

AAIPU# A09-01471



AIR ACCIDENT INVESTIGATION AND PREVENTION UNIT CIVIL AVIATION DEPARTMENT

NASSAU, N. P., BAHAMAS

AIRCRAFT ACCIDENT REPORT

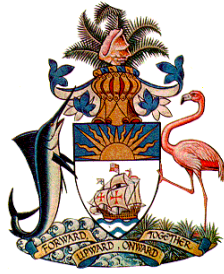
LOSS OF CONTROL



DASSAULT SUD FAN JET FALCON
N28RK

MATTHEW TOWN, INAGUA, BAHAMAS
DECEMBER 17, 2009





**Bahamas Department of Civil Aviation
Air Accident Investigation and Prevention Unit
P. O. Box AP-59244
Lynden Pindling International Airport
Nassau N. P., Bahamas**

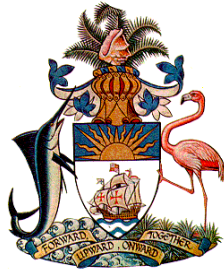
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N28RK**

**LOSS OF CONTROL
MATTHEW TOWN, INAGUA, BAHAMAS
DECEMBER 17, 2009**

**AAIPU# A09-01471
Adopted July 7, 2010**

Abstract: This Final Report explains the circumstances surrounding the loss of control and crash of 28RK a Dassault Sud, Mystere 20, Fan Jet Falcon aircraft which occurred while the aircraft was enroute from Joaquin Balaquer Int'l Airport (MDJB) in the Dominican Republic, to Ft Lauderdale Executive Airport, (FXE) Ft Lauderdale, Florida, USA. The aircraft lost contact with ATC around Great Inagua and was later reported to have crashed in Great Inagua.



Bahamas Department of Civil Aviation Air Accident Investigation and Prevention Unit

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Letter to Director

July 7, 2010

Mr. Patrick Rolle
Director
Civil Aviation Department
Seaban House
Crawford Street, Oakes Field
P.O. Box N-975
Nassau, N.P.,
Bahamas

Sir

The attached report summarizes the investigation into the circumstances of the accident involving a Dassault Falcon DA-20 aircraft, United States Registration N28RK, registered to Florida Aviation Group, Ft Lauderdale, Florida, USA. This accident occurred approximately 10 nautical miles east of Matthew Town, Inagua, Bahamas on December 17, 2009.

This report is submitted pursuant to Part XII, Regulation 80, and Schedule 19 of the Bahamas Civil Aviation (Safety) Regulation (CASR 2001) and in accordance with Annex 13 to the Convention on International Civil Aviation Organization (ICAO).

In accordance with Annex 13 to the Convention on International Civil Aviation (ICAO), and Schedule 19 of the Bahamas Civil Aviation (Safety) Regulations (CASR April 17, 2001), the fundamental purpose of such investigations is to determine the circumstances and causes of these events, with a view to the preservation of life and the avoidance of similar occurrences in the future. It is not the purpose of such investigations to apportion blame or liability.

This information is published to inform the aviation industry and the public of the circumstances surrounding this accident. The contents of this Report may be subjected to alterations or corrections if additional information becomes available.

Delvin R. Major
Investigator in Charge
Flight Standards Inspectorate
Department of Civil Aviation (Bahamas)



BAHAMAS CIVIL AVIATION DEPARTMENT
AIR ACCIDENT INVESTIGATION AND PREVENTION UNIT

TITLE

Operator: Florida Aviation Group

Manufacturer: Dassault/Sud

Model: Mystere 20, Fan Jet Falcon Series "D"

Nationality: United States of America

Registration: N28RK

Place of Accident: Matthew Town, Great Inagua, Bahamas

Date of Accident: December 17, 2009

SYNOPSIS

Notification: DCA, NTSB, FAA, General Electric, Dassault/Sud

Investigating Authority: Civil Aviation Department
Air Accident Investigation and Prevention Unit

Investigator in Charge: Delvin R. Major

U.S. Accredited Representative: Mr. Ralph Hicks – NTSB

Advisors to Acc. Rep
Mr. Bob Hendrickson - FAA
Frank Hrizo – Falcon/Dassault
Leo de la Torre - Dassault Falcon
Thierry Taguet - Dassault Falcon
David Gridley – GE Aviation
Enmanuel Souffront – AIU Dominican Republic

Releasing Authority: Civil Aviation Department

ABBREVIATIONS and TERMINOLOGY

When the following terms are used in this report, they have the following meanings;

AAIPU	Air Accident Investigation and Prevention Unit
ADDS	Aviation Digital Data Service - Report by Meteorological Department
AIS	Automatic Information Services
ATS	Air Traffic Services
BDCA	Bahamas Department of Civil Aviation
CASR	Bahamas Civil Aviation (Safety) Regulations (April 17, 2001)
C of A	Certificate of Airworthiness
C of R	Certificate of Registration
CG	Center of Gravity
CVR	Cockpit Voice Recorder
DCA	Director of Civil Aviation
CAD	Civil Aviation Department
EST	Eastern Standard Time (-5 hours (-4DT) to convert from UTC)
FAA	Federal Aviation Administration
FSI	Flight Standards Inspectorate
FSS	Flight Service Station
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Condition
MALSF	Medium-intensity Approach Lighting System (with sequenced flashers)
MET	Meteorological Office / Department
METAR	Weather Report furnished by Meteorological Department
MIRL	Medium Intensity Runway Lights
NDB	Non-directional Beacon
NM or nm	Nautical Miles
NTSB	National Transportation Safety Board
PAPI	Precision Approach Path Indicator
RCA	Root Cause Analysis
SEP	Survival and Emergency Procedures Training
T/L	Technical Log
USA	United States of America
VFR	Visual Flight Rules
VOR	(Very High Frequency) Omni-directional Range Station
VMC	Visual Meteorological Conditions
UTC / Z	Universal Coordinated Time / Zulu time

DEFINITIONS

When the following terms are used in the Standards and Recommended Practices for Aircraft Accident and Incident Investigation, they have the following meaning:

Accident. An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which:

a) a person is fatally or seriously injured as a result of:
— being in the aircraft, or
— direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
— direct exposure to jet blast, except when the injuries are from natural causes, self inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) the aircraft sustains damage or structural failure which:

— adversely affects the structural strength, performance or flight characteristics of the aircraft, and

— would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tires, brakes, fairings, small dents or puncture holes in the aircraft skin; or

c) the aircraft is missing or is completely inaccessible.

Note 1.— For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified as a fatal injury by ICAO.

Note 2.— An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.

Accredited representative. A person designated by a State, on the basis of his or her qualifications, for the purpose of participating in an investigation conducted by another State.

Adviser. A person appointed by a State, on the basis of his or her qualifications, for the purpose of assisting its accredited representative in an investigation.

Aircraft. Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Causes. Actions, omissions, events, conditions, or a combination thereof, which led to the accident or incident.

Fatal injury. - means any injury which results in death within 30 days of the accident.

Flight recorder. Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

Incident. An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Note.— The types of incidents which are of main interest to the International Civil Aviation Organization for accident prevention studies are listed in the Accident/Incident Reporting Manual (Doc 9156).

Investigation. A process conducted for the purpose of accident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of causes and, when appropriate, the making of safety recommendations.

Investigator-in-charge. A person charged, on the basis of his or her qualifications, with the responsibility for the organization, conduct and control of an investigation.

Note.— Nothing in the above definition is intended to Preclude the functions of an investigator-in-charge being assigned to a commission or other body.

Maximum mass. Maximum certificated take-off mass.

Operator. A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Preliminary Report. The communication used for the prompt dissemination of data obtained during the early stages of the investigation.

Safety recommendation. A proposal of the accident investigation authority of the State conducting the investigation, based on information derived from the

investigation, made with the intention of preventing accidents or incidents.

Serious incident. An incident involving circumstances indicating that an accident nearly occurred.

Note 1.— The difference between an accident and a serious incident lies only in the result.

Note 2.— Examples of serious incidents can be found in Attachment C of Annex 13 and in the Accident/Incident Reporting Manual (Doc 9156).

Serious injury. An injury which is sustained by a person in an accident and which:

- a) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or
- b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
- c) involves lacerations which cause severe hemorrhage, nerve, muscle or tendon damage; or
- d) involves injury to any internal organ; or
- e) involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface; or
- f) involves verified exposure to infectious substances or injurious radiation.

State of Design. The State having jurisdiction over the organization responsible for the type design.

State of Manufacture. The State having jurisdiction over the organization responsible for the final assembly of the aircraft.

State of Occurrence. The State in the territory of which an accident or incident occurs.

State of the Operator. The State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

State of Registry. The State on whose register the aircraft is entered.

Note.— In the case of the registration of aircraft of an international operating agency on other than a national basis, the States constituting the agency are jointly and severally bound to assume the obligations which, under the Chicago Convention, attach to a State of Registry. See, in this regard, the Council Resolution of 14 December 1967 on Nationality and Registration of Aircraft Operated by International Operating Agencies which can be found in Policy and Guidance Material on the Economic Regulation of International

“State of Design” - The State having jurisdiction over the organization responsible for the type design

“State of Manufacture” - The State having jurisdiction over the organization responsible for the final assembly of the aircraft.

"Substantial damage" - means damage or failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent failings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered "substantial damage" for the purpose of this Report.

BODY

1.0 FACTUAL INFORMATION:

1.1 HISTORY OF THE FLIGHT

— On December 17, 2009 at approximately 7:30 pm local (2330UTC¹), N28RK a Dassault Sud, Falcon Fan Jet, Mystere 20, Series D aircraft which departed Joaquin Balaquer Int'l Airport (MDJB) in the Dominican Republic, for Ft Lauderdale Executive Airport, (FXE) Ft Lauderdale, Florida, USA, crashed in a remote area of Matthew Town, Great Inagua, Bahamas.



Figure 1 - N28RK

The accident occurred approximately 11.5 miles due east of Great Inagua International Airport at coordinates N 20° 58' 30" latitude and W 073° 40' 00.7" longitude. The aircraft made contact with the terrain on a heading of approximately 105 degrees magnetic.

The accident occurred in area that was not accessible by land and the investigation team had to be airlifted by helicopter to the site.

Witnesses on the island of Great Inagua reported hearing a load bang that rattled doors and windows of their homes, but they did not report seeing the aircraft fall from the sky.

The aircraft was under the command of Captain Harold Roy Mangel and First Office Freddy Castro. The aircraft reportedly departed Aruba, in the Netherland Antilles and made a fuel stop at Dr. Joaquin Balaquer Int'l Airport, Santo Domingo in

the Dominican Republic. The final destination filed by the crew was Ft. Lauderdale Executive Airport, Ft Lauderdale Florida.

The aircraft filed route of flight was, Altitude 28,000 feet / FL280² and IFR route – HGR - W36 – KODIX – W24 – SGO – W27 – RETAK – A636 – ZIN – A315 – ZBV – BR57V – DCT – FLL.

ATC route stripped showed N28RK – MDJB - ALBEE – ZIN - A315 – HODGY - DEKAL1 arrival - KFXE AT FL280.



Figure 2 - Flight Path MDJB to ZBV

The accident occurred approximately 6 mile off the filed flight path.



Figure 3 Aircraft Tracking based on radio communication

—ATC records and instructions were for the aircraft N28RK to maintain 28,000 ft (FL280). The aircraft transponder was reported as inoperative. It begun a rapid descent, with no report of an emergency declared or mayday call out. Investigation of the crash site indicates the airplane made contact with the terrain at a high rate of speed and approximately a 45 degree angle. The aircraft was destroyed on impact.

The crew of a United States Coast Guard helicopter was on a training mission in the Great Inagua area at the time of the accident. They reported hearing a loud bang and noticed a huge explosion and fireball emanating from the ground in an area close to their location.

The crew of the US Coast Guard helicopter reported that they did not see any in-flight fire prior to the fireball that they saw. The post impact fire engulfed approximately five (5) acres of trees and brush in the National Wildlife Refuge at Great Inagua.

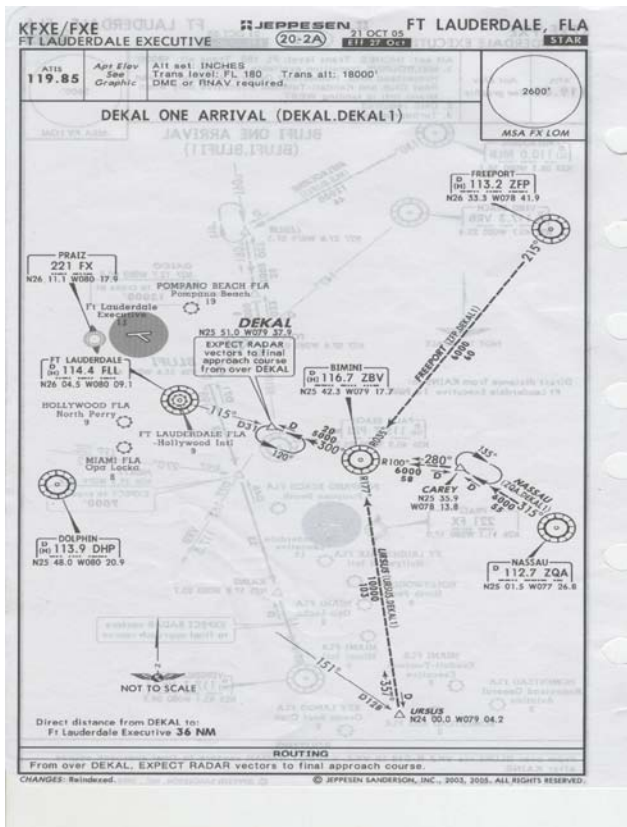


Figure 4 - Dekal1 arrival



Figure 3 - Flight path expanded view, MDJB to ZIN



Figure 6 Post impact fire in National Park



Figure 7 - Point of Impact, heading determined to be approximately 105 degrees at point of contact with terrain.

The coast guard helicopter crew stated that they discontinued their training mission and went to the site to investigate. Upon arrival at the site the crew reported that they lowered rescue personnel to the ground to investigate and search for survivors, but,

due to the heat and extent of the fire on the ground, they had to discontinue the search. They reported the accident to authorities at Great Inagua. This information was further passed along to the National Transportation Safety Board who alerted the accident investigation unit of the Bahamas Civil Aviation Department.

Night time conditions prevailed at the time of the accident.

1.2 INJURIES TO PERSONS

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Others</i>	<i>Total</i>
Fatal	2			2
Serious				
Minor/None				

The crew of the aircraft received fatal injuries. A search of the area discovered no distinguishable human remains. Approximately less than 1% of what is believed to be possible human flesh / internal body parts were recovered.

In addition clothing (piece of a pant with belt buckle fastened) was recovered, which possibly may have been worn by a member of the crew at the time of the accident. All recovered remains and clothing retrieved were gathered by officers of the Royal Bahamas Police Force that accompanied the investigation team and sent to the Forensic Science Laboratory at the Royal Bahamas Police Force, Nassau Bahamas for DNA analysis and possible identification.

1.3 DAMAGE TO AIRCRAFT

The aircraft broke into many pieces after contact with the terrain. Debris was spread over a large area of rough terrain. What remained of the aircraft post impact was either not found or possibly further destroyed by the post impact fire.

The “four corners” of the airplane were confirmed in the area downstream of where the initial ground impact occurred. However, engine cowling parts were found prior to the point of initial ground impact. This may suggest an aircraft over-speed

condition prior to ground impact. Less than 10% of the aircraft was recovered.



Figure 8 - Parts on the hanger floor represents the total recovered parts of the aircraft.

All recovered parts were transported to Air and Sea Recovery Facility in Ft Pierce Florida for further investigation and analysis.

1.4 OTHER DAMAGE

Post impact fire destroyed approximately 5 acre section of the National Park. No other damage was reported.

1.5 PERSONNEL INFORMATION

Records indicate that Mr. Mangels was type rated on the DA-20 Falcon aircraft. However, no records were produced to show his latest currency to fly the aircraft N28RK operated by Florida Aviation Group.

No records were produced to show Mr. Castro’s qualification or currency on this aircraft type.

Repeated requests to the owners for such information detailing qualification and currency on the aircraft for both pilots have gone unanswered.

1.5.1 Pilot Information-

N28RK was under the command of Captain Harold Roy Mangels age 60. Mr. Mangels of Beaumont Texas was certified by the Federal Aviation Administration.

Mr. Mangel held the following license / ratings with category and class classification;

- Airline Transport Pilot License - Airplane Multi-Engine Land category and class rating.

- Commercial Pilot License – Airplane Single Engine Land category and class rating.
- Commercial Pilot License – Airplane Single Engine Sea.
- Type Ratings on several other aircraft types including the DA-20 Falcon.

Mr. Mangel also held the following additional pilot licenses;

- Flight Instructor – Airplane Multi Engine
- Flight Instructor – Instrument Airplane

Mr. Mangel also held the following licenses;

- Mechanic – Airframe
- Mechanic - Powerplant

Mr. Mangel was the holder of a First Class Medical certificate issued on July 22, 2009. At the time of this medical, Mr. Mangel listed his total civilian flight time as 25,000 hours.

Mr. Mangel's occupation at the time of the accident was listed as Contract Flying from the January 2008 up to the time of the accident on aircrafts Lear-jet 25, Lear-jet 35 and the Lear-jet 55. Mr. Mangel also listed the West-wind 1124 and the Falcon 20 aircraft as aircraft that he was currently contract flying on. Mr. Mangel actual time from his latest resume list his total PIC time as 26,525 hrs, Turbo-jet time as 12, 323 hours and sea plane / float time as 1,725 hrs.

1.5.2 First Officer Information-

Mr. Mangel was assisted by First Officer Mr. Freddy Castro age 55 of Pembroke Pines, Florida.

Mr. Castro was also certified by the Federal Aviation Administration.

Mr. Castro held the following ratings with category and class classification;

- Airline Transport Pilot License - Airplane Multi-Engine Land category and class rating.
- Commercial Pilot License – Airplane Single Engine Land category and class rating.
- Mr. Castro **did not** have a Type Rating on the DA-20 Falcon aircraft or any other type of aircraft rating.

Mr. Castro also held the following additional pilot licenses;

- Ground Instructor – Advanced
- Flight Engineer – Turbojet powered

Mr. Castro also held the following licenses;

- Mechanic – Airframe
- Mechanic - Powerplant

Mr. Castro was the holder of a First Class Medical certificate issued on August 29, 2008. At the time of this medical, Mr. Castro listed his total civilian flight time as 4,800 hours.

Mr. Castro's occupation at the time of the accident was listed as B727 Flight Engineer for Amerijet International, Ft Lauderdale, Florida from November 2000 up to the time of the accident and Aeroservice Aviation Center, Miami, Florida as a B727 Simulator Support Flight Engineer and First Officer from 2006 up to the time of the accident.

1.6 AIRCRAFT INFORMATION

N28RK was a Fan Jet Falcon, fixed wing, multi engine aircraft. It was manufactured in 1969 by Dassault / Sud. It was certified in the standard category with serial number 206. The aircraft received an airworthiness certificate September 09, 1969. The aircraft weight was listed as 20,000 pounds. The aircraft was fitted with 12 seats. N28RK was fitted with two (2) General Electric, Turbine Air Generator, CF700 series engines.

The aircraft was registered to Wells Fargo Bank Northwest NA Trustee in Salt Lake City. It was operated by Florida Aviation Group, Ft. Lauderdale, Florida.

The left (#1) engine was a CF700-2D, serial number 299H-028. The last entry was made on March 7th 2004, by Privatair, when the igniter plugs and the main fuel control had been removed and replaced. Engine time since new (TSN) at this last entry was 10,068 hours. An entry on 2/7/03, when the carbon seal had been replaced for oil leaking, gave the TSN as 10,025 hours. Based on aircraft total time, the engine had an additional 325 hours since this entry up until 12/12/09. This would put the engine total time just prior to the accident at about 10,350 hours.

The right (#2) engine was a CF700-2D, serial number 304H-483B. The last entry was made on March 7th 2004, by Privatair, when the igniter plugs were changed. Engine TSN at this last entry was 6,258 hours. The last 3,000 hour hot section

inspection was in Feb 2001 at 5,842 hours TSN, when many turbine and fan parts had been replaced or repaired. Based on aircraft total time, it is estimated that this engine had an additional 282 hours since the last entry up until 12/12/09. This would put engine total time just prior to the accident at about 6,540 hours.

b) As the aircraft was listed with only two (2) persons on board and no listing of any cargo, it is assumed that the mass and balance were within limits.

c) N28RK uplifted 877 gallons of Turbo fuel at Joaquin Balaquer Int'l Airport (MDJB) in the Dominican Republic on December 16, 2009 just one (1) day prior to the accident.

1.7 METEOROLOGICAL INFORMATION

a) A public forecast was issued by the Bahamas Meteorological Department at Lynden Pindling Int'l Airport, Nassau, Bahamas.

For the Central and Southeast Bahamas "the weather was mostly sunny and hot conditions today with the slight chance of a brief but light passing shower, turning fair and mild tonight. Winds were reported as easterly at 15 knots. Sunset was expected at 5:24pm".

Upper Wind and Temperature forecasted for the Central and Southeast Bahamas, valid for 12 hours from 1800 UTC, Thursday December 17th, 2009 was winds from 250 degrees at 25 knots and temperature measured at 07 degrees Centigrade from 18,000 feet.

Weather conditions in the accident area at the time of the accident were received from Miami Air Route Traffic Control Center (ARTCC) (ZMA).

Providenciales, Turks Island METAR³ - 1900 EST (2300UTC): automated, wind one zero zero seven knots, visibility six statute miles, few clouds at zero one thousand eight hundred, temperature two five, dew point two one, altimeter two nine nine six.

Weather Report just prior to accident;
Providenciales, Turks island METAR – 1700 EST (2100UTC): automated, wind one zero zero at zero eight knots, visibility six statute miles, temperature two six, dew point two one, altimeter two nine nine four.

First weather report subsequent to accident;
Providenciales, Turks Island METAR – 2000 EST (0000UTC): automated, wind one one zero at one zero knots, visibility six statute miles, few clouds at zero one thousand five hundred, temperature two four, dew point two one, altimeter two nine nine eight.

b) At the time of the accident night time conditions existed.

1.8 AIDS TO NAVIGATION

N28RK was on a cross county IFR Flight Plan. The aircraft filed route of flight was, Altitude 28,000 feet and IFR route – HGR - W36 – KODIX – W24 – SGO – W27 – RETAK – A636 – ZIN – A315 – ZBV – BR57V – DCT – FLL.

At the time of the accident there was no report of any enroute navigational equipment malfunction.

ATC route strip showed N28RK – MDJB - ALBEE – ZIN - A315 – HODGY - DEKAL1 arrival - KFEX AT FL280.

However, N28RK reported his transponder equipment as inoperative and was issued an amended routing by ATC.

1.9 COMMUNICATIONS

At 0012 UTC (December 18, 2009) / 2012 Local (December 17, 2009), N28RK makes initial contact with ZMA (Grand Turk Sector (R62R) of the Miami ARTCC.

The pilot advised that he lost his transponder and was level at FL280.

At 0013 UTC N28RK was cleared to Fort Lauderdale Executive airport via over Great Inagua. He was advised to report Great Inagua and was further advised to standby for further routing after Great Inagua.

At 0020 UTC N28RK was given a full route clearance. He was cleared to Fort Lauderdale Executive via Great Inagua, A756 to Dukky, A555 to Nassau, BR22V to Dekal and the Dekal 1 arrival into Ft Lauderdale. N28RK asked ATC to repeat the clearance and was asked to standby by ATC.

At 0022 UTC N28RK was re-cleared via a new routing to Fort Lauderdale. He was given after Great Inagua A315 to Bimini and the Dekal 1 Arrival to Ft. Lauderdale Executive.

At 0023 UTC an unintelligible transmission was recorded which was best interpreted as a response from N28ZRk, possible: “standby please.”

From 0024 UTC and over the following eighteen minutes R62R controller made numerous attempts to contact N28RK, using the emergency frequency, relaying through other aircraft, and through other air traffic facilities but got no response.

At 0042 a coast guard helicopter contacts R62R controller and advised that he witnessed a massive explosion just east of Matthew Town, Great Inagua and that he was presently circling the burning area.

At 0045 another aircraft in the vicinity also advised R62R controller that he saw a fireball in the vicinity of Great Inagua Island.

At 0057 Coast guard helicopter in the area advised R62R controller that he was leaving the area to refuel and pick up emergency personnel to bring back to the area.

1.10 AERODROME INFORMATION

N28RK departed La Isabela International Airport Aeropuerto Internacional Dr. Joaquin Balaguer (IATA: JBQ, ICAO: MDJB) airport. Dr. Joaquin Balaguer airport opened in February 2006 to replace Herrera International Airport.

It serves mostly the Dominican Republic with domestic flights and some international flights to other Caribbean islands.

The airport type is listed as a Public Airport with a private operator, located in Santo Domingo. The Runway is 30ft / 15 m Above Mean Sea Level (AMSL), the direction is 01 and 19. It is 5,249ft / 1,500m long. The surface is Asphalt.

1.11 FLIGHT RECORDERS

N28RK was outfitted with a GA100 model Cockpit Flight Recorder (CVR) similar to the one below.

Successive searches of the area did not locate the internal parts of the CVR. The housing of the CVR was recovered; however the internal components were never recovered. Photo following showed the extent of damage sustained by the CVR.



Figure 8 - Cockpit Flight Recorder (CVR) Model GA100 similar to the model installed in N28RK

Due to the unavailability of the recorder the last moments of what took place will not be known.





Figure 9 and 10. Actual CVR case recovered from N28RK. Case was destroyed internal parts and recorder never recovered.

1.12 WRECKAGE AND IMPACT INFORMATION

Based on radio communications (figure 3) N28RK was level at FL280 when it began a rapid descent and turned off course and ended up crashing in the National Park at Great Inagua.

The “four corners” of the airplane were confirmed in the area downstream of where the initial ground impact occurred. However, engine cowling parts were found prior to the point of initial ground impact. This may suggest an aircraft over-speed condition prior to ground impact. The remainder of the aircraft hit terrain at a high rate of speed and roughly a 45 degree angle. The aircraft made contact with terrain on a heading of approximately 105 degrees. The contact with terrain resulted in a massive explosion.

The airplane broke into many pieces, with debris spread over a large area of rough terrain. Fire from the explosion burnt the immediate area of trees and parts of the aircraft.

Three engine nacelle cowlings were found before the main impact site, below the flight path of the airplane from radar tracking. One was the upper cowling from the right nacelle, found .4 miles west of the crash site. The other two were lower cowlings from the left nacelle which were found 1.2 miles west southwest of the crash site.

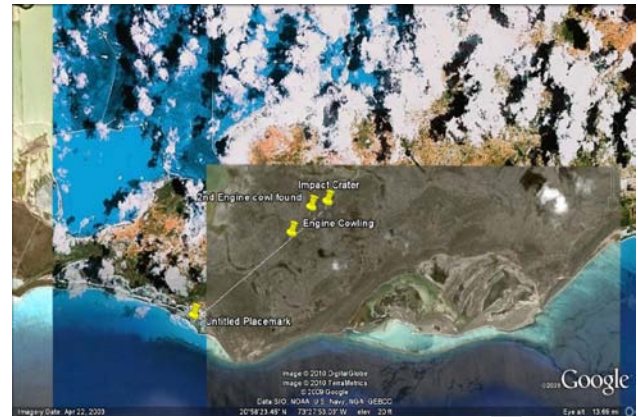


Figure 11 view showing aircraft break up and parts found from the ocean to the crash site.



Figure 12 view showing location of 1st and 2nd cowling found in relations to the impact and debris field

Seven (7) engine parts were recovered in addition to parts of the wing, flap, parts of the emergency exit, pieces from the vertical stabilizer, hydraulic tank and other miscellaneous parts.

Less than 10% of the aircraft was recovered. Parts, components and furnishings of the aircraft that survived the impact were further destroyed by the post impact fire. Clothing and other personal effects were also recovered some showing signs of burning and others showing damage as a result of impact.

1.13 MEDICAL AND PATHOLOGICAL INFORMATION

Several small parts (approximately 1 quart size bag) of what is believed to be human remains were recovered by members of the Royal Bahamas Police Force Forensic Team and transported to the Forensic

Science Laboratory at the Royal Bahamas Police Force for Forensic examination.

Deoxyribonucleic acid (DNA) samples were retrieved from the mother of Mr. Mangels and the son of Mr. Castro to determine relationship to either of the above individuals based on samples found at the crash site.

A major and minor DNA profile was extracted from the samples provided

The probability of relationship to Mr. Castro of the Major DNA profile (provided by his son) could not be excluded. The probability of paternity is 98.88 % when compared to an untested, unrelated random individual of the Caucasian population.

The probability of relationship to Mr. Mangels of the Minor DNA profile (provided by his mother) could not be excluded. The probability of maternity is 99.992% when compared to an untested, unrelated random individual of the Caucasian population (assumes a prior probability of 0.5).

(Forensic report not included as part of this Final Report)

1.14 FIRE

An explosion occurred when N28RK made contact with the terrain. A post impact fire ensued.

Approximately 5 acres of the national park was destroyed by the fire. Parts of the aircraft including personal effect, aircraft parts and furnishing, seat and seat cushions were also destroyed in the post impact fire.



Figure 13 show results of fire from explosion and burning that followed.

1.15 SURVIVAL ASPECTS

The explosion with N28RK making contact with the terrain was witnessed by the United States Coast guard who was in the area at the time conducting a training mission.

The coast guard discontinued its training mission and went to investigate the witnessed explosion. Personnel were lowered to the site where a search was made for survivors.

Due to the intensity of the fire and the need for more fuel, the search was discontinued and the authorities at Great Inagua and Miami ARTCC at Grand Turk were notified.

An aircraft in the area at the time of the accident, also reported observing the explosion.

Due to the force of the impact and the resulting fire; any evidence of body parts was completely destroyed. Based on evidence gathered the survivability of such a crash is impossible.

Additionally, seats, seat belts were destroyed by the post impact fire therefore failure of structures such as seats and seatbelt attachments could not be determined.

1.16 TESTS AND RESEARCH

Aircraft parts recovered were transported to the Air and Sea Salvage facility in Ft. Pierce Florida.

No tests were conducted on the engine parts recovered, however an examination was conducted by GE Aviation, manufacturer of the engine. Dassault / Sud manufacturer or the aircraft also conducted examinations of parts recovered at the facility in Ft Pierce. Report from both manufacturers attached as appendix and will not be discussed here.

Report from GE Aviation and Dassault Falcon not included as part of this Final Report. They, however are on file with this department and may be made available upon request.

1.17 ADDITIONAL INFORMATION

N28RK was owned by Wells Fargo Bank Northwest NA Trustee and operated by Florida Aviation Group Inc, Ft Lauderdale Fl.

Florida Aviation Group is a private company categorized under Aircraft, self-propelled and located in Fort Lauderdale. It was established in 1998 and incorporated in Florida. It employs a staff of 1 to 4.

It also does business as Fl Aviation Group Inc. It is managed by Mr. Estaban Fraga.

According to management at Florida Aviation Group N28RK was recently purchased by an individual in Venezuela. N28RK was delivered to the owner in Aruba in the Netherland Antilles. The new owner required additional equipment in the aircraft so the aircraft was to be returned to Ft Lauderdale for the installation.

The aircraft departed Aruba and made a fuel stop in Santo Domingo. In Santo Domingo, it was reported that the aircraft refueled and had some air put in the tire.

No records were produced to show that either pilot were current or qualified to fly the aircraft N28RK operated by Florida Aviation Group. Repeated requests for such information detailing qualification and currency on the aircraft for both pilots have gone unanswered.

The wallet of Mr. Harold Mangel was found at the crash site. It was turned over to the Royal Bahamas Police Force Inspector in Charge at Great Inagua Police Department.

Additionally, the pilot log book of Mr. Freddie Castro was also found among the wreckage at the crash site at Great Inagua.

2.0 ANALYSIS

Not included in this Final report.

3.0 CONCLUSIONS

3.1 PROBABLE CAUSE

The probable cause of this accident has been determined as loss of control.

3.2 CONTRIBUTING FACTORS

Undetermined.
Insufficient wreckage of the aircraft were recovered to make a conclusive determination as to the cause of the accident.

4.0 SAFETY RECOMMENDATIONS:

As a result of this investigation the AAIPU makes no recommendations.

¹ UTC - Coordinated Universal Time (UTC) is a time standard based on International Atomic Time (TAI) with leap seconds added at irregular intervals to compensate for the Earth's slowing rotation. Leap seconds are used to allow UTC to closely track UT1, which is mean solar time at the Royal Observatory, Greenwich.

² FL280 - A Flight Level (FL) is a standard nominal altitude of an aircraft, in hundreds of feet. This altitude is calculated from the International standard pressure datum of 1013.25 hPa (29.92 inHg), the average sea-level pressure, and therefore is not necessarily the same as the aircraft's true altitude either above mean sea level or above ground level.

³ METAR - METAR is a format for reporting weather information. A METAR weather report is predominantly used by pilots in fulfillment of a part of a pre-flight weather briefing, and by meteorologists, who use aggregated METAR information to assist in weather forecasting.

FINAL REPORT