



# **Trans-Pacific Flight by Hot-Air Balloon**

**Flight Project 2007 winter**



Japan Balloon Federation official pilot

**Pilot in Command: Michio Kanda**

**Flight Engineer: Hiro Andow**



## THE PROJECT OUTLINE

### A Journey Across the Pacific in a Hot-air Balloon

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#### **The PURPOSE:**

- Play a role in further promoting Japan-U.S and Canada friendship by ballooning sports.
- Achieve trans-Pacific flight which is long cherished dream of Japanese balloonists.
- Challenge to the aeronautical world record of hot-air balloon.
  - Current FAI Long Distance Record, 7,671.91km by P.Lindstrand & R.Branson(GB)
  - Current FAI Flight Duration Record, 50 Hrs.38 Min. by M.Kanda & H.Takezawa(JP)
- Scientific research for environmental data collection in the jet stream.
  - Cooperation for Meteorological Research Institute of Meteorology Agency of Japan

#### **The PROJECT:**

**Flight:** Across the Pacific Ocean

**Date:** Fine day on January or February 2007,

Exact flight day will be determined with weather forecast result.

**Lift off:** Japan, Tochigi-city which is located near Tokyo.

**Landing:** Mid-West region of North America, U.S.A or Canada.

Jet stream weather forecast data will show the estimated landing area when lift-off.

**Cruising altitude:** 23,000 to 30,000 ft AMSL (7,000 to 9,000 m)

**Cruising speed:** 80 to 110 kt (150 to 200 km/h)

**Estimated flight distance:** 8,000 to 9,000 km (Current World Record 7,671.91km)

**Time of flight:** Approx. 60 hours. (Current World Record 50:38)

**Weather condition:** There is no propulsion system in balloon. So we need strong wind to cross the Pacific. The westerly jet stream wind is blowing from west to east over the Pacific at high altitude. This wind is strong enough speed for us only in winter season. We will forecast a day when this jet stream is stable and fast enough for our flight. It also must be ideal sky condition at lift-off field.

#### **The CREW:**

- **Michio Kanda**, Pilot in Command, 56 years old from Saitama Japan
  - Address: Tobai 190-2, Kawashima, Hiki, Saitama JAPAN 350-0117
  - Tel: (81)049-297-0338 Fax: (81)049-297-7650 Mobile: (81)090-3919-0881
- **Hiromasa Andow**, Flight Engineer, 36 years old from Hiroshima Japan
  - Address: Watauchi 3-10-12 Fujisawa Kanagawa JAPAN251-0011
  - Tel&Fax (81)0466-25-2462 Mobile: (81)090-4436-8371

## ***The EQUIPMENT:***

**Name of Balloon:** Starlight (Black and red color)

**Type of Balloon:** FAI Class AX-15 Hot-Air Balloon

**Volume:** 40,000.cu.m. 20 times bigger than normal balloon

**Height:** 50 m equivalent height with 15 stories tall building

**Diameter:** 45 m

**Takeoff weight:** 5,500 kg

**Manufactured:** Made in Japan

**Fuel:** Liquid propane gas 4,000 kg with Liquid oxygen assist burner

**Special feature of the gigantic balloon:**

- It is the biggest hot-air balloon in the world in existence. (Second biggest in the history)
- We can carry 100 passengers if hang a huge gondola.
- Double walled envelope to get a solar heat effect for fuel-efficient mileage.

**Equipment in detail:**

**Flight equipment:** Open-air gondola made by aluminum: Propane burner with oxygen assists four burner heads system: Aluminum propane cylinders,

**Navigation equipment:** GPS, Altimeter, Variometer, Thermometer for internal envelope, Barometer, Automated flight log recorder, VHF Air Band Radio, HF Ham Radio, Iridium Satellite Phones, Rader Transponder with Mode C, Navigation lights, Compass, Watch, Mobile PC, Aeronautical charts, Emergency Locating Transmitter (406 MHz & 121.5 MHz)

**Life equipment:** Outfit for extremely cold weather with wind-water-burn-resistant material (Insulated suite clothes, Arctic boots, Mittens, Goggle so on), Electric lights, Lead batteries, Oxygen supplying device for breath, Photo & movie equipment, Gas heater, Emergency solar battery charger, Data collection equipment for meteorological research,

**Safety equipment:** Water in thermos, Foods, Reserve ration for 3 weeks, Medical equipment, Fire extinguisher, Emergency floatable FRP Capsule (yellow orange color), Immersion suits (insulated and floatable), Survival gear for ocean drift and extremely cold region landing (Sleeping bag, gas stove & cooker ,signals, knife, fishing gear, sea anchor, tools for repair so on)

## ***The SCHEDULE:***

2004 Jan. Kanda's first challenge across the Pacific was not success.

Emergency landing on the sea 1600km from Japan and rescued

2005 Jun. Project meeting with local stuff in Canada/USA for next challenge.

2005 Nov. Prototype of new balloon, Starlight, completed.

2.5 time bigger volume than previous model

2006 Jan. "Starlight" first trial flight with captive condition for test and evaluate.

2006 Nov. Completion of the "Starlight" envelope

2006 Dec. All other equipment will be ready to take off.

Final arrangement with related organization, authorities, rescue coordination.

2007 Jan. Standby for lift-off

2007 Jan-Feb. Challenge into the sky when weather condition is perfect

## **Michio Kanda, pilot in command**

### **Major Balloon Experience**

- 1977 Jun. Founded Saitama Balloon Club.
- 1979 Feb. Obtained Hot Air Balloon Pilot Licence.
- 1979 Jul. Flight over Mt. Fuji, from Asagiri to Gotemba 24km.
- 1980 May Flight over Northern Japan Alps, from Kamiho Mura to Omachi 37km.
- 1982 Apr. Test flight for challenge to the high altitude record. Saku Nagano to Kuki Saitama 106km. Altitude 6,236m.
- 1982 Dec. Flight from Kanazawa Ishikawa to Matsumoto Nagano 116km.
- 1983 Feb. Flight across Honshu Island.  
From Kanazawa Ishikawa to Ogawa-machi, Nasu, Tochigi 303km.
- 1984 Feb. Flight from Oki Island off the coast of Shimane Japan to Ida, Nagano, establishing New World Distance Record of 419km for FAI Class AX-6.  
Previous record was 369km.
- 1986 Nov. Challenged to renew World Altitude Record for FAI Class AX-6. Flight from Takeishi Nagano to Utsunomiya Tochigi. Climbed to 9,560m. Established a new altitude record of Japan.
- 1987 Nov. Challenged Class AX-7 World Altitude Record of 12,375m. Made 12,163m at the first attempt. Flight from Kamioka Gifu to Shiobara Tochigi.
- 1988 Mar. Second challenge flight from Matsumoto Nagano, ditched in the Pacific off the coast of Choshi, Chiba. Flight recorder lost in the Pacific.
- 1988 Nov. Third attempt: Flight from Kamioka Gifu to Matsumoto Nagano. Climbed to 10,800m.
- 1988 Nov. Fourth attempt: Flight from Kamioka Gifu to Utsunomiya Tochigi. Established a New World Altitude Record of 12,910m for FAI Class AX-7.
- 1990 May Challenged to fly over Mt. Everest by Hot Air Balloon. Made the first hot air balloon flight over Himalaya at altitude 10,000m. However couldn't fly across Mt. Everest.
- 1993 Feb. Flight across East China Sea for the first time by a hot air balloon. This was also a AX-8 distance record for Japan to cover 940km from Rudong (near Shanghai) China to Ubuyama Kumamoto, Japan.
- 1994 Jun. World Distance Record of 2,366.1km for FAI Class AX-10 up AX-14. Flight from Mullewa, Western Australia to Frome Downs, South Australia, Flight duration 24 hours 09 minutes.
- 1997 Feb. World Duration record of 50 hours 38 minutes for FAI Class AX-10 up AX-15, from Calgary, Canada to Jordan Montana, USA.
- 1998 Sep. Challenged Mt.K2 however flight abandoned due poor weather.
- 2000 Oct. Flew over Mt.Nanga Parbat, the highest peak in West Himalaya.
- 2004 Jan. First challenge to cross the Pacific but no success.

### **Diploma and Meris:**

- Icarus Diploma 1984, 1989, 1995, 1998, by Japan Balloon Federation,
- Aviation Sports Prize 1984, 1989, 1995, 1998, by Japan Aeronautic Assoc.
- Montgolfier Diploma 1989 by Federation Aeronautic International, first Asian recipient
- Citizen in Honor, 1997 Calgary, Canada
- Paul Tissandoier Diploma 1998 by Federation Aeronautic International
- Naomi Uemura Adventure Award 2001 by Uemura Naomi Memorial Foundation

## **Hiromasa Andow, flight engineer & co-pilot**

Japanese adventurer of climbing and long distance bicycle touring especially know for his solo bicycle tour across wintertime Siberia.

Challenger to any kind of adventure activities not only mountaineering or biking but also caving, kayaking, back country skiing, sky sports and so on. Prefer rough frontier such as polar region, deep area of Siberia or Tibet in extremely cold season.

Tour guide for mountaineering and frontier region adventure travel

Adventure travel writer or author and photographer for various magazines and books

Award winner of 2003 Naomi Uemura Adventure Awards

Bachelor of engineering. Father of 5 years old daughter. Speak Japanese, English and some Chinese and Russian. Website: [www.tim.hi-ho.ne.jp/andow/](http://www.tim.hi-ho.ne.jp/andow/)

A member of Japan Adventure Cyclist Club

Tottori University Alpine Club

Kunming Exploration Association in China

Tokyo Speleology Club

Japan Balloon Federation

### **Major Adventure Experience**

1988- Join the Tottori University Alpine Club. Climbed most of major mountains in Japan.

1991-92 Bike touring around Eurasian continent for nine months

1994- Student of Yunnan University of China. Start exploring southeast region of China.

1995 Jan. Central and East Tibet plateau bike touring in winter. 3500km in 3 months

1995 Oct. First to climb the peak of Mt. Harbar(5,190m) in Yunnan China.

1995 Nov. West Tibet bike touring in winter: Kashgar-Mt.Kailash-Kathmandu 2 months

1996 Nepal & India bike touring: Katmandu-Bengal bay

1998 Northeast Tibet plateau bike touring

1999 Indian Himalaya region bike touring

2000 Research for first attempt to climb Mt.Meili in Yunnan China

2001 East Tibet bike touring, Jukund-Lhasa

2002 Jan. Alaska bike touring in winter 2months

2002 May Summitter of Mt. McKinley (6190m)

2002-03 Trans-Siberia Bike touring in winter, 15000km,10 months, Europe to the Pacific

2004 Apr. Cross country ski expedition in Baffin Island of Arctic Canada, 600km

2005 Dec. Fareast Siberia Bike touring winter, 8600km, 6 months, Sakhalin to BeringSea

Visited countries: Japan, China, Tibet, Mongol, Korea, Thai, Malaysia, Indonesia, Singapore, India, Pakistan, Iran, Turkey, Greece, Bulgaria, Germany, France, Romania, Hungary, Czech, Poland, Russia, USA, Canada

### **Aircraft Concerned Activity:**

1987: First airborne with T-34 Mentor at Japan Air Self Defense Force pilot school examination (not pass the test)

1988: Study mechanical engineering at Tottori University Faculty of Engineering. Joined Hydrodynamics research laboratory

1996: Joined major radio control model manufacturing company for aircraft model as marketing research manager.

2001: Flight training for fixed wing private pilot license at Los Angels Torrance airport. Fly with Diamond Aircraft Katana for 24 hours but not yet complete training. Holder of Student Pilot Certificate.

2006: Obtained ballooning license in Japan

**Atmospheric aerosol particles transporting  
from Asia to North America through jet streams  
--- Samplings in an intercontinental thermal-balloon flight**

Tiny particles floating in air (called "atmospheric aerosol particles") influence the heat budget of the Earth's atmosphere by scattering and absorption of solar and terrestrial radiations. Moreover, they can form clouds through acting as the nucleus of cloud droplet or ice crystal in the atmosphere. Although aerosol particles occupy a small fraction in the atmosphere, they influence many atmospheric processes. In addition to their sizes, studies on the composition of aerosol particles are essential in order to evaluate the effect of these particles on atmospheric processes such as meteorological phenomena and atmospheric environment.

By now, studies have been carried out over various locations on board aircraft. The observation using an aircraft is adequate to obtain knowledge on the spatial distribution of aerosol particles, which show inhomogeneous properties. However, in order to obtain better understanding of properties of aerosol particles, the collections of particles should be carried out by following the movement of air because the composition of aerosol particles changes with time during transport due to chemical reactions with gases and vapor around them. A thermal balloon is an appropriate platform to study the change in the chemical composition during transport and the study using thermal balloon is very limited by now. Also, the observation of aerosols in jet streams with special interest in the intercontinental global transport is very important research issue, which have not been studied in detail.

In an intercontinental thermal-balloon flight from Japan to North America through jet streams (8-10 km altitude) in January/February 2007, we planned to collect individual aerosol particles with an automatic aerosol sampler. The sampler will be located 100 m below the cabin of thermal balloon and collect samples of aerosol particles every 3 hours. In the mid-latitudes of the Northern Hemisphere, there are many anthropogenic sources as well as large continents, as compared to those of the Southern Hemisphere. We focus on the composition changes of mineral dust and anthropogenic particles in jet streams from Asia to North America. After the collections, the samples will be examined with a transmission electron microscope equipped with an energy-dispersive X-ray analyzer.