

FLIGHT MH370

MALAYSIA AIRLINES

JUST THE FACTS

Compiled from various sources

CMG Archives
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(2014)

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The Plane

The plane's registration number is 9M-MRO

The Boeing 777 was carrying 239 people: 227 passengers (including 2 Canadians) and 12 crew.

Two-thirds of the passengers on board the plane were Chinese. Some were from a range of other Asian countries, North America or Europe.

The aircraft was flying at 35,000 feet and the weather was clear.

As the plane reached the boundary between Malaysian and Vietnamese airspace, the Malaysian air control announced it was handing over to Ho Chi Minh City Control.

Minutes later, all contact with Flight MH370 was lost.

It vanished about an hour after it took off from Kuala Lumpur International Airport, as it flew south of Vietnam's Ca Mau peninsula - there was no distress signal or radio communication about any change of course, etc.



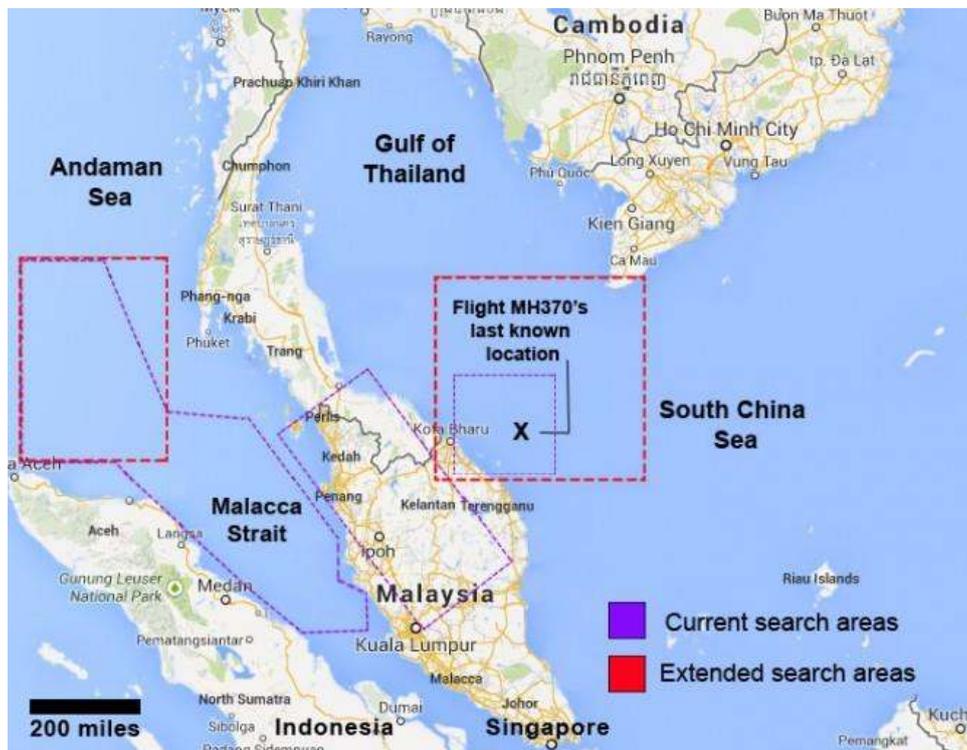
Search radius for missing Malaysian plane (CTV News)

Distress Transponders/Beacons

Civil Aviation Regulations require commercial civil aircraft to have Emergency Locator Transmitters (ELT). They are activated during a crash based on the G force they experience or by a pilot's manual input. Another beacon is attached to the flight recorder (black box) which is called an Underwater Locator Beacon (ULB). The black box beacon is activated when it comes in contact with water. If the aircraft crashed on water, the ELT's would have commenced transmitting, but they are not waterproof. The ULB would have started transmitting the moment it touched water.

The Under Water Beacon (ULB) can emit a signal for hundreds of miles. But if the black box is covered with debris or falls into a trench at the bottom of the sea, then the strength and range of the signal would be lower.

The ELT and beacons are fitted with batteries; consequently, an aircraft electrical failure does not affect them. The batteries of the black box beacons are designed to last for 28 days.



Malaysia Airlines Flight MH370 - last Known Location

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Time Line

Sat, 08/03/2014

Malaysia Airlines flight MH370, Boeing 777, went missing en route from Kuala Lumpur to Beijing.

The plane left Kuala Lumpur (on the western coast of Malaysia) at 12:41 a.m. local time and was due to arrive at Beijing at 6:30 a.m. local time Sat, 08/03/2014.

Location of the last contact with air traffic control was 120 nautical miles off the east coast of the Malaysian town of Kota Bhar.

The last message from Flight MH370 was the reply: "All right, roger that", to a radio message from Malaysian air traffic control. Moments later, the plane, at cruising altitude, around 35,000 feet, dropped from radar, +/- 01:30, Sat, 08/03/2014, with no indication from the pilots,

Radar at a military base detects the airliner at 2:40 a.m. local time -- near Pulau Perak at the northern approach to a strait separating the western coast of Malaysia and Indonesia's Sumatra island. But after that, the plane loses contact with Subang air traffic control.

ABC News reports that two communications systems on fated Malaysia Airlines Flight MH370 were turned off separately, and quotes an expert who believes this may indicate those systems were deliberately deactivated.

The plane's data reporting system was reportedly shut down at 1:07 a.m. local time, with a second transponder transmitting location and altitude was taken off-air at 1:21 a.m.

US investigators told ABC News that the two modes of communication were "systematically shut down."

Mon, 10/03/ 2014

The United States review of American spy satellite imagery shows no signs of mid-air explosion.

Wed, 12/03/2014

Search operations are now covering some 27,000 square nautical miles (92,000 sq km). Some 42 ships and 39 aircraft from several countries are taking part in the search.

Wednesday 12 March, 2014 The search for the missing Malaysia Airlines jet expands to an area stretching from China to India, as authorities struggle to answer what had happened to the aircraft that vanished almost five days ago with 239 people on board.

Thu, 13/03/2014

The mystery deepens, with Malaysian authorities expanding their search to the Andaman Sea, northwest of Malaysia, after saying the flight could have flown for several hours after its last contact with the ground.

Malaysian Transport Minister Hishammuddin Hussein added to the confusion, saying that government officials had contacted Rolls-Royce and Boeing (the plane's manufacturer) and both said the last engine data was received at 01:07 a.m., sat 08/03/2014, around 23 minutes before the plane lost contact.

A Chinese government agency releases satellite images it says shows unidentified "floating objects" in the "suspected crash area" of the missing Malaysia Airlines flight, but there is no immediate confirmation the pieces are part of the plane's wreckage. The site is near an oil rig off Vietnam where a New Zealand worker claimed to have witnessed a burning object in the sky about the time the missing flight is believed to have crashed.

A search of the area later finds no evidence of a crash site. China says the images, taken on Sunday, were "accidentally released".

Fri, 14/03/2014

Two sources say satellites picked up faint electronic pulses from flight 370 for several hours after it went missing, but the signals gave no information about where the stray jet was heading and little else about its fate. The "pings" indicated that the aircraft's maintenance troubleshooting systems were switched on and ready to communicate with satellites.

The US also announces it may expand its search into the Indian Ocean after "new information" is received.

Fri, 14/03/2014

New data points west - see information below.

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The Pilots

The pilot is Captain Zaharie Ahmad Shah, a 53-year-old Malaysian who has been with the airline since 1981 - he had logged 18,365 flying hours.

The First Officer is Fariq Ab, a 27-year-old Malaysian who has been with the airline since 2007 - he had logged 2,763 hours.

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Search & Rescue

40 ships and 34 aircraft are involved in the search operation, which encompasses 92,600 square kilometres.

As of 12/03/2014, teams from India, the U.S., China, Vietnam, Malaysia and the Phillipines were assisting in the search, which was concentrated in Gulf of Thailand between Malaysia and Vietnam.

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False Leads?

Debris

Satellite images posted on a Chinese government website on Wednesday show suspected debris from the missing jetliner floating off the southern tip of Vietnam, near the plane's original flight path, according to China's Xinhua News Agency. But those turned out to be false leads, after search planes found nothing.



Chinese satellite images show what might be debris; however, nothing was found at the location

Search for Malaysia Airlines MH370



Area of Spoted Debris

The satellite images were taken on Sun, 09/03/2014 - the day after the plane vanished.

The images, which appear to show fragments in the sea, were only published on Wed, 12/03/2014. The co-ordinates placed the objects in the South China Sea between Malaysia and Vietnam.

Even as viewed by satellite, the objects didn't seem to match that of a plane wreck. The largest of the objects was roughly the size of a basketball court, with no smaller debris around. The Chinese Embassy in Malaysia notified the Malaysian government on Thursday, saying the images - released by a relatively unknown Chinese agency - were made public by mistake and did not relate to Flight 370.

Oil Slick

Late on Sat, 08/03/2014, Vietnamese authorities spotted an oil slick off the southern tip of Vietnam -- each slick was between 10 and 15 kilometres long. However, authorities found that samples from the slick, as well as an orange object spotted floating in the ocean, had nothing to do with the missing plane.

Burning Plane

Vietnam's air traffic management earlier said it had received an email from a New Zealander working in one of the oil rigs off Vung Tau. Deputy general director Doan Huu Gia said: "He said he [the oil rig worker] spotted a burning [object] at that location, some 300 km (200 miles) southeast of Vung Tau,".



Oil Rig Location

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Radar Evidence

Fri, 14/03/2014

(Reuters) - Military radar-tracking evidence suggests a Malaysia Airlines(MASM.KL) jetliner missing for nearly a week was deliberately flown across the Malay peninsula towards the Andaman Islands, sources familiar with the investigation told Reuters on Friday [14/03/2014].

Two sources said an unidentified aircraft that investigators believe was Flight MH370 was following a route between navigational waypoints - indicating it was being flown by someone with aviation training - when it was last plotted on military radar off the country's northwest coast.

The last plot on the military radar's tracking suggested the plane was flying toward India's Andaman Islands, a chain of isles between the Andaman Sea and the Bay of Bengal, they said.

The last sighting of the aircraft on civilian radar screens came shortly before 1:30 a.m. Malaysian time last Saturday [08/03/2014] (1730 GMT Friday), less than an hour after it took off from Kuala Lumpur, as the plane flew northeast across the mouth of the Gulf of Thailand. That put the plane on Malaysia's east coast.

Malaysia's air force chief said on Wednesday an aircraft that could have been the missing plane was plotted on military radar at 2:15 a.m., 200 miles (320 km) northwest of Penang Island off Malaysia's west coast.

In a far more detailed description of the military radar plotting than has been publicly revealed, the first two sources said the last confirmed position of MH370 was at 35,000 feet about 90 miles (144 km) off the east coast of Malaysia, heading towards Vietnam, near a navigational waypoint called "Igari". The time was 1:21 a.m.

The military track suggests it then turned sharply westwards, heading towards a waypoint called "Vampi", northeast of Indonesia's Aceh province and a navigational point used for planes following route N571 to the Middle East.

From there, the plot indicates the plane flew towards a waypoint called "Gival", south of the Thai island of Phuket, and was last plotted heading northwest towards another waypoint called "Igrex", on route P628 that would take it over the Andaman Islands and which carriers use to fly towards Europe.

The time was then 2:15 a.m. That's the same time given by the air force chief on Wednesday, who gave no information on that plane's possible direction.

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Latest Data Points West

Fri, 14/03/2014

A US official has reportedly said there's a "likelihood" the missing plane is at the bottom of that ocean, according to CNN.

The engines of a missing Malaysian airliner continued to operate for about four hours after it disappeared from radar over the Gulf of Thailand, US authorities say.

Obama administration officials later said the new information was that the plane's engines remained running for approximately four hours after it vanished from radar early on Saturday en route from Kuala Lumpur, Malaysia, to Beijing.

One senior administration official said the data showing the plane engines running hours after contact was lost came from the Aircraft Communications Addressing and Reporting System, or ACARS, a way that planes maintain contact with ground stations through radio or satellite signals. The official said Malaysian authorities shared the flight data with the administration.

The Boeing 777-200 was sending out a signal to establish contact with a satellite, an official told AP.

Boeing offers a satellite service that can receive a stream of data during flight on how the aircraft is functioning. Malaysia Airlines didn't subscribe to that service, but the plane still had the capability of connecting with the satellite and was automatically sending pings, the official said.

"It's like when your cell phone is off but it still sends out a little 'I'm here' message to the cell phone network," the official said. "That's how sometimes they can triangulate your position even though you're not calling because the phone every so often sends out a little bleep. That's sort of what this thing was doing."

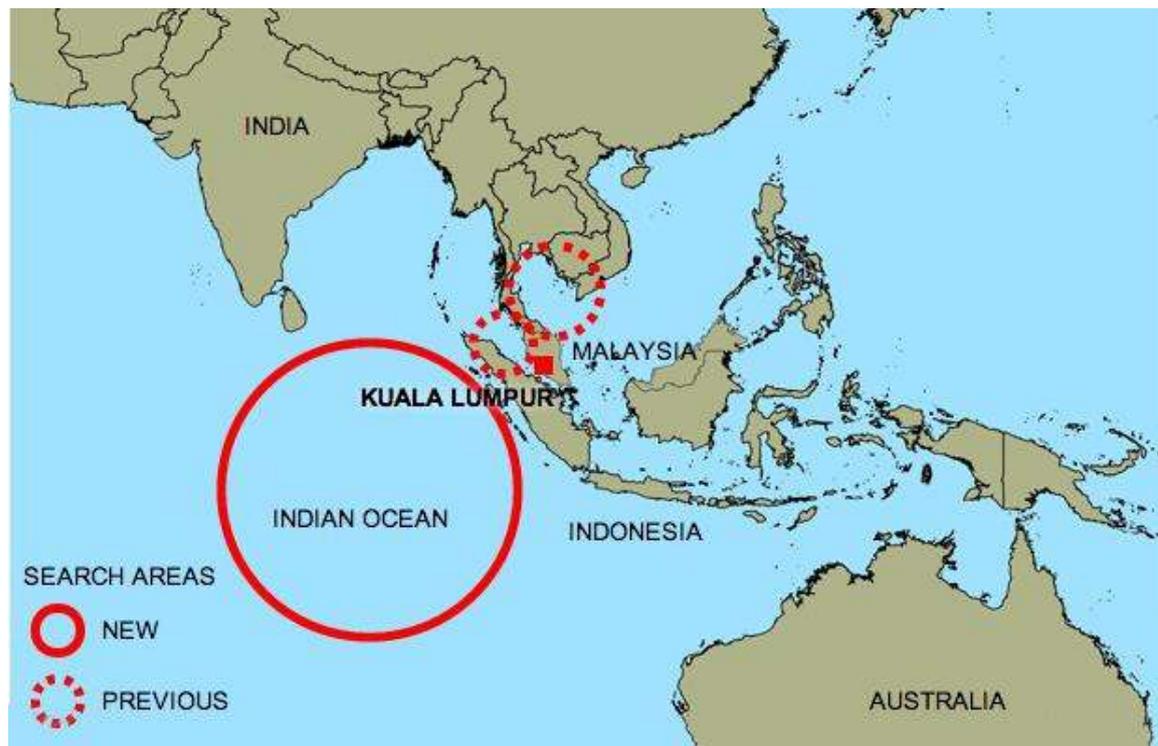
The continuing pings led searchers to believe the plane could have flown more than 1600km beyond its last confirmed sighting on radar, the official said. The plane had enough fuel to fly about four more hours, he said.

Messages involving a different data service also were received from the airliner for a short time after the plane's transponder - a device used to identify the plane to radar - went silent, the official said.

The Wall Street Journal first reported that US investigators suspect that the engines kept running for up to four more hours after the plane reached its last known location. The paper later corrected its report to say that this belief was based on satellite data, not signals from monitoring systems embedded in the plane's Rolls-Royce engines. The Malaysian government denied the initial report.

In Washington, Carney told reporters that the United States is not in a position to draw any conclusions. However, he added, "it's my understanding that based on some new information that's not necessarily conclusive - but new information - an additional search area may be opened in the Indian Ocean".

Search operations in the Indian Ocean, the world's third-largest ocean with an average depth of nearly 12,800 feet (3.9km), would present significant challenges.



India's Defense Ministry said Thursday that the Indian navy has launched its own search mission, sending two ships - the INS Kumbhir, an amphibious warfare ship, and the INS Saryu, a patrol vessel - into the Andaman Sea near the Malacca Strait. India also appointed Air Marshal AK Roy as co-ordinator for rescue operations with Malaysian authorities.

Indian coast guard and navy aircraft were also pressed into service from a base on the Andaman and Nicobar Islands. A senior Indian official said late on Thursday that a total of three ships, two planes and a helicopter have now been dispatched in the growing search effort.

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Andaman Islands

14/03/2014

Military radar-tracking evidence suggests a Malaysia Airlines jetliner missing for nearly a week was deliberately flown across the Malay peninsula towards the Andaman Islands, sources familiar with the investigation have said.

Two sources said an unidentified aircraft that investigators believe was Flight MH370 was following a route between navigational waypoints - indicating it was being flown by someone with aviation training - when it was last plotted on military radar off the country's northwest coast.

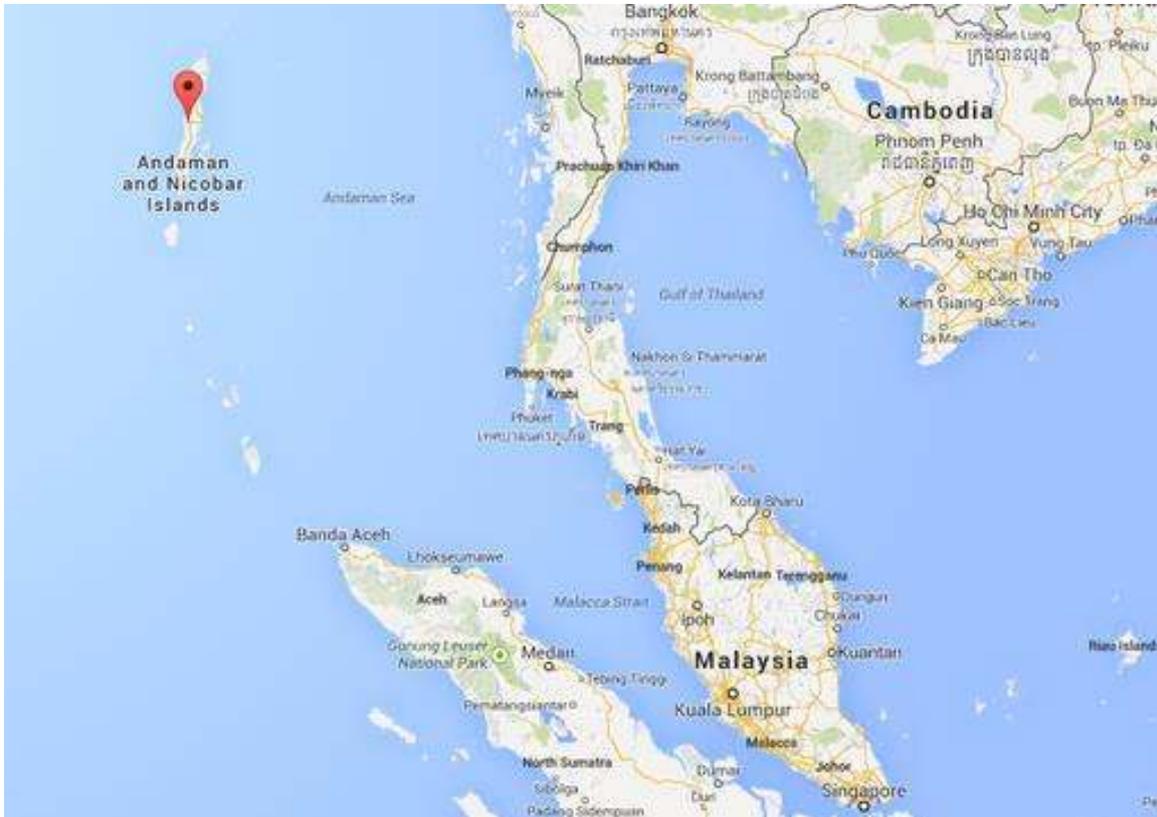
The last plot on the military radar's tracking suggested the plane was flying toward India's Andaman Islands, a chain of isles between the Andaman Sea and the Bay of Bengal, they said.

Waypoints are geographic locations, worked out by calculating longitude and latitude, that help pilots navigate along established air corridors.

A third source familiar with the investigation said inquiries were focusing increasingly on the theory that someone who knew how to fly a plane deliberately diverted the flight, with 239 people on board, hundreds of miles off its intended course from Kuala Lumpur to Beijing.

"What we can say is we are looking at sabotage, with hijack still on the cards," said that source, a senior Malaysian police official.

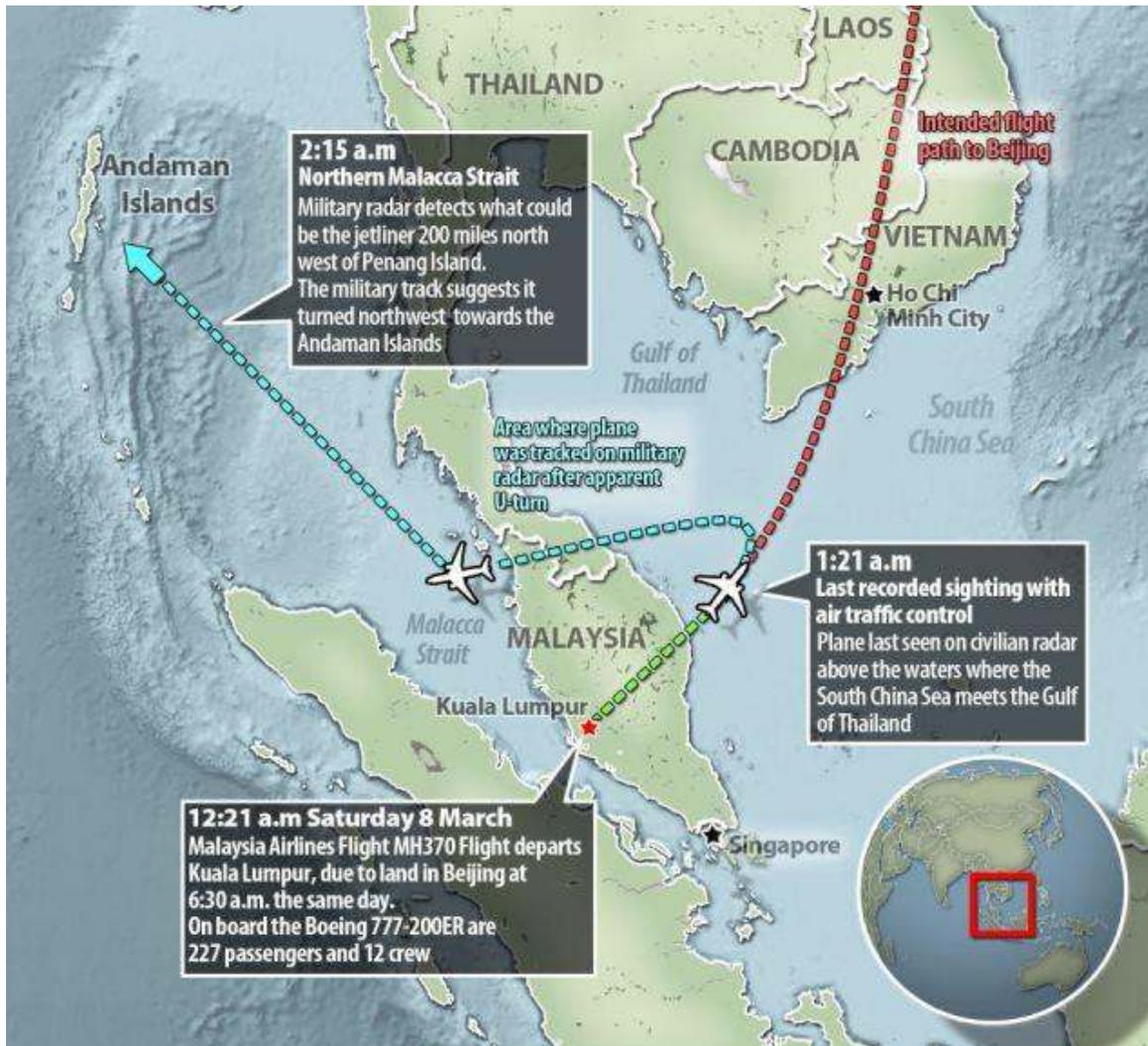
All three sources declined to be identified because they were not authorised to speak to the media and due to the sensitivity of the investigation.



Location of the Andaman and Nicobar Islands where it is now believed the Malaysia Airlines flight 370 was heading

The comments by the three sources are the first clear indication that foul play is the main focus of official suspicions in the Boeing 777's disappearance.

As a result of the new evidence, the sources said, multinational search efforts were being stepped up in the Andaman Sea and also the Indian Ocean.



An investigation into the disappearance of a Malaysia Airlines jetliner is focusing more on a suspicion the flight was deliberately diverted, as evidence suggests it was last headed out over the Andaman Islands, sources have claimed

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Pings

Malaysia Airlines flight 370 transmitted its location repeatedly to satellites over the course of five hours after it disappeared from radar, people briefed on the matter said, as searchers zeroed in on new target areas hundreds of miles west of the plane's original course.

The satellites also received speed and altitude information about the plane from its intermittent "pings," the people said. The final ping was sent from over water, at what one of these people called a normal cruising altitude. They added that it was unclear why the pings stopped. One of the people, an industry official, said it was possible that the system sending them had been disabled by someone on board.

The automatic pings, or attempts to link up with satellites operated by Inmarsat PLC, occurred a number of times after Flight 370's last verified position, the people briefed on the situation said, indicating that at least through those five hours, the Boeing Co. BA +1.26% 777 carrying 239 people remained intact and hadn't been destroyed in a crash, act of sabotage or explosion.

U.S. aviation investigators said they were analyzing the satellite transmissions to determine whether they can glean information about the plane's ultimate location or status. The transmissions were sent

via onboard technology designed to send routine maintenance and system-monitoring data back to the ground via satellite links, according to the people familiar with the matter.

The people said aviation investigators are exploring the possibility that someone on the plane may have intentionally disabled two other automated communication systems in an attempt to avoid detection. One system is the transponders, which transmit to ground radar stations information on the plane's identity, location and altitude, and another system that collects and transmits data about several of the plane's key systems.

After the plane dropped off civilian radar screens, two people said, the satellite link operated in a kind of standby mode for several hours and sought to establish contact with a satellite or satellites. These transmissions didn't include data about any of the plane's critical systems, they said, but the periodic contacts indicate to investigators that the plane was still intact and believed to be flying at least a significant portion of that time. All of the people said the transmissions included detailed information about the plane's location, speed and bearing.

The transmissions, one person said, were comparable to the plane "saying I'm here, I'm ready to send data."

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18 March 2014

A *satellite image* appears to show the missing Malaysian Airlines flight MH370 in the skies above a jungle.

The image is taken from Tomnod, the map search website currently being used by hundreds of thousands of people in an attempt to search for missing passenger plane, and was posted on Reddit on Sunday.

The authenticity of the photo has not yet been verified and the region depicted in the photo is as yet unknown. Intriguingly, the plane appears to have been painted white.



The satellite image from Tomnod, the online map site used by millions of netizens in the search for the missing Malaysia Airlines flight MH370, shows a passenger plane over a jungle



Mystery: The image was found by a university student in Taiwan

The image was found by an university student in Taiwan, according to Taiwan's China Times.

The image has surfaced at the same time as the news that Malaysian villagers claim to have seen the missing Malaysian Airlines jet flying over the north east of the country at around the time the aircraft is thought to have made a 'U-turn'.

At least nine people - tuna fishermen, farmers and villagers - in Kelantan in Malaysia have made reports to police about seeing lights in the sky and some said they heard the loud noise of an engine. Similarly, residents of a tiny island in the Dhaalu Atoll in the Maldives say they saw a plane with Malaysia Airlines markings in the early hours of Saturday March 8.

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Last Words Changed

01 April 2014

KUALA LUMPUR (Reuters) - The last words spoken by one of the pilots of the missing Malaysian Airlines airliner to the control tower were "Good night Malaysian three seven zero", Malaysia's civil aviation authority said, changing the previous account of the last message as a more casual "All right, good night."

The correction of the official account of the last words was made as Malaysian authorities face heavy criticism for their handling of the disappearance, particularly from families of the Chinese passengers on board Flight MH370 who have accused Malaysia of mismanaging the search and holding back information.

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General Speculation

Terrorism/Hijack

While terrorism has not yet been ruled out as a factor, authorities say there have not yet been any credible claims of responsibility from terrorist groups. The head of Interpol said on Tue, 11/03/2014 that he did not believe the plane had disappeared because of a terrorist incident.

Aviation website "Leeham news" lists some possible causes that will be investigated in an incident like this. While they stress these are not specific to this case, the causes could include:

- Catastrophic structural failure
- Dual engine flame-out
- Clear air turbulence
- Human intervention, including someone penetrating the cockpit, or a bomb
- Pilot suicide

"It could mean that it fell below the radar coverage altitude and landed on an island. It's possible that it's somewhere, though unlikely," Plourde said. "Or that it got destroyed and that's why we lost the radar coverage."

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Seafloor Event

Fri, 14/03/2014

Researchers have detected a "seafloor event" in the waters between Malaysia and Vietnam nearly two hours after flight MH370 went missing.

Researchers at the University of Science and Technology of China said: "The seafloor event could have been caused by the plane possibly plunging into the sea".

The report was revealed by China state news agency Xinhua which said the event was picked up on two seismographs based in Malaysia and was pinpointed on an area 72 miles to the north east of the last definite contact with the plane.

Researchers added: "The strength of the earthquake wave indicates the plunge was catastrophic."

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Fire

20/03/2014

If two large objects photographed in the Indian Ocean are confirmed to come from the missing Malaysia Airlines flight, they will shed new light on the theories of what happened to Flight MH370.

Electrical fire, structural damage, plane malfunction, hijacking, pilot murder-suicide and theft are among the numerous ideas circulating on forums and social media.

More outlandish claims include landing the plane somewhere to be used later in a 9/11-style attack, or it being involved in a collision with a military aircraft. Satellite data suggests the plane flew for at least seven hours after it was diverted west across Malaysia towards the Strait of Malacca.

Investigators are considering a number of theories about what happened to the aircraft, including hijacking, sabotage and terrorism.

However, background checks on all foreign passengers apart from three from Ukraine and Russia have yielded "no information of significance", Mr Hishammuddin said.

One theory that has gathered pace among aviation experts in recent days is that a fire in the cabin of flight MH370 may explain the mystery.

Pilot Fikri Zambi said the crew may have disabled tracking devices in response to a blaze and turned back towards the nearest airport, before being incapacitated by smoke.

The aircraft would then continue flying in auto-pilot mode, until it succumbed to the flames or ran out of fuel.

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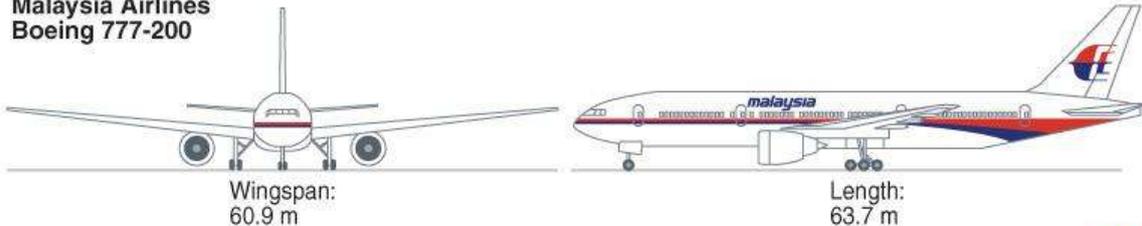
Search Map

Fri, 14032014

Search for Malaysia Airlines MH370



Malaysia Airlines Boeing 777-200



Source: Malaysia Airlines/Vietnam govt/Malaysia govt/NOAA

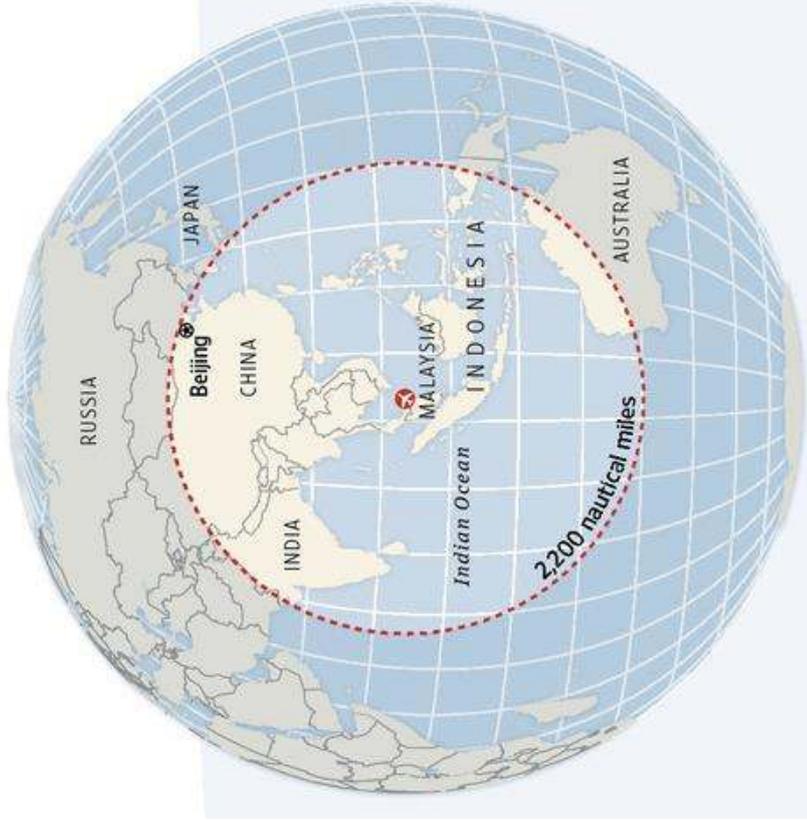


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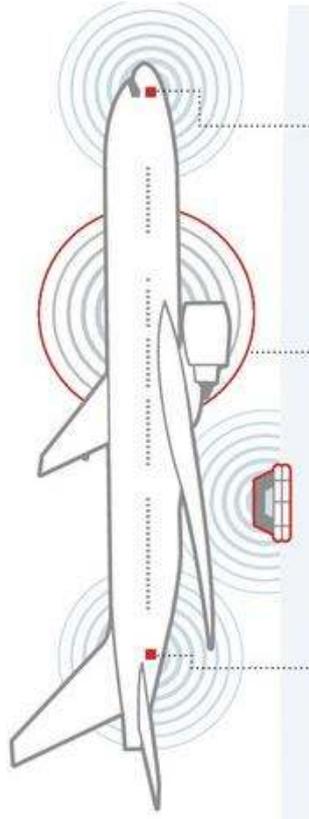
Tracking the Flight

Tracking the Flight

Communication satellites received transmissions from equipment aboard Malaysia Airlines Flight 370 for at least five hours after the jet fell off civilian radar screens. Based on a speed of 480 knots, this means the plane could have traveled an additional 2,200 nautical miles from its last known contact.



Equipment on the aircraft that can provide key data during normal operation and in case of emergency:



SIGNAL ITEM	Black box	Life rafts	ACARS	Transponders
	Records all flight data and voice communications. Sends out a signal when in contact with water.	Transmit emergency locator radio signals when deployed.	A satellite data link that intermittently transmits weather info and detailed status reports on select aircraft systems.	Send a unique four-digit number identifying the aircraft along with its location and altitude when prompted by ground radar.
FLIGHT 370	No signal detected.	No signal detected.	Signals detected after time of last confirmed location.	No signal after time of last confirmed location.

Sources: David Soucie, former FAA safety inspector; FAA; Rockwell Collins (ACARS)

The Wall Street Journal

Stolen Passports - 11/03/2014

Two men travelling on stolen passports on board a missing Malaysian airliner were Iranians with no apparent links to terrorist groups, officials say.

Malaysian police named one as Pouria Nour Mohammad Mehrdad, 18, and said he was probably migrating to Germany.

Interpol identified the other as Delavar Seyed Mohammadreza, 29.

Malaysia Airlines Flight MH370 from Kuala Lumpur to Beijing went missing on Saturday, after taking off with 239 on board. The search has been widened.



Pouria Nour Mohammad Mehrdad is second from the left. Delavar Seyed Mohammadreza, on the far right, travelled with him on the missing plane.



Police released pictures of the two as they boarded the plane

Experts have said the presence of two people with stolen passports on a plane was a breach of security, but one that is relatively common in a region regarded as a hub for illegal migration.

Malaysia's police chief, Inspector General Khalid Abu Bakar, said the younger Iranian was "not likely to be a member of a terrorist group", adding that the authorities were in contact with his mother in Germany, who had been expecting her son to arrive in Frankfurt.

Speaking in Paris later on Tuesday, Interpol Secretary General Ronald Noble said the two men had travelled from Qatar's capital Doha on their Iranian passports, and switched to stolen Italian and Austrian passports to board the Malaysia Airlines flight.

The secretary general of Interpol Ronald Noble: "These two individuals were probably not terrorists" "The more information we get, the more we are inclined to conclude it is not a terrorist incident," he added.

The authorities' statement supports an account given to the BBC by a young Iranian in Kuala Lumpur, who says he was a school friend of one of the men who boarded the airliner using stolen documents. He says the friend and another Iranian stayed with him before taking the Malaysia Airlines flight, and that they had hoped to settle in Europe.

Reports from Thailand suggest that the tickets of the two men, routing them to Amsterdam via Beijing, had been bought through a Thai travel agent and an Iranian middleman.

End

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