

Affidavit of Michael Hull

1. My name is Michael Hull.
2. I am a retired scientist presently conducting research on international terrorism as it pertains to aircraft incidents. My previous work experience is as follows:

Research Scientist U.S. Army Electronics Command,  
Ft. Monmouth, NJ 07724 1967-1969

Senior Scientist Electric Storage Battery,  
Yardley, PA 19067 1969-1978

Section Manager International Nickel Company,  
Suffern, NY 10901 1978-1982

Manager - Primary Research, Analytical Sciences, and  
Work Systems International Paper, Tuxedo Park, NY 10987 1982-2001

Education

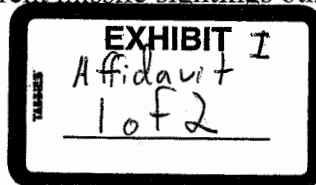
Ph.D., Electrochemistry, Queens University, Ireland (1967)

B.S., Chemistry (Physics & Mathematics) with first class honors, Queens University (1964)

3. I was the author of Exhibits 24 and 26 submitted as part of Commander William Donaldson's July 17, 1998 INTERIM REPORT ON THE CRASH OF FLIGHT 800 AND THE ACTIONS OF THE NTSB AND THE FBI, to the US House of Representatives Subcommittee on Aviation.

4. Exhibit 24, attached hereto as Exhibit 1, OTHER EYEWITNESS ACCURACY PROBABILITIES, concludes that where a witness is accurate only 10% of the time, and 50 similar witnesses report the same event, there is a 99.48% probability of the event having occurred.

5. Exhibit 26, attached hereto as Exhibit 2, OTHER REPORTED WITNESS SIGHTINGS, relates 12 or 13 apparent missile sightings other than Flight 800.



6. Page 2 of exhibit 26 states:

James Kallstrom: "We do have information that something was in the sky. A number of people have seen it. A number of people have described it similarly. It was ascending."

7. The comment was reported in the July 27, 1996 edition of Long Island Newsday. The article, titled *Abrupt End*, was written by Liam Plevin. It is attached (Exhibit <sup>3</sup>X). It includes:


"We're not here to declare what everybody is discussing in the newspapers, but I think we are closer to that," Kallstrom said. "There was something in the sky," he added later. "A number of people have seen it. A number of people have described it very similarly... It was ascending."

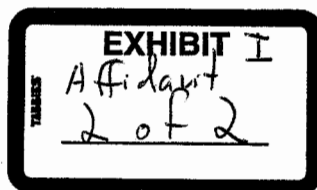
8. Mr. Kallstrom's remarks were also reported by CNN on July 26, 1996 in an article titled *Abrupt End*, subtitled *Black box recordings reveal no mechanical problems*, which is also attached (Exhibit <sup>4</sup>X). It includes:

"He [Kallstrom] said several witnesses reported seeing an object in the sky before the crash, but did not elaborate."

I hereby certify under penalty of perjury that the foregoing is correct.

Date: February 1, 2003.

  
Michael N. Hull



## EXHIBIT 24 - EYEWITNESS ACCURACY PROBABILITIES

By Michael Hull - Article provided for use by Cmdr. Donaldson and may be reprinted by others.

I would like to offer you some statistical calculations on the probabilities that can be assigned to the accounts of the TWA 800 eyewitnesses. In a December 15, 1996 article in the NY Times entitled "Many Answers in Crash Except the One That Counts" it is stated that: "safety board officials said their leading theory of the crash is that the fumes were ignited by a spark of static electricity created by fuel leaking into the tank. But they offered no evidence to support that theory and, in fact, they could not rule out a bomb or missile as the cause of the explosion -- two other possibilities for which there is no evidence."

Statistical calculations on the probabilities can be assigned to the accounts of the TWA 800 eyewitnesses. Granted, to date, there may have been no "physical" evidence found for a missile or rocket, but the NTSB should not discount the eyewitnesses' evidence that a streak of light rose towards the aircraft prior to its destruction. In the article it is indicated that 40 of these witnesses are considered to be "reliable" and include a pilot and a military officer. What statistical reliability can we place on this evidence provided by eyewitnesses?

If one assumes that a "reliable" witness can report an observation correctly in only one out of five observations, then there is only a 20 percent probability that an event reported by such a witness would have actually taken place as described. With two of these witnesses independently describing the same event, the probability rises to 36 percent and with ten witnesses it rises to 89.26 percent. With forty such independent and similarly "reliable" witnesses the probability rises to 99.99 percent that the event reported did indeed take place. This is as close to certainty as one can come mathematically. Further, even if one assumes that the reliability of these 40 "reliable" witnesses was so poor that each of them could report an observation correctly only one time out of ten, the probability that the event did indeed take place as described by the witnesses is still 98.52 percent.

The equation is as follows:

Probability of Event (P) =  $[1-(U^N)]$  where U is the Unreliability of the system and N is the number of participants.

For example: If you give a coin to one person and ask them to flip it and you hope to see a "head", what is the probability that you will get it? Answer 50%. What if we give two people a coin each and ask both to flip their coins and we hope to have one "head" show up, the probability that we will get it is now 75%. With three people the chances that we can get at least one head is 87.5% and with four people it is 93.75%.

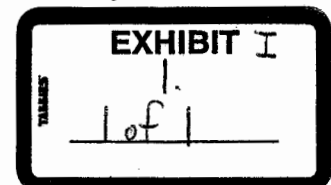
Another way to look at these probability outcomes is as follows:

Assume that one has identical pieces of equipment which need to operate for a set period of time, but each can do so with only 50% reliability. How many pieces of equipment do we need to operate simultaneously to ensure with 99.9% probability that we will get the job done? Answer 10.

Now if a witness is "right" in an observation only 10% of the time (or another way of putting this is that the witness is unreliable in 90% of his observations) then if one had 50 such witnesses what is the probability that what they said happened, actually happened? The solution table is shown below: Accuracy of Witness Groups at Ten Percent Reliability:

No. of Witnesses	Probability that Event Happened
1	10.00 % (N=1 and U=0.9)
5	40.95 % (N=5 and U=0.9)
15	79.41 % (N=15 and U=0.9)
20	87.84 % (N=20 and U=0.9)
35	97.50 % (N=35 and U=0.9)
50	99.48 % (N=50 and U=0.9)

In the search for 'likely scenarios' of what caused the TWA 800 crash, the probability that the center tank explosion was linked to the streak of light, as reported by the eyewitnesses, has more support than speculation by the NTSB on static electrical charges, leaking fuel lines, and air conditioning units warming fuel in the tank to explosive limits.



## EXHIBIT 26 - OTHER REPORTED MISSILE SIGHTINGS

Provided by Michael Hull

*June 25, 1987 NY Times on June 27, 1987*

The National Weather Service doubts it was theirs and the Defense Department insists it wasn't theirs. About the only thing the Federal Aviation Administration can say about the object that encountered a Delta Airlines Jet-At 29,500 feet Thursday is that no one is likely to find it. The pilot of Delta Flight 1083, flying 60 people from Pittsburgh to Atlanta, told investigators that an object, which appeared to be a missile, seemed headed straight for his Boeing 737 before passing to the side and slightly below. "The pilot described it as a rocket or missile about 4 feet long, with fins," a Delta spokesman, Bill Berry, said. "It went so fast that's all he saw." The aviation agency said it would probably never know what had the encounter with the jet 31 miles northeast of Charleston. Kathleen Bergen, an agency spokesman, said it was left with two explanations: The official one is that it was a promotional balloon that escaped. "Balloons can travel pretty far" she said. "We don't acknowledge the existence of UFOs."

*Mid-year, 1992 Reported in alt.disasters.aviation on Wed, 21 Jan 1998 18:08:48-0800*

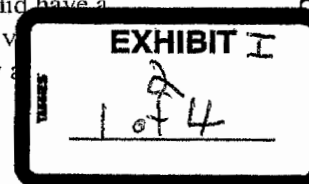
Christopher Coon wrote: The TWA Missile Conspiracy notwithstanding, here is a "rogue missile" event straight from the participant (me, as a controller at L.A. Center). In mid '92 I was working a UAL 747 climbing out of about 23,000 near Victorville, California (about 50nm NE of LAX). 23,000, by the way, is in what is called "Class A" airspace (back then, "Positive Control" airspace), meaning nothing--absolutely nothing, military or otherwise--may fly above 18,000 feet without the controller knowing about it and approving it. About 30nm to the north is a huge military restricted area, R-2508, in which the military can play their games as they wish, without notifying FAA controllers. All of their activity, though, must remain within the lateral confines of the restricted area, unless they coordinate a "whisky alert," and identify the accidental spillout. There was no such notification on that day. The 747 pilot suddenly came on and told me a "rocket of some type" just missed their aircraft, passing about 500 feet below. He said it went by at "3 or 4 times the normal closure rate." 3 or 4 times normal closure rate of a head-on Jet-Aircraft comes out to about mach 2. I saw absolutely nothing on radar, and told him so. I pulled up the primary (raw radar) targets, but there was absolutely nothing in his area. He elaborated that the "rocket" was about the size of an F-16, and was heading in the opposite direction (i.e. southwest). I alerted the sectors in its possible path, and alerted my supervisor, who just scratched his chin and said "Hmmmmm." There was no collision, and no loss of life, so it was left at that. The pilot was alarmed enough to report it, though, and I subsequently saw a short article about it in Aviation Week & Space Technology (early August, '92), with a "mysterious black aircraft" slant instead of a "rocket" like the pilot initially reported to me. The voice and radar tapes were pulled, but they revealed no further info, and the cursory investigation was dropped.

*October 11, 1994 Associated Press report datelined 09/28 23:55 EDT V0009 (1994)*

A State bomb squad destroyed a French-made surface to air rocket launcher armed with a live missile and explosives ....along a rural roadside in Westminster, Maryland.

*November 17, 1995 22:20 (EST)*

Lufthansa 405 (747) departing JFK at 9:20pm bound for Frankfurt at 25,000 feet, south of Long Island, reported an object flying directly opposite its course about 2-3,000 feet above them. Confirmed by British Airways 226 (747). Directly north of W-105. Large bright light in front, no red or green beacons, long green light in rear and left a vapor trail. "It was looking strange". "Looked like a green trail on it, and a very bright light on the front of it". "It was looking very strange, with a long light, in the tail". "It did have a very strong trail to it...a vapor trail, which looked more like smoke. And the light on the front was very bright" "It didn't have any lights...((normal)) lights, beacon lights, or red or green lights. Only a



light in the front, and with a long green light. The FAA transcript of the controller - pilot conversations on this incident are public.

**November 17, 1995?**

November 17 is considered the most probable date based on Lufthansa sighting above but alternative dates are November 22, 1995, February 2, 1996, or March 8, 1996 with March 8 being the second most likely date. Missile or rocket launch witnessed by Michael Hull from I95 in Connecticut off the highway or from Long Island Sound. Hull was driving along Interstate 95 (Connecticut turnpike) going to Stamford and was between exits 4 and 6 when suddenly to the right front side of his car there was a flash through the trees and then a very white, bright streak, was observed rising, accelerating extremely rapidly in the direction of Long Island Sound and arching across the sky. The incident was reported to the FBI.

**July 17, 1996 TWA 800**

James Kallstrom: "We do have information that there was something in the sky. A number of people have seen it. A number of people have described it similarly. It was ascending." Sikorsky aircraft in Stratford CT [less than 100 miles from the disaster] indicated that Sikorsky's radar at its airport picked up an air to air missile. The radar was on tape and was turned over to the FBI. Sikorsky is a manufacturer of helicopters for the military and has extensive facilities in Stratford, which is on Long Island Sound.

**August 29, 1996 Reported in the NY Times on September 9, 1996**

The pilot of an American Airlines jet reported that he saw a missile off the wing of his 757 plane while he was traveling from San Juan to Boston. The plane was over Wallops Island, VA. According to the NTSB's report on the near-miss, "the missile was a Black Brant V missile, with an inert payload and was launched ... in support of the Department of Defense."

**November 16, 1996 22:00 (EST)**

Pakistan International Airlines Flight 712 Leaving Kennedy at 9:25pm, bound for Frankfurt. The pilot, W. Shah, said his co-pilot saw an orange light coming from the left hand side to the right hand side of the airplane. The object was 3 - 4 miles in front of the aircraft and above it. Shah was told by Boston controllers that there were no military exercises in the area. Boston apparently confirmed 'two unidentified blips' on radar. The tapes have been turned over to the FBI and NTSB. The object(s) rose directly out of Long Island Sound and ascended almost vertically. The Pakistani crew just saw a flash, and apparently a TWA crew, which was behind the Pakistani, saw the whole thing. The TWA crew was so alarmed by what they had just seen that they considered returning to JFK. Later, they requested clearance to skirt the area where the light had been seen. Radio 5 in the U.K. reported that the object which crossed the Pakistani aircraft had exploded. (On a subsequent McNeill - Lehrer newshour when asked about the direction of the object Mr. Kallstrom replied, "ascending".)

Another report on this incident stated: This evening I flew flight 1504 FLL to BOS. It was an extremely clear night over the Eastern Seaboard. You could see the Connecticut shoreline from Cape May, NJ. We were at FL 330 just east of JFK proceeding direct to PVD. It was about 10:15 PM when an aircraft asked center the following question: were there any fireworks going off in the area. Center replied in the negative, to the best of their best knowledge. The aircraft then reported they had something streak up towards them from the left and pass in front of them and through their altitude. There was silence on the frequency. I asked center the position of the aircraft reporting the event. Center replied 20nm south of HTO. It was a foreign carrier, but judging by the accent of the pilot, I would say it was Air India or Pakistan Intl. I didn't get a call sign, and to my surprise, center did not ask any more questions. It was a crystal clear night we could see the Hamptons from our position. There were no fireworks taking place anywhere. Unless the controller was working both frequencies, the aircraft was at least climbing to or in the high sector.

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little bit of checking, and found out Air India leaves at 7:30. PM, and Pakistan Intl. leaves at 9:45 PM from Kennedy. It doesn't really matter who it was. Fact is someone reported a streak that came from the ground and to the left of them and passed in front and through their altitude. It was 10:17 when center replied to me that the aircraft was 20nm south of Hampton. Is it merely a coincidence this is close to where TWA 800 blew up, or is something else going on? I don't believe the aircraft was flying inverted and that was a meteor that streaked by their windshield. Again I was amazed at the silence of the controller after the report. This event certainly got our attention.

**November 17, 1996 WCBS-TV**

WCBS-TV reports that last night Pakistani International Airlines flight 712 radioed Logan International (Boston) that a missile had just flown by their plane (the story implied 'just missing them') ...Boston confirmed 'two unidentified blips' on radar at the same time as the PIA report.

**November 17, 1996 Associated Press**

FBI spokesman Joseph Valiquette said Sunday, "At this point we don't know what, if anything, was seen." Shah (pilot of PIA 712) said they were told by Boston air traffic controllers that there were no military exercises in the area. He also said the pilots were interviewed by officials with the U.S. Embassy in Frankfurt... A TWA plane flying immediately behind the Pakistanis jet Saturday made a similar sighting and asked to turn around .... The TWA plane was rerouted and the air corridor used by the Pakistan Airlines flight was closed.

**December 12, 1996**

A Saudi Arabian Airlines crew reported sighting a bright greenish object streaking by their plane as it approached Kennedy Airport Thursday morning. It was approaching Kennedy airport, 15 miles south west of East Hampton, at about 12,000 feet when the object appeared on radar. At least one crewmember saw the object from the cockpit window for about two seconds.

**February 7, 1997**

Passenger from JFK to Atlanta on Delta Flight 592 (which had a scheduled departure of 6:45 am) between 7:15 and 7:30 am seated on the left side of the plane observed a missile/rocket. It was an early morning flight and after a delay of about half an hour the plane took off. It was a very clear morning with excellent visibility. She had taken a window seat on the left side of the plane. About 10 minutes into the flight the plane had just finished a rather wide turn and had reached about 8-10 thousand feet. It was still climbing but had taken a course heading that took it over the coast. Passenger could see the coastline all the way down to her left and the ocean beyond. As she looked down she saw a trail of light gray smoke pouring out of a missile that came up from the ground (she could see the smoke trail) it arched out pouring smoke from the rear, wobbling as it went and took a heading parallel to the coastline. There were no visible fins or coloration of the fuselage. It was about 2,000ft below the left side of the plane moving she believed in an easterly direction following the coastline but inland perhaps a mile or two. The plane was, she believes, heading in a southerly direction directly across the coast and then over the Atlantic. At the time she was a bit amazed at what she was seeing and remember saying to herself "Thank God it is going in the other direction." The missile was land-launched missile about 2 or 3 miles inland from the coast of eastern Long Island. She called Delta Airlines on 4/16/97 in Atlanta and spoke to Warren Garland (Mgr. of Consumer Affairs?). Her presence on the flight was confirmed and great interest was shown in what she had to relate. She also called TWA on 4/17/97 and again much interest was expressed. She then called the Airline Pilots Association (AOP) in Virginia and again there were many questions and much interest. She finally called the FBI in Melville on the same day or within a day or two. The person who handled the call showed interest compared to the others - almost no questions - a whole different reaction. On 5/12/97 she called Newsday reporter after seeing a TV interview of one of the Newsday reporters who said almost every

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believed the TWA crash was due to mechanical failure. She spoke to a woman reporter who was very interested and called her back with more questions.

**March 17, 1997 19:15 (EST)**

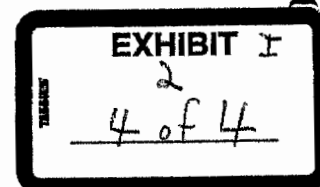
Northwest Airlines D93 Flight 775 Newark to Minneapolis and Flight 361 A320 LaGuardia to Minneapolis report missile both departing at 6:55 PM about 15 minutes into flight. Plus Delta and US Airways flights. A Reuter's report of April 10, 1997 indicated that Northwest Airlines pilots reported that they saw what appeared to be a missile or a rocket over the New York area the evening of March 17, the Saint Paul Pioneer Press reported Thursday. In a copyrighted story, the Pioneer Press reported that investigators are piecing together tapes of air traffic control radar recorded the night of the sightings. Two other flight crews, from Delta Airlines and US Airways have filed similar reports, the newspaper said. The possibility that missiles are flying in commercial airspace is particularly significant in the aftermath of last summer's crash of TWA flight 800 minutes after takeoff from JFK International Airport in New York, the Pioneer Press said. The pilots of a Northwest Airlines DC-9 reported a possible missile sighting about 15 minutes into their flight from Newark International Airport in New Jersey in March, according to the Newspaper. A second Northwest flight crew, in an aircraft that left from LaGuardia Airport in New York reported a similar sighting.

**August 9, 1997 September 26 Reuters**

A Swissair passenger jet flying over New York had a close encounter last month with a weather balloon, the Federal Aviation Administration said on Friday. The crew aboard the Swissair 747, flight 127 traveling from Philadelphia to Boston, said the encounter occurred on Aug. 9 at 5:10 p.m. local time over Deer Park (Long Island), New York. The crew could not identify the object, which the airplane passed at an elevation of 23,000 feet (7,000 meters). The airplane was traveling about 500 mph (800 kph) at the time. A United Airlines flight passing through the same area a short time later identified the object as a large balloon, the FAA said. An FAA investigation of the incident "concluded that it was indeed a weather balloon," FAA spokesman Jim Peters said. He said the National Weather Service balloon had been cleared in advance to be in that area. Swissair spokesman Ulrich Wohn said the pilot followed standard procedure by reporting the close encounter. He said the flight landed on time in Boston and continued on to Zurich without incident. "At no time were any of the passengers at risk," said Wohn. "They didn't even see it."

**September 27, 1997 Electronic Telegraph Issue 856**

An unidentified object narrowly missed a Swissair jumbo jet with 64 passengers aboard at 23,000 feet near New York, a company spokesman said yesterday. The object was described by the 747 captain as "elongated, white and without wings" but the co-pilot recalled it as being "more spherical". American aviation authorities dismissed speculation that the object was a missile and said it was a weather balloon. Swiss Radio reported the captain as saying he did not find that explanation credible although neither he nor his co-pilot thought it was a missile. The near-miss occurred on Aug 9, close to the spot where a TWA airliner exploded in July last year with the loss of 230 lives. Swissair flight 127 was traveling from Philadelphia to Zurich via Boston.



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<http://www.newsday.com/news/nytwa96-jet7main.0,4795387.story>

**TWA Flight 800**

# Abrubt End

## 'Black box' recordings reveal no mechanical problems

Written By Liam Plevin  
Staff Writer

July 27, 1996

The flight data recorder retrieved from the wreckage of TWA Flight 800 contained no sign the plane was suffering mechanical problems before it exploded over the Atlantic Ocean last week -- only the same sudden end as the cockpit voice recorder tape that earlier heightened suspicions of sabotage.

Instruments aboard the aircraft showed that the Boeing 747 was climbing steadily and smoothly into the summer skies without any engine trouble or even a change in speed, according to officials investigating the July 17 crash that killed 230 people.

Taken together with the conversations of crew members, which ended at almost exactly the same instant, the data suggest the crew had no indication of the impending explosion. Conversations between the pilots, portions of which were also disclosed yesterday, revolved only around such logistical problems as a minor difficulty with a fuel gauge and the eye-transplant material the plane was carrying.

On a day in which the only other evidence mentioned by investigators was two of the plane's engines, which divers have located but not retrieved from the ocean floor, the information from the so-called black boxes was the most significant advance in the investigation.

The remainder of the salvage effort that continues about 10 miles off the South Shore focused on the ongoing effort to retrieve bodies of the dead, 139 of which have been pulled from the water. The Suffolk medical examiner said 131 of the bodies had been identified by late afternoon.

Despite the new evidence, both Robert Francis, who is heading the investigation for the National Transportation Safety Board, and James Kallstrom, the lead investigator for the FBI, refused to say that the combined recordings were definitive evidence that a missile or a bomb downed the plane.

"We're not here to declare what everybody is discussing in the newspapers, but I think we are closer to that," Kallstrom said. "There was something in the sky," he added later. "A number of people have seen it. A number of people have described it very similarly . . . It was ascending."

But experts said that the third possibility repeatedly advanced by investigators -- a massive mechanical failure -- had been rendered all but impossible by the information retrieved from the flight data recorder.

"I can't think of one so catastrophic that nothing could show," said Bill Gunston, the editor of Newsday.

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Aero-Engines, a guide to airplane engines published in Great Britain. "The only other thing that could do that would be to have total catastrophic fuselage failure, and you're not going to get that at these heights unless you have a mid-air collision."

"I don't think it's mechanical," said Frank Taylor, a former director of accident investigation for the NTSB. "Based on the data coming out of the flight data recorder, I think it goes back to a massive explosion in the airplane for some reason."

The sudden noise on the cockpit voice recorder, the existence of which was disclosed Thursday, had already prompted investigators to seek a comparison with the sharp sound which was later attributed to a bomb in the explosion of Pan Am Flight 103 over Lockerbie, Scotland, in 1988.

But the information from the flight data recorder added a dimension to the evidence. "There's nothing to indicate that an engine stopped or the aircraft tipped or pitched up or changed speed," said Francis. "The airplane was in a stable, wings level climb."

Nor did the pilots appear to be struggling with their ascent or with the atmosphere on a night that was clear and warm. But the normalcy recorded on the tapes in the two black boxes ended in an instant. "Both recordings ended at nearly the same time, within a fraction of a second," said Francis.

Francis also said the end of the tapes was "approximately coincident" with the last signal which shows that the plane's transponder was operating properly, which was received at the radar tower at Long Island-MacArthur Airport at eight seconds after 8:31 p.m. The shutdown of the transponder and the two recorders together indicated an overall electrical failure.

"After that time, only primary radar targets were recorded," added Francis, referring to the signals that radar picks up from everything from a plane to a piece of metal to smoke.

The targets did not show altitude, Francis added, but a cluster of them did follow a path that ended near the spot where investigators have now found what they believe is a significant percentage of the plane's still-unretrieved wreckage.

"One sequence of primary targets continued on from the transponder track for about 41 seconds and two-and-one-half nautical miles, to near the position where the engines and large pieces of wreckage have been found," Francis said. That distance is equivalent to just under three statute miles. It was unclear where in the sequence the plane erupted in a fireball; pilots in the air that night have told investigators it occurred at about 8,000 feet, or a mile below the point where the plane's electrical systems failed.

The cockpit voice recorder, whose "loud, unknown" noise had been disclosed by investigators Thursday, contained such minutiae as a discussion about the late arrival of baggage and a passenger who it turned out had been on the plane the entire time.

The tape, in fact, contained only two signs of anything even remotely unusual about the flight before the sudden noise, and investigators said neither was considered significant to their probe into the explosion.

The first involved a discussion between the pilots and the controllers at Kennedy before takeoff about the plane's status as a "lifeguard" flight, which gives planes priority clearance because they carry human tissue for transplants -- in the case of Flight 800, a cornea.

A spokesman for TWA, Don Etling, said the airline filed a release indicating the lifeguard

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traffic controllers at 5:23 p.m. the day of the flight. But Francis said the status of the plane apparently caught controllers off-guard, according to the tape.

The cornea was being sent by the Medical Eye Bank of Maryland, in Baltimore, to a doctor in Marseilles who was going to transplant it into an Italian patient, said Toby Bernstein, an eye bank official. She said both the Federal Aviation Administration and the FBI have interviewed eye bank officials.

Etling said TWA was informed of the shipment 24 hours in advance and the container which carried the cornea arrived on a plane flown by Trans World Express, a contract carrier. "It would be very noticeable if the package were somehow heavier," Etling said of the package, which weighed about four pounds. Etling added that such packages are usually kept with the captain but that the plane's manifest indicated it was placed in a cargo area at the rear of the plane.

But Kallstrom said that while investigators were initially interested in the cornea's origin, they were no longer concerned about it.

The only other unusual discussion on the tape occurred two minutes before the tape was suddenly stopped. "The crew discussed an erratic number four fuel flow gauge," Francis said, referring to the fourth engine.

But Francis said the situation was apparently resolved because the cockpit crew stopped discussing the subject, and there is no indication from the flight data recorder that there was any malfunction in the engine or the gauge that would have threatened the flight.

Beyond those two subjects, Francis said, the flight appeared to be routine. As the plane headed out over the Atlantic, the pilot began climbing to 13,700 feet. "Last conversation on the recording was a call out by the captain for climb power," Francis said.

Whether the two engines from Flight 800 that divers located yesterday -- or the two that have yet to be found -- will also answer families' questions about the cause of the crash won't be clear until they are lifted from the bottom of the ocean and taken apart.

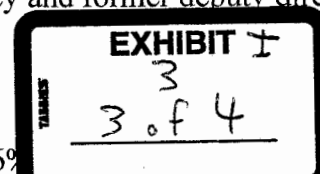
According to Francis, however, that may take time. The four engines, manufactured by Pratt & Whitney of Connecticut, are each almost 13 feet long and weigh approximately 8,850 pounds, according to the company. Francis said they are likely the heaviest objects the salvage crews will have to lift.

Moreover, Francis reiterated his decision yesterday to give priority to recovering the bodies of victims over retrieving the engines or other pieces of wreckage, even if some evidence is washed away by the Atlantic Ocean.

But when the turbofan engines are lifted, the nature of any damage they suffered when the plane exploded or when it hit the water could provide investigators with clues about whether Flight 800 was blown out of the sky by a bomb or a mechanical problem.

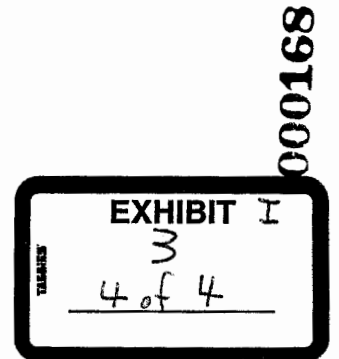
While experts increasingly consider it a slim possibility that a mechanical failure would be severe enough to suddenly and utterly disable a large plane, the condition of the engines might either revive that prospect or virtually eliminate it.

"It's easy enough to rule an engine problem out, because the engine will look in good mechanical shape, except for damage from the crash," said Ira Furman, a Freeport attorney and former deputy director of the NTSB.



But the engines could also contain evidence that would point directly toward sabotage. In the case of Pan Am Flight 103, for instance, British investigators found a dent on the interior left wing engine that matched the size and markings of a piece of cable, which they concluded was shot from a metal baggage container by a bomb blast.

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# U.S. NEWS

STORY PAGE

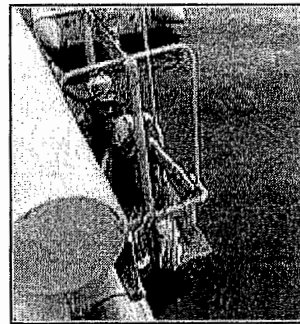


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- SEARCH

## TWA engines remain underwater until more bodies recovered

### British experts to help analyze black boxes

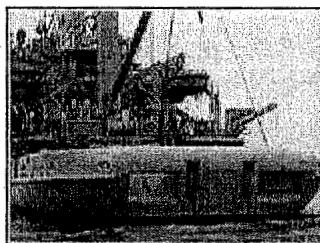
July 26, 1996  
Web posted at: 9:15 p.m. EDT



Preparing to search (CNN)

NEW YORK (CNN) -- Two Boeing 747 engines found on the bottom of the Atlantic Ocean could hold valuable clues to the cause of the crash of TWA Flight 800, but divers will search for more bodies before bringing the engines to the surface.

Two of the plane's four engines were found early Friday. Robert Francis, vice chairman of the National Transportation Safety Board, called the discovery "extraordinarily important."



USS Grasp continues the search (CNN)

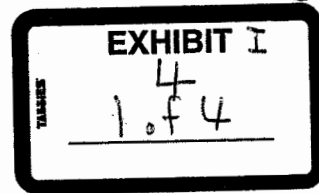
Examination of the engines may be the best evidence, Francis said. But he said he did not know when the 7,000-9,000-pound engines would see the light of day, because recovering bodies of the victims is the first priority.

However, CNN was told that FBI officials expect to bring significant pieces of the plane out of the water by Sunday afternoon.

Investigators will try to determine if the engines had a power failure or if there was an explosion in the engines that could have caused the Paris-bound jet to crash July 17, killing all



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230 people aboard.

Experts said the juxtaposition of the engines -- whether they are located close together or scattered -- can help point to a crash cause.

### Loud noise unexplained

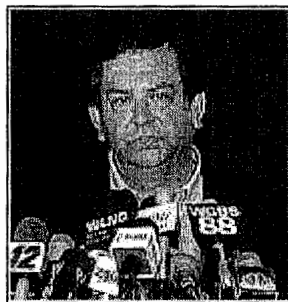
Meanwhile, Francis also reported Friday that an audio tape from the cockpit voice recorder ends with "a loud, abrupt noise." Francis said nothing unusual preceded the noise on tape. Investigators are convinced there was a "catastrophic explosion" on the plane before it went down.

Sound experts were on their way from Britain to help analyze the noise, he said. Investigators may benefit from their experience investigating the Pan Am 103 crash over Lockerbie, Scotland, in 1988, which was blamed on a bomb.

As for the flight data recorder, which tracks mechanical functions of the plane such as speed and altitude, Francis said, "All recovered data ends abruptly with no anomalies."

Both recordings ended at the same time "within a fraction of a second," Francis said.

### Nothing ruled out



Kallstrom: "We do have some information that there was something in the sky." (CNN)

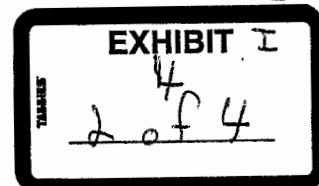
Despite the noise, Jim Kallstrom, assistant director of the FBI, told reporters Friday he is not ready to conclude that the explosion was caused by a bomb, although that is one of three primary theories investigators are examining. (514K AIFF or WAV sound)

He said his team has not ruled out the possibility that a missile or some external object hit the plane or that there was a massive mechanical failure. He said several witnesses reported seeing an object ascending in the sky before the crash, but did not elaborate. (450K AIFF or WAV sound)

There is circumstantial evidence to support all three theories, but forensic evidence is needed before a crash cause can be determined. (619K AIFF or WAV sound)

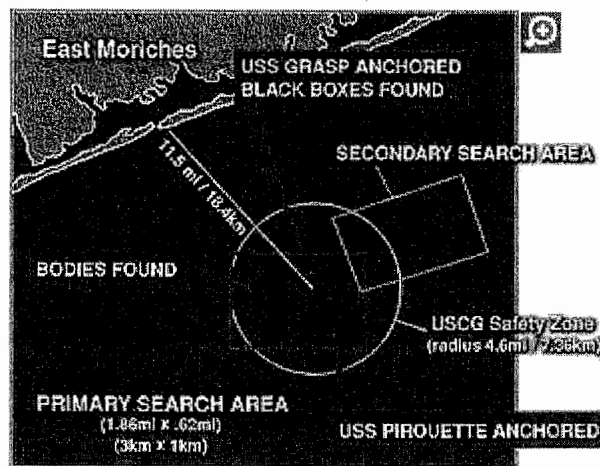
"We're going to solve this accident," Francis said. "There is

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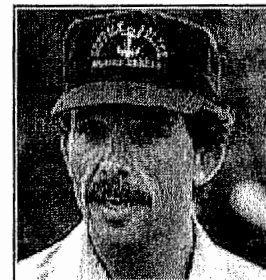
evidence down there that's going to tell us what happened to this aircraft."



### Families get more bodies

So far, 140 bodies have been recovered. Of those bodies, 131 have been positively identified, with 128 families notified and 109 bodies released to relatives, Francis said. Three other bodies have been tentatively identified.

Divers such as Andrew Gliganic said what they see underwater is so disturbing that they need to talk to a psychologist when they surface.



Gliganic (CNN)

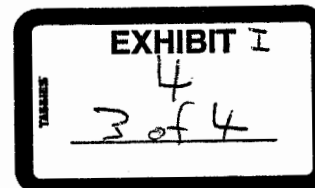
Also Friday, federal officials said they had set up a "family information center" to make sure relatives receive prompt information on the investigation and the recovery of bodies.

Kallstrom reported Friday that debris that may be linked to the crash is washing ashore on Coney Island. He warned anyone finding such debris to leave it alone and contact police.

He again asked anyone with information about the crash to call the FBI's toll-free hot-line.

FBI Director Louis Freeh met with federal investigators in New York Friday to discuss strategy, according to Kallstrom who dismissed speculation that the meeting was a sign the FBI was getting ready to take charge of the crash investigation.

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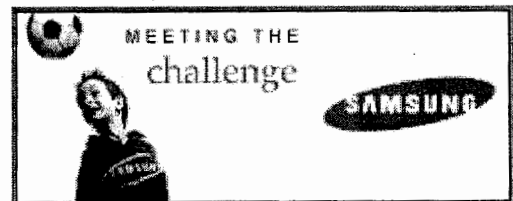
The FBI has said it would take over the probe from the NTSB if it was determined that the crash was caused by a criminal act.

*The Associated Press contributed to this report.*

<b>CNN-Time Magazine Special</b> <b>TWA Flight 800</b> Sunday, July 28, 9p.m. EDT/6 p.m. PDT		
<b>TWA Flight 800</b> <b>CRASH COVERAGE</b>	Sights and sounds The investigation The victims	The security issue Background Related sites



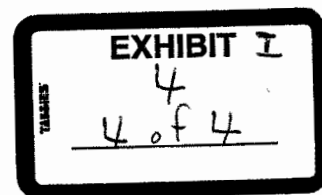
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