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**AIRCRAFT ACCIDENT INVESTIGATION REPORT**

**AIRCRAFT ACCIDENT INVOLVING  
F-16/A SERIAL NUMBER 81-0706  
F-16/A SERIAL NUMBER 81-0704**

Pilot - [REDACTED] (706)

Pilot - Lieutenant Colonel Roy A. Keyt (704)

**191ST FIGHTER GROUP  
SELFRIDGE AIR NATIONAL GUARD BASE  
MICHIGAN AIR NATIONAL GUARD**

**3 MARCH 1992**

*PFS Exh. 136*

**Submitted By:  
Richard S. Kenney  
Colonel, VTANG  
Investigating Officer**

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## SUMMARY OF FACTS

### A. HISTORY OF FLIGHT:

Buc 01 flight of four F-16A aircraft was scheduled for a four ship, 2v2, air combat tactics training mission. Two instructor pilots were in the flight, Buc 01 [REDACTED] and Buc 04 [REDACTED]. During mission coordination, the instructors decided to split the mission into Buc flight and Scamer flight so [REDACTED] could evaluate Scamer 01 for flight lead upgrade. The briefed alternate mission of 2V1 was flown when Scamer 01 ground aborted two aircraft. Major Moore (Scamer 02) launched as a single ship taking Scamer 01 for his element call sign.

The mission was a Continuation Training (CT) flight for all three pilots, and was scheduled to perform the training within the Peck and Franklin Military Operating Areas (MOA). The flight was a local training mission scheduled for a 1515 local departure for Buc 01, with Scamer planned for 1520L. The mission was planned for 1.9 hours duration with recovery back at Selfridge ANGB. (TAB K) All aircraft were also scheduled to complete an air refueling prior to

the engagements. Buc 01 flight departed Selfridge on 3 Mar 92 at 1520, followed by Scamer 01 at 1530L. At approximately 1620L, Buc 01 and Buc 02 collided in mid-air destroying both aircraft and impacting the ground in Elkton, Michigan, 40 nautical miles southeast of Wurtsmith AFB, Michigan.

Information about the mishap was released through the Base Public Affairs Office at Selfridge soon after the accident. Media and public interest was high, and all local television stations broadcast live from the scene within hours. Media coverage continued for several days following the mishap.

#### B. MISSION:

The mission of Buc and Scamer flights was to accomplish Continuation Training (CT) events to maintain proficiency and currency in flying training requirements. Mission profile included an air refueling prior to the engagements, followed by multiple 2V1 intercepts, and recovery at Selfridge. This mission was not an instructional ride; it was briefed and flown in accordance with the 191st Flight Briefing Guide published by Standardization and Evaluation, and the Continuation Training Syllabus published by Weapons and Tactics. Mission scenario and objectives are established by the flight lead.

#### C. BRIEFING AND PREFLIGHT:

The four ship briefing on Tuesday afternoon, 3 Mar, was conducted by [REDACTED] Two hours before scheduled takeoff time, [REDACTED] met with [REDACTED] second element lead and instructor, to discuss the mission objectives. It was decided to split the flight into two elements so that a flight lead upgrade could be accomplished in the second element, as well as complete the combat tactics portion. All four flight members then gathered for the main briefing. Testimony states the briefing was very detailed and complete, and all required areas were covered while referencing the standard briefing guides. A fallout plan, or alternate mission plan, was briefed; the same scenario would be used in a 2V1 instead of the 2V2. Because of the recent low flying time for both [REDACTED] and Lt Col Keyt, Buc 02, [REDACTED] designed the scenario to be task manageable for [REDACTED] element and for the upgrading flight lead in element two.

The briefing covered a planned takeoff for Buc flight 5 minutes prior to Scamer flight. Both would proceed directly to the tanker, unload fuel and proceed into the MOA for the tactics mission. [REDACTED] would take [REDACTED] element to the east side of the MOA and CAP there until Scamer flight was off the tanker and ready to initiate a sweep

from the west to the east. The objective was for Buc flight to simulate protecting a small town in Canada by intercepting Scamer flight, the prestrike sweepers. Once briefed objectives were obtained for each engagement, the elements would reposition for another engagement. After several engagements, the elements would return to Selfridge as two ship formations for recovery. Testimony indicates all preflight and ground activities were standard and normal, except for a Scamer 01 ground abort forcing a retreat to the alternate three ship mission; Scamer 02 became Scamer 01. After the all flight member briefing by [REDACTED] the elements accomplished separate element tactics briefings. [REDACTED] states that the element briefing was normal; there were not any questions or misunderstandings apparent.

#### D. FLIGHT ACTIVITY:

Buc 01 flight, scheduled for a 1515L takeoff, departed Selfridge of 1520L. Scamer 01 departed at 1530L, after being delayed because of the original Scamer 01 ground aborting two aircraft. Operations were normal for both elements through departure, air refueling and positioning in Franklin MDA for the engagements. All required inflight and pre-engagement checks were completed.

The communications and ground radar control plans were to have both elements on the same UHF frequency and VHF frequency. Scamer, the bandit would turn the VHF volume down so as to deny himself knowledge of Buc flight tactics. Scamer had use of the only GCI scope. The alternate mission they were employing was to have the single bandit sweeping with radar missiles against Buc flight using only heat missiles. However, Scamer 01 aircraft had not been modified with the ADF yet, and did not have radar missile capability. The first engagement was conducted using heat missiles only. One of the mission objectives was to practice employment of the AIM-7 radar missile; since the bandit did not have that capability, [REDACTED] modified the plan. He directed that each member would take turns as the single bandit while the other two would pair up as the defenders. Both Buc flight aircraft were ADF modified. The next two engagements saw Buc 01 and Scamer paired with Buc 02 the bandit, and then Buc 02 and Scamer paired with Buc 01 the bandit. The first three engagements were terminated when objectives were accomplished; nothing out of the ordinary occurred during these engagements.

The fourth (mishap) engagement began the same as the first with Scamer, a single bandit attacking Buc 01 flight. Again, both elements were limited to heat missile employment only, due to Scamer not having ADF.

Scamer 01 began the engagement in the northeast corner of the working area in block 25,000 to 29,000 feet. Buc flight was in the west in the 20,000 to 24,000 feet block. When the two elements began

the engagement, Scamer offset along the northern border and Buc flight proceeded from west to east. Buc 01 realized that Scamer had offset north and turned his flight into Scamer. This put MP-2 (Buc 02) in a wide, visual echelon formation.

When the two elements were approximately 18 NM apart, Scamer targeted Buc 02 (MP-2) the southern target, and handed the northern target (Buc 01) to GCI to monitor. His intent was to flow past MP-1 and engage MP-2.

At about 16 NM separation, MP-1 directed MP-2 to "bracket" or pincer the target; he offset north to gain turning room, and MP-2 separated to the southeast. At 8 NM from Scamer, MP-1 called MP-2 to advise he had radar locked on target; ten seconds later he called a tally and continued to convert to Scamer's 6 o'clock. At 5 NM separation, Scamer called a tally on MP-1, and Buc 01 repeated his own tally at 5 miles. Huntress reported to Scamer that MP-2 was 7 miles south. Twenty seconds later, MP-1 called in trail of Scamer as MP-2 was about to enter the merge.

Scamer had begun a shallow descent through 25,000 feet, still planning to attack MP-2. He sighted MP-2 going in the opposite direction at 21,000 feet at his lower left; he began a slow speed split-S to convert on MP-2, and had to vertically extend to regain airspeed. Buc 01, who was in trail of Scamer delayed following into the split-S long enough to ensure deconfliction with MP-2. He had a visual on MP-2 who was now in a hard left turn. Both Scamer and Buc 01 considered Buc 02 to not be a factor anymore, based on his hard turn away from the merge. Scamer now reversed roles to be defensive against Buc 01 who was in his 6 o'clock positioning for a gunshot. Buc 01 was guns only now, due to a heat missile malfunction. Scamer began a climbing right turn in an attempt to defeat Buc 01's maneuvering for a gun shot. They were climbing through about 20,000 feet, since the split-S extension had taken Scamer down to 18,000 feet.

As Scamer was in his split-S, MP-2 must have picked up a tally because he began a hard left defensive turn. He transmitted that he was in a "right hand fight with the guy". (TAB N) MP-1 replied with "Roger, I'm at his 6 o'clock". MP-2 continued a hard left turn, although not visible now to the two engaged fighters. He probably considered himself the engaged fighter rather than the supporting fighter since Scamer initially was offensive to him. His situational awareness was deficient in that he did not take into account that MP-1 was directly behind and below the bandit. As MP-2 continued a left turn from north to west, MP-1 and MP-2 were on a collision course and neither had a visual on the other. MP-1 completed the gun shot from about 700 feet below Scamer and was 30 degrees nose high, 30 degrees right bank and heading 135 degrees. As he looked left to clear after

the gun shot, he momentarily saw an aircraft approaching from the left at a high rate of closure. Impact occurred almost simultaneously.

MP-2 had continued a hard left turn through a full circle that actually brought him in front of and turning into the fight. As he was rolling out through approximately 260 degrees, 25 degree left bank, 15 degree nose down, his aircraft collided with MP-1. The exact attitude and approach of MP-2 was not determined conclusively. MP-2's left wing cut through MP-1's F-1 fuel tank, just aft of the cockpit, traveling from left to right towards the rear. The vertical stabilizer of MP-1's aircraft cut through the cockpit of MP-2's aircraft from forward lower right to aft upper left. MP-2 was fatally injured at the moment of impact. Scamer recalled a blur at his lower left just prior to the collision - assumed to be MP-2. Immediately thereafter, he witnessed a huge explosion/fireball direct behind him.

The force of the collision caused MP-1's helmet to rotate up and back on his head, pulling his oxygen mask up over his eyes. He perceived he had been blinded by the collision, but he did realize his aircraft was out of control. He initiated a successful ejection at approximately 20,000 feet. As he performed the post ejection procedures, he regained his vision when the oxygen mask was discarded.

Scamer circled the impact scene searching for a parachute after he had made radio notification of the mid-air. He finally sighted MP-1's parachute as it inflated after the Mode III ejection. He determined that MP-1 was able to wave at him before the parachute entered the 4,000 feet undercast. Scamer marked the location in his INS and then returned to Selfridge for a full stop landing.

Total elapsed time from the point all aircraft were merged, and MP-2 started a hard left turn, to the time of impact was 21 seconds. Fifteen seconds elapsed from the time MP-2 communicated he was in a right hand fight with the bandit to the time of impact. (TAB N)

Based upon the events that were recorded and the testimony of the other ~~TWR~~ pilots, MP-2 must have assumed that he was the engaged fighter rather than the supporting fighter. Even though he must not have had a tally on the bandit, or a visual on his leader, he continued to maneuver in the same airspace where the flight's last known position was. MP-2 never called a tally-ho or a visual, although he did acquire Scamer visually and maneuvered defensively. MP-2 did not call blind, lost tally, no joy, or hound dog. (TAB N) (TAB G)

Testimony indicates that aircraft performance and flight operations up to the last 21 seconds were normal and as expected. There were not any minimum closure range violations and all training rules were followed.

Weather in the Peck/Franklin MDA during the engagements was VMC, and the entire tactics mission was flown VFR. There was an undercast cloud deck at 4,000 feet that did provide a tactical advantage for a fighter looking down. Testimony confirms visibility unlimited above the low deck. (TAB K)

#### E. IMPACT:

The mishap aircraft (F-16A, 81-0704; F-16A, 81-0706) impacted the ground in the town of Elkton, eight miles west of Bad Axe, Michigan in Huron County (N 43° - 45', W 83° - 12') at 1620 EST, 3 March 1992. Ground impact area is located on the 164° radial at 40 nautical miles from Wurtsmith AFB, Michigan. Impact points cover a several square mile area oriented along a northwest to south east path. An approximate five mile area of impact was included. (TAB R)

#### F. EJECTION SEATS:

The ejection seat of mishap aircraft number one (81-0706) operated successfully in Mode III after pilot activation. The ejection seat of mishap aircraft number two (81-0704) was destroyed during cockpit impact at the moment of collision.

#### G. PERSONAL AND SURVIVAL EQUIPMENT:

All applicable inspections were current for both aircraft. Equipment for MP-1 functioned properly. He momentarily attempted to use his survival radio, but the CAP aircraft was not on frequency yet. He decided to go directly to a nearby farmhouse. MP-2 equipment was not utilized due to fatality at collision.

#### H. RESCUE AND CRASH RESPONSE:

The time of the mishap was 1620 EST. Scamer 01 transmitted on UHF Guard channel that a mid-air had occurred. At 1625 Scamer 01 called the 191st Command Center and advised the center that Buc 01 and 02 had just had a mid-air. The Command Center immediately initiated the Aircraft Mishap and Disaster Response checklist. [REDACTED] 127 TFW [REDACTED] was notified and began to assemble a response force by 1630. Due to the time of day, many persons had to be located and recalled to the base before a team was organized and ready to depart. A response team including Crash/Rescue, Security, Medical, and supporting members arrived at the crash about 2130 and established a command post; [REDACTED] became the on-scene commander and interim safety board representative.

The local sheriff's department and fire departments had secured the site prior to the response team arrival. Local officials

responded immediately and were at the scene almost by the time [REDACTED] parachute landed. The Sheriff's Department met [REDACTED] at the farmhouse where [REDACTED] intended to use the telephone. [REDACTED] called [REDACTED] and then the Selfridge Command Post to check in. The sheriff then transported [REDACTED] to Bad Axe airport where [REDACTED] was met by a Coast Guard Helicopter from Selfridge. The chopper took [REDACTED] to Wurtsmith AFB Hospital, where [REDACTED] remained overnight to return to Selfridge the next day.

Lt Col Keyt was found and determined to be a fatality. His location was secured for the medical authorities who investigated and removed him the next morning.

I. MAINTENANCE DOCUMENTATION:

A review of the mishap aircraft AFTO Forms 781 series and associated maintenance records did not reveal any discrepancies related to the mishap. There were not any negative trends or problem areas, and both aircraft were properly certified for flight. There were not any maintenance procedures or practices related to this accident. (TAB H)

J. FUEL, HYDRAULIC, AND OIL INSPECTION ANALYSES:

All inspection analyses were found normal or satisfactory (TAB J)

K. AIRFRAME AND AIRCRAFT SYSTEMS:

Both aircraft were destroyed at the collision with subsequent further damage at ground impact. Inspections and analyses possible did not reveal any malfunctions up to the time of impact that would have contributed to the accident. Both aircraft were fully operational up to the time of collision. (TAB J)

L. OPERATIONS PERSONNEL AND SUPERVISORS:

The mishap flight was conducted under the authority of the 191st FG Commander, in accordance with AFR 60-1. The daily flying schedule for this flight (Computer Generated Form 35) was approved by the Commander's delegated representative, the Air Operations Officer, who was further represented by the Air Force Advisor, senior officer on duty. (TAB K) Before approval it is reviewed for compliance with crew rest requirements, pilot qualifications, turn times, mission/syllabus requirements, working area deconfliction, and any other operations factors impacting effective mission accomplishment. All pilots were current in all administrative requirements for flight. The briefing guide used by the flight leads is approved and published by the 191st FG Standardization/Evaluation Section.

#### M. PILOT QUALIFICATIONS:

Mishap pilot number one, [REDACTED], is an F-16 instructor pilot with 2320.1 total flying hours at the time of the mishap. [REDACTED] is a traditional Guardsman with full-time pilot employment with Northwest Airlines. [REDACTED] has 482 total instructor hours, 133.9 F-16 instructor hours, and 893.0 total F-16 hours. Other aircraft flown after UPT include the OAO37B, F-4D, and the O2A. (TAB G) [REDACTED] last tactical mission flight check was on 3 Jan 1992 and was graded "Exceptionally Qualified". The examiner's remarks included, "It couldn't have been led or performed better". In the 30 days prior to the mishap, [REDACTED] had only flown two sorties for 1.4 flying hours - the last sortie flown was on 14 Feb. In the 60 days prior, [REDACTED] flew a total of 5 sorties for 6.0 hours and in the 90 days prior, flew 12 sorties for 20.3 hours. (TAB G) This flying history is below the minimum required for Level A Graduated Combat Capability requirements. Several factors affected the low sortie total, including the holiday season, personal availability, aircraft modification to the ADF and winter weather. The entire ANG fighter community had recently had a two weeks flying standdown for safety, and a restricted "back to basics recurrency".

Mishap pilot number two, Lt Col Keyt, was an Air Technician Flying Training Instructor, (GS-13) militarily assigned to the Group Plans office. He had not yet begun upgrade training to instructor qualified. Lt Col Keyt had 3053.8 total flying hours, 230.3 in the F-16. He had a total of 599.5 instructor hours, primarily in the F-4C and F-106. Other aircraft flown after UPT include the F-106, F-4C, D E and T-33. (TAB G) Lt Col Keyt completed F-16 conversion training at the 184th TFG, McConnell AFB, KS in August, 1990. He completed an initial tactical check ride at the 191st on 10 October 1990, with an overall qualified grade, including a deficiency in the inflight checks area. His last checkride was an instrument/qualification check on 31 Jan 92, graded qualified, with no deficiencies.

In the 30 days prior to the mishap, Lt Col Keyt had flown 5 sorties and 6.9 hours; the last sortie was on 28 February. In the 60 days prior, he flew 9 sorties for 13.1 hours, and 90 days prior, 17 sorties for 24.1 hours. (TAB G) These sortie totals are at the minimum for maintaining Graduated Capability Level A. Some factors affecting the low sortie counts were documented earlier in this report.

#### N. MEDICAL:

Both members of the mishap flight were medically qualified/certified for flight. Lt Col Keyt was a fatality as a result of the midair collision impact. A post accident examination of [REDACTED] at Wurtsmith AFB Hospital did not reveal any injuries.

Toxicological analyses were conducted for both pilots by the Air Force Institute of Pathology, Washington D.C.; all tests were negative.

O. NAVIGATIONAL AIDS AND FACILITIES:

There are not any navigational aids or facilities that may have contributed to this mishap.

P. WEATHER:

The reported weather at Selfridge ANGB at takeoff was 2500 feet overcast and 7 miles visibility, altimeter setting 30.22 and winds out of the southeast at about 5 knots. The forecast for time of recovery was for little change.

The MOA forecast was for a low layer of broken to overcast clouds at 2500 to 3000 feet and ground visibility of 7 miles. Flight level winds at 20,000 feet were 300° at 45 knots. (TAB K) The weather at 20,000 feet at the time of the mishap was Visual Meteorological Conditions (VMC) and the flight was conducted under Visual Flight Rules (VFR) on top of the clouds. Pilot testimony shows visibility unlimited above a 4,000 ft deck.

Q. DIRECTIVES AND PUBLICATIONS:

Publications applicable to the operation of the mission are:

AFR-60-1  
AFR 60-16  
F-16A-1  
TACM 51-50  
NG-R 51-50  
TACR 55-116  
TACR 55-79  
191st FG Briefing Guide  
191st FG Continuation Training Syllabus

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