Unclassified Executive Summary

Background: On 22 March 2003, a United Kingdom (U.K.) Royal Air Force (RAF) TORNADO GR4A aircraft assigned to RAF Bomber Squadron Number Nine participated in a combat mission over Iraq as part of Operation IRAQI FREEDOM. While returning to its base the plane was engaged by a U.S. Army PATRIOT missile battery. The PATRIOT Battery believed the TORNADO to be a hostile missile and, in self-defense, launched a PATRIOT missile to intercept it. During this engagement the RAF plane was shot down and its crew was killed.

Discussion: On the night of 22 March 2003, the TORNADO was approaching Ali Al Salem Air Base in Northern Kuwait when it was struck by the PATRIOT missile. The return flight path of the plane was directly over the launching battery's position. The mission of the firing PATRIOT battery was to suppress Iraqi missiles and defend concentrations of allied troops in the area from airborne threats.

That night, the battery detected what appeared to be an approaching hostile Iraqi missile. The PATRIOT system depicted the missile as directly targeting the battery location. Regrettably, this "missile" detection was in fact the U.K. TORNADO. Systems that had identified other TORNADOs flying in the same area as friendly, did not in this instance, function correctly.

This investigation confirmed the 22 March 2003 death of the RAF aviators was due to friendly fire. In the aftermath of these tragic deaths, appropriate authority directed technical changes to PATRIOT operating equipment, training, procedures and review of coalition Identify Friend or Foe (IFF).

The U.S. investigation was conducted in parallel and in cooperation with a separate U.K. investigation. Appropriate command authorities of both nations have been provided a copy of the investigation for review. These officials will use the investigative report to determine whether further actions are needed in order to better protect coalition ground and air forces.

DEPARTMENT OF THE AIR FORCE
UNITED STATES CENTRAL COMMAND AIR FORCES (USCENTAF)
SHAW AIR FORCE BASE, SOUTH CAROLINA

15 JUL 2003

MEMORANDUM FOR CDRUSCENTCOM
7115 SOUTH BOUNDARY BOULEVARD
MACDILL AFB FL 33621-5101

FROM: COMUSCENTAF
524 SHAW DRIVE
SHAW AFB SC 29152-5029

SUBJECT: Friendly Fire Investigation Board (FFIB) Report Concerning a Patriot Missile Engagement of a UK RAF Tornado GR4A Aircraft in the Airspace Over Kuwait on 22 March 2003

1. In accordance with your message dated 23 March 2003 and Department of Defense Instruction 6055.7, I am forwarding Brigadier General Lennox's attached report of investigation concerning an incident in the airspace over Kuwait on 22 March 2003 involving a Patriot Missile Unit and a UK RAF Tornado GR4A aircraft. I have reviewed the report and am satisfied that the evidence fully supports the Board's findings and conclusions regarding this matter. I have also reviewed the report in order to determine whether any personnel actions, to include disciplinary actions, are warranted. I have determined that no personnel actions against anyone under my command are warranted in relation to this incident.

2. After carefully considering the Board's recommendations, I am forwarding this report with a recommendation that this incident be given a joint review to further analyze those technical aspects of the Patriot Missile's targeting system [redacted] I also recommend further joint review of current procedures for airspace control and management consistent with the Board's final recommendations.

T. Michael Moseley

T. MICHAEL MOSELEY
Lieutenant General, USAF
Commander

DEPARTMENT OF THE ARMY
COALITION JOINT TASK FORCE 7
UNITED STATES ARMY FORCES CENTRAL COMMAND
THIRD UNITED STATES ARMY
APO AE 09304

REPLY TO
ATTENTION OF:

AFRD-JA

12 June 2003

MEMORANDUM THRU
Commander, CJTF-7 (ATTN: C3/MG Thurman) MG USA C3
Commander, CJTF-7 (ATTN: COS/BG Benes) BG USMC COS

FOR Commander, CJTF-7 (ATTN: CG/LTG McKiernan)

SUBJECT: Preliminary Legal Review of Findings of Patriot Shootdown of UK Tornado

1. Enclosed are the executive summary of the investigation into the UK Tornado shootdown by a Patriot missile; the preliminary legal review; and, BG Bromberg's memorandum. The enclosures are forwarded for your information. The complete investigation will be forwarded to CFACC which is primarily responsible for completion of the investigation. This investigation requires no additional action by this Headquarters.

2. POC this action is CPT [redacted], OSJA, CJTF-7 DSN [redacted]

Encls

[redacted]
Colonel, JA
Staff Judge Advocate

DEPARTMENT OF THE ARMY
32d AIR AND MISSILE DEFENSE COMMAND
COALITION FORCES LAND COMPONENT COMMAND
UNITED STATES ARMY FORCES CENTRAL COMMAND
APO, AE 09889

AFVL-CG

1 June 2003

MEMORANDUM THRU

Commander, Coalition Forces Air Component Command, APO AE 09871
Commander, Coalition Forces Land Component Command, APO AE 09304

FOR Commander, United States Central Command, Mac Dill AFB, Tampa, Fl, 33621-5101

SUBJECT: Investigation of British Tornado Shoot-down by Patriot Missile System

1. Enclosed for your review is the complete original of the AR 15-6 investigation into the Patriot shoot-down of the British Tornado, which occurred on 23 March 2003. The tragedy was determined to have been caused in major part by the incorrect setting of the Identification Friend or Foe, (IFF) of the British aircraft. The Aircraft Data Recorder, (ADR) in British aircraft is far more difficult to analyze than are ours. For that reason the device has not confirmed the setting on the IFF was incorrect. However the AWACs and another firing battery confirmed that the aircraft's IFF was not working.

2. I have approved of the findings and will take no further action in this matter except to include it in lessons learned into appropriate AARs and joint service schools as basis for instruction. Additionally, we have prepared a message for CFACC to release to JFCOM stressing key joint lessons learned and areas that need further investigation.

3. There is a parallel British investigation, the results of which have not yet been provided. In the extremely unlikely chance the eventual analysis of that device indicates the IFF was properly functioning further action might need to be taken.

4. The British have requested that we not make public the results of this investigation until they have completed their parallel investigation. Recommend a joint US/UK release.

Encl
as

HOWARD B. BROMBERG
Brigadier General, U.S. Army
Commanding

For use of this form, see AR 15-6; the proponent agency is OTJAG.

IF MORE SPACE IS REQUIRED [illegible] FILLING OUT ANY PORTION OF THIS FORM, ATTAC[illegible] ADDITIONAL SHEETS

SECTION I - APPOINTMENT

Appointed by HOWARD B. BROMBERG, BG, USA; DEPUTY AREA AIR DEFENSE COMMANDER
(Appointing authority)

on 26 MARCH 03 (Date) *(Attach inclosure 1: Letter of appointment or summary of oral appointment data.) (See para 3-15, AR 15-6.)*

SECTION II - SESSIONS

The *(investigation) (board)* commenced at CAMP DOHA, KUWAIT (Place) at 1900 HRS (Time)

on 26 MARCH 2003 (Date) *(If a formal board met for more than one session, check here* ☐*. Indicate in an inclosure the time each session began and ended, the place, persons present and absent, and explanation of absences, if any.)* The following persons *(members, respondents, counsel)* were present: *(After each name, indicate capacity, e.g., President, Recorder, Member, Legal Advisor.)*

ROBERT P. LENNOX, PRESIDENT

[redacted]

The following persons *(members, respondents, counsel)* were absent: *(Include brief explanation of each absence.) (See paras 5-2 and 5-8a, AR 15-6.)*

The *(investigating officer) (board)* finished gathering/hearing evidence at 1300 HRS (Time) on 6 APRIL 2003 (Date)

I completed findings and recommendations at 1600 HRS (Time) on 11 APRIL 2003 (Date)

SECTION III - CHECKLIST FOR PROCEEDINGS

COMPLETE IN ALL CASES

Inclosures *(para 3-15, AR 15-6)*	YES	NO[1]	NA[2]
Are the following inclosed and numbered consecutively with Roman numerals: *(Attached in order listed)*			
1. The letter of appointment or a summary of oral appointment data?	X		
2. Copy of notice to respondent, if any? *(See item 9, below)*			X
3. Other correspondence with respondent or counsel, if any?			X
4. All other written communications to or from the appointing authority?	X		
5. Privacy Act Statements *(Certificate, if statement provided orally)?*	X		
6. Explanation by the investigating officer or board of any unusual delays, difficulties, irregularities, or other problems encountered *(e.g., absence of material witnesses)?*			X
7. Information as to sessions of a formal board not included on page 1 of this report?			X
8. Any other significant papers *(other than evidence)* relating to administrative aspects of the investigation or board?			

NOTES: *1/ Explain all negative answers on an attached sheet.*
2/ Use of the N/A column constitutes a positive representation that the circumstances described in the question did not occur in this investigation or board.

	YES	NO[1]	NA[2]
a. Are all items offered *(whether or not received)* or considered as evidence individually numbered or lettered as exhibits and attached to this report?	X		
b. Is an index of all exhibits offered to or considered by investigating officer or board attached before the first exhibit?	X		
c. Has the testimony/statement of each witness been recorded verbatim or been reduced to written form and attached as an exhibit?	X		
d. Are copies, descriptions, or depictions *(if substituted for real or documentary evidence)* properly authenticated and is the location of the original evidence indicated?	X		
e. Are descriptions or diagrams included of locations visited by the investigating officer or board *(para 3-6b, AR 15-6)?*	X		
f. Is each written stipulation attached as an exhibit and is each oral stipulation either reduced to writing and made an exhibit or recorded in a verbatim record?	X		
g. If official notice of any matter was taken over the objection of a respondent or counsel, is a statement of the matter of which official notice was taken attached as an exhibit *(para 3-16d, AR 15-6)?*			X
Was a quorum present when the board voted on findings and recommendations *(paras 4-1 and 5-2b, AR 15-6)?*	X		
COMPLETE ONLY FOR FORMAL BOARD PROCEEDINGS *(Chapter 5, AR 15-6)*			
At the initial session, did the recorder read, or determine that all participants had read, the letter of appointment *(para 5-3b, AR 15-6)?*			
Was a quorum present at every session of the board *(para 5-2b, AR 15-6)?*			
Was each absence of any member properly excused *(para 5-2a, AR 15-6)?*			
Were members, witnesses, reporter, and interpreter sworn, if required *(para 3-1, AR 15-6)?*			
If any members who voted on findings or recommendations were not present when the board received some evidence, does the inclosure describe how they familiarized themselves with that evidence *(para 5-2d, AR 15-6)?*			
COMPLETE ONLY IF RESPONDENT WAS DESIGNATED *(Section II, Chapter 5, AR 15-6)*			
Notice to respondents *(para 5-5, AR 15-6):*			
a. Is the method and date of delivery to the respondent indicated on each letter of notification?			
b. Was the date of delivery at least five working days prior to the first session of the board?			
c. Does each letter of notification indicate —			
(1) the date, hour, and place of the first session of the board concerning that respondent?			
(2) the matter to be investigated, including specific allegations against the respondent, if any?			
(3) the respondent's rights with regard to counsel?			
(4) the name and address of each witness expected to be called by the recorder?			
(5) the respondent's rights to be present, present evidence, and call witnesses?			
d. Was the respondent provided a copy of all unclassified documents in the case file?			
e. If there were relevant classified materials, were the respondent and his counsel given access and an opportunity to examine them?			
If any respondent was designated after the proceedings began *(or otherwise was absent during part of the proceedings):*			
a. Was he properly notified *(para 5-5, AR 15-6)?*			
b. Was record of proceedings and evidence received in his absence made available for examination by him and his counsel *(para 5-4c, AR 15-6)?*			
Counsel *(para 5-6, AR 15-6):*			
a. Was each respondent represented by counsel?			
Name and business address of counsel:			
(If counsel is a lawyer, check here ☐)			
b. Was respondent's counsel present at all open sessions of the board relating to that respondent?			
c. If military counsel was requested but not made available, is a copy *(or, if oral, a summary)* of the request and the action taken on it included in the report *(para 5-6b, AR 15-6)?*			
If the respondent challenged the legal advisor or any voting member for lack of impartiality *(para 5-7, AR 15-6):*			
a. Was the challenge properly denied and by the appropriate officer?			
b. Did each member successfully challenged cease to participate in the proceedings?			
Was the respondent given an opportunity to *(para 5-8a, AR 15-6):*			
a. Be present with his counsel at all open sessions of the board which deal with any matter which concerns that respondent?			
b. Examine and object to the introduction of real and documentary evidence, including written statements?			
c. Object to the testimony of witnesses and cross-examine witnesses other than his own?			
d. Call witnesses and otherwise introduce evidence?			
e. Testify as a witness?			
f. Make or have his counsel make a final statement or argument *(para 5-9, AR 15-6)?*			
If requested, did the recorder assist the respondent in obtaining evidence in possession of the Government and in arranging for the presence of witnesses *(para 5-8b, AR 15-6)?*			
Are all of the respondent's requests and objections which were denied indicated in the report of proceedings or in an inclosure or exhibit to it *(para 5-11, AR 15-6)?*			

FOOTNOTES: *1/ Explain all negative answers on an attached sheet.*
2/ Use of the N/A column constitutes a positive representation that the circumstances described in the question did not occur in this investigation or board.

SECTION IV - FINDINGS *(para 3-10, AR 15-6)*

he ~~*(investigating officer)*~~ *(board)*, having carefully considered the evidence, finds:
EE THE ATTACHED MEMORANDUM CO)INING THE BOARD'S FINDINGS.

SECTION V - RECOMMENDATIONS *(para 3-11, AR 15-6)*

iew of the above findings, the ~~*(investigating officer)*~~ *(board)* recommends:
3 THE ATTACHED MEMORANDUM CONTAINING THE BOARD'S RECOMMENDATIONS.

elow, indicate the reason in the space where his ... ture should appear.)

[redacted] WG CDR, ~~USAF~~ RAF
~~(Recorder)~~ PARTICIPANT

(Member)

(Member)

ROBERT P. LENNOX, BG, USA
(President)

[redacted] COL, USA

[redacted] CW3, USA
(Member)

SECTION VII - MINORITY REPORT *(para 3-13, AR 15-6)*

o the extent indicated in Inclosure _____, the undersigned do(es) not concur in the findings and recommendations of the board.
n the inclosure, identify by number each finding and/or recommendation in which the dissenting member(s) do(es) not concur. State the asons for disagreement. Additional/substitute findings and/or recommendations may be included in the inclosure.)

(Member)

(Member)

SECTION VIII - ACTION BY APPOINTING AUTHORITY *(para 2-3, AR 15-6)*

e findings and recommendations of the *(~~investigating officer~~ board)* are *(approved) (~~disapproved~~) (approved with following exceptions/ bstitutions). (If the appointing authority returns the proceedings to the investigating officer or board for further proceedings or rrective action, attach that correspondence (or a summary, if oral) as a numbered inclosure.)*

11 April 03

PATRIOT SHOOT-DOWN OF TORNADO GR4A ZG710 222347Z MAR 03

FINAL REPORT

EXECUTIVE SUMMARY

1. (U) Following the loss of RAF Tornado GR4A number ZG710, call sign Yahoo 76, and the death of its 2-man crew, a Board of Officers conducted an informal investigation under the procedures of Army Regulation 15-6. The President of the Board was BG Robert Lennox, and board membership included a Royal Air Force officer participant, as well as technical advisors, to include a U.S. Air Force officer. The investigation was conducted in parallel with a United Kingdom Board of Inquiry (U.K. BOI) and a US Army Safety Investigation Board. The U.S. Board of Officers and U.K. BOI jointly interviewed witnesses and exchanged evidence that was independently developed.

2. [redacted] Overview. C/5-52 ADA (PATRIOT) was deployed in the vicinity of Udari Range, [redacted] nautical miles (nm) North of Ali Al Salem Airbase, Kuwait. In order to provide additional air defense coverage, specifically defense against Theater Ballistic Missiles (TBM) for Coalition forces, the battery was operating autonomously. Autonomous operation includes [redacted] was returning to Ali Al Salem Airbase from a [redacted] mission over Baghdad, Iraq. It was not transponding an Identification Friend or Foe (IFF) signal. [redacted] In response to [redacted] classification, the crew [redacted] engaged the aircraft and a PATRIOT missile was launched which destroyed the aircraft and killed the crew of two airmen.

3. [redacted] The PATRIOT system uses [redacted] parameters to classify a tracked object ("track") as an [redacted]

[redacted]

[redacted]

4. [redacted] Radar data from two (2) other PATRIOT units recorded the entire incident. Yahoo 76 was approximately [redacted] km from C/5-52 at an altitude of approximately [redacted] and air speed of [redacted] knots (PATRIOT system showed [redacted] knots). Yahoo 76 had a radar cross section of [redacted] According to AWACS, Control and Reporting Center (CRC) and KU radar data Yahoo 76 was not squawking IFF. Yahoo 76 was on a direct vector right over the PATRIOT radar. While on that vector, Yahoo 76 began a steep descent [redacted] It is unknown if Yahoo 76 had its Skyshadow jammer on and what effect that may have had.

5. [redacted] Immediately following the incident, the following changes were implemented via the Special Instructions (SPINS) concerning PATRIOT ROE and IFF procedures:

a. (U) 23 March 03: CFACC ordered the following immediate changes to the ROE/SPINs:

i. [redacted]

ii. [redacted]

iii. [redacted]

iv. [redacted]

b. (U) 3 April 03: [redacted] Further recommended changes to ROE and [redacted] criteria to ensure protection against short range TBMs and prevent engagement of friendly aircraft are:

i. [redacted]

ii. [redacted]

iii. [redacted]

iv. [redacted]

v. (U) Published detailed evaluation criteria for all PATRIOT crews to ensure they are tracking valid targets.

c. (U) Every possible effort is made to expand communications for autonomous batteries (via battery command posts, and/or point- to-point communications with higher C2 agencies).

[redacted]

[redacted]

d. [redacted]

6. (U) Determination. The Board has determined that the PATRIOT crew fired in self-defense, following existing procedures and ROE [redacted] The incident occurred as a result of asynchronous processes and procedures across the coalition force. However, there are several key lessons learned that must be carried forward in our efforts to ensure this never happens again.

a. (U) Current air defense systems are extremely lethal. Operators must never allow themselves to become overly reliant on the system and what it is telling us. The difficulty in classifying tracks (ABTs, cruise missiles, air to surface missiles, unmanned aerial vehicles (UAVs), and TBMs) will only continue to grow in complexity. Operators must understand the target identification parameters used in air defense systems, and then ensure the parameters and crew training on the system are tailored to the situation.

b. (U) [redacted] Operators must be highly diligent in understanding their IFF systems, how the systems function, and ensuring the systems are used correctly.

c. (U) The airspace is very crowded. More effort needs to be expended in finding ways to deconflict that airspace and ensure that everyone's situational awareness is complete.

d. (U) [redacted] Collectively, all Services must continue to explore the impacts of EMI and mitigate its effects.

7. (U) Two airmen died tragically. It is clearly our obligation to take the lessons that were learned during this unfortunate incident and apply them in such a way so as to eradicate the systems errors and procedures that played a part in causing these airmen's deaths. Finally, significant emphasis must be given to how joint and combined training is conducted to ensure we fight as one team.

[redacted]

[redacted]

PATRIOT SHOOT-DOWN OF TORNADO GR4A (ZG710) 222347Z MAR 03

COMPLETE REPORT

1. (U) Introduction. Following the loss of RAF Tornado GR4A number ZG710, call sign Yahoo 76, and the death of its 2-man crew, a Board of Officers ('Board") conducted an informal investigation under Army Regulation 15-6. The investigation was conducted in parallel with a United Kingdom (UK) Board of Inquiry (BOI) and a US Army Safety Investigation Board. The U.S. Board of Officers and U.K. BOI jointly interviewed witnesses and exchanged evidence that was independently developed.

2. (U) The US Board of Officers consists of three U.S. Army Officers and one British Royal Air Force (RAF) Officer who is a Participant, and technical advisors to include a USAF Officer (Annexes A & B). The US Board and UK BOI have jointly interviewed witnesses and considered evidence together. The US Safety Investigation Board has independently investigated the incident, with full access to materials developed by the two other boards. All three investigations are set against the operational imperative of establishing the cause of the incident, during on-going, high-intensity combat operations while, at the same time, meeting national investigative requirements. Accepting these conditions, the three boards have worked well together.

3. (U) Operational context: To fully appreciate the operating environment, a brief summary of the air and missile situation per the 32d AAMDC Operational Summary DTG 220300ZMar03 (Annex C) is provided:

a. [redacted]

b. [redacted]

4. (U) Chronology:

a. [redacted] On 22 March 2003, a flight of two RAF TORNADO GR4 aircraft (call signs YAHOO 75 and YAHOO 76) assigned to the RAF Combat Air Wing, at Ali Al Salem AB Kuwait, were tasked to fly to Iraq [redacted]

b. [redacted] Following the aircrew's mission briefing and pre-flight of their two aircraft, YAHOO 75 and 76 took off from Ali Al Salem Airbase at 2210 ZULU (Z)/(0110L). Once airborne, the flight lead (YAHOO 75) checked the flight in with [redacted] -the Ali Al Salem-based Control and Reporting Center (CRC) radar unit--which performed a

[redacted]

successful IFF check on the leader and then handed the flight off to [redacted] (AWACS) at 2223Z for follow-on control of the aircraft into Iraq.

c. [redacted] During their mission over Iraq, YAHOO 75 and YAHOO 76 successfully supported the strike package [redacted] At 2331Z the Kuwaiti Air Operations Center (KAOC) picked up the two aircraft on radar (assigning them tracks #KA344 and KA361 respectively). YAHOO 75 appeared to be squawking proper IFF, however YAHOO 76 was not. Two minutes later, AWACS identifies the two radar contacts (pair) as "Friendly" based on only one set of IFF returns and a single, valid Mode IV response.

d. [redacted] During the next ten minutes, the YAHOO flight proceeded to the Kuwait border [redacted] At the same time, the AWACS [redacted] conducted an on-station handover with its replacement. YAHOO 75 crossed the Kuwait border at [redacted] (with YAHOO 76 still in trail), and was handed off by AWACS to [redacted] One minute later, YAHOO 76 crosses the border [redacted] At 2345Z, [redacted] cleared YAHOO 75 to descend and directed him to contact Al Salem Approach Control for ATC approach and landing instructions.

e. [redacted] At 2346Z, YAHOO 76 crosses [redacted] behind YAHOO 75 from right to left heading [redacted] YAHOO 75 had already descended [redacted] (squawking all IFF Modes/Codes), with YAHOO 76 descending [redacted] (squawking in no IFF Modes or Codes).

f. [redacted] During the hours prior to this incident, operations at PATRIOT Battery C/5-52 were tense. [Shortly after the PATRIOT crew came on duty, the battery received reports of a small arms or grenade attack at Camp Virginia, which was closely located to the battery's position.] In addition, at 2318Z, the battery lost [redacted] communications [redacted] with their Battalion HQ/2-1. At 2343Z, the Tactical Control Assistant (TCA) of C/5-52 [redacted] within 50km of the battery heading towards them at a speed in excess of [redacted] on his scope at the Engagement Control Station (ECS). He yelled to the Tactical Control Officer (TCO) [redacted]

g. [redacted] Within the next minute, the TCO looked at her scope and also saw [redacted] symbology on the radar screen in a location that indicated it was an [redacted] from her defended asset, heading straight toward them, at an altitude of [redacted] and a speed of [redacted] (but decreasing). The TCO re-interrogated IFF on the the tracked object("track") and made a radio call to B/2-1 [redacted] reporting [redacted] B/2-1, in turn, [redacted] which called the CRC requesting track information/clarification. Approximately 10 seconds after the target was [redacted] she gave the TCA permission to place the PATRIOT launchers in the "operate" configuration, and authorized him to [redacted] engage the track in "self-defense" using a [redacted] method of fire.

h. [redacted] Hard copy data from the engagement control station (ECS) indicates that an engagement took place at 2347:47Z, [redacted] altitude [redacted] ft, speed [redacted] Knots, heading [redacted] from the launcher, with no response to IFF interrogation in any mode. The time to the last launch to engage the target was [redacted] seconds.

i. [redacted] At approximately 2348Z, YAHOO 75 reports "rocket launch" to Al Salem Approach Control—which coincides with radar and other indications that a catastrophic event had occurred with YAHOO 76. One minute later, YAHOO 75 radios [redacted] CRC that "a missile had been fired in the vicinity of the western edge of the Udari Range". In addition, YAHOO 75 radio calls [redacted] to another nearby TORNADO GR-4 aircraft warning it of a missile launch.

j. [redacted] Six minutes later, at 2354Z, YAHOO 75 contacts Ali Al Salem AB Tower for landing at the airfield (lands at 0001Z, 23 March) and, approximately 10 minutes after he lands, another GR-4 [redacted] also lands at Al Salem AB.

k. [redacted] During the following two hours (0001Z – 0200Z, 23 March), were marked by considerable confusion over the "YAHOO 76 missing aircraft", its reported/predicted downed location, multiple emergency locator transmitters/beacons, and the scramble of rescue helicopters and CSAR support aircraft. Many telephone/radio calls took place between the CRC, AWACS, CAOC PSAB, HQ 11th ADA Brigade Al Salem, and the Joint Search and Rescue Center (JSRC) at PSAB--who took charge of the CSAR/Personnel Recovery and launched two helicopters [redacted] at 0145Z and two CSAR fighters [redacted] at 0145Z. At the same time, a ground search was initiated by C Company, 5/158 Bn, V Corps (LRSC Team). The ground team eventually found the wreckage and the aircrew bodies (on the Udairi Range in Kuwait), secured the site, and handed it over to the British forces—which recovered the remains.

5. (U) Systems Descriptions

a. (U) PATRIOT

i. (U) System description: The PATRIOT system constitutes the lower tier of a layered defensive umbrella, providing the battlefield commander with an engagement capability supporting the Theater Air and Missile Defense concept. PATRIOT is a battalion-sized weapon system with the battalion (Bn) elements of the Tactical Command Station/Information Coordination Central (TCS/ICC) jointly integrating and orchestrating the efforts of up to [redacted] Fire Units (FUs) [redacted] The ICC provides a communications interface with elements external to the battalion, [redacted] and processes intelligence information in support of engagements. Directly supporting the weapon system, the TCS has been designed to automate defense planning for the Battalion, to automate a subset of communications planning and to increase the commander's situational awareness. In like manner, the Battery Command Post (BCP) is designed to directly support the weapon system by providing computer-

aided defense planning for the Battery, automation of a subset of communications planning, increased situational awareness for the Battery commander, two-way participation on the [redacted] PATRIOT is deployable by land, sea, or air. The PATRIOT system has the capability of receiving certain IFF modes signals from aircraft and automatically interrogates a track before any engagement.

ii. (U) Capabilities [redacted] PATRIOT has the capability to defend against all enemy aircraft, cruise missiles, ballistic missiles, and anti-radiation missiles Iraq is assessed to have. PATRIOT was designed to fight as a Battalion. [redacted]

iii. [redacted] ADA configuration. The personnel from C/5-52 ADA arrived in theater [redacted] the unit had the equipment necessary to successfully engage a track meeting engagement criterion.

b. (U) Tornado GR4 Aircraft

i. (U) System description: The Tornado GR4 is a variable geometry, two-seat, day or night, all-weather attack aircraft, capable of delivering a wide variety of ordnance. The aircraft can fly automatically at low level using Terrain Following Radar when poor weather prevents visual flight. The aircraft is also equipped with Forward Looking Infrared and is Night Vision Goggle compatible making it a capable platform for passive night operations. For navigation the Tornado is equipped with an integrated GPS/Inertial Navigation System that can be updated from visual or radar inputs. The aircraft is also equipped with a Laser Ranger and Marked Target Seeker system that can provide accurate range information on targets and for ground designation. The Tornado can carry up to three Paveway II, two Paveway III or Enhanced Paveway Laser Guided Bombs (LGB), and by using a Thermal Imaging Airborne Laser Designation (TIALD) pod it is able to self-designate targets for LGB delivery. The Tornado also has a Ground Mapping Radar to identify targets for the delivery of conventional 1000lb bombs. All GR4 aircraft are capable of carrying the Air Launched Anti-Radiation Missile (ALARM), which homes on the emitted radiation of enemy radar systems and can be used for the suppression of enemy air defenses. The Tornado is capable of carrying up to 9 ALARM missiles and can carry

a mixed configuration of ALARM missiles and bombs. When used in the reconnaissance role the GR4 can carry the RAPTOR pod to provide detailed reconnaissance imagery. For self-protection the Tornado GR4 is normally armed with two AIM-9L Sidewinder short-range air-to-air missiles, together with a BOZ-107 pod on the right wing to dispense chaff and flares, and a Sky Shadow-2 Electronic Counter Measures pod on the left wing. The Air Launched Anti-Radiation Missile (ALARM) is designed to destroy or suppress the use of enemy ground-based air defense radar systems. [redacted] The GR4A is a reconnaissance variant equipped with additional reconnaissance equipment rather than the 27mm gun. Skyshadow is a pod mounted fully autonomous jammer that can jam multiple simultaneous threats. Its receivers and jamming transmitters are connected to a dedicated central processor that identifies the threat, establishes priorities and decides optimum jamming strategy. Once a threat has been identified, classified and given a priority, Skyshadow automatically sets the jamming frequency and optimum modulation technique to counter the threat radar. The system is software programmable to allow modification of the threat library. The Tornado is equipped to operate using IFF modes which transponds data including friendly indicators to tracking systems.

ii. [redacted]

6. (U) Major Findings

a. [redacted]

i. [redacted]

[redacted]

[redacted]

ii. [redacted]

iii. [redacted] The board has reconstructed the events using radar data and interviews of those involved. These sources include the PATRIOT hard copy data produced during the engagement (Annex H), available radar data from AWACs, the Kuwaiti Air Operations Center (KAOC) radars, the Control and Reporting Center (CRC) data, and the EDR tapes from A/2-1 and D/2-1 ADA. We have also gleaned some data on the Tornado GR4 from the interviews with the pilot and navigator of the lead aircraft (Annexes I and J). In simulations constructed by the Lower Tier Project Office (PATRIOT), the inbound [redacted]

iv. [redacted]

[redacted]

[redacted]

v. [redacted] Both PATRIOT hard copy data (Annex H) and independent AWACS and KAOC verification (Annex K) show that Yahoo 76 was not transponding ("squawking") IFF at the time of the engagement. [redacted]

vi. [redacted] We believe it may have helped shape the PATRIOT fire control team's mistaken belief that they had to engage the target immediately. Further research into this must be accomplished by LTPO and the UK Air Warfare Center.

vii. [redacted] A review of the cockpit audio and video tape (Annex O) of Yahoo 75's flight appears to show that this step was not taken prior to the launch of the PATRIOT missile. The recently recovered Yahoo 76 Aircraft Data Recorder (ADR) should demonstrate whether the [redacted] was still in operation at the time of the engagement[1].

b. (U) Identification of Friend or Foe (IFF).

i. [redacted]

[redacted]

[redacted]

ii. (U) PATRIOT IFF status

(1) [redacted] PATRIOT [redacted] More importantly, the PATRIOT system automatically interrogates a track before any engagement. If a target responds with at least one valid response [redacted] the engagement process is halted.

(2) [redacted] However, since Yahoo 76 was not squawking on any mode this was not a proximate cause of the incident.

iii. (U) Yahoo 76 IFF status

(1) [redacted]

(2) [redacted] The Tornado GR4 ground crew entered the IFF codes before take-off (Annex Q). Pre-flight checks confirm that Yahoo 76 took-off with all modes serviceable (Annex Q). [redacted] E-3 and the Kuwaiti AOC radars show that Yahoo 76 was not squawking any IFF modes/codes as it crossed the Kuwaiti border[2]. According to

[2] We await evidence from a UK E-3D as a third primary source of evidence.

[redacted]

Yahoo 75 video, there were no calls from the controlling units to indicate Yahoo 76 either was or was not transponding IFF correctly.

c. [redacted]

d. (U) Crew training status.

i. (U) PATRIOT Crew.

(1) (U) Certification Process (Annex S). PATRIOT crews work toward attaining three levels of certification IAW the PATRIOT Combined Arms Training Strategy and Unit SOPs. Each of these certification levels includes air battles which are highly intense. They teach crews to react quickly, engage early, and trust their system. The training simulations do not include tracks that are false or spurious as seen in reality. Each level and the required standard is summarized below.

(a) (U) Table IV Certification (Individual Level): Table IV certification for the Tactical Control Officer (TCO) and the Tactical Control Assistant (TCA) consists of two elements: 1) a comprehensive written examination and 2) a practical exercise. The Table IV certification for the crew's communication specialist is accomplished via the practical exercise. Table IV certification means the individual has demonstrated the basic skills necessary to begin training with their assigned crew.

(b) (U) TCOs spend nine weeks in the Air Defense Artillery School studying the PATRIOT weapon system, tactics, techniques, and procedures. They are tested throughout that nine-week period. The school's objective is to fully prepare the officer for a Table IV certification after arrival at his first unit of assignment. TCA training in the Air Defense School is similar. The communication specialist is not involved in the tactical employment of the system. His job is to ensure all the communication equipment is operational.

(c) (U) After arrival to the unit, TCO's and TCA's spend some amount of time (normally 30 days) studying unit specific tactics, techniques, and procedures normally governed by the unit's unique mission. They also spend a great deal of time in the Engagement Control Station (ECS) fighting simulated air battles designed to be representative of threat situations they may encounter.

(d) (U) Once ready, the next higher level of command (the PATRIOT Battalion Headquarters) administers a written test. Assuming that test is passed, the Battalion level Tactical Director administers a practical test involving power up and initialization procedures and an air battle. If for any reason the standard is not met, retraining is conducted until the desired level of proficiency can be demonstrated.

(e) (U) Table VIII Certification (Crew Level): The TCO, TCA, and the communication specialist then continue their training working toward a Table

VIII certification. Table VIII certification is the minimum level required for conducting combat operations. The train-up towards a Table VIII certification focuses on the crew learning to work as a team and on their proficiency at increased complex situations. It includes demonstrating the ability to prepare the equipment for movement, setting the equipment up, putting the equipment into operations, and conducting a more complex air battle. When ready, the crew undergoes a Table VIII certification by the Battalion. Table VIII certification means the crew has demonstrated the skills necessary to put the PATRIOT weapon system into operation and successfully execute the air battle skills to counter a moderately difficult threat.

(f) (U) Table XII Certification (Fire Unit Level): The final certification level is called Table XII. Table XII requires the same type of evaluation, as does Table VIII. However, Table XII includes the challenges of difficult operating environmental conditions and their impact on the crew's ability to successfully operate the PATRIOT Fire Unit. Those conditions include, night-time, under NBC conditions, and adverse weather. This is also coupled with a more challenging air battle.

(2) [redacted] Certification status. [redacted] The crew was certified at Table VIII in February 2003 shortly before they deployed to Operation Iraqi Freedom.

(3) (U) Experience. The TCO and her crew completed their certification just prior to deployment. That fact alone indicates they were inexperienced. Their training prior to arrival in this theater focused on generic threats representative of the wide array of potential threats a PATRIOT crew could see in several possible deployment locations. There was no time spent specifically focused on the ballistic missile, cruise missile, anti-radiation missile, and air threat posed by Iraq. Based upon their statements, it is clear that their knowledge of the detailed characteristics of Iraqi threats, and how the PATRIOT system detects, classifies, discriminates, and engages those threat is rudimentary. However, they had passed the required certifications and demonstrated through questioning in their statements the basic knowledge necessary to identify and engage threatening targets IAW the rules of engagement in the theater.

ii. [redacted] Tornado GR4 Aircrew. The crews of both Yahoo 75 and 76 were very experienced aircrews (Annex I). All were classed as attack combat ready, the standard required to fly combat missions, and gained after completing the combat ready work-up syllabus on the squadron, and after the Operational Conversion Unit. In addition the crews were combat ready in the ALARM specialist role. The No 1 Group RAF Tornado GR4 Combat Ready Syllabus is enclosed at (Annex T).

iii. [redacted] Other Human Factors. The sortie was [redacted] long and the crew had rested before the sortie. The sortie against the [redacted] will have been taxing and stressful. The aircrew may have

taken action to evade anti-aircraft artillery and surface to air missiles during the sortie, and the [redacted]. The crews of Yahoo 75 and 76 were very experienced. On this rotation on Operation SOUTHERN WATCH[3] the pilot and navigator of the lead aircraft, Yahoo 75, had flown [redacted] It is probably reasonable to assume that levels of anxiety would have been reducing on the return to Kuwait and the distancing from the very high threat in the Baghdad area. However, the aircrew was aware of the challenge of returning through Kuwait airspace, and also the [redacted] threat around Ali Al Salem Airbase. This threat accounts for Yahoo 75's assumption that the missile fired at them was an infrared homing SAM and their use of flares as a counter-measure (Annex I). [redacted]

e. (U) PATRIOT Operations

i. [redacted]

(1) [redacted]

(2) [redacted]

ii. (U) GR4 Tornado Operations

(1) (U) [redacted]

[3] The UK codeword for the operation is Operation RESINATE SOUTH.
[4] The UK codeword for the operation is Operation TELIC.

[redacted]

(2) [redacted]

f. (U) Engagement Process (Annex V).

i. [redacted]

(a) [redacted]

(b) [redacted]

(c) [redacted]

(d) [redacted]

(e) [redacted]

(f) [redacted]

(g) [redacted]

(2) [redacted]

(a) [redacted]

(b) [redacted]

(c) [redacted]

ii. [redacted]

(1) [redacted] According to the crews' statements, the TCA was looking at his scope at the time of the incident. [redacted] The TCO may have had her back to the console to work temporarily on the [redacted] When the TBM alert went off, the TCA stated [redacted]

(2) [redacted] Sequence of events at unit:

(a) [redacted] TCA received [redacted] alert from system

[redacted]

[redacted]

(b) [redacted] TCA notified TCO of [redacted] attack

(c) [redacted] TCO notifies B-2/1 of [redacted] attack. B-2/1 confirms receipt of message.

(d) [redacted]

(e) [redacted]

(f) [redacted]

(g) [redacted]

(h) [redacted]

(i) [redacted]

(j) [redacted]

(k) [redacted] TCA engages [redacted] Communications Technician battle shorts the EPP

g. [redacted]

h. (U) PATRIOT Equipment Status. There has been no equipment serviceability issues identified that would have contributed to the events that led to this incident.

i. (U) Tornado GR4 Equipment Status. The Aircraft Maintenance Form (Annex Q) is evidence that Yahoo 76 was serviceable on take-off. The HF radio required testing in the air to the satisfaction of the pilot. Also there were a number of acceptable deferred faults, all approved by the appropriate engineering officer. None of these contributed to the incident.

7. [redacted] Other Insights.

a. [redacted]

b. [redacted]

8. [redacted] Conclusions:

a. [redacted] The PATRIOT crew fired in self-defense, following appropriate procedures, [redacted] Recommend that no one be found negligent.

b. [redacted]

[redacted]

[redacted]

9. (U) Recommendations:

a. (U) Immediate steps that were taken:

i. [redacted] 23 March 03: CFACC orders immediate changes to ROE/SPINS.

(1) [redacted]

(2) [redacted]

(3) [redacted]

(4) [redacted]

ii. [redacted] 3 April 03: 32AAMDC issues further changes to ROE and [redacted] criteria.

(1) [redacted]

(2) [redacted]

(3) [redacted]

(4) [redacted]

(5) (U) Detailed evaluation criteria published as a check list to all PATRIOT crews to ensure they are tracking valid targets

iii. (U) Every attempt being made to expand communications for autonomous batteries via battery command posts, and/or point to point communications with a higher echelon controlling element (e.g. ICC).

iv. (U) Emphasized importance of operable IFF on PATRIOT and all aircraft platforms.

b. (U) Further steps to be taken immediately:

i. [redacted] Emphasis must be placed on the importance of IFF on PATRIOT and all aircraft platforms. Further engineering analysis must take place to determine the effects of other factors on IFF. Some examples might be, [redacted]

ii. [redacted]

c. (U) Future steps:

i. (U) Lower tier project office (PATRIOT) conduct extensive work with the Joint/Coalition Air Warfare Centers/System Centers to:

(1) [redacted]

(2) [redacted]

[redacted]

ii. (U) Areas for further Joint and Combined exploration to avoid future reoccurrence:

(1) (U) Training: individual, crew and collective
(2) (U) EMI on dense battlefield
(3) (U) Airspace control/management
(4) (U) Combat ID/ROE/PATRIOT Classification procedures
(5) (U) Operational employment of weapon systems

10. (U) Annexes

Annex A: Appointment Letter

Annex B: Foreign Disclosure Guidance

Annex C: Operational Summary for 22 and 23 Mar 2003

Annex D: Air Tasking Order P

Annex E: Role Equipment and Expendable Stores

Annex F: [redacted]

Annex G: PATRIOT Classification Logic

Annex H: PATRIOT Hard Copy of the Engagement

Annex I: Sworn Statement of Wing Commander [redacted]

Annex J: Sworn Statement of Squadron Leader [redacted]

Annex K: AWACS, ADSI, and Kuwaiti Air Operations Center radar data

Annex L: 1LT [redacted] sworn statements

Annex M: SP4 [redacted] sworn statements

Annex N: Tornado GR4 Fence Checks

Annex O: Yahoo 75 Cockpit Audio and Video recording

Annex P: PATRIOT Hard Copy of valid Mode IV return

Annex Q: Supplementary Flight Servicing Register

Annex R: Rapier Log

Annex S: PATRIOT Combined Arms Training Strategy

Annex T: Tornado GR4 Combat Ready Workup Syllabus

Annex U: Captain [redacted] sworn statement

Annex V: PATRIOT FORSCOM Tactical Standard Operating Procedures

Annex W: ROE in effect prior to incident

Annex X through EG: Other evidence considered in the investigation

Floppy
Disk

2 CDs

REPORT OF PROCEEDINGS BY INVESTIGATING OFFICER/BOARD OF OFFICERS

For use of this form, see AR 15-6; the proponent agency is OTJAG.

IF MORE SPACE IS REQUIRED IN FILLING OUT ANY PORTION OF THIS FORM, ATTACH ADDITIONAL SHEETS

SECTION I - APPOINTMENT

Appointed by HOWARD B. BROMBERG, BG, USA; DEPUTY AREA AIR DEFENSE COMMANDER
(Appointing authority)

on 26 MARCH 03 *(Date)* *(Attach inclosure 1: Letter of appointment or summary of oral appointment data.) (See para 3-15, AR 15-6.)*

SECTION II - SESSIONS

The *(investigation) (board)* commenced at CAMP DOHA, KUWAIT *(Place)* at 1900 HRS *(Time)*

on 26 MARCH 2003 *(Date)* *(If a formal board met for more than one session, check here* ☐*. Indicate in an inclosure the time each session began and ended, the place, persons present and absent, and explanation of absences, if any.)* The following persons *(members, respondents, counsel)* were present: *(After each name, indicate capacity, e.g., President, Recorder, Member, Legal Advisor.)*

BG ROBERT P. LENNOX, PRESIDENT
COL [redacted] MEMBER
WG CDR [redacted] PARTICIPANT
CW3 [redacted], MEMBER
COL [redacted] TECHINICAL ADVISOR
COL [redacted], TECHNICAL ADVISOR
COL [redacted], LEGAL ADVISOR

The following persons *(members, respondents; counsel)* were absent: *(Include brief explanation of each absence.) (See paras 5-2 and 5-8a, AR 15-6.)*

The *(investigating officer) (board)* finished gathering/hearing evidence at 1300 HRS *(Time)* on 6 APRIL 2003 *(Date)*

and completed findings and recommendations at 1600 HRS *(Time)* on 11 APRIL 2003 *(Date)*

SECTION III - CHECKLIST FOR PROCEEDINGS

A. COMPLETE IN ALL CASES

1		YES	NO[1]	NA[2]
	Inclosures *(para 3-15, AR 15-6)*			
	Are the following inclosed and numbered consecutively with Roman numerals: *(Attached in order listed)*			
	a. The letter of appointment or a summary of oral appointment data?	X		
	b. Copy of notice to respondent, if any? *(See item 9, below)*			X
	c. Other correspondence with respondent or counsel, if any?			X
	d. All other written communications to or from the appointing authority?	X		
	e. Privacy Act Statements *(Certificate, if statement provided orally)?*	X		
	f. Explanation by the investigating officer or board of any unusual delays, difficulties, irregularities, or other problems encountered *(e.g., absence of material witnesses)?*			X
	g. Information as to sessions of a formal board not included on page 1 of this report?			X
	h. Any other significant papers *(other than evidence)* relating to administrative aspects of the investigation or board?			

FOOTNOTES: *1/ Explain all negative answers on an attached sheet.*
2/ Use of the N/A column constitutes a positive representation that the circumstances described in the question did not occur in this investigation or board.

		YES	NO 1/	NA 2/
	a. Are all items offered *(whether or not received)* considered as evidence individually numbered or lettered exhibits and attached to this report?	X		
	b. Is an index of all exhibits offered to or considered by investigating officer or board attached before the first exhibit?	X		
	c. Has the testimony/statement of each witness been recorded verbatim or been reduced to written form and attached as an exhibit?	X		
	d. Are copies, descriptions, or depictions *(if substituted for real or documentary evidence)* properly authenticated and is the location of the original evidence indicated?	X		
	e. Are descriptions or diagrams included of locations visited by the investigating officer or board *(para 3-6b, AR 15-6)?*	X		
	f. Is each written stipulation attached as an exhibit and is each oral stipulation either reduced to writing and made an exhibit or recorded in a verbatim record?	X		
	g. If official notice of any matter was taken over the objection of a respondent or counsel, is a statement of the matter of which official notice was taken attached as an exhibit *(para 3-16d, AR 15-6)?*			X
3	Was a quorum present when the board voted on findings and recommendations *(paras 4-1 and 5-2b, AR 15-6)?*	X		
B.	COMPLETE ONLY FOR FORMAL BOARD PROCEEDINGS *(Chapter 5, AR 15-6)*			
4	At the initial session, did the recorder read, or determine that all participants had read, the letter of appointment *(para 5-3b, AR 15-6)?*			
5	Was a quorum present at every session of the board *(para 5-2b, AR 15-6)?*			
6	Was each absence of any member properly excused *(para 5-2a, AR 15-6)?*			
7	Were members, witnesses, reporter, and interpreter sworn, if required *(para 3-1, AR 15-6)?*			
8	If any members who voted on findings or recommendations were not present when the board received some evidence, does the inclosure describe how they familiarized themselves with that evidence *(para 5-2d, AR 15-6)?*			
C.	COMPLETE ONLY IF RESPONDENT WAS DESIGNATED *(Section II, Chapter 5, AR 15-6)*			
	Notice to respondents *(para 5-5, AR 15-6):*			
	a. Is the method and date of delivery to the respondent indicated on each letter of notification?			
	b. Was the date of delivery at least five working days prior to the first session of the board?			
	c. Does each letter of notification indicate –			
	(1) the date, hour, and place of the first session of the board concerning that respondent?			
	(2) the matter to be investigated, including specific allegations against the respondent, if any?			
	(3) the respondent's rights with regard to counsel?			
	(4) the name and address of each witness expected to be called by the recorder?			
	(5) the respondent's rights to be present, present evidence, and call witnesses?			
	d. Was the respondent provided a copy of all unclassified documents in the case file?			
	e. If there were relevant classified materials, were the respondent and his counsel given access and an opportunity to examine them?			
	If any respondent was designated after the proceedings began *(or otherwise was absent during part of the proceedings):*			
	a. Was he properly notified *(para 5-5, AR 15-6)?*			
	b. Was record of proceedings and evidence received in his absence made available for examination by him and his counsel *(para 5-4c, AR 15-6)?*			
	Counsel *(para 5-6, AR 15-6):*			
	a. Was each respondent represented by counsel?			
	Name and business address of counsel:			
	(If counsel is a lawyer, check here ☐)			
	b. Was respondent's counsel present at all open sessions of the board relating to that respondent?			
	c. If military counsel was requested but not made available, is a copy *(or, if oral, a summary)* of the request and the action taken on it included in the report *(para 5-6b, AR 15-6)?*			
	If the respondent challenged the legal advisor or any voting member for lack of impartiality *(para 5-7, AR 15-6):*			
	a. Was the challenge properly denied and by the appropriate officer?			
	b. Did each member successfully challenged cease to participate in the proceedings?			
	Was the respondent given an opportunity to *(para 5-8a, AR 15-6):*			
	a. Be present with his counsel at all open sessions of the board which deal with any matter which concerns that respondent?			
	b. Examine and object to the introduction of real and documentary evidence, including written statements?			
	c. Object to the testimony of witnesses and cross-examine witnesses other than his own?			
	d. Call witnesses and otherwise introduce evidence?			
	e. Testify as a witness?			
	f. Make or have his counsel make a final statement or argument *(para 5-9, AR 15-6)?*			
	If requested, did the recorder assist the respondent in obtaining evidence in possession of the Government and in arranging for the presence of witnesses *(para 5-8b, AR 15-6)?*			
	Are all of the respondent's requests and objections which were denied indicated in the report of proceedings or in an inclosure or exhibit to it *(para 5-11, AR 15-6)?*			

FOOTNOTES: 1/ *Explain all negative answers on an attached sheet.*
2/ *Use of the N/A column constitutes a positive representation that the circumstances described in the question did not occur in this investigation or board.*

SECTION IV - FINDINGS *(para 3-10, AR 15-6)*

The ~~*(investigating officer)*~~ *(board)*, having carefu considered the evidence, finds:
SEE THE ATTACHED MEMORANDUM TAINING THE BOARD'S FINDINGS.

SECTION V - RECOMMENDATIONS *(para 3-11, AR 15-6)*

n view of the above findings, the ~~*(investigating officer)*~~ *(board)* recommends:
EE THE ATTACHED MEMORANDUM CONTAINING THE BOARD'S RECOMMENDATIONS.

SECTION VI - AUTHENTICATION *(para 3-17, AR 15-6)*

THIS REPORT OF PROCEEDINGS IS COMPL[illegible] AND ACCURATE. *(If any voting member or t[illegible] order fails to sign here or in Section VII below, indicate the reason in the space where his [illegible]ature should appear.)*

[redacted], WG CDR, ~~USAF~~ RAF
~~(Recorder)~~ PARTICIPANT

ROBERT P. LENNOX, BG, USA
(Investigating Officer) (President)

(Member)

[redacted], COL, USA
(Member)

(Member)

[redacted], CW3, USA
(Member)

SECTION VII - MINORITY REPORT *(para 3-13, AR 15-6)*

To the extent indicated in Inclosure _____, the undersigned do(es) not concur in the findings and recommendations of the board. *(In the inclosure, identify by number each finding and/or recommendation in which the dissenting member(s) do(es) not concur. State the reasons for disagreement. Additional/substitute findings and/or recommendations may be included in the inclosure.)*

(Member)

(Member)

SECTION VIII - ACTION BY APPOINTING AUTHORITY *(para 2-3, AR 15-6)*

The findings and recommendations of the *(~~investigating officer~~ board)* are *(approved) (~~disapproved~~) (approved with following exceptions/substitutions). (If the appointing authority returns the proceedings to the investigating officer or board for further proceedings or corrective action, attach that correspondence (or a summary, if oral) as a numbered inclosure.)*

[redacted]

DEPARTMENT OF THE ARMY
32d ARMY AIR AND MISSILE DEFENSE COMMAND
COALITION FORCES LAND COMPONENT COMMAND
UNITED STATES ARMY FORCES CENTRAL COMMAND
THIRD UNITED STATES ARMY
APO AE 09889

REPLY TO
ATTENTION OF:

S: 16 April 2001

AFVL-CG (15-6)

26 March 2001

MEMORANDUM FOR BG Robert P. Lennox, Deputy Commanding General, U.S. Army Air Defense Center and Fort Bliss, Fort Bliss, TX 79916

SUBJECT: Investigating Officer Appointment

1. [redacted] Appointment. You are appointed as President of a Board of Officers pursuant to Army Regulation (AR) 15-6 to conduct an investigation into all facts and circumstances surrounding the suspected downing on, or about, 23 March 2003 of a GR-4 Tornado aircraft of Her Majesty's Royal Air Force (RAF) (United Kingdom) aircraft by a Patriot missile fired by a U.S. Army air defense unit. This is a "legal investigation" as envisioned by DoDD 6055.7, para E4.7. This investigation is the primary duty for you and the other appointed officers and takes precedence over all other duties assigned. LTC (P) [redacted] and CW4 [redacted], U.S. Army Air Defense Artillery Center, are designated as the remaining board members.

2. [redacted] United Kingdom Coordination and Participation.

a. [redacted] United Kingdom Participation. United Kingdom authorities have designated Wing Commander John [redacted] RAF, to participate in this board. You will collaborate with him on opinions as to the cause of the incident and seek his recommendations as to corrective measures to the extent they address combined or coalition military activities. In addition, and as appropriate, you and Wing Commander [redacted] may each make individual findings of fact, opinions, or recommendations, or reserve concurrence on specific matters as each of you deem appropriate. Only United States board members will make assessments as to fault or neglect and recommendations concerning administrative and disciplinary actions involving United States personnel. Wing Commander [redacted] will conduct liaison with his national representatives in the conduct of their internal Board of Investigation into this incident. However, information, data, evidence, witness statements or any other material will only be provided to United Kingdom authorities subject to safeguard and use restrictions set forth in applicable United States and United Kingdom national laws and regulations. Information concerning the board proceedings, testimony, findings, conclusions and/or recommendations shall be released as agreed upon the respective governments.

[redacted]

b. [redacted] Coordination with United Kingdom Board of Investigation. To the maximum extent possible, you should coordinate your investigative efforts with the United Kingdom Board of Investigation that is conducting a concurrent investigation. Board members of the two investigations should conduct joint interviews of witnesses.

3. (U) Legal Orientation. Before you begin your investigation, you must receive a briefing from your legal advisor, COL [redacted], Office of the Staff Judge Advocate, Coalition Forces Land Component Command, Building 8, Bay 13, Camp Doha, Kuwait, (DSN) [redacted] You must have your legal briefing completed no later than 27 March 2003. You will consult with COL [redacted] regarding all aspects of this investigation, including developing an investigative plan, determining whether United States witnesses need to be advised of their rights under the UCMJ, Article 31 or the Fifth Amendment, special procedures for interviewing Department of the Army civilian employees, and preparing findings and recommendations. COL [redacted] will provide you with the forms and regulations necessary for you to complete your investigation.

4. (U) Procedures. While the manner of conduct of the board will be as directed by you, you should conduct this investigation using the procedures outlined in AR 15-6. No individual has been named as a respondent at this time. All witnesses will be sworn prior to their interview. You are to thoroughly document all witness interviews in writing, preferably on a DA Form 2823 (Sworn Statement). You will interview all witnesses in person, if practical. If in the course of your investigation you come to suspect that certain United States citizens may have committed criminal conduct, you must advise them of their rights under Article 31, UCMJ, or the Fifth Amendment, U.S. Constitution, as appropriate. Witness waivers of their Article 31 or Fifth Amendment rights will be documented on a DA Form 3881 (Rights Warning Procedure/Waiver Certificate). In addition, you may need to provide a witness with a Privacy Act statement before you solicit any information. You are to maintain a daily written chronology of your actions on this investigation. You are strongly encouraged to consult your legal advisor if you have any questions regarding these procedures.

5. [redacted] Evidence. Your investigation will obtain and preserve all available evidence for use in litigation, claims, and disciplinary actions. To this end, all physical evidence (e.g., aircraft video and audio recordings) will be immediately secured, preserved, and provided to the investigating board upon request.

6. [redacted] Specific Areas for Inquiry. The report of investigation must include, but is not limited to, findings on the following issues:

a. [redacted] Establish a detailed timeline of the events of 23 March 2003 that lead to the loss of the RAF aircraft, tracking the actions of both the aircraft and C Battery, 5th Battalion of the 52 Air

[redacted]

Defense Artillery Regiment, 11th Air Defense Artillery Brigade, 32 Army Air Missile Defense Command (C Battery, 5-52 ADA), the unit which possibly downed the RAF aircraft.

b. [redacted] A comprehensive review of all factors relating to the actions of C Battery, 5-52 ADA, that you believe may have contributed to the possible downing of the RAF aircraft. Provide a review, where appropriate, of technical training of unit members, tactical employment of the unit, the established doctrine for siting of this type of unit, the established doctrine for engagement of aerial targets by this type of unit, unit Standard Operating Procedures (SOP) for tactical employment, performance and readiness of unit members, performance of unit weapons systems (to include: radar systems, communications systems internal and external to the unit, graphic display systems used to convey information to the Tactical Control Officer and section of the unit, and the missile systems in use by the unit), the Special Instructions (SPINS) and the Rules for Engagement (ROE) used by this unit.

c. [redacted] A complete review of any factors relating to the employment of this RAF aircraft that you believe contributed to its possible downing. Provide a review, where appropriate, of technical training of the aircrew, tactical employment of the aircraft, coordination of air control measures for the battle space, unit Standard Operating Procedures (SOP), briefings provided to the crew, performance and readiness of crew members, performance of the aircraft systems (to include: radar systems, communications systems, anti-fratricide systems such as transponders to identify friendly aircraft (IFF)).

d. [redacted] If you determine that the RAF aircraft was downed by a Patriot missile fired by C Battery, 5-52 ADA, provide me with specific recommendations as to whether any unit member's actions rise to the level of negligence, dereliction, or misconduct. If fault, negligence, dereliction, or misconduct are identified, provide me with recommendations on the appropriate level of disposition.

e. [redacted] If you determine that the RAF aircraft was downed by a Patriot missile fired by C Battery, 5-52 ADA, provide me with specific recommendations to prevent recurrence of such events in the future, identifying systemic technical, tactical, or SPINS/ROE related deficiencies, as well as unit-specific deficiencies that must be corrected. Identify any retraining requirements for unit members.

You will consult with your legal advisor in developing your findings and recommendations. Submit your findings and recommendations on a DA Form 1574 (Report of Proceedings by an Investigating Officer/Board of Officers) to me no later than 16 April 2003. Submit any requests for modification of this suspense or the scope of your investigation to me, through your legal advisor.

[redacted]

6. (U) Expert Assistance. COL[redacted] Project Manger, Lower Tier Air Missile Defense, and Col[redacted], USAF, CFACC LNO to 32d Air Missile Defense Command are appointed as technical advisor to assist you in the conduct of your investigation. If you require additional expert assistance during the course of this investigation (such as public affairs, medical, technical, or safety experts) you may request the appointment of technical advisors to provide expert testimony and assistance.

7. (U) Criminal Misconduct. If you determine through your investigation that possible criminal conduct has occurred, immediately notify your legal advisor before proceeding any further with your investigation.

8. [redacted] Foreign Nondisclosure. While it is believed that your investigation can be conducted without transfer of techniques, tactics, procedures, or technology for which foreign disclosure is limited, if you identify such issues, you will contact the Office of the Legal Advisor, U.S. Central Command, for assistance.

9. (U) Coordination. This appointment was made after coordination with the Commander, U.S. Central Command, and the Commanding Generals, Coalition Forces Land Component Command, Coalitional Forces Air Component Command. This investigation constitutes the "legal investigation" of the Commander, U.S. Central Command, and appointment is made pursuant to his delegation of authority to the Commander, Coalitional Forces Air Component Command, and a subsequent redelegation to me. Additionally, your appointment, and the designation of the technical advisors was made after securing the approval of your and their commander, MG Stanley Green, Commanding General, U.S. Army Air Defense Center and Fort Bliss.

HOWARD B. BROMBERG
Brigadier General, USA
Deputy Area Air Defense Commander

[redacted]

TAB A

DEPARTMENT OF THE AIR FORCE
UNITED STATES CENTRAL COMMAND AIR FORCES (USCENTAF)
APO AE 09871

25 March 2003

MEMORANDUM FOR BGEN HOWARD B. BROMBERG
DEPUTY AREA AIR DEFENSE COMMANDER

FROM: COMUSCENTAF

SUBJECT: Investigation of Friendly Fire Incident

1. You are hereby directed to conduct an investigation of the friendly fire incident that reportedly occurred earlier this date in which a Patriot Missile engaged a UK GR-4 aircraft in the airspace of Kuwait.

2. The investigation will, in accordance with Department of Defense Instruction 6055.7, paragraph E4.6, inquire into all facts and circumstances surrounding the suspected friendly fire incident and will obtain and preserve all available evidence for use in litigation, claims, disciplinary actions, or adverse administrative actions. The investigation will include findings of fact, opinions, and recommendations to include the cause of the incident. Further, the investigation will make an assessment as to any fault or neglect and make recommendations concerning corrective measures and disciplinary actions, as appropriate.

3. The investigation will be conducted by a board of officers, with a general officer named as its president and composed of additional officers of appropriate training and expertise. The Board will be supported by special assistants such as legal advisers, Public Affairs officers, and medical, safety and technical experts. Finally, the Board will have assigned administrative support personnel qualified to catalog, maintain and preserve all evidence, document chain of custody, and take and transcribe testimony or statements, in order to ensure availability and admissibility for any possible future legal actions. The manner of conduct of the Board will be as directed by the Board chair. While service regulations may be used as a guide, the report of investigation will meet the requirements set forth in this memorandum.

4. UK authorities may appoint an officer to participate in this Investigation Board. The president of the Board of Investigation will collaborate with him on opinions as to the cause of the incident and seek his recommendations as to corrective measures to the extent they address combined or coalition military activities. In addition, and as appropriate, the US president and the UK participant may each make individual findings of fact, opinions or recommendations, or reserve concurrence on specific matters as each of them may deem appropriate. Assessments as to fault or neglect and recommendations concerning administrative and disciplinary actions involving US personnel shall only be made through US Board members. The UK participant will conduct liaison with his national representatives in the conduct of their internal Board of Investigation into this incident. However, information, data, evidence, witness statements or any other material provided to, obtained or developed by the investigating board will only be provided to UK authorities subject to safeguards and use restrictions set forth in applicable us and British national laws and regulations. Information concerning the board proceedings, testimony, findings, conclusions and/or recommendations shall be released as agreed upon by the respective governments.

5. All physical evidence (e.g., aircraft video and audio recordings) will be immediately secured, preserved, and provided to the investigating board upon request. The Board of Investigation shall not conduct witness interviews or perform site visits until the UK has named a Board participant and that participant has been afforded the opportunity to be present.

6. Investigative reports will be submitted to USCENTAF not later than 23 April 2003, with any request for extension submitted to me in writing prior to this date. This appointment order authorizes you all necessary assistance from members of my command in executing this tasking. Access to records germane to this review will be provided. All public affairs activity shall be coordinated in advance with USCENTCOM PAO, Col [redacted] USCENTCOM FWD, [redacted]

T. MICHAEL MOSELEY
Lieutenant General, USAF
Commander

TAB B

[redacted]

From: [redacted]
Sent: Thursday, March 27, 2003 7:31 AM
To: [redacted]
Cc: [redacted] DCS, G-2
Subject: Policy Guidance

[redacted]

[redacted]

(U) This disclosure is required to prevent further loss of life and is consistent with Army Disclosure policy and is driven and supported by urgent military necessity.

(U) The following conditions and limitations apply:

1. The PM, LTO will only disclose that CMI necessary to support this investigation.
2. That these disclosures will be recorded and reported back to DAMI-CDD as soon as practically possible.

(U) Request the acknowledgement of this e-mail upon receipt.

(U) Point of Contact for this request is MAJ [redacted] HQDA, DCS G-2, DAMI-CDD [redacted].

[redacted]

TAB C

MATERIALS REDACTED IN ENTIRETY (TAB OMITTED)

FOIA Ex 1 (NS)

TAB D

MATERIALS REDACTED IN ENTIRETY (TAB OMITTED)

FOIA Ex 1 (NS)

TAB E

Materials redacted in entirety (tab omitted)

FOIA Ex1 (NS)

TAB F

MATERIALS REDACTED IN ENTIRETY (TAB OMITTED)

FOIA Ex1(NS)

TAB G

MATERIALS REDACTED IN ENTIRETY (TAB OMITTED)

FOIA Ex 1 (NS)

TAB H

MATERIALS REDACTED IN ENTIRETY (TAB OMITTED)

FOIA (Ex 1)(NS)