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AIRCRAFT ACCIDENT INVESTIGATION REPORT

PRIVATELY OPERATED,
AEROMOT-INDUSTRIA MECANICO METALURGICA
AMT-200 (MOTOR GLIDER, DUAL-SEAT) JA203X
MIHO AIRSTRIP, SHIMIZU-KU WARD, SHIZUOKA-CITY
JULY 15, 2006

March 30, 2007

Aircraft and Railway Accidents Investigation Commission
Ministry of Land, Infrastructure and Transport

The investigation for this report was conducted by Aircraft and Railway Accidents Investigation Commission, ARAIC, about the aircraft accident of PRIVATELY OPERATED AEROMOT-INDUSTRIA MECANICO METALURGICA AMT-200(MOTOR GLIDER,DUAL-SEAT) JA203X in accordance with Aircraft and Railway Accidents Investigation Commission Establishment Law and Annex 13 to the Convention of International Civil Aviation for the purpose of determining cause of the aircraft accident and contributing to the prevention of accidents and not for the purpose of blaming responsibility of the accident.

This English version report has been published and translated by ARAIC to make its reading easier for English speaking people those who are not familiar with Japanese. Although efforts are made to translate as accurate as possible, only the Japanese version is authentic. If there is difference in meaning of the texts between the Japanese version and the English version, texts in the Japanese version are correct.

Norihiro Goto,
Chairman,
Aircraft and Railway Accidents Investigation Commission

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**PRIVATELY OPERATED,
AEROMOT-INDUSTRIA MECANICO METALURGICA
AMT-200 (MOTOR GLIDER, DUAL-SEAT)
JA203X
MIHO AIRSTRIP, SHIMIZU-KU WARD, SHIZUOKA-CITY
AROUND 14:40 JST, JULY 15, 2006**

February 21, 200

**Adopted by the Aircraft and Railway Accidents Investigation Commission
(Air Sub-committee Meeting)**

Chairman Junzo Sato

Member Yukio Kusuki

Member Susumu Kato

Member Noboru Toyooka

Member Yukiko Kakimoto

Member Akiko Matsuo

1 PROCESS AND PROGRESS OF THE ACCIDENT INVESTIGATION

1.1 Summary of the accident

On Saturday July 15, 2006, privately operated Aeromot-Industria Mecanico Metalurgica AMT-200, registration JA203X, took off from Fujigawa glider strip for proficiency training and had a plan to return to Chofu aerodrome after practicing touch-and-go's at Miho airstrip. Upon making the first landing at Miho airstrip, left wingtip of the aircraft was caught by tall grass near the boundary of airstrip and subsequently the aircraft was immobilized after turning counter clockwise to opposite heading near the boundary between shoulder-like area and the airstrip around 14:40 Japan Standard Time (JST¹).

Injury to persons on board: No casualty

Damage to aircraft: Airframe sustained medium level damage. No fire broke out.

1.2 Outline of Accident Investigation

On July 16, the investigator-in-charge and one investigator made on-site investigation.

Accredited representative from Brazil, as the state of design and manufacture of the aircraft, participated in the investigation.

Comments were taken from the parties relevant to the cause.

Comments were invited from the participating state.

¹ Unless otherwise indicated, all times are JST, based on a 24-hour clock.

2 FACTUAL INFORMATION

2.1 History of flight

Privately operated Aeromot-Industria Mecanico Metalurgica AMT-200 (Commonly known as Super Ximango), registration JA203X (hereinafter called “the aircraft”), took off from Fujigawa glider strip around 14:35 on July 15, 2006 with pilot in command (PIC) in its left seat and a person² in its right seat. The aircraft was to practice touch-and-go’s at Miho airstrip (35°01’15”N, 138°32’10”E) and then to fly back to Chofu aerodrome.

The outline of the flight plan submitted to Japan Civil Aviation Bureau (JCAB) Tokyo Airport Office was as follows.

FLIGHT RULES: VFR
DEPARTURE AERODROME: Fujigawa glider strip
ESTIMATED OFF BLOCK TIME: 14:40
CRUISING SPEED: 90kt
CRUISING ALTITUDE: VFR
ROUTE OF FLIGHT: Atami
DESTINATION AERODROME: Chofu aerodrome
ENDURANCE: 1 hour 20 minutes
PERSONS ON BOARD: 2

The history of the flight up to the accident was stated by the PIC, the second pilot and a witness as follows.

(1) The PIC

I became an owner of the aircraft last year [2005]. Because I was not confident with my skill, I asked instruction to the second pilot. Last June [2006] under his instruction, I had once conducted touch-and-go practice at Fujigawa glider strip and navigation practice to Chofu aerodrome. Again this time I asked him to do so.

On that day, the pre-flight check at Chofu aerodrome was non-problematic and we took off there at 11:00 and landed at Fujigawa glider strip at 11:45. My initial plan was to practice some touch-and-go’s there, however, the glider strip was used by radio controlled model airplanes and I had to give up training there. The flight plan for our return flight to Chofu aerodrome, which included some touch-and-go practice at Miho airstrip, was filed by the second pilot while I was away from him. I accepted his plan. We took off from Fujigawa glider strip at 14:35 and headed for Miho airstrip. On 5nm radius of Miho airstrip, on the frequency of 123.5MHz, I radioed one-sidedly (to the ground and air stations concerned) that my aircraft was heading to the airstrip, and on 2nm radius of the airstrip, I radioed my direct entry to the left base. Landing at Miho airstrip as a pilot was my first experience although I landed there as a passenger long time ago. When I land at unfamiliar airstrip I make it a rule to conduct a low pass, however, this time I didn’t do that and continued approach and landed because the second pilot was very familiar with it.

Because my attention was mainly directed to align the aircraft on final approach path and touch down on the airstrip center line, as near to the threshold as possible, I could not afford to pay attention to airstrip width or grass height nearby. Upon touch down I thought the aircraft was a little

² This person is called “second pilot” hereinafter in English version of this report as he is a pilot.

left from the center line but I judged it quite normal as my skill is not good enough. Touchdown airspeed was 60kt. Soon after the touchdown the aircraft veered to the left. I thought this was caused by imbalance of main landing gears and I gave it a corrective input, however, the aircraft direction remained unchanged. The second pilot realized that something went wrong, he increased power and tried to steer the aircraft to the right, but no avail. After he took control of the aircraft I just loosely grabbed control stick and did not applied any corrective input. The aircraft finally came to a halt after turning counter clockwise to opposite heading.

When the aircraft started to veer left neither of us knew what happened. A man who witnessed the occurrence told me that the wing was caught by the grass.

When I saw the touchdown point later, I thought I wouldn't have landed there if I had known how narrow that part of the airstrip was. If the second pilot had advised me to extend the touchdown point further, I would have done that, however, without that sort of advice I landed the aircraft as I intended. Furthermore from the air you can't tell grass height. I thought the grass ought to have been mowed.

(2) The second pilot

I filed a flight plan with duration of flight of 1 hour and 20 minutes to return to Chofu aerodrome after conducting a couple of touch-and-go practice at Miho airstrip. I filed the reversed route of flight out of the flight plan bound for Fujigawa glider strip and forgot to include touch-and-go practice at Miho airstrip under the OTHER INFORMATION column.

It takes about five minutes for the aircraft to fly from Fujigawa glider strip to Mino airstrip.

Because the length of airstrip is 600m, I suppose the PIC wanted to touch down the aircraft as near to the threshold as possible. Wind was weak and it seemed to have measured 130° at 4kt. Landing was good and I thought we touched down 1 or 2m left of the center line. At first I didn't understand what was going on. I thought the PIC was applying left rudder input, I said "What are you doing?" Her answer was "Nothing." I thought the left main wheel had a flat tire, I increased power and tried to steer the aircraft to the center of the airstrip. However with the continued drag of grass, the aircraft finally pivoted to the left on the left wingtip.

My latest flight experience at Miho airstrip was one or two weeks before the accident.

(3) The witness

I had been monitoring the aircraft since it was on final. Its approach was steady and I thought it landed on the centerline of the airstrip. The place it landed was narrow part of the airstrip and its left wing was caught by the grass and the aircraft veered left. I think it was when the aircraft proceeded to the wider part of the airstrip, engine power was increased. The aircraft's left wingtip was occasionally caught by grass as it proceeded. Just after passing the wind sock, the aircraft pivoted to the left on its left wingtip and came to a halt. Then I ran to the aircraft.

The accident site was on Miho airstrip located in Shimizu-ku ward, Shizuoka city, Shizuoka prefecture and the time of occurrence was around 14:40.

(See figure 1 and Picture)

2.2 Personnel information

(1) Pilot: Female, age 50

Private Pilot Certificate (Motor Glider)

Date of issue	August 3, 1993
Class 2 Airman Medical Certificate	
End of validity	December 21, 2006
Total flight time	524 hours 51 minutes (Glider: 346 hours 19 minutes, number of launch: 671)
Flight time, last 30 days	None
Total flight time on AMT200	7 hours 45 minutes
Flight time, last 30 days	None
(2) Second pilot: Male, age 83	
Private Pilot Certificate (Motor Glider)	
Date of issue	October 16, 1969
Class 2 Airman Medical Certificate	
End of validity	June 22, 2007
Total flight time	About 24,500 hours (Glider: about 2,000 hours, number of launch: about 8,000)
Flight time, last 30 days	8 hours 00 minutes
Total flight time on AMT200	6 hours 50 minutes
Flight time, last 30 days	2 hours 20 minutes
(Total flight time is based on his statement.)	

2.3 Aircraft Information

2.3.1 Aircraft

Type	Aeromot-Industria Mecanico Metalurgica AMT-200
Total time in service	17 hours 45 minutes
Weight and center of gravity at the time of the accident	Estimated as 811.1kg with the position of center of gravity at 130.7cm aft of datum line, both being within the allowable limits.

(See Figure 2)

2.3.2 Engines

Type: Rotax 912A2
Total time in service: 17 hours 45 minutes

2.3.3 Aircraft damage by part

- (1) Main landing gears and tail wheel Fractured
- (2) Left wing Damaged
- (3) Propeller Fractured

2.4 Meteorological Information

The witness near the accident site stated the weather at the time of accident as follows.
Wind direction 130°, Wind speed 2 to 3kt, Visibility more than 10km

2.5 Information on accident site

Miho airstrip, the accident site, lies on Miho beach, whose direction is 15/33 and elevation is 3m.

Length and width of the airstrip, according to the airstrip layout which is attached to the temporary take-off/landing application submitted by an airplane operator to the Tokyo Airport Office, measure 600m long by 20m wide paved with asphalt, however, in reality northern end portion of the airstrip (62m in length) where the aircraft touched down is paved 10m wide. The area outside of the width is covered by grass, but perimeter of the airstrip including this area has not been mowed for a certain period of time, which resulted that the grass height measured about 80cm in the area where right wingtip passed whereas it measured about 1m in the area where left wingtip passed.

The aircraft was immobilized oriented to the north near the boundary between shoulder-like area and airstrip. Contact marks made by both main wheels stretched about 12m long to the point where the aircraft stopped. A contact mark made by left main wheel was found about 10m before the beginning of the aforementioned marks. A hit mark made by propeller was found on the shoulder-like area about 10m before the point where the aircraft stopped.

(See figure 1)

2.6 Detailed information of aircraft damage

Damage of major parts was as follows.

(1) Main landing gear shock struts and tail wheel shock strut were all fractured. The spring housed in the left main landing gear strut was fractured after a part of it was extended.

(2) On the left wing leading edge about 2m away from the wing root, there was a about 40cm long span-wise crack and paint was scratched off there. On the lower part of the crack there was a dent which is considered to have been hit by a part of rectangular shaped object and red oil streaks were observed nearby. A part of left wingtip paint was thinly scratched off in the span-wise direction.

(3) Both propeller blades were fractured at about 30cm from their root.

2.7 Other necessary information

(1) Coordination of training at Miho airstrip

The PIC and the second pilot, as the second pilot was the representative of the managing body of the airstrip and was well aware of Miho airstrip, did not make coordination with the personnel stationed at the airstrip on their planned touch-and-go practice.

(2) Utilization of Miho airstrip by motor gliders

Motor gliders use Miho airstrip once or twice a year.

(3) Extension of length of Miho airstrip

Miho airstrip had been an airstrip of 500m long and 20m wide, however, an airplane operator applied to Tokyo Airport Office to extend each end by 50m, which resulted in 600m long airstrip, and permission was obtained.

(For reference gliders are not required temporary take-off/landing permission in accordance with Article 79 of Civil Aeronautical Law.)

(4) Relocation of runway designation marking

According to the managing body of Miho airstrip, in April this year [2006] it relocated the designation marking “15” to present position from the previous position.

(See figure 1)

(5) Grass mowing work at Miho airstrip

Grass mowing work near the boundary of the airstrip was scheduled in latter half of July. Latest grass mowing was conducted about one month before [this accident].

(6) Clearance between wingtip and the ground of the type of the aircraft with two persons on board measured around 1.1m.

(7) The type of the aircraft has oleo type shock struts for main landing gears, which contain oil (colored red), spring and compressed air.

(8) The flight plan filed by the second pilot to the Tokyo Airport Office lacked a waypoint “Shimizu” in the ROUTE column and the information to conduct touch-and-go training at Miho airstrip in the OTHER INFORMATION column.

3. Analysis

3.1 Aircrew certificates and medical certificates

The PIC and the second pilot had adequate airman certificates and valid airman medical certificates in accordance with applicable regulations.

3.2 Certificate of airworthiness

The aircraft had a valid certificate of airworthiness and was maintained in accordance with applicable regulations.

3.3 Relations with weather conditions

It is estimated that the weather condition at the time of the accident had no effect on the occurrence of the accident.

3.4 Preparation of flight

As to practicing some touch-and-go's at Miho airstrip on the return flight to Chofu aerodrome, it is estimated that the PIC had had no plans to do that and had not known data and information of Miho airstrip, including cautions for take-off and landing. However, it is considered possible that the PIC might have obtained the information of grass height among others if the PIC had received information by telephone or had consulted the second pilot who knows about Miho airstrip very well.

3.5 Relationship between PIC and the second pilot

Based on the statements in 2.1(1) and because the PIC conducted the practice without confirming its details as the second pilot knows very well [about Miho airstrip], and because the PIC did not manipulate the control stick after the second pilot increased the power and took the control stick when the aircraft nose veered to the left, it is estimated that practically there was such relationship that the PIC was a trainee and the second pilot was an instructor.

3.6 Landing operations

The PIC maneuvered the aircraft to directly enter the base leg, turned left, flew the final and landed on the airstrip. It is estimated that with an idea to use the airstrip with ample margin by touching down as short as possible, the PIC maneuvered the aircraft to land aiming the vicinity of [runway] designation marking.

It is estimated that during approach the PIC had a mindset that the grass area near the boundary of the airstrip should have been properly mowed.

As described in the statement, the PIC should have flown a low pass and check the condition of the airstrip, where the PIC has never landed as pilot. If done, it is considered possible that the PIC could recognize that the width of paved area near the north-end of airstrip was narrower than the wingspan of the aircraft.

Furthermore if the PIC had paid additional attention to the surroundings other than touchdown point when the aircraft reached over the threshold, it is considered possible that the PIC

could recognize that paved area near the touch-down point was narrower than the wingspan of the aircraft.

3.7 Aircraft maneuver after touchdown

After touchdown left wingtip or its vicinity was caught by grass, the aircraft nose veered to the left and the aircraft was going out of the airstrip. In order to counter this, the second pilot increased the power and tried to return the aircraft to the centerline. This caused the aircraft's speed to increase. However because the left wingtip or its vicinity was trapped by grass intermittently, left yawing moment kept working on the aircraft. When the aircraft nose was oriented almost perpendicular to the direction of airstrip the aircraft was in a condition of skidding and both main landing gears fractured and the aircraft was immobilized.

The reason for the 40cm long crack on the left wing leading edge is estimated as follows.

When the left main landing gear fractured, a spring contained in the oleo was extended when the main landing gear's fractured part detached from the airframe, then a part of the main wheel was pulled back by the spring and strongly hit the left wing leading edge.

Both propeller blades were estimated to have been fractured by hitting the ground because the clearance to the ground was lost due to fracture of both main landing gears.

3.8 Recognition of second pilot on danger

Based on that no advice was provided from the second pilot until the aircraft nose veered left after touch down and the flight plan was changed in a short period of time, it is estimated that the second pilot paid no attention to grass height at Miho airstrip, aircraft wingspan or ground clearance of wingtips.

3.9 Airstrip management at Miho

It is desirable that managing body of the airstrip should maintain flat airstrip surface.

4. Probable Cause

It is estimated that, when the aircraft landed at the airstrip, this accident was caused as follows:

Left wingtip or its vicinity was caught by grass, the aircraft nose veered to the left and the aircraft was going out of the airstrip, the power was increased to counter it without success, the aircraft was immobilized near the boundary between shoulder-like area and airstrip and sustained medium level damage.

As to the points that the PIC touched down the aircraft on the narrow part of paved area of the airstrip, and that the situation aggravated even after the second pilot took over the control, it is considered possible that the following might have contributed: flight preparation was not sufficient including prior communication between the PIC and the second pilot, low pass was not conducted to check the condition of the airstrip, and maintenance of Miho airstrip was not sufficient.

Figure 1 Accident Site Layout

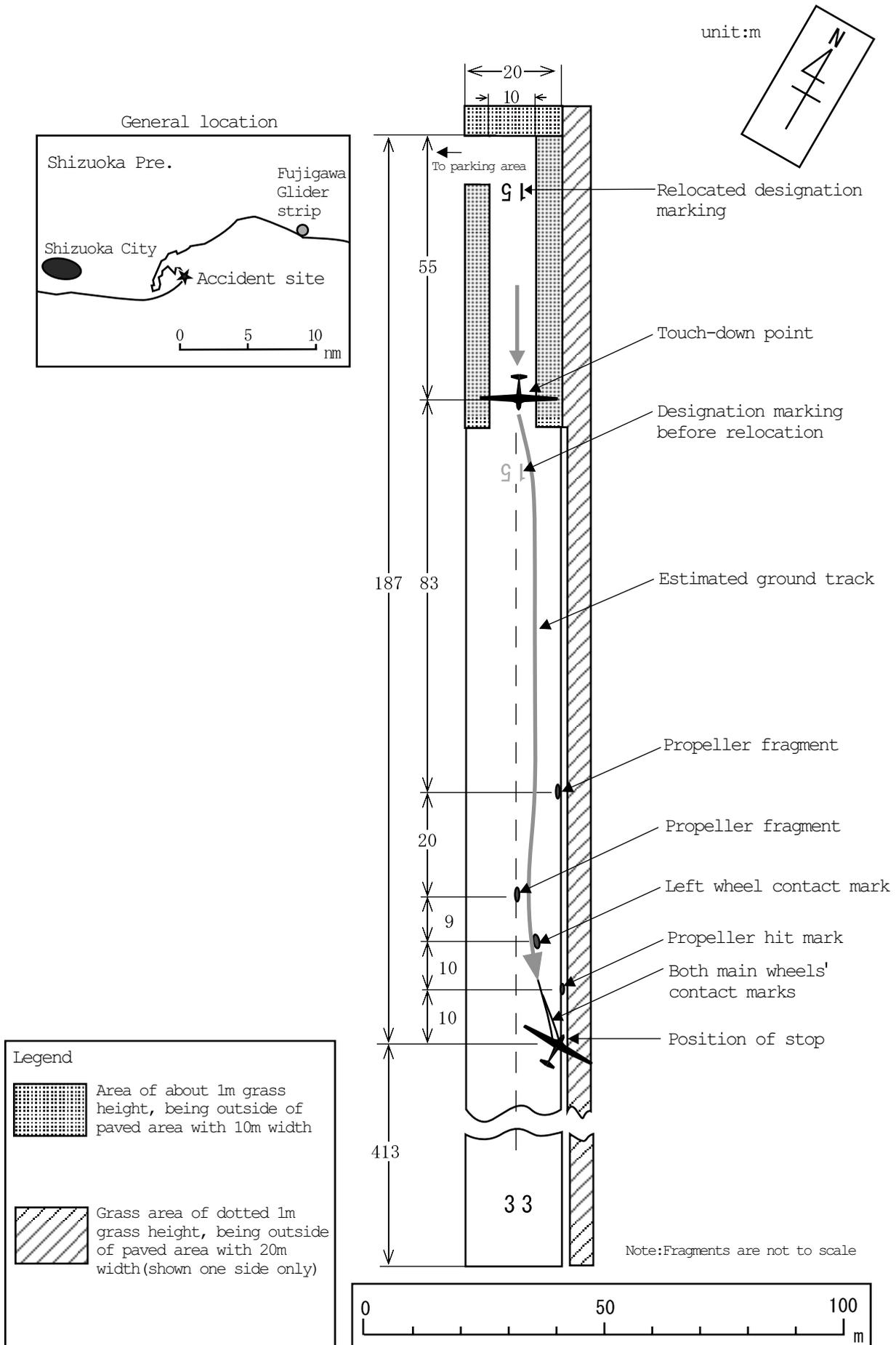
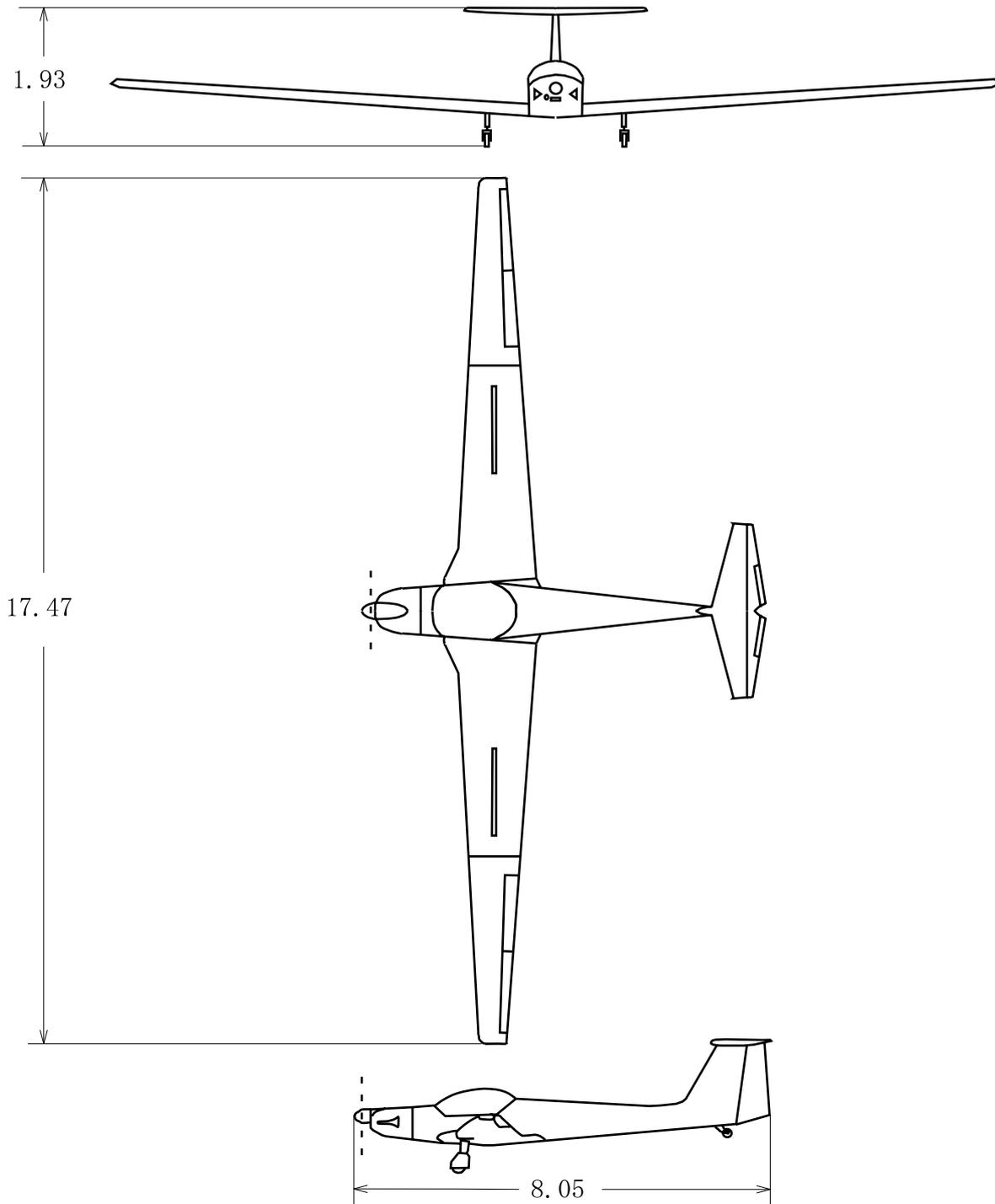


Figure 2 Three-angle-view of
Aeromot-Industria Mecanico Metalurgica
AMT-200

unit:m



Picture Accident aircraft and damage



Leading edge, Left wing



Left main gear

Streak of red oil



Right main gear