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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS USAF TACTICAL FIGHTER WEAPONS CENTER (TAC)
WELLS AIR FORCE BASE NY 11901 3000
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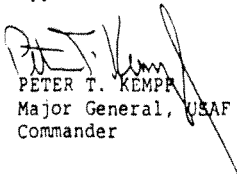
JAN 14 1987



OFFICE OF THE COMMANDER

SUBJECT: Aircraft Accident - F-117A, BL-0792, 11 July 1986 (S-SAR)

to TFWC/JA

46) The Report of Investigation pertaining to the above identified aircraft has been reviewed in accordance with the provisions of AFR 110-14, paragraph 9d, and is approved.


PETER T. KEMPF
Major General, USAF
Commander

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DECLASSIFY ON: OADR

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS USAF TACTICAL FIGHTER WEAPONS CENTER (TAC)
HOLLIS AIR FORCE BASE NV 89191-5000

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REPLY TO
ATTN OF JA

11 JUL 1987

SUBJECT Report of Investigation of Accident of F-117A, 81-0792,
11 July 1986 ~~(S-SAR)~~

TO TFWC/CC

1. ~~(S)~~ Subject Report of Investigation has been reviewed and is legally sufficient. Upon your approval one copy of the report will be filed with the 4461st Support Group legal office and the other copy will be provided to HQ TAC/JA. Because of the classified nature of the matters investigated no further distribution will be made.

2. ~~(S)~~ No further disciplinary or administrative action appears appropriate in this case. If you concur an action approving the report has been prepared for your signature.

R. K. Rothenburg
R. K. ROTHENBURG, Colonel, USAF
Staff Judge Advocate

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STATEMENT OF AUTHORITY AND PURPOSE

AUTHORITY: AN INVESTIGATION OF THE F-117A ACCIDENT (SN 81-0792) WHICH OCCURRED 15NM NORTHEAST OF BAKERSFIELD, CA. ON 11 JULY 1986, WAS CONDUCTED FROM 4 AUGUST 1986 THROUGH 20 AUGUST 1986 AT NELLIS AFB, NEVADA. LT COL MARC R. MARCHESSEAU WAS APPOINTED BY THE COMMANDER, TACTICAL FIGHTER WEAPONS CENTER, TO CONDUCT AN AFR 110-14 INVESTIGATION OF THE ACCIDENT UNDER AUTHORITY OF HQ IFWC/JA LETTER DATED 4 AUGUST 1986 (TAB Y-1). VERBAL AUTHORITY BY THE IFWC/JA IAW AFR 110-14 APPOINTED CAPTAIN MICHAEL S. SACKLEY, UNITED STATES AIR FORCE, PILOT TECHNICAL ADVISOR AND CAPTAIN JAMES M. ROY, UNITED STATES AIR FORCE, MAINTENANCE TECHNICAL ADVISOR. THE INVESTIGATING OFFICER IS ASSIGNED TO HQIAC/DUCX, LANGLEY AFB, VIRGINIA; AND THE TWO TECHNICAL ADVISORS ARE MEMBERS OF THE 4450TH TACTICAL GROUP, NELLIS AFB, NEVADA.

PURPOSE: THE PURPOSE OF THIS ACCIDENT INVESTIGATION WAS TO OBTAIN ALL AVAILABLE EVIDENCE FOR USE IN CLAIMS, LITIGATION, DISCIPLINARY ACTIONS, ADVERSE ADMINISTRATIVE PROCEEDINGS, AND FOR OTHER PURPOSES IN ACCORDANCE WITH AFR 110-14.

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SUMMARY OF FACTS

1. HISTORY OF FLIGHT: ARIEL 31, AN F-117A AIRCRAFT, DEPARTED TONOPAH TEST RANGE (TTR) ON 11 JULY 1986 AT 0113 PDT FOR A SINGLE SHIP NIGHT [REDACTED] MISSION [REDACTED] (TAB A). BRIEFING, GROUND OPERATIONS, AND TAKEOFF WENT AS PLANNED. ROUTE OF FLIGHT WAS UNDER IFR AND PROCEEDED WESTBOUND INTO THE EASTERN PORTION OF THE SAN JOAQUIN VALLEY AT FL200. THE ROUTE TURNED SOUTHBOUND PROCEEDING THROUGH THE VALLEY BEFORE HEADING EAST [REDACTED] (TAB O-1, TAB R4-5). ARIEL 31 BEGAN A DESCENT AND CANCELLED IFR AT 0144 PDT. THE AIRCRAFT IMPACTED THE GROUND AT APPROXIMATELY 0145 PDT, 11 JULY 1986. THE IMPACT WAS APPROXIMATELY 3NM [REDACTED] (15 NM NORTHEAST OF BAKERSFIELD, CA) IN RISING MOUNTAINOUS TERRAIN (TAB A). THE AIRCRAFT WAS DESTROYED (TAB M); AND THE PILOT, MAJOR ROSS E. MULHARE, WAS FATALLY INJURED (TAB X). NO EJECTION ATTEMPT WAS MADE (TAB U-4). LOCAL AND NATIONAL MEDIA INVOLVEMENT SURROUNDING THE ACCIDENT AND ITS INVESTIGATION WERE EXTENSIVE. LOCAL MEDIA QUESTIONS WERE HANDLED THROUGH THE EDWARDS AFB PUBLIC AFFAIRS OFFICE, AND NATIONAL MEDIA WAS HANDLED THROUGH THE OFFICE OF THE SECRETARY OF THE AIR FORCE (TAB AA 6-13).

2. MISSION: ARIEL 31 WAS FLYING A SINGLE SHIP NIGHT [REDACTED] THE MISSION WAS FLOWN AS A [REDACTED] (TAB AA-4).

3. BRIEFING AND PREFLIGHT: SUBJECT PILOT HAD ADEQUATE CREW REST BEFORE THE FATAL FLIGHT (TAB AA-2). THE MISSION WAS THOROUGHLY BRIEFED AND PLANNED BY THE MISSION LEADER, CAPTAIN BRAD CARLSON. THE PROCEDURES BRIEFED FOR THE MISSION WERE NORMAL (STANDARD) AND NO MISUNDERSTANDINGS WERE NOTED. PREFLIGHT PROCEDURES WERE NORMAL (TAB AA-4).

4. FLIGHT: ARIEL 31 DEPARTED THE TONOPAH TEST RANGE (TTR) AT 0113 PDT (TAB A). THE PLANNED MISSION INCLUDED: [REDACTED]

[REDACTED] LANDING WAS PLANNED AT TTR AFTER AN APPROXIMATELY [REDACTED] FLIGHT (TAB O-1). THE AIRCRAFT FLEW SINGLE SHIP ON AN IFR CLEARANCE [REDACTED] THE ROUTE OF FLIGHT WAS INITIALLY NORTHWEST TO TONOPAH, NEVADA FOLLOWED BY A SOUTHWESTERLY TURN CLIMBING TO FL 200. [REDACTED] APPEARED NORMAL WITH THE PROPER RADIO CALLS TO OAKLAND AND LOS ANGELES CENTER. ARIEL 31 NEXT MADE A TURN TO THE SOUTH AND PROCEEDED DOWN THE EAST SIDE OF THE SAN JOAQUIN VALLEY TOWARD BAKERSFIELD, CA.; WHILE DESCENDING AS REQUESTED TO FL 190. ALL RADIO TRANSMISSIONS WERE NORMAL UP TO THAT POINT. THE AIRCRAFT TURNED TO THE SOUTHEAST [REDACTED] AND ARIEL 31 REQUESTED A DESCENT TO 17,000 FEET. LOS ANGELES CENTER CLEARED ARIEL 31 TO DESCEND TO 17,000, AND HE ACKNOWLEDGED ONLY THE BAKERSFIELD ALTIMETER. ARIEL 31 CANCELLED IFR WITH LA CENTER AT 0144 PDT. ARIEL 31'S ACKNOWLEDGEMENT OF LA CENTER'S RECEIVING THE CANCELLATION WAS THE LAST TRANSMISSION RECEIVED FROM THE MISHAP AIRCRAFT (TAB R 4-5), (TAB N), (TAB AA-6). THE MISHAP AIRCRAFT'S FINAL FLIGHT PROFILE (ALTITUDE AND GROUND TRACK) ARE DERIVED FROM AN OAKLAND ARTCC RADAR PLOT (TAB R-4). THE AIRCRAFT IMPACTED A HILLSIDE (ELEVATION 2280 FEET MSL) AT APPROX 0145 PDT AND WAS DESTROYED (TAB A, TAB B). CAROL A. BLOCH, A PILOT FOR CALIFORNIA AIR CHARTER, REPORTED THE "EXPLOSION" (GROUND IMPACT) TO LA CENTER AT 0146:26 PDT (TAB N). THE IMPACT TERRAIN WAS DESCRIBED AS A "ROLLING FOOTHILL" PRIMARILY COVERED WITH DRY

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GRASS AND SCRUB VEGETATION (TAB J-3). THE SKY WAS CLEAR
AND MOON ILLUMINATION WAS 14%. (TAB W).

5. IMPACT: F-117A AIRCRAFT NUMBER 81-0792, ASSIGNED TO THE 4450TH TACTICAL GROUP, NELLIS AIR FORCE BASE, NEVADA, IMPACTED THE GROUND 15 NAUTICAL MILES NORTHEAST OF BAKERSFIELD, CALIFORNIA (TAB A) AT LATITUDE 35 DEGREES 29' 24" NORTH, LONGITUDE 118 DEGREES 48' 50" WEST (TAB R-1) ON 11 JULY 1986 AT 0145 PDT (TAB A). THE AIRCRAFT WAS TOTALLY DESTROYED (TAB M). THE AIRCRAFT WAS HEADING 080 DEGREES AT IMPACT (TAB R-1). ANALYSIS, OF THE FIRE PATTERN, CRATER AND THE SCATTER PATTERN OF THE PARTS, INDICATE THAT THE AIRCRAFT WAS UPRIGHT IN A STEEP DIVE ("NO LESS THAN 20 DEGREES, AND PROBABLY IN THE NEIGHBORHOOD OF 60 DEGREES") AND AT "HIGH VELOCITY" (TAB J-3, TAB AA-16).

6. EJECTION SEAT: INVESTIGATION REVEALED THAT NO EJECTION ATTEMPT WAS INITIATED (TAB U-4).

7. PERSONAL AND SURVIVAL EQUIPMENT: ALL PERSONAL AND SURVIVAL EQUIPMENT INSPECTIONS WERE CURRENT AND DOCUMENTED IN ACCORDANCE WITH PERTINENT TECHNICAL ORDERS WITH THE EXCEPTION OF MAJOR MULHARE'S HELMET AND OXYGEN MASK. THEY WERE 1 DAY OVERDUE INSPECTION. EQUIPMENT DEFICIENCY WAS NOT SUSPECTED TO BE A FACTOR IN THIS ACCIDENT (TAB AA-3).

8. RESCUE: ARIEL 31 COLLIDED WITH THE GROUND AT APPROXIMATELY 0145 PDT ON 11 JULY 1986 (TAB A). ARIEL 33 PLACED THE FIRST RESCUE CALL WHEN HE WAS APPROXIMATELY 40 NM SOUTH OF FURNACE CREEK, CA., AFTER ASSESSING THAT ARIEL 31 WAS DOWN. HE CALLED THE SUPERVISOR OF FLYING (SOF) AT TONOPAH TEST RANGE (TTR) WHERE TOWER PERSONNEL INITIATED IMMEDIATE RESCUE, FIRE, MEDICAL AND SAFETY RESPONSE (TAB V-23).

9. CRASH RESPONSE: LOCAL FIRE AND POLICE DEPARTMENT OFFICIALS WERE THE FIRST INDIVIDUALS ON SITE. A BRUSH FIRE HAD STARTED WHICH MADE ACCESS TO THE AREA VIRTUALLY IMPOSSIBLE. AIR FORCE PERSONNEL EDWARDS AFB ARRIVED SHORTLY THEREAFTER. AT 0300 PDT A DIVERT TEAM WAS INITIATED AT THE TONOPAH TEST RANGE AIRFIELD AND ARRIVED AT THE CRASH SITE APPROXIMATELY 8 HOURS AFTER IMPACT. SOME DELAYS IN TRANSPORTATION, AND CONTAINMENT OF THE FIRE HINDERED RESPONSE TIME.

10. MAINTENANCE DOCUMENTATION: A THOROUGH REVIEW OF ALL MAINTENANCE DOCUMENTATION WAS ACCOMPLISHED. NO OUTSTANDING OPEN DISCREPANCIES EXISTED. ALL SCHEDULED INSPECTIONS, BOTH AIRFRAME AND ENGINE RELATED WERE PROPERLY ACCOMPLISHED. AFTER REVIEWING ALL OF THE MAINTENANCE DATA COLLECTED, IT WAS DETERMINED THAT NO IRREGULARITIES EXISTED (TAB U).

11. MAINTENANCE PERSONNEL AND SUPERVISION: TECHNICAL EXPERTISE AND SUPERVISION WERE EVALUATED BY MAI AND DEEMED ADEQUATE (TAB U).

12. AIRFRAME STRUCTURE: NO INFLIGHT FIRE DAMAGE WAS NOTED ON ANY AFT FUSELAGE STRUCTURES, CONTROL SURFACES, ENGINE PARTS, OR AVIONICS BAYS. ALL INDICATIONS ARE THAT THE AIRFRAME WAS INTACT, AND HAD NO VISIBLE INFLIGHT FIRE DAMAGE (TAB J-3).

13. AIRCRAFT SYSTEM:

A. FLIGHT CONTROLS: BASED ON THE FLIGHT CONTROL HISTORY OF THE AIRCRAFT IT WAS DETERMINED THAT THIS SYSTEM WAS FULLY OPERATIONAL AT THE TIME OF

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IMPACT (Tab I-1).

B. ENGINE SYSTEM: THROUGH ANALYSIS OF PARTS RECOVERED, IT WAS DETERMINED THAT BOTH ENGINES WERE OPERATING AT HIGH POWER SETTINGS PRIOR TO IMPACT (Tab I-1).

C. INSTRUMENT AND PNEUDRAULIC SYSTEMS: NO DOCUMENTATION OF ANY TYPE PROBLEM TO EITHER SYSTEM HAD BEEN RECORDED IN THE PAST 30 DAYS. INVESTIGATION AND ANALYSIS OF RECOVERED PARTS INDICATED THAT THE SYSTEMS WERE OPERATING AT THE TIME OF IMPACT (Tab J-2).

D. LOX AND FUEL SYSTEM: EVALUATION OF SAMPLES WERE FOUND NOT TO CONTAIN HAZARDOUS MATERIALS. A RECOVERY AND ANALYSIS OF FUEL PARTS DISCLOSED THAT THE SYSTEM WAS FUNCTIONING AS REQUIRED (Tab D-1, Tab J-1).

E. THE FOLLOWING AREAS WERE INVESTIGATED AND CONSIDERED NOT TO BE FACTORS:

1. WEIGHT AND BALANCE.
2. ENGINE (OIL) SPECTROMETRIC ANALYSIS.
3. TECHNICAL COMPLIANCE DIRECTIVES (TCD).
4. MATERIAL DEFICIENCY REPORTS (MDR).
5. FOREIGN OBJECT DAMAGE REPORTS (FOD).

14. OPERATIONS PERSONNEL AND SUPERVISION: THE MISSION WAS FLOWN UNDER AUTHORITY GIVEN TO THE COMMANDER, 4450TH TACTICAL GROUP, BY THE COMMANDER, TACTICAL AIR COMMAND, UNITED STATES AIR FORCE. THE MISSION WAS FULLY BRIEFED IN ACCORDANCE WITH THE APPROVED 4450TH TACTICAL GROUP AND TACR 55-117 BRIEFING GUIDES BY ARIEL 35, CAPTAIN BRAD CARLSON. THERE WERE NO OPERATIONS OR SUPERVISORY ERRORS DETECTED BY THE INVESTIGATING OFFICER IN THE CONDUCT OF UNIT FLYING OPERATIONS DURING THE EVENING/MORNING OF 10-11 JULY 1986.

15. CREW QUALIFICATIONS: A REVIEW OF THE FLIGHT RECORDS FOR ARIEL 31 INDICATE THAT HE WAS QUALIFIED AND AUTHORIZED TO FLY THE MISSION. MAJOR ROSS MULHARE WAS CURRENT IN THE F-117A AIRCRAFT (Tab T). HIS TRAINING AND INITIAL INSTRUMENT/QUALIFICATION EVALUATION IN THE AIRCRAFT WERE COMPLETED ON 13 JANUARY 1986 (Tab T 8-9). MISSION READY (MR) TRAINING AND INITIAL TACTICAL QUALIFICATION TRAINING AND EVALUATION WERE COMPLETED ON 18 MARCH 1986 (Tab T 5-7). ALL TRAINING AND EVALUATIONS WERE COMPLETED IN ACCORDANCE WITH APPLICABLE 4450TH TACTICAL GROUP REGULATIONS. THERE WERE NO TRAINING DEFICIENCIES OR DISCREPANCIES NOTED IN A REVIEW OF MAJOR MULHARE'S TRAINING RECORDS. MAJOR MULHARE'S FLIGHT RECORDS SHOW THAT HE WAS A HIGHLY EXPERIENCED FIGHTER PILOT (Tab G). CURRENT DUAL QUALIFICATION IN THE F-117A AND THE A-7D/K WAS PROPERLY DOCUMENTED ON AF FORMS 8 (Tab T 6-13). HIS FLYING TIME/SORTIES FOR THE PREVIOUS 30, 60, AND 90 DAY PERIODS WERE, FOR THE F-117A: 6.1/1, 15.3/1 AND 20.0/1 AND FOR THE A-7D: 10.2/7, 14.1/10 AND 20.5/16 (Tab G-2). HIS TOTAL FIGHTER TIME WAS 2334.3 HOURS IN THE A-7, F-15, F-4, F-5 AND F-117A AIRCRAFT, OF WHICH 547.7 HOURS WAS INSTRUCTOR TIME. HE HAD A TOTAL OF 53.5 HOURS IN THE F-117A. AN ADDITIONAL 208.8 HOURS OF FLYING TIME WAS ACCRUED IN UNDERGRADUATE PILOT TRAINING AS A STUDENT IN THE T-37 AND T-38 AIRCRAFT (Tab G 4-5). ALL PHYSIOLOGICAL TRAINING RECORDS INDICATE THAT HE WAS CURRENT WITH HIS REFRESHER COURSE BEING 30 JULY 1985 (Tab T-3). ALL EGRESS, HANGING HARNESS, AND SURVIVAL TRAINING REQUIREMENTS WERE CURRENT (Tab T-16). DOCUMENTATION DID

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SHOW THAT MAJOR MULHARE WAS OVERDUE HIS MONTHLY F-117 SITUATIONAL EMERGENCY PROCEDURES TRAINING (SEPT). ACCORDING TO RECORDS, HIS LAST F-117 SEPT WAS ACCOMPLISHED ON 12 MARCH 1986 (TAB T-15). ON THE DATE OF THE ACCIDENT, MAJOR MULHARE WAS SCHEDULED FOR A F-117A SINGLE SHIP. HIS LAST F-117A WAS FLOWN ON 10 JULY 1986 (TAB T-14).

16. MEDICAL: MAJOR MULHARE WAS MEDICALLY QUALIFIED FOR FLIGHT DUTY (TAB X). TOXICOLOGY REPORTS ARE PENDING.

17. NAVAIDS/FACILITIES: THERE WERE NO NOTAMS (NOTICE TO AIRMEN) FOR THE LOCAL AREA THAT HAD AN AFFECT ON THE FLIGHT. NAVAIDS/FACILITIES WERE NOT A FACTOR IN THE ACCIDENT (TAB AA-4).

18. WEATHER: THE INFLIGHT CONDITIONS DURING THE FLIGHT WERE CLEAR SKIES AND UNLIMITED VISIBILITY. MOON ILLUMINATION WAS 14%. WEATHER/INFLIGHT CONDITIONS WERE NOT A FACTOR IN THIS ACCIDENT (TAB W).

19. DIRECTIVES AND PUBLICATIONS: THE FOLLOWING DIRECTIVES AND PUBLICATIONS APPLICABLE TO THIS MISSION, IN ADDITION TO THE AIRCRAFT TECHNICAL ORDERS, WERE:

- A. TACR 55-117 AIRCREW OPERATIONAL PROCEDURES (S-SAR)
- B. 4450TG SUP 1 TO TACM 51-50 VOLUME 1, CHAPTERS 1-6, 1 DEC 84, (S-SAR)
- C. 4450TG REGULATION 51-50, 15 FEB 85 (S-SAR)
- D. F-117 PILOT AID "CAMERA ATTACK SWITCHOLOGY" p2-4 (S-SAR) (TAB AA-5)
- E. 4450TG PFCIF THROUGH 86-09 (S-SAR)
- F. 4450TG "OFF RANGE FLYING PROGRAM" (S-SAR)
- G. 4450TG PPIF THROUGH 86-06 (S-SAR)
- H. AFR 60-16, 10 DEC 85, "GENERAL FLIGHT RULES".

C. R. Marchesseault

MARC R. MARCHESSEAUULT, LT COL, USAF
AFR 110-14 ACCIDENT INVESTIGATION OFFICER

20 AUGUST 1986

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