National Transportation Safety Board
Aviation Accident Final Report

Location:	Taos, NM	**Accident Number:**	FTW03FA036
Date & Time:	11/08/2002, 1457 MST	**Registration:**	N61RS
Aircraft:	Israel Aircraft Industries 1124A	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General Aviation - Positioning		

Analysis

After passing the initial approach fix, during an instrument approach to the destination airport, radar and radio contact were lost with the business jet. One witness reported hearing "distressed engine noises overhead," and looked up and saw what appeared to be a small private jet flying overhead. The engine seemed to be "cutting in and out." The witness further reported observing the airplane in a left descending turn until his view was blocked by a ridge. The witness then heard an explosion and saw a big cloud of smoke rising over the ridge. A second witness heard a loud noise and looked up and saw a small white airplane with two engines. The witness stated that the airplane started to turn left with the nose of the airplane slightly pointing toward the ground. The airplane appeared to be trying to land on a road. A third witness heard the roar of the airplane's engines, and looked toward the noise and observed the airplane in a vertical descent (nose dive) impact the ground. The witness "heard the engines all the way to the ground." Examination of the airframe and engines did not disclose any structural or mechanical anomalies that would have prevented normal operation. The National Weather Service had issued a SIGMET for severe turbulence and mountain wave activity. Satellite images depicted bands of altocumulus undulates and/or rotor clouds over the accident site.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadvertent flight into mountain wave weather conditions while IMC, resulting in a loss of aircraft control.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: APPROACH - FAF/OUTER MARKER TO THRESHOLD (IFR)

Findings
1. (C) FLIGHT INTO ADVERSE WEATHER - INADVERTENT - PILOT IN COMMAND
2. (C) WEATHER CONDITION - MOUNTAIN WAVE
3. (F) ALTITUDE - LOW

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
4. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On November 8, 2002, approximately 1457 mountain standard time, an Israel Aircraft Industries 1124A (Westwind 24) transport category airplane, N61RS, was destroyed when it impacted terrain after passing the initial approach fix while executing the VOR/DME-B approach to the Taos Municipal Airport (SKX) near Taos, New Mexico. The aircraft was registered to Abrams Aviation LLC, of Auburn, Alabama, and operated by Richmor Aviation of Hudson, New York. Both airline transport pilots were fatally injured. Visual meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan was filed for the 14 Code of Federal Regulations Part 91 positioning flight. The flight originated from Las Vegas, Nevada, at 1353 and was destined for Taos to pick up a passenger.

Radar data indicates that the airplane passed the TAOS VORTAC at 1456:39, at an altitude of 15,000 feet msl. Albuquerque Air Route Control Center (ARTCC) controllers heard a "MAYDAY" radio call, and radar contact was lost with the airplane at 1457:08, at an altitude of 14,700 feet msl. There was no further communication with the airplane.

One witness, located about 0.3 mile northeast of the accident site, reported in a written statement that he heard "distressed engine noises overhead," and looked up and saw what appeared to be a small private jet flying overhead. "The engine seemed to be cutting in and out." The witness observed the airplane "attempt to bank to the south as it dove down till my view was blocked by the ridge to the west of me." The witness then heard an explosion and saw a big cloud of smoke rising over the ridge.

A second witness, working with cattle about 0.4 mile northwest of the accident site, reported to the NTSB investigator-in-charge (IIC) that he heard a loud noise and looked up and saw a small white airplane with two engines coming from the northwest. The witness stated that the airplane "started to turn left with the nose of the airplane slightly pointing toward the ground." The witness added that the airplane appeared to be "trying to land on the road (U.S. 64)." The airplane appeared to be above the wires when it caught fire. The witness did not see the airplane impact the ground:; however, moments later there was smoke and an explosion. Then "a cloud of dust rose up and blew away."

A third witness, located about 1.5 miles west-northwest of the accident site, reported to the NTSB IIC that she heard the roar of the airplane's engines. She looked toward the noise and observed the airplane in a near vertical descent (nose dive) impact the ground, followed by a "huge fire ball and puff of smoke." The witness reported that she "heard the engines all the way to the ground."

FLIGHT CREW INFORMATION

Captain

The captain was hired by Richmor Aviation on September 24, 2000, and was trained under the provisions of the operator's Part 135 Air Taxi Certificate. The captain held an airline transport pilot certificate with an airplane multiengine land rating, and was type-rated in CE-500, LR-JET, and IA-Jet aircraft. He held a first-class medical certificate dated July 5, 2002, without limitations. According to the captain's training records, which were provided by the operator, he satisfactorily completed his most recent Israel Aircraft Industries 1124A aircraft recurrent

training on October 9, 2002.

The NTSB IIC did not obtain the captain's personal flight logbook. The flight hours reflected in this report were provided by the operator. According to the operator, the captain accrued 5,251.0 total flight hours, of which 877.0 hours were in the same make and model of the accident airplane.

First Officer

The first officer was hired by Richmor Aviation on March 19, 2001, and was trained under the provisions of the operator's Part 135 Air Taxi Certificate. The first officer held an airline transport pilot certificate with a airplane multiengine land rating and commercial privileges for airplane single-engine land. He was type rated in CE-500, BE-1900, HS-125, and IA-Jet aircraft. He held a first-class medical certificate dated July 5, 2002. The medical certificate stipulated a limitation to wear corrective lenses while operating an aircraft. According to the first officer's training records, which were provided by the operator, he satisfactorily completed his most recent Israel Aircraft Industries 1124A aircraft recurrent training on August 7, 2002.

The NTSB IIC did not obtain the first officer's personal flight logbook. The flight hours reflected in this report were provided by the operator. According to the operator, the first officer accrued 14,234.0 total flight hours, of which 682.0 hours were in the same make and model of the accident airplane.

AIRCRAFT INFORMATION

The 1983-model Israel Aircraft Industries 1124A, serial number 384, was a twin-engine, mid-wing, turbojet airplane. The airplane was powered by two Garrett TFE731-3-1G turbofan (serial number P-77567 and P-77515) engines, rated at 3,700 pounds of thrust. The accident airplane was configured to carry nine occupants.

The airplane was issued a standard airworthiness certificate on June 2, 1983, and was certificated for transport category operations. The airplane's current registration was issued on December 29, 1999. A review of the maintenance records revealed that the airframe underwent a 200-hour inspection on July 10, 2002, at a total airframe time of 3,275.2 hours. On October 30, 2002, both engines underwent a 300-hour inspection at a total airframe time of 3,408.8 hours and #1 engine total time of 3,375.6 hours and #2 engine total time of 3,326.8 hours. At the time of the accident, the aircraft had accumulated a total of 3,428.7 hours.

METEOROLOGICAL INFORMATION

The Aviation Area Forecast (FA) for the Salt Lake City area (region that covers New Mexico), issued by the Aviation Weather Center (AWC) at Kansas City, Missouri, and valid around the accident time, started in part:

FA issued November 8, at 1336, clouds/weather valid until 0200; New Mexico, northern portion...ceilings broken at 12,000 feet msl and layer to 20,000 feet, with widely scattered light rain showers. Surface winds were from the southwest gusting to 25 knots. Conditions becoming from 1700 to 2000, ceiling broken to overcast at 9,000 feet msl and visibility 3 to 5 miles in light rain showers. The outlook from 0200 through 0800 was for VFR conditions to prevail with rain showers.

The closest weather reporting facility was located at the Taos Regional Airport, (SKX), located approximately 12 miles southeast of the accident site.

At 1435, SKX automated weather observation system reported the wind from 200 degrees at 12 knots gusting to 17 knots, visibility 10 statute miles, ceiling broken at 3,100 feet agl, temperature 7 degrees Celsius (45 degrees Fahrenheit), dew point minus 1 degree Celsius (20 degrees Fahrenheit), and altimeter 29.92 inches of Mercury. Remarks: automated observation system without a precipitation discriminator.

At 1455, SKX reported the wind from 230 degrees at 15 knots gusting to 19 knots, visibility 10 statute miles, scattered clouds at 3,100 feet, ceiling overcast at 3,700 feet, temperature 7 degrees Celsius, dew point minus 2 degree Celsius (28 degrees Fahrenheit), and altimeter 29.92 inches of Mercury. Remarks: automated observation system without a precipitation discriminator.

At 1515, SKX reported the wind from 220 degrees at 14 knots gusting to 19 knots, visibility 10 statute miles, ceiling overcast at 3,700 feet agl, temperature 7 degrees Celsius, dew point minus 2 degree Celsius, and altimeter 29.94 inches of Mercury. Remarks: automated observation system without a precipitation discriminator.

The National Weather Service (NWS) Center Weather Service Unit at the Albuquerque Center (ZAB) issued Meteorological Impact Statement number 2 at 1002 for air traffic control planning purposes. The advisory warned of strong west-northwesterly wind flow across the mid and upper levels across the ZAB airspace with occasional severe turbulence over north central and northeastern New Mexico between 12,000 and 34,000 feet. The advisory indicated that elsewhere across the ZAB airspace to expect occasional moderate turbulence below 40,000 feet over mainly New Mexico and Arizona, with occasional moderate turbulence below 6,000 feet expected over the Texas Panhandle. The advisory also indicated that occasional moderate rime to mixed icing was likely over the northern portion of the area between the freezing level and 24,000 feet. The advisory ended warning the users to see the latest AIRMETs and SIGMETs for further details.

The NWS AWC issued SIGMET series Whiskey beginning at 0945 on November 8, 2002, for portions of Colorado and New Mexico for severe turbulence and mountain wave activity. At the time of the accident SIGMET Whiskey 3, issued at 1045, was current and was valid until 1745. The advisory covered the area from 40 miles northeast of Hayden, Colorado (CHE), to 40 miles east southeast of Cheyenne, Wyoming (CYS), to Tobe, Colorado (TBE), to Tucumcari, New Mexico (TCC), to Albuquerque, New Mexico (ABQ), back to 40 miles northeast of Hayden, Colorado (CHE). The advisory was issued for severe turbulence between 12,000 and 34,000 feet. The turbulence was confirmed from aircraft observations and/or pilot reports. The advisory also warned of strong updrafts and mountain-wave activity. Conditions were expected to continue beyond 1745. The accident site was within the boundaries of this SIGMET.

The Geostationary Operations Environmental Satellite number 10 (GOES-10) data was obtained from the NTSB's Man-computer Interactive Data Access System (McIDAS) workstation. GEOES-10 visible images at 1430, 1500, and 1515 on November 8, 2002, depicted bands of altocumulus undulates and/or rotor clouds over the accident site, with no apparent motion of the clouds eastward during the 45 minute period.

According to the Advisory Circular AC 00-57 "Hazardous Mountain Winds and Their Visual Signs," rotor clouds typically look like a line of cumulus clouds parallel to the mountain range line. Rotors form on the lee side and often have their bases near the height of the mountain

peaks, with its top extending considerably above the peak. The tops may extend to twice the height of the highest peak. Rotor clouds are often identified by their ragged leeward edge, where it appears the cloud is being torn apart, but can also appear as "normal" cumulus clouds. The rotor cloud is identified as capable of producing severe to extreme turbulence and has been recorded to have updrafts up to 5,000 feet per minute on the windward edge, and downdrafts up to 5,000 feet per minute on the leeward edge. The primary or first roll cloud may form immediately on the lee side of the mountain, or it may form up to 10 miles downstream from the mountain ridge. Several successively weaker bands of roll clouds may form at intervals downstream from the primary roll cloud and merge into a stratocumulus cloud formation. The stratocumulus clouds also form bands paralleling the mountain peaks. The ragged rotor appearance is less evident in each succeeding band, and the turbulence is less extreme with each band. These bands are very evident on satellite imagery and are often seen extending 150 to 300 miles downwind of a mountain range. The rotor cloud is stationary, constantly forming on the leading edge and dissipating on the trailing (downwind) edge.

AERODROME INFORMATION

The Taos Regional Airport is located eight miles northwest of Taos, New Mexico, at an elevation of 7,091feet. The airport features one asphalt runway 04/22, which is 5,798 feet long and 75 feet wide.

FLIGHT RECORDERS

Cockpit Voice Recorder

The airplane was equipped with a Fairchild model GA100A Cockpit Voice Recorder (CVR). The CVR was transported to the Safety Board on November 12, 2002. The Cockpit Voice Recorder group convened on November 15, 2002, and a transcript was prepared for the final 15 minutes of the recording. The recording starts when the aircraft is in cruise flight with communications with Albuquerque Center. The transcript starts at 1442 and continues uninterrupted until the recording ends at 1457:08.

The following are excerpts of the CVR transcript starting one minute and ten seconds prior to the aircraft passing the initial approach fix (TAOS VORTAC):

1455:29, the first officer stated, "flaps twenty."

1455:30, a hot microphone (HOT) recorded [sounds similar to pitch trim activation tone]

1455:34, a HOT recorded [sounds similar to pitch trim activation tone]

1455:36, the first officer stated, "oh, boy."

1455:47, a HOT recorded [sounds similar to pitch trim activation tone]

1455:52, the first officer stated, "surprise surprise surprise huh."

1455:56, a HOT recorded [sounds similar to 2 pitch trim activation tone]

1455:58, the first officer stated, "it's gunna be commin' in."

1455:59, a HOT recorded [sounds similar to 5 pitch trim activation tone]

1456:05, the captain stated, "gear down."

1456:08, the first officer stated, "yup."

1456:09, a HOT recorded [sounds similar to pitch trim activation tone]

1456:09, a HOT recorded [sounds similar to pitch trim activation tone]

1456:10, the first officer stated, "here it goes."

1456:11, the cockpit area microphone (CAM) recorded [sound of landing gear being lowered]

1456:12, a HOT recorded [sounds similar to pitch trim activation tone]

1456:13, a HOT recorded [sounds similar to pitch trim activation tone]

1456:13, a HOT recorded [sounds similar to pitch trim activation tone]

1456:14, a HOT recorded [sounds similar to pitch trim activation tone]

1456:16, a HOT recorded [sounds similar to pitch trim activation tone]

1456:18, a HOT recorded [sounds similar to pitch trim activation tone]

1456:19, a HOT recorded [sounds similar to pitch trim activation tone]

1456:19, the first officer stated, "it's gunna go through."

1456:21, a HOT recorded [sounds similar to pitch trim activation tone]

1456:22, a HOT recorded [sounds similar to 2 pitch trim activation tone]

1456:26, a HOT recorded [sounds similar to pitch trim activation tone]

1456:30, the first officer stated, "do I have to shoot a procedure turn."

1456:33, the captain stated, "ah #. I don't know. probably should." [# denotes an expletive]

1456:37, the first officer stated, "wanna make one spin that'll be it.."

1456:38, the captain stated, "yeah."

1456:38, the first officer stated, "I don't.."

1456:39, a HOT recorded [sounds similar to 5 pitch trim activation tones in short succession]

1456:41, the captain stated, "#."

1456:41, the first officer stated, "oh # what's that."

1456:42, the captain stated, "#."

1456:44, the captain stated, "power."

1456:45, the first officer stated, "full power."

1456:47, the captain stated, "ah # [strained voice]."

1456:48, the CAM recorded [sound of wind noise starts to increase until end of recording]

1456:50, the CAM recorded [sound of strained breathing and grunting starts and continues until end of the recording]

1456:51, the first officer stated, "come on around."

1456:52, the ground proximity warning system (GPWS), "bank angle."

1456:52, the captain stated, "holy #."

1456:53, the GPWS, "bank angle."

1456:53, the first officer stated, "mayday, mayday, mayday, mayday, mayday."

1456:53, the GPWS, "caution, terrain terrain terrain."

1457:04, radio transmission from Albuquerque ARTCC, "aircraft calling say again."

1457:05, the first officer stated, "unload it unload it."

1457:08, end of the recording.

WRECKAGE IMPACT INFORMATION

The global positioning satellite (GPS) location of the accident site was 36 degrees 36 minutes 12.1 seconds north latitude and 105 degrees 51 minutes 17.5 seconds west longitude. The accident site was approximately 18 miles northwest of Taos, at an elevation of 7,574 feet.

An examination of the accident site revealed that after the airplane impacted the ground, aircraft wreckage struck power lines, crossed State Highway 64 at mile marker 230, before coming to rest. The wreckage distribution path was oriented on a measured magnetic heading of 050 degrees. Ground scars indicated that the airplane impacted the ground left wing low at a slight nose down attitude. The furthest piece of wreckage was the right engine, which was located approximately 1,125 feet from initial point of impact. The largest piece of the wreckage, a portion of the center fuselage and fuel cell area, traveled for 925 feet before coming to rest.

The wreckage of the airplane was removed and transported to Beegles Aircraft Service located in Greeley, Colorado, for further examination.

MEDICAL AND PATHOLOGICAL INFORMATION

The office of the Medical Investigator of the University of New Mexico in Albuquerque, New Mexico, conducted an autopsy of both pilots. Toxicological testing was performed by the FAA Civil Aeromedical Institute's (CAMI) Forensic Toxicology and Accident Research Center at Oklahoma City, Oklahoma. The toxicological tests for both pilots were negative for alcohol and drugs.

TEST AND RESEARCH

The airplane was examined at the Beegles Aircraft Service Facilities on December 10 thru December 12, 2002, under the supervision of the NTSB IIC.

During the examination of the wreckage, control system parts were set aside for system reconstruction to see if there was any sign of malfunction or failure prior to ground impact. All the parts were found free of corrosion, fatigue cracking and signs of mechanical jamming. Aileron control system control rods and flight surfaces were found bent, distorted, and fractured. Elevators were found bent, distorted, and fractured. Flap actuators were found partially extended, corresponding to partial flap extension. The rudder actuators - upper and lower, were found both in their "Zero Rudder" position. The extension of each actuator was measured and verified to be that of the "0" rudder deflection. The rudder and part of vertical tail were found distorted, bent and fractured. The horizontal stabilizer trim actuator was found with one upper attachment fitting to the horizontal stabilizer front spar still attached, lower attachments were intact with attachment beams still attached. The actuator was found in its extended position, and was assembled correctly. All structural componenants were found and identified. An examination of airframe and both engines did not disclose any structural or

mechanical anomalies that would have prevented normal operation. Parts identification was performed with the assistance of Israel Aircraft Industries Maintenance Manual, Illustrated Parts Catalogue and computer database file containing all of the Westwind part numbers and drawings.

On March 26, 2003, an Israel Aircraft Industries 1124 simulator was provided by FlightSafety of Wilmington, Delaware. The following models were executed under the supervision of the NTSB: wake turbulence "normal encounter"; wake turbulence "unusual attitude encounter"; microburst encounter; left hand thrust reverser inadvertent deploy; stabilizer trim runaway; icing condition encounter; aileron trim runaway; rudder trim runaway; flap unbalance condition; gyro precession anomaly. All of the simulated models presented resulted in conditions that were fully recoverable by the pilot with minimal effort; however, there were limitations of the simulator, and there was no actual in-flight recorded data from the accident airplane.

ADDITIONAL DATA

The airplane was released to the owner's representative on September 9, 2003.

Pilot Information

Certificate:	Airline Transport	**Age:**	34, Male
Airplane Rating(s):	Multi-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	07/09/2002
Occupational Pilot:		**Last Flight Review or Equivalent:**	10/09/2002
Flight Time:	5251 hours (Total, all aircraft), 877 hours (Total, this make and model)		

Co-Pilot Information

Certificate:	Airline Transport; Commercial	**Age:**	48, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	**Last FAA Medical Exam:**	07/08/2002
Occupational Pilot:		**Last Flight Review or Equivalent:**	08/07/2002
Flight Time:	14234 hours (Total, all aircraft), 682 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Israel Aircraft Industries	**Registration:**	N61RS
Model/Series:	1124A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Transport	**Serial Number:**	384
Landing Gear Type:	Retractable - Tricycle	**Seats:**	9
Date/Type of Last Inspection:	07/10/2002, Continuous Airworthiness	**Certified Max Gross Wt.:**	23500 lbs
Time Since Last Inspection:	153.5 Hours	**Engines:**	2 Turbo Fan
Airframe Total Time:	3428.7 Hours at time of accident	**Engine Manufacturer:**	Garrett-AiResearch
ELT:	Not installed	**Engine Model/Series:**	TFE731-3-1G
Registered Owner:	Abrams Aviation LLC	**Rated Power:**	3700 lbs
Operator:	Richmor Aviation Inc	**Operating Certificate(s) Held:**	On-demand Air Taxi (135)
Operator Does Business As:	Richmor Aviation	**Operator Designator Code:**	BQVA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	SKX, 7091 ft msl	**Distance from Accident Site:**	10 Nautical Miles
Observation Time:	1455 MST	**Direction from Accident Site:**	135°
Lowest Cloud Condition:	Scattered / 3100 ft agl	**Visibility**	10 Miles
Lowest Ceiling:	Overcast / 3700 ft agl	**Visibility (RVR):**	
Wind Speed/Gusts:	15 knots / 19 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	230°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.92 inches Hg	**Temperature/Dew Point:**	7°C / -2°C
Precipitation and Obscuration:			
Departure Point:	Las Vegas, NV (LAS)	**Type of Flight Plan Filed:**	IFR
Destination:	Taos, NM (SKX)	**Type of Clearance:**	IFR
Departure Time:	1353 MST	**Type of Airspace:**	Class E

Airport Information

Airport:	Taos Regional (SKX)	**Runway Surface Type:**	Unknown
Airport Elevation:	7091 ft	**Runway Surface Condition:**	Unknown
Runway Used:	22	**IFR Approach:**	VOR/DME
Runway Length/Width:	5798 ft / 75 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	N/A	**Aircraft Fire:**	On-Ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	36.603333, -105.850556

Administrative Information

Investigator In Charge (IIC):	Douglas D Wigington	**Report Date:**	02/05/2004
Additional Participating Persons:	James L Malecha; FAA FSDO; Albuquerque, NM Ilana H Podlovsky; Israel Aircraft Industries LTD; Israel, Louie Casias; Gulfstream; Houston, 0A Harald Reichel; Honeywell; Phoenix, AZ James P Colton; Richmor Aviation; Hudson, NY		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		