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AFR 110-14

**USAF AIRCRAFT
ACCIDENT INVESTIGATION
BOARD**

**30 JULY 1991
HILL AFB, UTAH**

**F-16D AIRCRAFT
S/N 88-0168**

**388 TFW
34 TFS**

INVESTIGATING OFFICER

**ROBERT W. SCHLOSS, LT COL, USAF
HQ 9 AF
SHAW AFB SC**

COPY NUMBER 1 OF 11 PFS Exh. 131

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CLEAN REGULATION DIVISION

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DEPARTMENT OF THE AIR FORCE

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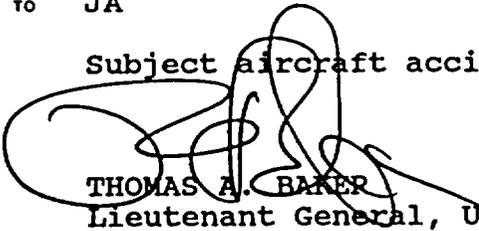
OFFICE OF THE COMMANDER

30 September 1991

SUBJECT Aircraft Accident Investigation: F-16D, SN 88-0168, 388 TFW
(34 TFS), 30 July 1991, Utah Test and Training Range

TO JA

Subject aircraft accident investigation is approved.


THOMAS A. BAKER
Lieutenant General, USAF
Commander

Readiness is our Profession

57225

CERTIFICATION

I certify that the documents contained in this report are true copies of the originals.



ROBERT W. SCHLOSS, Lieutenant Colonel, USAF
AFR 110-14 Investigating Officer

1. STATEMENT OF AUTHORITY AND PURPOSE

A. Authority:

At the direction of the Commander, Headquarters Twelfth Air Force, an AFR 110-14 investigation of a major aircraft accident involving F-16D, SN 88-0168, was conducted at Hill Air Force Base, Utah. 12 AF/CC letter, dated 14 August 1991, appointed the investigating officer and 12 AF/CC letters, dated 3 September 1991, appointed the technical advisors. (Tab Y-1, Y-2, Y-3, Y-4)

Investigating Officer:

Lieutenant Colonel Robert W. Schloss
HQ 9AF/DOXX, Shaw AFB, South Carolina

Technical Advisors:

Colonel Harvey L. Casebeer, Flight Surgeon
832d Medical Group, Luke AFB, Arizona

Captain Carlos M. Nejaime, Operations Advisor
421 TFS, Hill AFB, Utah

Captain Jerry L. Reed, Maintenance Advisor
388 TFW/MAT, Hill AFB, Utah

Supporting Staff Judge Advocate:

Captain Leslie D. Long
OO-ALC/JAD, Hill AFB, Utah

B. Purpose:

This investigation gathered facts and circumstances surrounding the crash of a United States Air Force F-16D aircraft on 30 July 1991, in northern Nevada.

2. SUMMARY OF FACTS

A. History of Flight:

Bugle 1 flight, one F-16D and one F-16C aircraft, line numbers 223 and 224, took off at 2140 hours Mountain Daylight Time (MDT) on 30 July 1991. They were assigned to the 34th Tactical Fighter Squadron (TFS), 388th Tactical Fighter Wing (TFW), Hill AFB, Utah. The planned route was a westbound departure direct to a Military Operating Area (MOA) to accomplish Low Altitude Navigation

Targeting Infrared Night (LANTIRN) system checks, followed by air refueling and then single-ship low level navigation to Eagle Bombing Range for multiple air-to-surface weapons deliveries before recovery to Hill AFB. Landing time was scheduled for approximately 2345 MDT. (Tab K-3)

The pilots were: Bugle 1 - Captain Keith G. Nylander
Bugle 2 - Captain Jeffrey T. Weathers

Bugle 1 flight briefed and departed normally. A standard departure was flown and LANTIRN operational checks were performed enroute to the air refueling track. Night air-to-air refueling operations were normal. The flight departed the air refueling track and proceeded to an alternate low level entry point. Approaching the low level entry point Bugle 1 directed Bugle 2 to take spacing to setup for single-ship low level navigation. The accident occurred as Bugle 1 passed approximately six nautical miles (NM) north of the low level entry point with Bugle 2 in an eight NM trail formation position. Bugle 1 impacted the ground and the pilot sustained fatal injuries. There was no attempt to eject.

No news media were at the site of the accident. The 388 TFW Public Affairs Office issued the initial news release and has handled all inquiries.

B. Mission:

The accident occurred on a nighttime LANTIRN continuation training mission. The mission included night air-to-air refueling, LANTIRN terrain-following-radar (TFR) low level navigation, and air-to-surface weapons deliveries.

C. Briefing and Preflight:

All flight members had adequate crew rest and less than twelve hours of work scheduled on the day of the accident. Captain Nylander had a self-scheduled dental cleaning appointment at 1030 MDT on the morning of the accident. This is not considered an official duty and, therefore, not in violation of AFR 60-1 flight duty period restrictions. Both flight members arrived early and had sufficient time for pre-mission planning. (Tabs V-5-7, V-12-3)

Bugle 1 briefed a night low-level LANTIRN mission with night air-to-air refueling enroute to the low level start point. Options were briefed to enter the low level route at alternate

entry points based on fuel and timing considerations. Night air-to-surface weapons deliveries on Eagle Range were also briefed. The briefing was conducted in accordance with TACR 55-116 with no discrepancies noted. Special emphasis was placed on night operations. The briefing ended with sufficient time to step to the aircraft. All administrative pre-flight requirements were accomplished and the pilots stepped to the aircraft on time. (Tabs V-12-3 through V-12-9)

The aircraft pre-flight was accomplished with no discrepancies in the aircraft or maintenance records. All ground operations were normal. (Tabs U-1, V-7-5, V-7-6, V-9-2, V-11-5, V-12-10)

D. Flight:

Takeoff through air-to-air refueling occurred without incident. Bugle 2's testimony revealed that Bugle 1 was the last aircraft to refuel and Bugle 1 was on the wing of Bugle 2 as the flight initially departed the tanker. Shortly thereafter, Bugle 1 reassumed the lead and directed Bugle 2 to a 2 NM trail formation position. A review of radar tape footage and recorded radio transmissions obtained from Clover Control, the 299th Range Control Facility which controls the Utah Test and Training Range (UTTR), reveals the sequence of events from the time that Bugle flight departed the air refueling track until Bugle 1 impacted the ground. At approximately 2220 MDT, the mishap flight departed the refueling track under radar control by Warlock GCI (Ground Controlled Intercept), the 109th Tactical Control Squadron, Utah Air National Guard. Warlock initially vectored Bugle flight to the north in order to obtain separation from the tanker. The flight was cleared to descend out of the refueling altitude block to 16,000 feet MSL (mean sea level). At approximately 2222 MDT, after achieving the required tanker separation, the flight was vectored to the south. At this point, Bugle flight was positioned approximately 12 NM north of the desired alternate low level entry point. The flight was handed off from Warlock GCI to Clover South, the portion of Clover Control that controls the southern sector of the UTTR. (Tabs N-1, V-12-12 through V-12-15)

Bugle 1 proceeded south at 16,000 feet MSL toward low level point four, an alternate low level entry point, with Bugle 2 in a 2 NM trail formation position. According to Bugle 1's flight planning data, Bugle 1 needed to arrive at point four by approximately 2229 MDT in order to fly the remainder of the low

level route and arrive at Eagle Range by the beginning of their scheduled range time. Bugle 1 coordinated his low level and range entry with Clover South and was cleared to descend at his discretion to maintain visual flight rules (VFR) at or below 9,000 feet MSL.

At approximately 2224 MDT, Bugle 1 arrived over low level point four. At this time, Bugle 1 informed Clover South and Bugle 2 that he was starting a right-hand turn to the north and descending through 13,500 feet MSL to 500 feet above ground level (AGL) to begin the low level. Bugle 1 directed Bugle 2 to assume a pre-briefed 8 NM trail formation position. According to data obtained from the Crash Survivable Flight Data Recorder (CSFDR), Bugle 1's radar altimeter and terrain-following-radar (TFR) were both in the standby position from the time the flight departed the air refueling track until time of impact. CSFDR data also reveals that Bugle 1 held a 10 to 12 degree nose low pitch attitude from the time he initiated his right-hand turn to the north until the time of impact, approximately 2225 MDT. (Tabs J-2, N-1, N-2, V-12-14 through V-12-16)

While maneuvering to 8 NM trail formation, Bugle 2 leveled off at approximately 14,000 feet MSL in order to setup his cockpit for LANTIRN operations. Bugle 2 observed the fireball impact of Bugle 1's aircraft. (Tabs J-3, N-2, V-12-16)

E. Impact:

Bugle 1 impacted the ground 6 NM north of the low level entry point at approximately 2225 MDT. The location of the impact is 39 degrees 36.9 minutes north latitude and 114 degrees 14.7 minutes west longitude, at an elevation of approximately 6800 feet MSL, in a remote desert area 133 miles southwest of Hill AFB, Utah. (Tabs A-1, C-1)

Analysis of available flight instruments and CSFDR data indicates that the engine was operating at 78% RPM, 515 degrees Celsius FTIT (Fan Turbine Inlet Temperature), and with a fuel flow indication of 1320 pounds per hour. The aircraft was traveling at approximately 375 knots (.64 mach). The fuel totalizer had a reading of approximately 8,000 pounds of fuel. All of these indications are within normal operating limits. Aircraft attitude (pitch and bank) was determined to be upright, 11 degrees nose low and wings level at impact. (Tabs J-1 through J-8)

The following major aircraft systems were determined by the CSFDR and wreckage inspections to have no annunciated failures at impact: all electrical systems were operational, all hydraulic pressures were adequate for flight control surface deflections, and the flight control system was operational. The radar altimeter and terrain-following-radar were both set in the standby mode at impact. (Tabs J-2, J-9, J-10)

There was no evidence of aircraft breakup prior to ground impact. There is a single hole in the ground with debris thrown in the direction of travel. The aircraft did not skip or slide on the ground. (Tabs S-1, S-2)

F. Ejection Seat:

Review of photographs from the accident site and laboratory analysis of components of the ejection seat were performed by the Life Support Equipment Investigation Laboratory (SA/LDILL) at Kelly AFB, Texas. Based on this evaluation, Bugle 1 did not activate/pull the ejection handle and associated linkage prior to ground impact. Evaluation of available evidence indicated that the seat would have functioned as designed had an ejection been initiated within advertised parameters. (Tabs J-12, J-13)

G. Personal and Survival Equipment:

All required inspections of Captain Nylander's personal and survival equipment were current. There was no evidence of personal or survival equipment failure. (Tabs J-12, J-13)

H. Rescue:

The mishap took place at approximately 2225 MDT on 30 July 1991. A Search and Rescue Combat Air Patrol (SARCAP) was initially setup by Bugle 2. Bugle 2 contacted the controlling agency, Clover South who relayed the rescue information to the 388 TFW Supervisor of Flying (SOF). There were no rescue calls noted on the emergency rescue frequency. (Tabs V-5-4, V-5-5)

I. Crash Response:

At approximately 2230 MDT, Bugle 2 notified Captain Mark Lankford, the 388th SOF, through Clover Control, that Bugle 1 had crashed. At that point, Captain Lankford notified Colonel William Huddle, 388 TFW Deputy Commander for Operations (DO). The SOF then

notified the Ogden ALC Consolidated Command Post and instructed them to activate the primary crash net. The SOF instructed Bugle 2 to return to base from the SARCAP and directed Beak 1, an airborne 388th F-16D with an instructor pilot on board, to take over the SARCAP. Beak 1 remained in the SARCAP until returning to base at 2340 MDT. (Tabs V-5-4 through V-5-6)

At the time of the accident, Clover Control was in contact with two U.S. Army Cobra helicopters operating within range of the crash site. Since the Cobras were equipped with night vision goggles, Clover Control directed the Cobra helicopters to search for the crash site. The Cobras were unable to locate the crash site and returned to Michael Army Airfield (AAF) due to fuel considerations. (Tabs V-1-5, V-5-5, V-5-7)

At approximately 0230 MDT on 31 July 1991, a UH-1 helicopter from Michael AAF departed Hill AFB with a rescue team which included Major (Doctor) Chris Kleinsmith, Flight Surgeon. The UH-1 proceeded to the vicinity of the crash site but was unable to locate it and returned to Michael AAF to refuel. The UH-1 returned a second time to the vicinity of the crash site but was again unable to locate the wreckage and returned to Michael AAF to refuel. On the third attempt, the UH-1 was able to locate the crash site at sunrise, approximately 0730 MDT. Captain Nylander was pronounced dead on the scene by Doctor Kleinsmith. (Tab V-3-8)

The difficulties the rescue team experienced in locating the crash site on their first two attempts were due to the majority of the search being conducted at night in mountainous, sparse terrain. (Tab V-3-7)

J. Maintenance Documentation:

There were no maintenance discrepancies discovered in the aircraft forms, specialists logs, or automated records that related to the accident. All Time Compliance Technical Orders applicable to this aircraft were accomplished in a timely manner and none were overdue. All scheduled inspections were accomplished prior to their due dates. Unscheduled maintenance actions for 30 days prior to the mishap were reviewed. All maintenance was accomplished in accordance with technical data. There were two minor delayed discrepancies documented in the aircraft forms, unrelated to the mishap. (Tabs U-1 through U-9)

K. Maintenance Personnel and Supervision:

Servicing, preflight, and thru-flight inspections were accomplished by qualified technicians, in accordance with applicable technical data. Training records display qualification in all tasks assigned. (Tabs U-1 through U-9)

L. Engine, Fuel, Hydraulic, and Oil Inspection Analysis:

Pre-accident engine inspection data and engine oil analysis results were normal. Post-accident fuel, hydraulic fluid, and oil samples from servicing equipment were normal. Hydraulic fluid samples obtained from the mishap aircraft at the crash site were within all technical limits. (Tabs U-4 through U-7)

M. Airframe and Aircraft Systems:

Flight characteristics obtained from the CSFDR as well as cockpit flight instruments, hydraulic reservoir pistons, the emergency power unit, angle-of-attack probes, jet engine fan and compressor sections, and various egress components were analyzed. Analysis confirms the engine, flight control surfaces, electrical and hydraulic systems, and the egress system were operational prior to impact. (Tabs J-1 through J-13)

N. Operations Personnel and Supervision:

The mission was authorized by Lieutenant Colonel Jeffrey B. Kohler (34 TFS Commander). (Tabs K-1, K-3) The briefing was conducted by Captain Keith G. Nylander, Bugle 1, in accordance with TACR 55-116. Captain Weathers was the only other member present for the briefing. All TAC Special Interest Items and pertinent areas of the mission were covered in appropriate detail. (Tab V-12-3 through V-12-9)

O. Aircrew Qualifications:

A review of the flight records show the following:

Captain Nylander had a total of 443.9 hours in the F-16C/D. He was recently checked out as a two-ship flight lead. Captain Nylander was qualified (Q) on all checkrides and his gradebooks reflect no deficiencies or associated trends. Training records reflect that he was qualified and current for the flight at the time of the accident. (Tabs E-3, T-4 through T-17)

Witness statements reveal that Captain Nylander was a highly disciplined pilot with no past problems with adherence to flight regulations and training rules. Additionally, Captain Nylander had no known physical or mental problems on the night of the mishap. (Tabs V-1-3, V-4-3, V-4-4, V-12-4)

Captain Weathers is an experienced wingman with 371.1 hours in the F-16C/D. Training records reflect that he was qualified and current for his position in the flight at the time of the accident. (Tab T-16)

P. Medical:

Captain Nylander was medically cleared for flying at the time of the accident. (Tab T-1) He was on an indefinite medical waiver granted by the Air Training Command Surgeon General, dated 1 April 1986, for excessive refractive error, distant visual acuity. The toxicology report from the Armed Forces Institute of Pathology (AFIP) revealed no evidence of narcotics, sedatives, opiates, or other substances which could have adversely affected his performance. A small amount of ethanol was found in the specimens included in the report which was felt to be a product of decomposition and not a factor in the accident. A review of all medical documents and records revealed no evidence of any pre-existing disease or illness which could have contributed to this mishap. (Tab X-1)

Q. Navigational Aids:

All navigational aids and facilities used by Bugle 1 flight were operating normally. (Tab V-12-6)

R. Weather:

The weather forecast briefed for the working area was scattered clouds at 6,000, 14,000 and 25,000 feet, visibility better than seven miles and surface winds at ten knots. There was an intermittent forecast for the flight period with scattered clouds forecast at 6,000 feet, a broken cloud deck at both 14,000 and 25,000 feet, seven miles visibility and a chance of thunderstorms producing variable surface winds of twenty knots gusting to forty knots. At the time of the mishap the moon had not risen. (Tab W-1)

A surface observation was taken at the airport at Ely, Nevada, 35 miles southwest of the crash site, at the time of the mishap. The observation reported scattered clouds at 6500 and 14,000 feet, a broken cloud layer at 25,000 feet, visibility 15 miles and surface winds from the south at 11 knots. A pilot report at the time of the mishap reported a broken cloud layer between 19,000 and 20,000 feet with FLIR (Forward Looking Infrared Radar) visibility of approximately fifteen miles. (Tabs T-20, W-3, W-5)

S. Directives and Publications:

The following publications were applicable to the mission:

AFR 60-1	Flight Management
AFR 60-16	General Flight Rules
TACR 51-50	Flying Training - Tactical Fighter
TACR 51-50	F-16 Aircrew Training
Vol VIII	
TACR 55-116	F-16 Aircrew Operational Procedures
T.O.1F-16CG-1	F-16 Flight Manual

No known or suspected deviations from the directives or publications were noted.



ROBERT W. SCHLOSS, Lt Col, USAF
AFR 110-14 Investigating Officer

Reply to
Attn of: LtCol Schloss
Investigating Officer

Subject: Release of Wreckage, F-16D, S/N 88-0168

To: 00-ALC/JA

The accident investigation board convened to investigate the 30 July 1991 crash of F-16D, S/N 88-0168, flown by Captain Keith G. Nylander, has completed its investigation. The wreckage is hereby released to 00-ALC/JA for disposition.



ROBERT W. SCHLOSS, LtCol, USAF
AFR 110-14 Investigating Officer

1st Ind

00-ALC/JAD

To: LtCol Schloss

Receipt acknowledged.



LESLIE D. LONG, Captain, USAF
Assistant Staff Judge Advocate

INDEX OF TABS

<u>TITLE</u>	<u>PAGE</u>
AF Form 711 - USAF Mishap Report	Tab A
AF Form 711B - Aircraft Flight Mishap Report	Tab C
AF Form 711C - Aircraft Maintenance & Materiel Report ..	Tab D
Flight and Personnel Records	Tab G
AFORMS Individual Flying Summary	G-1
Flying History Report	G-2
Report of Individual Flying Time	G-3
Technical and Engineering Evaluations	Tab J
Flight Control/LANTIRN Analysis	J-1
Instrument Analysis	J-6
Egress Systems Analysis	J-11
Flight Plans	Tab K
Weight and Balance Clearance	Tab L
Certificate of Damage	Tab M
Transcripts of Recorded Communications	Tab N
Additional Substantiating Data Reports	Tab O
Crash Survivable Memory - Events Summary	O-1
Crash Survivable Memory - Engine Analysis	O-2
Crash Survivable Memory - Aircraft Parameter Analysis	O-3
Statement of Damage to Private Property	Tab P
Documents Appointing the Safety Investigation Board	Tab Q
Diagram	Tab R
Photographs	Tab S
Crash Site Overview	S-1
Crash Site Impact Crater	S-2
Individual Flight Records	Tab T
Medical Recommendation for Flying	T-1
Physiological Training	T-2
Aeronautical Orders	T-3

INDEX OF TABS (Continued)

<u>TITLE</u>	<u>PAGE</u>
AF Form 942	T-4
AF Forms 8	T-5
Individual Flight Data	T-14
Letter of X's	T-16
Training Summary	T-17
Flight Crew Information File Cards	T-18
Life Support Training Record	T-19
Aircraft Maintenance Records	Tab U
Aircraft Flight History	U-1
Oil Analysis Records	U-2
JP-4 Fuel Analysis	U-4
Hydraulic Fluid Analysis	U-6
Cryogenic Analysis	U-8
Testimony and Statements of Witnesses	Tab V
Glossary of Terms	V-i
Lieutenant Colonel Jeffrey D. Kohler	V-1-1
Captain John P. Dismukes	V-2-1
Major Christopher Kleinsmith	V-3-1
Lieutenant Martin F. O'Loughlin, U.S. Navy	V-4-1
Captain Mark M. Lankford	V-5-1
Lieutenant Colonel Larry Shervanik	V-6-1
Staff Sergeant Robert Ernst	V-7-1
Airman First Class Timothy M. Alexander	V-8-1
Airman Karl M. Pauna	V-9-1
Airman First Class Roland L. Willey, Jr.	V-10-1
Staff Sergeant Robert F. Markland	V-11-1
Captain Jeffrey T. Weathers	V-12-1
Weather Observations	Tab W
Weather Flimsy	W-1
Alternate Forecasts	W-2
Weather Photo Imagery	W-4
Supervisor of Flying End of Tour Report	W-5
Statements of Injury or Death	Tab X
Documents Appointing the Accident Investigation Board ..	Tab Y
Lieutenant Colonel Schloss	Y-1
Colonel Casebeer	Y-2
Captain Nejaime	Y-3
Captain Reed	Y-4