgment



【Probable Causes: Improper Piloting】
 It is probable that the pilot did not operate the control bar and throttle properly during the training of jump flight, resulting in the aircraft ascending to a height unintended by the pilot after floating, and then continuing to ascend and losing speed afterwards, causing the aircraft to crash from the nose.

【Factors: Lack of Knowledge, Skills, and Experience】
 Probable reasons why the piloting maneuver was not performed properly are as follows:

- Operational training on the ground prior to the jump flight and flight training with a flight instructor on board were not sufficiently conducted.
- The pilot did not master the basic piloting operation.

Please view the accident investigation report for detailed findings. (issued on June 24, 2021)
<https://www.mlit.go.jp/jtsb/aircraft/rep-acci/AA2021-4-1-JR7151.pdf>

Case 4: Defects in Aircraft and Parts

Date and Time of Occurrence: Around 15:19, June 9, 2020

Type: Sanyo Tekko EX-03C PUFFIN-LT447 (rudder surface controlled ultralight plane)

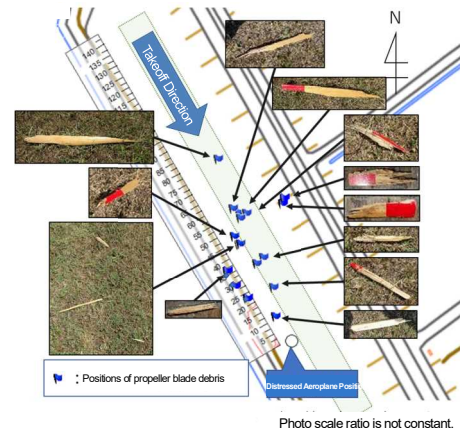
Summary of the Accident: The aircraft crashed during a jump flight at a temporary airfield. Only the pilot of the aircraft was on board, and was deceased.

The airframe was severely damaged but did not catch fire.

Figure 1 Flight progress based on video analysis



Figure 2 Distribution of Propeller Blade Debris



Flight situation at the time of the accident

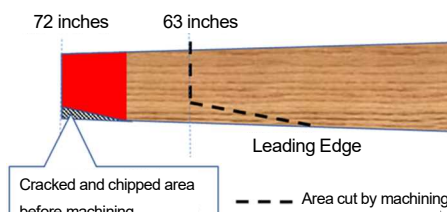
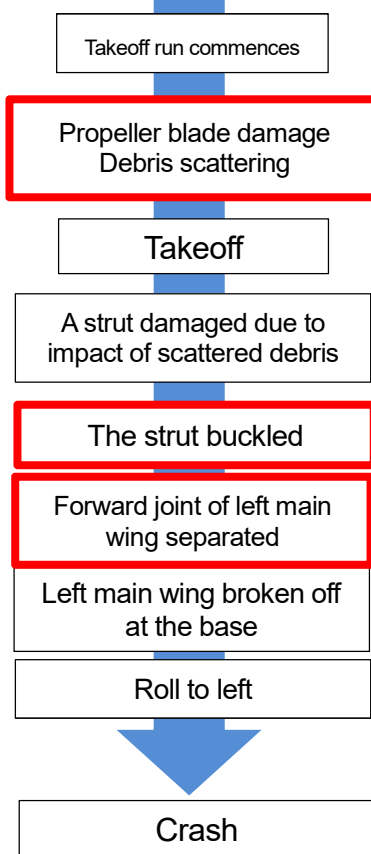


Fig. 3 Before and after propeller machining

Propellers found to be damaged were used by machining. Such machining not only drastically alters propeller performance, but may also significantly affect the strength and durability of propeller blades, and may cause internal delamination or other damage during machining. The user should not perform such machining and should request the propeller manufacturer to do so if necessary.

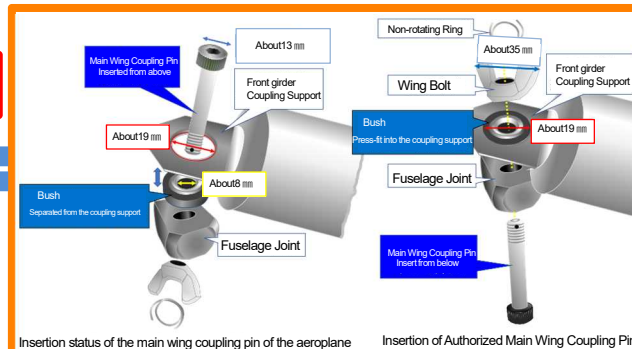


Fig. 4 Insertion direction of the main wing coupling pin is upside down

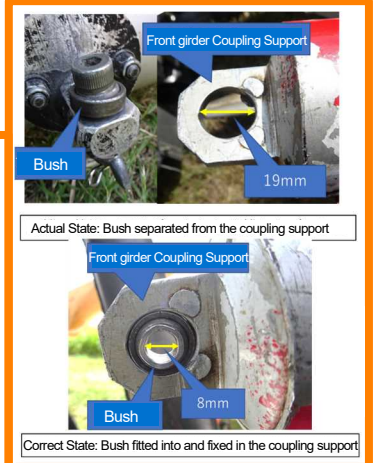


Fig. 5 Bush separated from coupling support of wing front girder due to wear

【Probable Causes: Failure of Airframe or Parts】

It is probable that the propeller blade was damaged after the takeoff run started, and some of the scattered debris hit the rear strut of the left wing, causing the strut to buckle and the forward joint of the left wing to separate during the subsequent ascent, resulting in the crash.

【Factors: Improper Inspection and Maintenance, Improper Assembly】

- The damage of the propeller blades may have possibly been caused by external damage or potential internal damage due to collision with foreign objects and the effects of machining to change the propeller diameter.
- The following factors are most likely to have contributed to the separation of the forward joint of the left main wing:
 - Insertion direction of the
 - (1) main wing coupling pin is upside down (improper assembly)
 - (2) Bush of front girder coupling of the main wing separated (improper inspection and maintenance)
 - (3) From (1) and (2), because the pin head became 13 mm and the

Please view the accident investigation report for detailed findings. (issued on April 22, 2021)

<https://www.mlit.go.jp/jtsb/aircraft/rep-acc/AA2021-3-3-JR0862.pdf>

5. Summary (Conclusion)

Accidents involving ultralight planes, etc., result in serious damage

Out of total 54 accidents, 42 (78%) were accidents involving fatalities or serious injuries.

Fatal accidents	5 (28%)
Accidents resulting in serious injury	27 (50%)
Others	12 (22%)

Out of the 54 accidents, 47 (87%) were cases of large/medium breakage.

Accidents with large breakage	39 (72%)
Accidents with medium breakage	8 (15%)
Others	7 (13%)

The main factors of the accidents are as follows:

Improper piloting	40	Lack of Detection, Recognition and Knowledge	6
Weather effects	19	Flying at Low Altitude	6
Lack of Knowledge, Skill, and Experience	19	Deviation from Operational Limits and Lack of Checks	6
Defects in Aircraft and Parts	12	Flight Characteristics	3
Flawed Safety Management	11	Improper Assembly	2
Improper Inspection and Maintenance	9	Others	6

Let's judge and act on the safe side!

【Maintenance and Management of Aircraft】

- (1) Do you have access to the maintenance manual and understand its contents?
- (2) Are you conducting inspections and maintenance in accordance with manuals and manufacturer's or other instructions?
- (3) With aging in mind, do you carefully inspect and maintain even small abnormalities and changes in condition with the utmost care?

【Assembly of Airframe】

- (1) Do you have access to the assembly manual and understand its contents?
- (2) Are you assembling the parts in accordance with the manual?

【Before Flight】

- (1) Do you have access to the flight manual and understand its contents, including limitations and prohibitions?
- (2) Have you obtained the necessary air permits and plan to fly in accordance with the permit conditions and the flight manual?
- (3) Do you lack or have deteriorated the skills necessary for flying, such as not being familiar with basic control operations or having a blank in flying?
- (4) Do you check the maintenance status, fuel loading, weight and center of gravity position, and other items necessary for safe flight?
- (5) Do you check weather conditions and forecasts, paying particular attention to wind?
- (6) Do you observe safety management regulations and install safety equipment such as seat belts, helmets, life jackets, etc.?

【When Flying】

- (1) Are you able to maintain a stable attitude and speed?
- (2) Are you paying attention to the flight characteristics, avoiding abrupt maneuvers, and performing necessary and appropriate steering and throttle operations?
- (3) Are you properly monitoring the exterior and instruments to properly assess the status of the flight?

One way to reduce risk is to learn about risks from past accident cases and consider countermeasures. In addition to this Digest, please use the accident and serious incident investigation reports published by the Japan Transport Safety Board (JTSB) for case studies.

In addition, the Civil Aviation Bureau also disseminates safety-related information. Please also refer to these documents listed below.

Website of the Ministry of Land, Infrastructure, Transport and Tourism (Ensuring the Safety of Ultralight Planes, etc.)

https://www.mlit.go.jp/koku/15_bf_000073.html

A word from Director for Analysis, Recommendation and Opinion

While ultralight planes, etc. are popular for sky leisure, it is a matter of concern that the number of accidents in recent years has tended to be higher than that of small airplanes. Although there are various factors that contribute to accidents, I feel that it is important to stick to the basics, even though the assembly, maintenance, and operation of airplanes may change. I believe it is important to enhance safety in basic and commonplace actions while learning from so-called failed cases.

By the way, in the Accident Case 4 introduced on page 13, video footage taken by an eyewitness was helpful in determining the cause of the accident. In this way, taking video of flight conditions from a safe location on the ground allows you to look back on your own flight objectively, which is useful for improving your piloting skills, and can also be used to nip accidents in the bud by reviewing the situations when you got a fright or faced a gasp scene. I believe that taking and using video from the ground is also effective for safety.

We sincerely wish that you will use this digests and accident investigation reports to further improve the safety of your flights and enjoy the sky as much as possible.





Courtesy of Japan Microlight Aeronautic League

JTSTB Secretariat, MLIT
15F Yotsuya Tower
1-6-1, Yotsuya2-1-2, Shinjuku-ku
Tokyo, 160-0004 Japan
(Staff in charge: Director for Analysis,
Recommendation and Opinion)

TEL 03-5367-5030
URL <https://www.mlit.go.jp/jtsb/index.html>
e-mail hqt-jtsb_bunseki@gxb.mlit.go.jp

We welcome your comments on "JTSTB Digests"
and requests for dispatching lecturers.