AA2010-5

AIRCRAFT ACCIDENT
INVESTIGATION REPORT

PRIVATELY OWNED

J A 4 0 7 9

June 25, 2010

Japan Transport Safety Board

The investigation for this report was conducted by Japan Transport Safety Board, JTSB, about the aircraft accident of Privately Owned, Piper PA-28R-201T, registration JA4079 in accordance with the Act for the Establishment of the Japan Transport Safety Board and Annex 13 to the Convention on International Civil Aviation for the purpose of determining causes of the aircraft accident and contributing to the prevention of accidents/incidents and not for the purpose of blaming responsibility of the accident.

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

Norihiro Goto
Chairman,
Japan Transport Safety Board

AIRCRAFT ACCIDENT INVESTIGATION REPORT

PRIVATELY OWNED
PIPER PA-28R-201T, JA4079
ON THE RUNWAY OF MATSUYAMA AIRPORT
AT AROUND 15:35 JST, OCTOBER 10, 2009

May 28, 2010

Adopted by the Japan Transport Safety Board (Aircraft Sub-committee)

Chairman	Norihiro Goto
Member	Shinsuke Endoh
Member	Toshiyuki Ishikawa
Member	Noboru Toyooka
Member	Yuki Shuto
Member	Toshiaki Shinagawa

1. PROCESS AND PROGRESS OF AIRCRAFT ACCIDENT INVESTIGATION

1.1 Summary of the Accident

On October 10 (Saturday), 2009, a privately owned Piper PA-28R-201T, registered JA4079, took off from Nanki Shirahama Airport at around 14:10 Japan Standard Time (JST: UTC+9hr, unless otherwise stated all times are indicated in JST). When the aircraft landed at Matsuyama Airport, it landed with the landing gear retracted and stopped on its belly on the runway.

The captain and another passenger were on board the aircraft and there were no dead and injured.

The aircraft sustained substantial damage, but there was no outbreak of fire.

1.2 Outline of the Accident Investigation

1.2.1 Investigation Organization

On October 10, 2009, the Japan Transport Safety Board designated an Investigator-in-Charge and another investigator to investigate this accident.

1.2.2 Representatives from Foreign Authorities

An accredited representative of the United States of America, as the State of Design and Manufacture of the aircraft involved in this accident, participated in the investigation.

1.2.3 Implementation of the Investigation

October 11, 2009	Aircraft examination and Interviews
October 22- November 18, 2009	Analysis of ATC Communication Records and Meteorological data
October 26 and November 17, 2009	Aircraft maintenance records examination and Interviews

1.2.4 Comments from Parties Relevant to the Cause of the Accident

Comments were invited from parties relevant to the cause of the accident.

1.2.5 Comments from the Participating State

Comments on the draft report were invited from the participating State.

2. FACTUAL INFORMATION

2.1 History of the Flight

On October 10, 2009, a privately owned Piper PA-28R-201T (Turbo Arrow ш), registered JA4079 (hereinafter referred to as "the Aircraft"), where the captain and another passenger were on board for a familiarization flight, took off from Ami airfield at 10:35. After it landed at Nanki Shirahama Airport once, it took off for Matsuyama Airport.

The flight plan of the Aircraft, relating to the flight from Nanki Shirahama Airport to Matsuyama Airport, submitted from the captain to Narita Airport Office, is outlined below:

> Flight rules: Visual flight rules (VFR), Departure aerodrome: Nanki Shirahama Airport, Estimated off-block time: 14:00, Cruising speed: 120kt, Cruising altitude: VFR, Route: Kochi VOR/DME (KRE), Destination aerodrome: Matsuyama Airport, Estimated flight time: 1 h and 30 min, Fuel load expressed in endurance: 4 h and 00 min, Person on board: 2

The history of the flight up to the time of the accident after the Aircraft took off from Nanki Shirahama

Airport is summarized below, based on the ATC communication records, the radar track records, and the records of the portable GPS receiver which the captain possessed as well as the statements from the captain, the passenger and an air traffic controller.

2.1.1 History of the Flight based on ATC Communication Records and others

Around 14:10	The Aircraft took off from Nanki Shirahama Airport.
Around 14:47	The captain asked Kochi Approach Control (hereinafter referred to as "Kochi Approach") for the radar monitor. At 20nm east of Kochi VOR/DME, he reported to Kochi Approach that the Aircraft was flying at 7,500ft.
Around 14:54	The captain intercepted the turbulence information near Mt. Ishizuchi (6,503ft above sea level) from another aircraft's communication.
Around 15:01	The Aircraft passed over Kochi City.
Around 15:03	Kochi Approach reported to the Aircraft that it was flying 40nm short of Matsuyama VOR/DME.
Around 15:13	The Aircraft began to descend from 7,900ft.
Around 15:14	Landing gears of the Aircraft were extended.
Around 15:15	The Aircraft passed over near Mt. Kuromori (5,034ft above sea level) at an altitude of 6,000ft.
Around 15:18	The Aircraft began to climb after it reached at an altitude of 5,000ft.
Around 15:21	The landing gears were retracted and the Aircraft flew at an altitude of 7,200ft.
Around 15:26	The Aircraft flew at an altitude of 9,600ft.
15:27:26	The captain reported to Matsuyama Aerodrome Control Tower (hereinafter referred to as "Matsuyama Tower") that it was flying at 7,000ft, 10nm east of Matsuyama Airport.
Around 15:28	The Aircraft flew at an altitude of 6,000ft.
Around 15:31	The Aircraft flew at an altitude of 2,000ft, about five nm east of Matsuyama Airport.
15:32:01	The captain reported "Left base" to Matsuyama Tower.
15:32:10	Matsuyama tower gave "Report base" instruction to the Aircraft.
15:32:18	The captain read back "Left base" to Matsuyama Tower. The Aircraft flew at an altitude of 1,000ft.
15:32:48	Matsuyama Tower issued Landing clearance to the Aircraft.
15:33:55	Matsuyama Tower informed the Aircraft that wind was 200° at five kt.
15:35:16	The captain reported to Matsuyama Tower that the Aircraft had belly-landed.

2.1.2. Statements of the Captain and others

(1) Captain

We flew to Matsuyama Airport via Kochi City from Nanki Shirahama Airport.

When we were around Kochi City, we obtained the information from another aircraft's communication that there was cumulonimbus near Mt. Ishizuchi and turbulence at an altitude of 7,000ft. At first, we were planning to fly directly to Matsuyama from there, but feeling afraid after hearing about the turbulence, we flew off seaward (Saijo City) and avoided the cumulonimbus near Mt. Ishizuchi. We were not able to receive the signal of Matsuyama VOR/DME at around Saijo City although we had been able to receive it normally until Kochi City. I checked our actual location with

a portable GPS because we were uncertain about the Aircraft's position (lost position) after we avoided the cumulonimbus near Mt. Ishizuchi, and we found that we were flying near Mt. Higashi Akaishi (about 5,597ft above sea level).

Feeling the need for the Aircraft to descend since there was not enough distance to the Airport, I extended the landing gears to slow down. I felt threatened when I saw the mountain on my left. I could not locate the Airport although I flew in the direction of the airport based on the GPS. I continued to descend, but realizing there was a considerable distance to the Airport, I retracted the landing gears to pick up speed. Around there, we were not able to receive the signal of Matsuyama VOR/DME, so we looked for the coastline to fly from the sea. We were intently looking for the Airport, which was not seen from the Aircraft. We were trying to figure it out with the portable GPS. The Aircraft was flying near the Airport, but we could not see ahead due to the clouds and could not contact Matsuyama Tower. When we were able to see in the direction of Matsuyama Airport through the clearing clouds and finally decided to descend, we were at an altitude of 9,000ft.

I remember that it was when we were at about an altitude of 2,000ft and about five nm east of Matsuyama Airport that we confirmed the Airport. At that time, both of us were concentrating on landing.

We contacted the Tower to receive approach and landing clearance. The Aircraft was approaching the runway with a shorter left turn than usual. The runway and the Control Tower were visible. The throttle was a little over and the engine revolutions were between 1,500rpm and 1,600rpm (I remember the manifold air pressure was about 17inHg). For a successful landing, I lifted the nose of the Aircraft slightly to glide smoothly and adjusted the power when landing.

The Aircraft touched down at the end of the touchdown point at a speed of 75kt (stall speed of 65kt). I fully extended the flaps when the Aircraft was almost lined up with the runway. I thought it was a successful landing.

I did not realize until touchdown that the landing gears had not been extended. I was wearing a headset, so I could not hear the warning sound of the landing warning system. I think the engine was not set to idle until touchdown. I had not referred to the checklist for landing which was available.

I guess I forgot to extend the landing gears again because the memory, that I had once extended the landing gears, stuck in my mind, and because I concentrated on looking for the Airport. I think the Aircraft approached the runway at an engine speed of nearly 1,200rpm, which would normally activate the alarm.

The reason I had planned the flight at this time was because the airworthiness certificate would expire in a short time and the weather forecast said it would be fine at this time.

(2) Passenger

There was no abnormality found on the airplane from departure to the occurrence of the accident.

The Aircraft climbed to 9,000ft to clear Mt. Ishizuchi, which was 6,000ft in height, but there were still clouds at high altitude. I knew the city of Matsuyama was just beyond the mountain. Since the sky was clear and cloudless on the right side of the Aircraft, I advised the captain to fly seaward without lowering the altitude.

It was after we heard an abnormal sound that I realized the landing gears had not been extended at the time of landing at Matsuyama Airport. I had believed that it had been a normal landing. The propeller stopped after one or one and a half revolutions. I felt as if the Aircraft had slid over the snow after touch down, but I found its step torn after it stopped. Its flap edges and its FWD

landing gear doors were damaged, although its main frame seemed to be intact.

(3) Matsuyama Tower Controller

The Aircraft contacted me from at about 10nm east of the Airport. At that time, a scheduled flight airplane was flying at 10nm final for the runway 14. I placed the Aircraft second in the landing, considering the speeds and locations of both aircrafts. I remember saying “Report left base, the runway 14.” The Aircraft did not report any particular abnormalities, and it was a quite normal approach. I provided instructions while monitoring the Aircraft with radar and checking the scheduled flight airplane. I visually confirmed both aircrafts at a time at five nm.

I think the visibility was good and it was about 40km. The wind was not particularly strong.

The Aircraft approached from the east in relation to Matsuyama Airport. I do not check whether the landing gears of the Aircraft were extended when I saw it on a downwind from the Control Tower. The captain of the Aircraft called "Left base," but I gave an instruction by saying, "Report left base, you are No.2," and provided the traffic information on the preceding aircraft when I visually confirmed that the Aircraft was still on a downwind.

After the Aircraft read back, “Left base,” I issued a landing clearance while monitoring it, because the preceding scheduled flight airplane was already out of the runway.

Subsequently, the Aircraft made a short approach with its body banked, causing its landing gears to be on the other side of it, which was invisible from the Control Tower.

After that, I said to the Aircraft, “Wind check for landing,” as the wind information on the turning final.

The Aircraft made an approach that appeared to be considerably shorter and faster than the normal flight pattern. Although I did not see the Aircraft’s belly-landing, I think it was around 15:35 that I confirmed it at a stop after landing.

Then I asked the captain what had happened, and he replied, “No gear landing,” so, I closed the runway. The runway was closed from 15:36 to 18:30.

I made contact with Air Safety Foundation (fire station) and a Flight Information Officer by a crash phone. At the same time, I contacted Iwakuni Approach, Fukuoka Area Control Center, and Air Traffic Management Center. The Flight Information Officer issued " NOTAM" for the runway closing.

I think three fire trucks were called out and I received the report that there were no fuel leakage, no fire and no injuries.

The accident occurred at around 15:35 on the runway of Matsuyama Airport (Latitude 33°49'46" N, Longitude 132°41'47" E).

(See Figure 1 Estimated Flight Route (In Shikoku-Island), Figure 2 Altitude Change of the Aircraft in the Track Record, Figure 3 Estimated Flight Route (Approach) , Figure 4 Accident Site Sketch, Photo 1 The Accident Aircraft, Photo 2 Traces on the Runway, Photo 3 Damaged FWD L/G Door, Photo 4 Damaged Lower Surface of the Fuselage, Photo 5 Full View of the Instrument Panel, Photo 6 Instrument Panel and others of the Accident Aircraft)

2.2 Injuries to Persons

There were no injuries.

2.3 Damage to the Aircraft

(1) Propeller Tips of the both blades were bent.

(2) Fuselage Lower surface of the fuselage was damaged (Keel was damaged).

(3) Flap	The trailing edge of both right and left side were damaged and destroyed due to the abrasion.
(4) Step	The tread were missing.
(5) Antenna	The ATC transponder antenna and DME antenna were worn due to the abrasion.

(See Photo 1 The Accident Aircraft, Photo 3 Damaged FWD L/G Door, Photo 4 Damaged Lower Surface of the Fuselage)

2.4 Other Damage

None in particular

2.5 Personnel Information

Captain	Male, Age 67
Private pilot certificate (Airplane)	January 26, 1985
Type rating for Single-piston engine (land)	January 26, 1985
Class 2 aviation medical certificate	
Validity	February 20, 2010
Total flight time	1,863 h 59 min
Flight time in the last 30 days	9 h 09 min
Total flight time on the type of aircraft	950 h 54 min
Flight time in the last 30 days	9 h 09 min

Although the captain had taken antihypertensive, he made a declaration of it at the time of application for Aviation Medical Certificate, and a doctor permitted him to take the medicine. We heard that he was in good health, and he felt well at the day of the accident.

2.6 Aircraft Information

2.6.1 Aircraft

Type	Piper PA-28R-201T
Serial number	2803001
Date of manufacture	March 21, 1989
Certificate of airworthiness	Toh-20-322
Validity	October 30, 2009
Total flight time	2,069 h 02 min
Flight time since last periodical check (100-hour check on May 2, 2009)	39 h 23 min

(See Figure 5 Three Angle View of PIPER PA-28R-201T)

2.6.2 Weight and Balance

When the accident (landing gear up) occurred, the Aircraft's weight is estimated to have been 2,473.7lb and the center of gravity is estimated to have been 87.44in, both of which are estimated to have been within the allowable range (maximum takeoff weight of 2,900lb, and 79.5 to 90.0in to the weight at the time of the accident).

2.6.3 Fuel and Lubricating Oil

Fuel was an Aviation Gasoline100, and lubricating oil was an Aeroshell W80.

2.7 Meteorological Information

2.7.1 General weather condition of the Ehime Prefecture reported by Matsuyama local meteorological observatory at 10:35 on the day of the accident was as follows:

"It is mostly fine in Ehime Prefecture covered by the high pressure. From 10th to 11th , it will be mostly fine covered by the high pressure."

2.7.2 Aerodrome routine meteorological report(METAR) at Matsuyama Airport around the time of the accident was as follows:

15:00 Wind direction 300° (variable 260 to 340°); Wind velocity 4kt; Visibility 40km;
Cloud: Amount 1/8, Type Cumulus, Cloud base 3,000ft
Amount 6/8, Type Unknown, Cloud base Unknown
Temperature 21°C; Dew point 11°C
Altimeter setting (QNH) 30.02inHg

16:00 Wind direction 270°; Wind velocity 8kt; Visibility 40km;
Cloud: Amount 1/8, Type Cumulus, Clouds base 3,000ft
Amount 5/8, Type Unknown, Cloud base Unknown
Temperature 22°C; Dew point 11°C
Altimeter setting (QNH) 30.03inHg

2.8 Information on Air Navigation Facilities

VOR/DME facilities and Air Traffic Communication facilities of Matsuyama Airport at the day of the accident were operated normally.

2.9 Accident Site Information

The accident site was on the runway 14 at Matsuyama Airport (859m from the runway end.), and the tread of the step was found 15m away from the airplane.

On the runway, the traces made by the Aircraft were left 609m away from the runway 14 end to the place where it stopped. Hit marks which would be made by propeller were also found on the way of the trace.

Flaps of the Aircraft were full down.

(See Photo 1 The Accident Aircraft, Photo 2 Traces on the Runway, Photo 3 Damaged FWD L/G Door, Photo 4 Damaged Lower surface of the Fuselage)

2.10 Test and Researches for Fact-Finding

At Matsuyama Airport, the verification of the operation of the landing gears and the operation test on the landing warning system of the Aircraft were conducted, and it was confirmed that both of them were operated normally. Also, at the landing warning system checking in the flight test of the last airworthiness certificate inspection, the actuating value when the throttle was closed was 15inHg (Standard was 14 ±2inHg) of the manifold air pressure, and it was normal.

2.11 Additional Information

2.11.1 Throttle warning and flap warning were equipped in the landing warning system of the Aircraft. The alarm(landing gear warning horn) is to be sounded and red warning light (landing gear warning light) is to be lit up when the landing gears were not extended in the landing condition.

(1) Throttle Warning

The switch activates when the manifold air pressure goes down lower than or equal to about 14inHg.

(2) Flap Warning

The flap warning activates when the selected flap angle is greater or equal to 10°, or when the flap lever gets in excess of the first notch.

2.11.2 The following are written in the Flight Manual of the Aircraft about the operation at landing. (Excerpt)

Basic Flight Manual

Chapter 4 Normal operation procedure

5. Normal operation procedure check list

5k. Approach and Landing check list(29.)

Approach and Landing(29.)

Fuel selector ……..Select a suitable tank

Reclining seat …….. BACK UP

Belt/Harness……..... ON

Air conditioner……..... OFF

Mixture……..... SET

Propeller……..... SET

Landing Gear……..... DOWN – Max. 129 KIAS

Flap……SET – Max. 103 KIAS

TRIM to 75 KIAS

(omitted)

39. Landing Gear

The pilot must fully understand the meaning and the function of landing gear position lights and warning lights.

WARNING

Turn off the "NAV LIGHT" switch in the daytime flight for the brighter luminance of the landing gear position light. In the nighttime flight, landing gear position light automatically gets dark when "NAV LIGHT" switch is turned on.

When the landing gear is not in the Down position during the flight, if the throttle is down to about the lower than or equal to 14in.Hg. manifold air pressure, then, the red landing gear warning light on the instrument panel and the landing gear warning horn activate at the same time. Also, the red warning light on the instrument panel and the warning horn activate at the same time when the landing gear selector switch is in the Up position, the throttle is in the closed position, and the battery master switch is "ON".

Three green lights on the instrument panel light up individually when the landing gears corresponding to each light are locked in the Down position.

(See Photo 5 Full View of the Instrument Panel, Photo 6 Instrument Panel and others of the Accident Aircraft)

2.11.3 The captain of the Aircraft made another belly-landing by JA3873 (Beech A-36) on May 26, 2004, and he also had forgotten to extend landing gears at the landing.

3. ANALYSIS

3.1 Qualification of Personnel

The captain held both a valid airman competence certificate and a valid aviation medical certificate.

3.2 Airworthiness Certificate of the Aircraft

The Aircraft had a valid airworthiness certificate and had been maintained and inspected as prescribed.

3.3 It is considered highly probable that the weather conditions at the time of the accident did not have any relation to the occurrence of the accident.

3.4 Visual Flight

As described in 2.1, the flight plan was to fly straight to Kochi VOR/DME after taking off from Nanki Shirahama Airport, and then fly to Matsuyama VOR/DME by Visual Flight Rules.

In the actual flight, it is considered highly probable that, since the captain checked the Aircraft's position using VOR or GPS, he could not grasp the geological formation when the signal of Matsuyama VOR/DME was not able to be received in the situation that the ground was temporarily invisible from the Aircraft during on-top flight, so he was flying to Matsuyama Airport relying solely on GPS.

Visual Flight Rules stipulate that, in principle, one should fly by making spot reference to ground targets, and VOR or GPS should be limited to supplementary use only. When bad weather and others are expected, one should make careful plans including preparations for alternate routes, and should turn back if unable to respond to the situation.

As described in 2.1.1, the Aircraft descended to 5,000ft from 7,900ft when it had not passed the mountainous terrain. This is considered probable that the Aircraft attempted to avoid the clouds to confirm the ground. But it was descending at an altitude of 6,000ft when it was passing the east side of Mt. Kuromori. It is considered probable that it was dangerous to lower its altitude over the mountainous terrain without knowing its position. It is considered highly probable that it had a very instable flight, in which it started climbing, after reaching 5,000ft, to 9,600ft, and steeply dived to 1,800ft.

It is considered probable that if the weather had been fine, there would have been no problem with the planned route which would enable the pilot to see the geological formation, but if the weather were cloudy as on the day of the accident, it would be necessary for the pilot to lower the altitude while visually confirming the geological formation and, as the others on board stated, it would have been safe to fly to Matsuyama Airport after accurately confirming the current position above the north coastline.

Thus, it is considered probable that the captain flew without visually confirming the ground targets and maintaining the safe altitude, which may be deemed an inadequate visual flight.

3.5. Reason for the Aircraft’s Belly Landing

Judging from the aircraft examination, it is considered highly probable that the Aircraft had no problem with its airplane including the function of extending and retracting the landing gears until the time the accident occurred, and as described in 2.1.2 (1), it is considered highly probable that the Aircraft landed on its belly because the captain forgot to extend the landing gears.

3.6 Forgetting to Extend the Landing Gears

As described in 2.1.2 (1), the captain stated that he had been conscious that he had once extended the landing gears. But on this occasion, the landing gears were extended to reduce the speed of the Aircraft; the Aircraft was more than 30nm away from Matsuyama Airport when its landing gears were extended, and it was more than 20nm away from the Airport when its landing gears were retracted. Therefore, it is considered unlikely that what the captain stated had affected the situation.

Since the Aircraft’s speed was about 120kt and it takes 10 minutes to fly 20nm, it would have been desirable to fly below 5,000ft at 20nm from Matsuyama Airport, in order to try to descend at a descending rate of

500ft/min, which is normal for a small aircraft. However, since the altitude of the Aircraft was 7,200ft then and was even rising to about 9,600ft despite approaching the Airport, it is considered highly probable that he did excessive decent of the Aircraft in a forced manner.

Judging from the statements of the captain described in 2.1.2 (1), it is considered highly probable that the captain visually confirmed Matsuyama Airport when it was about five nm from the Airport and at about an altitude of 2,000ft, and it is considered highly probable that, based on the radar track, the Aircraft did not follow the normal traffic pattern, and ended its final turn at the runway threshold.

It is considered highly probable that the captain forgot to extend the landing gears because he lost composure for descending excessively and for failing to follow the normal traffic pattern, and also failed to implement the items on the check list.

As described in 2.11.3, the captain made a similar belly landing accident about five years ago (May 26, 2004), it is considered probable that he should have been more careful about implementing the items on the landing check list.

3.7 Landing Gear Warning System

(1) Throttle Warning

According to the statements of the captain, the throttle slightly opened at the time of the landing. Therefore, it is considered possible that all the conditions for activating the throttle warning were not met.

Given that the landing gears were not extended, however, it is considered probable that the Aircraft had its throttle nearly closed before touchdown, and it is considered possible that the throttle warning was activated.

(2) Flap Warning

The captain stated, "I fully extended the flaps when the Aircraft was almost lined up with the runway." Therefore, it is considered highly probable that after he was notified by the controller about the winds, the flaps were fully extended. It was confirmed that the Aircraft remained its flaps fully down in the examination after the accident.

The captain said he was unaware of the landing gear warning, but the Aircraft had its flaps fully down at the time of landing, and the flap warning was normal in the operation test described in 2.10. Therefore, it is considered highly probable that all the conditions for activating the flap warning were met, and the landing gear warning horn was sounding. With regard to the fact that the captain did not notice the landing gear warning horn sounding, it is considered possible that he was focused on maneuvering the aircraft toward the runway.

In addition, with regard to the fact that the captain was not aware of the lighting-up of the landing gear warning light, it is considered possible that he was intensively looking at solely on the runway, paying no attention to the landing gear warning light.

3.8 Health Condition of the Captain

Judging from the valid aviation medical certificate the captain held, his statements described in 2.1.2 (1), and his response to deal with the accident, it is considered highly probable that his health condition at the time of the accident was not associated with the accident.

3.9 Prevention of Recurrence

The flight was much shorter than the final in the normal traffic pattern, and the Aircraft ended its final turn very close to the runway threshold, based on the estimated flight route at the time of the accident. Therefore,

it is considered possible that the captain did not have enough time to make the final preparations for landing.

It is necessary for pilots to allow enough time for making the traffic pattern, to follow the specifications and procedures; moreover, to make sure that all items on the landing check list to be implemented, in an effort to perform the normal operation safely in landing.

3.10 Reason that the signal of Matsuyama VOR/DME was not Received

With regard to the fact that the Aircraft failed to receive the signal of Matsuyama VOR/DME and communication from Matsuyama Tower, since they are transmitted on the VHF radio, in which obstacles in a straight line between transmitters and receivers would block it, it is considered highly probable that the Aircraft was behind the mountains.

4. PROBABLE CAUSE

It is considered highly probable that the accident occurred when the captain forgot to extend the Aircraft's landing gears at the time of landing, which resulted in its belly landing and damaged its fuselage.

With regard to the fact that the captain forgot to extend the landing gears, it is considered highly probable that the captain lost composure and failed to implement the items on the landing checklist because he descended excessively, failing to follow the normal traffic pattern before landing.

Figure1　Estimated Flight Route　(In Shikoku-Island)

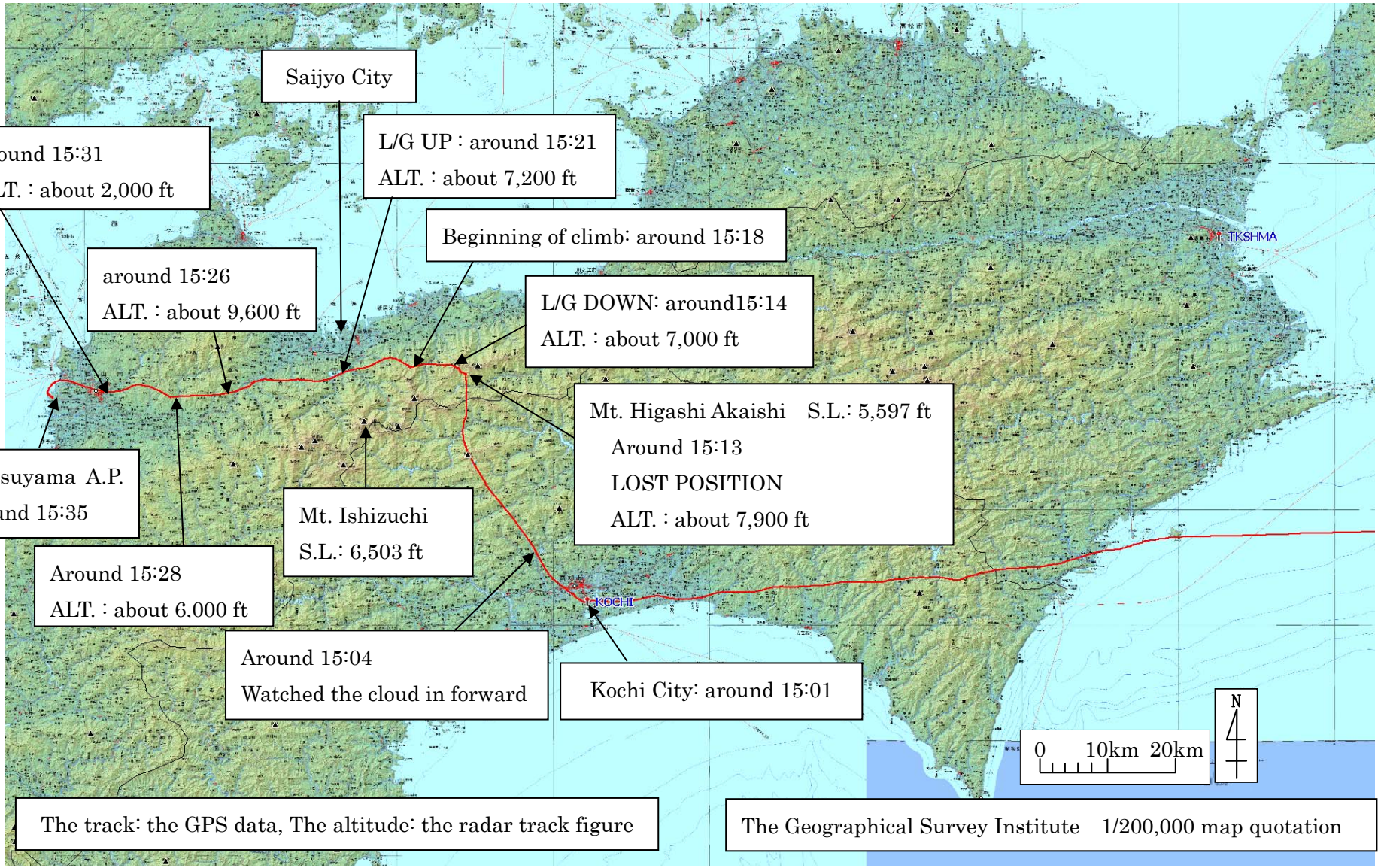


Figure 2　Altitude Change of the Aircraft in the Track Record

Figure 3　Estimated Flight Route（Approach）

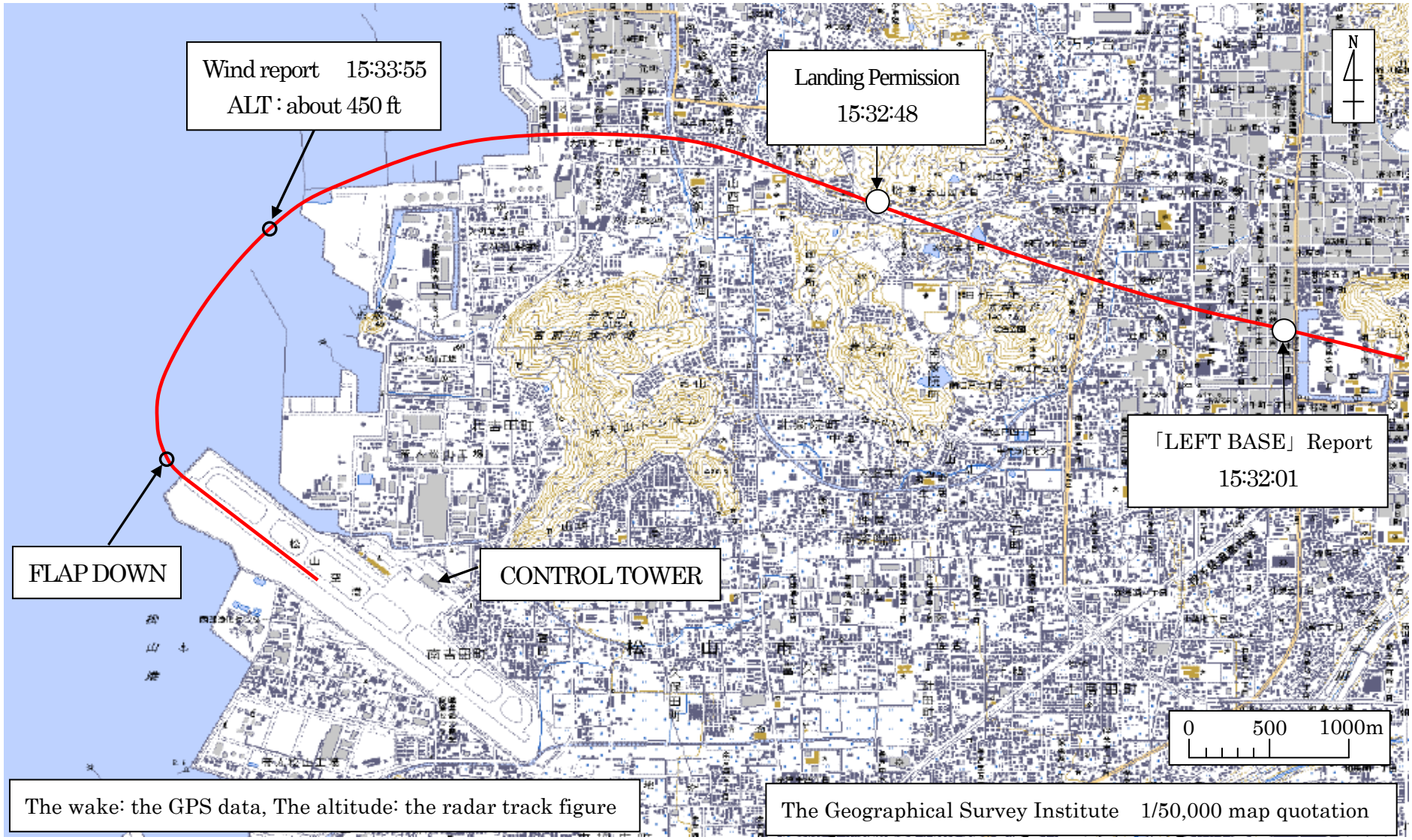


Figure 4　Accident Site Sketch

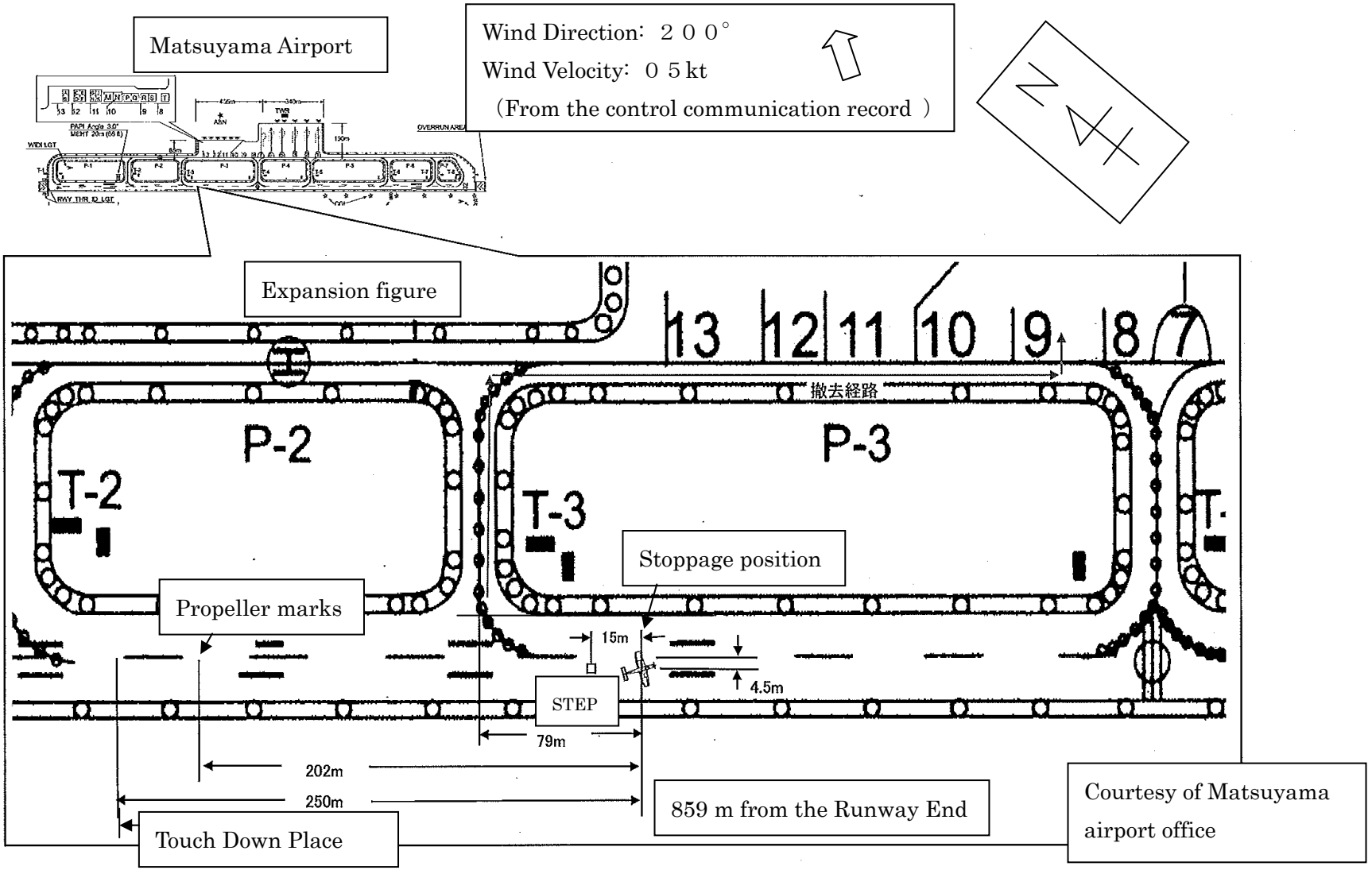
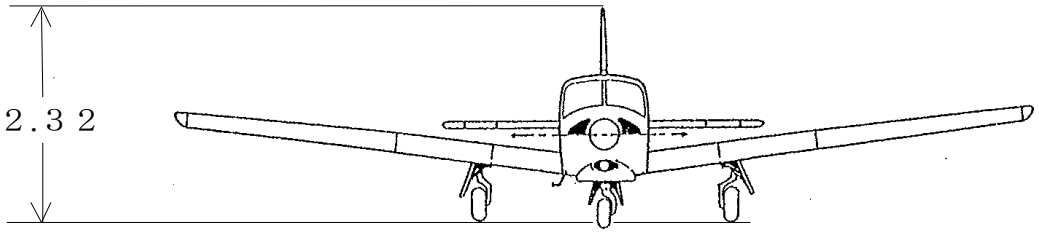
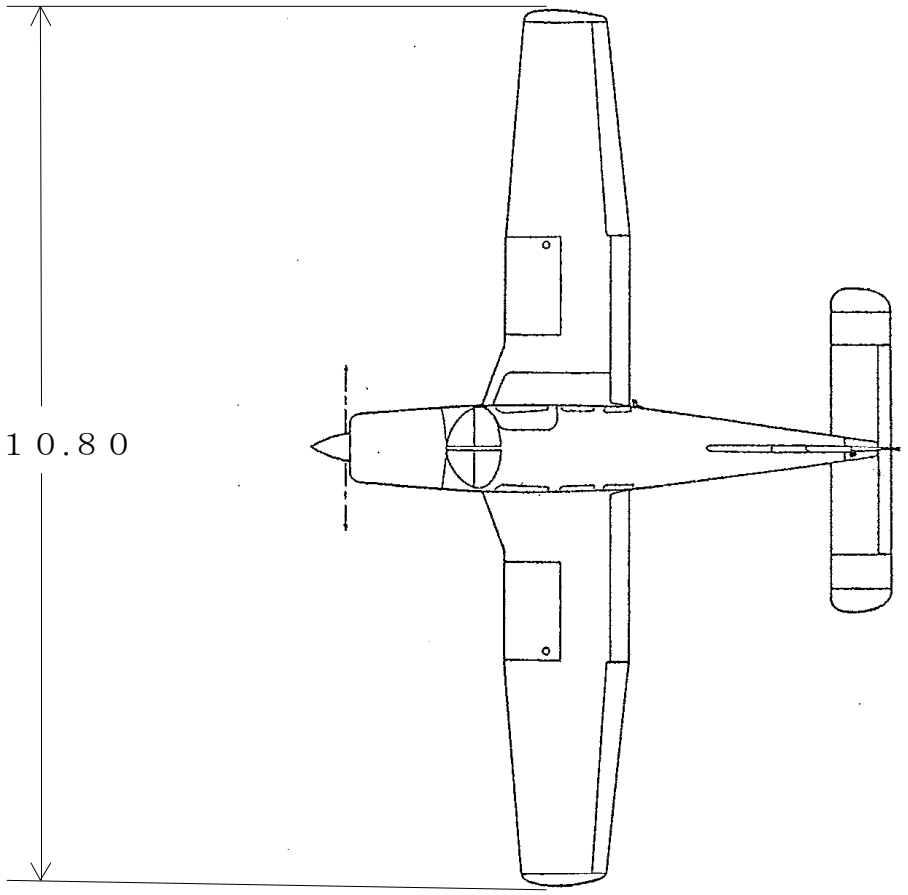


Figure 5　Three Angle View of PIPER PA-28R-201Ｔ

Unit : m





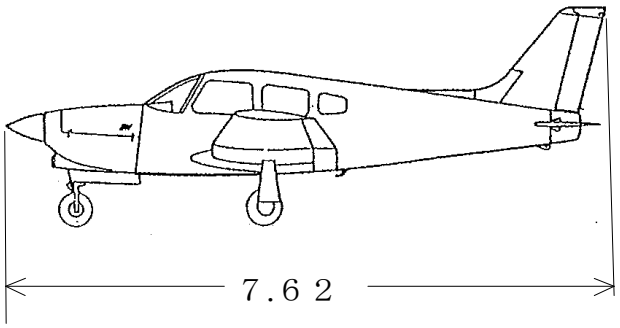


Photo 1　The Accident Aircraft

Photo 2　Traces on the Runway

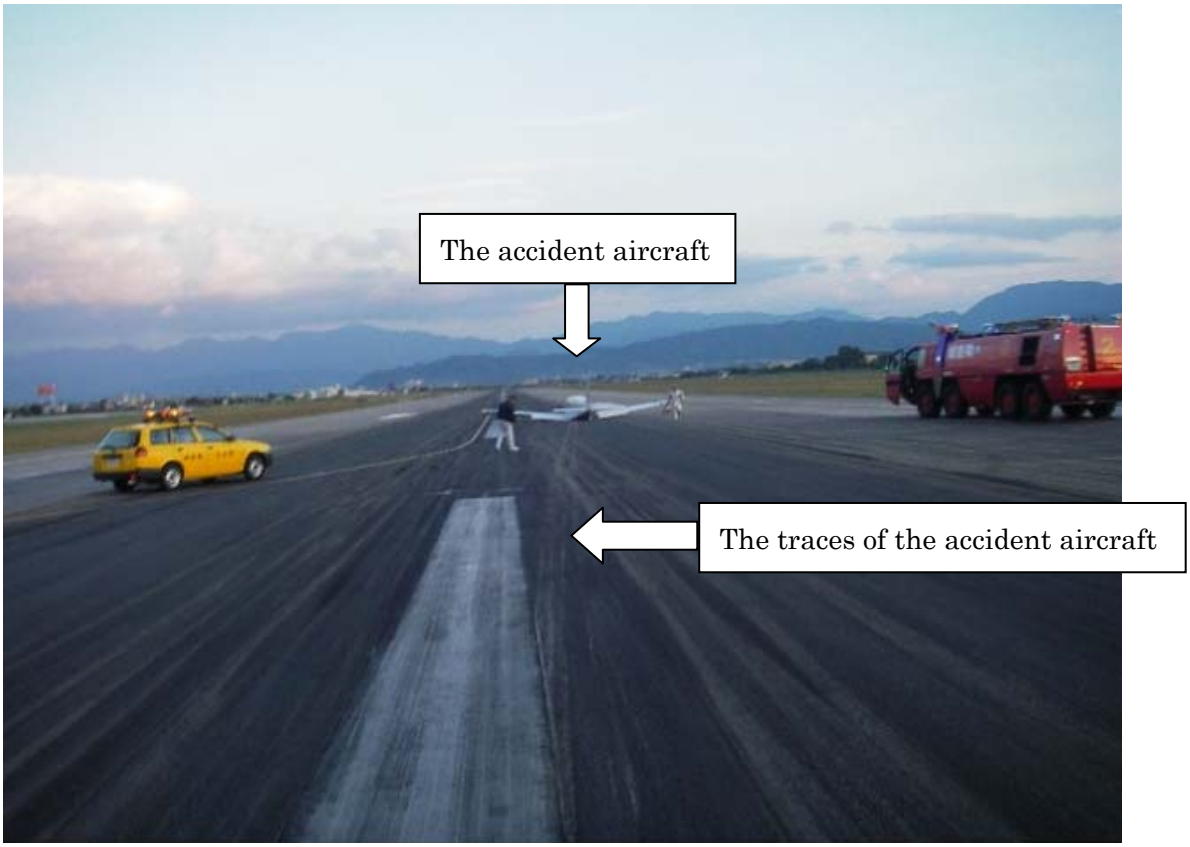


Photo 3　Damaged FWD L/G Door

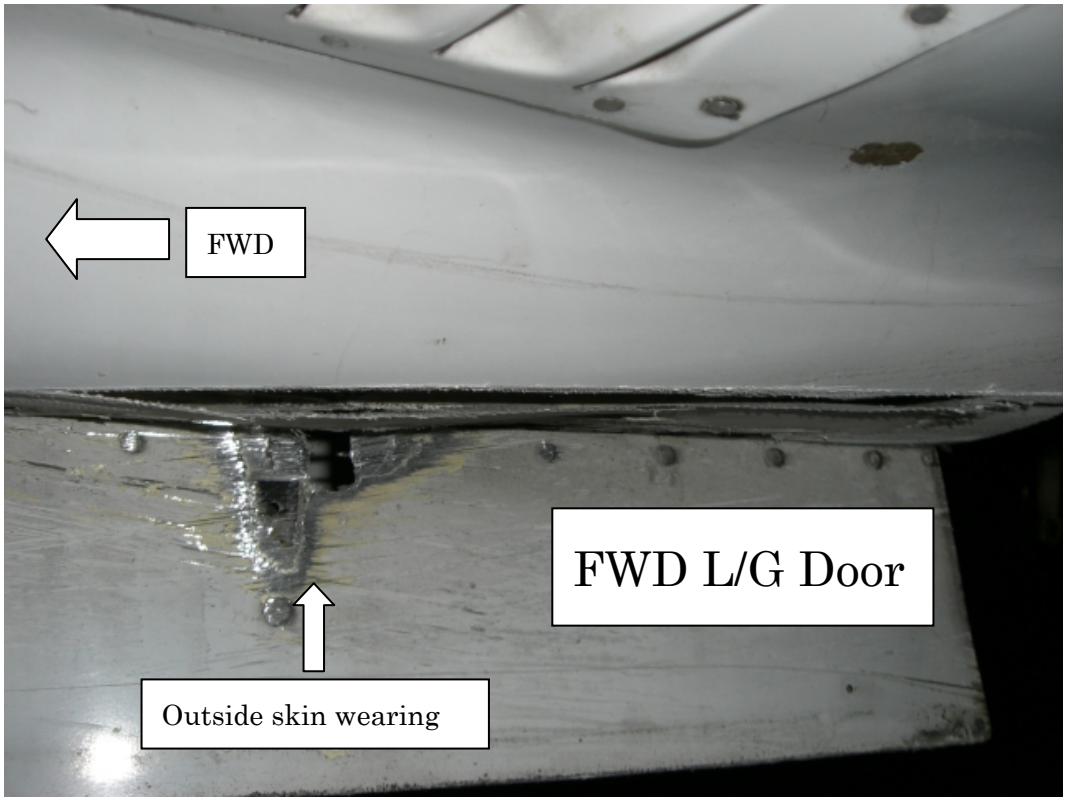


Photo 4　Damaged Lower surface of the Fuselage

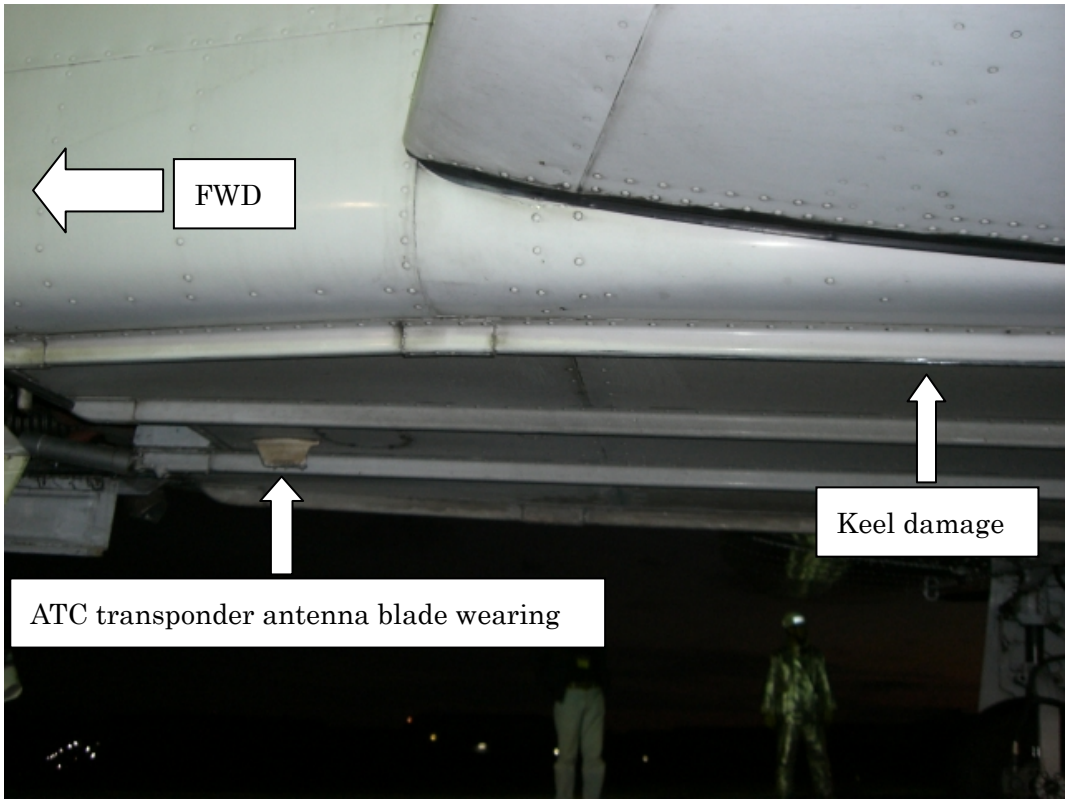


Photo 5　Full View of the Instrument Panel

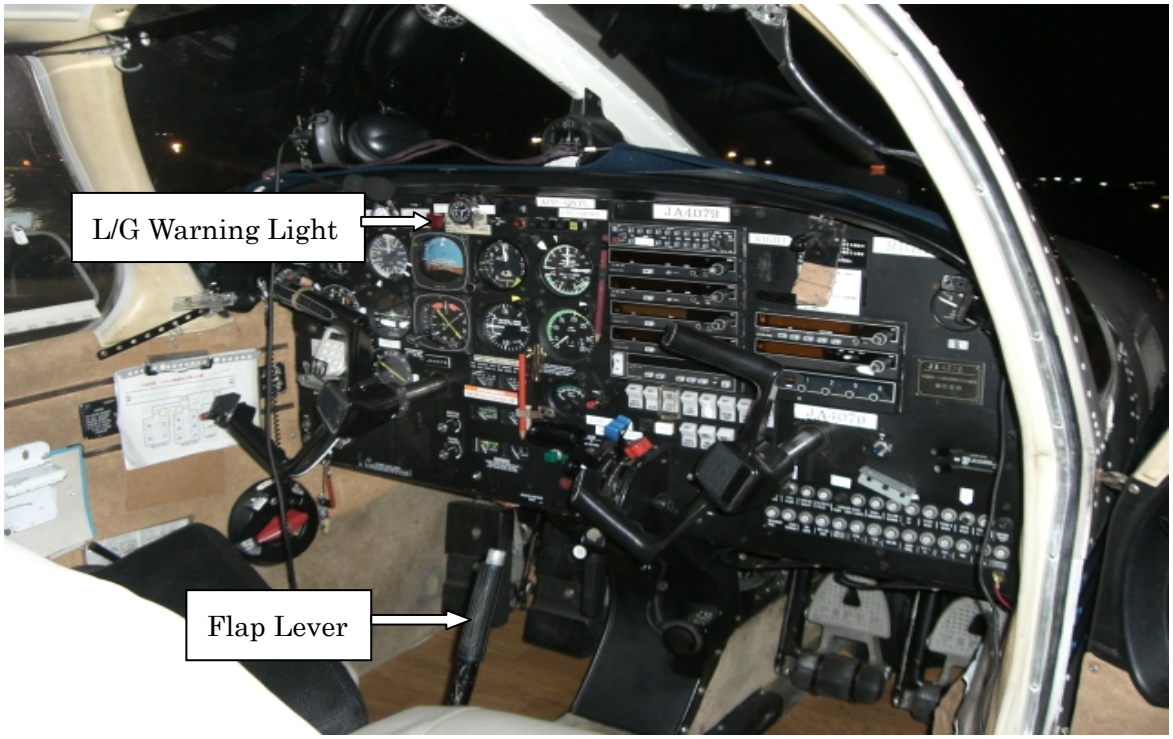


Photo 6　Instrument Panel and others of the Accident Aircraft