NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety
Washington, DC 20594

December 17, 2006

ATC GROUP CHAIRMAN'S FACTUAL REPORT
DCA07MA003

A. AIRCRAFT ACCIDENT

Location: Manhattan, N.Y.
Date: October 11, 2006
Time: 1442 Eastern daylight time / 1842 Coordinated Universal Time[1]
Aircraft: N929CD, Cirrus SR-20

B. AIR TRAFFIC CONTROL GROUP

Chairman: Mr. Scott J. Dunham
National Transportation Safety Board
Washington, D.C. 20594

C. SUMMARY

On October 11, 2006, at 1442 eastern daylight time, a Cirrus Design Corp. SR-20, N929CD, was destroyed when it struck a building while maneuvering over New York, New York. The certificated private pilot and flight instructor were fatally injured. Visual meteorological conditions prevailed for the flight that departed Teterboro Airport, Teterboro, New Jersey. No flight plan was filed for the personal sightseeing flight conducted under 14 CFR Part 91.

D. DETAILS OF THE INVESTIGATION

1. History of Flight and Radar Data

Radar data for this accident was obtained from airport surveillance radars located at Newark, New Jersey, Jamaica, New York, and White Plains, New York. Review of target data showed that N929CD departed runway 1 at the Teterboro, New Jersey airport at 1829 UTC on transponder code 0312. According to Federal Aviation Administration (FAA) communication transcripts, the pilot advised the tower controller that he was planning to turn east toward the Hudson River, and then follow the river southeast-bound along the west side of Manhattan. The controller cleared N929CD to leave the tower frequency at 1832:41 and instructed the pilot to "squawk VFR," that is, set his transponder to code 1200. N929CD continued to follow the Hudson River until reaching the Statue of Liberty National Monument. The aircraft flew a left-hand 180 degree turn around the monument and then headed northeast-bound over the

[1]All radar and radio transmission times are expressed in Coordinated Universal Time (UTC). Altitude references are in feet above mean sea level (MSL).

East River on the east side of Manhattan. Shortly after passing the 59th Street bridge, N929CD entered a left turn and struck a building on the west side of the river. The pilot had not been in contact with air traffic control since leaving the Teterboro tower frequency, and was not in contact with air traffic controllers at the time of the accident. After the accident, the FAA requested that all New York area air traffic control facilities review their communication recordings for communications with N929CD, but no additional contacts were found. An overview of the aircraft's track for the accident flight is shown in figure 1. According to recorded radar data, N929CD conducted all of its flight around Manhattan between 500 and 700 feet.

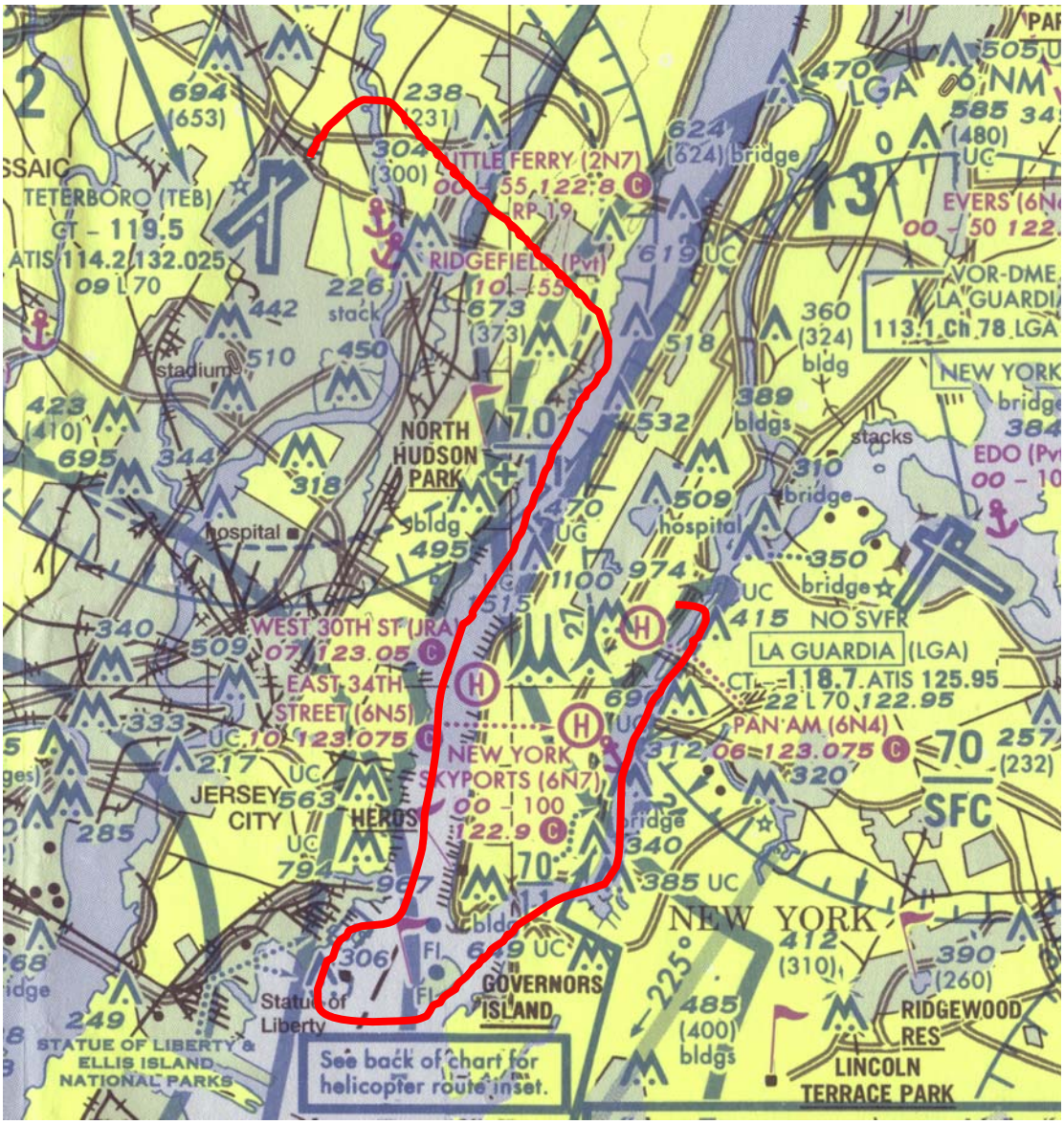

Figure 1 – N929CD approximate accident flight track.

2. Airspace Information

This accident occurred in a complex section of airspace surrounding Manhattan Island, near three major air carrier airports and a variety of other general aviation facilities accommodating both fixed-wing and rotary-wing aircraft. Because of the high density of air traffic in this area, the FAA has designated the majority of the airspace as class B, the second most restrictive designation for airspace in the United States. Paragraph 3-2-3 of the Aeronautical Information Manual, "Class B Airspace," provides the following information on class B airspace and associated flight operations:

> a. Definition. Generally, that airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of IFR operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers (some Class B airspace areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace. The cloud clearance requirement for VFR operations is "clear of clouds."
> b. Operating Rules and Pilot/Equipment Requirements for VFR Operations. Regardless of weather conditions, an ATC clearance is required prior to operating within Class B airspace. Pilots should not request a clearance to operate within Class B airspace unless the requirements of 14 CFR Section 91.215 and 14 CFR Section 91.131 are met. Included among these requirements are:
> 1. Unless otherwise authorized by ATC, aircraft must be equipped with an operable two-way radio capable of communicating with ATC on appropriate frequencies for that Class B airspace.
> 2. No person may take off or land a civil aircraft at the following primary airports within Class B airspace unless the pilot-in-command holds at least a private pilot certificate:
> (a-i, k-l omitted)
> (h) Newark Intl. Airport, NJ
> (i) New York Kennedy Airport, NY
> (j) New York La Guardia Airport, NY
> 3. No person may take off or land a civil aircraft at an airport within Class B airspace or operate a civil aircraft within Class B airspace unless:
> (a) The pilot-in-command holds at least a private pilot certificate; or
> (b) The aircraft is operated by a student pilot or recreational pilot who seeks private pilot certification and has met the requirements of 14 CFR Section 61.95.
> 4. (not applicable)
> 5. Unless otherwise authorized by ATC, each aircraft must be equipped as follows:
> (a) For IFR operations, an operable VOR or TACAN receiver; and
> (b) For all operations, a two-way radio capable of communications with ATC on appropriate frequencies for that area; and
> (c) Unless otherwise authorized by ATC, an operable radar beacon transponder

with automatic altitude reporting equipment.
6. Mode C Veil. The airspace within 30 nautical miles of an airport listed in Appendix D, Section 1 of 14 CFR Part 91 (generally primary airports within Class B airspace areas), from the surface upward to 10,000 feet MSL. Unless otherwise authorized by ATC, aircraft operating within this airspace must be equipped with automatic pressure altitude reporting equipment having Mode C capability…
c. Charts. Class B airspace is charted on Sectional Charts, IFR En Route Low Altitude, and Terminal Area Charts.
d. Flight Procedures.
1. (not applicable)
2. VFR Flights.
(a) Arriving aircraft must obtain an ATC clearance prior to entering Class B airspace and must contact ATC on the appropriate frequency, and in relation to geographical fixes shown on local charts. Although a pilot may be operating beneath the floor of the Class B airspace on initial contact, communications with ATC should be established in relation to the points indicated for spacing and sequencing purposes.
(b) Departing aircraft require a clearance to depart Class B airspace and should advise the clearance delivery position of their intended altitude and route of flight. ATC will normally advise VFR aircraft when leaving the geographical limits of the Class B airspace. Radar service is not automatically terminated with this advisory unless specifically stated by the controller.
(c) Aircraft not landing or departing the primary airport may obtain an ATC clearance to transit the Class B airspace when traffic conditions permit and provided the requirements of 14 CFR Section 91.131 are met. Such VFR aircraft are encouraged, to the extent possible, to operate at altitudes above or below the Class B airspace or transit through established VFR corridors. Pilots operating in VFR corridors are urged to use frequency 122.750 MHz for the exchange of aircraft position information.
e. ATC Clearances and Separation. An ATC clearance is required to enter and operate within Class B airspace. VFR pilots are provided sequencing and separation from other aircraft while operating within Class B airspace.

Class B areas (formerly known as Terminal Control Areas) were established pursuant to Safety Board recommendations made to the FAA following a 1978 midair collision in San Diego, California, between a Boeing 727 and a Cessna 172.[2] The FAA decided to increase the amount of control exercised over aircraft operating in the airspace around major air carrier airports by requiring all aircraft, VFR or IFR, to obtain a specific clearance for entry into the area. For aircraft operating under instrument flight rules (IFR), entry permission is essentially automatic. VFR aircraft are required to establish contact with ATC and request clearance into the class B airspace, or remain above, below, or outside the lateral limits of the area.

As shown in figures 1 and 2, the lower limit of class B airspace over the Hudson River and the East River is 1,100 feet MSL. At the southern ends of the two rivers, below the dashed arc

[2] Aircraft Accident Report, Pacific Southwest Airlines, Inc. B-727 N533PS, and Gibbs Flite Center, Inc., Cessna 172 N7711G, NTSB AAR 79-5, September 25, 1978.

extending from North Hudson Park down toward Governor's Island, the floor of class B airspace is 1,500 feet. Overhead the Statue of Liberty, the class B airspace floor is again 1,100 feet. Setting the floor of the class B area to 1,100 feet over the rivers allows access for visual flight rules (VFR) aircraft to the heliports and seaplane base located on the East River, and permits itinerant aircraft to transition through the New York metropolitan area along the Hudson River without an air traffic control (ATC) clearance. If the class B areas went to the surface, all East River helicopter and seaplane operations would require ATC clearances to operate and all north/south transient aircraft passing through the New York City area would have to overfly the area above 7,000 feet or obtain an ATC clearance to operate in the class B area.

Criteria for establishment of controlled airspace such as a class B area are contained in FAA order 7400.2, "Procedures for Handling Airspace Matters." The standards are mainly based on number of aircraft and passengers handled by the airport(s) in question, and the three major New York airports (Newark, Kennedy, and La Guardia) readily qualify. Order 7400.2 requires airspace designers to also take into account the needs of satellite airports in the vicinity, stating in paragraph 15-2-3(e), "Configuration,";

> Satellite Airports. When establishing the airspace floor, consider the adverse effect on satellite airport operations as well as operations at the primary airport. When airspace directly over a satellite airport is not required, it should be excluded from the Class B airspace. Special published traffic patterns and/or procedures may be required for satellite airports.

Designers are also required to take into account known VFR flyways when implementing class B airspace. Consequently, areas such as the East River and Hudson River exclusion areas are explicitly acknowledged in FAA airspace guidance materials.

On December 12, 2006, Safety Board staff and management were briefed on the origins of the New York metropolitan area airspace design, including the exclusion areas. Because of the density and complexity of air traffic in the New York area, airspace restrictions there predated the national implementation of TCAs / class B airspace at other high-traffic airports. The original design for a TCA surrounding New York was proposed in 1971, and did not include an exclusion area over the East River. Because of the 35 year interval since then, the FAA was unable to provide a conclusive answer about the decisions made. Their research into the Federal Register for that period and other available documentation showed that the exclusion area was most likely added in response to rulemaking comments from helicopter and seaplane operators using Manhattan access points along the east side of Manhattan. Their comments indicated that the proposed airspace restrictions would be unnecessarily restrictive. The FAA responded by excluding the airspace over the East River up to the northern end of Roosevelt Island at 1,100 feet and below from the TCA, allowing access to heliports and the Manhattan seaplane base without ATC clearance. This exclusion has continued to the present time.

3. Post-accident FAA Actions

On October 13, 2006, the FAA published Notice to Airmen (NOTAM) 6/3495 restricting fixed-wing flight operations in the airspace above the East River. The NOTAM states, "EFFECTIVE IMMEDIATELY UNTIL FURTHER NOTICE, VFR FLIGHT OPERATIONS INVOLVING FIXED WING AIRCRAFT (EXCLUDING AMPHIBIOUS FIXED WING AIRCRAFT LANDING OR DEPARTING NEW YORK SKYPORTS INC SEAPLANE BASE) IN THE EAST RIVER CLASS B EXCLUSION AREA EXTENDING FROM THE SOUTHWESTERN TIP OF GOVERNORS ISLAND TO THE NORTH TIP OF ROOSEVELT ISLAND, ARE PROHIBITED UNLESS AUTHORIZED AND BEING CONTROLLED BY ATC. TO OBTAIN AUTHORIZATION CONTACT LGA ATCT SOUTH OF GOVERNORS ISLAND ON 126.05."

The effect of this restriction is to limit flights such as that made by the accident aircraft without negatively affecting operations at the seaplane base and heliports along the East River. (Figure 2.) At the December 12 briefing, the FAA indicated that they would be proceeding with a rulemaking action to make the restrictions contained in the NOTAM permanently effective.

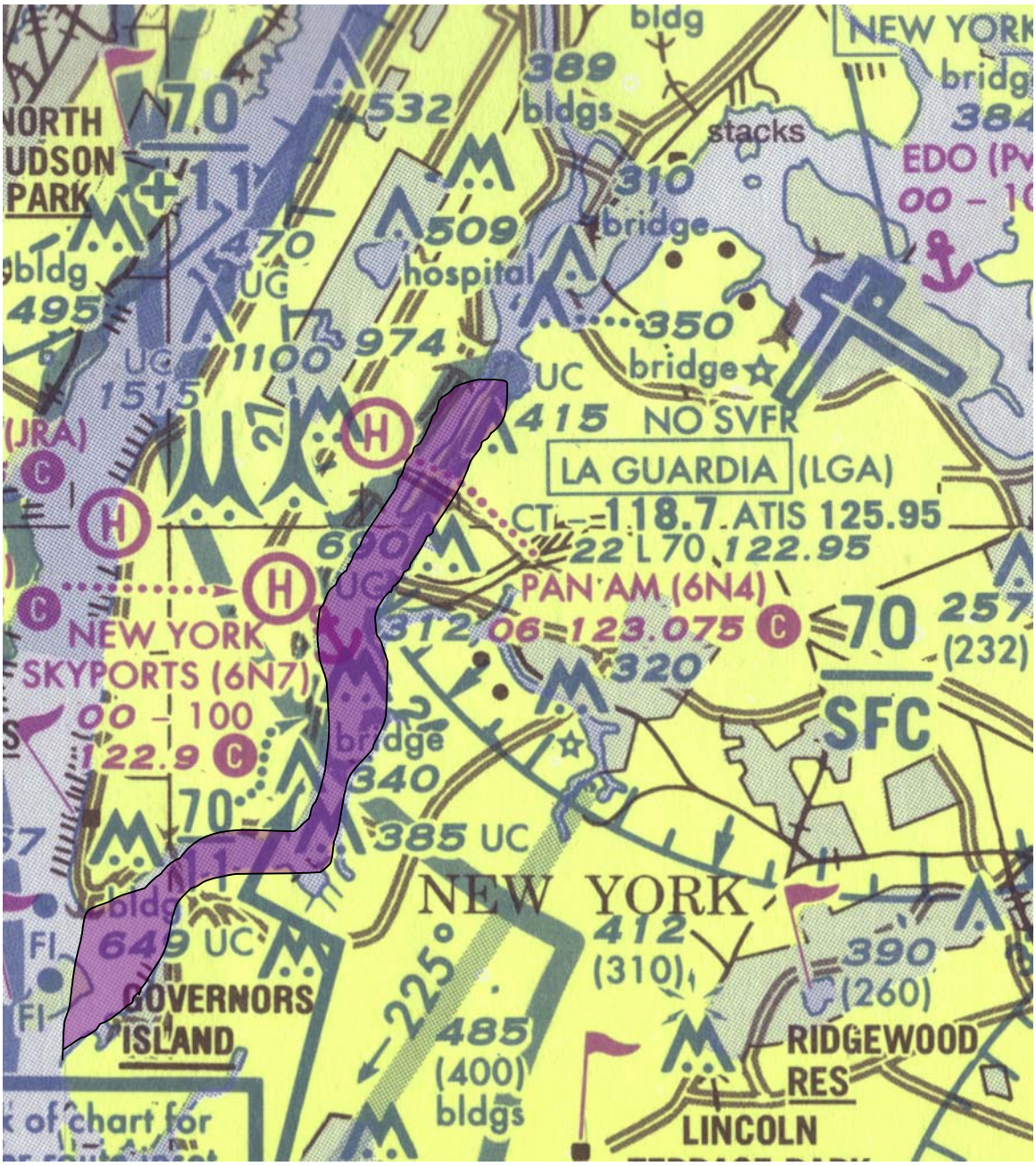

Figure 2 – La Guardia and East River area. Purple fill indicates approximate area subject to NOTAM 6/3495 fixed-wing flight restrictions.